*cxImpact User Manual*

# Contents

**IBM Tealeaf cxImpact User manual.....1**
cxImpact Overview.....1
What is Tealeaf cxImpact?.....1
How cxImpact Works.....1
Working with visitor session data in Tealeaf.....15
Logging on to the Tealeaf Portal.....15
Understanding the menu bar options on Portal user interface.....16
Licensing considerations.....17
Tealeaf status messages.....18
Delete sessions.....20
Real-time monitoring of Tealeafactivities.....21
Displaying active status for hit and session activity.....21
Interpreting Active Status report data.....22
Listing Active Sessions.....23
Active Session command icons.....24
How data in the Active Sessions list is organized.....25
Setting columns for your Session list report.....26
Displaying active events.....26
Working with the Active Events report.....27
Filter options for the Active Events list.....28
Filtering the Active Events list.....28
Working with the Alert status.....28
Portal search capabilities.....30
Searching session data.....30
Search field configuration.....41
Working in the Session list page.....55
Other functions that you can perform from the Session List page.....64
Search and indexing.....66
Searching for visitors.....67
Search Keywords.....83
Scoring Search Results.....88
Overview of segments.....88
The Managing Session Segments page.....89
Working in the Manage Session Segments page.....89
Importing externally created segments.....91
Combining segments.....93
Analyzing session segments.....94
Creating session segments.....94
Session segments and user association.....94
Controlling the auto-generation of session segments.....94
Selecting reports from the Report gallery.....95
Analyzing the sequence of pages for session segments.....105
My Reports.....107
Managing visitor segments.....108
Fields on the Completed Searches page.....109
Visitor segments context menu commands.....109
Configuring Tealeaf.....110
Configuring preferences and setting your password.....110
Browser Based Replay.....112
Opening Browser Based Replay to access sessions.....113
Session replay.....114

Finding pages to view in Browser Based Replay....132
Managing the BBR interface.... 132
Searching Archived Sessions for Text.... 132
Sharing sessions for replay with other Tealeaf users.... 133
Creating Event Data from BBR....134
Configuring the replay server or associated proxy server.... 134
Browser Based Replay interface....135
Browser Based Replay menu bar.... 135
Browser Based Replay toolbar.... 141
Content Pane....143
Display views....144
Page statistics.... 149
Navigation Pane.... 150
Events pane....156
Form Fields pane....157
Session statistics....158
Tracking Interactions through BBR....158
Shadow Browsing Live Sessions....159
Replay Highlighting.... 159
Adding annotations.... 159
Finding search results in BBR....160
BBR Replay of Client User Interface Events....161
Sub-Search in BBR....161
Searching for Sessions....161
Filtered Results.... 165
Sub-Search in RTV.... 169
BBR replay rules.... 169
Replay rule types....170
Replay rule configuration in BBR....177
Replay Rule Configuration through the Replay Server....184
Replay Rule Configuration in RTV....187
Replay Rule Configuration File....188
Step-based eventing....189
Prerequisites and limitations using for step-based eventing.... 190
Message types....191
Step-based objects.... 194
Browser based replay and step-based events....196
Event manager processing of step-based event objects ....198
Indexing and step-based events.... 204
Reference information about BBR and Events....205
Tealeaf End-to-End Scenarios.... 205
E2E Scenario - Auditing Page Counts.... 206
E2E Scenario - Build Top IPs and Top IPs by Referrer dashboard reports....209
E2E Scenario - Configure Login ID to be Searchable.... 218
E2E Scenario - Create Conversion Rate Dashboard....225
E2E Scenario - Create Top Products Dashboard....243
E2E Scenario - Getting Value out of Tealeaf in One Hour.... 255
E2E Scenario - Configure Login ID to be Searchable.... 274
IBM Tealeaf documentation and help....294

**Index.... 296**

# IBM Tealeaf cxImpact User manual

Use this manual to learn how IBM Tealeaf processes data that is captured from a visitor's interaction with your website and for instructions on how to use that data to analyze your customer's experience and improve the effectiveness of your website.

**Intended audience**

The intended audience for the *IBM Tealeaf cxImpact User manual* are:

- Application developers who design and develop your customer-facing websites.
- Business analysts who have a thorough understanding of your online strategies and business goals.
- Tealeaf Professional Services personnel or IBM Tealeaf users who understand how to analyze and extrapolate session data using the IBM Tealeaf Browser Based Replay and the various reporting and analysis features available from the IBM Tealeaf Portal.

## cxImpact Overview

Use the cxImpact Overview to learn how Tealeaf® servers work together to capture and process the data that gets generated when customers visit and interact with your website.

The Overview is intended to provide users who install, configure, and use IBM® Tealeaf a general understanding of what Tealeaf data is and what it consists of, the IBM Tealeaf component architecture, and how data flows between the Tealeaf server components.

### What is Tealeaf cxImpact?

IBM Tealeaf cxImpact is customer experience management (CEM) software that performs the following functions:

- Captures each interaction between your visitors and your website.
- Processes the low-level interaction detail to provide alerts, reports, and analysis, plus playback of those interactions.
- Shows you what happened during each visitor's experience with your site.

IBM Tealeaf cxImpact enables website owners to:

- Ensure a good experience for your visitors
- Protect revenue streams
- Reduce application support costs

Businesses are relying on Web applications to deliver business-critical services. IBM Tealeaf cxImpact addresses the challenge of managing high-volume dynamic websites by providing visibility into the production state of Web applications and allowing IT operations to ascertain whether they are functioning correctly.

IBM Tealeaf cxImpact provides a single data source that captures an audit trail of what each visitor did and saw. Tealeaf users can then analyze, isolate, replicate, and communicate problems.

### How cxImpact Works

Tealeaf software running on computers in your data center is configured to see every byte of data exchanged between your web servers and the browsers on your visitors' computers. Tealeaf passively captures the bi-directional data stream and forwards a copy of each relevant packet of that data to a server running the Tealeaf system.

The figure below shows a typical IBM Tealeaf cxImpact setup with three types of Tealeaf servers.

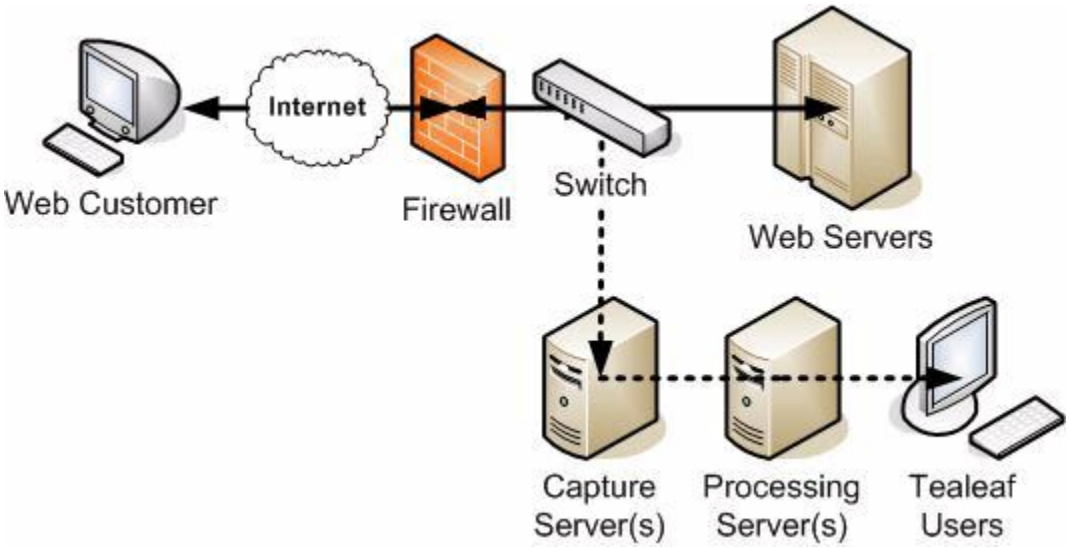



*Figure 1. Tealeaf Server Network*

- Capture Server - Tealeaf's Passive Capture software reassembles TCP/IP packets into HTTP requests and responses for each exchange between visitor and web application. Optionally, uninteresting data can be dropped, and sensitive data can be deleted. The captured combinations of requests and responses (called hits) are then forwarded to another server running the Tealeaf processing software.
- Processing Server (also called Canister Server) - Individual hits sent from the Capture Server are grouped together into a Tealeaf session, which is assembled hit-by-hit to include all web page interactions between a specific visitor and your website. The data contained in this session is scanned for keywords and codes that you have defined. When matches are found, a record of this event is stored for additional processing, including generation of reports and alerts. When the session is complete, the session is indexed for search and written to disk.
- Tealeaf Portal (also called Report Server) - This server's Web-based interface allows data analysts, business owners, IT staff, and administrative users to view the status of interactions with your website, with aggregate data reports that display what visitors are doing on your site. Tealeaf users can search the saved visitor sessions and analyze them for common attributes, such as order completion. Individual visitors' sessions can be replayed with the actual data that was sent and received, so a high-fidelity recreation of the visitor's experience can be reviewed.

**Tealeaf data capture and processing**

IBM Tealeaf includes software that captures and processes the data that flows (in the form for *requests* and *responses*) between your website and the users who interact with your website.

The following sections describe:

- How Tealeaf Passive Capture works
- How Tealeaf processes captured data

***Passive Capture***

Passive Capture is the process by which Tealeaf software captures the data that flows between your visitor's computer and your web servers.

Tealeaf's Passive Capture software runs on one or more dedicated capture servers. The following list of terms apply to the passive capture process:

**Switch**

The switch is a hardware device that routes all incoming and outgoing data packets between your visitors' computers and your web servers. Typically, switches are configured using a hardware option called a https://www.cisco.com/c/en/us/support/docs/switches/catalyst-6500-series-switches/10570-41.html, which delivers a copy of every HTTP packet to the capture server.

**Packet**

The TCP/IP protocol organizes interaction between computers into packets. An individual Web page can be broken down into many packets, each transmitted individually between computers. The capture server typically monitors millions of packets traveling nearly simultaneously between your Web servers and visitors' computers. These packets can arrive in any order and sometimes must be retransmitted. The capture server can be configured to ignore packets that are not of interest, such as email messages or packets sent to IP addresses of servers not hosting the website.

**Request**

The HTTP protocol defines a request as a message requesting a response from one computer to another. The capture server collects all HTTP data to re-create the request and response traffic.

**Response**

A response is the return message to a computer, which has made a request. After capturing a request, the capture server then processes and assembles packets in search of the response to it.

**Hit**

A hit is defined as a request and the corresponding response to it.

After the hit has been collected, the Passive Capture software can scan the data to see if the hit is of interest. For example, images that are displayed on every web page are not very interesting and can be discarded. Also, sensitive information such as user names, passwords, and credit card numbers can be deleted.

After removing unwanted data, the Capture software securely transmits the hit data to the Processing Server.

**SSL**

Many website interactions are encrypted to protect the data from being read or manipulated by third parties. The Capture software has to decrypt the data in order to match requests and responses. Typically, the Capture software is configured to re-encrypt the software using SSL for transmission to the processing servers.

### *Tealeaf data processing*

Tealeaf data processing refers to the actions performed by the Tealeaf Processing software against the data that it receives (in the form of a hit) from the Passive Capture software.

The Tealeaf processing software runs on one or more dedicated processing servers, sometimes called Canister servers. These servers are typically behind the company firewall and are not visible to the Internet. They accept connections from capture servers and receive hits for processing.

Each hit includes information that maps to a specific visitor. This information is used to group the hits into a session.

The following terms apply to Tealeaf data processing:

**Session**

As each hit is received, it is grouped with the other hits that apply to the same visitor's current interaction with your website. The processing server collects these hits until no more hits are received for the visitor or until a configured limit is reached. For example, if no more hits are received over an interval of 15 minutes, then the session can be considered complete. If a visitor performs an extended session, it may be necessary to end that session and to start a new one due time or memory constraints. While hits are arriving and being added to a session, the session is considered active. Tealeaf allows you to search for an individual session while it is still active and to view pages and interactions that have just occurred.

**Short Term Canister**

Sessions containing hits are stored in an area of volatile memory on the processing server. As each hit arrives, it is added to a new or existing session.

**Event**

As each hit is added to a session in the short-term canister, a series of events can be applied. An event is defined as a combination of a condition and an action.

The condition can be noteworthy information in the request or response code. For example, a match can be a 404 status code in the response or a particular text string such as "Purchase Confirmed."

When a condition evaluates to true, the action associated with the condition is performed. This action may be to increment a counter or to record a value. Event-related data is written to the short-term canister and may be aggregated into the report server. Some events are specific to a hit, while others can only be processed with the session. When a session ends and is written to the long-term canister, events that are associated with an entire session are evaluated. An event can be triggered off multiple conditions

**Long Term Canister**
As each session ends, either due to visitor action, lack of further hits within a timeout period, or insufficient memory to hold a longer session, it is encrypted for security and written to non-volatile storage on a hard drive. This area is called the long term canister.

**Index**
As each session is written to the long term canister, the data within it is indexed for later searching. In most deployments, a selection of the most important data is indexed. After indexing, Tealeaf users can search on specific values, for example, all sessions where the user name field contained the value "smith."

**Alert**
An alert is an action, such as sending an email, that should be taken when a predefined condition occurs. This may be the execution of an event or the crossing of a threshold, such as exceeding a total number of hits within a period of time.

**Tealeaf data**
In Tealeaf, data can be categorized into separate parts based on the content.

The 4 parts of Tealeaf data are:

**Stream data**
Stream data is the HTTP DataStream captured by Tealeaf includes request, response, hit, session, and event data.

**Canister data**
Canister data is *derived data* that is created from the HTTP DataStream. Canister data is stored in several places and forms.

**Index**
In Tealeaf , an index is an arrangement of important words that appear in the HTTP DataStream.

**Database**
In Tealeaf there are databases for

- system configuration and statistics.
- aggregated counts and statistics that are collected from the Canister data, mostly based upon event data.
- event information that is collected from the Canister and populated with visitor-related information delivered to IBM Tealeaf cxResults.
- session information for faster session searching.

These parts and their relationships are shown in the following diagram.

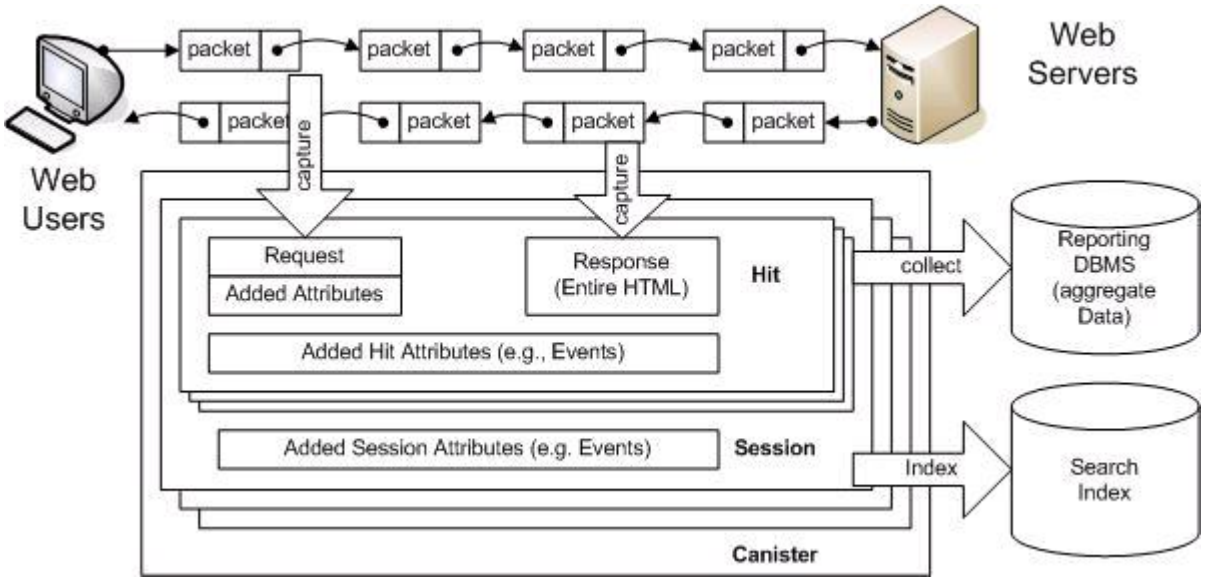



*Figure 2. Tealeaf Data Flows*

Each of the four major parts is described in the following sections.

***Stream data***

Stream data is a sequence of digitally encoded signals (packets of data or data packets) that is used to transmit or receive information.

Tealeaf receives all packets copied by the switch and forwarded down the SPAN port to the IBM Tealeaf CX Passive Capture Application server.

Stream data can be modified in the PCA server and in the Windows pipeline on the Processing Server. The data can be modified in these two places only.

Of the packets received by the PCA server, only the HTTP and HTTPS packets are re-assembled, processed, and forwarded for additional processing and storage. In most configurations, other types of packets are ignored.

Two modes determine what is processed:

- Business Mode:

  Retains only specified file extensions (such as `.html` and `.asp`) and encoding types.
- Business IT Mode:

  Retains all hits, including static objects.

*Request*

In Tealeaf, a Request is the component of data that originates from when user visits your website.

Typically, the raw request data is not displayed anywhere in the Tealeaf system, although for debugging purposes the system can be configured to show it. Instead, the REQ buffer is used to store meta data about the hit, including everything contained in the original request.

Each HTTP request (and only HTTP) that is captured causes the Passive Capture software to look for an HTTP **response**.

- If there is no request, any response is ignored.
- If the HTTP request is encrypted, Tealeaf must decrypt it to understand what was requested.

Request and response data can be manipulated in the PCA pipeline through privacy rules and in the Windows pipeline via deployed and configured session agents.

You can use the **Request** view when you replay a visitor session to view the data contained in the Request.

*Request record*
In addition to storing the raw HTTP request data in Tealeaf, the request record is used to store additional attributes for the hit.

These hit attributes are extracted or computed from the request or response and include information such as the IP address of the sender and receiver, performance timing, and form field variables.

This buffer is generated by the IBM Tealeaf CX Passive Capture Application after the request and response have been captured.

The request record is an unstructured text blob containing multiple text delimited sections of either `name=value` pairs or XML. The request record is always encoded as UTF-8. In addition to Tealeaf predefined sections, a custom `[appdata]` section can be populated during processing by configured session agents, usually to simplify downstream data processing or evaluation.

The request record can be viewed using session replay, either through the web browser or the standalone RTV viewer application.

*Figure 3. Request*

The hit attributes can be used as source data for events and reports. Hit attribute data can be exported to third-party systems via IBM Tealeaf cxConnect for Data Analysis

### Sections of the Request Record

Hit attributes can be displayed in a list of sessions found through search, either in the Tealeaf Portal or the IBM Tealeaf CX RealiTea Viewer.

The following table lists some of the request sections from which hit attribute data is extracted.

| Request section | Description |
|---|---|
| `[appdata]` | Custom attributes populated by session agents. These attributes are automatically indexed for search. |
| `[env]` | HTTP request environment variables such as the HTTP Referer and HTTP Status Code. |
| `[timestamp]` | Time stamp of the request and performance timing for the hit, calculated by Tealeaf |
| `[urlfield]` | Parsed GET and POST data fields from the request. |
| `[TLFID_*]` | Fact information derived from the hit. |

### Hit Attribute Export

Displays showing selected hit attributes for sessions that are found through search can be exported from the Portal and the Viewer into Excel.

The contents of the request record can be extracted from the Tealeaf system for import into other external systems by using ETL tools with the IBM Tealeaf cxConnect for Data Analysis product.

*Response*
For each HTTP request, the corresponding HTTP response is also captured and, if necessary, decrypted.

Typically only responses of content-type `text/html` are retained, except for the following items, which are also retained:

- Error code responses
- RIA requests (XML)
- Binary Files explicitly kept

HTML data is stored in the same encoding scheme as it was captured.

*Figure 4. Response*

The response data can be viewed using session replay, either in the browser or the viewer. For HTML responses, a rendered view and a source view are provided.

Response data can be used for evaluating events.

Request and response data can be manipulated in the PCA pipeline through privacy rules and in the Windows pipeline via deployed and configured session agents.

*Hits*
Each request record/response pair is reassembled in Tealeaf to compose a *Hit*.

**Note:** Tealeaf discards most hits as static objects not unique to a particular browser session. This approach is how Tealeaf keeps the data volume to a reasonable size.

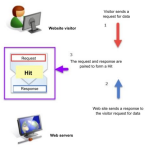



*Figure 5. Request*

For a typical web page, there can be many (20-50) hits, but most images, style sheets, JavaScript includes are discarded, so typically only a few hits per page are retained. For example, if the web server provides a HTTP Redirect response to the browser, which then fetches a page to display, the page that recorded two hits.

If a page contains JavaScript that requests XML data for display, there are at least two hits for the page.

**Note:** Tealeaf uses the term page to refer to hits that are not discarded.

Tealeaf hit counts often do not include every hit of the web server but sometimes do include more hits than page views recorded by other systems. While Tealeaf defaults to keeping hits of `content-type = text/html`, it can also be configured to keep other data types such as dynamically created images.

The attributes of the hit are displayed in the request record.

After a hit is discarded, the hit does not exist in Tealeaf. However, its existence can be uncovered through replay, where the hit is regenerated, or by looking at the response HTML in some cases. A record of dropped hits is reported in the statistics that are generated by the IBM Tealeaf CX Passive Capture Application.

*Event*
For hits that are not discarded, the data in the request record or response can be processed by the Tealeaf Event Engine.

An event is defined as a trigger, a condition, and an action that is specified by a Tealeaf user.

A trigger is a defined moment in the lifespan of a session when events can be evaluated. Each event is associated with a specific trigger and can only reference the event-related data available in that trigger.

A condition is either the occurrence of a text string in the hit data or the combination of other Events occurring in the hit.

The action for a hit event is to record the Event Identifier, actual Hit Time, event value, and more. These items are stored in separate records with the hit data.

Events are useful for modeling user interactions with the web application and to represent those interactions in structured reports. Events are similar to web page tags yet are added dynamically based upon the DataStream.

Events also help to manage session recording. Data triggered events can be used to monitor session, request record, and response text, which provides the basis for the event conditions and the basis for recording.

Hit event data can be seen in multiple places. Counts for active events are shown in the **Portal in the Active Events** page and can be used to trigger alerts.

### Event Conditions

The following are sample conditions that can be used for event definitions:

- Hit is received.
  - Hit attribute is found in the request or response. Hit attribute can be defined as a specific string or as the content between two specified tags.
- Other events are processed.
  - session attribute value: `Exact Match`, `Contains`, >, <, or a range of values.
- Session End
  - session attribute value: `Exact Match`, `Contains`, >, <, or a range of values.

### Event Actions

Based upon the event conditions, one or more of the following actions can be taken:

- Make the event searchable: First occurrence or every occurrence
- Make the event reportable: First occurrence or every occurrence
- Store the detected value as text or as a number
- Trigger another event
- Scrape text between tags
- Store session state when the event occurred as dimensions
- Identify membership in a list/group
- Update session attributes
- Send event data to an external system through the Tealeaf Event Bus
- Close session in Tealeaf
- Extend Tealeaf session timeout
- Discard session

### Event Data

Definitions of the events are stored in a common database location to which all Canisters in the environment refer. Individual instance event data are stored with the session to which it is associated.

- Aggregated counts and average numeric values for events are recorded into a database. Individual instance data can be copied into IBM Tealeaf cxResults database.

Event data fields include:

- Session Key
- Hit Attributes: Key, Index, or other metadata
- Detected values:

  - String that matched
  - String that is bounded by the match pattern, such as `Name = Value`
  - String that is converted to a number (for example, `27.50` as shopping cart total)
  - String identifier of value that is defined in an enumerated list (for example, List of OS types)
  - String identifier of group to which text found belongs (for example, `CA` belongs to `West`)
- Any reference dimensions that are associated with the event.

### Event Data Export

Event records can be exported every hour to the IBM Tealeaf cxResults product where custom queries can generate reports.

Selected event data can also be streamed across a TCP/IP socket to external systems in real time by using the Event Bus API for third-party analysis.

*Session*
In Tealeaf, a session is a series of hits between a specific browser and the web server, assembled to present a clear picture or representation of how a visitor interacted with the web site.

A typical session involves an individual user interacting with the web server to request (by sending an HTTP request) and retrieve (through the returned HTTP response) a series of web pages before leaving the site. These request/response pairings are stitched together into hits, and the sequence of hits in the session are stitched together to comprise the session data.

Website visitor
Session
Request
Response
Request
Response
Request
Response

- Poor sessionization

At search time, Tealeaf provides the ability to defragment such sessions. For replay and analysis of individual sessions, Tealeaf can connect the fragments.

**Note:** Reporting data indicates that session fragments are individual sessions. For example, the time gap between fragments may be longer than the reporting data collection interval.

See "Managing Data Sessionization in Tealeaf CX" in the *IBM Tealeaf CX Installation Manual*.

### Session Attributes

Through events, you can populate session attributes with specified values. These variables and their values can be found through search in the Portal or the RTV application.

The results segment can be analyzed by IBM Tealeaf cxResults to produce a set of canned reports on the contained sessions.

*(Session) Event*
For sessions that are completed, Tealeaf can process event conditions for the entire session, such as the occurrence of certain hit events during the session.

### Event Definitions

Events are defined and managed through the Tealeaf Event Manager, which is accessible through the portal. By defining events, the user can model the workflow through the monitored website and create markers for search and report aggregation.

***Canister data***
A properly configured Tealeaf system attempts to store all hits for a session in the same Canister, which is a daily collection of sessions that are processed by one Processing Server and the indexes that are associated with them.

Although most users do not see canister data, it can be viewed through the Active menu in the Portal or by searching for active sessions through the Portal or the Viewer. Completed Canister data can be viewed through search of completed sessions through the Portal or the Viewer.

**Note:** Active sessions are not indexed, but the data structures allow fast searching of some hit attributes. Tealeaf can perform full scans of the response data, but this method can slow system performance.

Canister data is typically retained for 10 days, after which it is erased to make room for newer data. The IBM Tealeaf cxVerify product allows for search-based subsets of each Canister to be stored for longer periods in a different Canister.

Sessions can sometimes be fragmented across multiple Canisters. Beginning in Release 7.2, Tealeaf can defragment sessions across multiple Canisters for replay in the Portal.

The Canister is divided into two parts:

- The Short Term Canister contains active sessions, where hits are still being received as they occur. Hit event records are created now.
  - Unless the Canister is spooling, a new hit added to an active session is available for search and review through the Portal in a matter of seconds.
  - Search of active sessions is limited to full text search, which is slower than indexed search for completed session data.
- The Long Term Canister contains completed sessions, which are created when no hits are received for the Idle Timeout period or other trigger met. When a session is closed, all session events are processed. The session is recorded to disk, and the contents are indexed by a text search engine.
  - An active session is rendered a completed session within approximately five minutes of the end of the session, unless the system is behind in indexing sessions.
  - Completed sessions are collected into a set of LSSN files for the day.

  - Aggregate counts for hit events and session events are collected and aggregated for the reporting database.

*Dimensions*
Dimensions are sets of reference data that can be captured and recorded when the event is triggered. Dimensions are associated with a defined event .

A dimension contains a set of values that are captured by a defined pattern or value recorded from an event. These values provide contextual information at the time when the event is recorded. They are stored in the request when the hit is processed by the Canister.

For example, Tealeaf provides the following reference dimensions (in versions prior, these were the only dimensions and they were provided for every event. Now users can define their own event dimensions.

- `#* Server`
  - `URL`
  - `Host Name`
  - `Application Name`

If an event is associated with these dimensions, the values of these dimensions are recorded with the event when it is triggered. So, if an event is created to detect the presence of Status Code 500 errors in the response, the values of the above can be recorded with this event instance to facilitate debugging the issue.

**Report Groups**

Dimensions are organized into groups. A report group is a collection of dimensions. A dimension may belong to multiple report groups. When recording, the Tealeaf system collects aggregate counts for every combination of dimension values.

An event may be associated with multiple report groups.

*Facts*
When an event is triggered in a hit, the Report Group data is recorded with the event in a structure that is called a fact in the REQ record. A fact contains the recorded event value and any dimension values for associated report groups and other data.

This internal data structure is used to facilitate searching on dimensional data that are related to the recorded event. Each dimension instance value is hashed to provide a more easily indexed value for searching. When a string is input through the search interface (for example, "/DEFAULTPAGE"), the same algorithm is used to create a hashed value that can be found in the search index.

Below is an example fact that is recorded in the `[TLFID_80]` section of the request buffer:

```
[TLFID_80]
Searchable=True
TLFID=80
TLFactValue=1
TLDimHash1=38A7EF5D4FA961F712055D92FC56088A
TLDimHash2=BC3F1812E3C8837962A83226D4A30082
TLDimHash3=8606AC74FD2DECC1899004C49B226FAE
TLDimHash4=5E6D512952FFBB9673B1D0CB08EF33B0
TLDim1=/DEFAULTPAGE
TLDim2=WWW.TEALEAF.COM
TLDim3=OTHERS
TLDim4=63.194.158.200
```

In the above, the fact identifier (`TLFID=80`) and recorded event value (`TLFactValue=1`) are listed above the hashed values and plain text values for each dimension. Only the first 256 characters of the dimension value are recorded in plain text.

***Indexing***
When a session is completed, it is written from the in-memory database (STC) to disk and marked for indexing.

Because retaining captured hit data is expensive in terms of disk space, for most Tealeaf deployments, only a subset of the captured hit data is indexed. Tealeaf indexes:

- The body of the response, without HTML tags.
- Selected sections stored in the request record.
- Selected event data such as the event identifier and event value.

Indexed data includes:

- Select data from the request record
  - `[appdata]`, `[urlfield]`, session attributes
  - Event Data (ID, value)
- Response
  - HTML/Headers are excluded

This index data is retained for the same length of time as the Canister data. The index data can be regenerated from the Canister data at any time.

**Note:** Depending on system load and configuration, canister data is typically indexed within 5 minutes of session completion.

A generated index cannot be viewed, although search results indicate the use of indexes. Using the same indexing algorithms as the Canister, the Viewer can create and display an index for the sessions that are currently loaded, although an exact match is not guaranteed.

***Database collection and reporting***
Database information is collected and reported for IBM Tealeaf cxImpact and IBM Tealeaf cxView.

The following sections describe database collection and reporting.

*Reporting Data*
The Report capabilities of IBM Tealeaf cxImpact and IBM Tealeaf cxView are based upon aggregate counts of hit attributes, session attributes, and events. During normal operations, the Processing Server maintains counters in 1-minute buckets as sessions are completed.

At five-minute intervals, these counts are collected and aggregated into hourly buckets in the Reporting database from which reports are generated based upon the Tealeaf time zone for display in the Tealeaf Portal. At the end of the system day, daily aggregations are created based upon the defined system time zone.

Because reporting data is aggregated, you can obtain:

- Counts: Count of individual event occurrences by time period, which might be filtered by pre-defined dimensions.
- Numeric Values: For events that store a number that is parsed from the data stream (for example, a shopping cart value) or calculated by the event (the number of hits between two events), the minimum, maximum, and average values can be displayed for the time period, which is filtered by the reference dimensions.

All report data is available through the Portal, through pre-defined and user-defined reports, including scorecards and dashboards.

Direct extraction of reporting data from the Tealeaf database is not currently supported. Data from the reports can be exported into Excel.

### General Event Data Information

The following general event data information is available:

- Hourly and Daily data are updated every 5 minutes for sessions that are ended within the current hour
- Hourly (30 days) and Daily (365 days) report data are available for longer than the supporting Canister data.
- Depending on the system load, Data Collection can run behind.
- Fragmented sessions break session events.
- Hourly data and daily data are reported based on the value of midnight for the Tealeaf system time.

Event data can be aggregated across each reference dimension, for each combination. To search for sessions that contain the event data, drill-down links are provided in reports.

Event data reports are available in the following places in the Tealeaf Portal:

- IBM Tealeaf cxImpact: Tealeaf Reports
- IBM Tealeaf cxView: Dashboards and Scorecards

### Event Data Reporting

Event data is reported through the Tealeaf Portal as aggregated data, not instance data. Counts of events can be reported, and minimum, maximum, and rolling averages, or data can be reported as numeric values.

*Top Movers*
Optionally, you can track and store deviations of event values and dimension values for reporting purposes. Since the storage of these deviations can require more space, you must choose to record them.

Deviations can be reported over a four-week rolling period against any other configured deviations to identify the top movers on your site.

*cxResults Data*
The IBM Tealeaf cxResults product enables saving into a separate database only the visitor information, session information, and event records as individual instance data. This database maps data to individual visitors based upon a persistent cookie that is defined by the web application.

From the database, it is possible to retrieve session and event data for uniquely identified visitors. You can also find sessions where events occurred in a specific sequence, even across multiple sessions.

- In IBM Tealeaf cxResults, segments are defined based on ran searches. Searches, segment generation, and reports can be scheduled in IBM Tealeaf cxResults.
- Generated reports can populate dashboards.

IBM Tealeaf cxResults data is collected from the Canisters hourly and is typically retained for 40-60 days, barring performance issues. Even without the HTML data, the database can grow quickly.

**Note:** The use of dimensional data in IBM Tealeaf cxResults reports is not supported in this release. Dimensional data can be used in specifying searches.

Results data is accessed through the Portal through a special search interface.

For regular reports, pre-defined searches can be scheduled and the report data included in dashboards.

### Alerts
Email alerts can be generated based on event or non-event data in the Tealeaf system. This independent service uses its own database, and alert data is not used outside the alert system.

Alerts can be generated by hit and session events, as well as canister events, which are a set of predefined monitors for data in the Tealeaf Canister. Alerts can be delivered through Portal, SMS, Email, or SNMP. Only the preceding six hours of data is available to the alert service. The interval for checking for alerts can be set to as low as one (1) minute.

You can configure the following components for an alert:

- Thresholds

- Measurement Intervals
- Ratios
- Blackouts

**cxConnect for Data Analysis**
When scheduled, a IBM Tealeaf cxConnect for Data Analysis job can extract session and request buffer data from one or more Canisters that are based on a predefined search term.

Extracted sessions can be delivered to multiple output formats and destinations, including:

- Data files
- W3C Log format

IBM Tealeaf cxConnect for Data Analysis is configured through the Tealeaf Portal. Exported data is displayed in the local file directory, depending on the output option.

**Glossary**

For more information about these terms, see "Tealeaf Glossary" in the *IBM Tealeaf Glossary*.

**Additional resources for information about Tealeaf data**
Use the table in this section to learn where to find additional information about Tealeaf data.

*Table 1. Documentation about Tealeaf data*

| Data Type | Using or Viewing | Configuring |
|---|---|---|
| Request | BBR: "CX Browser Based Replay" in the *IBM Tealeaf cxImpact User Manual* RTV: "RealiTea Viewer - Request View" in the *IBM Tealeaf RealiTea Viewer User Manual* | "Configuring CX Indexing" in the *IBM Tealeaf CX Configuration Manual* |
| Response | "RealiTea Viewer - Response View" in the *IBM Tealeaf RealiTea Viewer User Manual* | "Configuring CX Indexing" in the *IBM Tealeaf CX Configuration Manual* |
| Event | "Monitoring Active Events" in the *IBM Tealeaf cxImpact User Manual* | "TEM Events Tab" in the *IBM Tealeaf Event Manager Manual* |
| Dimension | "Tealeaf Report Builder" in the *IBM Tealeaf Reporting Guide*. | "TEM Dimensions Tab" in the *IBM Tealeaf Event Manager Manual* |
| Report Group | "Tealeaf Report Builder" in the *IBM Tealeaf Reporting Guide*. | "TEM Dimensions Tab" in the *IBM Tealeaf Event Manager Manual* |
| Fact | BBR: "CX Browser Based Replay" in the *IBM Tealeaf cxImpact User Manual* RTV: "RealiTea Viewer - Request View" in the *IBM Tealeaf RealiTea Viewer User Manual* | "Configuring CX Indexing" in the *IBM Tealeaf CX Configuration Manual* |
| Session Attribute | N/A | "TEM Session Attributes Tab" in the *IBM Tealeaf Event Manager Manual* |
| Index | Portal<br>RTV: "RealiTea Viewer - Session Search and Subsearch" in the *IBM Tealeaf RealiTea Viewer User Manual* | "Configuring CX Indexing" in the *IBM Tealeaf CX Configuration Manual* |
| Alert | "Alert Monitor" in the *IBM Tealeaf cxImpact User Manual* | "TEM Alerts Tab" in the *IBM Tealeaf Event Manager Manual* |
| Top Mover | "Analyzing Top Movers" in the *IBM Tealeaf Reporting Guide* | "TEM Top Movers Tab" in the *IBM Tealeaf Event Manager Manual* |

For more information about user-configured data as it applies to reporting, see "Tealeaf Data Model" in the *IBM Tealeaf Reporting Guide*.

## Working with visitor session data in Tealeaf

After Tealeaf captures and processes a visitor's interaction with your website, the data of that interaction is available for you to work with through the Tealeaf Portal.

The Tealeaf Portal is a web-based interface to the Tealeaf system. The Portal provides a menu-driven navigation system to search for both active and completed sessions, a means to review and analyze data across search results, a means to replay a user session within a browser, and for administrative users, it provides the controls to manage the Tealeaf system. It provides a wide variety of options for creating and viewing reports, including **dashboards**, **scorecards**, and other ad-hoc reports.

### Searching session data

The indexes created by the processing server can be searched through the Portal. It is also possible to search for text strings in currently active sessions in the short term canister. But the search for completed sessions in the archive is much more powerful; Tealeaf users can search for specific types of information, such as form field values, that are not yet indexed in active sessions.

### Replaying sessions

Replay is a powerful tool for understanding your customer's experience. When you use the Portal to search for sessions, you see a list of sessions matching your search criteria. You can select one of these sessions and launch a replay of the session. With Replay, you can see the actual Web pages served up to the visitor, the links the visitor clicked on, and the form fields the visitor edited as they traversed your website. In addition to being able to view the visitor session as it occurred, Replay provides the HTTP request data that was sent from the visitor's browser and the actual HTML returned by the Web server. The Browser Based Replay (BBR) feature also provides Page Load Details so that administrators can troubleshoot technical issues relating page loading.

Replaying visitor sessions can provide insight into what leads to a customer sale, or what might cause a customer to abandon their visit. The information you gather from replaying and analyzing visitor sessions can be passed along to your website designers and business strategists, so that they can improve the parts of the website that resulted in visitor pain points or frustration.

### IBM Tealeaf CX RealiTea Viewer

In addition to the browser user interface for search and replay, Tealeaf also supplies a Windows desktop application called the IBM Tealeaf CX RealiTea Viewer (RTV) that you can install on your personal computer. This application includes additional options for configuring playback on the system. For more information, see *IBM Tealeaf RealiTea Viewer User Manual*.

## Logging on to the Tealeaf Portal

To begin working with session data, log on to the Tealeaf Portal.

### Before you begin

If you have not done so already, it's recommended that you change the default administrator account passwords as soon as possible. To change passwords, select **Tealeaf** > **Portal Management**.

### About this task

To log on to the Tealeaf Portal:

### Procedure

1. Start a supported browser.

2. Enter `http://<servername>/portal` in your browser.

   where `<servername>` is the host name of the machine on which the IBM Tealeaf CX Portal is installed.

   a) On the machine where the IBM Tealeaf CX Portal is installed, to the login page, select from the Windows **Start** menu:

   ```
   Programs > Tealeaf Technology > Tealeaf CX Portal > Portal Login Page
   ```

3. Enter your login name and password.

   If Tealeaf is configured to use the Windows Active Directory system, your login is the same as the name and password that you use for Windows.

#### Results

You have logged on to the Tealeaf Portal and can now work with session data.

The Portal screen that is displayed is the screen that your Tealeaf administrator configures and assigns to your user account.

### IBM Tealeaf login requirements

IBM Tealeaf has browser and user name and password login requirements.

#### Browser requirements

To use the Tealeaf Portal make sure you have a web browser that is supported. The following browsers are supported for use with the Tealeaf Portal:

- Microsoft Internet Explorer Web browser version 9 or later

  **Note:** If you enable Windows Enhanced Security features, you can experience issues when using Internet Explorer to access the Tealeaf Portal. See "Troubleshooting - Portal" in the *IBM Tealeaf Troubleshooting Guide*.
- Mozilla Firefox version 14 or later
- Chrome version 17 or later
- Safari version 5 or later

**Note:** If you have licensed IBM Tealeaf cxOverstat, the list of supported browser versions is smaller, as HTML5 support is required. See "cxOverstat Installation and Configuration" in the *IBM Tealeaf cxOverstat User Manual*.

**Note:** Several Portal features support the export of Tealeaf data into Microsoft Excel. If you are unable to properly display these files in Microsoft Excel, see "Troubleshooting - Portal" in the *IBM Tealeaf Troubleshooting Guide*.

**Note:** A different set of browsers and versions is supported for connecting to the web console of the IBM Tealeaf CX Passive Capture Application.

#### User nameand password requirements and conditions

In Tealeaf, user names are not case-sensitive. `admin` and `ADMIN` both work.

In Tealeaf, passwords are case-sensitive. So, `myPassword` and `MYPASSWORD` are not the same password.

Passwords can be up to 32 characters in length.

## Understanding the menu bar options on Portal user interface

User actions in the Portal are performed from the menu bar.

The following table lists and describes the options available from the menu bar in the Tealeaf Portal and provides references to documents that contain detailed descriptions of the options.

| *Table 2. Portal menu bar options* | | |
|---|---|---|
| **Menu bar option** | **Description** | **Where to find more information** |
| Dashboards | The **Dashboard** menu bar option provides a graphical view and layout of the data that is captured by Tealeaf.<br>You can customize dashboards for specific roles and responsibilities to show only the most relevant reports and metrics. | For information about using and configuring Dashboards, see the *IBM Tealeaf cxView User* manual. |
| Active | The **Active** menu bar option provides real-time reporting on current Tealeaf session, status, and event activities. | |
| Search | The **Search** menu bar option provides a search mechanism for finding relevant visitor sessions.<br>You can search active sessions, completed sessions, or both to look for text that appears in the request or response data, as well as metadata included in each session.<br>Based on the criteria that you specify, the search utility returns a list of matching sessions. | |
| Analyze | The **Analyze** menu bar option provides users reporting capabilities. | |
| Configure | The **Configure** menu bar option provides access to configuration options for dashboards and reports, as well as an option for configuring settings and views for the Portal | |
| Tealeaf | The **Tealeaf** menu bar option provides statistics for the Tealeaf system, including statistics about. | |
| Admin | The **Admin** option provides access to pages for configuring the product preferences and password. | |

From the menu bar, you can search the product documentation on Tealeaf Online Help product. Enter your search term in the textbox and click **Search Online Help**. See *Getting Help*.

## Licensing considerations

Some Tealeaf components and features have licensing considerations.

### About this task

Take into consideration the following licensing requirements for Tealeaf features and components:

- Event Manager:

  The Event Manager is available with the IBM Tealeaf CX license. However, some Event Manager features are available only if additional licenses are enabled.
- Alerts tab:

  Alert configuration and use requires the IBM Tealeaf cxImpact license.
- Top Movers tab:
  - Daily Top Mover configuration and use requires the IBM Tealeaf cxImpact license.
  - Hourly Top Mover configuration and use requires the IBM Tealeaf cxView license.
- Technical Site Metrics Dashboard:

  This dashboard is available through IBM Tealeaf cxImpact as the Activity Summary report.
  - Drill-down links on the dashboard are available only if the user has access to the Report Builder.
  - Access to the Dashboard menu requires the IBM Tealeaf cxView license.
- Manage Session Segments:

  The ability to generate and manage session segments is available with the IBM Tealeaf cxImpact and IBM Tealeaf cxReveal licenses.
- Search menu:

  This menu is available for both IBM Tealeaf cxImpact and IBM Tealeaf cxReveal. IBM Tealeaf cxReveal does not require IBM Tealeaf cxImpact to be installed.

## Tealeaf status messages

Tealeaf status messages provide information about the state of your IBM Tealeaf CX solution.

The messages are displayed at the top of the **Portal** window. The issues that are reported in the status messages can range from the minor to the severe.

You can use these messages to monitor the overall system health and performance.

To close the message for the remainder of your current session, click the **X** in the upper right corner.

Warning messages are displayed in exported reports, regardless of whether you close the message in the Portal.

### Troubleshooting Tealeaf status messages

**There is a delay processing data acquired after <timestamp>. Reports, alerts and indexes can not have complete data until the processing completes.**

- **Severity:**

  Major to Minor.
- **Cause:**

  The most likely cause is that one or more of your Tealeaf Canisters is spooling data.

  If a Canister is unable to process incoming hits in a timely manner, the system begins writing those hits to the hard disk, from which it pulls hits when more processing resources become available.

  The appearance of this warning message in the Portal is enabled by setting. See "CX Settings" in the *IBM Tealeaf cxImpact Administration Manual*.
- **What to do:**

  If the spooling message disappears within an hour, it can temporary surge in traffic volume. If the message redisplayed consistently or displayed for significant periods during a workday, the conditions that lead to spooling must be investigated further.

You can use Health-based Routing (HBR) to manage load balancing between multiple Canisters. If your system uses HBR, see "System Status" in the *IBM Tealeaf cxImpact Administration Manual*. You can also refer to "Health-Based Routing (HBR) Session Agent" in the *IBM Tealeaf CX Configuration Manual*.

You can verify if the system is spooling by checking to see if the DecoupleEx session agent, which sits at the top of each Tealeaf pipeline, is spooling hits to disk.

1. In the Portal, select **Tealeaf** > **TMS**.
2. Click the Pipeline Status tab.
3. Select a Windows pipeline.
4. Find the DecoupleEx row. Review the value in the Queued column.
5. If this value is not zero, the pipeline is spooling hits to disk.
6. Perform the check for each Windows pipeline in your system.

See "TMS Pipeline Status Tab" in the *IBM Tealeaf cxImpact Administration Manual*

Additional information can be available in the DecoupleEx report and the Tealeaf Status report.

- See "System Status" in the *IBM Tealeaf cxImpact Administration Manual*.
- See "Tealeaf Status Report" in the *IBM Tealeaf cxImpact Administration Manual*.

The root issue is that the Canister is unable to process hits as fast as they are coming in, due to any of the following factors:

- Spikes in volume - Depending on your web application, there can be periodic spikes in volume due to expected or unexpected changes in site traffic. For example, if a marketing campaign is released, which directs traffic to the site, there can be a spike in traffic soon after. If the only effect on the Canister is a temporary spooling of hits due to these spikes, then the issue can not be significant.
- Other processes taking up Processing Server resources - If other processes are consuming system resources on the server hosting the Processing Server, overall throughput of hits can be impacted.
  - Wherever possible, you must minimize the other applications or services in use on the Processing Server.
  - Periodic maintenance tasks must be scheduled during off-peak hours for all Tealeaf servers.
- Poorly designed events - Events that perform inefficient searches, use regular expressions too liberally, or fire too frequently can affect Canister throughput.
- Poorly designed pipelines - The Windows pipeline is intended to be a sequence of efficient, high-performance processing agents that drop unnecessary data and change the captured data to meet the search, reporting, and replay requirements of your enterprise. It is a good idea to periodically review the configuration of a spooling pipeline to verify the following conditions:
  - All included session agents are required.
  - Data that is not necessary is removed early in the pipeline, so that it is not processed needlessly by other session agents. See "Data Drop Session Agent" in the *IBM Tealeaf CX Configuration Manual*.
  - If the Privacy session agent is deployed, verify that all privacy rules are needed and are efficiently designed. Poor design of regular expressions in privacy rules can have a large impact on Canister throughput. See "Privacy Session Agent" in the *IBM Tealeaf CX Configuration Manual*.
- Insufficient hardware - If your traffic volumes are changed significantly, the hosting system can be inadequate to handle the change.
  - For more information about the recommended sizing, please contact Tealeaf Professional Services.

**Report groups on one or more events have been disabled because they exceeded the safety limit of 500,000 new occurrences within a single hour.**

Report groups on one or more events are disabled because they exceeded the safety limit of 500,000 new occurrences within a single hour. Make the necessary changes to the report group and/or event to ensure that the safety limit is not exceeded before manually reactivating the report group.

- **Severity:**

  Minor to Major.

- **Cause:**

  This error message indicates that the number of instances that are recorded of one or more report groups exceeded 500,000 within a single hour. Tealeaf automatically disables the report group so that the database does not become burdened with data.

  – The appearance of this warning message in the Portal is enabled by setting. See "CX Settings" in the *IBM Tealeaf cxImpact Administration Manual*.

- **What to do:**

  Typically, this situation is caused by a poorly constructed event. In many cases, the event is configured to be recorded on every hit, which means that the event value and all related dimensional values are being recorded on each detected hit.

  **Note:** In some cases, the source of the problem can be constrained to a single dimension within the report group. To reduce the number of recorded instances for the dimension, you might be able to constrain the dimension to use a whitelist of recorded values. See "TEM Dimensions Tab" in the *IBM Tealeaf Event Manager Manual*.

To locate the sources of these messages, complete the following steps:

1. In the Portal menu, select **Configure** > **Event Manager**.
2. Click the **Events** tab.
3. From the filter drop-down at the top of the page, select **Events with Disabled Report Groups**.
4. The list of events that have one or more disabled report groups is displayed.
5. If possible, you must change the evaluation of the item to a different trigger. If the event data is available on the first hit or last hit and is not required for other evaluations during the active period of the session, then you must change the event trigger.

   You can record the event data to a session attribute, which is accessible throughout the life of the session.
6. Additionally, you must consider whether the report group is necessary for recording with each instance of the event. If possible, remove the report group from the event.
7. If you believe that the data is generated by an unusual situation in the traffic in the web application, you can re-enable the recording of the report group data.

## Delete sessions

You can delete sessions and session fragments from the IBM Tealeaf system with the Selective Deletion tool.

### Selective Deletion tool

IBM Tealeaf Customer Experience captures the interaction visitors have with your website and mobile applications in sessions. These sessions can be searched and replayed to understand customer behavior and to identify customer struggle.

The IBM Tealeaf Selective Deletion tool allows users to search sessions and session fragments based on a user-defined search criteria and then delete the sessions and session fragments from the system.

#### Accessing the Selective Deletion tool

The Selective Deletion tool is available for download on IBM Fix Central.

#### How to install and use the Selective Deletion tool

For more information on how to install and use the Selective Deletion tool, see the IBM Tealeaf Selective Deletion tool 9.0.2.1393 Readme file on IBM Fix Central.

# Real-time monitoring of Tealeafactivities

Tealeaf can capture, process, and analyze the bi-directional data stream between visitors to your website and the web servers in real-time.

Use the **Active** option on the Tealeaf Portal menubar to review reports of the current activities for your website's visitors, as well as a means to define events that trigger alerts for your review.

## Displaying active status for hit and session activity

You can display the active status of short-term hit and session activity. The data that is displayed is based on the last known state of the canister.

#### About this task

You display status information for an individual IBM Tealeaf CX server or for all known canisters.

When active sessions reach the time-out period or are ended by the visitor, the sessions are closed and moved to the long-term canister for indexing. They are no longer active sessions.

To display the active status for hit and session activity:

#### Procedure

1. Log on to the Tealeaf Portal.
2. From the menubar, select **Active** > **Status**.
   a) Using options from the tool bar you can control the data that is displayed.
      - From the **Tealeaf CX Server** field, select the Tealeaf Canister from which to gather the active status.
        - To display the report for another Canister, make a selection from the IBM Tealeaf CX Server drop-down.
        - To display the report for all Canisters in the environment, select `<All Servers>`.

          The displayed charts and detail tables are similar.
      - Select the **Manually Refresh** check box to disable automatic refresh.

        By default, the report refreshes automatically every minute.

        If you select the **Manually Refresh** check box, the report data is refreshed only if you click the **Refresh** icon.
      - Use the **Refresh** icon to refresh data manually.

   The Activity statistics for live user sessions are displayed. See Active status for session activity and hits for an example of the data that is displayed.

**Example**

*Figure 7. Active status for session activity and hits*

## Interpreting Active Status report data

The Active Status report includes three graphical charts that contain information about session, page, and hit distribution for all canisters or for an individual canister. Additionally, a table listing the Session Activity is displayed beneath the graphical charts.

*Figure 8. Active status for session activity and hits*

*Table 3. Active Status Report Description*

| Chart | Description |
|---|---|
| Session Distribution | Each bar represents the number of sessions in the short-term canister of the specified IBM Tealeaf CX Server, which is broken down into Single-Hit Sessions and Multi-Hit Sessions.<br>For computation information, see Session Distribution - chart computations. |
| Single Page Sessions | Displays two bars for each canister as follows:<br>**Stand-alone Hits bar**<br>This bar indicates the number of one-hit sessions that are divided by the total hits.<br>**Single Hit Sessions bar**<br>This bar indicates the number of one-hit sessions that are divided by the total number of sessions.<br>For computation information, see Single Page Sessions - chart computations. |
| Hit Distribution | Each bar represents the number total hits for all sessions in the short-term canister of the specified IBM Tealeaf CX Server.<br>For computation information, see Hit Distribution - chart computations. |

**Session Distribution - chart computations**

*Table 4. Computations for Session Distribution*

| Computation | Description |
|---|---|
| Single Hit Sessions | The number of active sessions with only a single hit. |
| Multi-Hit Sessions | The number of active sessions with multiple hits. |

#### Single Page Sessions - chart computations

| *Table 5. Computations for Single Page Sessions* | |
|---|---|
| **Computation** | **Description** |
| Stand-Alone Hits | The number of single-hit sessions divided by total hits per canister.<br>This computation represents the percentage of hits that are single-hit sessions. |
| Single Hit Sessions | The number of single-hit sessions divided by total sessions per canister.<br>This computation represents the percentage of sessions that are single-hit sessions. |

#### Hit Distribution - chart computations

| *Table 6. Computations for Hit Distribution* | |
|---|---|
| **Computation** | **Description** |
| Hits | The total count of hits currently in the selected Canister or Canisters. |

#### Session Activity table

The Session Activity table contains information about the short-term canister as described in the following list:

**Field**
**Description**

**`Sessions`**
The total number of sessions in the short-term canister.

**`Single-Page Sessions`**
The number of session that are containing only one page.

**`Hits`**
Shows all hits that are entering the canister.

**`Pages (*.aspx, *.jsp, *.do)`**
The number of hits on text-based pages.

**`Non-Pages (*.gif, *.jpg)`**
The number of hits that are on images and other binary resources.

## Listing Active Sessions

You can list all sessions that are currently active.

#### About this task

The Active Sessions report queries the Short-Term Canister or Canisters and returns all currently active sessions.

To list all currently active sessions:

#### Procedure

- Log on to the Tealeaf Portal.
- From the menubar, select **Active** > **Sessions**.

  This list is initially populated with all STC sessions that have multiple hits.

- Click **Limit Hits To** to select additional filters.
- Click **Refresh** to refresh the display.

**Results**

**What to do next**

Once you have a list of Active Sessions, you can work with the data in a variety of ways. You can:

- Use the command icons to:
  - Replay sessions
  - Display the web pages in the session.
  - Display storage and user information for the session.
  - Show Server Results Distribution
- Use the report columns to learn about the sessions in the list
- Apply filters to the list of Sessions
- Group data in a way that suits your viewing needs

## Active Session command icons

For each session listed on the Active Sessions list, there are a group of command icons.

*Figure 9. Command icons for sessions on the Active Sessions list*

You can click the icons to run commands against any of the sessions in the list.

The following table describes the function associated with each of the command icons.

*Table 7. Active session command icon functions*

| Icon | Function associated with the icon |
|---|---|
| | The **Status indicator** icon indicates an active session.<br>All sessions in the Active Sessions list have a blue dot. |
| | The **Replay** icon replays the session.<br>When you click the **Replay** icon, you are presented with a dialog from which you can choose to replay the session using IBM Tealeaf CX RealiTea Viewer or using Browser Based Replay (BBR).<br>**Note:** IBM Tealeaf CX RealiTea Viewer (RTV) is a standalone application that enables high-fidelity replay of Tealeaf sessions. |
| | The **Page list** command icon displays the web pages in the session. |
| | The **Quick View** command icon provides a summarized view of the session. |
| | The **Session Information** command icon displays storage and user information for the session. |

| *Table 7. Active session command icon functions (continued)* | |
|---|---|
| **Icon** | **Function associated with the icon** |
| | The **Send to Event Tester** command icon Shows Server Results Distribution.<br>Click this link at the bottom of the page to display distribution information on the servers from which the sessions were retrieved. |

## How data in the Active Sessions list is organized

The data for the Active Sessions list is organized by columns.

The following table lists the columns in the Active Sessions list. The table shows the default configuration for the Active Session list.

| *Table 8. Active Session List columns* | |
|---|---|
| **Column Heading** | **Description** |
| Session Time | The Session Time column contains the timestamp for last hit recorded by the Canister. |
| Duration | The Duration column lists the current length of the session.<br>This value changes whenever the display is refreshed. |
| Login ID | The Login ID column lists the Login ID value for the displayed session. |
| Events | The Events column contains the icons representing the Tealeaf events that appear in the session.<br>**Note:** Events marked for evaluation on the last hit of the session or at the end of the session never appear for active sessions. |
| Hits | The Hits column contains the current number of hits in the session.<br>This value can change when the display is refreshed. |

### Filtering and sorting data on the Active Sessions list

You can filter and sort data on the Active Sessions list so that you see only the data that you want to see.

#### About this task

The sorting and filtering capabilities are controlled a group of drop-down boxes that are located just above Active Sessions list.

To apply sort and filter data on the Active Sessions list report:

#### Procedure

From the Active Sessions list report, select the filter options.

**Filter**
: **Description**

**`Sort By`**
: Sort the display of the report by `Time` or number of `Hits`.

  **Note:** This function applies to the sessions that have been returned to the browser. If the number of returned sessions is more than the number of sessions permitted for display, the set of sessions may differ depending on the selection.

**`Limit Hits To`**
To limit the report to display only sessions whose current hit count is over a selected size, make a selection from this drop-down list.

**`Server`**
By default, this report displays active sessions from all Short-Term Canisters (`<All Servers>`). To display active sessions from only one server, make a selection from the drop-down list.

**Grouping sessions by column values**
You can manipulate the column headings on the Active Session list to group sessions in ways that make sense to you.

**About this task**

Here are some ways in which you can group sessions:

**Procedure**

- Drag the **Hits** column header to the bar above it.

  All displayed sessions are organized based on the number of hits in the session.
- Click a column header and drag it to the bar above the listed column headers.

  The displayed sessions are grouped according to the column.
- Click the **Up** or **Down** arrow next to the grouping column header to sort the grouping
- Group by multiple levels by dragging more headers to the group bar.
- Remove a grouping by clicking and dragging the group header out of the group bar.

## Setting columns for your Session list report

Use the Session List Templates to set the columns for the your Session list report.

**About this task**

Session list templates are used to set the appearance and the data of the list of sessions returned from a search. The Session List templates allow you to control the display of session data.

Tealeaf administrators can create and configure session list templates. For information about how session list templates are configured, see "Configuring a Session List Template" in the *IBM Tealeaf cxImpact Administration Manual*.

To set the columns for your Session list report with a Session List Template:

**Procedure**

From the Active Sessions list report, select a template option from the **Session List Template** field.

The list of available templates always includes a standard default template. Additionally, any templates created and configured by your administrator are listed.

When you select template from the **Session List Template** field, the columns for your Session list report are displayed in accordance with the template configuration.

## Displaying active events

You can display all events that have been detected in the short-term canister or canisters (STC) and the number of times that each event has occurred among all active sessions.

**About this task**

The Active Events report does not include event counts for completed sessions stored in the Long-Term Canister (LTC).

*Figure 10. Active Events*

**Procedure**

- Log on to the Tealeaf Portal.
- From the menubar, select **Active** > **Events**.
- To display all active sessions containing a specific event, click the **Live Count** column value.

  This value totals the number of sessions that contain the event.

  This value does not include the number of times an event occurred within individual sessions or compound session or session attribute information. A session containing two instances of a single event is counted once.
- You can drill down on active events only if they have been configured to be searchable in the Portal.

## Working with the Active Events report

After displaying the Active Events, use the sort and view capabilities to control the display of data.

By default, the report is configured to display event counts across all Tealeaf servers.

Events are organized by default according to event labels. Clear the **View by Labels** check box to see the events in alphabetical order.

Click any column header to sort event types in ascending or descending order.

*Table 9. Fields in the Active Event Report*

| Field | Description |
|---|---|
| `Watch` | When the list is displayed in alphabetical order, you can select events to watch. When you sort by this column, these events are grouped and displayed at the top of the list. |
| `Label/Event` | When the list is displayed in alphabetical order, you can select events to watch. When you sort by this column, these events are grouped and displayed at the top of the list. |
| `Live Count` | The number of instances of the event in the Short-Term Canister<br>• Click any non-zero value in this column to show all matching sessions of the current type.<br>**Note:** Some events might displayed multiple times in a single session. |

To review details on an event, move the mouse over its icon.

The event ID is an internal identifier that is displayed in the tooltip for the event in the Events tab.

## Filter options for the Active Events list

The Active Events list includes filtering options.

*Table 10. Filter options for the Active Events list*

| Filtering option | Description |
|---|---|
| Refresh | Click the **Refresh** icon to immediately update event counts. |
| Tealeaf CX Server | Selects an individual server or all servers. |
| View by Labels | Select this check box to sort events according to event label.<br>When this box is not selected, active events are listed in alphabetical order. |
| Include Zeros | Select this check box to sort events according to event label. |
| Watch | When you deselect the **View by Labels** check box, the active events are listed alphabetically and a **Watch** column heading is displayed.<br>Event counts are updated automatically.<br>After you select the events to watch, you can drag the column to the header to display the events you are watching at the top of the list. |

## Filtering the Active Events list

You can filter the Active Events list.

### About this task

To filter the Active Events list:

### Procedure

- Enter a string in the filter text box.

  The list of available events is updated based on the text string that you entered.
- To group the events according to their event labels, click the **View by Labels** check box.
- To display all events, including the ones with zero counts, select the **Include Zeros** check box.
- To refresh the list, click the **Refresh** icon.

## Working with the Alert status

You can monitor the status of each Alert configured for the Tealeaf system and work with the status information provided.

### About this task

The Alert Monitor displays the status of each alert configured for the system.

**Note:** Top Mover alerts do not display in the Alert Monitor.

Alerts are generated by the Tealeaf Alert Service. For information about enabling and configuring the Alert Service, see "Configuring the Alert Service" in the *IBM Tealeaf CX Configuration Manual*.

Users with the appropriate permissions can create and configure alerts through the Tealeaf Event Manager. For information about configuring alerts from session events or canister events, see "TEM Alerts Tab" in the *IBM Tealeaf Event Manager Manual*.

To monitor the status for Alerts:

**Procedure**

1. From the Tealeaf Portal, select **Active** > **Alert Monitor**.

   The list of Alerts by Status and by Group are displayed in the pane on the left.

   You can review the status color coding for each alert listed.

   *Table 11. Alert status codes and icons*

   | Alert status code | Icon | Description |
   |---|---|---|
   | 0 | | OK |
   | 1 | | Warning |
   | 2 | | Alert |
   | 3 | | Suppressed |
   | 4 | | Pending (Negative Alert) - Insufficient data to evaluate. An evaluation is not possible until the entire time period of the Alert Interval is occurred. |
   | 5 | | Pending (Ratio Alert) - Denominator fails to meet minimum condition for alert calculation. A minimum count value for the denominator event must occur before evaluation is possible. |

2. To view the detail information for an Alert, click on an Alert listed in the **List** pane on the left.

   The Alert is displayed in the **View** pane on the right.

3. Select the Alert from the **View** pane to display the **Alert State** window and a graph of the Alert activity.

   The **Detail** pane contains an Alert State window for a selected alert and (regardless of current alert state) and a minute-by-minute list of details of past history in a table.

   *Table 12. Alert State information*

   | Details | Description |
   |---|---|
   | Value | Current value |
   | Status | Graphical representation of status |
   | Interval start | Time of current alert interval start |
   | Interval End | Time of current alert interval end |
   | Alert Threshold | Value to trigger an alert |
   | Warn Threshold | Value to trigger a warning |

| *Table 12. Alert State information (continued)* | |
|---|---|
| **Details** | **Description** |
| Alert History | Link to download minute-level data |

4. Click the **Download** link in the **Alert State** window to export the contents of the alert detail data to an Excel (.XLS) file.
5. Click the links in the **Search in** field to run a search as described in the link text

   The search criterion is based on the event the alert originated from.

   The following limitations apply to search links:

   - Alerts that are based on canister events do not have Search links available. Since canister event data is not stored with session data, search cannot be used to find these sessions.
   - Alerts based on categories of session-end events cannot be searched against live sessions. These types of events are not fired until the end of the session, which has not yet occurred in a live session.
   - Search drill-downs are disabled for ratio alerts.
   - Drill-down is disabled for events for which searching is impossible. For example, you cannot drill down to active sessions for events based on triggers that are not fired until the end of the session or that are configured to be discarded or to have their final occurrence tracked.

## Portal search capabilities

The Tealeaf Portal provides a powerful search mechanism for finding relevant visitor sessions.

You can use the search mechanism in the Portal to look for text that appears in the request or response data, as well as metadata included in each session.

Based on the criteria that you specify, the IBM Tealeaf cxImpact search utility returns a list of matching sessions.

You can also search for sessions through the IBM Tealeaf CX RealiTea Viewer, a desktop application for session replay.

#### Licensing considerations

If you have licensed IBM Tealeaf cxResults, you can also search for session data on specific visitors. This mechanism is particularly useful for addressing customer support issues.

**Note:** IBM Tealeaf cxResults is a separately licensable component of the IBM Tealeaf CX platform. IBM Tealeaf cxResults is no longer available as a newly licensed product as of Release 8.7. Customers that licensed IBM Tealeaf cxResults in Release 8.6 and earlier may continue to use and receive support for the product in Release 8.7 and later. For more information, please contact Tealeaf Customer Support.

### Searching session data

Through the Portal, you can analyze Tealeaf data through a simple yet powerful search interface.

#### About this task

For example, if visitors are reporting a particular scenario, you can search for the characteristics of the scenario. Or, if visitors are abandoning transactions, you can search these sessions and explore commonalities.

By querying data captured by Tealeaf, you can locate sessions for further analysis or replay. By capturing the entire stream of request and response data, Tealeaf provides users a rich reservoir of data that describes web application activities and issues.

Through the Portal, you can initiate searches for active sessions, completed sessions, or both types of sessions.

To initiate a search from the Tealeaf Portal:

### Procedure

- From the Portal, select **Search** and choose from the following search options:
  - **Active Sessions**

    Active sessions are are sessions that have not been closed by the visitor or timed out by the web application.

    Hits are currently being added to active sessions based on visitor activity.

    The default active search template is selected and displayed in the Search page.
  - **Completed Sessions**

    Completed sessions are sessions that have been closed, written to disk, and indexed for searching. Hits are no longer being added to these sessions.

    The default completed search template is selected and displayed in the Search page
  - **All Sessions**

    All sessions contain both completed and active sessions.

    The default All Sessions search template is selected and displayed in the Search page.

### What to do next

Other search features include:

- The IBM Tealeaf CX RealiTea Viewer (RTV) standalone application includes a separate search interface. See "RealiTea Viewer - Searching Sessions" in the *IBM Tealeaf RealiTea Viewer User Manual*.
- Through IBM Tealeaf cxResults, you can also search session data captured by Tealeaf based on a rich dataset unique to each visitor. IBM Tealeaf cxResults is a separately licensable product.

  **Note:** IBM Tealeaf cxResults is no longer available as a newly licensed product as of Release 8.7. Customers that licensed IBM Tealeaf cxResults in Release 8.6 and earlier may continue to use and receive support for the product in Release 8.7 and later. For more information, please contact Tealeaf Customer Support.

  - See "Searching for Visitors" in the *IBM Tealeaf cxResults User Manual*.

Consult the following table for additional information about session search:

*Table 13. More information about the Active status*

| For more information about... | See... |
|---|---|
| Session Search and subsearch in RealiTea Viewer | "RealiTea Viewer - Session Search and Subsearch" in *IBM Tealeaf CX RealiTea Viewer User Manual* |
| Exporting session data from RTV | "Exporting Session Data from RTV" in *IBM Tealeaf CX RealiTea Viewer User Manual* |
| Locating static content in session data | "Locating Static Content in Session Data" in *IBM Tealeaf CX RealiTea Viewer User Manual* |
| Configuring the number of days to retain session data | "Configuring the Number of Days to Retain Session Data" in *IBM Tealeaf CX Configuration Manual* |
| Creating events to enable searching for session data | "Creating Events to Enable Searching for Session Data" in *IBM Tealeaf CX Configuration Manual* |

| *Table 13. More information about the Active status (continued)* | |
|---|---|
| **For more information about...** | **See...** |
| Resolving issues about moving the Canister session data | "Moving the Canister Session data" in *IBM Tealeaf CX Troubleshooting Guide* |
| Session information that is written to the session data file | "Session Data File" in *IBM Tealeaf cxConnect Data Analysis Administration Manual* |
| How session data is stored | "Session Data Retention" in *IBM Tealeaf cxImpact Administration Manual* |

**Performing a basic search from the Portal**
To perform a basic search, complete the steps listed here.

**Procedure**

1. From the Portal, select **Search** and select the type of session to search.

   When you select the type of session to search, a default template session type select is displayed. The current search template is listed above the search panels.
2. If you want to use a template other than the default, click **Select Template**.

   A search template is the set of fields that you can include in your search.

   Depending on the type of search, you might want to select a different session list template, which is used to specify how the search results are displayed.
3. In the **Search Range** field, select a data range.

   For searching completed sessions, you can specify a range of dates over which to search.
4. From the **Basic Search Fields** pane on the left, select search fields to include in the search.
5. Configure selected search fields.

   In the main panel, you can specify the values and other conditions for the selected search fields.
6. Click **Search** to run the search with your configured search fields.

   A status of the progress of your search is displayed and then the search results are displayed.

**Results**
When results are returned, they are displayed in the selected session list template.

***Timestamps in Search and Reporting***
Generally, the timestamps listed in the Portal are reported in the Tealeaf time zone, which is displayed in the upper-right corner of every Portal page.

For example, when you drill down from a report displayed in the Tealeaf Report Builder, the displayed time zones in the list of sessions are consistent with the times reported in the source report. However, for active search and for reports on active sessions, time information is reported in the time zone selected for the current user. For example, if you are located in the Pacific time zone, creating and executing a search of today's sessions results in a list of sessions whose timestamps match to the current date in the Pacific time zone. In this manner, you can identify activity that is going on right now by comparing times in active data in the Portal to the time of your local desktop.

For more information about configuring your personal time zone, see "My Settings" in the *IBM Tealeaf cxImpact User Manual*.

Time zone information is displayed in the Portal according to the following table.

**Note:** Except as noted in the table, timestamps in the Portal are in the Tealeaf system time zone.

| *Table 14. Portal activity and time zone used* | |
|---|---|
| **Portal Activity** | **Time zone Used** |
| Active Sessions | User time zone |
| Active Search | User time zone |
| Completed Search | Time zone is specified in the search criteria. By default, the selected time zone is set to the User time zone. You can configure to search according to a different time zone. |
| All Sessions Search | Same as Completed Search. |
| Report Drill-down | Tealeaf time zone |

**Working in the Search page**

In the Search page, you can configure a search using the selected search template to look for active, completed, or all sessions that match the criteria you specify.

Each user can select the search template to use.

Search templates are created and configured by your Tealeaf administrator.

The following sections describe each functional area of the Search page.

**Search toolbar**

The toolbar for the Search page is located at the top of the page.

*Figure 11. Search Toolbar*

The function for each icon and button on the Search toolbar is described in the following table.

| *Table 15. Search toolbar icon descriptions* | |
|---|---|
| **Icon** | **Click this icon or button to. . .** |
| | Reset the search to the default fields and values specified in the search template. |
| | Open a search that has been previously saved. |
| | Save the current search. |
| | Display a URL to the specified search. |
| **Search Template** button | Select a different search template, which enables searching for a different type of session: active, completed, or all sessions.<br>For detailed information about search templates, see Search Template. |

| *Table 15. Search toolbar icon descriptions (continued)* | |
|---|---|
| **Icon** | **Click this icon or button to. . .** |
| **Search Options** button | Open search options.<br>The Search options vary depending on the search template that you select. For information about this option, see Search Options. |

### Search Template

From the **Search** page, you can choose the search template appropriate for the search you are specifying. Typically, search templates are provided based on the type of session for which you are searching: Active, Completed, or All Sessions. You can also open saved searches, which automatically select the template that was used to create them. Search templates are defined and assigned by a Tealeaf administrator.

The currently selected search template is displayed as a hyperlink above the search panels. To select a different search template, click the search template hyperlink. The Template Selector is displayed:

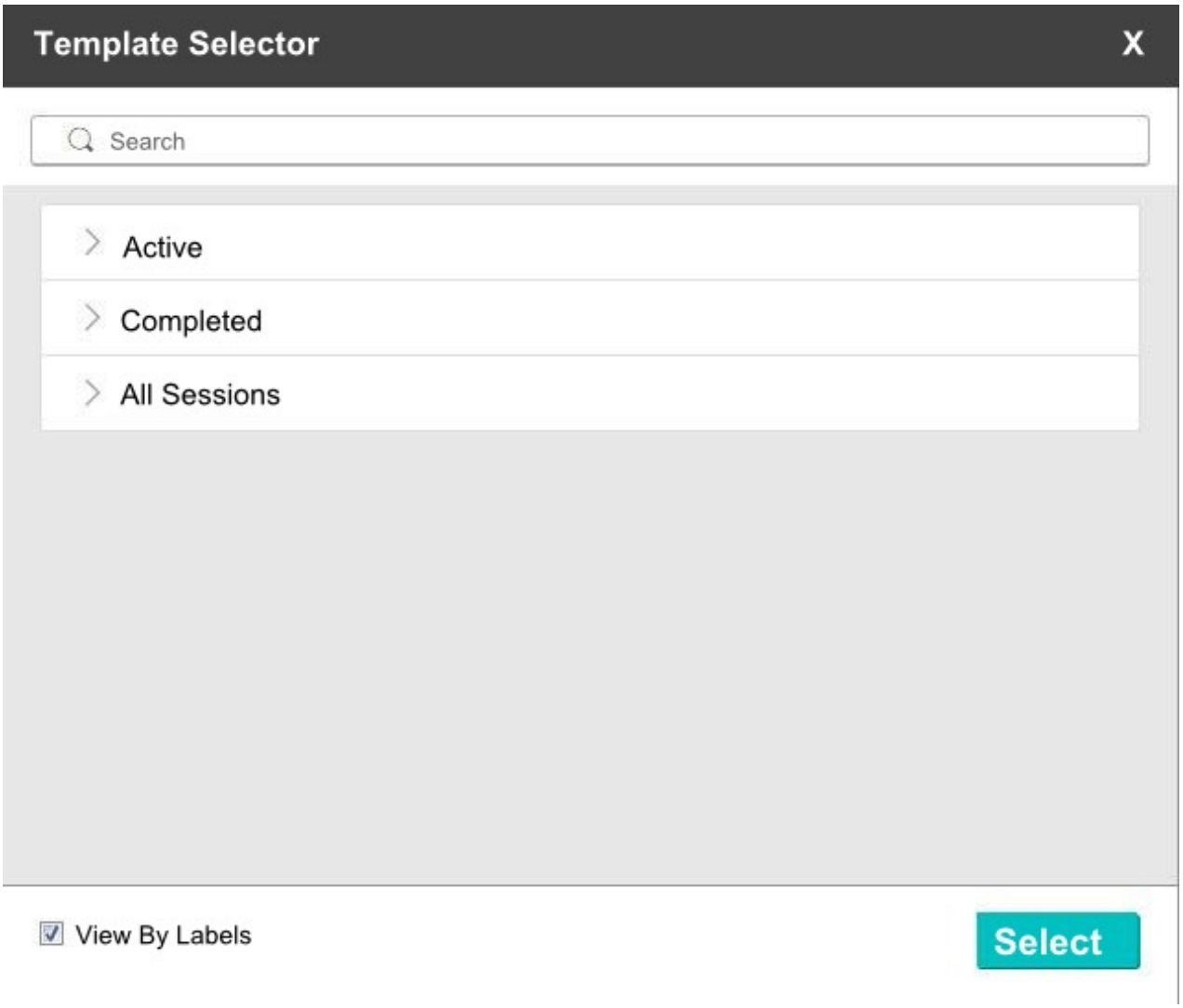



*Figure 12. Template Selector*

Select the template to use in the Template Selector.

- To filter the display, enter text in the Search textbox. The listed templates are filtered as you type.
- To select a template, click it. Then, click **Select**. Based upon your selection, a search template is displayed. With the help of that template you can search by using predefined parameters.

- After you complete your search, the **Search** page remembers the last template that you used for the current type of search. If you switch from Active search to Completed search, for example, the Search page loads the last template used for Completed search.

**Note:** If you are interested only in the number of sessions in which your search criteria occurred, you can configure a session list template to display only the counts, which can improve search speed.

Depending on whether you select an **Active**, **Completed**, or **All Sessions** search template, the available options for the following search features may change:

- Available search fields
- Search options
- Search scope

For information about the search template types, See Search Template Types

### Search Template Types

Tealeaf monitors a visitor's interaction with a web application during a session. Tealeaf provide default templates for active, completed, and all session searches.

*Table 16. Search Template Types*

| Template type | Description |
|---|---|
| Active | From captured data packets, Tealeaf assembles requests from visitors to a web application and responses from the application to the visitor's browser. The requests and responses are combined into Tealeaf entities called **hits**. A sequence of hits for a specific visitor can be assembled into a representation of the visitor's **session** with the web application.<br>While the visitor is interacting with your web application, the session is considered **active**, as hits are added to the session based on the visitor's continuing experience with the site.<br>• The sessions that are being experienced by visitors to your web application at this moment are known as **active sessions**. To search for them, use a search template from the Active category.<br>• `<Default_Active>` - default template for active session searches<br>Because sessions remain active only for a short period of time, the list of active sessions is constantly changing with new sessions starting and older sessions being completed and moved to the archive. If you are trying to solve a problem that is occurring with the web application right now, search active sessions for the most relevant session data.<br>**Note:** The number of active sessions that you can search at any time is limited to a maximum of 150,000. Under various conditions, this maximum may be reduced, such as heavy usage of user-defined session attributes or memory resource limitations in the search process. |
| Completed | When the visitor is no longer interacting with the site either due to a logout action or inactivity for a period of time, the session is no longer active, and Tealeaf closes the session. Tealeaf considers the session complete and saves it to the archive, which is also known as the Long-Field Canister (LTC), where additional indexing and processing functions are completed.<br>• At this point, these sessions become **completed sessions**. Completed sessions are no longer changing in real time. To search for them, use a search template from the Completed category.<br>• `<Default_Completed>` - default template for completed session searches |

| *Table 16. Search Template Types (continued)* | |
|---|---|
| **Template type** | **Description** |
| All Sessions | Tealeaf users can search active sessions, completed sessions, or both.<br>• To search for both types of sessions, use a search template from the All Sessions category.<br>• `<Default_All_Sessions>` - default template for All Sessions searches |

### Search Options

Each Search Template has its own search options. Depending on the type of search template that you select, the following options are displayed:

| *Table 17. Search option descriptions* | |
|---|---|
| **Search option** | **Description** |
| Search Time Zone | The **Search Time Zone** option is for Completed Sessions search only.<br>For Completed searches, you can select the time zone to use for your search. When a different time zone is selected, the date and times that are applied to the search are defined regarding the selected time zone.<br>By default, the applied time zone is the local time zone for the Tealeaf user. |
| Session List Template | Select the session list template to use with the current search.<br>To use the one auto-assigned with the base search template, select `<Default>` |
| Sort Results By | The method by which to sort the returned sessions. This setting also determines the order in which sessions are matched against the search, which can impact the sessions that are returned if the search is aborted.<br>The available options vary depending on whether you are using an Active or Completed search template. |
| Search Servers | Select one or more servers whose Search Servers are queried when the search is executed. |
| Automatic Search Timeout | The **Automatic Search Timeout** option is for Completed Sessions search only.<br>The length in time that the search must run before stopping and returning any matched sessions.<br>By default, this value is set to `90` seconds. |
| Automatic Stop Limit | The **Automatic Stop Limit** option is for Completed Sessions search only.<br>The maximum number of sessions that are found before the search is stopped and any matches are returned.<br>This value is applied to each server. So, if your search is spanning four servers, the maximum limit is defined as four times this value. |

### The Search Range field

When searching completed sessions, you can use the **Search Range** field to search for completed sessions within a specified range of time.

1. To search completed sessions for a specified date range, select **`<Specify>`** from the **Search Range** field and enter values for a start date and time and an end date and time.

   When specifying a time, you may use the arrow keys and TAB and ENTER to make your selection. To cancel the time configuration, press ESC

   The specified range is applied when you execute your search.
2. To search the widest possible date range of all sessions stored in all active Canister and Selective Archive servers, as defined in the Portal, select **`Available Dates`** from the **Search Range**.

   **Note:** The timestamp values in the Available Dates range correspond to the timestamps of the last hit of the earliest and latest sessions in the Canisters. Within a session, this value is recorded as the `TltStsLastUse` session attribute.

   Tealeaf administrators can define the set of active Canister and Selective Archive servers in the Portal Management page.

   **Note:** If you change the selected servers in the Search Options, the Available Dates from which you can search does not change. The date range for available sessions may no longer match the Available Dates range.

   From **Search Range**, you can specify a predefined period back from the current date. Most of the options are intuitive, with the following exceptions:

   **`Latest 5 Minutes`**
   Searches the most recent 5 minutes of sessions that have been indexed among the available date-time range (Completed sessions only).

   **`Latest Hour`**
   Searches the most recent hour of sessions that have been indexed among the available date-time range (Completed sessions only).

### Search fields

In the left panel of the Search Page, you can select the search fields to include in your search. You can include up to six search fields.

- Click **Basic Search Fields**, **Session Info** or **Page Info** to show the list of fields on which you can search.

  Depending on the selected search template, one or more of the following groups of fields is available in the **Search Fields** panel.

*Table 18. Search fields*

| Search field type | Description |
|---|---|
| Basic Search Fields | Free text search of each request or response in a session or search for specific events or both. |
| Session Info | As hit data is captured, Tealeaf begins assembling and updating data pertaining to the individual session. |
| Page Info | When a hit is captured, Tealeaf evaluates its contents and assembles information pertaining to the page or the entire hit. |

- To add a field to the **Search Configuration** window, click it.

  The selected field is displayed in the **Search Configuration** pane of the Search page.
- To remove a field, click the X icon in the upper-right corner of the box in the **Search Configuration** window ( ).

  If this icon is missing, then the field is required and must be populated.

### The Configuration window

In the **Search Configuration** window, you can specify the scope of the search and enter or select specific data for each of your selected search fields.

### The Search scope

From the **Search Scope** field, you can select how the populated search fields are logically bound in the search.

**Option**
**Description**

**`AND - Same Session`**
All given fields must match against a session.

**`AND - Same Page`**
All given fields must match against a single page in a session.

**Note:** The above option is only available for Completed search templates.

**Note:** And on Same Page searches cannot include negative operators on search criteria.

**`OR - Any Session`**
Any given field must match against the session.

### Notes on AND Searches

When an event fires, it is recorded in the report database with the reference values at the time the event fired. When you drill into a hit-based report, a search is run to return relevant results, which may return session counts that do not match expectations based on the report data for the following reasons.

- If you specify an AND search with only a single search term, the Portal automatically converts it to a single-term search so that sessions are returned.

  **Note:** The following explanation applies to hit-based reports using dimension value filters and how to match up report results with search results. Session-based report data should match search results.

Text searching is session-based. When a search is run, any session containing the dimension value and the event is returned, even if the dimension value on the hit where the event fired is different from the dimension value in the search. For this reason, a higher number of sessions may be displayed when drilling into the initial session list.

For example, suppose you have two 4-page sessions:

- Session 1 has page 1 with dimension value App1. On page 4, the value is App2 when `Event 1` fires.
- Session 2 has page 1 with dimension value App2. On page 4, the dimension value is App1 when `Event 1` fires.

Suppose that you are viewing a report that identifies the occurrence of App2 on the first page of the session. When you click the drill-down link, the Portal essentially specifies the following search:

```
Event=Event 1 and Application=App2
```

Since search is session-based, the logical and is applied to the entire session, not to the individual hit. When this search is run, both of Session 1 and Session 2 are returned, as `Event 1` and App2 is displayed somewhere in the session.

The report data displays a count of 1 for `Event 1` with dimension value App2. However, when you drill down, two sessions are returned, because both sessions have dimension value App2 and `Event 1`.

For the above example, you can generate search results through the Portal search interface that are consistent with the report data by specifying the search terms and the following conditions:

**Note:** This search must be run through the Portal search interface. It cannot be configured as a drill-down search through the session list.

- Apply a logical AND
- Specify the data/time range appropriately
- Apply And on same page in the search specification, if filtering a dimension value other than Path. By default, And on same page is applied to searches by using the Path filter.

  **Note:** And on same page searches are available only for completed sessions.

### Working with Search Configuration

Each search template has a list of search fields that are associated with it. You can add a search field by selecting the field in the list.

- You can add up to 10 search terms to a search.
- Fields can be selected more than once and specified independently.
- Fields left empty when the search is submitted are ignored. If no fields are specified, all sessions that are meeting the other constraints are returned.
- Searches by using Boolean search terms can be applied to a single session fragment only, as the underlying search engine is unaware of fragmentation. If the session contains multiple fragments, search results can be inaccurate. Through RTV, you can retrieve search results for one search term and then perform a search of the returned sessions for the other term.
- To remove a field, click the X icon ( ).

  **Note:** Using a NOT operator, such as does not include, on a search for field values can slow response time. The underlying search engine must retrieve all possible values for the field and then apply the NOT to generate results.

*Figure 13. Search fields*

Depending on the type of search field you added, different search field configuration options are available.

#### *Session list templates*

In addition to the search templates, you can also configure and select a template for displaying the list of sessions that are resulting from a search.

A session list template defines the columns of data in which the returned sessions from a search are displayed.

- Before running the search, the session list template can be selected from Search Options.
- After the search is run, you can switch to a different session list template as needed.
- You can configure session list templates for use in exporting session data for analysis through third-party tools.

#### *Running the search*

After you finish adding and configuring search fields, you are ready to run the search.

### About this task

This topic describes how to run the search and review the contents of the search status window.

### Procedure

- Click **Search** to run your search.

**Note:** If your search is taking a long time or appears to be searching too many indexes, you can re-configure it to optimize performance.

The search criteria that you specified are passed to the selected search server(s). The servers analyze the relevant indexes to return the appropriate results.

**Note:** When the search is run, any fields that you added to the search and left unpopulated are ignored and are not submitted. If no search field is properly populated, the Portal runs a query to retrieve all sessions for the specified date range from the queried Canisters.

- Optional: To cancel the search, click **Cancel Search**.

  Any results that were found prior to you cancelling the search are returned and displayed in the configured session list template.

- Review the Search Status window.

  While search results are gathered from the selected Search Server or Search Servers, the **Search Status** window is displayed to indicate status.

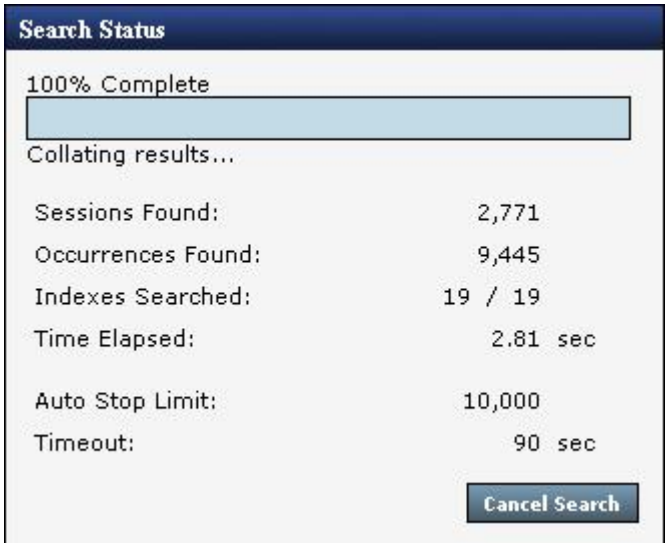



*Figure 14. Search Status Dialog*

*Table 19. Fields in the Search Status window*

| Field | Description |
|---|---|
| Sessions Found | The number of sessions found. |
| Occurrences Found | Within the found sessions, the number of occurrences found. |
| Indexes Searched | Lists the number of indexes that are searched and the number of indexes that are scheduled to be searched based on the Search Servers and date range you specified. |
| Time Elapsed | The number of seconds elapsed since initiating the search. |
| Auto Stop Limit | The maximum number of sessions that are found before the search is stopped and any matches are returned.<br>– This value is applied to each server. So, if your search is spanning four servers, the maximum limit is defined as four times this value.<br>– This setting is designed to prevent runaway searches that can significantly affect system performance. |

| *Table 19. Fields in the Search Status window (continued)* | |
|---|---|
| **Field** | **Description** |
| Time Out | The length in time that the search is permitted to run before you stop and return any matched sessions. |

*Search optimization tips*
If your search is taking a long time to complete, there are some things you can do to optimize it's performance.

When you are configuring a search, the following tips can help return faster and better results:

- Searches of completed sessions are faster than active sessions because completed sessions are indexed.
- Avoid doing free text searches of the request or the response. Use keywords and provided search fields instead.
- For completed session searches, try to minimize the date range to only the relevant dates.

*Search processing*
When you click the Search button, the Tealeaf system performs a set of actions in sequence as described in the following list.

1. The Portal passes the search query to the Report Server.
2. The Report Server examines the query.

   If the search spans multiple Search Servers, the Report Server farms out pieces of the request to the Search Server on each relevant Canister Server.
3. Each Search Server examines its part of the request and determines the session indexes that must be searched.
4. Those indexes are searched for matches.
5. Information about matching sessions is retrieved from the indexes and sent back to the Report Server.
6. The Report Server collates the results and delivers them back to the Portal for display to the user.

If you are searching across multiple servers, duplicate search hits and sessions are removed. The number of returned sessions reflects the number of unique sessions that returned, capped by the maximum permitted number of returned sessions. The number of sessions that are found is not adjusted to reflect any duplicate sessions that were found yet not returned due to the maximum number of sessions setting.

You can select individual Search Servers to query as part of your search criteria

## Search field configuration

After you add the fields Search Configuration section of the Search page, you can enter text or make selections for each field.

There are two kinds of data in Tealeaf:

- **Captured data** from session hits
- **Derived data** from processing the captured hits

Tealeaf organizes both types of data into commonly used groups.

Except for the * and ? wildcard characters, when a search for completed session data is submitted, the contents of each text field is stripped of characters that are not indexed and replaced with spaces.

**Overview: Basic search fields**
In the **Basic Search Fields** panel, you can select from different types of criteria to use in your search.

The following table lists and describes the fields that are available in the Default Completed search template.

| *Table 20. Search types for Basic search* | |
|---|---|
| **Search type** | **Description** |
| All Text | When you search completed sessions, you can search for a text string in any part of the session data, including the request, the response, and any derived data such as events or custom user-defined fields.<br>You can also use the **All Text** search field to insert coded search queries to the search engine. This data is indexed by using the dtSearch software program, so any of the search options that are provided by dtSearch are available.<br>Some dtSearch reserved words such as `not` and `contains` must be bracketed in single quotation marks, if they are used as literal string values in the `All Text` field.<br>You can insert search keywords into the **All Text** field to search for annotations and annotation authors.<br>All Text search is not available for active sessions. |
| Text in Request | You can search for a text string in the request portion of a hit. The examined content can vary depending on the type of search. |
| Text in Response | You can search for a text string in the response portion of a hit in completed sessions. |
| Events | You can search for the appearance of specific events in the session data. |
| Event Values | In completed sessions, you can search for the appearance of specific event values. However, more configuration can be required. |
| session attribute | You can search for user-created session attributes. |

**Configuration for text searches**

Depending on the type of session you are searching, you can search for text strings that are contained in requests, responses, events, and other derived data.

In general, specify the minimum text that is required to produce meaningful search results; lengthy search terms with extraneous words in them take longer to return the same or marginally improved results.

You can choose to return results that include the search field or to exclude the search field by selecting the applicable radio button.

- `include` - returns results with the search field. This is the default setting.
- `exclude` - returns results without the search field.

  **Note:** If merging of fragments is enabled, using the NOT option might cause returning improper results. If you search the session for the absence of a search field returns a true result and a related fragment of the session returns a false result (meaning that the field is present in the fragment), both the session and the fragment are listed in the results, even though the field is displayed in the fragment. Avoid using the NOT operator when sessions are fragmented.

You can configure the maximum word length that is permitted in newly created session indexes by changing the value of the `Maximum Word Size` setting in the Indexing Options tab of the Session Indexer configuration in TMS. Changing this setting can have immediate impacts on search results.

**Note:** To limit index size, which is indexed words are truncated to a maximum of 32 characters each, by default. Longer words are truncated at 32 characters to match search fields in the index and are submitted without prompting the user.

**Note:** If a search field must search for values that are longer than 32 characters, you can create an MD5-hashed search field in the search template. When a Tealeaf user enters the full plain text, it is converted to a 32-character MD5 value and submitted to the search engine for processing.

***Text searches by session type***

The way a text search functions varies depending on the session type in which the search is implemented.

The following table describes how each text search behaves for the different session types.

*Table 21. Text searches by session type*

| Search Field | In Active Sessions | In Completed Sessions | In All Sessions |
|---|---|---|---|
| `All Text` | This field is not available for active sessions, due to the inefficiency of this type of un-indexed sessions. | The entered string is searched against all session indexes for matches.<br>• In the default configuration, the response is not indexed, so this search field cannot be used to search response data. See below. | Search queries are applied only to completed sessions. |
| `Text in Request` | The entered string is searched against the request text in all active sessions. | The entered string is searched against the values in the name/value pairs of the request that have been stored in the search indexes.<br>**Note:** In standard indexing, only a selection of request fields is indexed for search.<br>• In completed sessions, value information is stored as words in search indexes. Name fields are stored as fields, which can be searched using the Form Field search term. | Search queries are executed against both active and completed sessions.<br>**Note:** Since the behaviors of this field vary depending on the type of search performed, single search term in this field cannot be applied to both active and completed sessions. |
| `Text in Response` | Searches all response text for matching strings. | In completed sessions, the response is not indexed by default, so this type of search does not apply.<br>• To search for specific information in the response, you can create an event to identify specific patterns in the response and then perform a search for that event.<br>• You can also create a privacy rule to insert the data into the `[appdata]` section of the request, which is always indexed. This method is more advanced. | Search queries are executed against both active and completed sessions.<br>**Note:** Since the behaviors of this field vary depending on the type of search performed, single search term in this field cannot be applied to both active and completed sessions. |

***How to handle URLs in a search***

URLs are split up by non-alphanumeric characters, typically the forward slash (`\/`).

Then, each word is truncated to the maximum word limit, effectively becoming multi-word search terms.

***Support for wildcards in text searches***

You can use wildcards in text searches. The following wildcard patterns are supported:

*Table 22. Supported wildcard patterns*

| Wildcard pattern | Description |
|---|---|
| `*` | Matches any number of characters. For example, `C*` matches both `CC` and `CAT`. |
| ? | Matches any single character |

How the wildcards are supported depends on the type of search you are running.

**Note:** It is by design that completed session search is based on words and does not match any text within a word unless wildcards are specified.

In the table below, you can see how two different search strings, one with a wildcard and one without, result in different matches that are depending on the type of search.

*Table 23. Wildcards in text searches*

| Search Type | String: `town` | String: `town*` | Explanation |
|---|---|---|---|
| Active Sessions | Matches `town`, `towns` and `township`. | None. | In Active search, matches are strict text matches. Since the text `town` exists in all 3 words, all are returned as matches.<br>• In the second string, there is no such word as `town*`, so no results are returned. |
| Completed Sessions | Matches `town`. | Matches `town`, `towns` and `township`. | In Completed search, matches are made based on the word as the fundamental unit of comparison.<br>• The first string is treated as a word and thus returns the word `town`.<br>• The second string includes a wildcard, which is supported in completed search. So all 3 words are returned. |
| All Sessions | • Active: Matches `town`, `towns` and `township`.<br>• Completed: Matches `town`. | • Active: None.<br>• Completed: Matches `town`, `towns` and `township`. | An All Sessions search runs separate queries against the specified sets of active sessions and of completed sessions. Thus, the behavior of wildcards varies depending on the type of session that are queried. |

***Limitations on use of regular expressions***
Search provides support for regular expressions, with the following limitations:

- A regular expression must match a single whole word. You cannot use regular expressions to match multiple words.
- Only letters are searchable by using regular expressions.
- No information is stored about line breaks. Searches that include beginning-of-line or end-of-line regular expression criteria (^ and \$) do not work.
- Wildcards that are closer to the start of a search expression impacts the speed of search more. For example, the search for `appl.*` is nearly as fast as searching for `apple`, while you search for `.*pple` is much slower.

***Text queries in the All Text field***
You can also use the **All Text** field to construct text-based queries of the database.

When All Text queries are in the form that is expected by the underlying dtSearch engine, they run as if they are constructed through the Portal form.

**Note:** These queries are submitted to the dtSearch engine with minimal pre-processing. As a result, it is possible to submit invalid search queries that would otherwise be prevented by the user interface. Where possible, use the search criteria that are provided in the Portal Search screen.

**Note:** dtSearch does not support searching for empty string values. To search for an empty string value, you must create an event to identify patterns that are matching the empty string value.

One useful way to learn to construct text-based queries is to create form-based queries and then to examine the query that is displayed beneath the search results. When inserted back into the All Text field of a new search, the query repeats the same search query. You can use these displayed queries as the basis for constructing queries of your own.

You can use the dtSearch keyword `contains` and the parentheses (`(` and `)`) to demarcate dtSearches.

### Time grades

You can search for time grades that are assigned by Tealeaf for network transit, round trip, and page generation times.

For example, add the following string to the **All Text** field:

```
RT_Grade contains ExcellentRT
```

The previous query returns all sessions in which the round-trip time was graded as `ExcellentRT`.

The three types of time grades that can be searched for are:

- `NT_Grade` - network trip
- `RT_Grade` - round trip
- `WS_Grade` - web server page generation

For each type of time grade, there are four grade levels. For example, following are the RT time grades:

- `ExcellentRT`
- `NormalRT`
- `HighNormalRT`
- `HighRT`

The definitions of the grade levels are specified at the point of capture in the PCA.

If this search is frequently needed in your environment, you can configure the Portal and/or the IBM Tealeaf CX RealiTea Viewer to include these options in search.

### Client UI URLs

If Tealeaf UI Capture is implemented in your Tealeaf solution, you can search for client user interface URLs.

**Note:** The Tealeaf UI Capture enables the capture of client user interface events that do not generate a request to the web server, which can be captured through default Tealeaf capture. Tealeaf UI Capture requires more installation and implementation. See "UI Capture for Ajax Guide" in the *IBM Tealeaf UI Capture for Ajax Guide*.

The following client user interface data are inserted into the `[appdata]` section of the request. You can search for this data by using the Search Keywords that are listed in your All Text search query.

*Table 24. Text queries in the All Text field*

| Request Field | Search Keyword | Description |
|---|---|---|
| `TLT_CUI_URL` | `Client UI URL` | The URL on the web server where the event was triggered. |
| `TLT_CUI_APPLICATION_NAME` | `Client UI Application` | The name of the client UI application name, which can differ from the `TLT_APPLICATION_NAME` request variable value. |

### Search conditions for numeric fields

For search fields such as `Hit Count`, the text you enter is a numeric value. The following search conditions apply to numeric fields:

- `equals`
- `does not equal`
- `<=`
- `>=`
- `is between` (specify a non-inclusive range)
- `is not between` (specify a non-inclusive range)

When some of the conditions are selected, a second textbox is displayed with the default limit for the value.

**Note:** When you search for numeric values, values are treated as integers. Use of floating point values (for example, `9.99`) can result in false positives.

In most fields, integers are required by the interface.

Some fields, such as event value fields, can contain numeric or text data, depending on the type of field. It means that the integer restriction cannot be imposed by the user interface. For event values that are expecting numeric values, all entered values are converted to integers.

Session attribute fields are stored as text data, regardless of the type of value in them.

### Searching Events

During processing of active and completed sessions, Tealeaf events are created based on user-defined circumstances. The data that is derived from events is stored with the actual hit and session information and can be searched like captured data.

#### About this task

Searching for events whose trigger is `End of Session` or whose reporting is set to `Report last occurrence` can require adjustments to your search timeframe, as the event time associated with these events is in the past because of the must wait for the session timeout.

**Note:** If you create hit attributes from the request buffer, note that the `[HitType]` section and `[TLFID_*]` sections (where `*` is the identifier for the fact) are generated by the event engine and cannot be detected in live sessions. As a result, any events by using these hit attributes do not fire in the Windows pipeline and are therefore not available for searching. They do fire, however, when they are evaluated in the Event Tester on sessions that are already passed through the Canister.

**Note:** You can search for inactive events, which can contain no data, as long as they are configured for display in the Portal. You cannot search for events that are configured to discard the session.

*Figure 15. Event Selector*

**Procedure**

1. With the Event in the Search Configuration area of the Search page, configure the search:
   a) Click the **Include** or **Exclude** radio button.
      - `Include` - returns sessions that include the data specified in the search. This is the default setting.
      - `Exclued` - returns sessions that exclude the data specified in the search..
2. Click **Select Event** to launch the Event Selector.

   In the Event Selector, you can display events by event label or by name.

   **Note:** When events are displayed by name, you can move the mouse over the event name to view tooltip information.

   In the Event Selector, you can filter the display of events by entering text in the textbox. The search filter is applied as you type.

   The list of available events is filtered based on which ones can be displayed in the selected template. For example, End of Session events cannot displayed in an active or an All Sessions search template.
3. To select an event, click it and then click **Select**.

   The event title is displayed in the **Search** page.

   **Note:** When you select an event, by default, the search configuration looks for the event in combination with *any* dimension. If needed, you can look for instances of the event that match only a selected dimension.

   Dimensions can be configured to capture contextual information from the session at the time when an event occurs. For example, you can capture into a dimension the value of the URL for the page where the event occurred.

   By default, the dimension filter is set to `<Any Dimension>`, which corresponds to the `No Report Group Dimension`.
4. Optional: To apply a dimension filter, click **Select Dimension**.

   The **Dimension Selector** is displayed.
5. In the **Dimension Selector**, you can filter the displayed dimensions by entering text in the textbox.

   The search filter is applied as you type.
6. To select a dimension, click it and then click **Select**.
7. To remove the dimension filter, select `Any Dimension`.
8. After selecting a dimension, the **Dimension Value Selector** is displayed.

   You can select one of the displayed values as part of your search term.

   The values in brackets are constants that are assigned by Tealeaf.

   **Note:** You cannot directly search for null values. To search for a null value, perform a `not includes` operation on the non-null dimension values.

   Values with a flag next to them are whitelisted values, which are defined in the dimension definition.

**Note:** You cannot search for a specified dimension without selecting a value. Wildcard searches on a dimension value are not supported.

You can be able to modify the conditions of the event to include a condition that identifies if a dimension value is present. Then, you can search for the event, knowing that whenever it fires, a dimension is present.

9. After you selected a dimension value, click **Select**.

   The Event search term is updated with a reference to the name of the dimension and the value you selected.

   Dimensions and their values are configured in the Event Manager.

### Results

**Note:** If multiple facts are available that meet the search criteria, the oldest dimension is selected based on creation time, since it is likely to have the most data.

#### *Limitations in searching for events in active sessions*

When you search for active sessions for events, the Event Selector does not contain events that meet any of the following conditions:

- Events that are triggered on the `End of Session` or `Last Hit` triggers have not been triggered yet for active sessions.
- Events that are configured to report the last occurrence, which cannot be assessed until the session is closed.

Events that meet any of the conditions mentioned are filtered from the Event Selector.

#### *Event timestamps*

Event timestamps are recorded at the time that the event occurred in the session.

Individual events are triggered at the following trigger points:

- Beginning of session
- First hit
- Each hit
- Last hit
- End of session

Depending on when the event was triggered, there can be impacts on searching for session data.

**Note:** Since events are recorded at the time they occurred, you can sense mismatched counts in events if you are searching for a session that ends in a different hour. For example, if the event fires at 11:55 and the session ends at 12:05, search drilldowns look for sessions in the 11-12 bucket yet will not discover the specific session, which ended in a different hour. Reporting data is more accurate, but drilldowns can show discrepancies.

The alert service uses the timestamp of the event to put the counts into 1-minute time intervals. These intervals are used to determine if an alert threshold is met.

Tealeaf session data files are stored in session files by day, which is defined by the timestamp of the last hit of the session that is compared to the GMT definition of a day.

The IBM Tealeaf cxResults database uses the session rules, too. The database has the details for each event and therefore can use the actual timestamp that is recorded in the session.

#### Event values

Event values are recorded in the request buffer of the hit in which they occurred. Through the Search page, you can search for specific event values.

Event values cannot be searched for events whose value type is configured to be `Count Only`.

Event values are not available in active sessions. You can return event values in active sessions by searching the request buffer for the fact data.

### Searching session attributes

System-managed session attributes are available for search in the **Session Info** panel. You can also review session attribute values in the session list that is containing search results.

#### About this task

Tealeaf supports the creation and indexing of up to 64 session attributes. These variables can be populated by events.

From pre-Release 8.0 versions of Tealeaf, the LoginID and UserDef 1-4 user-defined values are moved to Session Attribute 0 and Session Attributes 1-4.

Configure your search parameters to look for the existence of the session attribute or for specified values in it.

#### Procedure

Perform the following steps to search for a session attribute:

1. In the **Basic Search Fields** pane, click **Session Attribute**.
2. In the **Session Attribute** panel added to the search, click **Select attribute**.
3. In the **Session Attribute Selector**, select a user-created session attribute to add. Click **Select**.
4. The session attribute is inserted into the search criterion. You can also change the operator and value to test for the search.

### Searchable session information

As Tealeaf builds and processes sessions, it derives data from the captured information that is applicable to the entire session. The following session-level fields can be searched:

*Table 25. Search fields for session information*

| Field | Description |
|---|---|
| Annotations | Use this text field to enter search fields for the specific annotation note. Wildcards are accepted. An annotation value is indexed with the author's Tealeaf username, as described in the following field. |
| Annotation Authors | You can also search for the author of the annotation based on the author's Tealeaf username. |
| Browser Type | Search sessions by the type of browser, as identified by the user agent: `IE`, `Firefox`, `Chrome`, or other values.<br>Browser type data is populated only if extended user agent parsing is enabled in the Tealeaf Reference session agent deployed in your Windows pipeline. See "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*. |
| Client IP | The IP address of the web browser that requested the page. This value rarely deviates from the IP address value for the session. |
| First Page | Search all sessions for a path that is also the first page of the session, e.g. `/home/index.asp`. |
| Hit Count | Search all sessions for any session with the number of hits that is more than, less than, equal to or not equal to the number you input. You can use the operators =, >, and <. |

| *Table 25. Search fields for session information (continued)* | |
|---|---|
| **Field** | **Description** |
| Last Page | Search all sessions for a path that is also the last page of the session, e.g. `/store/confirmation.asp`. |
| Session Index | The unique session ID assigned by Tealeaf. |
| TLT Session ID | Like the Tealeaf User ID, Tealeaf can inject a session-specific cookie into the visitor's browser. This cookie simplifies grouping all hits related to a specific session if no other common session key is available. |
| User ID | (Completed sessions only) A Tealeaf cookie injector can be installed on your web servers and configured to insert a unique, permanent cookie into the browser of each visitor. This cookie's value is automatically added to the session data. |

***IP address search***

Tealeaf supports the ability to capture, store, and search for IP addresses that are specified in IPv4 format or IPv6 format.

The IPv4 format is prevalent on the Internet for many years, while the IPv6 format was designed to replace IPv4 by offering potentially many more possible addresses.

**Note:** The capture of IPv6 data is supported in PCA Build 3500 or later. The IBM Tealeaf CX Passive Capture Application must be configured to capture IPv6 data.

IP address data is inserted by the IBM Tealeaf CX Passive Capture Application into the `[env]` section of the request. The fields that are defined in your search templates can be configured to scan for the presence of this request data. Tealeaf provides search terms in the default templates to search for IP addresses, including the client IP, server IP, and more.

IP addresses in either format can be inserted into any search field that is specified to search for this data.

**Note:** IP addresses can be copied from other sources, such as Tealeaf session data or report data, and pasted into the IP field in the search interface.

**Note:** If you upgrad Tealeaf solution from a pre-Release 8.4 build, the Portal automatically checks the upgrade data and adjusts searching for the above search fields to use the appropriate search keyword, using the legacy versions if the search dates include days before the upgrade was completed.

In the available default templates, IP address specification applies to `Session Info\Client IP` and `Page Info\Server IP`. For more information about searching:

**Note:** If you are using the `Text in Request` field to search for IP addresses, the address must be inserted without periods (AAABBBCCCDDD).

### IP address formats

IPv4 and IPv6 address are valid IP address formats.

### Wildcards in IP addresses

You can use wildcards in any octet (IPv4) or group (IPv6).

| *Table 26. Searching for IP addresses* | | |
|---|---|---|
| **Wildcard** | **IPv4 support** | **IPv6 support** |
| * | See IPv6 support column. | The asterisk (*) can be used to replace one or more groups.<br>**Note:** You cannot use the asterisk as part of a specified group or octet (for example, 4* as an entry for a group or octet is not allowed). |
| ? | Wildcards for single characters are not supported. | Not supported |

**Ranges in IP addresses**

In an IPv4 address, a range can be specified in a single octet as:

```
100-199
```

For IPv6 address, a range can be specified in one or more groups as:

```
0000-1000
```

IPv6 Limitations:

- none

IPv4 Limitations:

- You can specify a range in only one of the octets.
  - If multiple ranges are specified in a single octet, then the IP address is ignored.
  - If multiple octets each contain ranges, then the IP address is ignored.
- Wildcards can not be included in octet ranges. For example, an IP address with an octet such as `CCC-D*` is ignored when the search is run.

Examples for IPv4:

| *Table 27. Searching for IP addresses* | | |
|---|---|---|
| **IP address** | **Works** | **Explanation** |
| `1.12.113.114` | Y | A valid entry |
| `1.?2.113.114` | Y | Not supported |
| `1-99.22.113.114` | Y | Returns all matching IP addresses whose first octet a value between 1 and 99 inclusive. |

**Notes on searching for client IP addresses**

In most web applications, the client IP address is contained in the `REMOTE_ADDR` field in the request.

- Tealeaf provides the search field `Session Info\Client IP` in the default completed template, which is configured to search for the client IP address, provided it is displayed in `REMOTE_ADDR`.
- This value is the raw, non-normalized remote address.

- If this value is an IPv6 address, the REMOTE_ADDR contains the IPv6 value in compressed format, if compression is enabled in the PCA.

If the **Client IP** search field is not available, the client IP address can be available in the [env] or [appdata] section of the request, depending on the rules that are configured for your Windows pipeline.

- If it is an IPv6 address, the value is stored in the [env] section of the request and can be in compressed format, as captured and processed by the PCA.

  **Note:** If your web infrastructure uses a proxy, such as Akamai, in front of your web servers or if your network traffic is passed through a Network Address Table, the REMOTE_ADDR field does not contain the true client IP address. In these configurations, you must review the request headers for a special label such as HTTP_X_FORWARDING, which contains the true client IP.

  – Beginning in PCA Build 3501, the IBM Tealeaf CX Passive Capture Application can be configured to use the HTTP_X_FORWARDING setting for populating the REMOTE_ADDR value.

*Searching for IPv4 addresses*
In Active, Completed, or All Session searches, you can search for IP addresses in IPv4 format for the visitor's client or your web servers.

### About this task

For fields identified as an IP address, you can search for IPv4 addresses as a set of four octet values.

To search for IPv4 addresses:

### Procedure

1. From the **Session Info** panel, click **Client IP**.

   The search field for Client IP is displayed in the Search Configuration window.
2. In the text field, enter the IP address in the following format:

   ```
   AAA.BBB.CCC.DDD
   ```

   **Note:** IPv4 addresses entered in the following formats are not supported for search:

   ```
   AAA BBB CCC DDD
   AAABBBCCCDDD
   ```
3. Click **Search**.

*Searching for IPv6 addresses*
You can search for IP addresses in IPv6 format for the visitor's client or your web servers.

### About this task

IPv6 addresses are inserted by the PCA into the <env> section of the request.

**Note:** The capture of IPv6 addresses must be enabled in the PCA for these addresses to appear in the request.

To search for IPv6 addresses:

### Procedure

1. From the **Session Info** panel, click **Client IP**.

   The search field for Client IP is displayed in the Search Configuration window.
2. In the text field, enter the IP address

   For IPv6 addresses, you may enter the address in the provided IP address field in either uncompressed or compressed format.

**Note:** In IPv6 notation, the port number may be appended to the address in parentheses: `(8080)`. In Tealeaf, searches using port numbers are not supported.

**Note:** You cannot search for full, compressed IPv6 addresses. You must apply wildcards to the search string.

In compressed format, the above address can be entered as follows:

```
2001:db8:85a3:0:0:8a2e:370:7334
```

The compressed address is expanded as part of the submitted query.

Wildcards and ranges may be applied to IPv6 addresses.

3. Click **Search**.

***Searching for IP addresses in free text***

You can use the freetext search field to specify an IP address by using wildcards. However, since this search method is run against all applicable fields, results are returned at a slower rate.

Tealeaf captures IP addresses in active session data in their native form. After a session is complete, IP addresses are turned into 12-digit values so they can be easily indexed. For example, the IP address `192.168.0.1` in an active session is rendered into the following value that is stored with the completed session data: `192168000001`.

Depending on the type of search, you must specify a free-text search of an IP address in either of the following ways:

- Active Sessions: For active sessions, you can specify the full IP address, by using wildcards. In the previous example, search for `192.168.*.1` matches the above IP address and all other IP addresses whose first, second, and fourth field is the same.
- Completed Sessions: For completed sessions, the IP address is now stored as a 12-digit text string, so wildcards do not apply. Full IP addresses must be supplied. For example, the value `192168000001` for an IP address in a completed session is not equivalent to 192,168,000,001.
  - Storing as a numerical value enables searching across ranges of IP addresses.

***Searching for annotations***

You can search for annotations that are added to session data through Tealeaf.

**About this task**

Annotations provide a mechanism for tracking activities by Tealeaf users about individual sessions. Annotation data is stored with the session data.

After an annotation is saved into a session, the session must be indexed or reindexed before the annotation is available through search.

You cannot search for annotations in active sessions.

You can search for annotations through RTV, as well.

To search for annotations:

**Procedure**

1. When a search template includes annotations, you can search for either of the following fields in the Session Info node.

   **Note:** Since Visitor search queries are broken up into queries for each individual search term, you can combine searching for Annotation or Annotation Author with other search terms in Visitor search.

   **`Annotation`**
   Use this text field to enter search terms for the specific annotation note. Wildcards are accepted.

**`Annotation Author`**
You can also search for the author of the annotation that is based on the author's Tealeaf user ID

**Note:** You cannot create searches for these fields in combination with other search fields. Annotations and Annotation Authors are indexed through a different document mechanism, which results in null search results when combined with other search fields. In IBM Tealeaf cxResults, searches for Annotations or Annotation Authors can include other search terms, since IBM Tealeaf cxResults searches are split into individual queries for each search term.

2. Optional: Search for annotations using the free-text search .

   If your search templates do not include the Annotations and Annotation Authors search fields, you can still search for this data by using free text search.

   You must enter the appropriate search keyword for these search items in the text field. Examples:

   - Searching for annotation text:

     ```
     annoobject/text contains error
     ```

     – Previous searches for annotations whose text contains `error`.
   - Searching for annotation author:

     ```
     annoobject/name contains ADMIN
     ```

     – Previous searches for annotations whose author has the Tealeaf user ID `ADMIN`.

   If you find yourself frequently using free-text search for annotations, a Tealeaf administrator can add the annotation fields to your search template. The keywords to add are `Annotations` and `Annotation Authors`, and MD5 hashing does not apply.

**Searchable page information**
As Tealeaf creates and processes hits, it derives data from the captured information that applies to the entire hit or page.

For this grouping, the list of searchable fields for active sessions is completely different from completed sessions.

The active page fields are aggregated into reports contained within dashboards.

The following table lists and describes the fields that can be searched:

*Table 28. Search field descriptions*

| Field | Description |
|---|---|
| AppData | Search for specified name/value pairs in the `[appdata]` section of the request. For more information, see `Form Field` .<br>The `[appdata]` section is always indexed. |
| Domain | (Active sessions) Search all sessions for a particular domain from which the pages were served. For example, if your web application uses multiple domains, you can restrict your search to one domain. |
| Form Field | (Completed sessions) A field name and value combination in `[urlfield]` section of the request. This section contains query parameters extracted from the URL. For example, in the URL `/page.html?myName=myValue`, the values inserted into the `[urlfield]` section are `myName=myValue`. To search for these values, you specify `myName contains myValue` in the Form Field term.<br>The `[urlfield]` section is always indexed. See "Configuring CX Indexing" in the *IBM Tealeaf CX Configuration Manual* |

| *Table 28. Search field descriptions (continued)* | |
|---|---|
| **Field** | **Description** |
| Page Generation Time (usecs) | (Active sessions) Search for sessions with pages that took a specified number of seconds to be created. Page Generation Time is useful for finding slow pages |
| Page Size (bytes) | (Active sessions) The size of a page measured in bytes. You can use Page Size to search for session containing large pages. |
| Page URL | (Completed sessions) The full name of a requested page, not including the server name. |
| Referer | (Active sessions) Search all sessions for a particular text string in the Browser User Agent field of the HTTP Request, e.g. `*Mozilla/ #.0*`. |
| Server IP | The IP address of the server for this page. Use this field to search for pages generated by the same web server. |
| Status Code | (Completed sessions) The HTTP status code returned for a requested page. |

## Working in the Session list page

After the search has completed, a list of matching sessions is displayed in the **Session List** page.

Active sessions are marked with a blue light indicator ( ) and are listed above Completed sessions.

To sort the display list of sessions by a specific column, click the column header. To reverse the sort order, click the header again.

Columns populated by session attributes are sorted as text values.

In the columns of a session list, some non-alphanumeric characters in event values may be replaced by the space character. This is a known issue. These values are accurately displayed in QuickView.

The session list is displayed in a session list template, which you can select.

### Encrypted fields in the Session list page

Fields that have been encrypted using privacy rules in the IBM Tealeaf CX Passive Capture Application or Windows pipelines, cannot be decrypted in the Portal. Instead, encrypted fields can be decrypted **only** during replay. As an alternative, you can leave the configured fields in unencrypted state in the session data and then define privacy rules specifically to be applied during session replay, permitting the display of the unencrypted data in the Portal, as needed.

### Session List page buttons and command icons

The Session List page has buttons for managing the sessions and several icons for running commands against the sessions.

The following table lists and describes the functions of the buttons that are available in the **Session List** page.

| *Table 29. Buttons on the Session List page* | |
|---|---|
| **Button** | **Function performed** |
| Analyze Segment | If you search completed sessions and a session segment was created, the session segment can be submitted for analysis by Tealeaf's analysis engine. |
| Manage Segments | Show the list of session segments that are created by the current and previous searches. |

| *Table 29. Buttons on the Session List page (continued)* | |
|---|---|
| **Button** | **Function performed** |
| Download All | Download data from all sessions in the Session List. |

In the top-left corner, you can select the following actions to apply to the entire list of displayed sessions. These options are also available for individual sessions.

| *Table 30. Session list commands* | | |
|---|---|---|
| **Command** | **Icon** | **Description** |
| Replay | | Replays the session in the browser or in the IBM Tealeaf CX RealiTea Viewer (RTV), depending on your account configuration. |
| Page List | | View the page list for the session. |
| QuickView | | Open session QuickView, where you can review the event and dimensional data for every event that was triggered in the session. |
| Session Info | | View session properties. |
| Send to Event Tester | | Send the selected session to the Event Tester as sample data. |

**The standard template for the Session List page**

The columns that are displayed in the Session List page are based on a template. By default, session lists are displayed using the *Standard Template*.

The following table lists the columns that are displayed on the Session List page when using the `Standard Template`.

**Note:** You can select a different template in the upper right corner of the session list.

| *Table 31. Session Page columns from the Standard Template* | |
|---|---|
| **Column** | **Description** |
| Session Time | The timestamp when the most recent hit was recorded by the Canister. |
| Duration | The duration in `hh:mm:ss` form for the session. |
| Login ID | The login identifier that is used for the session.<br>This value is populated by configuring `Session Attribute 00` to store it. Additional configuration may be required. |
| Events | A list of the icons for the events that are displayed in the session. This list cannot be complete. Additional information is available in the tooltip for each event icon.<br>**Note:** The icons are displayed in the approximate order in which the events first fired in the session. If multiple events fire on the same hit, they cannot be listed in the precise order of firing. |
| Hits | The number of hits in the session |

### Grouping sessions

You can drag column headers in the **Session List** page to group sessions according to the values in the column.

#### About this task

For example, if you drag the **Hits** column header to the bar above the column headers, then the listed sessions are grouped by the number of hits in them.

You can create multiple levels of grouping.

**Note:** You can only group by columns that contain numeric or text data. Data such as event lists or timestamps cannot be grouped due to inherently high variation in it.

#### Procedure

- To reverse the sort order of the grouping, click the triangle next to the grouping indicator.
- To undo the grouping, drag the triangle back over the source column header.

### Viewing event information from the Session List page

On any page where event icons are displayed, including the **Session List** page, you can view detailed information about the event.

#### About this task

To view event information from the Session List page:

#### Procedure

Move the mouse cursor over an event icon in the **Events** column.

A tooltip for the event icon is displayed.

The following table lists and describes the fields that are displayed in the tooltip for the Event icon.

*Table 32. Event Icon tooltip description*

| Field | Description |
|---|---|
| Display Name | Indicates the name of the event. |
| Description | The free form text "notes" of the event. |
| ID | Indicates the Internal ID for the event.<br>This value is also displayed in the tooltip inside the Event Manager. |
| Internal Name | Indicates the internal text identifier of the event object in the system. |
| Active | Indicates the status of the event. Whether the event is currently active (i.e. whether the event is evaluated by the system for incoming data): true/false. |
| Evaluated On | Indicates the trigger in which the event is evaluated.<br>**Note:** Events marked for evaluation on the last hit of the session or at the end of the session never gets displayed when you search for active sessions. |

| *Table 32. Event Icon tooltip description (continued)* | |
|---|---|
| **Field** | **Description** |
| Tracked Occurrence | Indicates at what occurrence the event fires. Valid values are:<br>• First Occurrence<br>• Every Occurrence<br>• Last Occurrence |
| Published At | Indicates when the Event is published (i.e., when the event is pushed into the session data). Valid values are:<br>• Immediate<br>• End of Session<br>This is relevant for goal based dimensions, which may be populated after the event has fired chronologically in the session. |
| Condition Group Operator | Indicates how conditions are evaluated against each other for event to fire: Valid values are<br>• Or<br>• And |
| Condition | Indicates the condition to check against in order for the event to fire. |
| Modified | Indicates the date of last saved modification to the event definition. |
| Recorded Value | Indicates what the event records.<br>Only that it fired (Count), or some value (text/numeric). |
| Update Session Attribute | Indicates the attribute to be updated with the event's value when the event fires. |
| Created | Indicates the timestamp that the event was created. |
| Updated | Indicates the timestamp that the event was updated. |

**Displaying a session list at the page level**

You can display a session list at the page level and then analyze the details of the pages that are displayed.

**About this task**

Displaying a session list at the page level can make it easier for you to focus your analysis on the page level data within a session.

To display a session list at the page level:

**Procedure**

1. From the Session List page, click the Page List icon of the session for which you want to display pages.

   A **Session Summary** section is displayed.

The pages in the session displayed below the Session Summary section. See “3” on page 59 for information about the page information that is displayed.

**Note:** Events that have the `Display in Session List` setting disabled are not displayed in the Page List.

2. Review the **Session Summary** section.

   The following table explains the data that is displayed in the **Session Summary** section:

| *Table 33. Session Summary data* | |
|---|---|
| **Field** | **Description** |
| TLTSID | Tealeaf session identifier. |
| Page Count | Total number of pages in the session.<br>**Note:** Hits captured from the client user interface through one of the Tealeaf logging frameworks are not tabulated in this metric. |
| Total Events | Total number of events that are found in the session. |
| Connection Type | The type of connection (DSL for example) used for the session. |
| Avg Round Trip | Average time between start of the response to the end of the request. |
| Avg Network Trip | Average time for hit and response to travel across the network. |
| Session ID | The internal identifier that is indicating where the session is stored in the Canister. |
| Session Start | Displays the time when Tealeaf began recording the session in the short-field canister. |
| Duration | Specifies the length of the session in minutes. |
| Avg Page Gen | Average generation time in seconds. |
| Avg View Time | Average view time in seconds. |

3. Review the information pages that are displayed.

   The pages are displayed in the order in which they were encountered by the visitor.

   The following table lists the grid headings and explains the contents for headings.

| *Table 34. Page List headings* | |
|---|---|
| **Field** | **Description** |
| Page | Specifies the number of the page in the sequence of the session.<br>The page number for each page is a link to drill down into individual page views. |
| Events | Displays the icons that are representing the events that occurred on that page. |
| URL | The URL address of the page. |

| *Table 34. Page List headings (continued)* | |
|---|---|
| **Field** | **Description** |
| Status | The status code that is generated by the web server for the page. |
| RT Time | Round-trip time for the request and response. The time from the first byte of the request coming in to the last byte of the response going out. |
| Net Time | Network time is the number of seconds required to receive the request and transmit the response. |
| Gen Time | The time that is taken by the web server to generate the page. |
| View Time | The length of time the visitor remained on the page. |
| Size | The size of the response in kilobytes. |

4. Optional: To see the query strings that are used to run the search, click the **Show query strings** check box.
5. Click the **Page number** link ( ) to display the details of the page.

   The page detail view contains information about the individual pages in a session. The Page Details table lists and describes the sections in the Page Detail view, each of which can be expanded or collapsed by clicking the section's header.

   To scroll forward and backward through other pages in the session, click **<<** or **>>**.

   To replay the session, click **Replay**

| *Table 35. Page Detail sections* | |
|---|---|
| **Section** | **Description** |
| Hit Details | Page number, hit number, and session ID.<br>To replay the session, click the session identifier |
| [iamie] | The unique IDs associated with the hit and session, as well as capture information. |
| [env] | Environment variables from the request and the response. |
| [timestamp] | The timestamps and time ratings. These values are specified by the Tealeaf passive capture application and do not reflect time values for the web server or visitor's browser. |
| [urlfield] | The data that is contained in the **URL** field area of the request. |
| [headers] | The data that is contained in the response headers. |
| [cookie] | The cookies that were sent with the request. |
| [appdata] | Extra data that is associated with the hit, which can also include configurable fields. |
| [ref] | Contains reference data that is inserted into the request. Typically, this section is empty. |

| *Table 35. Page Detail sections (continued)* | |
|---|---|
| **Section** | **Description** |
| [response] | The raw response content of the hit. |

### Viewing page events for a session

You can use the **QuickView** command icon to view information about which events fired on each page on a session, and to view the dimension values recorded with the events.

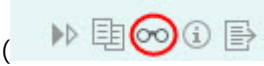
#### About this task

The view provided by the **QuickView** command icon lets you see the details on the triggering of each event in the session.

This topic explains how to use **QuickView** command icon and provides a description of the content that is displayed via the QuickView command.

To view the page events for a session:

#### Procedure

- From the **Session List** page, find the session that you want a quick view of and click the **QuickView** command icon (  )

  **Note:** For sessions that do not contain at least one standard request and response, QuickView data might not be displayable

  For the selected session, information about which events fired on each page, and the dimension values recorded with the events is displayed.

  You might order the display by the page number or by event name.

  Events are displayed according to the values they are configured to track.

  Events must be configured to be displayed in the Portal and to be displayed in a session list.

  Events that are provided with IBM Tealeaf cxOverstat are not displayed in a session list.

  See "TEM Events Tab" in the *IBM Tealeaf Event Manager Manual*.

  **Note:** If you cannot see events in QuickView, select the `All Events` option from the Event Label drop-down. Events that have the `Display in Session List` setting disabled are not displayed in QuickView at all. See "TEM Events Tab" in the *IBM Tealeaf Event Manager Manual*.

  **Note:** If you deploy one of the Logging Frameworks from IBM Tealeaf CX Mobile for Mobile App, QuickView contains no data. The pages captured from any supported Logging Framework do not contain viewable data.

  If you deploy UI Capture, user interface events are displayed on the last valid page on which they fired.
- Review the QuickView information displayed.

  **QuickView Fields**

  **Field Name**
  **Description**

  **Page**
  Page number where the event was triggered.

  – To review the page details, click the page number link.

  Click the Replay icon to open the session for replay on the listed page.

- See "RealiTea Viewer - Replay View" in the *IBM Tealeaf RealiTea Viewer User Manual*.
- See "CX Browser Based Replay" in the *IBM Tealeaf cxImpact User Manual*.

**`Event`**
Display name of the event.

- Move your mouse pointer over the event icon next to the event name to display the event tooltip information.
- If dimension values were recorded when the event fired, you might review them by clicking the Plus (+) icon.

**`Value`**
The event value that was detected when it fired.

- This value is recorded as a part of a fact (event value + dimension values) in the request. See "Tealeaf Data Model" in the *IBM Tealeaf Reporting Guide*.

  **Note:** A non-null value might or might not be recorded in the database. Events can be configured to record specific instances of event firings. This screen lists all event firings that occurred and were marked for searching in the session. For more information about configuring event values to track in the database, see "TEM Events Tab" in the *IBM Tealeaf Event Manager Manual*.
- `[Null]` - A null value indicates that no value was recorded when the event fired.
  - Some events, such as count events, do not record event values.
  - If no dimensional data was captured for an event that is configured with report groups, then the displayed value is a null value.

At the top of the screen, you can review the information from the session list for the selected session.

Additional details are available in the tooltip for each event in the Events list.

- To view details for a page, click the page number link in the left column.
- To control order of the data displayed on the page, select an option from the **Order By** drop-down list.
  - `Hit Number` - events and dimensions are listed by the sequence that is determined by the hit number. The events that fired on a hit are ordered by the hit number.
  - `Event Name` - events are listed in alphabetical order. For each listed event, you can see all of the pages on which it fired.
- To select a different event label whose events you want to see in the event list, click the **<Add Label>** link.

  To see all events that fired in the session, select `All Events`.
- Select the **Show Dimension Constants** check box to include in the list dimensions where constant values such as `[Limit]`, `[Others]`, and `[Empty]` were recorded.

  To display dimension values that contain non-constant data from the capture stream, clear the **Show Dimension Constants** check box.
- Click **Email** to email the selected session to a comma-separated list of recipients.
- Click **Replay** to replay the session in IBM Tealeaf CX RealiTea Viewer or Browser Based Replay.

  See "RealiTea Viewer - Replay View" in the *IBM Tealeaf RealiTea Viewer User Manual*.

  See "CX Browser Based Replay" in the *IBM Tealeaf cxImpact User Manual*.
- To review the dimension values that were recorded when an event was triggered in the session, click the Plus (+) icon next to the event name.

  On individual lines, each dimension and its recorded value are listed.

  Dimensions are listed in alphabetical order by name.

  To normalize values or place limits on the volume of data that is stored, Tealeaf supports a set of dimension constants. These constants can be inserted as dimension values when actual data is not

available or exceeds allotted storage space. Constants such as `[Null]`, `[Others]`, `[Limit]`, and `[Empty]` are displayed in place of detected values in these situations.

For more information about dimension constants, see "TEM Dimensions Tab" in the *IBM Tealeaf Event Manager Manual*

**Viewing session properties from the Session List page**

You can use the **Session info** command icon to view the session properties for the sessions that are displayed on the **Session List** page.

**Procedure**

To display the properties for any session in the session list, click the icon in the session list.

The session properties vary depending on the type of session. For example:

- For active sessions, the session properties include all possible Session Info terms regardless of whether they have yet been populated with values.
- For completed sessions, the Session Info terms include session attributes that have been populated with values. Fields that have not been populated with data from the session are excluded.

The following table lists and describes the properties for active and completed sessions:

*Table 36. Session Properties*

| Property | Description |
|---|---|
| TLTSID | Global Tealeaf session identifier |
| Canister ID | The LSSN file containing the session |
| Session Index | The session identifier within the LSSN file |
| IP Address | IP address of the visitor |
| Domain | The domain from which the session was recorded |
| Browser | Browser information retrieved from the visitor browser |
| Session attributes | Any defined session attributes that have been populated with data at the time of retrieval are listed here.<br>For active sessions, session attributes are listed even if they have not been populated with data.<br>Session attributes are user-defined variables that can be created to track session information relevant to your web application. |

## Other functions that you can perform from the Session List page

Tealeaf provides additional functions that can be performed from the Session List page, including send to event tester, link to search, saving and sharing searches, sub-search, and exporting session data.

### Sending sessions to the Event Tester

You can send any session in the **Session List** page to the Event Tester for use as test data against events in development.

#### About this task

In a session list, you can move the mouse over an event icon to display a tooltip that identify the name of the event. So, you can locate events that you are testing using the event tooltips and then send the event to the Event Tester as sample data.

#### Procedure

Complete the following steps to send a session to the Event Tester:

1. From the **Session List** page, locate the session that you want to send to the Event Tester.
2. Click the **Send to Event Tester** icon next to the description of the session.
3. In the **Send Session to Event Tester** dialog, enter a description or accept the default.

   The default description is the session ID.
4. Click **Send to Event Tester**.

   A message indicating that the session was successfully loaded for the Event Tester is displayed.
5. To go to the Event Tester, click **OK**.

   To return to the session list, where you can add more sessions to the Event Tester, click **Cancel**. The event that you sent is still available in the Event Tester.

#### Results

The sessions that you send to the Event Tester can be selected and used to test against some or all available events.

### Providing a Search URL to Portal users

You can use the **Link to URL** command icon to access the Search URL and provide that URL to Portal users.

#### Procedure

- From the Sessions Search page, click the **Link to URL**( Link ) icon in the Search toolbar.
- Copy the URL from the Search URL window.
- Provide the URL to Portal users.

  **Note:** This URL does not run the specified search. When this URL is selected, Tealeaf users must still authenticate through the Portal. Tealeaf does provide an external API for running through code specified searches.

### Saving and sharing searches

You can save a specified search at any time.

#### Procedure

After adding search criteria to the Search Configuration window and configuring the search, complete the following steps to save the search:

1. Click the **Save** icon in the Search toolbar.

2. Enter a name for your search in the **Save Search** window.
3. If you want to share the search with other Tealeaf users, select the **Shared** check box.
4. To save the search, click **Save**.

   **Note:** To save a search under an existing name, you must delete the old search first and then save the new search by using the existing name.

***Opening and working with saved searches***

After saving a search, you can access a list of saved searches and load the one that you want to work with.

**About this task**

To open a list of saved searches:

**Procedure**

1. From the Session Search page, click the **Open Saved Search** ( Open ) icon in the Search toolbar.

   The Saved Searches dialog is displayed.

   The Saved Searches dialog lists the searches that you have saved, as well as searches that other users have saved and shared. The shared searches are marked with the shared icon.

   You can load, edit, or delete a saved search from the list.
2. To load a saved search, select a search from the list of saved searches and click **Load**.

   **Note:** To load a search, you must have permission to use the search template to which it the search is associated.

   Loading a search populates the search page with the saved options and fields.
3. To edit a saved search, select a search from the list of saved searches and click **Edit**.

   **Note:** You can only edit saved searches that you created or to which you have been granted shared access.
4. To delete a saved search, select a search from the list of saved searches and click **Delete**.

   **Note:** You can delete only the searches that you created.

**Sub-search feature**

When a session is loaded in BBR and RTV, you can configure and perform a search for additional search strings to locate the specific hits in the session where these search strings are located.

This sub-search capability enables search for text strings, request variables, or request variable values.

For information about how to configure and run a sub-search, see *Running a Sub-Search*.

**Exporting session data**

Through the **Session List** page, you can download the list of displayed sessions to RTV, Excel, or PDF format for active, completed or all searches.

**About this task**

The exported session list includes all columns of the session list, as well as links for replaying sessions in BBR or RTV.

**Note:** For active sessions, data export from the session list represents the only way to export active session data without deploying the Tealeaf Event Bus. See "Tealeaf Event Bus" in the *cxConnect for Data Analysis Administration Manual*.

**Note:** In the session list, a column value represents the value of the last request of the session. To acquire each value for the column in the session, you must license and install IBM Tealeaf cxConnect for Data Analysis, a separately licensable product of the IBM Tealeaf CX platform.

To download the displayed set of sessions from the Session List page:

**Procedure**

1. Click **Download All**.

   The following options are available:

   - Download to RTV - Download a file that can be opened in the IBM Tealeaf CX RealiTea Viewer (RTV) later to retrieve the session list.
   - Download to Excel - Download the session list to Excel (XML) format.
   - Download to PDF - Download the session list to PDF format.
2. Optional: Change the session list display limits

   The number of sessions displayed in the session list is configured by a set of parameters depending on the type of session:

   - Active Sessions - Configure the `Live Max Results Limit` parameter setting to define the number of sessions.
   - Completed Sessions - Configure the `Session Segment Max Sessions Limit` parameter setting to define the number of sessions that can be displayed in a session segment.

     This limit also applies to IBM Tealeaf cxReveal searches.
   - All Sessions - A single All Sessions search executes one search for active sessions and one search for completed sessions, so the maximum number of sessions displayed in a segment is the sum of the above two parameter settings.

   **Note:** The actual number of sessions displayed may be reduced by the applied session list template.
3. Optional: Change the columns to be exported

   You can configure a session list template to display other fields. For example, you may wish to insert session attributes as columns in the session list template. These values can then be exported for third-party analysis.

   For data export purposes, you may wish to create a separate session list template to export session data. Or you can modify your existing session list template, as needed.

## Search and indexing

To enable improved search performance, Tealeaf scans completed sessions for a predefined set of data that is typically of use in locating sessions.

The Portal and RTV then use these indexes to quickly locate sessions based on search criteria that you enter. For many customers, this data set is sufficient to enable effective search for sessions of interest.

Indexes are not used for search of active sessions.

In some cases, you may decide that some session data that is not available by default for search should be accessible. For example:

- You have created pipeline rules that insert application-specific data into the request.
- You have deployed IBM Tealeaf CX UI Capture for AJAX, which enables the capture of user interface events from the visitor's browser.
- You have deployed a Tealeaf Logging Framework, which enables the capture of application and event data from mobile native applications.

  **Note:** Tealeaf Logging Frameworks are components of the IBM Tealeaf CX Mobile module. Additional configuration and deployment is required.

In the above circumstances, the data may not be automatically indexed for search. Using one of the provided methods, you can make this data available for search through indexed data or event values.

**Important:** Adding index data is considered a Tealeaf administrator task. Adding data to be indexed for search increases the size of the indexes stored in the Processing Server. Depending on the volume of increased data that is marked for indexing, indexes can grow considerably and may impact available disk space and performance of the Processing Server. Before you begin adding data, you should review your goals with IT staff.

## Searching for visitors

IBM Tealeaf cxResults enhances traditional search capabilities by using a relational database to support searching on *visitors*. Visitor search is a component of cxResults.

### About this task

In cxImpact, Tealeaf users can find relevant sessions by using full-featured text and event search, much like that provided by search portals on the Internet.

cxResults extends that search capability by wrapping session data in a relational database that tracks information unique to each visitor to your web application.

**Note:** cxResults is no longer available as a newly licensed product as of Release 8.7. Customers that licensed cxResults in Release 8.6 and earlier can continue to use and receive support for the product in Release 8.7 and later. For more information, contact Tealeaf Customer Support.

To search for visitors:

### Procedure

Select **Search** > **Visitors** in the Portal menu.

For more information about visitor sequence search, see "Visitor Sequence Search" in *IBM Tealeaf CX Installation Manual*.

#### Overview of Visitor Search

This section provides an overview of how visitor data is organized and how you can configure your searches to find the data.

**Note:** Visitor search only applies to completed sessions that are indexed and then extracted for use in cxResults by the Visitor Database Extractor, a process that applies visitor information to completed sessions.

##### *Identifying visitors*

A visitor can be uniquely identified by a data token that persists across multiple visits (sessions).

This identifier is typically retained based upon values that are stored in a persistent cookie. If a cookie is unavailable, the identifier can be a login ID, query string, or other mechanism that is provided by your website for uniquely identifying visitors.

If the website does not have a persistent cookie or identifier, it is possible to use other persistent cookies such as those used by web analytics packages.

Tealeaf also provides a Cookie Injector program that can be installed on your web servers to create the persistent cookie in addition to any session cookies.

A visitor can have multiple persistent cookies, especially if the visitor uses multiple computers (home/work) or multiple browsers on one computer (IE, Firefox). This common situation generates multiple records per visitor. However, if the website application requires a user login, cxResults uses the final cookie values (after login) to identify the visitor for that session.
The method by which cxResults identify visitors is configured by settings in the Portal.

***Visitor Segments***
Visitor search provides a powerful capability to search for events and text strings occurring in sequence in single sessions and across multiple sessions. This search method can query the visitor database and session text database and can merge the results.

Visitor search queries are broken down into individual queries for each search term and run. When the results are returned, they are aggregated together by using a logical AND. Session searches assemble a defined search into a single query.

**Note:** Timestamps in visitor search are always reported in the Tealeaf system timezone.

Like Session search, the results of a Visitor search query are called segments. Visitor Segments can be analyzed by using reports that are provided by Tealeaf.

Like Session Segments, Visitor Segments are automatically purged after a time by the system, unless the user takes actions to extend the life of the segment. This auto-removal prevents the system from filling up with old and unused data.

**Note:** When segments are created from the current day's data, their contents remain static. If the same search is re-executed, then a new segment is created with data up to the last hour. Since a report is specific to a segment, viewing a report that is created from the first segment after you create the second segment can be confusing, as new data in the second segment does not display in the old report. As a best practice, avoid generating segments from the current day's data, and configure scheduled searches at the end of the day to acquire the day's data.

***Visitor Data Storage***
In addition to the unique visitor data, cxResults replicates the session and event data from the text search database in cxImpact without replicating all data required for replay. This storage mechanism uses less space, allowing the data to be retained over a longer period of time.

In Visitor Search, searches that include Event or Event Value fields query the Visitor database. All other fields generate queries against the session database.

**Visitor search tabs**
The **Visitor Search** screen includes search tabs.

The following tabs are available in the **Visitor Search** screen:

*Table 37. Search tab descriptions*

| Tab | Description |
|---|---|
| Define Search | Specify the criteria for your search. |
| Recent Searches | Review and re-execute the status of recently run searches. |
| Completed Searches | Analyze the session segments generated from recently completed searches. |
| Scheduled Searches | Review the list of schedule visitor searches. |
| Scheduled Search History | Review the history of scheduled searches that are recently ran. |

**Define Search Tab**
In the **Define Search** tab, you specify the criteria for your search.

By using the fields displayed in the tab, you can specify the terms for which you are searching the visitor data.

Tealeaf administrators can create and deploy customized search templates for Visitor Search.

***Running a basic visitor search***
To run a basic visitor search, perform the steps listed in this procedure.

**Procedure**

1. Specify date range.

   Review the list of available dates for visitors. The, specify the date range from the **Search Range** drop-down.
2. Select search fields.

   From the left panel, select the search fields to include in the search.
3. Configure selected search fields.

   In the main panel, you can specify the values and other conditions for the selected search fields.
4. Run your configured search.

   When you are satisfied with the search that you specified, click **Search** to run it.

**Results**

When results are returned, they are displayed in the selected session list template.

If required, searches can be saved and scheduled for execution at predefined times.

*Requirement for conducting searches for specific visitors*
To search for a specific visitor, you must include the field that is used for *visitorization* as a field in your search template.

When this field is available for use in your searches, you can add it to your search and specify a unique visitor ID or a range of IDs by using wildcards as the values for which to search.

***Command icons for Define Search***
At the top of the **Define Search** tab, the following commands are available in the toolbar.

*Table 38. Toolbar*

| Icon | Command | Description |
|---|---|---|
| | New | Clear the search terms and begin specifying a new search. |
| | Save | Save the currently specified search. |
| | Open | Open a saved search. |
| | Reorder Search | Re-order the search terms. |
| Search Options | Search Options | View search options. |

***Visitor search configuration options***
There are several configuration options available for visitor searches.

*Visitor search within a single session*
You can search for text or events that occurred in a single session or across multiple sessions.

For example, you can search for visitors who had an "Add to Cart" event in one session followed by a "Proceed to Checkout" event in another session later. Or, you can search for both events that are occurring in the same session.

When this item is cleared, the search criteria can span multiple sessions.

**Note:** For Session Info criteria, searching within a single session is not likely to change the results for these events that are already occurred in a session.

*Visitor search in the listed sequence*
Sometimes, the order of occurrence of events or text strings is important.

For example, did the visitor see an "Out of Stock" message after the "Proceed to Checkout" event? Or, when searching across sessions (`Within a single session` is cleared), did the visitor ever reach the "Proceed to Checkout" event again in the session after the "Out of Stock" message occurred?

**Note:** Within a single session, sequence is irrelevant for session-level events, which all fire at the conclusion of the session. The order of execution for session-level events within a session cannot be configured.

*Sequence search methods*
Tealeaf supports two methods of performing visitor sequence searches: "Every occurrence", and "Last occurrence".

Both methods have the same restrictions and behaviors in sequence search.

**Every occurrence**
This method performs much faster searches for sequences that are based on each occurrence in the session. If your Tealeaf solution is deploying this method, the label in Search Options is `In the listed sequence`.

**Note:** Tealeaf recommends by using this method for sequence search. This method requires more installation in your Tealeaf databases.

**Last occurrence**
This method searches for sequences that are based on the last occurrence of events in the session. The last occurrence method is the default sequence search method. If your Tealeaf solution is deploying this method, the label in Search Options is `In the listed sequence (uses last occurrence)`.

*Visitor search Restrictions configuration*
When you specify the **Restrictions** configuration option, the events that are specified in the search criteria must occur in the order in which they are listed on the form, according to the following restrictions, depending on the method in use

- The search evaluates every or the last occurrence of each search criteria.
  - If the `Within a single session` option is selected, the search query looks for the specified sequence of the selected parameters that are based on their occurrence within a single session. Comparisons across multiple sessions are not performed.
  - If the above option is not selected, the search query looks for the specified sequence of the selected parameters across sessions, which are based on every occurrence or the last occurrence of individual parameters.
- In both of the cases, if every or last occurrence of each event occurs in the proper sequence, then the session is matched.

  **Note:** If two events that are listed as occurring in sequence fire on the same page, they are evaluated as occurred in the proper sequence, since it is not possible to determine the order of evaluation within a page.

### Field Limitations

Searches in the listed sequences cannot be applied to the following fields:

- All Text
- The NOT operator is disabled in these types of searches.
- Any session-level information, such as Session Info fields or any session attributes included in the search template, including the following session-level attributes:

- Annotations
- Annotation Author
- Domain
- Session Duration
- Session Index
- Hit Count
- Browser Type
- First Page
- Last Page
- TLT Server
- TLT SessionID
- TLT Application
- TLT Host
- Session Attributes
- Fact Count
- Event Count
- Browser OS
- Browser Version
- Bot Session

*Sequence within a single session*
You can evaluate the events within a single session, searching for a sequence.

Suppose you are trying to match a sequence `A,B,C`. Following are some examples listed .

If you are evaluating the events within a single session, searching for the sequence `A,B,C` has the following results.

- In the following table , the last instance of each event in the session is emphasized.

*Table 39. Sequence within a single session*

| | Session 1 | Session 2 | Session 3 |
|---|---|---|---|
| | A | **A** | A |
| | B | **B** | **A** |
| | C | C | B |
| | A | C | **B** |
| | B | **C** | **C** |
| Results | fail | pass | pass |

Session 1 fails because the final instance of C occurs before the final instances of A and B, meaning the final sequence in the session fails.

*Sequence across multiple sessions*
You can evaluate the events across multiple sessions, searching for a sequence.

When you search across multiple sessions, the same logic applies to the evaluation; the search query evaluates the sequence that is based on the last or every occurrence of the parameter.

If you are evaluating the events across multiple sessions, the first order of evaluation of sequence is the session, specifically the timestamp for the end of the session. Suppose that you are searching across Session 1, Session 2, and Session 3, whose ending timestamps are in the same order.

Example 1:

In this sequence of events, the last or every occurrence of each of the sought events across the three sessions is emphasized:

- Session 1: A B C D E
- Session 2: B B C D A
- Session 3: A D D B D

Searching for `A,B,C` fails, as the last instance of `C` is in Session 2 and occurs before the last instance of `A` and `B` in Session 3.

Example 2:

Suppose that you have this sequence of events.

- Session 1: A B C D A
- Session 2: B B B D E
- Session 3: C D D E D

Searching for `A,B,C` matches, as the occurrences of `A`, `B` and `C` are in sequence across the sessions.

*Sequencing on a single page*
You can evaluate multiple events on a single page, searching for a sequence.

If multiple events in the sequence occur on a single page, they are always evaluated as occurring in sequence within the page, since it is not possible to determine order of firing on an individual page.

If a page contains two events (`D` and `E`) in the sequence, they are always evaluated as occurred in the proper sequence, regardless of whether the sequence is listed as `D,E` or `E,D`.

Some examples can clarify. Suppose that you are searching for three events that are listed in sequence: `D,E,F`.

*Table 40. Sequencing on a single page*

| Session # | Page 1 | Page 2 | Page 3 | Evaluation |
|---|---|---|---|---|
| 1 | D | E | F | pass |
| 2 | D, E | | F | pass |
| 3 | E, D | | F | pass |
| 4 | F, E, D | | | pass |
| 5 | F, D | | E | fail |

In the previous table, sequence searches of Session 1-4 all evaluate to having occurred in the proper order. Session 5 fails because event F occurred on a page before event E, which is therefore out of order.

*Session end events and session-level attributes*
You can configure sequences of session-end search criteria across multiple sessions

The timing of the occurrence for session-end events (events evaluated in the `End of Session` trigger) and session-level parameters (such as `referrer`) is at the session end. So, a query for multiple session-end parameters within a single session always fails.

*Ignore unknown visitors*
Select to **Ignore unknown visitors** to withhold visitors identified as `UNKNOWN` from search results.

Some websites are regularly visited by computer programs that do not display a persistent cookie, which can result in a large number of visitors identified as `UNKNOWN`. You can select this option to withhold those visitors from the results and any subsequent reporting.

***Viewing visitor data by date range***
You can review the range of dates that contain data for visitors and general session data.

**About this task**

**Note:** For the currently specified terms, the dates that are listed in bold represent the limits of available data.

**Procedure**

1. Available Dates (Visitors) - The available range of visitor data in the Visitors database. The Visitors data set is much smaller than session data, which allows for storage over longer periods of time.
   - You can search for event data across the entire Visitors database.
   - Visitor data does not become available until it is loaded in the Visitor database, which typically occurs 1-2 hours after a session is completed.
2. Available Dates (Sessions) - The available range of indexed session data in the CX database. Session data is typically retained for approximately two weeks because the data needed for replay is much larger.
   - You can only search for text data, Session Info, and Page Info for the date range of available session data.
   - Session data is only available for completed sessions. It is not available for active sessions.

***Specifying a search range***
You can specify a range of dates to search.

**About this task**

To specify the range of dates to search:

**Procedure**

1. Make a selection from the **Search Range** drop-down.

   All options are relative to the current date.
2. To specify a custom search range, select `<Specify>`.

   The date range selector is displayed.
3. Specify the **From** and **To** date and time values.

***Working with the Visitor Search Fields panel***
In the left panel of the **Define Search** tab, you can review the available search terms and add selected ones to your specified search.

You can include up to four terms in a search. The following search term categories are displayed:

*Table 41. Search term categories for Visitor Search*

| Search term category | Description |
|---|---|
| Basic Search Fields | Search for text in the request, response, or both or events and event values. |

| *Table 41. Search term categories for Visitor Search (continued)* | |
|---|---|
| **Search term category** | **Description** |
| Session Info | Add search terms that apply to the entire session, including session identifiers, session metrics, and annotations. |
| Page Info | Add search terms for specific data on individual pages. |

***Configuring search terms***
You can configure the search terms to include in the searched sessions.

**About this task**

To add a search term to your search:

**Procedure**

1. Open the node that is containing the term that you want to use:
2. Select the term to include.
3. Specify the values in the search term.
   a) Text values can be specified to be included or not included in the searched sessions.
      - To search for included text values, select `includes`.
      - Specify the number of times that the value must be displayed or must not be displayed in the session.
   b) Numeric values can be specified to match exactly, fit within a range, or to be greater than or less than a specified value. You can also specify `NOT` operators for the `equals` operator and `is between` operator.
      - Select the appropriate operator from the drop-down list.

        **Note:** The `does not include` operator can be used only with event search terms. It cannot be applied to event + dimension value combinations or any other search terms.
      - Depending on the operator, you canspecify a range or a single comparative value.
      - For range operators, you must specify a value in the first textbox as the lower bound of the range and the upper bound in the second textbox.
4. Add more search terms as needed.

*Specifying comparisons and counts*
You can compare the number of times that the criteria is displayed in the visitor search to a fixed value.

This ability to specify the counts to which the criteria counts are compared enables useful analysis. For example:

- An error count that occurs more than three times in a session can indicate application issues.
- Failures to sign in more than three times can suggest fraud or user access troubles.
- If the same IP address is touching the same URL more than 10 times, it can be an indicator of fraud attempts.

These counts and other examples must be configured to meet the requirements of your web application.

**Note:** When doing a comparison by using a `NOT` term, you can only use a count of 1 for that term.

***Basic search fields for visitor search***
The following basic search fields are available in the default template, which is typically the same template as the default **Completed Search** template in cxImpact.

*Text searches for website visitors*
You can perform free text searches for specific terms in the request, the response, or both of session data. You can specify multiple instances of each criterion.

When a visitor text search is run, the corresponding session data must be gathered from the queried Canisters and inserted into the Visitor database before the database is queried to retrieve the results. Some implications:

- Simple text searches of visitor data takes longer than corresponding searches of session data. Because there is no upper bound on number of records that are returned in these searches, they are broken down into smaller searches over periods of no more than one hour, by default. To improve search speed, Tealeaf administrators can raise this hour limit, which is defined by the parameter `Maximum Text Search interval (minutes)` in the cxResults settings page.
- The available data for text-based visitor searches is limited by the number of days of data that is retained in the queried Canisters. Options for extending the number of days of data retained in the Canisters:
  1. Change the Data Retention settings.

*Table 42. Text field descriptions*

| Field | Description |
|---|---|
| All Text | Search for specified term in the request and response. |
| Text in Request | Search for specified term in the request. |
| Text in Response | Search for specified term in the response. |

**Note:** Searches by using these fields are submitted to Search Server, which runs them against session data that is stored in the selected Canisters.

*Events and event values visitor search*
You can search the number of occurrences for events and event values in the presence of an optionally specified dimension.

Searches by using these fields are run against the Visitor database.

*Table 43. Event and Event Value fields*

| Field | Description |
|---|---|
| Event | Search for a specified event when an optional dimension is present. |
| Event Values | Search for a specified event value. |

**Note:** When you search for numeric values, values are treated as integers. Use of floating point values (for example, `9.99`) can result in false positives.

- In most fields, integers are required by the interface.
- Some fields, such as event value fields, can contain numeric or text data, depending on the type of field, which means that the integer restriction cannot be imposed by the user interface. For event values that are expecting numeric values, all entered values are converted to integers.
- Session attribute fields are stored as text data, regardless of the type of value in them.

***Session Info visitor search***
From the **Session Info** panel, you can select search terms that apply to the entire session. Some of these session search terms can be used to uniquely identify the session.

Searching for counts of session-level information within a single session is not supported. You can search for counts across multiple sessions, with the count of occurrences in a single session always returned as `0` or `1`

***Page Info***
From the **Page Info** panel, you can select search terms that apply to individual pages. These terms can identify characteristics of the page or specific data inserted into the request.

***Running the visitor search***
After configuring the visitor search, you can run it.

**About this task**

**Note:** To limit index size, which is indexed words are truncated to a maximum of 32 characters each. Longer words are truncated at 32 characters to match search terms in the index and are submitted without prompting the user. Tealeaf administrators can change this limit through the configuration options of the Index Service configuration.

To run the specified search:

**Procedure**

- Click **Search**

  The search is queued for processing, and the **Search Status** popup is displayed..

  You can perform other tasks while the search is queued and run.

  Depending on the contents and search fields in your search, some modification of the characters in your search criteria can be performed to match the format of the indexes that are searched.

  **Note:** If you are unable to execute searches, the Visitor database extract job cannot be enabled.
- To check the status of your search, click the **Recent Searches** tab.
- To cancel the search, click **Cancel Search**.
- To hide the dialog and resume by using the Portal, click **Run In Background**. The search continues to be processed.

  After the search is complete, the Status screen shows the number of matching visitors.
- If there are matches, click **View Results** to open the **Analyze Visitor Segment** page for that segment.

  If the search results contain multiple sessions for the same visitor, the first listed session is the initial visit, and all subsequent sessions are repeat visits.

  **Note:** By default, the Visitor extraction process excludes all one-hit sessions, so the count of returned sessions for Visitor searches can differ from an equivalent search in cxImpact. If required, you can enable extraction of one-hit sessions in Visitor search.

***Managing searches***
You can use the **Define Search** tab to manage searches that you save and to perform other tasks.

**About this task**

To manage your searches:

**Procedure**

- To save the currently defined search, click the **Save** icon in the toolbar.
- To open a saved search, click the **Open** icon in the toolbar.

- To schedule the current search to occur on regular intervals, click the **Scheduled Searches** tab.
- To clear the Define Search terms, click the **New** icon in the **Define Search** toolbar.
- To reorder the search terms in the **Define Searches** tab, click the **Reorder** icon in the **Define Search** toolbar.
- To run the specified search, click **Search**

*Saving your visitor searches*
You can save your visitor searches. A saved search can be scheduled for periodic run, which generates a session segment that can be analyzed at your convenience.

**About this task**

To save your visitor search:

**Procedure**

1. Click the **Save**icon ( ) in the **Define Search** toolbar.
2. To save the currently specified search, enter a name for the search and click **Save**

*Opening saved visitor searches*
You can open saved visitor searches and reuse previously defined search terms.

**About this task**

To open saved visitor searches:

**Procedure**

1. Click the **Open** icon ( ) in the Define Search toolbar.
2. Select the search to open and click **Load**.

*Reordering search terms*
Using cxResults, you can search for terms that occurred in a specific sequence within a session.

**About this task**

For example, you can want to identify sessions in which the visitor began the checkout process (Page URL includes `checkoutbegin.asp`) yet received an application error (All Text in Response includes `Application Error`). In this situation, the search terms must be listed in a specific order:

**Procedure**

1. Page URL includes `checkoutbegin.asp`
2. All Text in Response includes `Application Error`

**Results**

To enable searching in a specific order, you must configure your search options to be in the listed sequence.

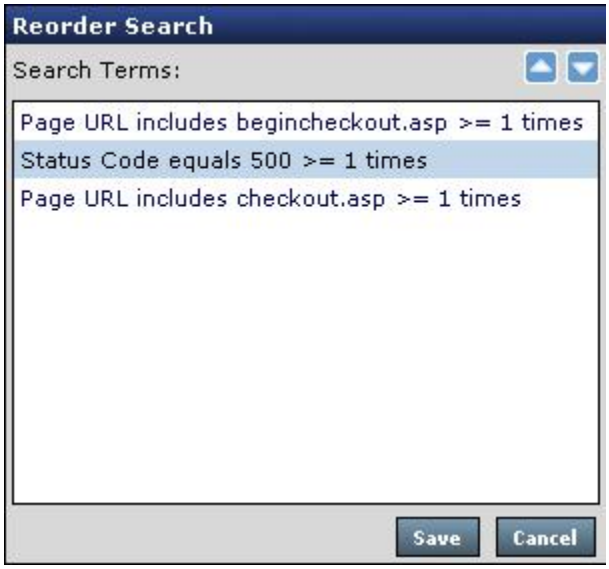



*Figure 16. Reorder Search*

- To reorder the sequence of the search terms, select a search term and use the Up or Down arrow to reposition it. To save the new order, click **Save**. The Define Search tab is updated.

*Deleting visitor searches*
You can delete the visitor searches that you have created.

**About this task**

To delete a visitor search:

**Procedure**

1. Click the **Open** icon ( ) in the toolbar.
2. Select the saved search and click **Delete**.

**Results**
The visitor search is deleted.

***Visitor search templates***
Visitor Search uses the default template for searches for completed session data in cxImpact.

The applicable fields from the template are available in the **Visitor Search** screen.

You can create a custom search template that is containing different search fields for use with Visitor Search.

**Note:** You cannot create a customized session list template for Visitor Search.

*Customizing search templates*
Tealeaf administrators can create custom search templates for use in Visitor Search. A custom template must be created for Completed Sessions and then selected for use in Visitor Search.

*Search fields for enabling a search for specific visitors*
Depending on your implementation of cxResults, the unique visitor identifier can be available for search through one of the following search template fields:

- `TLTVID`
- `LoginID`
- Custom event or session attribute

Tealeaf administrators can add the appropriate field to the visitor search template that enables users to search for unique visitor identifiers.

*Selecting a visitor search template*
You can select a different template to use for your Visitor Search.

**Procedure**

To select a different template to use for your Visitor Search:

1. If you are a Tealeaf administrator, select **Tealeaf** > **Portal Management**.
2. In the **Portal Management** screen, select **CX Settings** from the left pane.
3. Select the search category.
4. In the Search settings, select **Visitor Search Template**.
5. At the bottom of the screen, select the completed sessions search template to use from the **Value** drop-down list.

***Search Results***
Visitor search results are displayed as a visitor segment of sessions in the **Visitor List page**.

**Recent Searches Tab**
The **Recent Searches** tab shows all the recent searches and their current status. A green square in the first column means the search completed successfully. A yellow hourglass means the search is running. A red exclamation point means there was a problem.

You can run multiple searches simultaneously.

*Figure 17. Recent Searches*

Right-click on any displayed search and complete one of the following actions:

- **View Results and Reports**- Opens the search in the Analyze Visitor Segments page.
- **View Search Parameters**- Displays a popup where you can select parameters to populate the Define Search page.
- **Rename the Search** - Enter a new name for the search.
- **Cleanup List** - Removes old completed searches.

**Completed Searches Tab**
In the **Completed Search** tab, you can review and manage the visitor searches that are successfully run.

More commands are available in the context menu.

*Figure 18. Completed Searches*

**Scheduled Searches Tab**

Saved searches of the Visitors database can be scheduled to run on a periodic basis. Before you schedule a search, you must configure it and save it.

For example, you might want to schedule a search of sessions that resulted in error conditions for the previous day at 2AM in each morning.

To create, review, and reschedule searches of the Visitors database, click the **Scheduled Searches** tab.

When these searches are successfully run, a visitor session segment is generated and is available for analysis through the **Managing Visitor Segments** page.

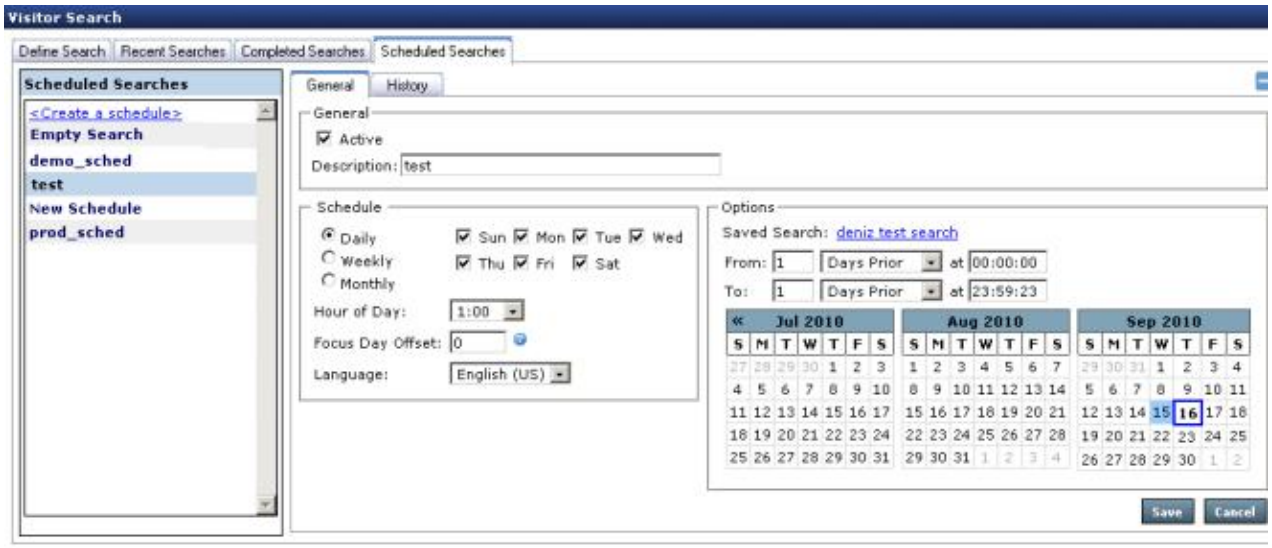



*Figure 19. Scheduled Searches Tab*

In the left pane of the Scheduled Searches tab, you can review the list of searches that are scheduled.

- To create a search, click **<Create a schedule**. Provide a name and other information for the search. Then, use the right pane to define the search.
  - To save your created search, click **Save**. The search is scheduled to be run.
  - To cancel your created search, click **Cancel**.
- To edit a search, select it. The right pane is populated.
- To delete a search, select it and click the Minus ( ) icon.

***Configuring a scheduled search***
Use the information in this topic to learn how to configure a scheduled search.

**About this task**

| *Table 44. Property settings for configuring a scheduled search* | |
|---|---|
| **Setting** | **Description** |
| Active | To enable the search, click the **Active** check box. |
| Description | Enter a user-friendly name for the search. |
| Schedule | Enter a schedule |
| Search Frequency | You can specify the time and day or days of the week that the search is run. Searches can be run daily, weekly, or monthly. |
| Hour of Day | Set the hour when the search is run, based on the 24-hour clock. |
| Language | Select the language in which the search is run. |
| Options | Set your options |
| Saved Search | Click the link to select a visitor search that is saved to be run at the scheduled time. |
| Calendar | Specify the date and time range for your search. |

**Procedure**

1. Specify the previous settings.
2. In the calendar, configure the scope of the search.
3. To save the new search, click **Save**. The search is saved and now displayed in the left pane.

   When the search is run, the results of the search are listed in the history tab.

***Configuring Search Range***
Using the Search Range controls, you can specify the date and time range for your scheduled search.

**Note:** These settings override any date range that you can specify in the search definition.

*Figure 20. Scheduled searches calendar*

In the Calendar, the current date is marked by a dark blue square. The currently specified range of dates for the search is highlighted by using light blue.

You can use the From/To controls or the Calendar tool or both to change your search range. The Calendar displays the currently configured date range for your search.

- By default, a scheduled visitor search is configured to search the day that is preceding the date of execution.

From/To:
Use the From/To tools to specify offset days, weeks, or months before the current focus date.

- The From/To offset date values must be a positive value. You cannot set the value to zero.
- You can also specify a start time that is applied to the From date and an end time that is applied to the End date.

  **Note:** The date units (days, weeks, or months) in the From/To tools indicate the offset value for From and To independently and relative to the date of execution. For example, you can specify a number of weeks From dates to a number of days To date.
- If you select a start time that is after the currently specified end time, no calendar dates are selected.

Calendar:
The Calendar is primarily a visualization tool for identifying the search range if the scheduled search ran today. Optionally, you may use it to specify a date range by making selections.

- To select from months that are not displayed in the Calendar, click the **<<** or **>>*** icons.
- To specify a range of dates, click the start date. Then, press SHIFT and click the end date. The highlighted dates are updated in the Calendar, and the From/To selectors are updated.
- Changes that are made through the Calendar are applied to the From/To values. The From/To values provide the most accurate information about the range of the scheduled search.

**Scheduled Search History Tab**
The **Scheduled Search History** tab provides a history of visitor searches. Use this tab to review the history of searches that you have scheduled.

*Figure 21. Scheduled Search History*

*Table 45. Scheduled search history field descriptions*

| Field | Description |
|---|---|
| Created At | Timestamp for when the scheduled search was last saved. |
| Scheduled At | Timestamp for when the search was scheduled to be run. |

| *Table 45. Scheduled search history field descriptions (continued)* | |
|---|---|
| **Field** | **Description** |
| Log Level | Log level used for the scheduled search. |
| Message | Message reported upon execution.<br>• `Schedule process time` - Scheduled search executed successfully.<br>• `No scheduled status returned` - Scheduled search failed. |

**Enabling Visitor Search**

Visitor Search is a component of cxResults, a separately licensable component of the Tealeaf CX platform. To enable Visitor Search, you must enable and configure the Visitor Database Extractor process.

**About this task**

Visitor Search scans both the session database and the Visitor database. The Visitor database is populated by periodic executions of the Visitor database Extractor. This process scans the session database for sessions that are ready for inclusion in the Visitor data set and then extracts and inserts the data into the Visitor database, including more information specific to the visitor.

**Procedure**

Complete the following steps:

1. cxResults is enabled through license key. If you have not acquired a key to enable cxResults, contact Tealeaf http://support.tealeaf.com.
2. The Visitor database Extractor is managed by the Tealeaf Scheduling Service, which can be configured to periodically run Tealeaf-specific tasks. You must enable and configure the process through the Scheduling Service.
3. After you have enable the Extractor process, you can perform additional configuration, including the specification of the field on which unique visitor identification is based.
4. When cxResults is enabled, you can configure the menu profile of user groups to enable access to the Visitor Search and Segment Analysis pages.

   **Note:** Visitor Search and Segment Analysis pages can be enabled only for CX user groups.
5. When the Extractor process is enabled and successfully run at least once, you can use the **Visitor Search** page to search for visitors.

## Search Keywords

IBM Tealeaf includes search keywords. Use the information in this topic to review the search keywords available in Tealeaf and to understand how they are implemented in each storage mechanism.

**Legend**

**Keyword**
The name of the keywords as it appears in the Portal search templates.

**STC**
The keyword as it is used in the short term canister, which contains active sessions.

**LTC**
The keyword as it is used in the long term canister, which typically contains today's sessions.

**In Default?**
If set to A (active) or C (completed), the keyword does appear in one of the default search template provided by Tealeaf.

**Description**
A brief description.

| *Table 46. Search Keywords* | | | | |
|---|---|---|---|---|
| **Keyword** | **STC** | **LTC** | **In Defaul t?** | **Description** |
| All Text | | | C | Performs text search of indexed items in completed sessions, including text in request and response and event-based data. |
| Annotation Authors | | annoobject/name | C | Username of person who created an annotation is indexed along with the annotation. This search field lets you search for annotations by username. |
| Annotations | | annoobject/text | C | In RTV, you can add annotations to pages during replay. These annotations are stored in a separate table and are indexed (caveat: sessions moved to an archive machine are not indexed). This search field lets you search the text of the annotation you entered. |
| AppData | request/appdata | request/appdata | A, C | [appdata] section of the request |
| Bot Session | isbot | | | Is the session generated by a bot?<br>To capture data for this keyword, extended user agent detection must be enabled. |
| Browser | TLT_BROWSER in request | | | The browser identifier as reported by the browser user agent. This value is stored in the Browser hit attribute.<br>To capture data for this keyword, extended user agent detection must be enabled. |
| Browser OS | browseros | | | The operating system as reported by the browser user agent.<br>To capture data for this keyword, extended user agent detection must be enabled. |
| Browser Type | browser | tltstsbrowser | A | Type of browser, such as `IE`, `Firefox`, or `Chrome`.<br>**Note:** The source of this search field has changed beginning in Release 8.6. |

| *Table 46. Search Keywords (continued)* | | | | |
|---|---|---|---|---|
| **Keyword** | **STC** | **LTC** | **In Defaul t?** | **Description** |
| Browser Version | browserversion | | | The version of the visitor's browser<br>To capture data for this keyword, extended user agent detection must be enabled. |
| Client IP (IPv4 legacy) | ipaddr | tltstsipaddr | A, C | Visitor's Internet Protocol address (aaa.bbb.ccc.ddd)<br>• The `tltstsipaddr` value is indexed only if the environment uses IPv4 addresses. Maintained for legacy purposes.<br>• If IPv6 addresses are present, Portal-based searches for Client IP use the `IPV6_REMOTE_ADDR` request variable for searching for client IP addresses. |
| Client IP (IPv6) | | ipv6_remote_addr | C | Visitor's Internet Protocol address in IPv6 format (aaaa.bbbb.cccc.dddd.eeee. ffff.gggg.hhhh) |
| Client UI Application | request/appdata/ TLT_CUI _APPLICATION_NAME | TLT_CUI _APPLICATION_NAME | | The application name as reported by Tealeaf UI Capture. To capture data for this keyword, extended user agent detection must be enabled, and the IBM Tealeaf CX UI Capture for AJAX must be deployed and enabled. |
| Client UI URL | request/appdata/ TLT_CUI_URL | TLT_CUI_URL | | The URL as reported by Tealeaf UI Capture. To capture data for this keyword, extended user agent detection must be enabled, and the IBM Tealeaf CX UI Capture for AJAX must be deployed and enabled. |
| Domain | domain | TltStsDomain | A, C | Domain from which the visitor is visiting |
| Env | request/env | request/env | | Search for data in the [env] section of the request. |
| Events | uniqueid | tltstsuniqueid | A, C | Search for named events in active and completed sessions. |

| *Table 46. Search Keywords (continued)* | | | | |
|---|---|---|---|---|
| **Keyword** | **STC** | **LTC** | **In Defaul t?** | **Description** |
| Events with dimensions | factidwithdims | hit//TLFID_{0}/ TLDimHash{1} | A, C | Search for events by name with dimensions. |
| Event Count | numevents | | | Counts of occurrences of events. |
| Event Values | | hit//TLFID_{0}/ TLFactValue | | Values of Tealeaf events |
| Fact Count | numfacts | | | Count of recorded facts in the session |
| First Page | frstpage | tltstsfirstpage | A, C | The first page of the session |
| Form Field | request/urlfield | request/urlfield | A, C | Form field data in the request |
| Hit Count | numhits | tltstsnumhits | A, C | The number of hits in the session |
| Last Page | lastpage | tltstslastpage | A, C | Last page of the session |
| Page Generation Time (usecs) | request/timestamp/ WS_generation | | A | Time required to generate the page on the visitor's browser in milliseconds |
| Page Size (bytes) | request/env/ responsedatasize | | A | Size of the page in bytes |
| Page URL | request/env/url | url | A, C | URL of the page |
| Referring URL | referer | http_referer | C | URL of the page from which the visitor accessed the current one |
| Server IP Address (IPv4 legacy) | request/env/ LOCAL_ADDR | local_addr | A, C | The Internet Protocol address of the web server.<br>Maintained for legacy purposes. Use `ipv6_local_addr` instead. |
| Server IP Address (IPv6) | request/env/ IPV6_LOCAL_ADDR | ipv6_local_addr | C | The Internet Protocol address of the web server in IPV6 format. |
| Session Attribute | customvarX | tltstscustomvarX | | Search for Tealeaf user-defined session attribute with index number X.<br>Session attributes are defined through the Tealeaf Event Manager and are updated based on Tealeaf events. |
| Session Duration (secs) | | tltstssesnduration | | The length of the session in seconds |

| *Table 46. Search Keywords (continued)* | | | | |
|---|---|---|---|---|
| **Keyword** | **STC** | **LTC** | **In Defaul t?** | **Description** |
| Session Index | sesnidx | tltstssesnidx | A, C | Identifier of a session within a canister. Typically it is a number like 1 or 469683648. |
| Status Code | | statuscode | C | The HTTP status code for the page |
| Text In Request | request | request | A, C | Active: Searches entire request for matching strings Completed: Search indexed values in name/value pairs of the request |
| Text In Response | response | response | A, C | Active: Searches entire response for matching strings Completed: Search the response text that is not HTML tags. This content is indexed. |
| TLT Application | | tlt_application_name | | The value of the TLT Application field, as defined in Tealeaf |
| TLT Host | | tlt_host_name | | The value of the TLT Host field, as defined in Tealeaf.<br>To capture data for this keyword, the Tealeaf Reference session agent must be deployed in your Windows pipeline. |
| TLT Path | | tlt_url | | The value of the TLT Path field, as defined in Tealeaf.<br>To capture data for this keyword, the Tealeaf Reference session agent must be deployed in your Windows pipeline. |
| TLT Server | | tlt_server | | The value of the TLT Server field, as defined in Tealeaf.<br>To capture data for this keyword, the Tealeaf Reference session agent must be deployed in your Windows pipeline. |
| TLT Session ID | sesnid | tltstssesnid | A, C | The value of the Tealeaf session identifier |
| TLTVID | tltvid | tltststltvid | | The value of the Tealeaf visitor identifier |

| *Table 46. Search Keywords (continued)* | | | | |
|---|---|---|---|---|
| **Keyword** | **STC** | **LTC** | **In Defaul t?** | **Description** |
| Traffic Type | tltststraffictype | tltststraffictype | A,C | The type of traffic, such as `MOBILE`, `BOT`, or `BROWSER`.<br>**Note:** The source of this search field has changed beginning in Release 8.6. |
| User ID | userid | tltstsuserid | A, C | The user identifier, as defined by the web application |

### Scoring Search Results

This information describes how search results are scored and ranked by Tealeaf. When a session segment is created, it uses a default value of 1000 sessions from the search that is completed. When the defined limit of sessions is exceeded in the results, some rules are applied to the sessions to determine which ones are shown to the requesting user.

Each session is assigned a score that is based on what was found in it and the number of occurrences. The score is a count of words that were found for each search term.

- If you search for a phrase in the response, a session that contains five instances of that phrase is more likely to be returned than a session that contains two instances of the phrase.
- If you search for a session-level attribute that is displayed only once in the session, that search item yields only one hit per session. As a result, the score is consistent across all returned sessions. In this case, the most recent sessions are returned, as the search indexes are searched from new to old.

  **Note:** Events are indexed as session-level attributes. No matter how many times an event fires in a session, it can generate one only search hit.

## Overview of segments

When you run a search, Tealeaf queries the database and returns a list of sessions that match the search conditions. This list is called a **segment**, which can either be a list of sessions or a list of sessions identified by visitor, depending on the type of analysis performed.

Searching for session data is part of the cxImpact product.

In cxResults, searching for visitors queries the Visitor database and returns a list of matching sessions called a **visitor segment**. In a visitor segment, all returned sessions have unique visitor identifiers and session identifiers, so that you can drill into the visitor information and sessions themselves. Most websites manage visitor identification through their own methods. Tealeaf can rely on your visitor identifiers. Optionally, the Tealeaf Cookie Injector can be deployed on your web server to generate guaranteed unique identifiers for each visitor.

After a visitor segment has been generated by search or a saved one has been loaded, it can be subjected to analysis by the Tealeaf reporting engine. After a segment has been analyzed, you can select one or more sessions in it and generate cxResults reports on those segments. Visitor segments can be converted to session segments, which enables page and path analysis through the cxImpact reporting capabilities. Recent and completed searches can be managed through a common interface, through which you generate analysis and reports, review segment parameters, and share or delete the segment.

## The Managing Session Segments page

The Managing Session Segments page shows the lists of currently stored sessions, which may include the results of your session searches and imported segments.

Depending on your configuration settings, each search that you execute may create a segment in this page, where you can execute analysis of it.

- To manage session segments, select **Analyze** > **Segments** > **Manage Session Segments**.
- When a segment is analyzed, the segment files are read from storage. If the analysis is successful, the segment data is inserted into the Tealeaf database. As a result, data for analyzed segments exists in two places.
- After managed segments have been analyzed, they may be reviewed in detail.

### Working in the Manage Session Segments page

In the **Manage Session Segments** page, you can review the available session segments, submit them for analysis, and manage access to them.

You can access the Sessions Segment page by selecting **Analyze** > **Segments** > **Manage Session Segments**.

- You can use the buttons that are displayed above the list of segments to run various commands.
- You can perform actions against an individual session segment by right-clicking on it to display a menu of options.

#### Session segments commands

The Session Segments List page includes buttons and context menu options for issuing commands.

To refresh the page, click **Refresh**.

To review the legend for the page icons, click **Show Legend**.

*Table 47. Avaliable Commands on the Session Segment List page*

| Command | Description | Required License |
|---|---|---|
| Import Segment | Import an external session segment for integration with Tealeaf CX through the Portal. | cxConnect |
| Build Combined Segment | You can build combine segments based on sessions that have been searched for or replayed. | cxReveal |
| Context Menu | More menu options are available through the context menu. | Analysis options require cxResults. |

#### Fields on the Session Segment List page

The session lists that are displayed on the Session Segment List page are displayed in a table format. Each row contains a session segment and information about the segment is displayed in table columns as described in this topic.

*Table 48. Field descriptions for session segments*

| Column heading | Description |
|---|---|
| Segment Status | Any displayed icon indicates the status for the segment. |
| Shared | Indicates if the segment is shared. |

| *Table 48. Field descriptions for session segments (continued)* | |
|---|---|
| **Column heading** | **Description** |
| Name | The name of the segment. |
| Owner | The Tealeaf user who owns the segment. |
| Time Stamp | The timestamp for when the segment was created. |
| Expiration | The timestamp for when the segment is scheduled to expire. |
| Session Count | The number of sessions in the segment.<br>The maximum number of sessions that are permitted in a session segment is defined by the `Session Segment Max Sessions Limit` setting in the Portal. For session segments created from Portal searches, this limit is applied to the returned search results, which can reduce the number of sessions in the generated session segment. |

**Session Segment List page context menu**
You can right-click from inside the Session Segment List page to display a menu of commands.

For any session segment, you can right-click its row to open the following context menu options:

**Menu Item**
**Description**

**`View Job Status`**
See the status for any task that is performed on the segment.

**`Share`**
Share the segment with others.

**Note:** This option is only available if you are a Tealeaf administrator or the owner of the segment. See “Sharing session segments” on page 91.

**`Copy`**
Create a copy of the segment. In the dialog, enter the new name for the segment and click **Copy**. The segment now displayed in the list.

**`Rename`**
Rename the segment. Enter the new name, and click **Save**.

**`Delete`**
Queues the segment for deletion and changes its status to be expired.

**`Postpone Expiration`**
You can delay the expiration date of the segment. Select the time period to delay the expiration from today's date. Then click **Postpone**.

**`View Sessions List`**
Click this option to view the individual sessions in the segment. To return to this screen, click **Manage Segments** above the session list. See "Analyzing Session Segments" in the *IBM Tealeaf cxResults User Manual*.

**`Replay All Sessions`**
When selected, this option creates a Tealeaf session file (`.TLX`) for export, which you can then import and replay through RTV.

**`Properties`**
Click this option to review the read-only properties of the session segment. See “Segment properties” on page 91.

**Segment properties**
Most of the segment properties are self-explanatory. More properties are displayed after the segment is analyzed.

There are two expiration times for a segment, and they can vary slightly. Raw segment data is stored as file-based data on the search server. Analyzed segments and their analysis are stored in the Tealeaf database. If analysis is performed on the segment, these timestamps must be very close together.

Times listed in the **Segment Properties** dialog and the main page are in the Tealeaf system timezone.

The Size property indicates the actual file size of the segment on the search server. It does not indicate database size.

**Sharing session segments**
You can share your segments among all Tealeaf users.

**About this task**

Individual users can share segments that they create, and administrators have access to all segments in the list.

**Note:** Segments that are shared can be deleted by any Tealeaf user.

To share session segments:

**Procedure**

- Right-click it in the Session Segment list and select **Share**
  To share a segment,.
- To stop sharing a segment that you have shared, right-click it and select **Stop Sharing**

**Expiring segments**
By default, analyzed segments are configured to expire 7 days after they are created.

You can use the context menu option **Postpone Expiration** to delay expiration as needed.

When a session segment expires, it is removed from the Canister the next time that the Data Collector scans the canister.

**Note:** Sessions that are not analyzed are removed after 24 hours.

## Importing externally created segments

You can integrate externally created queries to generate session segments for use. This mechanism can be useful for integrating Tealeaf with third-party systems that need access to Tealeaf data

**About this task**

To be able to import externally created segments into Tealeaf you must have the Segment Builder Service, which is a component of cxConnect, a separately licensable component of the Tealeaf CX system. for more information, please contact your IBM Tealeaf representative.

Through the Portal, you can upload the session segment query for the import segment service. The Tealeaf Segment Builder service runs the query against the Tealeaf session data set to generate sets of sessions that are assembled into a single segment.

Segment files that are successfully imported and run are displayed as new segments in this list.

The Segment Builder service can integrate files in `.txt`, `.csv`, or `.zip` format. See "Segment Builder Service" in the *IBM Tealeaf cxConnect for Web Analytics Administration Manual*.

To import a segment file

### Procedure

1. Click **Import Segment**.
2. In the dialog, click **Browse...** to navigate and select the file to import.
3. To override the integration settings that are specified in the Portal, clear the **Use Default Settings** check box. The following settings are displayed:

| *Table 49. Property settings for importing segments* | |
|---|---|
| **Setting** | **Description** |
| Segment Name | The name of the imported segment, which is displayed in the **Manage Session Segments** page after successful import. |
| Use Integration ID Prefix | When selected, the integration identifier prefix is added to search for values in the import file. |
| Integration ID Prefix | This value is pre-populated with the value stored in the **CX Settings** page. You can change this value to override the system value for the specific segment that is being imported. |
| Search Date Span | The number of days before the current date to search for matching data. |
| Search Term | The name of the term to search for values that match those provided in the query file. The search terms that are displayed in the drop-down come from the request of each hit of session data. |
| MD5 Hashing | If enabled, an MD5 hash is applied to the imported segment file values before running it. |
| Data Field Column | The column number in the imported segment in which data is stored. If the query file contains a single column of values for which to search in the search term, then this value can be set to the default value: `1`. |
| Column Delimiter | If the import file contains multiple columns, this value defines the character that is used to separate column data in the segment. |
| Share Segment | When set to `Yes`, the imported segment is automatically shared with other Tealeaf users. |

4. Click **Upload**.

   A success message indicates that the segment file is queued for importation.

   **Note:** Depending on the size of the segment and the load on the system, it can be a few minutes before the segment is available in this list. See "Integration" in the *IBM Tealeaf cxImpact Administration Manual*.
5. To refresh the displayed list of segments, click **Refresh**.

   **Note:** When the segment to import is displayed in the list, check the session count column. If the value is `0`, then the segment builder importation process failed.

## Exporting segments

You can export segments from the Session Segment List page.

### About this task

To export a session segment:

### Procedure

1. Right-click the segment and select **View Sessions List**.
2. In the session list, click **Download All**.

## Combining segments

Using the **Build Combined Segment** command, you can specify segment data based on date, users or groups, and session criteria to combine into a single segment, which users can access from the Tealeaf Portal.

### Before you begin

To be able to combine segments, your Tealeaf administrators must set the **`Create Combined Session Segment`** property to `Enable` for selected users, groups, or both.

### About this task

You can combine session segments that were created by cxReveal users and groups only.

To combind segments:

### Procedure

1. Fronm the Portal, select **Analyze** > **Segments** > **Manage Session Segments**
2. From the **Session Segments** page, click **Build Combined Segment**.
3. In the dialog, enter a name for the new session segment.
4. Select the **Session Criteria**:
   - `All Sessions from Searches` - Combines all sessions that are returned from searches for the users. The date range is not available for this selection.
   - `All Replayed Sessions` - Combines all sessions that are replayed by the users over the date range.
   - `All Sessions Replayed via BBR` - Combines all sessions that are replayed through Browser-Based Replay by the users over the date range.
   - `All Sessions Replayed via RTV` - Combines all sessions that are replayed through the desktop RealiTea Viewer application by the users over the date range.
5. Select a date or range of dates in the calendar panel.
   - To select a predefined range, use the Quick Select® drop-down.
   - The date range is not available if `All Sessions from Searches` is selected.
6. Select the Tealeaf user or users whose segments you want to combine into a single one.
   - To select a user group, click the cxReveal Groups option button. Then, select the group of users from the drop-down.
   - To select an individual user, click the cxReveal Users option button. Then, select the user from the drop-down.
7. To create the specified segment, click **Create**.
8. If the resulting segment contains any sessions, the segment is generated and listed in the Manage Session Segments list.

# Analyzing session segments

You can submit session segments to the cxImpact analytics engine for analysis.

**About this task**

Analyzing session segments can help identify, understand, and quantify the impact of online customer issues. Tealeaf's analytic functions produce insightful reports that present the overall impact of an issue and can identify the source of the problem. The analysis section is divided into a series of galleries that provide views into different aspects of the set of sessions.

A *session segment* is the set of sessions returned when a specific search is executed. The session segments that have been generated and made available can be accessed through the Session Segments page for review and reporting.

By default, whenever you perform a search on completed sessions, a session segment is automatically saved with a default name that includes the date and the words or terms for which you searched. For example, if you searched for the words `login error` on July 6, 2006, any automatically generated session segment may be named: `07062006 (login error)`

## Creating session segments

The first step in analyzing session segments is to create the session segments. There are two ways that you can create session segments.

**About this task**

- Automatically

  Session segments are generated automatically when you run a search of completed sessions.
- By query

  Session segments are created when a query is submitted to the Segment Builder Service through the Portal. See "Import Segment" in the *IBM Tealeaf cxResults User Manual*

You can save the parameters that you use to search for re-execution later. With the help of a saved search, you can quickly run a common search that can help to localize recurring problems or to perform system maintenance work.

If your user account is configured to auto-create session segments, each scheduled execution of the saved search generates a new session segment that can be analyzed.

For cxResults users, you can turn visitor segments into session segments, against which segment analysis can be performed.

## Session segments and user association

Session segments are associated with the the Tealeaf user who defined the search.

You can see only those results sets that you create or that are marked for sharing by other Tealeaf users.

Tealeaf administrators can see and interact with all segments.

Some sessions displayed in the list cannot be able to be replayed. Over time, available sessions can be trimmed from Tealeaf. While the record of the session is retained, the underlying data is not

## Controlling the auto-generation of session segments

You can control the auto-generation process for session segments at the user level or site level.

### Controlling the auto-generation of session segments at the user level

You can enable or disable the ability to auto-generate session segments for individual users.

#### About this task

For individual users, there are two ways to enable or disable automatic session segment creation:

#### Procedure

1. Using My Settings to enable or disable automatic session segment creation:
   a) From the Portal menu, select **Configure** > **My Settings**.
   b) Click the **Preferences** link.
   c) For `Create Session Segment for Completed Session Search`, select `Disable` to disable auto-generation or select `Enable` to enable auto-generation.
   d) Click **Save**.
2. Using Tealeaf administrator authorization to enable of disable the automatic session segment creation:
   a) From the Portal menu, select **Tealeaf** > **Portal Management**.
   b) Click **CX User Administration** in the left panel to expand the CX User Administration options .
   c) Click the option for **Users** .
   d) Select the user whose permissions you want to edit.
   e) For `Create Session Segment for Completed Session Search`, select `Disable` to disable auto-generation or select `Enable` to enable auto-generation.
   f) Click **Save**.

### Controlling the auto-generation of session segments for all users at your site

You can enable or disable the ability to auto-generate session segments for all users at your site.

#### About this task

To enable or disable auto-session segment creation for all users:

#### Procedure

1. From the Portal menu, select **Tealeaf** > **Portal Management**.
2. Click **CX Settings** in the panel on the left hand side of the Portal.
3. Click **Search**.
4. Select **Create Session Segment for Completed Searches**.
5. From the drop-down, select `Disables` to disable auto-session segment creation or click `Enabled` to enable auto-session segment creation .
6. Click **Save**.

## Selecting reports from the Report gallery

The Report Gallery contains a set of useful reports that are provided by Tealeaf.

#### About this task

You can use these reports to review summaries on search and segment data for the currently selected sessions or as the basis for building your own analytical reports.

There is a Report Gallery for session segments, as well. Since you can create session segments from visitor segments, you can find it useful to review the session segment report gallery for more reports.

To select and view a report in the visitor Report Gallery:

### Procedure

1. Click **Report Gallery** in the left navigation pane.
2. To select a report, click **<Select a Gallery**> in the main display pane.
3. In the **Dashboard Selector**, select the report gallery to load.
   a) To load the default dashboard, select `Report Gallery` in the Dashboard Selector.
   b) Then, click **Select**.
4. The selected dashboard is displayed by using the visitor segment data as inputs.

## Exploring report data details

You can use the **Drilldown** icon to explore the details of report data.

### About this task

Each selected component is displayed in the report as a separate chart.

To explore report data:

### Procedure

1. Click the Drilldown icon ( on the report in the Gallery view to explore the data that composes the chart.

   In the Detail view, you can see the underlying data that composes the chart component.
2. To download this data to excel, click **Download to Excel** in the detail table.
3. For those reports that contain drill-down links in counts that are reported in the detail table, you can click the links to perform a search for sessions that are matching the report criteria for the specified time frame.

   The resulting session list is displayed in the default session list template for completed searches.

   **Note:** When drilling into session segment data from a report that spans multiple hours, if you load the sessions into RTV, you can notice that a single page or event is displayed in the list for each hour's report. While the Portal-based report identifies items based on the individual timestamp of the page, RTV can identify items based on the timestamp of the session. Suppose that a session begins at 8:50 and ends at 9:10. This session has pages in both the eight o'clock and the 9 o'clock hours. Drilling into hourly page or event reports can result in the display in RTV of the session in the list for the 8 o'clock hour report and for the nine o'clock hour report, which can cause confusion for some RTV users. This issue applies to any report whose reporting period spans multiple hours and does not apply to visitor segments.
4. To return to the report gallery, click the link in the breadcrumb trail above the detail report.

## Business Impact Report

Business Impact reports display the total number of sessions and users that are contained in the session segment.

They also display the percentage of total sessions that are contained in the session segment over time.

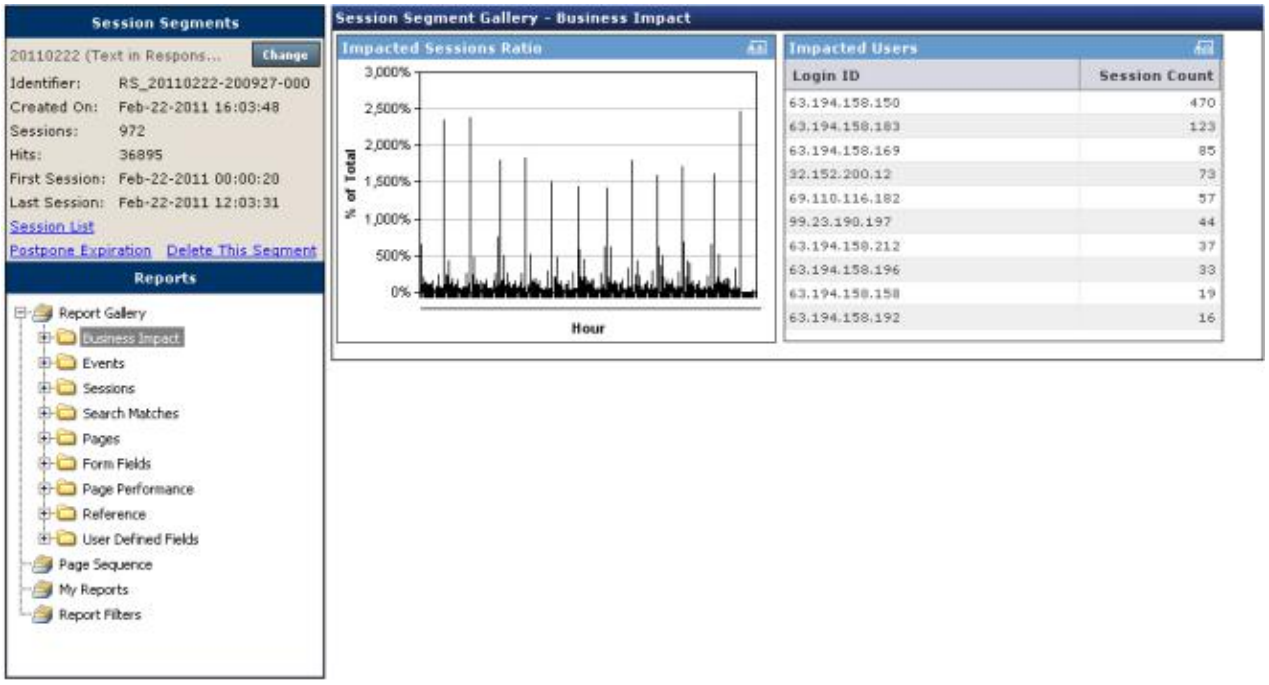



*Figure 22. Business Impact report*

**Report Component**
**Description**

**`Impacted Sessions Ratio`**
A breakdown of sessions per hour (percentage)

**`Impacted Users`**
Review the count of sessions per login identifier in the session segment.

**Events report**
The Events report shows the most frequently occurring events and pages, as well as graphs for event and page data.

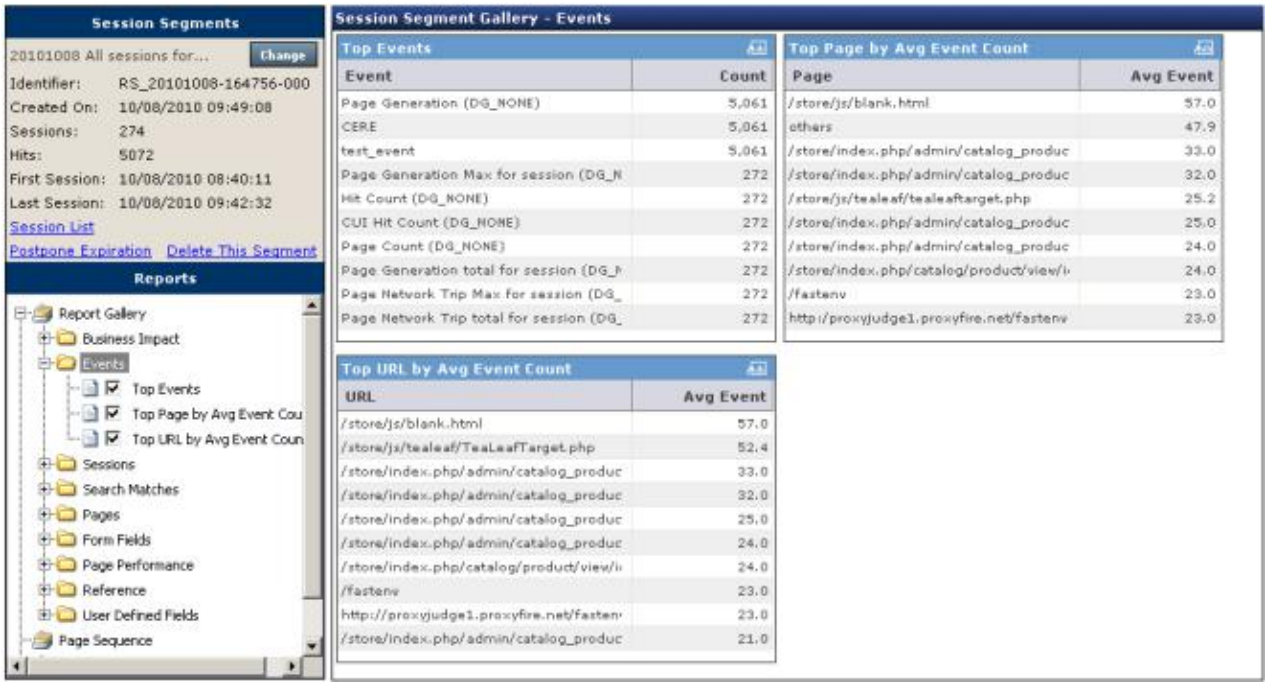



*Figure 23. Events report*

**Report Component**
**Description**

**`Top Events`**
Most frequently triggered events in the session segment

**`Top Page by Avg Event Count`**
Top pages that are based on the average number of events that are fired on the page across all sessions in the segment

- Page data is URL data that is filtered through dimensional values.

**`Top URL by Avg Event Count`**
Top URLs in session data based on the average number of events fired on the page across all sessions in the segment

**Sessions report**

Sessions include a set of reports that portray session-level attributes, such as browser type and session length.

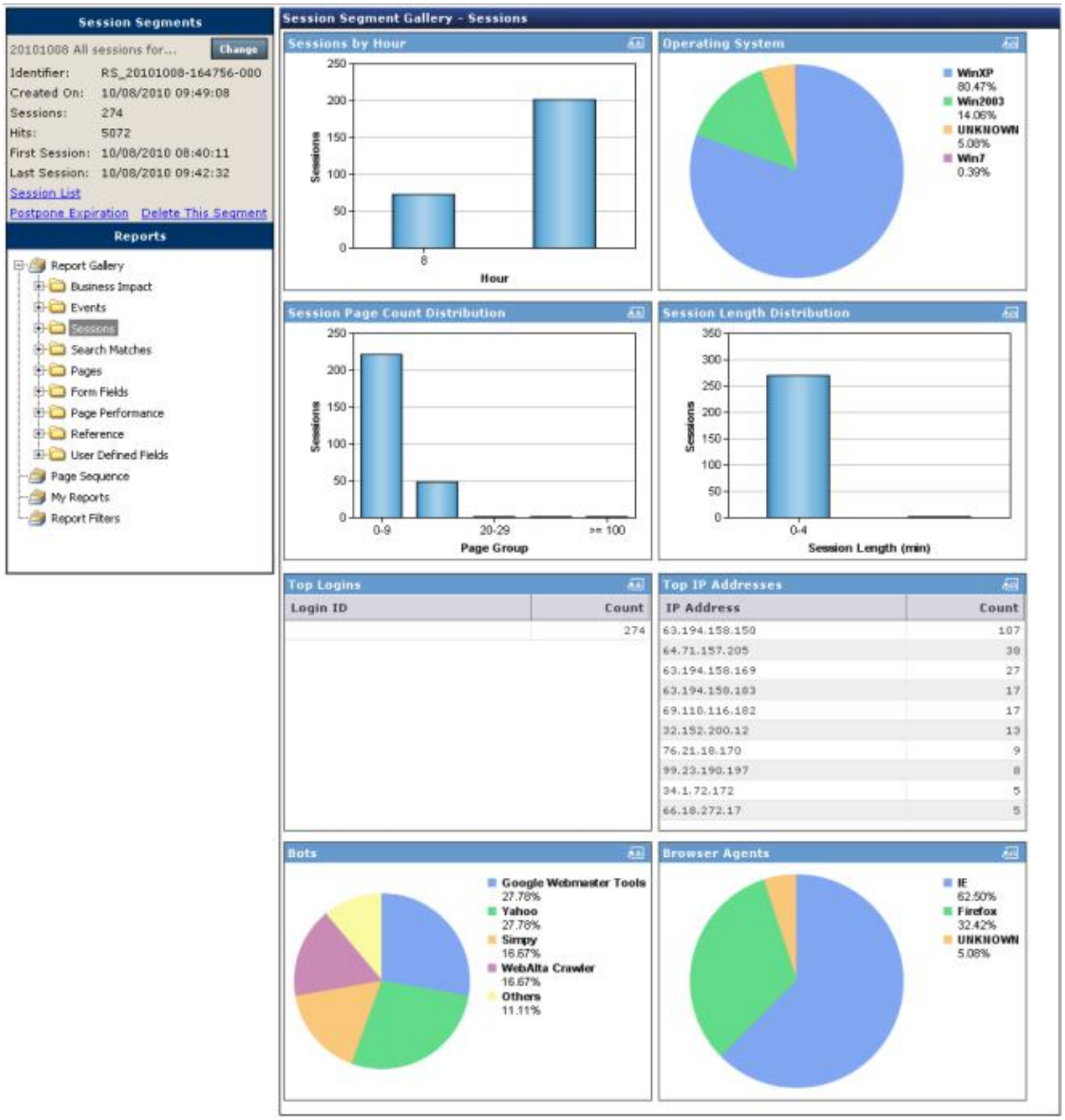



*Figure 24. Sessions report*

The Session Report can display the following counts for the sessions in the segment:

**Report Component**
**Description**

**`Sessions by Hour`**
Count of sessions per hour in the segment

**`Operating System`**
Pie chart breakdown of operating systems used by visitors

**`Session Page Count Distribution`**
Number of sessions, grouped by the number of pages in each

**Session Length Distribution**
Number of sessions, grouped by the length in minutes

**Top Logins**
Top unique user IDs (Login ID) that are displayed in sessions

**Top IP Addresses**
Top IP Addresses showing up in sessions

**Bots**
Automated bots crawling the site

**Browser Agents**
Statistics on browser agents in the session segment

### Search matches report

Search matches indicate the pages where your search terms were found. When you review Search Match reports for session-level search terms, the reports are empty because they display hit-level results only.

**Note:** If you created the session segment from the results of a search for visitors, this report contains no data. Visitor searches do not contain match count information, which is unavailable in the generated segment.

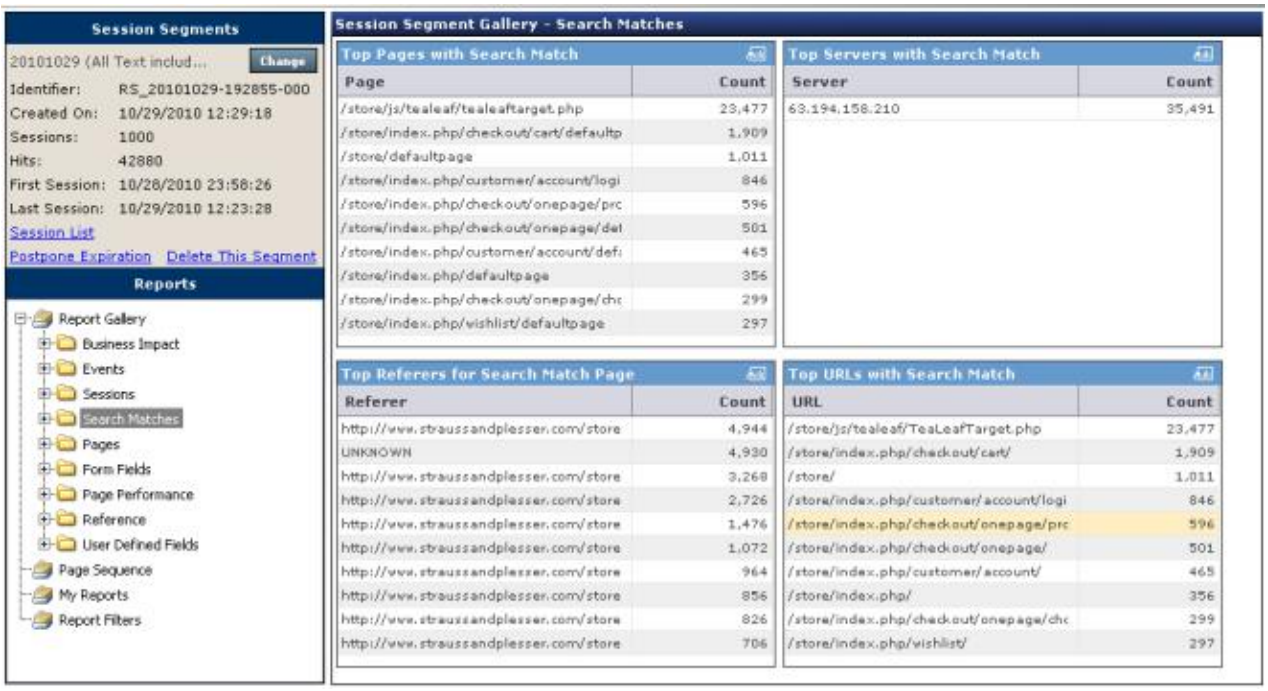



*Figure 25. Search Matches report*

**Report Component**
**Description**

**Top Pages with Search Match**
Top pages where a search match was found

- Page data is URL data that is filtered through dimensional values.

**Top Servers with Search Match**
Servers where the highest number of search matches were found

**Top Referrers for Search Match Page**
Where search matches were found, this component lists the most frequent referrer values.

**Top URLs with Search Match**
Top URLs in the session data where a search match was found

**Pages report**

The Pages report provides detail on the pages that were viewed within the set of sessions.

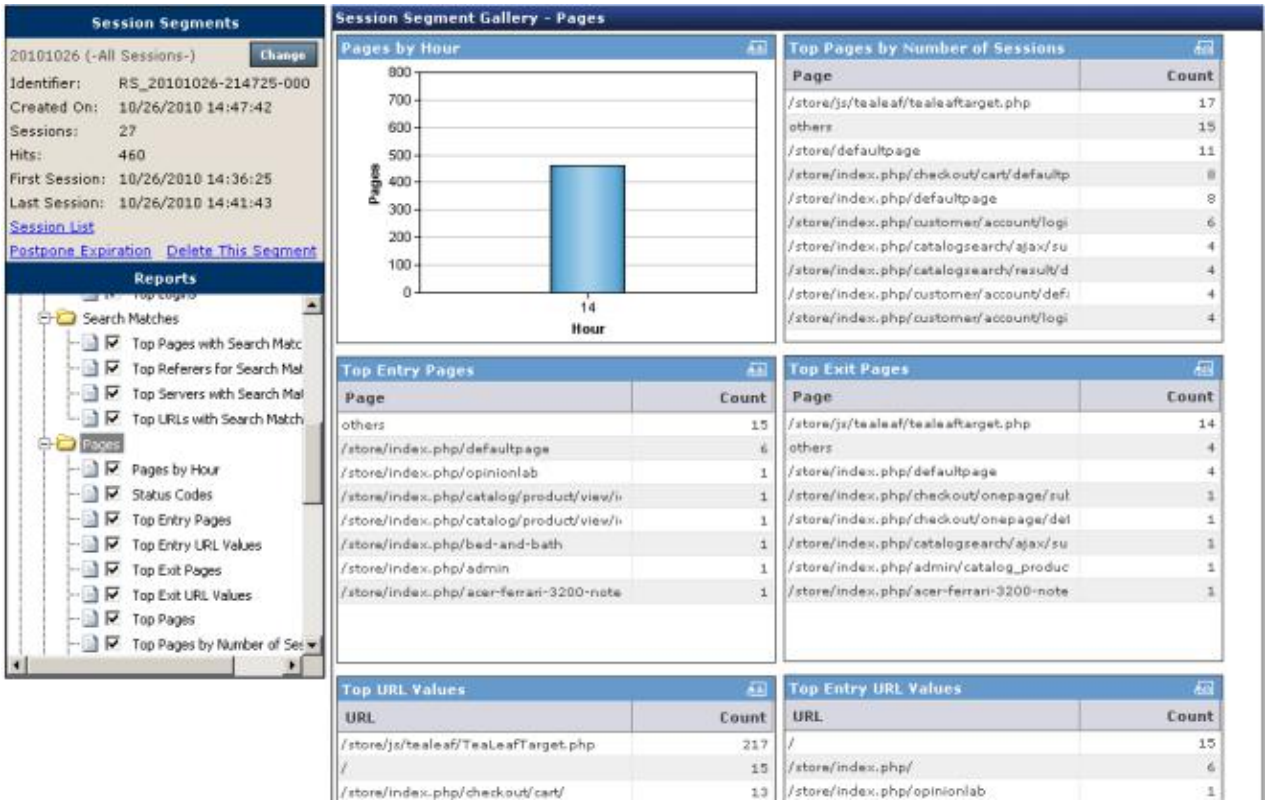



*Figure 26. Pages report*

**Report Component**

**Description**

**`Pages by Hour`**

Number of pages in the session data for each hour of the segment

- Page data is URL data that is filtered through dimensional values.

**`Top Pages by Number of Sessions`**

Top pages in the segment that is based on the number of sessions in which they appear

- Page data is URL data that is filtered through dimensional values.

**`Top Entry Pages`**

Top pages where sessions in the segment were begun

- Page data is URL data that is filtered through dimensional values.

**`Top Exit Pages`**

Top pages where sessions in the segment were ended

- Page data is URL data that is filtered through dimensional values.

**`Top URL Values`**

Top URLs in the segment that is based on total count

**`Top Entry URL Values`**

Top URLs where sessions in the segment were begun

**`Top Session Referrer`**

Top session referrer values in the segment

**`Status Codes`**

Pie chart of the status code information for responses in the session segment

**Top Exit URL Values**
Top URLs where sessions in the segment were concluded

**Top Pages**
Top pages in the segment that is based on total count

- Page data is URL data that is filtered through dimensional values.

**Top URLs by Number of Sessions**
Top URLs in the segment based on the number of sessions in which they are displayed

### Form Fields report

Form Fields enable you to drill into the names and values of form fields that existed in this set of sessions.

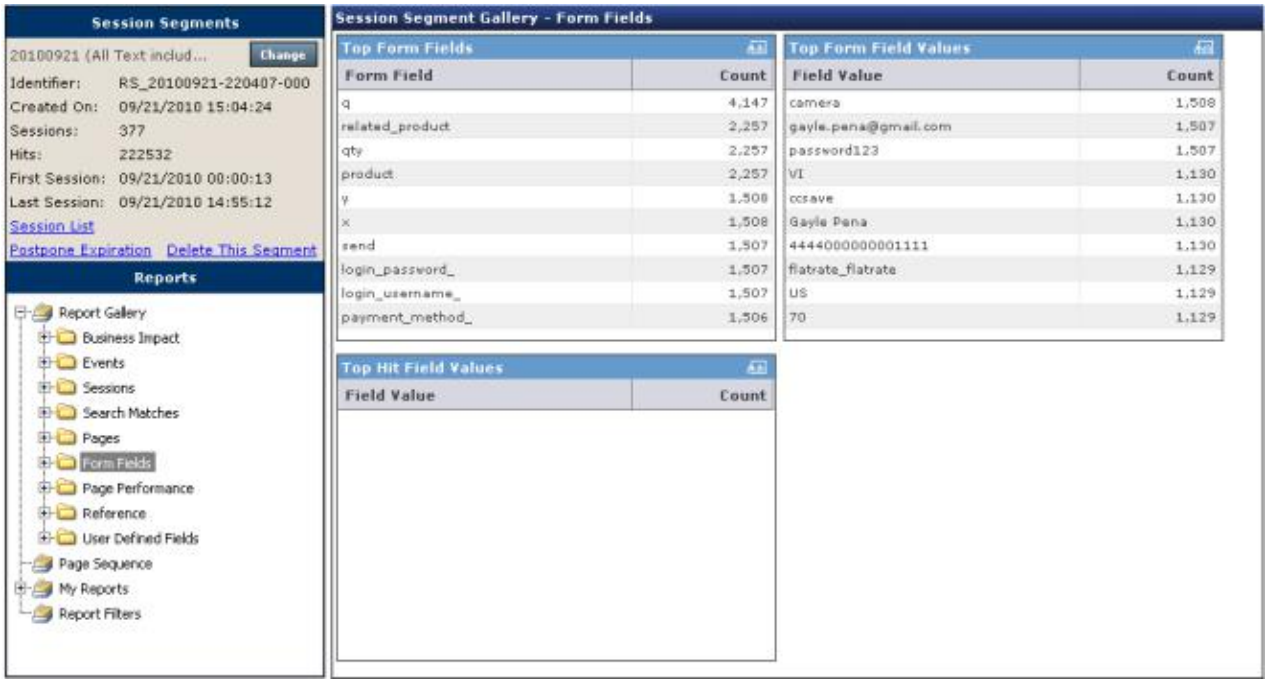



*Figure 27. Form Fields report*

| Report Component | Description |
|---|---|
| **Top Form Fields** | The top form fields used in the session segment |
| **Top Form Field Values** | The top values used in form fields in the segment |
| **Top Hit Field Values** | The top field values extracted by the RS Extractor.<br>• To display data in this report component, you must configure the values for the RS Extractor to extract from the session segment data. |

### Page Performance report

Page Performance details the specific performance metrics for the pages served in this set of sessions.

The grades in this report are assigned by the Passive Capture Application.

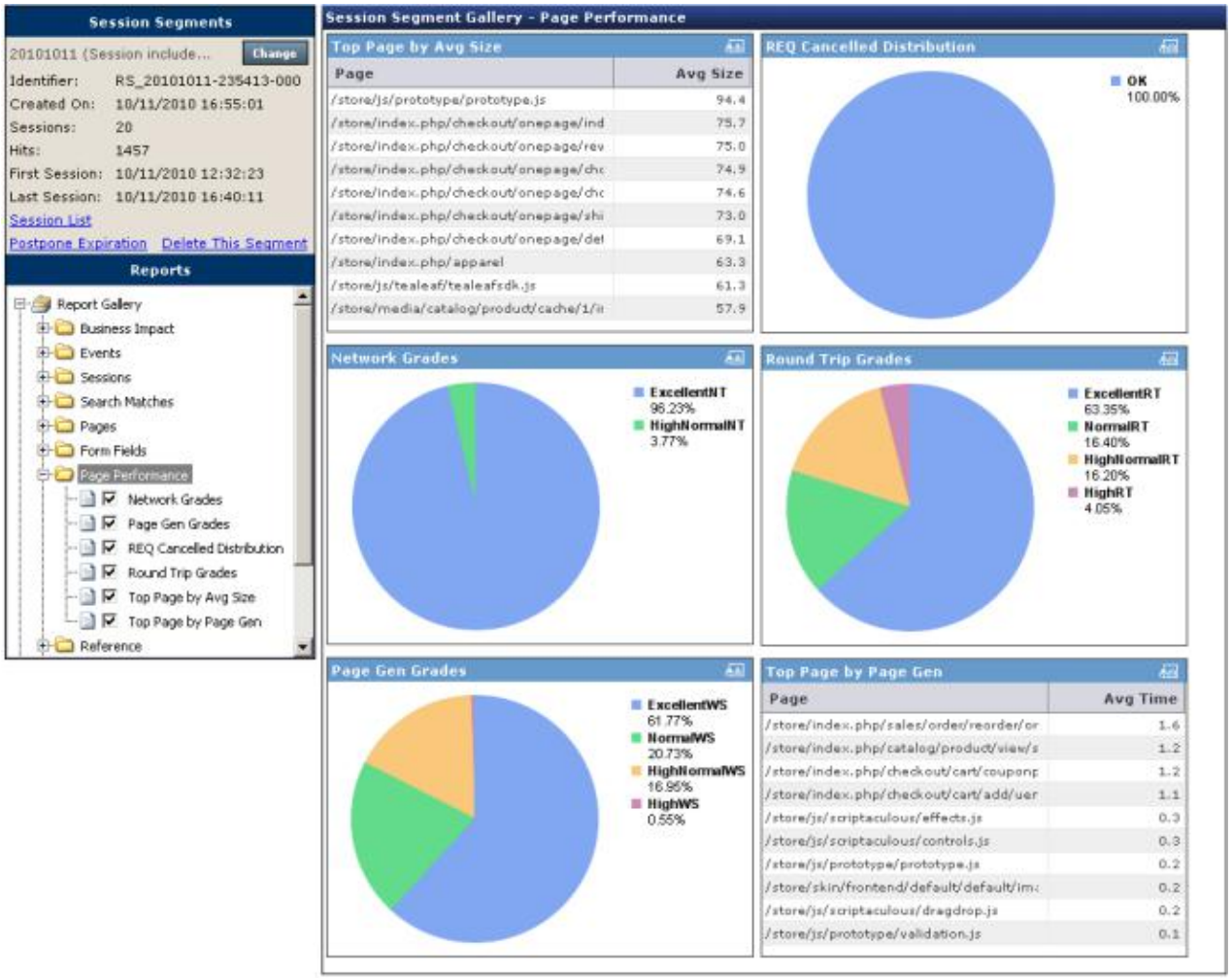



*Figure 28. Page Performance report*

**Report Component**
**Description**

**`Top Page by Avg Size`**
Top average page size in kilobytes for hits in the segment

- Page data is URL data filtered through dimensional values.

**`Req Cancelled Distribution`**
Pie chart showing request cancelled by client percentages for the hits in the segment

**`Network Grades`**
Pie chart of grades for network travel time for the hits in the segment

**`Round Trip Grades`**
Pie chart of grades for round trip time for the hits in the segment

**`Page Gen Grades`**
Pie chart of grades for page generation time for the hits in the segment

**`Top Page by Page Gen`**
Top page generation times in seconds for hits in the segment

- Page data is URL data filtered through dimensional values.

### Reference report

The Reference gallery provides information about the applications, hosts, and servers that are represented in this set of sessions.

Data for this report is normalized using the URL/Host/App/Server report group of dimension data. This report group is provided by Tealeaf.

To populate this report with data, you must include the Tealeaf Reference session agent in your Windows pipeline.

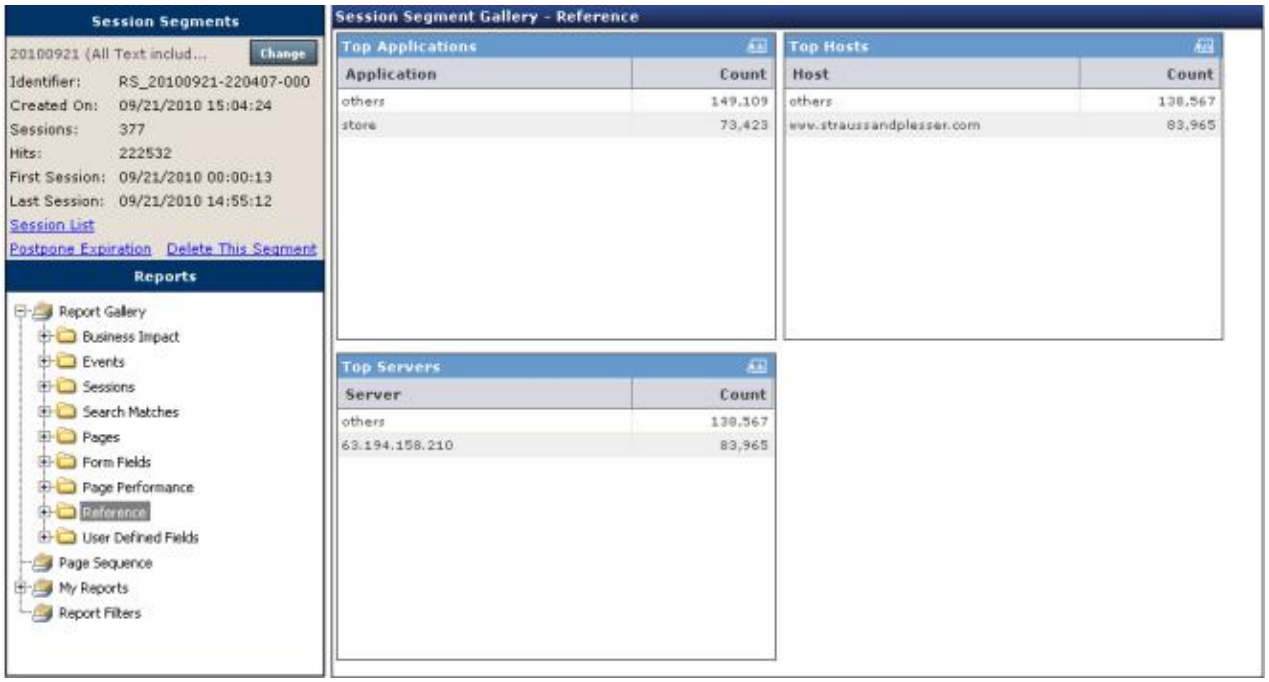



*Figure 29. Reference report*

| Report Component | Description |
|---|---|
| **Top Applications** | The top Application values in the segment.<br>• The Application dimension is populated by values captured and stored in the `TLT_APPLICATION_NAME` variable for the request. |
| **Top Hosts** | The top Host values in the segment.<br>• The Host dimension is populated by values captured and stored in the `TLT_HOST_NAME` variable for the request. |
| **Top Servers** | The top Server values in the segment.<br>• The Server dimension is populated by values captured and stored in the `TLT_SERVERS` variable for the request. |

### User-defined fields report

The User-defined fields gallery provides information about values in the UserDef1 through UserDef4 fields in the set of sessions.

Typically, these four fields are mapped to the Session Attributes 1 - 4. These attributes are defined during upgrade or may be defined through the Tealeaf Event Manager.

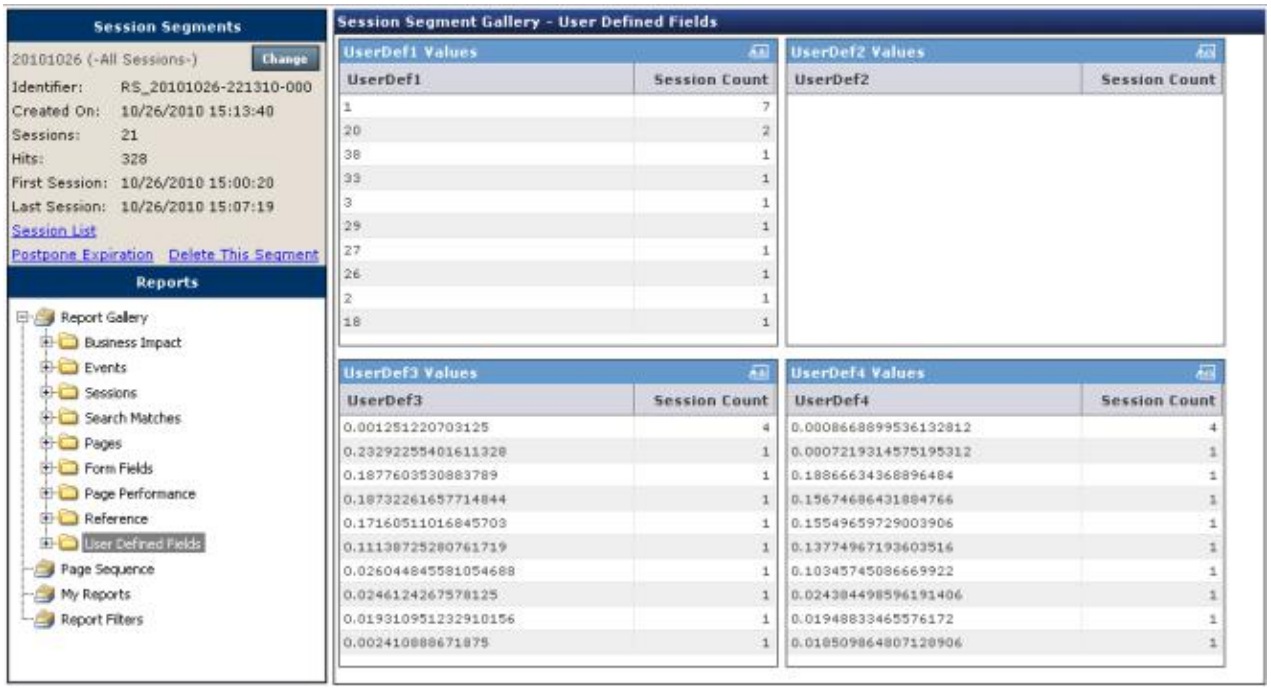



*Figure 30. User Defined Fields report*

## Analyzing the sequence of pages for session segments

For the selected session segment, you can analyze the sequence of pages as percentages. For a selected page, you can review the entry and exit pages to the selected page as a percentage across the session segment.

### About this task

To analyze the sequence of pages for a session segment:

### Procedure

1. In the left pane, click **Page Sequence**.
   - All of the pages values that is displayed in the segment are loaded into the Focus drop-down. Depending on the number of pages, this step can take a while.
   - Page data is URL data that is filtered through dimensional values.
2. In the main window, select the focus page from the **Focus** drop-down.
3. The Page Sequence report for the selected page is displayed:

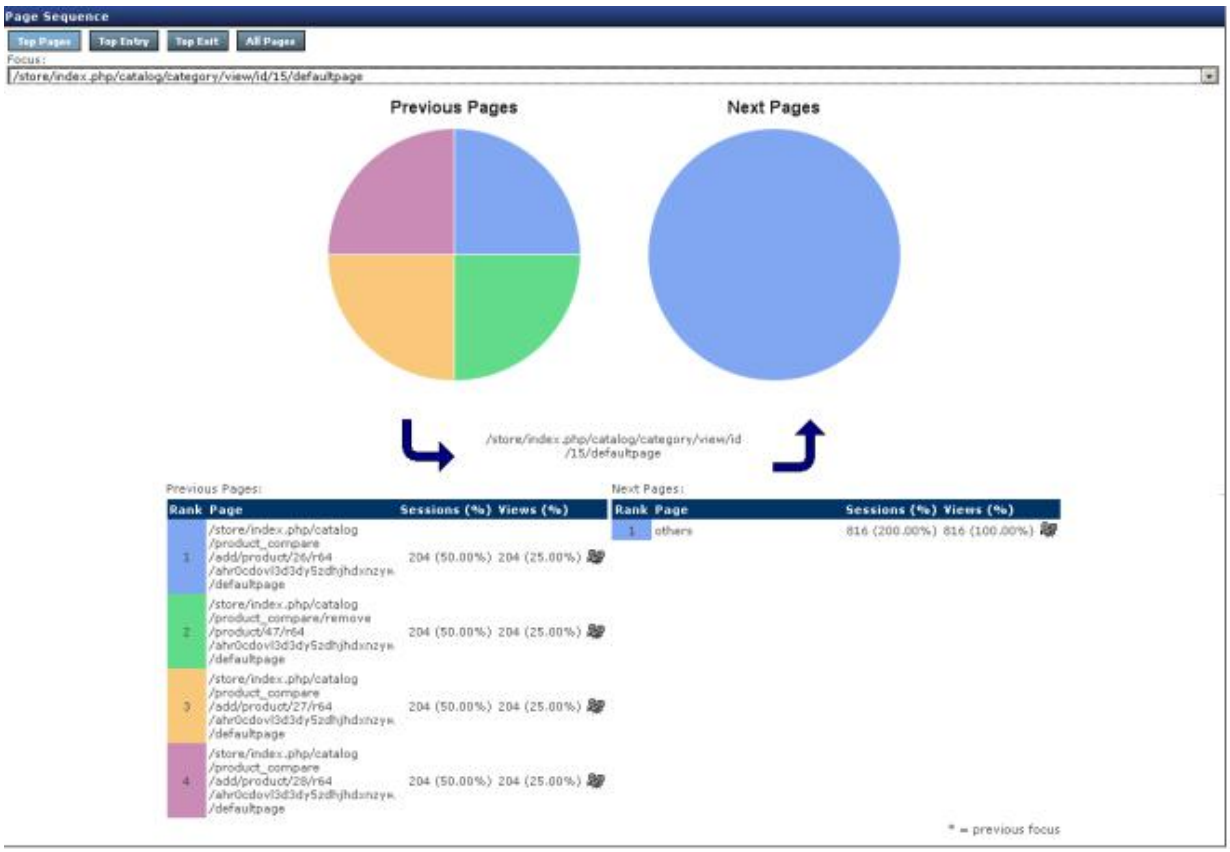



*Figure 31. Page Sequence Report*

- To review page sequencing for the most popular pages in the segment, click **Top Pages**.
- To review page sequencing for the most popular individual page in the segment, click **Top Entry**.
- To review page sequencing for the most popular final page of the segments, click **Top Exit**.
- To review page sequencing for all pages that is displayed in the segments, click **All Pages**.

### Results

In the Page Sequence report, you can examine the most common previous and next pages in the sequence for the focus page in the rank order of their appearance. In the left chart, you can see the rank order of pages that are leading into the focus page, while the right chart displays the rank order of the pages visited subsequent to the focus page.

- The Session % metric computes the percentage of sessions in which the focus page is preceded or followed by the listed page. If the focus page is visited multiple times in the same session from different pages, the Session % metrics for previous Pages can total over 100%. The same applies to Session % metrics for Next Pages.
- The View % metric totals the percentage of sessions that viewed the listed page. Since this metric is tabulated only once per session, the percentage totals 100% for each focus page.
- When you select a next or previous page in the detail table, the focus is changed to that page.
- To drill-down to the sessions that contain the listed page, click the **Camera** icon.
  - To return to the Page Sequence report, click the **Page Sequence** link in the breadcrumb trail above the main panel.

## My Reports

My Reports allow you to save a specific report into a local folder for viewing at a later time, and you can gather reports from different groups onto the same pane.

You can use these as shortcuts to display favorite reports.

- To add a report to your My Reports area, right-click the report in the Reports Tree and select **Copy To My Reports**.
- To remove a report from your My Reports area, right-click the report and select **Remove Report**. The report is removed from My Reports but is still available in the Reports Gallery.

### Report filters

You can filter any session segment report that is based on the data that is presented in the report.

That filter can then be applied to any other report in the report gallery.

**Note:** A filter is specific to the report from which it was created. For example, if you create a filter that is based on the Top Entry Pages report, the filter is defined to filter sessions that have the selected value as their entry page. The filter does not get applied to all sessions that include the page. As a result, it is important to name your filters carefully.

The include and exclude filter options describe how the sessions that match the filter are used in report data set. For example, if you exclude a filter that applies to all sessions, none of the reports have any data. If you include a filter, all reports perform their actions on the subset matching the included filter.

- Multiple filters can be combined to add or remove sessions from the base data set.

#### *Creating report filters*

You can create report filters for session segment reports.

#### About this task

To create a report filter:

#### Procedure

1. From the **Reports** panel on the left side of the screen, select a report to view.
2. For the selected report, click the drill-down button in the upper-right corner of a pane.

   The data is displayed.
3. To create a filter based on the value of the data, right-click it and select **Set Value as Filter**.
4. If prompted, provide a name for the filter, and click **Create**.

#### Results

The new filter appears under the Report Filters node in the **Reports** panel on the left side of the screen.

You can now apply the filter.

#### *Applying a report filter*

After you create a report filter you can apply it and use it.

#### About this task

The newly created filter is displayed under the Report Filters node in the **Reports** panel on the left side of the screen.

#### Procedure

To use a filter, right-click and select from the context menu.

The following table lists and describes the commands for applying the report filter.

| *Table 50. Commands for applying report filter* | |
|---|---|
| **Right-click command** | **Description** |
| Include Filter | Filter reports to only apply to sessions that match the filter. |
| Exclude Filter | Filter reports to only apply to sessions that do not match the filter. |
| Disable Filter | Disable the use of the filter. This setting also excludes the filter from use. |
| Disable All Filters | Disable all displayed filters. This setting also excludes all filters from use. |
| Remove Filter | Delete the filter. The filter is removed from the Report Filters node. |
| Remove All Filters | Delete all filters. All filters are removed. |

In the figure below, the filter `Page: others` is excluded, and the filter `Hour: 8` is included:

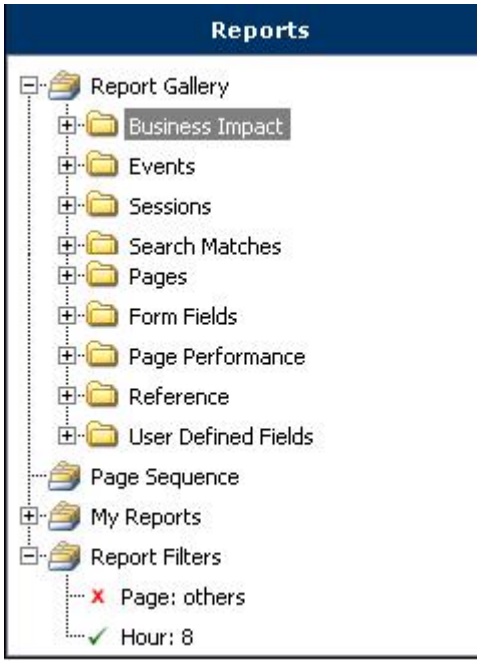



*Figure 32. Applied Report Filters*

## Managing visitor segments

Using the Portal, you can review visitor segments and perform various functions on them.

### About this task

The ability to manage visitor segments requires the cxResults product. cxResults is no longer available as a newly licensed product as of Release 8.7. Customers that licensed cxResults in Release 8.6 and earlier may continue to use and receive support for the product in Release 8.7 and later. For more information, please contact Tealeaf Customer Support

To manage your visitor segments:

**Procedure**

1. From the Portal menu bar, select **Analyze** > **Segments** > **Manage Visitor Segments** .

   The **Completed Searches** tab of the Visitors Search page is displayed.

   This page shows all completed searches that are still retained by the system.
2. To refresh the page, click **Refresh**.

## Fields on the Completed Searches page

The data on the Completed Searches page for Visitor Segments is organized in table format.

Each search has a unique ID, a description that defaults to a list of editable search parameters, the Request date time, and Expiration Date/Time, and the number of visitors that matched the search.

*Table 51. Completed Searches page for Visitor Segments*

| Field | Description |
|---|---|
| ID | Unique identifier for the search. |
| Description | A user-friendly description of the search. This value defaults to a list of the editable search parameters. |
| Requested On | Timestamp when the search was run. |
| Expires | Timestamp when the search is scheduled to expire. |
| Matches | Number of positive matches in the visitor search. |

## Visitor segments context menu commands

The Visitor Segments List page supports context menu options for issuing commands.

For any visitor segment, you can right-click its row to open the context menu, which has the includes the following options:

**Note:** Any unavailable options are not applicable for the current selection.

*Table 52. Context menu command options for Visitor Segements*

| Context menu command option | Description |
|---|---|
| View Results and Reports | For any search with a positive number of matches, this option opens the "Analyzing Visitor Segments" in the *IBM Tealeaf cxResults User Manual* page that is displaying the segment matches. |
| View Segment Parameters | Opens a window showing the search parameters. From this popup, you can initiate another search. |
| Schedule This Search | When you save the search, you can schedule the selected search to occur at regular intervals through the **Scheduled Searches** tab. |
| Share | Share the segment with others.<br>**Note:** This option is only available if you are a Tealeaf administrator or the owner of the segment. |
| Rename | Rename the segment. Enter the new name, and click **Save**. |

| *Table 52. Context menu command options for Visitor Segements (continued)* | |
|---|---|
| **Context menu command option** | **Description** |
| Delete | Queues the segment for deletion and changes its status to be expired. |
| Set Expiration Date | You can set the expiration date of the segment. Select this option and then enter the number of days to delay the expiration from today's date. Click **Save**. |
| Refresh List | Refreshes the list to include any status changes or new searches that are completed since the page was displayed. |

**Sharing visitor segments**

Individual users can share the visitor segments that they create, and administrators have access to all segments in the list.

Tealeaf users and administrators can share segments among all Tealeaf users.

**Note:** Segments that are shared can be deleted by any Tealeaf user.

# Configuring Tealeaf

You can use the **Configure** menu in the Portal to configure your personal settings and, if you have the appropriate permissions, dashboards, scorecards, and search templates.

**Note:** Access to the Configure menu is determined by permissions in your user account. For more information, please contact your Tealeaf administrator.

Through the **My Settings** page, you can make adjustments to your location, language, start page, replay, password, and default search and dashboard settings.

Through your settings, you can also clear your local cache, which is used to store common data used by Tealeaf.

**Note:** If you believe that any cached data has been refreshed in the Tealeaf system, clearing the cache forces your browser to reload the data from Tealeaf.

From time to time, you should change your password. Users can be forced to change their password periodically.

## Configuring preferences and setting your password

You can use options on the **My Settings** configuration to configure and modify preferences and to update your password.

### About this task

All Portal users can modify their own preference settings and passwords.

To configure your Tealeaf preferences and to change your Tealeaf password:

### Procedure

1. Select **Configure** > **My Settings**.

   The **My Settings** section is displayed in the sidebar on the left.

   **Note:** If you are forced to this page immediately after login, please verify that you have access to your configured landing page. This page is defined by the `Start` Page value in the My Settings page.
2. Select **Preferences** to configure or update preferences.

For most of your preferences, you can apply the default values assigned by your Tealeaf administrator to your primary user group. To apply the default value, select **Primary Group Default**

The Preferences window is displayed.

*Table 53. Preference settings*

| Field | Description |
|---|---|
| ID | This value is a system-generated number used internally to identify your account. |
| Email | Enter a valid email address for delivery of scheduled dashboards, alerts, and other output of the Tealeaf system.<br>**Note:** You cannot create and deliver report snapshots if you do not have an entry for this email address. It is recommended that you do not create report snapshots from admin accounts. |
| Time Zone (used in Search) | Hourly report values are displayed in the user's timezone, but the daily roll-up of reporting data is controlled by the system timezone. To avoid confusion, set this value to the same as the system timezone.<br>This time zone setting applies primarily to the affected users' search activities. Other Portal activities utilize the Tealeaf system time zone. |
| Date Format | Select the format to display dates from the drop-down list. |
| Language | Select your choice of language to display in the Portal. |
| Start Page | The list of available start pages depends on your account's access permissions. |
| Log Out If Idle | You can toggle this feature, if needed. You cannot adjust the timeout length. |
| Create Session Segment for Completed Session Search | By default, every search you perform on completed sessions creates a session segment that remains available for 24 hours. |
| Replay Mode | This setting appears only if your user account has the `Lock Replay Mode` setting disabled.<br>• RTV - Launch the IBM Tealeaf CX RealiTea Viewer desktop application to replay sessions. RTV must be installed on your local desktop.<br>• `Browser` - Replay sessions inside the web browser.<br>• `Prompt on Replay` - For each replay, you can choose to display it in RTV or your web browser. |
| Dashboard Detail Mode | To display drill-down information, you can choose to do it in the same browser window or to open a new one. |
| Default Active Search Template | The default search template to load when you choose to search for active sessions. |
| Default Completed Search Template | The default search template to load when you choose to search for completed sessions. |

| *Table 53. Preference settings (continued)* | |
|---|---|
| **Field** | **Description** |
| Default All Sessions Search Template | The default search template to load when you choose to search for all sessions. |
| Primary User Group | Allows the user to change what group they belong to. Many users will not have any options here beyond the administrator selected group. |

a) To apply preferences, click **Save**.

3. Select **Password** to set or change your Tealeaf password.

   The window for changing your password is displayed.

   **Note:** This setting does not appear if you are logged in via NT or SSO authentication.

   Update the password.

   Portal passwords can be a maximum of 32 characters in length.

   a) To apply the change to your password, click **Save**.

## Browser Based Replay

The cxImpact Browser Based Replay (BBR) feature enables users to replay visitor sessions directly through a web browser.

You can use the Browser Based Replay interface to review in real time all pages in visitor sessions as they are displayed to the user. Or, you can quickly step through selected pages to identify issues that occurred during the session.

The following terms are frequently used:

**Replay**

A *replay* is the display of the visitor's experience with your web application. By assembling all of the requests, responses, and related data in the sequence of the visitor session, the Tealeaf system can replay the session through Browser-Based Replay to accurately mimic the visitor experience.

You can replay both active sessions and completed sessions.

Additionally, users with Admin authorization can view page load details in real-time to assist with diagnostics and to help identify specific files that might be the cause of discrepancies in fidelity.

For information about how to use real-time logging of Replay Server, see "Using real-time page load logging information for session diagnostics" in the *IBM Tealeaf cxImpact Administration manual*.

For information about how to configure the Replay Server to use real-time logging, see "Replay Server Configuration" in the *IBM Tealeaf CX Configuration manual*.

**Active session**

An *active session* is a visitor session with the web application to which the visitor is adding pages right now by browsing the website.

During replay of active sessions, BBR automatically refreshes active sessions on a periodic basis. When an active session is refreshed, the currently displayed page is not refreshed. When UI events are part of the current page, a refresh can cause replay to jump to the previous standard page and disrupt the replay.

**Completed session**

A *completed session* is a visitor session that the visitor has completed or abandoned or that has been timed out by Tealeaf.

Browser Based Replay runs entirely within the Portal and requires no additional software installation for Tealeaf users.

**Note:** BBR maintains and forwards to your browser the required Set-Cookie headers to properly replay a session. To ensure that the Portal cookies are maintained, Tealeaf resends them at the end of each request. If the maximum number of permitted cookies is exceeded, the oldest cookies in your browser are discarded, which enables BBR replay and your Portal session to be sustained.

BBR is an alternative to Tealeaf's IBM Tealeaf CX RealiTea Viewer (RTV) desktop application, which must be installed on each user's desktop system as an advanced search and replay system.

### Primary functions of Browser Based Replay

You can use BBR to complete the following functions:

- Replay visitor sessions or track live visitor sessions as they occur.
  - Replaying active sessions as they occur enables you to provide real-time customer support for customers and to diagnose web application issues that you are personally experiencing.
- Show visitor input, such as entered text, selected menu options, and clicked links or buttons.
- Track activities that occur on different views of a dynamic page.
- View the raw request and response data.
- Drill down into session details.

## Opening Browser Based Replay to access sessions

You can open Browser Based Replay to access a list of active sessions, completed sessions, or a list of all (active and completed) sessions

### Opening Browser Based Replay for active sessions

You can open BBR to access a list of active visitor sessions.

#### About this task

To open Browser Based Replay for active sessions:

#### Procedure

1. Select **Active** > **Sessions** in the Tealeaf Portal menu.
2. Next to the session you want to replay, click the **Replay** icon ( ).
3. In the popup dialog, select **Browser**.

   The session that you selected is opened in Browser Based Replay in a new browser window.

   See "Listing Active Sessions" in the *IBM Tealeaf cxImpact User Manual* for information about the display window that contains the active sessions.

### Opening Browser Based Replay for completed sessions

You can open BBR to access a list of completed visitor sessions.

#### About this task

To open Browser Based Replay for completed sessions:

#### Procedure

1. Select **Search** > **Completed Sessions** in the Tealeaf Portal menu.
2. Select a Completed search template.
3. Specify the search criteria for which you are looking.

4. Next to the session you want to replay, click the **Replay** icon ( ).
5. In the popup dialog, select **Browser**.
6. The selected session is opened in BBR in a new browser window.

## Session replay

You can examine pages as they are displayed to the visitor and replay the visitor's experience through your web browser.

For best replay results, replay the session in the same browser that was used to create the session. This information is displayed along the **User Agent Information Bar** under **Best Replayed Using**.

**Note:** Replay of sessions across multiple browser tabs or multiple browser windows is not supported.

**Note:** BBR cannot set cookies that are intended to be captured as part of the visitor experience. If cookies are integral to replay, you must use the IBM Tealeaf CX RealiTea Viewer desktop application instead.

### Replaying a page

You can use Browser Based Replay to replay a page and view how the visitor saw the page.

#### About this task

To view a page as the visitor saw it:

#### Procedure

1. Select the page in the Navigation pane.
2. In the toolbar, click **Replay** ( Replay ).

### Replaying a session

You can use Browser Based Replay to replay a visitor session in its entirety.

#### About this task

To replay the visitor session in its entirety:

#### Procedure

1. Select the page at which to begin the replay in the Navigation pane.
2. Click the **Start Replay** ( Start Replay ) icon in the toolbar.
3. You can choose to replay the session as it was captured or to delay each page a preset number of seconds.

#### Results

During replay, a counter at the top of the page indicates how many seconds remain in the replay of the current page.

- To stop replay at any time, click the **Pause** ( Stop Replay ) icon in the toolbar. The currently replaying page remains in the Content Pane for further exploration.

### Mobile device applications and BBR

You can capture interactions that mobile device users have with your web site and then replay their sessions using Browser Based Replay.

Browser Based Replay supports the following types of mobile device applications:

- **Mobile Web Apps:**

  Mobile web apps are web applications that can be accessed by mobile devices.

- Support for Mobile Web Apps was introduced in IBM Tealeaf Version 8.8
- Mobile Web Apps are coded entirely in JavaScript and use Java™ classes.
- Mobile Web Apps use only UIC.

- **Native Apps**:

  Native applications are applications that are *native* to the mobile devices on which they run.

  - Support for Native applications was introduced in IBM Tealeaf Version 9.0.
  - Native applications use either the iOS or Android operating system platform and are *platform-specific* (meaning, iOS applications do not run on an Android device and vice versa).

- **Hybrid Apps**

  - Support for Hybrid applications was introduced in IBM Tealeaf Version 9.0.1
  - With Hybrid applications, you can call native APIs from a web app.

  **Note:** In IBM Tealeaf Version 9.0.1, Replay has the following limitations for hybrid apps:

  - There is no support for frame/iframe within the webView.
  - Only simple UI events are supported within webView.

*Figure 33. Mobile device applications supported by BBR*

***Replaying sessions from mobile visitors***

If you have licensed and enabled the IBM Tealeaf CX Mobile module, BBR supports the replay of user interface events that are captured from the visitor's mobile browser.

To render sessions that are captured from mobile devices for display in the web browser, the Tealeaf Replay Server uses an embedded renderer that is based on the Chromium engine. For best results in replay of mobile-based sessions, use the Chrome browser in Browser-Based Replay.

The IBM Tealeaf CX Mobile module is a separately licensed module of the IBM Tealeaf CX platform. for more information, please contact your IBM Tealeaf representative.

**Note:** If IBM Tealeaf CX Mobile module has not been licensed, there are limitations that are applied to replay of sessions in BBR.

The manner in which you work with mobile device sessions in BBR is basically the same as it is for non-mobile device sessions.

When you replay sessions from a mobile device in BBR, a graphical representation of the device is displayed in the viewing area.

You can set the toggle for **Options** > **Resize View to Match Session** to enable or disable various functions when replaying a mobile device session. For a description of the functionality that you can enable or disable by toggling the **Resize View to Match Session** option, see "Options menu" in the *IBM Tealeaf cxImpact User Manual*.

**Note:** The option to resize the view to match the session is enabled by default.

The visitor interactions with the mobile application are depicted graphically. For example, if the visitor tapped two times on a UI element on the mobile application screen, BBR depicts this action on the screen in the viewing area as follows:

### Mobile device gestures in BBR

When a visitor interacts with your mobile-based web site, mobile app, or native hybrid app using a touch device (for example, a smart phone or tablet), you can replay the *gestures* from that experience in BBR.

The capability to capture and replay mobile device gestures (for example, `tap` and `swipe` gestures) gives you insight into interactions that are specific to a mobile device user's experience.

**Note:** If there is no mobile licence, gesture Replay is not supported.

Being able to view mobile device gestures in BBR can help you identify and troubleshoot customer pain points and address design flaws in your web site or application that otherwise might have gone unnoticed. For example, lets say your business has a mobile banking application for your customers. A customer accesses the banking application from their mobile device to view their account balance. After viewing their account balance, the customer wants to go back to the application's home page to perform a different transaction. The user taps the logo in the top of the account balance page several times, assuming that the logo functions as a link to the home page. However, the application developer for the mobile app did not code the logo to link to the home page. As a result, the user is frustrated and confused about how to navigate back to the home page. By having access to mobile device gestures in BBR, you can see where the visitor struggled (multiple taps on the logo) and you can share this information with the mobile app developer.

**Note:** Highlighting in BBR is not supported for mobile gestures (type11 messages).

Gestures are enabled in the supported frameworks as follows:

*Table 54. Enabling gestures reference table*

| Framework | Method for enabling | For more information see |
|---|---|---|
| iOS | Gestures are enabled in the `TLFConfigurableItems.plist` file in each application in which you want to capture gestures. | *IBM Tealeaf CX Mobile iOS Logging Framework Guide* |
| Android | Gestures are enabled in the `mainActivity.jar file` in each application in which you want to capture gestures UIC. | *IBM Tealeaf CX Mobile Android Logging Framework Guide* |
| Java-based web application | Gestures are enabled in the `TealeafSDK.js` file configuration object. | *IBM Tealeaf CX UI Capture j2 Guide* |

### Analyzing gesture events in BBR

When you replay sessions from a mobile device in BBR, a graphical representation of a mobile device is displayed in the viewing area.

Like standard BBR, you can replay the customer's session from beginning to end, or you can go through the session one page at a time by clicking the UI events in the Navigation pane.

The gestures are displayed graphically on the graphical representation of the device.

Additionally, you can review the request and response message formats.

### Searching for gesture events in sessions

You can use the **Search** function in Tealeaf Portal to search sessions that contain gesture events and unresponsive gesture events.

**Note:** When searching sessions for gesture or unresponsive gesture events, keep in mind that gesture event you are searching for might have been renamed by a Tealeaf user.

**Note:** To enable unresponsive events, you must have an IBM Tealeaf CX Mobile license.

For more information about searching for Events in a session, see "Events" in *Specifying your search fields*.

### Unresponsive gestures in BBR

If a mobile device user performs a gesture (for example, a **Tap** or a **Swipe**) and the application does not respond, the gesture is categorized as "unresponsive".

Being able to identify unresponsive gestures easily in BBR can help you troubleshoot usability or design issues in the mobile device application.

In BBR, unresponsive gestures are identified with specific icons that denote unresponsiveness. See *Gesture events captured* for a list of gestures and their associated icons.

*Gesture events captured*
Gestures that are used to select items in an application or to adjust views in the application are captured by Tealeaf.

#### Tap gestures
This table lists and describes the tap gestures that are captured from web and mobile apps.

**Note:** The arrows that illustrate the direction of a swipe or pinch gesture are not supported by the Internet Explorer browser.

*Table 55. Tap gestures*

| Gesture name | Description | Image displayed in Replay |
|---|---|---|
| Tap | | |
| Tap and Hold | | |
| Double tap | | |

#### Swipe gestures
This table lists and describes the swipe gestures that are captured from web and mobile apps:

*Table 56. Swipe gestures*

| Gesture name | Description | Image displayed in Replay |
|---|---|---|
| Swipe vertically | | |
| Swipe horizontally | | |

#### Resize gestures
This table lists and describes the resize gestures that are captured from web and mobile apps:

**Note:** See the *IBM Tealeaf Customer Experience 9.0.1 Release Notes* for information about a known limitation for handling some iOS pinch gestures.

| *Table 57. Resize gestures* | | |
|---|---|---|
| **Gesture name** | **Description** | **Image displayed in Replay** |
| Pinch open | | <br>**Note:** Accompanying arrows indicate the direction (open or close) of the pinch |
| Pinch close | | <br>**Note:** Accompanying arrows indicate the direction (open or close) of the pinch |

**Unresponsive gesture events captured**

Unresponsive gestures are gestures that do not respond when a user tries to select items in an application or tries to adjust views in the application. Like other gesture events, unresponsive gestures are captured by Tealeaf.

Unresponsive gestures are displayed graphically in BBR as orange outlined icons accompanied by a circled "X" . The circled "X" denotes that the gesture was unresponsive. For example, if a double tap gesture did not yield a response in the mobile application, then at replay time that gesture is displayed with the following icon in BBR:

The following table lists the unresponsive gestures that are captured from web and mobile apps and shows the images that are displayed in BBR:

| *Table 58. Unresponsive gestures and icons* | |
|---|---|
| **Unresponsive Gesture** | **Image displayed in Replay** |
| ***Tap gestures*** | |
| Unresponsive tap | |
| Unresponsive double tap | |
| Unresponsive tap and hold | |
| ***Swipe gestures*** | |
| Swipe vertically | <br>**Note:** Accompanying arrows indicate the direction of the swipe. |
| Swipe horizontally | <br>**Note:** Accompanying arrows indicate the direction of the swipe. |
| ***Resize gestures*** | |
| Pinch open | <br>**Note:** Accompanying arrows indicate the direction of the pinch. |

| *Table 58. Unresponsive gestures and icons (continued)* | |
|---|---|
| **Unresponsive Gesture** | **Image displayed in Replay** |
| ***Tap gestures*** | |
| Pinch close | <br>**Note:** Accompanying arrows indicate the direction of the pinch. |

*Responsive and unresponsive gesture controls*
Tealeaf logs gestures that the user makes when the user interacts with applications. Tealeaf logs the gestures, for example, taps, even if the gesture is on a part of the screen that has no controls, for example, a label or the application background.

If users are consistently making gestures on unresponsive areas of the screen, it might be an indicator that the user interface is confusing and frustrating to the users.

A responsive gesture is a gesture that happens on a part of the screen that has an interactive control. After the user makes the gesture, the application responds with an action.. For example, the user taps on a button and the application runs a command from the button.

An unresponsive gesture is a gesture that happens on a part of the screen that does not have any interactive controls. No matter how many times the user makes the same gesture, the application makes no response. For example, the user Taps on a label for a button and nothing happens.

The following sections list responsive and unresponsive gesture controls.

### Unresponsive gesture controls - all gestures

These controls are not interactive and log unresponsive gestures when the user taps, swipes, or pinches them:

- canvas
- imageSwitcher
- command
- quickContactBadge
- clock
- progressSpinner
- progressBar
- label

### Responsive gesture controls - single tap only

These controls are interactive and respond only when the user does a single tap. For all other gestures, these controls are unresponsive:

- button
- calendar
- checkBox
- collectioniItem
- dialerFilter
- gallery
- image

  **Note:** The on tap on Image is a responsive gesture for Mobile web sessions only, and will be treated as unresponsive for Native and Hybrid sessions.

- link
- menu
- numberPicker
- radioButton
- tabBar
- tabBarItem
- grid
- toggleButton
- keyboard
- collectionItem
- colorPicker

**Responsive gesture controls - all tap gestures**

These controls are interactive and respond when the user does a single tap, double tap, or tap and hold:

- url
- emailPicker
- stepper
- textBox

**Responsive gesture controls - single tap and swipe only**

These controls are interactive and respond when the user does a single tap or swipe gesture:

- slider
- ratingBar
- timePicker

**Remaining responsive gesture controls**

This table lists the remaining supported controls. Controls that are responsive are marked with an 'X':

| Control | Tap | Double Tap | Tap and Hold | Swipe | Pinch |
|---|---|---|---|---|---|
| PageControl | | | | X | |
| searchBox | X | X | X | | |
| selectList | X | | | | |
| Scroll | X | X | X | X | X |
| datePicker | X | | | X | |

***Replaying sessions that have both web and mobile data***
You can use BBR to replay sessions that contain "hybrid" data (data captured from a mobile device and from a webView).

**Before you begin**

Hybrid Replay for Tealeaf Version 9.0.1 requires the mobile device SDK version 9.0.1. If you are running a pre 9.0.1 Version of the Replay Server, Hybrid Replay will not work.

To support Native Hybrid replay, create the following directory structure on the machine where Replay Server is installed:

- For Native Replay:

- `D:\IBM\IBM Tealeaf CX\ReplayServer\Idt`

  The **Idt** folder contains the dojo library.
- `D:\IBM\IBM Tealeaf CX\ReplayServer\TLT`

  The **TLT** folder contains the native replay templates.

- For Hybrid Replay:
  - `C:\IBM\IBM Tealeaf CX\ReplayServer\Apps\mobile app name\mobile app verson \images`

    The **images** folder contains the static image resources.
  - `C:\IBM\IBM Tealeaf CX\ReplayServer\Apps\mobile app name\mobile app verson \css`

    The **css** folder contains the static css resource.

**Note:** If the original path to the static resource file is `file:///abc/def.jpg`, then you copy `def.jpg` to `IBM Tealeaf install dir\ReplayServer\Apps\mobile app name\mobile app verson\`.

**About this task**

Replaying sessions that contain data that was captured from multiple sources, is known as *Hybrid replay*.

For information about how to add capture code to the events that you want to capture, see the *IBM Tealeaf CX UI Capture j2 Guide*.

If you are using BBR for Hybrid replay, you must upload to the Replay server all the static resources captured from the mobile device. Examples of static resources include image files and cascading style sheet (css) files.

Upload the static resources into the following directory:

```
ReplayServer/Apps/mobile app name/mobile app verson/
```

where the values for *mobile app name* and *mobile app verson* are pulled from the JSON hit. For example:

*Figure 34. JSON hit sample*


```
{
    "serialNumber": 0,
    "messageVersion": "0.0.0.1",
    "sessions": [
        {
            "startTime": 1328311295574,
            "id": "945202AC4E93104E05EDADE1F6059B97",
            "messages": [
                {
                    "offset": 124,
                    "contextOffset": 4556,
                    "type": 2,
                    "logicalPageName": "HomeActivity"
                }
            ]
        }
    ],
    "clientEnvironment": {
                "height": 800,
                "osVersion": "2.2",
                "pixelDensity": 1.5,
                "width": 480,
                "deviceHeight": 533.3300170898438,
                "osType": "Android",
                "mobileEnvironment": {
                    "appName": "sdkTest4",
                    "android": {
                        "keyboardType": "QWERTY",
                        "brand": "generic",
                        "fingerPrint": "generic/sdk/generic/:2.2/FRF91/43546:eng/test-keys"
                    },
                    "totalMemory": 459243520,
                    "totalStorage": 45568,
```

```
                    "orientationType": "PORTRAIT",
                    "appVersion": "1.0",
                    "manufacturer": "unknown",
                    "userId": "d192d257-b308-42cf-aacc-2dd034c232bd",
                    "locale": "English (United States)",
                    "deviceModel": "Android Simulator",
                    "language": "English"
                },
                "deviceWidth": 320
            }
}
```


**Note:** The path to the images and css resources are relative in html file where they are used.

Using Figure 34 on page 121 as an example, the path into which you upload the static resources is:

```
ReplayServer/Apps/sdkTest4/1.0/
```

***Making static content for Native Hybrid applications available to BBR***

Static content such as image files and css files for Hybrid applications must be hosted on the Replay Server machine in order for BBR to retrieve them at replay time.

**About this task**

Perform the following steps to make static content for Native Hybrid applications available to BBR:

**Procedure**

1. In BBR, open the iOS or Android session that will replay the hybrid portion of the application.
2. Switch to the Request view.
3. Select a page that contains some UI events (in JSON format).
4. In the JSON posts, locate the section that is similar to what is shown in Figure 35 on page 123.

   **Note:** Take note of the values assigned to the **appName** and **appVersion** properties.

```
"clientEnvironment": {
    "height": 800,
   "osVersion": "4.4.2",
    "pixelDensity": 1.5,
        "width": 480,
        "deviceHeight": 533.3300170898438,
        "osType": "Android",
        "mobileEnvironment": {
         "appName": "HybridHTMLEmbedded",
        "android": {
        "keyboardType": "QWERTY",
        "brand": "generic",
        "fingerPrint": "generic/sdk/generic:4.4.2/KK/938007:eng/test-keys"
                    },

         "totalMemory": 407351296,
        "totalStorage": 46338,
        "orientationType": "PORTRAIT",
        "appVersion": "9.1.0.1",
         "manufacturer": "unknown",
        "locale": "English (United States)",
        "deviceModel": "Android Simulator",
         "language": "English",
        "deviceId": "9b548103-b9c0-4bc5-add4-0897af5a8a02"
```


*Figure 35. Sample JSON*

5. Connect to the server that hosts the Replay Server component.
6. Navigate to the Replay Server directory.

   For example:

   ```
   <IBM_Tealeaf_home_folder>\ReplayServer\
   ```

7. In the `ReplayServer` directory, create a folder and name it **Apps**.
8. In the **Apps** folder, create a folder and name it according to the value assigned to **appName** as shown in Figure 35 on page 123.

   For example, name the folder `HybridHTMLEmbedded`.
9. In the new application folder, create a folder and name it according to the value assigned to **appVersion** as shown inFigure 35 on page 123.

   For example, name the folder `9.1.0.1`.
10. In the new version folder, create a folder and name it `mobile_domcap`.

    Using Figure 35 on page 123 as an example, the full directory path is:

    *<IBM_Tealeaf_home_folder>\ReplayServer\Apps\HybridHTMLEmbedded \9.1.0.1\mobile_domcap*.
11. In the `mobile_domcap` folder, paste all of the static content required by the Hybrid application.

    For example:

    - `css` folder

- h5 folder
- `images` folder
- `*.html`

12. Recycle the Replay Server.
13. Make a new attempt to open an iOS or Android Hybrid session in BBR.

***Addressing device size issues in native replay***

There might be scenarios where customers visit your mobile application using devices with very small display dimensions, or scenarios where the device dimensions are captured incorrectly.

**About this task**

If the display dimensions on the device are smaller than the defined threshold, Browser Based Replay:

- removes the mobile skin
- applies no sizing to the replay frame
- presents the following warning message:

```
Device size is less than the threshold.
Mobile skin is removed.
Please refer to the documentation for more details on this warning.
```

Use the following procedure to adjust replay screen dimension values so that you can replay sessions that were either captured incorrectly, or that were captured from devices with dimensions smaller than the defined threshold.

**Procedure**

1. Go to `\IBM Tealeaf CX\Portal\WebApp\js` and open the file named `replayConfig.js`.
2. Edit the values in **`minDeviceWidth`** and **`minDeviceHeight`**
3. Save your changes.
4. Clear the browser cache to view the changes.

**Results**

By modifying the variables in `replayConfig.js`, Browser Based Replay is able to replay the session correctly.

Any changes you make to `replayConfig.js` will not be overwritten if you upgrade to a new release of Tealeaf.

If you want to apply the edits made to `replayConfig.js` to a new release, you can merge the changes in `replayConfig.js` with the file in `\IBM Tealeaf CX\Portal\WebApp\CFG`.

**DOM Capture and Replay**

Classic Capture and Replay works well for a traditional customer-to-website-interaction scenarios, where everything that runs the application and or website is contained in the response to the customers request.

For scenarios not currently supported by Classic Capture and Replay (such as SasS) or for scenarios where the complexity for configuring classic replay makes it prohibitive, consider using DOM Capture and Replay. For example, consider using DOM Capture and Replay when a complicated JavaScript runs in a single-page application.

**Deciding between Classic Capture and Replay and DOM Capture and Replay**

There are advantages and disadvantages related to using Classic Capture and Replay or DOM Capture and Replay. Consider the following factors when trying to determine which type of capture and reply solution (Classic or DOM) to implement:

- Different areas of focus for UIC configuration

  Both the Classic and DOM solutions require a similar level of complexity when it comes to configuring the UIC.

  While Classic replay configuration focuses on ensuring all user interactions are captured, DOM Capture focuses on the strategic capture of trigger events and on optimizing the triggers for snapshots.
- Client-side processing and network bandwidth

  DOM Capture incurs additional processing and network transmission cost that is directly proportional to the size of the snapshot and frequency of the triggers.
- Complexity of the replay configuration

  Classic replay recreates the entire sandbox within the browser in which the application runs and behaves exactly as the user experienced it. For some types of applications, for example single page applications (SPAs), the configuration required to achieve this can be extensive. In contrast, the replay of DOM snapshots requires minimal replay configuration.
- Tealeaf storage and processing

  DOM snapshots require additional storage and processing capacity which is directly proportional to the quantity and size of the snapshots.

For traditional multi-page web applications, consider a "mixed mode solution" with elements of Classic Capture and Replay and judicious use of DOM Capture and Replay.

Optimal UIC configuration is the key to successfully integrating DOM Capture into your capture and replay solution. If you are an existing Tealeaf customer, you can continue to use and extend your traditional Tealeaf capture, replay, events, and technological investments. You do not need to view DOM Capture and Replay as a replacement for Classic Capture and Replay solutions. Instead, consider using DOM Capture and Replay for specific pages, screen views, or elements of interest where additional visibility is needed.

### Benefits of DOM Capture and Replay

With DOM Capture and Replay, you have:

- More control over dynamic interaction
- More data in session
- Less Rich Internet Application (RIA) work

### Classic Capture and Replay versus DOM Capture and Replay

This table compares Classic Capture and Replay and DOM Capture and Replay:

*Table 59. Comparing classic Capture and Replay to DOM Capture and Replay*

| **For Classic Capture and Replay. . .** | **For DOM Capture and Replay. . .** |
|---|---|
| UI Capture SDK collects the UI event | UI Capture SDK collects DOM and the UI event |
| Uses rendering agent based on user agent | Does not use rendering agent. |
| The Rendering Engine runs JavaScript for dynamic content | Uses the exact DOM that the user saw at the moment of capture, rather than a simulation by the renderer. |
| HTML consists of re-rendered response. | HTML consists of the response + DOM. |

### Performance and DOM Capture and Replay

Using DOM Capture and Replay instead of the classic Capture and Replay can result in faster performance at replay time and a truer replay experience, because:

- Classic capture and replay relies on the Rendering Engine to render a page in BBR, while DOM Capture and Replay uses the captured DOM to display a page in BBR.

  Because DOM Capture and Replay does not rely on a rendering process, there are less resources that are involved to display the page, resulting in better performance in BBR.
- Classic capture and replay processes dynamic content when the session is recalled, while DOM Capture and Replay captures dynamic content in the DOM (when it happens to the user the first time).

  Because DOM Capture and Replay uses the exact DOM that the user saw at the moment of capture, rather than a simulation produced by a Rendering Engine, DOM Capture and Replay provides a "truer" replay experience.

### Use DOM Diff to reduce the size of the captured session

**Note:** This information pertains to functionality available in IBM Tealeaf version 9.0.2 Fix Pack 1. For information about the fix pack, contact your IBM Tealeaf representative.

The DOM Diff feature applies only the differences (diffs) for the captured DOM when replaying the session. By processing the DOM Diffs only, you can reduce the size of the captured session. Reducing the size of the captured session can improve replay performance.

**Note:** DOM Diff functionality is not supported for replaying Hybrid Mobile apps.

The type of capture performed (DOM Diff, Full DOM, or Classic) is controlled by setting specific properties in the UI Capture SDK, as shown in the following table.

*Table 60. Specifying the type of capture to perform*

| To enable . . . | Set the following properties in the UI Capture SDK |
|---|---|
| DOM Diff capture | domCapture enabled = True<br>diffEnabled = True |
| Full DOM capture | domCapture enabled = True<br>diffEnabled = False |
| Network / Classic capture | domCapture enabled = False |

### How DOM Diff works

The UIC SDK uses the DOM Diff feature to process the differences. By default, this service is enabled. This feature is only active if the DOM Capture feature module is enabled.

In the DOM Capture (Type 12 JSON) message, the `fullDOM` property indicates whether the Type 12 message contains a full DOM or DOM diffs. When the `fullDOM` property is `true`, the Type 12 message contains a full DOM capture. When the `fullDOM` property is `false`, the Type 12 message contains DOM Diffs.

Replay uses the diffs to transparently reconstruct the DOM capture on the server.

### DOM Diff feature availability

The DOM Diff feature is available only with specific browsers:

- Internet Explorer 11 and above
- Chrome 42 and above
- Firefox 38 and above

***How DOM Capture and Replay works***

DOM Capture relies on the Document Object Model (DOM), which provides a structured representation of the web page (document). The DOM Capture Service captures a "snapshot" of the rendered DOM. The "snapshot" is sent to the server as a Type 12 JSON message. The Replay server processes the DOM for Browser Based Replay (BBR).

**Note:** DOM Capture can be enabled or disabled on a per page basis. For pages, which do not have DOM Capture enabled, the classic capture and replay process is used.

### Stages of DOM Capture and Replay

There are four stages of DOM Capture and Replay:

| Stage | Processing |
|---|---|
| Capture | During this stage, UI Capture processes the DOM message into a UI hit request. |
| PCA Processing | During this stage, PCA handles decompression of the compressed POST data. |
| Pipeline Processing | During this stage, the pipeline moves the captured DOM from the UI hit to a 'virtual' hit that uses the captured DOM as the hit response. |
| Replay | This stage processes the session on the replay server according to the defined rules. |

### Capture

After the raw DOM is captured, Tealeaf updates input variables and applies privacy masking according to the UI Capture privacy masking rules. Inline script elements are deleted.

If the captured DOM is below the configured size limit, the capture is serialized into JSON Type 12 message format. The message is compressed or not, depending on the settings. If the captured DOM is over the configured size limit, the capture is discarded and an error message is logged.

### PCA processing

DOM capture data is sent from the UIC in two ways:

1. JSON text with no compression
2. JSON text with gzip compression

### Pipeline processing

The Windows pipeline moves the captured DOM from the UI hit into a virtual hit with the captured DOM as a response. The DOM Capture data is removed from the JSON and metadata is modified. The virtual hit has the same PAGE URL as the UI hit that had the DOM captured data.

### Replay

The replay server processes the session according to the defined rules. For pages on which DOM Capture is enabled, the replay server goes through the UI events and identifies those events that have a captured DOM associated with them. The Replay server uses the page ID and token of the captured DOM to identify the virtual hit and the rendered DOM for the UI event.

*Replaying sessions with captured DOM*

Replay rules are used to determine whether DOM Capture replay is enabled or disabled for a particular page URL.

Replay processes the session according to the rules.

For pages on which DOM Capture is enabled, the Replay identifies those UI events on the page that have captured DOM associated with them.

**Note:** If there is no DOM Capture associated with a UI event, Replay does not display the event in the BBR navigation list.

Replay uses the page id and the token associated with the captured DOM, to identify the virtual hit in the session that is tagged with the same information in its request headers. Replay associates the response of the virtual hit as the rendered DOM for the UI event.

The **Capture** field in the page statistics bar of the BBR user interface indicates the "type" of capture. Pages with captured DOM have a Capture type of DOM. For information about the **Capture** field, see Page statistics in the *IBM Tealeaf cxImpact User Manual.*.

*Configuring IBM Tealeaf DOM capture and replay*
Implementing DOM capture involves configuring your application to be "DOM-enabled" and configuring IBM Tealeaf to process and replay sessions of visitors that use the DOM-enabled application.

### Before you begin

Before you enable DOM capture and replay:

- Understand the pros and cons of using DOM capture
- Get classic capture to work first for your application

### About this task

This task describes the end-to-end configuration procedure for an IBM Tealeaf DOM capture and replay solution. The procedure includes steps for configuring DOM capture on the client side and for enabling the replay of DOM captured data on the server side.

Enabling DOM capture on the client side involves configuring the UIC by:

| Action | Description |
|---|---|
| Enabling DOM Capture | You can log full DOM captures or DOM Diffs. DOM Diff is an enhancement to the DOM capture feature. The default setting for DOM Diffs is enabled.<br>**Note:** DOM Diff functionality is not supported within hybrid mobile apps. ScreenViews and DOM snapshots are used to replay sessions from hybrid mobile apps.<br>**Note:** This information pertains to functionality available in IBM Tealeaf UI Capture version 5.0.0. For information about the release, contact your IBM Tealeaf representative.<br>DOM capture is enabled for an individual page by adding a DOM-capture trigger event to the page. The classic Capture process is used to capture any page that is not configured with a DOM-Capture trigger event. |
| Adding triggers for page load, page unload, click, and change | A trigger tells the UIC when to do a DOM Capture. For initial setup and testing, you want to perform a DOM capture on every page load and unload, on every click, and on every change event. After you test your setup and verify that DOM capture is |

| Action | Description |
| --- | --- |
| | working, you want to tune the trigger events to capture only specific data. |

After you verify that the DOM capture feature is enabled and working in replay, you determine if DOM Diff is affecting performance and fine-tune triggers for capture. Depending on the application, there may be so many DOM Diffs to process that the performance is affected. In that case, you may want to disable DOM Diff and use a full DOM capture.

In a production environment, to capture every screenview load and unload and every click or change on a control would be such a large amount of data that it would cause performance issues. You might need to limit the captures to specific clicks and changes. You can create custom triggers to limit the DOM capture to specific user actions.

You can trigger DOM captures on specific events to capture the data that is critical to your application:

- Pre-defined event triggers - The click, load, unload, change - you can trigger a DOM capture on the click of a specific button or the load of a specific screenview. After you assign an event to a specific control or screenview event, the system stops capturing a DOM snapshot for every event of that type. For example, defining a trigger as click without specifying a control means that a DOM capture is triggered on every click event. Specifying a control for the click, such as the **Next** button, means that DOM captures are only triggered when the user clicks a **Next** button.
- Custom event triggers - You can define a custom event in the replay module configuration and use that event to trigger a DOM capture. For example, you can create a custom event that is called Login and use the Login event to trigger a DOM capture.

Configuring DOM capture on the server-side involves enabling DOM Capture on the Replay server, increasing the byte size specified in the **`Canister Safety Limits [BB]`** Event, and adding a DOM Capture Virtual Session Agent to the pipeline.

The DOM Capture Virtual Session Agent processes data by:

- Extracting DOM or DOM Diff from type 12 message.
- Creating a virtual hit with extracted DOM or DOM Diff being the response.
- Inserting the newly created virtual hit into the session.
- Sending the processed data to the Canister.

At replay time, the Replay Server pulls the session that contains virtual hits.

Additionally, the DOM Capture Virtual Session Agent ensures the seamless integration of the DOM or DOM Diff with existing Tealeaf features, such as search index and privacy.

**Note:** The DOM Diff feature applies to IBM Tealeaf Version 9.0.2, fix pack 1 and later. For information about fix pack 1, contact your IBM Tealeaf support representative.

### Procedure

1. Configure DOM Capture on the client side:
   a) Start the configuration wizard for the application that you are using with Tealeaf.
   b) On the **DOM Capture** page, select **Enable DOM Capture**.
   c) If you want to use Hybrid Mobile replay, remove the **DOM Diff** selection from the **DOM Capture** page.
   d) Add four triggers, one each for load, unload, click, and change:
      1) Select **Add trigger**. Leave the **Event** drop-down at Load, and the **Screenview** and **Delay** fields blank.
      2) Select **Add trigger**. Change the **Event** drop-down to Unload. Leave the **Screenview** and **Delay** fields blank.

3) Select **Add trigger**. Change the **Event** drop-down to Click. Leave the **ID**, **ID Type**, **CSS Selector**, and **Delay** fields blank.
4) Select **Add trigger**. Change the **Event** drop-down to Change. Leave the **ID**, **ID Type**, **CSS Selector**, and **Delay** fields blank.

e) Select **Finish**.

2. Configure the Replay server session agent for DOM captured data:

a) Use TMS to add the DOM Capture Virtual Session Agent.

1) Log on to the IBM Tealeaf Portal as an administrator.
2) From the menu bar, select **Tealeaf** > **TMS**.
3) From the **Worldview** tab, expand the twistie so that you can see all of the nodes in the server view.
4) Expand the **Transport Service** node.
5) Scroll to the **Transport Service configuration** and select it.

   The **Config Info** panel for the Transport service is displayed.
6) In the Config Actions section of the panel, select **View/Edit**.

   The **Pipeline Editor - Transport Service Configuration** window is displayed.
7) In the **Available Session Agents** panel, locate **DOMCaptureVHit** and select it.
8) With **DOMCaptureVHit** selected, drag it to the panel on the left and drop it between the **Inflate** and **PrivacyEX** session agents.

   The Edit Session Agent dialog is displayed.
9) In the **Edit Session Agent** dialog, select **Add Config Items** and select the **DownStreamConfigSection** check box.
10) Click **OK**.
11) Click **OK** again.

You created and configured the DOM Capture Virtual Hit Session Agent by using the Tealeaf Management System (TMS).

b) Enable the Replay server to play captured DOM data:

1) Log in to the Tealeaf Portal as an administrator.
2) From the menu bar, select **Tealeaf** > **TMS**.
3) From the **Worldview** tab, expand the twistie so that you can see all of the nodes in the server view.
4) Expand the **Replay Server** node and select the server on which to enable DOM capture.
5) In the Config Actions section of the panel, select **View/Edit**.

   The **Replay Server Configuration** window is displayed.
6) Locate the property that is named **`EnbableDomCapture`** and select it.
7) In the **Edit Config Item** window, set a value of 1 and click **Apply**

You enabled the Replay of captured DOM or DOM Diff data on the server.

c) Consider changing the byte size of the **`Canister Safety Limits [BB]`** Event.

When DOM Capture is enabled, you will likely need to increase the byte size specified in the Bytes section of the Canister Safety Limits [BB] Event.

The Canister Safety Limits [BB] event closes the session if the session is too long, too large, or has too many hits. Because DOM Capture can incur additional processing and network transmission cost, you might need to increase the byte size to accommodate these costs and to prevent the session from splitting too early.

The amount by which to increase the byte size varies depending on the website and on how DOM capture is utilized. Consult Tealeaf Professional Services for advice about increasing the byte size of the Canister Safety Limits [BB] Event.

To increase the byte size specified in the `Bytes` section of the **`Canister Safety Limits [BB]`** Event:

1) From the Tealeaf Portal, select **Configure** > **Event Manager**
2) From the Filter Events panel, select Tealeaf Standard Events.
3) Sort the list of standard events by name to find the `Canister Safety Limits [BB]` event in the view area.
4) Right-click the `Canister Safety Limits [BB]` and select **Edit Event. . .** .

   The following figure shows the **`Canister Safety Limits [BB]`**. The text in bold indicates the value that needs to be increased if DOM Capture is enabled.

   *Figure 36. Canister Safety Limits [BB]*

```
// Canister Safety Limits [BB]
function PALI$E_SAFETY_LIMITS()
{
  //Default: 2048 Hits
  if ($S.NumberOfHits > 2048)
    TLCloseSession.CloseForSafetyHits();

  //Default: 5242880 Bytes (5MB)
  if (($S.TotalREQBytes + $S.TotalRSPBytes) > 5242880)
    TLCloseSession.CloseForSafetySize();

  //Default: 3600 Seconds (60 minutes)
  if ($S.TotalTime> 3600)
    TLCloseSession.CloseForSafetyTime();
}
```

5) After increasing the default byte size, click **Validate Javascript** to ensure change is valid.
6) Click **Save Draft**.
7) Click on the Events tab and click **Save Changes** to commit the change.

3. Refine the DOM capture triggers on the client side, in your application:
   a) Use a specific page or control to trigger a DOM capture, for example, when the application user clicks on the **Next** button:
      1) In the Configuration wizard in your application, go to the **DOM Capture** page.

         **Note:**
      2) Remove all of the triggers that you are no longer using.
      3) Set the **Event** drop-down to Click.
      4) Enter the ID for the control that you want to capture on a user click.
      5) Enter the ID type for the control.
      6) Enter a delay, in milliseconds, that you want the application to wait before it takes the DOM capture.
   b) Use a custom event to trigger a DOM capture, for example Login:
      1) In the Configuration wizard in your application, go to the **Module** page.
      2) Select the **Add a Custom Replay Event**.
      3) Enter the **Event** name.
      4) Enter the **Event Target.**.
      5) Enter the **Event State**.
      6) Select **Next** to go to the DOM capture page.
      7) Remove the triggers that you no longer want to use.

8) Select **Add Trigger**.

9) Select the custom Event that you created from the **Event** drop-down.

10) Enter the configuration information.

c) Select **Finish**.

**Session timeouts in Browser Based Replay**
If a BBR session has been idle for 30 minutes, it is timed out by the server.

If you fail to browse to new pages within the timeout period, you must close and reload the session in BBR to continue navigating.

Check the session identifier and the page you were on before you click **Close**.

## Finding pages to view in Browser Based Replay

You can view specific pages in Browser Based Replay.

In the Navigation pane, you can review the pages from the current session that apply to the current mode. For example, if you are currently in Replay mode, only pages that can possibly be replayed in BBR are displayed in the Navigation pane.

- To see a list of all pages in the session, click the **Page List** (Page List) icon in the toolbar.
- To jump to a page, click the Blue Arrow icon in the leftmost column of the Page List.

## Managing the BBR interface

You can change the Browser Based Replay interface to display the most relevant content needed to find pages and replay sessions.

### About this task

The Browser Based Replay includes controls for managing the data that is displayed in the interface.

The information in this topic explains the controls available to you for managing the BBR interface.

### Procedure

- To hide the display of the entire sidebar, click the **Hide** (Hide) icon in the BBR toolbar.
- To display the sidebar when it is hidden, select **Options** > **Options** > **Show Sidebar** from the BBR toolbar.
- To close a subpane, click the **X** icon in its corner.

  **Note:** You cannot close the Navigation pane. To hide it, close the entire sidebar.
- To redisplay a hidden pane, you can enable it through the **Options** > **Options** sub-menu
- To minimize a sub-pane, click the Minimize icon in its corner. The other panes expand to occupy their space.

## Searching Archived Sessions for Text

Through BBR, you can search completed sessions for text that you see during replay. This mechanism is useful for matching the results of active sessions to activities that are already processed by the Tealeaf system.

### About this task

### Procedure

1. To search completed sessions for a text string, select **Options** > **Search Completed Sessions** from the BBR toolbar.

2. In the dialog box, enter the text for which to search.
   - To copy text to the dialog box, select it in the Content pane. Then, in the dialog box, click **Copy Selected Text**.
3. To search for the entered text, click **Search**.
   - All available Canisters are searched across the available dates.
   - Submitting a search closes the current replay.
   - To cancel the search in progress, click **Stop Search**. Any retrieved results are displayed.

## Sharing sessions for replay with other Tealeaf users

You can share your sessions for replay with other Tealeaf users.

### About this task

The sessions that you share are accessed by other Tealeaf users through a URL on the Tealeaf server.

You can share sessions by email or by copying and pasting the session link URL.

### Emailing sessions for replay to other Tealeaf users

You can email your sessions for replay to other Tealeaf users.

### About this task

To send the URL of the session by email:

### Procedure

1. Select **Options** > **Sessions** > **Send Link by Email** from the BBR toolbar.
2. Enter the email addresses of the individuals who must receive the email. Separate each email address by a comma. Do not include spaces or carriage returns.

   **Note:** The list of email addresses is authenticated against known users of the Tealeaf system.
3. Enter a title for the replay session. This title is displayed as the display text for the URL link.
4. If needed, you can include a message with your replay link.
   - You do not need to include the URL in the message.
5. To send the message, click **OK**.

### Copying session links

You can copy and paste session replay links.

### About this task

If needed for other purposes, you can retrieve and copy the URL of a session for replay to the clipboard of your local desktop for pasting elsewhere.

### Procedure

1. Select **Options** > **Session** > **Copy Link To Session** from the BBR toolbar.
2. The link is displayed in an address bar at the top of the BBR window. To copy it, press CTRL + C.
3. Paste it as needed.
4. To close the address bar, click the**X** on the right side of the screen.

## Creating Event Data from BBR

Through the context menu in Replay, Request, or Response mode, you can create events that are based on your selections in BBR.

### About this task

Based upon the selected text, a hit attribute is created, and an event definition is pre-populated with values to accurately identify the selected text in the session data.

**Note:** As a precaution before you begin you must verify that there are no unsaved changes in the Tealeaf Event Manager.

### Procedure

1. Select the text. This text might be an HTML element in Replay mode, a name-value pair in Request mode, a header in Response mode, or another text selection.
2. Right-click the selection and select one of the following options:

*Table 61. Context menu option descriptions*

| Option | Description |
|---|---|
| Create New Event from selection... | When text is selected, this context menu command is available for creating an event from the selected text. The Tealeaf Event Manager is pre-populated with values to match the selected text. |
| Create New Hit Attribute from selection... | When text is selected, this context menu command is available for creating a hit attribute that uses the selected text as the pattern to match. The Tealeaf Event Manager is pre-populated with values to match the selected text.<br>**Note:** Hit attributes that are created from BBR match on a fixed text string. Since these attributes always return the same value, they are not permitted to be used to populate dimensions. |

3. The Tealeaf Event Manager is opened, with the new definition pre-populated with detection parameters to identify the selection.
4. Continue specifying the event or hit attribute.
5. To save changes, click **Save Draft**.

   **Note:** If you click **Cancel** to cancel an event creation, the hit attribute to match the event is already saved as a draft. You must delete the drafted hit attribute through the Hit Attributes tab or revert all changes, which remove all local, drafted changes through the Tealeaf Event Manager.
6. To commit your changes to the server, click **Save Changes**.
7. The event and hit attribute data are created.

## Configuring the replay server or associated proxy server

You can configure the replay server or associated proxy server.

### Replay server configurations

Tealeaf administrators can create and configure Replay Server instances through the Portal Management page.

Multiple Replay Servers can be deployed to distribute the BBR rendering load among multiple servers.

***Replay rules configuration in BBR***
Tealeaf administrators can configure the replay rules that are applied to Browser-Based Replay through the Replay Server configuration in the **Portal Management** page.

**Proxy configuration**
If a proxy is in use to broker connections between BBR users and the Replay Server and the origin server, review and complete the following configuration changes.

**ESI tag support in BBR**
BBR provides partial support of the ESI include tags, which are a form of partial dynamic page caching, without additional configuration.

See "RealiTea Viewer - Replay Rules" in the *IBM Tealeaf RealiTea Viewer User Manual*.

## Browser Based Replay interface

The Browser Based Replay interface is composed of four panes and includes a toolbar and multiple statistical bars through which you can control replay and review session data.

The main areas of the Browser Based Replay interface are:

- Toolbar - The area at the top of the page contains controls and displays for replaying sessions.
- Content Pane - The large window on the right side. It displays replayed hits, parsed requests, and raw responses.
- Page Statistics - Statistics that are related to the currently displayed page.
- Sidebar - The left sidebar contains multiple panes that enable review of the session pages, events, and form field data. This page can be toggled for display. See "BBR Options" in the *IBM Tealeaf cxImpact User Manual*.
  - Navigation Pane - The list of pages within the session that can be replayed. Click an entry to display it in the content window. Red text indicates a hit that either returned an error, such as HTTP 400+ or 500+, or a request that the user canceled before it finished loading.
  - Events Pane - The events that fired for the currently selected hit. Each event links to an event chart report for that event.
  - Form Fields Pane - The posted form fields and parsed URL fields that are associated with the hit. These values are used to highlight the form fields that the visitor submitted.
- Session Statistics - At the bottom of the page, you can review statistics about the current session.

### Browser Based Replay menu bar

The Browser Based Replay menu bar is located at the top of the interface and includes the following menus:

- Session
- View
- Options
- Overlays

Use the information in this section to lean about the functions provided by each menu on the Browser Based Replay menu bar.

**Session menu**
The **Session** menu provides options for working with the session you are viewing.

**Note:** The **Session** menu is not available if all of the underlying features are separately disabled in BBR.

| *Table 62. Options from the Session menu* | |
|---|---|
| **Option** | **Description** |
| Open TLA | Select this option to open an archived session file in BBR for replay.<br>Replay rules are applied during replay.<br>**Note:** TLA files that are loaded through BBR do not have On-Demand Privacy rules that are applied to them and can pose a security risk if this feature is enabled. |
| Export as TLA | Select this option to export the current session as a TLA file. |
| View in RTV | Select this option to view your current session in RTV instead of BBR. |
| Send to Event Tester | Select this option to send the current session to the Event Tester.<br>The Event Tester can be used to evaluate event definitions against sessions that are found through search or uploaded to the server. |
| Email Link to Session | Select this option to open a window to email a direct link to the BBR session.<br>A message can be included with the link.<br>BBR replay links can be configured to last for a predefined number of days. |
| Copy Link To Session | The direct link to the session is displayed in place of the toolbar. Click **X** to close it and redisplay the toolbar. |

**View menu**

The **View** menu provides various view options for your current session. A check mark to the left of an option means that it is enabled.

| *Table 63. Options from the View menu* | |
|---|---|
| **Option** | **Description** |
| Show | Provides the following options for opening windows and panels in the BBR interface:<br>• **Sidebar**<br>Opens the display of the sidebar that contains the **Navigation**, **Events**, and **Form Fields** panes.<br>• **Events Panel**<br>Opens the display of the **Events panel**. This panel can be displayed in Replay view only.<br>• **Form Field Panel**<br>Opens the display of the **Form Fields** panel. This panel can be displayed in Replay view only. |
| Replay | Select this option to view the web page as it is seen by the visitor. |
| Request | Select this option to view in the **Content pane** the headers in the request that are sent by the visitor's browser to the web server. |
| Response | Select this option to view in the **Content pane** the raw HTML sent from the web server to the visitor's browser. |

| *Table 63. Options from the View menu (continued)* | |
|---|---|
| **Option** | **Description** |
| Page Load Details | Select this option to view the **Page Load Details** screen. |
| Page Hit Logs | Displays the logs from the rendering engines that show the processing being performed by the Replay Server.<br>This option is available to users with Admin authorization only.<br>Information in the Page Hit logs can help users diagnose and troubleshoot problems related to the customer's session.<br>For information about how to use real-time logging of Replay Server, "Using real-time page load logging information for session diagnostics" see in the *IBM Tealeaf cxImpact Administration manual*. |
| User Agent Info | Select this option to view user agent information for the session. A *user agent* is the entity that is used to contact your web application. In most cases, the user agent is a web browser.<br>For a list of the default user agent fields that are captured and maintained by IBM Tealeaf, see "Configuring User Agent Detection" in the IBM Tealeaf cxImpact Administration Manual. |
| Full Page List | Select this option to open the Page list. |
| Annotations | Select this option to view existing annotations or add annotations. |

**Options menu**

The **Options** menu provides options for controlling the content displayed in the interface. A check mark to the left of an option indicates that the option is enabled.

*Table 64. Descriptions of Menu options*

| Option | Description |
|---|---|
| UI Events | Controls the level of UI Events displayed in the Navigation pane of the BBR interface.<br>Options for **UI Events** include:<br>• **Show All**<br>Show all UI Events.<br>Select this option to show a list of all of the UI Events for each page in the session.<br>When you select this option, every UI Event for each page in the session is displayed in the Navigation pane in BBR.<br>• **Hid All**<br>Hide all UI Events.<br>Select this option to collapse the list of UI Events in the Navigation pane, so that only the pages (not the associated UI Events) are shown.<br>• **Only Show Last**<br>Show the last UI Event of the session only.<br>Select this option to show only last UI Event of the session in the Navigation pane.<br>• **Show ScreenView Load / Unload**<br>Sh<br>(Replay view only) Shows the UI events in the Navigation pane. |
| Page Numbering | Controls what type (Page, Hit, or Timestamp) of numbering is displayed in the Navigation pane.<br>Options for **Page Numbering** include:<br>• **Use Page Numbers**<br>Shows the page numbers in the Navigation pane.<br>• **Use Hit Numbers**<br>Shows the hit numbers in the Navigation pane.<br>• **Use Timestamp**<br>Shows timestamp in the Navigation pane. |
| Page Naming | Controls what value (**URL**, **TLT_URL**, or **Page Title**) to show for the pages displayed in the Navigation pane. |

| *Table 64. Descriptions of Menu options (continued)* | |
|---|---|
| **Option** | **Description** |
| Sort | Sorts the UI events in the Navigation pane by timestamp.<br>By default, **Sort** > **Use Timestamp** is disabled (unchecked).<br>**Note:** When enabled, **Sort** > **Use Timestamp** persists for the life of the session only. Logging out will reset the option to its default (disabled).<br>For information about using this option, see Sorting events by timestamp. |
| Replay Rules | Controls options for working with replay rules.<br>Options for **Replay Rules** include:<br>• **Edit Rules Profile**<br>The **Edit Rules Profile** option displays the **Rules Profile Editor** that you can use to view your list of existing rules.<br>You can add rules, delete rules, edit rules, rename rules, and view properties.<br>You can also edit the raw XML for the rules and view the rules history.<br>• **Suggest Rules**<br>The **Suggest Rules** option opens a dialog with suggested rules for the loaded session. |
| Advanced | Provides the following options:<br>• **Merge Session Fragments**<br>When enabled, you can configure and execute the merging of session fragments.<br>• **Report JavaScript Errors**<br>When enabled, Javascript errors are reported to the BBR user. |
| Subsearch | Search the displayed session for one or more strings. |
| Search Completed Sessions | Opens free text search of completed sessions. You can copy and paste text from the Content pane to search in completed sessions. |

| *Table 64. Descriptions of Menu options (continued)* | |
|---|---|
| **Option** | **Description** |
| Resize View to Match Sessions | **Note:** You must have an IBM Tealeaf CX Mobile license to use this opton.<br>You can toggle this option to be enabled (check mark) or disabled (no check mark).<br>• Enabling **Resize Replay Pane to Match Session**<br>When **Resize Replay Pane to Match Session** is enabled, the following functionality (if present) is applied to the replay page: in BBR<br>– scale (zoom-in/out)<br>– scroll animation<br>– gestures<br>For example, `type11` messages<br>– mobile keyboard<br>• Disabling **Resize Replay Pane to Match Session**<br>When **Resize Replay Pane to Match Session** is disabled, only scroll animation functionality (if present) is applied to the replay page in BBR. All other functionality is disabled. |

***Merging session fragment overrides***

You can use the **Merge Session Fragment Overrides** menu option to manage session fragmentation.

**About this task**

Ideally, a session is stored in a single Canister file on a single server. However, session timeouts, data storage, and other factors can contribute to the fragmentation of sessions, in which the entire session is stored in multiple files in multiple locations.

**Note:** These settings override the default Replay Server behaviors and apply only to the current session being replayed in BBR. They are not retained from replay to replay. As a result, replay behaviors can vary between BBR and RTV.

You can configure the Replay Server to automatically merge fragments of a requested session into a single session for replay. When configured to do so, the Replay Server acquires all fragments of a session from a set of selected Canisters within a specified time range. This range is specified as a number of hours before to a number of hours after the main session fragment.

**Note:** When the merging of session fragments is enabled, the request is submitted to Search Server, which attempts to fulfill it by gathering the requested fragments. In situations where Search Server is unable to gather the session information, it returns the main session fragment, which enables partial replay of the session. No session information is available for the fragment.

The default options for merging fragments can be configured through the Portal.

Merging session fragments is enabled and disabled for users at the group level.

By using the **Merge Session Fragment Overrides** menu option, you can specify new settings for the merging of session fragments for the session that is currently loaded in BBR.

To manage session fragmentation:

**Procedure**

1. From the menu bar, select **Options** > **Advanced** > **Merge Session Fragments**

   The **Merge Session Fragments** window opens, displaying the current merge session fragment settings.

2. Change the current merge session fragment settings as needed.

   **`Merge Session Fragments`**
   Enable or disable merging of session fragments for the current session. When enabled, the following settings are applied to the current session only.

   **Note:** To restore the default settings, reload the session.

   **`Session Merge Timespan Radius (Hours)`**
   Specify the number of hours in front of and behind the selected session fragment in which to search for other fragments in the session.

   **`Session Merge Search Servers`**
   Select the servers across which search server searches to find and assemble session fragments into a complete session.

   To search across all currently available servers, click the **All Servers** check box.

3. Click **OK** to apply the changes.

#### Results

The fragmentation settings for the session are changed.

***Sorting session events by timestamps***
You can sort UI events by timestamp so that the events display in the sequence as performed by the visitor.

#### About this task

In web applications with multiple windows or tabbed sections, a visitor might go back and forth from one page to another to enter data or make selections. When replaying the session in BBR, the UI events in the Navigation pane might not be displayed in the actual sequence as performed by the visitor.

Sorting by timestamp displays events sequentially in a flat file format in the Navigation pane. The UI event child tasks are displayed in the sequence in which the visitor performed them.

**Note:** When enabled, **Sort** > **Use Timestamp** persists for the life of the session only. Logging out resets the option to its default (disabled).

To sort session events by timestamps:

#### Procedure

With the session displayed in BBR, select **Options** > **Use Timestamp** from the menu bar.

The UI events in the Navigation pane are displayed according to their timestamp.

**Overlays menu**
If IBM Tealeaf cxOverstat is licensed and Tealeaf is capturing data, the Overlays menu is available.

**Note:** IBM Tealeaf cxOverstat is a separately licensable product that is used to monitor usability aspects of your web application. for more information, please contact your IBM Tealeaf representative.

**Note:** The Overlays menu may not be available for all BBR sessions.

## Browser Based Replay toolbar

The Browser Based Replay toolbar is located under the menu bar. It includes control icons and buttons for working with the session.

The toolbar can be configured for individual groups or users.

Browser Based Replay toolbar provides the following controls and display options:

| *Table 65. Browser Based Replay Toolbar controls* | |
|---|---|
| **Control** | **Description** |
| | The **Refresh List** icon is displayed for active sessions only.<br>Click the **Refresh List** icon to display any new pages that the visitor has added to their session since the last time you loaded or refreshed the page list. |
| | Click the **Page List** icon to open a window that lists all pages in the current replay session. Blue arrows indicate pages that can be viewed in BBR.<br>Click the blue arrow to view the associated page.<br>If Tealeaf is configured to capture UI Events, BBR can be configured to display them in the Page List, marked with a UI icon. Display of UI Events can be toggled. |
| Hide | The **Hide** button collapses the three panes on the left sidebar.<br>To reopen the panes, select **View** > **Show** > **Sidebar**. |
| Start Replay | Switches to the Content pane and begins an automatic playback of the session from the page that is currently selected in the Navigation pane, timed to match the original visitor's view times.<br>When you click **Start Replay**, the **Page Delay Time** window is displayed.<br>In the **Page Delay Time** window, set a delay time for the pages.<br>You can choose to replay the session as it was captured (`Auto`) or to delay each page a preset number of seconds.<br>**Note:** When set to `Auto`, replay accurately reflects how long the visitor waited between completing recorded actions on the site.<br>To begin replay, click **Start**. The label on the toolbar button changes to **Stop Replay**, and a timer is displayed to the left of the button to count down the seconds between each hit in the recorded session. |
| First | When you click **First**, the **Navigation List** scrolls to the first page in the list. The first row is highlighted and the first page loads. |
| Last | When you click **Last**, the **Navigation List** scrolls to the last page in the list. The last row is highlighted and the last page loads. |
| Previous | Steps backward through the navigation list, displaying the replay, request, or response view in the Content pane, depending on the currently selected view. |
| Next | Steps forward through the navigation list, displaying the replay, request, or response view in the Content pane, depending on the currently selected view. |
| Request | Displays the headers in the request that are sent by the visitor's browser to the Web server. |
| Response | Provides BBR users the ability to view (in different modes) the information that is sent by the web server in response to the client's request.<br>You can use the **Response view** to view the response in an HTML format, an indexed response, or as a hexadecimal display of the response. |
| Replay | Shows the web page display as seen by the visitor. |

| *Table 65. Browser Based Replay Toolbar controls (continued)* | |
|---|---|
| **Control** | **Description** |
| | Click the **Annotations** icon to add annotations to the current page. |

## Content Pane

This pane displays the replayed hit, the request headers sent from the visitor's browser to the website server, or the raw HTML of the response that is sent from the website server to the visitor's browser.

- To change the content pane, click the Replay, Request, or Response button in the toolbar.

*Figure 37. Content Pane*

- If highlighting is enabled, the modified form fields and selected links are highlighted in green on the page in Replay view.
- When Replay Shield is enabled, your mouse-driven interactions with the Content pane are disabled, which prevents accidental execution of any JavaScript that might be triggered.

**User Agent Information Bar**

If IBM Tealeaf CX Mobile is licensed, user agent information can be inserted in a title bar above the replay pane.

Just above the content pane, you can review any available information that Tealeaf has detected and extracted from the user agent string that is submitted by the visitor's device to the web server that delivered the session.

**Note:** This information is available only if the IBM Tealeaf CX Mobile module is licensed and properly configured.

A *user agent* is any device that is used to browse a web application. Most user agents self-report a unique string that identifies the exact brand and model of the device. This string is used to query a public standard for additional information about the device.

In the table below, you can review the content of each field, its source, and how it can be accessed.

| *Table 66. User Agent Information Bar* | | |
|---|---|---|
| **Item** | **Source Request Field** | **Description** |
| `Browser` | `TLT_BROWSER` | Visitor browser type<br>• This value is also available in the Tealeaf System Hit Attribute `Browser`. |
| `Browser Platform` | `TLT_BROWSER_PLATFORM` | The mobile device platform |
| `Best Replayed Using` | `TLT_BROWSER_VERSION` | The X.0 version of the browser |
| `Traffic Type` | `TLT_TRAFFIC_TYPE` | The type of traffic, as identified by extended user agent parsing<br>• This data is also captured in the Traffic Type dimension. |

| Table 66. User Agent Information Bar (continued) | | |
|---|---|---|
| **Item** | **Source Request Field** | **Description** |
| `Replay Renderer` | | The type of renderer that is used by Replay Server to render the session<br>• The type of renderer is determined by the configured renderer types and the browser from which the session was originally experienced. |

## Display views

You can display session data in various views.

- Replay view shows the web page display as seen by the visitor.
- Request and Response views show the request and response interactions between the browser and Web server

You can use Load Page Details to review individual objects.

### Replaying a page

You can use Browser Based Replay to replay a page and view how the visitor saw the page.

#### About this task

To view a page as the visitor saw it:

#### Procedure

1. Select the page in the Navigation pane.
2. In the toolbar, click **Replay** (Replay).

#### *Replay view context menu*

In Replay view, the following commands are available in the right-click context menu.

| Table 67. Replay view context menu commands | |
|---|---|
| **Command** | **Description** |
| View Document Source | View the source code for the selected document of the current response. |
| View Element Source | View the source code for the element that is currently selected on the page. |
| Add Annotation | Add an annotation for the current selection. |
| Create New Event from selection... | When text is selected, this context menu command is available for creating an event from the selected text. The Tealeaf Event Manager is pre-populated with values to match the selected text. |
| Create New Hit Attribute from selection... | When text is selected, this context menu command is available for creating a hit attribute that uses the selected text as the pattern to match. The Tealeaf Event Manager is pre-populated with values to match this selection. |
| Test Response Modify Rules | In Replay view, you can review and test the response modification rules that are applied to the current page. |

| *Table 67. Replay view context menu commands (continued)* | |
|---|---|
| **Command** | **Description** |
| Examine Cookies... | Review the cookies that are stored for the current session, which you can copy to the clipboard as needed. |

**Request view**
You can use the Request view to display in the Content pane the headers from the requests that are sent by the visitor's browser to the web server.

From the Request view content pane, you can view messages submitted through the client application.

***Viewing step attributes***
If you deploy one of the Tealeaf client frameworks to submit events from the client application to Tealeaf, you can use the Request view to review submitted messages.

**About this task**

To access step attributes:

**Procedure**

From within the Content pane, click **Click here to view Step Attributes** .

**Note:** If you do not have access to the Event Manager, you cannot create step attributes.

**Results**

The raw JSON messages are displayed in the `[RequestBody]` section.

**Response view**
The **Response view** provides BBR users the ability to view (in different modes) the information that is sent by the web server in response to the client's request.

You can use the **Response view** to view the response in an HTML format, an indexed response, or as a hexadecimal display of the response.

***Response view context menu***
In Response view, the following commands are available in the right-click context menu.

**Note:** Context menu commands are only available in Response view if some text is selected.

| *Table 68. Response view context menu commands* | |
|---|---|
| **Command** | **Description** |
| Create New Event from selection... | When text is selected, this context menu command is available for creating an event from the selected text. The Tealeaf Event Manager is pre-populated with values to match the selected text. |
| Create New Hit Attribute from selection... | When text is selected, this context menu command is available for creating a hit attribute to match the selected text. The Hit Attributes tab of the Tealeaf Event Manager is pre-populated with values to match this selection. |
| Create Response Modify Rule | You can create and review the response modification rules that are applied to the current page. After the rule is applied, the Response Modify Rule is applied and the session is reloaded. |
| Test Response Modify Rules | You can review and test the response modification rules that are applied to the current page. |

### Page Load Details

You can review the individual objects that are referenced and loaded for a page after session replay completes or interactively during session replay.

#### Reviewing page load details after session replay

To review the page load details for a page after Session Replay has completed:

1. From the navigation area, select the page for which you want to review the load details.
2. From the menu option drop down list, select **View** > **Page Load Details**.

   The **Page Load Details** window is displayed.

**Note:** Page Load Details are not provided for DOM captured pages.

#### Reviewing page load details during session replay

To review page load details during session replay:

1. Load the session for viewing.
2. While the session is replaying, select **Page Load Details** from the **Processing** window.

   The **Page Load Details** window is displayed.

#### Working with the Page Load details window

The time, in seconds, that it took to render the page is displayed at the top of the **Page Load Details** window.

The **Page Load Details** window can be used to review all of the content that is requested from an individual page and whether the replay client was successful in loading it. It displays all of the requests to get the resources for a page. If a resource fails to load, the page might not render correctly.

Having access to real-time PLD gives users insight into the workings of the HTTP interactions (as it pertains to getting the resources for a page) that occur in the client / server architecture. The details presented in the window are an account of the interaction between the renderer and Replay Server or the Remote Host.

You can size the columns and scroll vertically and horizontally to optimize content viewing.

If you are using a TLI Server, you can identify the objects in the page that were retrieved from a TLI file. In the Source column, any entry that includes `TLI` indicates that Replay Server either retrieved it from the TLI Server or from the TLI cache that is maintained on the Replay Server. See "Managing Static Archives" in the *IBM Tealeaf cxImpact Administration Manual*.

The column definitions for the Page Load details window are as follows:

*Table 69. Page Load Details window - Column Definitions*

| Heading | Description |
|---|---|
| Page | A numeric identifier created by the Replay server. The number indicates the order in which the page was captured by IBM Tealeaf during the visitor session.<br>The number corresponds to the number that is displayed in the Navigation panel in the BBR user interface. |

| *Table 69. Page Load Details window - Column Definitions (continued)* | |
|---|---|
| **Heading** | **Description** |
| State | Indicates the page load status in text and icon format.<br>A page load state of `Done` with a green icon indicates that the page loaded with no errors or informational messages.<br>Other page load statuses include:<br>• `Other`<br>with a yellow icon<br>• `Fail`<br>with a red icon<br>• `Info`<br>with a yellow icon |
| Code | Indicates the HTTP status code of the request.<br>Valid values are any standard HTTP status.<br>The codes displayed coincide with the page load status as follows:<br>**200**<br>The page load request succeeded.<br>The **State** column cell displays `Done` with a green icon.<br>**404**<br>The page load request failed.<br>The **State** column cell displays `Fail` with a red icon.<br>**0**<br>The page load request succeeded with informational messages.<br>The **State** column cell displays `Info` with a yellow icon.<br>For HTTP status codes other than `404`, `200`, and `0` the **State** column cell displays `Other` with a yellow icon. |
| Load Time | The time in seconds it took for the renderer to receive a particular resource. |
| Content | The Content column specifies the MIME or Content-type of the content received.<br>MIME is a standard identifier that indicates the *type of data* that a file contains. For example, the content might be `text/html`, `text/plain`, or `text/javascript`. |
| Method | Indicates the HTTP method type. This will almost always be `GET` or `POST`. |
| Source | The source of the loaded page. Valid values include:<br>• Session<br>A value of `Session` indicates that the content that was found within the session.<br>• RemoteHost<br>A value of `RemoteHost` indicates the content was not found within the session, thus getting it from the original source.<br>• Info<br>A value of `Info` indicates the content is of an informative nature. |

| *Table 69. Page Load Details window - Column Definitions (continued)* | |
|---|---|
| **Heading** | **Description** |
| URL | The content URL or resource URL. |
| Error Message | Displays the error message text for a page when there are socket connection errors.<br>If the page load resulted in information logging only (as denoted by the value `Info` in the **Source** column), the **Error Message** cell will be empty. |
| Error code | Displays the code if a socket connection error occurs when the page is loading.<br>If the page load resulted in information logging only (as denoted by the value `Info` in the **Source** column), the **Error code** cell will be empty. |

You can right-click in the **Page Load Details** window to access operations from the context menu.

***Page Load Details context menu***
In the **Load Details** window, the following commands are available in the right-click context menu.

**Note:** The available context menu commands may change depending on the currently selected content in the **Page Load Details** window.

| *Table 70. Page Load Details - Context menu commands* | |
|---|---|
| **Command** | **Description** |
| **`Host/Port Remap`** | Using host/port remapping, you can redirect BBR to retrieve content from a different host name and port from the origin server. This feature prevents unnecessary retrieval from the origin server during replay. |
| **`Copy URL to clipboard`** | This option allows you to copy the URL to your clipboard so you can paste it elsewhere. |
| **`Open URL`** | This option allows you to open the selected URL in a new browser. |
| **`QueryData`** | If the URL contains query parameters, they are listed as name-value pairs in this sub-menu.<br>For example, if the URL was `www.test.com/?type=JSON&reload=false`, then the sub-menu displayed would be:<br>`type=JSON`<br>`reload=false` |
| **`Request Headers`** | Mouse-over to view name-value pairs in the header of the request. Select one to open an edit window from which you can copy values. |
| **`Response Headers`** | Mouse-over to view name-value pairs in the header of the response. Select one to open an edit window from which you can copy values. |
| **`View Response Text`** | When the selected object is an AMF hit, this option decodes the binary object and displays it in text form in Notepad.exe. |
| **`Add Block URL Rule`** | Use this command to remove a resource. Sometimes resources are not critical for the page to render correctly, and if the resource impacts page load performance in a negative manner, you can use this command to write a "Add block url rule". |

## Page statistics

Page statistics provide statistical data as it relates to page processing.

Page statistics are displayed above the Topic pane.

*Table 71. Page statistics descriptions*

| Statistic | Description |
|---|---|
| Gen Time | Time that is required to generate the page, in seconds. |
| Net Trip | The time that is required to transmit the page across the network to the visitor's browser, in seconds. |
| Round Trip | The time that is required to transmit both the request and the response, in seconds. |
| Response Size | The size of the page that is delivered to the visitor (the response), in bytes. |
| Status Code | Any HTTP status code that is generated by the hit. |

| *Table 71. Page statistics descriptions (continued)* | |
|---|---|
| **Statistic** | **Description** |
| Capture | **Note:** This information pertains to functionality available in IBM Tealeaf version 9.0.2 Fix Pack 1. For information about the fix pack, contact your IBM Tealeaf representative.<br><br>Per hit selected, **Capture** indicates the "type" of capture, which has an impact on how Replay processes the capture in BBR.<br><br>When configuring capture with the UISDK, users specify on a per-page-basis, the capture type. By exposing this information to BBR users, users can easily associate the page with a capture type.<br><br>Knowing the capture type of a page can expedite the process for changing the capture type if need be.<br><br>Valid values for **Capture** are as follows:<br><br>• `DOM`<br><br>The UISDK captures the DOM of the page and PCA captures the post made by the UISDK.<br><br>For pages that have a capture type of `DOM`, there is no rendering on the replay server. Tealeaf uses the captured DOM to display a page in BBR.<br>• `Diff`<br><br>The UISDK captures the Diff, and PCA then captures the post made by the UISDK.<br><br>For pages that have a capture type of `Diff`, there is no rendering on the replay server. Tealeaf uses the Diff from the captured DOM to display a page in BBR.<br>• `Network`<br><br>Classic capture, where the PCA captures the request and response of the page.<br><br>For pages that have a capture type of `Network` , Tealeaf uses the Rendering Engines inside Replay to display the page in BBR.<br><br>For information about DOM Capture and DOM Diff, see "DOM Capture and Replay" in the *IBM Tealeaf cxImpact User Manual*.<br><br>For information about configuring DOM capture and DOM Diff capture, see "Configuring settings and features with the Configuration wizard" in the *IBM Tealeaf CX UIC SDK 4.1 Guide*. |

## Navigation Pane

The Navigation pane displays the pages and their related sub-pages in the order in which they were experienced by the visitor.

- If the Content pane is in Replay view, only the hits that can be visibly replayed are displayed.
- If the Content pane is in Request or Response view, all hits are displayed.

muir/portal/Replay.aspx?server=MUIR.TEALEAF.COM%3a19000&resultSetId=RS_20120719-170815-000&resultSetIndex=6&canister=CANISTER.dbs\LSSN_20120716_MUIR.dat&sessionid=145746

Navigation

Hide

Filter By

| Page | Title | Time Stamp | Gen Time | Net Trip | Round Trip | Response Size | Status |
|---|---|---|---|---|---|---|---|
| 1 | Home page | 07/16/2012 14:12 | 0.553 | 0.010 | 0.563 | 24,597b | 200 |
| | ScreenView: LOAD root | 07/16/2012 14:12 | 0.000 | 0.001 | 0.001 | 270b | 200 |
| | ScreenView: LOAD root root | 07/16/2012 14:12 | 0.000 | 0.001 | 0.001 | 270b | 200 |
| | xpath: [["HTML",0],["BODY",0],["DIV",0],["DIV",0],["C | 07/16/2012 14:12 | 0.000 | 0.000 | 0.001 | 270b | 200 |
| 2 | Customer Login | 07/16/2012 14:12 | 0.522 | 0.009 | 0.532 | 15,888b | 200 |
| | ScreenView: LOAD root | 07/16/2012 14:12 | 0.000 | 0.001 | 0.001 | 270b | 200 |
| | ScreenView: LOAD root root | 07/16/2012 14:12 | 0.000 | 0.001 | 0.001 | 270b | 200 |
| | xpath: [["HTML",0],["BODY",0],["DIV",0],["DIV",0],["C | 07/16/2012 14:12 | 0.000 | 0.000 | 0.001 | 270b | 200 |
| 4 | Customer Login | 07/16/2012 14:12 | 0.486 | 0.008 | 0.495 | 15,888b | 200 |
| 5 | Home page | 07/16/2012 14:13 | 0.521 | 0.009 | 0.531 | 24,597b | 200 |
| 6 | Nine West Women's Lucero Pump | 07/16/2012 14:13 | 2.438 | 0.030 | 2.468 | 37,960b | 200 |
| | ScreenView: LOAD root | 07/16/2012 14:13 | 0.000 | 0.000 | 0.001 | 270b | 200 |
| | ScreenView: LOAD root root | 07/16/2012 14:13 | 0.000 | 0.000 | 0.001 | 270b | 200 |
| | id: attribute502 value: event: click 6 | 07/16/2012 14:13 | 0.000 | 0.000 | 0.001 | 270b | 200 |
| | id: attribute502 value: 43 event: change 6 | 07/16/2012 14:13 | 0.000 | 0.000 | 0.001 | 270b | 200 |
| | id: attribute502 value: 43 event: click 6 | 07/16/2012 14:13 | 0.000 | 0.000 | 0.001 | 270b | 200 |
| 8 | Shopping Cart | 07/16/2012 14:13 | 1.254 | 0.024 | 1.278 | 57,813b | 200 |
| 9 | Checkout | 07/16/2012 14:13 | 1.114 | 0.031 | 1.145 | 89,485b | 200 |
| 10 | http://m.straussandplesser.com/index.php/checkout/o | 07/16/2012 14:13 | 0.405 | 0.001 | 0.406 | 2b | 200 |
| 11 | http://m.straussandplesser.com/index.php/checkout/o | 07/16/2012 14:13 | 0.694 | 0.001 | 0.695 | 1,538b | 200 |
| 12 | http://m.straussandplesser.com/index.php/checkout/o | 07/16/2012 14:13 | 0.448 | 0.001 | 0.450 | 4b | 200 |
| 13 | http://m.straussandplesser.com/index.php/checkout/o | 07/16/2012 14:13 | 0.512 | 0.000 | 0.513 | 1,330b | 200 |
| 14 | http://m.straussandplesser.com/index.php/checkout/o | 07/16/2012 14:13 | 0.575 | 0.002 | 0.578 | 5,465b | 200 |
| 15 | http://m.straussandplesser.com/index.php/checkout/o | 07/16/2012 14:13 | 0.484 | 0.000 | 0.485 | 1,777b | 200 |
| 16 | http://m.straussandplesser.com/index.php/checkout/o | 07/16/2012 14:13 | 0.662 | 0.001 | 0.663 | 3,644b | 200 |
| 17 | http://m.straussandplesser.com/index.php/checkout/o | 07/16/2012 14:13 | 0.489 | 0.001 | 0.490 | 2,024b | 200 |
| 18 | http://m.straussandplesser.com/index.php/checkout/o | 07/16/2012 14:13 | 1.593 | 0.000 | 1.594 | 30b | 200 |
| 19 | Strauss and Plesser | 07/16/2012 14:13 | 0.529 | 0.009 | 0.538 | 17,236b | 200 |

Session First Use: 07/16/2012 14:12:48 Session Last Use: 07/16/2012 14:14:24 Hit Count: 19 Last Update: 07/19/2012 10:08:28

*Figure 38. Navigation List*

The preceding image displays a partially expanded set of pages and sub-pages.

- The page or sub-page that is displayed in the content pane is highlighted in blue.
- Next to some pages in the Navigation List, you may see carets to expand the page. Click the caret to display the sub-pages for the selected page.

In the preceding image, you can see the Navigation List that is expanded to display all of the available columns.

- As needed, you can click and drag the right side of pane to display additional columns of information.
- A set of tools is available in the toolbar above the pane.

### Navigation pane hierarchy

In the Page column, you can see how the pages are organized in a hierarchy. The currently displayed page is highlighted. To display a page in the **Content** pane, select it in the Navigation pane.

Right-click any entry in the Navigation pane to open a menu.

To see a full list of all pages in the session, click the Page List icon in the toolbar.

### Structure of hierarchy

**Note:** ScreenView nodes are visible only in Replay view.

- In Request and response view, UI events are listed in physical order of occurrence under a page.

```
+ Page
    + ScreenView
    + ScreenView
```

```
        + UI Event
        + UI Event
    + ScreenView
        + UI Event
```

**Definitions**

*Table 72. Navigation pane hierarchy*

| Icon | Term | Description |
|---|---|---|
| 2 | Page | A page is defined as any hit (request and response pair) in which the returned response is in a text-based format, such as HTML, XML, or plain text. If a page is not displayed during replay, none of the underlying events is displayed either. A page can be hidden by replay rule, by ReqCancelled failure, or by another means. Redirect pages are not displayed by BBR. The page number is listed next to the icon. These numbers can differ if the session is fragmented.<br>• Pages that are numbered with two dashes (- -) can indicate UI hits, pages that are served from a caching server, or non-pages such as redirects.<br>– UI events are positioned beneath the page where they were detected.<br>• Pages that are followed by an asterisk and a number in parenthesis, for example *(110), indicate that was a cached back page was hit. The number in parenthesis is the previous page hit.<br>• If you want, you can display the hit number, instead of the page number, in the first column. To toggle display of hit numbers, select **Options drop-down** > **Options** > **Use Hit Numbers in Navigation List**.<br>– When the above is selected, hit numbers are displayed for all objects in Request and Response view and only for pages in Replay view. |

| *Table 72. Navigation pane hierarchy (continued)* | | |
|---|---|---|
| **Icon** | **Term** | **Description** |
| 2<br>continued | Page | • The title of the UI event provides some information about the event that occurred.<br>• If the session is captured by using a Logging Framework from IBM Tealeaf CX Mobile for Mobile App, there are no page numbers, as sessions for mobile native application sessions do not contain viewable pages. Red text indicates a hit that either returned an error, such as HTTP 400+ or 500+, or a request that the visitor canceled before it completed loading. |
| | Caret | Click to display the sub-page that is associated with this page. |
| | ScreenView | A Tealeaf-specific term, a ScreenView is defined as a state or stage of a single URL. Some web applications can contain multiple sets of user interaction objects that are referenced from the same URL. For example, a page on your web application may contain multiple tabs, in each of which the visitor performs separate discrete actions. For tracking purposes, you can group user actions by the tab in which they occurred by using the Tealeaf Screen Views.<br>• Screen Views are displayed in BBR only. These subpages are not available for display in RTV.<br>ScreenView tracking requires the deployment of a Tealeaf client framework. For more information: |

| *Table 72. Navigation pane hierarchy (continued)* | | |
|---|---|---|
| **Icon** | **Term** | **Description** |
| UI | UI Event | A UI event is any user interface event that is captured from the visitor's client by using one of the Tealeaf client frameworks. For mobile native and AJAX-based applications, for example, some user interactions do not generate a request and corresponding response from the server. Using Tealeaf client frameworks, you can capture these types of user interface events and actions and submit them for capture and processing to Tealeaf.<br><br>**Note:** Click events are fired after the HTML for the rendered page is stored. For the last click event on the page, the click event can be delayed until any configured UI custom highlighting is applied.<br><br>**Note:** Orientationchange, touchstart, touchend, and scroll UI Events do not replay if you did not installed or configured the CX Mobile licence.<br><br>Although they are present in the session data, events of the following types are not displayed in the Navigation List:<br>• `load`, `unload`, `attention`, `scroll`, and `resize`.<br>• ClientState events that are submitted from UI Capture<br><br>UI event tracking requires the deployment of a Tealeaf client framework. For more information: |

**Navigation pane columns**

By default, the navigation pane is sized to show only some of the available columns on the left side of the screen. As needed, you can click and drag the right side of the navigation pane to display the other columns of information.

| *Table 73. Navigation pane columns descriptions* | |
|---|---|
| **Column** | **Description** |
| Page | The page and its associated subpages. |
| Title | Title of the page as reported in the data |
| Time Stamp | The time stamp when the page was captured |
| Gen Time | The time that it took to generate the response |
| Net Trip | The network transit time to send the response |
| Round Trip | The network transit time to send the request and return the response |

| *Table 73. Navigation pane columns descriptions (continued)* | |
|---|---|
| **Column** | **Description** |
| Response Size | The size of the response in bytes |
| Status | The HTTP status code for the response.<br>A status code of `200` means that all is well |

**Navigation pane tools**
The following tools are available in the Navigation pane toolbar.

| *Table 74. Navigation pane tools* | | |
|---|---|---|
| **Icon** | **Tool** | **Description** |
| | Page List | Click to display the full list of pages in the session, with additional details. |
| | Hide | Click to hide the left navigation pane.<br>• To show the pane again, select **Options drop-down** > **Options** > **Show Sidebar**. |
| | Filter By | Click to select filtering options for the Navigation pane, as they are specified in Sub-Search. |

**Additional panes**
The following panes can also be displayed on the left side of BBR below the Navigation pane.

- Events Pane
- Form Fields Pane

The options to toggle the display of the above panes are available through the **Options** menu.

**Navigation pane context menu commands**
The following menu commands are available in the context menu for the Navigation pane.

When you select a page or subpage in the Navigation pane, the following options can be displayed:

| *Table 75. Navigation pane context menu command descriptions* | |
|---|---|
| **Command** | **Description** |
| Replay | Display selected page in Replay view.<br>**Note:** This option is not available in Request and Response view if the selected page or subpage cannot be replayed. |
| Request | Display selected page in Request view. |
| Response | Display selected page in Response view. |

**Navigation context menu commands for Administrators**

For Tealeaf administrators, the following items are displayed in the context menu accessible through the Navigation pane.

**Note:** To configure replay rules, you must be a member of one of the following admin groups:

- `Admin Group`
- `cxReveal Admin`

- `cxView Admin`

Using replay rules, you can apply changes to the content before it is displayed in the screen. Replay rules can be used to remove pages from replay, suppress display of replayed pages, and more.

**Note:** Replay rules that are configured in BBR are saved to the replay server, where they are applied to all Tealeaf users during replay. These replay rules do not apply to a specific user or to a specific session.

Tealeaf administrators can also configure replay rules by using the **Portal Management** page.

For more information about replay rules in general, see RealiTea Viewer - Replay Rule.

*Table 76. Navigation pane context menu commands for Administrators*

| Command | Description |
|---|---|
| Remove this page from replay | Marks the selected page to not be displayed in Replay view. While the page is still displayed in the Navigation pane, it does not display replay. To add the page back into replay, right-click the page after the one that is removed in Navigation pane and select **Delete rule which removes this page from replay...**. |
| Delete rule which removes this page from replay... | If a replay rule is applied to the page to remove it from replay, you can this option to revert the removal from replay. |
| Treat this page as Highlight Only | You can instruct BBR to treat this page as containing highlighting information only. The previous page in the Navigation list is displayed, and the content of the selected page is applied as highlighting to the page. |
| Treat this page as a Popup Page | You can create a replay rule that instructs BBR to treat this page as a pop-up window. During replay, a pop-up window can interrupt the flow of replay and can cause some page data to fail to display. |
| Add Custom UI Event Highlighting... | When a UI Event entry is selected in the Navigation List, you can apply custom highlighting to the selected element by specifying a JavaScript function. |
| Ignore Element | There might be occasions where processing a UI Event adds no value to the replay. For such occasions, you can use the **Ignore Element** option to remove the UI Event from Navigation list in BBR.<br>When you right-click an element in the Navigation pane and select, **Ignore Element**, the **UI Event Element Ignore** dialog is displayed. The field on the **UI Event Element Ignore** dialog is prefilled with the regular expression pattern identifying the UI element.<br>To have replay ignore UI Elements matching the regular expression pattern, click **OK**.<br>**Note:** You cannot use the **Ignore Element** option to remove ScreenViews. |
| Open URL in browser | This option allows you to open the selected URL in a new browser. |
| Copy URL to clipboard | This option allows you to copy the URL to your clipboard so you can paste it elsewhere. |

## Events pane

The Events pane displays a list of all events that are logged for the currently selected page.

Events are listed in the order of execution. The Events pane is visible only when the Content pane is in Replay view.

For each line in an event listing:

- *Event (n)* - This line identifies the sequence in the session when the event fired, after which is listed the event name.
  - The `Icon:` value indicates the file name of the icon that is displayed in session lists and other reports for this event.
  - You can display a chart that shows the counts of the event occurrences for any day. Right-click the event entry and select **Show Report**.
- *Event Occurrences in Session (n)* - Indicates the number of instances of the event on the page.
- *Value[Type] (n)* - The recorded value of the event, including an indicator of the type of value recorded (`Numeric` or `Text`).
- *ReportGroup (n)* - Parent node a report group that is associated with the event. The number in parentheses is the report group identifier.
  - The report group `No Dimension Report Group` is displayed as `No Dimension Report Group`, and always has a report group index of `1`.
  - *Fact(n)[Type] (n)* - Indicates the fact into which the indicated value is recorded. Multiple listings of the fact indicate that values were recorded more than once.
    - Beneath facts in report group other than `No Dimension Report Group`, you can review the dimensions and their applicable values.

**Charting Event reports**

When an event is selected, you can optionally generate an event chart of the report that is displayed in BBR.

**About this task**

To chart an Event report:

**Procedure**

- Right-click the event entry in the Events pane and select **Show Report**.

  The displayed chart shows the counts of the selected event for each hour of the current day.
- To change the size of the chart, click and drag from the lower-right corner of the chart display.

  To revert to the default size, minimize the chart and then expand it again through the toolbar.
- To change the selected focus period, click the Calendar icon in the chart's toolbar.
- You might specify a focus period that extends across multiple dates. Click the start date, and then click the end date.
- You might also display data from a comparison range.
- To hide the report, click the Minimize icon in the toolbar.
- To close the report, click the **X** icon in the toolbar.

## Form Fields pane

During replay, if the page displayed in the Content pane contains form fields, you can review the form field names and the values that are entered by the visitor in the Form Fields pane.

Form field names are listed in alphabetical order.

Values of `true`/`false` typically indicate that a check box or radio button was selected or cleared.

The Form Fields pane is visible only when the Content pane is in Replay view.

**Form Fields menu**

The following commands are available in the menu when items are listed in the Form Fields.

| *Table 77. Form field commands* | |
|---|---|
| **Command** | **Description** |
| Search Completed Sessions | Search the available completed sessions for the form field name. |
| Create New Event from | Create an event that detects the form field name in the session data. |
| Create New Hit Attribute from | Create a hit attribute that detects the form field name in the session data. The Hit Attributes tab of the Tealeaf Event Manager is pre-populated with values to match this item. |

### Session statistics

Session statistics provide statistical data as it relates to session processing.

Session statistics are displayed at the bottom of the window.

| *Table 78. Session statistics* | |
|---|---|
| **Statistic** | **Description** |
| Session First Use | The first date and time stamp of the session. |
| Session Last Use | The last date and time stamp of the session. |
| Hit Count | The number of hits in the session. |
| Last Update | The date and time stamp of the last time that Browser Based Replay was updated with session information, which is useful for identifying the currency of your session data.<br>For active sessions, this information updates when the page and navigation lists are refreshed. |

## Tracking Interactions through BBR

As sessions are currently being experienced by visitors to your web application, you can use Browser-Based Replay to track how they evolve in real time. You can select the pages of active sessions like the pages of a completed session. As needed, you can refresh the list of pages to see where the visitor is browsing in the web application.

- In the Session List in the Portal, active sessions are denoted with a blue circle marker in the leftmost column.

During replay, items that are displayed in the Events and Form Fields panes can be highlighted in the session.

- You can also add annotations to active sessions.

## Shadow Browsing Live Sessions

If needed, you can follow along in real time as a visitor explores the website. This "shadow browsing" feature enables close support of your customers and the tracking of activities that are otherwise causing problems with the web application.

**Note:** Shadow browsing applies to active sessions only.

- To update the list of session pages through Browser-Based Replay, click the Refresh icon ( ). Results of the refresh are displayed so that you can monitor the changes in the page list.
- During replay, active sessions are automatically refreshed every 60 seconds.

## Replay Highlighting

During replay, you can monitor the visitor's clicked or entered data.

When replay highlighting is enabled, the elements that the visitor interacted with are highlighted by a green border in Browser Based Replay.

Each type 4 message corresponds to a user action such as a `click` on a **button** or `text change` in a **text box**.

Highlighting elements makes it easier to monitor and track clicked buttons, selected links, and any form data entered by the web site visitor.

### Replay highlighting and mobile gestures

Traditional highlighting in BBR is not supported for mobile gestures (type11 messages).

Unlike type 4 messages, most type 11 messages do not contain UI element information related to user actions such as `swiping` or `pinching`, because those actions are not performed on an element, but rather on an area of the mobile device screen.

For several mobile gestures, Tealeaf collects data from the area of the mobile device screen that the visitor interacts with, not on the underlying UI element. Because of the fundamental difference in how mobile device users interact with your web site or application, Tealeaf does not apply the traditional green highlight border to indicate when a gesture occurred. Instead, Tealeaf represents Gestures from a mobile device by displaying animated hand icons on the Replay view.

**Note:** Only Type 11 gestures are shown with the hand icons. If a Type 4 UI event is captured, and highlighting is enabled, Tealeaf uses the regular green border for mobile sessions.

## Adding annotations

You can annotate specific pages during replay through BBR.

### About this task

For example, if you are assisting a customer with a problem, you can mark the page where the problem occurred for resolution by your web development team.

Any BBR user can add annotations.

**Note:** You cannot add annotations to a TLA session that you loaded into BBR.

To annotate a session page:

**Note:** You cannot add annotations to UI events pages, which are inserted by the Tealeaf IBM Tealeaf CX UI Capture for AJAX.

**Note:** After an annotation is added, it cannot be removed.

### Procedure

1. In BBR, select the page that you want to annotate.

2. In the toolbar, click the **Annotations** ( ) icon.

   The Annotations dialog is displayed.
3. To add an annotation:
   a) Enter the text of the annotation in the textbox at the bottom of the dialog.
      - You can select from preselected values by using the drop-down indicator next to the textbox.
      - Tealeaf administrators can configure the list of preselected values.
   b) Then, click **Add Annotation**.
4. The annotation text, your Tealeaf user ID, and the Time Stamp when it was added are displayed in the Annotations popup.

**Results**

Annotations are stored with the session data as annotation text and the author of the annotation, like they are displayed in the Annotations dialog.

You can search for annotations through the Tealeaf Portal.

**Related concepts**

UI Capture for Ajax Guide

**Related tasks**

cxReveal Settings

CX Settings

Searching session data

Through the Portal, you can analyze Tealeaf data through a simple yet powerful search interface.

**Availability of Annotations through Search**

After you add, edit, or delete an annotation, the session is queued for re-indexing. When the session is re-indexed, changes to its annotations are now available for search.

- If multiple changes are made to a single session, each change is queued. If possible, the indexer re-indexes all changes at the same time.

**Note:** Depending on the length of the queue at the time annotation changes are saved, it can take a few minutes before the changes are available through search of completed sessions.

**Note:** Since annotations must be indexed for search, you cannot search for annotations in active sessions.

**Locating Annotations**

After you finish adding annotations, you can locate annotations in the session through the **Navigation** panel, where a small yellow icon ( ) is displayed next to the Title of any page that has been annotated.

- In the BBR toolbar, the **Annotation** button is also highlighted when you select the page in the**Navigation** panel that contains the annotation.

## Finding search results in BBR

If you load the session in Browser-Based Replay from a session list of search results, you can identify the pages where search terms are found through the**Navigation** panel.

Next to the Title of pages that contains search hits is displayed a small red flag icon ( ).

## BBR Replay of Client User Interface Events

If you install and deploy the UI Capture JavaScripts into your web application, Browser-Based Replay supports replay of client user interface events.

### About this task

- UI Capture enables the capture of user interface events that occur on your visitor's client browsers that would otherwise not be detected by Tealeaf. These events are submitted to Tealeaf for capture, analysis, and replay. In BBR, replay of client user interface events is managed by Replay Server, instead of your browser. Replay Server renders the user interface event inside the browser control on the server and then delivers the finished rendering to your browser for display.

For example, suppose UI Capture captures a client user interface event in which the following actions occur:

### Procedure

1. User selects a drop-down menu. Menu is displayed.
2. User makes a selection from the menu.

### Results

In BBR, the captured UI event is displayed as a static page in which the user makes the selection from the menu.

### Related concepts

UI Capture for Ajax Guide

# Sub-Search in BBR

After you locate a session and opened it for replay in BBR, you can search the text contents of the session to filter the displayed list of hits. Through Sub-Search, you specify one or more search terms to examine text or specified fields in the request of the session that is currently loaded in Browser Based Replay.

- Search terms can be strings or numeric values.
- For numeric values, ranged searches are supported.

When the Sub-Search is run, the Navigation List is filtered to display only the hits in the session that match the Sub-Search criteria. Then, you can use the**Hit Details** window to further review the matches to locate the specific hit of interest.

- The maximum number of items or occurrences that are returned in a Sub-Search is 10,000. There can be multiple items that are returned for an individual hit.

## Searching for Sessions

Sub-Search operates only on sessions that are loaded into Browser Based Replay. Before you begin, you must locate and replay a session.

- For more information about loading a TLA session file directly into BBR, see "Session menu" in the *IBM Tealeaf cxImpact User Manual*.

### Considerations and limitations for running sub-searches on active sessions

There are limitations and things to consider before running a sub-search on active sessions.

For example:

- The search is applied against only the pages, ScreenViews, and UI events that are currently listed in the Navigation list.
- Before you define a Sub-Search against an active session, you must refresh the list of pages by using the **Refresh** button in the toolbar.

- Any actions that are not applied to a session until it is completed are not searchable in the session.

  Events that are triggered on the `Last Hit` or `End of Session` trigger cannot be displayed in an active session and are therefore not searchable

**Available operators for search location**
You can use search operators to refine your search of the location.

The following operators can be used:

**Note:** Depending on the type of data that is specified for the search term, some of the following operators might be available.

*Table 79. Search operators*

| Operator | Description |
|---|---|
| contains | Search location contains the specified string. |
| does not contain | Search location does not contain the specified string. |
| matches | Search location matches the specified string. |
| does not match | Search location does not match the specified string. |
| less than/equal to | For numeric values, the search location contains at least one value that is less than or equal to the specified numeric value. |
| greater than/equal to | For numeric values, the search location contains at least one value that is greater than or equal to the specified numeric value. |
| between | For numeric values, the search location contains at least one value that is between the two specified values. |

**Running a sub-search**
Running a sub-search involves defining the search and then running it.

**About this task**
To run a sub-search of a session that is loaded in BBR:

**Procedure**

1. Sselect **Options** > **Sub-Search**.

   The **Sub-Search** window is displayed.
2. To enable a search field, click the leftmost check box for a row, or make a selection in the first column of options.
3. To specify a search field:
   a) Specify the columns in the search field:
      1) Column 1: Select a search location from the drop-down list. Depending on the field you select, the Column 3 drop-down list is populated with all available values in the session.
      2) Column 2: Select the field operator. The available operators depend on the type of location that is selected for Sub-Search.
      3) Column 3: Enter or select the text string for which to search in the available location, by using the specified operator.
         - For text-only fields, you enter the value for which to search.
         - For other fields, you select the value for which to search from the drop-down list.

- Wildcards and regular expressions are not supported.

b) To match only items in the session data that match the search term exactly, click the **Match Case** checkbox.

4. To add multiple search terms:

a) Specify the appropriate search operator in the drop-down in the upper-right corner:

*Table 80. Search operator descriptions*

| Search operators | Description |
|---|---|
| OR | Any match of the specified search terms yields a matching hit. |
| AND | All of the specified search terms must occur on a hit to yield a matching hit. |
| AND on same page | All of the specified search terms must occur on a single request or response to yield a matching hit. |

b) Click the checkbox next to the following row in list.

c) Specify each column for the search term, as described above.

5. Click **Filter** to run the search.

**Note:** If you receive a data retrieval error when you run your search or attempt to review the hit details, the BBR session can time out. In the BBR window, select the address bar and press ENTER to refresh the session. Your filter operation can now work. If the issue persists, contact your Tealeaf administrator.

**Results**

When the results are returned, the Navigation List is filtered to show only the matching hits.

To review the details of the matching hits, click **Hit Details**.

**Related concepts**

Available locations for Sub-Search
In Sub-Search, you can specify the following locations for which to search for the specified string.

***Available locations for Sub-Search***

In Sub-Search, you can specify the following locations for which to search for the specified string.

- This list includes more fields than the session's request fields that are indexed for search.

**Note:** To filter the list, begin typing the name of the section in the request where the field you want is located. For example, entering `env` in the textbox limits the list to only the `[env]` fields of the request.

**Location**
**Description**

**`Full Response Text`**
Search the entire response of each hit for the specified text.

**Note:** You can use this search field to search for specific error conditions that are emitted from your web server to the visitor. For example, you can search for error messages that generated when Replay Server was unable to properly render the page. Enter `Error rendering this page!` in this textbox.

**`Request Text`**
Search the indexed fields in the request of each hit for the specified text.

**`All Text`**
Search all available name-value pairs in the request and response text of each hit.

**HitType**
Selected field is listed in the `[HitType]` section of the request. This data is gathered and generated by Tealeaf.

**TLFID_***
Available fields for an instance of an event and its associated dimension values that are recorded in the hit.

**appdata**
Selected field is listed in the `[appdata]` section of the request. This data is inserted by user-defined actions that are completed in the Windows pipeline.

**ExtendedUserAgent**
Selected field is listed in the `[ExtendedUserAgent]` section of the request. This data is inserted by the Tealeaf Reference session agent for user agent detection.

**env**
Selected field is listed in the `[env]` section of the request. This data is gathered and generated by Tealeaf.

**iamie**
Selected field is listed in the `[iamie]` section of the request. This data is gathered and generated by Tealeaf.

**timestamp**
Selected field is listed in the `[timestamp]` section of the request.

- This section contains timestamp information that is gathered and generated by the IBM Tealeaf CX Passive Capture Application.

**urlfield**
Selected field is listed in the `[urlfield]` section of the request. This data is gathered and generated by Tealeaf.

**HTTP_***
These values represent headers that are submitted from the client.

- Some headers can be submitted by the IBM Tealeaf CX UI Capture for AJAX solution.

**TRANSFER_ENCODING**
The transfer encoding defines the encoding character set used by the web server to generate the response.

**Related concepts**

Configuring CX Indexing

BBR Sessions do not replay in BBR due to Proxy Errors in Replay Server

Performance Measurement

UI Capture for Ajax sample client event message

**Related reference**

Tealeaf Reference Session Agent

*Event data fields*

For each event that occurred in the session, you can search for the event occurrence's value or for specific dimension values that are associated with the event. The fields that contain event data available in Sub-Search correspond to entries inserted into the request when an event occurs.

The request data is in the following format:

**Example Field**
**Description**

**TLFID_375TLFactValue**
The Tealeaf event with internal identifier 375 was recorded. This field contains its recorded value.

**TLFID_375/TLDim1**
This field contains the plain-text value of dimension 1, recorded when event 375 occurred.

**TLFID_375/TLDimHash1**

This field contains the hashed value of dimension 1, recorded when event 375 occurred.

- Hashed dimension fields are stored to enable search for dimension values that are longer than 32 characters. This data is not user-readable.

## Filtered Results

After a Sub-Search is specified and run, the Navigation List is filtered to display only the matching hits.

*Table 81. Filtered Results*

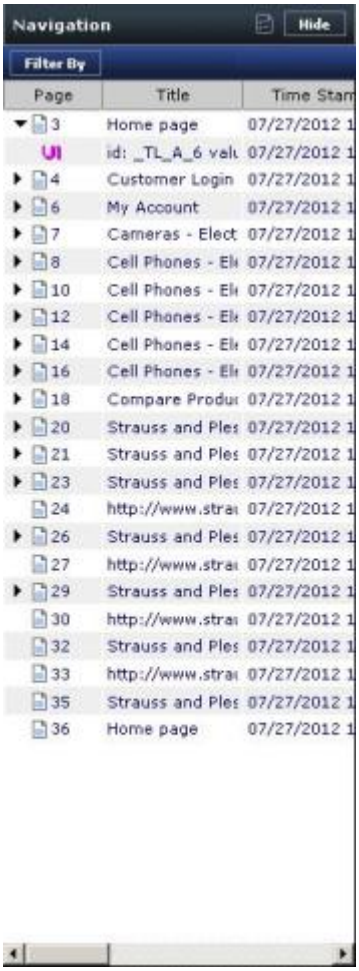



*Figure 39. Nav List before Sub-Search*

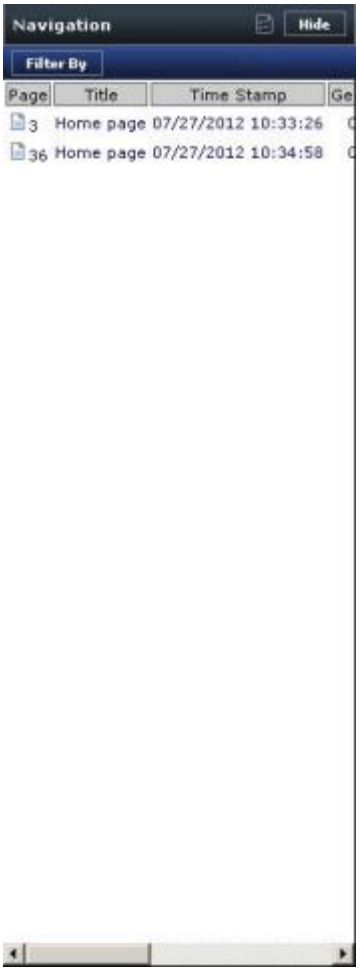



*Figure 40. Nav List after Sub-Search*

**Note:** To refresh this list, you must re-execute the search.

**Note:** The filtered list is a flat list. ScreenViews and UI events can be included in the list of hits.

You can use the **Previous** and **Next** icons in the toolbar above the main panel to step through the filtered list of hits.

### Navigation list toolbar

| *Table 82. Navigation List toolbar* | | |
|---|---|---|
| **Icon** | **Title** | **Description** |
| | Page List | Opens the page list. See "Browser Based Replay Interface" in the *IBM Tealeaf cxImpact User Manual*. |
| Hide | Hide | Hide the **Navigation List** panel.<br>• To re-display the Navigation List, select **View** > **Show** > **Sidebar**. See "View menu" in the *IBM Tealeaf cxImpact User Manual*. |
| Filter By | Filter By | Filter the Navigation List by the item that is selected in the drop-down. |

### Reviewing hit details from sub-search results

In the Hit Details popup, you can review the details of the hits that match the Sub-Search results.

#### About this task

- To jump to the occurrence, double-click the row in which it is listed. The**Hit Details** window closes, and BBR displays the matching page, ScreenView, or UI event where the Sub-Search match occurs, in the current view: Request, Response, or Replay.

Sub-Search Hit Details. Matching occurrences found: 10000

| Page | Location | Term | |
|---|---|---|---|
| 3 | Request Text | tl | TLTSID=956E025D060F67413A5D4B1B67793DE5 |
| 3 | Request Text | tl | TLTHID=8E1859618A496471EE2EB6C1DEB14BD3 |
| 3 | Request Text | tl | TLTUID=A13C5523FB53AC1D7B44FE6F280D866B |
| 3 | Request Text | tl | TLT_URL=/store/defaultpage |
| 3 | Request Text | tl | TLT_SERVER=206.169.17.19 |
| 3 | Request Text | tl | TLT_HOST_NAME=www.straussandplesser.com |
| 3 | Request Text | tl | TLT_APPLICATION_NAME=store |
| 3 | Request Text | tl | HTTP_COOKIE=magento=fu38lw4bzubmyxzvhui2oc |
| 3 | Request Text | tl | HTTP_COOKIE=magento=fu38lw4bzubmyxzvhui2oc |
| 3 | Request Text | tl | HTTP_COOKIE=magento=fu38lw4bzubmyxzvhui2oc |
| 3 | Request Text | tl | HTTP_COOKIE=magento=fu38lw4bzubmyxzvhui2oc |
| 3 | Request Text | tl | HTTP_SET_COOKIE=TLTHID=2F46F398527C105209 |
| 3 | Request Text | tl | TLapiArrivalTimeEx=2008-07-15T19:58:41.9046542 |
| 3 | Request Text | tl | ReqTTLB=0 |

*Figure 41. Hit Details of matching Sub-Search hits*

**Column**
**Description**

**Page**
The page in the full session where the match was found

**Note:** Values of -1 in this column indicate that the page cannot be displayed.

**Location**
The location in the hit where the match was found

**Term**
The search term that was found

**Context**
The byte number in the request or response where the matching text was found, followed by the contextual information that surrounds the matching string

**Note:** You can use the text of the Context column to locate other sessions with the same text pattern:

1. Highlight the text of interest. Do not highlight the byte number.
2. To copy the text, press CTRL + C. The text is copied.
3. To go to the **Search** page, select **Search** > **Completed Sessions** from the Portal menu.
4. Paste the text into the appropriate field.
   - See "Searching Session Data" in the *IBM Tealeaf cxImpact User Manual*.

***Hit Details context menu***

The following menu commands are available in the context menu from the **Hit Details** window.

| *Table 83. Hit Details context menu options* | |
|---|---|
| **Command** | **Description** |
| Replay | Display selected page in Replay view. |
| Request | Display selected page in Request view. |
| Response | Display selected page in Response view. |

When you select a page in the **Hit Details** window, the following options may be displayed:

For Tealeaf administrators, the following items can also be displayed in the context menu.

**Note:** To configure replay rules, you must be a member of one of the following admin groups:

- "CX User Administration" in the *IBM Tealeaf cxImpact Administration Manual*: `Admin Group`
- "cxReveal User Administration" in the *IBM Tealeaf cxReveal Administration Manual*: `cxReveal Admin`
- "cxView User Administration" in the *IBM Tealeaf cxImpact Administration Manual*: `cxView Admin`

Using replay rules, you can apply changes to the content before it is displayed in the screen. Replay rules can be used to remove pages from replay, suppress display of replayed pages, and more.

**Note:** Replay rules that are configured in BBR are saved to the replay server, where they are applied to all Tealeaf users during replay. These replay rules do not apply to a specific user or to a specific session.

Tealeaf administrators can also configure replay rules through the **Portal Management** page.

| *Table 84. Hit Details context menu - Administrator options* | |
|---|---|
| **Command** | **Description** |
| Remove this page from replay | Marks the selected page to not be displayed in Replay view. While the page is still displayed in the**Hit Details** window, it does not appear during replay.<br>To add the page back into replay, right-click the page after the one that has been removed in the Hit Details window and select **Delete rule which removes this page from replay...** |
| Treat this page as Highlight Only | You can create a replay rule that instructs BBR to treat this page as containing highlighting information only. The previous page in the list is displayed, and the content of the selected page is applied as highlighting to the page. |
| Treat this page as a Popup Page | You can create a replay rule that instructs BBR to treat this page as a popup window. During replay, a popup window can interrupt the flow of replay and can cause some page data to fail to display. |

### Sub-Search in RTV

You can also complete searches within sessions through the IBM Tealeaf CX RealiTea Viewer, the desktop client for searching and replaying sessions.

## BBR replay rules

To enable the highest fidelity replay without impacting the origin server or servers of your web application, you can configure and deploy replay rules.

A *replay rule* is a modification to the session data during replay so that the replay looks as close as possible to the original experience of your web application's visitor. For example:

- The captured session data can contain references to a server that is not available from where Tealeaf users are replaying the session. So, you must configure a replay rule to modify URLs pointing to the origin server to point to a different server.
- If the session is from an application that requires authentication, an unauthenticated Tealeaf user can generate a significant number of Status Code 401 - Access Denied errors during replay. Using a replay rule, you can instruct BBR to ignore or remove these pages during replay.
- The session can reference an external JavaScript file, which you may or may not want to reference during replay. You can configure replay rules to suppress the JavaScript file or to modify it so that it works effectively during session replay.

There are many more uses for replay rules. In the sections below, you can review the replay rules that can be configured through the Replay Server to be applied to all Browser Based Replay sessions.

**Note:** Replay rules do not change the stored session data. They are applied only during replay by the Replay Server to the data that is passed to Browser Based Replay for display to the Tealeaf user.

**Note:** The quality of session replay is dependent upon the nature of the web application. Websites that employ sophisticated display technologies or rely on client user interaction events can require significant customization of the common replay profile and replay rules.

#### Ways to access and work with replay rules

Replay rules that apply to BBR can be configured in the following locations:

- Replay Server

  Through the **Portal Management** page, you can select the master Replay Server and configure replay rules through the GUI. Changes to the replay rules from the master Replay Server are automatically forwarded to any slave Replay Servers, so that all servers are using the same set of rules.
- Browser-Based Replay

  When you have a session that is loaded into BBR, you can use the context menus to create replay rules that are based on specific, highlighted data in the currently loaded session.
- **IBM Tealeaf CX RealiTea Viewer**

  If you must configure replay rules that are not supported through the BBR or Replay Server interfaces, you can download and install the IBM Tealeaf CX RealiTea Viewer desktop application, which can be used to search and replay sessions from your local desktop. When changes are made to replay rules through RTV, they can be synchronized with the BBR replay rule set.
- Configuration File

  For Tealeaf users who are comfortable working with XML, you can configure replay rules in the native XML format by accessing the configuration file on the master Replay Server.

  **Note:** Tealeaf does not recommend configuring replay rules through the XML file, as no data validation is completed on the edited file. Where possible, use the user interface methods for configuring replay rules.

To create or modify replay rules for BBR, you must have access to the **Portal Management** page (**Tealeaf** > **Portal Management** in the Portal menu). For more information, contact your Tealeaf administrator.

You must have command-line write permissions on the server that hosts the Replay Server.

#### BBR replay rules and RTV

In many cases, the original replay rule was developed for use with the IBM Tealeaf CX RealiTea Viewer. RTV is a desktop application for locating and replaying sessions.

**Note:** Many of the sections in the BBR replay rules area reference corresponding content in the *IBM Tealeaf RealiTea Viewer (RTV) User Manual*.

## Replay rule types

Tealeaf supports the following types of replay rules.

In the table below, you can determine whether the rule is supported for configuration through the Replay Server, BBR, or RTV.

- Links are provided to additional documentation on each replay rule type. In some cases, the best documentation is available in the "RealiTea Viewer (RTV) User Manual" in the *IBM Tealeaf RealiTea Viewer User Manual*.

*Table 85. Replay Rule Types*

| Rule Name | XML Node | Description |
|---|---|---|
| **Popup Page** | `PopupURL` | PopupURL marks pages as popup, so they are not used for highlighting.<br>This rule is available in the BBR **Rule Profile Editor**. |
| **Remove this page from Replay** | | You can create a regular expression to match URLs that you do not wish to display in the Navigable Pages List or during replay. |
| **HighlightonlyURL** | `HighlightOnlyUrl` | For AJAX-based pages, you can configure a page to apply highlighting only to the content retained from the previous page. In this manner, you can simulate the application and the capture of UI events.<br>This rule is available in the BBR **Rule Profile Editor**. |
| **Ignore ReqVar for URL Match** | `IgnoreReqVarForURLMatch` | During replay, the replay client attempts to match requests to responses in the session data. In some cases, you can improve matching by providing a URL pattern, which is used to remove request variables, such as timestamp information, from the set that is used to match the request to the response.<br>This rule is available in the BBR **Rule Profile Editor**. |

| *Table 85. Replay Rule Types (continued)* | | |
|---|---|---|
| **Rule Name** | **XML Node** | **Description** |
| **ResponseMod** | `ResponseModify` | ResponseModify rules are used to complete special modifications to the response to enhance the replay that is displayed to the Tealeaf user. For example, you can configure a ResponseModify rule to disable JavaScript used to break their pages out of frames.<br>This rule is available in the BBR **Rule Profile Editor**. |

| *Table 85. Replay Rule Types (continued)* | | |
|---|---|---|
| **Rule Name** | **XML Node** | **Description** |
| **RequestMod** | `RequestModify` | The Request Modify rule is useful for fixing anomalies in data or fixing custom content not handled by Replay. For example, you can use the Request Modify rule to modify the URL of a page or make corrections to incorrect data in the JSON UISDK. The Replay server can then load the modified data and perform its task.<br><br>This rule is available in the BBR **Rule Profile Editor**. Here are the parameters defined:<br><br>**URL**<br>This is a regular expression defining which URLs this rule is to be applied to.<br><br>**Reqvar(optional)**<br>The name portion of a name/value pair in the request to evaluate.<br><br>**Value**<br>A regular expressions. If the expression matches the value for reqvar the rule is applied.<br><br>**Pattern**<br>A regular expression used to match the text in the request to be replaced.<br><br>**Replacement**<br>This is a literal string that will replace the text matched by the pattern. Meta-characters (e.g. \r, \n, \t) are converted tothe corresponding characters prior to replacement.<br><br>**Occurrences**<br>One of the following values:<br>• **`First`** - Replaces only the first occurrence of pattern<br>• **`All`** - Replaces all occurrences of pattern |
| **External File Modification** | `ExternFileModify` | ExternFileModify rules can be configured to complete additional processing to external files that can interfere with replay.<br><br>This rule is available in the BBR **Rule Profile Editor**. |

| *Table 85. Replay Rule Types (continued)* | | |
|---|---|---|
| **Rule Name** | **XML Node** | **Description** |
| **Dynamic Response Modification Rules** | `DynResponseMod` | When replaying a session that includes data that is delivered from a third party, the contents from the third party must be associated with a specific request. If the third-party content is required to accurately represent the customer's experience, a dynamic response modification rule must be configured to acquire the content at replay time. |
| **Dynamic External File Modification Rules** | `DynExternalFileMod` | If the main page loaded into RTV references a separate file that is not part of the session, the file may require modification before it is loaded into RTV. For example, if a JavaScript file referenced by a page in a session contains a domain reference, that reference can result in a JavaScript error during replay. You can design dynamic external file modification rules to apply to the referenced JavaScript file that modify the file before it is loaded into RTV. |
| **Remove this page from Replay** | `IgnoreURL` | IgnoreURL removes pages that should not be replayable from the Viewable Pages list.<br>This rule is available in the BBR **Rule Profile Editor**. |
| **Host Remap** | `RemapHost` | RemapHost remaps the host that is named in the HostProfile node to some other host. For example, you can use this mapping to replay session data from a backup server, instead of the origin server, which can impact usage metrics.<br>This rule is available in the BBR **Rule Profile Editor**. |
| **Portal Remap** | `RemapPort` | RemapPort remaps the port number of the host that is named in the HostProfile node to some other port number.<br>This rule is available in the BBR **Rule Profile Editor**. |

| *Table 85. Replay Rule Types (continued)* | | |
|---|---|---|
| **Rule Name** | **XML Node** | **Description** |
| **Host Protocol** | `Protocol` | Protocol forces the protocol to a specific value: auto, http, https.<br>This rule is available in the BBR **Rule Profile Editor**. |
| **Frame Rule** | `FrameRule` | FrameRule is used to force a URL to alway load into particular frame |
| **BlockedURL** | `BlockRemoteURL` | If needed, you can specify a URL or set of URLs that are prevented from reaching out to the origin server. If the replay client is unable to locate the response in the session data, no effort is made to reach the origin server for the missing content.<br>This rule is available in the BBR **Rule Profile Editor**. |
| **New Host** | `HostProfile` | Add a host to monitor. The name of the host must be the full domain name of it (for example, www.example.com. Each host has its own set of profile rules, so you must add or copy rules from any existing host to the new one.<br>This rule is available in the BBR **Rule Profile Editor**. |
| **Whitelist Rule** | `whitelistName` | By default, the Replay Server operates in Blacklist mode, in which all URLs are permitted to contact the origin server. In many environments, this ability to touch the origin server during replay is not desirable or even permitted. In Whitelist mode, you can configure URL patterns that are permitted to contact the origin server, and all other URLs are blocked.<br>This rule is available in the BBR **Rule Profile Editor**. |

| *Table 85. Replay Rule Types (continued)* | | |
|---|---|---|
| **Rule Name** | **XML Node** | **Description** |
| **Custom UI Event Highlighting** | `UIElementCustomHighlight` | Replay Rule for UI Events: For the selected UI event, you can add or modify custom highlighting rules. These rules can be used when the element being highlighted needs special handling, such as calling a javascript function for some custom control. They can also be used for debugging or alerting purposes when specific user actions or values is displayed in a session.<br>This rule is available in the BBR **Rule Profile Editor**. |
| **Ignoring UI Elements during Replay** | `Replay Rule for UI Events` | Replay Rule for UI Events: You can choose to ignore selected UI elements during session replay. When this option is selected, the UI Event Element Ignore dialog is displayed with the regular expression pattern to identify the UI element. |
| **Keystroke Breakouts** | `Replay Rule for UI Events` | Replay Rule for UI Events: UI Capture supports the capture of Intellisense keystrokes as UI events. Keystrokes applied with UI elements, such as textboxes and form fields, are bundled together into a single UI event for capture. To support appropriate replay of the visitor experience, RTV can be configured to break out these aggregated keystroke events into individual UI events for each keystroke. When keystrokes are broken out in RTV, you can see the characters that are displayed in the order that the visitor entered them. |
| **Remap URL** | | You can use the remapping URL feature to remap the URL of content external to the captured pages of a session to a new destination. Remapping URLs is commonly used in situations where the external content is not available or accessible from the original site, and a copy is made on another server to which you can remap the URL. |

| *Table 85. Replay Rule Types (continued)* | | |
|---|---|---|
| **Rule Name** | **XML Node** | **Description** |
| **PatchResponseWithPostValue** | `PatchResponseWith PostValue` | This rule allows you to set up patterns in the request, from which values are grabbed. These values are patched in the response. This work is handled by the plug-ins, since the type of the data can vary, and each plug-in best knows its data type.<br><br>This rule has several attributes.<br><br>`requestValue` - Use this attribute for query string values, or values where the plug-in parses and 'flattens' the request into name-value pairs. This is a simple string match, not a regex. Use this attribute or `requestPattern`, not both.<br><br>`requestPattern` - Use this attribute for request body values. This is a regex pattern, which is used on the raw request body as a whole. Use this attribute or `requestValue`, not both. When `responsePattern` is empty, this pattern is used as the response replacement pattern.<br><br>`responsePattern` (optional) - Use this attribute when the response replacement pattern needs to differ from `requestPattern`.<br><br>You can also use this rule when a value in a query string needs to be patched into a jsonp response. The `responsePattern` attribute is used to specify what to replace in the response.<br><br>This rule is available in the BBR **Rule Profile Editor**. |
| **MobileMod Rule** | `MobileMod` | MobileMod Rule corrects the dimensions of mobile devices that are based on user agent information during Replay.<br><br>This rule is available in the BBR **Rule Profile Editor**. |

## Replay rule configuration in BBR

You can configure browser based (BBR) replay rules in the navigation list, main panel, load details, or Options menu.

### Editing replay rules from the Options menu

In the **Options** menu, you can access the **Rules Profile Editor** and view suggested rules.

#### About this task

Use the steps in this topic to learn how to access the rules editor and work with the replay rules.

#### Procedure

1. Click **Options** > **Replay Rules** > **Edit Rules Profile** to open the **Rules Profile Editor**.

   In Browser-Based Replay, you can use the **Rules Profile Editor** to view your list of existing rules. You can add rules, delete rules, edit rules, rename rules, and view properties. You can also edit the raw XML for the rules and view the rules history.

   The **Rules Profile Editor** in Browser-Based Replay supports the following rules:

   - Host or Domain
   - IgnoreURL
   - PopupURL
   - Host Remap
   - Portal Remap
   - Host Protocol
   - ResponseMod
   - RequestMod
   - HighlightonlyURL
   - Custom UI Highlight Rule
   - BlockedURL
   - PatchResponseWithPostValue
   - Whitelist Rule
   - MobileMod Rule
   - IgnoreReqVar for Matching URL

   If you have Admin privileges, you can view and apply suggested rules for a Microsoft AJAX-based session from the **Options** menu.

   You can also view and apply suggested rules to block or ignore third party calls to clean up the replay experience so that you only see what is viewable and necessary. `Ingore URL` removes the page from the navigation list and replay. `Block URL` does not allow the Replay Server fetch the data from third-party Origin site.
2. Click **Options** > **Replay Rules** > **Suggest Rules** to open a dialog with suggested rules for the loaded session.

   Suggested rules are displayed in an expandable tree view. You can apply all of the suggested rules or select some of the rules you want to apply. Once you selected the rules to apply, click **Apply Rules** to apply the rules to Replay Server. The session reloads with the new rules applied.

### Applying replay rules from the Navigation list

You can apply replay rules from the context menu in the Navigation list.

Depending on the current selection in the Navigation List, you can apply the following replay rules to the current page.

| *Table 86. Replay rules context menu options* | |
|---|---|
| **Context menu option** | **Description** |
| Remove this page from replay | For Administrators only, this option marks the selected page to not be displayed in Replay view.<br>**Note:** The page continues to be displayed in the Navigation pane.<br>To add the page back into replay, right-click the page after the one that is removed in Navigation pane and select **Delete rule which removes this page from replay....** |
| Treat this page as Highlight Only | Treats the selected page as containing highlighting information only. The previous page in the Navigation list is displayed, and the content of the selected page is applied as highlighting to the page. |
| Treat this page as a Popup Page | If needed, you can mark pages as popup pages so that BBR can adjust to improve replay performance. |
| Add Custom UI Event Highlighting? | When a UI Event entry is selected in the Navigation List, you can apply custom highlighting to the selected element by specifying a JavaScript function. |
| Ignore Element | Choose this option to ignore selected elements during session replay.<br>When you right-click an element in the Navigation pane and select, **Ignore Element** from the context menu, the selected element is removed from the Navigation pane. |

***Treat this page as a Popup Page***
A *popup page* is considered to be any page that the web application forces to be rendered in a new browser window. During replay, BBR can have some difficulties in displaying popup content, user interactions, and subsequent hits if it does not know that specific pages are popup pages.

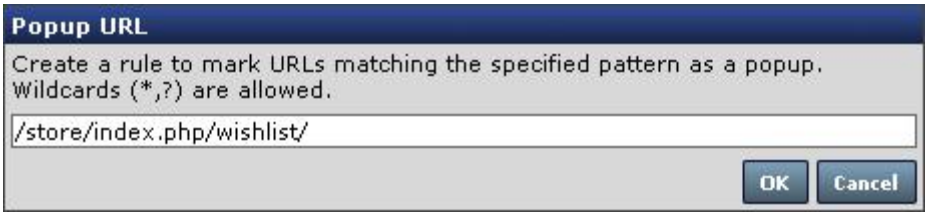



*Figure 42. Treat URL as a Popup Page*

When this option is selected in the context menu, the URL of the current page is automatically specified for you. As needed, you can use wildcards (* or ?) to specify a set of URLs as popups.

**Applying replay rules from the Request, Response or Replay view**
You can configure replay rules through the context menus in BBR.

In Request, Response or Replay view, you can select an item, right-click, and select one of the following options.

| *Table 87. Replay rules context menus from Request, Response or Replay view* | |
|---|---|
| **Option** | **Description** |
| Remove page from Replay based on request field | Based on a field included in the request, you can selectively remove the page from display during replay.<br>**Note:** This selection is available only if text is selected in Request view. |

| Table 87. Replay rules context menus from Request, Response or Replay view (continued) | |
|---|---|
| **Option** | **Description** |
| Test Response Modify Rules | Through this dialog, you can review and test any response modify rules that are applicable to the current page.<br>**Note:** This selection is available in Response view only. |
| UI Event Custom Highlight | When a UI event is selected in the Navigation List, you can add or modify custom highlighting rules to be applied to the user interface event.<br>**Note:** This selection is available through the context menu when you select a UI event in the Navigation List. |
| Host/Port Remapping | From the Load Details screen, you can configure host/port remapping rules. |

***Removing pages from replay based on a request field***

Through BBR, you can choose to remove one or more pages that are based on the URL pattern, request variable parameters, or both. By removing pages that are based on request variables, you can significantly remove the replay experience.

**Note:** Pages that are removed from replay are not removed from the session data. You can still search for and report on these pages.

**Note:** If your site responds to multiple `HTTP_HOST` values, you must manually edit the profile to ensure that the ignore rule is correctly recorded against all `server_name` values.

For example, you can choose to remove from replay pages that are permanently moved or are redirect pages, which are determined based on specific values for the `StatusCode` request variable.

**Note:** This selection is available only if text is selected in Request view.

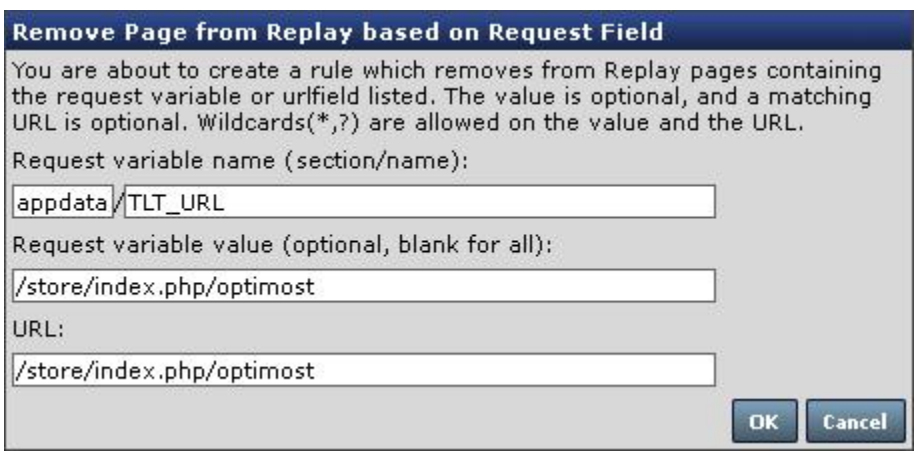



*Figure 43. Remove pages from replay based on a request field*

`StatusCode=301` indicates a page is moved permanently. In the example, when the URL matches `/store/index.php/electronics/cellphones/` and the `StatusCode` request variable in the `[env]` section is set to `301`, then the page is removed from replay.

In the preceding dialog, you can specificy exact values, and also patterns of values.

**Parameter**
**Description**

**`Request variable name`**
In these fields, you must specify the request variable section and variable name on which to match pages for removal from BBR replay.

- The request variable section must be specified.

- Wildcards are not permitted.

**`Request variable value`**

For additional specification, you can enter a specific value for the request variable on which to match. In the previous example, a request variable value must be included, or all hits that contain `StatusCode` entries are dropped from replay, which would remove all valid hits that are returned from the web server.

- Specifying this parameter is optional. If it is not specified, all values are matched.
- When you specify values, you can use the standard wildcards: ? to replace a single character, and * to replace multiple characters.

**URL**

You can use this field to specify whether the replay rule is applied to a specific URL or a pattern of URLs. If this value is not specified, the replay rule is applied across the entire domain.

- Specifying this parameter is optional. If it is not specified, all values are matched.
- When you specify values, you can use the standard wildcards: ? to replace a single character, and * to replace multiple characters.

***Testing BBR Response Modify rules***

Through BBR, you can review the Response Modify rules that are applied to the current page and test them as needed by using the current hit as test data.

### About this task

**Note:** This selection is available in Response view only.

**Note:** Through BBR, you can review rules only. Response Modification rules are created through the **Portal Management** page.

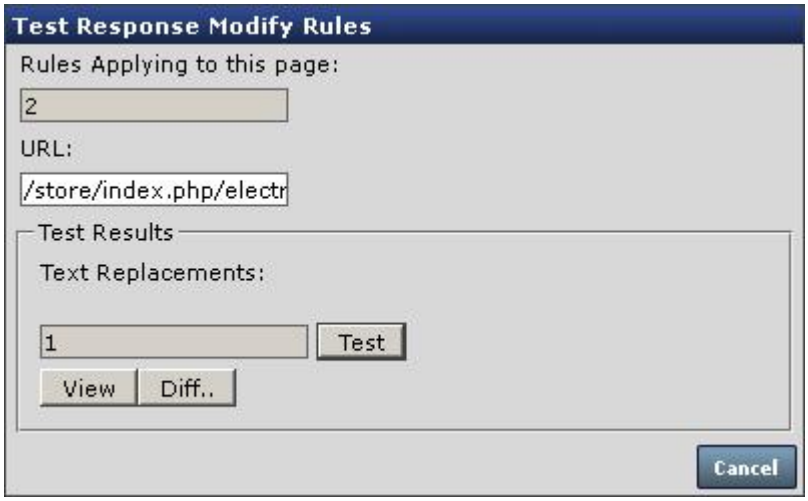



*Figure 44. Test Response Modify rules*

In the Test Response Modify Rules dialog, you can review the number of rules that are applied to current URL and then complete tests by using those rules and review the test results.

To test applicable Response Modify rules:

If the Rules Applying to this Page count is greater than 0, you can:

### Procedure

1. In the Test Response Modify Rules dialog, click **Test**.
2. If changes are applied to the response based on the tested rules, the number of changes is listed under Test Results.

- To view the modified response, click **View**.
- To view a text-based diff display of the changes, click **Diff...**.

***Custom UI Event Highlighting***

For the selected UI event, you can add or modify custom highlighting rules. These rules can be used when the selected element requires special handling, such as calling a JavaScript function for a custom control. Custom highlighting rules can also be used for debugging or alerting purposes when specific user actions or values are displayed in a session.

**Note:** Custom UI event highlighting applies to UI events captured from the visitor's browser through UI Capture.

**Option**
**Description**

**`Element ID`**
The element ID is pre-populated with the unique identifier for the selected event through element ID or XPath.

- You can modify the**Element ID** field to use a regular expression, if needed, for matching multiple elements.

**function**
In the dialog, you can specify the function that is evaluated by BBR for purposes of highlighting this element. During evaluation, no setting of values, highlighting or clicking is performed.

- Tealeaf provides a set of references that you can use in your JavaScript function.

**Note:** Custom UI event highlighting works exactly like the RTV version.

**Applying replay rules from the Load Details screen**

When the Load Page Details screen is displayed, you can configure the following rules from the context menu.

***Host-Port Remapping***

You can configure BBR to pull static content that is referenced in the session data from a different host, port, and protocol as needed.

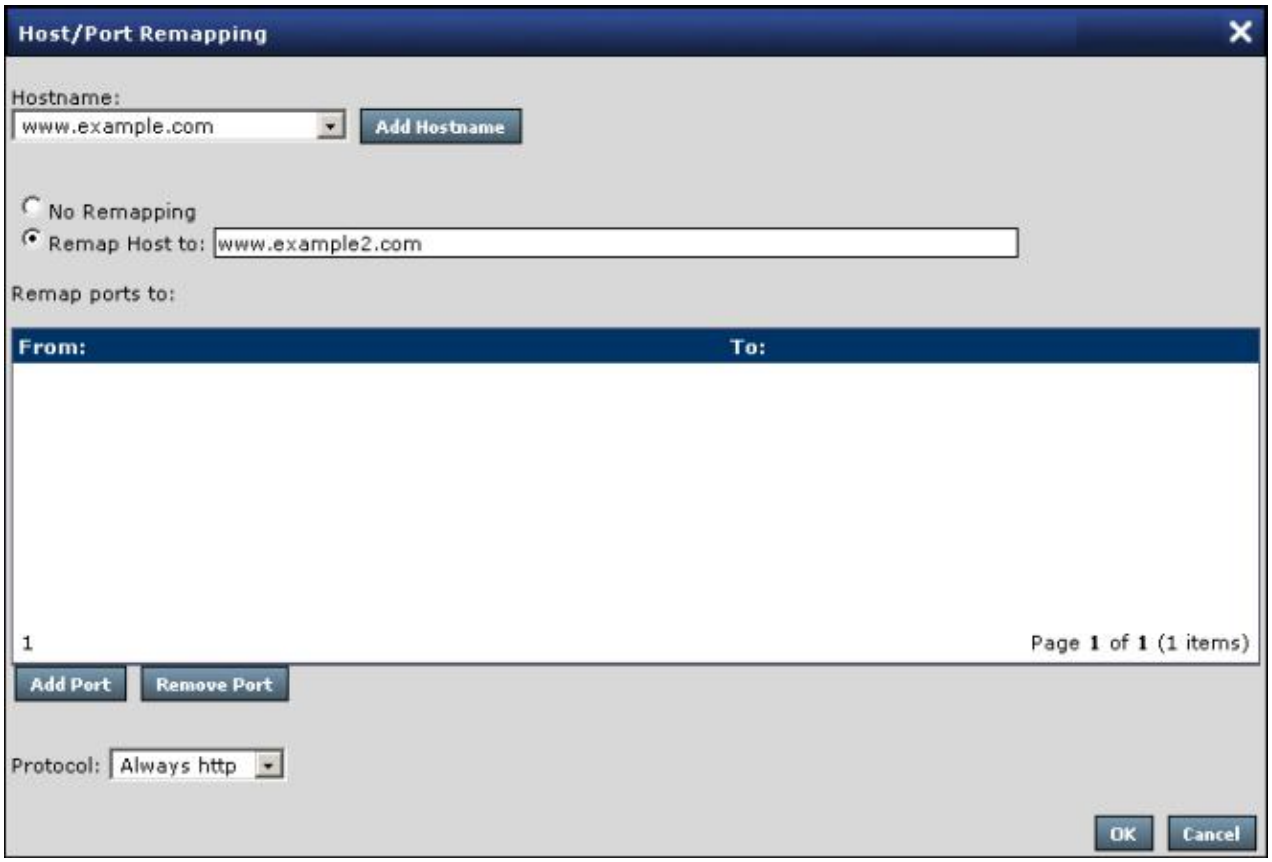



*Figure 45. Host/Port Remap*

In the preceding screen, you can specify how host names and port numbers in the session data are translated to other values. You can also specify an explicit HTTP/HTTPS protocol to use.

Hostname: Select the host name from the list of available ones.

- To add a host name, click **Add Hostname**. Enter the host name in the form of `www.example.com`.
- To complete no remapping for the selected host name, click the **No Remapping** check box. This setting enables the remapping of port numbers and protocols without redirecting to a new server.
- To remap the host to a different one, click the **Remap Host to** check box and enter a new host name in the form of `www.example2.com`.

Remaps ports to: For the selected host name, you can remap ports that are detected in the session data to new ports on the destination host.

- To add a port number to remap, click **Add Port**. Enter the port to remap from and the port to which to remap. Click **OK**.
  - To remap to the default HTTP port, set the remapped value to `0`.
- To remove a port remapping, select it in the list and click **Remove Port**.

Protocol: For the selected host name, you can change the protocol to use when you contact the remap host: `Auto` (default), `Always http`, or `Always https`.

Host/Port remapping is also supported in replay through IBM Tealeaf CX RealiTea Viewer.

### *Remapping a URL*

You can add a rule to Remap a URL. The Remap URL rule remaps the URL of content external to the captured pages of a session to a new destination.

#### About this task

You can apply the remap URL rule in situations where the external content is not available or accessible from the original site, and a copy is saved on another server to which you can remap the URL.

**Note:** The Remap URL rule applies to external content only. It cannot be used to modify the URL of captured pages. This remapping feature simplifies the response modification methods.

Advantages to remapping URLs are:

- You can modify based on content that you can see, instead of working to locate the content to remap.
- You can circumvent potential cross-site scripting issues that can occur in response modification of some sites.

To create a rule to remap a URL:

#### Procedure

1. From the Portal, select **Options** > **Replay Rules** > **Edit Rules Profile**.
2. Click the **Raw XML** tab to edit the XML.
3. Click **Save** to save the changes to the XML.
4. Click the **GUI Editor** tab, and click **Apply Rules**.

### Validating the syntax and pattern matching of a regular expression

As an administrator, you can validate the syntax and pattern matching of a regular expression by using the Regex Matcher utility.

#### About this task

The Regex Matcher utility provides administrators with a way to:

- practice writing strings
- test that a regular expression is valid and able to be used for advanced replay rules.

**Note:** Regex Matcher does not test the expression on the Replay sever. The primary purpose of this utility is provide a way for you to practice writing strings and to test for pattern matching in the response.

To validate the syntax and pattern matching of a regular expression:

#### Procedure

1. Access the **Regex Matcher** utility.

   To access **Regex Matcher** from the IBM Tealeaf CX menu bar:

   a. Select **Options** > **Replay Rules** > **Edit Rules Profile**.

   b. From the **Rule Profile Editor**, select **New** > **Add ResponseMod**.

      **Note:** For Mobile sessions, select **New** > **Add MobileMod**.

   To access **Regex Matcher** from a response message in the view area of BBR:

   a. Highlight a text string in the response that you want to remove.

   b. Right-click and select **Create Response Modify Rule**.

   The **Create Response Modify Rule** dialog box is presented.
2. In the **Create Response Modify Rule** dialog box, enter the text for the rule if it has not been pre-filled.
3. To test for a valid regex, click the **Test**.

4. To test pattern matching, enter text in the **Test pattern** field.

   If the pattern matches, the background color in the **Test pattern** field display in green.

*Figure 46. Matching Pattern*

## Replay Rule Configuration through the Replay Server

The Replay Server supports the creation of a custom set of replay rules to apply to BBR sessions. These rules are managed by the master Replay Server, which publishes them on request to the other slave Replay Servers.

If you are deploying white lists in an environment with multiple Replay Servers, additional configuration is required.

### Editing replay rules for domains monitored by Tealeaf

You edit replay rules for domains that are monitored by Tealeaf:

#### About this task

To edit replay rules for domains that are monitored by Tealeaf:

#### Procedure

1. In the Portal menu, select **Tealeaf** > **Portal Management**.
2. The **Portal Management** page is displayed. In the left navigation panel, click the **Manage Servers** link.
3. Select the master Replay Server.

   **Note:** You can configure replay rules only on the master Replay Server, which provides rules to all slave servers.
4. Click **Rules** in the toolbar. This option is available only for the master Replay Server.
5. The **Replay Rule Domains** panel is displayed at the bottom of the screen.
   - To add a domain, enter the domain in the space that is provided and click **Add**. Use the following format for the domain name:

     ```
     www.<domain_name>.com
     ```
   - To edit the replay rules for an existing domain, select the domain, and click the **Edit** link.
   - To delete replay rules for a domain, select the domain, and click the **Delete** link.

### Editing, deleting, and loading properties for replay rules

You can edit, delete, and load properties for replay rules.

#### About this task

When you edit replay rules, you can populate new rules by using the following commands.

#### Procedure

- To add a rule, complete the appropriate properties and click **Add**
- To delete a rule, click the **Delete** link next to its name.
- To load the properties from the rule into the appropriate text boxes for editing, click the **Load** link.

  Saving a loaded rule replaces it.

When you enter URLs for replay rules, protocol identifiers, such as `http://` or `https://`, are not needed. You can specify the protocol to use for all replay rules or allow the Portal to resolve.

Port identifiers such as `:8080` and `:443`, are not applicable and must not be entered.

**Selecting the protocol**
You can select the Protocol in use from the drop-down.

Set this value to `Auto` so that replay server detects the appropriate protocol to use.

**Ignored URLs**
You can configure the Replay Server to ignore specific URLs during replay. URLs matching the parameters that are specified here are not displayed during replay.

**Property**
**Description**

**URL**
The URL to ignore. This value is concatenated with the value for the domain to produce the full path to be ignored.

- The URL can include the wildcard character (`*`) to represent a pattern of URLs, such as `/home/*`.

**`Request variable`**
Optionally, you can specify a variable in the request with which to match a URL. Matches of this variable are not replayed.

**`Request Variable Value`**
Optionally, you can specify a value for the `Request variable` in the request with which to match a URL. Matches of this value are not replayed.

**Highlight Only URLs**
The Replay Server can be configured to highlight only the URLs that match the parameters that are specified here.

**Property**
**Description**

**URL**
The URL to be highlighted. This value is concatenated with the value for the domain to produce the full path.

- The URL can include the wildcard character (`*`) to represent a pattern of URLs, such as `/home/*`.

**`Request variable`**
Optionally, you can specify a variable in the request with which to match a URL. Matches of this variable are highlighted.

**`Request Variable Value`**
Optionally, you can specify a value for the `Request variable` in the request with which to match a URL. Matches of this value are highlighted.

**Host / port remapping**
You can add a host to track and map the port for the selected host.

**About this task**

**Procedure**

- To add a host to track, enter the host name in the **Host** text box and click **Set**.
- To map a port for the selected host, enter the port to map and then enter the port to which it is mapped and click **Add**.

| *Table 88. Host and port property descriptions* | |
|---|---|
| **Property** | **Description** |
| Host | This host name is used instead of the host pulled from the domain of the session. Since the host is used for the <base> to indicate the source of the content, this value can be used to remap the content in the session to a site other than the original site For example, if the original site is obscured by proxies, this setting can be used to remap to a static, available resource. It can also be used to map to an available server within the proxy from which images and other content can be loaded. |
| Port | The port to remap. |
| Maps To | The port to which remapped traffic is delivered. |

**Modifying content in the response**
If you want, you can modify content in the response by using simple search-and-replace.

| *Table 89. Response properties* | |
|---|---|
| **Property** | **Description** |
| URL | The URL whose response you want to modify. |
| Pattern | The pattern for which to search in the response. The pattern can be specified as a regular expression.<br>Special regular expression characters (such as ( or )) must be escaped by using a backslash. For example:<br>`\(` |
| Replacement | The replacement text for the found pattern. |
| Replace | The occurrences for which to make the replacement. |

**White List Rules**
By default, the Replay Server operates in Blacklist mode, in which all URLs are permitted to contact the origin server. In many environments, this ability to touch the origin server during replay can not be desirable or even permitted.

In Whitelist mode, you can configure URL patterns that are permitted to contact the origin server, and all other URLs are blocked.

**Note:** Whitelist mode must be enabled in each Replay Server in your environment.

Whitelist and Blacklist mode rules apply only if the Replay Server is not able to satisfy the request for content from its local cache of objects or from a TLI Server that is deployed in your environment.

***Regular expressions***
When you enable Whitelist mode for the Replay Server, you can specify the set of URLs that are permitted to contact the origin server through the **Portal Management** page. Using regular expressions, you can specify a set of URL patterns that are permitted to query the origin server during replay. For the listed URL or URLs, the Replay Server references the data that is stored on the origin server during replay.

- The URLs that do not match the whitelist are effectively blacklisted, which can be used to protect the source application from triggering web analytics metrics and Tealeaf data counts, among other things.

  **Note:** Poorly specified regular expressions can significantly affect server performance. See "Regular Expressions in the RealiTea Viewer" in the *IBM Tealeaf RealiTea Viewer User Manual*.

**Property**
**Description**

**`Pattern`**
The pattern in URLs for the selected server. Matching URLs are permitted to contact with the origin server. The pattern can be specified as a regular expression.

- Special regular expression characters (such as `(` or `)`) must be escaped by using a backslash. For example:

  ```
  \(
  ```

- If the pattern value is empty, the default pattern is used. This pattern causes Replay Server to contact the origin server for image and static content, which is not stored as part of the session data.

  ```
  \.(jpg|jpeg|gif|css|js)$
  ```

***Adding a white list domain rule to the Replay Server profile***
You can add a white list domain rule to the replay server profile.

**About this task**
To add a white list domain rule to the Replay Server profile:

**Procedure**

1. Add a new XML node named `DomainWhitelistURLPattern` within the ReplayServerProfile node.

   **Note:** Do not add the new XML node inside a `HostProfile`.
2. Apply the following syntax rules

   ```
   <DomainWhitelistURLPattern urlpattern=".*\.foo\.com"/>
   ```

   `urlpattern` is a regular expression used to match allowed domain names.

   More than one `DomainWhitelistURLPattern` rule may be defined if needed.

**What to do next**

To enable the whitelist rules, set **`WhiteListEnable`** to 1 in the Replay Server global options.

## Replay Rule Configuration in RTV

If you install the IBM Tealeaf CX RealiTea Viewer on your local desktop, you can create replay during replay from data that is displayed in request or replay view.

**Note:** Replay rules that are created in RTV are applied to the local application only by default. If you use RTV to create replay rules, you can choose to synchronize your RTV replay rules with those rules maintained in the Replay Server for BBR. See "Synching RTV Profile with BBR" in the *IBM Tealeaf RealiTea Viewer User Manual*.

RTV can be configured to auto-suggest rules for AJAX-based replay.

## Replay Rule Configuration File

Through the Replay Rules text file, you can use control host and port remapping, custom page modification, and the fields in the session's requests that are used for the URL, host name, and more.

- The `RequestMapping` node contains a standard set of entries that are found in the session requests and rarely must be modified.
- For an example replay rule profile, see "Example Profile" in the *IBM Tealeaf RealiTea Viewer User Manual*.

**Note:** Tealeaf recommends using the **Portal Management** page to configure BBR replay rules, as some data validation is completed before rules are permitted to be defined.

The replay configuration is an XML file in the following location on the Replay Server:

```
<Tealeaf_install_directory>\System\ReplayServerProfile.xml
```

Host and port remapping and other custom page modifications are applied to sessions based on their host names. For example, to customize sessions from `www.sample.com`, the following node must be displayed in `ReplayServerProfile.xml`:

```
<HostProfile name="www.sample.com">
```

Within the `HostProfile` node, the follow entries control remapping:

```
<!-- RemapMode values: off, on, null -->
<RemapMode value='on' />
<RemapHost value="www.sample2.com" />
<!-- There can be multiple RemapPort nodes -->
<RemapPort valueIn="49191" valueOut="80" />
```

**RemapMode** toggles remapping, or it remaps a host to a null host, which can always return a 404 status code on any request.

- With RemapMode enabled, the `RemapHost` node specifies the host name to which to remap.

**`RemapPort`** is used to remap port numbers to other numbers. This value is needed when images or other page elements are available on a port other than the port number that appears in the captured data.

**`IgnoreURL`** specifies the URLs that must not be displayed in the NavList. It supports the asterisk wildcard (`*`). In the following example, any URL matching `/path.axd` with query parameters is ignored:

```
<IgnoreURL value="/path.axd?*" />
```

**ResponseMod** is used to apply regular expressions to response pages to alter them as might be required for replay. For example, you might use it to disable a JavaScript that forces a page to break from a FRAMESET if it finds itself in one. The `ResponseMod` node has the following attributes:

```
<ResponseModify url=".*" pattern="top.location != location"
```

```
replacementString="0" occurrences="first" id="7"/>
```

**PopupURL** Similar to IgnoreURL rules, PopupURL rules can be used to identify popup pages. BBR includes these pages in the NavList and displays them in the main replay window.

```
<PopupURL value="/path/popup.asp?*" id="3"/>
```

**Note:** PopupURL behavior is different in RTV. See "RealiTea Viewer - Profile Options" in the *IBM Tealeaf RealiTea Viewer User Manual*.

**`ExternalFileModify`** These rules are used to modified external files that are referenced in the response. In the following example, an external JavaScript file is modified in order to change the value of `this.fadeDuration` from `.8` to `.001`, which causes the fade for the page to be much shorter.

```
<ExternalFileModify id="409"
  url="/path/Details.js\?cache=.*"
  pattern="this.fadeDuration = .8;"
 replacementString="this.fadeDuration = .001;"
occurrences="all"/>
```

**Special rules**
Special rules are rules that you can apply to manage special or unusual situations in replay.

***On-Demand privacy rule configuration***
As needed, you can configure privacy rules to be applied to sensitive data only during replay, which enables the original session to retain the data for search and reporting purposes.

These privacy rules can be configured to block or mask sensitive data without affecting the stored session.

On-Demand Privacy rules are applied through Search Server.

***Replay rules and UI capture***
If you deploy IBM Tealeaf CX UI Capture for AJAX by using the XML method of submitting client-side events, you must configure special rules to make replay work effectively.

**Note:** If you deploy a Tealeaf client framework solution to capture interactions for a Javascript-based or AJAX-based web application, you must develop and apply replay rules.

As needed, you can configure a replay rule to disable UI Capture during replay.

## Step-based eventing

Through *step-based eventing*, you can create Tealeaf events of these user interface events that are generated by your rich internet application.

On the traditional, HTML-based web, user actions typically triggered a single responding action from the web server. When you clicked a button, a form was submitted. When you clicked a link, a new page was loaded. For applications built on this framework, an individual event might occur only once per page.

In rich internet applications, however, this paradigm was altered. Many user interactions on a page do not change the page itself. In fact, a user can complete the same action of interest multiple times. For example, suppose that your web application enables the entry of multiple addresses from a single form. When **Submit** is clicked, the address data is submitted, and the form is cleared, enabling another entry. In

this case, the same event, `SubmitAddress`, can occur multiple times on the same page. In Tealeaf, you want to be able to track all of these occurrences, instead of just the first one.

**Note:** A primary usage for step-based eventing is to track events that may occur multiple times on a single page.

With *step-based eventing*, you can create Tealeaf events of these user interface events that are generated by your rich internet application. In addition to creating events from individual hits, you can also create events from steps, which are individual user actions that are captured from the client application and submitted to Tealeaf by using one of Tealeaf's client frameworks.

- A step can be considered a "subhit" of a hit; a step reflects a discrete, trackable user action, or a server-side action that does not result from a user action (such as a redirect).
- Steps are captured by a client framework, which is bundled together, and submitted as JSON messages to Tealeaf. These messages are then inserted into a designated section of the request of the parent hit.

Step-based eventing enables the capture of multiple events from a single page of your client application.

**Note:** Step-based eventing requires licensing, installation, and configuration of one of the Tealeaf client frameworks, including IBM Tealeaf CX UI Capture for AJAX, IBM Tealeaf Android SDK, and IBM Tealeaf iOS SDK. Beginning in Release 8.5, new versions these frameworks are required to enable step-based eventing. For more information, contact Tealeaf Professional Services.

**Note:** IBM Tealeaf CX UI Capture for AJAX is only available to legacy users.

This information provides background information about client framework-generated steps and step-based eventing.

### Technical definition of a step

A *step* is defined as a specially formatted JSON message that is submitted by the Tealeaf client frameworks to represent a session state of a form field.

- Step messages can contain any type of data. The data depends on the specific client framework that is sending the message.
- A step contains UI events from a single session only.
- In Tealeaf, these messages are submitted in JSON format and are not easy to decipher in raw format.

## Prerequisites and limitations using for step-based eventing

There are several prerequisites that must be met in order to create step-based events.

Use the information here to determine what prerequisites need to be met.

To create step-based events, the following components are required:

- Tealeaf Release 8.5 or later
- PCA Build 33xx. Tealeaf recommends using PCA Build 3330 at a minimum.

  **Note:** Since PCA Build 3330, there were bug fixes and new features that can be of interest to you, including the ability to capture IPv6 addresses and support for new Linux platforms. See "Release Notes - PCA" in the *IBM Tealeaf Release Notes - Passive Capture Application*.

  You must be able to configure the capture of the `application/json` POST data types through the IBM Tealeaf CX Passive Capture Application.
- One or more of the Tealeaf capture solutions:

| *Table 90. Pre-Requisites* | | |
|---|---|---|
| **Solution** | **Description** | **Documentation** |
| IBM Tealeaf CX UI Capture for AJAX | Used to capture client-side user interface events for AJAX-based applications | "UI Capture for Ajax Guide" in the *IBM Tealeaf UI Capture for Ajax Guide* |
| IBM Tealeaf Android SDK | Used to capture client-side from Android-based mobile native applications | "Tealeaf Android Logging Framework Reference Guide" in the *IBM Tealeaf Android Logging Framework Reference Guide* |
| IBM Tealeaf iOS SDK | Used to capture client-side from iOS-based mobile native applications | "Tealeaf iOS Logging Framework Reference Guide" in the *IBM Tealeaf iOS Logging Framework Reference Guide* |

**Limitations for using step-based eventing**

The maximum length for selected values of text for attributes and events is 256 characters.

**Note:** Distance and Sequence events operate on hits, not steps. As a result, the distance between events on multiple steps of the same hit evaluates to zero (`0`).

## Message types

Events that are captured from client frameworks are bundled together and submitted as a set of messages.

A *message* from a client framework is what defines a single step in Tealeaf, which is a single event that is identified and captured by a client framework.

Multiple messages can represent a single action of the visitor. For example, clicking a radio button might result in two messages of different types: one for the click event and one for change event.

**Note:** If you do not want to double count actions, use both the event type AND the ID/name when you create events for a specific action. If you look only for `ID = checkout method` for example, then this event fires twice when you only wanted it to fire once.

The volume of messages can depend on the configured logging level, which is defined in the client frameworks.

You can review the raw format of a submitted set of JSON messages and the format in which they are displayed after processing in Tealeaf. For examples, see Example message: Raw request body and Example message: Formatted request body.

| *Table 91. Client framework and associated documentation resource* | |
|---|---|
| **Client framework** | **Documentation** |
| IBM Tealeaf CX UI Capture for AJAX | UI Capture does not support dynamic logging levels. |
| IBM Tealeaf Android SDK | "Tealeaf Android Logging Framework Configuration File" in the *IBM Tealeaf Android Logging Framework Reference Guide* |
| IBM Tealeaf iOS SDK | "Tealeaf iOS Logging Framework Installation and Implementation" in the *IBM Tealeaf iOS Logging Framework Reference Guide* |

### Example message: Raw request body

The `[RequestBody]` following information includes a sample raw request, which contains a set of JSON messages.

**Note:** In the raw request, the following entry is a single paragraph. You cannot use this section to create step-based attributes.

- While it is possible to create hit attributes from the `[RequestBody]` section, it is not recommended, as this format might change over time.


```
[RequestBody]
{"version":"0.0.0.4","serialNumber":1,"sessions":[{"id":"ID14H2M3S663R0.36228193
267311725","startTime":1326837723663,"timezoneOffset":480,"messages":[{"type":2,
"offset":2226,"count":1,"context":{"type":"LOAD","name":"root","renderTime":
2226}},{"type":6,"offset":2230,"count":2,"exception":{"description":"Unable to
get value of the property 'nodeValue': object is null or undefined",
"url":"http://straussandplesser.com/store/js/coremetrics/eluminate.js",
"line":1}},{"type":4,"offset":24878,"count":3,"event":{"type":"click"},"target":
{"id":"[['main'],['DIV',1],['DIV',0],['TABLE',0],['TR',0],['TD',0],['DIV',0],
['P',0],['A',0]]","idType":-2,"type":"A"}},
{"type":2,"offset":24880,"count":4,"context":{"type":"UNLOAD","name":"root"}}]}]}
```


After the messages were passed through Tealeaf, the raw request is stored in the `[RequestBody]` section of the request, which is viewable through Request View in BBR.

### Example message: Formatted request body

When the JSON messages are received, Tealeaf reformats them into a more legible format, which is listed here.

This information is available at the bottom of the request, which is formatted for view in Request View in BBR.

Click to view expanded example messages.


```
{
    "version": "0.0.0.4",
    "serialNumber": 1,
    "sessions": [
        {
            "id": "ID14H2M3S663R0.36228193267311725",
            "startTime": 1326837723663,
            "timezoneOffset": 480,
            "messages": [
                {
                    "type": 2,
                    "offset": 2226,
                    "count": 1,
                    "context": {
                        "type": "LOAD",
                        "name": "root",
                        "renderTime": 2226
                    }
                },

                {
                    "type": 6,
                    "offset": 2230,
                    "count": 2,
                    "exception": {
                        "description": "Unable to get value of the property
                        'nodeValue': object is null or undefined",
                        "url":"http://straussandplesser.com/store/js/
                         coremetrics/eluminate.js",
                        "line": 1
                    }
                },

                {
                    "type": 4,
                    "offset": 24878,
```

```
                    "count": 3,
                    "event": {
                        "type": "click"
                    },
                    "target": {
                        "id":
                        "[['main'],['DIV',1],['DIV',0],['TABLE',0],
                         ['TR',0],['TD',0],['DIV',0],['P',0],['A',0]]",
                        "idType": -2,
                        "type": "A"
                    }
                },

                {
                    "type": 2,
                    "offset": 24880,
                    "count": 4,
                    "context": {
                        "type": "UNLOAD",
                        "name": "root"
                    }
                }
            ],
        }
    ]
}
```

In the preceding example, the content after the following string is a set of four separate messages:

```
"messages": [
```

Each message is demarcated by a set of curly brackets.

- Data that is defined at the same level as `messages` (such as `serialNumber` or `timezoneOffset`) is considered environmental data.

Each step message constitutes a single step.

- Step-triggered events can fire per message step.
- In the preceding example, there are four-step messages. As a result, step-triggered events can fire up to four times on this hit.

**Note:** Each step-triggered event also has access to the hit attribute data of its parent hit and the environmental data included for reference in each step.

When you create step attributes, the value that is extracted is the contents between the colon (`:`) and the final comma (`,`) on the line.

Suppose you want to monitor exception messages that are submitted from the client framework. In the example above, the data is in the following area.

- In the following example, message data that was present in the previous example but is not relevant to the example is replaced with the `<omitted>` string.

```
"sessions": [
    {
    <omitted>
            "messages": [
           <omitted>
                {
                    "type": 6,
                    "offset": 2230,
                    "count": 2,
                    "exception": {
                        "description": "Unable to get value of the property
                        'nodeValue': object is null or undefined",
                        "url": "http://straussandplesser.com/store/js/
                                        coremetrics/eluminate.js",
                        "line": 1
```

In the preceding example, you can see that the exception message is stored in the `description` value. To reference this value in step-based eventing, when you create the step attribute to monitor the above, the node in the tree is referenced by using the following structure:

```
sessions[0].message.exception.description
```

The naming structures for the `sessions` and `messages` nodes are changed, and the `type` identifier is omitted.

**Note:** When you create step attributes through BBR, you use the menu, which automatically pre-populates the attribute with the appropriate reference within the Event Manager. These steps are described later.

## Step-based objects

In Tealeaf, you can create two types of objects to monitor events that are captured from a client framework and passed as messages to Tealeaf:

- *Step attributes* are hit attributes that acquire its data from a step. Step attributes are specified in a slightly different manner but complete an identical function.
- *Step-based events* are standard Tealeaf events that are configured to fire on one of the steps triggers. As conditions, they can use any standard type of Tealeaf condition, and also step attributes.

### Default step objects

Tealeaf provides a number of step-based events and attributes for use in step-based eventing.

- For more information about provided step attributes, see "Pattern Objects Reference" in the *IBM Tealeaf Event Manager Manual*.
- For more information about provided step-based eventing, see "EES Reference - Tealeaf Event Reference" in the *IBM Tealeaf Event Manager Manual*.

### Step trigger types

To support step-based eventing, the Event Manager now provides two more trigger types:

**Trigger**
**Description**

**`Every Step`**
Event is evaluated with other events in each step.

**`After Every Step`**
Event is evaluated after every step is evaluated.

**Note:** This trigger is rarely used.

In the previous example, any event triggered to fire on `Every Step` is checked for each combination of JSON `message` and environmental data. In the previous example, any `Every Step` event is checked for the load, unload, exception, and other data message.

**Note:** Step attributes are permitted to reference objects from the parent hit. As a result, you can reference hit attributes in step events, but not vice versa.

In the event definition, the trigger can be selected from the Evaluate drop-down:

*Figure 47. Available event triggers*

Available triggers are displayed in the order of evaluation. For a particular hit with underlying steps, each `Every Hit` event is evaluated first, followed by each `Every Step` event and `After Every Step` event. Then, the `After Every Hit` events are evaluated.

**Note:** The events that fire on each trigger determine the availability of data. An event can use data from any event that fired before the current event. In a multi-hit session, the `After Every Hit` trigger fire on the previous hit before the events configured to fire on `Every Hit` from the next hit. The same applies to step-based triggers.

The order of firing is more accurately displayed as a nested structure:

```
* First Hit of Session
    * Every Hit
        * Every Step
        * After Every Step
    * After Every Hit
    * Last Hit
* End of Session
```

***Considerations for using the `After Every Step` trigger***

In almost all cases, when you create step attributes, you are interested in the current context of the session. You create attributes to monitor the current data that is available as of the current step. As a result, the `After Every Step` trigger is rarely used.

In the example below, the `After Every Step` trigger is used. This scenario mirrors the `After Every Hit` trigger usage, except that it applies to steps instead of hits.

The `After Every Step` trigger is useful when you must compare the current state with the previous state. For example, suppose you want to know whether users clicked the same object twice in a row.

- To test this scenario, you must know both the object currently being click, and the previously clicked object. If the events that track both the current and previous states fire on the same trigger, they are updated at the same time and therefore always have the same value.
- However, if the previous state event fires just after the current state value by using the `After Every Step` trigger, the previous state event is not updated when the current state event fires. Therefore, you can compare the current state with the previous state by using an event that fires on the `Every Step` trigger.

**Note:** Form messages contain the `currState` and `prevState` properties within a step. The `currState` property refers to the final value of the form field after editing, and `prevState` refers to the default value before editing. These references do not work for testing if the same action occurred twice, since the default value can be reset to blank each time it is accessed.

**Privacy**

To manage blocking or masking of sensitive data, Tealeaf provides privacy mechanisms to manage specific data before it is transmitted to Tealeaf.

**Note:** Application of privacy blocking or masking in the PCA or in the Windows pipeline requires complex regular expressions, which can cause significant performance degradation if improperly specified. Tealeaf strongly recommends using the privacy solution that is provided with your client framework to manage sensitive data.

## Browser based replay and step-based events

In Browser based replay, steps are displayed as subpages to the main page on which they occurred.

Any triggered events are displayed beneath them.

During replay, steps can be displayed in a more user-friendly format.

**Note:** Replay of step-based events in RTV is not supported.

A single web action can require multiple attributes and events to track. You can create multiple attributes, which are inputs to a single compound event to track a single user action.

### Navigable Pages List

Using the Request view of BBR, you can create hit attributes and events for steps.

When you load a session that contains JSON-based steps into BBR, the Navigable Pages List looks like:

In the preceding image, the step that is captured from the visitor's user interface are indicated by the `UIEvent` label. In the preceding example, each instance also lists the range of user interface events captured. `UIEvent: 1 -4` indicates that the specific step includes 4 individual user interface events.

*Figure 48. BBR Navigable Pages List*

### Viewing formatted JSON messages

When one of the UIEvent steps is selected, you can review the JSON messages that are submitted as part of the step.

#### About this task

**Note:** Any BBR user can view the formatted client framework messages. To create attributes and events from them, you must have access permissions to the Tealeaf Event Manager.

### Procedure

1. Click **Request** in the toolbar to display the request data.
2. Click one of the `UIEvent` entries in the Navigable Pages List.
3. The raw JSON messages are displayed in the `[RequestBody]` section.
4. However, this information is not easy to read. To review the JSON messages in a more legible format, click the **Click here to view Step Attributes** link at the top of the request pane.
5. The list of JSON messages are broken out into separate lines for easier reading.
   - Each selectable item is a name-value pair that is highlighted when you move your mouse over it.
   - Null values can be selected for creation of step-based attributes.
   - Hit and event objects that you create search for the values for the specified JSON item.

## Event manager processing of step-based event objects

You can create step attributes through Request view in Browser Based Replay.

**Note:** Creation of step attributes is not supported in RTV.

When you create objects through Browser Based Replay, the Event Manager checks to see if the selected content is already referenced in an existing event object. If so, the Event Manager selects that object for you to edit.

In some cases, the selected event object is provided by Tealeaf and is therefore not editable. For example, Tealeaf provides the `CUI Hit` hit attribute, which references the contents of the `HTTP_X_TEALEAF` request variable. When you choose to create attributes or events from the values of this request variable, the Event Manager selects the `CUI Hit` attribute for you to edit. This hit attribute cannot be edited.

**Note:** If you want to create more step attributes and events from session data for which attributes or events are already created, you must create them manually through the Event Manager.

**Note:** There is a known issue in which the PCA fails to properly recognize UTF-8 encoding in data that is submitted from client frameworks, and the data can be mangled in the stored session, causing issues in eventing and search.

**Note:** The following information applies to IBM Tealeaf version 9.0A only.

9.0A can properly recognize UTF-8 encoding in data that is submitted from client frameworks.

### Permissions for creating step-based event objects

To create step attributes, you must have permissions to access the Tealeaf Event Manager, where event-related objects are created in the Portal.

To test access, select **Configure** > **Event Manager**

### BBR step attribute context menu

Use the BBR step attribute context menu to create a new event from a step attribute or to create a new step attribute.

### About this task

**Note:** To access the BBR step attribute context menu, you must have access to the Event Manager.

### Procedure

1. Select a page from the page navigation list in BBR.
2. Right-click a name-value pair in the formatted JSON message.
3. From the context menu, select one of the following options:

- **Create New Event from Step Attribute selection** to create a step-based event and any necessary hit attribute to gather the data.
- **Create New Step Attribute from selection** to create a step attribute.

**Creating a step attribute**
When you select a JSON item in BBR and choose to create a step attribute, the Event Manager is opened in the browser window currently opened to the Portal.

The following dialog is displayed:

**Note:** Depending on your browser type and configuration, you can manually switch over to the **Portal** window.

*Figure 49. Creating a step attribute*

Step attributes are commingled with hit attributes. They do not belong to a special category. What defines an attribute as a step attribute are the properties that are listed.

*Table 92. Key Properties:*

| Attribute Properties | Description |
|---|---|
| `Use Step Pattern` | For step attributes, the Use Step Pattern radio button is selected for you, which enables specification of the xpath to the node whose value you want to track.<br>• When a step pattern is used to identify an attribute, the check is completed by using a case-sensitive search by default. If you choose to change the type of pattern tag to a step pattern, the existing case-sensitive settings are preserved. |

| *Table 92. Key Properties: (continued)* | |
|---|---|
| **Attribute Properties** | **Description** |
| `Step Attribute Path` | The Step Attribute Path value contains the node information to uniquely identify the JSON value to acquire in the attribute. For the preceding example, the path is:<br>`.sessions[0].message.exception.description`<br>This provides a unique path to the description value for the exception message that was submitted from a client framework to Tealeaf. |

**Note:** You can complete the same Post-Match Operations on a step attribute that you can complete on a hit attribute.

***Data format***
The values of step attributes are always treated as text patterns. As a result, operators such as `equals` perform text-based comparisons, even if the captured value is a numeric or Boolean value.

***Data availability***
Like the hits that contain them, steps are processed in isolation from all other steps. For example, if you want to use data from step 1 for use on step 2, you must create an event to record the data from step 1 for later use.

- Since each step is associated with a parent hit, any hit attributes triggered on the parent hit are available for reference in each step of the hit.
- However, step attributes are available only within the single step that is being evaluated.
- If you want to use a hit attribute in a step attribute, the event trigger must be configured to be evaluated on one of the step triggers.
- Data from events that are triggered on previous steps is available in later steps.

***Using data between step attributes***
A step triggered event uses only data that is contained in the step in which it is triggered, which is a similar behavior to how hits are triggered.

To use data from step 1 in step 2, you must record the data from step 1 in an event and then reference the event in step 2.

For example, suppose your request data for a single hit looks like:

```
[appdata]
TLT_URL=/tealeaftarget.php
TLT_CUI_URL= /checkout

[StepAttributes]
                {
                    "type": 4,
                    "offset": 8063,
                    "count": 1,
                    "event": {
                        "type": "change"
                    },
                    "target": {
                        "id":  firstname",
                        "idType": -1,
                        "type": "INPUT",
                        "dwell": 2196,
                        "currState": {
                            "value": "MyName"
                        }
                    }
                },
                {
```

```
                    "type": 4,
                    "offset": 2293,
                    "count": 2,
                    "event": {
                        "type": "click"
                    },
                    "target": {
                        "id": "login:guest",
                        "type": "INPUT",
                        "subType": "radio",
                        "currState": {
                            "checked": true,
                            "value": "guest"
                        }
                    }
                },
```

In the preceding data:

- `[appdata]` data is available through standard hit attributes.
- There are 2-step messages:
  - Step 1: The first step identifies the `change` client event, in which the `firstname` form field is set to `MyName`.
  - Step 2: The second step identifies the `click` client event, in which the `login.guest` element is set to `guest`.

A single step-triggered event cannot use data from both step 1 and step 2 at the same time. For example, you cannot create a step-triggered event that fires on the click message and records the value of the `firstname` value by using only step attributes.

To capture the value of Step 1 based on the condition of Step 2, you must:

- Create a step attribute to capture `firstname`'s value on Step 1.
- Create an event that records the value of the step attribute for Step 1.
- Create an event that fires on the click for guest and uses the value for the Step 1 event for the guest value.

***Capturing a specific value***

By default, a step attribute captures all possible values for the selected JSON path. When the attribute is specified, any value that is detected for the node becomes the value for the attribute.

### About this task

In some situations, you can gather in the step attribute only specified values. For example, suppose that you are tracking the following JSON path:

```
.sessions[0].message.clientState.event
```

By default, any step attribute can capture any instance of any value. So, your attribute can capture values such as `load`, `attention`, `resize`, or `scroll`. Suppose that you are interested in creating a step attribute to track only the `scroll` values. After you create the step attribute through BBR, you can complete the following modifications to the attribute definition through the Event Manager.

### Procedure

1. Edit the step attribute.
2. Click the**Post Match Operations caret**.
3. Select the **User RegEx** check box.
4. In the RegEx textbox, enter:

```
scroll
```

5. To save the change, click **Save Draft**.
6. To commit the change, click **Save Changes**.

**Results**

Now, the step attribute records only the instances of the `scroll` value for the specified JSON path.

As an alternative, you can specify a step attribute without using the RegEx portion. When you use the step attribute in an event, specify that the value of the step attribute equals `scroll`.

**Creating a step event**

When you select a JSON item in BBR and choose to create an event, the Event Manager is opened in the browser window currently opened to the Portal. The Event Wizard is displayed.

**Note:** Depending on your browser type and configuration, you can manually switch over to the **Portal** window.

The default event checks every step to see whether the JSON item is present and records the last occurrence in the event by default. Using this configuration, you can track the number of sessions in which the event occurred.

**Note:** If you cancel creation of a step-based event, you must revert the step attribute, if created, through the Hit Attributes tab.

***Triggers for step objects***

Step-based events can be evaluated on the `Every Step` and `After Every Step` trigger.

***Triggers for compound events using step-based events as conditions***

There are specific triggers that must be applied when compound events use step-based events as conditions.

**Note:** If you are creating an event with multiple conditions that uses one or more step-based events, you must set the event to be evaluated on `After Every Hit`. That trigger is evaluated after `Every Hit`, `Every Step`, and `After Every Step`, in that order.

***Tracked Occurrences for step events***

For any event that is triggered off step-based data, you must configure it to track occurrences at the individual hit level.

**Note:** Do not use session-level tracking, as those options operate only on the first or last hit of the session.

***Condition step***

When you create an event to track a JSON message item, the step attribute that is required to detect the name-value pair is also created in draft mode for you. For such scenarios, the Hit Attribute condition specifies the step attribute that the Event Manager has also created for you.

The Event Manager pre-populates the event definition with properties to identify the specific JSON item to track.

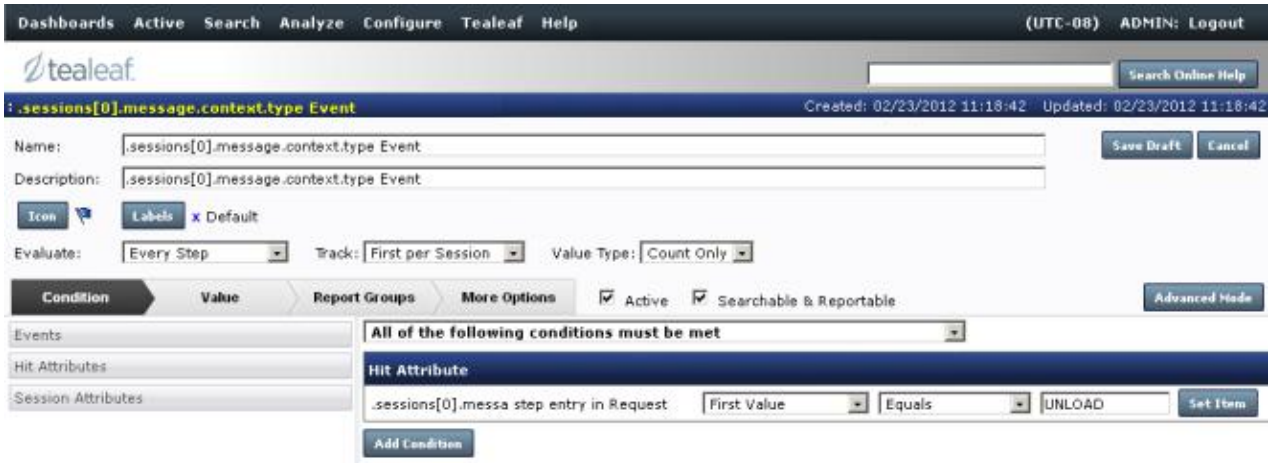



*Figure 50. Creating a step-based event - Condition step*

**Note:** For step attribute conditions, `Match Count` and `Last Value` value tests are not useful, as there is only one unique match and its value for a specified property on the hit.

**Note:** If you do not want to double count actions, use both the event type and the ID/name when you create events for a specific action.

- If you look only for `ID = checkout method`, then this event fires twice when you only wanted it to fire once. Suppose you want to track clicked objects. Each object has the event type `click`.
- To track clicks of a specific object, you must specify both the event type and object ID.
- If a step attribute with the same properties exists, the Event Manager uses the existing step attribute.
- As needed, you can add extra conditions to the event you are creating.

*Table 93. Key Properties:*

| Attribute Properties | Description |
|---|---|
| Icon | You must select an identifying icon for your step-based events. |
| Labels | You can organize your step-based events into labels within the Event Manager. |
| `Evaluate` | Set the trigger to be either of the step-based triggers. |
| `Track` | Set the occurrences to track to monitor the first or last occurrence in the session or every occurrence.<br>• If you want to track the number of sessions in which the event occurrence, set the value to `Last Occurrence`.<br>• If you want to track each time that the event occurred in a session, set the value to `Every Occurrence`. |
| `Value Type` | Step-based events can track numeric or text values or the count of occurrences of the event. |

***Value step***
The value of step-based events can be specified like any other event.

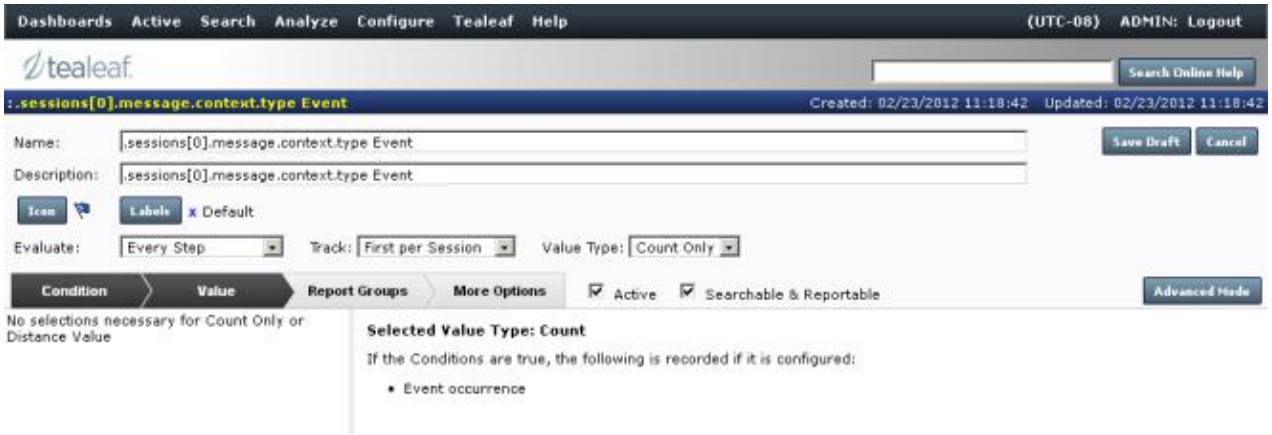



*Figure 51. Creating a step-based event - Value step*

***Other steps***
For step-based events, you can configure the other steps as you would any other event.

***Advanced Mode***
To see the native JavaScript created for your step-based event, click **Advanced Mode**.

**Creating a dimension**
After you create the step attribute, event, or both to track a value in a submitted message, you can create a dimension to record values from the event or attribute in the standard manner.

**Note:** Dimensions that are populated by step attributes or events can capture new values from multiple steps in a hit.

**Support statement for creating step attributes and events in RTV**
Creation of step attributes and events is not supported in RTV.

In request view, you can review the raw JSON messages in the `[RequestBody]` section of the request.

You can use RTV to save test TLA sessions, which can be loaded into the Event Tester to use as test data for step-based events.

**In Event Tester**
In the Event Tester, you can validate the triggering of step-based attributes and events. Step attributes and the events that are triggered from them are displayed as regular hit attributes and events in the test results.

**Note:** After you create step-based objects, it can take a few minutes before they are available for selection in the Event Tester.

## Indexing and step-based events

Step-based event data is not indexed by default. You can, however, search for events through BBR and RTV.

It is possible to move data from one location in the request into another section which is automatically indexed for search.

**Note:** If you must index some JSON-based session data for search, you must use a privacy rule to insert the data into the `[appdata]` section. Creation of the rule requires configuration of a regular expression to locate the data. Regular expressions are considered an advanced configuration option, as if they are poorly specified, they can significantly impact system performance.

- For more information about configuring regular expressions, contact Tealeaf http://support.tealeaf.com.
- Use of privacy rules against JSON message data is likely to be supported in a later release.

### Reference information about BBR and Events

Use the information here to find the IBM Tealeaf publications that contain information about BBR and Events.

**Section**
**Description**

**"CX Browser Based Replay" in the *IBM Tealeaf cxImpact User Manual***
BBR documentation

**"Browser Based Replay Interface" in the *IBM Tealeaf cxImpact User Manual***
How to use BBR, including how to access request view

**"TEM Hit Attributes Tab" in the *IBM Tealeaf Event Manager Manual***
How to create hit attributes or step attributes in Event Manager

**"TEM Events Tab" in the *IBM Tealeaf Event Manager Manual***
How to create events in Event Manager

**"UI Capture for Ajax Guide" in the *IBM Tealeaf UI Capture for Ajax Guide***
Reference guide for the IBM Tealeaf CX UI Capture for AJAX solution

**"Tealeaf Android Logging Framework Reference Guide" in the *IBM Tealeaf Android Logging Framework Reference Guide***
Reference guide for the IBM Tealeaf Android SDK

**"Tealeaf iOS Logging Framework Reference Guide" in the *IBM Tealeaf iOS Logging Framework Reference Guide***
Reference guide for the Tealeaf IOS Logging Framework

**"Event Tester" in the *IBM Tealeaf Event Manager Manual***
Portal-based Event Tester displays step-based attributes and events transparently

**"Searching Session Data" in the *IBM Tealeaf cxImpact User Manual***
Searching for sessions through the Portal

**"RealiTea Viewer - Request View" in the *IBM Tealeaf RealiTea Viewer User Manual***
Request view page for RTV.

**Note:** You cannot create step attributes through RTV.

**"RealiTea Viewer - Session Search and Subsearch" in the *IBM Tealeaf RealiTea Viewer User Manual***
Searching for sessions through RTV

**"Configuring CX Indexing" in the *IBM Tealeaf CX Configuration Manual***
How sessions are indexed and how data is added for indexing

**"Privacy Session Agent" in the *IBM Tealeaf CX Configuration Manual***
Session agent that is used to move content in the request

## Tealeaf End-to-End Scenarios

The End-to-End Scenarios demonstrate end-to-end functionality in Tealeaf. Use End-to-End Scenarios to learn how to build the objects required to monitor critical aspects of your web application, as contained in the data captured by Tealeaf.

After the required objects are created, these scenarios provide steps for publishing the data in reports, displaying in replay, or searching for it to identify potential issues with the application.

Each scenario is designed to produce a useful result of a general use case. After you have completed a scenario, feel free to modify the steps in order to customize results for your specific web application.

#### Scenarios

- "E2E Scenario - Auditing Page Counts" in the *IBM Tealeaf cxImpact User Manual*
- "E2E Scenario - Build Top IPs and Top IPs by Referrer dashboard reports" in the *IBM Tealeaf cxImpact User Manual*

- "E2E Scenario - Configure Login ID to be Searchable" in the *IBM Tealeaf cxImpact User Manual*
- "E2E Scenario - Create Conversion Rate Dashboard" in the *IBM Tealeaf cxImpact User Manual*
- "E2E Scenario - Create Top Products Dashboard" in the *IBM Tealeaf cxImpact User Manual*
- "E2E Scenario - Getting Value out of Tealeaf in One Hour" in the *IBM Tealeaf cxImpact User Manual*
- "E2E Scenario - Tracking User Agent Information in Tealeaf" in the *IBM Tealeaf cxImpact User Manual*

## E2E Scenario - Auditing Page Counts

This section describes how to create a report in the Tealeaf Report Builder to monitor daily page counts and the rolling average of page counts over the preceding year.

Many Tealeaf customers utilize a licensing model in which the count of pages captured and processed by Tealeaf is the primary metric for billing purposes. For example, a customer may license Tealeaf products based on an estimated an average daily page count of 10 million. To monitor compliance, this customer may wish to track the average page counts captured by Tealeaf on a daily basis. Since licensing is renewed on an annual basis, the average count over the preceding days is a useful metric for monitoring compliance.

- The standard Tealeaf licensing model is based on counts of CPUs where Tealeaf software has been deployed.
- The page count licensing model is particularly useful for customers who have installed Tealeaf in virtualized environments.

Use the information in this section to learn how to create a report in the Tealeaf Report Builder to monitor daily page counts and the rolling average of page counts over the preceding year.

- For customers that do not use the page count licensing model, this End-to-End Scenario is a useful demonstration of how to surface data captured by Tealeaf Standard Events into reports and to track their changes using Top Movers and alerts.

**Changes in Licensed Page Count Model between Release 7.x, Release 8.x, and Release 9.x**
If you upgraded from release 7.x to release 8.x to release 9.x, there are several factors that contribute to changes in the page count model that can result in a change in the count of licensed pages.

### Changes in Release 7.x

In Release 7.x, discard events were evaluated at the end of a session, which resulted in the pages of the discarded session being counted as licensed pages. In Release 8.x, they can be evaluated anywhere in the session. Since Tealeaf recommends discarding sessions as early as possible, the licensed page counts may drop as a result of where you apply the discard event(s) in the session.

### Changes in Release 8.x

In Release 8.x, a licensed page is defined as having any of the following content types:

```
text/html;
text/xml;
application/xml;
application/xhtml;
application/json;
application/x-json;
text/json;
text/x-json;
```

- For the mobile client frameworks, licensed pages are counted based on the occurrence of the ScreenView load message in the JSON data.

  **Note:** In Release 8.5 and earlier, the ScreenView object was called the Application Context object.

In Release 8.x, page redirects are also processed as licensed pages. This ensures that a page redirect is captured by Tealeaf and can be used to create an event or troubleshoot issues with the hosted page that contains the redirect.

### Changes in Release 9.x

In release 9.0.2.1223 (FP3), in keeping with the new web development technologies for dynamic pages, using AJAX/JSON calls, IBM has developed a mechanism to identify useful AJAX/JSON calls and drop the rest. The mechanism for identifying usefulness of a call, is based on the size of the call. The size is a proprietary but has been determined based on a statistical study of large number of representative sessions from a cross section of significant number of customers across industries.

### Creating Report Builder Report

You can use the Report Builder to create a report that monitor page counts.

#### About this task

**Note:** This information pertains to functionality available in IBM Tealeaf version 9.0.2 Fix Pack 1. For more information about the fix pack, contact your IBM Tealeaf representative.

To create the Report Builder report to monitor page counts:

#### Procedure

1. Login to the Tealeaf Portal.
2. Before you begin, you may wish to review the volume of reporting data that is currently available in the database:
   a) From the Portal menu, select **Tealeaf** > **Portal Management**.
   b) Click the IBM Tealeaf CX Settings category.
   c) Click the Data Retention link.
   d) Review the value for `Reporting Data (daily) Days Retain`. This value indicates the number of days previous to today for which you can compute the daily page counts.
   e) You may wish to use this information later in this scenario. See "CX Settings" in the *IBM Tealeaf cxImpact Administration Manual*.
3. From the Portal menu, select **Analyze** > **Report Builder**.

   The Report Builder is displayed. See "Tealeaf Report Builder" in the *IBM Tealeaf Reporting Guide*

   The Report Builder may display the most recent report that you opened.
4. To create a new report, click the **Create New** report ( ) icon in the toolbar.
5. In the Events tab on the left side, click **Add Event**. The Event Selector is displayed.
6. Verify that the View by Labels checkbox in the **Event Selector** window is selected.
7. Click the `Tealeaf Standard Events` event label.
8. Click the + icon.
9. To view the event in further detail, hover over the icon to the left of the event you intend to select.
10. From the Event Selector window, select the `Page Count` event.
11. Click **Select**.

    The event is added to the report.
12. In the generated report, page counts for a particular date are broken down by each hour of the day. For purposes of this exercise, this level of detail is not useful. For licensing purposes, only the daily counts of page counts are meaningful.
13. Click the Calendar tool and select the date range over which you would like to review the daily page count totals.
14. In the resulting report, data may be grouped at weekly (in this case) or monthly levels. At the bottom of the report, you can review the totals and daily average, which are automatically tabulated for you.
15. These figures can be used to track your daily page counts for reporting purposes.

16. To save the report, click the Save icon in the toolbar. Enter a name such as `Weekly Page Counts`. Click **Save**.

### Results

For more information on creating reports, see "Tealeaf Report Builder" in the *IBM Tealeaf Reporting Guide*.

## Adding reports to a dashboard

Optionally, you can add reports to a dashboard. When the report is available in a dashboard, users can visit the dashboard, which may contain other useful reports, on a daily basis to keep tabs on system activities.

### About this task

Use the steps in the procedure to add a report to the Technical Site Metrics dashboard.

### Procedure

1. If it is not already, open the `Weekly Page Counts` report in the Tealeaf Report Builder.
   - See "Tealeaf Report Builder" in the *IBM Tealeaf Reporting Guide*.
2. From the toolbar, select the **Add Report to Dashboard** icon.
3. Enter a title and click **Save**.

   The Add Report to Dashboard dialog is displayed.
4. Select the following options:
   a) Change the title as needed.
   b) For Updates, select `Every Hour`. Since this report tabulates values for the preceding day, it should not need more frequent updates.
   c) For the Display, select `Chart`. You can select the `Table` option if you prefer to see the raw counts instead of the graphic.
   d) To enable exploration of the underlying Report Builder report, select `Enabled` for the Drilldown option.
   e) For the Period, select `Yesterday`.
   f) For the target dashboard tab:
      1) Click the link next to Target Tab.
      2) Click the `Technical Site Metrics` entry.
      3) Select `Activity Reports` and click **Select**.
   g) To add the configured report to the selected dashboard, click **Add**.
5. The report is added.
6. To see the report, select **Dashboard** > **Technical Site Metrics**.
7. Click the Activity Reports tab.
8. The report is displayed at the bottom of the page.

   See "Using Dashboards" in the *IBM Tealeaf cxView User Manual*.
9. You may wish to reposition the dashboard component on the Activity Reports tab. See "Configuring Dashboards" in the *IBM Tealeaf cxView User Manual*.

## E2E Scenario - Build Top IPs and Top IPs by Referrer dashboard reports

This scenario provides step-by-step instructions on how to create the data objects to identify and report on the Top IP addresses and referrers for your web application.

IP addresses often provide unique identifiers to the machine from which the visitor is starting the session. By tracking the IP addresses of your visitors, you may be able to identify the most frequent visitors to your application and, if needed, filter out unwanted traffic from your Tealeaf reporting data for visits, for example, by bots.

- Depending on the visitor's connection to the Internet, the IP address can be dynamically assigned, so these values cannot be guaranteed to be unique identifiers to a machine in all cases.

A session's referrer identifies the URL from which one of your visitors started to begin the session. Identifying the top referrers to your web application can be useful in tracking the effectiveness of your marketing campaigns. By identifying the top referrers as dimensional data, you can assess the value of your relationships with partners driving content to your web application.

For example, if your campaigns include identifying information as query parameters in the URL, you can configure Tealeaf to capture and track this information. In the following simple example, the URL value for this referrer contains a query parameter (`CampaignID`) and value (`01`), which would be useful to track:

```
http://www.example.com?CampaignID=01
```

These pieces of information provide contextual information for the most frequent visitors to your web application and the most common points of entry. These reports are then added to a dashboard for convenient review.

**Overview**

Use the Overview for a high-level look at the activities required to build Top IPs and Top IPs by Referrer dashboard reports.

You will need to perform the following activities:

1. To begin, you create an event that is fired at the beginning of each session.
2. You then create the dimensions to capture the IP address and referrer for each session.
3. You create a report using the Every Session event and the IP address as a dimension on the report.
4. When the report is created and populated with data, you export the Top 100 values reported in the report.
5. These values are added to the whitelist for the dimension, which allows you to report on them.
6. You may also filter out the other observed values in the dimension into a blacklist.
7. You then add the report to a dashboard, which displays the Top 100 IP addresses for your site.
8. The above steps can be repeated to create a dashboard component based on the referrer value for each session.

**An Important Note about Dimension Data Limits**

To prevent runaway creation of dimensional data that becomes unwieldy to use in reporting, Tealeaf imposes a configurable limit on the maximum number of unique dimension values to be captured on an hourly basis.

Suppose that you are interested in creating dimensions to capture referrer URLs and IP addresses. Typically, URL and IP address data is captured and stored in Tealeaf as dimensional data. As hits are passed through the pipeline, these values are captured and stored in the Tealeaf database. Depending on the volume of traffic on your site, this dataset could number in the millions of unique values.

The configurable limit:

- Can be configured for individual dimensions.
- Is applied to each Canister.

For example, if you define a limit of 10 unique values and have two Canisters in your environment, a maximum of 10 X 2 unique values for the dimension can be recorded per hour.

Suppose for the IP address dimension, you configure a limit of 2 unique values per hour in a single Canister environment. This limit means that in a single hour, a maximum of 2 unique values is written to the database from your lone Canister. Any other value that is subsequently captured in the same hour is written using the limit value, which is set to `[Limit]` by default.

- This example limit is extremely small for demonstration purposes; by default, the limit value is set to `1000` unique values per hour.

In the following table , you can see a set of example IP addresses that are detected in the pipeline for each hour:

*Table 94. An Important Note about Dimension Data Limits*

| **Address** | **Hr 1** | **Hr 2** | **Hr 3** |
|---|---|---|---|
| Addr 1 | 1.1.1.1 | 1.1.1.4 | 1.1.1.4 |
| Addr 2 | 1.1.1.2 | 1.1.1.5 | 1.1.1.5 |
| Addr 3 | 1.1.1.3 | 1.1.1.1 | 1.1.1.1 |
| Addr 4 | 1.1.1.4 | 1.1.1.2 | 10.255.255.1 |
| Addr 5 | 1.1.1.5 | 1.1.1.3 | 10.255.255.2 |

If the limit for this dimension is set to 2 per hour, then for each hour, the following addresses are recorded for the dimension:

*Table 95. An Important Note about Dimension Data Limits*

| **Hour** | **Recorded** | **Recorded as `[Limit]`** |
|---|---|---|
| Hr 1 | 1.1.1.1, 1.1.1.2 | 1.1.1.3, 1.1.1.4, 1.1.1.5 |
| Hr 2 | 1.1.1.4, 1.1.1.5 | 1.1.1.1, 1.1.1.2, 1.1.1.3 |
| Hr 3 | 1.1.1.4, 1.1.1.5 | 1.1.1.1, 10.255.255.1, 10.255.255.2 |

Based upon the configured limit of two unique values recorded per hour for this dimension, all other values for URL are recorded as `[Limit]`.

- For Hour 1, you can see that two new values are recorded. Three IP addresses are not.
- For Hour 2, two of the values that were assigned the `[Limit]` value in Hour 1 are now recorded. Values that were recorded in Hour 1 are present in Hour 2, but because they appeared after the limit had been reached, they are recorded as `[Limit]`.
- For purposes of recording, Hour 3 looks identical to Hour 2. However, two new, previously undetected values are captured, but they are not recorded because the limit has already been reached.

The above example demonstrates the potential uncertainties around capturing dimensional values with a high volume of unique values per hour. To manage the data volume:

- You can raise the limit for each configured dimension sufficiently high to account for the volume.

  **Note:** This approach can significantly impact your data storage.
- Use an approximation for the IP address.
  - Instead of using the `Referrer` value, you can use the `Referrer Domain for Session` session attribute provided by Tealeaf as the source for the dimension. Instead of capturing the full referral URL (e.g. `www.tealeaf.com/mypage.htm`), this session attribute just captures the domain value (e.g. `www.tealeaf.com`).
  - Instead of the `Client IP Address` value, you can use the `User Agent of Client` session attribute provided by Tealeaf as the source for the dimension.

**Note:** Depending on the volume of traffic to your site and the number of unique URLs that are configured to be captured for referrer and IP address, you can not be able to produce a high-fidelity dataset for Top values. If you do not have the available storage to meet your requirements, you should use one of the above recommendations as the source of the dimension data instead. Please make the replacements as needed in the instructions for creating the dimensions below.

**Step 1 - Create Event: Every Session**
Create an event that is called `Every Session`, which fires on the first hit of the session.

### About this task

This event uses the `Session GUID` session attribute, which is the internal Tealeaf identifier that is assigned by the Canister on the first hit of each valid session; each session has a Session GUID value, which means that this event fires for every valid session.

**Note:** You can find other uses for this event.

This event then creates reports that evaluate all sessions.

### Procedure

1. To open the Tealeaf Event Manager, select **Configure** > **Event Manager**.
2. In the Event Manager, click the **Events** tab.
3. Click **New Event**.
4. For the Name of the event, enter `Every Session`.
5. For the trigger of the event, set Evaluate On to `First hit of session`.
6. For organizational purposes, you can find it useful to assign the event to a new event label. Otherwise, the event is listed in the `Default` event label after it is created.
7. Select the **Condition** step.
8. Click the **Session Attributes** category.
9. Click `Session GUID`. This session attribute is the session identifier that is created by Tealeaf. Every session is marked with one on the first hit of the session.
10. The Session GUID session attribute is added to the main pane. From the drop-down for the attribute, select `Is not empty`. The event is configured to fire on the first hit of the session, whenever the Session GUID is specified. This event fires on every valid session.
11. Save your draft.
12. Save your changes and commit them.

### Results

Expected Results:

The `Every Session` event is created.

**Step 2 - Search for Event in Active Sessions**
Use the information in this topic to find a session where the event is displayed and can be reused for locating sessions to test after you create new event objects contained in them.

### About this task

After you create a new event, you should verify that is being written to sessions. Since this event is created on the first hit of any new session, it must be available in any active session that was started after you saved the event to the server.

These steps help you to find a session where the event is displayed and can be reused for locating sessions to test after you create new event objects contained in them.

### Procedure

1. In the Portal, select **Search** > **Active Sessions**. The Active Session Search page is displayed.

   *Figure 52. Search - Active Sessions*
2. If any search fields are displayed, click the **X** icon in the corner to remove them.
3. From the left navigation panel, click the **Basic Search Fields** panel. Click **Events**.
4. An Events search term is displayed in the search criteria.
   a) Click **<Select an event**.
   b) Open the event label containing the `Every Session` event.
   c) Click the `Every Session` event.
   d) To select it, click **Select**.
5. Leave the dimension value as `<Any Dimension>`.
6. Click **Search**.

### Results

**Expected Results:**

When the search results are returned, all active sessions in which the `Every Session` event has occurred are displayed.

You can also use the Event Tester to verify event operations.

**Step 3 - Create Dimension: IP Address**
Tealeaf provides a session attribute `Client IP Address`, which is created and maintained by the Canister to identify the IP address from which the visitor's client application is connecting. In this step, you create a dimension that is called `IP Address`, which is populated by the `Client IP Address` session attribute.

### About this task

A dimension provides contextual information that can be recorded when an event is recorded. When you create a dimension and associate it with a specific event, whenever the event is recorded, the value for the dimension is also recorded. In this case, the value for the visitor's IP address can be recorded.

### Procedure

1. To open the Tealeaf Event Manager, select **Configure** > **Event Manager**.
2. In the Event Manager, click the **Dimensions** tab.
3. To create a dimension, click **New Dimension**.
4. Set the name: `IP Address`.
5. Set the Populated By value: `Client IP Address` session attribute.
6. Set the Populated With value: `First Value in Session`.
7. For Values to Record, set the value to `Whitelist + Observed Values`.
8. For Default Value, select `[Others]`.
9. For Max Values Per Hour, you must adjust the setting that is based on traffic volume for your site.

   **Note:** If the accepted maximum for `Max Values Per Hour` is not already known, you must leave the default value. Depending on the volume of traffic to your site, setting it to a much higher value can increase data storage requirements.

   **Note:** For this dimension, you might not be able to configure an acceptable limit to generate a high-fidelity data set.
10. Click **Turn On Logging**.
11. Save your draft.

12. Save your changes and commit them.

### Results

Expected Results:

The dimension `IP Address` is created and is populated by the session attribute `Client IP Address`. Dimension logging is enabled.

**Step 4 - Create Dimension: Referrer by Session**
You configure a dimension to capture the referrer for the session. The referrer is the IP address from which the visitor left to begin the session on your web application.

### About this task

In this step, you configure a dimension to capture the referrer for the session. The referrer is the IP address from which the visitor left to begin the session on your web application.

There is a hit attribute for capturing the referrer, which tracks the previous page visited by the visitor for each hit. For this exercise, use the session referrer.

A session attribute is a variable associated with each session. Tealeaf provides a number of session attributes for your use and enables the configuration of up to 64 user-defined session attributes.

- See "TEM Session Attributes Tab" in the *IBM Tealeaf Event Manager Manual*.

In the following sequence, you create a dimension, which is populated by the `Referrer for Session` session attribute. This attribute is a default session attribute provided by Tealeaf. Call this new dimension `Referrer for Session`.

### Procedure

1. To open the Tealeaf Event Manager, select **Configure** > **Event Manager**.
2. In the Event Manager, click the Dimensions tab.
3. To create a new dimension, click **New Dimension**.
4. Set the name: `Referrer for Session`.
5. Set the Populated By value: `Referrer for Session` session attribute.
6. Set the Populated With value: `First Value in Session`.
7. For Values to Record, set the value to `Whitelist + Observed Values`.
8. For Default Value, select `[Others]`.
9. For Max Values Per Hour, you must adjust the setting based on traffic volume for your site.

   **Note:** If the accepted maximum for `Max Values Per Hour` is not already known, you must leave the default value. Depending on the volume of traffic to your site, setting it to a much higher value can increase data storage requirements.

   **Note:** For this dimension, you can not be able to configure an acceptable limit to generate a high-fidelity dataset.
10. Save your draft.
11. Save your changes and commit them.

### Results

Expected Results:

The dimension `Referrer for Session` is created.

**Step 5 - Create Report Group: IP Addresses**
Bring together the objects that you have created by creating a report group.

### About this task

You create a simple report group containing the `Client IP Address` and `Referrer for Session` dimensions.

A report group is an organizing structure for dimensions. In the Tealeaf Report Builder, you can include multiple dimensions in a report if they belong to the same report group. This structure enables efficient storage of dimensional data while maintaining flexibility in reporting.

- A report group may contain up to 4 dimensions.
- A dimension must belong to at least one report group.

This report group is then associated with the `Every Session` event.

To create the report group:

### Procedure

1. To open the Tealeaf Event Manager, select **Configure** > **Event Manager**.
2. In the Event Manager, click the **Dimensions** tab.
3. To create a report group, click **New Report Group**.
4. In the Add Report Group dialog, set the Name: `IP Addresses`.
5. If it is not already configured, set the Template to `Standard`.
6. Click **Add Dimensions**.
7. Select `IP Address` and `Referrer for Session` dimensions.
8. Click **Save Draft**.

   Report group `IP Addresses` is created.
9. In the Event Manager, click the **Events** tab.
10. Edit the `Every Session` event.
11. Click the **Report Groups** step.
12. Add the report group `IP Addresses` to the event.
13. Save your draft.
14. Save your changes and commit them.

### Results

Expected Results:

The report group `IP Addresses` is created and associated with the event `Every Session`. Since the event fires on each session once, the IP address and referrer values are captured into the dimensions in the report group. This information can be used as context for reporting.

**Step 6 - Test Active Sessions for Dimensions**
You can search for event + dimension combinations in active sessions. This method of search is useful for finding specific sessions that are based on narrowly defined dimensions.

### About this task

When the `Every Session` is triggered, the values for the dimensions, the IP address, and the referrer value, are also written into the request of the first hit of the session. So, this data is available as soon as the event is recorded, which is on the first page of every session.

The following steps show how to search for event + dimension combinations in active sessions. This method of search is useful for finding specific sessions that are based on narrowly defined dimensions.

To search for event + dimension combinations in active sessions:

### Procedure

1. As you did in a previous step, search active sessions for the `Every Session` event.

   As you did previously, leave the dimension as `<Any Dimension>`.
2. The list of returned sessions includes all active sessions where the `Every Session` event fired. This event is fired on the first page of a session. Now, the dimensions are configured to be recorded when the event fires, so you can quickly locate a session that contains the recorded dimensions.

   a) In the displayed list of sessions, click the **Send to Event Tester** icon ( ). In the dialog, you might want to change the Description to something easier to locate, such as `Test Session - Every Session`. Click **Send to Event Tester**. Click **OK** to go immediately to the Event Tester.
3. In the Event Tester, click the ( ) icon next to the session you want to begin testing. The session is evaluated.
4. In the Select Events tab, click the event label containing the `Every Session` event. Click the event to add it to the list of tested events. Do not select any other events.
5. Click the **View Results** tab.
   a) Expand the Events node to display the Every Session event.
   b) Expand the entry for Page 1.
   c) Expand the entry for the report group to which you assigned the two dimensions. See `IP Addresses`.

### Results

Expected Results:

If the two dimensions are displayed in the tested results, then they are being recorded with the event. In the above, the `Referrer for Session` value is set to a null value (`TLT$NULL`). In this case, no value was recorded for it.

**Step 7 - Create Report by using Every Session event**
After the event is tested and at least one hour is passed, you can create your first report by using the event.

### Before you begin

Before you continue with this step, you must wait at least one hour so that reporting data can be gathered and aggregated into the database. Data for your new event and dimensions is not available until it is aggregated into the database.

### About this task

In this step, you generate a report in the Tealeaf Report Builder that uses the `Every Session` event with the `IP Address` dimension added to the x-axis.

The Tealeaf Report Builder enables Portal users to create ad hoc reports by using events, dimensions, and ratios of their own choosing. The Report Builder uses the flexibility of data object creation to deliver critical analytical capability to the desktops of the users that are most informed about your web application.

### Procedure

1. To open the Tealeaf Report Builder, select **Analyze** > **Report Builder** from the Portal menu.
2. In the Report Builder, click the **Create New** button in the toolbar.
3. A new report is created.

4. To add an event, click **Add Event**. Add the `Every Session` event to the report.
   - If you did not assign an event group to the event, it is in the `Default` group.

     **Note:** If you create the `Every Session` event within the last hour, you might not see any data in the report.
5. Click the **Dimensions** tab. Click and drag the dimension `IP Address` to the x-axis.
6. When you add the IP address dimension, you might be prompted that the report is too large to display. Click **OK** for the moment.
7. Next to the IP address dimension, click the drop-down menu caret. Select **Filter**.
8. In the Dimension Filter dialog, select the `Top N` check box.

   For the Maximum Number of Values to Display, enter the number of top IPs to display. 25 is a good starting value.
9. Click **Apply**. The report is updated to show sessions for only the Top IP addresses.
10. To save the report, click the **Save** button in the toolbar. Enter the name `Top IP Addresses`.
11. Click **Save**. The report is saved.

    See "Tealeaf Report Builder" in the *IBM Tealeaf Reporting Guide*.

### Results

The `Top IP Address` report is created.

This report generates a simple list of the IP addresses visiting your site for the designated time period. The meaningful data in the report is the dimension `IP Address`.

- If you configured a Top N filter, only the top IP addresses are listed.

By adding the report group to other events, you can now create reports on those events that are filtered by the top values for `IP Address` and `Referrer for Session`.

You can modify the report to display the `Referrer for Session` dimension to identify top referrers. These steps are described later in this tutorial.

### Step 8 - Create a blacklist of IP Addresses from observed values

You can add the IP address to a blacklist for the dimension you created in order to prevent its appearance in reports using the dimension.

### About this task

Suppose you are able to identify that some of your "top" IP addresses are sourced from traffic in which you have no interest. For example, you may have been able to determine through extended user agent parsing that the IP address `76.21.18.170` is a bot crawling your site. You can add this IP address to a blacklist for the dimension you created in order to prevent its appearance in reports using the dimension.

For more information about extended user agent parsing, see "Tealeaf Reference Session Agent" in the *IBM Tealeaf CX Configuration Manual*.

To create a blacklist of IP Addresses from observed values:

### Procedure

1. To open the Tealeaf Event Manager, select **Configure** > **Event Manager**.
2. In the **Event Manager**, click the Dimensions tab.
3. Right-click the dimension `IP Address` and select **Edit Dimension...**.
4. In the Edit Dimension dialog, click **Edit Blacklist**.
5. Click **Download Log Values...**.
6. Open the downloaded file in Microsoft Excel.
7. Edit the list of log values into include only the items that you wish to add to your blacklist.

8. In the Edit Blacklist window, click **Import File...**.
9. Select the file you edited locally. Click **Import**.
10. The values are displayed in your blacklist. Click **Done**.
11. Save your draft.
12. Save your changes and commit them.

### Results

Expected Results:

After completing this step, the IP values in the blacklist do not appear in the report, starting at ten minutes past the next hour.

### Step 9 - Add Report to Dashboard

As needed, you can add the report that you created to a dashboard for display in the Portal.

### About this task

In this step, you add the `Top IP Addresses` report to a dashboard as a table from the Report Builder.

### Procedure

1. If not done already, create a dashboard where this report can be posted.
   a) To configure dashboards, select **Configure** > **Dashboard** in the Portal menu.
   b) Click the **Dashboards** link in the left navigation pane.
   c) To add a dashboard, click the + icon in the upper-right corner.
   d) Enter a name for the dashboard. For this scenario, the name is `E2E_TopIPdash`.
   e) Click **OK**.
   f) To save your dashboard, click **Save**.
   g) The dashboard `E2E_TopIPdash` is created. It is empty now.
2. To open the Tealeaf Report Builder, select **Analyze** > **Report Builder** from the Portal menu.
3. Click the **Open** button in the toolbar.
4. Open the `Top IP Addresses` report.
5. The `Top IP Addresses` report is displayed.
6. In the toolbar, click the **Add Report to Dashboard** button ( ) in the toolbar.
7. In the **Add Report to Dashboard** dialog, set the following values:
   a) Set Display: `Table`.
   b) Set Target Tab.
      - Select the `E2E_IPdash` dashboard.
      - Select the `Default` tab or other tab if you want to put it elsewhere.
      - Click **Select**.
   c) To add the report, click **Add**.
8. A success message indicates that the report is added to the dashboard.
9. In the Portal menu, select **Dashboard** > **More**.
10. In the Dashboard selector, select `E2E_TopIPdash`.

### Results

Expected Results:

The `Top IP Addresses` report is displayed in table format in the selected tab of the dashboard.

**Step 10 - Add Referrer Dimension to Report**
Optionally,you can reconfigure the `Top IP Addresses` report so that it represents the top IP address of your visitors for each referrer. This information is valuable in determining which sources of traffic are most valuable to your site.

**About this task**

To reconfigure `Top IP Addresses` report:

**Procedure**

1. To open the Tealeaf Report Builder, select **Analyze** > **Report Builder** from the Portal menu.
2. Open the existing `Top IP Addresses` report.
3. Save the report as a new name: `Top IP Addresses by Referrer`.
4. Add the `Referrer for Session` dimension to the X-Axis.
5. Click the **Options** button in the toolbar.
6. Set Report Title: `Top IP Addresses by Referrer`. Click **Apply**.
7. Save the report.
8. Add the new report to the same dashboard.

**Results**

Expected Results:

The report is saved with a new name and the `Referrer for Session` dimension added to it.

**Step 11 - Check Dashboard for new component and refreshed data**
Navigate to the dashboard where the `Top IP Addresses` report was previously added to verify that the new report is displayed.

**About this task**

To verify hat the new report is displayed:

**Procedure**

1. In the Portal menu, select **Dashboard** > **More**.
2. In the **Dashboard selector**, select `E2E_TopIPdash`.
3. Verify that both reports are added to the dashboard and are populated with data.
4. If not, click the refresh icon ( ) in the toolbar in the dashboard component to force a data refresh.

**Results**

**Expected Results:**

The report with `Referrer for Session` data is displayed.

## E2E Scenario - Configure Login ID to be Searchable

For web applications that use or require user authentication, capturing Login ID's can be a useful means for tracking visitor behavior.

While a Login ID is not a guaranteed indicator of a unique visitor, it does provide insight into the activities on your web application that are engaged through specific user accounts, which is useful for addressing customer service issues.

- Tealeaf recommends using the Tealeaf Cookie Injector to generate unique, persistent cookies for individual visitors.

As part of the installation, Tealeaf provides a number of pre-defined data objects that you can use for tracking basic activities, metrics, and other useful information about your web application. Among these are two objects for capturing Login IDs. This End-to-End Scenario describes how to configure the provided `Login ID` data objects for your web application's needs and then to surface that information in search through the Tealeaf Portal.

**Note:** For customers who have upgraded from Release 7.2 or earlier, the existing Login ID values in your system have been migrated to be stored in the `Login ID` session attribute in your upgraded system. However, you must still complete these steps in order to configure the hit attribute and event for tracking Login IDs.

As part of the set of provided data objects, Tealeaf includes a hit attribute, an event, and a session attribute for detecting the Login ID displayed in your web application.

- A hit attribute is used to define the set of characters in request or response data that demarcate an element of data that you want to track through an event.
- An event is triggered by a condition. In this case, the condition is the presence of the `Login ID` hit attribute. When this hit attribute is detected, the event is fired, which stores the Login ID value in the session attribute `Login ID`.
- A session attribute is a session-level variable that can be populated and updated based on events. The `Login ID` session attribute is the first one in your system. Tealeaf supports the creation of up to 64 session attributes.
- When the hit attribute for Login ID is detected, the event is triggered, and the session attribute `Login ID` is updated with the value.

The scenario begins with how to configure the `Login ID` hit attribute and test if the session attribute is being properly populated.

**Prerequisite steps for configuring Login ID to be searchable**

Before you configure Login ID to be searchable, you must review where the value of the Login ID for your web application is published in the response delivered to the visitor.

You can identify this information by logging into your publicly available version of the web application, navigating to a page where the Login ID is published, and then viewing the source of the page through your web browser.

In the web page source, you must locate a uniquely identifiable snippet of HTML code that appears just before the Login ID value and the HTML snippet that marks the end of the Login ID.

For example, Tealeaf Online Help display Login ID's in the HTML response that is returned to each authenticated visitor. This information is demarcated in the HTML code.

**Note:** If you are currently viewing this section through Tealeaf Online Help, you can view the source code of the HTML page through your browser.

In the HTML code delivered by Tealeaf Online Help, the Login ID's look like the following:

```
<input type="hidden" id="userID" value="nobody@tealeaf.com" />
```

In the above snippet, the markers to identify the login would be the following:

- Start Tag: `<input type="hidden" id="userID" value="`
- End Tag: `" />`

The Start Tag and End Tags to uniquely identify the Login ID published on the pages of your web application must be known before you can complete this scenario.

**Note:** The login ID for your web application can be more easily extracted from the request of a hit. Where it appears depends on your web application and how Tealeaf is configured. For more information, contact your web development team.

**Step 1 - Configure Hit Attribute Login ID**
Most of the Tealeaf End-to-End Scenarios begin with creating or configuring the required data objects in the Tealeaf Event Manager.

### About this task

The Tealeaf Event Manager is a Portal-based interface for creating the data objects required to detect important data values concerning user behavior, site performance, and other key metrics and to generate searchable and reportable events from them.

This first step requires the configuration of the `Login ID` hit attribute provided by Tealeaf to identify the login identifiers published in each page of your web application.

**Note:** If you have upgraded from Release 8.0, you may need to create this hit attribute. You can complete the same steps below, creating the attribute instead of editing the pre-existing one.

### Procedure

1. Login to the Tealeaf Portal as an administrator.
2. From the Portal menu, select **Configure** > **Event Manager**. The Tealeaf Event Manager is displayed.
3. In the Tealeaf Event Manager, click the **Hit Attributes** tab.
4. Locate the `Login ID` hit attribute.
   - You can filter for the hit attribute by entering `Login ID` in the Filter Hit Attributes entry box in the left column.
5. Right-click the `Login ID` hit attribute and select **Edit Hit Attribute...**.
6. In the Edit Hit Attribute window, configure the following properties:
   a) Name: Leave this value as `Login ID`.
   b) Description: Enter a meaningful description here.
   c) Active: Set to `true`.
   d) Search In: Set to `Response` if login ID's are published in the pages delivered to your visitors. Otherwise, if it appears in the request, set this value to `Request`.
      - Depending on your web application and Tealeaf configuration, the login ID may be in the Request instead of the Response.
   e) Select `Use Start Tag/End Tag`.
   f) Start Tag: Enter the value of the start tag as specified in your web application.
   g) End Tag: Enter the value of the end tag as specified in your web application.

      **Note:** In a tag, you may use `\r` for carriage return and `\n` for line feed.
      - All lines in the Tealeaf request are separated by `\r\n`, so they can be used to indicate the start and end of lines.
      - The line separator used in the response is controlled by your application's code. It may contain `\r`, `\n`, or both.

      **Note:** If you want to reduce the memory usage of a hit attribute, set All Matches to `false`. Only the first instance of the hit attribute is tracked; all other instances on the page are ignored.
7. Save your draft.
8. Save your changes and commit them.

### Results

**Expected Results:**

The `Login ID` hit attribute is configured with the Start and End tags to track login identifiers for your web application.

**Step 2 - Review and configure Login ID sample event**
Review the provided event `Login ID Sample` to verify that it is properly configured.

### About this task

A key step in the review is to verify that it is supplying values to record to the `Login ID` session attribute.

This session attribute is included by default in all new installations. However, it is not enabled at startup. Those steps are included.

When you finish the configuration, the data flow look like the following line:

```
Login ID hit attribute > Login ID Sample event > Login ID session attribute
```

**Note:** It is possible that the session attribute is modified to suit another purpose. If you verify that it is being used differently than expected, you must create another session attribute to store the output of the `Login ID Sample` event.

### Procedure

1. In the Tealeaf Event Manager, click the **Events** tab.
2. Locate the `Login ID Sample` event.
   - You can filter for the event by entering `Login ID` in the Filter Events entry box in the left column.
3. In the Icon column, you can see the icon that is displayed in the Portal when the event is fired. Remember this icon.
4. Right-click the event and select **Edit Event...**.
5. The Event Wizard is displayed. Verify the following information:
   a) Summary information:
      1) Set Evaluate On to `Every Hit`. Depending on how your application is constructed, the login identifier can be first displayed on any page in the session.
      2) Set Track to `First Per Session`.
      3) Set Value Type to `Text`.
      4) Select the **Active** check box.
      5) Searchable and Reportable: `false`
         - When set to `true`, this option enables the storage of the event data in the database. For this scenario, however, you must assign a session attribute to track this information.
         - If you do enable this option, then the `Display in Portal` option is enabled. If that option is selected, then the `Display in Session List` option becomes available.
   b) Click the **Condition** step:
      1) The hit attribute that is listed as the only condition for the event must be `Login ID`.
      2) The action is set to `First Value` must be tested. This value must be set to `Is not empty`.
   c) Click the **Value** step. The following properties and values should be specified:
      1) If the listed value to record is not set to the `Login ID` hit attribute, then click **Select...**.
      2) Select the `Login ID` hit attribute.
      3) Set the value for the item to record to be `First Match per Hit`.
   d) Click the **Report Groups** step.
      1) In this step, you can configure the report group that is associated with the Login ID event. Report groups contain dimensions, which are defined contextual information that can be captured and associated with an event occurrence. For purposes of this exercise, you do not must configure report groups.

e) Click the **More Options** step.

f) Next to Update Session Attribute, click **Select...**. Select or create the Login ID session attribute.

6. To save your draft, click **Save Changes**.
7. Save your changes and commit them.

**Results**

Expected Results:

The event `Login ID Sample` is configured to use the hit attribute `Login ID` as a condition. The values that are detected update the session attribute `Login ID`.

**Step 3 - Configure Session List Template for Login ID**
After you create the data objects, you can configure your session list template so that these values are surfaced in the Portal.

**About this task**

In the subsequent step, you will locate a session that contains a populated Login ID value.

**Note:** The standard session list template includes the Login ID column. If you do not want to add this column to a different session list template, then you can skip this step.

**Procedure**

1. In the Portal menu, select **Configure** > **Search Templates**.
2. Click the **Session List Templates** tab.
3. In the **Session List Templates** tab, click **Standard Template**.
4. The fields in the standard session list template are displayed.
5. Look for the Login ID field.
6. If Login ID is listed:
   a) Select it and click **Edit**.
   b) In the Configure Session List Column dialog, verify the following properties:
      1) Title: `Login ID`
      2) Type: If this drop-down is present, select `cxImpact`.
      3) Field: `Session Attribute Value`
      4) Attribute: The name of the session attribute that you created or modified to store the value of the login identifier (e.g. `Login ID`).
      5) Operation: `<Display Field Value>`.
      6) Leave **Contains Large Text Values** cleared.
      7) If you made changes to the above properties, click **Save**.
7. If Login ID is not listed:
   a) Click **All Columns**.
   b) In the **Configured Session List Columns** dialog, click the + icon.
   c) In the **Configure Session List Column** dialog, create the new session list column. Be sure to specify the properties and values described in the verification step above.
   d) Click **Save**.
   e) In the **Configured Session List Columns** dialog, select the new Login ID field and click **Add to Template**.
   f) The newly created session list column has been added to the selected session list template.

### Results

Expected Results:

A session list column containing the recorded Login ID session attribute value is added to a selected session list template.

### Step 4 - Test Login ID Hit attribute and event

After you have created or configured the hit attribute, event, and session attribute for `Login ID`, you can test that they are properly configured and captured from your web application.

### About this task

**Note:** Tealeaf must be currently capturing and analyzing data from your web application.

You may also test events and hit attributes in the Event Tester.

To test the Login ID Hit attribute and event:

### Procedure

1. Login to the version of the web application that you're monitoring using a login ID that is unique and not used by others.
2. Navigate to a page where the Login ID is populated.
   - When the page is captured by Tealeaf and processed in the Short Term Canister, the `Login ID` hit attribute on the page is detected, and the event is fired on the page in your captured session. The login ID value is recorded in the session attribute and can now appear in the session list template you configured.
   - Within a minute or two, the data should be available in Tealeaf.
3. From the Tealeaf Portal menu, select **Active** > **Sessions**.
4. In the Active Sessions page, in the displayed session list template the Login ID column for one of the sessions should be populated by the Login ID value that you used to login. Also, you should see the icon for the `Login ID` event in the Events column.
   - If the Login ID column or Events column does not appear in the page, select the session list template that you modified in the previous step from the drop-down in the upper-right corner.
5. If the test fails, verify that the Start Tag and the End Tag for the hit attribute match **exactly** the HTML output from your web application.
   a) You must edit the hit attribute again.
   b) You can then rerun the sequence in this step to verify that the data is being captured properly.

### Results

Expected Results:

The session you were creating is displayed the list of active sessions. In the list of fields in the session list template is the Login ID column, which contains the value for the login identifier that you used to create the session.

Since this value is populated by the `Login ID` session attribute, you have verified that it is being properly populated by the event, which is triggered by the hit attribute.

### Step 5 - Configure Search Template for Login ID

After you verify the capture and storage of the Login ID value to the `Login ID` session attribute, you might want to enable searching for the session attribute in active and completed session data.

#### About this task

For example, for customer service representatives in your organization, you might want to add the Login ID session attribute to the default Active search template, so that they can review sessions with customers on the phone who are still navigating the web application.

- Search for active sessions and for completed sessions uses different search templates. You can repeat this step for each type of search template.
- To begin, you must add it to an Active search template first, since you can immediately search for data against the active session that you already created.

#### Procedure

1. In the Portal menu, select **Configure** > **Search Templates**.
2. Click the **Search Templates** tab.
3. In the Search template configuration page, select the type of search template in which to add the**Login ID** field. For this example, you can click the Active node. Select **<Default Active**.
4. The search fields in the template are listed in the right pane. If Login ID is not included in the search template, complete the following steps:
   a) Click **Search Fields**.
   b) In the Configured Search Fields dialog, scan the list for `Login ID`.
   c) If the field is available, select it and click **Add to Template**. Skip the remaining steps in this sequence.
   d) If it is not available, complete the following steps:
      1) Click the + icon. In the Configure Search Field dialog, you must specify the following properties:
         a) Name: Enter a name for the search field (for example, `Login ID`).
         b) Input Type: Select `Free Text`.
         c) Keyword: Select `Session attribute`.
         d) MD5 Hashing: Select `Disabled`.
         e) Attribute: Click **<Select an attribute**. In the Attribute Selector, select `Login ID` and click **Select**.
         f) Click **Save**.
      2) In the **Configured Search Fields** dialog, click **Add to Template**.
      3) Close the window.
   e) Click **Save**. The new field is added to the selected search template.
5. You might want to repeat the previous steps to add the `Login ID` session attribute field to search templates of the other types (Completed and All Sessions).

#### Results

Expected Results:

The `Login ID` field is added to one or more search templates.

**Step 6 - Search for Login ID**
Use the newly added search field `Login ID` to search for Login ID values.

**About this task**

To search for Login ID values:

**Procedure**

1. To test the search template, select **Search** in the Portal menu, followed by the type of search template.
   - If you have added it to a Completed session search template only, you may have to wait until your sample session is closed by you or times out and the session is processed by Tealeaf.
2. In the **Search**page, check the search template in use. If it is not the one that you edited, click the **Search Template** link and select the edited search template.
3. In the**Search** page, the **Login ID** field should be available. Click the **Login ID** field to add it the search criteria.
4. Enter the value for the login identifier that you used to create your session.
5. Click **Search**.
6. Your created session should be displayed in the **Search Results** page.
7. If you cannot see the Login ID column, select the session list template that you modified from the drop-down.

**Results**

Expected Results:

You are able to search using the `Login ID` value you used to create your session and to find the session in the displayed search results.

This scenario is complete.

**Next Steps**
If required, you can create a dimension to track whether or not the `Login ID Sample` event occurred during a session, which can be useful in segmenting your reports between registered visitors and non-registered ones.

## E2E Scenario - Create Conversion Rate Dashboard

An important metric of any web application is the conversion rate of each key business process. The conversion rate measures the percentage of users that finish a business process after it is began.

For example, in many web e-commerce applications, the sales conversion process begins when a visitor loads an item into their shopping cart and proceeds to checkout. The conversion rate for this purchase process, then, is measured as the visitors who purchase the items in their shopping cart as a percentage of the visitors who begin the checkout process.

In this scenario, you create the data objects that are required to build a meaningful report on conversion rates for the checkout process of a web application. For the example web application, this scenario steps through the process of creating the objects and the reports necessary to surface conversion rates on the checkout process.

Then, this report is inserted into an existing dashboard and configured for email delivery. If emailed on a daily basis, you can quickly generate a snapshot of order conversion rates and deliver them to stakeholders first thing in the morning.

The steps in this report can be generalized to configure reports and dashboard components for multiple interrelated events and ratios.

**Overview**
This section introduces the example Strauss & Presser web application, including the prerequisites and checkout process.

***Example Web Application - Strauss & Plesser***
In this scenario, we are going to create objects that are based on a fictitious retail site named Strauss & Plesser web application.

***Prerequisites for running the scenario to create a conversion rate dashboard***
This scenario requires that extended user agent parsing be enabled in your Tealeaf solution. Extended user agent parsing enables the capture of user agent information from the visitor's browser.

This string-based information is used to look up against a public standard, which provides much greater detail.

Extended user agent parsing can already be enabled in your Tealeaf solution.

Extended user agent parsing is a component of the Tealeaf Reference session agent, which must be deployed in your Windows pipeline.

***Example Process - High-level overview of checkout process***
Use this topic to understand the checkout process.

Suppose that your web application is an e-commerce site with a simple checkout process.

*Table 96. Example Process - Checkout*

| Sequence | Page | Description |
|---|---|---|
| | Add to Cart | Whenever the customer clicks Add to Cart, this page is displayed. This page is not part of the checkout process but can be the referrer to the Checkout page. |
| | Checkout method | Choose whether to check out as a registered user or guest. On Strauss & Plesser, this step can or cannot be part of the checkout process, as visitors are not required to select one of these options; if no option is selected, then the visitor is automatically processed as a guest. For our purposes, this page is not part of the formal checkout process. |
| 1 | Billing | Customer enters billing address. |
| 2 | Shipping | Customer enters shipping information, if different from billing information. |
| 3 | Shipping Method | Customer enters preferred shipping method. |
| 4 | Payment | Customer enters billing information. Check/ Money order or credit card accepted. |
| 5 | Order Review | Last chance to review order before it is submitted. When the customer clicks Place Order, the order is processed. |
| 6 | Confirmation | Confirmation page with order ID is presented to customer. Process is complete. |

The flow of pages is a basic business process. In the steps below, you can see the process steps in detail, followed by the steps to create the Tealeaf data objects to track this process.

For purposes of this exercise, a conversion rate is measured only for a pair of the following two events:

- **`Checkout - Start`**. The checkout process is began. On Strauss & Plesser, this step occurs when the customer enters billing information.
- **`Checkout - Order Confirmation`**. The order was completed, and a success message was returned to the visitor. On Strauss & Plesser, this step occurs when the**Confirmation** page is displayed, containing an order number.

For more detailed reporting, you might want to create the more events to track all steps in the process.

*Add to Cart*
Through the product pages, you can add items to your shopping cart.

In this case, you added a Sony laptop to your Strauss & Plesser shopping cart:

*Figure 53. Example site - Add to Cart*

When the **Add to Cart** button is clicked, the item is added to the cart, which is displayed:

*Figure 54. Example site - Shopping Cart*

*Checkout Method*
Depending on whether you login to the site, you mightbe prompted to choose the account under which you are checking out.

In the following example, you are checking out of Strauss & Plesser as a registered user, Joe Customer:

**Note:** The workflow on your web application might not include this site. Customers might be required to login before they add products to a shopping cart, for example.

*Figure 55. Example site - Checkout Method*

*1 - Billing*
The first formal step of the checkout process is to review or enter your billing information as shown in this topic.

*Figure 56. Example site - Billing*

*2 - Shipping*
After reviewing the billing information, you determine your shipping method.

You can enter shipping information, if different, or you confirm your listed shipping information:

*Figure 57. Example site - Shipping*

*3 - Shipping Method*
You can select the method by which your order is shipped.

On Strauss & Plesser, only one option is available for the selected Sony product:

*Figure 58. Example site - Shipping Method*

*4 - Payment*
After selecting a shipping method, choose how you want to pay for your order.

On Strauss & Plesser, check, money order, or major credit card is "accepted":

**Note:** Credit card information is not captured on Strauss & Plesser.

*Figure 59. Example site - Payment*

*5 - Order Review*
After you enter all applicable shipping and billing information, you can review your order one last time before you place the order.

To place the order on Strauss & Plesser, click **Place Order**:

**Note:** Strauss & Plesser is a fictitious web application. No order is actually placed for products.

*Figure 60. Example site - Order Review*

*6 - Confirmation*
When the order is "processed," a confirmation page is displayed, including your confirmation order number.

*Figure 61. Example site - Confirmation*

*Other Checkout Activities to Track*
In addition to the standard checkout activities, there are other activities that can be performed at checkout time as described here.

The following checkout time activities can be useful to track on your web application. You can see examples and how they occur on the Strauss & Plesser web application.

**Note:** Configuring these items is outside the scope of this scenario.

*Table 97. Other Checkout Activities to Track*

| Action | Description | Strauss & Plesser |
|---|---|---|
| Clear shopping cart | Remove contents of the shopping cart. | On the **Shopping Cart** page, set all values to `0` and click **Update Shopping Cart**. |
| Remove from shopping cart | Remove one selection from the shopping cart. | On the **Shopping Cart**page, click **Remove Product**. |

| *Table 97. Other Checkout Activities to Track (continued)* | | |
|---|---|---|
| **Action** | **Description** | **Strauss & Plesser** |
| Continue shopping | After the shopping cart is cleared or a purchase is completed, visitors can choose to continue looking for things to buy. | On various pages, click **continue shopping** link. |

Now, you create the data objects to track this process.

**Step 1 - Create Dimension: Browser Platform**
You can create a dimension that is based on a hit attribute, which is a pattern of text that is detected in either the request or the response of a hit.

### About this task

This step creates a dimension that is called `Browser Platform` from an existing hit attribute `Browser OS`.

- This attribute is provided by Tealeaf.

A dimension is a piece of contextual information that can be recorded when an event occurs. In this example, when an event associated with this dimension occurs, the browser platform information, which can include entries for Windows or Macintosh operating systems, is also recorded with the event for reporting purposes.

In this step, you create the dimension that is based on a hit attribute, which is a pattern of text that is detected in either the request or the response of a hit. In this case, the Browser OS hit attribute is preconfigured to detect the presence of a value indicating the operating system.

- This value is inserted by extended user agent parsing.

The following steps provide the basics for how to create this dimension. You might have already created it in another End-to-End Scenario, where more detail is provided.

- See "E2E Scenario - Create Top Products Dashboard" in the *IBM Tealeaf cxImpact User Manual*.

### Procedure

1. In the Tealeaf Event Manager, click the **Dimensions** tab.
2. Click **New Dimension...**.
3. In the **Name** field, enter `Browser Platform` and in the **Populated by** field, select `Browser OS`.
4. Click **Save Draft**.

   See "TEM Dimensions Tab" in the *IBM Tealeaf Event Manager Manual*.

### Results

The new dimension is listed in the Event Manager, highlighted in red because it is not yet saved to the server. It is saved in a later step.

**Step 2 - Create Dimension: Browser Version**
You can create a dimension from an existing hit attribute `Browser Version`.

### About this task

This attribute is provided by Tealeaf and is captured when extended user agent parsing is enabled.

This dimension captures the version of the browser that the visitor is using to browse your web application. This information can be useful for debugging browser-specific issues, which can directly impact revenue in the checkout process.

The steps below provide the basics for how to create this dimension. You may have already created it in another End-to-End Scenario, where additional detail is provided.

See "E2E Scenario - Create Top Products Dashboard" in the *IBM Tealeaf cxImpact User Manual*.

### Procedure

1. In the Tealeaf Event Manager, click the **Hit Attributes** tab.
   - Right-click hit attribute `Browser Version` and select **Create Dimension Using Hit Attribute...**.
   - Enter Name: `Browser Version`.
2. Click **Save Draft**.

   See "TEM Dimensions Tab" in the *IBM Tealeaf Event Manager Manual*.

### Results

The new dimension is listed in the **Event Manager**, highlighted in red because it has not yet saved to the server. It is saved later.

**Step 3 - Create Report Group: Browser Platform & Version**
Use this step to create a report group `Browser Platform & Version`, which contains these dimensions: `Browser Platform`, `Browser Version`.

### About this task

A report group is an organizing structure for dimensions. In the Tealeaf Report Builder, you can include multiple dimensions in a report if they belong to the same report group. This structure enables efficient storage of dimensional data while maintaining flexibility in reporting.

- A report group can contain up to four dimensions.
- A dimension must belong to at least one report group.
- See "TEM Dimensions Tab" in the *IBM Tealeaf Event Manager Manual*.

The following steps provide the basics for how to create this dimension.

- See "E2E Scenario - Create Top Products Dashboard" in the *IBM Tealeaf cxImpact User Manual*.

### Procedure

1. In the Tealeaf Event Manager, press the CTRL key and select both dimensions `Browser Platform` and `Browser Version`.
2. Right-click and select **Create Report Group Using Dimension(s)...**.
3. Enter:
   - Name: `Browser Platform & Version`
4. If the **Template** drop-down is present, select **Standard**.
5. Click **Add Dimensions**.
   a) Add the `Browser Platform` dimension.
   b) Add the `Browser Version` dimension.
6. Click **Save Draft**.
7. To commit all of your changes to the server, click **Save Changes**. The changes are now part of the live event objects.

   See "TEM Dimensions Tab" in the *IBM Tealeaf Event Manager Manual*

### Results

The `Browser Platform & Version` report group is defined with the two new dimensions in it.

**Step 4 - Locate session with shopping cart value**
You must locate a session in which products have been added to the shopping cart. Through Browser Based Replay, you can then create a hit attribute to detect for the presence of a shopping cart value.

### About this task

To locate a session in which products have been added to the shopping cart:

### Procedure

1. In the Tealeaf Portal, select **Search** > **Completed Sessions**.
2. In the Completed Session Search page, add the following two search terms:
   a) Basic Search Fields: `Text In Response`
      - Specify that the response includes a product that has been ordered. In the Strauss & Plesser site, the `Sony VAIO` laptop product has been added as part of the data creation section above.
   b) Page Information: `Page URL`
      - Set this value to include the Order Review or Order Confirmation page. In our example, this URL is the following:

        ```
        http://www.straussandplesser.com/store/index.php/checkout/
          onepage/reviewOrder
        ```

      - Because of the way URLs are indexed, the entire URL text is not a useful, searchable item. When you enter URLs in the search fields, you should enter only the uniquely identifiable component of the URL. In our example, this text is the following:

        ```
        reviewOrder
        ```

3. To submit the search, click **Search**.

### What to do next

The list of sessions that are displayed represents a good data set for the next step that follows.

**Step 5 - Saving Searches**
This list of sessions can be useful for evaluation purposes later in this scenario.

### About this task

You might want to access this list at a later time. There are multiple ways of retrieving the search:

### Procedure

1. At the bottom of the session list, you must see a query string that looks like the following:

   ```
   (response contains "Sony VAIO") AND (url contains reviewOrder)
   ```

   This value can be inserted into the All Text field in the search page to re-execute the same query. Remember to specify the appropriate search scope.

   - See "Searching Session Data" in the *IBM Tealeaf cxImpact User Manual*.
2. Through the search page, you can save configured searches.
   - See "Searching Session Data" in the *IBM Tealeaf cxImpact User Manual*.

3. Depending on your configuration settings, this search may be automatically saved for you as a session segment. A **session segment** is a set of sessions that can be collectively reviewed and analyzed for reporting.
   - To review session segments, click **Manage Segment** in the session list. Or you may select **Analyze** > **Segments** > **Manage Session Segments**. If IBM Tealeaf cxImpact has been configured to create a session segment for each search, your search should be listed in the page. See "Managing Session Segments" in the *IBM Tealeaf cxResults User Manual*.

     **Note:** Depending on the products you licensed or the permissions in your account, the above menu item may not be available. For more information, please contact your Tealeaf administrator.
   - For more information about enabling the auto-creation of session segments, see "CX Settings" in the *IBM Tealeaf cxImpact Administration Manual*.

**Step 6 - Create Hit Attribute: Shopping Cart Value**
Use Browser Based Replay to create a hit attribute that is called `Shopping Cart Value`, which is configured to acquire the shopping cart value whenever it is displayed in your web application.

### About this task

See "CX Browser Based Replay" in the *IBM Tealeaf cxImpact User Manual* .

To create the hit attribute:

### Procedure

1. From the list of sessions that are returned in the search from the previous step, click the replay ( ) icon. Select **Browser**.
2. The session is opened in Browser Based Replay. See "CX Browser Based Replay" in the *IBM Tealeaf cxImpact User Manual*.
3. Scan the session to find a page in which the shopping cart value is displayed. The **Cart Subtotal** value is the desired value.
4. Highlight the value. Remember it. Then, right-click it and select the option that displays the HTML source of the page. This selection varies between browsers.

   **Note:** If you choose to create a hit attribute from the selection, the Event Manager specifies a hit attribute that is looking for the highlighted text, instead of the patterns of text that surround the value.
5. In the document source, scan for the shopping cart value. On Strauss & Plesser, the following HTML specifies the shopping cart value in the page:

```
<p class="subtotal">Cart Subtotal: <strong><span class="nobr">
$ 1,199.99</span></strong>
</p>
```

6. From the above, we can deduce that the tag that uniquely prefaces the current value for the shopping cart is:

```
<p class="subtotal">Cart Subtotal: <strong><span class="nobr">$
```

   - In the above, there is a space after the $.
7. Similarly, we can deduce that the tag that uniquely identifies the conclusion of the current value of the shopping cart is:

```
</span></strong>
```

8. Click **Cancel** to close the document source.
9. Now, highlight the value of the shopping cart. Right-click and select **Create new hit attribute from selection...**.
10. The Event Manager opens, displaying a preconfigured hit attribute definition to identify the specific value of the shopping cart. This hit attribute must be modified to locate the start tag and end tag that uniquely identify the presence of the shopping cart value on the page. Please make the following changes to the properties:
    - Name: `Checkout - Shopping Cart Value`
    - Description: Something meaningful to indicate that this is the shopping cart value from the checkout process.
    - Click the **Use Start Tag/End Tag** radio button.
    - For Strauss & Plesser, the Start Tag value is:

      ```
      <p class="subtotal">Cart Subtotal: <strong><span class="nobr">
      ```

    - For Strauss & Plesser, the End Tag value is the:

      ```
      </span></strong>
      ```

11. Leave other options as defaults.
12. To save your draft, click **Save Draft**.
13. To commit all of your changes to the server, click **Save Changes**.

    See "TEM Hit Attributes Tab" in the *IBM Tealeaf Event Manager Manual*.

### Results

The new hit attribute is displayed in the list in Tealeaf Event Manager.

### Step 7 - Create Event: Shopping Cart Value

Use this step to create an event that uses the `Shopping Cart Value` hit attribute as a condition input.

### Procedure

1. In the Tealeaf Event Manager, select the **Events** tab.
2. Click **New Event**.
3. The New Event dialog is displayed. Enter the following information:
    - Name: `Shopping Cart Value`
    - Evaluate On: `Every Hit`.
    - Track: `Last per Session`.

      **Note:** As configured, this event tracks the last value for the shopping cart value in the session. In most sessions, this value is the value that was purchased. However, it is possible for the visitor to make two distinct purchases in a single session. The first one cannot be captured.
    - Value Type: `Numeric`.
    - Active: selected.
    - Searchable & Reportable: selected.
4. For the Condition step:
    - Add Hit Attribute: `Shopping Cart Value`
    - From the fields, select `Hit Attribute Found`and `IsTrue`. The condition parameters are configured.

5. For the Value step:
   - Click **Select Item to Record**. Select the Hit Attribute: `Shopping Cart Value`. Set the value to `Last Match per Hit`.
   - Leave other options as defaults.
6. For the Report Groups step:
   - Add the `URL/Host/App/Server` report group.
7. You do not make any changes in the **More Options** tab.
8. Click **Save Draft**.
9. To commit your changes to the server, click **Save Changes**.
   - See "TEM Events Tab" in the *IBM Tealeaf Event Manager Manual*.

#### Results

The Shopping Cart Value event is added to the list in the Event Manager.

**Note:** The value that is recorded is the last value per session.

### Step 8 - Create Dimension: Shopping Cart Value

Use this step to create a dimension to capture the Shopping Cart Value.

#### About this task

To match the values generated by the event, which tracks the last instance in the session, you must base this dimension off of the event `Shopping Cart Value`, instead of the hit attribute.

#### Procedure

1. In the Tealeaf Event Manager, click the Dimensions tab.
2. Click **New Dimension...**.
3. Configure the following properties:
   - Name: `Checkout - Shopping Cart Value`.
   - Description: Add a user-friendly description.
   - Populated By: Click **Select...**. Navigate to select the `Checkout - Shopping Cart Value` event.
   - Populated With: Select `Last Value in Session`.
4. Click **Save Draft**.

   See "TEM Dimensions Tab" in the *IBM Tealeaf Event Manager Manual*.

#### Results

The new dimension is displayed in the Event Manager highlighted in red because it has not yet been saved to the server. It will be saved in a later step.

### Step 9 - Create Event: Checkout - Start

Use this step to create the events to identify the checkout process.

#### About this task

These events are then used in the dashboard as milestones for purposes of calculating the conversion rate.

This step creates an event from BBR to mark the start of the checkout process: `Checkout - Start`.

### Procedure

1. To begin, you must find a session in which the visitor began the checkout process and was able to complete the order.
   - If you saved your previous search, you can be able to use it to find an appropriate session.
2. Open the session in BBR. Go to the page where the visitor began the checkout process.
3. To switch to request mode in BBR, click **Request** in the toolbar.
   - Highlight the entire URL name/value pair in the request: In our Strauss & Plesser example:

     ```
     TLT_URL=/store/index.php/checkout/onepage/defaultpage
     ```

   - Right-click and select **Create New Event From...**.
4. The **New Event** dialog in the Event Manager is displayed with some fields populated. Populate the following fields.
   a) For the Event Summary:
      1) Event Name: `Checkout - Start`.
      2) Evaluate On: `Every Hit`.
      3) Track: `First per Session`.
      4) Value Type: `Count Only`.
      5) Active: selected.
      6) Searchable & Reportable: selected.
   b) For the Condition step:
      1) Verify that the Hit Attribute condition is set to URL (Normalized) including the correct value.
      2) Select `First Value` and `Includes` from the drop-downs.
   c) For the Value step, no additional parameters require configuration.
   d) For the Report Groups step:
      1) Add the report group: `Browser Platform & Version`.
   e) For the More Options step, no additional parameters require configuration.
5. Click **Save Draft**. The new event is shown in the list in the Event Manager, highlighted in red.
6. To commit your changes to the server, click **Save Changes**.
   - See "TEM Events Tab" in the *IBM Tealeaf Event Manager Manual*.

### Results

The event `Checkout - Start` is created.

**Step 10 - Create Event: Checkout - Order Confirmation**
Use this step to create an event from BBR to identify when the order is completed, which indicates a complete sales conversion: `Checkout - Order Confirmation`.

### Procedure

1. You can use the session from the previous section, if it includes the order complete step.
   - Otherwise, you might have to search again.
   a) Restore the browser window where the session is opened.
   b) In the toolbar, click **Replay**.

c) Scroll through the pages until you see the order confirmation page. Highlight an indicator on the page that identifies for the visitor that the purchase is completed. For example, in Strauss & Plesser, this confirmation is displayed in the following URL as recorded in the request:

```
TLT_URL=/store/index.php/checkout/onepage/success/defaultpage
```

**Note:** In some cases, there can be a uniquely identifiable message in the response, such as Thank `you for your purchase`. However, if someone makes the minor change to Thanks `for your purchase`, your event does not capture the change. You must configure it to track the uniquely identifiable object that is least likely to change without notice.

2. Right-click this message and select **Create New Event From...**. The **New Event** dialog is displayed, with fields populated. Configure the following properties:
   a) For the Event Summary:
      1) Enter Name: `Checkout - Order Confirmation`
      2) Evaluate On: `Every Hit`.
      3) Value Type: `Count Only`
      4) Tracked: `Last Per Session`.
   b) For the Condition step:
      1) Verify that the Hit Attribute condition is set to URL (Normalized) includes the correct value.
      2) Select `First Value` and `Includes` from the drop-downs.
   c) For the Value step, no additional configuration is required.
   d) For the Report Groups step:
      1) Add the report group: `Browser Platform & Version`
   e) For the More Options step, no additional configuration is required.
3. Click **Save Draft**. The event is shown in the list in the Event Manager, highlighted in red.
4. To commit your changes to the server, click **Save Changes**.
   - See "TEM Events Tab" in the *IBM Tealeaf Event Manager Manual*.

### Results

The new event `Checkout - Order Confirmation` is added.

### Step 11 - Create Other Events in Checkout Process

You can create other events in the checkout process. For higher fidelity reporting, you might want to create events for the intermediate steps in the checkout process.

### About this task

Already, you create the events to track the start and end of the process. Following are the steps in the checkout process, as reflected in Strauss & Plesser.

*Table 98. Step 11 - Create Other Events in Checkout Process*

| Step Number | Step Name | Description |
|---|---|---|
| 2 | Shipping | Customer enters shipping information, if different from billing information. |
| 3 | Shipping Method | Customer enters preferred shipping method. |

| *Table 98. Step 11 - Create Other Events in Checkout Process (continued)* | | |
|---|---|---|
| **Step Number** | **Step Name** | **Description** |
| 4 | Payment | Customer enters billing information. Check/ Money order or credit card accepted. |
| 5 | Order Review | Last chance to review order before it is submitted. When customer clicks **Place Order**, the order is processed. |

Depending on the structure of the checkout process of your web application, it may be a good idea to create the events to detect these pages. Below, a set of steps are provided to identify when the customer has visited the Order Review page.

### Procedure

1. In the Event Manager, click **New Event...**.
2. The **New Event** dialog appears, with fields populated. Configure the following settings:
   - For the Event Summary:
     - Enter Name: `Checkout - Order Review`
     - Value Type: `Count Only`
     - Track: `Last Per Session`.
   - For the **Condition** step:
     - Hit Attribute: `URL (Normalized)`
     - Select `First Value` and `Includes` from the drop-downs.
   - For the **Value** step, no additional configuration is required.
   - For the Report Groups step:
     - Add the report group: `Browser Platform & Version`
   - For the **More Options** step, no additional configuration is required.
3. Click **Save Draft**. The event is shown in the list in the Event Manager, highlighted in red.
4. To commit your changes to the server, click **Save Changes**.
   - See "TEM Events Tab" in the *IBM Tealeaf Event Manager Manual*.

### Results

Events to monitor the occurrence of all steps in the checkout process have now been created.

The listed in this topic can be repeated for each step in the checkout process, changing the Name, Description and URL for each event as needed.

## Step 12 - Create Report

You can create a simple report that tabulates the sum of completed orders, as reported by the event `Checkout - Order Confirmation`.

### Before you begin

Before creating a report, you must complete all of the previous steps in this scenario.

### About this task

**Note:** Allow sufficient time for the events to fire and to record data that can be captured in reports. This time can vary between 1 hour and 24 hours, depending on the volume of traffic to your website.

To create a simple report that tabulates the sum of completed orders:

### Procedure

1. In the Tealeaf Report Builder, click the **New** button to clear the report.
2. Click **Add Event**.
3. Select the event `Checkout - Order Confirmation`. The Complete Order event is added to the report.
4. In the **Event** drop-down menu, select **Rename**.
   - Enter the name as: `Transaction Counts`. The event display name is changed.

     **Note:** This renaming only changes the name of the event as it is displayed in this report. It does not affect the name of the event elsewhere in Tealeaf.
5. In the event drop-down, click **Add Function** > **Previous Days Average**.
6. The function is added. Select the function drop-down. Then, select **Function Period** > **7**.

   See "Tealeaf Report Builder" in the *IBM Tealeaf Reporting Guide*.

### Results

The report is created, including the event `Checkout - Order Confirmation`, which is renamed for display purposes to `Transaction Counts`. A function is added to calculate the average value for the event over the preceding 7-day period.

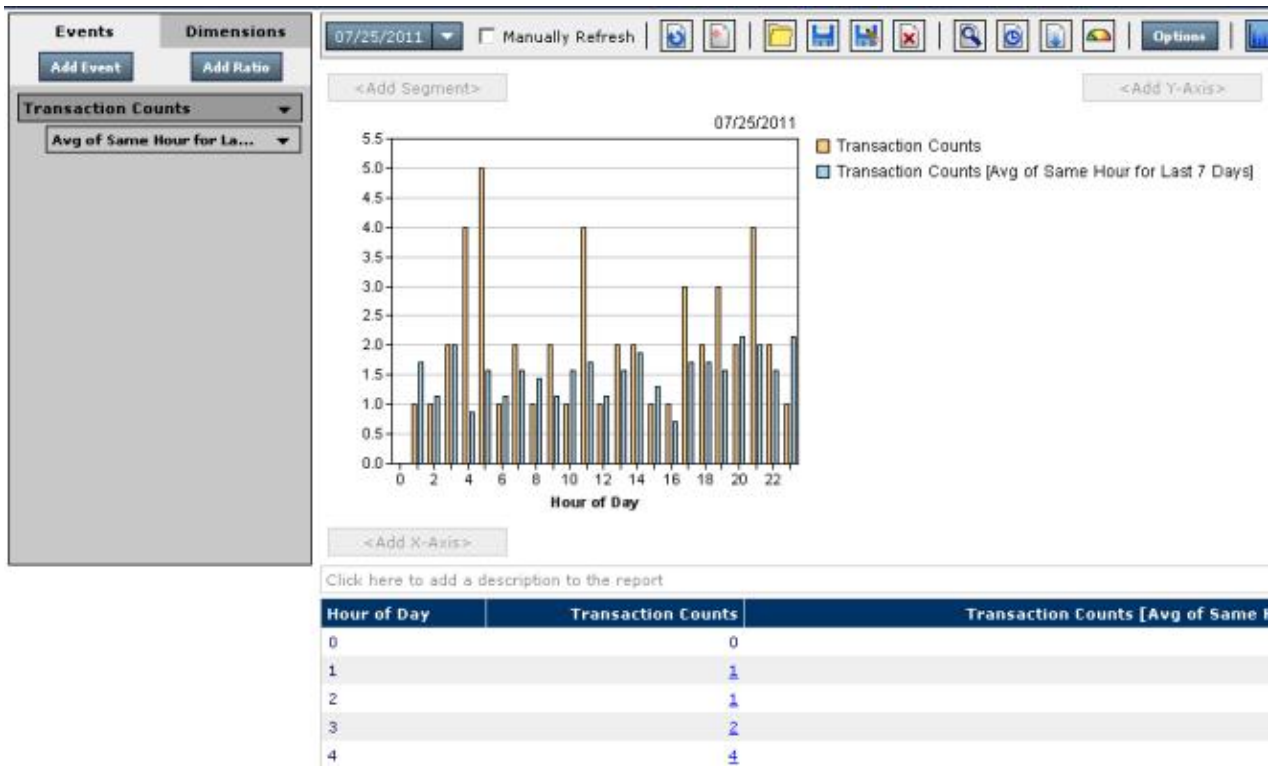



*Figure 62. Report Builder - Transaction Counts report*

**Step 13 - Add Conversion Rate Ratio (Checkout - Order Start to Checkout - Order Confirmation)**
You can create and add a ratio to the report, which tabulates the ratio of completed orders to those that began the checkout process.

### About this task

In the Tealeaf Report Builder, you can create a ratio between recorded values of events. In this example, you are dividing the number of order completions by the number of order starts to yield the conversion rate. Ratios in the Report Builder enable simple rate calculations.

- See "Tealeaf Report Builder" in the *IBM Tealeaf Reporting Guide*.

### Procedure

1. In Report Builder, click **Add Ratio**. Select the `Checkout - Order Confirmation` event as the numerator (count). Select the `Checkout - Start` event as the denominator (count).
2. Click **Add to Report**. The Report shows the ratio of count values.
3. In the **Ratio**drop-down menu, click **Rename**. Enter `Conversion Rate`. The ratio name is changed to `Conversion Rate`.
4. In the toolbar, click **Options**. Click the Advanced tab.
   - Select the Y-axis checkbox.
   - Scale: `100%`
   - Auto Zoom: `Enabled`
   - Select the metric to which the scaling applies.
   - Click **Apply**. The chart now shows a second Y-axis called percentage, and the conversion rate bar follows these ticks.
5. In the ratio drop-down, click **Add Function** > **Previous Days Average**.
6. The function is added. Select the function drop-down. Then, select **Function Period** > **7**. The chart displays the last 7 Day Average.
   - See "Tealeaf Report Builder" in the *IBM Tealeaf Reporting Guide*.

### Results

The conversion rate appears as a ratio in the report, along with a function to calculate the average value for the ratio over the preceding 7-day period.

**Note:** Since you just created the events, there may not be seven days of data from which to provide accurate comparisons. Within a week, the averaging function should contain meaningful data. Values of zero are not factored.

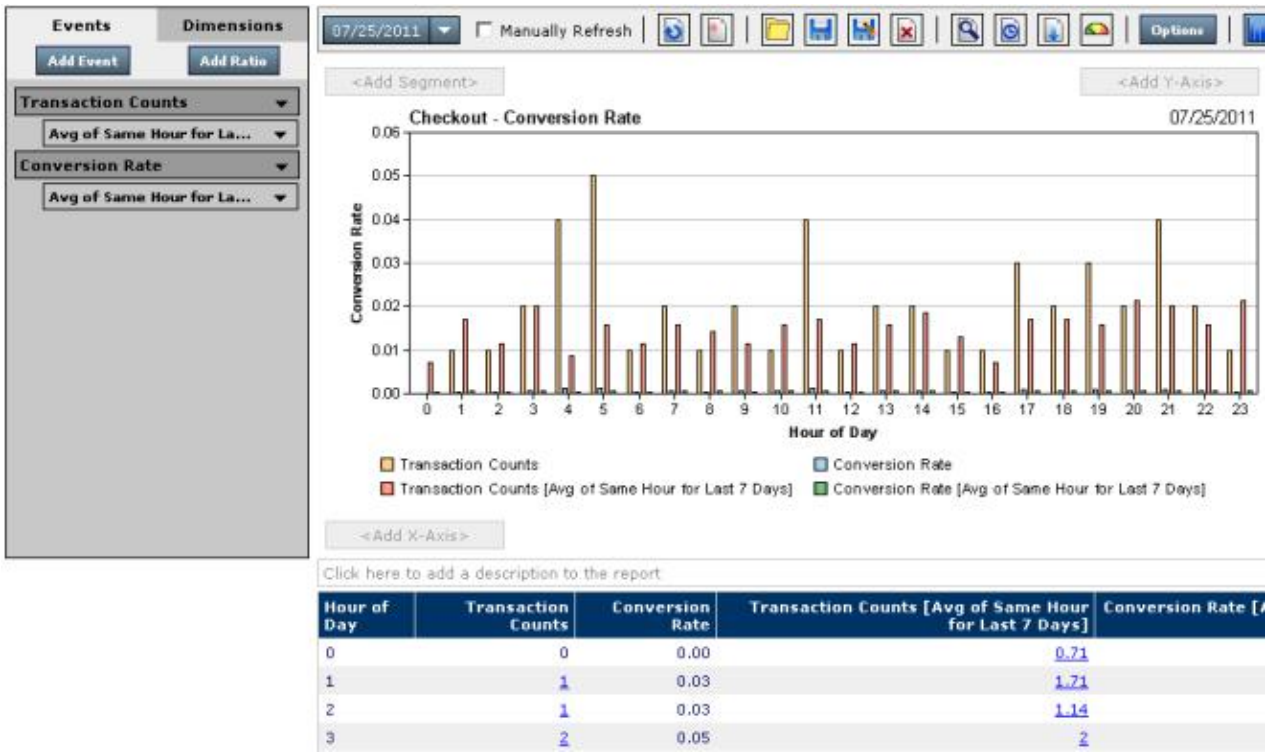



*Figure 63. Report Builder - Transaction Counts and Conversion Ratio report*

**Step 14 - Segment by Browser Platform**

You can use segments to filter the entire report based on a dimension. For example, your Customer Support department reported that some users of Windows XP-based systems are unable to complete the checkout process.

### About this task

You can add the `Browser Platform` dimension as the segment of the report and then filter to display only the Windows XP data, which can help you in identifying the issue and its impacts.

In this step, you add the `Browser Platform` dimension as the segment of the report and then filter the report by the `WinXP` value of the dimension.

### Procedure

1. Add the dimension `Browser Platform` as the segment for the report.
2. From the segment drop-down, select **Filter**.
3. From the Filter By Value drop-down, select `Include Only Selected Values`.
4. Click **All Values**.
5. Select **WinXP**.

   See "Tealeaf Report Builder" in the *IBM Tealeaf Reporting Guide*.

### Results

The report is modified to display only data for the WinXP browser platform.

**Step 15 - Set Y-Axis as Browser Version**
Adding a dimension to the Y-axis allows you to create stacked bar charts, in which you can see how the vertical value is affected by each detected value in the added dimension.

### About this task

In this step, you configure the Y-axis of the report to be the `Browser Version` dimension.

**Note:** If the X-axis contains multiple events and ratios, the chart cannot be displayed after adding the Y-axis dimension. The detail table shows specific transaction counts and conversion rates for each detected browser type for Windows XP. For purposes of this scenario, this step is optional.

**Steps:** #Add the dimension `Browser Version` to the Y-axis of the report.

**Note:** Since multiple items are charted on the Y-axis, the Tealeaf Report Builder does not support charting of reports containing multiple series.

### Procedure

The report must automatically update. If it does not, click the Refresh button in the toolbar.

- See "Tealeaf Report Builder" in the *IBM Tealeaf Reporting Guide*.

### Results

The report now shows data in the Y-axis for the browser version.

**Step 16 - Save/Clear/Reopen Report**
You can save, clear, and reopen a report.

### About this task

To save the report and re-open it:

### Procedure

1. In the toolbar, click the Save icon.
2. Enter name: `Checkout - Conversion Rate` and click **Save**.
3. The report is saved with the entered name, and name is displayed at top of the chart.
4. In the toolbar, click the New icon. The report becomes blank.
5. In the toolbar, click the Open icon. Select `Checkout - Conversion Rate`.
   - See "Tealeaf Report Builder" in the *IBM Tealeaf Reporting Guide*.

### Results

The `Checkout - Conversion Rate` report is re-loaded.

**Step 17 - Add Report to Dashboard**
You can add the configured report as a component to a dashboard.

### About this task

For this example, the report can be added to a dashboard called `Conversion Rates`.

- For more information about creating dashboards, see "Configuring Dashboards" in the *IBM Tealeaf cxView User Manual*.

### Procedure

1. With the Checkout - Conversion Rate report loaded in the Report Builder, click the Add Report to Dashboard ( ) icon. The Add Report to Dashboard pop-up window appears.
2. Click **<Select a dashboard tab**.
3. Select the `Conversion Rates` dashboard. Select the Default tab. Click **Select**. The target tab shows `Conversion Rates - Default`.
4. Verify that Drilldown is set to `Enabled`.
5. Click **Add**. The report is added as a component to the `Conversion Rates` dashboard.
   - See "Tealeaf Report Builder" in the *IBM Tealeaf Reporting Guide*.
6. To verify, select **Dashboards**. If **Conversion Rates** is available, select it. Else, click **More...**. Select the dashboard from the pop-up menu.
7. Click the Default tab.
   - See "Using Dashboards" in the *IBM Tealeaf cxView User Manual*.

### Results

The report is displayed as a component of the Default tab of the `Conversion Rates` dashboard.

**Step 18 - Email the dashboard to yourself daily**
You can email the dashboard to yourself as a test.

### About this task

To email the dashboard:

### Procedure

1. From the Portal menu, select **Configure** > **Dashboards**. The Configure Dashboards page is displayed.
2. Select **Dashboard Schedules**. Click **<Create Schedule**.
3. The New Schedule form is displayed.
4. Enter the following:
   - Description: `Conversion Rates`
   - Send At: Select the top of the next hour.
   - Recipient: Enter your email address.
   - Click **<Select dashboard**. Select the dashboard.
5. Click **Save**.
   - See "Configuring Dashboards" in the *IBM Tealeaf cxView User Manual*.

### Results

The Dashboard Schedule is saved. When the next hour arrives, you should receive an emailed version of the dashboard.

After the dashboard has been successfully received, you can reconfigure the dashboard schedule so that the dashboard is emailed to stakeholders each morning.

**Step 19 - Drill down to the report**
You can test the drill-down capabilities of the dashboard when the dashboard arrives in an email.

### About this task

To test the drill-down capabilities of the dashboard:

### Procedure

1. In the received email, click the Default tab. A browser window opens to display the dashboard tab.
2. For the dashboard component, click the View Report Data icon.
   - See "Using Dashboards" in the *IBM Tealeaf cxView User Manual*.

### Results

The Report Builder is loaded with the `Checkout - Conversion Rate` report.

### Step 20 - Drill Down to the Sessions

From the Report Builder, you can perform a drill-down search to retrieve the sessions that comprise the report data.

### About this task

To perform a drill-down search:

### Procedure

1. When the report has been loaded in the Report Builder, click the link in the detail table.
2. A session list shows the matching sessions.
   - See "Tealeaf Report Builder" in the *IBM Tealeaf Reporting Guide*.

### Results

The sessions underlying the report are displayed in the default session list.

This scenario is complete.

### What to do next

You can use this scenario as the basis for building the conversion rates for other business processes. When the reports are created in the Report Builder, they can be added to the `Conversion Rates` dashboard that you've already created.

Now that you've created the `Shopping Cart Value` hit attribute, event, and dimension, you can build quite a bit of value-based reporting off of these objects.

## E2E Scenario - Create Top Products Dashboard

A common use of Tealeaf reporting data is to derive information on products that customers are adding to their shopping cart, as segmented by information about the visitor's browser. In this End to End scenario, you can step through the process of creating the hit attributes, dimensions, and events that capture this visitor information and the products added to their shopping carts.

After the data has been captured, you can follow a few simple steps to create a report in which the data is segmented using the dimensions you created. This report can then be added to an existing dashboard.

### Overview

Use the Overview for a high-level look at the activities required to create a top products dashboard.

### About this task

The following steps outline the basic process for this end-to-end scenario.

***Basic Steps***

**Procedure**

1. Enable Extended User Agent Parsing in the Tealeaf Reference session agent that is deployed in your Windows pipeline.
2. Create the hit attributes and dimensions for the following visitor information:
   - Browser Platform
   - Browser Version
   - Added Product
3. Create a report group to hold the three dimensions.
4. Create an event that is called `Add Product` to count the number of added products and associated with the configured report group
5. Find a session with the `Add Product` event in it.
6. Test the session for the presence of the other hit attributes and dimensions that were created.
7. Create a report with the new event.
8. Apply dimensional filters from the report group to restrict the data to only show:
   - Top 5 products.
   - Requested from a single operating system
   - Broken down by operating system version
9. Add the report to an existing dashboard.

***Example Web Application - Strauss & Plesser***
In this scenario, we are going to create objects that are based on a fictitious retail site named Strauss & Plesser web application.

**Prerequisite steps for creating a top products dashboard**
Before you create a top products dashboard, you must enable extended user agent parsing and acquire start and end tags for added products.

***Enable Extended User Agent Parsing***
Before you begin the end-to-end scenario to create a top products dashboard, you must verify that your Tealeaf solution has been enabled and configured to capture user agent information and to utilize the public standards to acquire the additional information.

Browser platform and version information is collected from the visitor's browser based upon the detected user agent string. A **user agent** is any device or entity that accesses your web application. Example user agents could be fixed desktop browsers, mobile devices, or bots, which may be crawling your web application for searching engine indexing purposes.

A string identifying the user agent is reported in each request submitted to your web application. This string can then be used to look up additional information about the device contacting your web application. This additional information is maintained and published as a public standard, which Tealeaf utilizes to capture and store information about individual visitors and their devices. There are two public standards that Tealeaf uses:

- Browscap: This standard is utilized for fixed desktop user agents.
- WURFL: This standard is used for mobile devices.

  **Note:** The capture of mobile device information is a component of cxImpact, a separately licensable component of the Tealeaf CX platform. For more information, for more information, please contact your IBM Tealeaf representative.

To verify that your Tealeaf solution has been enabled and configured to capture user agent information and to utilize the public standards to acquire the additional information., verify the following:

- Tealeaf Reference session agent has been deployed and enabled in your Windows pipeline.

- For the Tealeaf Reference session agent, extended user agent parsing has been enabled.

***Acquire Start and End Tags for Added Products***
As a prerequisite to creating a top products dashboard, identify the response tags that bracket the product name when added to the shopping cart of your site.

In our Strauss & Plesser example, the name of the product added to the shopping cart always displayed between two uniquely identifiable bits of HTML. The hit attribute is populated by a consistent pattern in the response that is displayed between a Start tag and an End tag that you identify for Tealeaf. For the Strauss & Plesser site, the tags are the following.

Start tag:

```
<ul class="messages"><li class="success-msg"><ul><li>
```

End tag:

```
was successfully added to your shopping cart.
```

**Note:** There is a space before `was`.

If you are attempting to build this scenario for your own web application, your site is likely to have a different set of tags that appear in the response that bracket the product information.

**Note:** Before you continue, you must identify the response tags that bracket the product name when added to the shopping cart of your site. If you do not know this information, your event is unlikely to fire, and no reporting data will be present.

**Step 1 - Create Dimension: Browser Platform**
A dimension is a piece of contextual information that can be recorded when an event occurs. In our example, the browser platform information, such as `Win XP` can be configured to be recorded when an event occurs.

**About this task**

Later in the scenario, you will create an event that is triggered when a product is added to the shopping cart on the Strauss & Plesser web application.

In this step, you create a dimension called `Browser Platform`. This dimension is populated by the `Browser OS` hit attribute, which is provided by Tealeaf. A hit attribute is a pattern of text that is detected in either the request or the response of a hit. In this case, the Browser OS hit attribute is preconfigured to detect the presence of a value indicating the operating system.

- This value is inserted into the request by extended user agent parsing.

When this hit attribute is detected, the detected value is recorded in the dimension that is configured in this step.

**Procedure**

1. To open the Tealeaf Event Manager, select **Configure** > **Event Manager**.
2. In the Event Manager, click the Dimensions tab.
3. Click **New Dimension**.
4. Configure the following properties and values.
   a) Name: `Browser Platform`
   b) Click **Select?**. In the Select Item selector, expand the Hit Attributes category. Open `System Hit Attributes`. Select the `Browser OS` hit attribute.
   c) In the Populated With drop-down, select `First Value on Page/Hit`.
   d) Leave the other values at their default settings.

5. To save your draft, click **Save Draft**.
6. To commit your changes, click **Save Changes** in the toolbar.

### Results

Expected Results:

The `Browser Platform` dimension is created.

### Step 1 - Create Dimension: Browser Platform

You can create a dimension that is based on a hit attribute, which is a pattern of text that is detected in either the request or the response of a hit.

### About this task

This step creates a dimension that is called `Browser Platform` from an existing hit attribute `Browser OS`.

- This attribute is provided by Tealeaf.

A dimension is a piece of contextual information that can be recorded when an event occurs. In this example, when an event associated with this dimension occurs, the browser platform information, which can include entries for Windows or Macintosh operating systems, is also recorded with the event for reporting purposes.

In this step, you create the dimension that is based on a hit attribute, which is a pattern of text that is detected in either the request or the response of a hit. In this case, the Browser OS hit attribute is preconfigured to detect the presence of a value indicating the operating system.

- This value is inserted by extended user agent parsing.

The following steps provide the basics for how to create this dimension. You might have already created it in another End-to-End Scenario, where more detail is provided.

- See "E2E Scenario - Create Top Products Dashboard" in the *IBM Tealeaf cxImpact User Manual*.

### Procedure

1. In the Tealeaf Event Manager, click the **Dimensions** tab.
2. Click **New Dimension...**.
3. In the **Name** field, enter `Browser Platform` and in the **Populated by** field, select `Browser OS`.
4. Click **Save Draft**.

   See "TEM Dimensions Tab" in the *IBM Tealeaf Event Manager Manual*.

### Results

The new dimension is listed in the Event Manager, highlighted in red because it is not yet saved to the server. It is saved in a later step.

### Step 3 - Create Hit Attribute: Add Product

You can create a new hit attribute from scratch. This hit attribute (`Add Product`) is configured to gather the name of any product that is added to the shopping cart.

### Before you begin

In a previous step, you should have acquired the uniquely identifiable HTML snippets that bracket products added to the shopping cart of your web application.

### About this task

The example below is designed for the Strauss & Plesser web application. Please modify the properties below to reflect the response pattern appropriate for your web application.

### Procedure

1. To open the Tealeaf Event Manager, select **Configure** > **Event Manager**.
2. In the Event Manager, click the Hit Attributes tab.
3. Click **New Hit Attribute**.
4. Configure the following properties and values.
   a) Name: Add `Product`
   b) Search In: `Response`
   c) Click the Use Start Tag/End Tag button.
   d) Following tags need to be modified for your web application:
      1) Start tag for our example: `<ul class="messages"><li class="success-msg"><ul><li>`
      2) End tag for example: `was successfully added to your shopping cart.`

         **Note:** There is a space before `was`.
   e) Leave the other values as their default values.
5. To save your draft, click **Save Draft**.
6. To commit your changes, click **Save Changes** in the toolbar.

### Results

Expected Results:

Hit Attribute Add `Product` is created.

**Step 4 - Create Dimension: Added Product**
Now that you create the hit attribute Add `Product`, you can create a dimension to capture this information.

### About this task

Create a dimension that is called Added `Product`, which is populated by the Add `Product` hit attribute. This dimension contains the list of products that are added to the shopping cart.

### Procedure

1. To open the Tealeaf Event Manager, select **Configure** > **Event Manager**.
2. In the Event Manager, click the **Dimensions** tab.
3. Click **New Dimension**.
4. Configure the following properties and values.
   a) Name: Added `Product`
   b) Populated by: Add `Product` hit attribute
   c) Leave other values as their defaults.
5. To save your draft, click **Save Draft**.
6. To commit your changes, click **Save Changes** in the toolbar.

### Results

The Added `Product` dimension is created.

### Step 5 - Create Report Group: Browser Platform, Version, & Product

You can create an organizing structure known as a "Report Group" for efficient storage of dimensional data.

### About this task

In this step you create three dimensions to capture three sets of information from different hit attributes:

**Hit Attribute**
**Populated Dimension**

**`Browser OS`**
`Browser Platform`

**`Browser Version`**
`Browser Version`

**`Add Product`**
`Added Product`

To help organize this information, you can create a report group to contain the three dimensions.

A report group is an organizing structure for dimensions. In the Tealeaf Report Builder, you can include multiple dimensions in a report if they belong to the same report group. This structure enables efficient storage of dimensional data while maintaining flexibility in reporting.

- A report group can contain up to 4 dimensions.
- A dimension must belong to at least one report group.
- See "TEM Dimensions Tab" in the *IBM Tealeaf Event Manager Manual*.

To create a report group that contains the dimensions `Browser Platform`, `Version`, and `Product`:

### Procedure

1. To open the Tealeaf Event Manager, select **Configure** > **Event Manager**.
2. In the Event Manager, click the **Dimensions** tab.
3. Select `Browser Platform`, `Browser Version` and Added `Product` on the list of dimensions.
4. Right-click and select **Create Group using Dimensions**.
5. Configure the following properties and values.
   - In the Name field, enter `Browser Platform, Version, & Product`
   - Accept the default values for the remaining fields.
6. To save your draft, click **Save Draft**.
7. To commit your changes, click **Save Changes** in the toolbar.

### Results

The `Browser Platform, Version, & Product` report group is created with three dimensions in it.

**Step 6 - Create Event: Add Product**
Add the event Add `Product`, which is triggered whenever the hit attribute Add `Product` is detected. So, whenever a visitor adds a product to the shopping cart, this event is triggered, which allows you to track the number of products added. The value to record is the count of these products.

**About this task**

When the event is associated with the `Browser Platform, Version, & Product` report group, the contextual information that is contained in those dimensions is also written into the session whenever the event is recorded. So, that contextual information is available for reporting purposes.

**Procedure**

1. To open the Tealeaf Event Manager, select **Configure** > **Event Manager**.
2. In the Event Manager, click the Events tab.
3. Click **New Event**.
4. Configure the following properties and values.
   a) For the Event Summary:
      1) Name: Add `Product`
      2) Evaluate On: `Every Hit`
      3) Value Type: `Count Only`
   b) For the Condition step:
      1) Select Hit Attribute: Add `Product`
      2) For the Hit Attribute, verify that `Hit Attribute` Found and `IsTrue` are selected in the drop-down list.
   c) For the Value step, no additional configuration is required.
   d) For the Report Groups step:
      1) Select **Report Group**: `Browser Platform, Version, & Product`
   e) For the More Options step, no additional configuration is required.
5. To save your draft, click **Save Draft**.
6. To commit your changes, click **Save Changes** in the toolbar.

**Results**

The new event is added to the list.

**Step 7 - Find Sessions with New Objects**
Up to this point you have created all of the data objects for this scenario. Although it takes time before the data can appear in a report, you can locate sessions containing the Add `Product` event and then test for the presence of these objects in the session.

**About this task**

It can take at least an hour before the data can appear in a report. A full day of data won't be available until the following day.

In the interim, to locate sessions containing the Add `Product` event and to test for the presence of these objects in the session:

**Procedure**

1. In the Portal, select **Search** > **Active Sessions**.

2. The Active Session Search screen is displayed.
3. In the left panel, click the Basic Search Fields panel.
4. Click the Events link. An event search criterion is added to the search terms.
   a) Click **<Select an event**.
   b) In the Event Selector, expand the event label containing the Add `Product` event. Click the event and then click **Select**. The event is added to the search term.
   c) Do not select a dimension value. Leave it as **<Any Dimension>**.
5. Click **Search**.

### Results

The search results include all currently active sessions in which the Add `Product` event has been detected.

**Note:** If no search results are returned, it is possible that no visitor has added a product to their shopping cart since the event was created. You may need to wait a while. Or, you can navigate the site to add your own product to your shopping cart.

### Step 8 - Test Session for Presence of Other Objects

After you have located a session where the Add `Product` event is located, you can send the event to the Event Tester to check for the presence of the other objects that you created.

### About this task

The Event Tester is a Portal-based tool for testing for the presence of events and hit attributes against actual session data captured by Tealeaf. To use the Event Tester, you locate a valid test session through the Portal, mark the events and hit attributes for which you wish to test, and then view the results.

### Procedure

1. In the list of returned active sessions, find a session that contains at least a few hits. In the session row, click the Event Tester ( ) icon.
2. In the dialog, you might want to change the Description to something easier to locate, such as `Test Session - Add Product`. Click **Send to Event Tester**. Click **OK** to go immediately to the Event Tester.
3. In the **Event Tester**, click the From Session radio button and verify that your session has been selected. Click **Next**.
4. In the **Select Events** tab, click the event label containing the Add `Product` event. Double-click the event to add it to the list of tested events. Do not select any other events.
5. Click the **Hit Attributes** tab.
6. Add the following hit attributes:
   a) System Hit Attributes > Browser OS
   b) System Hit Attributes > Browser Version
7. Click the **View Results** tab.
   a) Expand the Events node to display the Add `Product` event.
   b) Expand the node for one of the pages where the event fired.
   c) Open the `Browser Platform, Version, & Product` report group.
   d) The values for the `Browser Platform`, `Browser Version` and Added `Product` dimensions are displayed.
   e) Similarly, you can expand the Hit Attributes node to display the detected instances of the three underlying hit attributes, which are used to populate the dimensions.

### Results

The hit attributes, dimensions, and events that you created are firing properly in the captured sessions.

### Step 9 - Create Report: Added Product

After you validate the data objects you created and wait for data to accumulate for reporting purposes, you can create a report that uses the Add `Product` event in the Tealeaf Report Builder.

### About this task

The Tealeaf Report Builder enables Tealeaf users to create ad-hoc reports from the events, dimensions, and ratios that they create through the Portal. This easy-to-use tool provides drag-and-drop capabilities for report creation, filtering, and drill-down analysis.

### Procedure

1. To open the Tealeaf Report Builder, select **Analyze** > **Report Builder** from the Portal menu.
2. In the Report Builder, click the **Create New**button in the toolbar.
3. Add the Add `Product` event:
   a) In the left panel, click **Add Event**.
   b) In the **Event Selector**, expand the event label where the Add Product event is stored.
   c) Click the check box next to the **Add Product** event.
4. In Report Builder, Click **Add Event**,Select Add `Product`

### Results

The Add `Product` event data is added to a new report.

### Step 10 - Put Added Product on x-axis

After the report is created, you can use the associated dimensions in the `Browser Platform, Version, & Product` report group to filter the results to show the added products that are based on browser platform, browser version, and specifically added products for your visitors.

### About this task

To filter based on product, add the Added `Product` dimension to the X-axis.

### Procedure

1. In the Report Builder, click the **Dimensions** tab in the left panel.
2. Click the **Add Product** dimension and drag it to the X-axis.

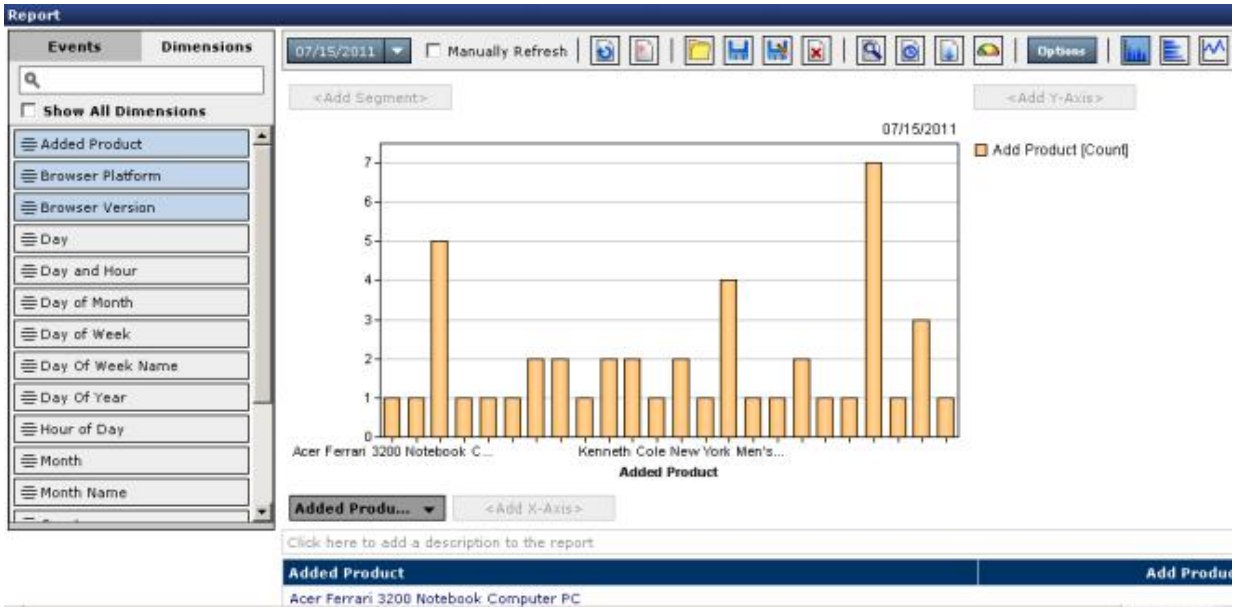



*Figure 64. Report Builder - Added Product dimension*

### Results

Expected Results:

The Report changes to include the Add `Product` dimension.

### Step 11 - Set Added Product dimension to show Top 5

You can now filter the dimension to show only the top dimension values.

### About this task

Since we are most interested in the behaviors of the top products, this filtering allows us to remove the minor products from the report so that we can focus on the most important products in our portfolio.

### Procedure

1. Click the Added `Product` drop-down menu and select **Filter**.
2. For the Filter Mode, select Top `N`.
3. Set the dimension filter: `Include only the top values by occurrence`.
4. Set Maximum Number of Values to Display: 5.
5. Click **Apply**.

### Results

The Report shows only the Top 5 values.

### Step 12 - Segment to only show browser platform WinXP

You can filter the report on a global level by applying a dimension as the segment of the report.

### About this task

In the Report Builder, a segment can be applied to filter the data at a global level.

Suppose that you are interested in the top products that are sold to uses of Windows XP. In the steps below, you apply a segment to the report to display only the shopping cart additions that were initiated by visitors using Windows XP.

### Procedure

1. In the Report Builder, click the **Dimensions** tab in the left panel.
2. Click the `Browser Platform` dimension and drag it to the Segment.
3. The `Browser Platform` is added as the report segment.
4. Click the `Browser Platform` drop-down menu and select **Filter**.
5. For the Filter Mode, select `Filter by Value`.
6. Select `Include only Selected Values`.
7. Click **Add Values**.
8. Select **All Values**.
9. All values are available for selection. Select `WinXP`.
10. Click **Apply**.

### Results

The report now shows data for WinXP browser platform only.

**Step 13 - Put Browser Version on Y-axis**
You can also apply dimension that are filtering to the Y-axis of the report, as well. This filtering creates stacked charts, in which the displayed data is broken up based on the dimensional values that are included in the y-axis.

### About this task

In the steps below, the `Browser Version` dimension is applied to the Y-axis to show stacked breakouts of the individual browser versions that are used when you add products.

### Procedure

1. In the Report Builder, click the **Dimensions** tab in the left panel.
2. Click the `Browser Version` dimension and drag it to the Segment.
3. The `Browser Version` is added as the Y-axis dimension.

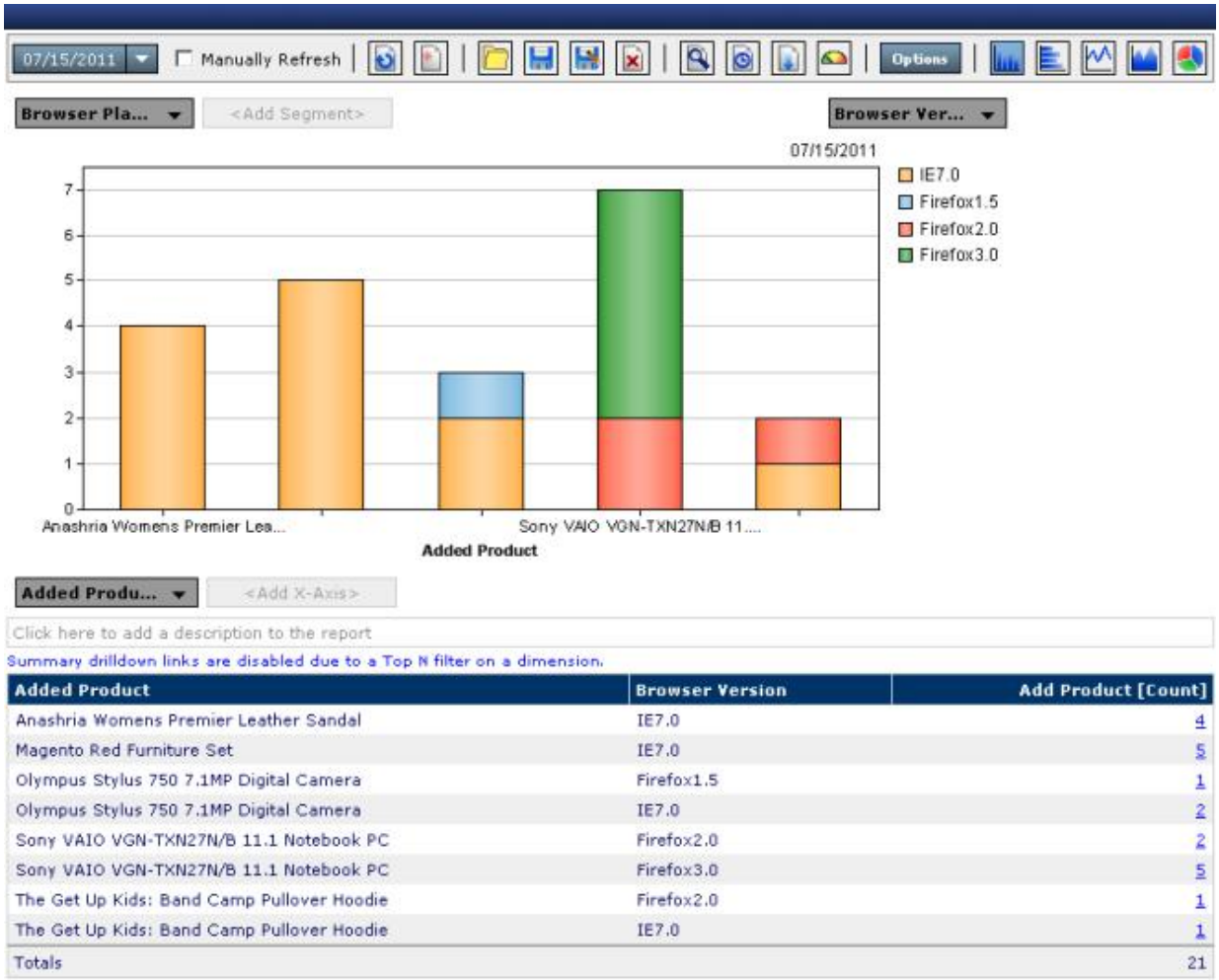



*Figure 65. Report Builder - Finished Report*

4. Before you can add the report, you must save it. In the toolbar, click the **Save** ( ) icon. Enter a title for the report and click **Save**.

### Results

Expected Results:

The report now shows data with `Browser Version` data as the y-axis dimension.

### Step 14 - Add the Report to a Dashboard

After the report are saved in the Report Builder, you can add the report you created as a component to an existing dashboard.

### About this task

This step allows you to surface in the Portal this report for easy review and, if necessary, drill-down to the report and its underlying data and sessions.

### Procedure

1. If not done already, click the **Save** icon in the toolbar to save the report.
2. When the report is configured to your liking in the Report Builder, click the **Add Report to Dashboard** ( ) icon in the toolbar.

3. In the Add Report to Dashboard dialog, configure the following properties and values:
   a) Display: Select `Chart` to show the graphical chart or `Table` to show the data grid.
   b) Drilldown: Select `Enabled` to allow dashboard viewers to drill down to display the report in the Tealeaf Report Builder.
   c) Target Tab: In the Selector, navigate to select a dashboard and the tab within it to which you want to add the report.
4. Click **Create**.

**Results**

The report is added as a component to the selected dashboard tab.

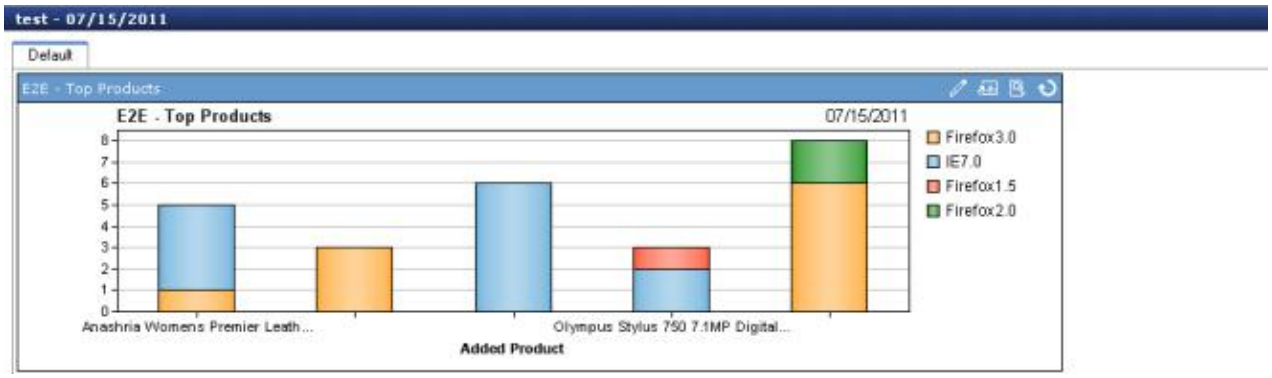



*Figure 66. Top Products in Dashboard*

As needed, dashboards can be exported from the system and emailed to selected recipients.

## E2E Scenario - Getting Value out of Tealeaf in One Hour

This information is intended to provide the beginning Tealeaf user with a simple, clear scenario for getting started with Tealeaf. By stepping through this scenario, you can acquire valuable information about your web application, which you can publish to other stakeholders in your organization. You do not require have prior experience with Tealeaf to follow this scenario.

This scenario is intended to be read from start to finish. In another browser window, you can run the steps through the Tealeaf Portal to complete the scenario.

**The Eventing Basics Series**
This section is part of a series on eventing and reporting in Tealeaf, which explores the data objects used to create events and how events are the fundamental markers for reporting on your web application.

**Note:** These sections should be reviewed in the order listed below.

*Table 99. The Eventing Basics Series*

| | | |
|---|---|---|
| **1** | **E2E Scenario - Getting Value out of Tealeaf in One Hour** | **For novice users, this scenario describes how to use the Tealeaf Portal to explore events provided by Tealeaf, which are already tracking activities on your web application.**<br>**Note: New Tealeaf users should begin here.** |
| Order | Section | Description |

| *Table 99. The Eventing Basics Series (continued)* | | |
|---|---|---|
| **1** | **E2E Scenario - Getting Value out of Tealeaf in One Hour** | **For novice users, this scenario describes how to use the Tealeaf Portal to explore events provided by Tealeaf, which are already tracking activities on your web application.**<br>**Note: New Tealeaf users should begin here.** |
| 2 | "Attribute Basics" in the *IBM Tealeaf Discovering Tealeaf Guide* | Overview of hit attributes and session attributes, which are basic mechanisms for tracking data in sessions of your web application. |
| 3 | "Event Basics" in the *IBM Tealeaf Discovering Tealeaf Guide* | Overview of how to create events, which rely in part on attributes, to record activities in session data. |
| 4 | "Dimension Basics" in the *IBM Tealeaf Discovering Tealeaf Guide* | Overview of how to create and use dimensions, which are contextual data objects stored when an event occurs. |
| 5 | "Reporting Basics" in the *IBM Tealeaf Discovering Tealeaf Guide* | When all of the above scenarios have been completed, you can apply these objects to reports through the Tealeaf Report Builder. |

**Prerequisites**

Although no prior experience is required to run the *E2E Scenario - Getting Value out of Tealeaf in One Hour*, there are some product prerequisites as documented here. Additionally, it might be useful if you have a basic understanding of Tealeaf.

Prerequisites include:

- Tealeaf must be operational and gathering data for at least a day before you begin this scenario.
- You must have a user account to the Tealeaf Portal. This account requires access to the following features.
  1. Tealeaf Report Builder
  2. Event Activity report
  3. Browser Based Replay
  4. Drill-down searches
  - For more information, contact your Tealeaf administrator. If you have an account but are unsure of its permissions, they are explained in detail in the scenario.

**Goals of the Scenario**

This scenario is designed to identify instances of one or more kinds of major errors that your web application can be issuing. You can use Tealeaf to track counts of these errors over time, generate reports that are measuring counts, narrow the criteria, locate affected sessions, and then replay them to see what actually happened during the visitor's session.

This information can be provided to developers to assist in measuring the impact and locating the source of the issue.

- Through Tealeaf, you can also monetize the impact. At the end of the scenario, more information is provided on how to do that.

Whenever a request is made from a browser to a server, the server returns a response that includes the HTTP status code, which indicates the category of the response. For example, if you enter http://www.tealeaf.com and see the home page of the Tealeaf corporate website, then the status code that is

returned in the response is `200 OK`, which means that the request successfully resulted in a valid and complete response. Here are some other status codes of interest:

*Table 100. Status code descriptions*

| Code | Description |
|---|---|
| 200 | All is well. |
| 404 | The content that was request was not found. |
| 500 | Internal server error. Something happened on the server-side that prevented the response from being delivered. |

There are many more HTTP status codes, but the above ones are of interest for purposes of this scenario.

The `404` and `500` errors are of interest to your web development team. A `404` error means that content was requested yet cannot be found by the browser and returned for display to the visitor. These errors can be caused by a number of issues, all of which your developers must be made aware.

- You might have the experience of visiting a web page and receiving a "Page Not Found" error. These pages are categorized as HTTP 404 status code pages.

Similarly, a `500` error indicates that something internal to the server failed. It could be some part of the web server application, a piece of code that your developers created, or other problem.

While Tealeaf cannot peer into the web server to decipher the issue, you can use Tealeaf to track the occurrences of these errors over time, generate reports that are measuring counts against narrower criteria, locate affected sessions, and then replay them to see what actually happened during the visitor's session. This session can then be provided to developers to help locating the issue.

At the end of this scenario, you must have useful information to provide to your developers about these error codes and their frequency as experienced by visitors to your website.

Let us get started.

**Logging in to the Portal**

For most Tealeaf users, the portal is the place to go for all things Tealeaf. The Portal is a web-based application, through which you can interact with Tealeaf applications and databases. This interface enables to complete most common Tealeaf user activities.

### About this task

Through the Portal, you can perform the following basic actions:

- Report: Review or generate reports, scorecards, dashboards, and alerts.
- Search: Search for sessions that meet a specified set of criteria.
- Replay: Replay a session that you select, experiencing it as the visitor who created the session originally experienced it.

In this scenario, you'll perform all of the above through the Tealeaf Portal.

Steps: Complete the following steps to log in to the Portal.

### Procedure

1. In your web browser, enter the address of the Tealeaf Portal for your enterprise. This address is in the following pattern:

   ```
   http://TealeafPortalServer/portal
   ```

   where

`TealeafPortalServer` is the machine hosting the portal web application.

- If you do not know this information, contact your Tealeaf administrator. You might want to read to the end of this section, which also describes the permissions needed for your account.

2. Enter the username and password for your Tealeaf account. Click **Login**.

   **Note:** Depending on how your Portal is configured, you may be automatically logged into the Portal whenever you visit it from your work desktop.

3. The Portal is displayed. It should look similar to the following. The displayed page can differ for your Portal.

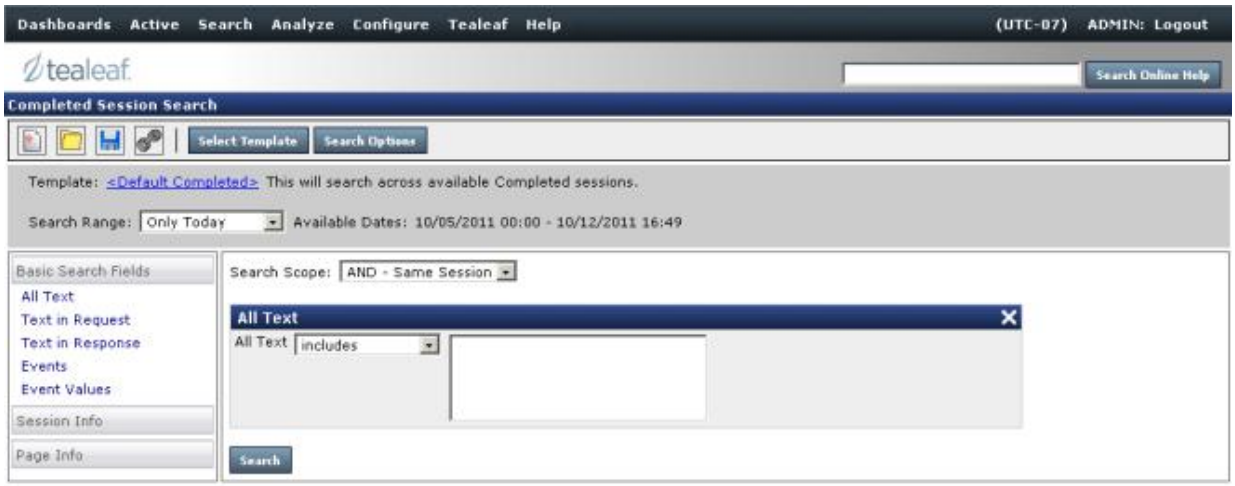



*Figure 67. Tealeaf Portal*

### Results

You are now logged in.

#### *Required Permissions*

Before continuing with this scenario, you must verify that you can access all of the following menu items from the Portal menu, which is displayed at the top of the above image:

- **Analyze** > **Event Activity**
- **Analyze** > **Report Builder**

If you do not see these menu items, contact your Tealeaf administrator about enabling access to them.

## Check Event Activity

The Portal provides access to many Tealeaf and user-created reports on web application activities and performance, as well as Tealeaf system use and activities.

### About this task

For this scenario, we begin with the Event Activity report. This report indicates the number of occurrences of all currently active events for a selected time period. To begin, select **Analyze** > **Event Activity** from the Portal menu.

**Note:** Later, feel free to explore the contents of the Dashboards, Active, Analyze, and **Tealeaf** menus.

- Some of these menus cannot be available to you, due to permissions and license limitations.

In Tealeaf, an event is an occurrence of a pattern of data in the captured data stream. In this scenario, we are looking for the occurrence of the `HTTP 404 - Not` Found event, which looks for a specified pattern of data. If that pattern is found, the count of occurrences increments.

You can see the counts in the Event Activity report.

Steps: To review the Event Activity report, complete the following steps.

**Procedure**

1. In the Portal menu, select **Analyze** > **Event Activity**.
2. The Event Activity report is displayed.

*Figure 68. Event Activity*

3. In the toolbar, click the **View by Labels** check box.
4. Under the list of Labels, open the `Tealeaf Standard Events` label.
5. Look for an entry for `Http 404 - Not Found`. In the Event Count column on the right side, the number of occurrences of the event during the selected period is displayed.
6. If the Event Count value is `0` (zero), you can do one of the following steps:
   a) Locate a `Http 4xx` event that contains a non-zero count. These can include the following values:
      - `Http 400 - Bad Request`
      - `Http 401 - Unauthorized`
      - `Http 403 - Forbidden`
      - `Http 404 - Not Found`

   b) Use the `Http 500 - Internal Server Error` event.
   c) Change the reporting period. By default, the Event Activity report is configured to display event counts from the current date (today). Click the date in the corner of the report.

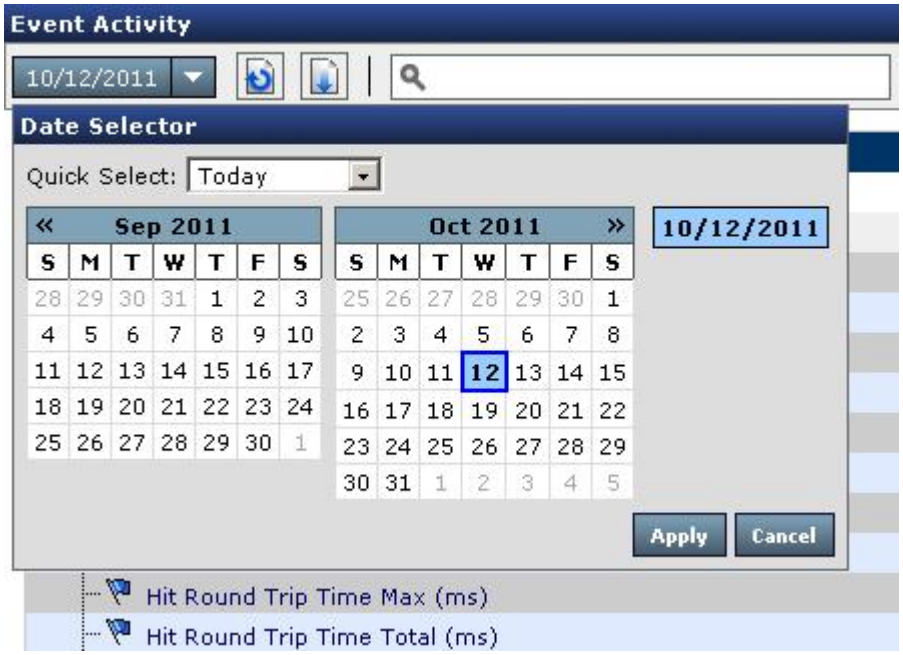



*Figure 69. Select Focus Period*

- You can select a range of dates. You might try to expand the range to the beginning of the month or even further. Select the first date. Press SHIFT and select the second date.
- After you have specify your date or dates, click **Apply**. The report is updated.

7. Continue making adjustments until you see a non-zero value in the Event Column for an Http 4xx event. Of these, Http 404 can be the most valuable to your developers.

### *A little detail on events*

**Note:** This section provides further detail on events, specifically how Status Code events are stored in sessions. Some novice users might not be interested in this technical detail.

In this scenario, we are relying on an event that is provided by Tealeaf. This event and other events that are provided by Tealeaf are called Tealeaf Standard Events and are grouped in the Portal under this label.

The HTTP Status Code events rely on the presence of some data that is inserted by Tealeaf. When data is captured and passed through Tealeaf, the Canister inserts some pre-configured data in each request that is part of the session. This inserted data is then part of the session that is retained.

Pertaining to the Status Code events, data is inserted in the `[env]` section of the request, which Tealeaf creates. Here is an example that is set of data:

```
[env]
REMOTE_ADDR=63.194.158.150
REMOTE_PORT=40177
LOCAL_ADDR=206.169.17.19
LOCAL_PORT=80
SERVER_NAME=206.169.17.19
SERVER_PORT=80
HTTPS=off
CONNECTION_ID=13144
PCA_NAME=jupiter
PCA_ADDR=127.0.0.1
PCA_UNAME_RELEASE=2.6.9-55.EL
PCA_UNAME_SYSNAME=Linux
REQ_BUFFER_ENCODING=UTF-8
REQ_BUFFER_ORIG_ENCODING=ISO-8859-1
REQUEST_METHOD=GET
URL=/store/index.php/placeholder
SERVER_PROTOCOL=HTTP/1.1
ResponseType=text/html; charset=UTF-8
StatusCode=404
```

```
StatusCodeText=Not Found
```

In the sample, the last two entries (called name-value pairs) contain Status Code information that is inserted by the Canister. These name-value pairs are variable names and their values.

**Variable Name**
**Value**

**`StatusCode`**
`404`

**`StatusCodeText`**
`Not Found`

This event, which is evaluated for each request that is passing through the Canister, detects the presence of this `StatusCode` entry in the request. If the entry is set to `404`, the event fires, and all actions that are configured for the event are taken. The number of occurrences in the Event Activity report is incremented by one.

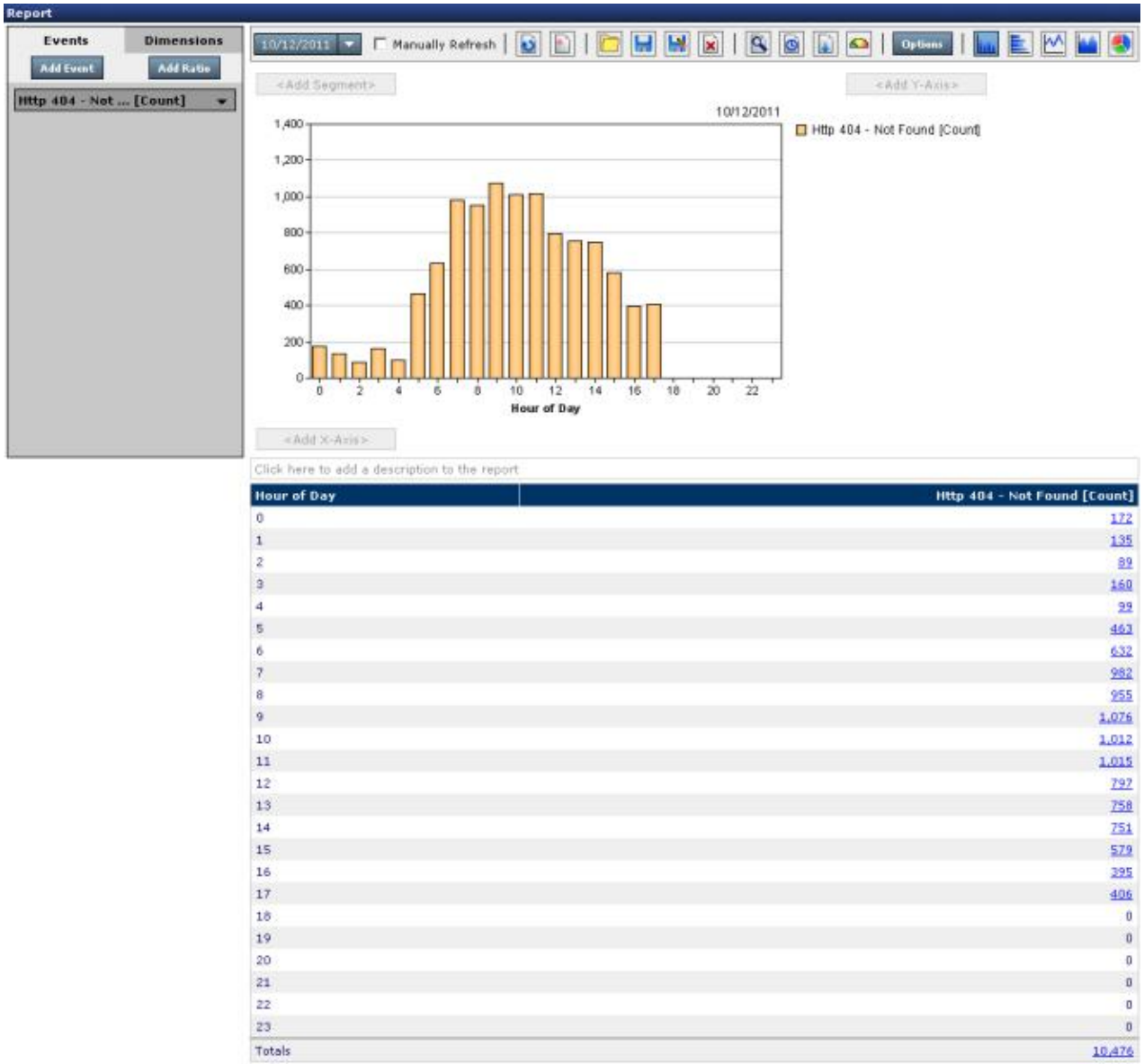
To go into a bit more detail, the event relies on the Status Code **hit attribute**, which is a Tealeaf-defined data object that performs the actual checking for the matching pattern in the request. According to the definition of the event, if the Status Code hit attribute is present and its value is `404`, then the event fires.

Tealeaf provides a number of events, and Tealeaf administrators can create events specific to your web application. You can create events that count occurrences. You can create events that detect the absence of specified patterns. Based upon the detection of events, a number of different kinds of actions can be triggered.

Event creation is a large topic and exceeds the scope of this scenario. Events can be created by Tealeaf administrators or individuals who are given access to the Tealeaf Event Manager.

**Explore the Report**
In the Event Activity report, you can now click the hyperlink for the non-zero Event Count to explore further.

When the link is clicked, a report is automatically generated and displayed in the Tealeaf Report Builder. This report displays the `Http 404 - Not` Found event for the selected period.




| Hour of Day | Http 404 - Not Found [Count] |
|---|---|
| 0 | 172 |
| 1 | 135 |
| 2 | 89 |
| 3 | 160 |
| 4 | 99 |
| 5 | 463 |
| 6 | 632 |
| 7 | 982 |
| 8 | 955 |
| 9 | 1,076 |
| 10 | 1,012 |
| 11 | 1,015 |
| 12 | 797 |
| 13 | 758 |
| 14 | 751 |
| 15 | 579 |
| 16 | 395 |
| 17 | 406 |
| 18 | 0 |
| 19 | 0 |
| 20 | 0 |
| 21 | 0 |
| 22 | 0 |
| 23 | 0 |
| Totals | 10,476 |

*Figure 70. Tealeaf Report Builder*

In the report, you can see the breakdown of counts for the selected event by day (if the focus period is greater than 1 day) or by hour (if the focus period is a single day). Since the above report was generated for today's date, the hourly data is incomplete. But it does have enough to begin work.

***Working with Dimensions***

If you presented the report to your web developers, it would not be terribly informative. They might immediately ask, "This is interesting, but where did all of these errors occur? Is it one problem? Or multiple problems? How are we expected to find the problem in our code?"

What is missing is any sense of context. When the error occurred, what were other characteristics of the session that can be of interest and, in this case, can help to locate the source of the problem?

Tealeaf defines this contextual data and associate it with events through dimensions. A dimension is a value that is recorded when an event occurs. At the moment when the event fired, for example, what is the URL where it occurred?

Tealeaf provides example dimensions, which you can apply to your reports to filter the data. Among the provided dimensions is the URL `(Normalized)` dimension, which captures the normalized value for the URL where the event occurred.

- The URL value is automatically normalized by Tealeaf. In a typical web site, the number of URLs can explode into the thousands, often because variable information, such as query parameters or timestamps, is inserted at the end of the URL. For purposes of identifying locations on the web site, this information is rarely useful.

*Apply a dimension*
In the following steps , you add the provided URL （`Normalized`）dimension to the report to filter the display to show only the URLs where these errors most frequently occur.

**About this task**

**Procedure**

1. In the **Report Builder**, click the Dimensions tab in the left panel.
2. You should see a list of items similar to the following:

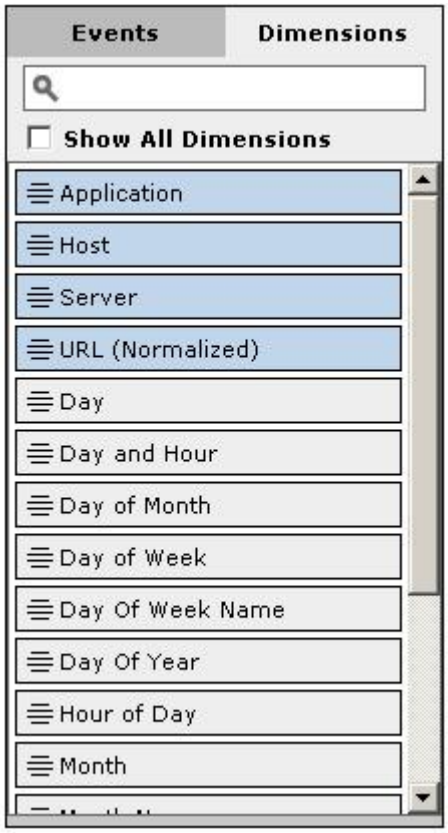



*Figure 71. Dimensions tab*

3. In the left panel, locate the URL （`Normalized`）dimension. Click and drag this dimension to the **<Add X-Axis>** box.
4. You are likely prompted with a dialog box indicating that adding this dimension may create a very large data set. Go ahead and click **OK**. The result may look something like the following:

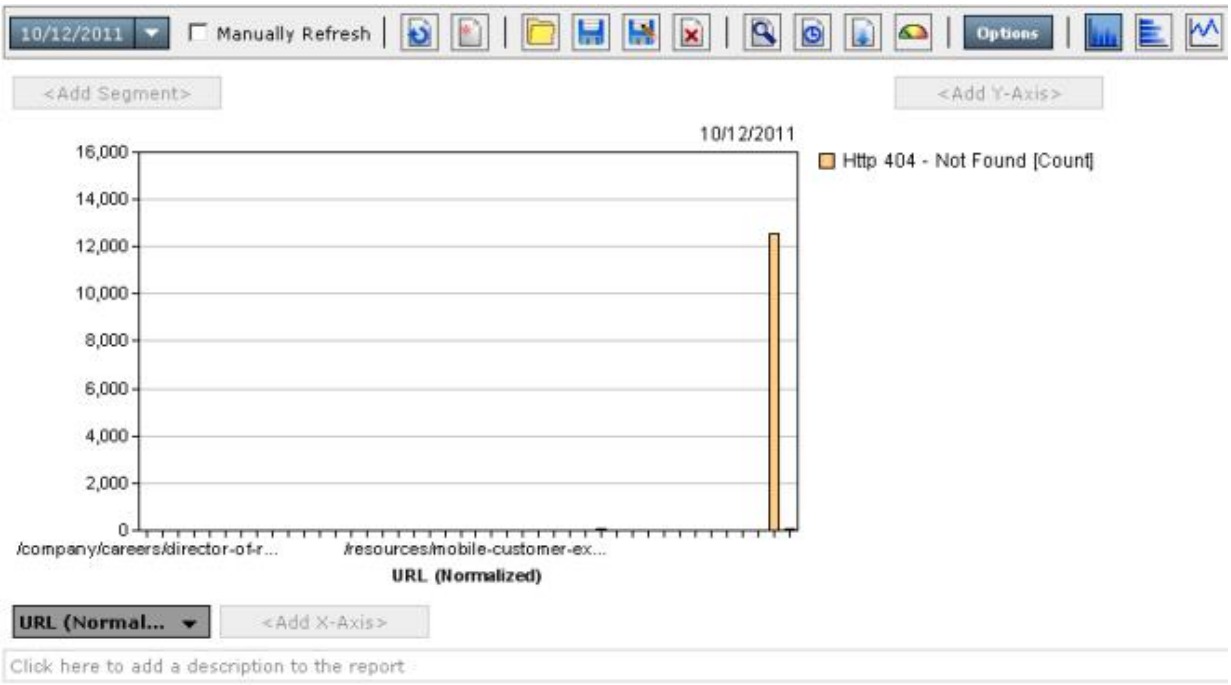



*Figure 72. Added URL dimension*

*Filtering a dimension by Top-N*

In the , image, you can see that the data is hard to read, in part because the scale is skewed by the large column tower. We can improve the chart display by filtering the dimension values down to the ones where the event has the highest values. This filtering also helps us to identify the URLs where the HTTP 404 error occurs most frequently.

**About this task**

To filter the dimension, complete the following steps.

**Procedure**

1. In the chart, click the drop-down icon (

) next to the dimension name in the chart (`URL (Normalized)`).
2. From the drop-down menu, select **Filter**.
3. In the **Dimension Filter** dialog, select `Top N` from the Filter Mode drop-down.
4. For the **Maximum Number of Values to Display**, enter `10`. This entry means the chart is configured to display only the dimension values that were recorded most frequently when the event fired.

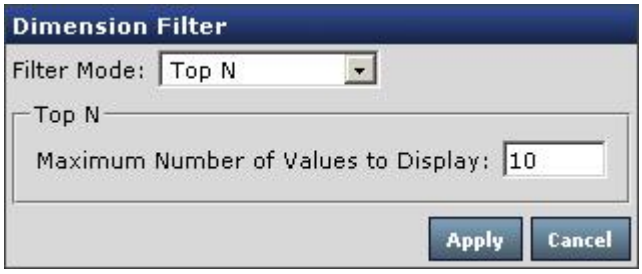
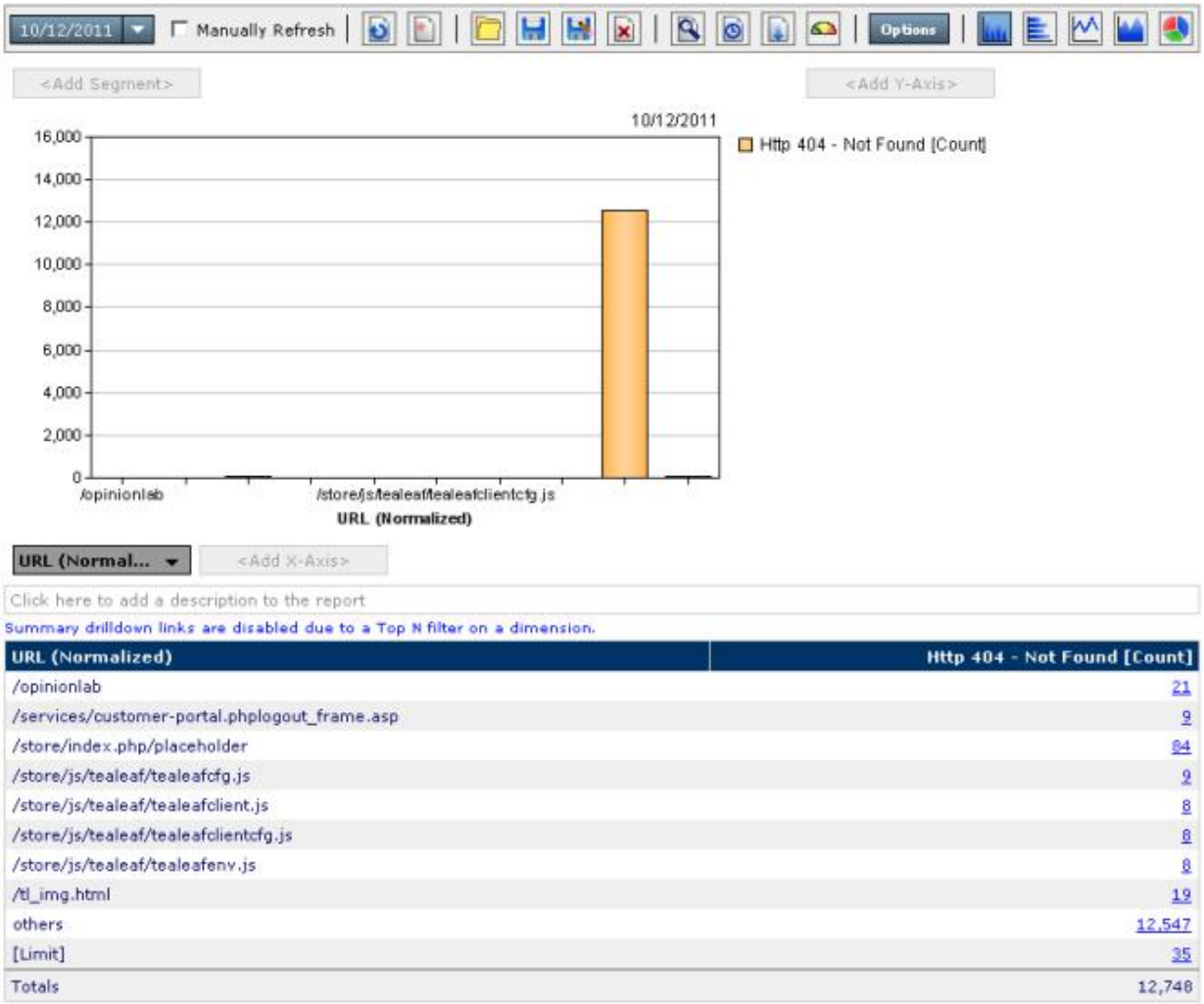



*Figure 73. Top-N Dimension Filter*

5. Click **Apply**.
6. The report is updated to show only the event counts for the 10 most frequently recorded dimensions.




| URL (Normalized) | Http 404 - Not Found [Count] |
|---|---|
| /opinionlab | 21 |
| /services/customer-portal.phplogout_frame.asp | 9 |
| /store/index.php/placeholder | 84 |
| /store/js/tealeaf/tealeafcfg.js | 9 |
| /store/js/tealeaf/tealeafclient.js | 8 |
| /store/js/tealeaf/tealeafclientcfg.js | 8 |
| /store/js/tealeaf/tealeafenv.js | 8 |
| /tl_img.html | 19 |
| others | 12,547 |
| [Limit] | 35 |
| Totals | 12,748 |

*Figure 74. Top-10 Report*

7. Now is a good time to save your report. To save it, click the **Save** ( ) icon in the toolbar. Enter a name, such as `http 404 - not found`, and click **Save**.

### Results

In the figure, the chart is still hard to read because of the one outlier. In the detail table, you can see the actual data values that are displayed in the chart. The outlier dimension values, called dimension constants, have a high number of counts. The dimension constants are recorded occurrences of limits on the number of permitted dimension values. For purposes of this scenario, ignore these values and focus on the actual captured and recorded values.

### Drilldown Search

The event + dimension combination is written into the request primarily for search purposes. When you run a search that looks for event occurrences, event values, or dimension values, you are instructing Tealeaf to effectively look into the request records for this specific data.

Let's look at our report. In the detail table, you must see ten items, similar to the following figure:

Summary drilldown links are disabled due to a Top N filter on a dimension.

| URL (Normalized) | Http 404 - Not Found [Count] |
|---|---|
| /opinionlab | 21 |
| /services/customer-portal.phplogout_frame.asp | 9 |
| /store/index.php/placeholder | 84 |
| /store/js/tealeaf/tealeafcfg.js | 9 |
| /store/js/tealeaf/tealeafclient.js | 8 |
| /store/js/tealeaf/tealeafclientcfg.js | 8 |
| /store/js/tealeaf/tealeafenv.js | 8 |
| /tl_img.html | 19 |
| others | 12,547 |
| [Limit] | 35 |
| Totals | 12,748 |

*Figure 75. Report Builder - detail table*

Of these values, we can ignore the following values:

**Values**
**Description**

**`others` and `[Limit]`**
These entries may be related with how dimension data is defined and are not currently actionable.

**all `*.js` URLs**
These entries apply to the IBM Tealeaf CX UI Capture for AJAX solution, which may not be properly installed. These would be worth exploring, if the IBM Tealeaf CX UI Capture for AJAX solution is implemented.

**`/opinionlab` and `/tl_img.html`**
These entries pertain to the OpinionLab integration supported by Tealeaf. Outside the scope of our scenario.

That leaves the following two URLs of interest:

- `/store/index.php/placeholder`
- `/services/customer-portal.phplogout_frame.asp`

The `placeholder` item may or may not be of interest. If this was a production system, you might be inclined to share that with your developers. The second one , though, looks like the URL that must not return an HTTP 404 - Not Found error.

In the Count column, you can see hyperlinks for each entry. When you click a link, you are actually running a search for the underlying sessions that compose the data in the metric. In our example, if you clicked the link for the `/services/customer-portal.phplogout_frame.asp` entry, you would instruct the Report Builder to query the set of stored sessions for any session where the `Http 404 - Not Found` event occurred on the listed page on the date(s) specified for the focus period.

- These search queries are run just like you would perform a search for an ad hoc set of sessions. How you specify ad hoc searches for terms of your choosing is different and covered in a different scenario.

***Session List***

The returned sessions are displayed in a session list, such as the following:

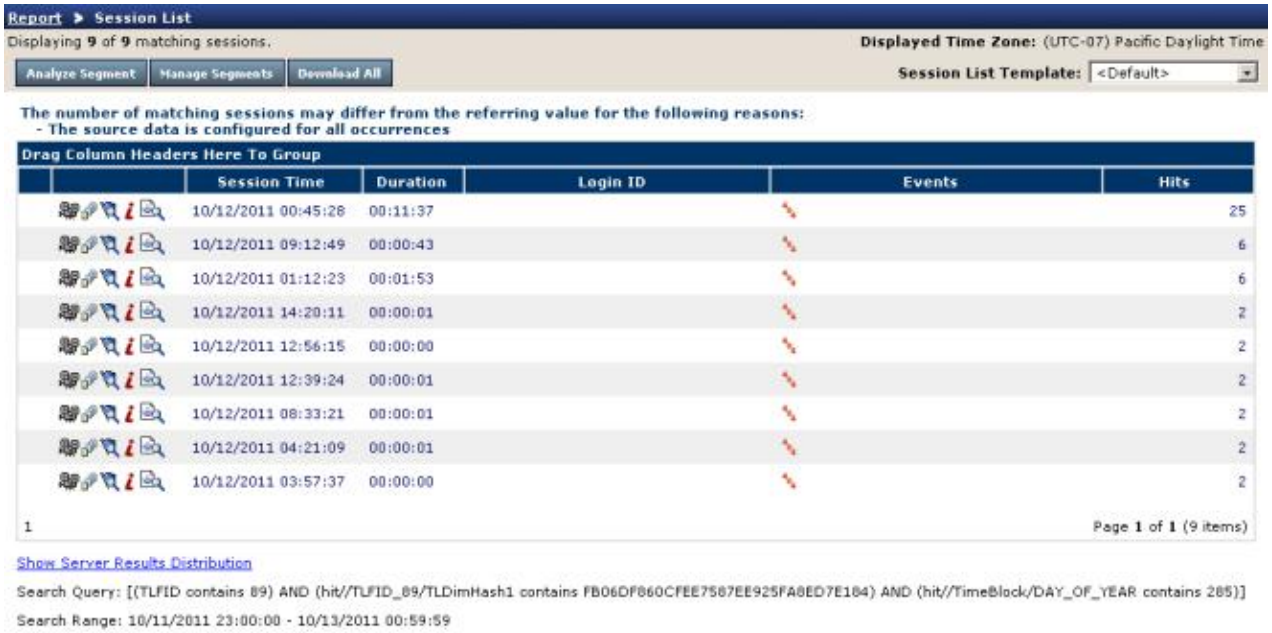



*Figure 76. Session List*

In the session list, the matching sessions are displayed by default in revise order of the number of hits in them. In the Events column, you can see the icon for the `Http 404 - Not Found` event is listed. Since this session list is displaying the results of searching for this event only, no other events are listed in the column.

- If you move your mouse over one of the icons, additional information about the event is displayed.
- At the bottom of the session, you can see the search query that was specified to execute the search. Search queries do not need to be specified in this hard-to-read format, but you can copy and paste that text to save it for later use, if desired.

There's quite a bit to explore and do in a session list. For now, we want to focus on the icons in the second column.

*Table 101. Session List*

| Icon | Command | Description |
|---|---|---|
| | Replay | Replay the session. |
| | Page List | Show the page list for all pages in the session. |
| | QuickView | Open QuickView, which shows events, dimensions, and attributes recorded in the session. |
| | Session Info | Display information useful for locating the storage location for the session. |
| | Send to Event Tester | Use the session as test data for the Event Tester. |

**QuickView**

In the displayed QuickView, you can see the page where the event was triggered.

At this time, we narrowed our search to just sessions where the HTTP 404 error occurred on the `/services/customer-portal.phplogout_frame.asp` page in the specified timeframe. But for this information to be of use to developers, we should provide a specific session example and, potentially, the exact page where the event occurred.

Expanding the entry displays all of the dimensions that were recorded when the event fired.

In the set of icons, click the QuickView ( ) icon for one of the sessions.

*Figure 77. QuickView*

- If you click the Page hyperlink, you can review the contents of many of the sections in the request of the selected page in the Page Detail. Use the breadcrumb trail to return to the QuickView page.

In the above example, you can see that the URL `(Normalized)` dimension has recorded the value of `/services/customer-portal.phplogout_frame.asp`. The other values may be of value to retain for your developers.

**Replay**

From QuickView, you can jump to the page where the issue occurred. In QuickView, click the Replay icon. In the dialog, click **Browser**.

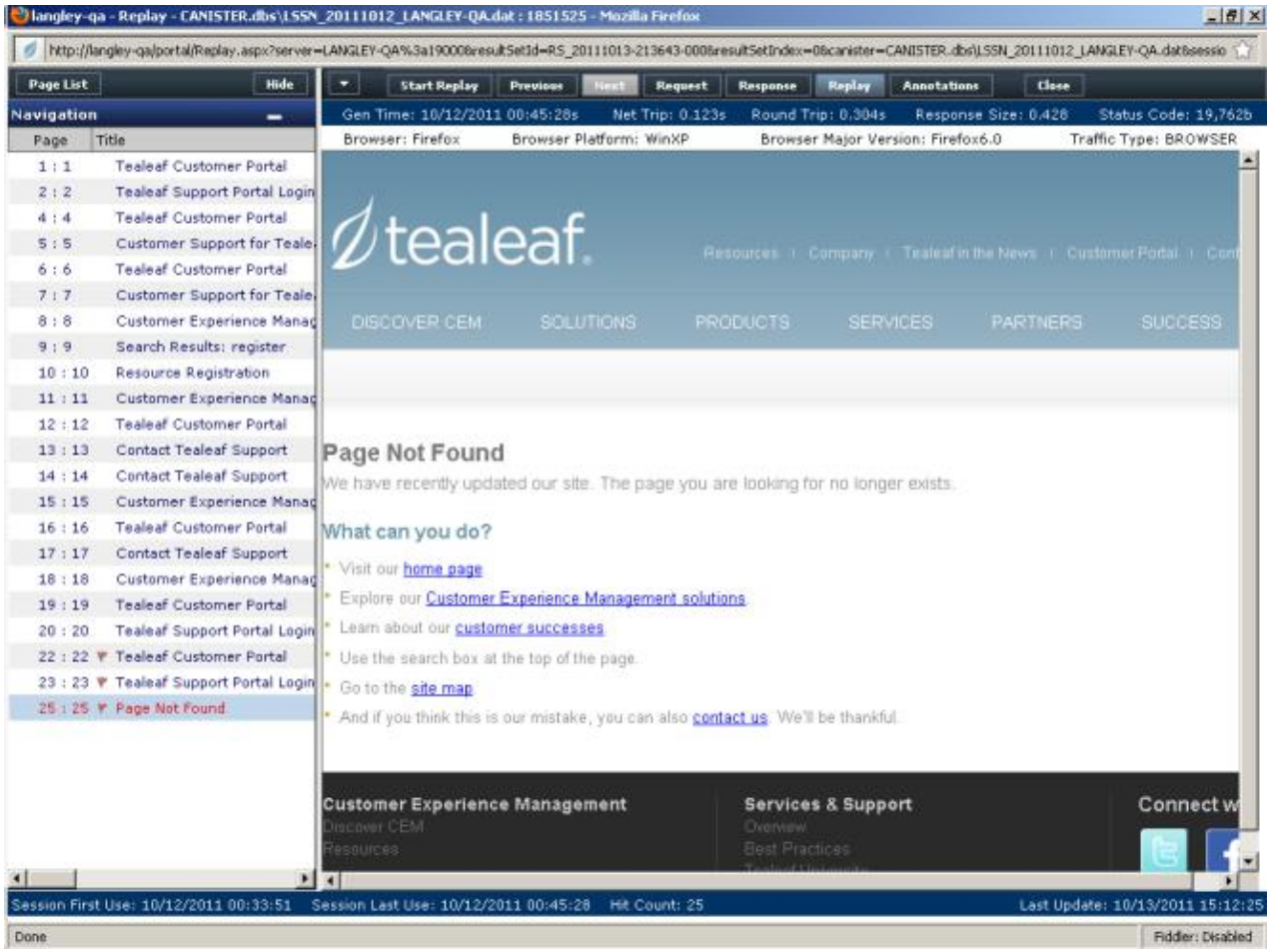



*Figure 78. Opened in BBR*

In Browser-Based Replay, you can replay captured sessions through your web browser. This replay method enables all Tealeaf users to have immediate access to replay capability.

In our scenario, BBR has been opened to display the selected session at the page where the issue occurred. On Page 25, the last of the session, the Page Not Found error page was displayed. The Tealeaf event `Http 404 - Not Found` occurred on this page.

This page itself can not be particularly informative. In fact, it can be the page that is universally served to all visitors of your web application when the HTTP 404 Status Code error occurs.

The page that is useful is likely to be the preceding one, where the visitor made the selection or performed another action that resulted in the web application generating the Page Not Found error page.

- In the left navigation panel, click the page immediately preceding the **Page Not Found** page.

***BBR Views***

What you must see now is the Replay view for the previous page. In Replay view, you can see the page as it is displayed to the visitor during the session.

For developers, though, the data, not the visual presentation is more important. In the toolbar, click **Request**.

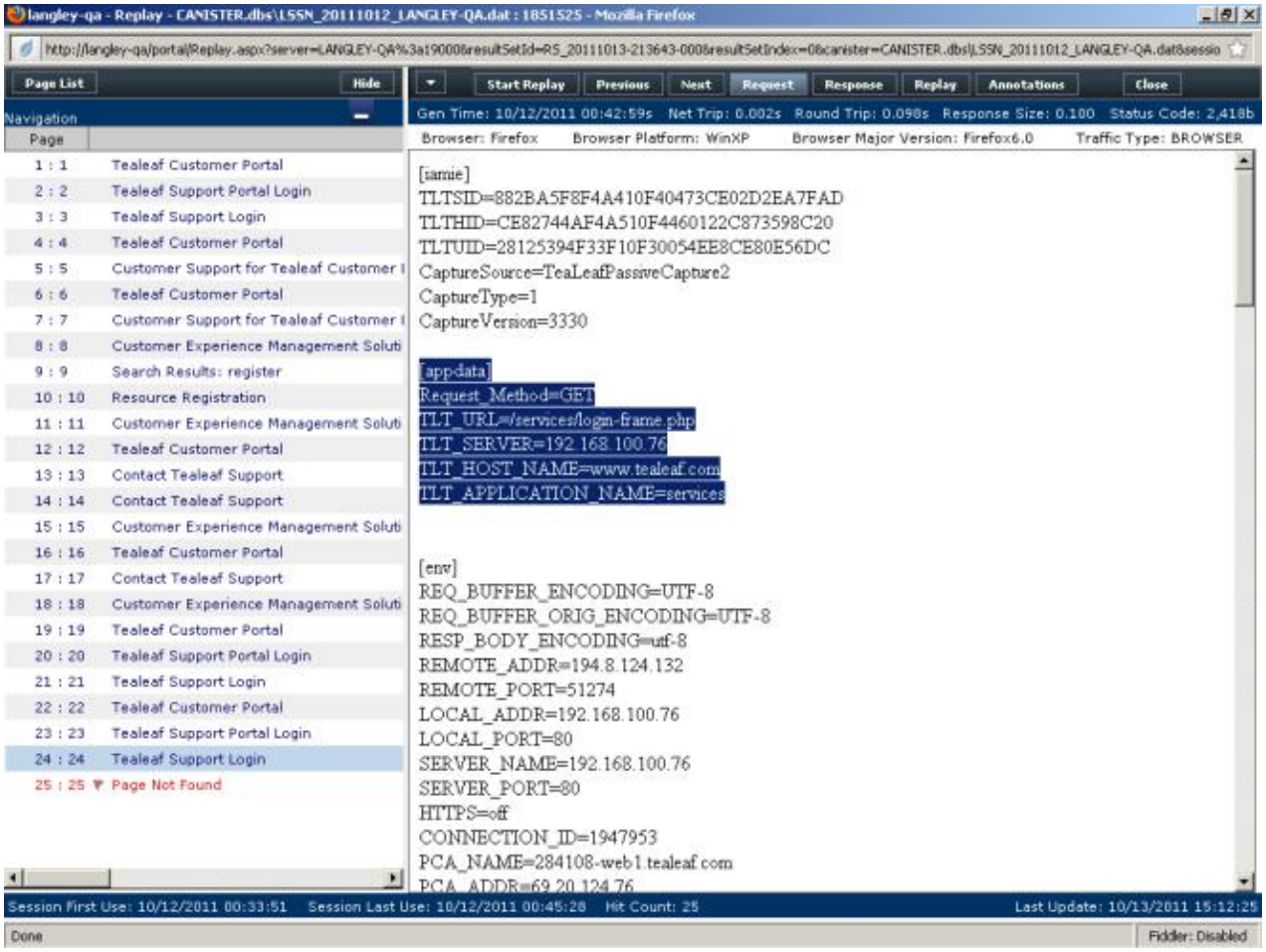



*Figure 79. Request View*

In Request view, you can review the contents of the request for the page. This data includes the data that was submitted to the web server to ask for the delivered content, as well as additional data inserted by Tealeaf during processing.

In the above image, you can see a section of the request (`[appdata]`) has been highlighted. This section typically includes application-specific information that is valuable for search purposes. All of this content is indexed for search.

Of the specific value in the `[appdata]` section is the TLT_URL value, which is the exact value that is recorded in the URL (`Normalized`) dimension. In this case, the value is `/services/login-frame.`php. This relative path indicates the location in the website's domain (in this case, http://www.tealeaf.com) where the page is located. This provides to your developers the location of the page from which some action was taken to generate the Page Not Found error page.

***Sending the email***

Now, you are prepared to submit your report to the developers. Here are some recommended steps:

**About this task**

**Procedure**

1. In Request view, highlight all of the `[appdata]` section and copy it. Paste it into a text editor.
2. Optional: In the toolbar, click **Response**. Response view shows the content that was sent by the web server to the client, based on the request. Your developers can be interested to know what was served. Click in the main pane, press `CTRL + A` to select all. Copy and paste this content into the text editor.

3. From the drop-down menu in the toolbar, select **Send Link by Email**.

**Results**

In the dialog, you might compose your email as follows:

- Recipients: Enter a comma-separated list of email addresses. Aliases are allowed.
- Session Title: For session title, you might enter `HTTP 404 - Not Found error`.
- Message: For the message, you could enter:

```
Dev Team--

Using Tealeaf, we have discovered a number of occurrences of HTTP 404 errors.
Many of these errors occur when a request is made from the
/services/login-frame.php page.

Use the link in this email to open an example session.
The Page Not Found error page is the last page of the session.
The previous page generates the error. This error was detected
9 times on this page alone today by Tealeaf.

Hope that this is helpful.
```

*Figure 80. Sending session by email*

To send, click **OK**.

**What You Have Discovered**

This concludes our scenario.

In a relatively short period, you devise an easy means of monitoring and reporting a serious error in your web application. Tealeaf is good at helping finding and fixing errors of this sort.

As part of this scenario, you have toured a number of features in Tealeaf, including the following features:

- Logging in to the Tealeaf Portal
- Event Activity
  - Drill-down searches
- Tealeaf Report Builder
  - Adding Dimensions
- Search Results - Session List
  - Session list icons

  - QuickView
- BBR replay
  - Replay View
  - Request View
  - Request variables
  - Options Menu

Well done.

**Discovering More**
The sections that follow provide information about extending the scenario.

***Characterizing the Problem***
By characterizing the problem, you can make it clear that the development issues identified in the web application also have a business impact.

**About this task**

You have done a good job in providing compelling evidence to your development team that a problem exists with your web application.

However, that is a code-level issue. At the business level, the impacts cannot be immediately known.

People outside the development team would find it useful to know how often these error codes are correlated with visitors abandoning their shopping cart. For example, what percentage of users who encounter an HTTP 404 error end up abandoning the site without completing a transaction? And how much in potential revenue that is left with them?

The answers to these questions exceed the scope of this scenario. However, the generalized approach is provided in the following section.

The process of "checkout" here is generalized; it represents the general case of when a visitor to your web application begins the process to complete a funnel or goal for which you designed the web application. That goal can indeed be to checkout of a retail site with a purchase. It can also be to download a document. It can be to complete a banking transaction.

**Note:** These steps require the creation of new events specific to your web application, which might require more permissions in your Tealeaf Portal account. For more information, contact your Tealeaf administrator.

*General Steps*

**Procedure**

1. Define an event that identifies when a person begins the process to check out: `Checkout - Begin`.
2. Define an event that identifies when a person is successfully completed checkout: `Checkout - Success`.
3. Define an event (`Checkout - Abandoned`) that combines the two events.
   a) `Checkout - Begin` AND
   b) NOT (`Checkout - Success`)
4. Define an event that combines two events:
   a) `Checkout - Abandoned` AND
   b) `Http 404 - Not Found`

### Results

The steps result in creation of an event that monitors general abandonment (`Checkout - Abandoned`) and the final one, which tracks abandonment when an HTTP 404 error occurs.

These session-level events can be used to track real losses to your business through your web application. By supplying the identifying the problem to enable fixing it, those losses can be turned into gains.

#### *Monetizing the Problem*

To apply a monetary figure to these losses, you can create a shopping cart event, which captures the value stored in the "shopping cart" for your web site. In a retail site, this value may be statically reported on each page. In other sites, this value may be tracked through different means.

- As a substitute, your enterprise might have calculated average transaction values, which can be used for this computation.

For each occurrence of the Abandoned + Http 404 event, you can report the value of the shopping cart. When the occurrences of this value are summed in the Tealeaf Report Builder, you have provided an accurate measurement of the actual lost revenue due to the Http 404 error. This same methodology can be applied to any other event.

Tealeaf provides a scenario that describes how to monetize these losses.

### Next Discoveries

Now that you know how to locate actionable information and sessions that are based on events, you can use other scenario ideas to expand your understanding of Tealeaf and to make new discoveries.

#### *Other Scenario Ideas*

You can use the following ideas to expand your understanding of Tealeaf and to make new discoveries.

- The Event Activity report provides a good entrance to exploring events and their behaviors through detailed, drill-down reporting. You might revisit this scenario by starting again the Event Activity report.
  1. You can check other error events in the Tealeaf Standard Events, such as the `Http 500 - Internal Server Error` for similar issues to the described scenario. The HTTP 500 error information would be of interest to developers.
  2. You can explore the `One Hit Session Count` event that is provided by Tealeaf, which tabulates the number of sessions that contained a single hit. These sessions are often sourced by bot traffic. You can add the dimension `Traffic Type` to the X-axis report to see the break-down of one-hit sessions by type of traffic.
- Other events tabulate generation, network, and round trip times, which feed into the Performance reports. These reports provide a good way for exploring large or otherwise anomalous values in these key performance metrics. Like the Event Activity report, you can explore these metrics by URL.
- Tealeaf provides a special event to help tracking user identifiers. The `Login ID Sample` event must be configured to reflect how user identifiers are displayed in your web application. This event can be used as the basis of exploring individual user activities through IBM Tealeaf cxImpact.
  - This event must be configured as part of your initial IBM Tealeaf cxImpact configuration. Contact your Tealeaf administrator to find out whether the Login ID event is populated.
  - The IBM Tealeaf cxImpact User Manual contains a scenario that describes how to configure the login identifier event for your web application.
  - Using IBM Tealeaf cxResults, you can track visitor activities over repeat visits to your web application.
- When you are ready, you can begin creating your own events to track activities specific to your web application.
  - Event creation is considered an administrative-level feature.

***Documented Scenarios***
A list of the documented scenarios is provided here.

- E2E Scenario - Auditing Page Counts
- E2E Scenario - Build Top IPs and Top IPs by Referrer dashboard reports
- E2E Scenario - Configure Login ID to be Searchable
- E2E Scenario - Create Conversion Rate Dashboard
- E2E Scenario - Create Top Products Dashboard
- E2E Scenario - Getting Value out of Tealeaf in One Hour
- E2E Scenario - Tracking User Agent Information in Tealeaf

## E2E Scenario - Configure Login ID to be Searchable

For web applications that use or require user authentication, capturing Login ID's can be a useful means for tracking visitor behavior. While a Login ID is not a guaranteed indicator of a unique visitor, it does provide insight into the activities on your web application that are engaged through specific user accounts, which is useful for addressing customer service issues.

- Tealeaf recommends using the Tealeaf Cookie Injector to generate unique, persistent cookies for individual visitors.

As part of the installation, Tealeaf provides a number of pre-defined data objects that you can use for tracking basic activities, metrics, and other useful information about your web application. Among these are two objects for capturing Login IDs. This End-to-End Scenario describes how to configure the provided `Login ID` data objects for your web application's needs and then to surface that information in search through the Tealeaf Portal.

**Note:** For customers who have upgraded from Release 7.2 or earlier, the existing Login ID values in your system have been migrated to be stored in the `Login ID` session attribute in your upgraded system. However, you must still complete these steps in order to configure the hit attribute and event for tracking Login IDs.

As part of the set of provided data objects, Tealeaf includes a hit attribute, an event, and a session attribute for detecting the Login ID displayed in your web application.

- A **hit attribute** is used to define the hit attributes in request or response data that demarcate an element of data that you wish to track through an event.
- An **event** is triggered by a condition. In this case, the condition is the presence of the `Login ID` hit attribute. When this hit attribute is detected, the event is fired, which stores the Login ID value in the session attribute `Login ID`.
- A **session attribute** is a session-level variable that can be populated and updated based on events. The `Login ID` session attribute is the first one in your system. Tealeaf supports the creation of up to 64 session attributes.
- When the hit attribute for Login ID is detected, the event is triggered, and the session attribute `Login ID` is updated with the value.

The scenario begins with how to configure the `Login ID` hit attribute and test if the session attribute is being properly populated.

### Pre-requisites
Before you begin, you must familiarize your self with user agents and the Tealeaf tools for managing them.

### About this task

### Procedure

1. *Acquire public standards:* User agent detection relies on two user agent public standards:

- *Browscap:* This public standard is used to track fixed desktop and bot user agents.
- *WURFL:* This public standard is used to track mobile user agents for Mobile Web sessions.

2. *Extended user agent parsing:* To capture user agent information, extended user agent parsing must be enabled.

   **Note:** Extended user agent parsing is enabled by default in the Tealeaf Reference session agent, which is included in the default Windows pipeline. This session agent must be included in each Canister pipeline that processes session data in your Tealeaf environment.

3. *Mobile Web:* To track sessions sourced from a mobile web browser, you must download, convert, and deploy the WURFL public standard for use by the Tealeaf Reference session agent.

   **Note:** Mobile user agent detection is a component of the IBM Tealeaf CX Mobile component. for more information, please contact your IBM Tealeaf representative.

   - Mobile Web sessions are captured by using the IBM Tealeaf CX UI Capture for AJAX solution.

4. *Mobile App:* To track sessions that are sourced from mobile native applications, you must deploy one of the Tealeaf client frameworks.

   **Note:** Mobile user agent detection is a component of the IBM Tealeaf CX Mobile component. for more information, please contact your IBM Tealeaf representative.

**Creating the Data Objects to Monitor User Agent Information**
Creating the data objects to monitor user agent information involves capturing and storing the data for use in eventing, as documented in the following sections.

***Download Report Templates***
Use the sections that follow to create the Tealeaf data objects to track the values in the session data.

***Edit or Create Data Objects to Store User Agent Values***
To include user agent information with your session data, you must create the data objects to locate, track, and record the information.

*Available hit attributes*
A *hit attribute* is the data object that is used to gather patterns of data from the request or response of each hit passed through the event engine.

Tealeaf provides several hit attributes that are configured to look for the name-value pairs that are inserted into the request that contains user-agent data. In the table below, you can review the request variables that are mentioned and the name of any applicable hit attribute that is provided by Tealeaf.

*Table 102. Available hit attributes*

| Request Variable | Common | Mobile Web | Mobile App | Default Hit Attribute | Description |
|---|---|---|---|---|---|
| TLT_TRAFFIC_TYPE | Y | Y | Y | Traffic Type | Type of traffic. See TLT_TRAFFIC_TYPE request variable in Request data. |
| TLT_BROWSER | Y | Y | Y | Browser | Visitor browser type. Example: IE |
| TLT_BROWSER_VERSION | Y | Y | Y | Browser Version | Visitor browser type and version. Example: IE7.0 |
| TLT_BROWSER_PLATFORM | Y | Y | Y | Browser OS | Visitor browser operating system. Example: WinXP |
| TLT_BROWSER_JAVASCRIPT | Y | | | None | |
| TLT_BROWSER_COOKIES | Y | | | None | |

| Table 102. Available hit attributes (continued) | | | | | |
|---|---|---|---|---|---|
| **Request Variable** | **Common** | **Mobile Web** | **Mobile App** | **Default Hit Attribute** | **Description** |
| TLT_BROWSER_VERSION | | Y | Y | None | |
| TLT_SCREEN_WIDTH | | Y | Y | None | |
| TLT_COLOR_DEPTH | | Y | Y | None | |
| TLT_PICTURE_SUPPORT | | Y | | None | |
| TLT_VIDEO_SUPPORT | | Y | | None | |
| TLT_STREAMING_SUPPORT | | Y | | None | |
| TLT_BRAND | | | Y | None | |
| TLT_MODEL | | | Y | None | |

*Tutorial steps*
For purposes of this tutorial, one of the most useful attributes to surface in reporting is the `Browser Version` attribute. This attribute is provided by Tealeaf. It pulls data from the `TLT_BROWSER_VERSION` request variable.

**About this task**

Since this data is already created for you, the following steps describe how you can review this information, highlighting the key values to specify.

- You can modify these steps to create new hit attributes for the other request variables that are inserted in extended user agent parsing.

After you review the `Browser Version` hit attribute, you complete the following steps:

**Procedure**

1. Create an event to capture and record the hit attribute value.
2. Create a dimension to record the event value for contextual reporting.
3. Link the dimension to the `Http 404 - Not` Found event, so that when the event occurs, the dimension value is recorded.
4. Create a report to segment the `Http 404 - Not` Found event by the browser version that is recorded in the session where the event occurred.

**Results**

In this manner, you can use the user agent information to provide segmented detail on key metrics of your web application.

*Create hit attributes*
There are some user agent variables that are not captured by any default hit attribute. However, creating these hit attributes is a simple process.

**About this task**

**Procedure**

1. Log in to the Portal.
2. From the Portal menu, select **Configure** > **Event Manager**.
3. Click the **Hit Attributes** tab.

4. In the left navigation panel, click the **System Hit Attributes** label.
5. In the steps below, you review the configuration for the `Browser Version` hit attribute.
   a) In the main panel, locate and right-click **Browser Version**. Select **Edit Hit Attribute...**.
   b) The hit attribute definition must look like:

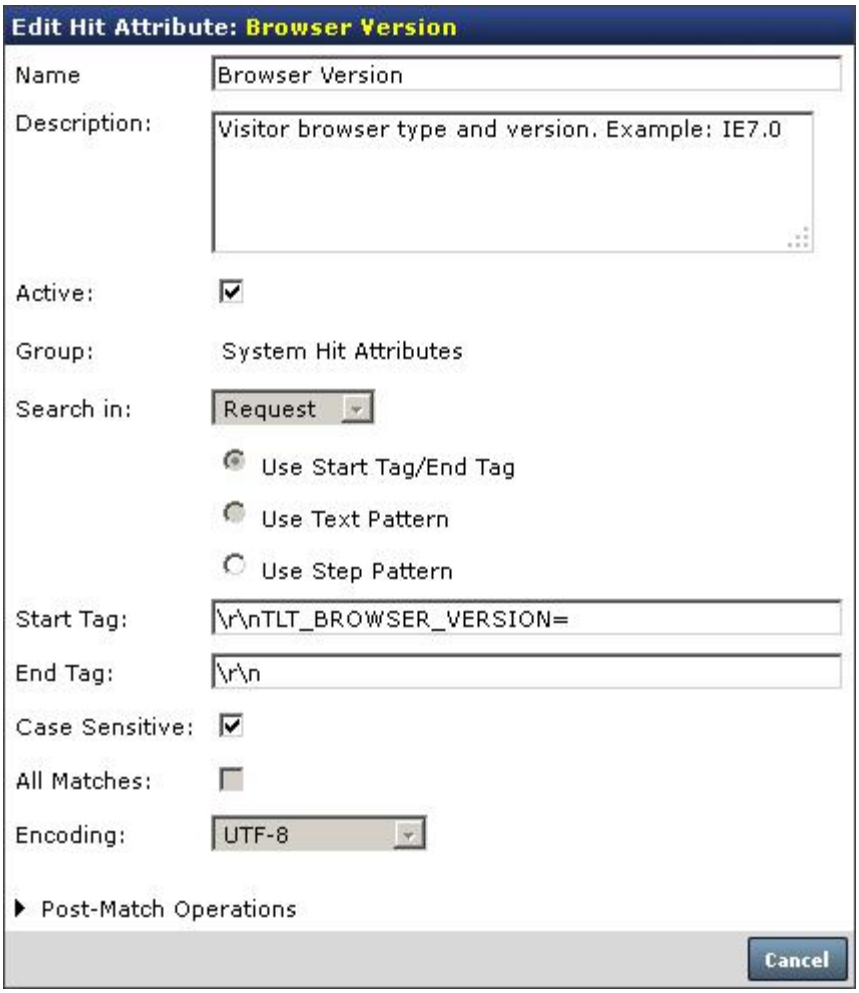



*Figure 81. Browser Version hit attribute to track TLT_BROWSER_VERSION*

6. For purposes of creating hit attributes to capture request variable data, the following values are important to specify:

**Setting**
**Description**

**`Name`**
Name that is displayed in the Event Manager

**`Description`**
User-friendly description that is displayed in the Event Manager

**Search in**
User agent values are stored in the `Request`.

**Use Start Tag/End Tag**
Select this value to specify the start and end patterns of text that define the beginning and end of the value to capture.

**Start Tag**
Enter:

```
\r\n<request_variable_name>=
```

where `<request_variable_name>` is the corresponding `TLT_` value in the preceding table.

**Note:** Be sure to include the terminating equals sign (=) in the Start Tag.

**End Tag**
Enter:

```
\r\n
```

**Case Sensitive**
Select this check box.

a) Since this object is a system hit attribute, it cannot be altered.

- For a hit attribute that you create, click **Save Draft** now. The draft is saved.

7. Repeat the preceding steps for other request variables you want to track. Instead of reviewing the values, you must create new values for each setting.
8. You can locate test data and test your drafted hit attributes in the Event Tester before you save it.
9. To commit your changes to the server, click **Save Changes**.
10. The hit attributes are now detecting user agent information that is written to the associated request variables.

*Data source considerations*
Consider the following information about data sources.

- Experienced event designers notice that it is possible to create a dimension that is populated directly from the source hit attribute. Tealeaf does not recommend this approach.
- By creating an event that is populated from the hit attribute first, you can apply modifications to the conditions and states in which the event is triggered, limiting the processing.
- If the dimension is populated directly from the hit attribute, the dimension is updated with each hit, which is not necessarily in most cases.
- Particularly for user agent data, which can not change from hit to hit, it is a best practice to create an event source from the hit attribute, which is used in turn as the source of the dimension.

*Create event to fire in the presence of user agent values*
After you create the hit attributes to locate user agent information in the request, you must create events to record this information.

### About this task

In this step, you create an event to record the value of the browser version, which is tracked in the `Browser Version` hit attribute created in the previous example. The hit attribute, in turn, is populated by values in the `TLT_BROWSER_VERSION` request variable, which is inserted by Tealeaf.

### Procedure

1. Log in to the Portal.
2. From the Portal menu, select **Configure** > **Event Manager.** The Tealeaf Event Manager is displayed.
3. Click the **Events** tab.
4. Click **New Event**.
5. In the **Add Event** window, you specify the definition of your new event through a series of tabs.

| *Table 103. Add Event Summary page - Settings* | |
|---|---|
| **Setting** | **Description and notes** |
| Name | The name for the event.<br>**Note:** For easiest identification, use the same name for the hit attribute, event, and dimension that use the same source data, if possible. |
| Description | The description of the event |
| Labels | You can use event labels to organize your events. An event can have multiple labels that are associated with it.<br>**Note:** You can create and use the label `User Agent` to store all of your user agent-related events. You can also add this event label to the standard user agent events provided by Tealeaf. |
| Evaluate | This value defines the trigger when the event is checked. For this one, you must check this event on the first hit of the session.<br>Some bot traffic is known to switch user agent strings during a session, so you can choose to make this event fire on every hit. However, depending on the data volume, this configuration change could significantly increase the data storage requirements. To begin, set this event to be evaluated once per session.<br>**Note:** Since the browser version of a device does not change during a session, there is no need to check for this event on any hit other than the first one, unless for some reason user agent information is not reported in the first request of the session. For data that changes from request to request, you can change the trigger for the event. |
| Track | Your selection identifies the instance or instances of the event occurrence that are recorded for the event. This value is set to be `First Per Session` for the event to be evaluated on the first hit of the session. No other configuration is permitted. |
| Value Type | This setting defines the type of value to record.<br>The count of the event is always recorded.<br>**Note:** For the `User Agent - Browser Version` event, the data that is captured is text data. |
| Active check box | Select this check box. When selected, the event is used to process session data as soon as the event is committed to the server. |
| Searchable & Reportable check box | Select this check box. When selected, the event can be used for search and reporting purposes in the Tealeaf Portal. |

6. Condition Step: Click the **Condition** tab. This area is used to configure the condition or conditions that are evaluated when the event is evaluated. When the conditions in this step collectively evaluate to `true`, then the event fires.
   a) For the `User Agent - Browser Version` event, you add the `Browser Version` hit attribute as the condition.

b) Click the **Hit Attributes** panel.

c) Click the **System Hit Attributes** category.

d) Select the `Browser Version` hit attribute as the condition for your event.

e) Set the hit attribute to be tested to `Hit Attribute Found` and `is true`.

This configuration means that whenever the hit attribute is detected, the event fires. Since the request data is written only when a corresponding user agent is matched, you can build the condition to detect only for the presence of the request variable.

7. Value Step: In the Value step, you define the value that is recorded.

a) The values to record are dependent on the Value Type selection you made in the Summary.

b) For each Value Type selection, the event count is always recorded.

c) In the `User Agent - Browser Version` example, the Value Type is configured to be `Text`, which means that data that is recorded is defined as text data.

d) In the Value step, click **Select Item to Record...**.

e) In this case, you want to record the browser version value, which is stored in the `Browser Version` hit attribute. Select this hit attribute.

f) The hit attribute is selected. From the drop-down, select `First Match per Hit`, if it is not already selected.

g) The Value step will have the following information:

- **Selected Value Type: Text**
-

If the Conditions are true, the following is recorded if it is configured:

- Event occurrence
- Value specified below:

**Select Item To Record. . .** x **Browser Version** `First Match per Hit`.

8. Report Groups Step: In the Report Groups step, you can specify any report groups whose contextual data is recorded with each instance of the event.

a) In Tealeaf, a *report group* is a collection of dimensions. A *dimension* is a contextual piece of data that is recorded when the event is recorded. The data is stored with the event in the session.

b) For the `User Agent - Browser Version` event, you can record the `URL/Host/App/Server` report group, which is provided by Tealeaf. This report group records the URL, host name, application name, and server name at the time that the event is triggered.

**Note:** For events that are evaluated on every hit and record values on most of them, adding report groups can affect the volume of recorded data. Add report groups only as needed.

c) Click **Add Report Group**.

d) Click **URL/Host/App/Server**.

The Report Groups window will have**URL/Host/App/Server**along the top of the window and the following will be displayed in the display area:

```
Dimensions:               URL (Normalized)
                          Host
                          Application
                                                    Server
```

9. More Options Step: In the More Options step, you can specify additional actions that are completed when the event fires.

10. For the `User Agent - Browser Version` event, verify that the following settings are specified.

- These options are specified in greater detail elsewhere. For this event, the default settings must be applied.

**Setting**
**Value**

**Display in Portal check box**
Selected

**Display in Session List check box**
Selected

**Flag Every Occurrence in Replay check box**
Selected

**Send to Event Bus check box**
Clear this item, unless you deploy the Event Bus and want to send user agent data to the external system.

**Minute Data On check box**
Cleared

**Update Session Attribute?**
There is no need to update a session attribute with these values.

**Update Session Timeout check box**
Cleared

**Additional Actions**
Select `None`.

**Include Event in IBM Tealeaf cxResults check box**
Select this item to include the event in IBM Tealeaf cxResults. Even if you have not installed IBM Tealeaf cxResults, you must select it so that the event is automatically included if the product is ever installed.

**IBM Tealeaf cxResults Session Filter**
Select `No Action`.

11. You are done specifying the event. Click **Save Draft**.
12. Before you commit events to the server, you must test them in the Event Tester. Draft versions of event-related objects can be tested.

*Create dimension to store user agent values*
You can create a dimension object to store information so that it can be used for report segmentation.

### About this task

You have now reviewed or created the objects necessary to report the values for the `TLT_BROWSER_VERSION` request variable, which captures browser versions reported from the client. Now, you can report on the counts of the number of instances where the `User Agent - Browser Version` event occurred. You can also generate reports on the different recorded values (`IE7.0`, and so on). Collectively, this information is not useful.

What is more useful is how this data can be used to segment reports. For example, you can create a report in which the counts for a different event, such as one tracking your application's errors, is segmented based on the recorded browser versions. This report would create a chart in which each detected browser version is represented by a vertical bar that indicates the occurrences of the event in the reporting period

To create the dimension object to store the browser version information so that it can be used for this report segmentation:

### Procedure

1. Log in to the Portal.
2. From the Portal menu, select **Configure** > **Event Manager.** The Tealeaf Event Manager is displayed.
3. Click the **Dimensions** tab.
4. Click **New Dimension**.

5. In the Add Dimension dialog, populate the following properties:
   a) Name: `User Agent - Browser Version`
   b) Click the **Populated By** button. Click the **Hit Attributes** tab. Open the group that contains the hit attribute that you created. Select the `Browser Version` hit attribute.
   c) Populate With: `First Value in Session`
   d) Click the **Advanced Options caret**.
   e) For the Values to Record entry, select `Whitelist + Observed Values`.
6. The window **Add Dimension: User Agent - Browser Version** will have the following settings:
   - **`Name:`** User Agent-Browser Version
   - **`Description:`** Records values from User Agent - Browser Version event, which extracts values from user agent.
   - **`Populated By:`** User Agent Browser Version.
   - **`Populated With:`** First Value in Session.
   - Advanced options
     - **`Values To Record:`** Whitelist + Observed Values
     - **`Default Value:`** [Others]
     - **`Max Values Per Hour:`** 1000.
     - **`Allow Empty values:`** Check box is cleared.
     - **`Set Value Display Order:`** Check box is cleared.
7. Click **Save Draft**.

   You have now configured the dimension to capture data from the capture stream.

   Before the dimension is operational, you must:

   a) Associate the dimension with a report group.
   b) Associate the report group with an event.

*Associate the dimension with a report group*
The dimension that you just created must be associated with a report group.

**About this task**

**Procedure**

1. In the Dimensions tab, click **New Report Group**.
2. In the Add Report Group dialog, enter a user-friendly name and description. These entries must reflect the function of the report group. For our example, enter the following code: `User Agent - Browser Version`.
   - More dimensions can be added as needed, and you can change the name of the report group then without affecting reporting.
3. For the Template value, select `Standard`.

   **Note:** Depending on your Tealeaf version, the Template selector may not be present. The Standard template is automatically selected for you.
4. Click **Add Dimensions...**.
5. Select `User Agent - Browser Version`.
6. The Report Group definition must look like:

*Figure 82. User Agent report group*

7. Click **Save Draft**.

*Associate the report group with an event*

Now, the newly created report group must be associated with an event. When the event occurs, the contextual data that is captured in the dimensions within the report group is recorded at the same time.

**About this task**

**Procedure**

1. Click the **Events** tab.
2. Select the event with which you would like to record the `User Agent - Browser Version` dimension.
   - In our example, you might associate it with the `Http 404 - Not` Found event that is provided by Tealeaf. This event is stored in the `Tealeaf Standard Events` event label.
3. Select the event. Right-click and select **Edit Event...**.
4. Click the **Report Groups** step.
5. Click **Add Report Group**.
6. Select the `User Agent - Browser Version` report group.

*Figure 83. Associating Http 404 - Not Found event with the new report group*

7. Click **Save Draft**.

***Saving changes***

Now, you must save the events objects that you create.

Click **Save Changes**.

***Managing Dimension Values***

The hit attribute is scanning for occurrences of the `TLT_BROWSER_VERSION` request variable. When it occurs, the event fires, recording the request variable value as a numeric value.

- When the `Http 404 - Not Found` event occurs, the current value of the event is recorded as the value for the `User Agent - Browser Version` dimension.

The dimension values are being gathered directly from the capture stream. Each value that is detected in the capture stream is recorded into the database, which presents some issues.

For the `TLT_BROWSER_VERSION` request variable, the range of value is extensive. For each browser known through the browscap public standard, there can be multiple versions. For example, values can be:

- `IE6.0`
- `IE7.0`
- `IE8.0`
- `IE9.0`

But each detected value can be a repeat of a value that is already known to Tealeaf through previously recorded dimension values. As a result, a great deal of replicated data is being recorded. Each time a session is captured from a device that is using Internet Explorer 7.0, another instance of the dimension value `IE7.0` is recorded in the database. For high-volume dimensions, this unnecessary recording is expensive.

As an alternative to this recording method, you can create a *whitelist* of values, which contains the values that are allowed to be recorded for the dimension. Recording instances from the whitelist requires a much smaller volume of data.

**Note:** Over time, a dimension that is configured to record `Whitelist + Observed Values` grows without bound. For data storage purposes, you must always try to convert these dimensions to `Whitelist Only`.

**Note:** For user agent data, the landscape of available browsers is constantly changing. As a result:

- You must regularly update your browscap and WURFL (if IBM Tealeaf CX Mobile is licensed) standards so that you have the latest user agent information.
- You must review your dimension data regularly to see whether new values are being recorded.

  These habits are good workflow habits to apply to your dimensional data.

There are two ways to create a whitelist:

- Specify the whitelist manually: If you know the acceptable values for a dimension, you can specify the list through the Event Manager. This method is useful only for dimensions with a limited number of dimensions.
- Upload list of values: If you know the acceptable values for a dimension, you can create a whitelist of values in a local file and upload it to the Portal.
- Gather whitelist values from dimension logs: Through the Event Manager, you can enable logging of dimension values in to a database log. After enough values are captured, you can download the logged values to a local text file, edit it, and then load it into the dimension as the whitelist through the Event Manager.

This last method is the easiest to manage and is described in the following sections.

*Enabling logging*
The first step for managing dimension values is to enable logging.

**About this task**

To enable logging on the dimension:

**Procedure**

1. In the Event Manager, click the **Dimensions** tab.
2. Select the `User Agent - Browser Version` dimension.
3. Right-click and select **Edit Dimension?**.
4. Click the **Advanced Options caret**.
5. Click **Turn On Logging**.
6. Click **Save Draft**.
7. Click **Save Changes**.

**Results**

Detected values for the dimension are now stored in the dimension logs.

**Note:** After you enable dimension logging, you must wait for a sometime to collect a sufficient volume and range of values to populate your dimension whitelist. For this exercise, wait 1 hour.

*Download log file*
After sufficient time, you can download the logs to your local workstation, where you build the whitelist of values.

**About this task**

**Procedure**

1. In the Event Manager, click the **Dimensions** tab.
2. Select the `User Agent - Browser Version` dimension.
3. Right-click and select **Edit Dimension?**.
4. Click the **Advanced Options caret**.
5. Click **Edit Whitelist?**.
6. In the **Edit Whitelist** window, click **Download Log Values**.
7. Save the file locally.
8. Click **Cancel** twice.

*Build whitelist and upload*
After you create the value lists, you must reformat them into single-column text files and then import them as whitelisted values in a dimension you create in the Tealeaf Event Manager.

*Import the data into the Tealeaf Event Manager*
The following steps outline the general workflow for importing value lists into the Tealeaf Event Manager.

**About this task**

**Procedure**

1. Click the Dimensions tab.
2. Select the `User Agent - Browser Version` dimension.
3. Edit the dimension.

a) Click **Edit Whitelist...**.
b) In the Edit WhiteList window, click **Import File...**.
c) In the Import WhiteList dialog, click **Browse...**. Navigate your local environment to select the text file you created. Click **Open**.
d) To import the selected file, click **Import**.
e) The imported files are displayed in the whitelist.
f) You may edit the values and their properties or add additional values as needed.

4. Click **Done**. Click **Save Draft** to save a draft of your new dimension.
5. To save the changes to the server, click **Save Changes**.
6. After 10 minutes or so, some completed sessions should be populated based on this dataset.

**Results**

**Note:** If you are satisfied with your whitelist, you should switch over to `Whitelist Only` for the dimension. Any values that are detected but do not appear in the whitelist are recorded as `[others]` for the dimension. When this dimension value begins recording counts, you can revise the whitelist to capture the newly detected values.

***Repeat Steps***
You can use the `User Agent - Browser Version` event and the associated dimension in search and reporting.

If you want, repeat the steps to create other hit attributes, events, dimensions, and dimension values for the other fields in the user agent data set.

**Using User Agent Data in Tealeaf**
Now that data objects are capturing and recording your user agent data, you can begin by using it elsewhere in the Portal.

***Search for user agent data***
You can use the Portal to search for the events and dimensions that you created and to locate instances of the event in returned sessions by using the QuickView feature.

*Search for `User Agent - Browser Version` event*
You can search for the existence of the `User Agent - Browser Version` event in a session. Additionally, you can search specific values for this event.

*Search for the event*
To search for sessions in which the event occurred, complete the following steps.

**About this task**

**Procedure**

1. From the Portal menu, select **Search** > **Completed Sessions**.

   **Note:** You can also complete this search against active or all sessions.
2. Clear all of the search fields.
3. Select the default completed search template.
4. Under the Basic Search Fields category, click the **Events** link.
5. In the main panel, click **Select Event**.
6. In the Event Selector, click the event label under which the `User Agent - Browser Version` event was stored.
7. Select the event. Click **Select**.
8. The search terms must look like:

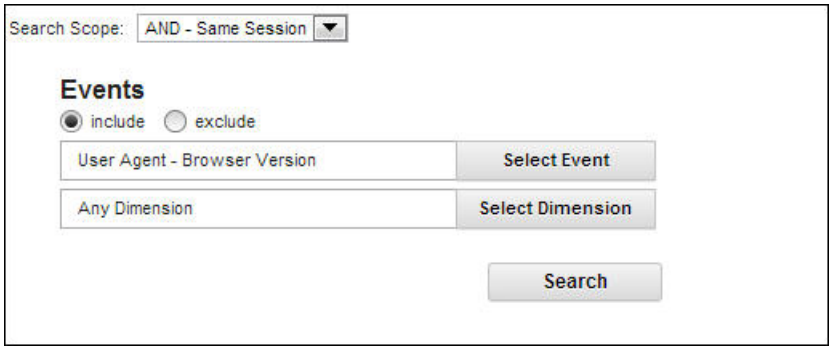



*Figure 84. Search for user agent event*

9. To run the preceding search, click **Search**.
10. Results are displayed in the session list.

*Search for specific values for the event*
To search sessions in which specific values of the event occurred, complete the following steps.

### About this task

### Procedure

1. From the Portal menu, select **Search** > **Completed Sessions**.

   **Note:** You can also complete this search against active or all sessions.
2. Clear all of the search fields.
3. Select the default completed search template.
4. Under the Basic Search Fields category, click the **Event Values** link.
5. In the main panel, click **Select Event**.
6. In the Event Selector, click the event label under which the `User Agent - Browser Version` event was stored.
7. Select the event. Click **Select**.
8. The event is added to the search criteria.
9. To search for a specific value for this event:
   a) Set the operator to `includes`, if it is not already selected.
   b) Set the value for the event for which you want to select.
   You might enter `IE7.0`.
10. The search terms must look like:

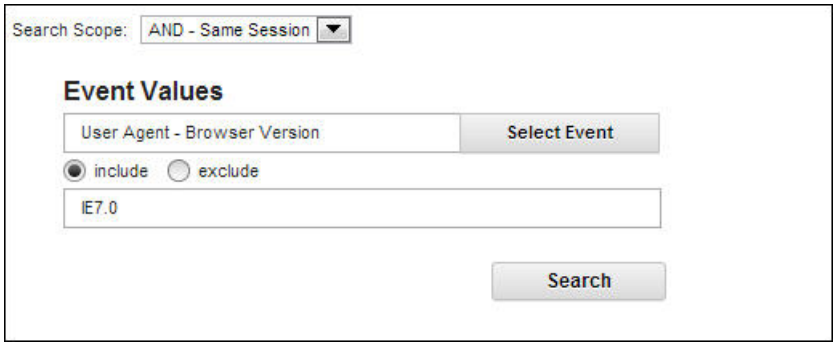



*Figure 85. Search for user agent event value*

11. To run the preceding search, click **Search**.
12. Results are displayed in the session list.

*Locating instances in returned results*

When the sessions are returned in the search results, you can locate the instances of the event or (event + dimension) combination by using QuickView.

### About this task

### Procedure

1. To locate, click the **QuickView** ( ) icon next to the session of interest to you in the search results.
2. In QuickView, from the Order By drop-down, select `Event Name`.
3. If there are too many event names to review, click the link next for the Event Label. Select the event label that contains the event for which you searched.
4. Locate the event. In the image below, the `Http 404 - Not Found` event is displayed.

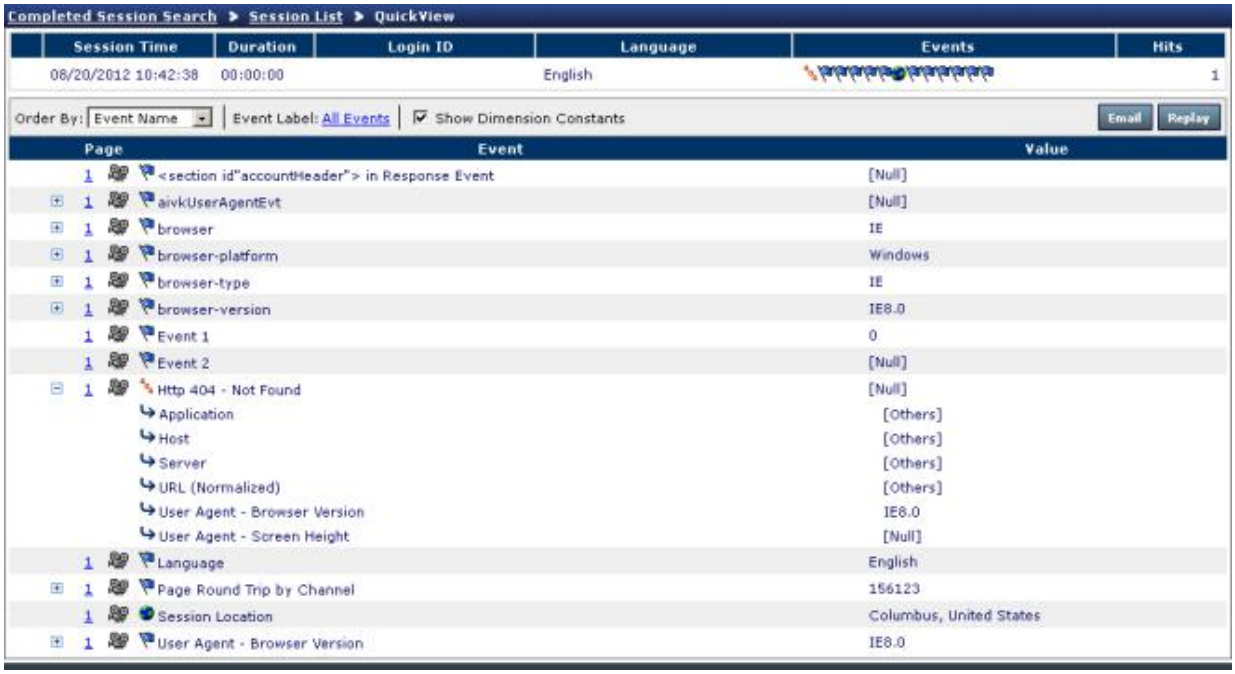



*Figure 86. QuickView*

5. The following information is of interest:
   - The *1* link indicates the page number. You can select this link to review page details about the page in question.
   - Beneath the listed event (`Http 404 - Not Found`), you can review all of the dimension values that were recorded when the event occurred.
     - If it is present, the `[Others]` value is a dimension constant that is recorded when the detected value does not match any values on a listed whitelist.
     - For the `User Agent - Browser Version` dimension, you can see that a value of `IE8.0` was recorded.

#### *User agent data in replay*

To begin replay of the session on the page where the event occurred, click the **Replay** ( ) icon next to the event name.

From the dialog, select **Browser** to replay the session in your web browser through Browser Based Replay.

*User agent information bar*
When the session is loaded in BBR, it is displayed in Replay view. At the top of the screen, you can see an extra bar is added with additional information about the session:

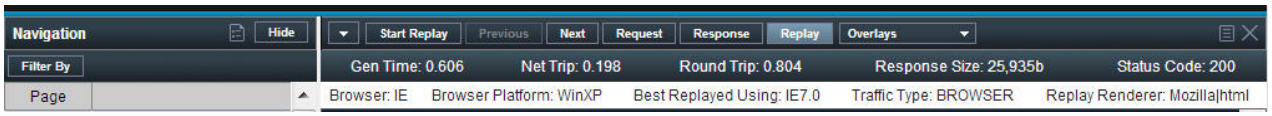



*Figure 87. User Agent information in BBR*

The preceding information is extracted from the user agent information that is submitted from the client. When a user agent match is found, these properties are displayed in BBR to help identifying the source of the session.

**User Agent Property**
**Source Request Variable**

**`Browser`**
`TLT_BROWSER`

**`Browser Platform`**
`TLT_BROWSER_PLATFORM`

**`Best Replayed Using`**
`TLT_BROWSER_VERSION`

**Note:** This data source corresponds to the source for the `User Agent - Browser Version` event and dimension objects that you created in this tutorial.

**`Traffic Type`**
`TLT_TRAFFIC_TYPE`

**`Screen`**
`TLT_SCREEN`

**Note:** Screen data is only visible if you have an IBM Tealeaf CX Mobile license.

**`Replay Renderer`**
`TLT_REPLAY_RENDERER`

*Mobile skins*
For mobile-based sessions, user agent information can be used to determine the surrounding trim (or *skin*) to apply during replay. A skin is applied during BBR replay to emulate the sizing of how the visitor experienced your web application through a mobile device.

**Note:** This option is only enabled if you have an IBM Tealeaf CX Mobile license.

*Request data*
To see user agent information in BBR, you must be in Request view. Select **Request** in the BBR toolbar.

In Request view, you can review the raw request data for the hit you selected. Tealeaf augments the raw request with additional data, including the user agent information that is retrieved if a user agent string submitted in the request is matched in one of the public standards.

User agent information in inserted in the `[ExtendedUserAgent]` section of the request.

- This information is inserted by the Tealeaf Reference session agent.

```
[ExtendedUserAgent]
TLT_BROWSER=IE
TLT_BROWSER_VERSION=IE8.0
TLT_BROWSER_PLATFORM=Windows
TLT_TRAFFIC_TYPE=BROWSER
```

```
TLT_BROWSER_JAVASCRIPT=true
TLT_BROWSER_COOKIES=true
```

***User agent data in reporting***

You can include user agent data in a report as a dimension, as described in the following sections.

*Dimensional user agent data*

The most interesting use of user agent data in reporting is including it as a dimension. In our example, we created the `User Agent - Browser Version` dimension and associated it with the `Http 404 - Not Found` event.

### About this task

In the steps below, you create a report in the Report Builder on the `Http 404 - Not Found` event, which is filtered by the `User Agent - Browser Version` dimension. You can determine these HTTP Status Code 404 errors from this report, which indicate that a resource was not found by the dimension added to it. In this case, you can review the counts of these 404 errors by the browser versions of devices that access your web application.

### Procedure

1. In the Portal menu, select **Analyze** > **Report Builder**.
2. The Report Builder is displayed. Click the **New** icon in the toolbar.
3. From the left panel, click the **Events** tab.
4. Click **Add Event**.
5. In the Event Selector, select the **Tealeaf Standard Events** label.
6. From the Tealeaf Standard Events, select the `Http 404 - Not Found` event. Click **Select**.
7. The Report Builder must look like:

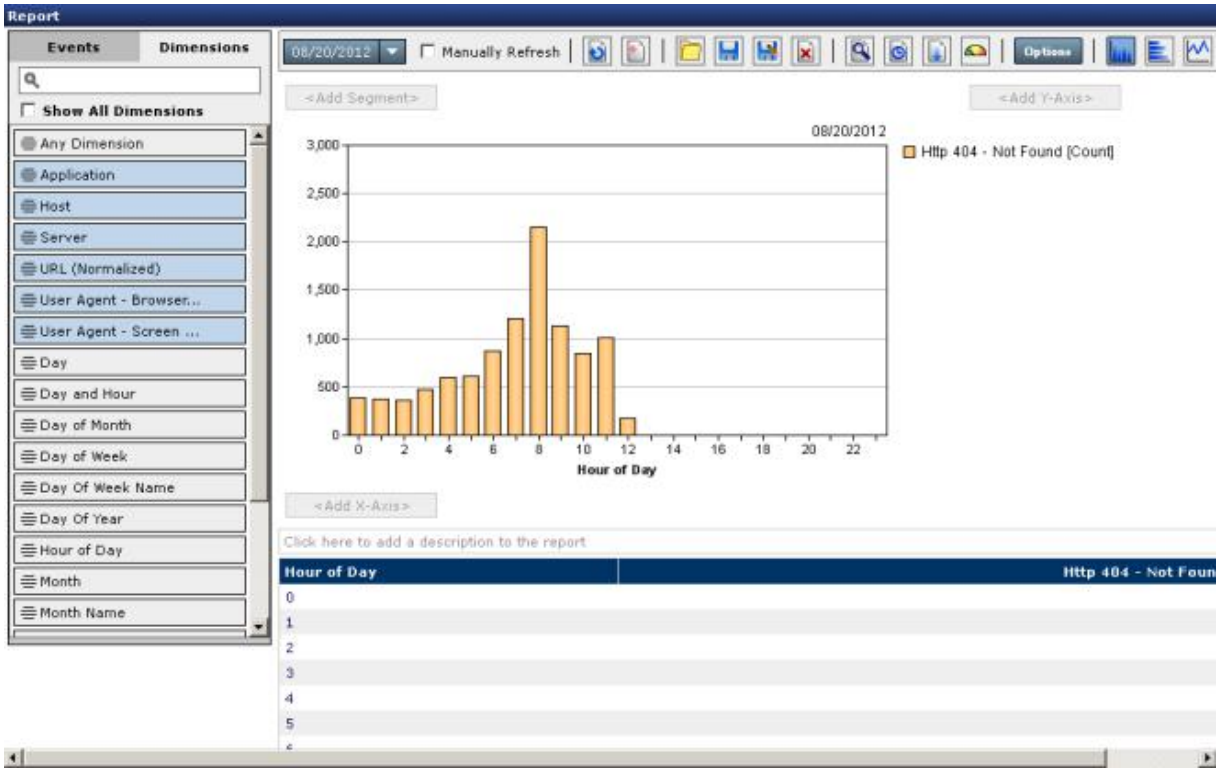



*Figure 88. Report Builder - User agent as dimension report*

8. The reporting data is incomplete in the chart. By default, the Report Builder displays data from the current date.

- If you created these data objects before today, you can review data from a previous date. Click the date that is displayed in the toolbar, and select the last business day before the current date.

9. Now, you can apply the dimension to it. In the left panel, click the **Dimensions** tab.
10. The dimensions that are listed in the Dimensions tab are the only ones that are compatible with the currently displayed set of events.
11. Click and drag the `User Agent - Browser Version` dimension to the <Add X-Axis> box below the chart in the report display.
12. The report must now look like:

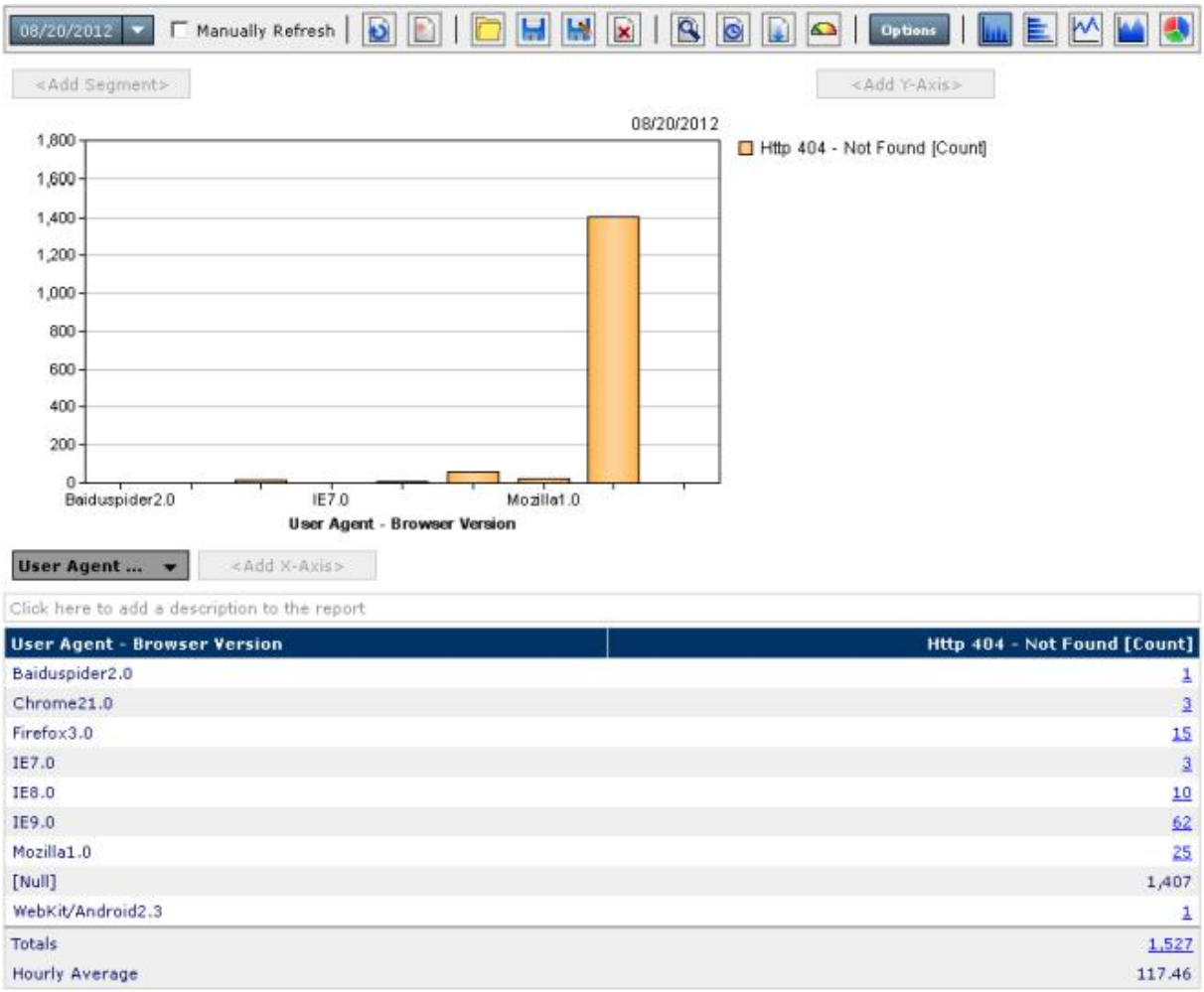



*Figure 89. Report Builder - User agent as dimension report*

13. In the preceding figure, the chart is somewhat obscured by the fact that there are so many instances of `[Null]` values. In dimensional report, a null value is recorded if the specific item of data is not recorded when the event was recorded. In these cases, the user agent information is not available.
    - If you created the dimension and began recording values to it at some point during the day, all recorded instances of the `Http 404 - Not Found` event recorded null values for the dimension.
14. To make the chart more meaningful, you might want to filter out the null values. You can use the following steps to filter out values in general from a displayed dimension.
    a) Next to the dimension that is added to the X-axis, select the **Down caret** to open the context menu for the dimension. From the context menu, select **Filter**.
    b) In the Dimension Filter dialog, click the **Filter By Value** check box at the top.
    c) From the drop-down, select `Exclude Only Selected Values`.
    d) Click **Add Values**. Select **All Values**.
    e) From the Dimension Value Selector, click the check box next to `[Null]`.

f) The Dimension Filter must look like:

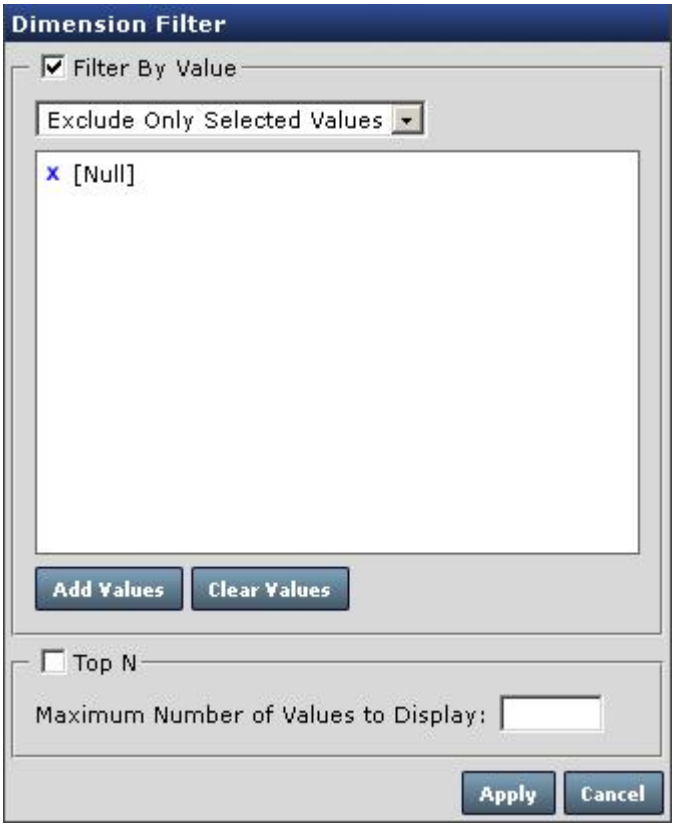



*Figure 90. Report Builder - Filtering dimensions*

15. Click **Apply**.
16. The Report Builder is updated to remove the null values from the report. It must look like:

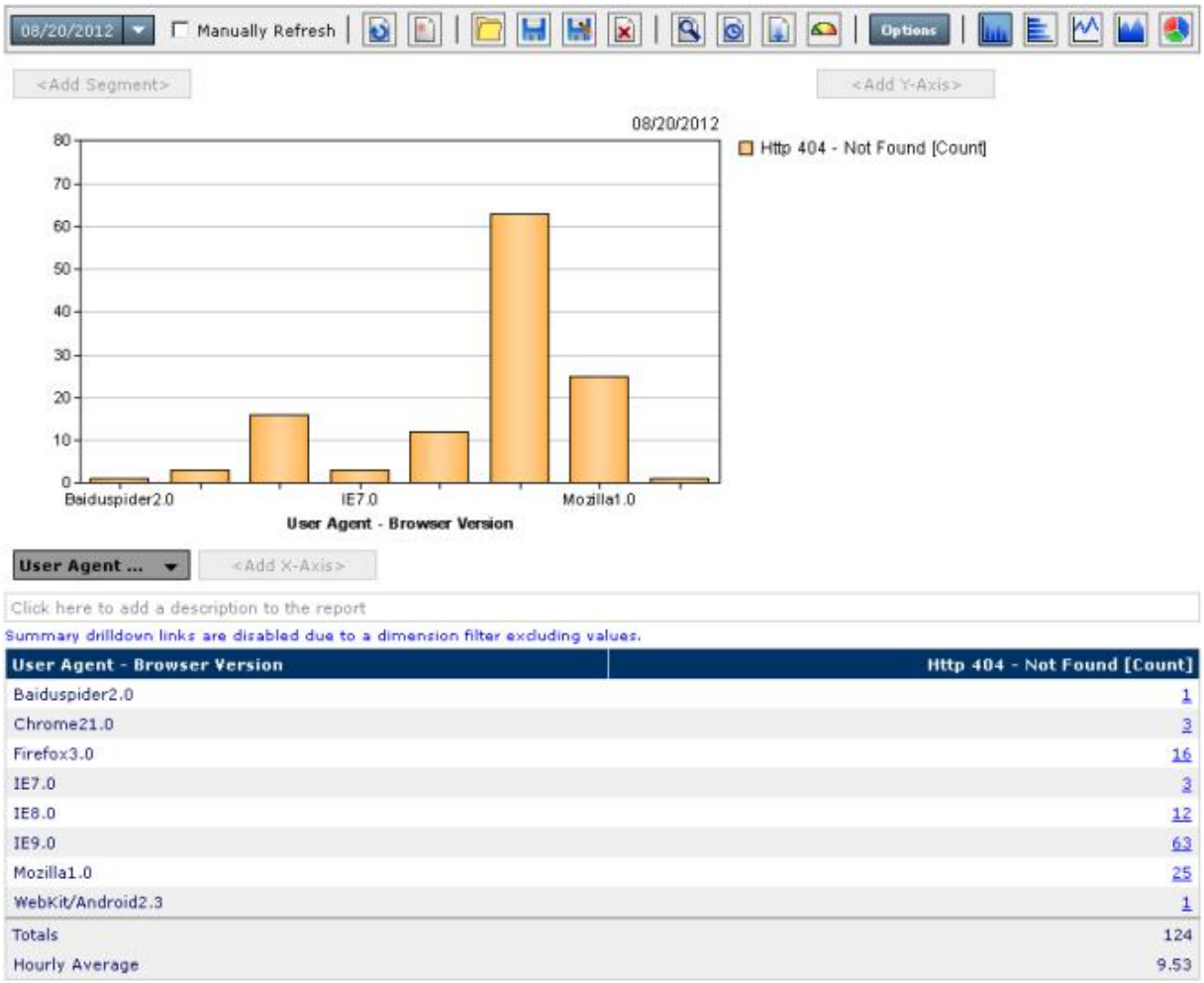



*Figure 91. Report Builder - Filtering dimensions*

### Results

In the preceding report, you can now visually identify that HTTP Status Code 404 errors are divided among various browser version values.

If this report is useful to you, click the **Save** icon in the toolbar to save the report.

*Modifications*
You can make modifications as described here.

- If you want to see the counts of the `HTTP 404 - Not Found` event for the dimension as it is configured, click the dimension entry in the X-axis and drag it to the **<Add Segment>** box at the top of the screen. In our example, this report now shows just the `Http 404 - Not Found` event counts for the selected date in which the `User Agent - Browser Version` dimension is not null.
- To segment the vertical counts of the event by the dimension values, click and drag the dimension as it is configured to the Y-axis box.

***Event report***
You can determine how often the user agent event occurred by performing the steps listed here.

### Procedure

1. Click the **New** icon in the toolbar.
2. In the left panel, click the **Events** tab.
3. Click **Add Event**.

4. In the filter box, enter `User Agent` or other string to help locating your user agent event or events.
5. Select the event. In our example, the event was `User Agent - Browser Version`.
6. Click **Select**.
7. The report is displayed.

   **Note:** The displayed report shows all instances when the event was fired, even instances when a null value was recorded for the dimension. Using this particular event for making assessments is not meaningful.

## IBM Tealeaf documentation and help

IBM Tealeaf provides documentation and help for users, developers, and administrators.

### Viewing product documentation

All IBM Tealeaf product documentation is available at the following website:

Tealeaf Customer Experience Support

Use the information in the following table to view the product documentation for IBM Tealeaf:

*Table 104. Getting help*

| To view... | Do this... |
|---|---|
| Product documentation | On the IBM Tealeaf portal, go to **?** > **Product Documentation**. |
| IBM Tealeaf Knowledge Center | On the IBM Tealeaf portal, go to **?** > **Product Documentation** and select *IBM Tealeaf Customer Experience in the ExperienceOne Knowledge Center*. |
| Help for a page on the IBM Tealeaf Portal | On the IBM Tealeaf portal, go to **?** > **Help for This Page**. |
| Help for IBM Tealeaf CX PCA | On the IBM Tealeaf CX PCA web interface, select **Guide** to access the *IBM Tealeaf CX PCA Manual*. |

### Available documents for IBM Tealeaf products

The following table is a list of available documents for all IBM Tealeaf products:

*Table 105. Available documentation for IBM Tealeaf products*

| IBM Tealeaf products | Available documents |
|---|---|
| IBM Tealeaf CX | • *IBM Tealeaf Customer Experience Overview Guide*<br>• *IBM Tealeaf CX Client Framework Data Integration Guide*<br>• *IBM Tealeaf CX Configuration Manual*<br>• *IBM Tealeaf CX Cookie Injector Manual*<br>• *IBM Tealeaf CX Databases Guide*<br>• *IBM Tealeaf CX Event Manager Manual*<br>• *IBM Tealeaf CX Glossary*<br>• *IBM Tealeaf CX Installation Manual*<br>• *IBM Tealeaf CX PCA Manual*<br>• *IBM Tealeaf CX PCA Release Notes* |

| *Table 105. Available documentation for IBM Tealeaf products (continued)* | |
|---|---|
| **IBM Tealeaf products** | **Available documents** |
| IBM Tealeaf CX | • *IBM Tealeaf CX RealiTea Viewer Client Side Capture Manual*<br>• *IBM Tealeaf CX RealiTea Viewer User Manual*<br>• *IBM Tealeaf CX Release Notes*<br>• *IBM Tealeaf CX Release Upgrade Manual*<br>• *IBM Tealeaf CX Support Troubleshooting FAQ*<br>• *IBM Tealeaf CX Troubleshooting Guide*<br>• *IBM Tealeaf CX UI Capture j2 Guide*<br>• *IBM Tealeaf CX UI Capture j2 Release Notes* |
| IBM Tealeaf cxImpact | • *IBM Tealeaf cxImpact Administration Manual*<br>• *IBM Tealeaf cxImpact User Manual*<br>• *IBM Tealeaf cxImpact Reporting Guide* |
| IBM Tealeaf cxConnect | • *IBM Tealeaf cxConnect for Data Analysis Administration Manual*<br>• *IBM Tealeaf cxConnect for Voice of Customer Administration Manual*<br>• *IBM Tealeaf cxConnect for Web Analytics Administration Manual* |
| IBM Tealeaf cxOverstat | *IBM Tealeaf cxOverstat User Manual* |
| IBM Tealeaf cxReveal | • *IBM Tealeaf cxReveal Administration Manual*<br>• *IBM Tealeaf cxReveal API Guide*<br>• *IBM Tealeaf cxReveal User Manual* |
| IBM Tealeaf cxVerify | • *IBM Tealeaf cxVerify Installation Guide*<br>• *IBM Tealeaf cxVerify User's Guide* |
| IBM Tealeaf cxView | *IBM Tealeaf cxView User's Guide* |
| IBM Tealeaf CX Mobile | • *IBM Tealeaf CX Mobile Android Logging Framework Guide*<br>• *IBM Tealeaf Android Logging Framework Release Notes*<br>• *IBM Tealeaf CX Mobile Administration Manual*<br>• *IBM Tealeaf CX Mobile User Manual*<br>• *IBM Tealeaf CX Mobile iOS Logging Framework Guide*<br>• *IBM Tealeaf iOS Logging Framework Release Notes* |

# Index


## A

active search 30
after every step 189
alert 28, 206
Alert Monitor 28
analysis 94
Android 189
annotation 30
audit 206

## B

blacklist 209, 243
Browser Based Replay 112, 135, 158, 161, 169, 189
business impact 94

## C

checkout 225
client framework 189
completed search 30
configuration 110, 218, 274
conversion rate 225
current 21, 26
custom highlighting 169
custom UI event 169
CX 112, 158, 161, 169
CX-Extended 189
cxImpact 1, 15, 21, 23, 26, 28, 30, 83, 110, 135
cxResults 67, 88, 89, 94, 108

## D

dashboard 206, 209, 225, 243
data 4
delay 18
dimension 255
disabled 18
disabling session segments 94
drill-down 225, 255

## E

E2E 205, 206, 209, 218, 225, 243, 255, 274
End-to-End 205, 206, 209, 218, 225, 243, 255, 274
event 189
event activity 255
event details 30
Event Manager 189
Event Tester 189
eventing 189
events 21, 23, 26
every step 189
example 206, 209, 218, 225, 243, 255, 274
export 30
extendeduseragent 243

## F

filter 161
find 161
focus date 225

## H

highlight only 169
highlighting 169
host-port 169
hour 255

## I

icons 30
ignore 169
incomplete 18
iOS 189

## J

JSON 189

## K

keywords 83

## L

license key 206
login ID 218, 274

## M

manage 89, 108
max values 243
menu bar 18
modification 169
monitoring
    real-time 21

## N

navigable pages 161
Navigation
    Portal 16

## O

overview 1, 88

## P

page count 206
page detail 30
page generation time 83
page info 30
page list 30
page performance 94
page sequence 94
Password
    Setting your Tealeaf password 110
popup 169
Portal
    interface
        menu bar options 16
    status messages
        diagnosing 18
Portal menu bar
    options 16
Preferences
    Setting personal preferences 110

## Q

QuickView 255

## R

reference info 30
remap 169
remote addr 83
remove page 169
replay 169
replay rules 169
Replay rules
    Remapping URL 183
Replay Server 169
report 209, 225, 243
Report Builder 206
reports gallery 94
request 161
response 161
responsemod 169
result set 67, 88, 89, 94, 108
rules 169

## S

safety limit 18
scenario 205, 206, 209, 218, 225, 243, 255, 274
scoring 88
search 30, 67, 83, 88, 161, 218, 274
search for IP address 30
search options 30
search results 30, 88
search syntax 83
search template 218, 274
segment 67, 88, 89, 94, 108
session 23, 30, 89, 94
session info 30
session list 30, 255
session list template 218, 274
settings 110
shopping cart 225
site metrics 206
start checkout 225
Status messages
    Troubleshooting
        diagnosing 18
step 189
step attribute 189
Step-Based Eventing 189
Sub-Search 161
syntax 83

## T

Tealeaf data 4
Top IP 209
Top Mover 206
Top-N 255
trigger 189
tutorials 205, 209, 218, 225, 243, 255, 274

## U

UI Capture 189
UIC 189
universal search 30
URL 169
user 1, 15, 21, 23, 26, 28, 30, 67, 83, 88, 89, 94, 108, 110, 112, 135, 158
user agent 243

## V

value 255
visitor 67, 108
visitor search 67

## W

white list 169, 209
wildcards 30, 67