HTTP Errors User Guide

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**Introducing HTTP Errors**

The HTTP Errors application provides information about the Hypertext Transfer Protocol (HTTP) error codes sent by web services in response to requests from subscribers on your network. Your technical operations team can use the data to track the success of subscriber sessions, enabling you to deliver proactive customer care, to reduce operating expenses, and to glean insight into the performance of specific mobile devices.

**Navigating the Landing Page**

After you provide your username and password on the login page, the MURAL landing page opens.

At the left end of the title bar on the landing page are two tabs:

- The **Home** tab, which is open by default, provides access to the Content Analytics and HTTP Errors applications—click the desired application in the navigation bar at the left of the tab and a graphic of the application appears in the right part of the tab. In the figure, HTTP Errors is selected. Then click the **Launch Application** icon below the graphic, and either the **Network** tab of the Content Analytics application or the **HTTP Errors** tab opens in a new browser window. For information about the
Content Analytics application, see the Cisco MURAL User Guide. For information about the HTTP Errors tab, see "Analyzing HTTP Errors" on page 3.

- The Configuration tab provides the interface for administering user accounts. See the Cisco MURAL User Guide.

The right end of the title bar provides interfaces for obtaining status information and controlling the session:

- Welcome username—Names the user logged in to this MURAL session. In the figure, it is admin.

- Change Password—Opens the pop-up window for changing the password of the current user. See the topic about administering user accounts in the Cisco MURAL User Guide.

- About Mural—Opens a pop-up window with information about this version of MURAL.

- Sign Out—Ends the current MURAL session and associated application sessions. The browser window for the application does not necessarily close immediately, but does so when you next perform any action in the application.

- TIME ZONE—Reports the time zone for the dates and times displayed and set on all tabs in the applications accessed from the landing page. Your system administrator sets the time zone during initial configuration of MURAL. In the figure, it is Coordinated Universal Time (UTC).
Analyzing HTTP Errors

The **HTTP Errors** tab in the HTTP Errors application provides information about the Hypertext Transfer Protocol (HTTP) error codes sent by web services in response to requests from subscribers on your network.

Use the **HTTP Errors** tab to:

- Identify service providers with the potential to affect network operations negatively
- Highlight failure percentages
- Explore trends over time in the top error codes, comparing them to historical data patterns
- Filter HTTP errors by location, service provider, and device

This topic has the following sections:

- "Navigating the HTTP Errors Tab" on the next page
- "Analyzing HTTP Errors for Services or Devices" on page 5
- "Analyzing HTTP Transactions and Traffic Volume" on page 11
Navigating the HTTP Errors Tab

The HTTP Errors tab is divided functionally into several panes, numbered 1 through 6 in the following figure.

The panes in the numbered boxes provide the following functionality:

1. HTTP Errors title bar—On the left side, provides access to the specialized information on each tab (click HTTP Errors to access the HTTP Errors tab). On the right side, reports status information about the current HTTP Errors session and provides interfaces for displaying help topics and closing the session. See "Controlling the HTTP Errors Session" on page 17.

2. Time range-selector—Sets the period of time for which data is reported on the tab. See "Setting the Time Range for Displayed Data" on page 19.

3. Filter panel—Use this panel to define and apply filters that limit the data in to include only the . When no filter is applied, the data includes all .

4. Summary list—Lists the services that returned the most HTTP errors (the default) or the devices which were used by subscribers that received the
most errors. See "Analyzing HTTP Errors for Services or Devices" below.

5. Error details—Specifies the most frequent error codes, and reports hourly values for number of HTTP transactions and volume of HTTP traffic. See "Analyzing HTTP Transactions and Traffic Volume" on page 11.

6. Time range selector for line charts—Reports and sets the period of time covered by the HTTP Transactions and HTTP Traffic line charts in box 5. It can be set independently of the overall time range. See "Setting the Time Range for the Line Charts" on page 20.

**Analyzing HTTP Errors for Services or Devices**

The summary table on the left side of the HTTP Errors tab (box 4 in the preceding figure) reports statistics for HTTP transactions on your network that result in error codes, both in terms of the web services that generated the errors in response to requests from subscribers, and in terms of the devices used by subscribers.

See the following sections:

- "Ranking Services or Devices by Network Impact, Error Rate, Error Count, or Affected Subscribers" on the next page
- "Changing the Sort Order in the Summary Table" on page 8
- "Listing Additional Services or Devices" on page 9
- "Analyzing Errors Per Device for a Service or Errors Per Service for a Device" on page 10
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Ranking Services or Devices by Network Impact, Error Rate, Error Count, or Affected Subscribers

When the HTTP Errors application initializes, the summary table on the left side of the HTTP Errors tab lists the web services that sent HTTP error codes in response to requests from subscribers on your network.

The top row in the table specifies the total number of services for which data is available (500 in the figure) and the time range for which data is reported (the
24 hours from 00:00 hours on 22 June to 00:00 hours on 23 June). When the HTTP Errors application initializes, this row is selected, as indicated by the light purple background color. Details for the selected row appear in the pane to the right of the table, as discussed in "Analyzing HTTP Transactions and Traffic Volume" on page 11.

To export the data in the table to a file in comma-separated value (CSV) format, click the export icon (▼) above the upper right corner of the table. For complete instructions, see "Exporting HTTP Error Data to a File" on page 25.

To list the devices that were used by subscribers, click by Devices in the top left cell of the table. (As shown in the figure, the background turns yellow as you mouse over a row.)

![](image1.png)

To switch from the list of devices back to the list of services, click by Services in the top left cell.

For both services and devices, the second row (enclosed in the orange box in the following figure) specifies the type of information reported in the column.

![](image2.png)
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- **Network Impact Rank**—Indicates the level of potential negative effect on network operations caused by errors generated by the service (or received by devices of the model type). The algorithm for calculating the rank considers two statistics for each service or device model:
  - The percentage of total errors (from all services or devices) it accounts for
  - Its average traffic volume per flow compared to the overall volume of HTTP traffic

- **Error Rate**—Specifies the percentage of HTTP transactions that resulted in errors. The ring chart that surrounds the numerical value graphically represents the proportion of successful (green) and failed (red) transactions.

- **HTTP Errors**—Specifies the number of HTTP errors generated by the service or received by devices of the model type.

- **Subs Impacted**—Specifies the number of subscribers using the service or device who were affected by the errors.

For the values in the **HTTP Errors** and **Subs Impacted** columns, the letter following the digits indicates the multiple, as specified in the **Count Statistics** column of the following table.

<table>
<thead>
<tr>
<th>Rate Statistics</th>
<th>Volume Statistics</th>
<th>Count Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>kilobits per second (Kbps)</td>
<td>kilobytes</td>
</tr>
<tr>
<td>M</td>
<td>megabits per second (Mbps)</td>
<td>megabytes</td>
</tr>
<tr>
<td>G</td>
<td>gigabits per second (Gbps)</td>
<td>gigabytes</td>
</tr>
<tr>
<td>B</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>T</td>
<td>terabits per second (Tbps)</td>
<td>terabytes</td>
</tr>
<tr>
<td>P</td>
<td>petabits per second (Pbps)</td>
<td>petabytes</td>
</tr>
<tr>
<td>Q</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

**Changing the Sort Order in the Summary Table**

When the HTTP Errors application initializes, the table ranks services by their network impact score, in increasing order starting with 1, as indicated by the purple,
non-underlined font and the increasing-order sort icon (▲) in the left cell in the second row. You can sort the table based on the values in any of the four columns. To change columns, click the statistic name in the second row of the table, as shown for Error Rate in the following figure. The sort icon (▲ or ▼) moves to the new column, the font changes to purple, and the rows are resorted. The increasing-order sort icon (▲) indicates the sort order is smallest to largest, and the decreasing-order sort icon (▼) largest to smallest.

To reverse the sort order of the column that is currently controlling it, click in the second-row cell again. The sort icon reverses direction to indicate the new order.

When you switch to the other list (from services to devices or vice versa), the sort basis for the current list is used for the new list.

**Listing Additional Services or Devices**

When the HTTP Errors application initializes, the table lists the 50 services with largest potential network impact (smallest numerical ranks). The number of entries listed in the table appears in the box below it. If data is available for additional services, you can add another 50 to list each time you click **Show More**. In the following figure, **Show More** has been clicked three times, so the table lists the 200 services with the largest network impact. (Because the ordering of rows has not changed, the only easily discernible change outside the bottom box itself is to the oval icon at the top of the scroll bar: its smaller size indicates that the visible rows represent a smaller percentage of the total rows than before.)

The **Show More** function is available for devices as well as services, and with any sort basis.
Analyzing Errors Per Device for a Service or Errors Per Service for a Device

For an individual service, you can display the rate and count of errors for each type of device model that exchanged HTTP data with the service. For an individual device model, you can display the rate and count of errors it received from each service with which it exchanged HTTP data. Click the triangle icon (▼) to the left of the service or device name.

In the following figure, the HTTP errors generated by company-c.com occurred during exchanges with devices of four model types. For each device model, the value in the second column is the percentage of HTTP transactions between the device and company-c.com that had errors, not the percentage of all errors generated by company-c.com that were sent to the model.
Analyzing HTTP Transactions and Traffic Volume

The right side of the main pane on the **HTTP Errors** tab, enclosed in box 3 in the following figure, features a graphic representation of the proportion of the five errors that occurred most, a line chart that tracks hourly counts of successful and failed HTTP transactions, and a line chart that tracks hourly HTTP traffic volume for the currently selected time range and a previous range. The values correspond to the row that is selected in the table on the left side of the pane (box 2).

In the figure, the top row of the table (all 500 services) is selected, as confirmed by the **500 Services** title at the top of the right pane.
The fields below the title report the following information:

- **Est Subscribers Affected**—Estimated number of unique subscribers whose requests to the service resulted in errors (in services view), or who used the type of device that received errors from a service (in devices view).

- **Error rate**—Percentage of HTTP transactions with the service or device that resulted in errors. The value matches the second column of the selected row in the summary table.

- **Number Locations**—Number of distribution centers currently selected in the left-hand filter above the summary table (box 1 in the first figure in this section), followed by a list of their names. The value **All Locations** indicates that no location filter is applied. The charts on the right side of the pane include data for these locations only.

- **Number Devices**—Number of device models currently selected in the in the right-hand filter above the summary table (box 1 in the first figure in this section), followed by a list of their names. The value **All Devices** indicates that no device filter is applied. The charts on the right side of the pane include data for these devices only.

The graph immediately to the right of the fields represents the proportion of HTTP transactions that were successful (green) or had errors (red). The next graph to the right shows the proportion of total errors accounted for by the five errors that occurred most, with the bottom gray bar representing all other errors.

For further information, see the following sections:

- "Tracking HTTP Transactions and Traffic" below
- "Displaying the Precise Value for an Hourly Interval" on page 15

**Tracking HTTP Transactions and Traffic**

The **HTTP Transactions** and **HTTP Traffic** line charts track those statistics for hourly intervals during the selected time range, which is reported in the time range selector above them. By default, the time range matches the time range that is set for the tab overall, but you can set an independent range for the line charts. For instructions, see "Setting the Time Range for Displayed Data" on page 1.
To export the data for either chart to a file in comma-separated value (CSV) format, click the export icon (✓) at the upper right corner of the chart. For complete instructions, see "Exporting HTTP Error Data to a File" on page 25.

In the **HTTP Transactions** chart, the green region represents successful HTTP transactions and the red region transactions with errors. To track only transactions with errors, click the **isolate errors** check box to add the check. The chart presents hourly values for the same set of errors as in the bar chart in the area above this chart—the five errors that occurred most often plus the aggregate of all other errors represented by the gray region.
In the HTTP Traffic chart, the solid line represents traffic volume during the selected time range. The meaning of the dotted line depends on the length of the selected time range. If the range is less than seven days, the dotted line represents the same hours and days of the week as the selected time range, but one week previous. In other words, if the selected time range covers 24 hours on 22 June, the dotted line covers 24 hours on 15 June. If the selected time range is eight days or more, the dotted line represents the period of time of the same duration as the selected time range that immediately preceded the selected time range.
Displaying the Precise Value for an Hourly Interval

To display precise values for an hourly interval on any of the three types of chart, mouse over the hour. On the HTTP Transactions chart, the pop-up box reports both errors and successes.

On the HTTP Traffic chart, the pop-up box reports the value for the moused-over line (in the figure, the value for the Previous line).
Controlling the HTTP Errors Session

The right-hand portion of the HTTP Errors title bar reports status information for the current session.

- **Welcome username**—Names the user logged in to this HTTP Errors session. In the figure, it is admin.
- **About Mural**—Opens a pop-up window with information about this version of the application.
- **Help**—Opens a new browser window to display help topics.
- **TIME ZONE**—Reports the time zone for the dates and times displayed and set on all tabs. Your system administrator sets the time zone during initial configuration of the HTTP Errors application. In the figure, it is Coordinated Universal Time (UTC).
Setting the Time Range for Displayed Data

The information displayed on the **HTTP Errors** tab always corresponds to a specific time range. Before you explore data on the tab, it is important to determine whether the range is set properly, and to reset it as necessary.

The *time range selector* in the boxes labeled 1 in the following figure controls the time period for which data is displayed on the tab as a whole (referred to here-after as the *overall time range*). The overall time range is set in the upper of the two boxes and reported in the lower one. See "Setting the Overall Time Range" on the next page.

Optionally, you can use the time range selector in box 2 to set a different time range for the **HTTP Transactions** and **HTTP Traffic** line charts, which appear below it. (Note, however, that each time you change a setting in the left half of the main pane—for example, switching between the list or services and the list of devices, changing which column controls the sort order, or selecting an individual service or device—the time range set in box 2 resets to match the overall time range.) See "Setting the Time Range for the Line Charts" on the next page.
HTTP Errors uses the 24-hour clock to represent times; for example, 00:00 hours is midnight and 18:00 hours is 6 PM.

**Setting the Overall Time Range**

The following figure depicts the overall time range selector in the upper of the boxes labeled 1 in the preceding figure. To set the overall time range to one of the listed durations, click the name of the duration. The term in purple is the currently selected time range (last 24 hours in the following example).

- last 6 hours
- last 24 hours
- last 48 hours
- last 7 days
- last 14 days
- last 30 days

For the first three durations (last 6 hours, last 24 hours, and last 48 hours), the time range consists of the indicated number of hour-long intervals, ending with the last interval on the current day for which analyzed data is available. For the other durations (last 7 days, last 14 days, and last 30 days), the time range consists of the indicated number of 24-hour-long intervals, again counting back from the last hourly interval on the current day for which analyzed data is available.

If you select a time range that begins before the time when data was first collected, HTTP Errors displays all available data (that is, data from the entire period between the first collection time and the last hourly interval on the current day for which data is available). The actual start and end times are reported in the **Time Range** field in the lower of the boxes labeled 1.

**Setting the Time Range for the Line Charts**

To set an independent time range for the **HTTP Transactions** and **HTTP Traffic** line charts, click the word adjust in the time range selector that appears in box 2 in the first figure in this topic.
The custom time range interface opens and displays the currently selected overall time range. As shown in the following figure, when the overall time range is last 24 hours, the full width of the interface represents those 24 hours.

This display is referred to as daily mode, and is also used when the overall time range is last 6 hours. For that time range, only the final 6 hours are unshaded to show that they represent the current overall time range.

When the overall time range is last 48 hours, the full width represents 7 days (weekly mode). When the overall time range is last 7 days or more, the full width represents 2 months (monthly mode).

In the following table, which defines the characteristics of each mode, the information in each column is as follows:

- **Span displayed**—The span of time within which you can set the time range
- **Marked increments**—The interval of time represented by each dot at the bottom of the interface (not all dots are necessarily numbered)
- **Settable range**—The minimum and maximum time range you can set
- **Minimum increment**—The smallest increment by which you can increase or decrease the setting

<table>
<thead>
<tr>
<th>Mode</th>
<th>Span displayed</th>
<th>Marked increments</th>
<th>Settable range</th>
<th>Minimum increment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>24 hours</td>
<td>1 hour</td>
<td>1 – 24 hours</td>
<td>1 hour</td>
</tr>
<tr>
<td>Weekly</td>
<td>7 days</td>
<td>6 hours</td>
<td>1 hour – 7 days</td>
<td>1 hour</td>
</tr>
</tbody>
</table>

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To set the time range for the charts, perform the following procedure:

1. Determine whether the desired start time and end time for the time range appears in the range selector. If not, shift the time span in the desired direction by clicking on the appropriate box with single or double arrows at the end of the selector. The following table specifies the amount by which the time span shifts in each mode.

<table>
<thead>
<tr>
<th>Mode</th>
<th>&lt; and &gt;</th>
<th>&lt;&lt; and &gt;&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>1 hour</td>
<td>1 day</td>
</tr>
<tr>
<td>Weekly</td>
<td>1 day</td>
<td>7 days</td>
</tr>
<tr>
<td>Monthly</td>
<td>7 days</td>
<td>31 days</td>
</tr>
</tbody>
</table>

2. Set the desired start and end times for the time range.

   - To set the start time, mouse over the triangle that appears below the current start time. A dark gray box appears below the triangle and reports the precise current setting. Press and hold the left mouse button as you slide the triangle to the desired time (the time in the box updates as you pass over each settable increment).

(Note that if the desired new start time is after the current end time, you must set the end time first.)
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- To set the end time, mouse over the triangle that appears below the current end time, then use the same instructions as for the start time.

- To move the time range without changing its duration, mouse over the thin bar between the start and end triangles. A dark gray box appears below the bar and reports the start and end times. Press and hold the left mouse button as you slide the bar right or left.

3. The **HTTP Transactions** and **HTTP Traffic** line charts update to the new time range as you set the new start and end times. To close the interface, click `close` in the time range selector.

![Time Range Selector](image.png)
Exporting HTTP Error Data to a File

You can export the data presented in the summary table and the two line charts on the **HTTP Errors** tab to a file in comma-separated values (CSV) format. To export the data:

1. Click the export icon (⬇️) above the upper right corner of a table or chart (enclosed in the orange boxes in the following figure).

2. Click in the box that pops up. The following figure is for the summary table in services view.
A new window pops up to display the CSV-formatted text.

There are three points to note:

- The values in the first row act as column headers, specifying the type of value in the corresponding position in the following rows (service name in the first field, in the second field, and so on).

- The data includes all entities used to generate the chart or table, not just the ones that are currently visible on the tab. For example, the third through fifteenth rows represent the devices that exchanged HTTP data with company-a.com, even though the devices do not appear by default in the table.

- The time range is not recorded in the file. If you want to note it, one possibility is to include it in the filename you choose in the next step.
3. To save the data in the window to a file, click the **SAVE** button. In the file system window that pops up, choose the directory location and change the default name (**export.csv**) if desired.

To close the window without writing the data to a file, click the **CLOSE** button or the close-window icon (**X**) on the title bar.