Analyze System Health charts to assess trigger performance

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Triggers are a powerful tool that can provide detailed insight about your environment. However, triggers consume resources and affect system performance, which is why you must monitor and assess the impact of triggers on your ExtraHop appliance through system health tools.

In this walkthrough, you will learn how to create a bad trigger, evaluate the negative performance impact with System Health tools, and then correct the bad trigger. You will also learn how to create a dashboard to continue monitoring trigger performance.

The tasks in this walkthrough will help you answer the following questions about the impact of triggers on the ExtraHop system:

- Has my new trigger resulted in an exception error?
- How many exceptions errors have occurred?
- What is the performance impact of the my new trigger?

Prerequisites

- You must have access to an ExtraHop Discover appliance with a user account that has limited write or full write privileges.
- Your ExtraHop system must have SMTP traffic.
- Familiarize yourself with the concepts in this walkthrough by reading the Get started with System Health and Get started with triggers sections in the ExtraHop Web UI Guide.
- Familiarize yourself with the processes of creating triggers and dashboards by completing the Trigger Walkthrough and the Dashboard Walkthrough.

Create a trigger with exceptions

In this procedure, you will create a simple trigger that logs the processing time of SMTP responses. You will introduce a deliberate error into the trigger configuration to ensure that a trigger exception occurs.

1. Click the System Settings icon, and then click **Triggers**.
2. Click **New** to open the Trigger Configuration window.
3. In the Name field, type `Track Processing Time`.
4. Click **Enable Debugging**.
5. Click the **Events** field, and then add the following events to the trigger configuration:
   - SMTP_REQUEST
   - SMTP_RESPONSE
   - SMPP_RESPONSE
6. Click the **Editor** tab, and then copy and paste the following code into the editor:

```
var proto;
switch(event) {
    case 'SMTP_REQUEST':
    case 'SMTP_RESPONSE':
        proto = SMTP;
        break;
    case 'SMPP_RESPONSE':
        proto = SMPP;
```

```
        break;
}

if (!proto || !proto.processingTime) {
    debug('Processing Time = ' + proto.processingTime + " on " + event);
}
```

7. Click the **Assignments** tab, and then click **Assign to All**.
8. Click **Save and Close**.
   The syntax validator displays a message that there is a syntax problem and the trigger is not saved. Ignore the message for the purposes of this walkthrough.

   Tip: We recommend always enabling syntax validation. You might disable validation to draft and continually save a complex trigger. If so, we recommend that you re-enable it before the a final save to catch errors.
9. Click **Disable Validation**, and then click **Save and Close**.

Next steps
Let the trigger run for at least ten minutes, and then check the System Health page.

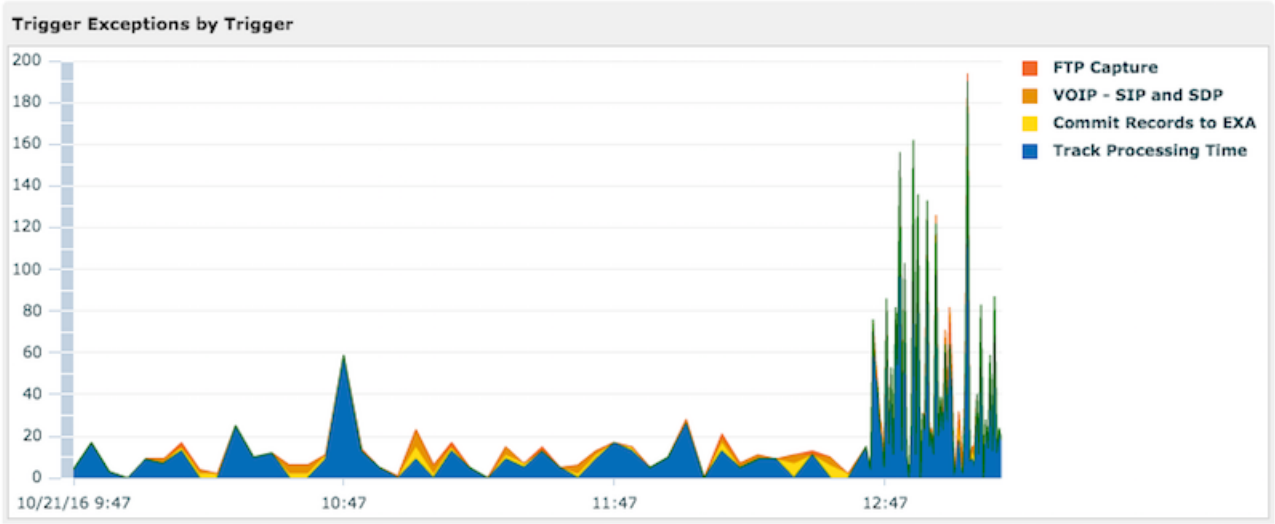
Tip: Always check trigger performance charts on the System Health page after you create a new trigger or modify an existing one. By only checking trigger results, such as metrics on a dashboard or record queries, you might miss the full picture. For example, a trigger might appear to collect metrics as expected, but it might also consume a large amount of resources causing a block in the trigger queue and triggers dropped from the queue.

Review trigger charts on the System Health page

The System Health page contains charts that pertain to the health and performance of ExtraHop system components and services. In this procedure, you will consult trigger performance charts on the System Health page to check the impact of the trigger you created in the previous section.

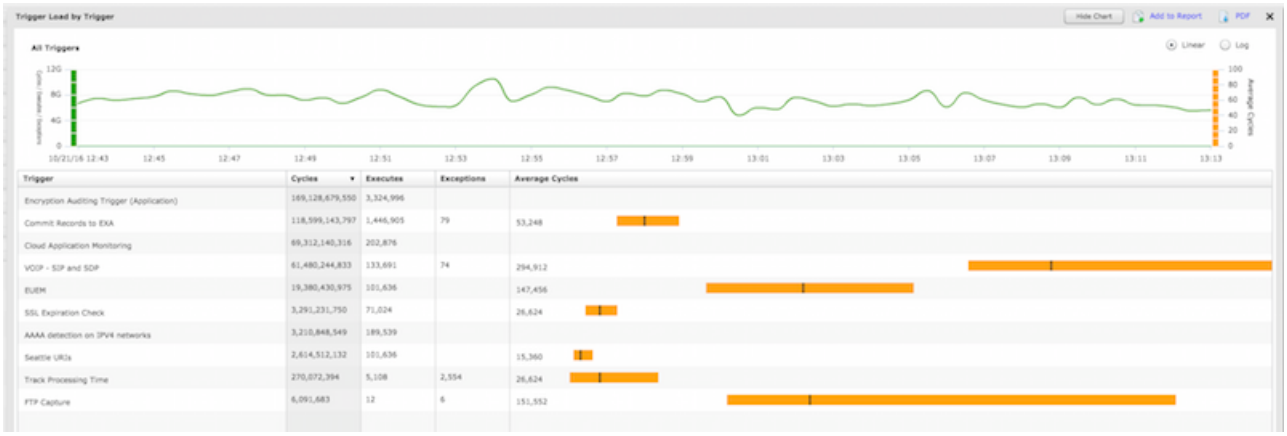
Note: The performance results reported for the example trigger on your system will differ from the results displayed in this section.

1. From the Triggers page, click **Settings** in the upper-left corner, and then click **System Health**.
2. Scroll down to the Trigger Exceptions by Trigger chart.
   The chart displays the Track Processing Time trigger you created, similar to the following figure:

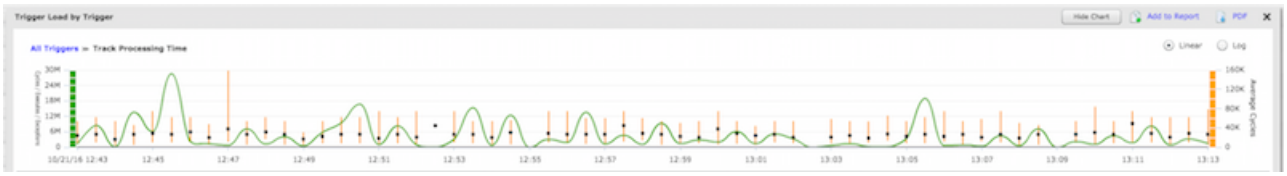


This chart displays which triggers have exceptions and the number of exceptions generated in the specified time range.

3. Click the **Trigger Exceptions by Trigger** chart to drill down and view details in a secondary chart, similar to the following figure:

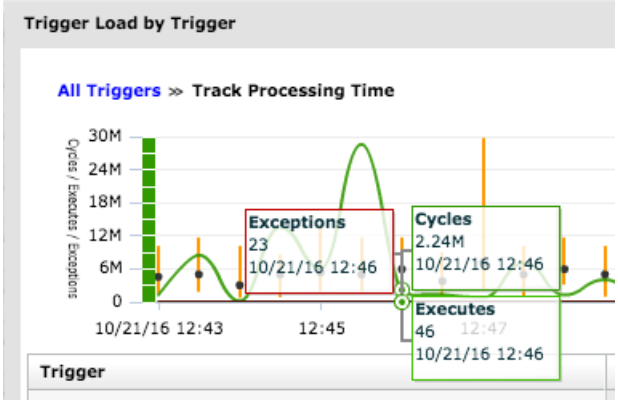


4. Review the data contained in the secondary chart to learn about the impact of the trigger on your ExtraHop system by completing the following steps:
   a) Compare the values in the Exceptions and Executes columns. This information reveals that half of the time the trigger runs, an exception occurs. Because this trigger does not run very often, the impact is not critical, but if the trigger were modified to run on a popular event such as HTTP, the impact could be extreme.
   b) Compare the value in the Average Cycles column with the same value for other triggers running on your system. This information reveals that the average number of cycles consumed by the trigger is relatively low compared to other running triggers. A high average of consumption can indicate that a trigger script is not efficient and might be prone to stall, causing triggers in the queue to back up and possibly be dropped from the queue.
5. Click the **Track Processing Time** trigger from the list to display its trigger load data, similar to the following figure:



This data helps you identify if there are increases in resource consumption or times when the trigger is run more often, and when trigger exceptions occur. It is important to check the trigger load for consistent surges in resource consumption, especially if consumption is close to the maximum amount of memory available for running triggers. If the amount of trigger memory is low, you might not be able to run new triggers.

6. Move the cursor along the bottom of the graph to find hovertips that display how many exceptions occurred at a specific time, similar to the following figure:



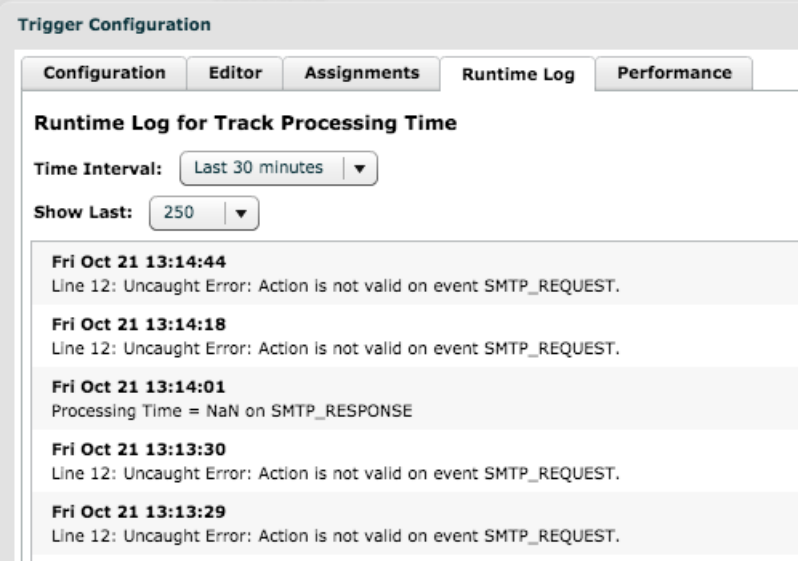
If a trigger causes an exception only occasionally, the timestamp can help you locate exception error messages in the trigger runtime log when you fix the trigger.

Fix the trigger and view results on the System Health page

In this procedure, you will view exceptions errors in the trigger runtime log that identify where the problem occurs in the trigger script, and then you will resolve the error.

1. From the System Health page, click **Settings** in the upper-left corner, and then click **Triggers**.
2. On the Triggers page, click **Track Processing Time** to open the trigger.
3. Click the **Runtime Log** tab.
   The runtime log displays exception error messages to help you determine the cause. For more information, see the View runtime log output section of the ExtraHop Web UI Guide.

   In this walkthrough, the runtime log displays output similar to the following figure:



4. Scroll through the log and look for entries flagged as Uncaught Error. Each error message includes the timestamp when the error occurred, the line number in the script that resulted in the error, and a description of the error.
   You should see the following error message in the log:

```
Line 12: Uncaught Error: Action is not valid on event SMTP_REQUEST.
```

Tip: In addition to exception errors, the runtime log also displays uncaught syntax errors, such as an unexpected curly brace, or a type error, such as an invalid value.

5. Click the **Editor** tab, and then locate line 12 in the script to identify the action that is invalid on SMTP requests. In the following figure, line 12 shows that the action is to access the `processingTime` property on events:

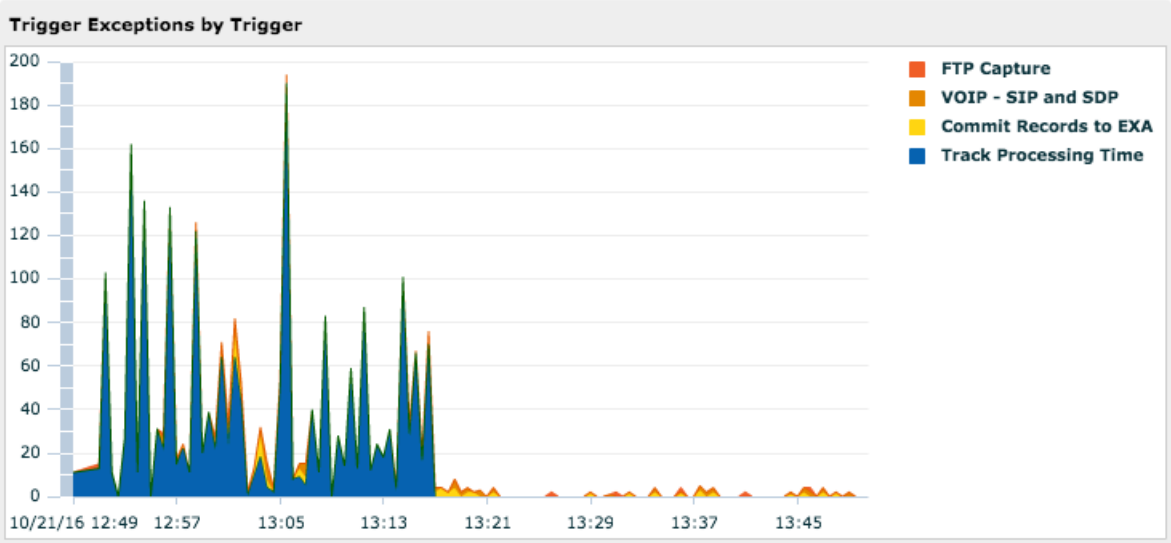
This information combined with the information from runtime log error messages shows that accessing the `processingTime` property is invalid on SMTP request events.

6. Remove the unsupported SMTP event from the script and the trigger configuration by completing the following steps:
   a) Click **Enable Validation**.
   b) Delete the following line from the trigger script:

```
case 'SMTP_REQUEST':
```

   c) Click the **Configuration** tab.
   d) Delete SMTP_REQUEST from the Events field.

   the unsupported event from the script and the trigger configuration,
7. Click **Save and Close**.
   The trigger is saved without displaying a validation error.
8. Click **Settings** in the upper-left corner, and then click **System Health**.
9. Wait 5-10 minutes, and then scroll to the Trigger Exceptions chart that should look similar to the following figure:



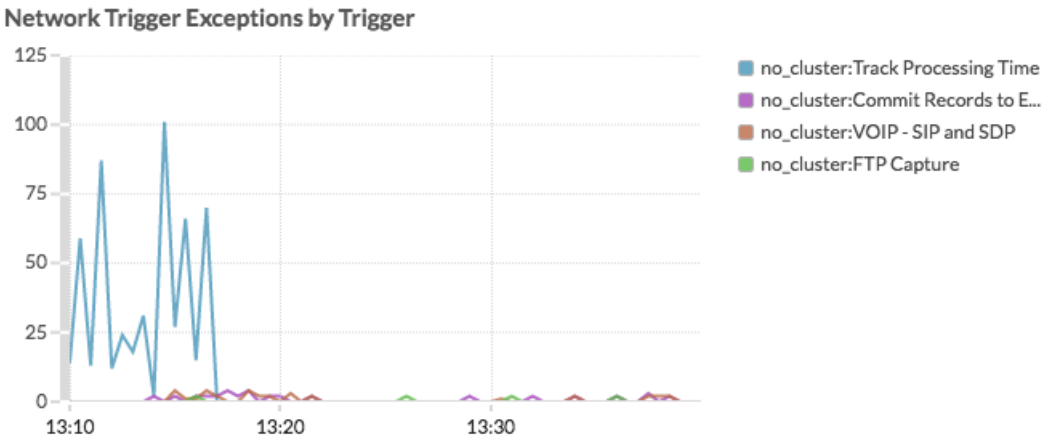
Create a trigger performance dashboard

In this section, you will create a trigger performance dashboard and add several charts discussed in this walkthrough.

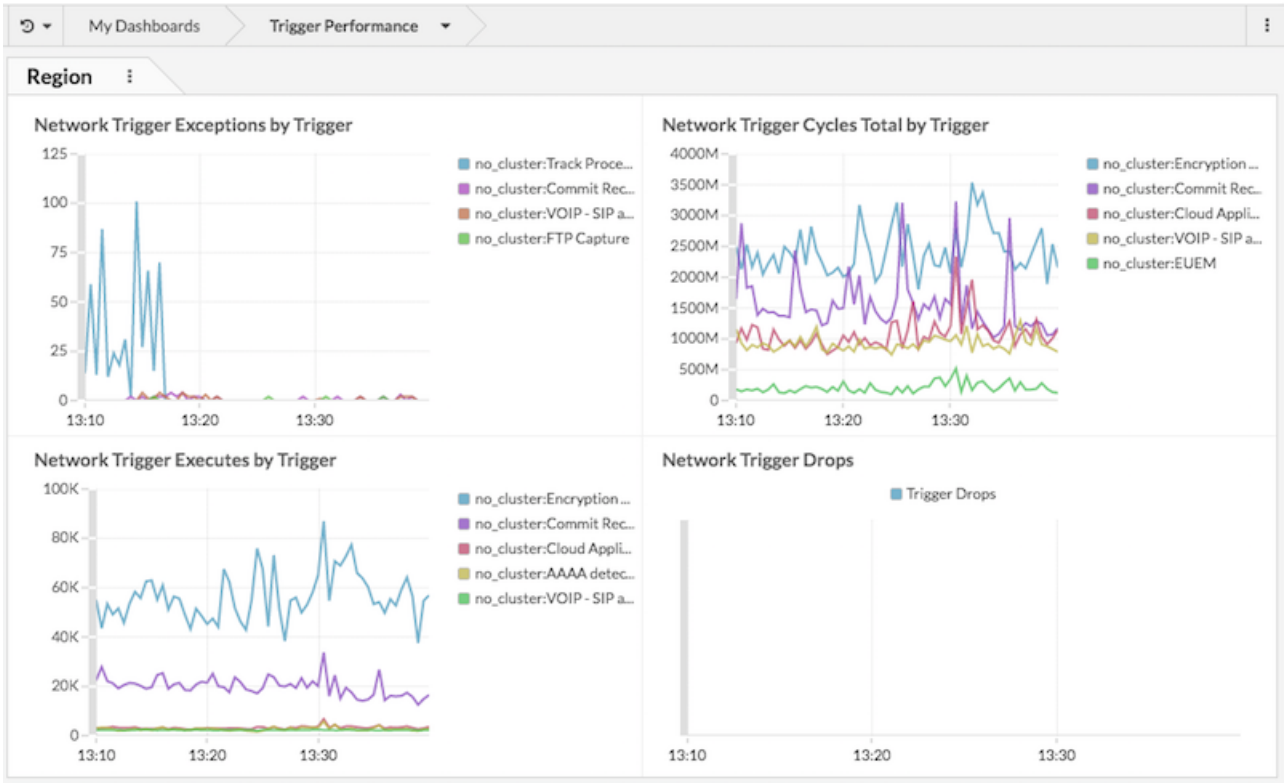
Adding system health metrics to a dashboard enables you to customize how you view the data such as choosing the chart type, adding chart notes and tips in text boxes, or adding multiple metrics to a chart.

If you are unfamiliar with creating dashboards, complete the Dashboard Walkthrough. For comprehensive information and procedures for creating and customizing dashboards, see the Dashboards section of the ExtraHop Web UI Guide.

1. Click **Dashboards**.
2. On the Dashboard page, click the command menu ⋮ in the upper-right corner, and select **Create Dashboard**.
3. In the Title field, type `Trigger Performance`.
4. Click **Create**.
5. Click the empty chart widget in your newly created dashboard to launch the Metric Explorer.
6. Click **Add Source**.
7. In the Sources field, type `capture`, and then select a capture network from the list.
8. In the Metrics field, click **Any Protocol**, and then select **ExtraHop** from the list.
9. In the Sources field, type `Trigger`, and then select **Network - Trigger Executes** from the list.
10. In the Details section, click **None**, and then select **Trigger**.
11. Click **Save** to return to your dashboard.
    The chart should look similar to the following figure:



12. Drag a new chart widget to the region and configure the chart by completing the following steps:
    a) Select the same capture network you specified for the previous chart.
    b) In the Metrics field, select **ExtraHop** for the protocol.
    c) Select **Network - Trigger Cycles** for the metric.
    d) In the Details section, select **Trigger** for the Split by option.
    e) Click **Save**.
13. Drag a new chart widget to the region and configure the chart by completing the following steps:
    a) Select the same capture network you specified for the previous chart.
    b) In the Metrics field, select **ExtraHop** for the protocol.
    c) Select **Network - Trigger Executes** for the metric.
    d) In the Details section, select **Trigger** for the Split by option.
    e) Click **Save**.
14. Drag a new chart widget to the region and configure the chart by completing the following steps:
    a) Select the same capture network you specified for the previous chart.
    b) In the Metrics field, select **ExtraHop** for the protocol.
    c) Select **Network - Trigger Drops** for the metric.
    d) Click **Save**.
15. Click **Exit Layout Mode** from the upper-right corner.
    The dashboard should look similar to the following figure:



Next steps

Tip: As a next step, you can upload the ExtraHealth Bundle to the ExtraHop system, which installs a dashboard that contains a wide variety of system health charts. Customize the ExtraHealth dashboard to suit your needs, or copy the charts you want to a new dashboard. To learn about bundles, see the Bundles section of the ExtraHop Web UI Guide.