



# TrafficPeak Grafana Guide

v1.0

# TrafficPeak Grafana Guide

TrafficPeak Grafana lets you drill down into your TrafficPeak data to reveal trends and troubleshoot problems.

## Table of Contents

<b>Customizing Dashboards</b>	<b>3</b>
List Dashboards	3
Dashboard Folder Layout	3
Copy Dashboards	4
<b>User Management</b>	<b>8</b>
Add Users	8
Edit Users	11
Alerting	12
<b>Writing Your Own Queries</b>	<b>12</b>
General Advice	12
Specific Tips	12
Grafana Dashboards	13
<b>Grafana Query Builder</b>	<b>13</b>
Searching for Data	13
Query Debugging	14
<b>Using the ClickHouse Driver for Grafana</b>	<b>14</b>
Connect Grafana to Hydrolix	14
<b>Data Field Reference</b>	<b>17</b>
<b>Dashboard Reference</b>	<b>17</b>
Akamai Observability	18


## Customizing Dashboards

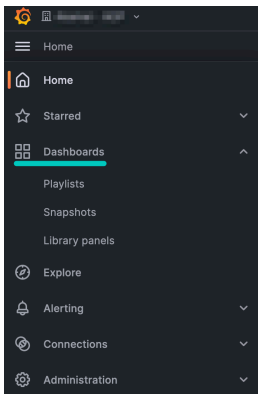
TrafficPeak provides ready-made dashboards to provide you with the most-requested information commonly requested by TrafficPeak customers. You're free to add your own new dashboards and add widgets to those dashboards.

Your dashboards are stored in your own Grafana organization within TrafficPeak's Grafana installations. If you need even more customization that requires modification of the Grafana server's configuration, you can create your own self-hosted Grafana instance or use Grafana Cloud for ultimate control.

Example dashboards are provided on the TrafficPeak site under Home -> Dashboards. If you would like to download these dashboards, [they're available here](#).

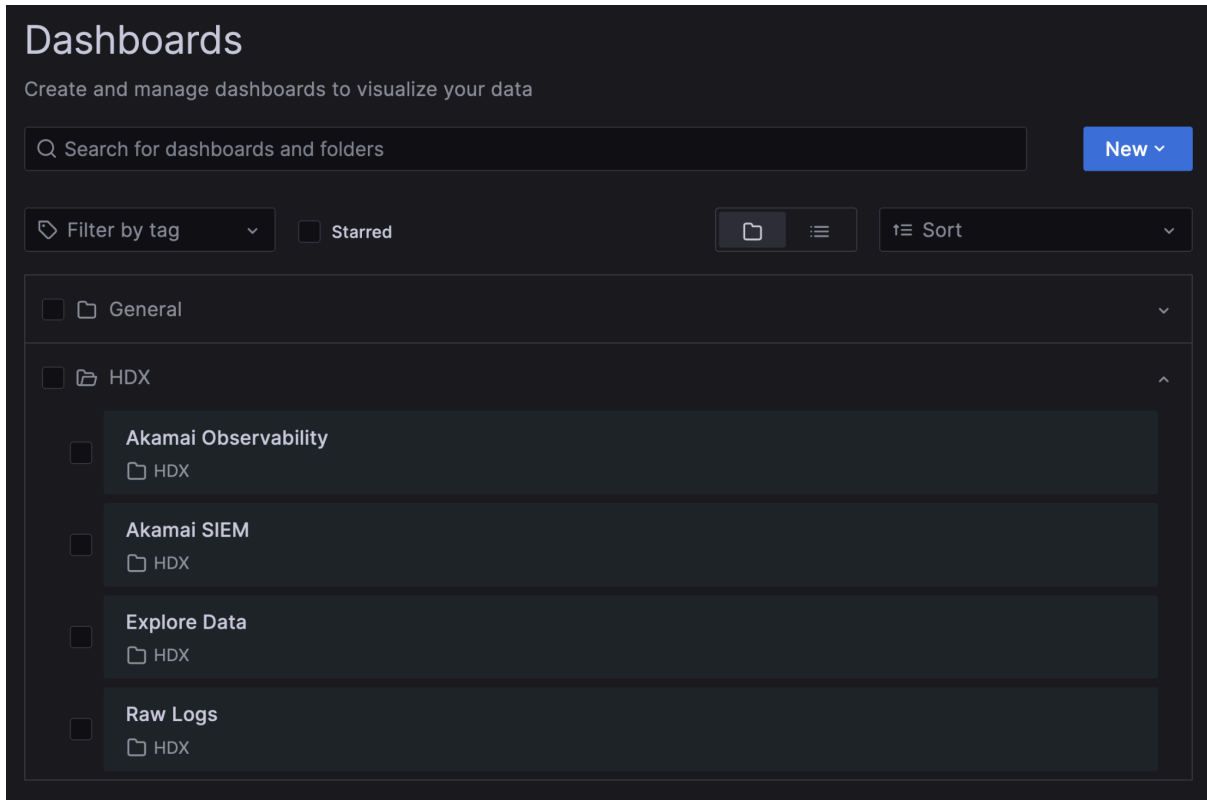
### List Dashboards

Your most commonly used dashboards will show up on the home page of the Grafana interface. However, if you want to list all the dashboards, open up the Home menu () and click "Dashboards."



### Dashboard Folder Layout

From this view, dashboards can be created, imported, and organized into folders via the "New" button on the right. Searching and filtering is available, as is the list of dashboards and folders.



In the view above, the “HDX” folder includes dashboards that are created by TrafficPeak. They are write-protected and automatically updated with new versions as they become available.

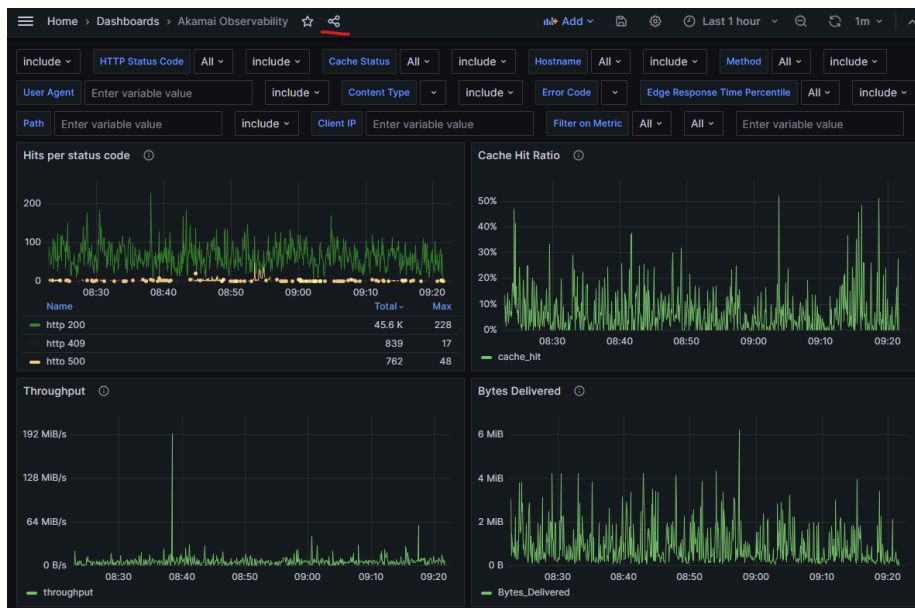
## Copy Dashboards

Hydrolix provides default dashboards as part of your service. Grafana makes it simple to create a copy of any dashboard for customization.

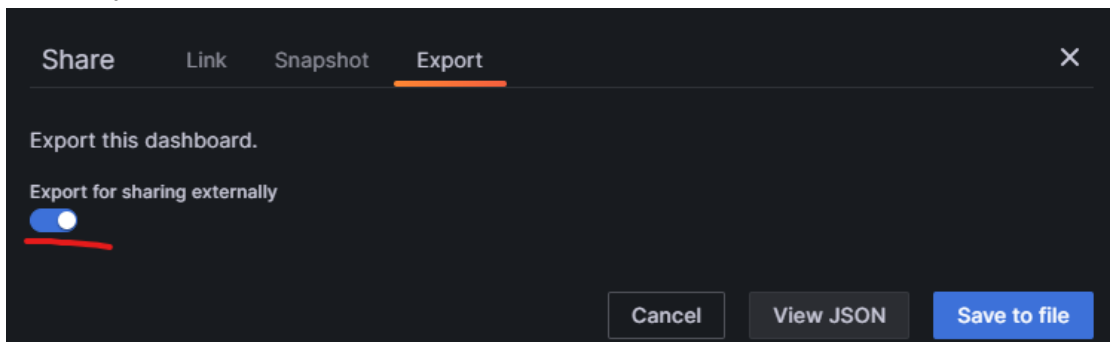
The default dashboards are occasionally updated with the latest widgets and charts. It’s a good practice to copy these dashboards and modify the copied versions rather than modifying the default dashboards directly. This will avoid having your changes being overwritten by new versions of dashboards that are written to the “Hydrolix” folder.

1. View the dashboard you wish to copy

## 2. Click the Share link

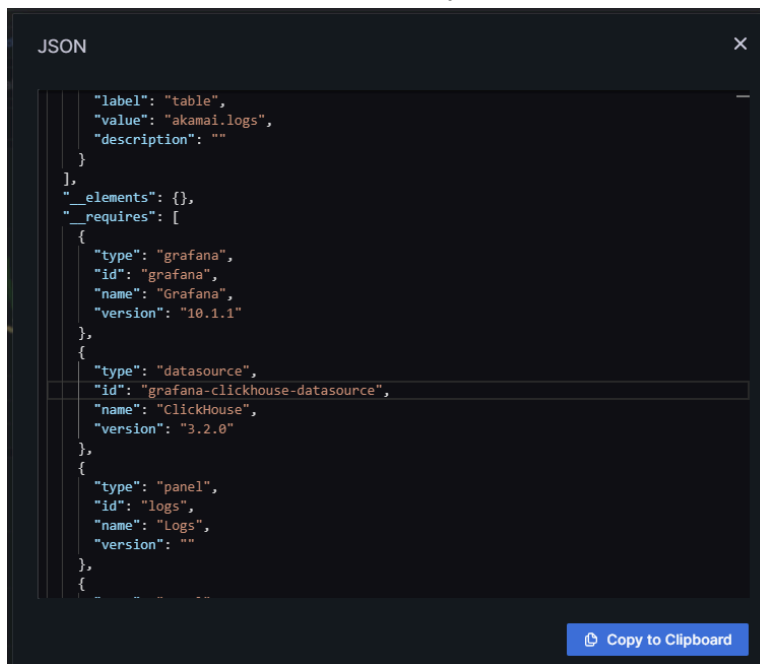


## 3. Select the “Export” option at the top and make sure to select “Export for sharing externally”

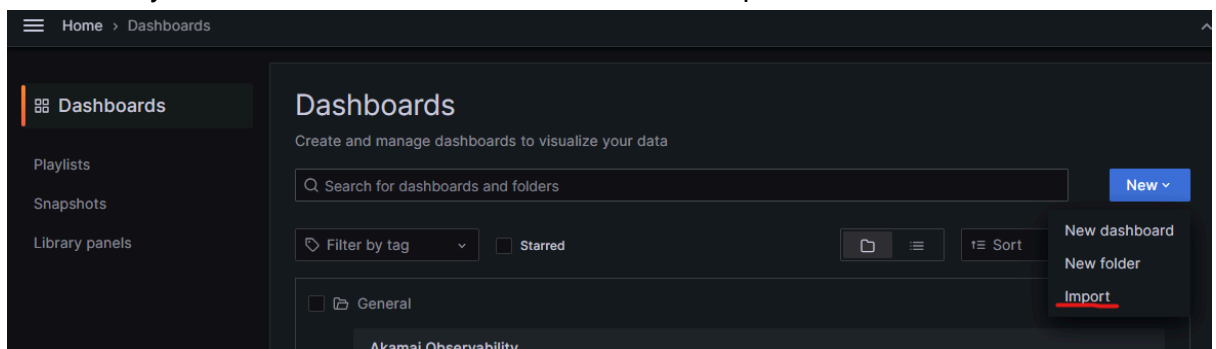


The screenshot shows the 'Export' tab of the Akamai Observability dashboard. The 'Export for sharing externally' toggle switch is turned on, and the 'Save to file' button is highlighted.

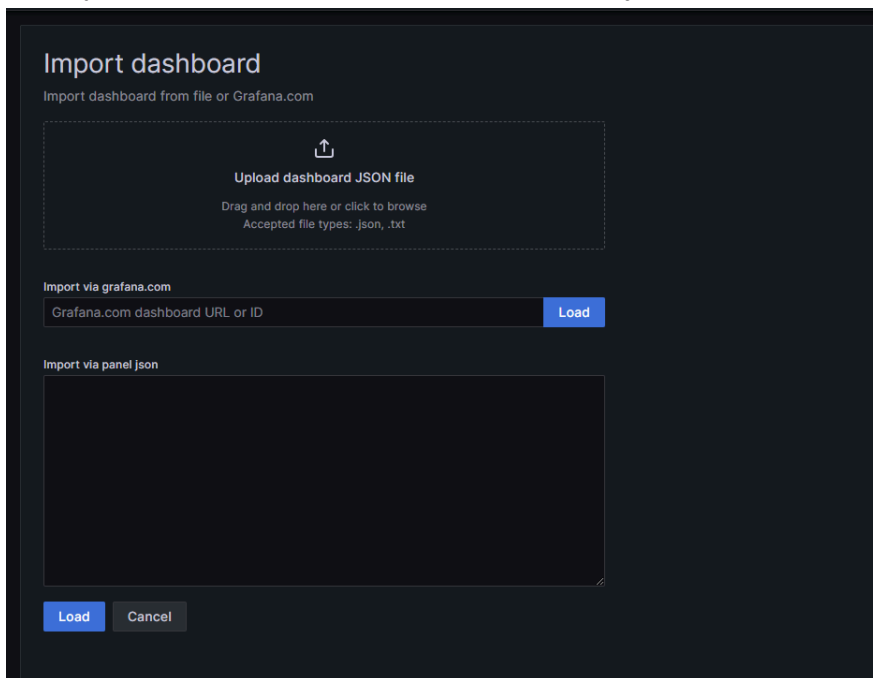
4. Select “View JSON” and then “Copy to Clipboard”



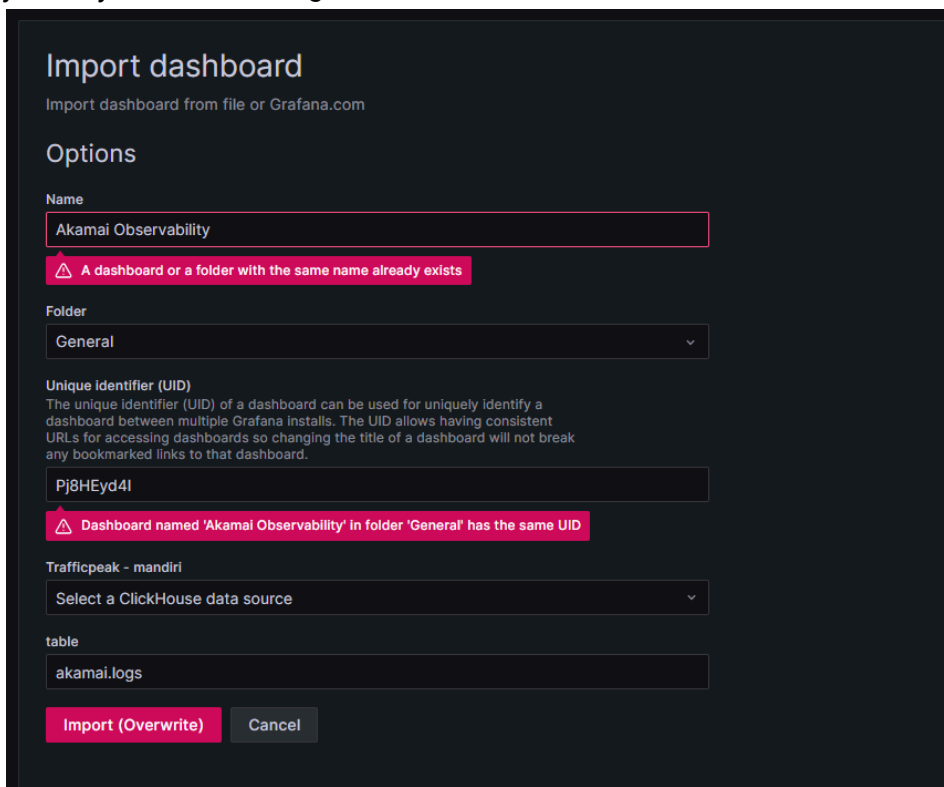
5. Go back to your “Dashboards” menu, Click “New” and “Import”



- Paste your dashboard into the “Import via panel json” box and click “Load.”



- You should see the following screen. If you are importing into the same organization, you may see the warnings below.

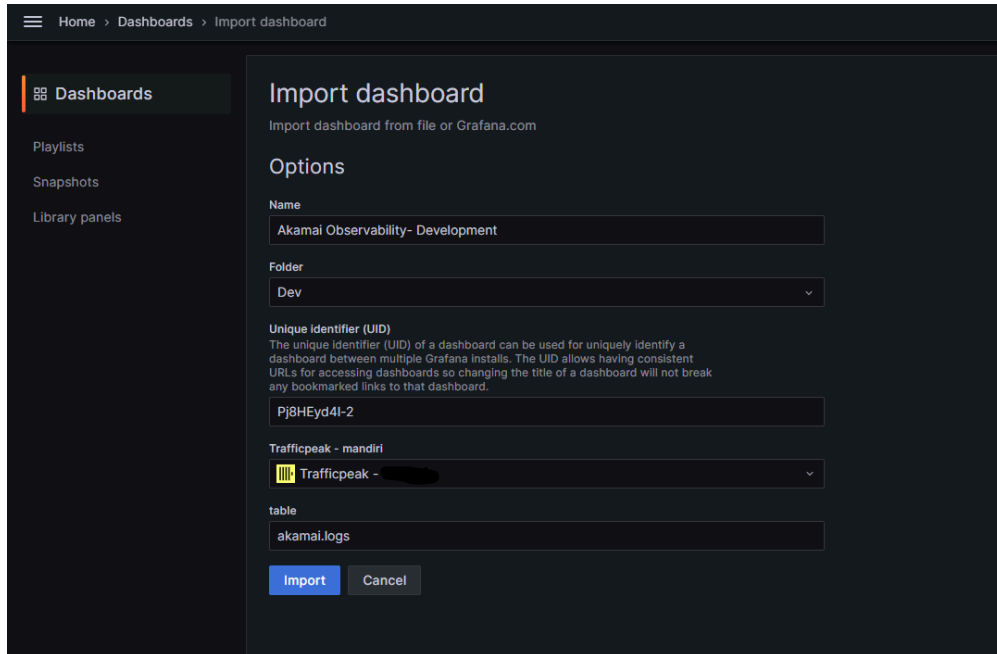


If you import now, you will overwrite the existing dashboard, which isn't what you want.

Instead, before you click “Import,” change the name, select the folder you want to put

it in and modify the UID. Also, make sure you select the Clickhouse DataSource as otherwise the Grafana dashboard won't know where to collect its data. The table can stay as it is.

8. Finally, click "Import".



You should now have a personalized copy of the dashboard that you can modify to suit your needs.

## User Management

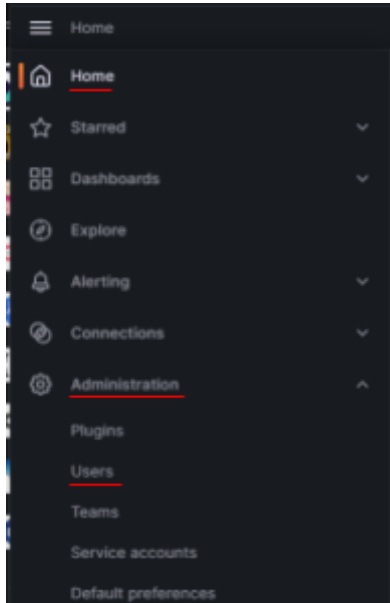
### Add Users

To add users, follow the steps below.

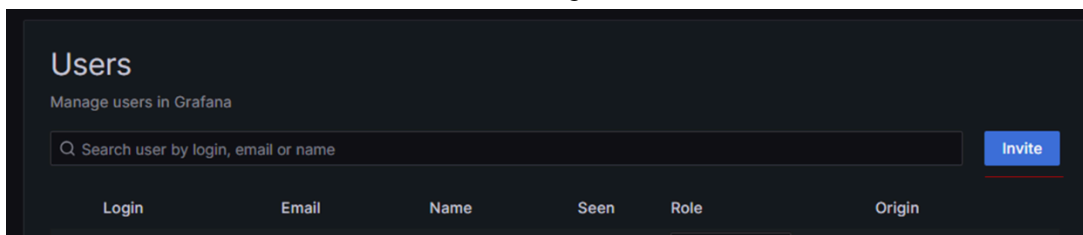
Note: You will need to be a Grafana Admin to add users.

1. Login to your Grafana Account.
2. Go to **Home -> Administration -> Users**

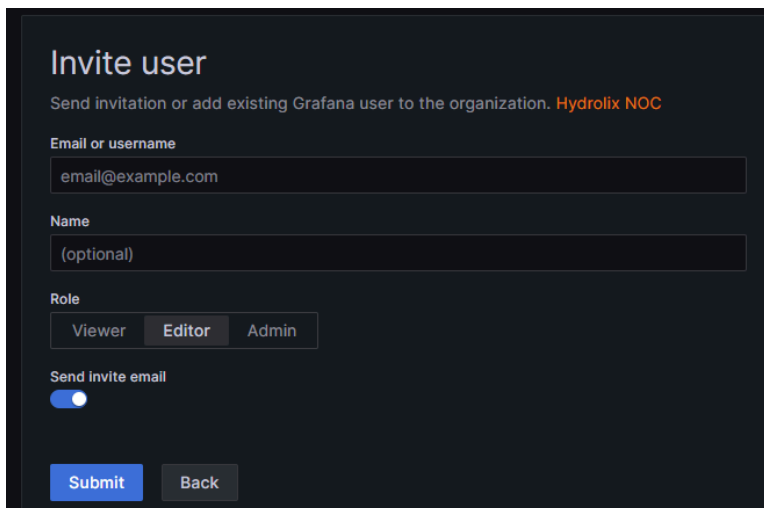




3. In the Users section, select ***“Invite”*** on the right-hand side.



4. Input the user’s details and assign a role.

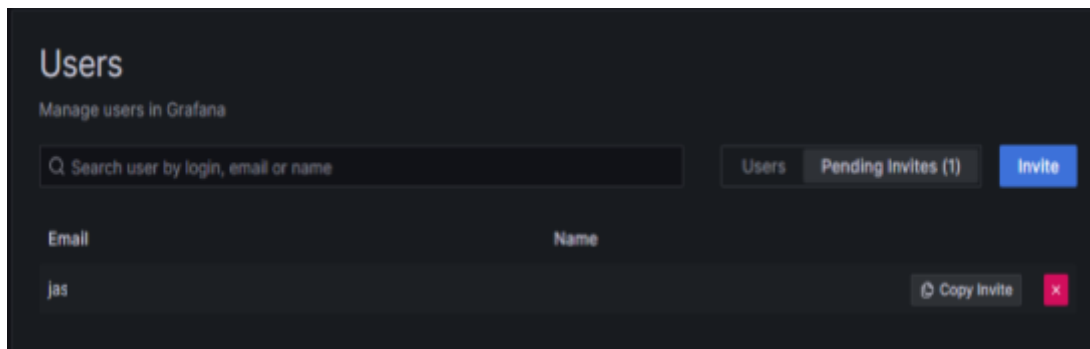


More information on the different roles above can be found here:

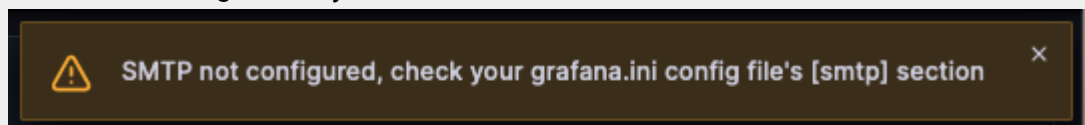
<https://grafana.com/docs/grafana/latest/administration/roles-and-permissions/#organization-roles>

5. Select “Submit” to send an invitation to their email address. The invitation includes a one-time token, so if using a distribution list, ensure that whoever clicks on the link sets the password and is able to communicate this to the rest of the team.

If the user does not see the invitation, advise them to check their spam folders. Alternatively, select “Pending Invites” and copy the invitation link to re-send it to them via e-mail or other messaging platform.



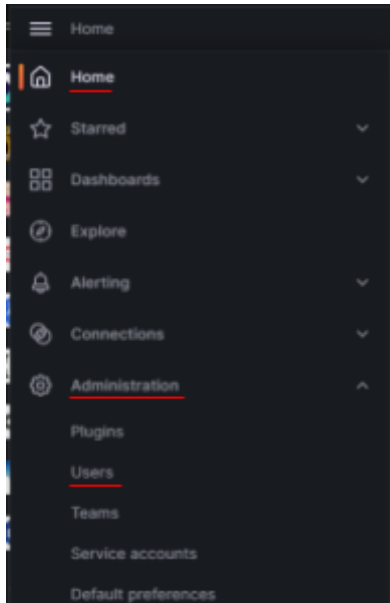
Note that if you’re using self-hosted Grafana and haven’t set up SMTP, you’ll see this error message when you click the “Invite” button:



Please configure SMTP for your local instance of Grafana and repeat this step.

## Edit Users

1. Go to **Home -> Administration -> Users**.



This interface will allow you to change users' permission levels.

### Users

Manage users in Grafana

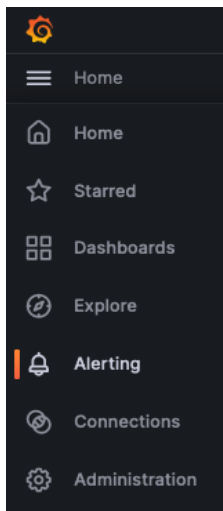
All users
Organization users

All users
Active last 30 days
New user

	Login	Email	Name	Belongs to	Last active	Origin
	admin	admin@localhost			4 minutes	
	cbrown	cbrown@sample.com	Clyde Brown		Never	
	jwarrington	jwarrington@sample.com	Jennifer Warrington		Never	
	rsoderlund	rsoderlund@sample.com	Robert Soderlund		Never	

To reset a user's password, either delete the user, re-create them and then and invite again, or have the user complete the "Lost Password" option on the login screen.

## Alerting



### Configure Grafana Alerts

TrafficPeak stores alerts in your Grafana organization. Configure alerts using the Alerting menu. Grafana has [an extensive guide to alerting](#) on their website.

### Alert Latency

Alert latency depends on the data source, how the alert is configured, and the method of alert delivery. For example, TrafficPeak's internal team uses Grafana alerting combined with PagerDuty and Slack to achieve notification within seconds of an alert firing. See the guide above for more information about alert configuration.

## Writing Your Own Queries

In addition to using the dashboards supplied by TrafficPeak, you can write your own queries for deeper knowledge about the performance of your CDN.

Keep in mind that **querying TrafficPeak data demands extra care** due to the very large amounts of data involved. Writing queries for multi-billion row data sets requires a change of mindset.

At this scale, it's easy to get into a situation where queries are slow and time out, possibly affecting other users in your organization. Here are some tips to help produce the best results when you're writing your own queries.

### General Advice

- **Always limit a query's output by using time constraints.** Queries unbounded by time will surprise you with the amount of data returned and processing required.
- **Keep your search narrow by limiting the number of columns in your query** to just what you need. Don't use `SELECT *`. Hydrolix is a [column-oriented database](#): it's different from a row-based database. Data in adjacent columns is not stored in an adjacent manner, possibly requiring an undue amount of work to retrieve data you don't need.
- **Consider creating a Summary Table.** At this scale, even a 30% reduction in compute, memory, and storage can be significant. Also, we see many summaries that save 95% while still presenting the same data.

### Specific Tips

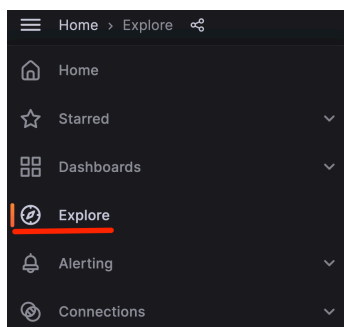
- **Be careful with LIMIT.** LIMIT is a valuable tool, especially when you're debugging a new query for syntax and other problems. However, don't rely on it to protect you from mistakes on a large dataset, even though the Hydrolix database has some safeguards in place for this. Don't scan 100 billion rows to return a LIMIT of 50 rows.

- **Limit your results before using ORDER and GROUP.** Ordering 100 billion rows is going to take a long time and use lots of memory. In the same vein, GROUPing by billions of high-cardinality fields is an invitation to failure.
- When counting rows, **don't use count(\*)**. Count just the timestamp field, since it's always there.
- **Use predicates.** Predicates are your greatest path to simple, fast queries, so use them whenever you can. Hydrolix will push predicate knowledge to the lowest levels of the system, saving you time and money.
- **Limit JOINS**, which are expensive at this scale. If you must use JOIN, make sure you first omit all the columns you don't need. There are often better ways to accomplish what you need without using a complicated JOIN statement.
- **Watch your CTEs.** Common Table Expressions are still queries under the hood, so be aware of them and make sure they obey these guidelines, too.

## Grafana Dashboards

- **Don't pipe data from SELECT \*** into a Grafana widget. Select just the columns you need.
- **Keep the count of your result sets as low as possible** while still showing what you need to see. Grafana will only show a limited number of data points per widget – in the low thousands.
- **Make sure your dashboard filters are efficiently written.** Dashboard filters run every time the page is loaded, so they can slow down the entire dashboard.
- **Be aware of [Grafana's lazy loading](#) and use it to your advantage.** If there's a widget that's expensive to generate and is rarely used, put it below the fold so those queries are only executed when necessary.
- **Use Summary Tables to provide a separate dashboard for management** and stakeholders. Save the unsummarized, low-latency dashboard for you and your NOC. This helps prevent query slowness based on sudden sharing of dashboards among many people.

## Grafana Query Builder



View the Query Builder in Grafana by visiting the main menu and selecting "Explore."

This will bring you to the Query Builder, which has two modes: SQL Editor and Query Builder. The Query Builder is a good way to get started with your own query. It will aid you with syntax and the timepicker placeholder variables. Later, switch to the SQL Editor to fine-tune the query.

## Searching for Data

- In the Query Builder, pick your database and table. Notice how the time filter is already in place to work with the timepicker in the upper-right corner of the page. You

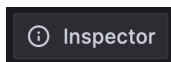
can see this in the `$_timeFilter(reqTimeSec)` and similar variables in the query.

- As you're working, periodically check the "SQL Preview" field to see the actual SQL the Query Builder is preparing to run.
- Start with a `count()` of rows satisfying your conditions. Once you've found candidate rows, pull several timestamps to discover the duration of the behavior you're seeking.
- Finally, narrow the next query down to just that time range and pull all the fields to help you spot corresponding anomalies.

## Query Debugging

When debugging queries, errors in the query will appear underneath the SQL preview. There are generally three types of errors: Grafana, ClickHouse driver, and SQL/database errors.

- Use the query inspector to show the final version of the query before it was sent to the database. It will show you how the query was interpreted to help find bugs. You will find it in the behind the "Inspector" button below the Query Builder:



- If you're seeing query timeouts, that can be adjusted on the Data source. In the main menu, select "Connections," then click "Data sources." From there, find your ClickHouse data source that you're currently using and adjust your query timeout setting.

## Using the ClickHouse Driver for Grafana

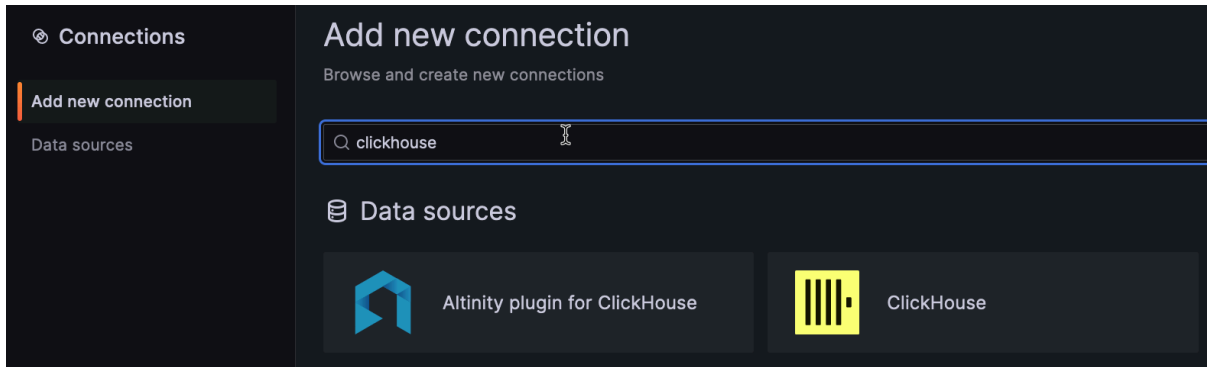
TrafficPeak instances usually come with a working Grafana installation. If you're using an instance of Grafana that's not automatically configured to query your TrafficPeak database, follow these steps to connect it.

### Connect Grafana to Hydrolix

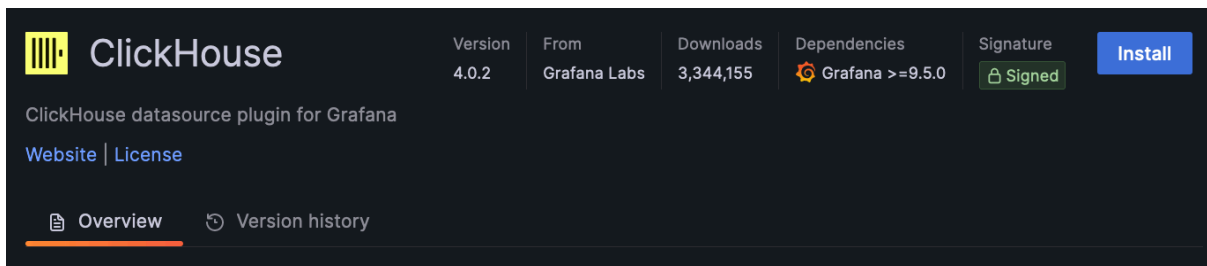
*Administrator Access Required:* You must have administrator access to your Grafana instance to connect to Hydrolix.

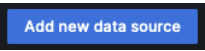
Follow the instructions in the Grafana documentation to [add a new data source](#). Click on "Add new connection" and filter for "ClickHouse."

You will see several options, but the one you want to use is the "ClickHouse" data source with the yellow logo:




Select it, and click the “Install” button in the upper right-hand corner:



Configure a new data source by clicking the  button.

While configuring, do these things:

1. Enter a unique name for this TrafficPeak connection.
2. Enter your TrafficPeak hostname for the server address. It will follow this format: `<host>.trafficpeak.live`. If you do not have this information, reach out to your Akamai service representative. If you are on a shared infrastructure, it will look like an airport code as the hostname, such as `ord.trafficpeak.live` or `ams.trafficpeak.live`.
3. Enter 9440 for your server port.
4. Select the **Native** protocol.
5. Enable **Secure Connection**.



# ClickHouse-Test

Type

ClickHouse

Alerting

Supported

Explore data

Build a dashboard

Type: ClickHouse

Settings

Dashboards

Name ⓘ

ClickHouse-Test

Default

☐

Before you can use the Clickhouse data source, you must configure it below or in the config file. For detailed instructions, [view the documentation](#).

*Fields marked with \* are required*

## Server

Server address \*

ClickHouse host address

Server port \*

ClickHouse server port (default for secure native: 9440)

9440

Protocol

Native or HTTP for server protocol

Native

HTTP

Secure Connection

Toggle on if the connection is secure

☒

5. Enter a default database that contains the data you would like to visualize.
6. Click **Save & test** to verify the connection.



### TLS / SSL Settings

Skip TLS Verify

Skip TLS Verify

☐

TLS Client Auth

TLS Client Auth

☐

With CA Cert

Needed for verifying self-signed TLS Certs

☐

### Credentials

Username

ClickHouse username

Password

ClickHouse password

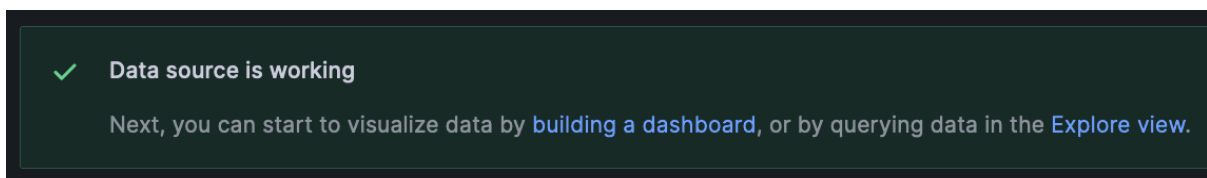
### Additional settings

Additional settings are optional settings that can be configured for more control over your data source. This includes the default database, dial and query timeouts, SQL validation, and custom ClickHouse settings.

Delete

Save & test

If you've configured everything correctly, you should see a "Data source is working" notification:



## Data Field Reference

Akamai sends TrafficPeak many different data types. You can find a complete glossary with explanations of them here on the Akamai [Data set parameters page](#).

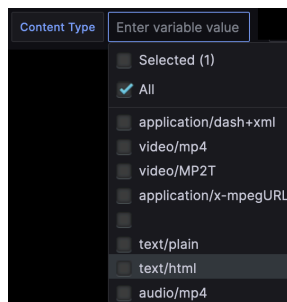
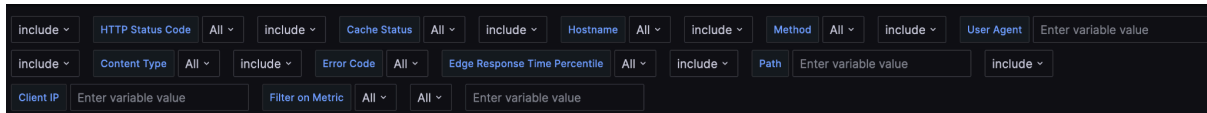
## Dashboard Reference

Read below for quick descriptions of each chart and data type you'll see in the main TrafficPeak dashboard, "Akamai Observability." If you find your dashboard is missing features listed below, please contact your TrafficPeak customer representative for help.


## Akamai Observability

### Filter Bar

The filter bar is your main tool for narrowing the results displayed in the charts below. This helps you see just the type of traffic in which you're interested, and it also helps you drill down to the individual sample-level for troubleshooting.

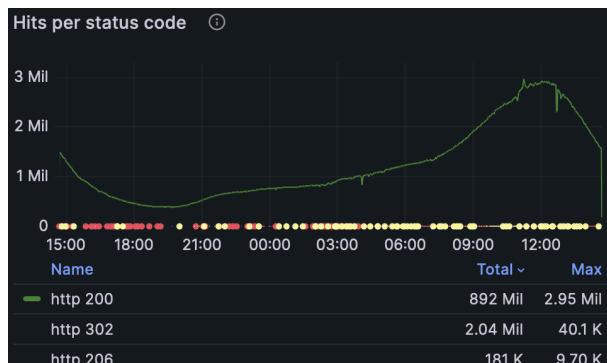


There are curated fields so you can quickly filter your results by what you need. Filter choices are also auto-populated with live data to make filter creation even faster. For instance, this example shows the most common values that TrafficPeak found in the "Content Type" field within your selected time range.

The queries behind the dynamic filter choices can be found in the dashboard's Settings→Variables section by clicking the  icon in the top-right corner of the dashboard header.

### Hits per status code

The hits per status code graph gives you the most basic throughput information faceted by HTTP response code sent to the end-user.

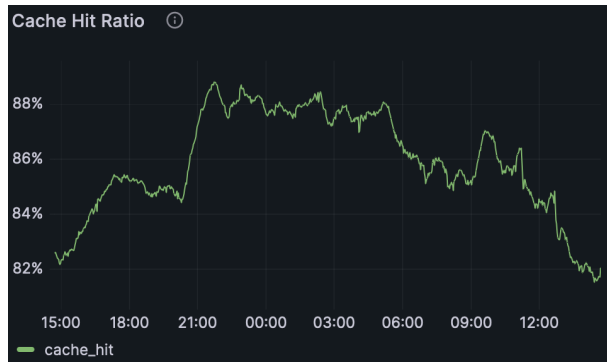


Click on each code in the table below to filter the chart above by just that response code. Shift-click to display more than one.

This chart is especially useful for showing spikes in specific response codes. For instance, if you see many HTTP 429 errors, you should review your Akamai rate limiting settings.

### Cache Hit Ratio

This chart shows how well the Akamai CDN caches are performing, graphing the number of cached objects divided by the number of all objects served:



A possible use for this is exploring cache hit ratios over time for different paths requested. Combined with your knowledge of your web property, this can uncover opportunities to increase your Akamai caching effectiveness.

## Throughput

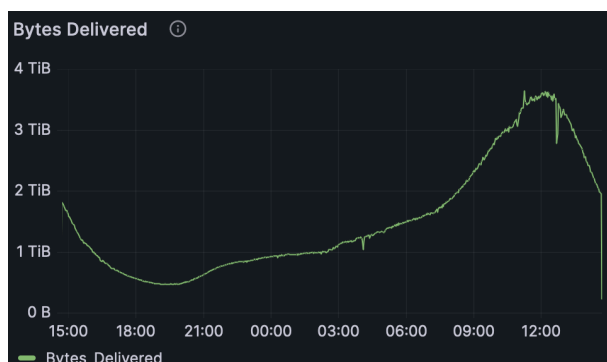
In this chart, throughput is defined as bytes delivered by Akamai divided by the sum of transfer time.



This chart, when faceted by the dimensions in the filter bar, can show which properties are using the most bandwidth and contributing most heavily to your bandwidth charges.

## Bytes Delivered

This will show actual bytes delivered from Akamai. It shows the sum of bytes served when divided up into equal time intervals.



This chart is good for showing the periodicity of customer requests.

## Top 50 Path

The top 50 paths are listed here, sorted by how many times they've been requested during the dashboard's selected time window.

count()	reqPath
34895414	
34298731	
333626...	
332454...	
21618406	
18538227	

This can help show targeted DDOS attacks or other automated processes that needlessly download web objects from your site.

## Top 50 User Agent

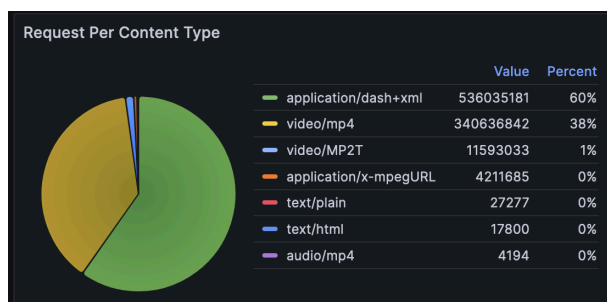
The top 50 user agents requesting objects from your site are listed here, sorted by how many times each particular user agent string has been seen by Akamai.

count()	UA
89717	Mozilla/5.0 (Linux; Android 12; SM-T505 Build/SP1A.2...
88688	AppleCoreMedia/1.0.0.20H115 (iPhone; U; CPU OS 16_...
86986	AppleCoreMedia/1.0.0.20D67 (iPad; U; CPU OS 16_3_1 ...
85890	Mozilla/5.0 (Linux; Android 11; SM-T725 Build/RP1A.2...
83332	Mozilla/5.0 (Linux; Android 8.1.0; SM-T580 Build/M1AJ...
83256	AppleCoreMedia/1.0.0.20J8378 (Apple TV; U; CPU OS...

This helps identify problematic user agents in the wild, including automated processes that may be using your bandwidth unnecessarily.

## Request per Content Type

This pie graph shows the proportions of which type of content Akamai is serving your customers. The "Value" below is the count of objects of that type served during the dashboard's current time window.



This shows how many requests are for data, HTML, or media, as is the case with the above screenshot.

## Top 50 IP

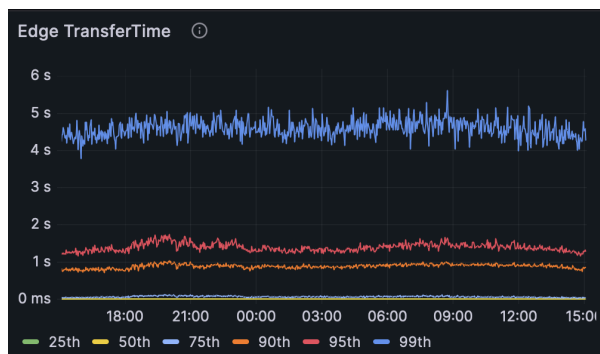
The top 50 IP addresses requesting objects from Akamai are listed here, sorted by the count of objects.

count()	cliIP
88045	<a href="#">2.207.64.93</a>
78830	<a href="#">2.206.245.198</a>
78201	<a href="#">88.134.4.116</a>
77338	<a href="#">109.42.109.42</a> <a href="#">Show Details</a>
76839	<a href="#">82.83.34.89</a>
74994	<a href="#">146.60.45.62</a>

This can be helpful for isolating specific service providers, corporate users, or bots residing at one address.

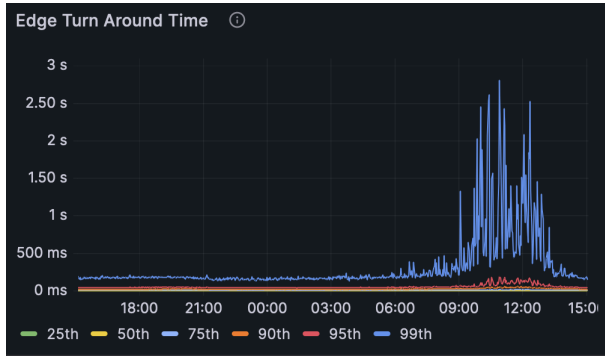
## Edge TransferTime

The time in milliseconds from when the edge server is ready to send the first byte of the response to when the last byte reaches the kernel.




## Edge Turn Around Time

This chart gives you an idea of the time it takes to process each request. More specifically, it's the time between when Akamai received the last byte of the customer request to when it sent the first byte of the response.



This is a good “smoke test” to show the presence of any problems with request processing and content delivery, whether it’s Akamai’s cache, a slow application server or network problems. The 99th percentile is especially useful when you’re troubleshooting, highlighting the slowest responses from the CDN.

Other dashboards are available, too – click the  that’s on the right-hand side of each widget title to learn about each graph.