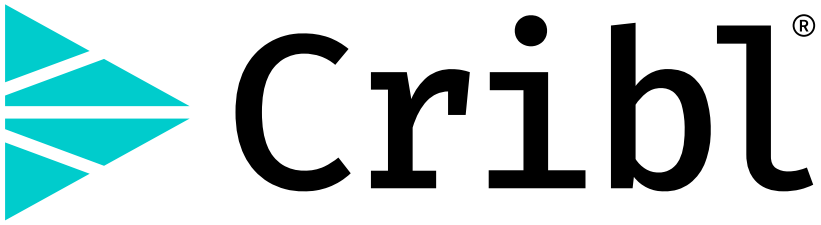

Cribl Lake Documentation Manual

Version: v4.17

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1. About Cribl Lake

Meet Cribl Lake, a data lake solution for long-term, full-fidelity storage of IT and security data.

Cribl Lake receives data from various sources via Cribl Stream or Direct Access, and stores that data - enabling you to later query the data in Cribl Search, or to replay it through Stream as needed.

Besides data you explicitly send to the Lake, Cribl Lake also receives and retains internal logs and metrics from the Leader of your Cribl.Cloud Organization.

What Can You Do with Cribl Lake?

Among the features that Cribl Lake provides, you can:

- Create a data lake in a few clicks and a few minutes.
- Store any type of IT and security data: raw, structured, or unstructured.
- Set and manage retention and access-control policies through a graphical UI, reducing dependencies among multiple teams.
- Use Cribl Stream Pipelines and Functions to control the mix, volume, and structure of data sent to your lake.
- Search your Lake data in place, using Cribl Search, to minimize ingress charges for analysis.
- Assign Lake Datasets to Lakehouses for dramatically faster search responses and more-predictable billing.

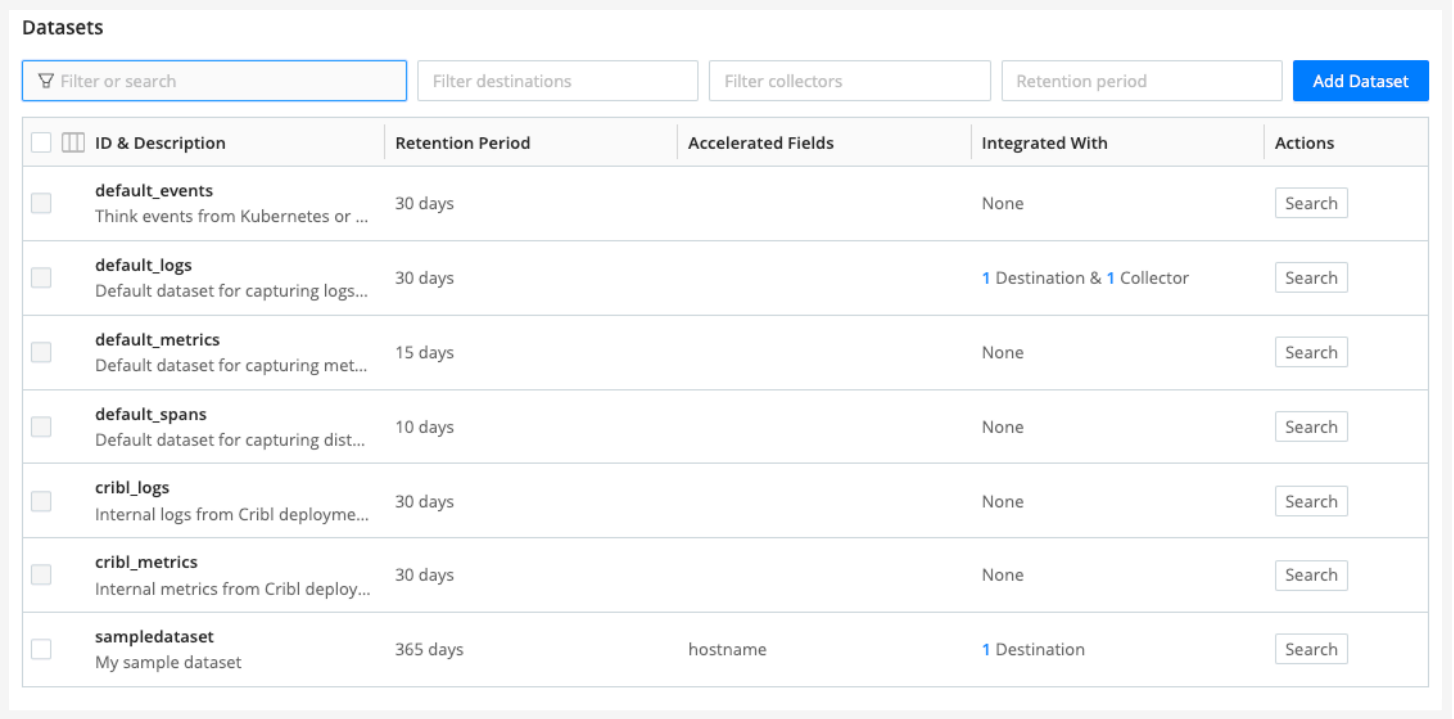
Requirements for Cribl Lake

Cribl Lake is available only in Cribl.Cloud.

Cribl Lake can connect, via a Collector or Destination, with both Cribl-managed Cloud and customer-managed hybrid Stream Worker Groups. Hybrid Worker Groups must be running version 4.8 or higher.

Data Storage in Cribl Lake

Cribl Lake organizes your data into Datasets.



Built-in and custom Datasets in Cribl Lake.

Your data is stored in open, non-proprietary formats, which avoids vendor lock-in. At any time, you can replay the stored data and send it to a Stream Destination of your choice.

You don't have to think about your partitioning configuration. Cribl Lake takes care of the schema and organizes the data for you.

Depending on your use case, you can store your data in gzip-compressed JSON, Parquet, or DDSS.

Storage Limits in Cribl Lake

With a Cribl.Cloud free plan, you can store up to 50 GB of data.

Data in the `cribl_metrics` and `cribl_logs` Datasets is stored for 30 days free of charge.

Send Data to Cribl Lake

You can archive data to Cribl Lake in several ways:

- To send data from any Cribl Stream Source to Cribl Lake, use the Stream Cribl Lake Destination.
- To send the results of a Cribl Search query to Cribl Lake, use the `export` operator.
- To archive Splunk Dynamic Data Self Storage (DDSS) data to Cribl Lake, use the Lake Splunk Cloud Self Storage option.
- To archive data to Cribl Lake over HTTP, use the Direct Access (HTTP) option.

(This option supports FluentBit, Logstash, Vector, the OpenTelemetry Collector, and a wide variety of other senders. You will find specific configuration settings for Elasticsearch Bulk API and Splunk HEC senders.)

Replay Data from Cribl Lake

Cribl Lake adds a dedicated Collector Source to Cribl Stream, which lets you replay data stored in the lake and send it via Routes or QuickConnect.

To replay data stored in Cribl Lake and send it to any Destination via Routes or QuickConnect, use the Cribl Lake Collector available in Cribl Stream.

Search Cribl Lake

Cribl Lake Datasets work as Cribl Search Datasets out-of-the-box.

This means you do not need to create any additional Dataset Providers or Datasets in Cribl Search. You can instantly start searching the data flowing to your Cribl Lake.

See Searching Cribl Lake for example searches you can run over your data stored in Cribl Lake.

Monitor Cribl Lake Usage

You can monitor your Cribl Lake data usage on the Cribl.Cloud portal's **FinOps Center** page.

2. Cribl Lake Datasets

Organize different types of data stored in Cribl Lake, using Lake Datasets.

Cribl Lake comes with ready-to-use default Lake Datasets and lets you create your own Datasets.

You can have up to 200 Lake Datasets per Workspace. If you need more, reach out to Cribl Support.

Lake Dataset Formats

You can set the format of a Lake Dataset to JSON, Parquet, or DDSS.

If you're just exploring, start with the default JSON. But to make the best choice, read these sections beforehand:

- Choose a Lake Dataset Format
- Structure Events for Cribl Lake

Lake Datasets Retention

Every Lake Dataset stores data for a defined retention period.

For built-in Datasets, the retention period is fixed to 10-30 days, depending on the Dataset.

For your own Datasets, you can configure a retention period of up to 10 years.

If you accelerate a Dataset by linking it to a Lakehouse, the Lakehouse can retain cached data for up to 365 days (but not longer than the Dataset).

How Lake Datasets Retention Is Calculated

The retention period of a Lake Dataset is based on the date on which data was uploaded and saved, not on the dates of individual stored events.

This distinction is important if you are uploading older events in a batch. Retention will then be calculated based on the date of the upload.

For example, if on the 1st Aug 2024 you upload a batch of data including events dated at 1st June 2024, and set the retention period to 1 year, the events will be deleted after 1st Aug 2025 (based on upload date), not in June 2025.

Built-in Lake Datasets

The following Lake Datasets are available by default in Cribl Lake:

Lake Dataset	Contains	Retention Period (Days)	Notes
`default_logs`	Logs from multiple sources.	30	
`default_metrics`	Metrics from multiple sources.	15	
`default_spans`	Distributed trace spans from multiple sources.	10	
`default_events`	Events from sources such as Kubernetes or a third-party API.	30	
`cribl_metrics`	Metrics from the Cloud Leader. Data is stored for 30 days free of charge.	30	Can't be targeted by a Destination.
`cribl_logs`	Logs from the Cloud Leader. Data is stored for 30 days free of charge.	30	Can't be targeted by a Destination.

Audit and Access Logs

Cribl Lake automatically collects audit and access logs, and metrics from the Cloud Leader Node (a node that manages the whole Cribl deployment). This data is stored in the `cribl_logs` and `cribl_metrics` Lake Datasets.

Because these Lake Datasets are internal, you can't use them as a target in the Cribl Lake Destination.

You can't edit or delete built-in Lake Datasets.

2.1. Manage Lake Datasets

Create, edit, partition, datatype, and delete Lake Datasets.

This page focuses on Lake Datasets that you populate from Cribl Stream using the Cribl Lake Destination. However, for selected types of data, you have the option to create and populate a Lake Dataset using Cribl Lake Direct Access.

You can also send Cribl Search results to Cribl Lake by using the Search `export` operator. Data ingested from Search to Lake will typically have field names and values pre-parsed, and this parsing is a prerequisite to achieving a Lakehouse performance boost.

You can maintain up to 200 Datasets per Cribl Lake instance (meaning, per Workspace).

Read on to learn how to manage your Lake Datasets:

- Create a New Lake Dataset
- Edit a Lake Dataset
- Delete a Lake Dataset
- Lake Partitions and Lakehouse-Indexed Fields
- Datatypes for Lake Datasets
- Choose a Lake Dataset Format

Create a New Lake Dataset

To create a new Lake Dataset:

1. In the Cribl Lake sidebar, select **Datasets**.
2. Select **Add Dataset**.
3. Enter an **ID** for the new Dataset.

   The identifier can contain letters (lowercase or uppercase), numbers, and underscores, up to 512 characters.

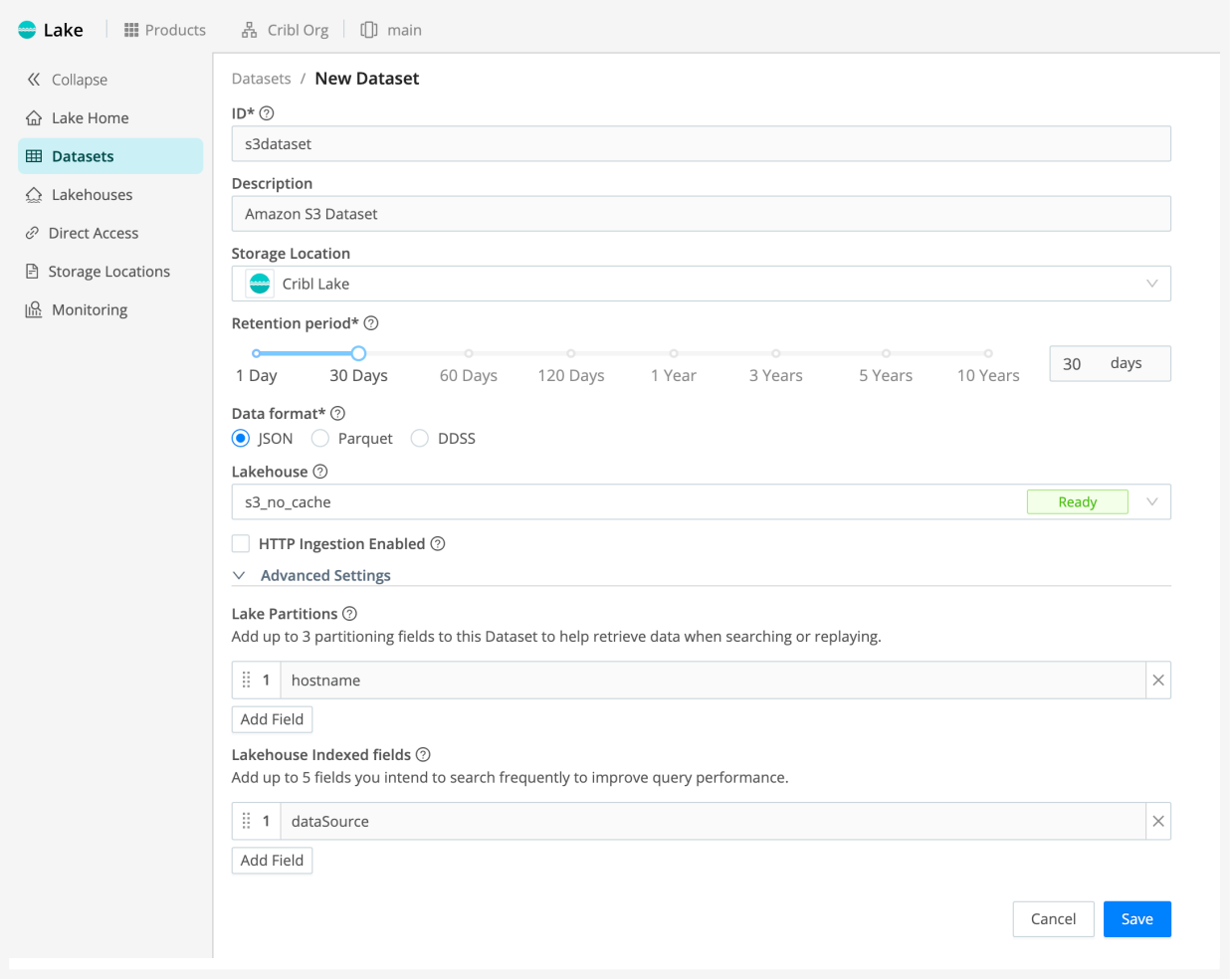
   You can't change the identifier after a Dataset is created, so make sure it is meaningful and relevant to the data you plan to store in it.

   The identifier must be unique and must not match any existing Cribl Search Datasets. Duplicate identifiers can cause problems when searching Cribl Lake data.
4. Optionally, enter a **Description** for the new Dataset.

5. Select a **Storage Location**. The internal `Cribl Lake` storage option is always available on this drop-down, and is the default location if you've configured no external Storage Locations. (Do not select an external Storage Location for a Dataset that you will populate via Direct Access.)
6. Define the **Retention period**. Cribl Lake will store data in the Dataset for the time duration you enter here. The allowed range is anywhere from 1 day to 10 years.
7. Select the **Data format**. Keep the default **JSON** to prioritize storage efficiency. Choose **Parquet** to optimize for search performance. Read more: Choose a Lake Dataset Format and Structure Events for Cribl Lake.

   DDSS is available for a Dataset that you will populate via Splunk Cloud Self Storage. The **HTTP Ingestion Enabled** check box will be automatically selected when you configure Direct Access (HTTP) to populate a Dataset.
8. Optionally, select the **Lakehouse** you want to link to the Dataset. When you select a Lakehouse at this point, the Lake Dataset will become a mirrored Dataset.

   You can't link Lakehouses to Datasets populated via Splunk Cloud Direct Access or those using an external Storage Location.
9. If you selected a Lakehouse, define the **Lakehouse retention period**. See Lakehouse Retention for more details.
10. Optionally, in **Advanced Settings**, select up to three **Lake Partitions** for the Dataset.
11. If you are linking the Dataset to a Lakehouse, then in **Advanced Settings**, you have the option to select up to five **Lakehouse Indexed fields**.
12. Confirm with **Save**.



Fill in a few fields and set the retention period, and you have a new Lake Dataset

You will now be able to select this new Dataset by using its identifier in a Cribl Lake Destination or Cribl Lake Collector.

Edit a Lake Dataset

To edit an existing Lake Dataset:

1. In the Cribl Lake sidebar, select **Datasets**.
2. Select the Dataset you want to edit and change the desired information, including description, Storage Location, retention period, partitions, and linked Lakehouse. You can't modify the identifier of an existing Lake Dataset.
3. Confirm with **Save**.

Change a Lake Dataset Retention Period

If you change the retention period of an existing Lake Dataset, this affects all data in the Dataset.

If you increase the retention period, data **currently** in the Dataset will adopt the new retention period.

Changing the retention period of the Dataset might affect the retention of its Lakehouse. If you decrease the Dataset retention below the current Lakehouse retention, the Lakehouse retention will be automatically reduced to match.

If you **decrease** the retention period, data older than the new time window will be lost. Make sure that this is your intention before you save the change.

Delete a Lake Dataset

To delete a Lake Dataset:

1. In the Cribl Lake sidebar, select **Datasets**.
2. Select the check box next to the Dataset(s) you want to delete.
3. Select **Delete Selected Datasets**.

Scheduled Deletion

A Lake Dataset is not deleted instantly. Instead, after you select it for deletion, it will be marked with `Deletion in progress`. In this state, you can no longer edit it, or connect it to Collectors or Destinations.

Data that is older than 24 hours will be removed the following day, after midnight UTC. Datasets are only deleted when all of the data in the dataset is 24 hours old or older. Once a Lake Dataset is marked for deletion, you will no longer be charged for any data that it contains.

You can't delete built-in Lake Datasets, or Lake Datasets that have any connected Collectors or Destinations.

Lake Partitions and Lakehouse-Indexed Fields

Each Lake Dataset can have up to three partitions configured, and, if you're using a Lakehouse, up to five Lakehouse-indexed fields, to speed up searching and replaying data from Cribl Lake.

A typical use case for applying partitions and indexed fields is to accelerate `hostname` or `sourcetype` if you are receiving data from multiple hosts or sources.

You can use partitions and indexed fields both in Search queries and in the filter for runs of the Cribl Lake Collector.

Which Fields to Use as Partitions and Indexed Fields?

To ensure that search and replay work best, make sure you provide broader partitions or Lakehouse-indexed fields first. The order in which you configure partitions or indexed fields for a Lake Dataset influences the speed of search and replay of the data.

We also do not recommend partitions or indexed fields that:

- Contain PII (personally identifiable information).
- Contain objects.
- Have a name starting with an underscore (such as `_raw`).

For partitions, additionally avoid using fields that:

- Have high cardinality values.
- Are nullable (that is, can have the value of `null`).

Don't use `source` or `dataset` as partitions or Lakehouse-indexed fields. These are internal fields reserved for Cribl, and are not supported as partitions/indexed fields.

Datatypes for Lake Datasets

Lake Datasets, like regular Cribl Search Datasets, can be associated with Datatypes. Datatypes help separate Dataset data into discrete events, timestamp them, and parse them as needed.

To configure Datatypes for a Lake Dataset:

1. On the top bar, select **Products**, and then select **Search**.
2. In the sidebar, select **Data**.
3. In the list of Datasets select your Lake Dataset.
4. Select the **Processing** tab.
5. In the **Datatypes** list, add desired Rulesets via the **Add Datatype Ruleset** button. (The order of Rulesets matters.)
6. When the list of Rulesets is complete, confirm with **Save**.

For more information about using Datatypes and Rulesets in searches, see Cribl Search Datatypes.

Choose a Lake Dataset Format

When creating a Lake Dataset, you can set its format to JSON, Parquet, or DDSS. Each format has specific use cases and performance characteristics.

To make the most of JSON or Parquet, preprocess your events in Cribl Stream. Learn more at Structure Events for Cribl Lake.

When to Use JSON

Set your Lake Dataset format to the default JSON when:

- You're just getting started and want to explore Cribl Lake.
- Your data is semi-structured.
- You need a high level of compression, and ordinary search performance.
- You plan to store your original events in the `_raw` field (for compliance, or replay), and drop all other fields.

2.2. Structure Events For Cribl Lake

Preprocess your events, optimizing either for long-term retention or frequent access.

Highlights

- Before sending events to Cribl Lake, format them in Cribl Stream.
- For maximum storage efficiency, use JSON, and remove all fields except `_raw`.
- For best search performance, use Parquet, and keep all fields.

Event Structure Matters

Cribl Lake stores data as either gzip-compressed JSON or Parquet files. The format you choose (when creating a Lake Dataset), and how you structure your events in Cribl Stream determines whether you optimize for **storage efficiency** or **search performance**.

Choose Your Format Based on How You'll Use the Data

If you're storing data primarily for compliance or long-term retention, JSON is typically the better choice. JSON with gzip compression produces smaller files when your goal is to minimize storage costs and you don't need to query the data frequently.

If you plan to search and analyze the data regularly, building dashboards, running investigations, or performing ad-hoc queries in Cribl Search, Parquet is often the better option. Parquet has a columnar format that enables faster queries, especially when your events contain structured fields that Cribl Search can filter efficiently.

Consideration	JSON	Parquet
Use case	Compliance, archival, infrequent access	Frequent search, dashboards, analysis
Event structure	Requires `_raw` only	Requires multiple parsed fields
Compression	Excellent with simplified events	Excellent with repeated field values
Search performance	Slower (scans full events)	Faster (columnar filtering, predicate pushdown)

Optimize Events for Storage Efficiency (JSON)

JSON works best when you prioritize compression and storage efficiency over query performance. For compliance or archival use cases, you can simplify events down to just the original log event stored in the `_raw` field. Use a Pipeline in Cribl Stream to remove all top-level fields except `_raw`. This approach preserves the original event for compliance purposes.

Example: Firewall Log for Compliance Storage

A firewall log arrives in Cribl Stream with multiple extracted fields:

```
{
  "_raw": "Jun 12 14:23:01 fw01 %ASA-6-302013: Built outbound TCP connection 847263 f
  "_time": 1718194981,
  "action": "Built",
  "protocol": "TCP",
  "src_ip": "192.168.1.100",
  "dest_ip": "203.0.113.50",
  "dest_port": "443"
}
```

Copy

If you aim for maximum storage efficiency (for example, for archival purposes), you can configure your Stream Pipeline to remove all non-essential fields, and keep only `_raw`.

You can also keep other top-level fields, which can improve search performance later, but will result in larger file sizes in Cribl Lake.

```
{
  "_raw": "Jun 12 14:23:01 fw01 %ASA-6-302013: Built outbound TCP connection 847263 f
  "_time": 1718194981
}
```

Copy

The original log remains intact in `_raw` for compliance. If you ever need to replay this data for analysis, you can re-parse it through Cribl Stream at that time using a Cribl Lake Collector.

Optimize Events for Search Performance (Parquet)

Parquet shines when your events are well-structured with multiple fields, particularly fields with repeated values. Unlike JSON, Parquet stores data in columns and compresses repeated values efficiently, which means fields like Kubernetes labels that appear across thousands of events are stored only once per file.

For Parquet to deliver these benefits, your events must arrive at Lake as parsed, structured data with multiple top-level fields. Sending events with only `_raw` to a Parquet Lake Dataset produces larger files than JSON and degrades search performance.

Cribl Search takes advantage of the Parquet structure through predicate pushdown, using min/max values within the files to skip irrelevant data during queries. This can significantly reduce query times when filtering on fields like `namespace`, `pod_name`, or `log_level`.

For tips on searching Parquet data, see Parquet in the Cribl Search docs.

Example: Kubernetes Event for Active Analysis

A Kubernetes log arrives with container metadata:

```
{
  "_raw": "2024-06-12T14:23:01.847Z INFO [main] Application started successfully",
  "_time": 1718194981,
  "kube_namespace": "production",
  "kube_pod": "api-server-7d4b8c6f9-x2vnm",
  "kube_container": "api-server",
  "kube_node": "node-pool-1-abc123",
  "log_level": "INFO",
  "message": "Application started successfully"
}
```

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Keep all these fields intact when sending to a Parquet Dataset. The repeated values in `kube_namespace`, `kube_node`, and `log_level` compress efficiently, and Cribl Search can filter directly on any of these fields without having to re-parse the full `_raw` field.

Understand How Cribl Stream Processes Events

To learn more about how Cribl Stream processes and structures events, see:

- Event Model – Understand the internal structure of events in Stream
- Event Processing Order – See how events flow through Pipelines

- Pipelines – Configure Functions to shape events before they reach Lake

3. Search Cribl Lake

Search your Cribl Lake data with Cribl Search.

Cribl Lake appears as a preconfigured Cribl Search Dataset Provider called `cribl_lake`. This enables you to use Cribl Lake Datasets as Cribl Search Datasets and instantly start searching them.

Search a Lake Dataset

To access Cribl Search: From your Organization's top bar, select **Products**, then select **Search**. You can then query your Lake Datasets from Cribl Search.

Search a Lakehouse

You can speed up searching your Cribl Lake data by caching it in a Lakehouse.

Once a Lake Dataset is linked to a Lakehouse, searches against that Dataset will run significantly faster, as long as your query's time range falls within the configured Lakehouse retention period.

Verify Lakehouse Use

To verify whether a search successfully used a Lakehouse, take a look at the tracking bar.

If the search failed to use a Lakehouse, the bar presents information about potential reasons. The reasons might include (as examples) the Lakehouse being disabled or misconfigured, or the query exceeding the time range of data stored in the Lakehouse.

Search Multiple Lakehouse Datasets

You can run a single query against multiple Lakehouse Datasets. For the query to execute at Lakehouse speed, all Datasets in the query must be Lakehouse-assigned, and your query must also meet one of these conditions:

- Include only operators from the following group: `cribl`, `centralize`, `extend`, `extract`, `foldkeys`, `limit`, `mv-expand`, `pivot`, `project`, `project-away`, `project-rename`, `search`, and `where`.
- Or, if you use any other operators, insert the `centralize` or `limit` operator before them. (Result counts will be further constrained by usage group limits.)

If neither of the above conditions is met, or if your query includes non-Lakehouse Datasets, the query will run at standard speed.

Cribl Search Differences with Lakehouse

Executing Cribl Search queries against a Lakehouse-assigned Dataset changes some behavior and results, compared to executing the same queries without Lakehouse caching. For details, see Lakehouse Search Differences.

Examples of Searching Cribl Lake

Use these examples as starting points for your own searches.

Basic Search into Cribl Lake

This search specifies the Dataset (`test_dataset`) and limits the number of results.

```
dataset="test_dataset"
| limit 100
```

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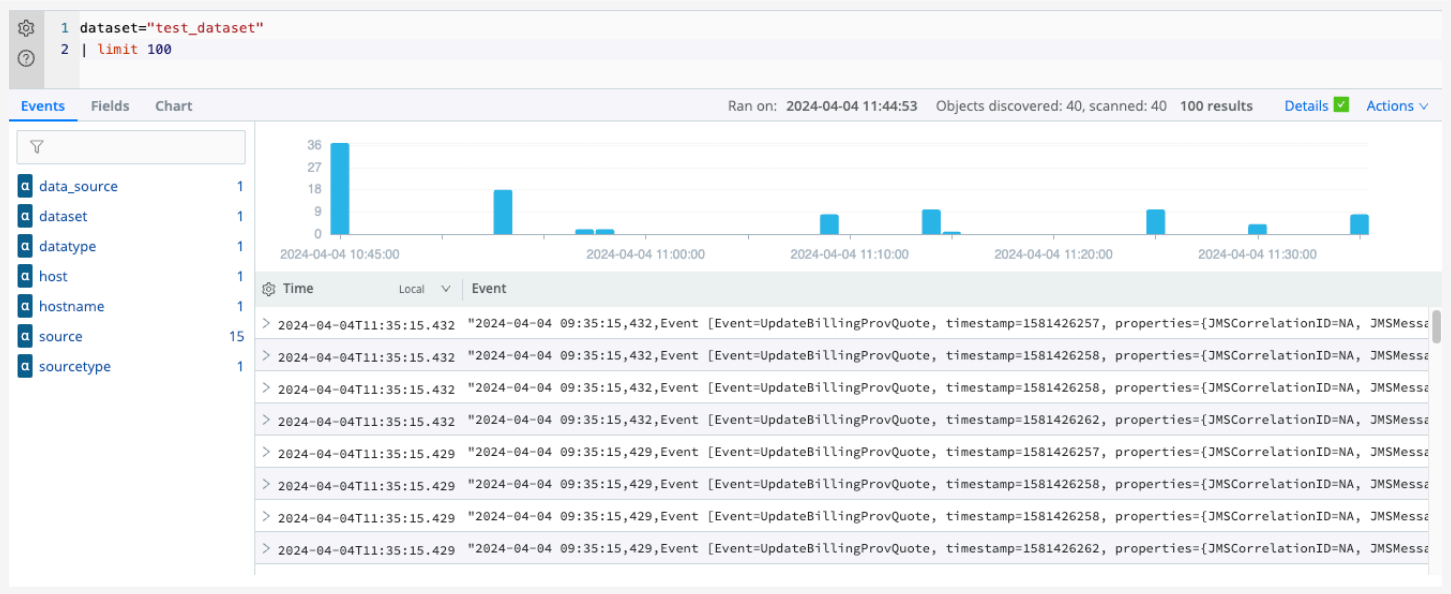

Sample Cribl Lake Search

Search Cribl Lake with a Partition

This search uses a Lake partition named `sourcetype` that is configured for the `partitioned` Dataset to speed up retrieval:

```
dataset="partitioned" host="cribl-stream"
```

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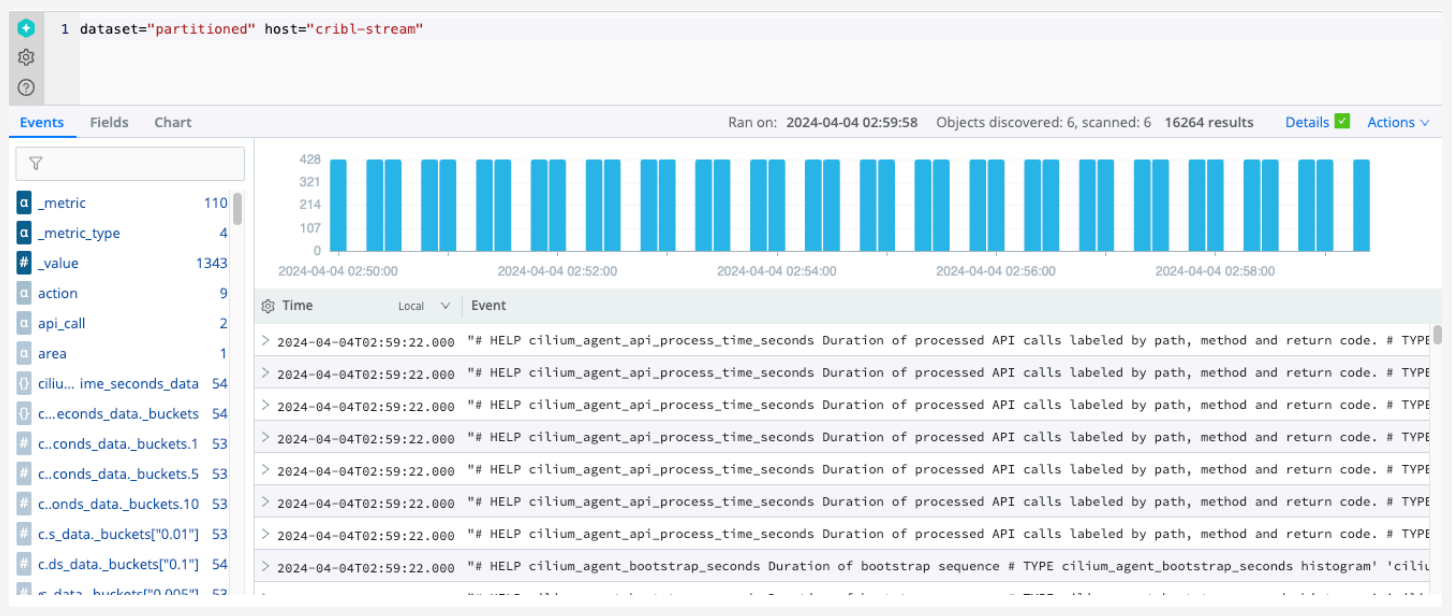

Sample Cribl Lake Search: Using partitions

Export Cribl Search Results to Cribl Lake

The `export` operator lets you export Cribl Search results to a Lake Dataset. You can later search this Dataset to extract relevant data from it.

An efficient way to search exported data is to provide the search job ID to the `where` operator:

```
dataset="exported_data"
| where source contains "1713177481843.9AOqxI"
```

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You can find the search job ID in search details after running it, or in the **History** tab, in the **Search ID** column.

You can also label exported events using the `extend` operator and then include the added fields in your search. For example, during export you can include the user that performed the search:

```
dataset="cribl_search_sample"
| extend user = user()
| export to lake exported_data
```

Copy Run in Cribl Search

You can then search for data by this user:

```
dataset="exported_data"
| where user == "John Doe"
```

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4. Lakehouses In Cribl Lake

Search Cribl Lake faster with a Lakehouse.

To speed up searching your Cribl Lake data, you can cache it in a Lakehouse.

For example, Lakehouses can enable efficient storage and fast search of high-volume recent telemetry data. For use case scenarios, see: Streamline Logs Storage and Analysis with a Lakehouse.

You can decide how long to cache data in a Lakehouse by configuring its retention period.

Lakehouse Availability

Lakehouses are available only in Cribl.Cloud Organizations on certain plans.

Lakehouse Sizes

Each Lakehouse has a size. The size defines the amount of data that can be ingested into and stored in the Lakehouse. When sizing your Lakehouse, consider your expected data ingest for Lake Datasets associated with that Lakehouse. Then, select a size based on this estimate. (An undersized Lakehouse will be able to cache fewer days of data.)

The following sizes are available:

Size	Capacity (per day)
Small	600 GB
Medium	1200 GB
Large	2400 GB
XLarge	4800 GB
XXLarge	9600 GB
3XLarge (Contact Support)	14 TB
6XLarge (Contact Support)	28 TB

Exceeding Lakehouse Capacity

When data flowing into a Lakehouse exceeds the Lakehouse capacity, this will degrade both ingest speed and search speed. To prevent these impacts, try to avoid sustained excessive loads. If they occur, consider expanding the Lakehouse capacity, as covered in the next section.

Resize a Lakehouse

After creating a Lakehouse, if you decide you need less or more storage capacity, you can resize an existing Lakehouse.

To do so, on the **Lakehouses** page, select the existing Lakehouse and choose a different size.

When you resize a Lakehouse, reserve some time for its resouces to be reprovisioned. During this period, Lakehouse-cached searching will be unavailable. So any search against Lake Datasets connected to the Lakehouse will proceed at the speed of a regular search. (Cribl Search will also consume credits for CPU time, because these searches are not covered by Lakehouse flat billing.) After the resize operation is complete, your Lakehouse-cached data will be searchable again.

Lakehouse Retention

You can cache data in a Lakehouse for a configurable retention period of 1 to 365 days (but not longer than the retention period of the underlying Lake Dataset).

The default Lakehouse retention is 30 days.

When data ages out of the Lakehouse, it's removed from the cache but remains available in the Lake Dataset (until it reaches the Dataset's own retention limit).

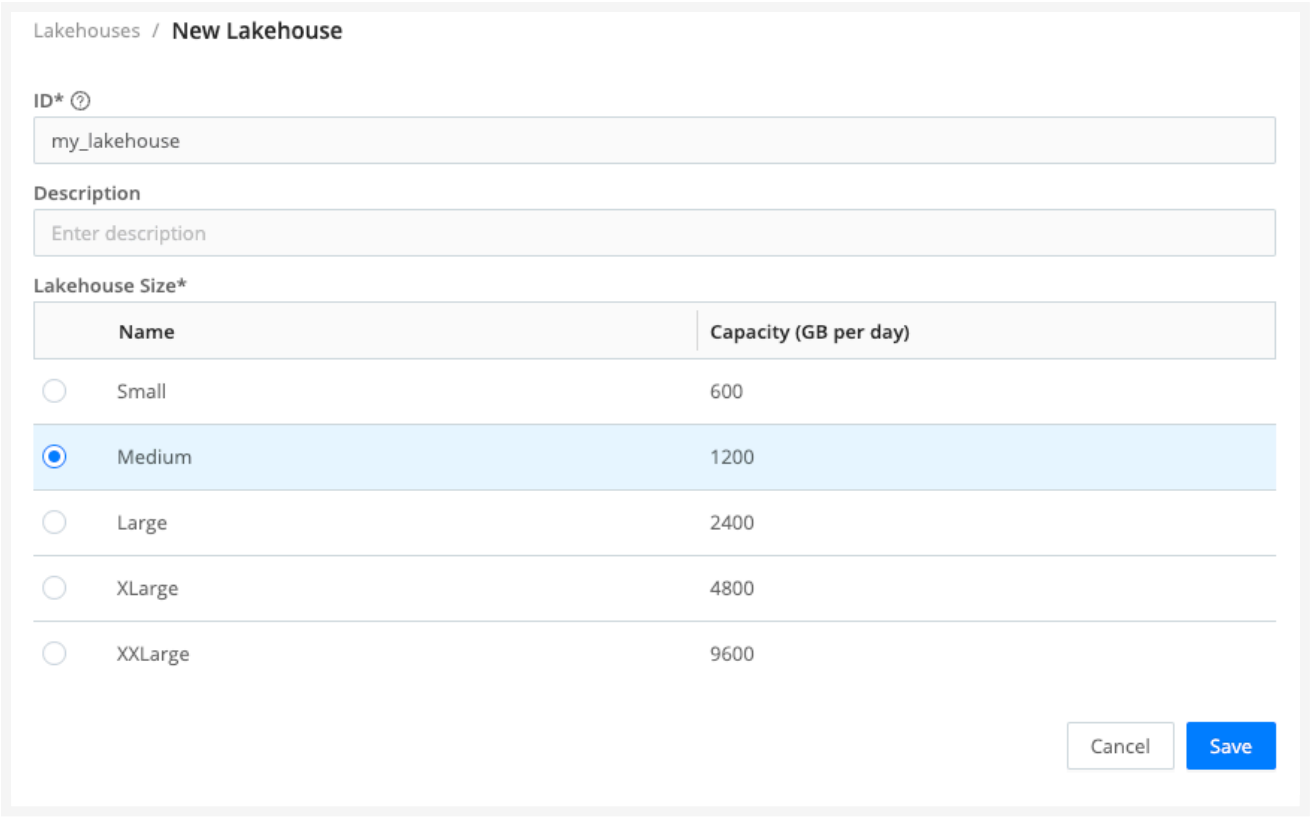
Add a New Lakehouse

A Lake Dataset can be linked to just one Lakehouse. However, a single Lakehouse can have more than one Lake Dataset linked to it.

To add a new Lakehouse, as an Organization Owner:

1. In the Cribl Lake sidebar, select **Lakehouses**.
2. Select **Add Lakehouse**.
3. Enter an **ID** for the new Lakehouse and, optionally, a **Description**.
4. Define the **Size** of the Lakehouse, based on expected ingest volume.
    - You can change the size later.
    - There are two larger Lakehouse sizes: 3XLarge and 6XLarge. To use one of these sizes, Contact Support.

The new Lakehouse will be fully active after it has been provisioned, which might take up to an hour.



Select an initial size for the new Lakehouse

Link a Lake Dataset to a Lakehouse

You can link one or more Lake Datasets to each Lakehouse. To do so, you need to be an Organization Admin or Lake Admin.

Linking Datasets is possible only after the Lakehouse has been fully provisioned.

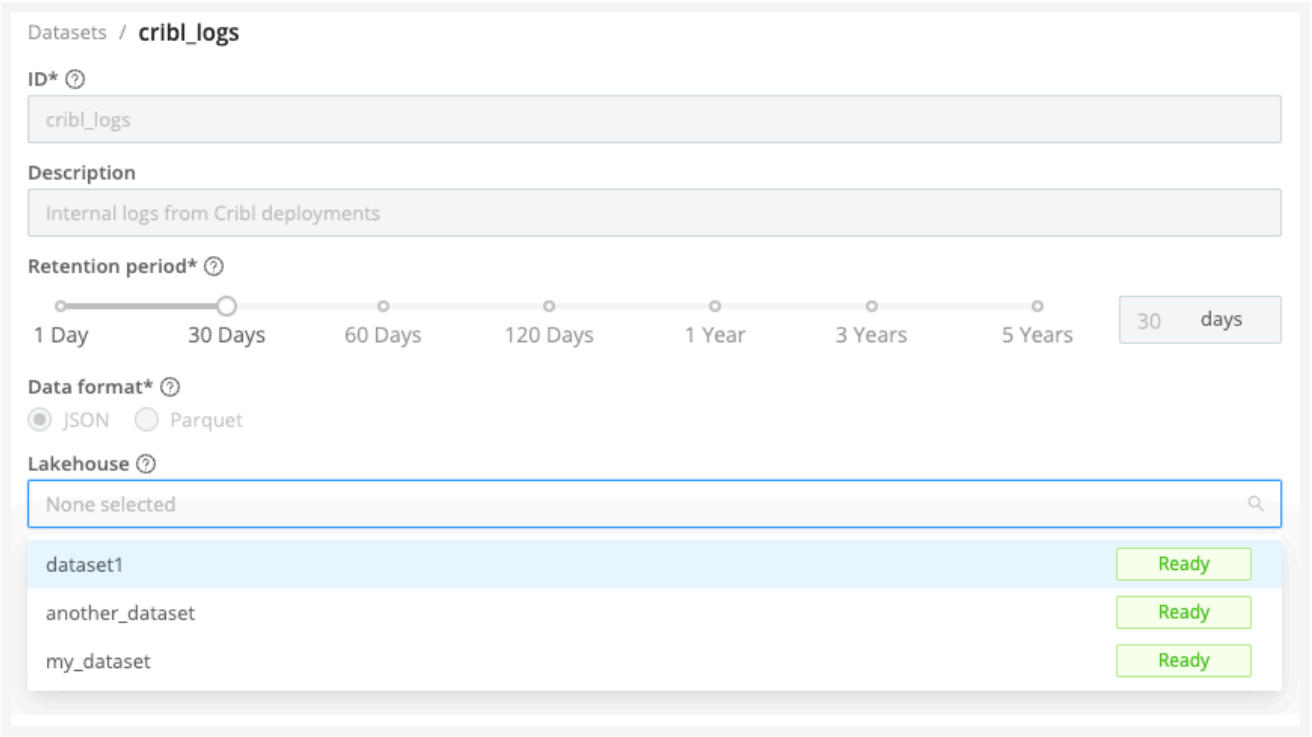
You can link Datasets in two ways, influencing how the Dataset will behave in relation to the Lakehouse:

- Link an already existing Lake Dataset, to only cache data ingested into the Dataset in the future.
- Link a new Lake Dataset, to mirror the Dataset's contents.

Link an Existing Lake Dataset to a Lakehouse

To link an existing Lake Dataset to a Lakehouse:

1. In the sidebar, select **Datasets**.
2. On the resulting **Datasets** page, select the Lake Dataset you want to assign to a Lakehouse.
3. In the **Lakehouse** drop-down, select the Lakehouse you want to assign the Dataset to.
4. Set the **Lakehouse retention period**. See Lakehouse Retention for more details.



Link Lakehouses to Lake Datasets

When you assign an existing Lake Dataset to a Lakehouse, only data newly ingested to that Dataset will be sent to the Lakehouse.

If you link an **empty** existing Lake Dataset to a Lakehouse, it will behave like a mirrored Dataset.

Link a New Lake Dataset to a Lakehouse

To link a Lake Dataset to a Lakehouse during its creation:

1. In the sidebar, select **Datasets**.
2. Select **Add Dataset**.
3. Configure the Dataset as described in Create a New Lake Dataset.
4. In the **Lakehouse** dropdown, select the Lakehouse you want to link to.
5. Set the **Lakehouse retention period**. See Lakehouse Retention for more details.

Assigning a Lake Dataset to a Lakehouse during creation results in a mirrored Dataset.

Mirrored Lake Datasets

When you assign a Lake Dataset to a Lakehouse **while creating** the Dataset, the Lakehouse will mirror the Dataset's contents.

Data sent to a mirrored Dataset will be ingested into the Lakehouse regardless of the `event_time` of the event. Cribl Search will always use the Lakehouse when searching a mirrored Dataset, unless you explicitly turn it off by setting the `lakehouse` option to `off`.

Insert Data into a Lakehouse

To populate a Lakehouse, see Prepare Data for Use with Lakehouse.

Delete a Lakehouse

To delete a Lakehouse:

1. In the sidebar, select **Lakehouses**.
2. Select the check box next to the Lakehouse(s) you want to delete.
3. Select **Delete Selected Lakehouses**.

A Lakehouse is not deleted instantly. Instead, once you select the Lakehouse for deletion, it will be marked with "Deletion in progress". At this point, you can no longer edit the Lakehouse, nor connect it to Lake Datasets.

Data that is older than 24 hours will be removed at midnight UTC the following day, while more-recent data might be deleted after that time. Once a Lakehouse is marked for deletion, you are no longer charged to maintain any data that it contains.

When you remove a Lakehouse, its data will still be available to be searched and replayed from its standard Lake Dataset.

Lakehouse Status

A Lakehouse can have one of the following statuses:

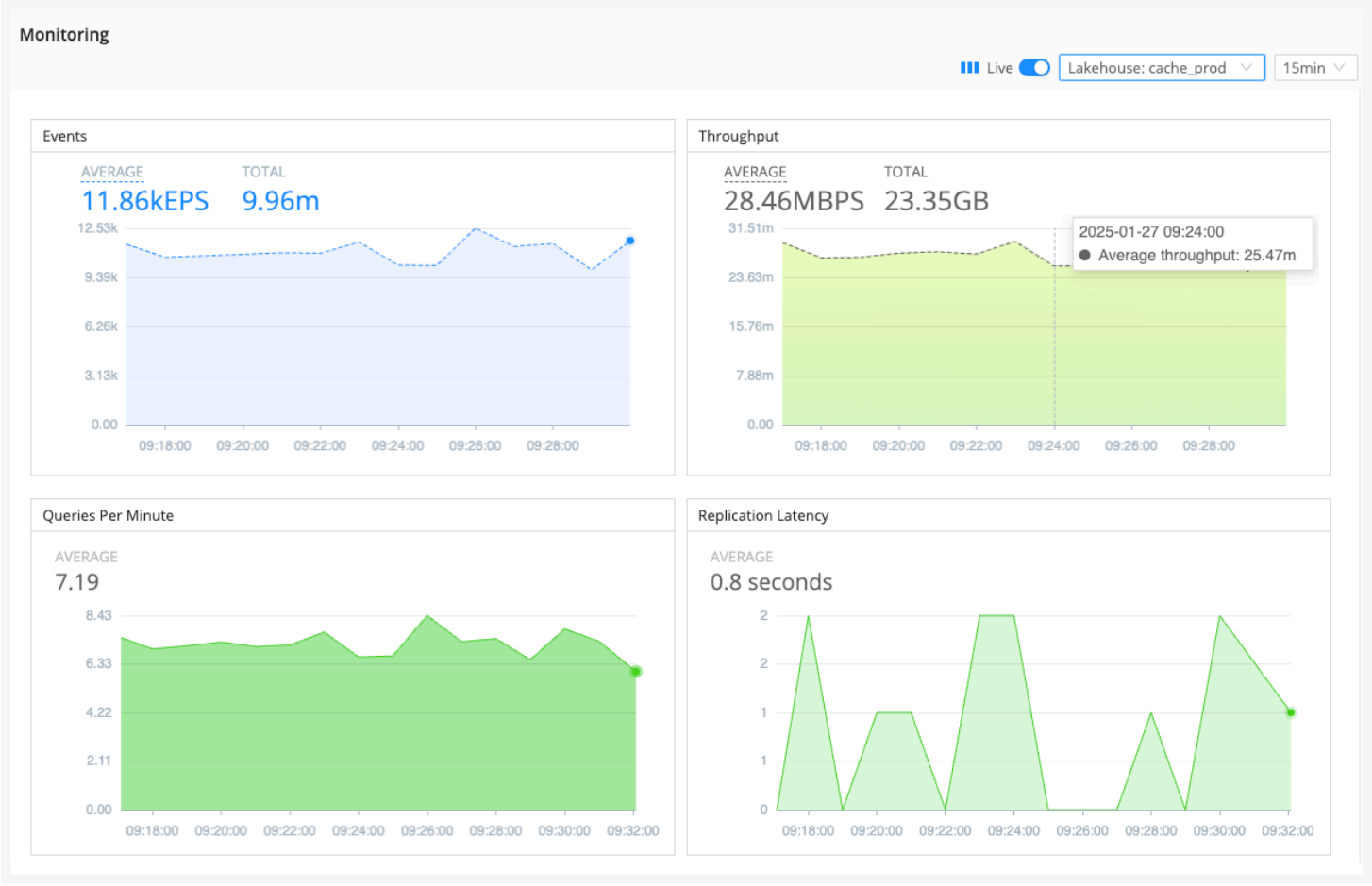
Status	Description
Ready	Lakehouse can be linked to Lake Datasets and used. You can resize it.
Provisioning	Lakehouse is being prepared, you can't resize it or link it to Lake Datasets.
Delayed	Provisioning the Lakehouse has encountered an issue, but it will move to Ready status when the issue is resolved. While the Lakehouse is Delayed, you can resize it, but you can't link it to Datasets.
Terminated	Lakehouse has been marked for deletion.

Monitor Lakehouse Usage

To control your usage of Lakehouses, and to make decisions about their potential resizing, you can display charts that present data per Lakehouse.

Select the sidebar's **Monitoring** link. On the resulting page, use the drop-down at the upper right to select among Lakehouses. You'll see the following charts.

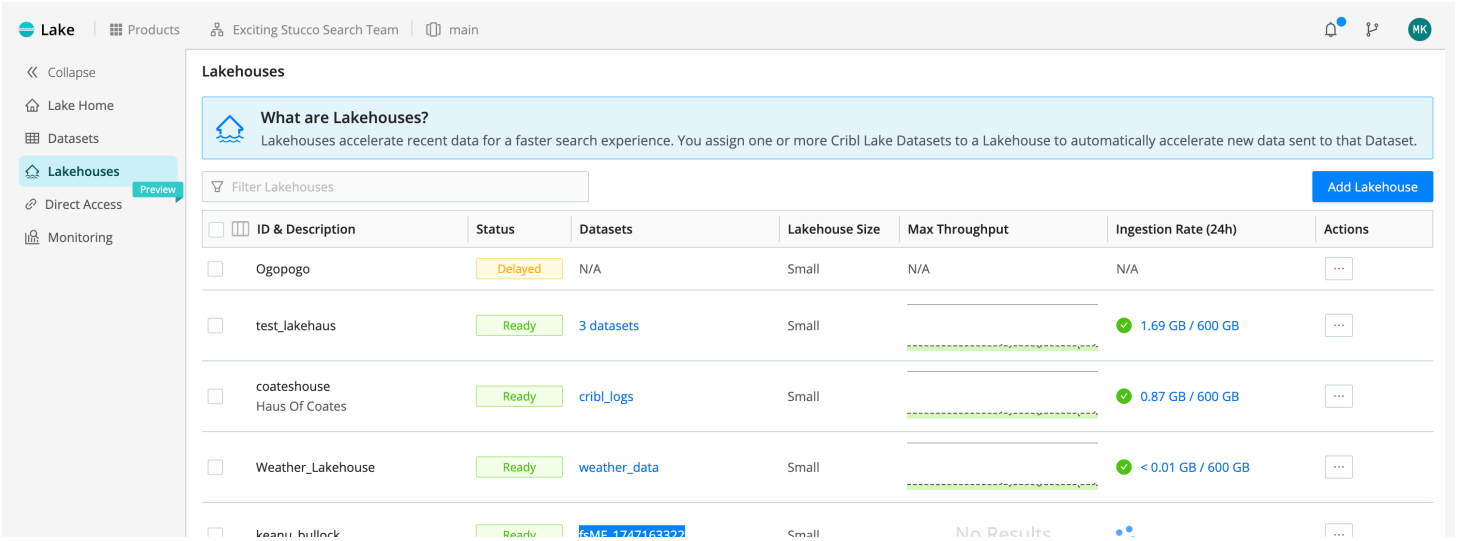
- **Events**: Number of events ingested into the Lakehouse.
- **Throughput**: Number of bytes ingested into the Lakehouse.
- **Queries per Minute**: Number of queries performed on the Lakehouse.
- **Replication Latency**: Latency of ingesting data into the Lakehouse.



Charts to monitor performance per Lakehouse

On the **Lakehouses** page, you can see summary data for all configured Lakehouses. **Ingestion Rate** measures the past 24 hours, compared with each Lakehouse's configured capacity.

Max Throughput graphically compares actual throughput to a guideline representing the recommended maximum, again based on the configured capacity.


Lake
Products
Exciting Stucco Search Team
main
MK
Collapse
Lake Home
Datasets
Lakehouses
Preview
Direct Access
Monitoring
Lakehouses
What are Lakehouses?
Lakehouses accelerate recent data for a faster search experience. You assign one or more Cribl Lake Datasets to a Lakehouse to automatically accelerate new data sent to that Dataset.
Filter Lakehouses
Add Lakehouse
ID & Description
Status
Datasets
Lakehouse Size
Max Throughput
Ingestion Rate (24h)
Actions
Ogopogo
Delayed
N/A
Small
N/A
N/A
test_lakehaus
Ready
3 datasets
Small
1.69 GB / 600 GB
coateshouse
Haus Of Coates
Ready
cribl_logs
Small
0.87 GB / 600 GB
Weather_Lakehouse
Ready
weather_data
Small
< 0.01 GB / 600 GB
Ready
Small
No Results

4.1. Streamline Logs Storage And Analysis With A Lakehouse

Use a Cribl Lakehouse to efficiently store, and quickly analyze, high-volume recent telemetry data.

This is an overview of how to ingest log files into a Lakehouse, and then use Cribl Search to periodically analyze only specific data relevant for threat-hunting or security investigations.

Especially as data volume increases, this can be a cost-effective alternative to bulk-forwarding data to a traditional SIEM system. This page demonstrates sequential setup in your upstream logs sender, Cribl Stream, Cribl Lake, and Cribl Search. The broad steps are:

1. Collect and stage logs in the applications and frameworks that generate them..
2. Shape the data, using a Cribl Stream Parser.
3. Create a Cribl Lake Dataset to store your parsed data.
4. Route the parsed data to the new Lake Dataset.
5. Configure a Lakehouse, to support low-latency analytics in Cribl Search.
6. Analyze relevant data, using Cribl Search ad hoc and scheduled queries.
7. Visualize your data, using Cribl Search predefined or custom Dashboards.

Collect, Stage, and Shape Logs

Once you've configured log collection on the infrastructure where you run your applications, ingesting logs into Cribl Stream provides a straightforward way to parse events for efficient storage and retrieval in Cribl Lake.

Cribl Stream ships with dedicated Source integrations for common data senders and protocols. Our Integrations page outlines steps for customizing our Sources to ingest data from senders without dedicated counterparts.

Shape with Parsers

With data flowing through Cribl Stream, you can apply the built-in Parser Function to parse events into fields optimized for Cribl Lake storage. This Function enables you to choose from a library of predefined Parsers for common data sources, and the library's UI facilitates customizing, cloning, and adding Parsers to shape your specific data.

Here, we provide specific steps for collecting, staging, and parsing three common Amazon log formats: VPC Flow Logs, CloudTrail logs, and CloudFront logs. Beyond these specific examples, you can use a similar

workflow to efficiently store and analyze many other types of logs, by substituting a different Stream Parser or configuring your own.

VPC Flow Logs | CloudTrail Logs | CloudFront Logs

Collect and Stage VPC Flow Logs

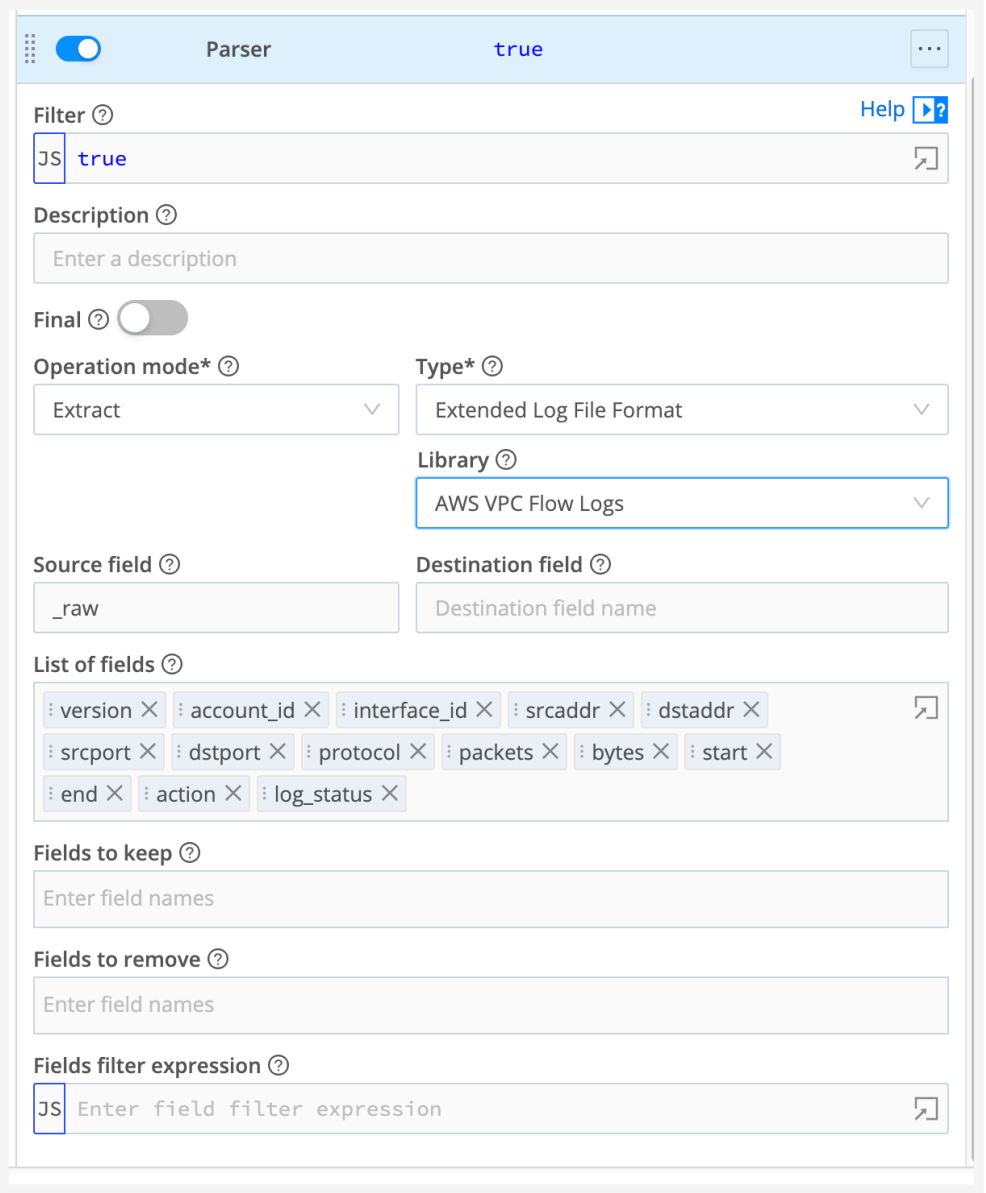
Your first steps take place in the Amazon VPC console or EC2 console. If you're not already collecting VPC Flow Logs, the Amazon Logging IP Traffic Using VPC Flow Logs documentation provides specific instructions.

1. Set up AWS VPC Flow logging within your AWS account.
2. Configure writing the VPC Flow Logs to an Amazon S3 bucket.
3. Enable S3 permissions for Cribl Stream to read from the bucket.

Shape (Parse) the Data

Next, use Cribl Stream to ingest your VPC Flow Logs data, and to parse the named fields that Lakehouse requires. (You'll want to configure all Stream steps within your Cribl.Cloud Organization, to enable routing to Cribl Lake later.)

1. Configure a Cribl Stream Amazon S3 Source to continuously collect (stream) data from your S3 bucket.
2. Create or adapt a simple Cribl Stream Pipeline that will process this data.
3. Add a single Parser Function to the Pipeline.
4. In the Parser, accept default `Extract` mode, then set the **Library** to `AWS VPC Flow Logs`. As shown below, this will automatically set the **Type** to `Extended Log File Format`.
5. Save the Pipeline.



Parser configuration for VPC Flow Logs

You might choose to expand this Pipeline to add Tags, or to add other predefined Cribl Stream Functions to shape or narrow your data in specific ways. This scenario presents the simplest scenario to parse your data for Cribl Lake.

The Cribl AWS VPC Flow for Security Teams Pack provides sample Pipelines that you can adapt and add to Cribl Stream. For usage details, see Cribl Stream for InfoSec: VPC Flow Logs - Reduce or Enrich? Why Not Both? You can also use the Cribl Copilot Editor (AI) feature to build a Pipeline from a natural-language description of the processing you want.

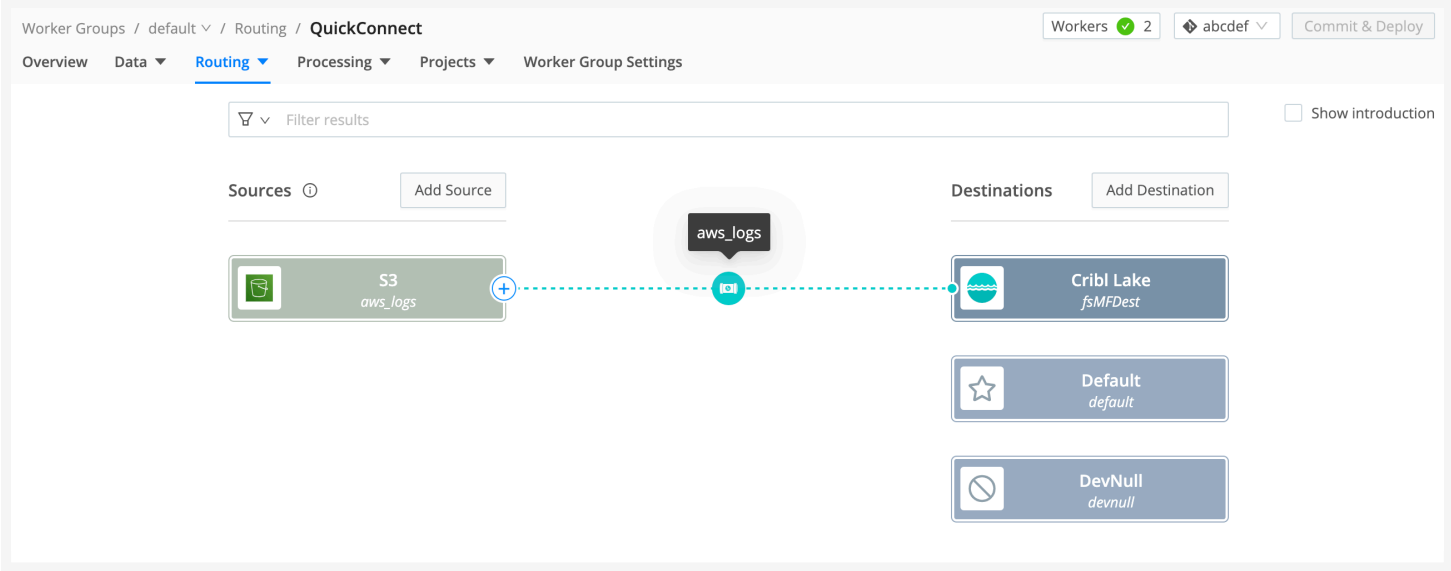
Create a Cribl Lake Dataset

In Cribl Lake, create a Lake Dataset to store your shaped data.

Route the Parsed Data to Cribl Lake

Back in Cribl Stream, route your shaped data to your Lake Dataset.

1. Add a Cribl Lake Destination.
2. Within that Destination, select the Lake Dataset you've just created, and save the Destination.
3. You can use either QuickConnect or Data Routes to connect your S3 Source to your Lake Destination through the Pipeline you configured earlier. (The Destination page linked above covers both options.)



Example QuickConnect configuration (data not yet flowing)

Configure a Lakehouse For Low-Latency Analytics

With data flow now established from your infrastructure all the way to Cribl Lake, assign the Lake Dataset to a Lakehouse to enable fast analytics.

1. Add a Lakehouse, sized to match your expected daily ingest volume.
2. When the Lakehouse is provisioned, assign your Lake Dataset to the Lakehouse.

Analyze Relevant Data

In Cribl Search, define queries to extract relevant data from your logs. Here is a sample query to retrieve and present rejected connections by source address:

```
dataset="<your_lakehouse_dataset>"
| action="REJECT"
| summarize by srcaddr
```

Copy

You can schedule your searches to run on defined intervals. Once a query is scheduled, you can configure corresponding alerts (Search Notifications) to trigger on custom conditions that you define.

Here is a sample query you could schedule to generate an hourly report that tracks traffic by source and destination:

```
dataset ="<your_lakehouse_dataset>" srcaddr="*" dstaddr="*"
| summarize count() by srcaddr, dstaddr
| sort by count desc
```

Copy

If you're moving high-volume log analysis from a traditional SIEM to Cribl, you might need to adapt existing queries to the KQL language that Cribl Search uses. See our Build a Search overview and our Common Query Examples.

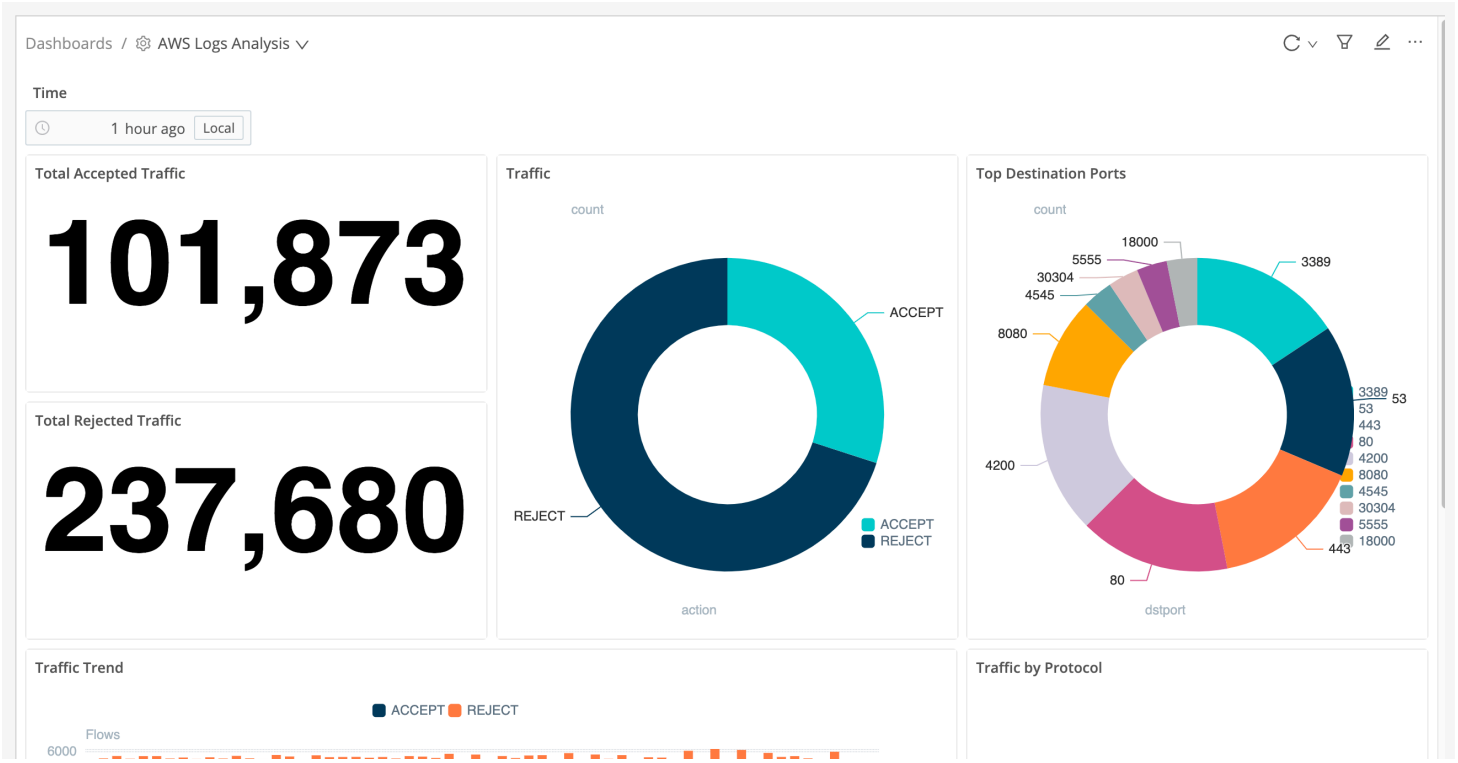
You can also Write Queries Using Cribl Copilot, enabling Cribl AI to suggest KQL queries from your natural-language prompts. If you already have searches in another system of analysis, try asking Copilot to translate them to KQL.

The `cribl_search_sample` Dataset, built into Cribl Search, contains VPC Flow Logs events. You can use this Dataset to experiment with queries before you enable continuous data flow and analysis.

Visualize Your Analyzed Data

In Cribl Search, you can build flexible Dashboards to visualize your analytics.

As a starting point for displaying analytics on many log types, you can import the Cribl Search AWS VPC Flow Logs Pack. It contains a sample **AWS VPC Flow Logs Analysis** Dashboard that displays traffic volume, traffic accepted and rejected (both time-series and cumulative), traffic by protocol, and top destination ports.


Dashboards / AWS Logs Analysis
Time
1 hour ago
Local
Total Accepted Traffic
101,873
Total Rejected Traffic
237,680
Traffic
count
ACCEPT
REJECT
ACCEPT
REJECT
action
Top Destination Ports
count
18000
5555
30304
4545
8080
4200
3389
53
443
80
dstport
Traffic Trend
ACCEPT
REJECT
Flows
6000
Traffic by Protocol

5. Cribl Lake Collector

Send your data from Cribl Lake to Cribl Stream, using the **Cribl Lake Collector**.

Requirements for Cribl Lake Collector

Cribl Lake Collector can gather data from both Cribl-managed Cloud and customer-managed hybrid Stream Worker Groups. Hybrid Worker Groups must be running version 4.8 or higher.

Configure a Cribl Lake Collector

1. On the top bar, select **Products**, and then select **Stream**.
2. Under **Worker Groups**, select a Worker Group.
3. On the **Worker Groups** submenu, select **Data**, then **Sources**.
4. In the **Sources** tiles, under **Collectors**, select **Cribl Lake**.
5. Select **Add Collector** to open the **New Collector** modal
6. In the Collector modal, configure the following under **Collector Settings**:
    - **Collector ID**: Unique ID for this Collector. For example: `myLakeCollector`.
    - **Lake dataset**: Lake Dataset to collect data from.
    - **Tags**: Optionally, add tags that you can use to filter and group Sources in Cribl Stream's **Manage Sources** page. These tags aren't added to processed events. Use a tab or hard return between (arbitrary) tag names.
7. Optionally, configure any Result and Advanced settings outlined in the below sections.
8. Select **Save**, then **Commit & Deploy**.

You can't use QuickConnect to configure Cribl Lake Collector Sources.

Result Settings

The Result Settings determine how Cribl Stream transforms and routes the collected data.

Event Breakers

In this section, you can apply event breaking rules to convert data streams to discrete events.

Event Breaker rulesets: A list of event breaking rulesets that will be applied, in order, to the input data stream. Defaults to `System Default Rule`.

Event Breaker buffer timeout: How long (in milliseconds) the Event Breaker will wait for new data to be sent to a specific channel, before flushing out the data stream, as-is, to the Routes. Minimum `10` ms, default `10000` (10 sec), maximum `43200000` (12 hours).

Fields

In this section, you can add Fields to each event, using Eval-like functionality.

Name: Field name.

Value: JavaScript expression to compute the field's value (can be a constant).

Result Routing

Send to Routes: Toggle on (default) if you want Cribl Stream to send events to normal routing and event processing. Toggle off to select a specific Pipeline/Destination combination. Toggling off exposes these two additional fields:

- **Pipeline**: Select a Pipeline to process results.
- **Destination**: Select a Destination to receive results.

Toggling on (default) exposes this field:

- **Pre-processing Pipeline**: Pipeline to process results before sending to Routes. Optional.

This field is always exposed:

- **Throttling**: Rate (in bytes per second) to throttle while writing to an output. Also takes values with multiple-byte units, such as `KB`, `MB`, or `GB`. (Example: `42 MB`.) Default value of `0` indicates no throttling.

You might toggle **Send to Routes** off when configuring a Collector that will connect data from a specific Source to a specific Pipeline and Destination. This keeps the Collector's configuration self-contained and separate from Cribl Stream's routing table for live data - potentially simplifying the Routes structure.

Advanced Settings

Advanced Settings enable you to customize post-processing and administrative options.

Environment: If you're using GitOps, optionally use this field to specify a single Git branch on which to enable this configuration. If empty, the config will be enabled everywhere.

Time to live: How long to keep the job's artifacts on disk after job completion. This also affects how long a job is listed in **Job Inspector**. Defaults to `4h`.

Remove Discover fields: List of fields to remove from the Discover results. This is useful when discovery returns sensitive fields that should not be exposed in the Jobs user interface. You can specify wildcards (such as `aws*`).

Resume job on boot: Toggle on to resume ad hoc collection jobs if Cribl Stream restarts during the jobs' execution.

Verify Data Flow

To verify that the Collector actually collects data, you can start a single run in the Preview mode.

1. Select your Collector's **Run** action.
2. Make sure mode **Preview** is selected and accept other default settings.
3. Confirm with **Run**.
4. Look at the preview screen to check that data is being collected from Cribl Lake.

6. Cribl Lake Destination

Send your data from Cribl Stream to Cribl Lake, using the **Cribl Lake Destination**.

The **Cribl Lake** Destination is a Cribl Stream feature that optimizes data management for two other Cribl products: It delivers data to Cribl Lake, and automatically selects a partitioning scheme that works well with Cribl Search.

Type: Non-Streaming | TLS Support: Yes | PQ Support: No

Requirements for Cribl Lake Destination

The Cribl Lake Destination can receive data from both Cribl-managed Cloud and customer-managed hybrid Stream Worker Groups. Hybrid Worker Groups must be running Cribl Stream version 4.8 or later.

On hosts for hybrid Worker Groups, this Destination requires outbound HTTP/S access to port 443. This Destination does not allow selecting a different port. For details, see Troubleshoot Hybrid Access to Cribl Lake.

Prepare Data for Use with Lakehouse

Storing data in regular Lake Datasets does not require setting a schema. However, if you want to make full use of the Lakehouse functionality, you need to make sure that events sent from Cribl Stream are parsed into distinct fields before sending to Cribl Lake/Lakehouse.

To do this, use the Stream Parser Function to ensure that all events have named fields.

Configure a Cribl Lake Destination

1. On the top bar, select **Products**, and then select **Stream**.
2. Under **Worker Groups**, select a Worker Group. Next, you have two options.

   To configure via the graphical QuickConnect UI:

   - On the **Worker Groups** submenu, select **Routing**, then **QuickConnect**.
   - Select **Add Destination** at right.
   - Hover over **Cribl Lake** from the list of tiles.

- Select **Add New** to open a **New Destination** modal.

Or, to configure via the Routing UI:

- On the **Worker Groups** submenu, select **Data**, then **Destinations**.
- In the **Destinations** tiles, select **Cribl Lake**.
- Select **Add Destination** to open a **New Destination** modal.

3. In the Destination modal, configure the following under **General Settings**:
   - **Output ID**: Enter a unique name to identify this Cribl Lake Destination.
   - **Lake dataset**: Select a Lake Dataset to send data to.

     You can't target the built-in `cribl_logs` and `cribl_metrics` Lake Datasets with this Destination.
4. Next, you can configure the following **Optional Settings** that you'll find across many Cribl Destinations:
   - **Backpressure behavior**: Whether to block or drop events when all receivers are exerting backpressure. (Causes might include an accumulation of too many files needing to be closed.) Defaults to `Block`.
   - **Tags**: Optionally, add tags that you can use to filter and group Destinations in Cribl Stream's **Manage Destinations** page. These tags aren't added to processed events. Use a tab or hard return between (arbitrary) tag names.
5. Optionally, configure any Post-Processing settings outlined in the below sections.
6. Select **Save**, then **Commit & Deploy**.
7. Verify that data is searchable in Cribl Lake.

Processing Settings

Post-Processing

Pipeline: Pipeline or Pack to process data before sending the data out using this output.

System fields: A list of fields to automatically add to events that use this output. By default, includes `cribl_pipe` (identifying the Cribl Stream Pipeline that processed the event). Supports `c*` wildcards. Other options include:

- `cribl_host` - Cribl Stream Node that processed the event.
- `cribl_input` - Cribl Stream Source that processed the event.
- `cribl_output` - Cribl Stream Destination that processed the event.

- `cribl_route` - Cribl Stream Route (or QuickConnect) that processed the event.
- `cribl_wp` - Cribl Stream Worker Process that processed the event.

How Cribl Stream Handles the `_time` Field

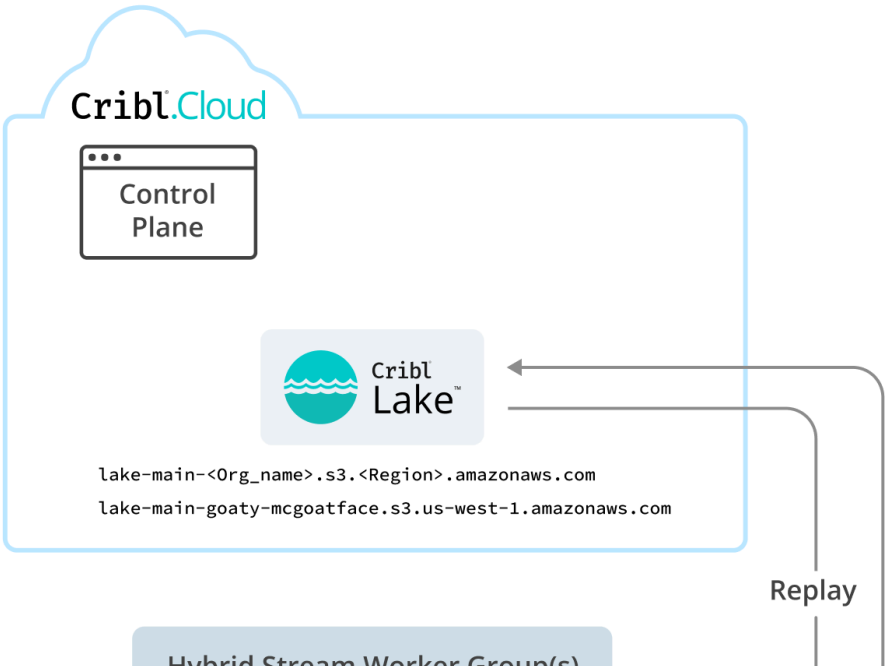
The Cribl Lake Destination requires `_time` to be a number and not `null`. If an incoming `_time` value is `null` or a string, this Destination will convert the value to `Date.now() / 1000`. This creates a time-based partitioning scheme that is readily searchable.

Troubleshooting Cribl Lake Hybrid Access

When running the Cribl Lake Destination on hybrid Worker Groups, you might receive SSL errors, or errors about being unable to connect to a host. This indicates that these Groups have restricted access to the internet through a firewall or proxy that performs SSL inspection. To reach the Cribl.Cloud Organization that hosts your Cribl Lake instance, you can remedy this as follows:

1. At the lower left of your Cribl.Cloud Organization, select **Organization Details**.
2. In the resulting fly-out, note the **Organization ID** and (AWS) **Region**.
3. Swap those two strings for the two placeholders in this fully qualified domain (FDQN) format: `lake-main-<organizationId>.s3.<region>.amazonaws.com`.

   With a fictional **Organization ID**, your FQDN might be: `lake-main-goaty-mcgoatface.s3.us-west-1.amazonaws.com`.
4. Provide the resulting FQDN to your Security team, asking them to add a corresponding exception on the firewall or proxy.
5. Verify that outbound port 443 is open for HTTP/S - this is required to access the FQDN.
6. Test the Cribl Lake Destination: Ensure that the target URL resolves, and that Cribl Stream can successfully send data to the corresponding Lake Dataset.


Cribl.Cloud
Control Plane
Cribl Lake
lake-main-<Org_name>.s3.<Region>.amazonaws.com
lake-main-goaty-mcgoatface.s3.us-west-1.amazonaws.com
Replay

7. Cribl Lake Direct Access

Ship your data straight into Cribl Lake, bypassing Cribl Stream.

You can use Direct Access options to archive certain data directly to Cribl Lake. Here, you bypass routing inbound data through Cribl Stream. Once your data is integrated with Cribl Lake, Cribl Stream and Cribl Search can access it as a Lake Dataset.

We provide the following Direct Access options for different data sources:

- Direct Access (HTTP): Use this option to ingest data over HTTP from a wide variety of senders. Examples include FluentBit, Logstash, Vector, and the OpenTelemetry Collector. You will find specific configuration settings for Elasticsearch Bulk API and Splunk HEC senders.
- Splunk Cloud Self Storage: Use this option to ingest data from Splunk Cloud DDSS (Dynamic Data Self Storage) indexes.

You can configure one Direct Access Source of each type per Workspace.

7.1. Direct Access (HTTP)

Ship your data straight into Cribl Lake, bypassing Cribl Stream.

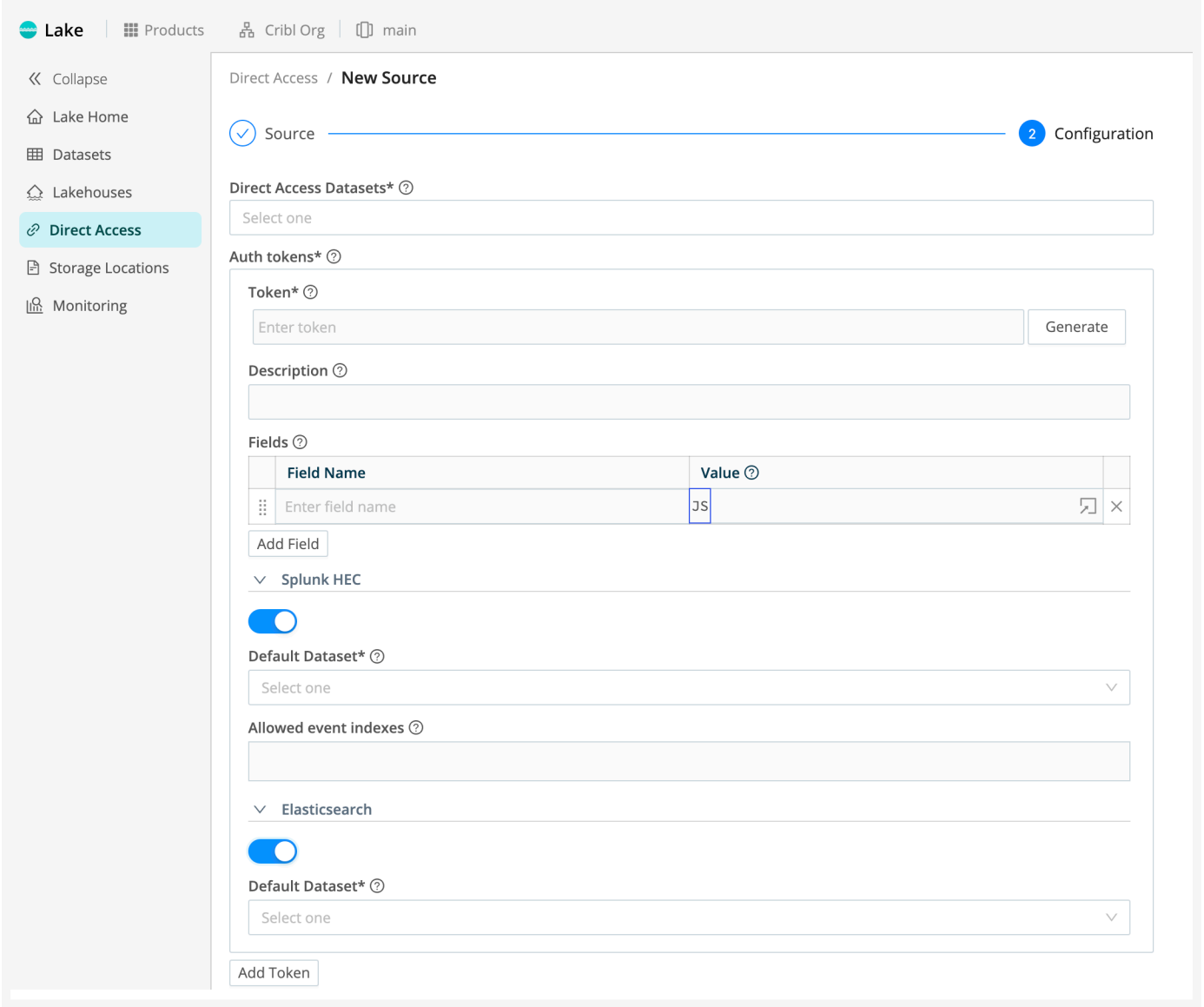
You can use the Direct Access (HTTP) option to archive data directly to Cribl Lake over HTTP from a wide variety of senders. Examples include FluentBit, Logstash, Vector, and the OpenTelemetry Collector. You will find specific configuration settings for Elasticsearch Bulk API and Splunk HEC senders.

This option bypasses routing or processing through Cribl Stream. Once your data is integrated with Cribl Lake, Cribl Stream and Cribl Search can access it as a Lake Dataset.

Create a Direct Access (HTTP) Source

You can configure one Direct Access (HTTP) Source per Workspace. (See other Limitations later in this topic.)

1. From the Cribl Lake sidebar, select **Direct Access**.
2. From the resulting **Direct Access** > **New Source** page, select **HTTP** and **Next**.
3. On the resulting **Configuration** page, you can select up to 10 **Direct Access Datasets**. (After you save this selection here, each targeted Dataset configuration will indicate **HTTP Ingestion Enabled**. For details, see Manage Lake Datasets.)



Direct Access (HTTP): all configuration options

4. In the **Auth tokens** section, you must configure at least one token, but you can add multiple tokens to authorize ingest from multiple senders. For configuration details, see Configure Auth Tokens.

   Each auth token supports an optional **Fields** section, where you can select **Add Field** to tag events with key-value pairs that identify or match this token and sender. You will also see specific options for Splunk HEC and Elasticsearch Bulk API senders.

5. Once you've configured auth tokens, select **Save**.

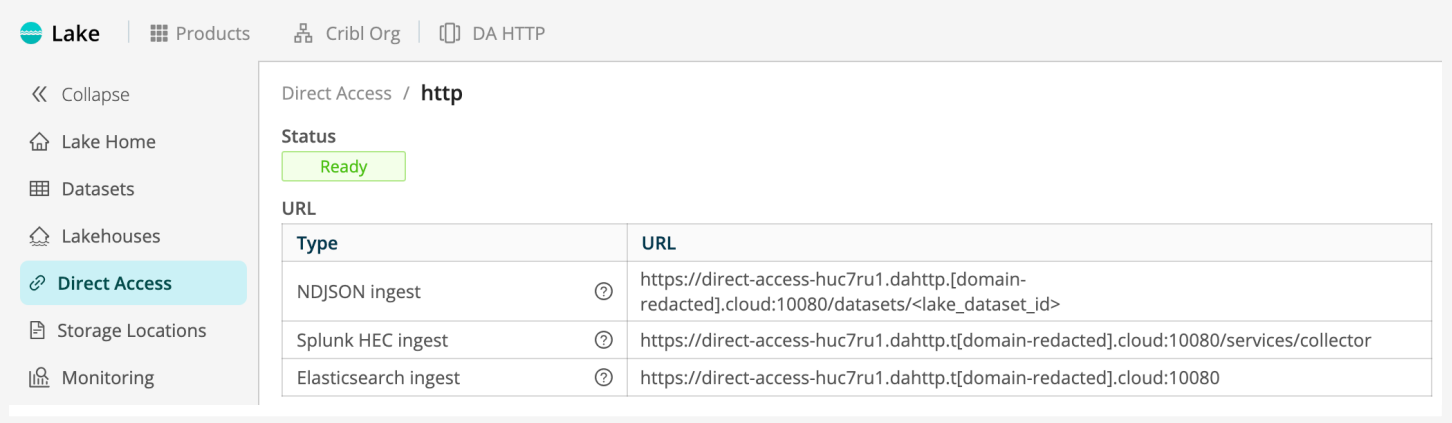
Provisioning and Ready States

For the first few minutes after you save Direct Access (HTTP) Source, you will see a badge showing that the Source is in a `Provisioning` state. In this state, it is setting up infrastructure and deploying onfigurations. You can't use the Source to ingest data until it shows a `Ready` badge.

Once the Source moves to `Ready`, it is available to ingest data and store it in Lake Datasets.

Examine HTTP Ingest Endpoints

After the Source indicates `Ready`, select it to open its config. Here, the **URL** table shows you the Cribl Lake ingest endpoints that will accept data in NDJSON, Splunk HEC, and Elasticsearch Bulk API formats. As outlined in the following section, you complete each URL by replacing the `<lake_dataset_id>` placeholder with the **ID** of each target Dataset.



Direct Access (HTTP) Source ready to ingest data, with ingest endpoints displayed

Send Data to Lake over HTTP

To ingest data, send a POST request to the endpoint provided in the **URL** of the Direct Access (HTTP) Source. Append the Lake Dataset **ID** to which the data should be sent. You must provide the auth token in the request header, in the format: `Authorization: <my_token>`. Here is an example:

```
curl --location "https://direct-access-huc7ru1.dev.trusting-carver-psu2edw.cribl-stag
--header "Content-Type: application/json" \
--header "Authorization: ••••••" \
--data '{"id": 974027, "name": "jnTdxFQXxd", "value": 0.1772688577715229, "timestamp'
```

Copy

Send Data to Lake with Vector

Vector is one agent that is compatible with Direct Access. To send data to a Cribl Lake Dataset with Vector:

1. In Cribl Lake, from your Direct Access (HTTP) Source page: Copy the **Ingest URL**, appending the **ID** of your target Dataset.
2. In Vector, configure an HTTP sink to the resulting endpoint.
3. As shown in the sample YAML below, your request headers must provide the auth token, in the format: `Authorization: <token>`.

```
cribl_lake_http:
    type: http
    inputs: ["<vector_sink_or_transform"]
    request:
      headers:
        authorization: "<token>"
    encoding:
      codec: "json"
      json:
        pretty: true
    uri: https://direct-access-huc7ru1.<tenant_id>.cribl.cloud:10080/datasets/<datase
```

Copy

Configure Auth Tokens

Here, you define the authentication token required to access each corresponding sender's inbound data. Ensure that the token is valid and has the necessary permissions for data retrieval. Select **Add Token** to define more tokens. For each token, you can configure the following settings, with specific options available for Splunk HEC and Elasticsearch senders.

Token: Enter your token here. You also have the option to **Generate** a new token.

Description: Optionally, enter a summary of this token's purpose. Recommended, because the description becomes a friendly display name for each token.

Fields: Fields to add to events referencing this token. Each field is a **Name**/**Value** pair.

Fields that you specify here will normally override fields of the same name in events. However, you can specify that event fields' values should prevail.

In particular, where inbound events have no `index` field, this Source adds one with the literal value `default`. You can override this value by using **Add Field** to specify an `index` field, and then setting its **Value** to an expression of the following form: `index == 'default' ? 'myIndex' : index`

Splunk HEC Token Options

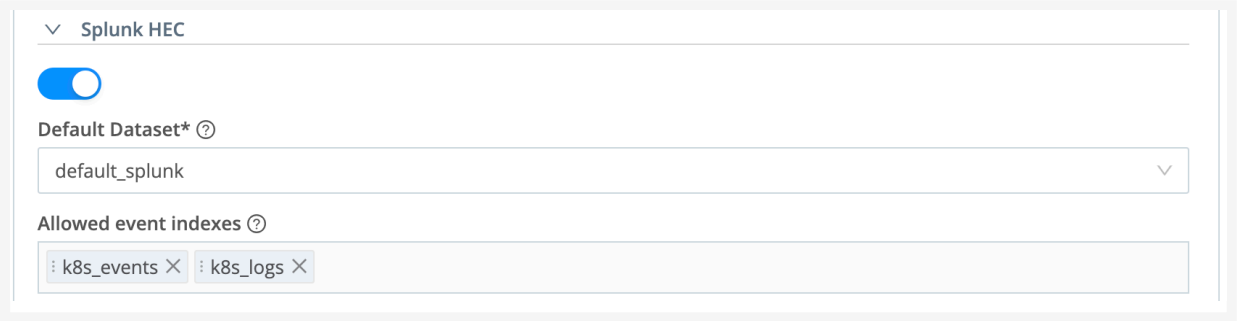
The Direct Access (HTTP) Source will inspect each Splunk HEC event, looking for a field named `index` that is sent by a Splunk Heavy Forwarder. Ideally,the `index` field's value should match an identically named Cribl Lake Dataset.

If Direct Access finds no `index`, or if the `index` value does not match a Cribl Lake Dataset, it will store the data in the Dataset that you select in the **Default Dataset** drop-down.

Allowed Event Indexes

In this optional field, you can specify which Splunk HEC event indexes are permissible for events ingested using this token. (Cribl Lake will reject requests whose indexes don't match strings or patterns here.) Leave empty to accept all events. You can enter multiple index values, and you can use wildcards (`*`) for pattern matching.

Events lacking any `index` field will still be ingested into the `hec_syslog_da` fallback Dataset.

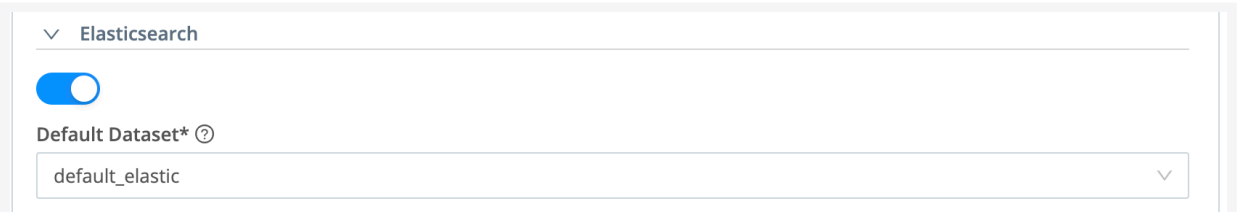


Splunk HEC configuration options

Elasticsearch Token Options

For data sent via the ElasticSearch Bulk API, the Direct Access (HTTP) Source will inspect each event, looking for a field named `index` that is sent by a compatible agent. Ideally,the `index` field's value should match an identically named Cribl Lake Dataset.

If Direct Access finds no `index`, or if the `index` value does not match a Cribl Lake Dataset, it will store the data in the Dataset that you select in the **Default Dataset** drop-down.



7.2. Splunk Cloud Self Storage (DDSS) Direct Access

Bring your Splunk data straight into Cribl Lake, bypassing Cribl Stream processing.

You can use the Splunk Cloud Self Storage option to archive one or more Splunk Cloud indexes directly to Cribl Lake. This option bypasses routing or processing it through Cribl Stream. Once your data is integrated with Cribl Lake, Cribl Stream and Cribl Search can access it as a Lake Dataset.

Requirements for Splunk Cloud Direct Access

To set up this integration, you need a Splunk index (new or existing).

You can configure one Splunk Cloud Direct Access Source per Workspace.

See other Limitations later in this topic.

Configure Splunk Cloud Direct Access

To configure this integration, you'll work back and forth between Splunk Cloud and Cribl Lake to share linking identifiers. The major steps are:

1. In Splunk Cloud, get your Splunk Cloud ID.
2. In Cribl Lake, create a Cribl Lake Source.
3. In Splunk Cloud, connect your Cribl Lake bucket.
4. In Cribl Lake, provision your Lake.
5. In Splunk Cloud, test and submit the connection.
6. In Cribl Lake, create a Cribl Lake Dataset.

Get Your Splunk Cloud ID

Locate and copy your **Splunk Cloud ID** (the first part of your Splunk Cloud URL).

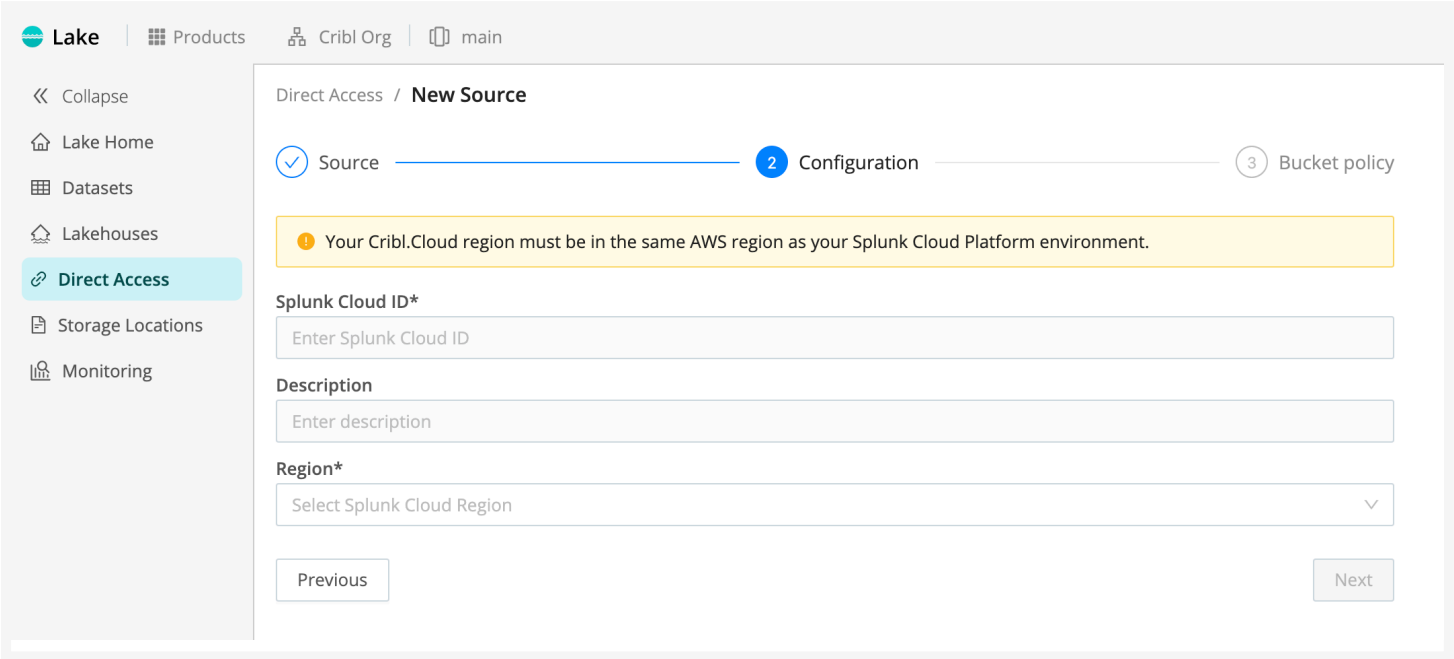
For more information on finding the ID, or creating a new Splunk index, see the Splunk Cloud docs.

Create Cribl Lake Source

In Cribl Lake, create the integration with your Splunk Cloud instance:

1. From the sidebar, select **Direct Access**.
2. Select the **Splunk Cloud Self Storage** Source, and select **Next**.

3. In the **Splunk Cloud ID** field, paste your ID that you copied from Splunk Cloud in the previous section.
4. Optionally, enter a **Description** of this Lake integration's purpose.
5. From the **Region** drop-down, select the AWS Region of your Splunk Cloud Platform.
6. Select **Next**.
7. Copy the Cribl Lake bucket name to your clipboard for the next section.



Configuring Cribl Lake matching storage location

Connect Splunk Cloud to Your Cribl Lake Storage Location

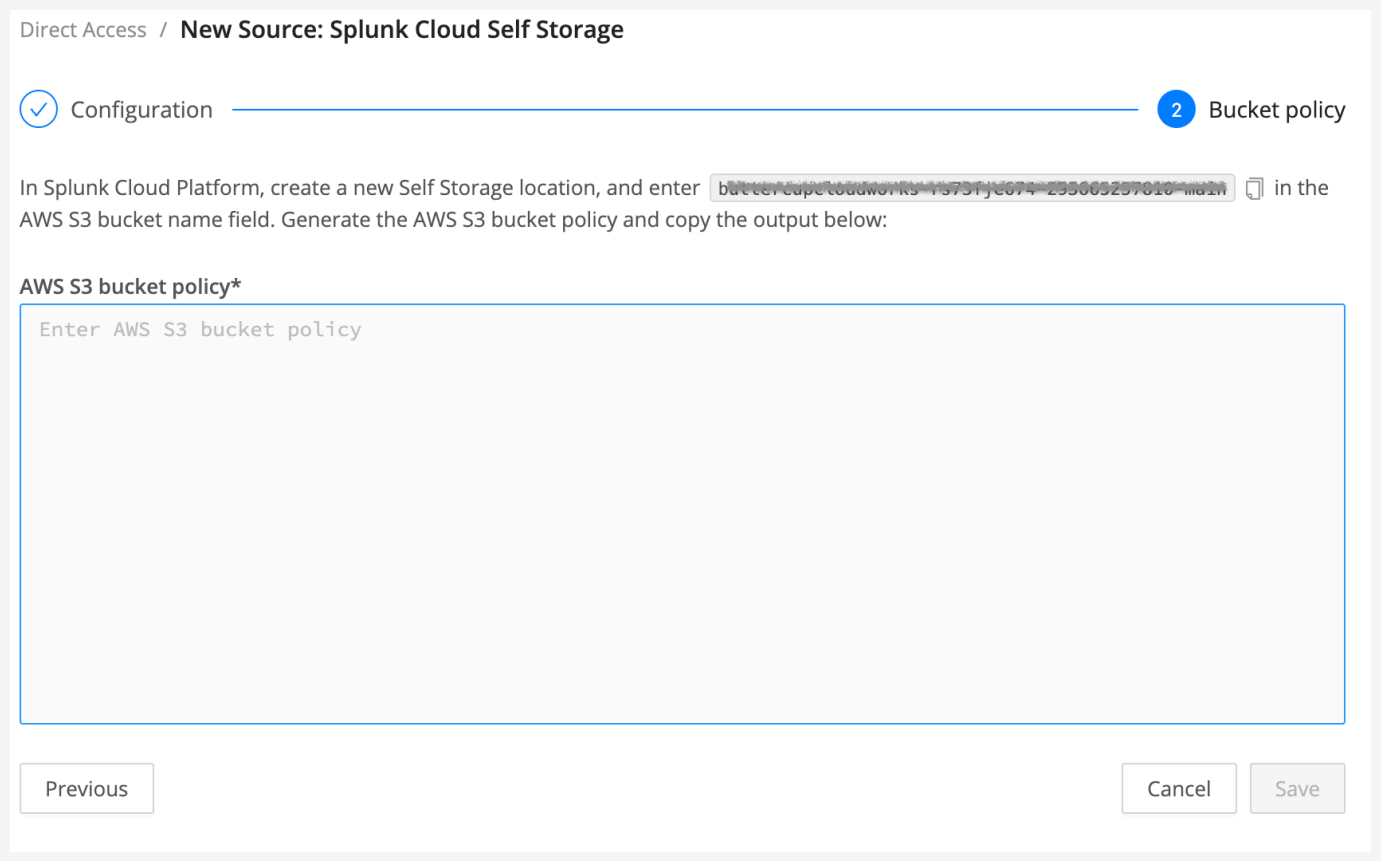
Next, return to your Splunk Cloud Platform, to point this environment to the Storage Location you've created in Cribl Lake:

1. In the **Amazon S3 bucket name** field, paste Cribl Lake bucket name you copied in the previous section.
2. Select **Generate** to generate a bucket policy.
3. Copy the resulting bucket policy to your clipboard for the next section.

Provision Your Lake

Return to Cribl Lake to link your bucket policy and provision the new Lake:

1. In the **AWS S3 bucket policy** pane, paste the Splunk Cloud bucket policy you copied in the previous section.
2. Select **Save**.
3. Wait a few minutes for your new Lake to be provisioned.



Cribl Lake modal for bucket name and policy

Test and Submit the Connection

After provisioning is complete in Cribl Lake, test the connection from Splunk Cloud:

1. In the **Self Storage Locations** dialog, select **Test**.

   Splunk Cloud will write a 0 KB test file to verify that Splunk Cloud Platform has permissions to write to Cribl Lake.

1. If you see a success message, select **Submit** to finish linking your Self Storage location to Cribl Lake.
2. If the test fails, see Troubleshooting Direct Access.

Create Cribl Lake Dataset

Once you've verified the connection from Splunk Cloud, your final setup step is to create a Lake Dataset to contain your data. Follow the steps in Create a New Lake Dataset, being careful to add these specific requirements to handle DDSS data:

- Give the Dataset an **ID** that exactly matches your Splunk index name from Set Up Splunk Self Storage Location. (Otherwise, you will be unable to search or replay your data.)
- Set the **Storage Location** to the default `Cribl Lake`, or make no selection on this drop-down.
- Set the **Data format** to `DDSS`.

Save your new Dataset, and your Splunk data should begin flowing into it. That's it!

Breaking a Direct Access Connection

After you link Splunk and Cribl resources, their interdependence means that deleting resources on either side has the following consequences:

- In Cribl Lake, deleting a Splunk Cloud Self Storage Source means that you will lose all your Splunk data archived here. Also, Splunk Cloud will no longer be able to write to Cribl Lake through this integration. However, this deletion will not affect your data flow and storage within Splunk Cloud.
- In Splunk Cloud, deleting a Self Storage location that's linked to a Cribl Lake Dataset means that Splunk Cloud will no longer archive data to Cribl Lake. However, this deletion will not affect your data already stored within Cribl Lake.
- However, if you cancel your Splunk Cloud **account**, your Splunk Cloud Self Storage Source in Cribl Lake can still remain intact. This will allow Cribl Stream (Collector) and Cribl Search (queries) to continue reading your Dataset's current contents. However, no new data can be written to the Dataset.

Limitations of Splunk Cloud Direct Access

A Lake Dataset created and populated via Splunk Cloud Direct Access is read-only to other Cribl products. So, although both Cribl Stream and Cribl Search can process data from the Dataset, neither product can write to it.

A Lake Dataset populated via Direct Access must use the default `Cribl Lake` Storage Location, not an external bucket.

A Lake Dataset created via Splunk Cloud Direct Access can't be assigned to a Lakehouse.

Troubleshooting Direct Access

If Splunk Cloud fails to write the test file to your Lake Dataset, look for the following possible sources of error. Correcting each of these requires re-creating your integration from scratch:

- Regions mismatched between Splunk Cloud and Cribl.Cloud.
- Bucket name does not start with the Splunk Cloud ID.
- Amazon S3 bucket policy not pasted in accurately.

8. Storage Locations (Bring Your Own Storage)

Create Datasets on storage that you directly own, achieving compliance while taking advantage of streamlined management in Cribl Lake.

You can set an Amazon S3 bucket as the Storage Location for a Cribl Lake Dataset. This enables you to maintain direct ownership of your data for regional or other compliance purposes, while taking advantage of Cribl's streamlined provisioning, retention policies, access control, and analytics.

You'll also see this option referred to as "bring your own storage (BYOS)." Storage Locations are available on an Enterprise plan - for details, see Cribl Pricing. See also Limitations on Storage Locations.

Buckets that you create through the Cribl Lake UI use the Amazon S3 Standard storage class. Using any S3 bucket with a Cribl Lake Storage Location will incur AWS charges in addition to Cribl Lake credits.

Configure a Storage Location

If you follow the recommended path in this section, Cribl Lake will simplify creating a **new** bucket on Amazon S3. After you configure initial settings in the Lake UI, Cribl will provide a ready-made CloudFormation template that you can download, then launch in the AWS CloudFormation console to create your infrastructure-as-code.

If you prefer to configure the bucket yourself on S3, see Setting Up a Dedicated Bucket Outside Cribl Lake.

Each Storage Location maps to one bucket. So you'll repeat this section's configuration steps for each external bucket you want to create.

Configure Initial Settings

To get started, from the Cribl Lake sidebar, select **Storage Locations**. Then, on the resulting **New Storage Location** > **Settings** page:

1. Enter a **Storage Location** name. This is arbitrary, and should be unique in your Cribl Lake instance.
2. Optionally, enter a **Description** that helps other users understand the purpose of this Storage Location.
3. Select a supported AWS **Region** in which to create the bucket.
4. Enter a **Bucket Name**.

   The **Bucket Name** is arbitrary, but must be unique on AWS. Cribl recommends giving your buckets a distinctive identifier. (For detailed naming recommendations, see General Purpose Bucket Naming Rules

from AWS.)

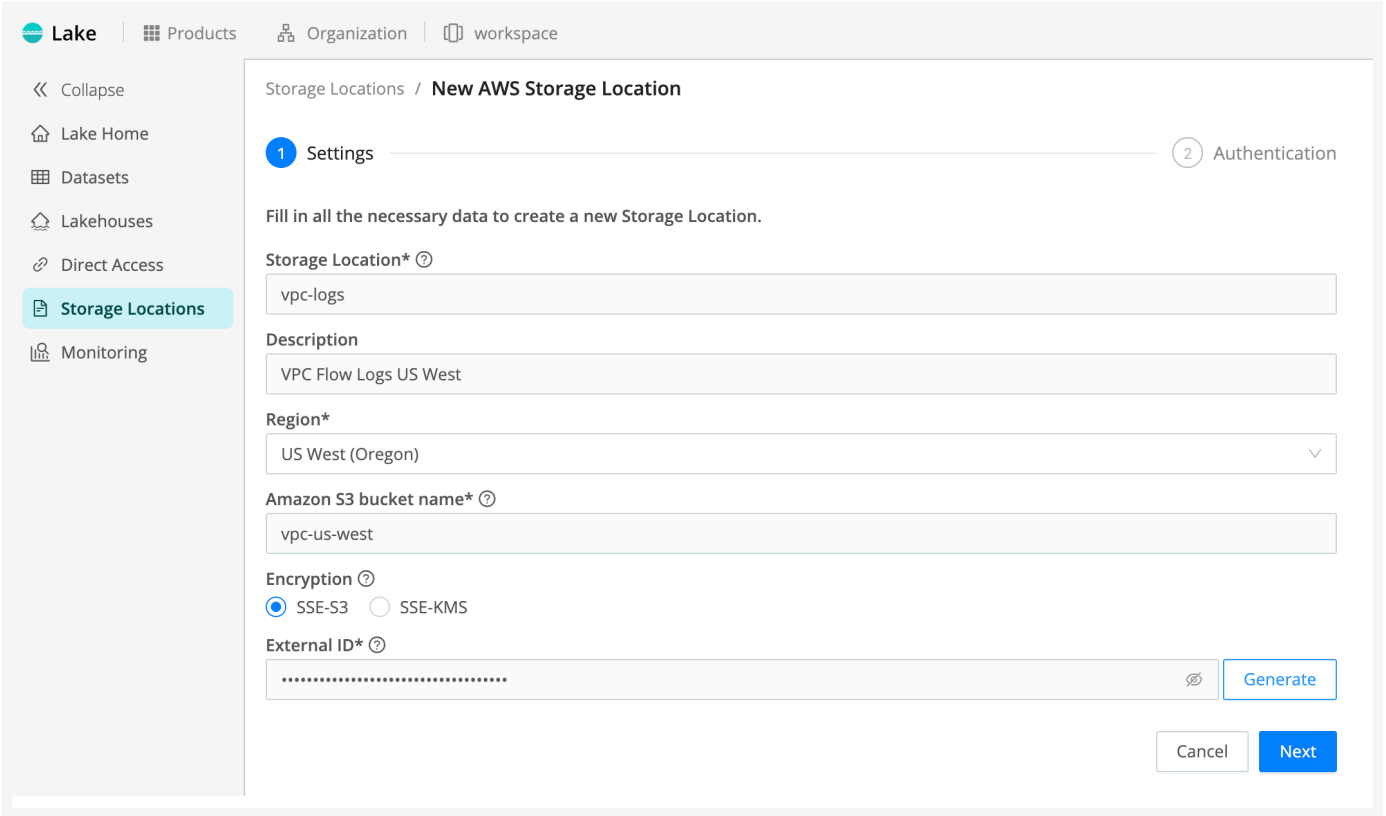
5. Optionally, customize the **Encryption** method on your bucket.

   This defaults to `SSE-S3` for Amazon S3-managed keys, but you can instead select `SSE-KMS` for the AWS Key Management Service (KMS). The `SSE-KMS` option offers enhanced lifecycle control (key rotation and revocation), auditability, and IAM policy customization - all of which require access through AWS interfaces. (For details, see Using Server-Side Encryption with AWS KMS Seys (SSE-KMS) from AWS.)

6. Generate or enter an **External ID**.

   The **External ID** is arbitrary, with no uniqueness requirement. However, to provide an extra layer of security, Cribl recommends using a random UUID here. You can use the **Generate** button for this purpose. (For details about external IDs, see How to Use External ID When Granting Access to Your AWS Resources from AWS.)

7. Click **Next** to proceed to the **Authentication** page.



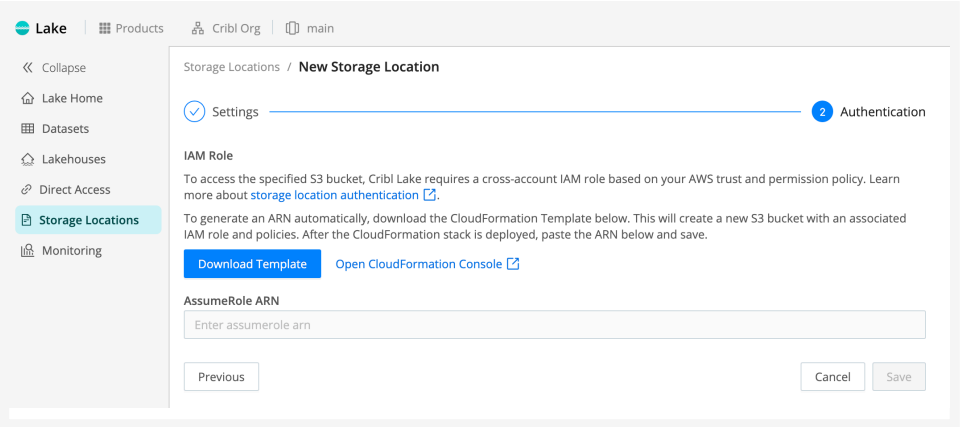
New Storage Location > Authentication page

Configure Authentication and Infrastructure

From the **New Storage Location** > **Authentication** page in Cribl Lake, you create your Amazon S3 infrastructure, and you then authenticate Cribl Lake on this infra.

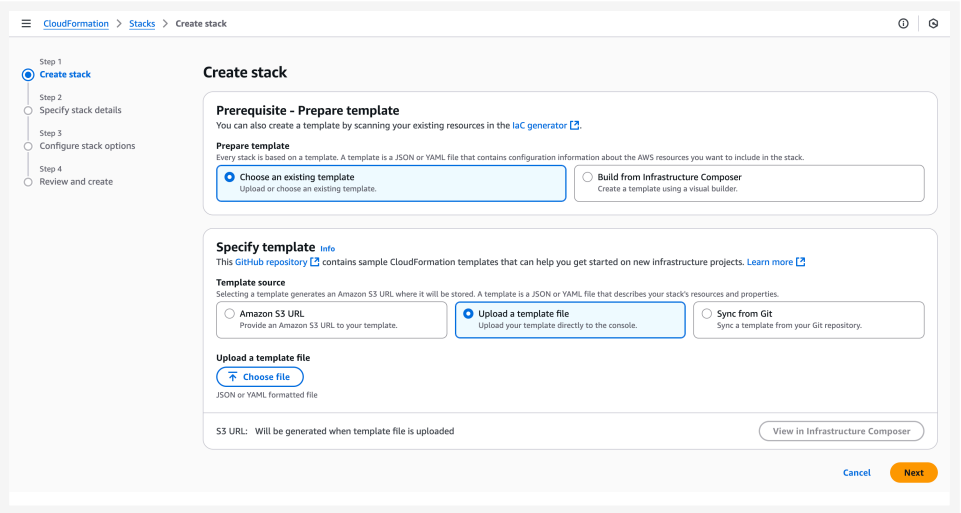
For details about required AWS permissions, see Authentication.

1. Select **Download Template** and save the resulting CloudFormation template locally.
2. Select **Open CloudFormation Console**.



Screenshot of Authentication page, the second step in configuring a new Storage Location in Cribl Lake.

3. On the resulting AWS CloudFormation **Stacks** > **Create stack** page, select **Upload a template file**, then **Choose file**.

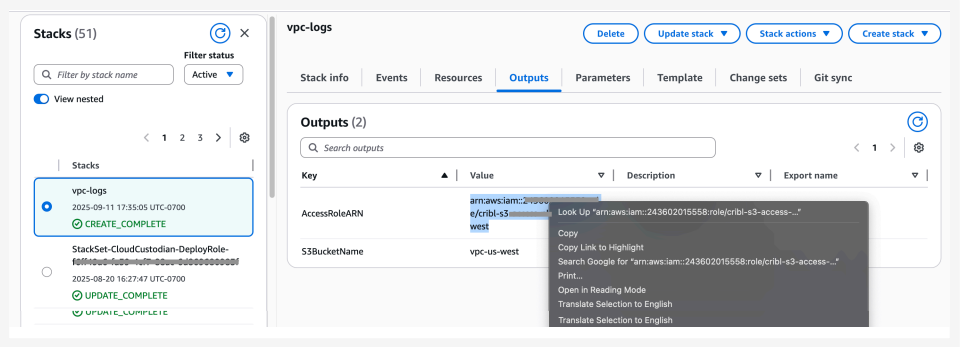


Screenshot of AWS CloudFormation “Create stack” page, showing selected radio button to upload template from Cribl Lake.

4. Upload the template you saved, then select **Next**.
5. In the resulting CloudFormation **Configure stack options** sequence, accept defaults, or adjust them to match your AWS practices. Then select **Next**.
6. On the **Specify stack details** page, assign your stack an arbitrary name. Then complete the **Configure stack options** sequence, accepting defaults and acknowledgments as appropriate.
7. On the **Review and create** page, select **Submit**.

   On the CloudFormation **Stacks** page, you will now see your new bucket progress from `CREATE_IN_PROGRESS` status to `CREATE_COMPLETE`.

8. Select the **Outputs** tab, and copy your new bucket's **AccessRoleARN** value to the clipboard.



Screenshot of newly created AWS stack's Outputs tab, showing how to copy the bucket's AccessRole ARN value.

9. Back on the Cribl Lake **Authentication** page, paste this ARN into the **AssumeRole ARN** field.
10. Select **Save** to link your Cribl Lake Storage Location with your S3 bucket.

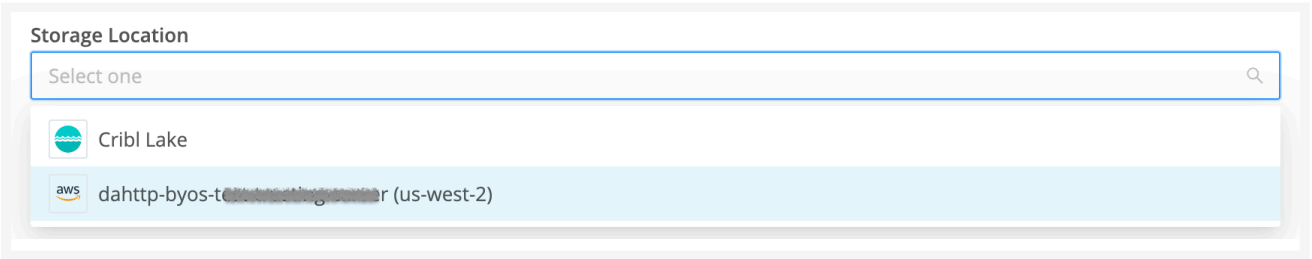
    Your new Storage Location will appear on the left side of the Lake **Storage Locations** page.

Connect Datasets to Storage Locations

You can link multiple **Connected Datasets** per Storage Location.

Follow the procedure in Manage Lake Datasets to create a new Dataset, or to edit an existing Dataset. On the Dataset configuration page, select a configured **Storage Location** from the drop-down. Then save or resave the Dataset.

If you don't make a selection on this drop-down, the Dataset will use the internal `Cribl Lake` default location.



Connecting a Dataset to a Storage Location

The Dataset will now use the selected (or default) Storage Location to store its data. On the **Storage Location** page, this Dataset will appear in the right column of **Connected Datasets**.

As with other Datasets, you can write to this Dataset from Cribl Stream with the Cribl Lake Destination. And you can access the Dataset contents from Cribl Search and Stream (subject to some Limitations).

The Retention period that you set in the Cribl Lake Dataset configuration will automatically be reflected in the Amazon S3 Console's **Management** tab. After you've connected a Dataset to an external S3 bucket, do not change the retention period directly in the S3 Console.

Detach a Storage Location Connection

If you choose to detach a Storage Location, all associated Datasets will also be removed from Cribl Lake. However, your data will not be deleted from S3.

A **Detach** button is available on each Storage Location configuration page. If you select it, it will open a confirmation modal. Here, if you've already revoked Cribl Lake permissions on the S3 bucket, you can select the option labeled **Proceed with detach operation despite permission errors**.

Supported Regions

Each Storage Locations can map to an S3 bucket in one of the following AWS Regions:

- US East (Virginia)
- US East (Ohio)
- US West (Oregon)
- Canada (Central)
- Europe (Frankfurt)
- Europe (London)
- Europe (Zurich)
- Asia Pacific (Singapore)
- Asia Pacific (Sydney)

FedRAMP-Supported Regions

In Cribl.Cloud Gov (FedRAMP Moderate), Cribl Lake storage locations that use Amazon S3 support the following AWS regions:

- `us-east-1` – US East (N. Virginia)
- `us-east-2` – US East (Ohio)
- `us-west-2` – US West (Oregon)

Cribl.Cloud Government currently does not support AWS GovCloud regions (such as `us-gov-west-1`,

`us-gov-east-1`) for BYOS storage locations.

API Support for Storage Locations

For automation and scripting, Members with appropriate Permissions can use Cribl `storageLocations` REST API endpoints. However, in this case, Cribl does not generate a CloudFormation template. So you will need to explicitly create corresponding S3 buckets and IAM roles with appropriate trust policy and permissions. (See Authentication for required permissions.)

Create a Storage Location via API

Here is an example request to create a Storage Location:

```
POST /products/lake/lakes/{lakeId}/storage-locations
```

Copy

Your request body should include the Storage Location details. Here's an example:

```
{
  "id": "byosLocation",
  "provider": "aws-s3",
  "credentials": {
    "method": "auto",
    "roleToAssume": "arn:aws:iam::1111111111:role/test"
  },
  "config": {
    "bucketName": "byosbucket",
    "region": "us-west-2"
  }
}
```

Copy

Attach a Dataset via API

When adding a Dataset via API, you reference the target Storage Location instead of a bucket name. Here is an example YAML configuration:

```
datasets:
  - id: my_dataset
    storageLocation: my-byos-location
    retention: 30d
    format: json
```

Copy

Setting Up a Dedicated Bucket Outside Cribl Lake

If you follow the procedure in Configure a Storage Location, the provided CloudFormation template will create your new Amazon S3 bucket's structure for you.

For advanced users who prefer to manage AWS resources directly, you can create a **new**, **dedicated** bucket and IAM role on S3, then link it as a Cribl Lake Storage Location. This is a more complex path, which requires you to explicitly configure access control on AWS.

Using the AWS Management Console or AWS API, you would:

1. Create a simple bucket configuration in an AWS Region that Cribl Lake supports.
2. Create a corresponding IAM role with an appropriate trust policy and permissions. (See Authentication for required permissions.)

Do not connect an **existing** S3 bucket that contains other data. Cribl Lake requires full control over lifecycle rules and S3 Inventory configuration, so each Cribl Lake Storage Location must be backed by a bucket dedicated exclusively to Cribl Lake.

Authentication

Cribl Lake accesses Amazon S3 buckets using STS Assume Role. If you follow the procedure in Configure a Storage Location, the provided CloudFormation template will create the required resources and permissions for you.

IAM Role Permissions

Read the remainder of this section only if you choose to configure access control on an S3 bucket yourself (see Setting Up a Dedicated Bucket Outside Cribl Lake. These instructions assume that you are permitted to view and manage access details on both AWS and your Cribl Organization.

Your IAM role must provide the permissions listed in the following example. Replace the `<bucketName>` placeholder with your own bucket's name:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "BucketAdminPermissions",
      "Condition": {
        "StringEquals": {
          "aws:PrincipalTag/Actor": "admin"
        }
      },
      "Action": [
        "s3:PutLifecycleConfiguration",
        "s3:GetLifecycleConfiguration",
        "s3:PutInventoryConfiguration",
        "s3:GetInventoryConfiguration",
        "s3:PutBucketNotification",
        "s3:GetBucketNotification",
        "s3:GetEncryptionConfiguration",
        "s3:GetBucketTagging"
      ],
      "Resource": "arn:aws:s3:::<bucketName>",
      "Effect": "Allow"
    },
    {
      "Sid": "BucketObjectLevelReadWritePermissions",
      "Action": [
        "s3:GetObject",
        "s3:PutObject",
        "s3:GetObjectTagging",
        "s3:PutObjectTagging",
        "s3:AbortMultipartUpload"
      ],
      "Resource": "arn:aws:s3:::<bucketName>/*",
      "Effect": "Allow"
    },
    {
      "Sid": "BucketLevelReadPermissions",
      "Action": ["s3:ListBucket", "s3:GetBucketLocation", "s3:ListBucketMultipartUplo
      "Resource": "arn:aws:s3:::<bucketName>",
      "Effect": "Allow"
    }
  ]
`
```

```
}
```

Copy

Also, for Cribl resources to be able to assume your IAM role, the IAM role must provide `sts:AssumeRole` and `sts:TagSession` permissions to these Cribl roles:

- `role/saas/cribl-lake-admin-<workspaceId>` (manages your bucket properties, like lifecycle and inventory).
- `role/<workspaceId>-*` (Workers from all Cribl Stream Worker Groups need read/write access to your bucket).
- `role/search-exec-<workspaceId>` (Cribl Search needs read/write access to be able to perform searches against your bucket).

IAM Role Trust Policy

If you choose to configure access control on an S3 bucket yourself, you must provide a trust policy comparable to the following example. (See also the Restrictive Trust Policy option.) Replace the `<CRIBL_AWS_ACCOUNT>`, `<workspaceId>`, and `<externalId>` placeholders as follows:

1. In your Cribl.Cloud Organization, select **Products** from the top bar, then select **Workspace** from the sidebar.
2. To insert the `<CRIBL_AWS_ACCOUNT>`, select **Trust** from the sidebar. Then, from the displayed **Worker ARN** field, copy the numeric value that follows the string `arn:aws:iam::`.
3. To insert the `<workspaceId>`, select the Workspaces button on the top bar. In the resulting modal, copy the **ID** of the appropriate Workspace.
4. To insert the `<externalId>`, switch to your Storage Location config, and copy the **External ID** value you defined there. (For details, see Configure Initial Settings.)

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "CriblLakeAdminAssumeRole",
      "Effect": "Allow",
      "Principal": {
        "AWS": "arn:aws:iam::<CRIBL_AWS_ACCOUNT>:role/saas/cribl-lake-admin-<workspac
      },
      "Action": "sts:AssumeRole",
      "Condition": {
        "StringEquals": {
          "sts:ExternalId": "<externalId>",
          "aws:RequestTag/Actor": "admin"
        }
      }
    },
    {
      "Sid": "CriblLakeAdminTagSession",
      "Effect": "Allow",
      "Principal": {
        "AWS": "arn:aws:iam::<CRIBL_AWS_ACCOUNT>:role/saas/cribl-lake-admin-<workspac
      },
      "Action": "sts:TagSession",
      "Condition": {
        "StringEquals": {
          "aws:RequestTag/Actor": "admin"
        }
      }
    },
    {
      "Sid": "CriblWorkerAssumeRole",
      "Effect": "Allow",
      "Principal": {
        "AWS": "arn:aws:iam::<CRIBL_TRUST_ACCOUNT>:root"
      },
      "Action": "sts:AssumeRole",
      "Condition": {
        "StringEquals": {
          "sts:ExternalId": "<externalId>"
        },
        "StringLike": {
```

```
          "aws:PrincipalArn": "arn:aws:iam::<CRIBL_AWS_ACCOUNT>:role/<workspaceId>-*"
        }
      }
    },
    {
      "Sid": "CriblSearchAssumeRole",
      "Effect": "Allow",
      "Principal": {
        "AWS": "arn:aws:iam::<CRIBL_AWS_ACCOUNT>:role/search-exec-<workspaceId>"
      },
      "Action": "sts:AssumeRole",
      "Condition": {
        "StringEquals": {
          "sts:ExternalId": "<externalId>"
        }
      }
    }
  ]
}
```

Copy

Restrictive Trust Policy

The preceding model trust policy enables all Cribl Stream Worker Groups in the current Workspace to write to the configured bucket. If you instead wish to limit write permissions to only certain Worker Groups, modify the model policy's `CriblWorkerAssumeRole` element as shown in the following listing.

Replace the `<workerGroupId1>` and `<workerGroupId2>` placeholders with the names of each Worker Group you want to authorize. Expand or contract the number of defined Worker Groups to meet your needs:

```
{
  "Sid": "CriblWorkerAssumeRole",
  "Effect": "Allow",
  "Principal": {
```

9. Integrating Cribl Lake With Cribl Edge

Archive your Cribl Edge data to Cribl Lake, via Cribl Stream.

To send data from Cribl Edge to Cribl Lake, you need to route it through Cribl Stream, using the Cribl HTTP or Cribl TCP Destination/Source pair. Either option prevents double billing when you ingest the data from Edge to Stream.

The main steps are:

1. Send data from Cribl Edge to a Stream Worker Group.
2. Receive data in Cribl Stream.
3. Send data from Cribl Stream to Cribl Lake.

> To learn more about communicating between Cribl Edge and Cribl Stream, see the Cribl Edge to Cribl Stream guide.
>
> The Edge Getting Started tutorial presents a similar use case with detailed steps for configuring the Cribl HTTP Sources and Destination to seamlessly send data between Edge and Stream.

Send Data from Cribl Edge

1. In Cribl Edge, create a new Cribl HTTP Destination. (You could also use Cribl TCP, but this example will use the former.)
2. Next, use QuickConnect to pass your Edge data to this Destination.

Receive Data in Cribl Stream

1. In Cribl Stream, create a new Cribl HTTP Source.
2. Make sure that the **Address** and **Port** fields in the Source's configuration correspond to what you configured in Cribl Edge.

Send Data to Cribl Lake

1. Once data is flowing from Cribl Edge to Cribl Stream, create a Cribl Lake Destination in the same Worker Group.
2. Select the Lake Dataset you want to use as the target for the Destination.

3. Finally, connect the Cribl HTTP Source with the new Cribl Lake Destination via QuickConnect.

Verify Data Flow

To make sure that data is flowing correctly into Cribl Lake, you can run a test search over the selected Lake Dataset.

10. Troubleshooting

View known issues, filtered for Cribl Lake. Check whether bugs are resolved, discover fix versions, and find temporary workarounds for open issues.