## Analyzing Machine Data with Datadog



# **Get started log management** with Datadog

#### Datadog Log Management: Rapid Troubleshooting

#### Discover Datadog Log Management

#### Rapid troubleshooting

Full observability

Seamless integrations

Customizable processing

Visualization and alerting

#### Rapid troubleshooting and exploration

Quickly search, filter, and analyze your logs for troubleshooting and open-ended exploration of your data.

- Explore and analyze logs from all your services, applications, and platforms.
- Search and filter your logs on the fly using automatically generated facets.
- See log data in context with automated tagging and correlation.

#### Datadog Log Management: Full observability

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Customizable processing

Visualization and alerting

#### Unifying the three pillars of observability

Smoothly navigate between logs, metrics, and request traces for a clear view of all your systems.

- Pivot from metric graphs directly to related logs from the same host or service.
- Jump from any log entry to a dashboard of metrics for the host.
- Put logs in a performance context by pivoting to APM for the service.

#### Datadog Log Management: Seamless Integration

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## Centralize log data from any source

Automatically collect, tag, and enrich logs with Datadog's built-in integrations.

- Send logs using your existing Datadog integrations with applications, services, and cloud providers.
- Automatically apply facets to your log data, such as availability zone, role, or HTTP status code.
- Use third-party log shippers such as Logstash, rsyslog, or FluentD.

#### Datadog Log Management: Customizable Processing

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#### **Build log-processing pipelines**

Enrich and process logs from common technologies instantly — or build your own custom pipelines.

- Automatically process logs from integrated technologies.
- Clone and modify built-in pipelines to capture custom data fields or facets.
- Build new pipelines to extract and enrich data from any log format.

#### Datadog Log Management: Visualization and Alerting

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#### Follow connections between logs, metrics, and traces

Visualize log data on Datadog dashboards or build sophisticated alerts.

- Add streams of logs matching any query to your Datadog dashboards.
- Visualize aggregated or processed log data in customizable graphs.
- Build real-time alerts that trigger on any combination of indicators.

## Sending Logs to Datadog

- 1. Sending logs manually
- 2. Send logs from a file

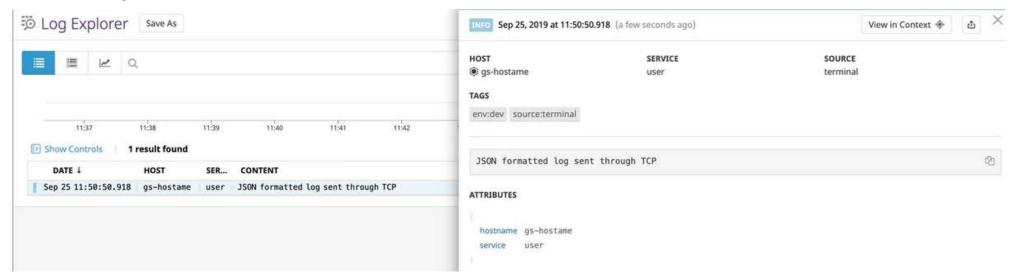
## Sending Logs to Datadog: Sending logs manually

The secure TCP endpoint is intake.logs.datadoghq.com(or port 10514 for nonsecure connections).

telnet intake.logs.datadoghq.com 10514 <DATADOG\_API\_KEY> Plain text log sent through TCP

telnet intake.logs.datadoghq.com 10514

<DATADOG\_API\_KEY> {"message":"JSON formatted log sent through TCP", "ddtags":"env:dev", "ddsource":"terminal",
"hostname":"gs-hostame", "service":"user"}



```
The TCP endpoint is not supported for this site - us5.datadoghq.com.

curl -X POST "https://http-intake.logs.us5.datadoghq.com/api/v2/logs" \
-H "Content-Type: application/json" \
-H "DD-API-KEY: 061585f627bb034f27fc61cec6a35f3b" \
-d @- << EOF
[
{
    "ddsource": "nginx",
    "ddtags": "env:staging,version:5.1",
    "hostname": "i-012345678",
    "message": "2019-11-19T14:37:58,995 INFO [process.name][20081] Hello World",
    "service": "payment"
}
]
EOF
```

### Sending Logs to Datadog: Send logs from a file

- Install the Datadog Agent
- Verify Datadog Agent Status and Look for "Logs Agent" which is not running. \$ sudo datadog-agent status
- Enable log collection

To enable log collection with the Agent, edit the datadog.yaml configuration file located at /etc/datadog-agent/datadog.yaml and set logs\_enabled:true

- Monitor a custom file \$ touch log\_file\_to\_monitor.log \$ echo "First line of log" >> log\_file\_to\_monitor.log \$ sudo mkdir /etc/datadog-agent/conf.d/custom\_log\_collection.d/ \$ sudo touch /etc/datadog-agent/conf.d/custom\_log\_collection.d/conf.yaml logs:

 - type: file path: /home/ubuntu/log\_file\_to\_monitor.log source: custom service: user

\$ sudo service datadog-agent restart

- Validation. Verify Dsudo datadog-agent status atadog Agent Status and Look for "Logs Agent" which is running. \$

- Add new logs to the file

\$ echo "New line of log in the log file" >> log\_file\_to\_monitor.log

### **Explore** Log

<u>Log Explorer</u>: Discover the Log Explorer view, and how to add Facets and Measures.

<u>Search</u>: Search through all of your logs.

<u>Live Tail</u>: See your ingested logs in real time across all your environments.

<u>Analytics</u>: Perform Log Analytics over your indexed logs.

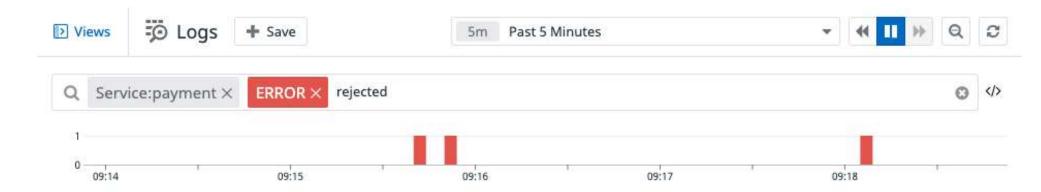
<u>Patterns</u>: Spot Log Patterns by clustering your indexed logs together.

Saved Views: Use Saved Views to automatically configure your Log Explorer.

## Log Explorer

#### **Log Explore: Filters Log**

The search filter consists of a timerange and a search query mixing key:value and full-text search. For example, the search query service:payment status:error rejected over a Past 5 minutes timerange:



#### Log Explore: Aggregate and Measure

Aggregate queried logs into higher-level entities in order to derive or consolidate information. Logs can be valuable as individual events, but sometimes valuable information lives in a subset of events. In order to expose this information, aggregate your logs. Aggregations are supported for indexed logs only



#### **Log Explore: Aggregate -> Fields**

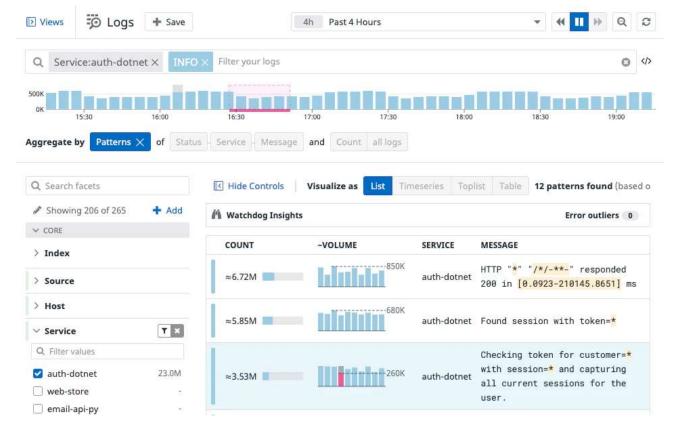
With fields aggregation, all logs matching the query filter are aggregated into groups based on the value of one or multiple log facets. On top of these aggregates, you can extract the following measures:

- count of logs per group
- unique count of coded values for a facet per group
- statistical operations (min, max, avg, and percentiles) on numerical values of a facet per group

#### **Log Explore: Aggregate -> Patterns**

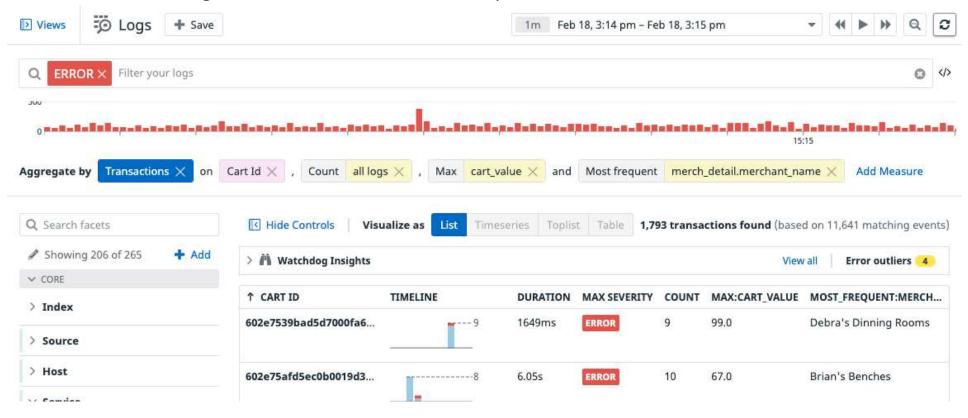
With pattern aggregation, logs that have a message with similar structures, belong to the same service and have the same status are grouped altogether. The patterns view is helpful for detecting and filtering noisy error patterns that could cause you to miss other

issues:



#### **Log Explore: Aggregate -> Transactions**

Transactions aggregate indexed logs according to instances of a sequence of events, such as a user session or a request processed across multiple micro-services. For example, an e-commerce website groups log events across various user actions, such as catalog search, add to cart, and checkout, to build a transaction view using a common attribute such as requestld or orderld.



#### **Log Explore: Aggregate -> Visualize**

**Lists -** The columns displayed in list of aggregates are columns derived from the aggregation.

**Timeseries -** Visualize the evolution of a single measure (or a facet unique count of values) over a selected time frame, and (optionally) split by an available facet.

**Toplists** - Visualize the top values from a facet according to the chosen measure.

**Nested tables -** Visualize the top values from a facet according to a chosen measure (the first measure you choose in the list), and display the value of additional measures for elements appearing in this table.

**Export -** At any moment, and depending on your current aggregation, export your exploration as a: Saved View, Dashboard widget, Monitor, Metric, CSV & Share

## Search Log

### Search Syntax

A query filter is composed of terms and operators.

#### There are two types of terms:

- A single term is a single word such as test or hello.
- A sequence is a group of words surrounded by double quotes, such as "hello dolly".

To combine multiple terms into a complex query, you can use any of the following Boolean operators:

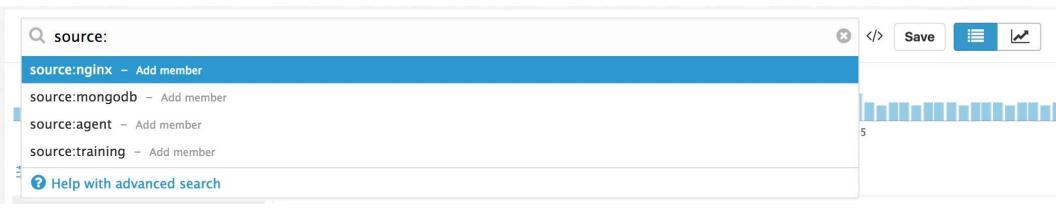
Operator	Description	Example
AND	Intersection: both terms are in the selected events (if nothing is added, AND is taken by default)	authentication AND failure
OR	Union: either term is contained in the selected events	authentication OR password
里.	Exclusion: the following term is NOT in the event	authentication AND -

## Search Syntax: AND OR

To combine multiple terms into a complex query, you can use any of the following Boolean operators:

Operator	Description	Example
AND	Intersection: both terms are in the selected events (if nothing is added, AND is taken by default)	authentication AND failure
OR	Union: either term is contained in the selected events	authentication OR password
4	Exclusion: the following term is NOT in the event	authentication AND -

### Search Syntax: Autocomplete



### Search Syntax: Escaping of special characters

The following characters are considered special:  $+ - = \&\& || > < ! ( ) { } [$  ] ^ " " ~ \* ? : \, and / require escaping with the \ character.

**Note**: These characters can be escaped, but are not searchable in logs search. To search for special characters, parse them into an attribute with the grok parser, and then search for logs that contain the attribute.

### Search Syntax: Attributes search

#### Message attribute search

To search for logs that contain user=JaneDoe in the message attribute use the following search:

user\=JaneDoe

#### **Facets search**

To search on a specific attribute, first add it as a facet and then add @ to specify you are searching on a facet. For instance, if your facet name is url and you want to filter on the url value www.datadoghq.com, enter:

@url:www.datadoghq.com

## Search Syntax: Attributes search

SEARCH QUERY	DESCRIPTION
@http.url_details.path:"/api/v1/test"	Searches all logs matching /api/v1/test in the attribute http.url_details.path.
@http.url:\/api\/v1\/*	Searches all logs containing a value in http.url attribute that start with /api/v1/
@http.status_code:[200 TO 299] @http.url_details.path:\/api\/v1\/*	Searches all logs containing a  http.status_code value between  200 and 299, and containing a value in  http.url_details.path attribute  that start with /api/v1/

## Search Syntax: Wildcards

To perform a multi-character wildcard search, use the \* symbol as follows:

- service: web\* matches every log message that has a service starting with web.
- web\* matches all log messages starting with web
- \*web matches all log messages that end with web

## Search Syntax: Wildcards

To perform a multi-character wildcard search, use the \* symbol as follows:

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#### Search Syntax: Numerical values

Use < , > , <= , or >= to perform a search on numerical attributes. For instance, retrieve all logs that have a response time over 100ms with:

@http.response\_time:>100

You can search for numerical attribute within a specific range. For instance, retrieve all your 4xx errors with:

@http.status\_code:[400 TO 499]

## Search Syntax: Tags

Your logs inherit tags from hosts and integrations that generate them. They can be used in the search and as facets as well:

- test is searching for the string "test".
- env:(prod OR test) matches all logs with the tag env:prod or the tag env:test
- (env:prod AND -version:beta) matches all logs that contain tag env:prod and that do not contain tag version:beta

If your tags don't follow tags best practices and don't use the key:value syntax, use this search query:

- tags:<MY\_TAG>

## Forwarding / Flushing Metrics to Datadog Cloud from restricted outbound traffic

- Using a web proxy, such as Squid or Microsoft Web Proxy, that is already deployed to your network
- Using HAProxy (if you want to proxy more than 16-20 Agents through the same proxy)
- Using the Agent as a proxy (for up to 16 Agents per proxy, only on Agent v5 )
- Using Prometheus Pushgateway Refer https://openapm.io/landscape/collector/prometheus-pushgateway

## **Pipelines**

What is Pipelines?

Datadog automatically parses JSON-formatted logs.

When logs are not JSON-formatted, you can add value to your raw logs by sending them through a processing pipeline.

#### What is Pipelines?

Pipelines take logs from a wide variety of formats and translate them into a common format in Datadog.

Implementing a log pipelines and processing strategy is beneficial as it introduces an **attribute naming convention** for your organization.

# What is Pipelines?

With pipelines, logs are parsed and enriched by chaining them sequentially **through processors**. This extracts meaningful information or attributes from semi-structured text to reuse as facets.

Each log that comes through the pipelines is tested against every **pipeline filter**. If it matches a filter, then all the processors are applied sequentially before moving to the next pipeline.

#### **Processors**

<b>~</b>	Grok Parser	5	✓ Url Parser	1	4
<b>~</b>	Date Remapper	5	Message Remapper	1	
<b>~</b>	Status Remapper	5	Category Processor	1	
<b>~</b>	Remapper	4	✓ No processors or n	-	
<b>~</b>	Service Remapper	2	✓ Nested pipeline	-	ı
<b>~</b>	Arithmetic Processor	2	✓ GeoIP Parser	-	ı
	Trace Id Remapper	2	✓ Threat Intel Proces	-	ı
_	rrace to Kerriapper	2	Severity Remapper	-	Ī
<b>~</b>	User-Agent Parser	1	String Builder Proc	-	-

#### **Processors**

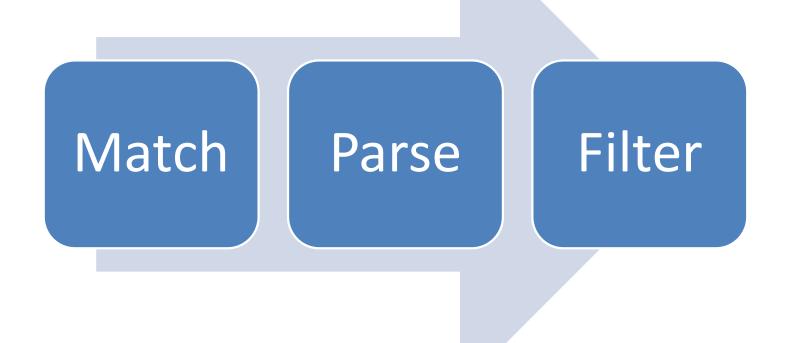
Grok parser
Log date remapper
Log status remapper
Service remapper
Log message remapper
Remapper

https://docs.datadoghq.com/logs/log\_configuration/processors

URL parser
User-Agent parser
Category processor
Arithmetic processor
String builder processor
GeolP parser
Lookup processor

Trace remapper

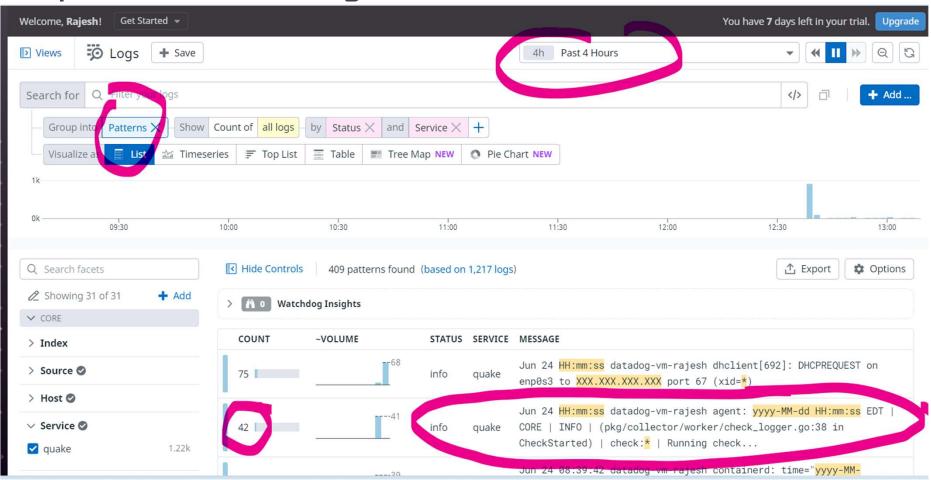
# Pipelines Workflow



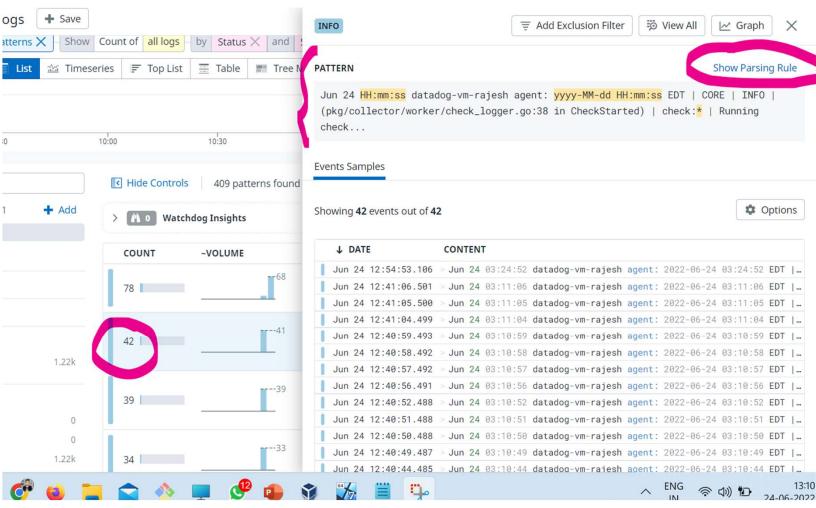
You can write parsing rules with the %{MA	MATCHER: EXTRACT: FILTER }	syntax:
---	----------------------------	---------

- Matcher: A rule (possibly a reference to another token rule) that describes what to expect (number, word, notSpace, etc.).
- Extract (optional): An identifier representing the capture destination for the piece of text matched by the Matcher.
- Filter (optional): A post-processor of the match to transform it.

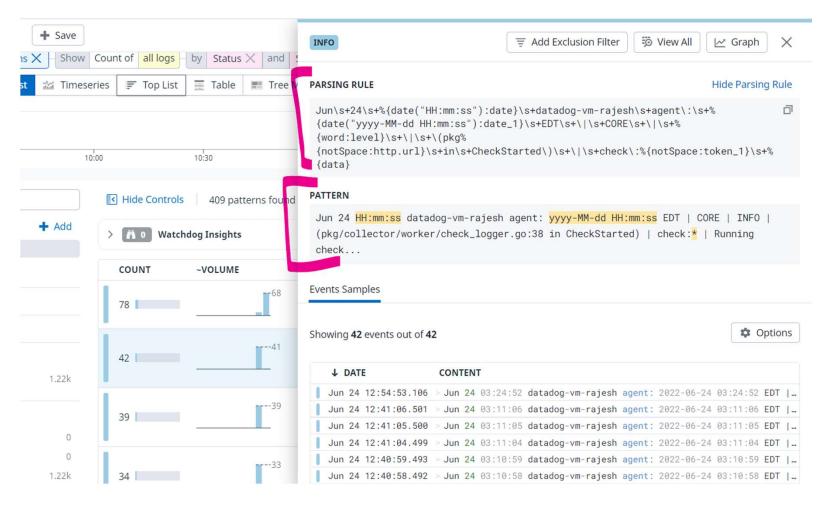
#### Step 1 – Know a Log Pattern



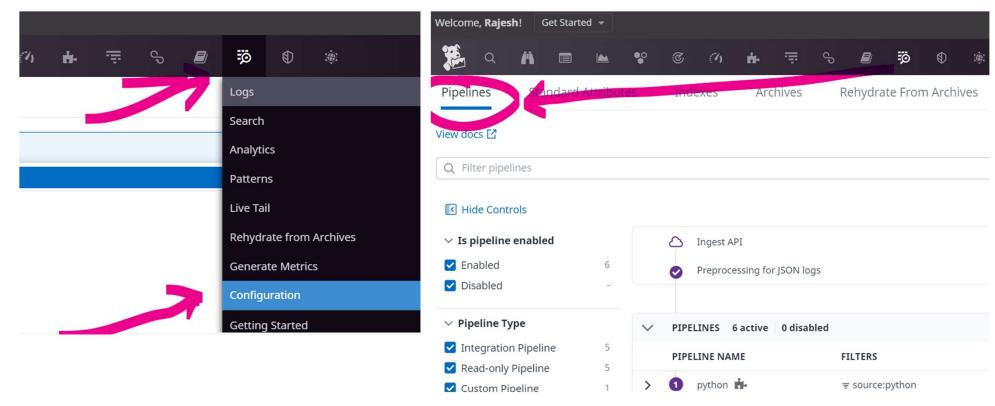
# Step 2 – Understand a Pattern & Parsing Rule



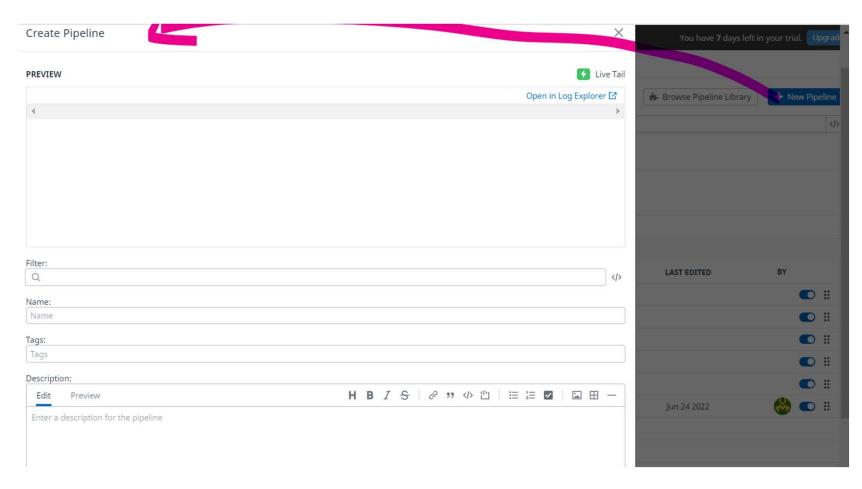
# Step 3 – Copy Parsing Rule & Pattern



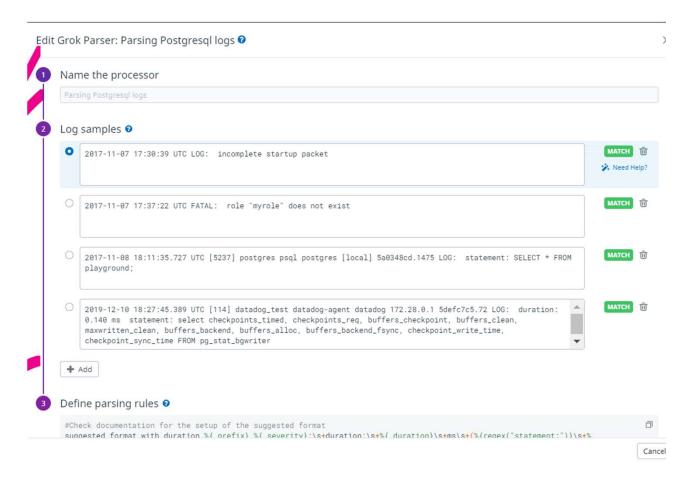
# Step 4 – Navigate to Pipeline



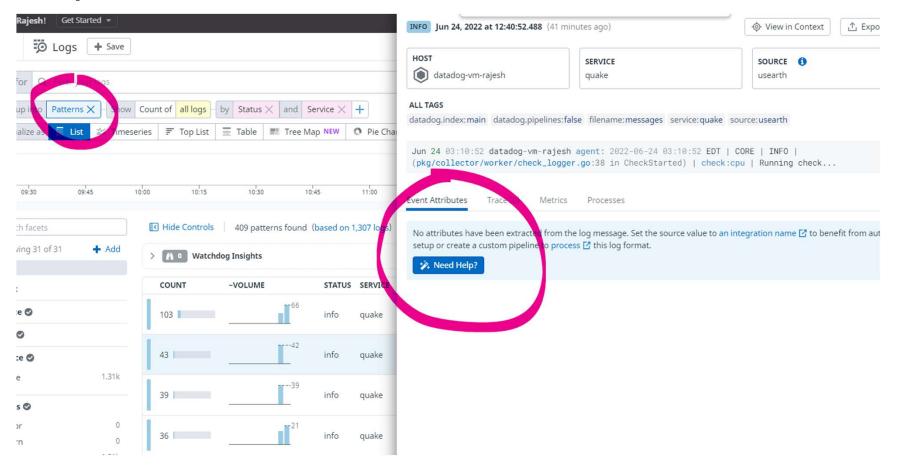
# Step 5 – Understand a Pattern & Parsing Rule



# Step 6 – Understand a Pattern & Parsing Rule



# Step 8 – Results - Before



# Step 9 – Results - After

