

Visualizing CICS performance data in Splunk using IBM CICS Performance Analyzer

Ezriel Gross

egross@rocketsoftware.com

Principal Solutions Advisor

Rocket Software

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Agenda

- **Demo of Splunk app** showing visualizations of data from CICS PA
- **CICS transactions and tuning:** background on CICS and CICS PA
- **Why do this, and what's new?** Requests for enhancements (**RFEs**) from customers
 - Customers want to use data from CICS PA in analytics platforms such as Splunk
 - What's new in CICS PA 5.4 APAR PH16158 (February 2020)
- **Try the app yourself with sample data:** see CICS SupportPac CA10
- **How** to forward JSON Lines from CICS PA
- **Details about JSON Lines** from CICS PA, and using it in other analytics platforms, such as Elastic Stack

Splunk app demo

Disclaimer

- This **sample app** showcases visualizations of data from CICS PA
- This app is ***not intended to be a fully-fledged out-of-the-box solution*** for analyzing CICS performance in Splunk
- The app developers expect customers to **examine the app, and then perhaps copy and adapt selected visualizations into bespoke apps**
- Let's **switch to the app...**

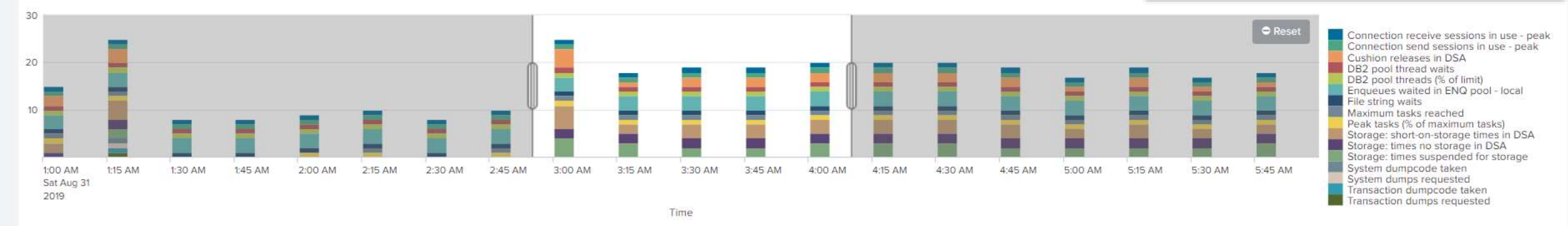
System alerts

Based on statistics alert definitions in CICS Performance Analyzer

Time range: 1:00 AM to 6:00 AM, Aug 31...
 Applid: All x
 Alert: All x
 Top # results: 10
 Extra search filter:
 Hide Filters

Sample Splunk app
 showing statistics
 alerts from CICS PA

Alerts over time



101 events, spanning 0 hour 59 minutes 54 seconds, from 2019-08-31T03:00:10+00:00 to 2019-08-31T04:00:04+00:00. Local times (times with no zone designator) are in time zone +00:00. Set dashboard to selection

Alerts by applid



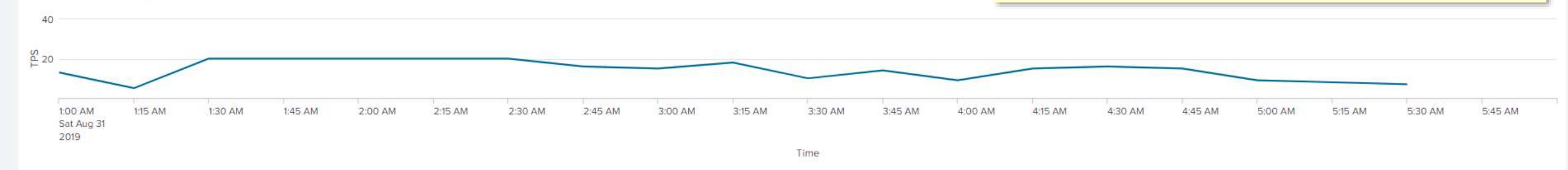
Transaction overview

Based on CICS monitoring facility performance class data, summarized by CICS Performance Analyzer

Time range: 1:00 AM to 6:00 AM, Aug 31...
 Applid: All x
 CICS transaction: BPMT x
 Top # results: 10
 Extra search filter:

Sample Splunk app showing performance summary data from CICS PA (1 of 3)

CICS transactions per second (TPS)



20 events, spanning 4 hours 45 minutes 0 second, from 2019-08-31T01:00:00+00:00 to 2019-08-31T05:45:00+00:00. Local times (times with no zone designator) are in time zone +00:00. Set dashboard to selection

CICS transaction metrics

252,815
Tasks

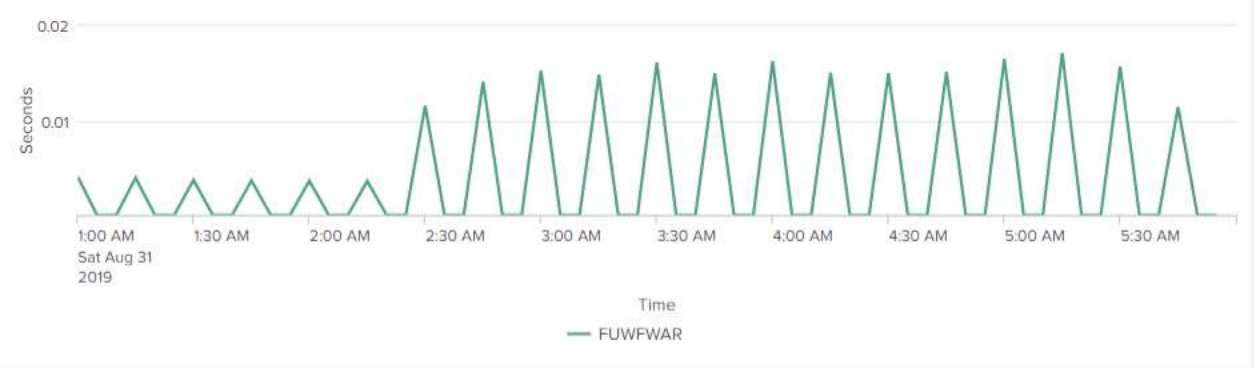
0.011
Average User CPU Time

24.106
Average Response Time

Average response time by applid



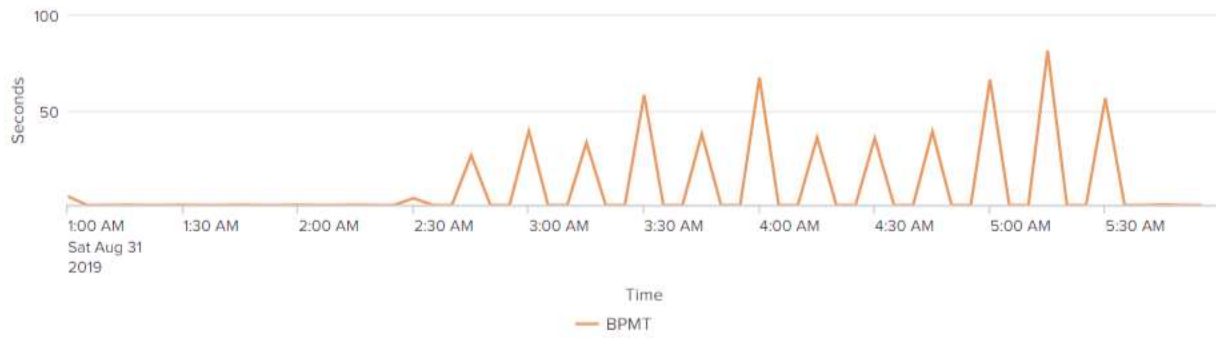
Average user CPU time by applid



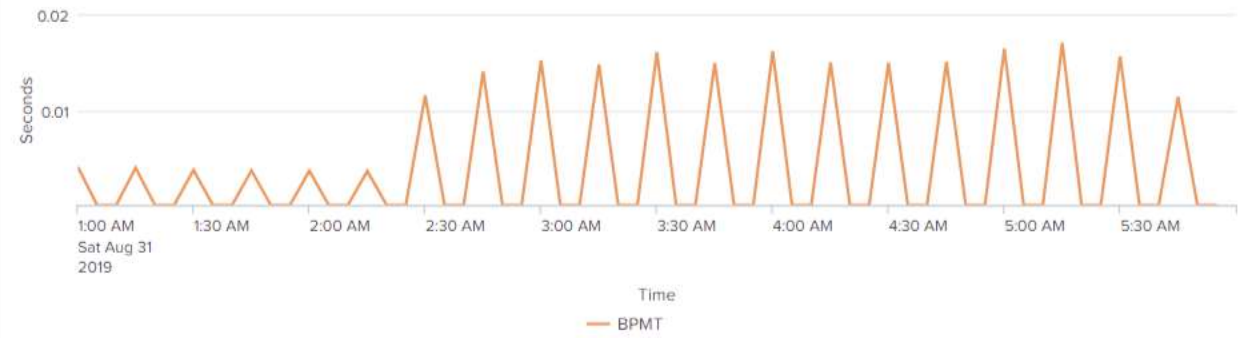
Average response time by transaction

Average user CPU time by transaction

Average response time by transaction



Average user CPU time by transaction



CICS transaction response time

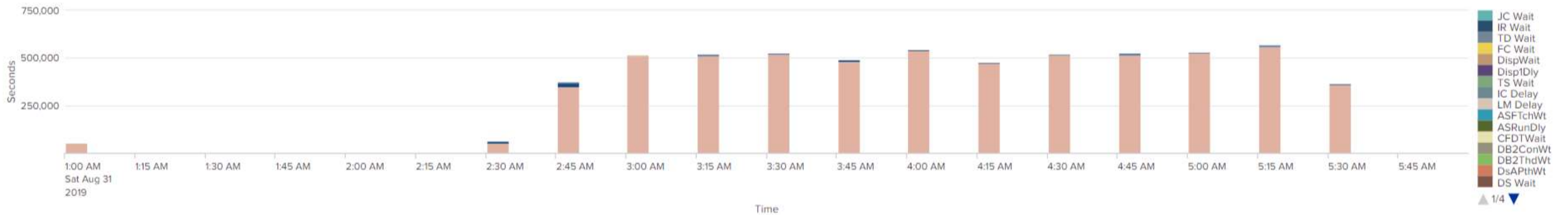
Average times

Response User+CPU

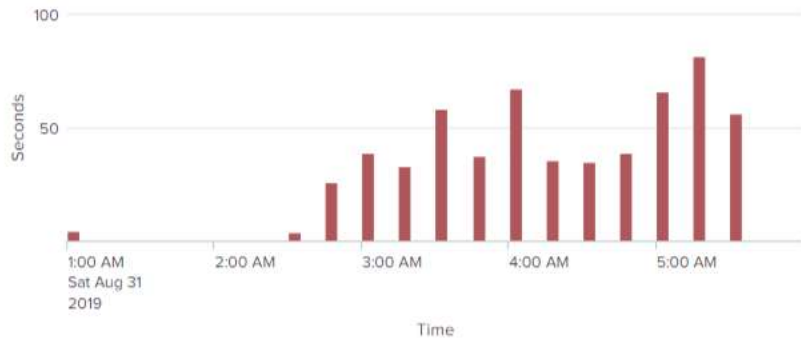
Dispatch



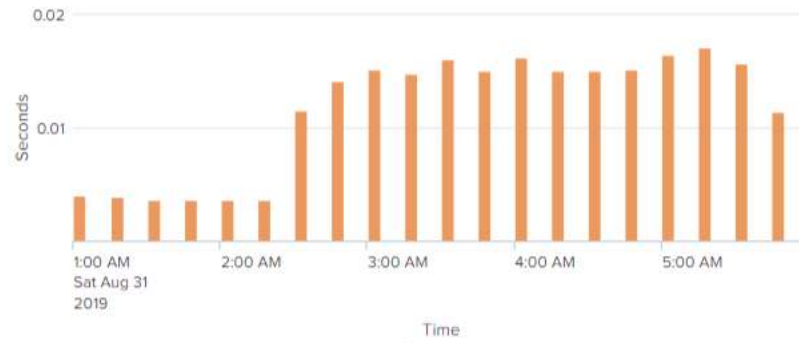
Wait analysis



Average response time



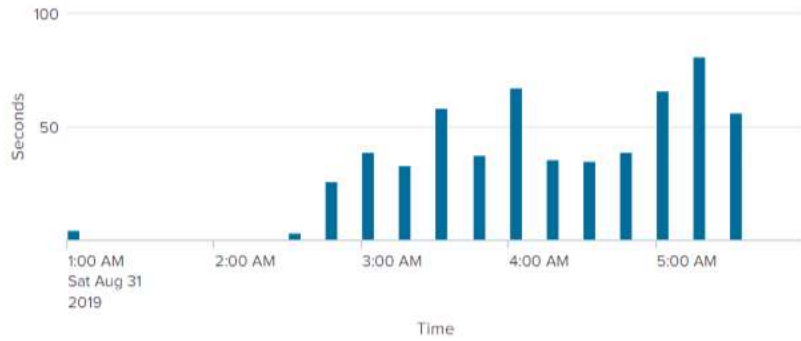
Average user CPU time



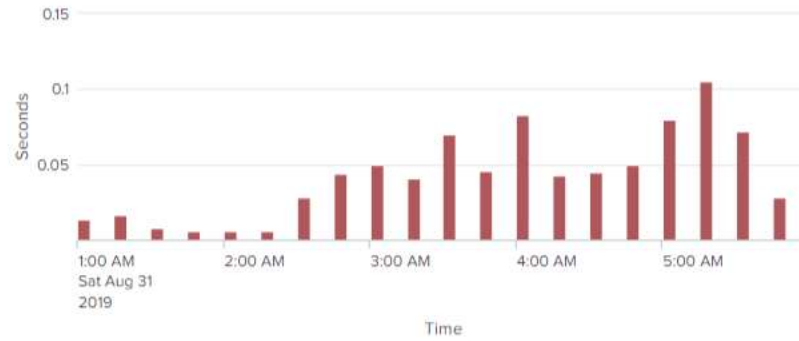
Average dispatch time



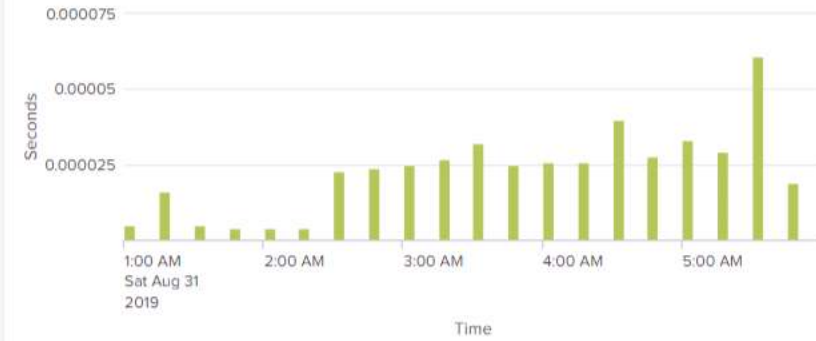
Average suspend time



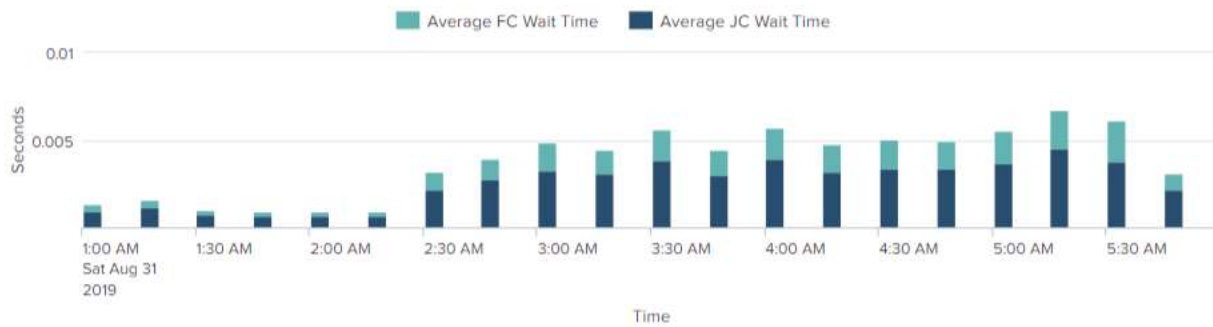
Average syncpoint processing time



Average RMI elapsed time



Average file and journal wait time

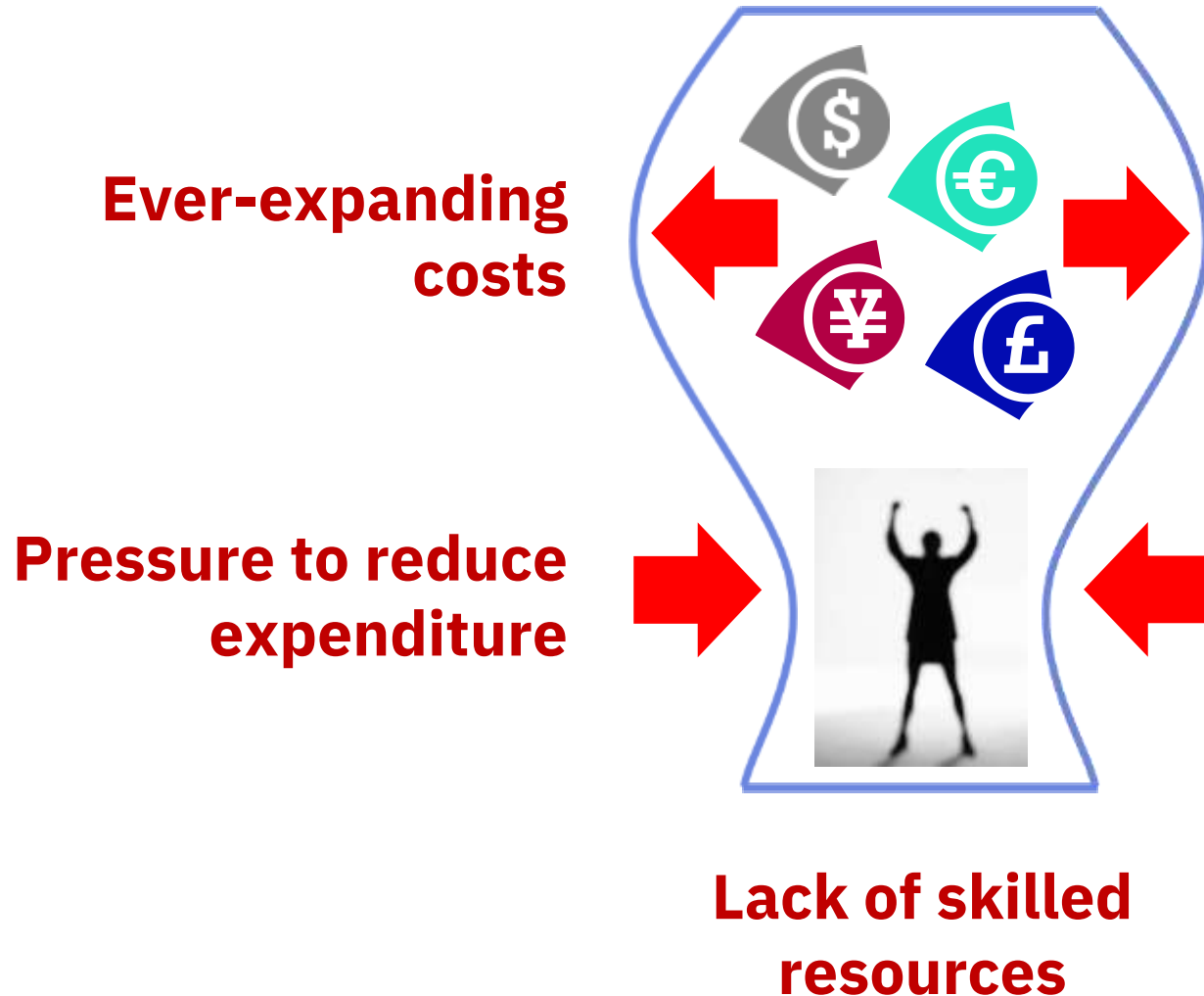


Average first dispatch wait time



CICS transactions and tuning

Today's world

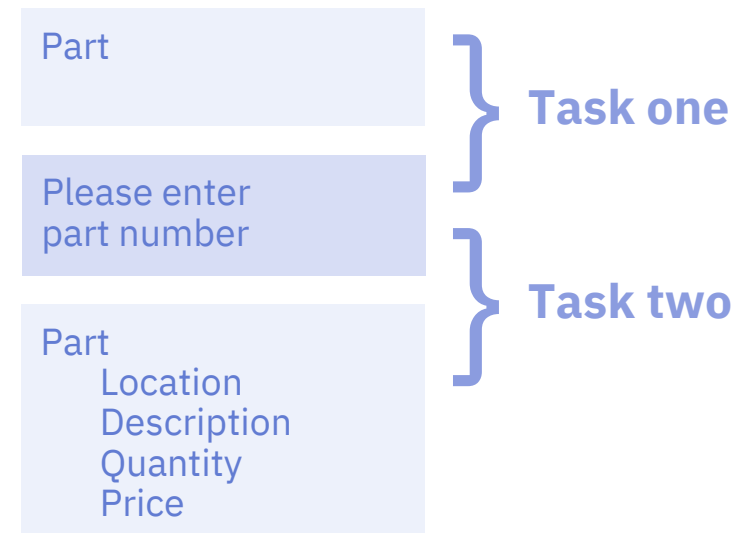
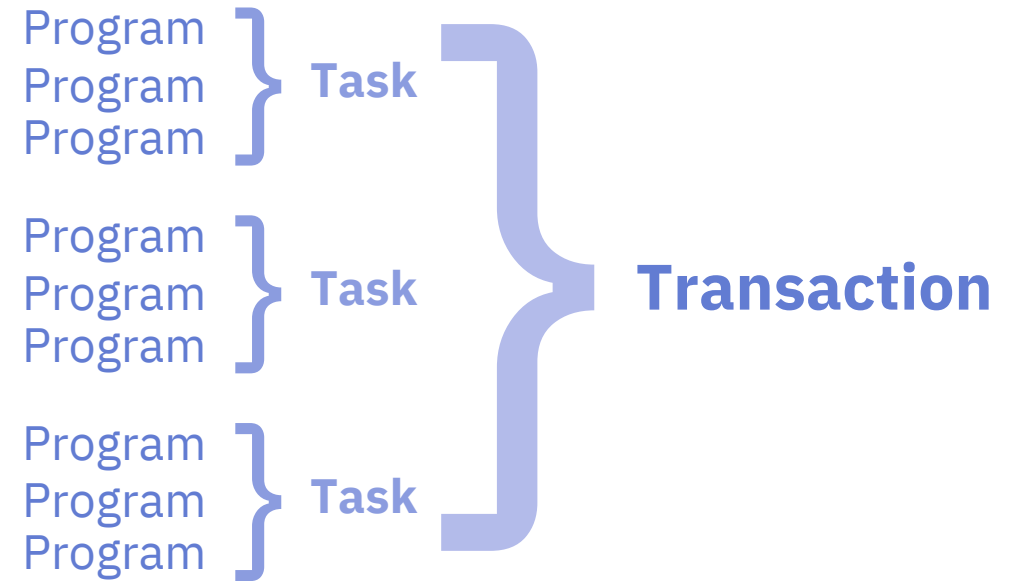


Tools can help!

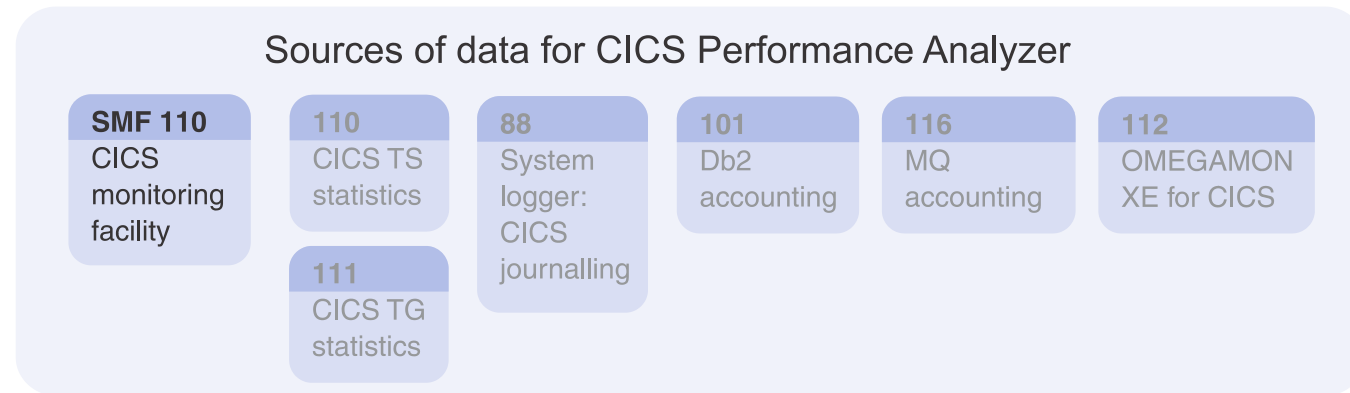
CICS Performance Analyzer for z/OS is IBM's premier CICS tuning product

CICS tasks and programs

- A **task** is an instance of a **transaction** started by a user
- When a user types in data and presses Enter or a Function key, CICS begins a task and loads the necessary **programs**
- Tasks run concurrently, so a user can run multiple instances of the same transaction simultaneously
- CICS multitasks giving fast response times
- CICS runs each task, briefly giving CPU to each one



CICS monitoring facility (CMF)



- CMF collects data about all transactions in CICS
- Records are written to SMF for later offline processing
- CMF collects 4 classes of data: exception, identity, performance, and transaction resource
- CMF can produce a large volume of data, so CICS compresses the data by default
- To exclude monitoring data fields, use a monitoring control table (MCT)
- To process output, use CICS PA or CICS-supplied sample program DFH\$MOLS

Response time

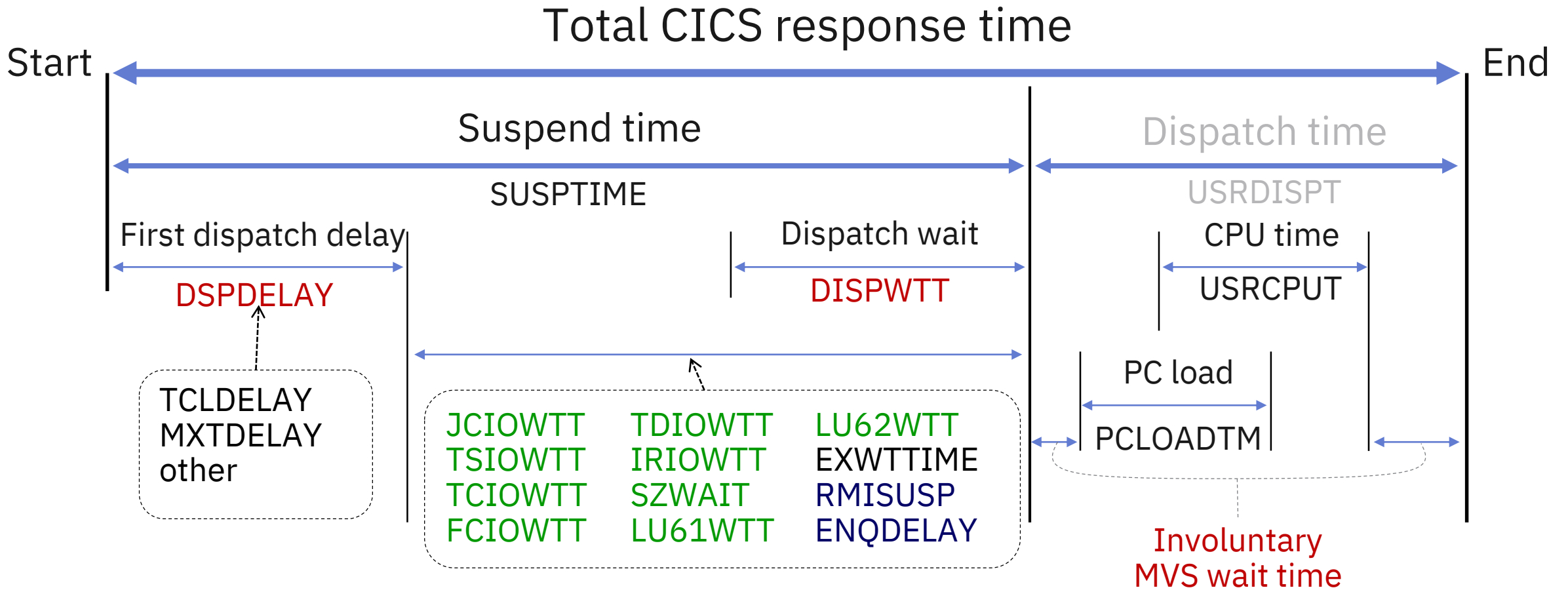
Response time consists of two elements:

1. **Suspend time:** the time a task is not executing (waiting)
2. **Dispatch time:** the time that CICS thinks the task is executing. This time is further divided into:
 - A. **CPU time:** the time the task is executing on CPU
 - B. **Wait time:** the time the CPU has been taken away from the task *without the knowledge of CICS*

CPU to dispatch ratio:

- Ratio = (CPU time / dispatch time) * 100
- Objective is 80% or higher

Response time structure of CICS transaction



Suspend time breakdown

Suspend time = **First dispatch time** + **I/O wait time** +
Other wait time + **Unaccounted wait time**

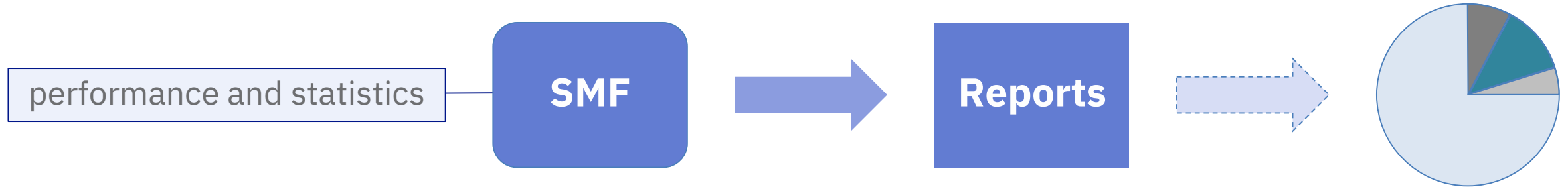
First dispatch delay includes
TRANCLASS delay and MXT delay

Total I/O wait time =
(terminal I/O wait time +
temporary storage I/O wait time +
shared temporary storage I/O wait time +
transient data I/O wait time +
journal (MVS Logger) I/O wait time +
file I/O wait time +
RLS file I/O wait time +
Coupling Facility Data Table (CFDT) I/O wait time +
inbound socket I/O wait time +
outbound socket I/O wait time +
inter-region (MRO) I/O wait time +
LU 6.1 I/O wait time +
LU 6.2 I/O wait time +
FEPI I/O wait time)

Total Other wait time =
(CICS OTE TCBS delay time +
CICS change-TCB mode delay time +
TCB mismatch wait time +
ENQ delay time +
IC/WAIT interval control delay time +
Lock Manager (LM) delay time +
RMI suspend time +
BTS delay +
JVM suspend +
request receiver wait time +
request processor wait time +
RRMS/MVS in-doubt wait time +
3270 bridge partner wait time +
CFDT server sync point wait time +
MVS storage constraint wait time +
dispatchable waits wait time)

What is CICS PA?

- A comprehensive performance reporting and analysis tool for CICS
- Provides ongoing system management and measurement reports on all aspects of CICS application performance



How does it work?

- Uses SMF data as input
- Easy to use interface for report generation (over 250 supplied report forms)
- Performance and statistical analysis
- Graphical performance analysis via CICS Explorer
- Forward PA data in JSON format to your analytics platform of choice

**Why do this,
and what's new?**

Customer requests for enhancement (**RFEs**)

CICS PA enhancements address the following public RFEs:

CICS PA Web solution: RFE 83233

“web-based analytics to CICS PA, where the PA reports ... can be sent to a **web** server ... accessed through **browser ... dashboard** / charts”

“trend analysis easily without running multiple reports ... store data for a very long period ... over a year+ ... queries ... **easier than ... from DB2 / UDB**”

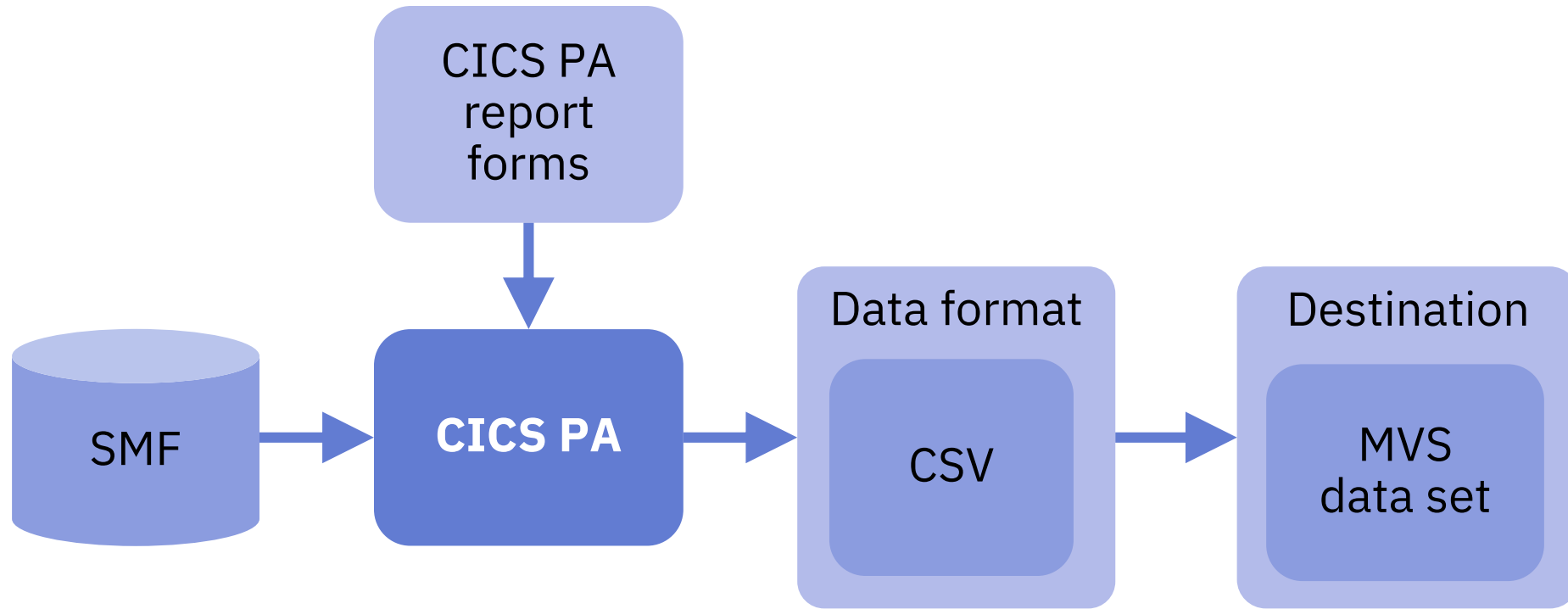
JSON format output: RFE 120510

“Can we have a switch ... to produce a JSON format file”

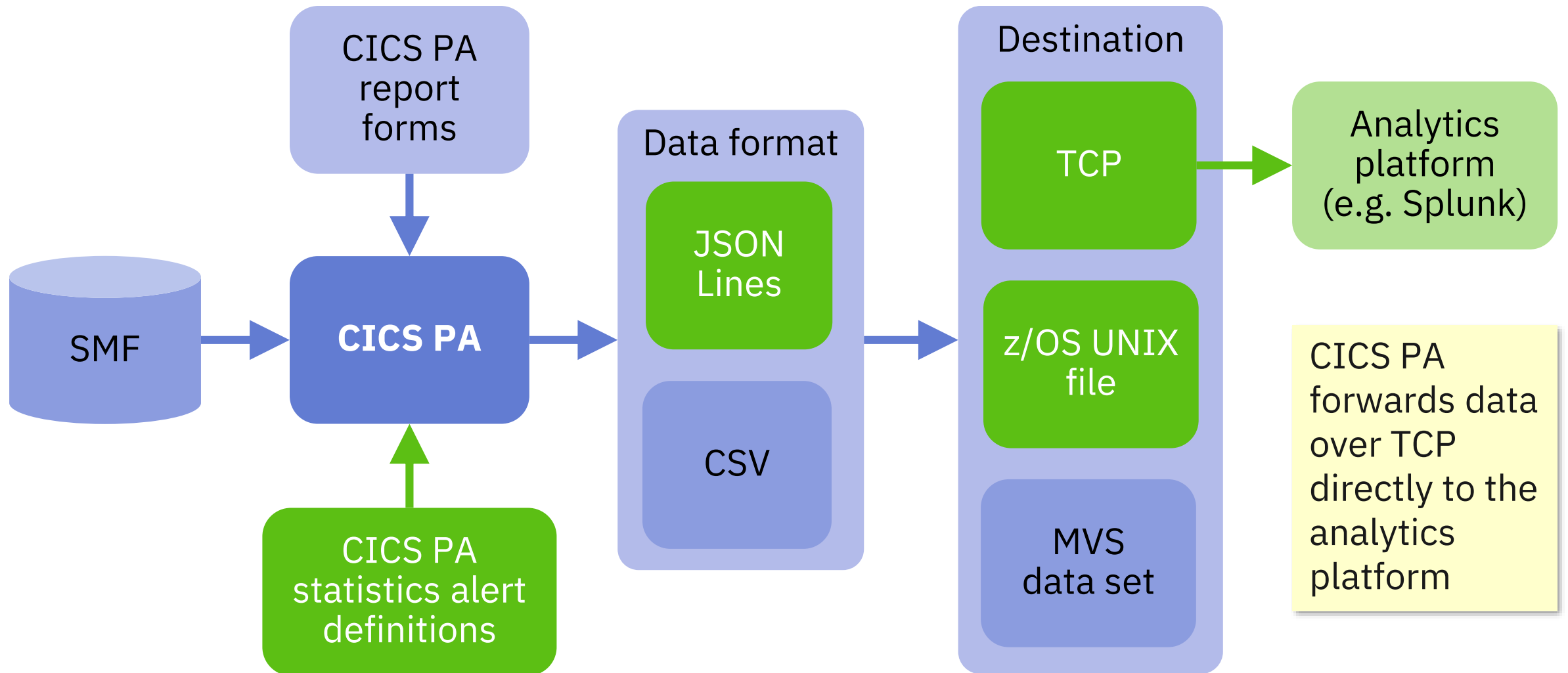
Enable **Splunk** as a destination for CICS PA: RFE 132212

“We generate many CICS PA threshold reports ... difficult to view singly if you are trying to understand multiple days and/or multiple regions. If the raw data for the reports are sent to Splunk, we can generate Splunk reports that show a larger view of the data.”

Existing CICS PA functionality: CSV to MVS data set



What's new: JSON Lines over TCP



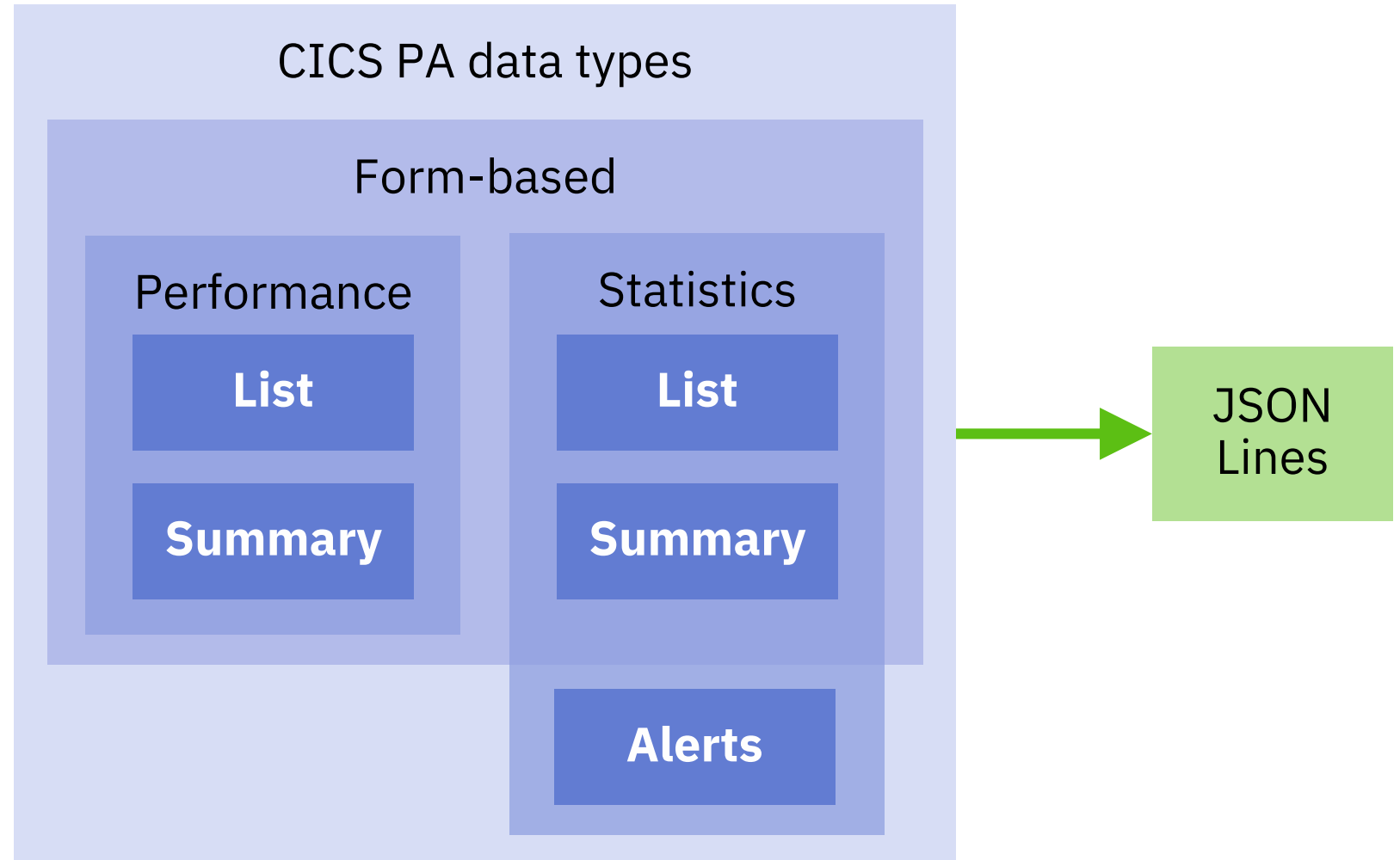
Forward the fields you want, from the records you want, when you want

These enhancements seamlessly extend **familiar CICS PA features**:

- If you know how to define a CICS PA **report form**, then you *already* know how to specify which fields you want to forward as JSON.
- You use existing CICS PA **selection criteria** to filter which records to forward based on field values.
- You decide when, and how frequently, to submit the batch job to run the CICS PA **report set** that forwards data.

CICS PA data types output to JSON Lines

- Form-based:
 - Performance list
 - Performance summary
 - Statistics list
 - Statistics summary
- Other:
 - Statistics alerts



Statistics alerts

- Help you find potential **tuning opportunities**
- Identify **trends** that could lead to poor CICS performance or even unnecessary CICS system outages
- Can help you focus your analysis efforts on:
 - Specific CICS regions
 - A time of day
 - Specific types of CICS resources

Statistics alerts (continued)

- Triggered by a **condition**. A condition is defined by a formula and up to three thresholds.
- A **formula** uses CICS statistics field names as variables. A formula can be as simple as a single field name, or it can be a combination of field names, arithmetic operators, and numbers.
- **Example:** current active user transactions as a percentage of the maximum task limit: **$XMGCAT / XMGMXT * 100$**
- A **threshold** consists of a comparison operator and a numeric value. Each threshold indicates a different severity.
- **Example:** **Critical > 95, Warning > 80, Info > 50**
- Conditions can be restricted to specific CICS resources and applids.

Summary of what's new in CICS PA

- New output format: JSON Lines
- New output destinations:
 - TCP port (for example, Splunk configured to listen for incoming data on a TCP port)
 - z/OS UNIX (zFS) files
- In addition to form-based output, you can now also write *statistics alerts* to JSON Lines. Previously, you could only write statistics alerts to a report.
- Time values can be output as a single ISO 8601 date and time of day representation (more details on this later)
- Corresponding enhancements to CSV output (e.g. ISO 8601 time stamps; write statistics alerts to CSV; forward CSV over TCP)
- New sample report set ANALYTIC, with report forms and statistics alert definition, to output JSON Lines that works with the sample Splunk app

Try the Splunk app yourself!

Install Splunk, the app, and then upload sample data

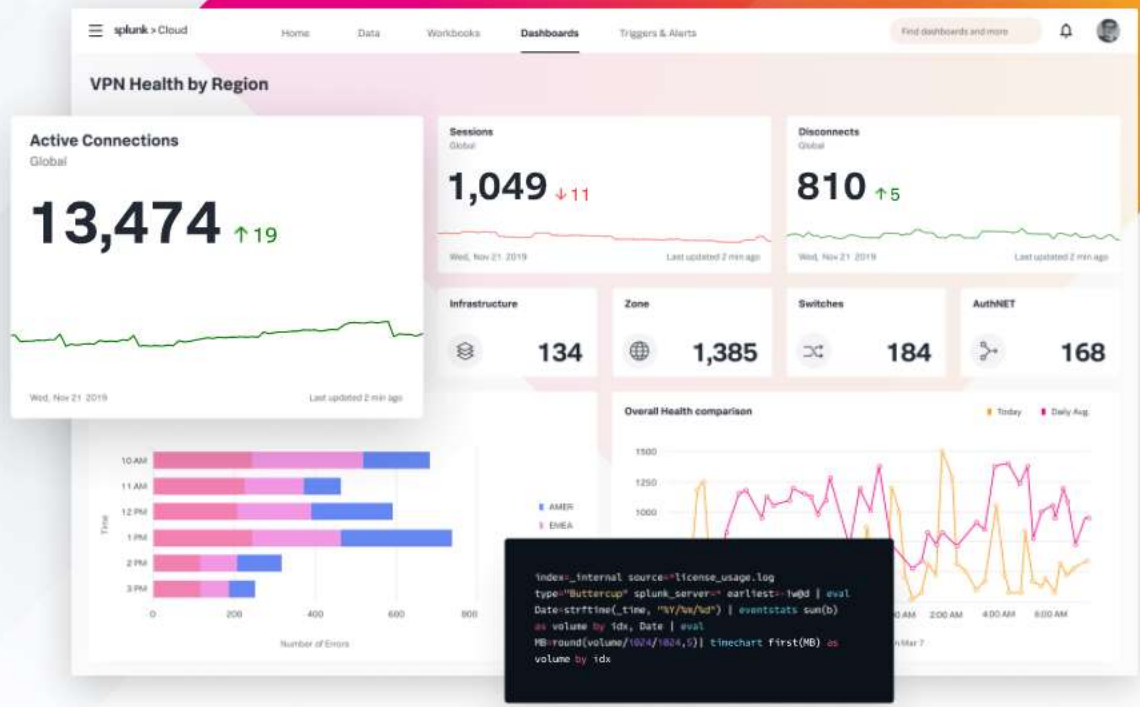
1. Install Splunk (the app was developed using Splunk **7.3.0**):
 - As a native application (for example, on Windows) or
 - In a Docker container
2. Install the CICS PA Splunk app:
 - Directly from the Splunk Web interface or
 - Download it from the Splunkbase website, and then install it
3. Download the sample data and doc (PDF) from the CICS SupportPac CA10 web page
4. Upload the sample data to Splunk
5. Use the app to view the sample data

On the splunk.com home page, click **Free Splunk**

The Data-to-Everything™ Platform

Drive outcomes across Security, IT and DevOps with the data platform built for the cloud.

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.conf20
splunk >

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Last Name

Job Title

Email Address

Phone Number

Company

United States ▾

Zip/Postal Code

Username

Password

Which would you like to try?

Cloud Trial

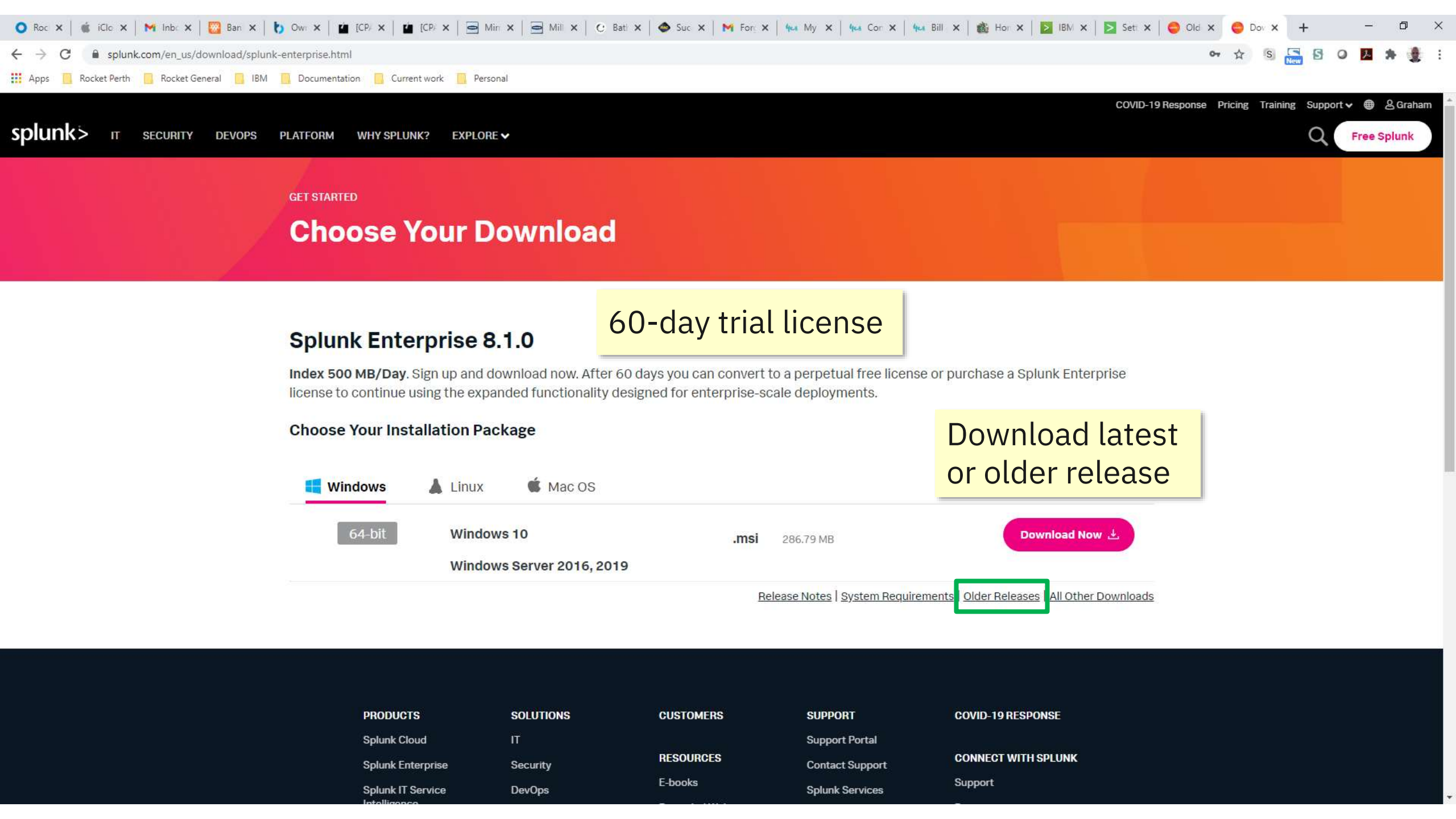
Software Download

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I'm not a robot



Create Your Account



GET STARTED

Choose Your Download

Splunk Enterprise 8.1.0

60-day trial license

Index 500 MB/Day. Sign up and download now. After 60 days you can convert to a perpetual free license or purchase a Splunk Enterprise license to continue using the expanded functionality designed for enterprise-scale deployments.

Choose Your Installation Package

Download latest or older release

Windows Linux Mac OS

64-bit

Windows 10

.msi 286.79 MB

Download Now

Windows Server 2016, 2019

[Release Notes](#) | [System Requirements](#) | [Older Releases](#) | [All Other Downloads](#)

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Add or forward data to Splunk. Afterwards, you may [extract fields](#).



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Apps and add-ons extend the capabilities of Splunk.



Splunk Docs [↗](#)

Comprehensive documentation for Splunk and for all other Splunk products.


Close

Choose a home dashboard

Browse More Apps

Best Match Newest Popular

1 Apps

 **IBM CICS Performance Analyzer for z/OS Sample App for Splunk** Install

Analyze CICS performance using data from IBM CICS Performance Analyzer for z/OS (CICS PA). This app configures Splunk to ingest data in JSON Lines format from CICS PA, and contains sample dashboards that visualize that data.

Category: IT Operations | Author: IBM CICS Tools | Downloads: 44 | Released: 8 months ago | Last Updated: 8 months ago | [View on Splunkbase](#)

2. Click **Install**

1. Type **cics pa** in the Search box, and then press Enter

- CATEGORY
- DevOps
 - IT Operations
 - Security, Fraud & Compliance
 - Business Analytics
 - IoT & Industrial Data
 - Utilities
- CIM VERSION
- 4.x
 - 3.x
- APP TYPE
- App
 - Add-on
- SUPPORT TYPE
- Developer
 - Splunk
 - Not Supported
- APP CONTENT
- Inputs
 - Alert Actions
 - Visualizations
- FEDRAMP
- Yes
 - No

Browse More Apps

cics pa X

- CATEGORY
 - DevOps
 - IT Operations
 - Security, Fraud & Compliance
 - Business Analytics
 - IoT & Industrial Data
 - Utilities
- CIM VERSION
 - 4.x
 - 3.x
- APP TYPE
 - App
 - Add-on
- SUPPORT TYPE
 - Developer
 - Splunk
 - Not Supported
- APP CONTENT
 - Inputs
 - Alert Actions
 - Visualizations
- FEDRAMP
 - Yes
 - No

Best Match Newest Popular

1 Apps

IBM CICS Performance Analyzer for z

Analyze CICS performance using data from IBM CICS Pa
Splunk to ingest data in JSON Lines format from CICS PA

Category: IT Operations | Author: IBM CICS Tools | Downloads: 4

[View on Splunkbase](#)

Login

Enter your Splunk.com username and password to download the app.

Ezriel_Gross

.....

[Forgot your password?](#)

The app, and any related dependency that will be installed, may be provided by Splunk and/or a third party and your right to use these app(s) is in accordance with the applicable license(s) provided by Splunk and/or the third-party licensor. Splunk is not responsible for any third-party app and does not provide any warranty or support. If you have any questions, complaints or claims with respect to an app, please contact the applicable licensor directly whose contact information can be found on the Splunkbase download page.

IBM CICS Performance Analyzer for z/OS Sample App for Splunk is governed by the following license: [IBM License Information](#)

I have read the terms and conditions of the license and agree to be bound by them. I accept that Splunk will securely send my login credentials over the Internet to splunk.com

Cancel Login and Install

1. If you have not already done so, go to Splunk.com and register yourself as a Splunk user

2. Click **Login and Install**


Browse More Apps

cics pa X

- CATEGORY
- DevOps
 - IT Operations
 - Security, Fraud & Compliance
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 - IoT & Industrial Data
 - Utilities
- CIM VERSION
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- Yes
 - No

Best Match Newest Popular

1 Apps



IBM CICS Performance Analyzer for z/OS Sample App for Splunk

Analyze CICS performance using data from IBM CICS Performance Analyzer for z/OS Sample App for Splunk to ingest data in JSON Lines format from CICS PA...

Category: IT Operations | Author: IBM CICS Tools | Downloads: 44 | Released: 8 months ago | Last Updated: 8 months ago | [View on Splunkbase](#)

Complete

IBM CICS Performance Analyzer for z/OS Sample App for Splunk was successfully installed.

Click **Go Home** or **Done**
(let's add some data
before we open the app)

Tip: If your Splunk instance cannot access the public web, then, separately, go to the Splunkbase website, **splunkbase.splunk.com**, search for **cics pa**, and download the app.

IBM Support

Now we've installed the app, let's get the sample data.
Go to the CICS SupportPac CA10 web page:
[ibm.com/support/pages/
ca10-cics-performance-analyzer-zos-output-json-lines](https://ibm.com/support/pages/ca10-cics-performance-analyzer-zos-output-json-lines)

CA10: CICS Performance Analyzer for z/OS - Output to JSON Lines

Download**Abstract**

SupportPac CA10 provides sample JSON Lines data output by IBM CICS Performance Analyzer for z/OS (CICS PA), and related user documentation.

Download Description

IBM CICS Performance Analyzer for z/OS (CICS PA) V5.4 with the PTF for APAR PH16158 introduces enhancements to output CICS performance and statistics data in JSON Lines format.

This SupportPac provides:

1. Sample JSON Lines data output by CICS PA
2. User documentation for the performance and statistics data enhancements

The sample JSON Lines data can be used with the [sample Splunk app for CICS PA](#), which is available on Splunkbase.

In addition to describing the CICS PA output to JSON Lines, the user documentation also describes corresponding enhancements to the existing output to comma-separated values (CSV) format.

Capabilities

The sample JSON Lines data provides the ability to:

- Test the sample Splunk app, without requiring the user to forward their own data to the app
- Test this data in the user's analytics platform of choice, without having to forward their own data

The user documentation describes how to:

Document Information**More support for:**

CICS Performance Analyzer for z/OS

Software version:

5.4

Operating system(s):

z/OS

Document number:

1282648

Modified date:

03 March 2020

Scroll down...

Installation Instructions

To download the files provided by this SupportPac click the links below.

Details on how to use this SupportPac are provided in the supplied PDF documentation.

Important: To view the sample data in the sample Splunk app for CICS PA, set the time range in the app dashboards to "Presets > Other > All time". Otherwise, the default time range of the dashboards (i.e. "Last 24 hours") will not show the sample data.

URL	LANGUAGE	SIZE
CICS PA V5.4 - Output to JSON Lines user documentation	US English	805668 B

Download the documentation (PDF)

Download Package

Download	RELEASE DATE	LANGUAGE	SIZE	Download Options
CICS PA V5.4 sample data in JSON Lines format	02 Mar 2020	US English	1576732 B	HTTPS

Download the sample data
(.zip file containing a .jsonl file)

Technical Support

SupportPacs in this category are available at no charge and provided "AS-IS", under the terms and conditions of the IBM International License Agreement for Non-Warranted Programs and of the associated License Information and other documentation. The terms and conditions of this license DO NOT provide for any entitlement to defect correction.

To determine if you want to use this SupportPac, read the accompanying license agreement.

Other CICS SupportPacs

Other SupportPacs are available for the CICS portfolio of products. Visit the [CICS SupportPacs Home Page](#).

Product Synonym

CICS PA/CICS Performance Analyzer

Expand the .zip file

Apps ⚙️

> Search & Reporting

App IBM CICS Performance Analyzer for z/OS

+ Find More Apps

Explore Splunk



Add Data

Add or forward data to Splunk. Afterwards, you may [extract fields](#).



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Comprehensive documentation for Splunk and for all other Splunk products.







Back at the Splunk Web home page, click **Add Data** (or, from the menu, Settings > Add Data)

Choose a home dashboard

Close

What data do you want to send to the Splunk platform?

Follow guides for onboarding popular data sources




 Cloud computing Get your cloud computing data in to the Splunk platform. 10 data sources	 Networking Get your networking data in to the Splunk platform. 2 data sources	 Operating System Get your operating system data in to the Splunk platform. 1 data source	 Security Get your security data in to the Splunk platform. 3 data sources
---	---	---	--

4 data sources in total

Or get data in with the following methods

Click **Upload**



 Upload files from my computer Local log files Local structured files (e.g. CSV) Tutorial for adding data	 Monitor files and ports on this Splunk platform instance Files - HTTP - WMI - TCP/UDP - Scripts Modular inputs for external data sources	 Forward data from a Splunk forwarder Files - TCP/UDP - Scripts
--	---	--

Add Data



< Back

Next >

Click **Select File**



Select Source

Choose a file to upload to the Splunk platform, either by browsing your computer or by dropping a file into the target box below. [Learn More](#)

Selected File: **No file selected**

Select File

Drop your data file here

The maximum file upload size is 500 Mb

FAQ

- > What kinds of files can the Splunk platform index?
- > What is a source?
- > How do I get remote data onto my Splunk platform instance?

Add Data



< Back Next >

Open

This PC > Windows (C:) > temp > ca10_cicspa_json_lines_sample_data.1.0.0

Search ca10_cicspa_json_lines...

Organize New folder

Name	Date modified	Type	Size
Licenses	2020-02-26 7:49 PM	File folder	
cicspa_sample_data.1.0.0.jsonl	2020-02-26 5:56 PM	JSONL File	51,021 KB

Select the **.jsonl** file from the sample data .zip file

File name: cicspa_sample_data.1.0.0.jsonl All Files (*.*)

Open Cancel

Add Data



< Back Next >

2. Click **Next**

Select Source

Choose a file to upload to the Splunk platform, either by browsing your computer or by dropping a file into the target box below. [Learn More](#)

Selected File: **cicspa_sample_data.10.0.jsonl**

Select File

Drop your data file here

The maximum file upload size is 500 Mb

Done

FAQ

- > What kinds of files can the Splunk platform index?
- > What is a source?
- > How do I get remote data onto my Splunk platform instance?

1. Wait for the **Done** message

Add Data



Set Source Type

This page lets you see how the Splunk platform processes your data. If not, use the options below to change your data, create a new one by clicking "Save".

Source: **cicspa_sample_data.1.0.0.jsonl**

Source type: default

filter

- Default Setting
- Splunk's default settings

- Application**
- Database
- Email
- Log to Metrics
- Metrics
- Miscellaneous
- Network & Security
- Operating System
- Structured
- Uncategorized
- Web

- catalina
- Output produced by Apache Tomcat Catalina (System.out and System.err)
- cicspa**
- JSON Lines produced by IBM CICS Performance Analyzer for z/OS
- log4j
- Output produced by any Java 2 Enterprise Edition (J2EE) application server using log4j
- log4net_xml
- An XML formatted output of the Apache log4j framework to the Microsoft .NET

Click **Source type** > **Application** > **cicspa**

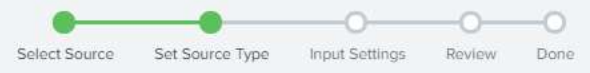
20 Per Page

View Event Summary

< Prev 1 2 3 4 5 6 7 8 ... Next >

Event	
1 8/30/19 4:00:00.000 PM	<pre>{ [-] APPLID: FWUTCIC Collection Time: 2019-08-31T00:00:00+08:00 Connection Name: FWAR Failed Allocates Other Reasons: 0 Failed Link Allocates: 0 Image: FTS1 Queued Allocates: 0 }</pre>
2 8/30/19 4:00:00.000 PM	<pre>{ [-] APPLID: FWUTCIC Collection Time: 2019-08-31T00:00:00+08:00 Connection Name: WJXW Failed Allocates Other Reasons: 0 Failed Link Allocates: 0 Image: FTS1 Queued Allocates: 0 Total Allocates: 0 Type: EOD code: CONECTIO stid: 052A }</pre>
3 8/30/19 4:00:00.000 PM	<pre>{ [-] APPLID: TXCQAIC Collection Time: 2019-08-31T00:00:00+08:00 Connection Name: QAAR Failed Allocates Other Reasons: 0 Failed Link Allocates: 0 Image: FTS1 Queued Allocates: 0 }</pre>

Add Data



< Back Next >

Click Next

Set Source Type

This page lets you see how the Splunk platform sees your data before indexing. If the events look correct and have the right timestamps, click "Next" to proceed. If not, use the options below to define proper event breaks and timestamps. If you cannot find an appropriate source type for your data, create a new one by clicking "Save As".

Source: cicspa_sample_data.1.0.0.jsonl

View Event Summary

Source type: cicspa

Save As

- Event Breaks
- Timestamp
- Advanced

List Format 20 Per Page < Prev 1 2 3 4 5 6 7 8 ... Next >

	Time	Event
1	8/30/19 4:00:00.000 PM	{ [-] APPLID: FUWTCIC Collection Time: 2019-08-31T00:00:00+08:00 Connection Name: FWAR Failed Allocates Other Reasons: 0 Failed Link Allocates: 0 Image: FTS1 Queued Allocates: 0 Total Allocates: 0 Type: EOD stid: 052A } Show as raw text
2	8/30/19 4:00:00.000 PM	{ [-] APPLID: FUWTCIC Collection Time: 2019-08-31T00:00:00+08:00 Connection Name: WJXW Failed Allocates Other Reasons: 0 Failed Link Allocates: 0 Image: FTS1 Queued Allocates: 0 Total Allocates: 0 Type: EOD stid: 052A } Show as raw text
3	8/30/19 4:00:00.000 PM	{ [-] APPLID: TXCQAIC Collection Time: 2019-08-31T00:00:00+08:00 Connection Name: QAAR Failed Allocates Other Reasons: 0 Failed Link Allocates: 0 Image: FTS1 Queued Allocates: 0 Total Allocates: 0 Type: EOD

Add Data



< Back Review >

3. Click **Review**

Input Settings

Optionally set additional input parameters for this data input as follows:

Host

When the Splunk platform indexes data, each event receives a "host" value. The host value should be the name of the machine from which the event originates. The type of input you choose determines the available configuration options. [Learn More](#)

- Constant value
- Regular expression on path
- Segment in path

Host field value

1. Set **Host field value** to your choice (typically, this value is not important)

Index

The Splunk platform stores incoming data as events in the selected index. Consider using a "sandbox" index as a destination if you have problems determining a source type for your data. A sandbox index lets you troubleshoot your configuration without impacting production indexes. You can always change this setting later. [Learn More](#)

Index: Create a new index

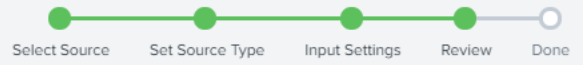
- ✓ Default
- cicspa
- history
- main
- summary

2. Set **Index** to **cicspa**

FAQ

- > How do indexes work?
- > How do I know when to create or use multiple indexes?

Add Data



< Back

Submit >

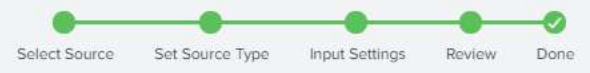
Click **Submit**

Review

Input Type Uploaded File
File Name cicspa_sample_data.1.0.0.jsonl
Source Type cicspa
Host CICS-DEMO
Index cicspa

- Search & Reporting >
- IBM CICS Performance Analyzer for z/OS
- Manage Apps
- Find More Apps

Add Data



< Back Next >

Click Apps > IBM CICS Performance...

Don't click this

✓ File has been uploaded successfully.
Configure your inputs by going to [Settings > Data Inputs](#).

- Start Searching** Search your data now or see [examples and tutorials](#).
- Extract Fields Create search-time field extractions. [Learn more about fields](#).
- Add More Data Add more data inputs now or see [examples and tutorials](#).
- Download Apps Apps help you do more with your data. [Learn more](#).
- Build Dashboards Visualize your searches. [Learn more](#).

Edit Export ...

Transaction overview

Based on CICS monitoring facility performance class data, summarized by CICS Performance Analyzer

Time range: Applid: CICS transaction: Top # results: Extra search filter:

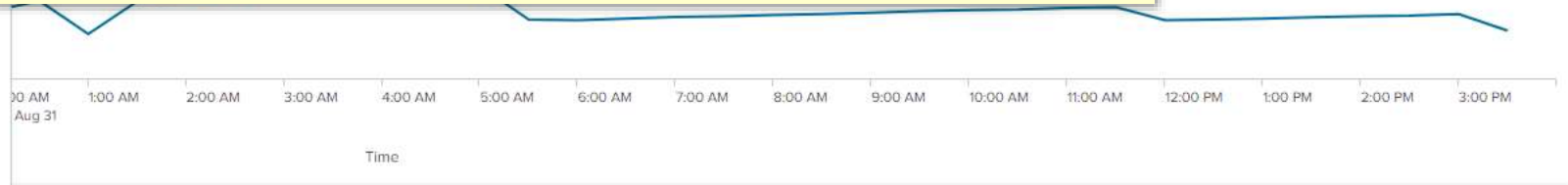
[Hide Filters](#)

Presets

- Relative
 - Today
 - Week to date
 - Business week to date
 - Month to date
 - Year to date
 - Yesterday
 - Previous week
 - Previous business week
 - Previous month
 - Previous year
- Date Range
- Date & Time Range
- Advanced

Other
All time

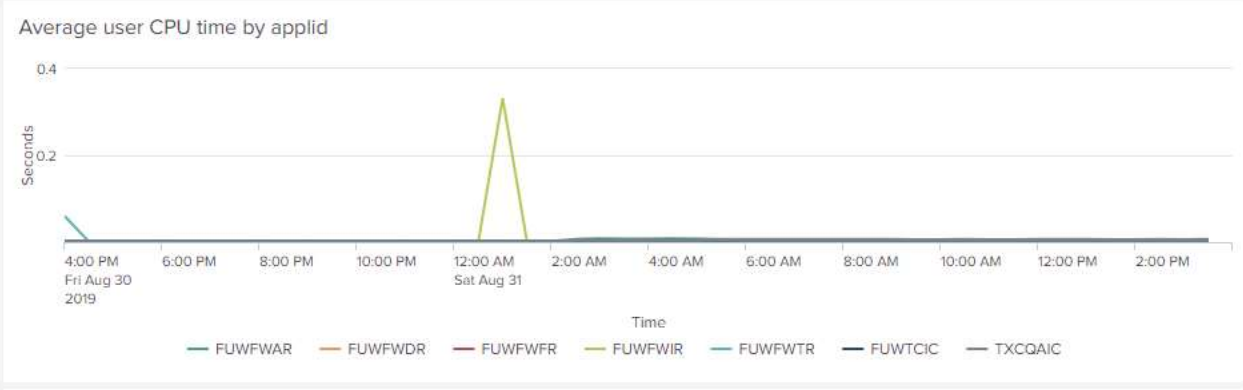
Click Time Range > Presets > Other: All time



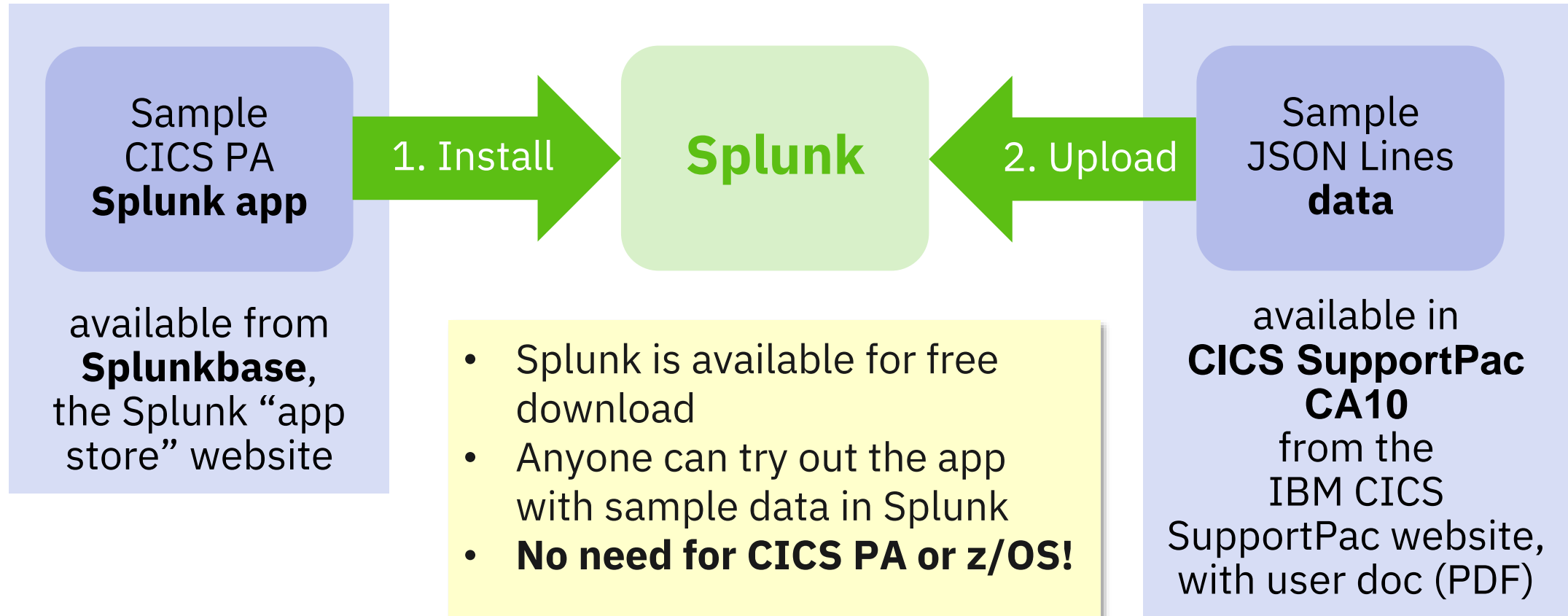
5:00+00:00. Local times (times with no zone designator) are in time zone +00:00. [Set dashboard to selection](#)

0.003
Average User CPU Time

1.360
Average Response Time



Sample Splunk app and data: free downloads



How to forward JSON Lines from CICS PA

New report category: Forwarding

EDIT

Report Set - ANALYTIC

Row 9 of 18

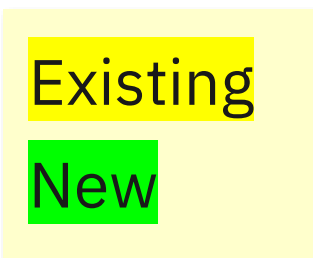
Command ==>

Scroll ==> CSR

Description . . . Analytics Sample Report Set

Enter "/" to select action.

	** Reports **	Active
—	Extracts	<u>No</u>
-	— Cross-System Work	<u>No</u>
—	— Performance	<u>No</u>
—	— Record Selection	<u>No</u>
—	— HDB Load	<u>No</u>
—	— System Logger	<u>No</u>
—	— Statistics	<u>No</u>
-	— Forwarding	<u>Yes</u>
—	— Performance	<u>Yes</u>
—	— Statistics	<u>Yes</u>
	** End of Reports **	



Performance Forwarding: sample report forms

```

                                ANALYTIC - Performance Forwarding
Command ==> _____ Row 1 from 3
                                Scroll ==> PAGE

  _____ System Selection _____
/ Exc APPLID + Image + Group + Recap Form + Alert + Selection
  *   _____          _____          _____  _____  _____  _____  Criteria
  _____          _____          _____  _____  _____  _____  _____
-----
  _____          _____          _____  _____  _____  _____  _____
-----
  _____          _____          _____  _____  _____  _____  _____
-----
***** Bottom of data *****

```

All you need to do is select your systems. The sample ANALYTIC report set refers to sample report forms that forward the data required by the sample Splunk app. No additional configuration required.

Statistics Forwarding: sample report forms

Sample statistics report forms and statistics alerts definition also supplied.

ANALYTIC - Statistics Forwarding Row 1 from 18

Command ==> Scroll ==> PAGE

System Selection			Recap	Form +	Alert +	
/ Exc	APPLID +	Image +	Group +	TRNMANAG	TRNMANAG	
---	---	---	---	TRNCLAS	TRNCLAS	---
---	---	---	---	TRANDUMP	TRANDUMP	---
---	---	---	---	DISPOVER	DISPOVER	---
---	---	---	---	DISPTCBM	DISPTCBM	---
---	---	---	---	DISPTCBP	DISPTCBP	---
---	---	---	---	ENQMANAG	ENQMANAG	---
---	---	---	---	STORAGE	STORAGE	---
---	---	---	---	DSA	DSA	---
---	---	---	---	TDQUEUES	TDQUEUES	---
---	---	---	---	TSQUEUES	TSQUEUES	---
---	---	---	---	CONNECTIO	CONNECTIO	---
---	---	---	---	DB2CONNS	DB2CONNS	---
---	---	---	---	DB2ENTRY	DB2ENTRY	---
---	---	---	---	LOGSTREM	LOGSTREM	---
---	---	---	---	MVSLOGST	MVSLOGST	---
---	---	---	---	SYSDUMPS	SYSDUMPS	---
---	---	---	---	SYSALERT	---	CTSKEY

Example forwarding panel

ANALYTIC - Performance **Forwarding**

Command ==>

System Selection:

APPLID . . _____ +
Image . . _____ +
Group . . _____ +

Forwarding Recap:

DDname . . . TRANLIST

Forwarding Focus:

Form TRANLIST +
Alert _____ +
Severity . . _____ +

Summary Processing Options:

Interval . . . 00:01:00 (hh:mm:ss)
Override Form _____ +
Timestamp . . . _____ +

Forwarding Format:

2 1. CSV 2. **JSON**
_ Options

Connection Settings Override:

Port _____

Selection Criteria:

_ Performance

Repository . . : MYID.CPA.REPOSTRY

Very similar to the existing
Performance Extract panel

New dialog option 0.6: Connection Settings

Connection Settings

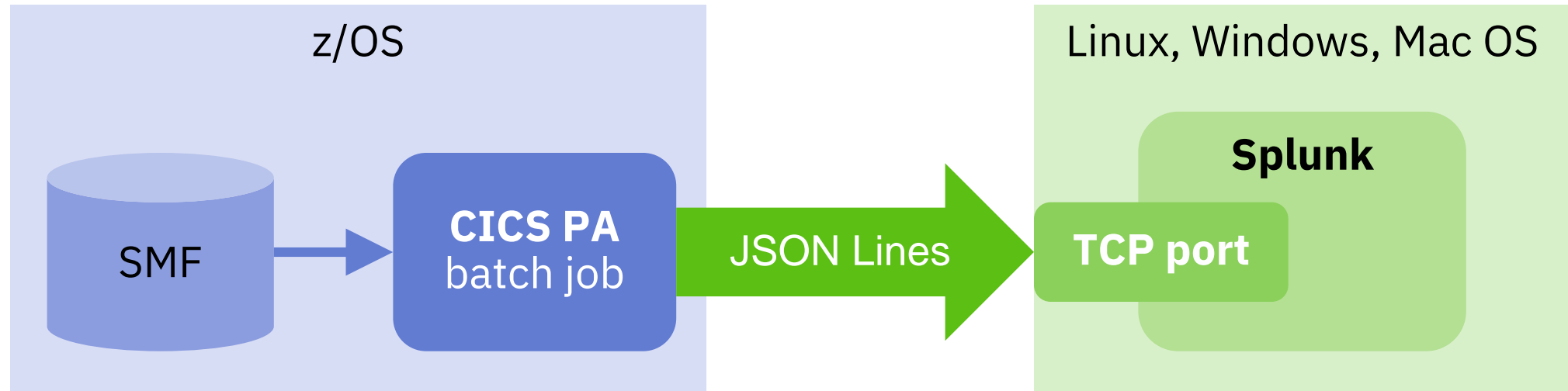
Command ==>

```
Host . . . . . MYSPLUNK
Port . . . . . 11516 (1-65535)
Timeout . . . . . _____ (seconds)
Security . . . . . _ 1. None 2. TLS
  FIPS . . . . . _ (Y/N)
  Key ring . . . . . _____ +
  Stash file . . . . . _____ +
  Password . . . . . _____ +
  Ciphers . . . . . _____ +
  Label . . . . . _____
```

Default timeout is no timeout.
Security settings are only required
for SSL/TLS connection.

Connection settings are not shared with other
users; they are stored in each user's ISPF profile.

Example process



CICS PA 5.4 with the
PTF for APAR PH16158

New CICS PA control operand: CONNECTION

```
CONNECTION(HOST('host_name'),  
           PORT(port_number),  
           [TIMEOUT(seconds)|TIMEOUT(0)],  
           [Security parameters])
```

Security parameters are required only for secure (SSL/TLS) connections:

```
SECURITY(TLS*|TLSV1.2|TLSV1.1|TLSV1.0,...),  
[FIPS,]  
KEYRING(' [user_id/]saf_key_ring_name' |  
        '*TOKEN*/pkcs#11_token_name' |  
        'pkcs#12_unix_file_path' |  
        'key_database_unix_file_path'),  
[PASSWORD('password')|STASH('stash_unix_file_path')]  
[CIPHERS(cipher_suites),]  
[CERTLABEL('label')]
```


New parameters of CICS PA report operands

New parameters are shown **highlighted**:

```
CICSPA [LIST|SUMMARY|STATISTICSLIST|STATISTICSSUMMARY|STATSALERT] (  
...  
[JSON,]  
[LABELS(label-options)|NOLABELS,]  
[CODE('string'),]  
[EBCDIC|ASCII,]  
[MISSING(INCLUDE|EXCLUDE),]  
[TIMEFORMAT(ISO8601),]  
[EOL(CR|CRLF|LF|NEWLINE)|NOEOL,]  
[OUTZONE(Z|+hh:mm|-hh:mm),]  
[STREAM[,PORT(port-number)]]  
...  
)
```

About the JSON Lines from CICS PA

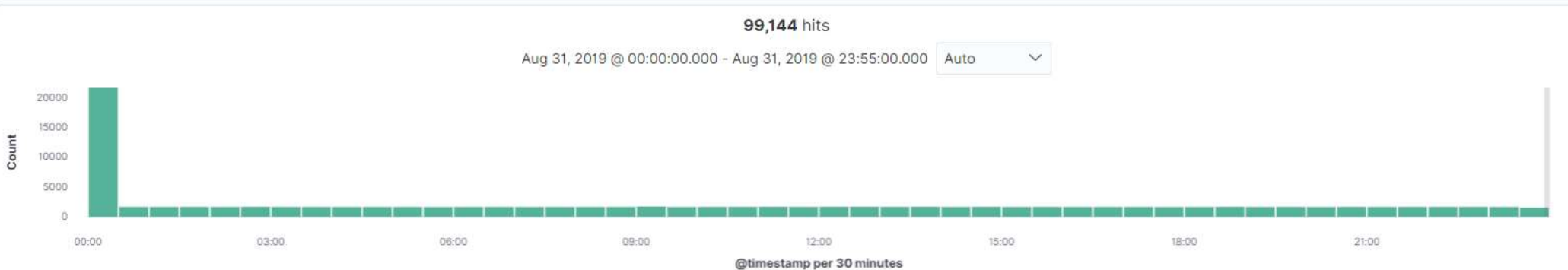
JSON Lines from CICS PA is *not* Splunk-centric

- The JSON Lines from CICS PA was designed to be ingested by any application that understands JSON Lines
- For example, you can forward exactly the same JSON Lines that you forward to Splunk to **Elastic Stack**, and develop dashboards in Kibana
- The documentation supplied with CICS SupportPac CA10 contains step-by-step instructions for configuring the Elastic Stack to use JSON Lines from CICS PA
- There is no Kibana equivalent of the IBM-supplied sample Splunk app for CICS PA

Data from CICS PA data ingested in the Elastic Stack

00:00:00.0 → Aug 31, 2019 @ 23:55:00.0

Refresh



Time	_source
> Aug 31, 2019 @ 23:55:00.000	Type: INT code: conectio Collection Time: Aug 31, 2019 @ 23:55:00.000 Total Allocates: 0 @version: 1 host: PER-L-GH01 Failed Allocates Other Reasons: 0 @timestamp: Aug 31, 2019 @ 23:55:00.000 Image: FTS1 Queued Allocates: 0 Failed Link Allocates: 0 Connection Name: FWAR stid: 052A APPLID: FUFWTR _id: y8fobXUBXUwATwJbEX0s _type: _doc _index: cicspa-conectio-2019.08.31 _score: -
> Aug 31, 2019 @ 23:55:00.000	Type: INT code: conectio Collection Time: Aug 31, 2019 @ 23:55:00.000 Total Allocates: 0 @version: 1 host: PER-L-GH01 Failed Allocates Other Reasons: 0 @timestamp: Aug 31, 2019 @ 23:55:00.000 Image: FTS1 Queued Allocates: 0 Failed Link Allocates: 0 Connection Name: FWFR stid: 052A APPLID: FUFWTR _id: zMfobXUBXUwATwJbEX0s _type: _doc _index: cicspa-conectio-2019.08.31 _score: -
> Aug 31, 2019 @ 23:55:00.000	Type: INT code: conectio Collection Time: Aug 31, 2019 @ 23:55:00.000 Total Allocates: 0 @version: 1 host: PER-L-GH01 Failed Allocates Other Reasons: 0 @timestamp: Aug 31, 2019 @ 23:55:00.000 Image: FTS1 Queued Allocates: 0 Failed Link Allocates: 0 Connection Name: FWIR stid: 052A APPLID: FUFWTR _id: zcfobXUBXUwATwJbEX0s _type: _doc _index: cicspa-conectio-2019.08.31 _score: -
> Aug 31, 2019 @ 23:55:00.000	Current ICV Time: 5 CICS TCB MODEs: 18 CICS TCB POOLs: 4 Type: INT code: dispover Address Space CPU Time: 0.13 Collection Time: Aug 31, 2019 @ 23:55:00.000 Address Space SRB Time: 0.095 @version: 1 host: PER-L-GH01 @timestamp: Aug 31, 2019 @ 23:55:00.000 Image: FTS1 stid: 062A Current ICVR Time: 500 APPLID: FUFWTR _id: A8fobXUBXUwATwJbG4I _type: _doc _index: cicspa-dispover-2019.08.31 _score: -
> Aug 31, 2019 @ 23:55:00.000	Total TCB Dispatch Time: 0.699 TCB Mode Name: QR TCB CPU / Dispatch Ratio: 18.5 Type: INT code: disptcbm Collection Time: Aug 31, 2019 @ 23:55:00.000 @version: 1 host: PER-L-GH01 Total TCB CPU Time: 0.129 @timestamp: Aug 31, 2019 @ 23:55:00.000 Image: FTS1 stid: 062B APPLID: FUFWTR _id: PcfobXUBXUwATwJbMsA2 _type: _doc _index: cicspa-disptcbm-2019.08.31 _score: -
> Aug 31, 2019 @ 23:55:00.000	Total TCB Dispatch Time: 0 TCB Mode Name: RO TCB CPU / Dispatch Ratio: 0 Type: INT code: disptcbm Collection Time: Aug 31, 2019 @ 23:55:00.000 @version: 1 host: PER-L-GH01 Total TCB CPU Time: 0 @timestamp: Aug 31, 2019 @ 23:55:00.000 Image: FTS1 stid: 062B APPLID: FUFWTR _id: PsfobXUBXUwATwJbMsA2 _type: _doc _index: cicspa-disptcbm-2019.08.31 _score: -
> Aug 31, 2019 @ 23:55:00.000	Total TCB Dispatch Time: 0 TCB Mode Name: CO TCB CPU / Dispatch Ratio: 0 Type: INT code: disptcbm Collection Time: Aug 31, 2019 @ 23:55:00.000 @version: 1 host: PER-L-GH01 Total

Rudimentary visualization in Kibana:
number of tasks by applid over time

Save Share Inspect

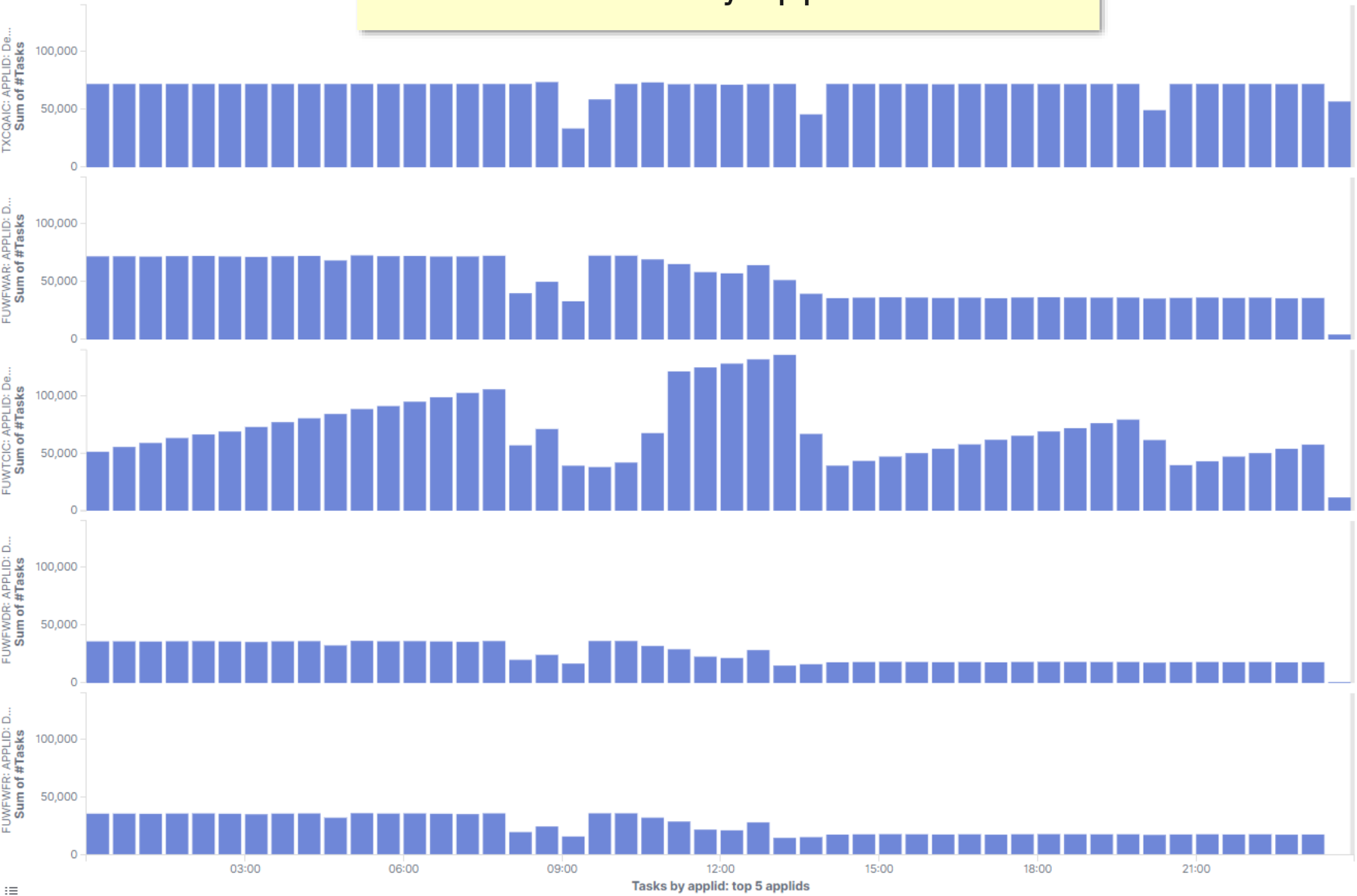
Search

KQL

Aug 31, 2019 @ 00:00:00.0 → Aug 31, 2019 @ 23:55:00.0

Refresh

+ Add filter



cicspa-transum-*

Data Metrics & axes Panel settings

Metrics

Y-axis

Aggregation

Sum

Field

#Tasks

Custom label

Advanced

+ Add

Buckets

X-axis

Aggregation

Date Histogram

Field

@timestamp

Minimum interval

Auto

Select an option or create a custom value. Examples: 30s, 20m, 24h, 2d, 1w, 1M

Drop partial buckets

Custom label

Discard

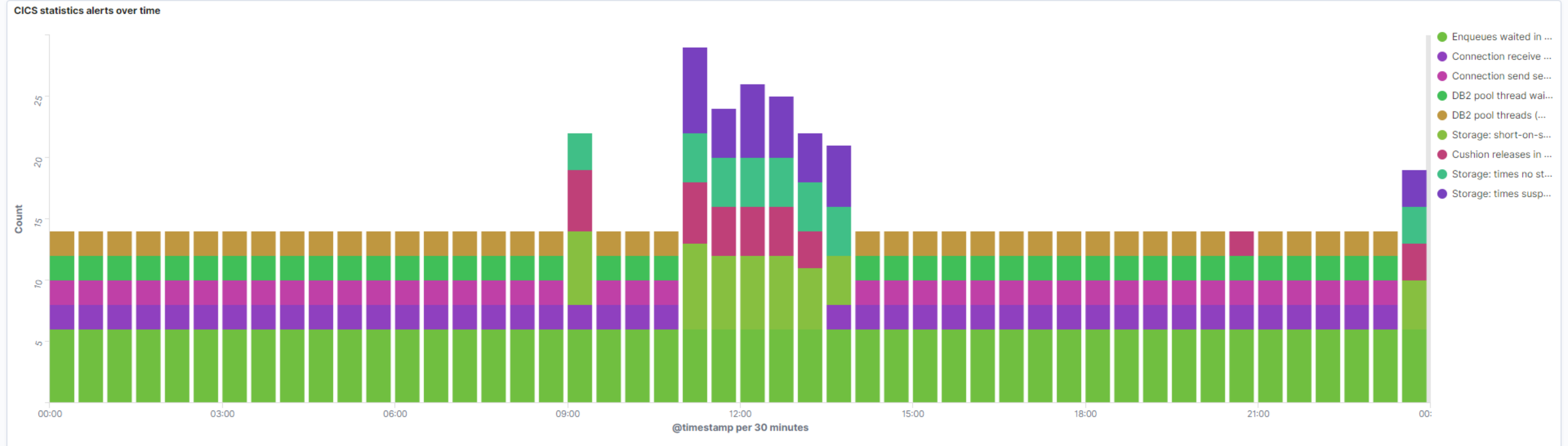
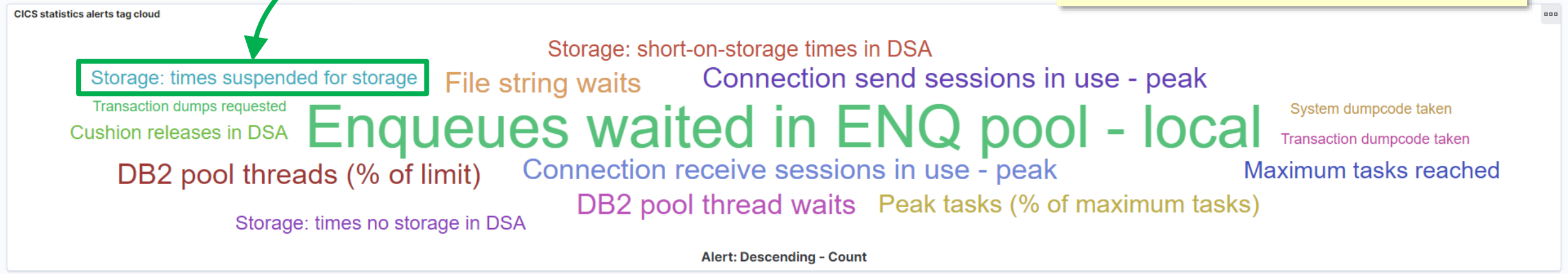
Update

Full screen Share Clone Edit

Search
+ Add filter

Click a "tag" to create a dynamic filter

Early prototype: statistics alerts in a Kibana dashboard



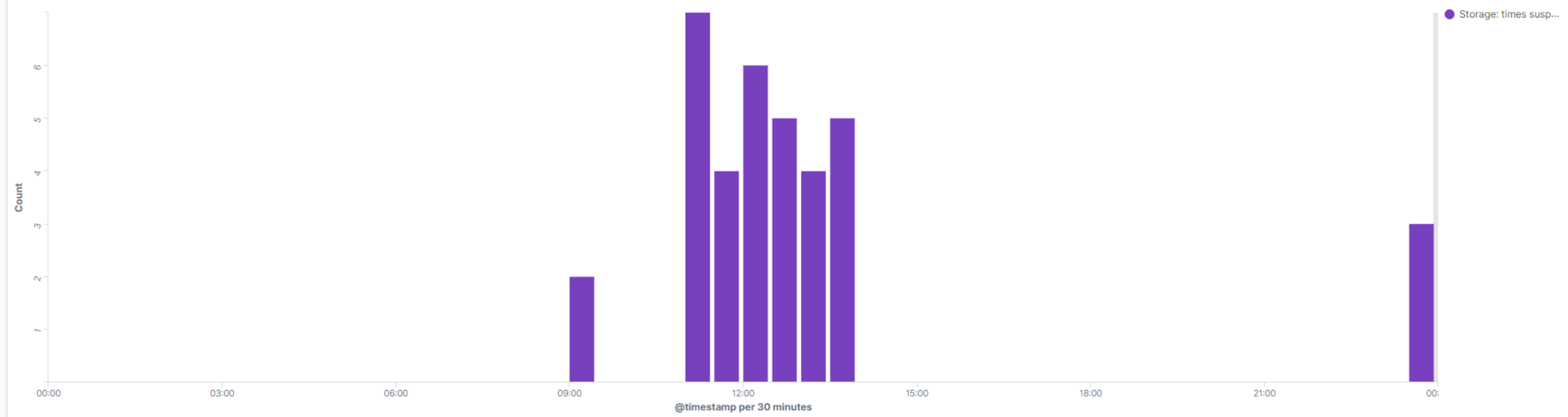
Alert: Storage: times suspended for storage X Add filter

Data now filtered by the selected alert

Storage: times suspended for storage

Alert: Descending - Count

CICS statistics alerts over time



Example JSON Lines output: performance list

```
{  
  "code": "perf_list",  
  "APPLID": "FUWTCIC",  
  "Tran": "CWYN",  
  "Start": "2020-10-20T00:00:00.885283+08:00",  
  "Dispatch Time": 0.0687,  
  "User CPU Time": 0.0011,  
  "Suspend Time": 0.7523,  
  "TaskNo": "54272"  
}
```

- The `code` property maps to a Splunk source type
- Elapsed time fields are in seconds
- Simple, “flat” sequence of key/value pairs: no nested structures

Example JSON Lines output: statistics alert

```
{  
  "code": "SYSALERT",  
  "Collection Time": "2020-10-31T00:00:00+08:00",  
  "Sev": "C",  
  "Alert": "File string waits",  
  "APPLID": "FUWFR",  
  "Image": "FTS1",  
  "System Type": "TS",  
  "Interval Type": "EOD",  
  "Threshold": ">25",  
  "Actual": 467,  
  "Resource": "File_Name",  
  "Resource value": "MBKACCT1",  
  "stid": "067A"  
}
```

Time stamps in ISO 8601 date and time of day format

- *yyyy-mm-ddThh:mm:ss.SSSSSS* with optional trailing zone designator *+hh:mm*, *-hh:mm*, or *Z*
- Example:

```
"Start" : "2020-10-20T00:00:00.885283+08:00" ,
```
- Even if you're not interested in JSON or Splunk, this combined date/time format is a useful enhancement for extracting CICS PA data in CSV format

Data volume

- Performance list data—one event per transaction—is potentially very high volume.
- Other data types (performance summary, statistics) are relatively low volume.
- With CICS PA, you can reduce data volume by:
 - Using report forms with very few fields
 - Using selection criteria to only forward events for selected applids and/or tran codes
 - Forwarding performance list data only for short time periods of special interest rather than continuously, 24/7
 - With summary report forms, specifying longer reporting intervals
- **Summarization is a key strength of CICS PA:** you can forward useful data to analytics platforms at relatively low volumes.

More information

- Go to IBM Support website > [CICS SupportPac CA10: CICS Performance Analyzer for z/OS - Output to JSON Lines](#)
- Read the documentation (PDF) available for download on the SupportPac page
- The documentation includes topics about:
 - Using the sample Splunk app
 - Configuring the Elastic Stack to ingest JSON Lines from CICS PA
 - Using the JSON Lines from CICS PA in any application that can understand JSON Lines

Questions?