Runtime metrics collection (RTMC) Update

Operations and coverage

Josh Wisniewski

2025 TPF Users Group Conference
May 4-7, Austin, TX

IBM Z

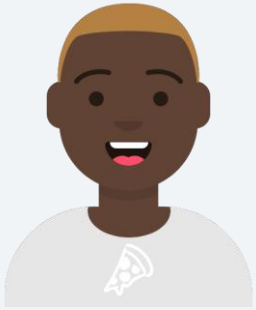
IBM

CDC enhancements for all RTMC users!

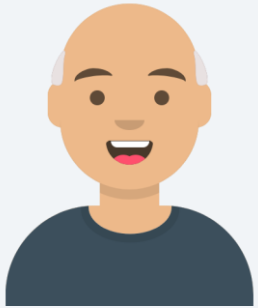
Derrick
operator

Carol
coverage programmer

Zach
application developer



Lawrence
test engineer



Calvin
capacity planner

Marcus
data scientist

PJ47254 (Jul 2024) CDC dashboards

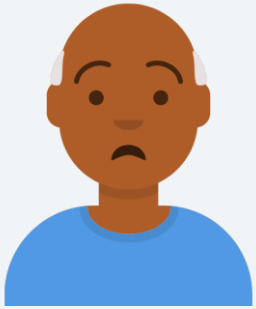
As-Is:

- Runtime metrics collection (RTMC) dashboards provided for REST, business events, and some key system metrics (CPU, ECBs, IOBs).
- You must use IBM Tivoli Monitoring Agent for z/TPF to see CDC data types not supported by RTMC.

PJ47254 (Jul 2024) CDC dashboards

Problem Statement:

- Everyone wants all CDC metrics to be displayed in RTMC dashboards.



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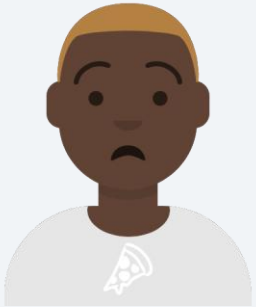

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test engineer

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PJ47254 (Jul 2024) CDC dashboards

To-Be:

- All CDC data types that were viewable in IBM Tivoli Monitoring Agent are now viewable in RTMC dashboards including CDC_TPFDF.
  - Support for IBM Tivoli Monitoring Agent for z/TPF ended 28 June 2024.

- For the DASD metrics data type (MOD level metrics), RTMC provides table definitions, python processing, summarization, and pruning. A dashboard is not currently available.

PJ47254 (Jul 2024) CDC dashboards

Solution Statement:

- Everyone HAS all CDC metrics displayed in RTMC dashboards!

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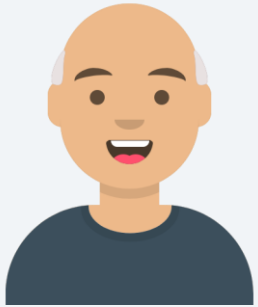

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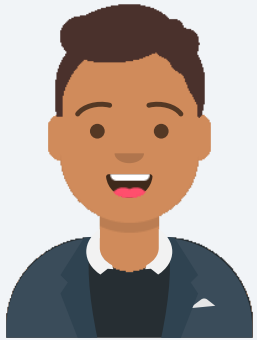
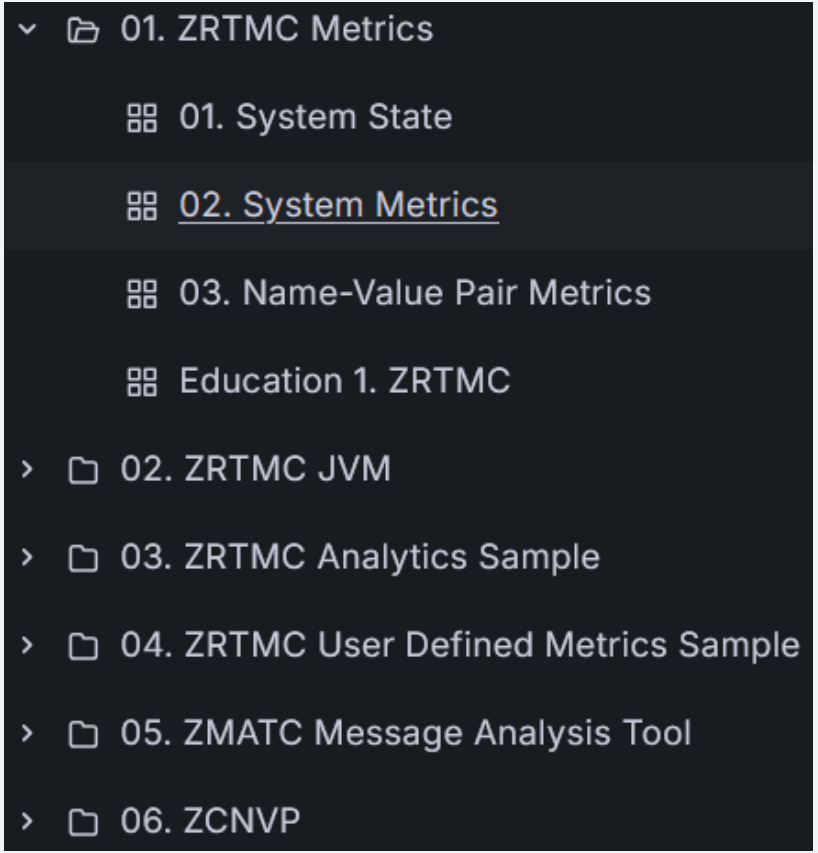


Marcus
data scientist

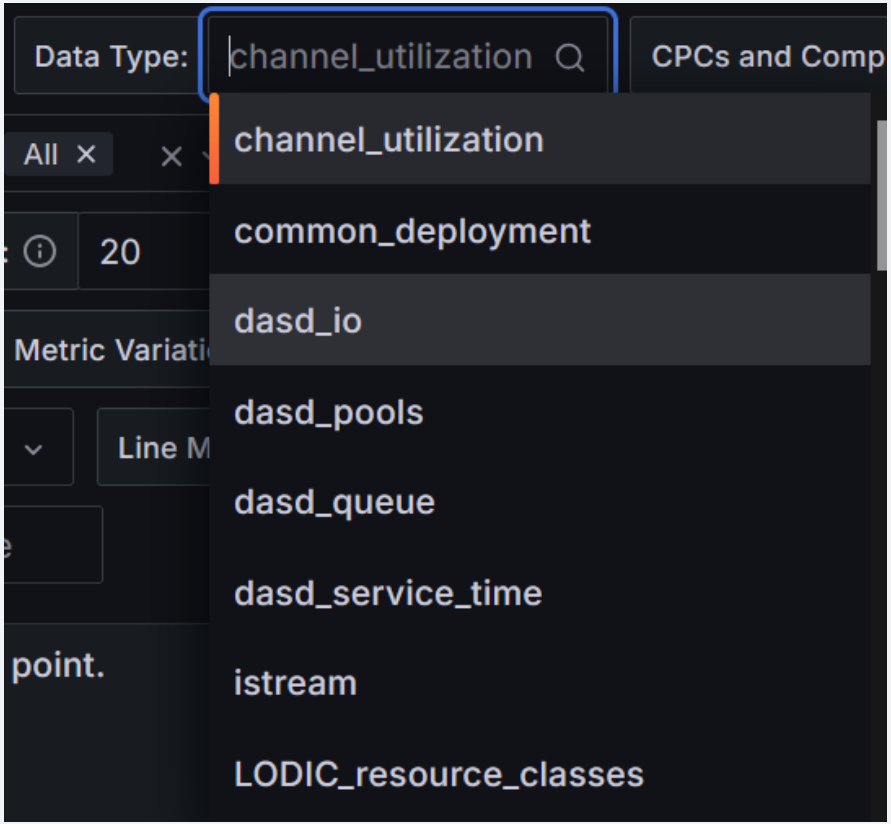
PJ47254 (Jul 2024) CDC dashboards – default folder layout

- Default folder layout is modified to better prioritize the dashboards by likely usage.
- **02. System Metrics** dashboard shows all CDC data types.



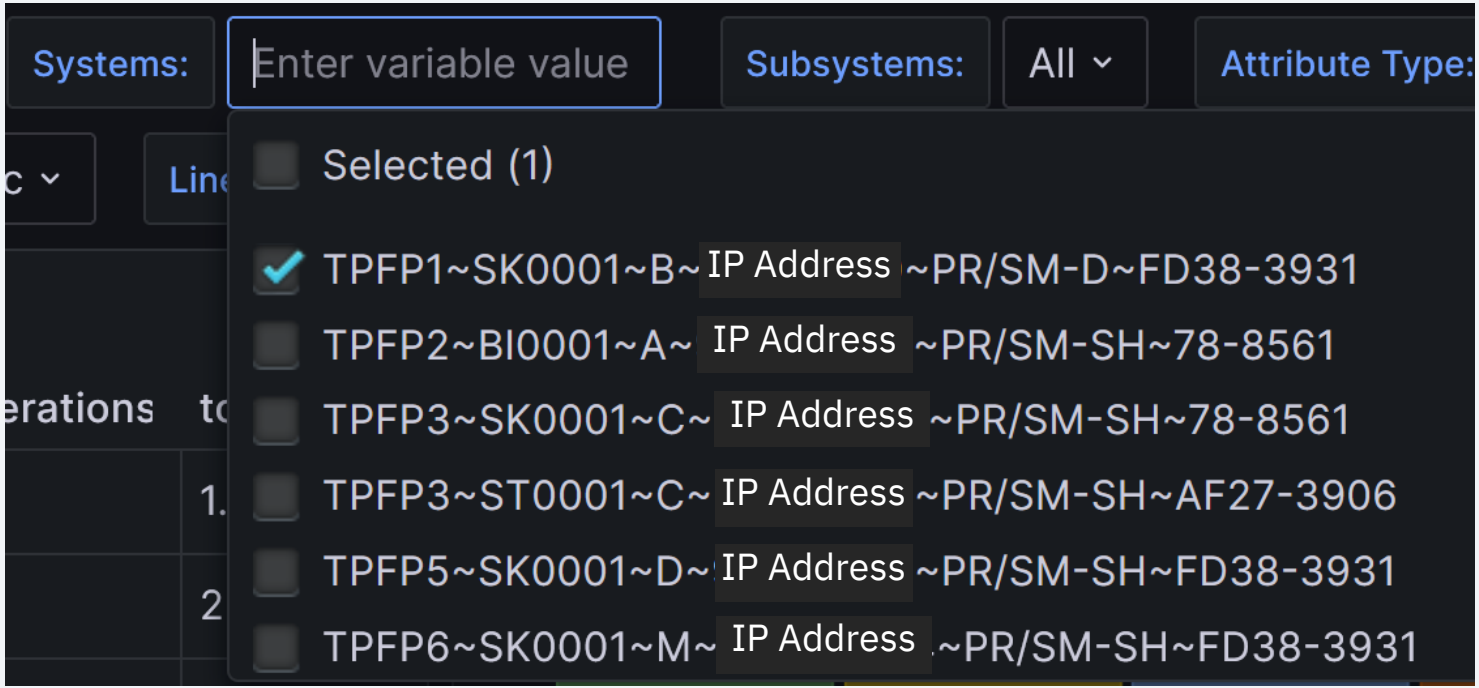
PJ47254 (Jul 2024) CDC dashboards – CDC data types

- Select the CDC data type of interest.



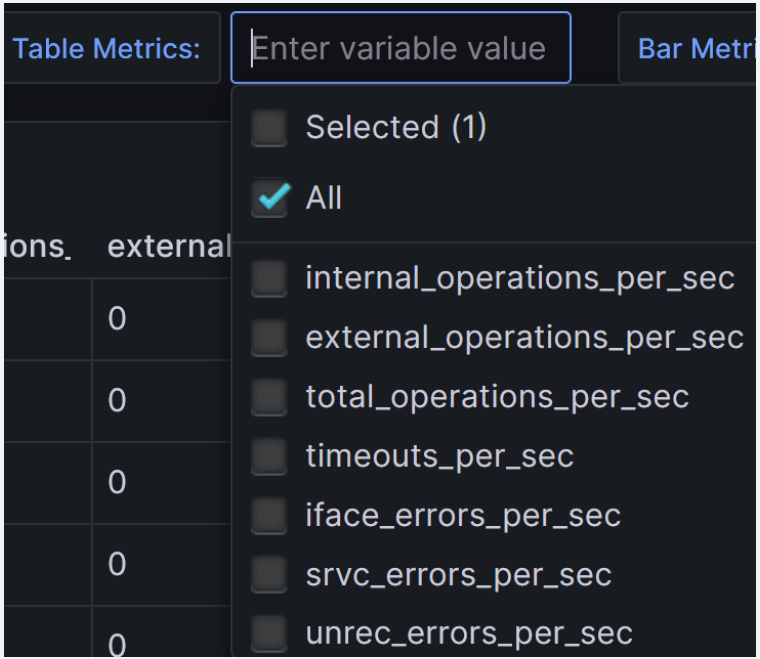
PJ47254 (Jul 2024) CDC dashboards – core features

- View metrics across multiple systems on single dashboard.



PJ47254 (Jul 2024) CDC dashboards – core features

- Filter by subsystem or attributes such as z/TPFDF file ID, REST operation ID, and so on.
- Choose which metrics to display in the table, bar, or line graph.

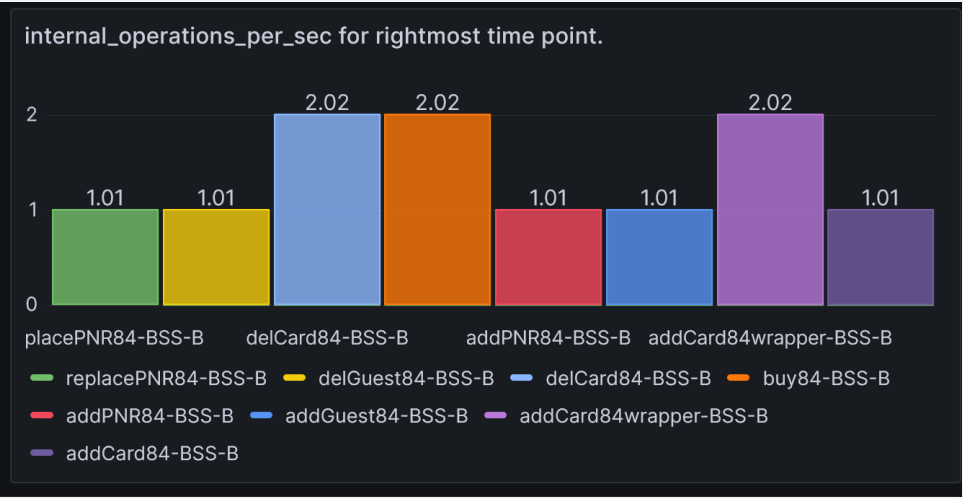


PJ47254 (Jul 2024) CDC dashboards – core features

- Table and bar graphs show the most recent values with filters applied.
- You can view averages and totals across selected systems.

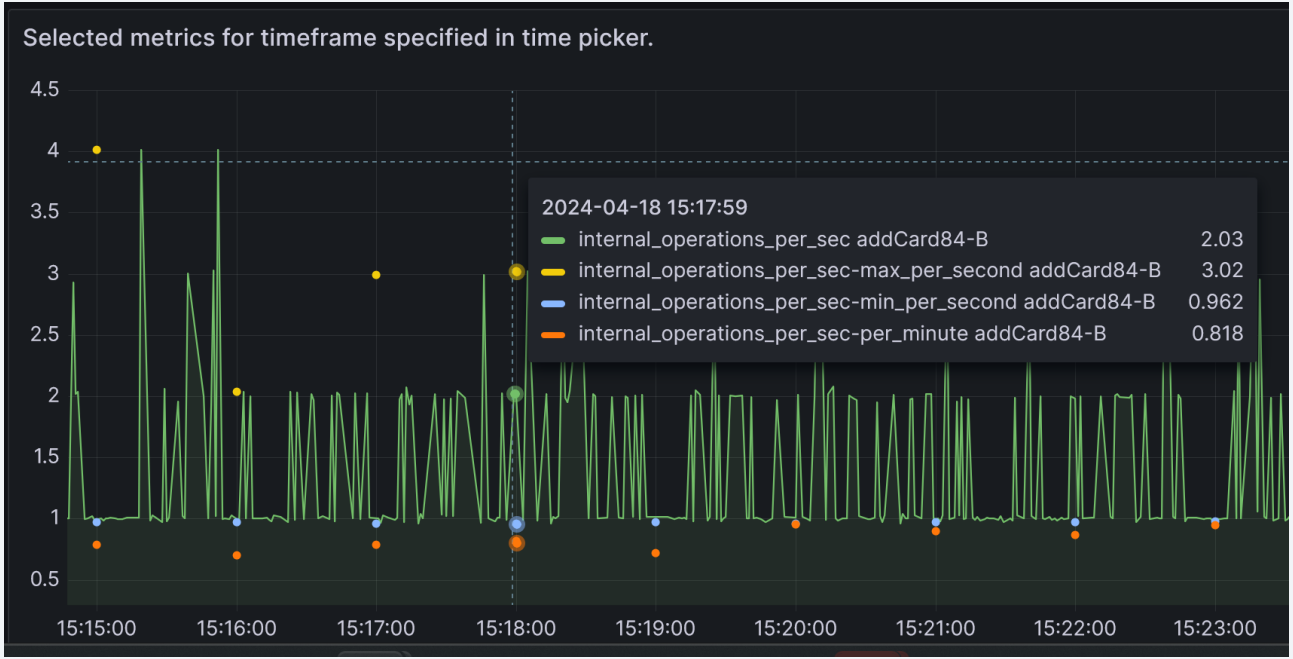
Selected metrics for rightmost time point.

systems	subsystems	operation	internal_operatior
B	BSS	delGuest84	1.01
B	BSS	replacePNR84	1.01
avg_by-operation-B	N/A	N/A	1.39
total-B	N/A	N/A	11.1
total-*	N/A	N/A	11.1
avg-*	N/A	N/A	11.1



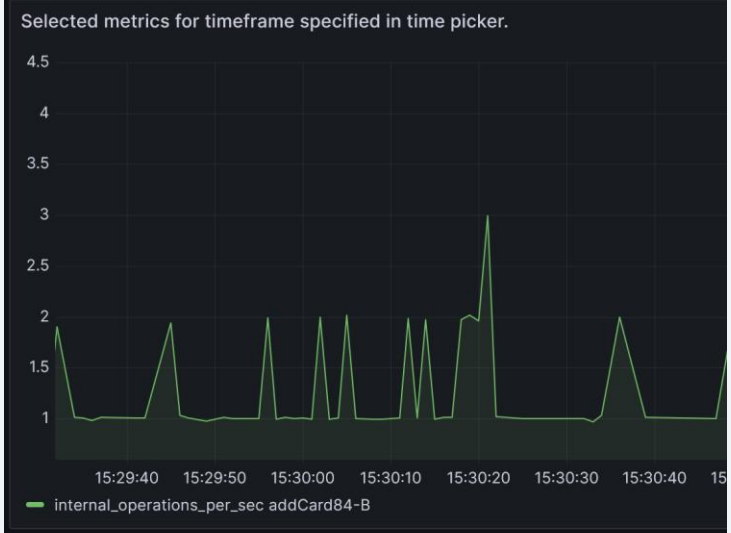
PJ47254 (Jul 2024) CDC dashboards – core features

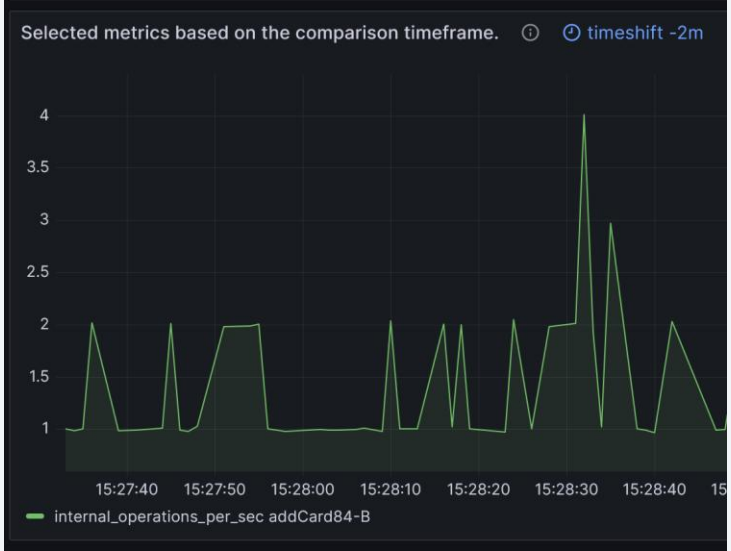
- Line graphs show metrics over time with filters applied.
- Sample summarization with max, min, and average metrics.



PJ47254 (Jul 2024) CDC dashboards – core features

- Side by side comparison of metrics to an offset time (that is, compare current metrics to 7 days, 1 hour, or 2 minutes ago).





PJ47254 (Jul 2024) CDC dashboards – core features

- Dashboard includes help that explains the metrics shown.

Documentation: dasd_service_time

Metric	Description	Source
ssid	The DASD subsystem id	MF1SSID
average_service_time	Average DASD service time Accumulated response time in microseconds / Number of times IOTIM incremented	MF2IOTIM MF2IOCNT
lowest_online_sda_on_lss	The lowest online symbolic device address on the logical subsystem	MF1DAD

Collection Routine: cdcdst.asm
Source: dctmfs.mac
Notes:

- Only DASD subsystem ids with an average service time greater than zero appear in the table.

PJ47254 (Jul 2024) CDC dashboards – z/TPFDF features

As-Is:

- IBM Tivoli Monitoring Agent for z/TPF showed the top 1-100 (default 10) file IDs for as many as 7 different z/TPFDF macro and metric usage types.
  - For example, the Tivoli monitoring agent shows the top 10 file IDs that issued a DBRED macro.
- This method of collection is focused on which file IDs are currently the biggest users.
- This tends to report the same file IDs for the 7 different z/TPFDF macro and metric usage types and is likely to be the same set of file IDs throughout the day. This potentially hides the lesser used file IDs that are increasing in usage until they break into the top 10.

PJ47254 (Jul 2024) CDC dashboards – z/TPFDF features

To-Be:

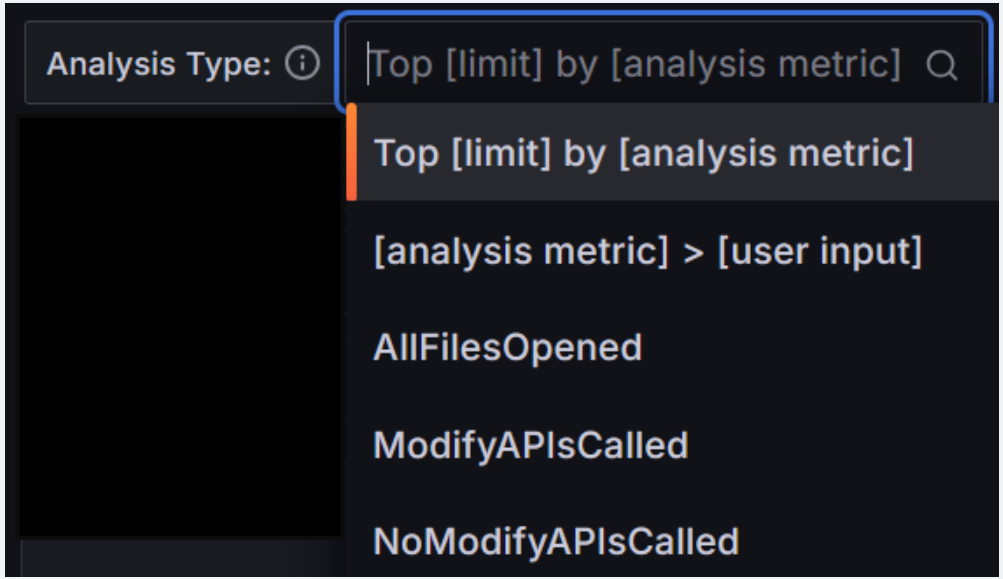
- z/TPFDF metrics are sent for all databases that were opened.
- You can analyze and detect growth scenarios before they break into the top 10 users.

PJ47254 (Jul 2024) CDC dashboards – extensible metrics profiles

- You can use the metric profile to quickly select a subset of metrics.
- Your administrator can add metrics profiles and edit the metrics shown.
- Can be customized for any CDC data type.
- Defaults are provided for z/TPFDF metrics:
  - Main – DBOPN, DBRED, DBADD, DBDEL, DBREP, DBKEY
  - I/O – PFIND, PFILE, CFIND, CFILE, RELFC, GETFC, LRFND, LRFIL
  - LLR – LRFND, LRFIL

PJ47254 (Jul 2024) CDC dashboards – analysis types

- Analysis types provided for CDC data types:
  - Top limit by metric
  - Metric greater than X
- Analysis types provided for z/TPFDF data types:
  - All files opened
  - Modify APIs called
  - No modify APIs called



PJ47254 (Jul 2024) CDC dashboards – extensible analysis types

- Your administrator can add custom analysis. For example:
  - Artificial intelligence, such as machine learning, of the CDC data to identify deviations from normal.
  - Correlations to your real-time user-defined metrics or name-value pair data.
- Can be customized for any CDC data type.

TE and GP enhancements for all RTMC users!

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operator

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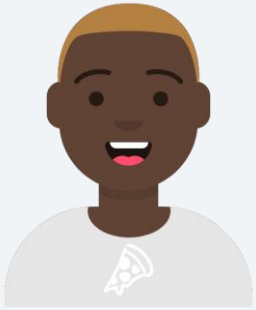
application developer



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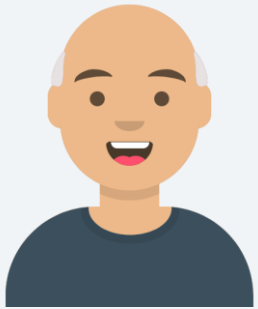

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capacity planner

Marcus
data scientist

PJ48103 (Dec 2024)
TE and GP system level metrics

As-Is:

- You can view the transformation engine (TE) and general processor (GP) usage as a rolling 4 hour rolling average of utilization in the subcapacity reporting tool (SCRT).
- You can also display the current GP usage using the ZSTAT GPU command.

PJ48103 (Dec 2024)
TE and GP system level metrics

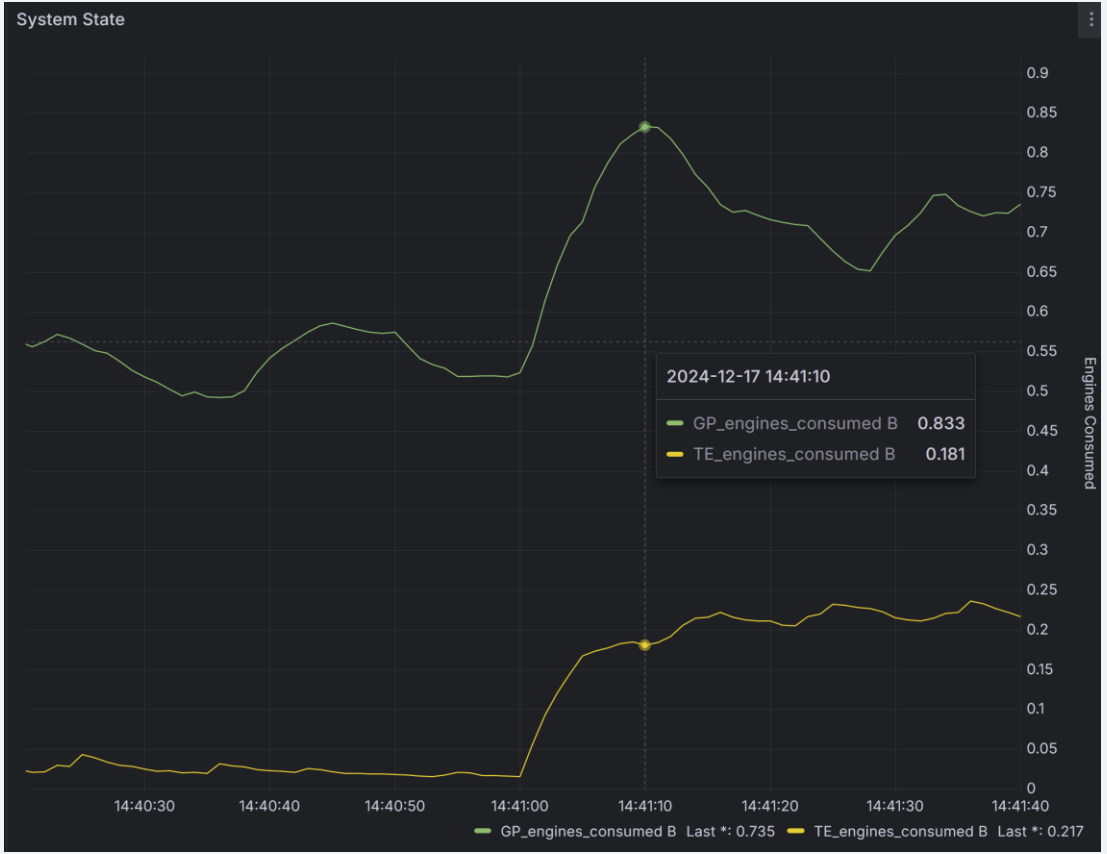
To-Be:

- You can view TE and GP metrics at the system level at a per second rate in the System State dashboard.
- You can view TE and GP metrics as percentages.

PJ48103 (Dec 2024)
TE and GP system level metrics

To-Be:

- You can view TE and GP metrics as the number of engines consumed.



Enhancements for data scientists!

Marcus
data
scientist

APAR PJ48032 (Feb 2025)
Name-value pair collection sample distribution

As-Is:

- Name-value pair collection presents the metrics as averaged values as summaries of what is occurring on your system by your name-value pairs.
- This can obscure transactions with extreme resource usage and underlying trends.

To-Be:

- The name-value pair sample distribution feature captures the data for one message of each type in every collection interval and writes this data into tables in MariaDB or MySQL.
- This allows you to perform statistical analysis across a day or week against the metrics for individual messages so you can understand the distribution of your transactions, how it's changing over time and further investigate outliers.

Enhancements for RTMC administrators!

Andres
Linux
admin

PJ47253 (Jun 2024) z/TPF real-time insights dashboard starter kit improvements

- Various open source dependencies, such as Grafana, are updated to use new versions.
- When you are configuring the starter kit, you can set the Grafana organization ID for use in enterprise Grafana installations.
- The dashboard refresh behavior is improved on Grafana version 9 and later.
- On Linux® on IBM Z installations, you can write Kafka logs in a specified time zone and write the logs to a volume directory to make them easier to access.
- Name-value pair values can include the following special characters: $ % / @. If you're going to display these name-value pairs on the console, the names and values must conform to the recommended character set.
- To simplify customer migration to newer versions of the starter kit, Docker images are specified in the tpf_prepare_configurations.yml file instead of the tpf_prepare_configurations.sh file.

PJ46955 (Sep 2024) RTMC name-value pair collection high availability improvements

As-Is:

- RTMC uses the high-speed connector (HSC) to send data from the z/TPF system to the tpfrtmc offline utility on Linux.
- In a high-availability configuration, when requests are queued in the HSC, the HSC immediately falls back to the secondary endpoint to send the data.
- Name-value pair collection requires all data in an interval to be sent to a single endpoint. If HSC fallback occurs when processing name-value pair collection data, data will be missing and the resulting calculations might be incorrect.

PJ46955 (Sep 2024) RTMC name-value pair collection high availability improvements

To-Be:

- Send requests for all collection types are queued in RTMC such that HSC falls back to the secondary endpoint only when the primary endpoint fails. This ensures name-value pair collection calculations are correct.
- The ZRTMC DISP QUEUE command displays the limit, the current queue depth, and the maximum queue depth. Limit is set to the qMaxDepth in your endpoint group descriptor.
- **Just install it without any configuration and you get the benefits!**

We now provide documentation that describes how to configure RTMC for a high-availability production configuration with no single points of failure.
ibm.biz/ztpf-rtmc-high-availability

PJ48114 (Dec 2024)
Name-value pair dashboard performance

- For some scenarios like large time frames, the name-value pair metrics dashboard could require minutes to refresh and **now only takes a few seconds**.
  - Just install it and you get the benefits!

- Among the various SQL changes made, all time-based tables are partitioned by day to improve the dashboard refresh time for CDC, JVM and name-value pair dashboards.

PJ48027 (Dec 2024) Sample analytics pipeline

- The z/TPF real-time insights dashboard starter kit has been replaced by the sample analytics pipeline:
  - Delivered as part of the z/TPF code as base/tpfrtmc/bin/tpf_sample_analytics_pipeline.tar.gz
  - Fully supported part of the z/TPF product
  - Starter kit download web page redirects to the z/TPF code download page

PJ48027 (Dec 2024) Sample analytics pipeline

- The readme file was expanded and integrated into the IBM documentation. Several new topics were added under the RTMC documentation:
  - Installing the sample analytics pipeline
  - High availability production installation
  - Applying IBM maintenance for RTMC
  - Diagnosing ZRTMC data problems
  - And more!

Thank you

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