IntelliMagic

Insights You Can Gain from Integrated Visibility Across Types of SMF Data

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SPARTA – July 11, 2023

Availability Intelligence

Integrated Visibility

Challenges to Deriving Value from SMF Data

- Primarily used in reactive manner
- **Siloed tooling across disciplines**
- Need to anticipate desired views in generated static reports
- Focusing analysis when dealing with massive data volumes
- Declining expertise with retirements of tenured staff

Db2 Team ** Needs to Know **

- 30 – Address space level
- 42.6 – Dataset performance
- 70.1 – CPU at system level
- **71 – Paging, large frames**
- 72.3 – CPU by SC; WLM PI
- 74.2 – XCF activity
- **74.4 – Coupling Facility**
- 110.1 – CICS transactions

Db2 Team ** Needs to Know ** Other Teams

- 30 – Address space level
- 42.6 – Dataset performance
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- 72.3 – CPU by SC; WLM PI
- 74.2 – XCF activity
- 74.4 – Coupling Facility
- 110.1 – CICS transactions

- CPU by connection type
- CPU by correlation ID (e.g., Db2 Call Attach job name)
- CPU by auth ID (e.g., DDF)
- CPU by plan
- Elapsed time by CICS tran ID

Db2 Team ** Needs to Know ** Other Teams

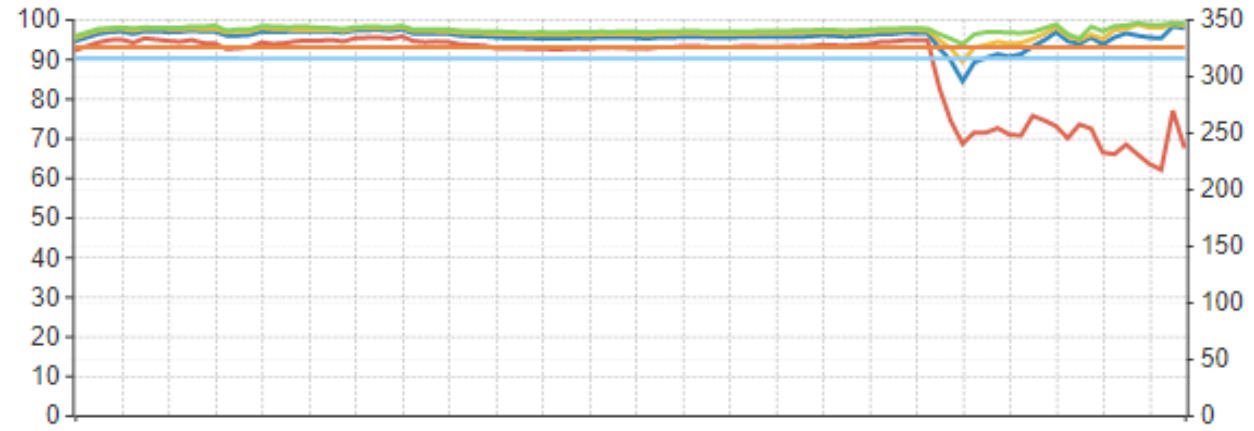
- 30 – Address s…nection type
- 42.6 – Dataset…elation ID (e.g.,
- 70.1 – CPU at …ach job name)
- 71 – Paging, la…n ID (e.g., DDF)
- 72.3 – CPU by …
- 74.2 – XCF act…S tran ID
- 74.4 – Couplin…
- 110.1 – CICS t…

Integrated Visibility Examples

- WLM goals (72.3) & CICS trans (110.1)
- Address space (30) & Db2 accounting (101)
- CICS trans (110.1) & Db2 accounting (101)
- Dataset perf (42.6) & Db2 buffer pools (102)
- XCF activity (74.2) & “almost everyone”
- MQ accounting (116) & CICS trans (110.1)
- Coupling facility (74.4) & Db2 (& others)
- Large frames (71) & Db2 buffer pools (100)

WLM Service Class Goals (72.3) & CICS Transactions (110.1)

Single day 7/2/2021
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**



Single day 7/2/2021
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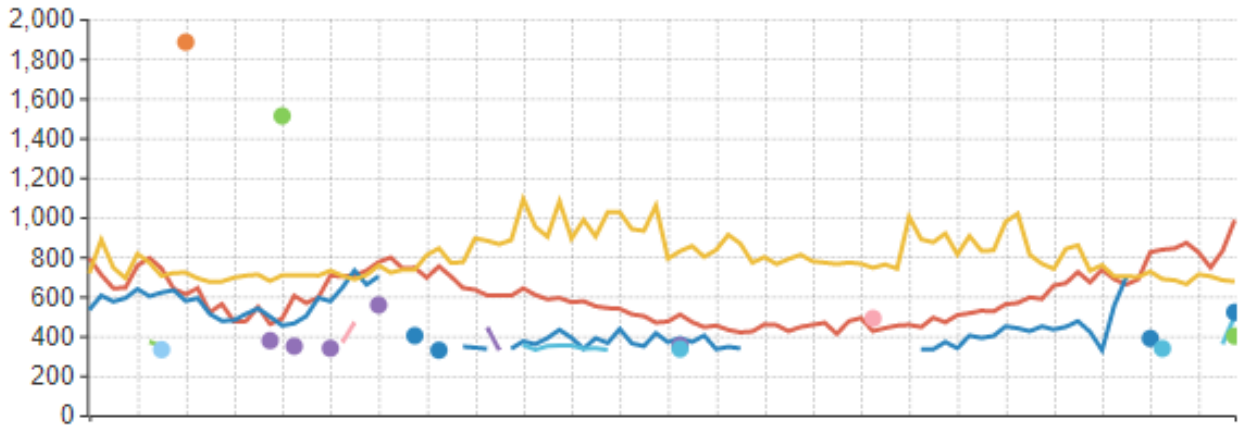
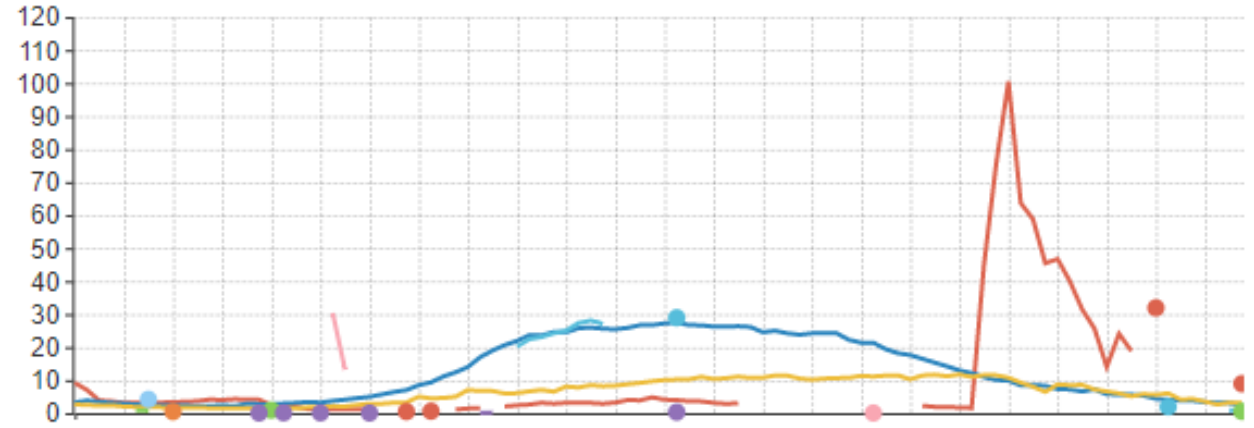


CICS TRANSACTION VOLUMES

for all CICS Transactions by CICS Transaction ID with filter on Trans... Full report

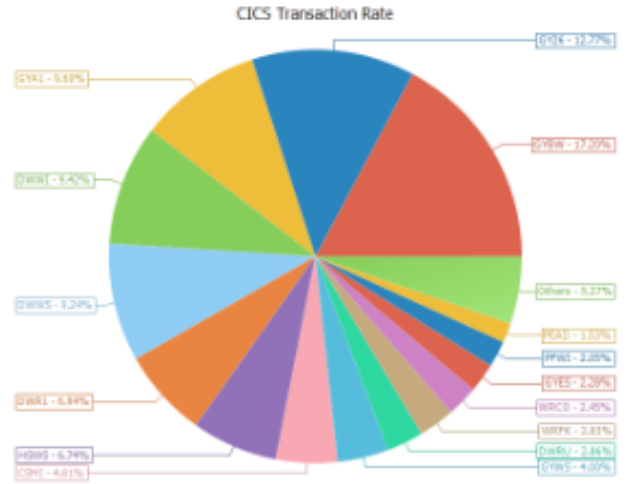
Single day 7/2/2021
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**



CICS TRANSACTIONS (TOP 20)

for all CICS Transactions by CICS Transaction ID with filter on Syste... Full report

Custom 7/2/2021 6:45 PM - 7/2/2021 7:15 PM
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**



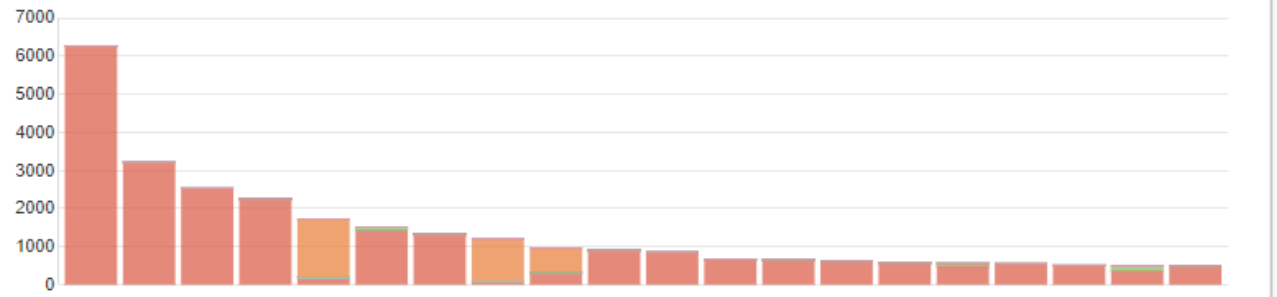
Address Space (30) and Db2 Accounting (101)

PROCESSOR TIME (CP, ZIIP AND ZAAP) (TOP 20)

by Address Space Name where z/OS Program Name begins with 'IKJEFT'

Full report

Single day 7/2/2021
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**

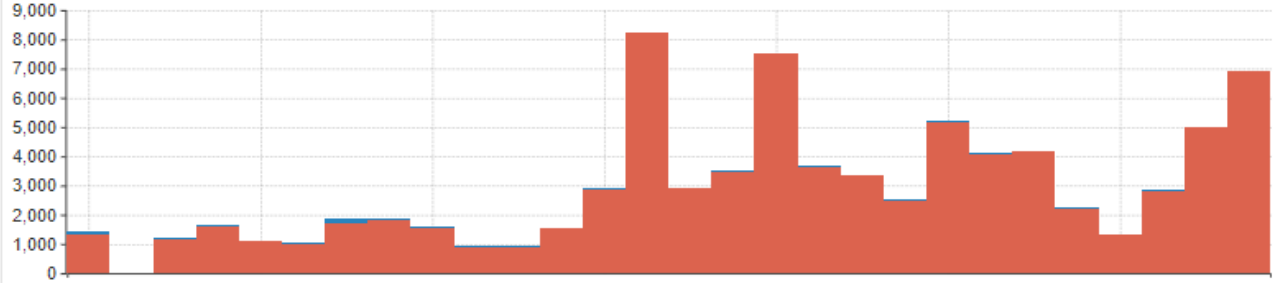


GETPAGES

For Correlation Name 'JIT4TLH', for Connection Type 'DB2 Call Attach' by Buffer Size

Full report

Single day 7/2/2021
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**

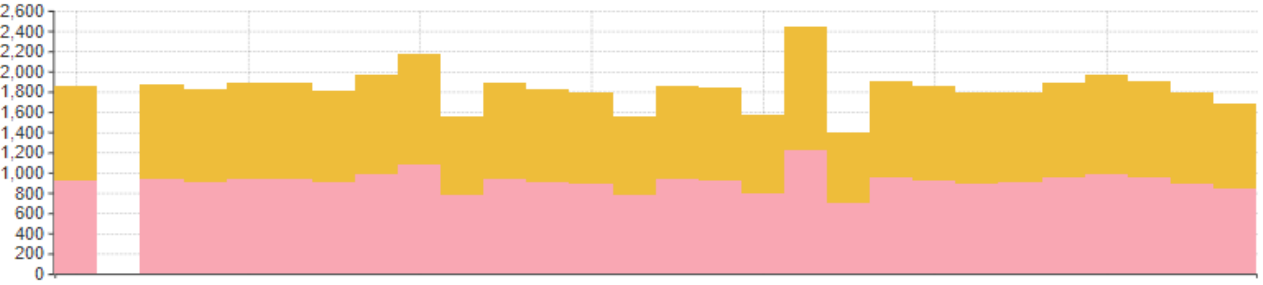


SQL STATEMENTS

For Correlation Name 'JIT4TLH', for Connection Type 'DB2 Call Attach'

Full report

Single day 7/2/2021
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**

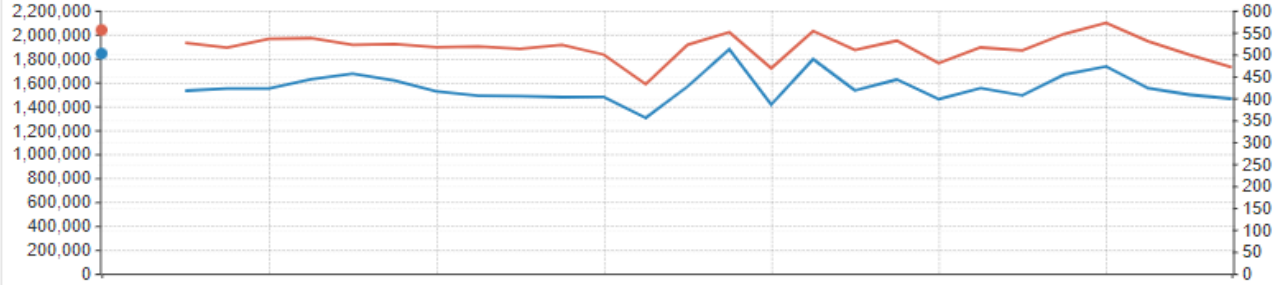


LOGGING

For Correlation Name 'JIT4TLH', for Connection Type 'DB2 Call Attach' with filter on System ID

Full report

Single day 7/2/2021
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**



DB2 AND APPLICATION CP AND ZIIP USAGE

For Data Sharing Group 'DB2H', for Connection Type 'DB2 Call Attach', for Correlation Name 'JFS4357'

Full report

Single day 7/1/2021
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**

KEY STATISTICS FOR ADDRESS SPACE

For Address Space Name 'JFS4357', for Address Space Name 'JFS4357'

Full report

Single day 7/1/2021
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**

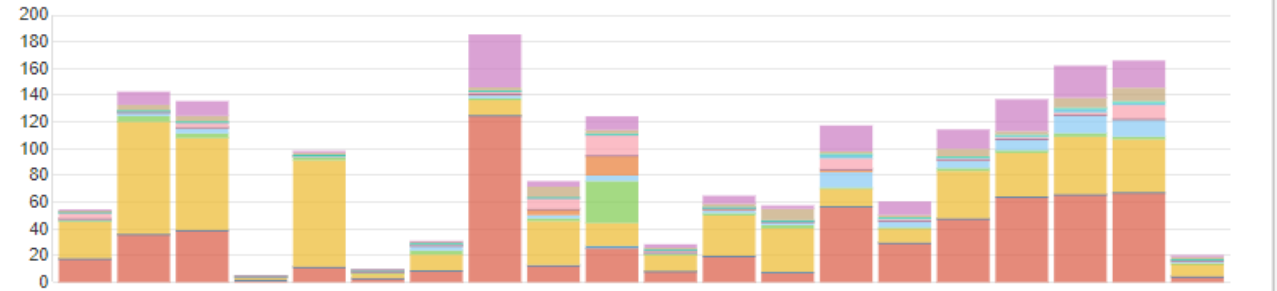
CICS Transaction (110.1) and Db2 Accounting (101)

DB2 TRANSACTION RESPONSE TIME (TOP 20)

For Connection Type 'CICS Call Attach' by Correlation Name

Full report

Single day 7/1/2021
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**

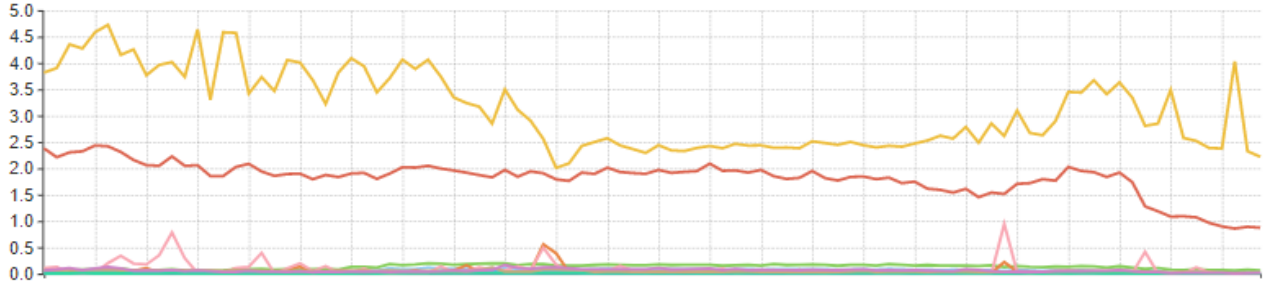


DB2 TRANSACTION RESPONSE TIME

For Connection Type 'CICS Call Attach', for Correlation Name 'DWWI'

Full report

Single day 7/1/2021
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**

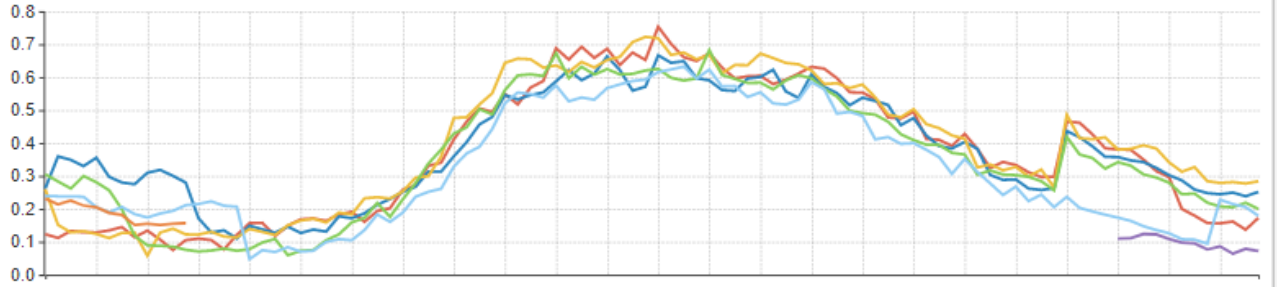


DB2 CLASS 2 CP PROCESSORS USED

For Plan Name 'GY7BP1G' by Date with filter on Connection Type

Full report

All data 6/27/2021 12:00 AM - 7/3/2021 2:59 AM
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**

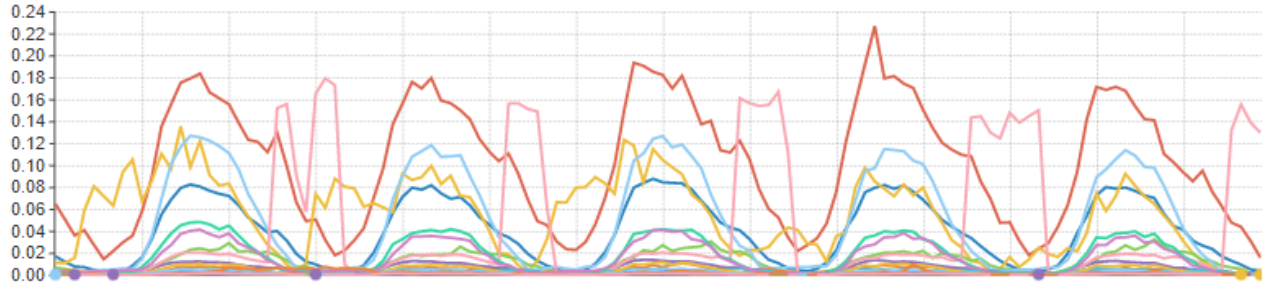


DB2 CLASS 2 CP PROCESSORS USED (TOP 20)

For Plan Name 'GY7BP1G' by Correlation Name with filter on Connection Type

Full report

All data 6/27/2021 12:00 AM - 7/3/2021 2:59 AM
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Hour**

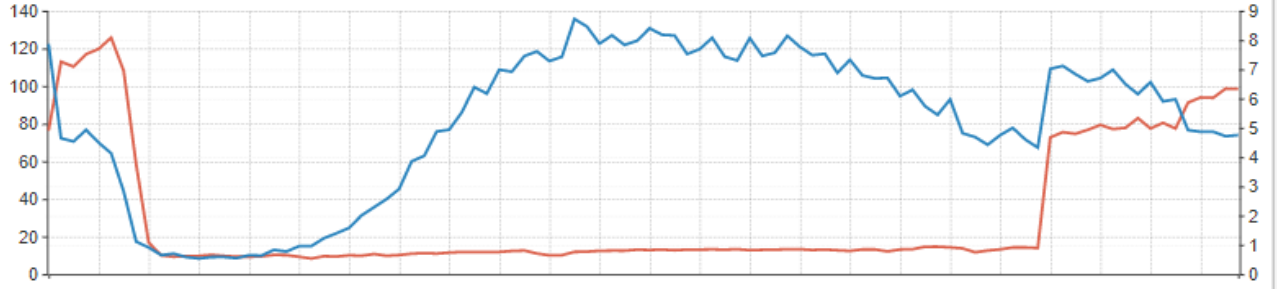


CICS CP AND ZIIP USAGE

For CICS Transaction ID 'GYEV' with filter on System ID, CICS Transaction ID

Full report

Single day 7/1/2021
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**

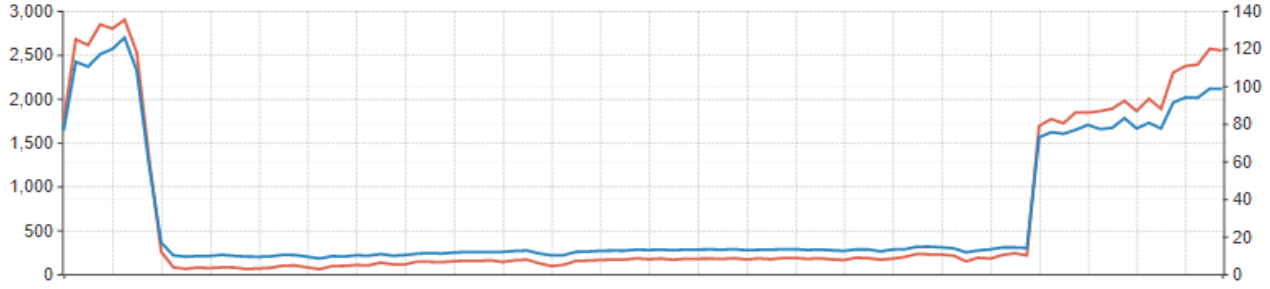


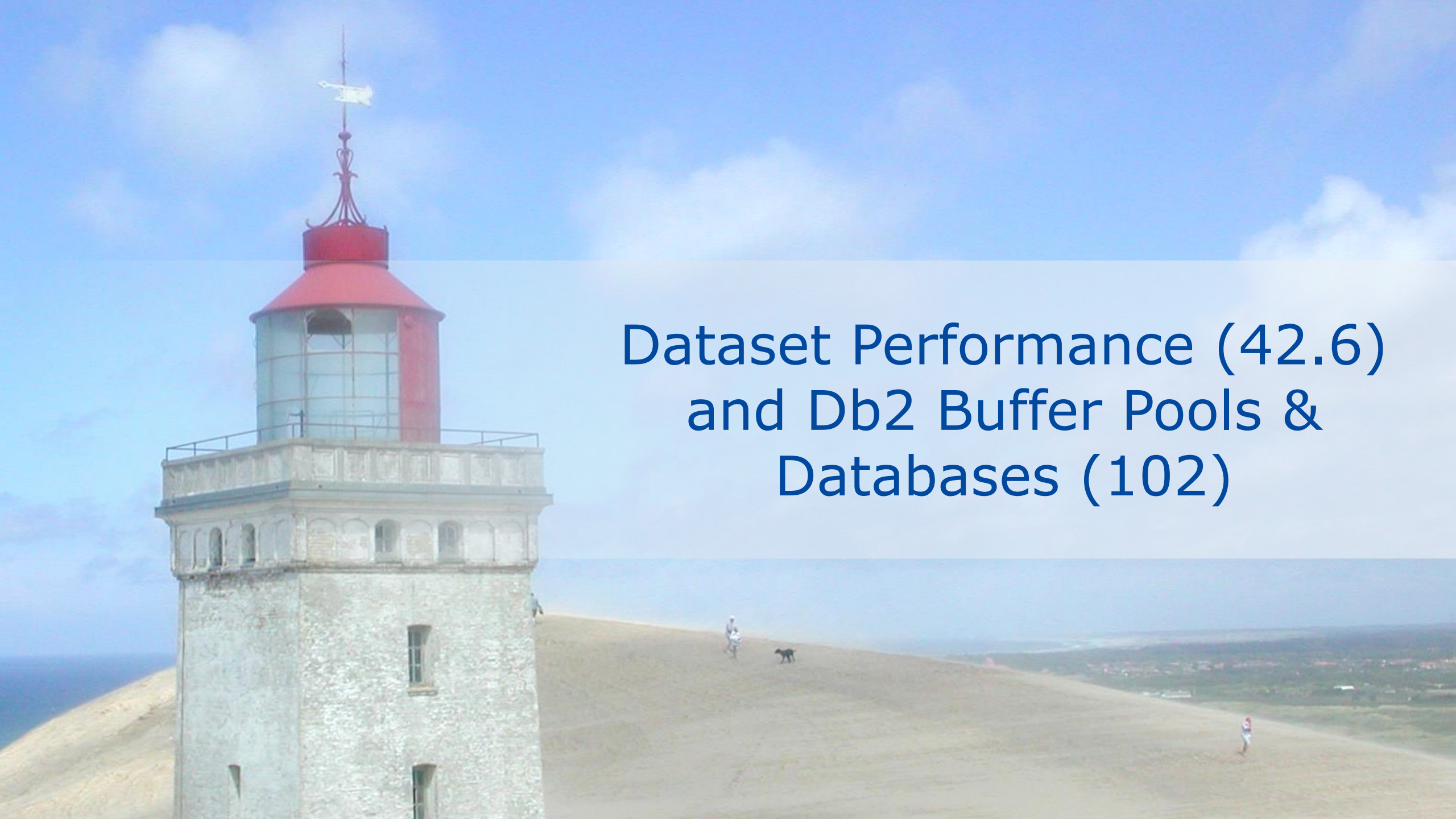
DB2 EXEC SQL AND IFI REQUESTS

For CICS Transaction ID 'GYEV'

Full report

Single day 7/1/2021
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**





Dataset Performance (42.6) and Db2 Buffer Pools & Databases (102)

Storage Performance for Buffer Pool Activity

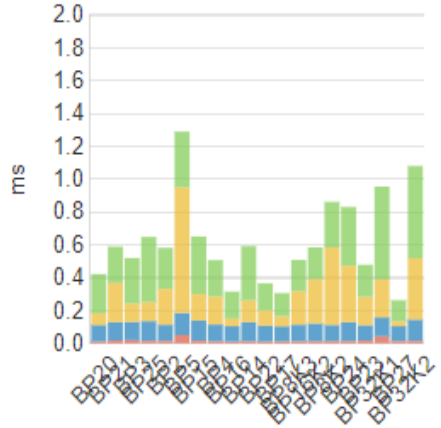
for all Buffer Pools

Add to: Collected | Dashboard | Favorites

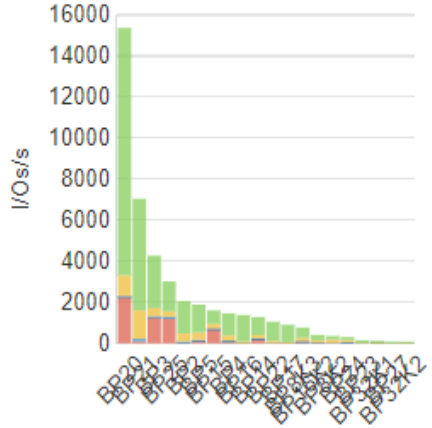
Single day 7/1/2021
Interest group **IGT**, **All sysplexes**, **All shifts**
Reporting interval **Measurement**

This overview shows the data set statistics for the I/O activity to support the DB2 buffer pools. The read and write disconnect time are good indications of the efficiency of the storage system in its support of the DB2 workload. The top row shows the activity summarized by supported buffer pool, the bottom row by database. Note that different buffer pools and databases will have different workload mixes, you would not expect the performance to be the same for all.

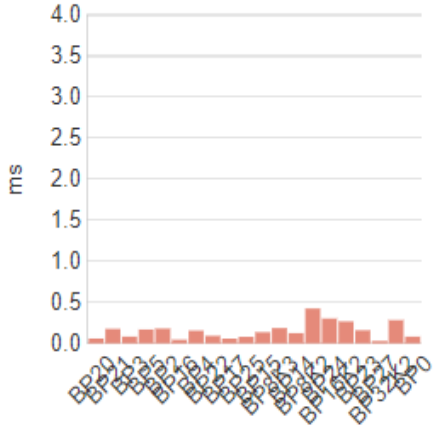
Disk Response Time Components (top 20)



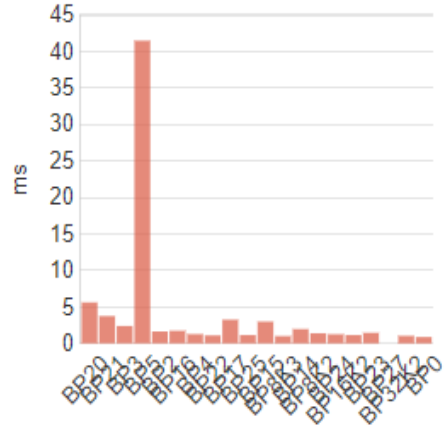
Synchronous Disk Cache Hit and Miss (top 20)



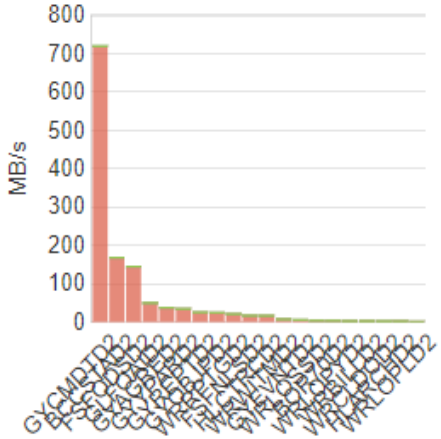
Read Disconnect Time (top 20)



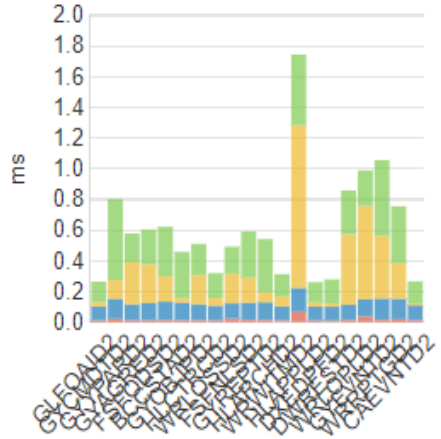
Write Disconnect Time (top 20)



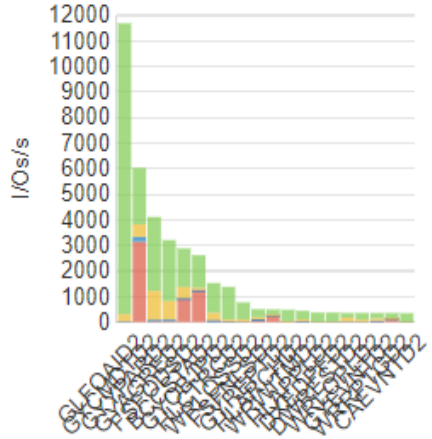
Use of DFSMS Encryption for Tablespaces (top 20)



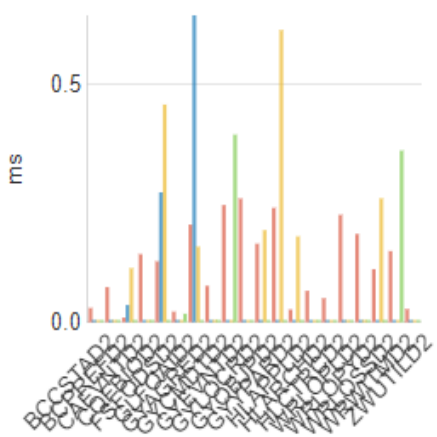
Disk Response Time Components (top 20)



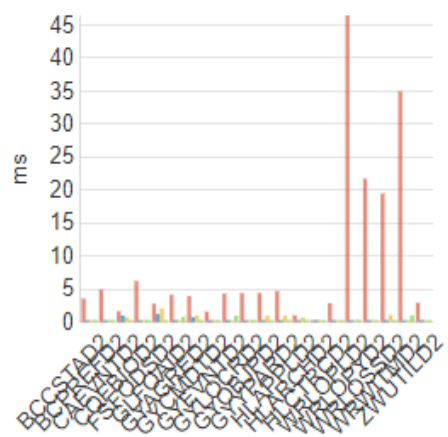
Synchronous Disk Cache Hit and Miss (top 20)



Read Disconnect Time (top 20)



Write Disconnect Time (top 20)

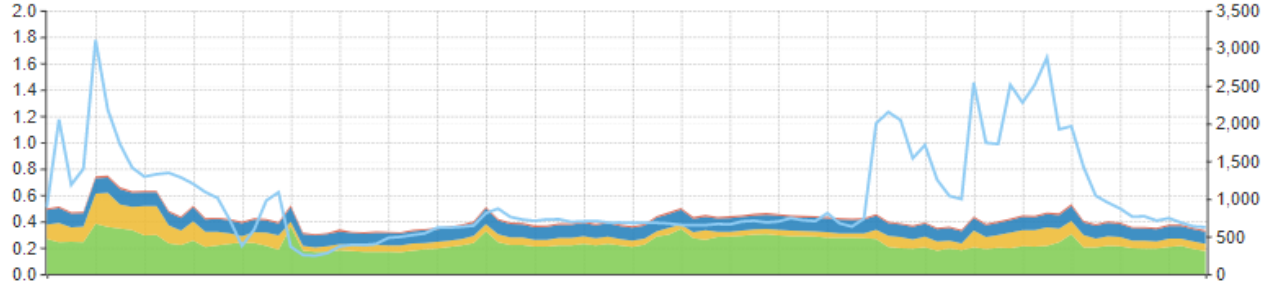


DISK RESPONSE TIME COMPONENTS

For DB2 Buffer Pool 'BP20'

Full report

Single day 7/1/2021
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**

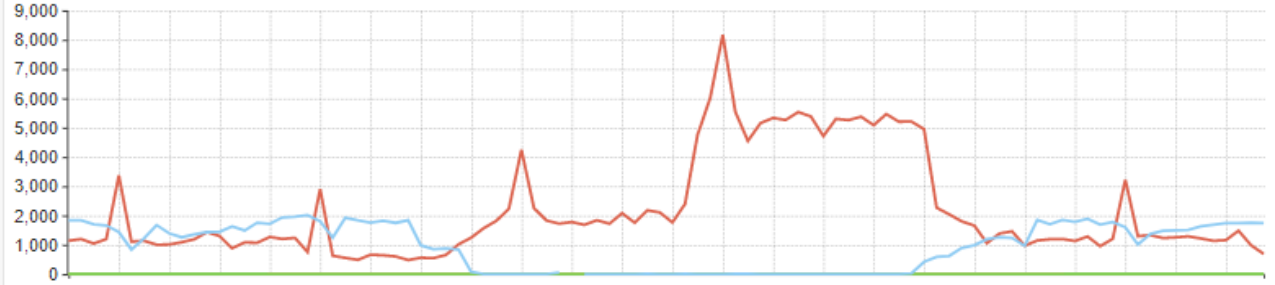


SEQUENTIAL I/OS (TOP 5)

For Database Name 'GYCMDTD2' by Page Set

Full report

Single day 7/1/2021
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**

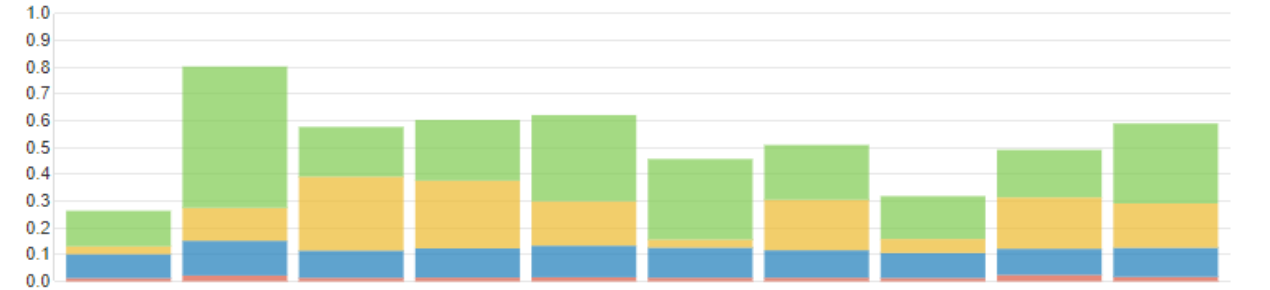


DISK RESPONSE TIME COMPONENTS (TOP 10)

for all Buffer Pools by Database Name

Full report

Single day 7/1/2021
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**

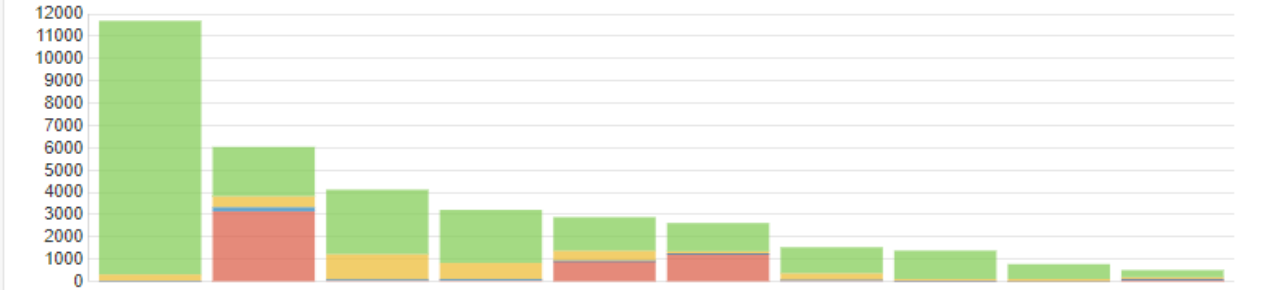


SYNCHRONOUS DISK CACHE HIT AND MISS (TOP 10)

for all Buffer Pools by Database Name

Full report

Single day 7/1/2021
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**

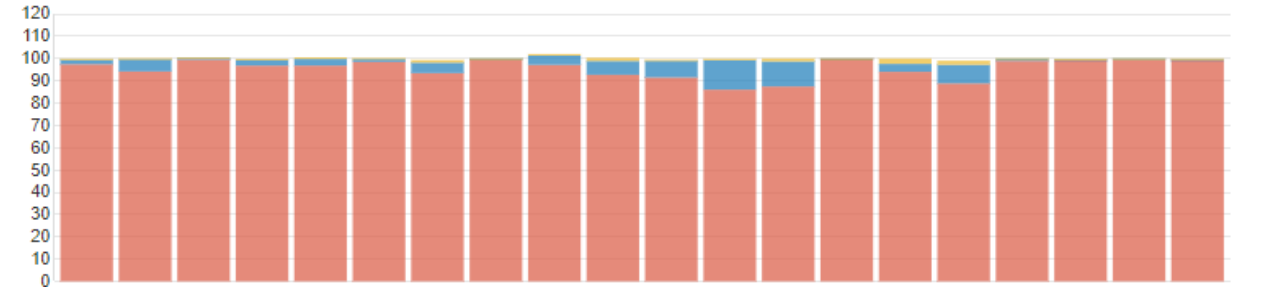


GETPAGES AND SYNCHRONOUS I/O (TOP 20)

For Data Sharing Group 'DB2H', for Buffer Size '4K' by DB2 Buffer Pool

Full report

Single day 7/1/2021
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**

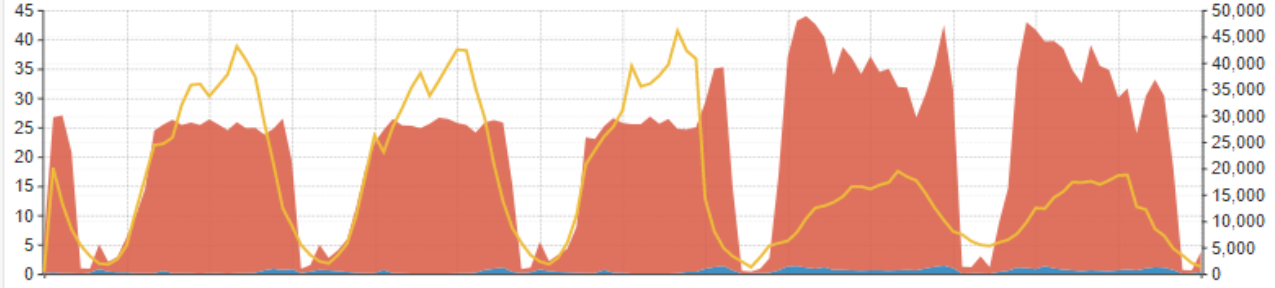


BUFFER EFFICIENCY AND I/O RATE

For Data Sharing Group 'DB2H', for Buffer Size '4K', for Database Name 'GLFOAID2'

Full report

All data 6/27/2021 12:00 AM - 7/3/2021 2:59 AM
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Hour**



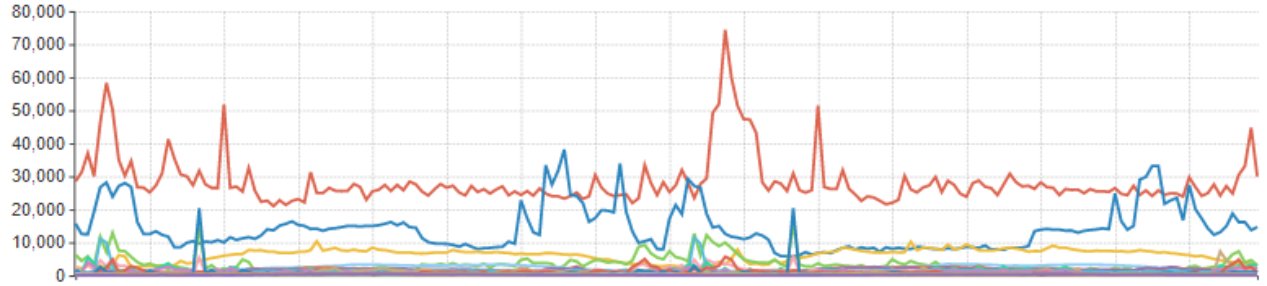
XCF Activity (74.2) & “Almost Everyone”

SIGNALS SENT BY MEMBER

for all XCF Member Activity by Group name where Group name does not begin with 'U'

Edit | Full report

Custom 2/28/2023 12:00 AM - 3/1/2023 11:45 PM
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**

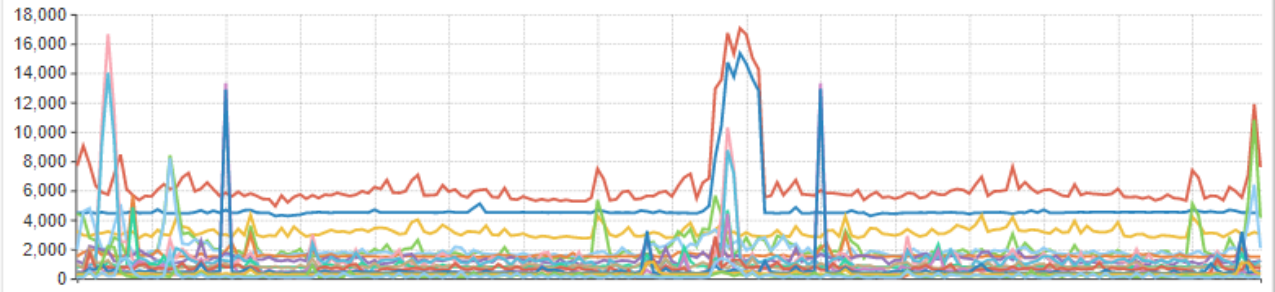


SIGNALS SENT BY MEMBER

For Group name 'SYSBPX' by Member name where Group name does not begin with 'U'

Edit | Full report

Custom 2/28/2023 12:00 AM - 3/1/2023 11:45 PM
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**

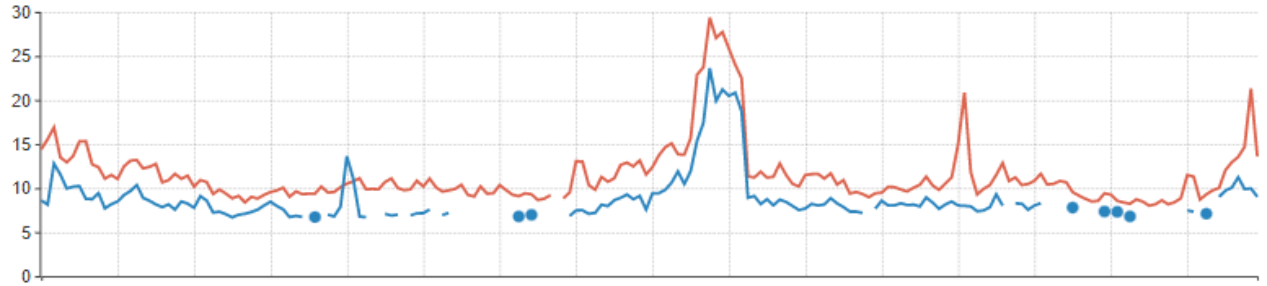


PROCESSOR USAGE

For Workload 'SYSTEM', for Service Class 'SYSTEM', for Address Space Name 'XCFAS' by System ID

Edit | Full report

Custom 2/28/2023 12:00 AM - 3/1/2023 11:45 PM
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**

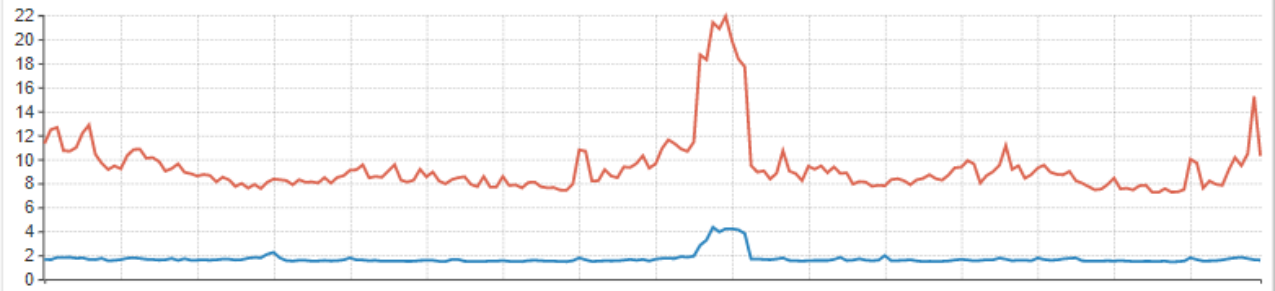


PROCESSOR USAGE

For Workload 'SYSTEM', for Service Class 'SYSTEM', for Address Space Name 'OMVS' by System ID

Edit | Full report

Custom 2/28/2023 12:00 AM - 3/1/2023 11:45 PM
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**

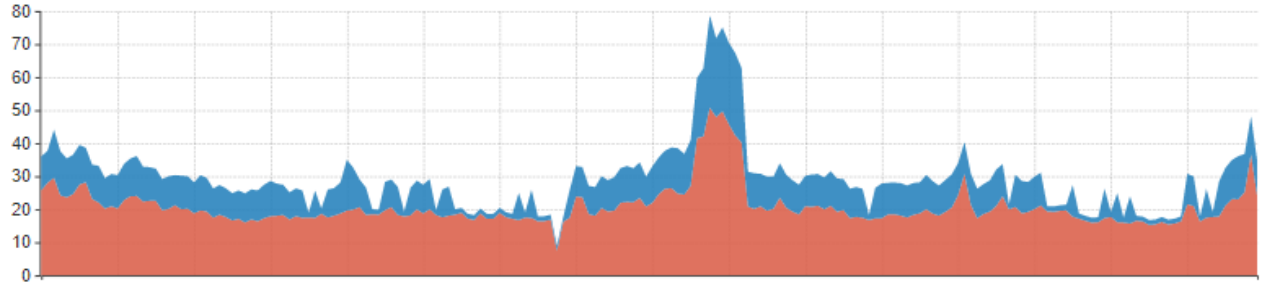


PROCESSOR USAGE

For Service Class 'SYSTEM' by System ID where System ID begins with 'A' and (Address Space Nam...

Edit | Full report

Custom 2/28/2023 12:00 AM - 3/1/2023 11:45 PM
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**

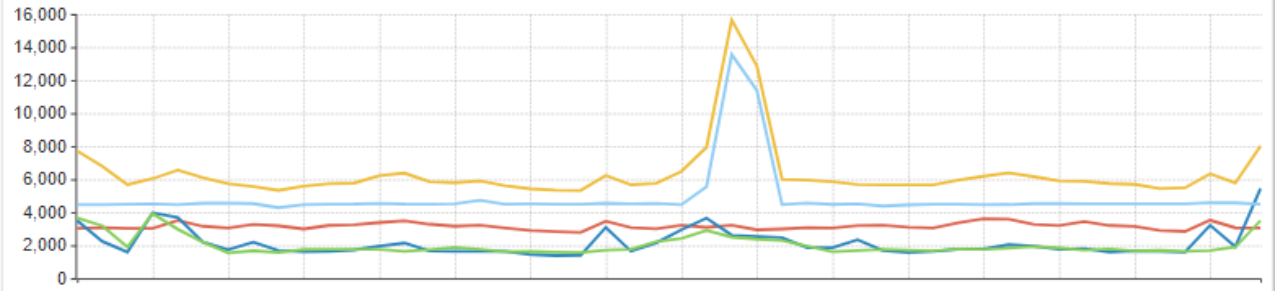


SIGNALS SENT BY MEMBER

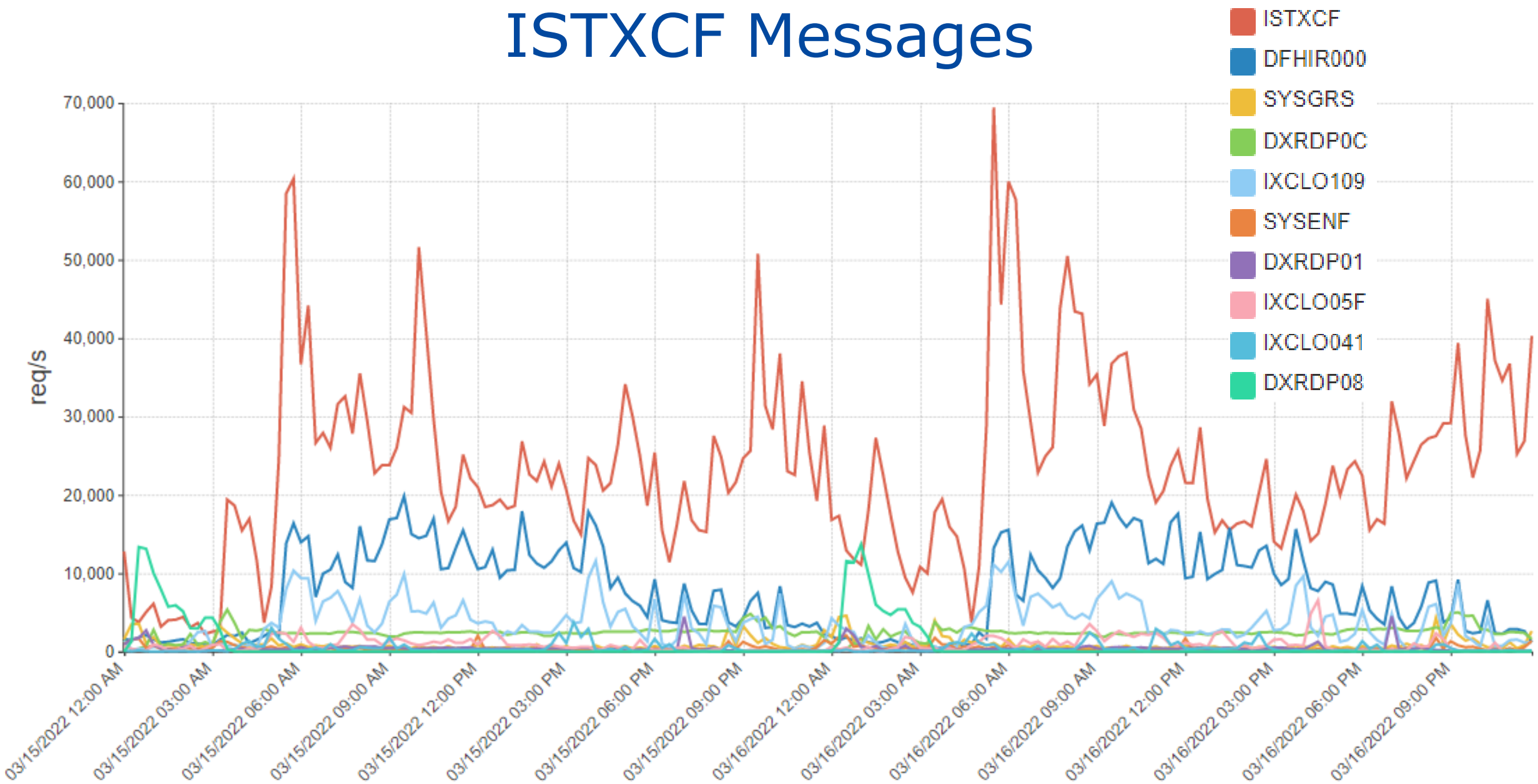
For Group name 'SYSBPX' by System ID where System ID begins with 'A'

Edit | Full report

Custom 2/28/2023 - 3/1/2023
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Hour**



ISTXCF Messages



TCP/IP Uses of XCF

TCP/IP takes advantage of the communication capabilities of the XCF in a sysplex in three different ways:

1. It maintains awareness of the status (health) of a TCP/IP instance within the sysplex.
2. It determines workload levels within each LPAR in the sysplex through Workload Manager (WLM).
3. It can send IP traffic among the LPARs.

www.ibm.com/docs/en/zos-basic-skills?topic=sysplex-cross-system-coupling-facility-xcf

SHARE Presentation – Gus Kassimis, IBM

So what should I use for what type of routing?

- **VIPAROUTE** is often the best choice for connection routing
  - Exploits network redundancy
  - Often as fast or faster than XCF
  - Does not use Coupling Facility CPU cycles, which often is a limited resource

	Exchange control messages between stacks in a Sysplex or Subplex	Sysplex Distributor connection routing (forwarding inbound packets for distributed connections)	General IP routing between stacks in a Sysplex or Subplex
XCF messaging	Always	Yes - If no VIPAROUTE specified (or for traffic associated with SWSA and MLS)	Can be used (not recommended)
IUTIQDIO (Dedicated HiperSockets LAN)	Never	Yes - If defined in VTAM start options and no VIPAROUTE defined. Used for connection routing to LPARs on same CPC only.	Can be used (not recommended since XCF will be used for LPARs on other CPCs)
All other connectivity options between stacks in a Sysplex or Subplex (OSA, HiperSockets, Channel links, etc.	Never	Yes - If VIPAROUTE is defined	Always

Potential Significant CPU Savings

So what should I use for what type of routing?

- **VIPAROUTE** is often the best choice for connection routing
  - Exploits network redundancy
  - Often as fast or faster than XCF
  - Does not use Coupling Facility CPU cycles, which often is a limited resource

	Exchange control messages between stacks in a Sysplex or Subplex	Sysplex Distributor connection routing (forwarding inbound packets for distributed connections)	General IP routing between stacks in a Sysplex or Subplex
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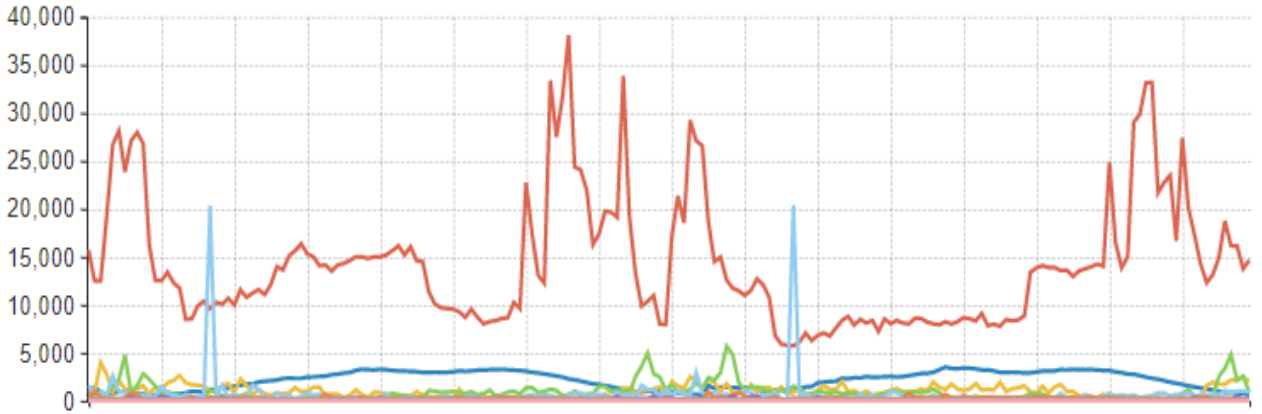
Use case: 600 MIPS savings in XCFAS & TCP/IP AS

Cheryl Watson's Tuning Letter 2015 #1, pp 32-34

SIGNALS SENT BY MEMBER (TOP 20)

for all XCF Member Activity by Group name where Group name begins with … Edit | Full report

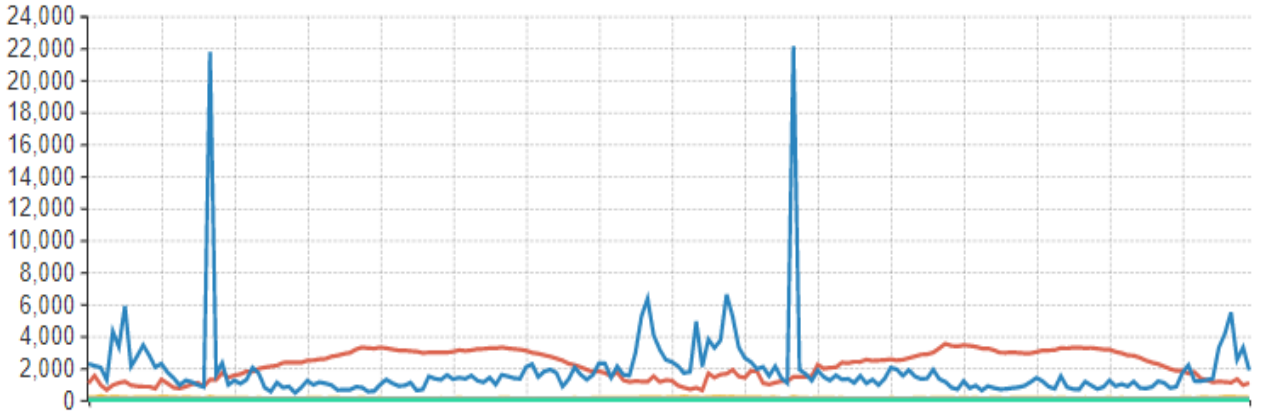
Custom 2/28/2023 12:00 AM - 3/1/2023 11:45 PM
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**



SIGNALS SENT BY MEMBER

for all XCF Member Activity by Address Space Name where Group name be… Edit | Full report

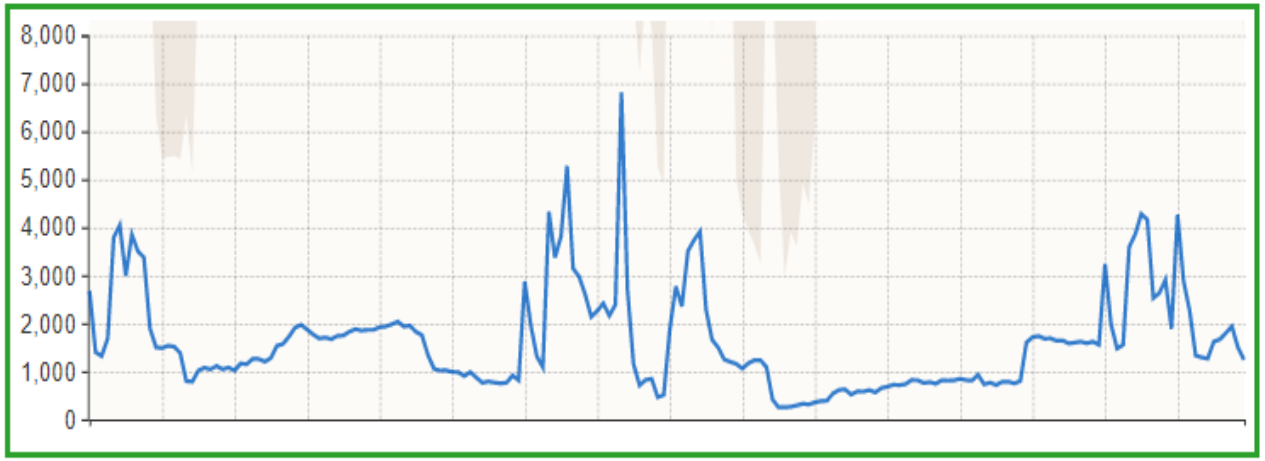
Custom 2/28/2023 12:00 AM - 3/1/2023 11:45 PM
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**



NUMBER OF TIMES ANY REQUEST ENCOUNTERED LOCK CONTENTION [RATING: 0.00]

for all Coupling Facility Structures by Coupling Facility Structure Name wher… Edit | Full report

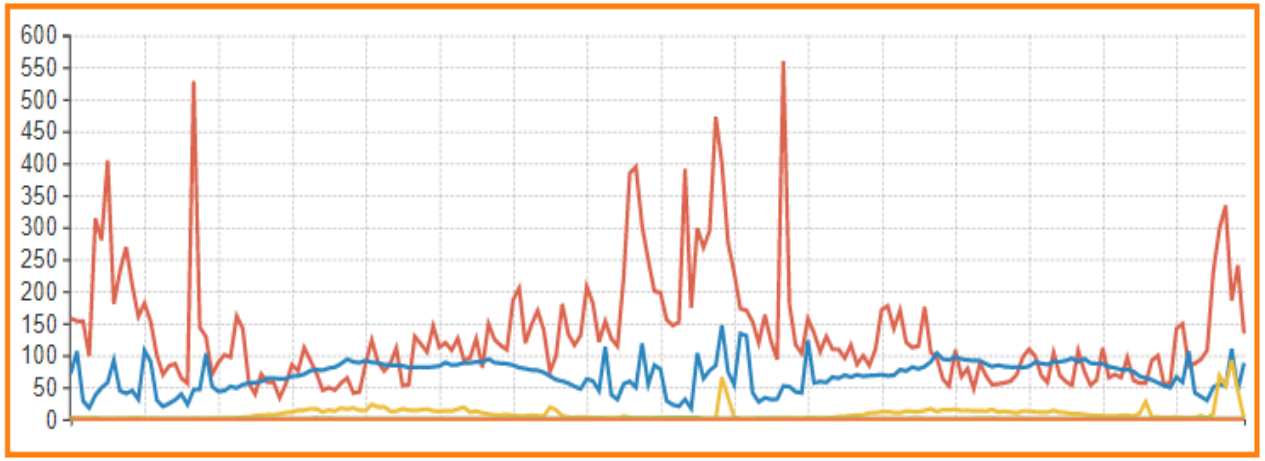
Custom 2/28/2023 12:00 AM - 3/1/2023 11:45 PM
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**



NUMBER OF TIMES ANY REQUEST ENCOUNTERED LOCK CONTENTION [RATING: 0.13]

for all Coupling Facility Structures by Coupling Facility Structure Name wher… Edit | Full report

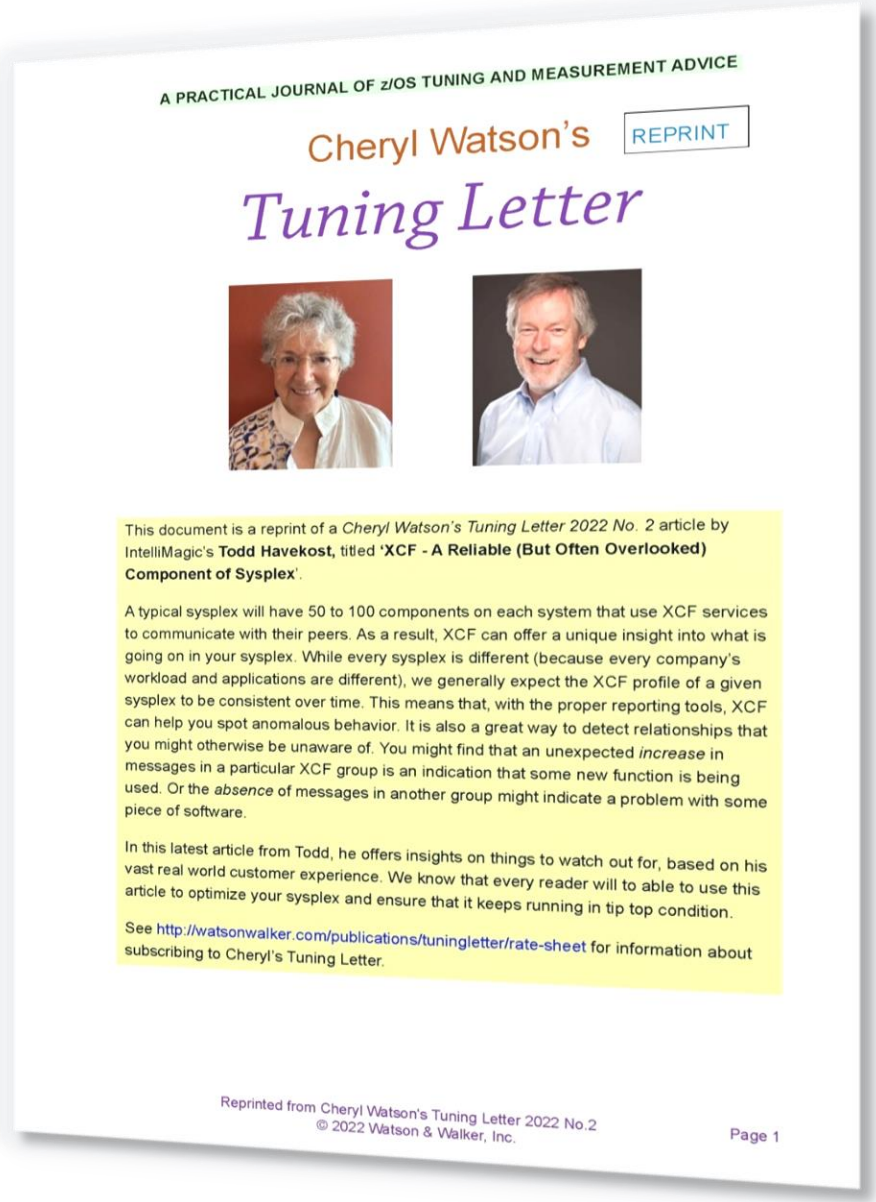
Custom 2/28/2023 12:00 AM - 3/1/2023 11:45 PM
Interest group **IGT**, **All sysplexes**, **All shifts**, Interval **Measurement**



Cheryl Watson's Tuning Letter – XCF Article Series

- Transport Class Simplification – Tuning Letter 2020 No. 2
- XCF: A Reliable (But Often Overlooked) Component of Sysplex – TL 2022 No. 2
- Using New XCF Metrics to Optimize XCF Buffer Use (Part 1) – TL 2022 No. 3
- Using New XCF Metrics to Optimize XCF Buffer Use (Part 2) – TL 2022 No. 4

- To receive reprints of IntelliMagic written articles in the Tuning Letter contact sales@intellimagic.com



A PRACTICAL JOURNAL OF z/OS TUNING AND MEASUREMENT ADVICE

Cheryl Watson's REPRINT

Tuning Letter

This document is a reprint of a *Cheryl Watson's Tuning Letter 2022 No. 2* article by IntelliMagic's **Todd Havekost,** titled **'XCF - A Reliable (But Often Overlooked) Component of Sysplex'**.

A typical sysplex will have 50 to 100 components on each system that use XCF services to communicate with their peers. As a result, XCF can offer a unique insight into what is going on in your sysplex. While every sysplex is different (because every company's workload and applications are different), we generally expect the XCF profile of a given sysplex to be consistent over time. This means that, with the proper reporting tools, XCF can help you spot anomalous behavior. It is also a great way to detect relationships that you might otherwise be unaware of. You might find that an unexpected *increase* in messages in a particular XCF group is an indication that some new function is being used. Or the *absence* of messages in another group might indicate a problem with some piece of software.

In this latest article from Todd, he offers insights on things to watch out for, based on his vast real world customer experience. We know that every reader will to able to use this article to optimize your sysplex and ensure that it keeps running in tip top condition.

See http://watsonwalker.com/publications/tuningletter/rate-sheet for information about subscribing to Cheryl's Tuning Letter.

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Page 1

Deriving More Value from SMF Data

- Primarily used in reactive manner
  - Automatically assess key metrics to proactively identify potential risks to availability and performance
- Siloed tooling across disciplines
  - Common interface into data types across platform promotes collaboration
  - Shared customized dynamic dashboards provide common views across teams

Deriving More Value from SMF Data

- Need to anticipate desired views in generated static reports
  - Dynamic navigation explores alternative analytical paths based on current view
- Focusing analysis when dealing with massive data volumes
  - Context sensitive drill downs to quickly focus on desired subset of data
- Declining expertise with retirements of tenured staff
  - Intuitive visibility expedites bringing newer staff up to speed
  - Interactive dialogs enable customized reports without coding

Benefits of Integrated Visibility – Webinar

Insights You Can Gain from Integrated Visibility Across Types of SMF Data

https://www.intellimagic.com/resources/zos/webinar/zacademy-insights-you-can-gain-from-integrated-visibility-across-types-of-smf-data/

Upcoming zAcademy Webinars

July 27 | 2 PM ET

MQ: How to Extract Insights and Optimize Performance Using SMF Data – Todd Havekost

August 24 | 2 PM ET

Metro Global Mirror (MGM) Monitoring in GDPS Sites – Joe Hyde

September 28 | 2 PM ET

Unraveling the z16: Understanding the Virtual Cache Architecture and Real-World Performance – John Baker & Todd Havekost

Questions?

Thank you for attending