z/OS Performance Management If You Only Have 20 Minutes a Day

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Questions?

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Abstract (why you're here!)

In today's IBM Z Enterprise environment, performance management is not always a full-time responsibility. Even in the world of AI (Artificial Intelligence), boots on the ground performance skills are still needed. This 20-minute presentation will outline how to conduct a z/OS performance management analysis if you only had 20-minutes a day while using Actual Intelligence (AI). This session will be filled with great and useful information.

EPS: We do z/OS Performance

- Pivotor - Reporting and analysis software and services
  - Not just reporting, but analysis-based reporting based on our expertise

- Education and instruction
  - We have taught our z/OS performance workshops all over the world

- Consulting
  - Performance war rooms: concentrated, highly productive group discussions and analysis

- Information
  - We present around the world and participate in online forums
    https://www.pivotor.com/content.html

EPS presentations this week

What	Who	When	Where
z/OS Performance Management If You Only Have 20 Minutes A Day	Scott Chapman	Mon 9:45	Salon 14
PSP: z/OS Performance Tuning - Some Top Things You May Not Know	Peter Enrico Scott Chapman	Tue 13:15	Salon 18
Planning Your Next Mainframe Processor Upgrade in 2026	Scott Chapman	Tue 15:45	Salon 15
Processor MSU Consumption Analysis	Peter Enrico	Wed 13:15	Salon 14
Can We All Share Fairly? Detection and Remediation of inter-LPAR Performance Impacts	Scott Chapman	Wed 14:30	Salon 14
Standard z/OS Measurements When Monitoring Transactions	Peter Enrico	Thu 14:30	Salon 19

Why 20 minutes?

- TBH: Because that matched this time slot

- The real point is my recommendation is that every shop have somebody who takes at least a cursory look at performance every day

- 20 minutes is only $1/24^{th}$ of an 8-hour workday so not a large investment

- When I was a customer, most days my daily check-out was much less
  - Of course, some days… life was more interesting

What are the goals?

- Gain a sense of the normal and expected
  - Train your neural network
- Gain a deeper understanding of the performance/capacity drivers
- Generate ideas for continuous improvements
  - May involve trade-offs that require a holistic view
- Be ready for problems
  - Problems will occur: if you've been using your tools to review performance everyday you'll be more prepared to analyze a new problem faster
- Prevent future problems
  - By catching problems when they're small and making continuous improvements
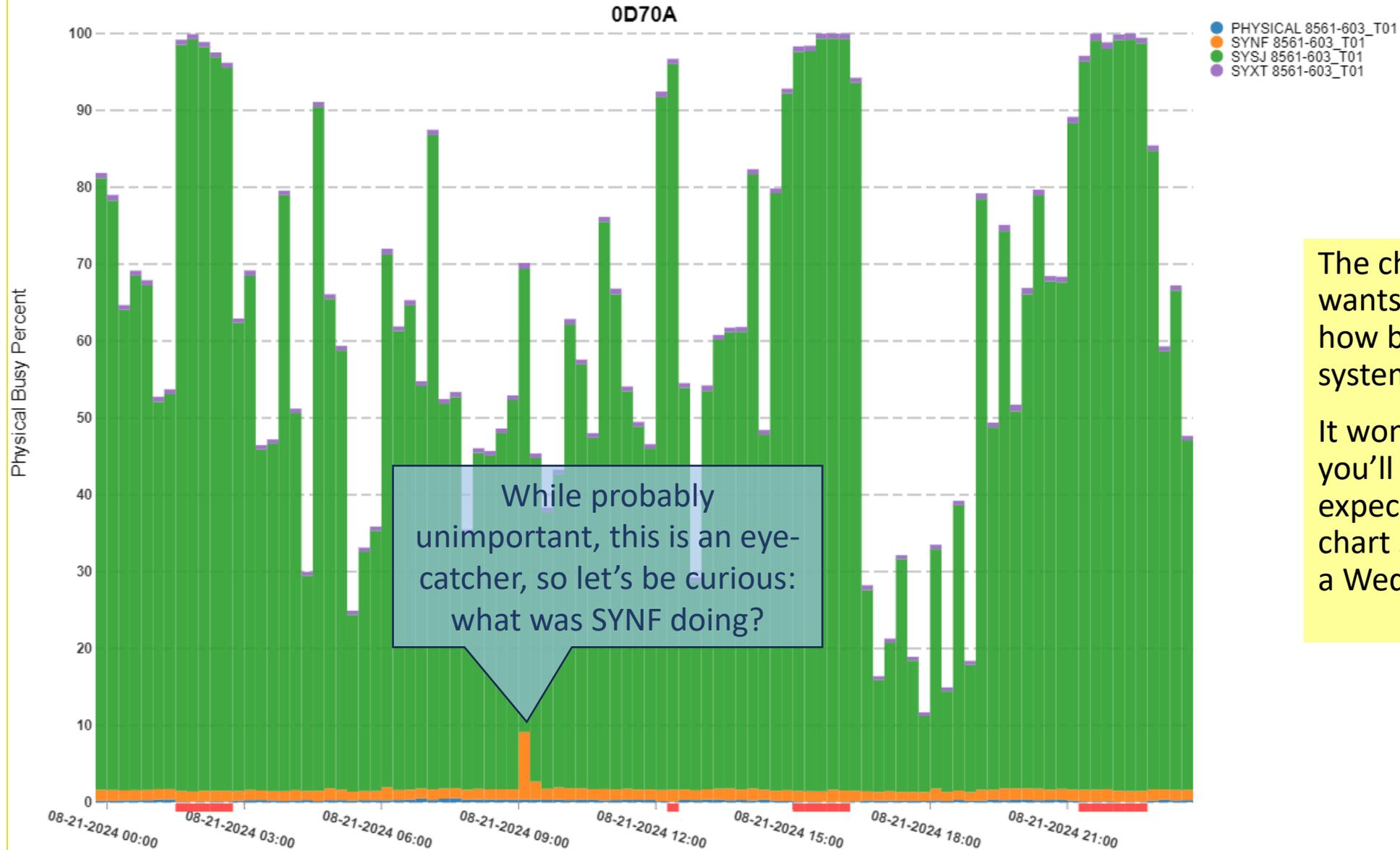
What do you need?

- Some form of performance reporting you can easily access everyday
  - Examples here are from our own tool: Pivotor
  - If you have to take 20 minutes running reports, that's not going to work so well!

- Knowledge of the business and the application
  - Need know what applications are important to the business and how
  - Need to understand where / how those applications run in z/OS
  - Ideally should capture business metrics!

- Curiosity
  - While probably not every day, you should expect to do some digging some days
  - Being curious about even minor eye catchers is a good way to practice and learn

What should you look at?

- System capacity utilization
  - How busy was the system yesterday?

- Application performance
  - Response times and batch completion: did you make all the SLAs?

- Business metrics
  - Whatever metrics drive utilization (and hence performance)
    - E.G. orders received, calls received, widgets produced, ATM transactions, whatever…
  - Special events such as storm mode or maybe just a special promotion

- System performance
  - Technical measures that may impact application performance
    - E.G. overall disk response time, CF response times, delay samples, etc.

While probably unimportant, this is an eye-catcher, so let's be curious: what was SYNF doing?
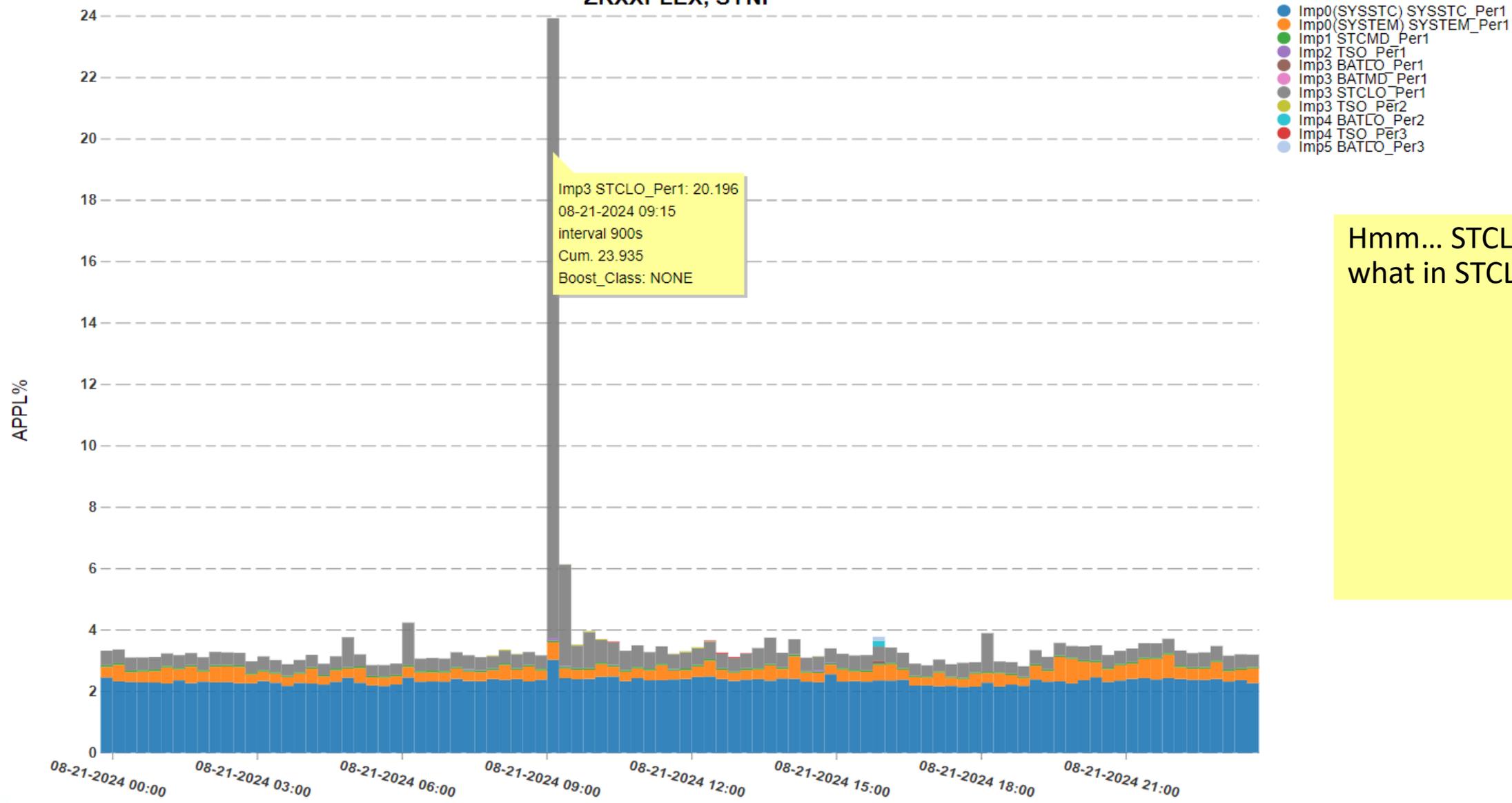
The chart everyone wants to look at first: how busy was the system yesterday?

It won't take long before you'll have an expectation of what the chart should look like on a Wednesday.

WLM CPU - CP APPL% by Service Class
(CP + zIIP on CP)
ZKXXPLEX, SYNF

Imp3 STCLO_Per1: 20.196
08-21-2024 09:15
interval 900s
Cum. 23.935
Boost_Class: NONE

Legend:
- Imp0(SYSSTC) SYSSTC_Per1
- Imp0(SYSTEM) SYSTEM_Per1
- Imp1 STCMD_Per1
- Imp2 TSO_Per1
- Imp3 BATLO_Per1
- Imp3 BATMD_Per1
- Imp3 STCLO_Per1
- Imp3 TSO_Per2
- Imp4 BATLO_Per2
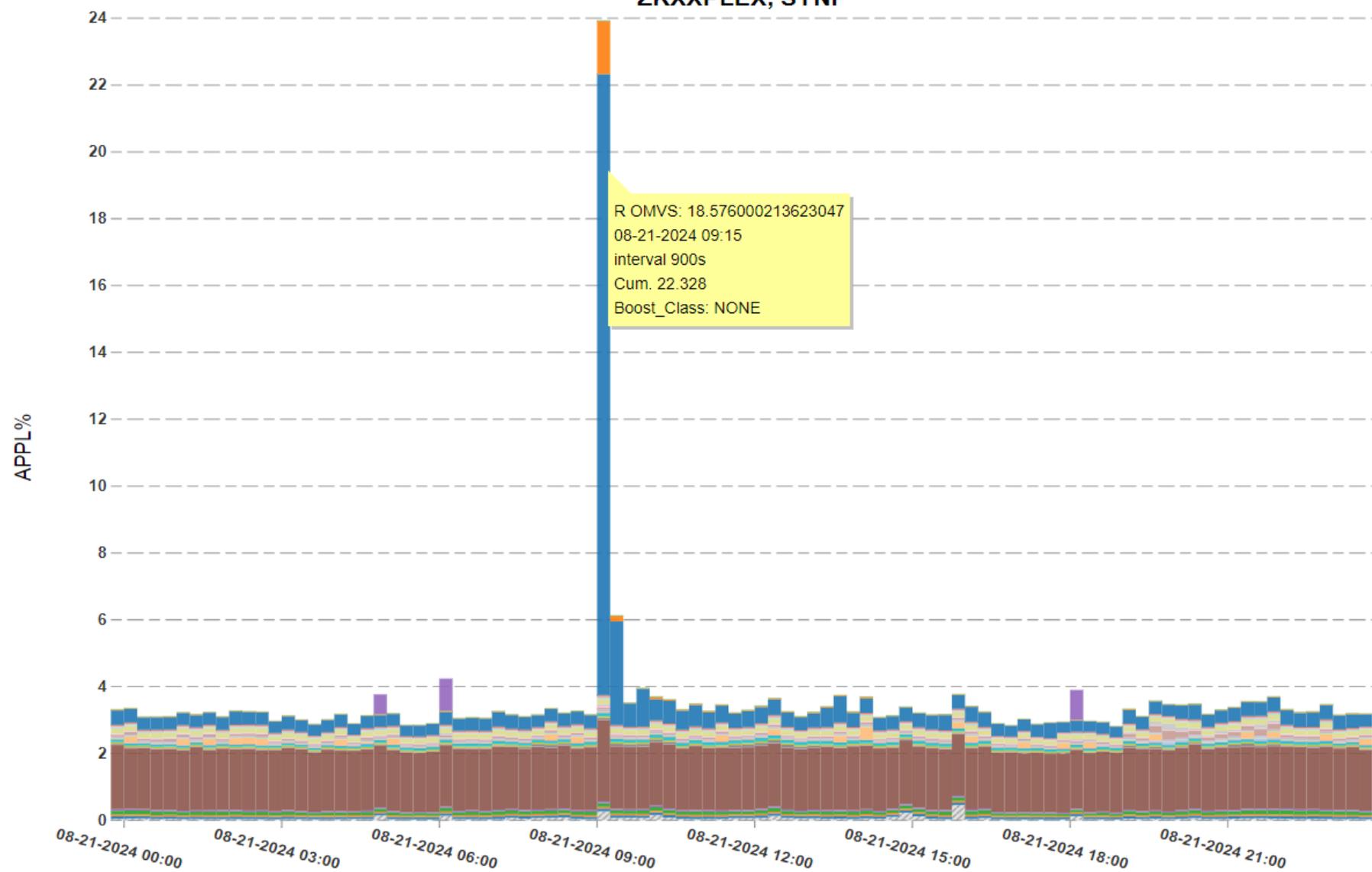- Imp4 TSO_Per3
- Imp5 BATLO_Per3

Hmm... STCLO. I wonder what in STCLO?

WLM CPU - CP APPL% for Top Report Classes
(CP + zIIP on CP)

ZKXXPLEX, SYNF

R OMVS: 18.576000213623047
08-21-2024 09:15
interval 900s
Cum. 22.328
Boost_Class: NONE

Legend:
- Other
- RBBCAS
- RDBNGL
- RIZU
- RJES2
- RMVSPAS
- RRRS
- RSDSFAUX
- RSMS
- RSS
- RSS CIM
- RSYIEFSC
- RSYIX
- RSYJ
- RSYM
- RSYX
- RSY C
- RSY
- RSY T
- RTCF
- RZFS
- R CB
- R OM
- R STO
- R SYS
- R LDA

Report class name seems to imply that this was OMVS work.

So we apparently have somebody doing OMVS work that is using about a fifth of CP for about 15 minutes. I wonder who and if this is something new they intending on doing regularly.

Top Address Space CPU Time for Service Class
Period of Study
ZKXXPLEX, SYNF, STCLO

Legend:
- LDAP STC00167
- ZWE1AC STC00261
- ZWE1AD STC00074
- ZWE1AG STC00314
- ZWE1CS STC00272
- ZWE1DS STC00306
- ZWE1MS STC00068
- ZWESLSTC STC00310
- ZWESLSTC STC00311
- ZWE1AD STC00079
- ZWE1AG STC00038
- ZWE1DS STC00305
- ZWE1AD STC00306
- ZWE1AG STC00249
- ZWESLSTC STC00064
- ZWE1AD STC00249
- ZWE1AG STC00305
- ZWE1DS STC00067
- ZWESLSTC STC00090
- ZWESLSTC STC00094
- ZWESLSTC STC00104

Tooltip:
ZWE1AG STC00305: 58.77
08-21-2024 09:44
interval 900s
Cum. 109.51
max cpu intensity: 3.264444
avg priority: 242.0

Note (yellow box):
Looks like there were a number of similarly named STCs which got extra intensive in the 9:00 hour.

Probably the first part of the name is a userid.

Follow-up with the owner to find out what they were doing.

You want me to talk to people?

- Yeah, sorry about that: but it turns out people know things
  - Be polite, friendly, and open
  - The goal is to learn a little a tidbit that may be useful in the future
- Yeah, this is an insignificant event: one tiny system used a bit more CPU briefly, but it may presage later changes
  - E.G. you may learn that the application team is testing some new process that's running new Unix scripts to do something
  - Or maybe it was just somebody doing a new product install on a sysprog test LPAR
- May give you an opportunity to get involved early in the process before they come looking for help
  - "I noticed that work was going to STCLO, which may be fine, but as you get a little further down the road to deploying this let's talk to make sure it's getting the service it needs to support the business."

# Avg Response Time and Rate
(Excluding system transactions)
SYSJ, CICS1016

Legend:
- avg response_time
- tran per_sec
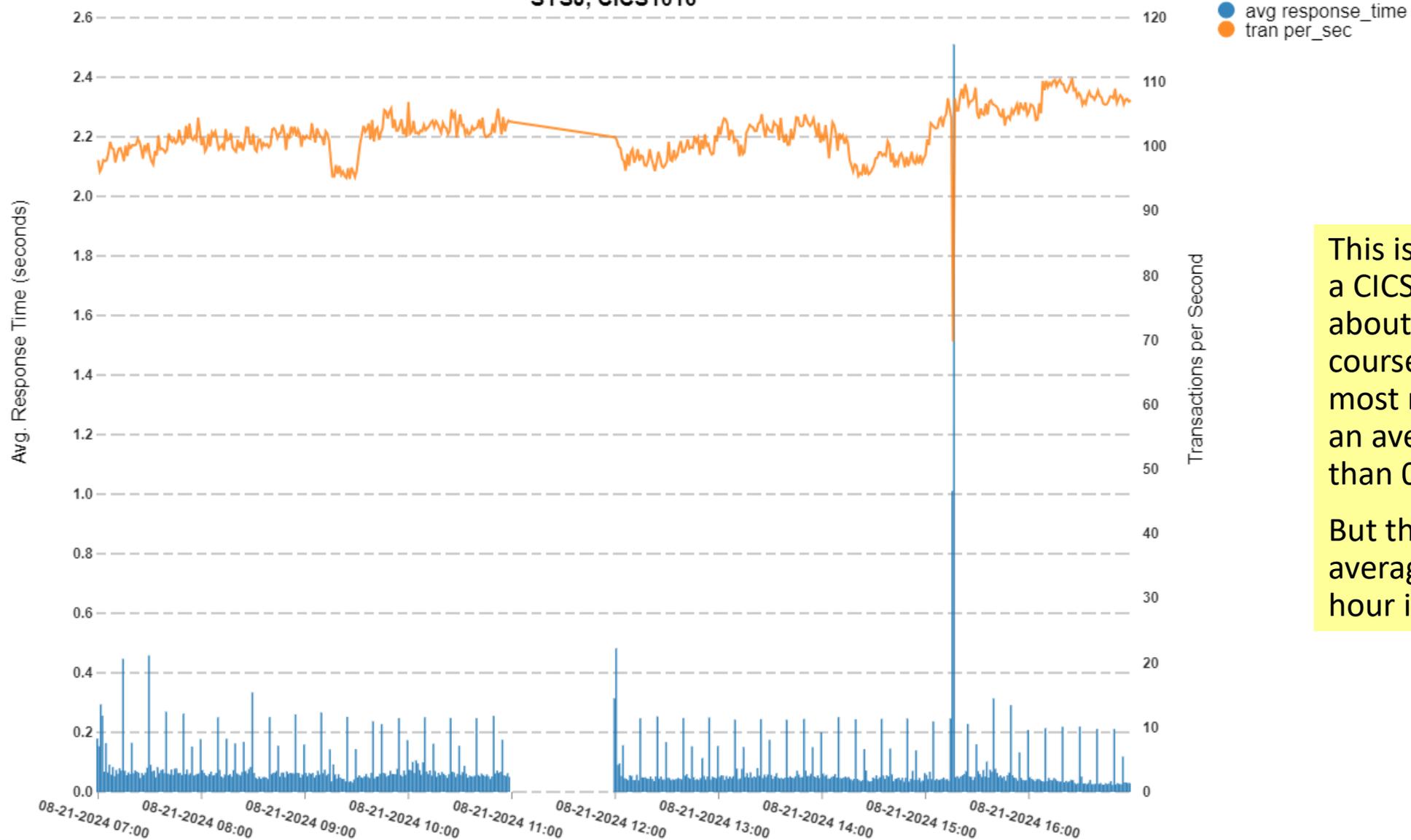
This is just an example of a CICS region doing about 100 tps over the course of the day with most minutes showing an average RT of less than 0.2 seconds.

But that large spike in average RT in the 15:00 hour is "interesting".

CICS Region Response Time Distribution

CICS1016, CICS1016
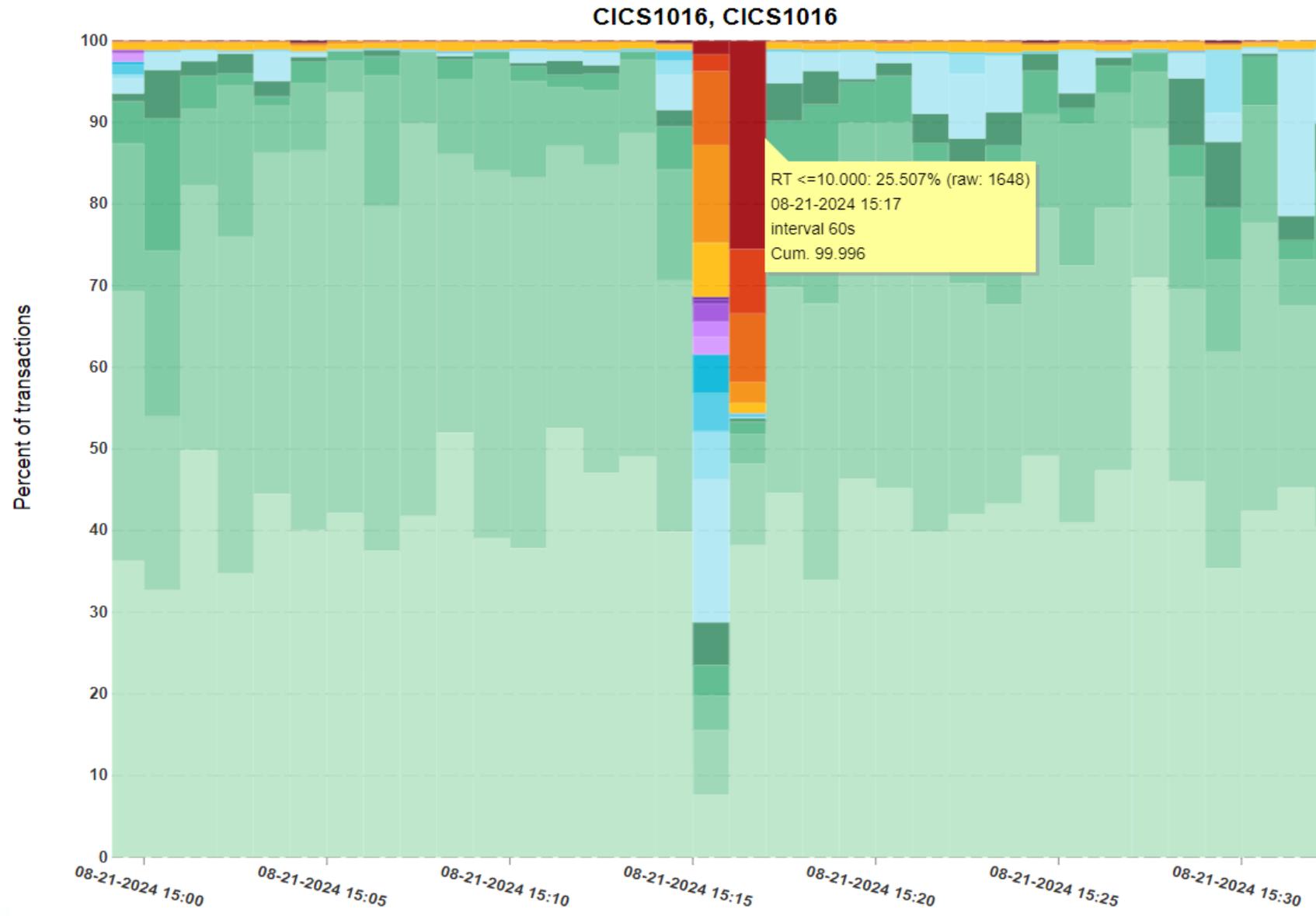
Legend:
- RT <= 0.020
- RT <= 0.040
- RT <= 0.060
- RT <= 0.080
- RT <= 0.100
- RT <= 0.200
- RT <= 0.300
- RT <= 0.400
- RT <= 0.500
- RT <= 0.600
- RT <= 0.700
- RT <= 0.800
- RT <= 0.900
- RT <= 1.000
- RT <= 2.000
- RT <= 3.000
- RT <= 4.000
- RT <= 5.000
- RT <=10.000
- RT > 10.000

Tooltip:
RT <=10.000: 25.507% (raw: 1648)
08-21-2024 15:17
interval 60s
Cum. 99.996

Zooming in on the response time distribution we can verify that there were several transactions finishing in the 5-10 second RT bucket, so not just a single long-running transaction that ended and drove up the average.

For time reasons, we're not going to try to dig into this.

Do we care about a 2-minute issue?

- Maybe so, maybe no

- Even if this wasn't an SLA violation, if it's unusual, it might be worth looking into so a small problem doesn't become a bigger one

- Also, helps you be prepared when maybe the users finally complain
  - Users don't necessarily report every hiccup: until it becomes too annoying or problematic, at which point it becomes an emergency
  - "Every day a little after 3pm everything seems to lock up, and today that happened when trying to help a VIP so we need to get this fixed now!"

What about business metrics?

- Talk to the application folks!
- The application does the business work, so often somebody can just write a database query to pull relevant daily business metrics
  - Even better would be to get them at an hourly or even per-minute basis!
    - Yes, I always want more data!
- Ideally collect that data and report on it with your performance/capacity measures
  - If you're a Pivotor customer: yes, we can set up custom reporting for you for that
- Can come in really handy for understanding if a change in performance or utilization is a result of doing more business work or a technical change
  - Just counting CICS transactions not necessarily enough: the application may change business flows that cause a change in transaction counts without a change in business volume

What about system performance?

- System performance metrics are interesting and important, but you can have bad performance metrics and be satisfying the business needs
  - Hence the reason I don't start at system performance
  - Note: system capacity is a different story!
- Don't necessarily need to look at things like CF or disk RTs daily
  - Probably fairly stable, and when they vary the first question will be what technical and business volumes changed: e.g. did we do more transactions yesterday?
- Do look in on them occasionally though
  - Fix easy things as they come to light, to help avoid problems in the future
  - Even if "nobody" notices
  - Also, sometimes the averages can hide the fact that something important is suffering significantly
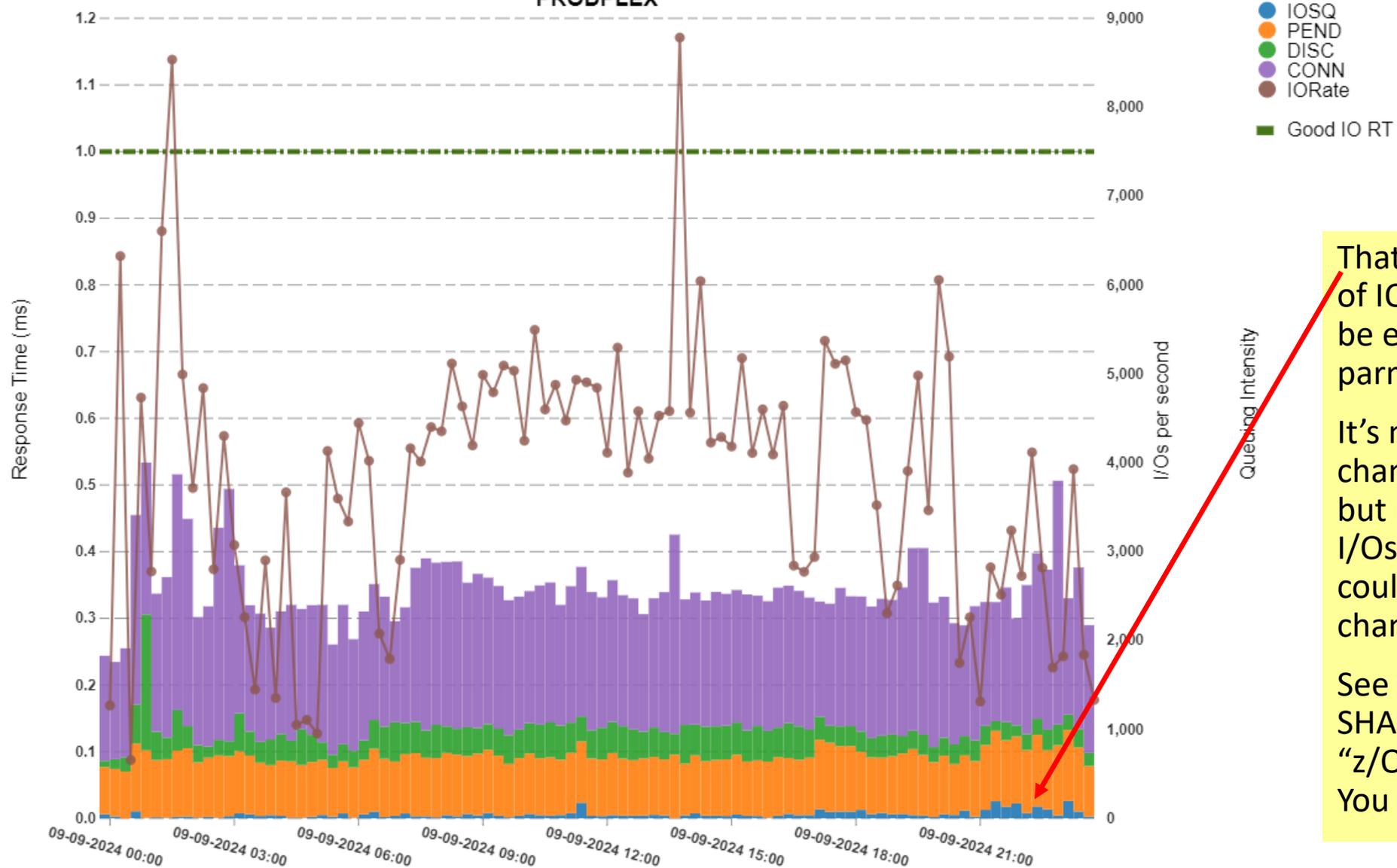
That tiny (on average) bit of IOSQ time can probably be easily resolved with a parmlib change.

It's not going to materially change the average disk RT, but if there were important I/Os waiting on a PAV, this could still be an important change.

See also my session from SHARE Cleveland 2025: "z/OS I/O Performance: Do You Have a Problem?"

Summary

- On a daily basis review:
  - Capacity Utilization
  - Application performance / SLA attainment
  - Business metrics
- Occasionally review technical system performance numbers
- Stay curious! Pull the thread, go down the rabbit hole!
  - You might learn something interesting
  - At the very least you're practicing looking into a problem, so you'll be faster at it when it's a "real" problem

Actual Intelligence > Artificial Intelligence

- Artificial Intelligence & Machine Learning can be very helpful, but won't:
  - Be curious about "why" something happened
  - Understand that thunderstorms that blew through yesterday, likely accounting for more calls into the call center
  - Know that Jane was installing new software yesterday
  - Balance the workload performance based on non-technical needs
  - Build relationships between teams

  (At least today)

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