PSM: FROM REACTIVE TO PROACTIVE WINDCHILL MONITORING

Jonathan Kim

Windchill Solution Architect – GE Aviation

June 9, 2016

AGENDA

- A little about myself and GE Aviation
- GE Aviation Architecture
- What is was like?
  - Reactive Monitoring and many sleepless/restless nights
- What happened?
  - Enter PTC System Monitoring (PSM) and transitioning away from Reactive to Proactive Monitoring
- What it is like now?
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  - Use-case Demonstration in the PSM Client (Time permitting)

WHAT IS MY GOAL?

- Describe the journey as we grow and adapt our efforts to monitor and sustain Aviation's Production Windchill instances.
- Portray life before PSM and life with PSM, as it is right now.

- Leave you with a realistic view of PSM implementation and wanting more!

FIRST, LET'S LEARN MORE ABOUT YOU

- Anyone currently have PSM implemented? Using it?
- If no PSM, what are you doing to monitor Production application?
- How many of you have experienced/worked an Enterprise Down?
  - Follow-the-sun triage?
  - Less than 1 day?
  - More than 1 day?

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PERSONAL AND AVIATION BACKGROUND

- Jonathan Kim (JK)
  - 15 years working with PTC PLM tools
    - Several as a consultant, traveling for a living
  - Functioned as
    - Developer
    - Dev Lead/Build Master
    - System Administrator
    - Architect
  - Performed many upgrades
    - 6 → 7 → 8 → 9 → 10
  - Support(ed) many PLM environments
    - DEV → QA → PROD

- GE Aviation
  - PLM instance has roots in Version 5
    - 5 → 6 → 7 → 9.1 → 10.2 → 11 (soon)
  - Currently at 10.2 M030
    - PDML, PJL
    - CSM – WBR – PTL
    - ESI – WGM
    - 3rd Party Integrations
  - TWO PRODUCTION Instances (US and UK)
  - Many Non-PROD environments

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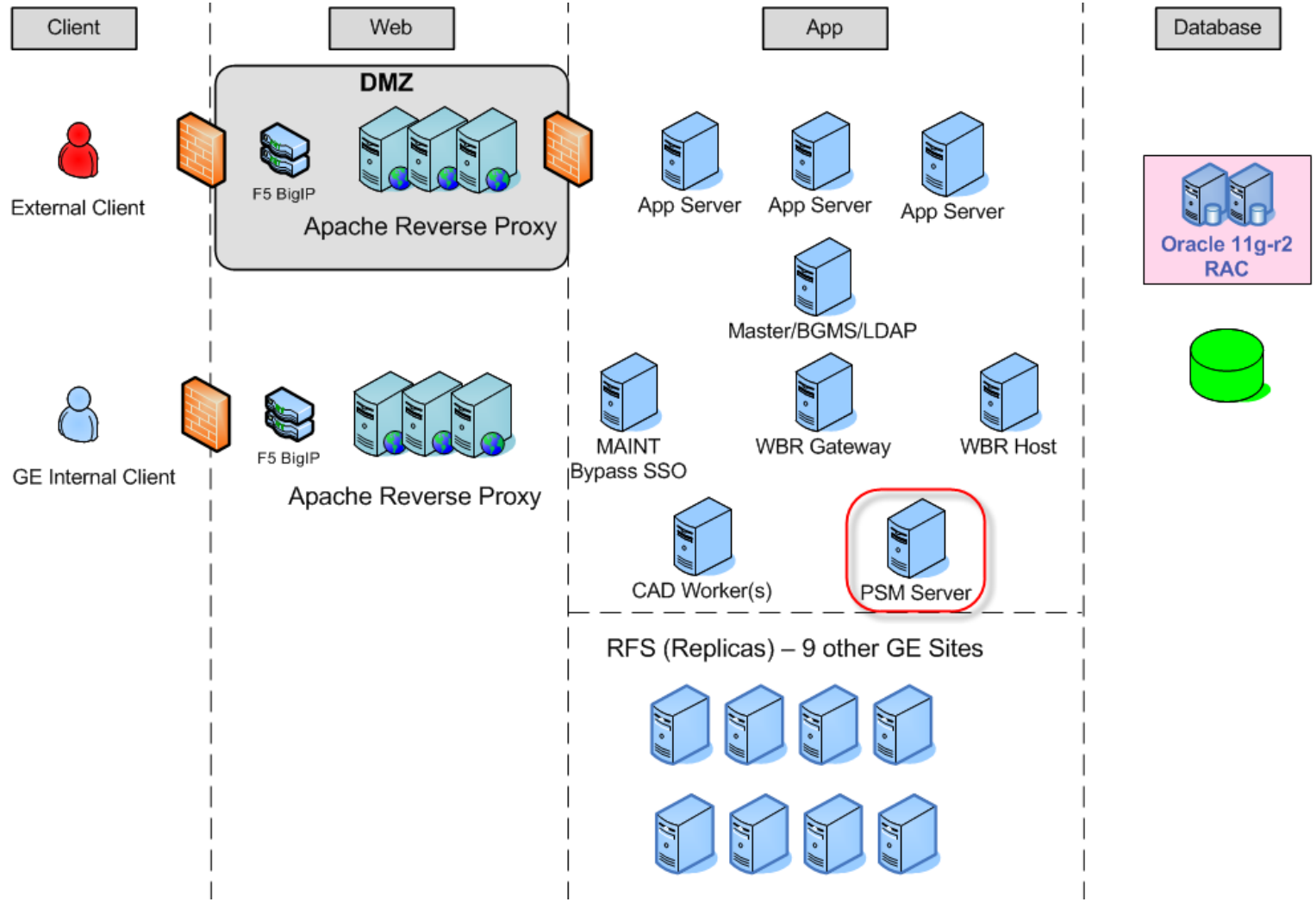
PRODUCTION LANDSCAPE

- Multi-Tier Architecture
- Internally/Externally accessible
- All layers are in EC Vault
- Virtualized RHEL
- Oracle RAC
- Single Sign On enabled
- 8 Remote File Servers
- Integrations to ERP, Global Trade Compliance Tool, Salesforce.com
- ~ 6000 named users
- 350 – 450 concurrent users



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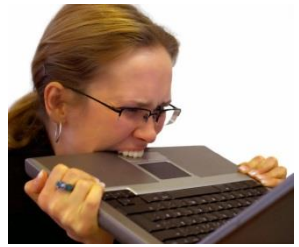
WHAT IT WAS LIKE IN A REACTIVE MONITORING WORLD

Windchill is down again....imagine that!?!?!

Why is Windchill so slow!?!?! It was working fine earlier!



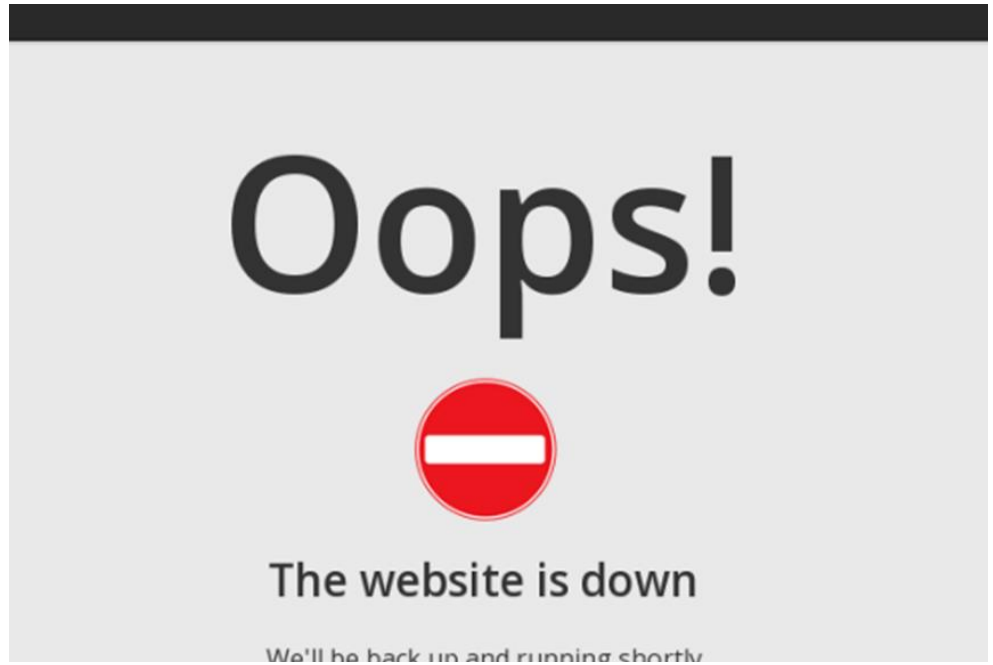
Time for a break...maybe it will be done when I get back.

UGH!!! I have to work in Windchill today!!!!

Something is wrong with Windchill! Is it down...again?

REACTIVE MONITORING AND RESPONSE

- How we found out Windchill was performing poorly or down?
  - Immediate team-members
  - Power Users contacting
  - Tickets→ Enterprise Down
- Is it truly down?
  - Windchill is fine, but still "down"
  - Many times, 3rd party is root-cause (SSO, LB, etc)
  - Damage already done anyway
- It is down…work around the clock until resolved.
- Many restless/sleepless nights



WHAT WAS THE FALLOUT?

- Productivity suffers and deliveries are frozen
- Shop Floor work stoppage
- Upper management attention and visibility
- Application (user-experience" and credibility is tarnished
- "Black-eye" on support team
- CRUX: LOST DOLLARS and PRODUCTIVITY

End User Satisfaction

PROBLEM AND RESULTANT NEEDS

- Current monitors are reactive
- Monitors at the process level and no deeper
- Daily health report
- P&A monitoring from regions
  - Simulates end-user clicks
  - All robots down before notified
- Monitoring getting better, but still usually a "too little, too late"
- Image/credibility really suffering
- Implemented mid-week/weekend bounces for stability
- P&A improvements consistently back-burnered

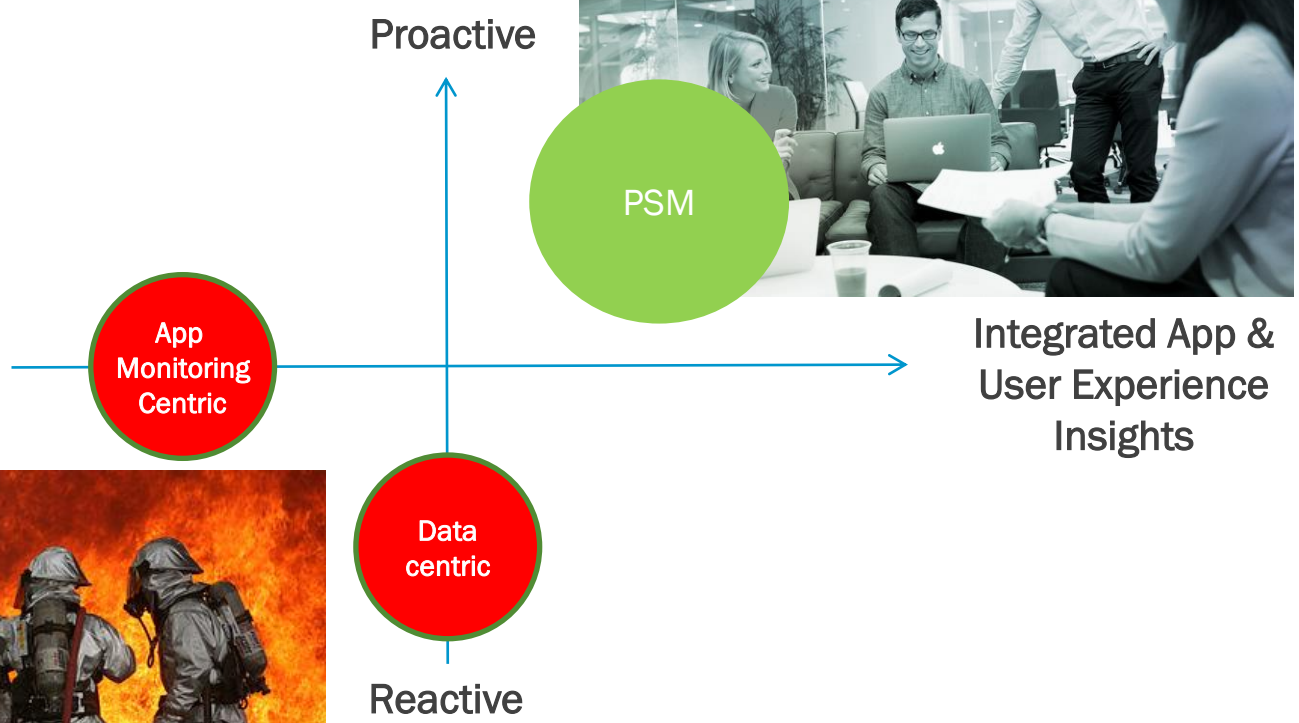
- Need ability to monitor health, availability and performance in real-time
- Notification of issues early
- Quicker response to issues and "head off at the pass"
- More effective tool(s) to assist with problem resolution and RCA
- Improve User-Experience and Windchill perception

BOTTOM LINE: Tools in place were effective, to an end…but we needed a systemic change to be successful

MORE ABOUT YOUR IMPLEMENTATIONS?

- Does anyone have reactive type tools in place?
- Anyone experiencing frustrated user-experience or Application performance “black-eyes”?
- Anyone have brief examples of steps taken to improve application stability? (e.g. bi-weekly bounces)

GO FROM FIGHTING FIRES TO PREVENTING THEM



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WHAT HAPPENED???

- Attended PTC Live Global (Anaheim) in 2013
- Saw several session on PSM and its use
- Also met with Dynatrace on exhibition floor….and was floored!

- Up until this point, I was aware of PSM…now had the proof and sufficient knowledge to go fight to get it implemented
- APPROVED! Go implement PSM!
- ALSO APPROVED – User Experience Module (UEM) bolt-on from Dynatrace
  - Track and monitor real user-experience to assess user satisfaction.

WHAT IS PSM?

- What is PTC System Monitor (PSM)
  - Separate, independent application performance monitor, powered by Dynatrace
  - Tailored by PTC for their applications, such as Windchill
  - *** NO INCREMENTAL COST – Included with licensed Windchill ***

Monitor every transaction 24/7
Host and Application Health Status
Pre-configured Alerts, Notifications

Rapidly Diagnose and Resolve Problems
Always-on code level transaction tracing
Trace and Capture across all Tiers

Report
Track business-critical transactions
Trend and correlate over time
Track user activity, click by click

KEY CAPABILITIES

Dashboards
Monitor host, application and business metrics

Alerts on Key Performance Indicators (KPI)
Real-time notifications of warning and more severe issues

Reports and Charting
Track and gather data on resource and response time trend analysis

User Tracking
Unprecedented view into End-user actions and "problem clicks"

Instrumentation
Logging at key locations enables code level diagnostics

Better cooperation with PTC TS
Save all live date to a session file offline for delivery to PTC TSEs working your case

PSM COMPONENTS

Agent – Allow JVM process monitoring

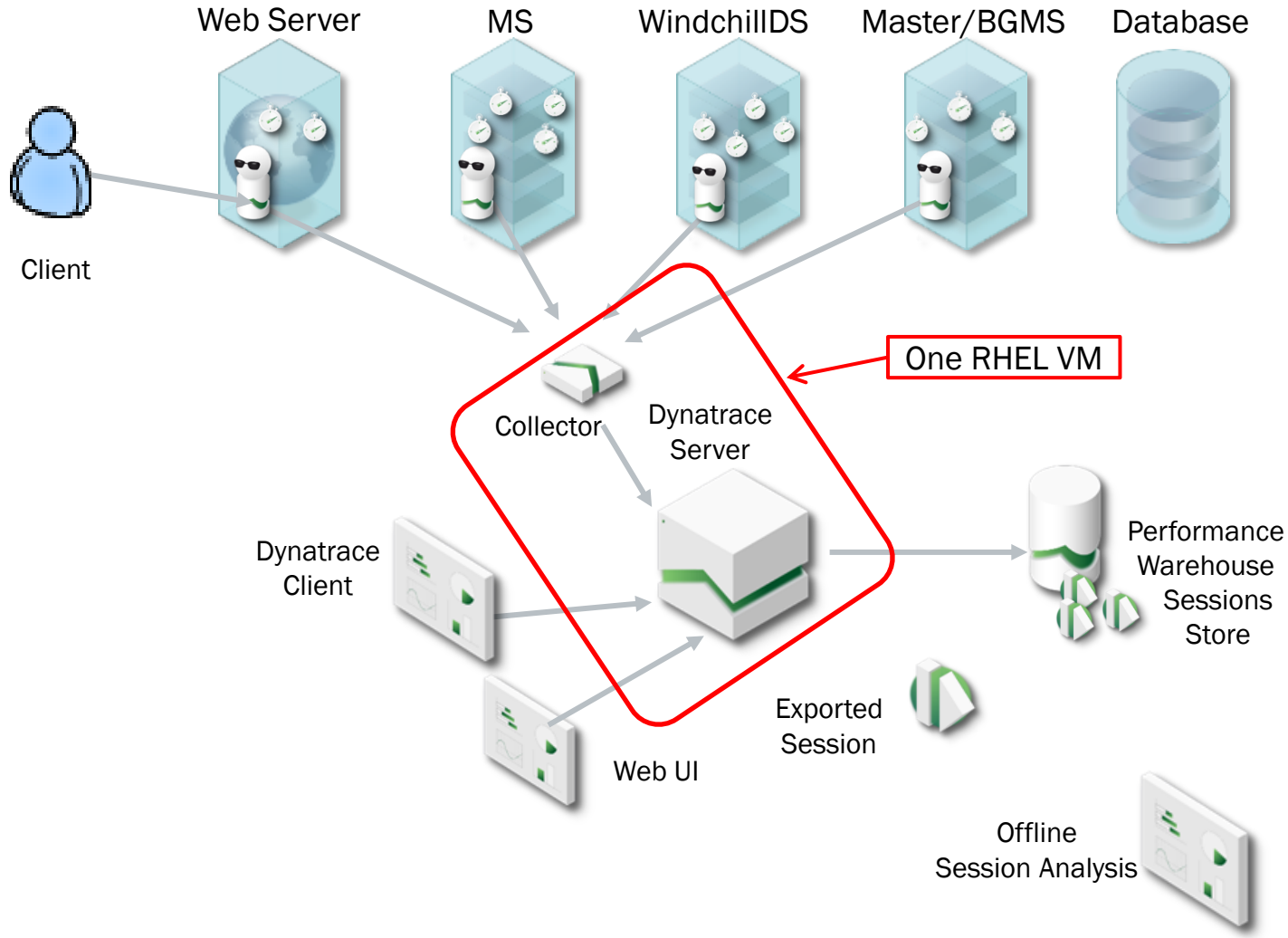
Collector – Collect and bundle info coming from agents

Dynatrace Server – Workhorse provides analysis, reporting and alerts

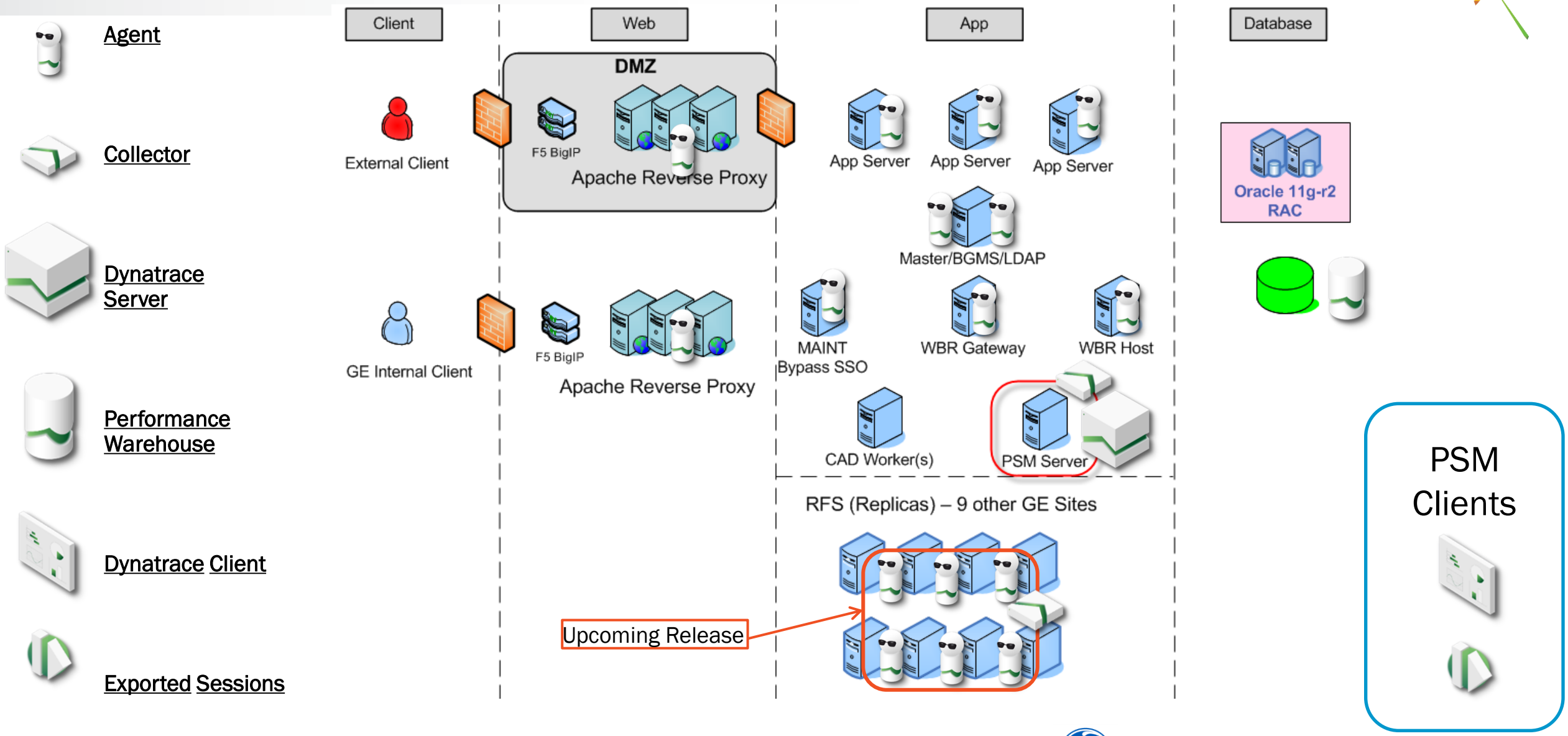
Performance Warehouse – Database used for long-term reporting

Dynatrace Client (Desktop or Web) – PSM User interface

Exported Sessions – For offline analysis or delivery to PTC TS (or demonstrations ☺)



PRODUCTION DEPLOYMENT



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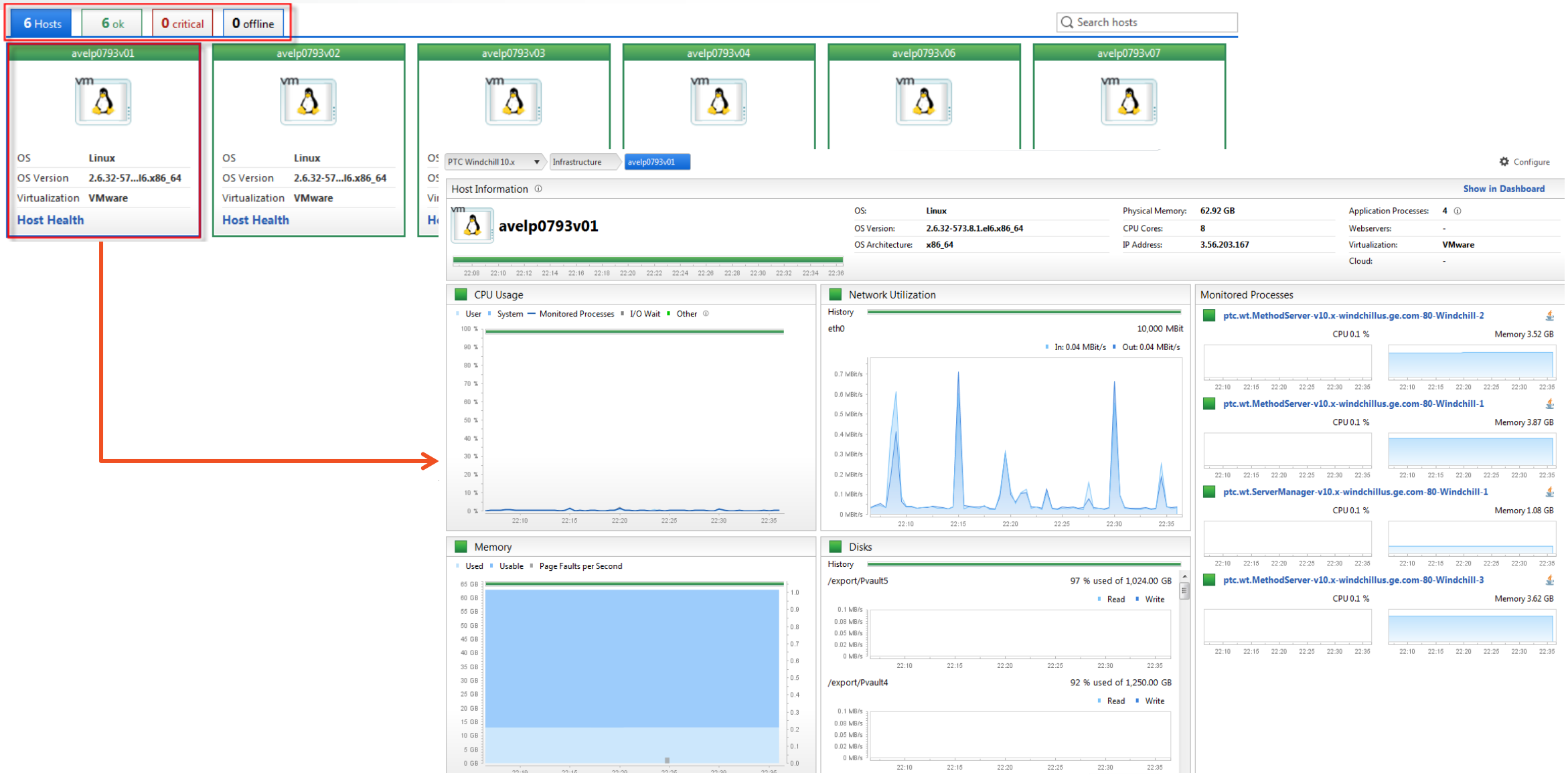
WHAT IT IS LIKE NOW?

PSM is a GAME-CHANGER

- Learning curve was very short – OOTB configurations are very powerful
- Dashboards are very intuitive – Point and Click
- Provides immediate visual cues of entire system
  - Visually isolating issues – impossible until now
- Configure and receive warnings of potential issues before they become issues
- All data is easily accessible through one place
  - No more jumping from server to server for logs
  - Captures data down to the transaction (method, sql) level
  - Easy packaging of data for PTC TS
- Helped to repair a tarnished/damaged Application image – You could consider it our "hidden public relations" rep.

HOST MONITORING



PROACTIVE NOTIFICATIONS

Severe Incident started: Active Contexts - severe

Details

Time:	2016-05-04 10:37:30
System Profile:	PTC Windchill 10.x
dynaTrace Server:	avelp0793v09

Violations

MS Active Contexts: ptc.wt.MethodServer-v10.x-windchillus.ge.com-80-Windchill-12@avelp0793v03: Was 25.00 but should be lower than 25.00.

dynatrace Open in dynaTrace Open in browser

Warning Incident started: MS GC Utilization

Details

Time:	2016-04-20 17:26:20
System Profile:	PTC Windchill 10.x
dynaTrace Server:	avelp0793v09

Violations

MS GC Total Utilization: ptc.wt.MethodServer-v10.x-windchillus.ge.com-80-Windchill-1@avelp0793v01: Was 7.67 % but should be lower than 7.50 %.
MS Memory Utilization: ptc.wt.MethodServer-v10.x-windchillus.ge.com-80-Windchill-1@avelp0793v01: Was 87.18 % but should be lower than 85.00 %.

dynatrace Open in dynaTrace Open in browser

Severe Incident occurred: Average response time degraded

The average response time (median) is significantly higher than expected. Although the observed response time might be still acceptable for users, this behavior is typically caused by application or infrastructure problems and reduces the maximum throughput you can achieve.

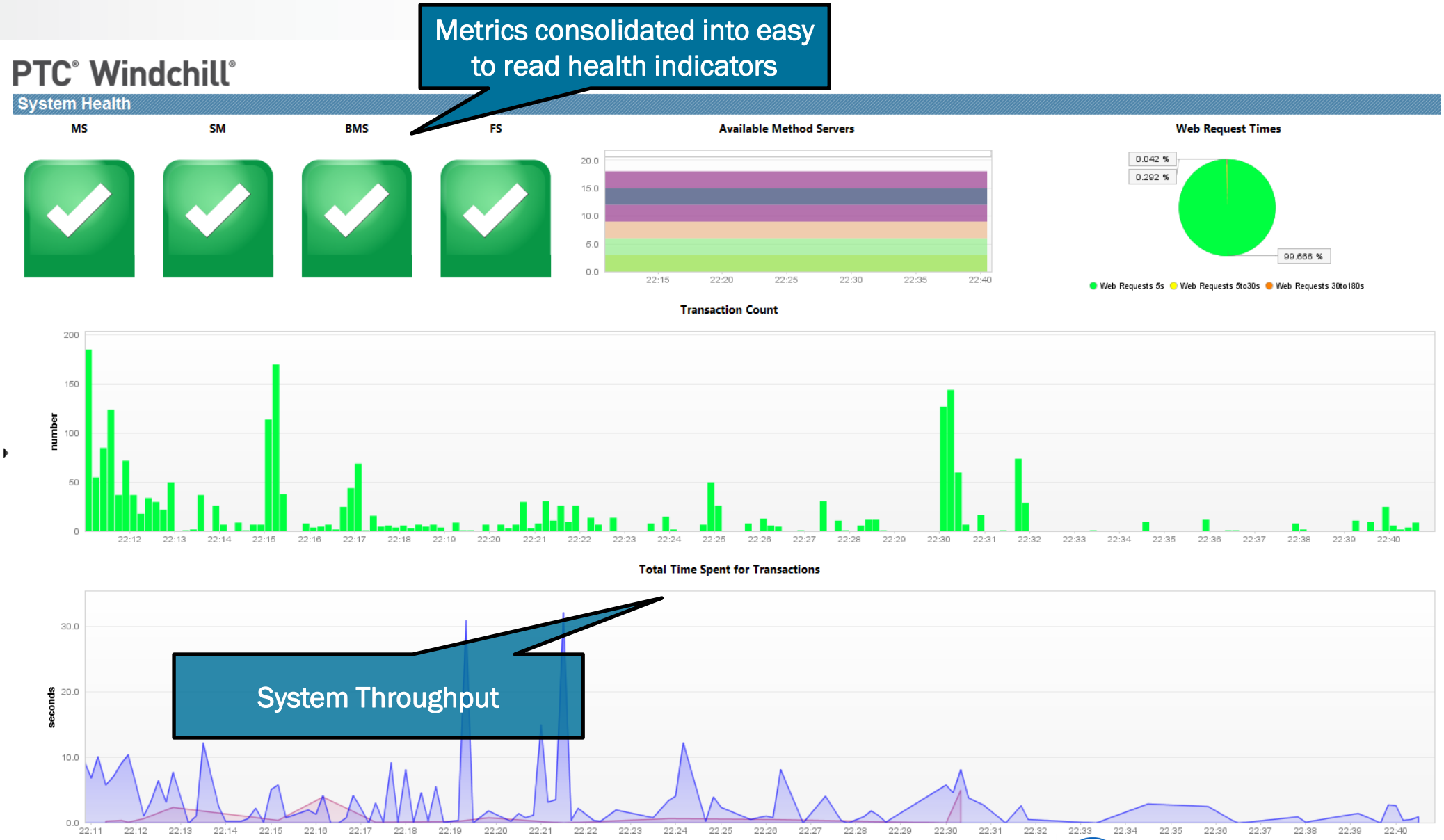
Details

Time:	2016-04-28 10:32:00
Business Transactions:	Web Page Requests [Windchill/ptc1/<...>]
System Profile:	PTC Windchill 10.x
dynaTrace Server:	avelp0793v09
Application:	windchillus.ge.com

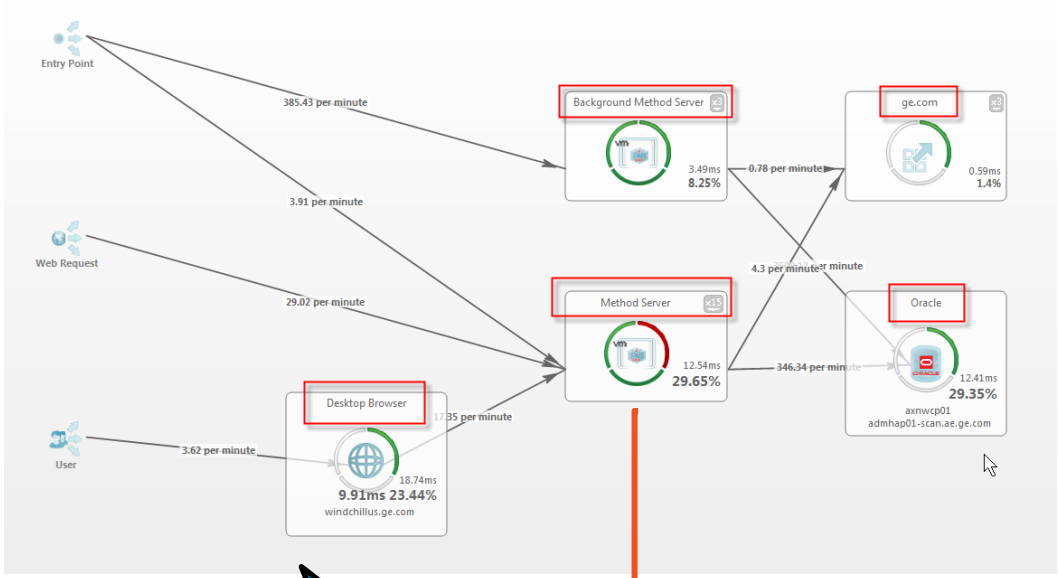
Violations

Observed response time of 167ms is higher than expected. During the last 7d the average response time was less than 55ms.

SYSTEM HEALTH DASHBOARD

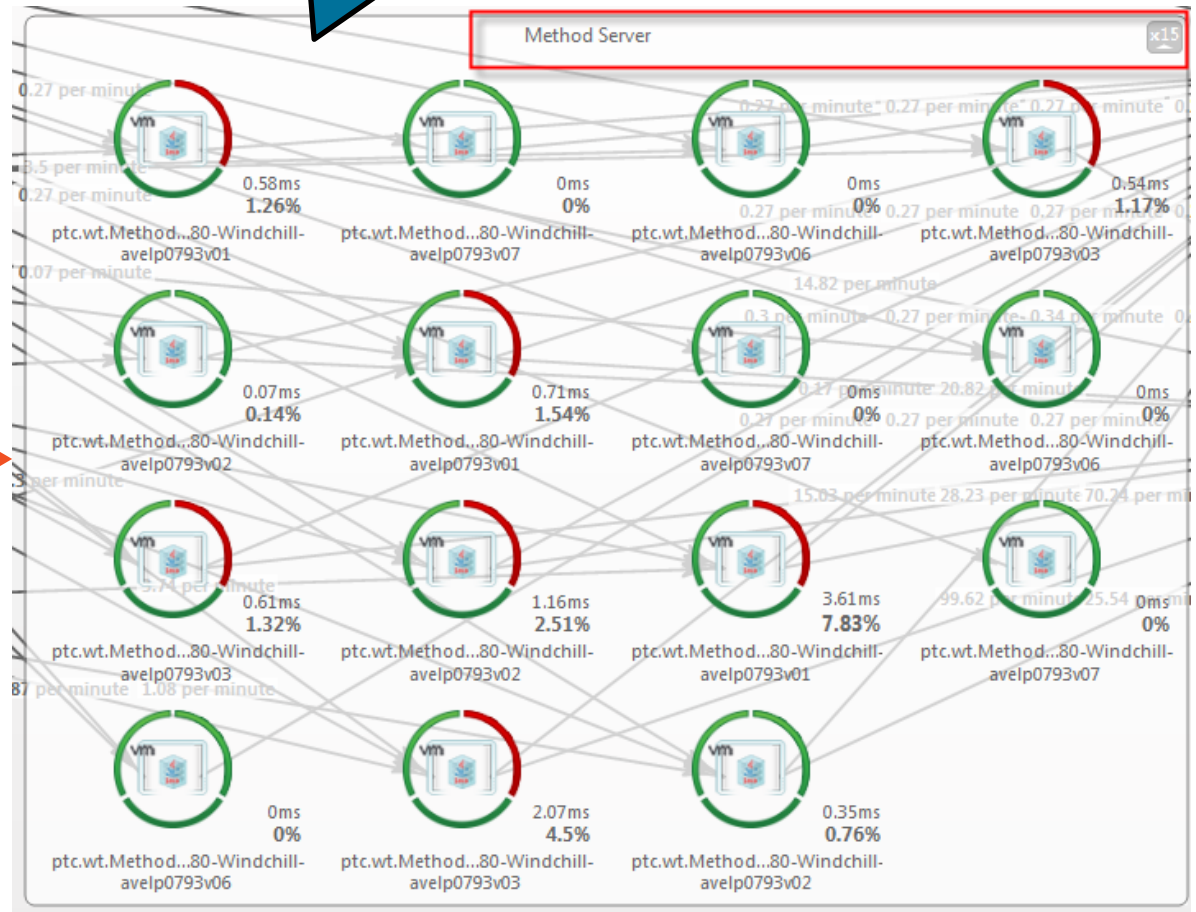


VISUAL DRILL DOWN INTO PROCESS



Graphical layout of VMs and other Processes

Drill down into all MethodServers and can go further



METHODSERVER STATUS DASHBOARD

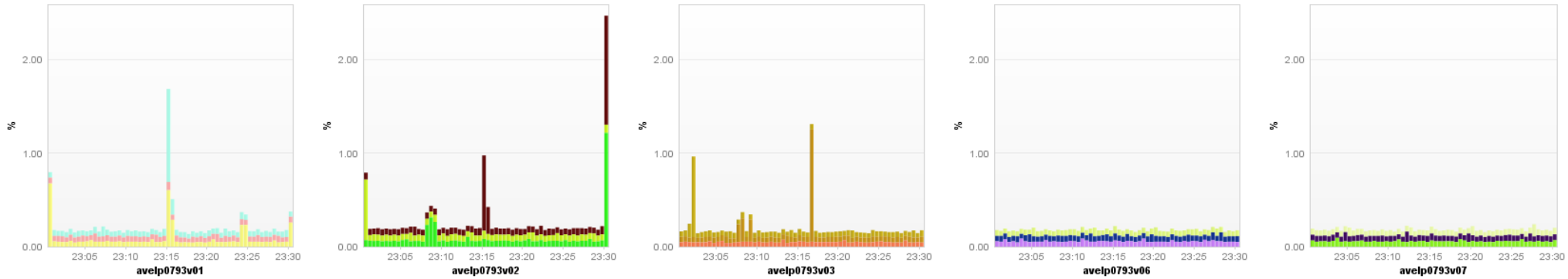
Easily identify with server in cluster is running into an issue

PTC® Windchill®

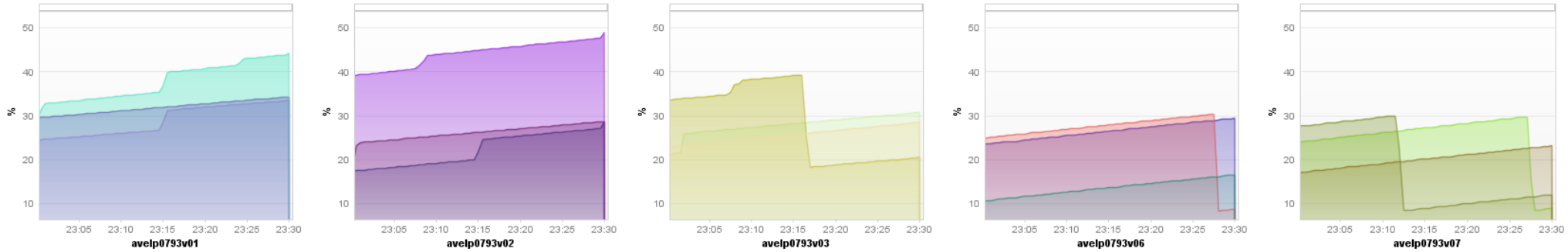
Method Server Status

Agent, Monitor or Transaction	MS Memory Utilization [max]		
avelp0793v01			0.01
ptc.wt.MethodServer-v10.x-windchillus.ge.com-80-Win		31.46 ms	
ptc.wt.MethodServer-v10.x-windchillus.ge.com-80-Win			0.03
ptc.wt.MethodServer-v10.x-windchillus.ge.com-80-Win		3.70 ms	
ptc.wt.MethodServer-v10.x-windchillus.ge.com-80-Win			0.00
ptc.wt.MethodServer-v10.x-windchillus.ge.com-80-Win		23.48 ms	
ptc.wt.MethodServer-v10.x-windchillus.ge.com-80-Win			0.00
avelp0793v02		77.13 ms	0.01

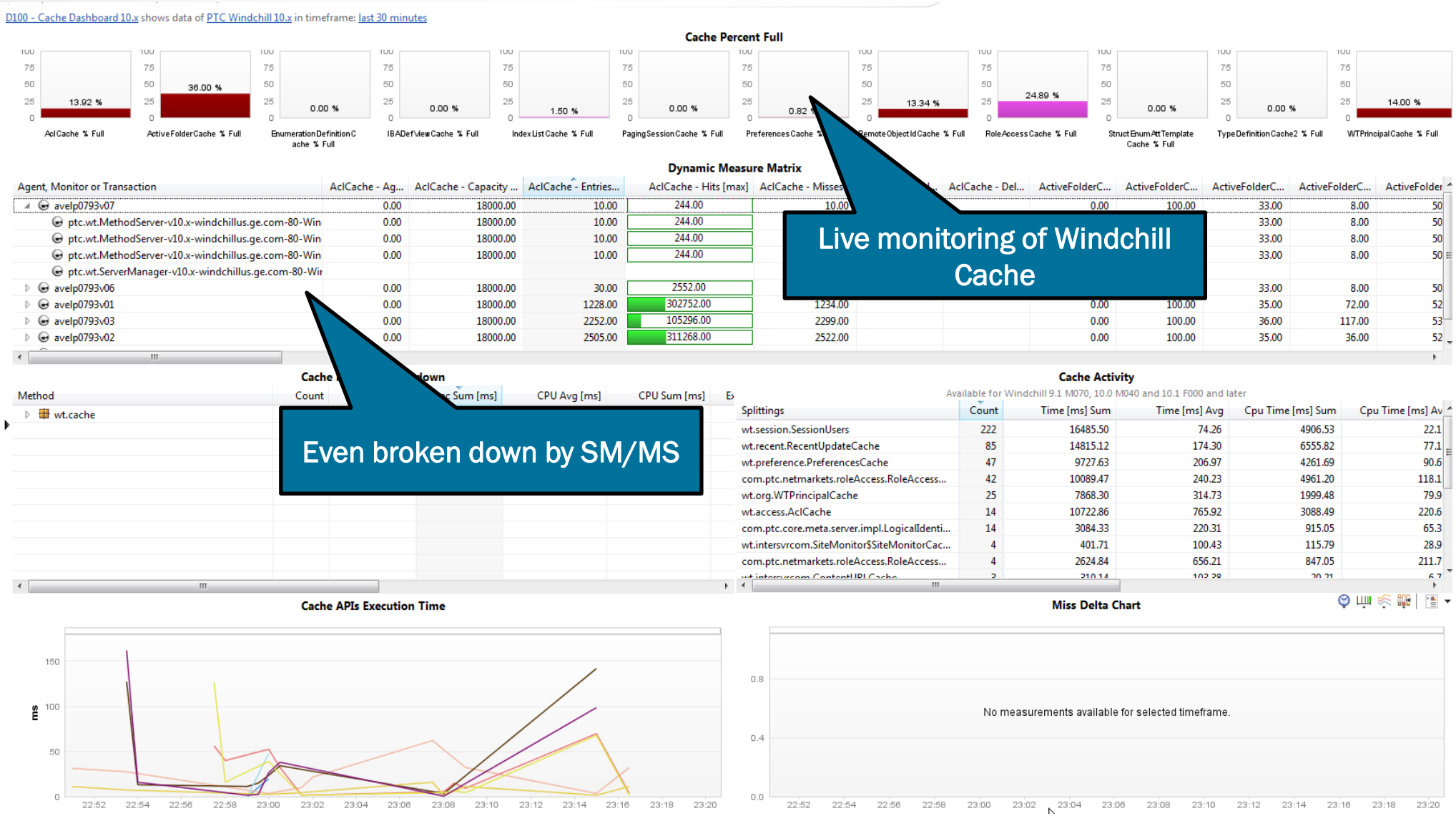
Method Server CPU Usage



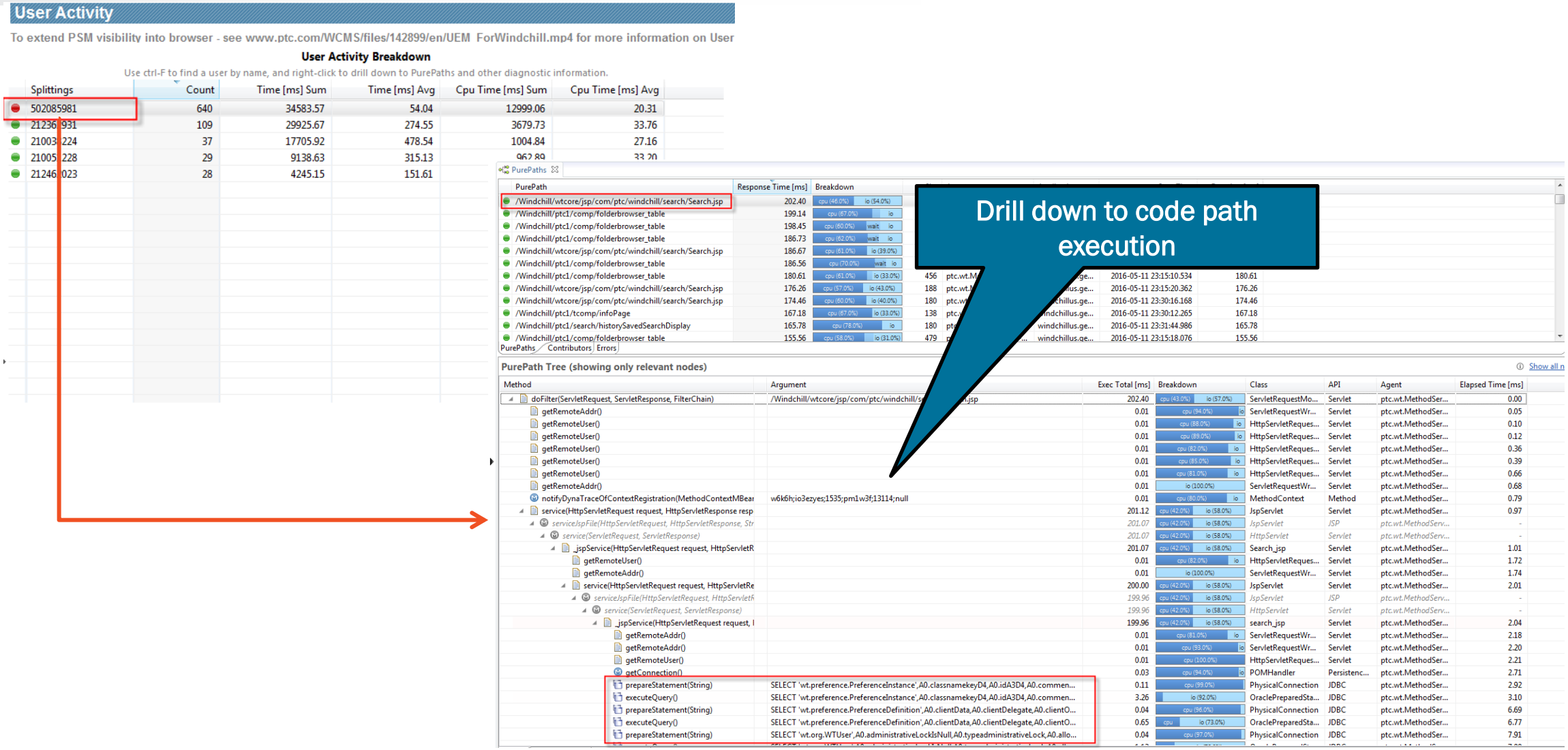
Method Server Memory Usage



PTC WINDCHILL CACHE DASHBOARD



USER ACTIVITY DASHBOARD



USE CASE DEMONSTRATIONS

IN SUMMARY

- PSM has enabled us to monitor Windchill proactively – Hosts and Application continuously monitored against KPIs
- Quickly notified of potential issues…before they become issues.
- Rarely have E-Down and application remains up for 1-2 months at a time
- User-experience is considerably better and we have repaired the Windchill image
- PSM has changed the way we troubleshoot – Issues are identified and resolved much quicker
- No more sleepless/restless nights! Ok, they are very rare now.

QUESTIONS?

Jonathan Kim
GE Aviation
IT Architect – Windchill

Phone: 214.473.4751
Email: Jonathan.Kim@GE.com

liveworx.com