Moving from AppMon and DC RUM to the Dynatrace platform

Breakout Session

dynatrace
Perform

Shaun Gautz
Lead Consultant
Dynatrace

Nestor Zapata
Manager of Data Center & Cloud Operation
Citrix

Greg Schullo
Performance Management Analyst
Optum

Travis Booth
DCRUM Service Level Owner
Optum

Kris Ziemianowicz
Technology Strategist
Dynatrace

dynatrace
Perform

Monitoring is required to drive the business forward with speed

dynatrace
Perform

Monitoring is required to drive the business forward with speed

Enterprise cloud is the platform for digital transformation

Complexity

Hybrid Multi-Cloud

Scale

Web-scale and automation

Dynamic

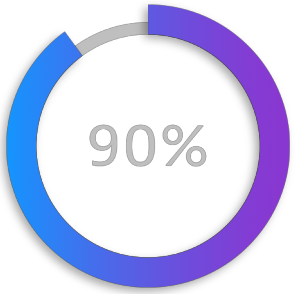
Containers and microservices

Frequency of Change

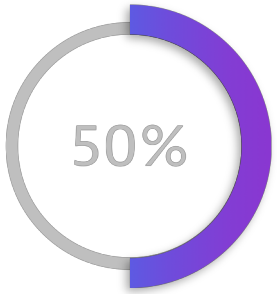
DevOps

User Expectation

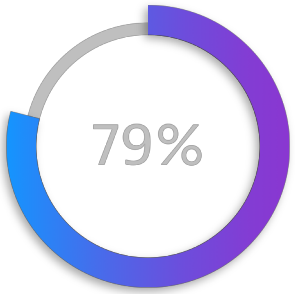
Digital Experience



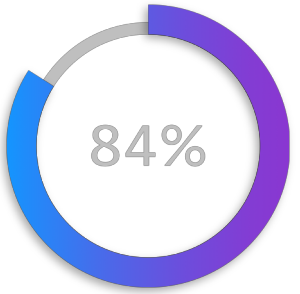
of enterprises are hybrid with multi-cloud



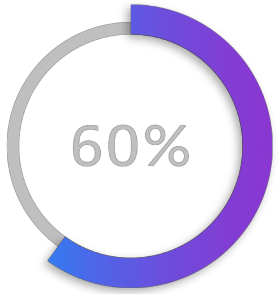
of enterprises building web-scale architecture



container and microservices adoption



of enterprises are adopting DevOps

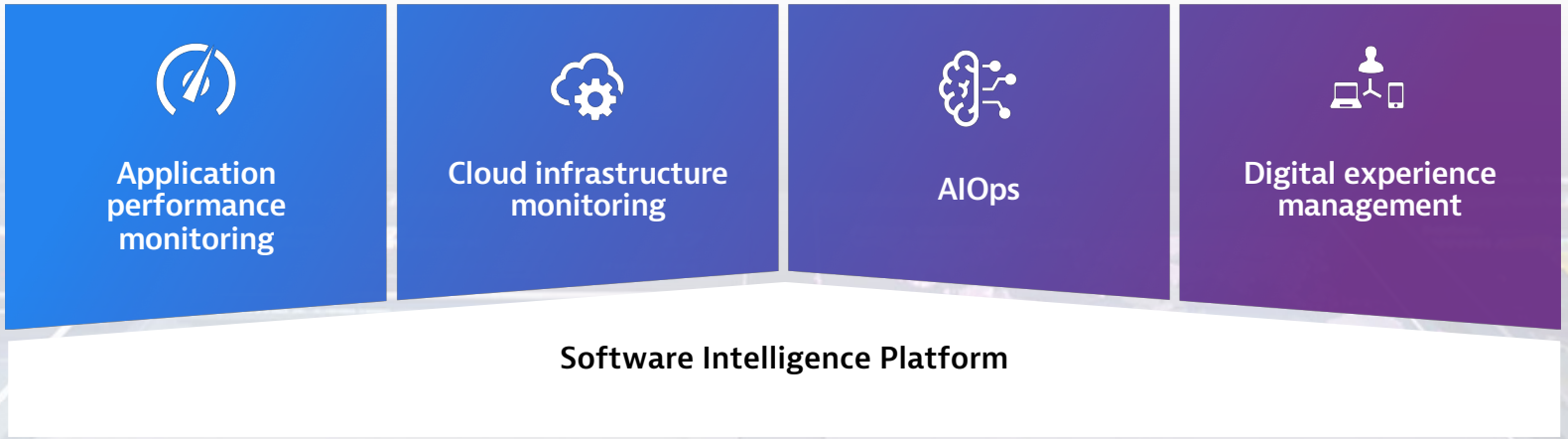


of users rate performance ahead of features and functions

dynatrace
Perform

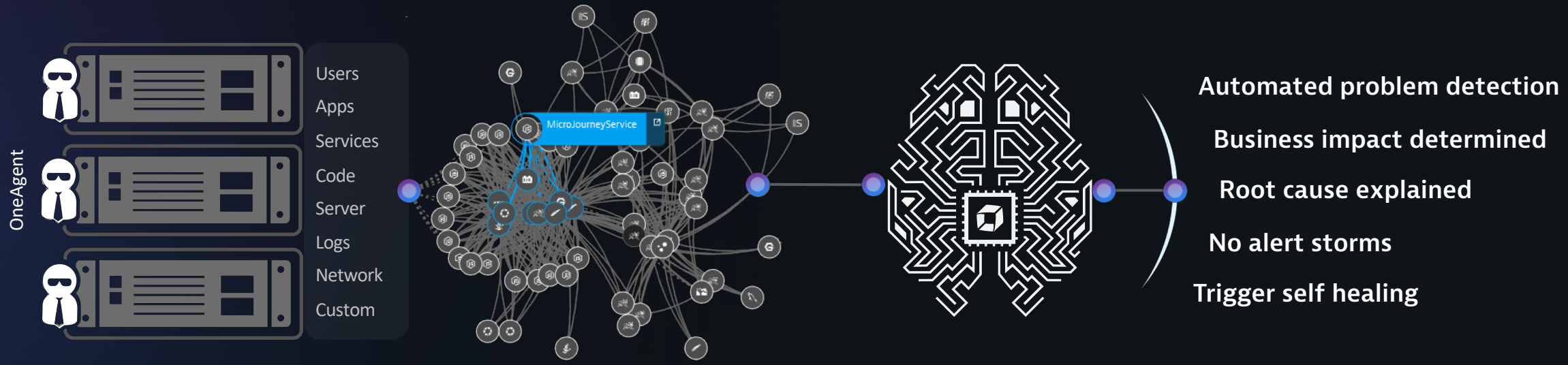
Software intelligence built for the enterprise cloud

Go beyond APM with the Dynatrace all-in-one platform



Better data makes Dynatrace A.I. and massive automation possible

High fidelity data | Mapped end-to-end | Deterministic AI | Answers + Action



Completely automated

Making the move to Dynatrace

SAP

- Massive CloudFoundry implementation (SAP Cloud).
- Buy or build tooling?
- Global Architect - “I deployed Dynatrace on 12,000 prod hosts while BBQing.”

Major US Airline

- Gen2 solution failed and needed overhaul before summer season.
- Dynatrace was rolled out in 3 months (Feb – April).
- CIO – “Best summer we‘ve ever had.”

One of the World’s Largest Retailers

- Several Gen2 solutions were tried and all failed to handle the scale.
- Dynatrace handled the scale with ease.
- Performance Team – “Dynatrace makes our jobs easier.”

Multinational Financial Services Company

- Too many separate monitoring tools across the organization (tool sprawl).
- Needed to choose a single solution for the whole enterprise.
- VP of Enterprise Monitoring - “We made the right choice.”

Moving from AppMon to the Dynatrace platform at CITRIX®

Nestor Zapata
Data Center & Cloud Operations Manager, Citrix
@NlzTech

dynatrace
Perform

Cultural Shift - Technology

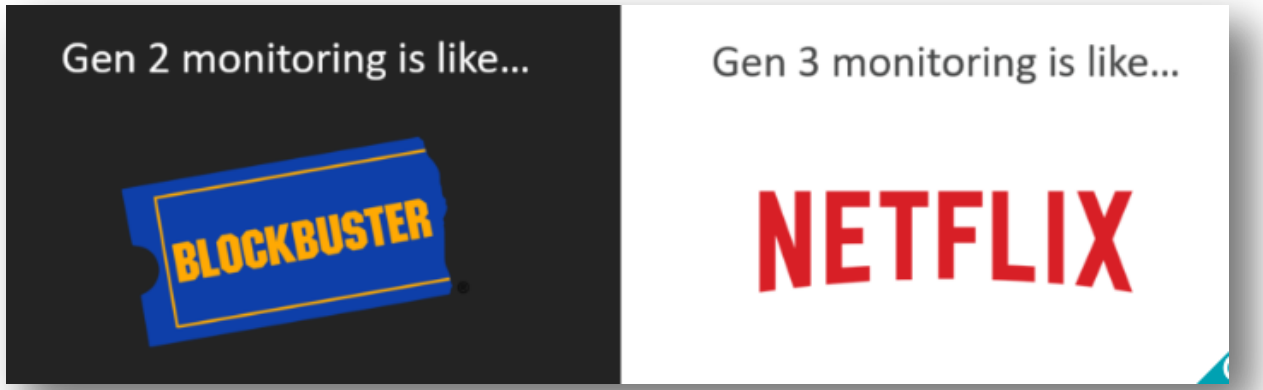
- Trust the data
- Work smarter not harder
- Don’t fear automation, AI or Bots will NOT take your job
- Shift left (Basic troubleshooting moved to L1 / L2)

Traditional Monitoring vs 3rd Gen Monitoring

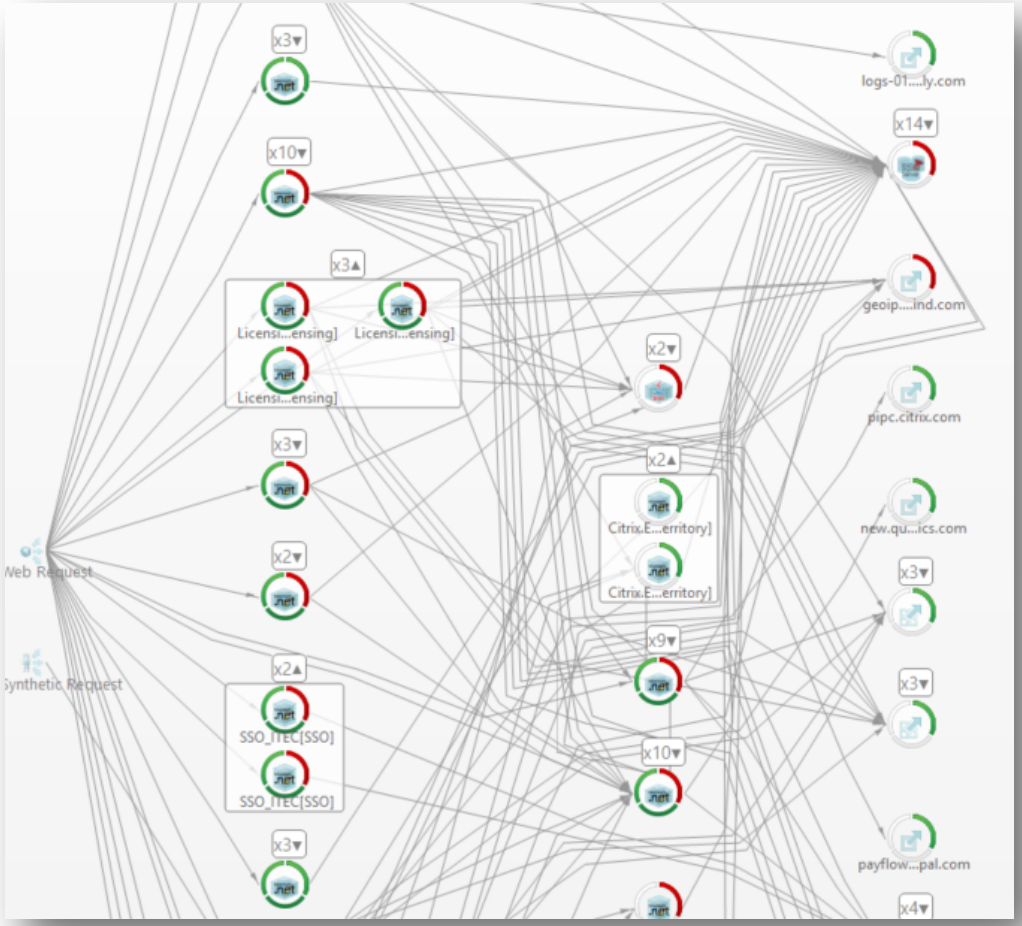
Web DevOps team migrated off Dynatrace AppMon to Dynatrace OneAgent (SaaS)

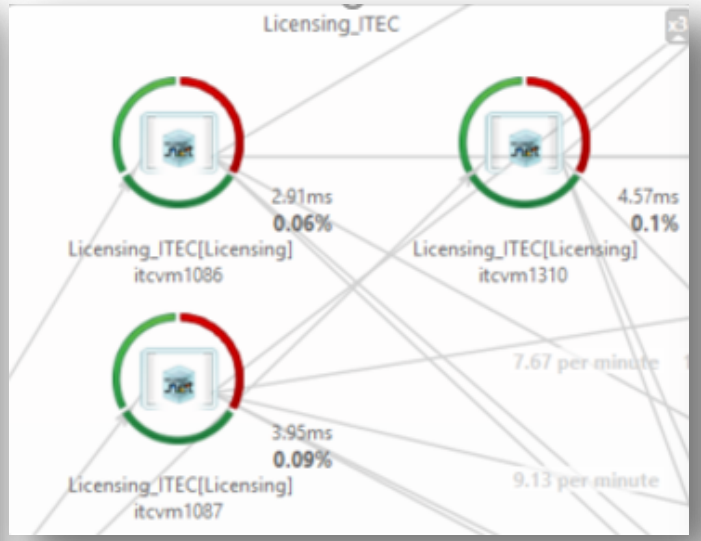
Benefits:

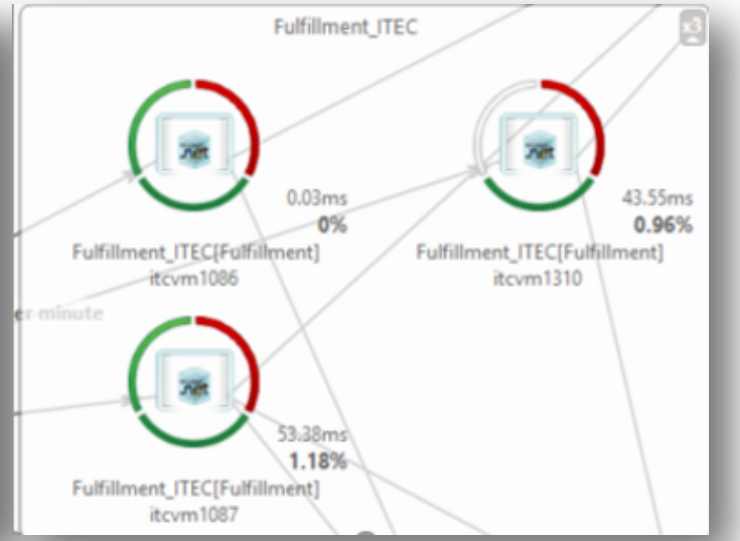
- Fully automated discovery of all our apps and technologies
- AI: Actionable Data + Correlation time series
- 1 tool for Full Stack monitoring
- Cloud native: AWS, Azure and Google
- SNOW Integration



AppMon Data

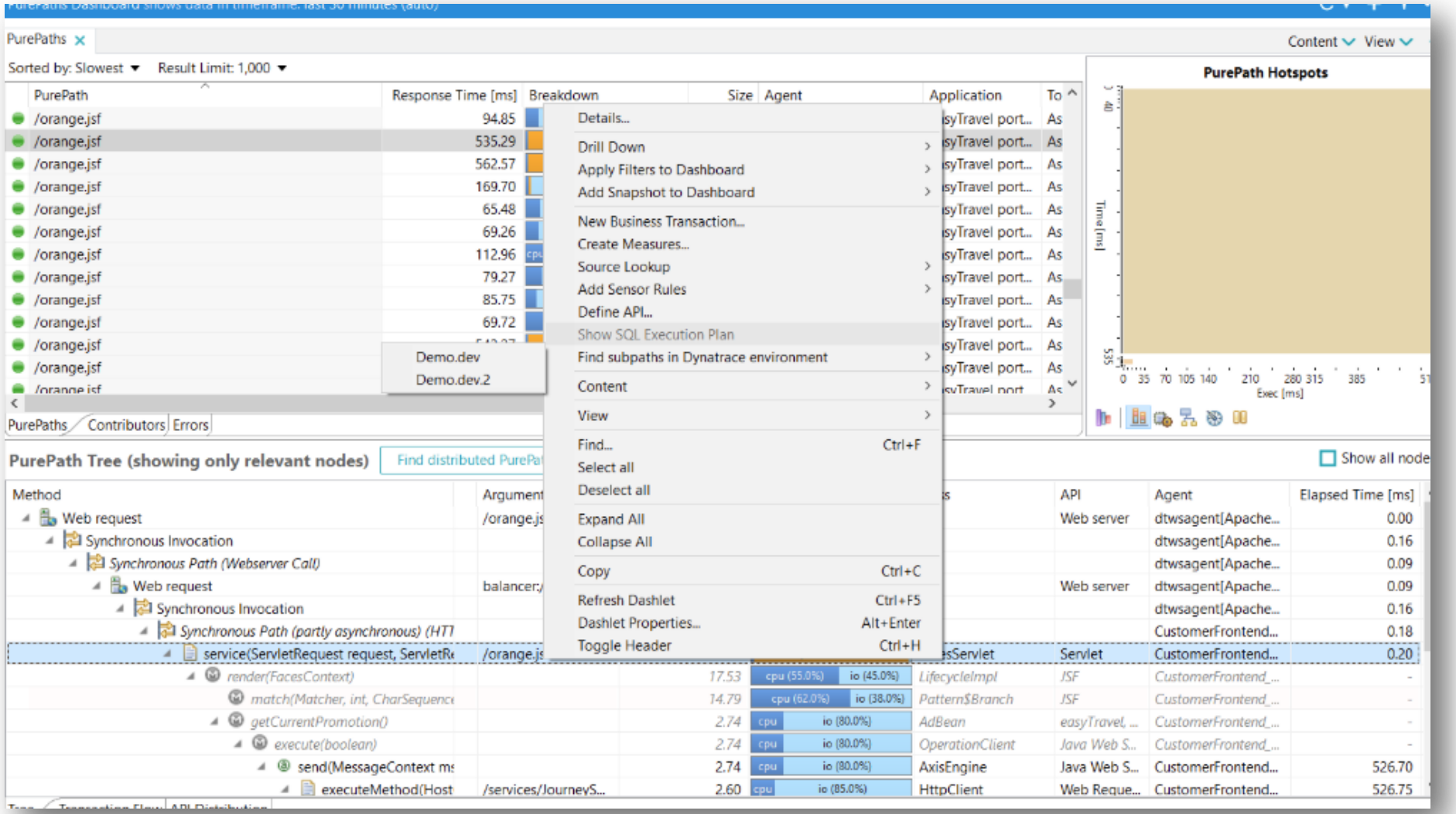

x3▾
x10▾
x3▴
Licensi...ensing]
Licensi...ensing]
Licensi...ensing]
x3▾
x2▾
x2▴
SSO_ITEC[SSO]
SSO_ITEC[SSO]
x3▾
x2▾
x2▴
Citrix.E...erritory]
Citrix.E...erritory]
x9▾
x10▾
x3▾
x14▾
logs-01....ly.com
geoip....ind.com
pipc.citrix.com
new.qu...ics.com
x3▾
x3▾
payflow....pal.com
x4▾
Web Request
Synthetic Request


Licensing_ITEC
2.91ms
0.06%
Licensing_ITEC[Licensing]
itcvm1086
4.57ms
0.1%
Licensing_ITEC[Licensing]
itcvm1310
7.67 per minute
3.95ms
0.09%
Licensing_ITEC[Licensing]
itcvm1087
9.13 per minute

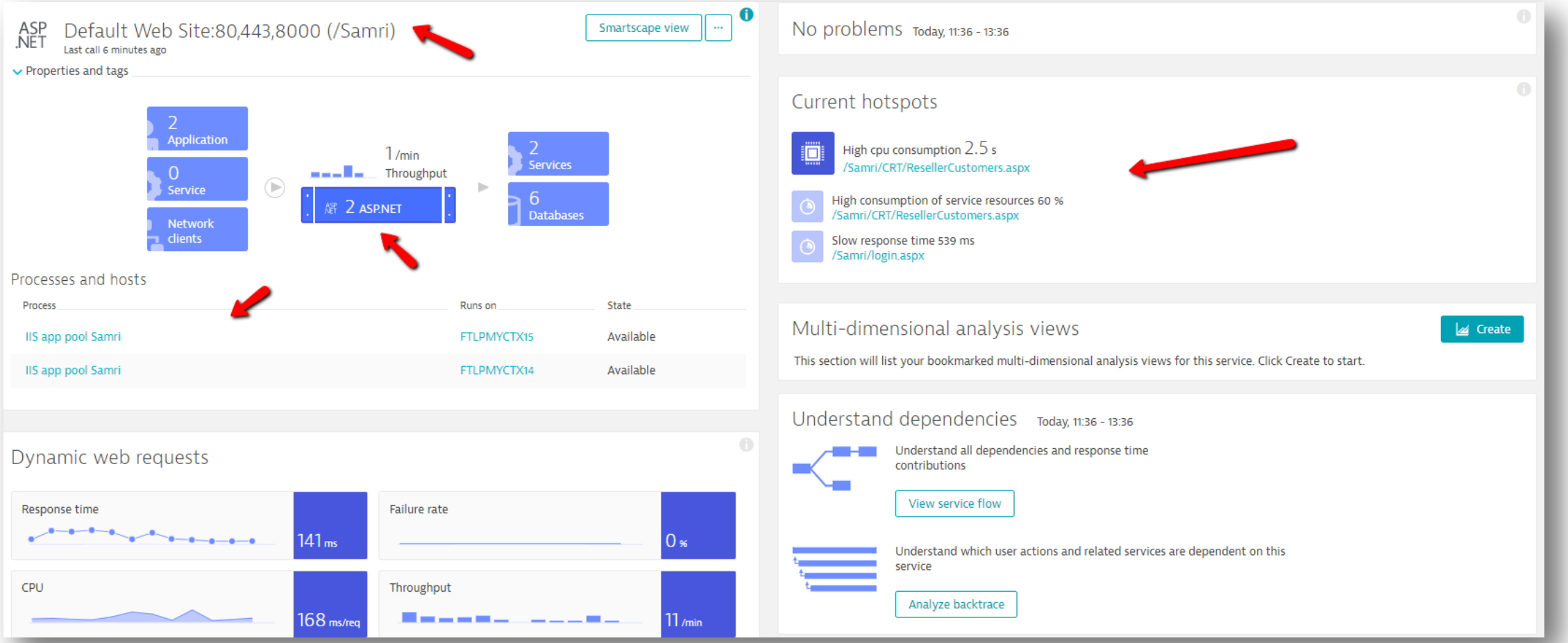

Fulfillment_ITEC
0.03ms
0%
Fulfillment_ITEC[Fulfillment]
itcvm1086
43.55ms
0.96%
Fulfillment_ITEC[Fulfillment]
itcvm1310
53.38ms
1.18%
Fulfillment_ITEC[Fulfillment]
itcvm1087

dynatrace
Perform

AppMon Data



Dynatrace: In-Depth 360° view (Single Pane of Glass)



Drill down to server, web app or services

Default Web Site:80,443,8000 (/Licensing)
Web request service

Response time degradation
The current response time (29.3 s) exceeds the auto-detected baseline (1.03 s) by 2,745 %

Affected requests	Service method
11.4 /min	/Licensing/Login.aspx

Default Web Site:80,443,8000 (/MyCitrix)
Web request service

Response time degradation
The current response time (1.1 s) exceeds the auto-detected baseline (611 ms) by 79 %

Affected requests	Service method
176 /min	All dynamic requests

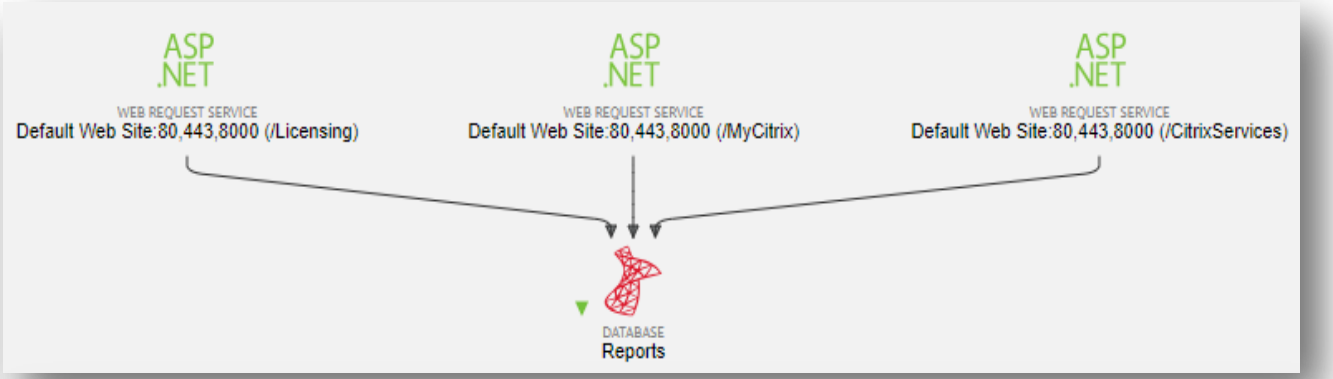
Default Web Site:80,443,8000 (/CitrixServices)
Web request service

Response time degradation
The current response time (21.7 s) exceeds the auto-detected baseline (554 ms) by 3,825 %

Affected requests	Service method
130 /min	All dynamic requests

Failure rate increase
by a failure rate increase to 21 %

Affected requests	Service method
117 /min	All dynamic requests



Root cause

Based on our dependency analysis all incidents have the same root cause

Reports
Database service

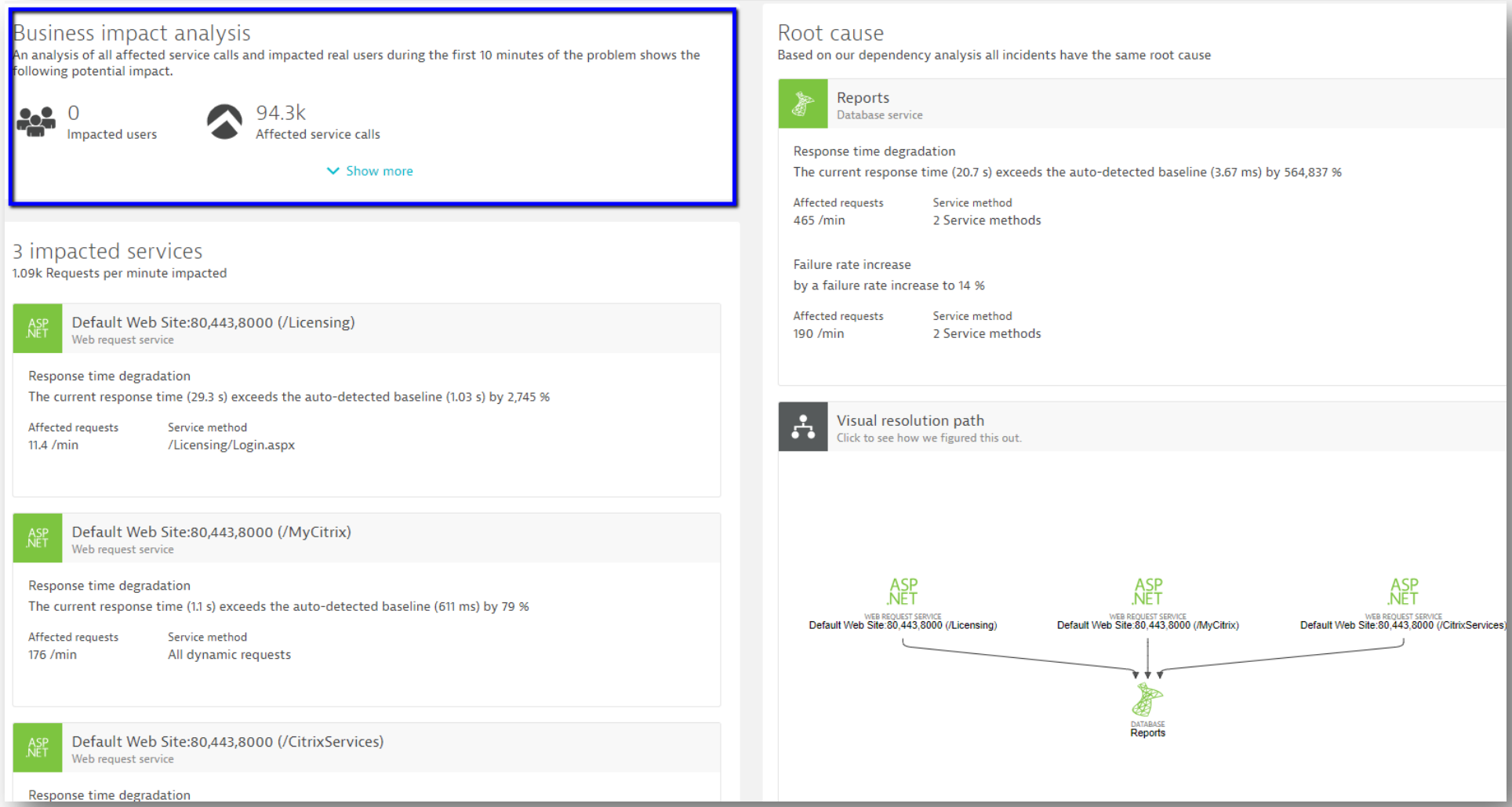
Response time degradation
The current response time (20.7 s) exceeds the auto-detected baseline (3.67 ms) by 564,837 %

Affected requests	Service method
465 /min	2 Service methods

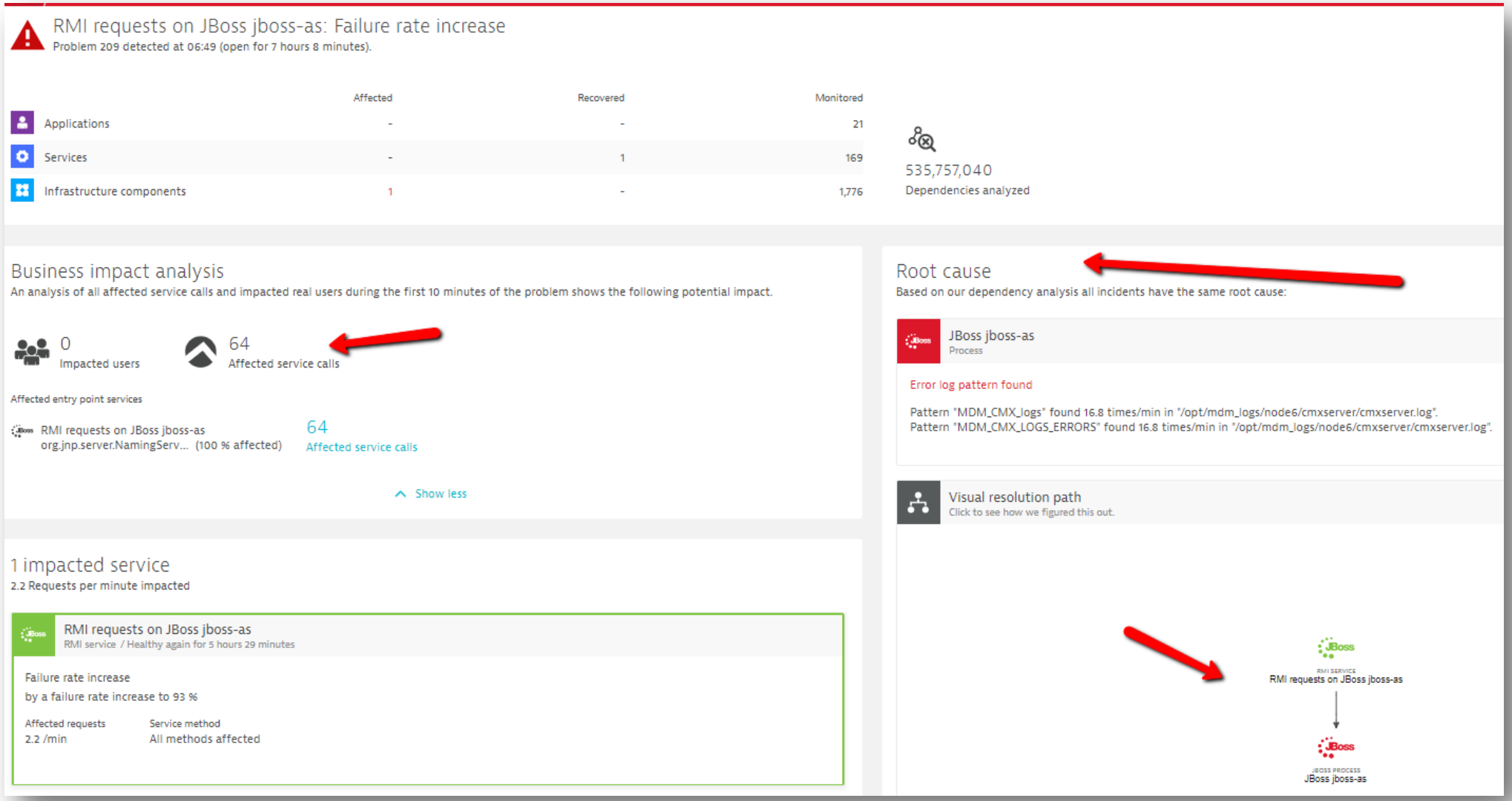
Failure rate increase
by a failure rate increase to 14 %

Affected requests	Service method
190 /min	2 Service methods

Leverage Monitoring for Business Impact

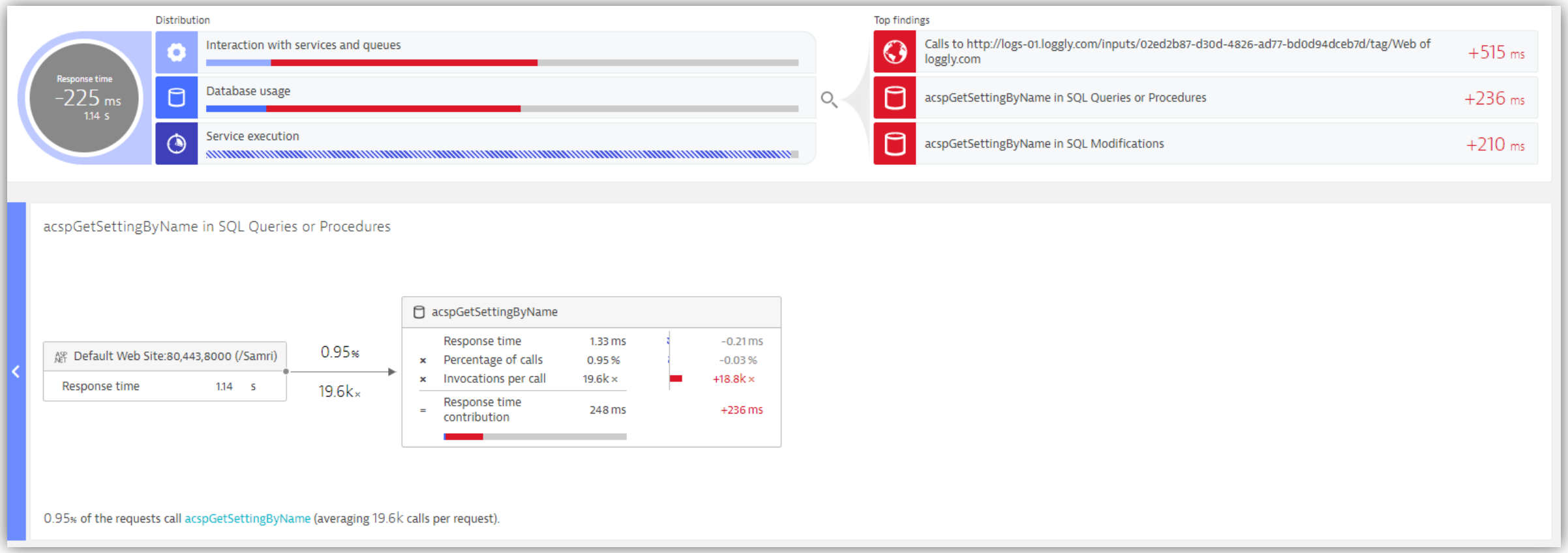


Root Cause & Predictive Analytics "Metrics that Matter"

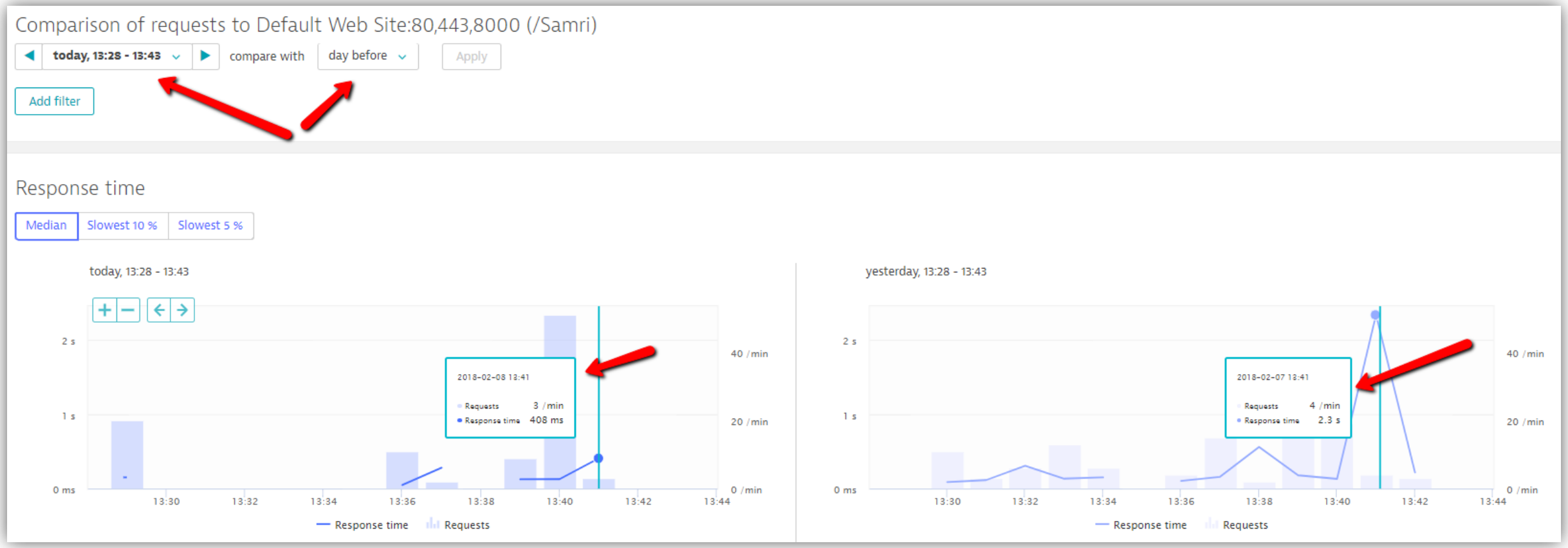


Log Analytics

Deeper Analytics

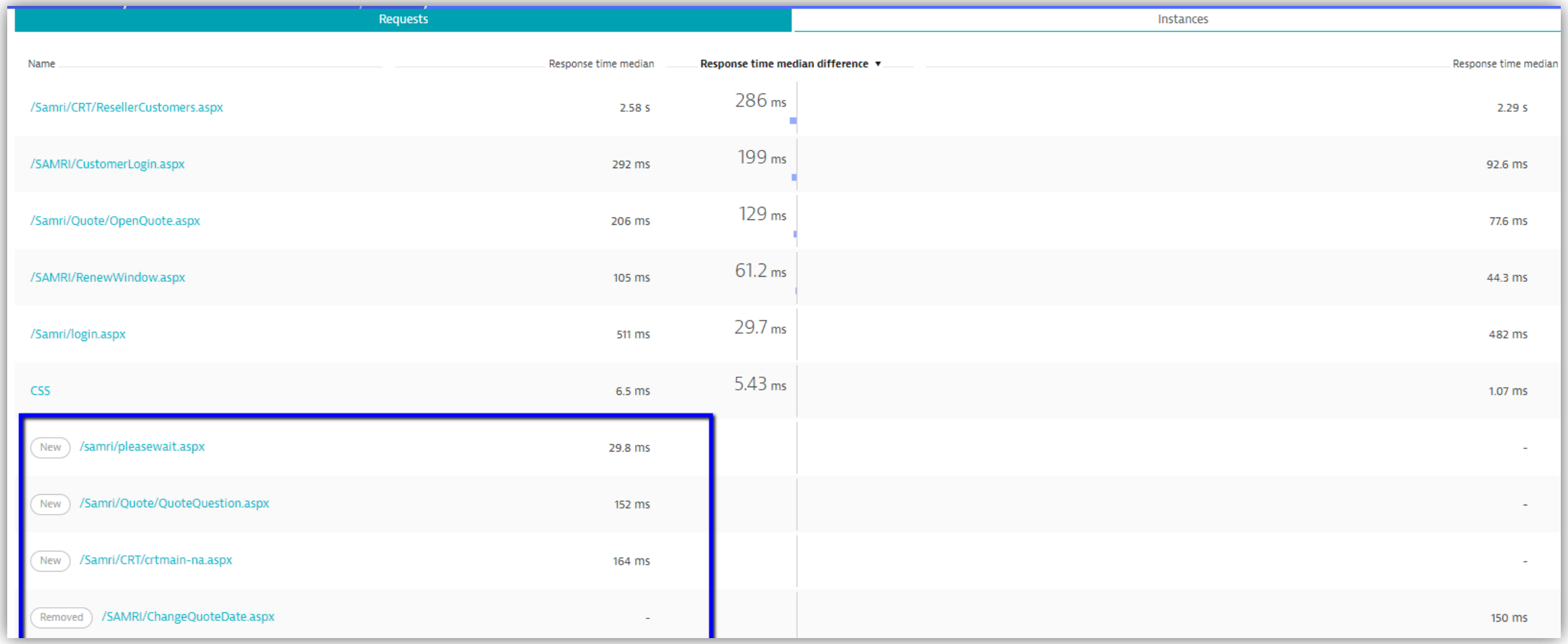


Compare features – post deployment



dynatrace Perform

Compare features – post deployment



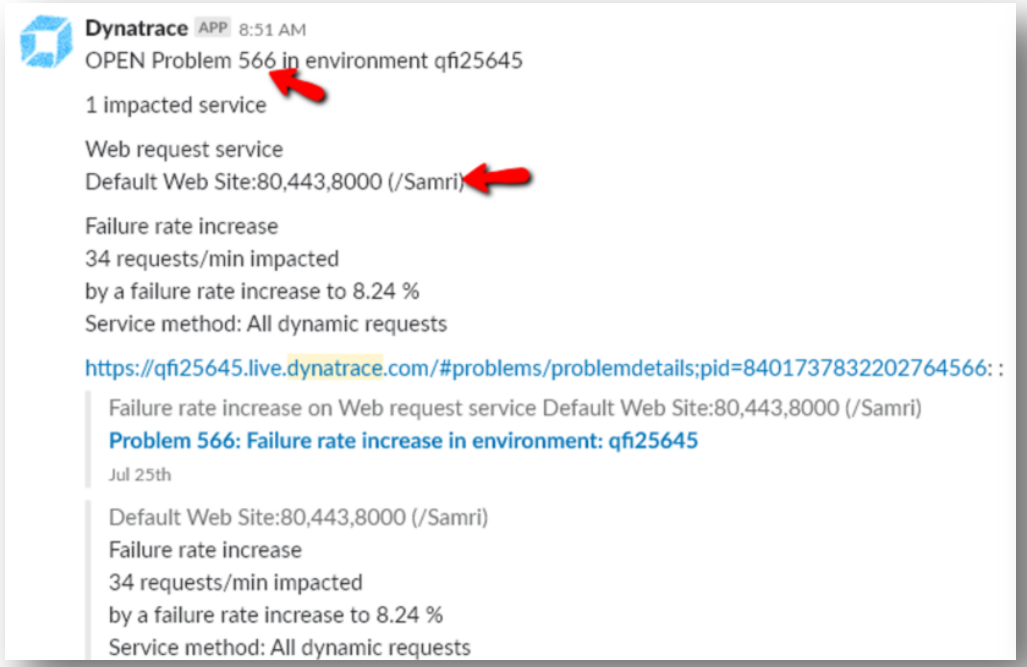
Requests			Instances
Name	Response time median	Response time median difference ▼	Response time median
/Samri/CRT/ResellerCustomers.aspx	2.58 s	286 ms	2.29 s
/SAMRI/CustomerLogin.aspx	292 ms	199 ms	92.6 ms
/Samri/Quote/OpenQuote.aspx	206 ms	129 ms	77.6 ms
/SAMRI/RenewWindow.aspx	105 ms	61.2 ms	44.3 ms
/Samri/login.aspx	511 ms	29.7 ms	482 ms
CSS	6.5 ms	5.43 ms	1.07 ms
New /samri/pleasewait.aspx	29.8 ms		-
New /Samri/Quote/QuoteQuestion.aspx	152 ms		-
New /Samri/CRT/crtmain-na.aspx	164 ms		-
Removed /SAMRI/ChangeQuoteDate.aspx	-		150 ms

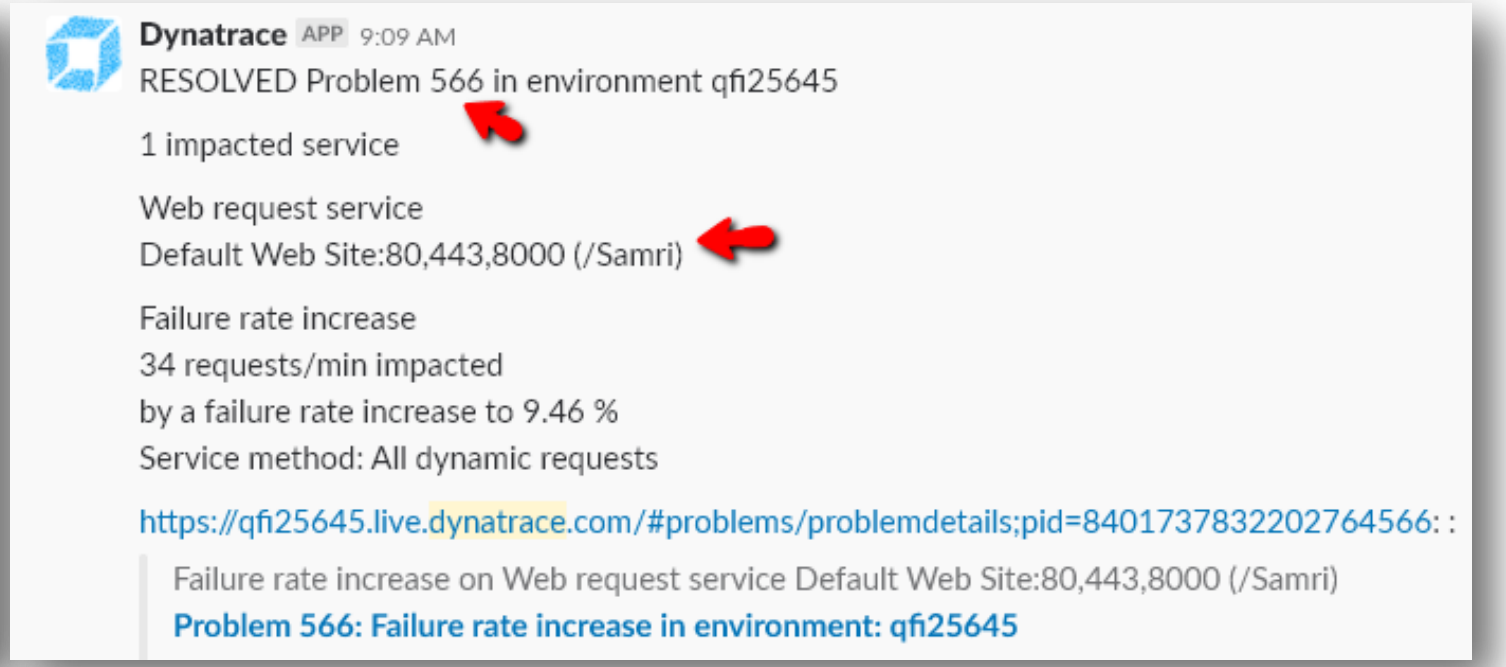
dynatrace Perform

Future use of Dynatrace in MyCitrix

11	XHR action	/dotiui/components/create-quote/create-quote.html	142 ms	0	Satisfied ☺
12	XHR action	/dotiui/components/finalize-quote/finalize-quote.html	9.27 s	0	Tolerated 😐
13	XHR action	/dotiui/assign-distri-list	20 ms	0	Satisfied ☺
14	XHR action	/DotiApi/api/v1/country	419 ms	0	Satisfied ☺
15	XHR action	/DotiApi/api/v1/country	372 ms	0	Satisfied ☺
16	XHR action	/DotiApi/api/v1/distributor	505 ms	0	Satisfied ☺
17	XHR action	/DotiApi/api/v1/distributor	124 ms	0	Satisfied ☺
18	XHR action	/DotiApi/api/v1/quotes/Q-00245131/update	16.9 s	0	Frustrated ☹
19	Load action	Loading of page /dotiui/	21.4 s	0	Frustrated ☹

Increased productivity

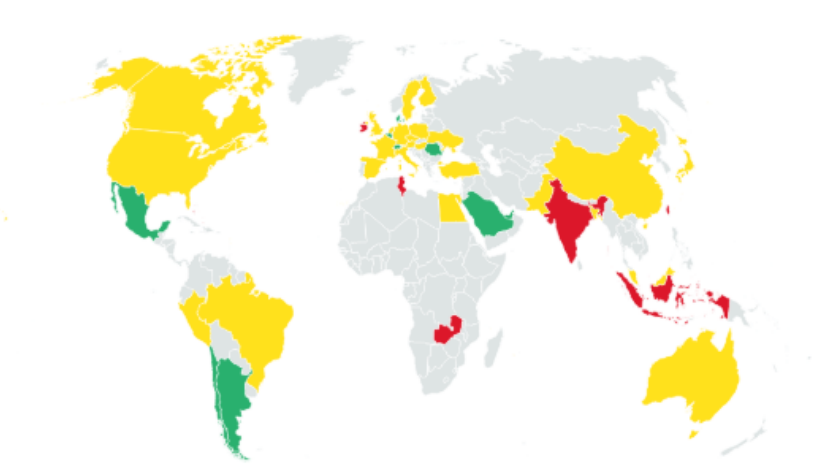




Future use of Dynatrace in MyCitrix

Business analytics

User experience



0.7
User experience index

7.22 s
Response time

57.7 /min
User actions

6.49 %
Failure rate

User satisfaction

669k
Satisfied

471k
Tolerating

280k
Frustrated

32.3% Bounce rate

5.23% Conversion rate

Omni channel

196
Web

149
Mobile web

63
Mobile app

24 Robots

6 Synthetic

From DCRUM to Gen 3 monitoring at Optum: The path forward.

OPTUM® Ops Optimize & Modernize: End User Performance Monitoring

Greg Schullo
Performance Management Analyst

Travis Booth
DCRUM Service Level Owner

OPTUM® Ops Optimize & Modernize: End User Performance Monitoring

Simplify | Enhance | Innovate

People	Process	Technology
• Modernize technical skills. • Strengthen engineering capabilities. • Reduce administrative overhead.	• Reduce complexity & harden core functions. • Enable engineers via self-service and automation. • Streamline engineering processes.	• Optimize footprint – reduce duplication. • Support Cloud (public, private, hybrid). • Increase quality & lower costs of core services.

Performance Monitoring at Optum

Infrastructure timeline & how we got here.

2013

DC RUM: 2 dedicated full-time employees.
12 Agentless Monitoring Devices.
5 Central Analysis Servers.
1 Advanced Diagnostic Server.
~200 Software Services.
~4TB-8TB traffic analyzed daily.

Dynatrace AppMon: 3 dedicated full-time employees
2 Dynatrace Servers
10 Dynatrace Collectors
20 Agent Groups
~1M PurePaths daily.
1TB PurePath storage per Server.

2018

DC RUM: 2 dedicated full-time employees, 4 full-time employees assisting between all Dynatrace offerings.
63 Agentless Monitoring Devices.
57 Central Analysis Servers.
8 Advanced Diagnostic Servers.
~1100 Software Services.
~25TB to 70TB traffic analyzed daily.
3 Billion to 10 Billion operations decoded daily.

Dynatrace AppMon: 2 dedicated full-time employees, 7 full-time employees assisting between Dynatrace Appmon & Dynatrace Managed offerings.
14 Dynatrace Servers
100+ Dynatrace Collectors
1242 Agent Groups
~2.1B PurePaths daily.
20TB PurePath storage per Server.

Dynatrace Managed: 7 full-time employees assisting between Dynatrace AppMon & Dynatrace Managed offerings.
18 Dynatrace Nodes
16 Dynatrace Active Gates
200+ Environments

Challenges facing traditional DC RUM implementations.

From agentless to agent-based.

Private Cloud Infrastructure

Applications moving from traditional server infrastructure to container based solutions such as Azure and OpenShift.

Perfect Forward Secrecy

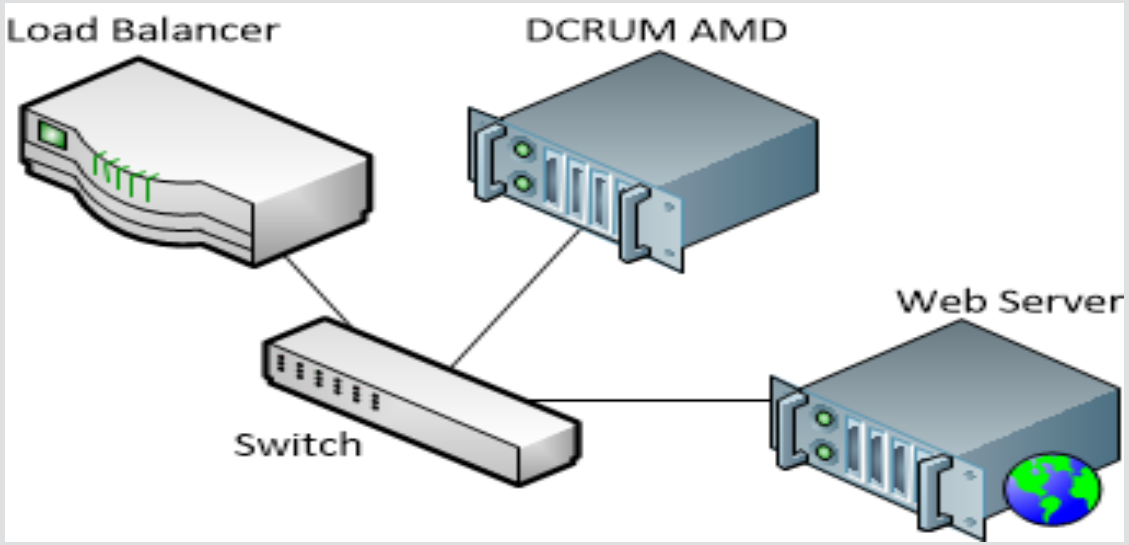
Applications implementing perfect forward secrecy encryption over traditional RSA encryption.

Private Cloud Infrastructure

Challenge: Providing application performance metrics to container based applications.

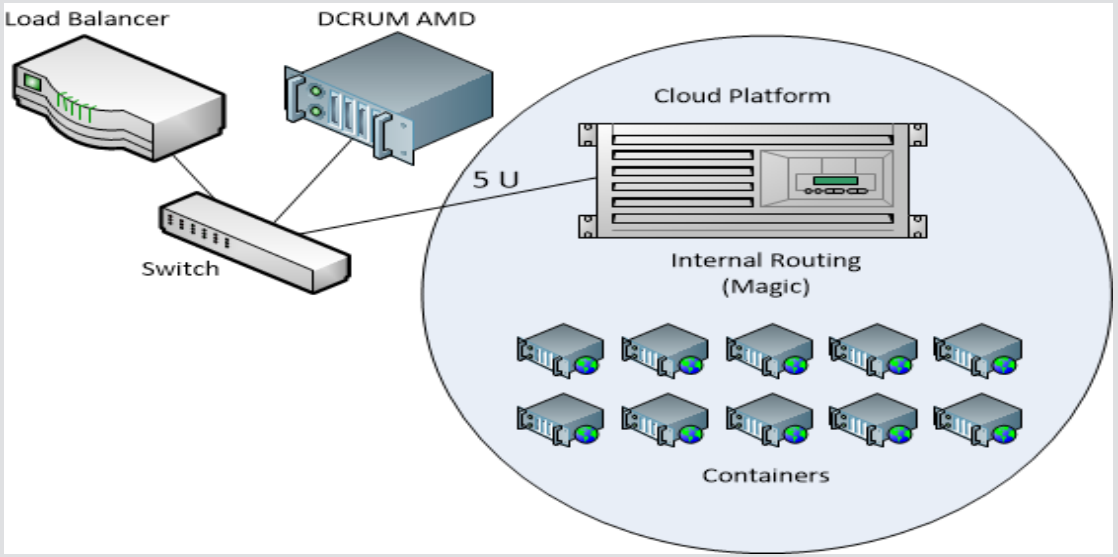
Traditional Application

- Dedicated servers with static IP:Port configured as a Software Service in DC RUM.
- Performance metrics for an application are contained within a Software Service.
- Easily usable by DC RUM customers.



Container Based Application

- All containers within a cloud platform are configured as one Software Service in DC RUM and share performance metrics as if they were one application..
- Hard for DC RUM customers to identify only their application's metrics.

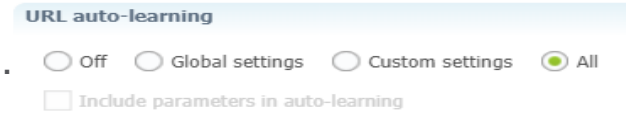


Private Cloud Infrastructure

What can be done? What have we done? What issues are there?

Traditional DCRUM

- Implement a virtual AMD inside the private cloud?
- Create a Virtual IP for each cloud application and monitor that IP in DC RUM.
- Monitor all URLs and split into business units.



- Create separate private cloud platform for each application team.

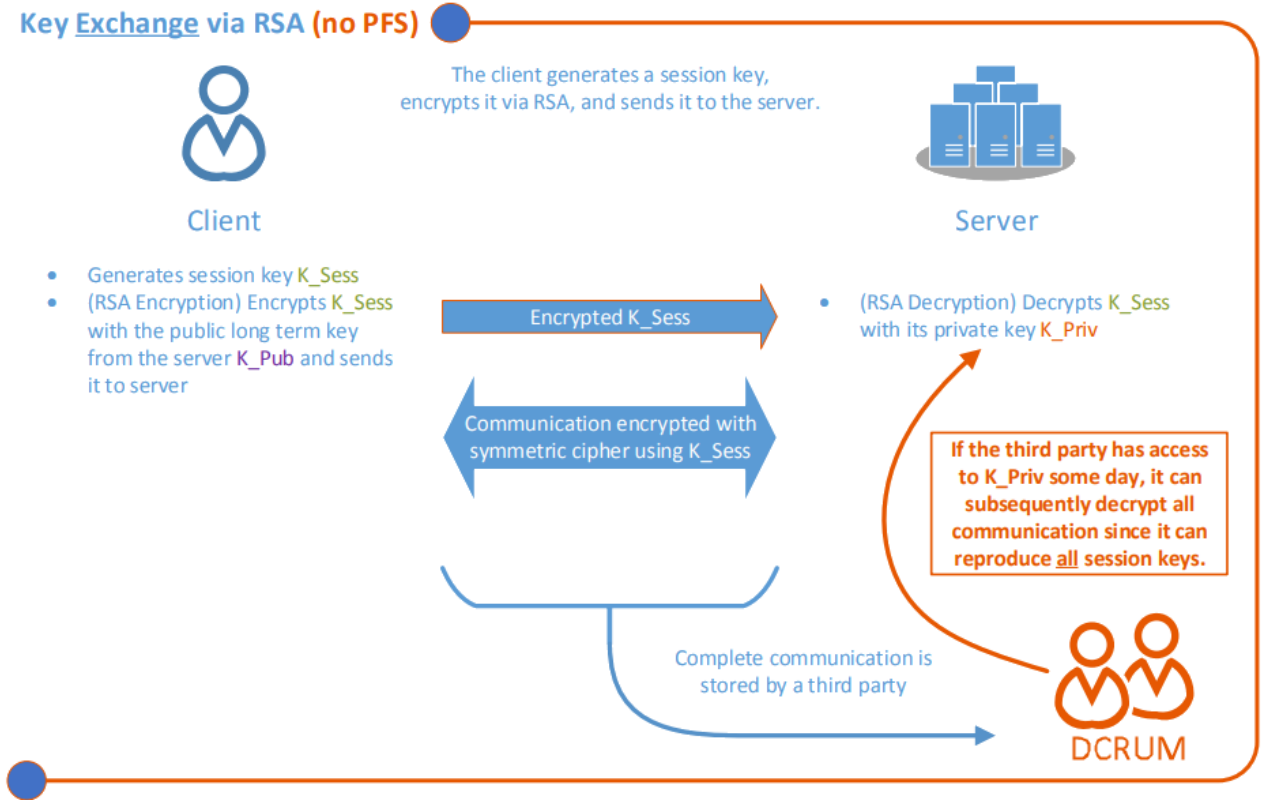
Gen 3 Dynatrace OneAgent

- Automate OneAgent installs for containers in private cloud infrastructure.
- OneAgent monitoring the Private Cloud Platform as a whole?
- Dynatrace is so popular at Optum that we run out of licenses quickly.

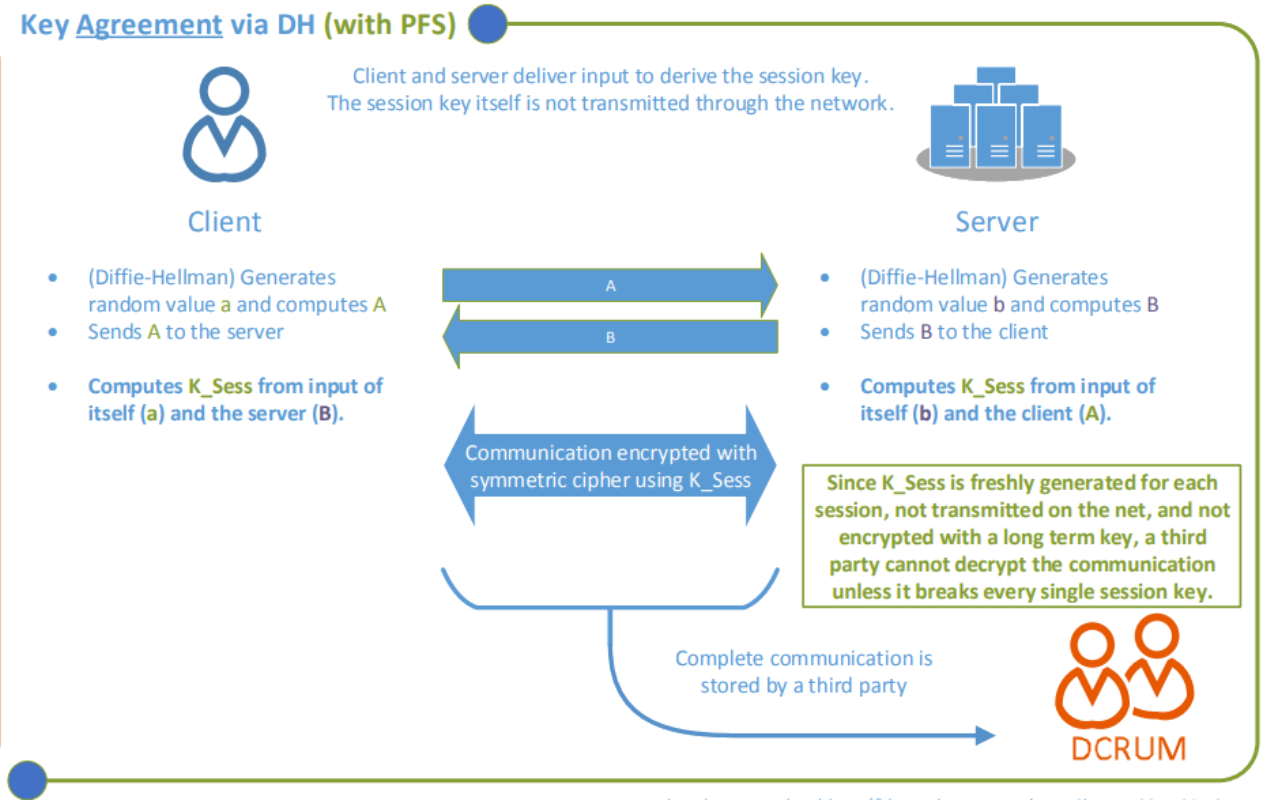
Perfect Forward Secrecy

Legacy Encryption vs Modern Encryption

Traditional RSA Encryption



Perfect Forward Secrecy Encryption



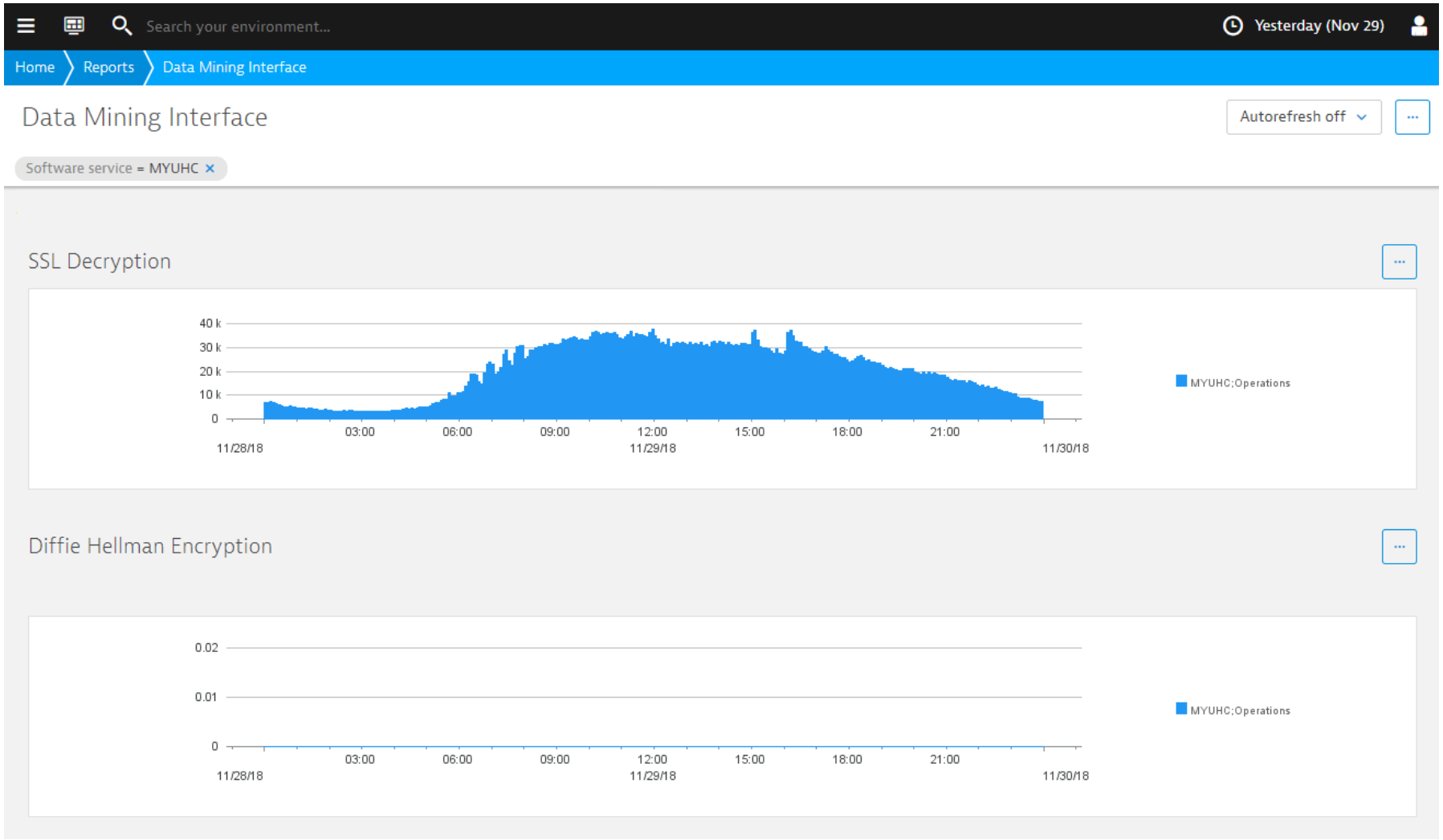
By Johannes Weber | http://blog.webernetz.net

How perfect forward secrecy affects DC RUM.

And how has Optum been impacted?

Traditional RSA encryption methods.

Perfect Forward Secrecy with Diffie Hellman cipher suites.

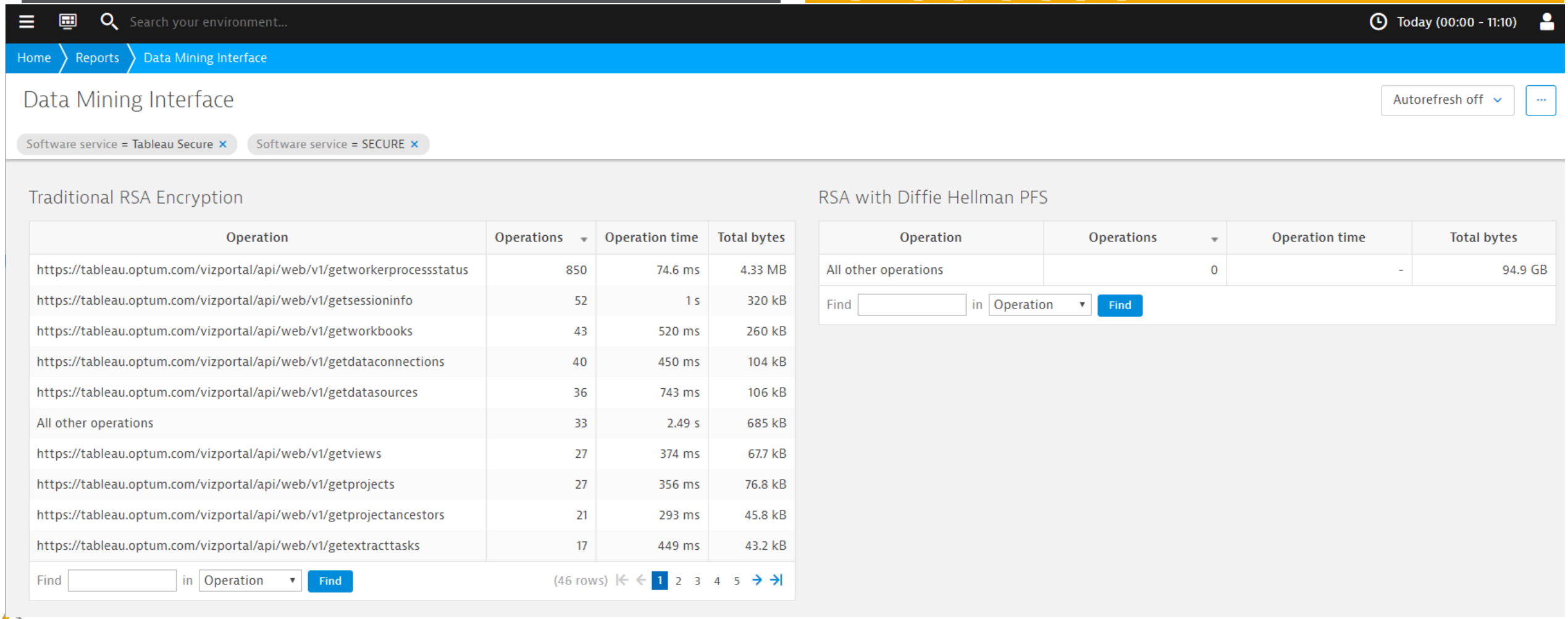


How perfect forward secrecy affects DC RUM.

And how has Optum been impacted?

TLS_RSA_WITH_AES_256_CBC_SHA
TLS_RSA_WITH_AES_256_GCM_SHA384

TLS_DHE_RSA_WITH_AES_256_GCM_SHA384
TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA
TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256
TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA
TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA384



Perfect Forward Secrecy

What can be done? What have we done? What issues are there?

Reorder cipher suites.

- Reorder your cipher suites removing or lowering priority of Diffie Hellman.
  - Only works for pre TLS 1.3 encryption standards.
  - TLS 1.3 IS COMING whether you like it or not.

Monitor pool nodes instead of front door.

- Monitor traffic to individual servers behind your front door VIP/load balancer.
  - Increases configuration complexity exponentially. Scalability challenges.
  - Only works if your pool nodes are unencrypted or using legacy encryption.

Re-architect network infrastructure with inline decryption devices.

- 1. Obtain traffic via Inline Bypass module.
  2. MITM decrypt select VIPs.
     a) Map select traffic to inline tools.
     b) Map select traffic to out of band tools (DCRUM).
  3. MITM re-encrypt select VIPs.
  4. Non Decrypted traffic is logically bypassed back to wire.

  Requires complete re-architect of network and new expensive equipment from Gigamon, A10, etc..

Move to gen-3 agent based monitoring.

- Install OneAgent on pool nodes/application servers and enable RUM/UEM.
  - Increases Dynatrace configuration complexity. Licensing challenges.

Example Dynatrace Managed dashboard showing OneAgent data similar to DC RUM.

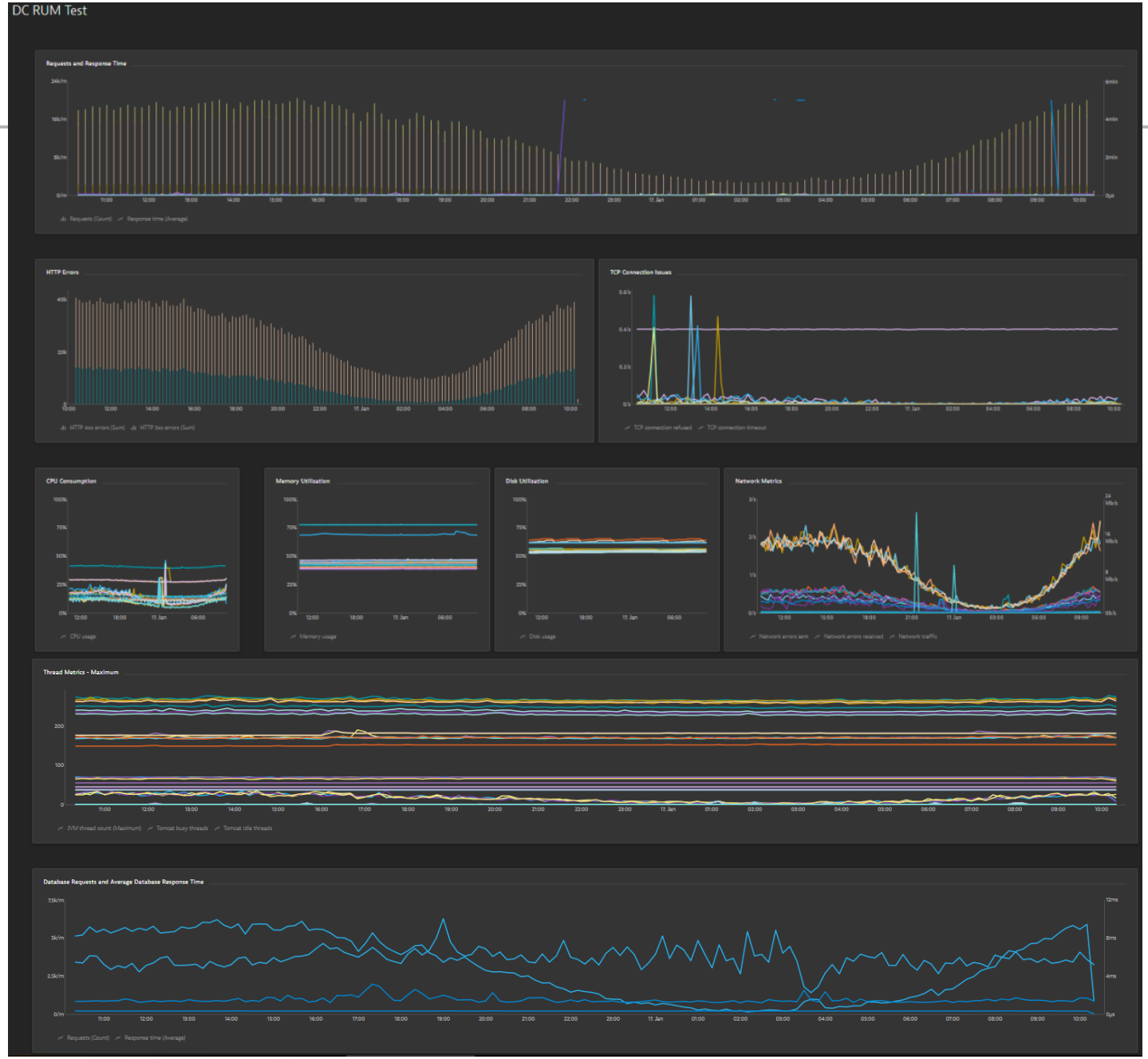
Requests & Response Time

HTTP Errors

CPU Consumption, Memory Utilization

Thread Metrics

Database Requests & Response Time

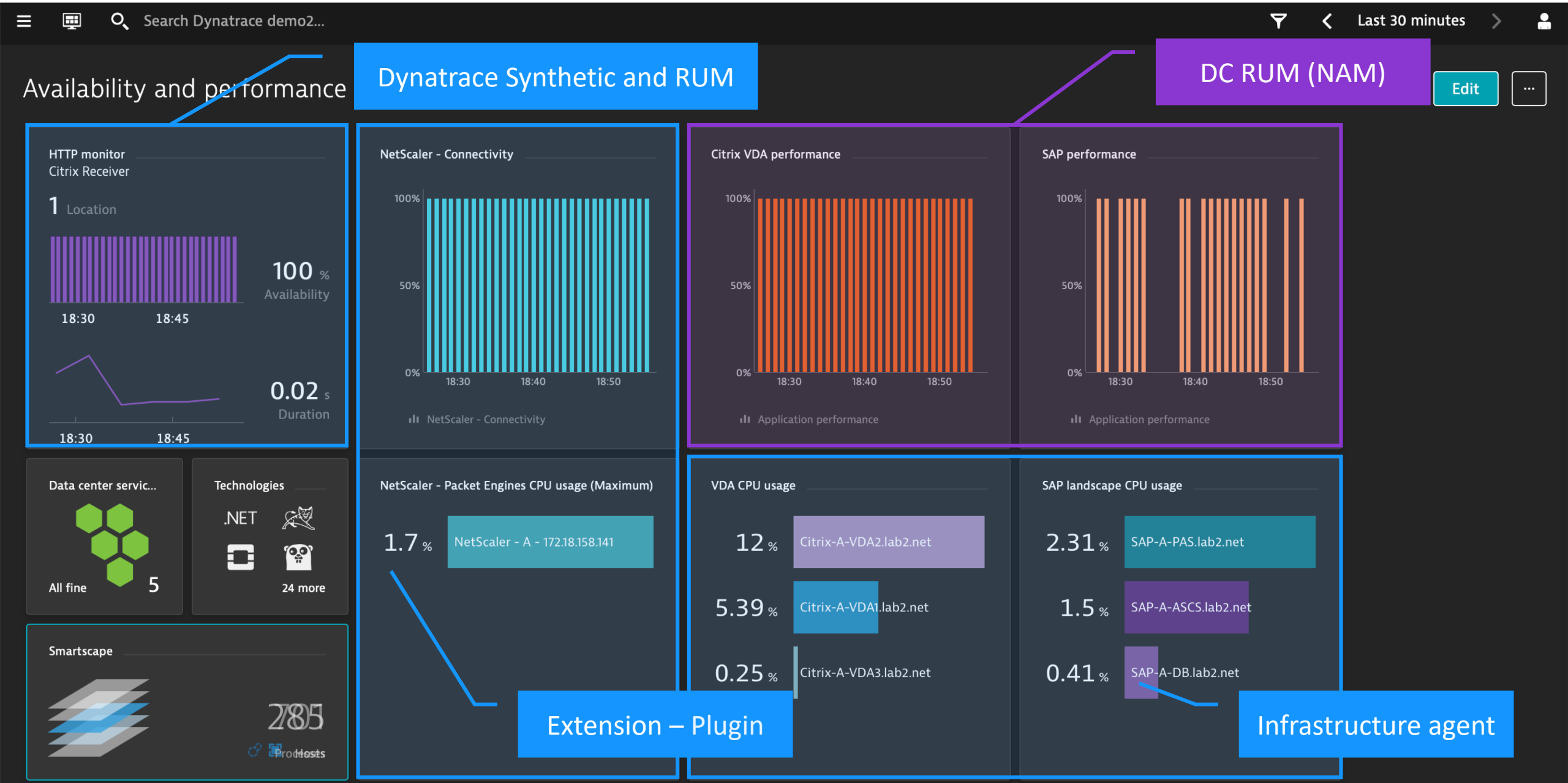


TCP Connection Issues

Disk Utilization, Network Metrics

Move when its going to improve monitoring efficiency. You can go hybrid first, then transition.

dynatrace Perform



What are the DC RUM “can-do” areas, today?

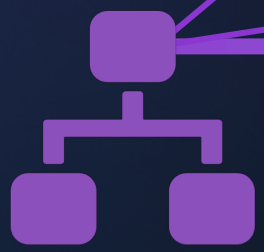
Enterprise applications
with static infrastructures

- Oracle EBS, SAP ERP, also Siebel, Peoplesoft, JDE
- where **agent-based monitoring may be overwhelming to manage** or not fitting the app provisioning model (can’t run agents)

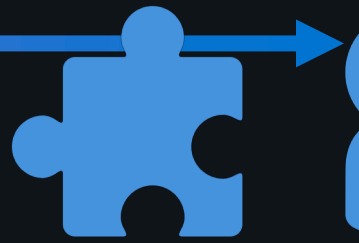
Application delivery

- Citrix, WAN optimization, SSL performance
- where **relation of user experience to network** determines monitored system efficiency, and this is naturally easy to measure with wire data.

2019



2022



Wire data monitoring is an efficient approach, today

Private cloud infrastructure adoption, massive PFS rollout, will trigger monitoring approach re-evaluation

Efficient use of agent- and API-sourced data

Transitioning from Gen 2 to Gen 3 at Optum

https://www.dynatrace.com/news/blog/gen-2-vs-gen-3-monitoring-why-does-it-matter/

Enterprise Technology Goals & Challenges

Transition Goals: Self-service, automation, and reduced complexity.

1. Using chef, Ansible, Jenkins, Docker, etc. we are nearing a more automated deployment process for Dynatrace Managed.
2. Eliminates lengthy engagement process to learn DC RUM Software Service specifics such as traffic type and advanced configurations (content-types, usernames, SOAP tags, etc.)
3. Transitioning from DC RUM to Dynatrace removes networking from the equation, reducing complexity.

Transition Challenges

1. **Our Biggest Challenge: Optum Loves DC RUM.**
   Our customers at Optum love DC RUM and its unique network-based monitoring perspective.
   DCRUM reports are used every day in all areas from operators to Optum's CTO.
   Ultimately, there is no direct 1:1 replacement for DC RUM, however we feel that Dynatrace Managed can provide similar UEM data and a more well-rounded view into the entire monitoring stack.
2. **Customer training & engagement.**
   Providing DC RUM-like dashboards within Dynatrace Managed requires learning the new product.
   Although we expect pushback on our transition efforts we feel the capabilities and simplicity of Dynatrace Managed will overcome apprehensions over time.
3. **Managing Licensing**
   Critical business applications must be our first priority.
   We don't have enough licenses to cover all applications at the company, or even all applications currently using DC RUM.
   Discrepancies on which applications get licenses and why.
4. **Alternatives to Dynatrace?**
   Non-critical business applications may have to utilize less fully functional monitoring tools due to licensing or other constraints.

OPTUM

Optum's Vision for 2019

So Long, and Thanks for All other operations.

Current Progress	Strategic Plan dynatrace
○ **Get DC RUM to a more manageable level in Q1 2019.** ○ Remove all non-production software services from DC RUM and associated network MAP Rules/Span/Tap/Gigamon configurations. ○ Remove all software services with no/minimal traffic/operations for the last 30 days. ○ Remove all software services where no customers have used custom reports and/or that are not in e-mailed reports.	○ **Migrate DC RUM customers off the product completely by October 1, 2019.** ○ Utilize Dynatrace monitoring already in place. ○ Migrate to Dynatrace for Critical Business Applications/Priority 1-2 apps where licenses are available. ○ Migrate to less fully functional APM tools for non Critical Business Applications/Priority 1-2 apps.

Thank You!

dynatrace

OPTUM® **Ops Optimize & Modernize: End User Performance Monitoring**

Greg Schullo
Performance Management Analyst
gregory_schullo@optum.com

Technology Leadership Career Path

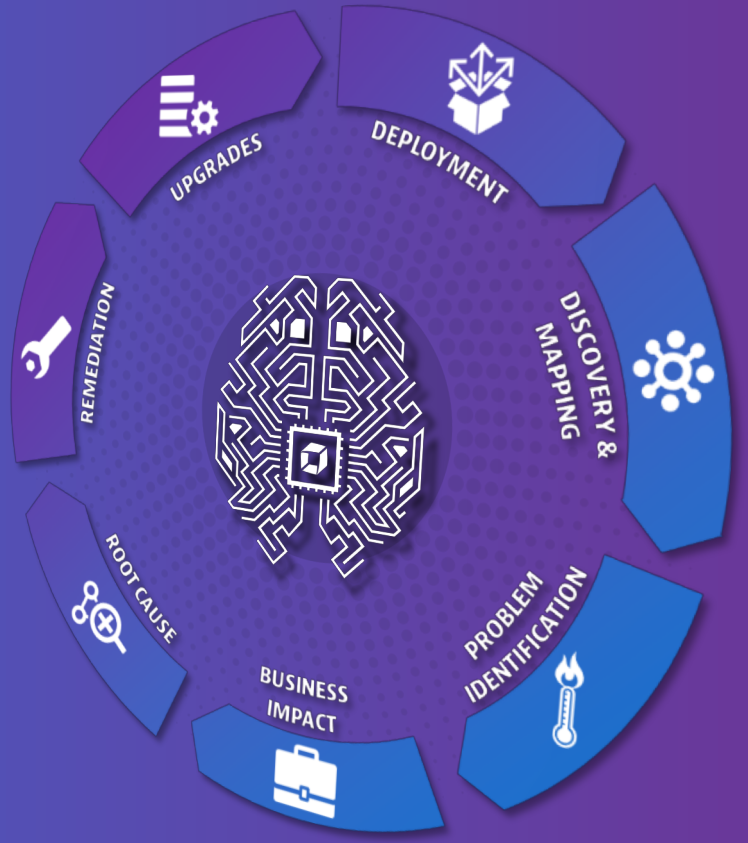
Travis Booth
Technology Principal Engineer
Network Application Monitoring/DCRUM SLO
travis_booth@optum.com

OPTUM®

Summary/Lessons Learned

- Not just an upgrade, but a different way of thinking
  - Automation
  - Data Analysis
  - Dashboarding
  - Alerting
- Don’t recreate your Gen 2 monitoring
- Expand out to new teams

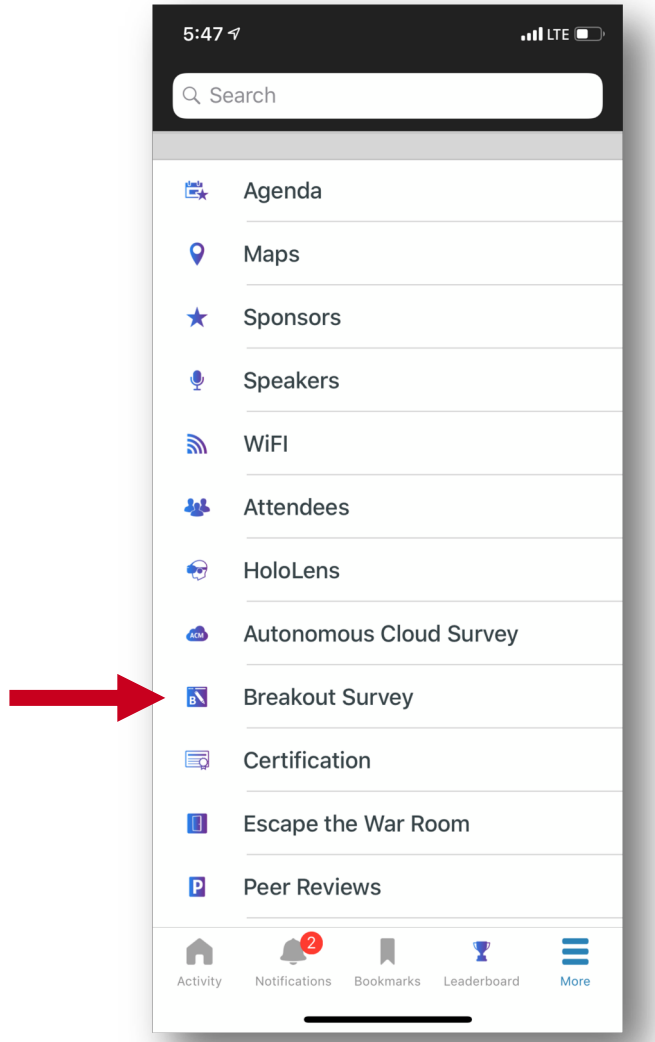
- Dynatrace Services can help



Let us know how we did!

- 2 minute survey
- Find it from the Perform app menu
- Complete survey for each breakout you attend

Track = Software Intelligence




Thank you
dynatrace
Perform