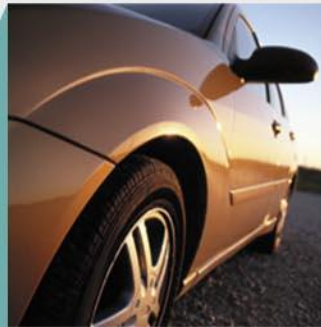


PTC System Monitor



Diagnostics & Troubleshooting Tools based on Customer & TS Requirements

■ Customer Challenges

- Visibility into System Health
- Time To Resolution
- High customer effort for diagnosing issues

■ Q2 FY12

- Debut of The Windchill System Performance Monitoring Tool for Windchill 9.1 & 10.0 powered by dynaTrace

■ Q3 FY12

- Debut for PTC System Monitor for Integrity 10 powered by dynaTrace

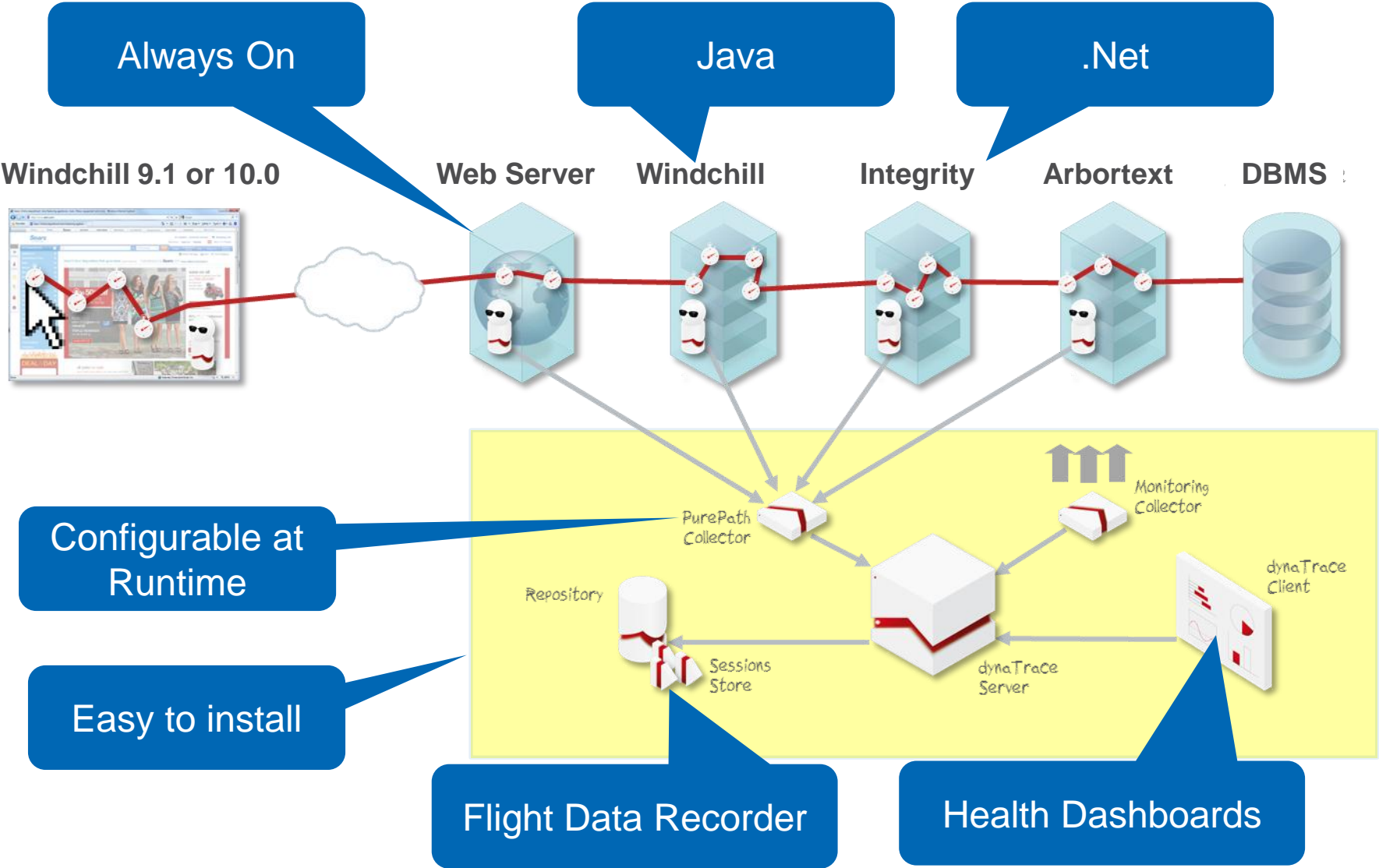


A DIVISION OF COMPUWARE
dynaTrace
software

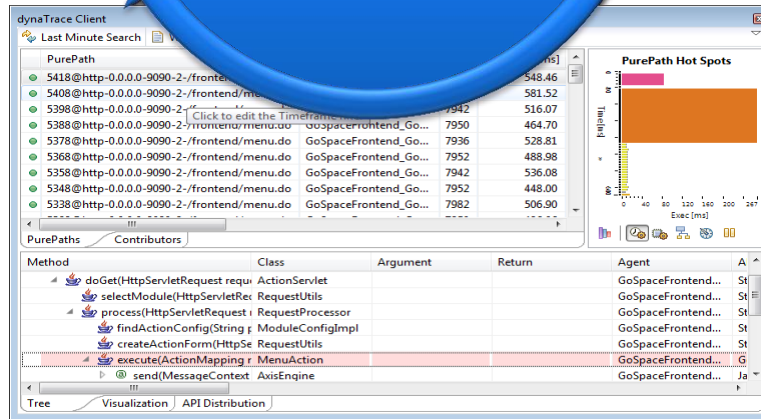
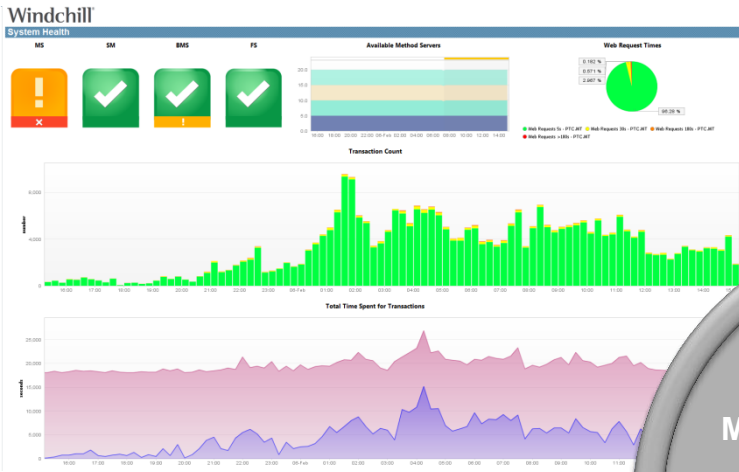
Key Use Scenarios

- **Detection (set thresholds and detect problems)**
 - Slow performing URL e.g. View a Part, Check in a Document
 - Unresponsive, Dead Method Servers, Memory Abuse, Partial failures
- **Diagnosis (viewing tools and automation of data collection)**
 - Transaction profile (avoid need for reproducing errors)
 - Integrated log viewing, gather save and send (Windchill Release 10)
- **Repair, Recovery and Validation (integration with WC environment)**
- **Planning and Reporting (analyze trends, measure availability)**
 - Reporting on serviceability metrics
 - Trending and correlation through time
- **Interoperability (fit within IT management)**
 - Integration with traditional Network and Systems Management Infrastructures





Product Features



<Cust> Sees Dramatic Reduction in Diagnosis Time

Poor Performing SQL Query Found in Minutes

■ <Cust> DBA

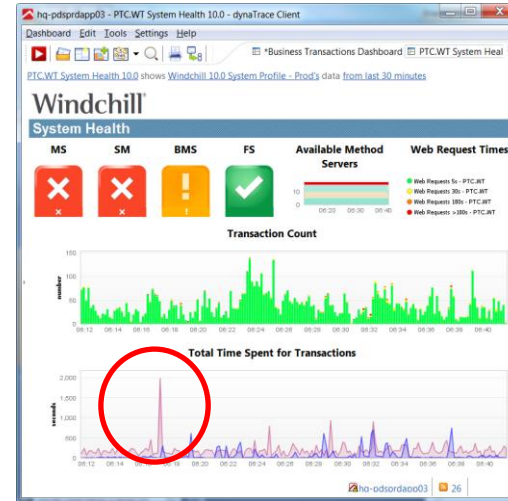
- Reports serious performance degradation in WF process history
- <Cust> started using PTC System Monitor as early adopter in January

■ Darrin Swenson, PTC Engineer

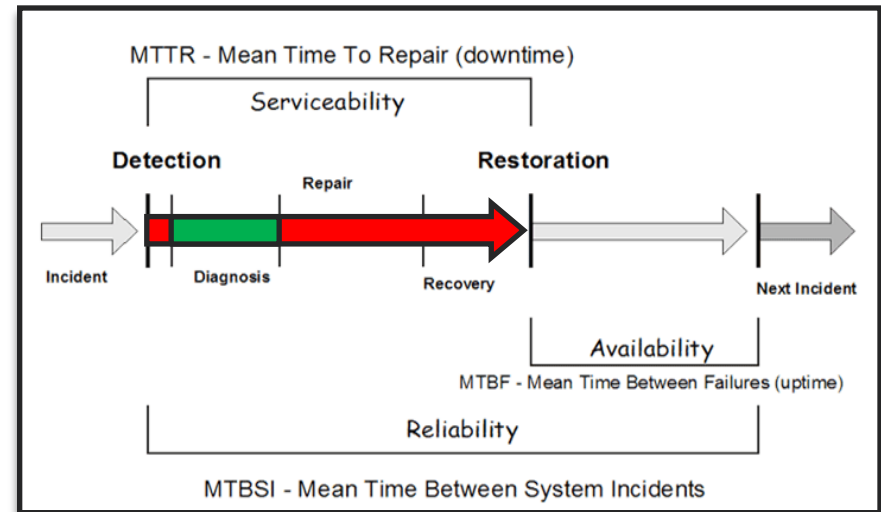
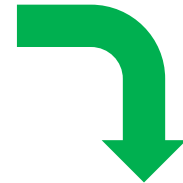
- Darrin calls DBA and starts WebEx
- Within 5 minutes they isolate root cause
- Missing index on a table

■ Client and PTC Benefits

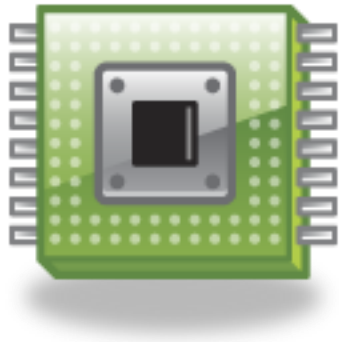
- No need to setup WC Profiler
- No impact on production system
- No need to reproduce incident
- No need setup environment to isolate cluster node
- No delays in starting diagnosis!



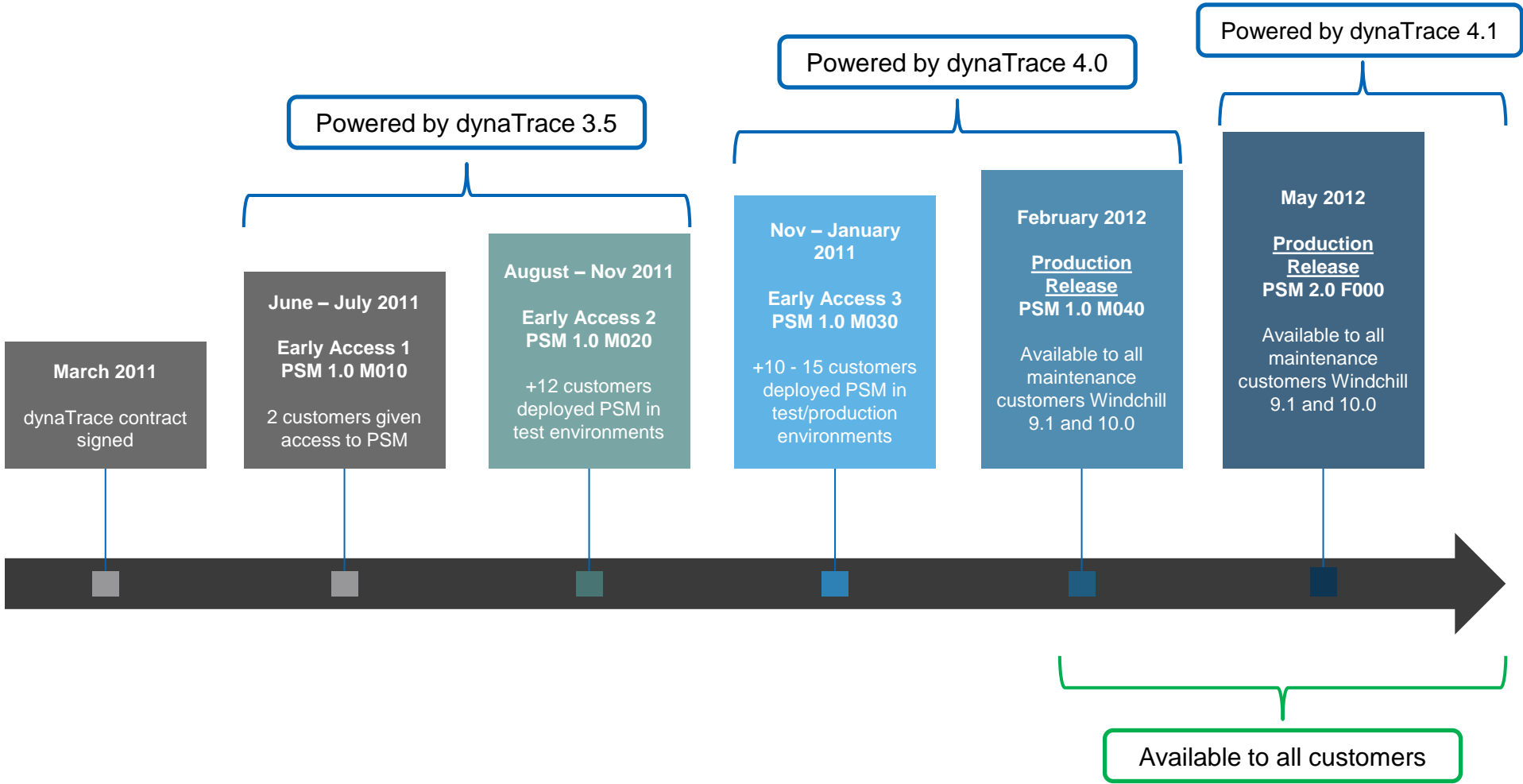
<Cust> goes from detecting incident to root cause in 5 minutes with PTC System Monitor



- Operating System: x64 Linux, Windows, Solaris, AIX
- CPU Requirement: 2 - 4 cores
- Memory Requirement: 8 - 16GB
- 20+ GB disk space storage



PSM Release Timeline



- **When can I get the PTC System Monitor?**
 - PSM was released February 2012
 - Available through the PTC Software Download catalog

- **What PTC applications does PSM support?**
 - Windchill 9.1 and 10.0 server components.
 - MKS Integrity product

- **Is there any cost to PSM?**
 - It's free
 - PSM will be available to maintenance-paying PTC customers of PTC PDS server software
 - There will be options to expand the PSM with dynaTrace add-on modules

- **What type of hardware will I need?**
 - A separate monitoring server (64 bit) is required

- **Is there training available from PTC?**
 - Yes, through PTC University

- **Does PSM monitor browser performance?**
 - No. The PSM is based on dynaTrace's Production Edition and is focused on server performance only.

- **Does PSM support Creo?**
 - Not directly. PSM monitors server-side interactions of Creo with Windchill. For example workspace operations can be monitored in Windchill that are driven by Creo.

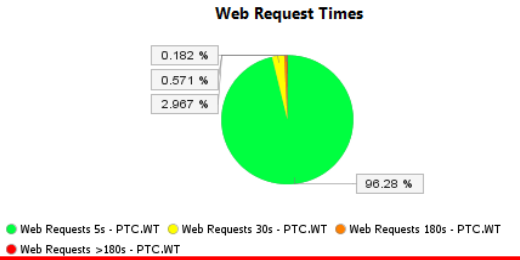
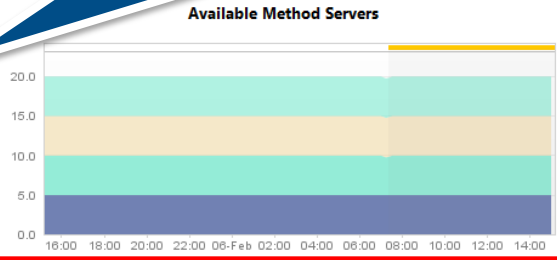
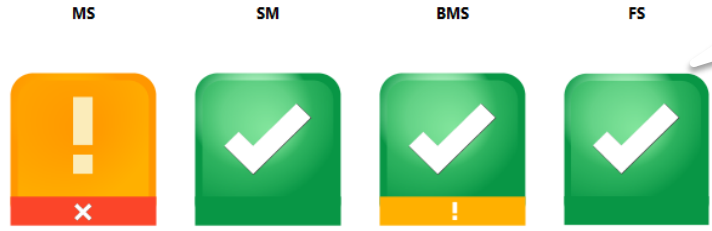
- **Can PSM replace enterprise system monitors: Nagios, OpenView, Tivoli?**
 - Yes and No. PTC System Monitor is not an enterprise monitoring solution, but rather it is an application monitoring solution that traces transactions across application components rather than monitoring just the hardware.

Simple View Into the System

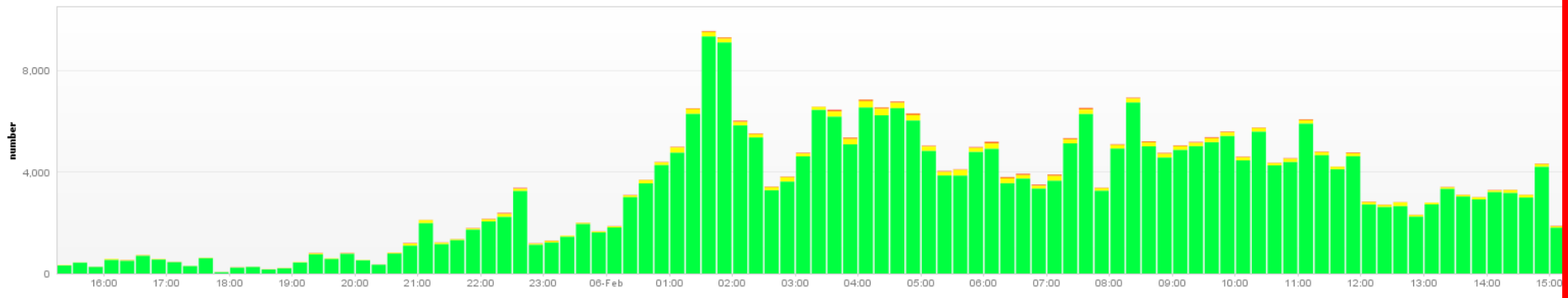
24 metrics consolidated into an easy to absorb health indicators

Windchill®

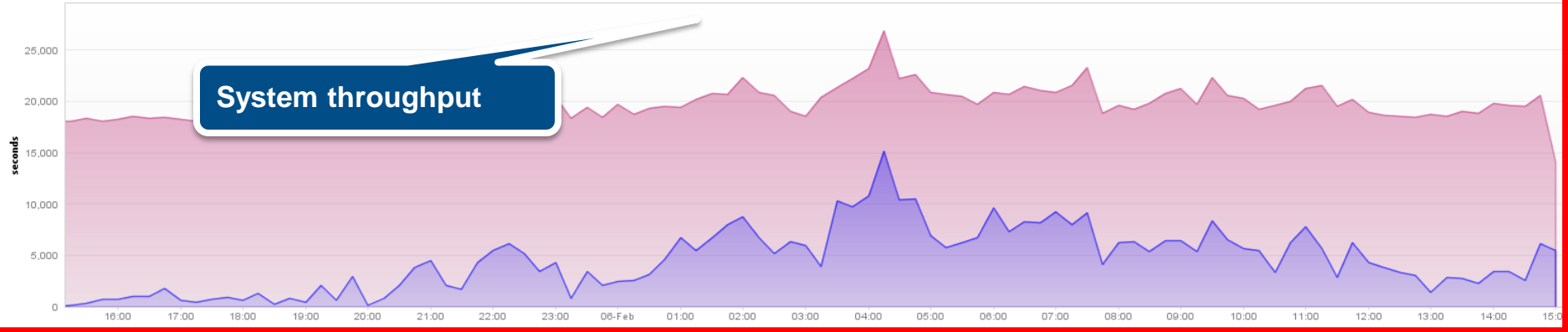
System Health



Transaction Count



Total Time Spent for Transactions



Drill Down Capabilities

Identify which server in cluster running into issue

Windchill®

Method Server Status

Method Server KPI

Aggregated View on Key Performance Indicators for Method Servers

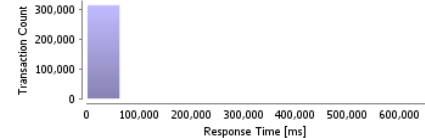
Agent, Monitor or Transaction	Web Request Duration [avg]	PTC.WT [avg]	MS Memory Utilization - PTC.WT [max]
hqpdsprdap01	532.67 ms	287.90 ms	⚠
ptc.wt.MethodServer-v10.0-pds.ptc.com-443-Windchill-1	462.79 ms	462.79 ms	✅
ptc.wt.MethodServer-v10.0-pds.ptc.com-443-Windchill-2	1292.23 ms	1292.23 ms	⚠
ptc.wt.MethodServer-v10.0-pds.ptc.com-443-Windchill-3	287.90 ms	287.90 ms	✅
ptc.wt.MethodServer-v10.0-pds.ptc.com-443-Windchill-4	332.77 ms	332.77 ms	⚠
ptc.wt.MethodServer-v10.0-pds.ptc.com-443-Windchill-5	1276.48 ms	1276.48 ms	❌
hqpdsprdap02	928.65 ms	928.65 ms	✅
hqpdsprdap03	2111.33 ms	2111.33 ms	✅
hqpdsprdap04			

Windchill 10.0 System Profile - Prod

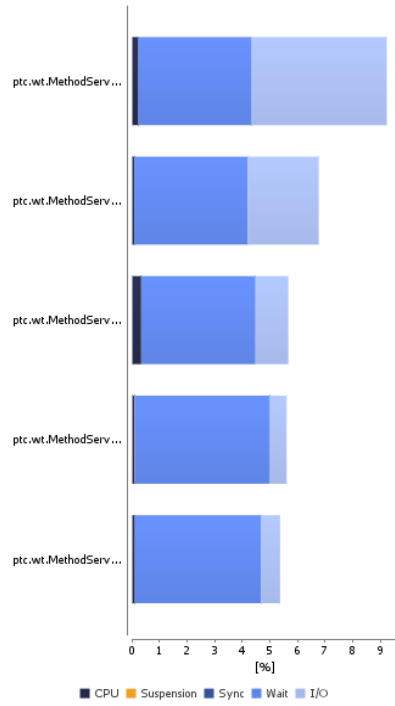
Analyze the transaction response time and its distribution across tiers and APIs to isolate performance problems

Server Transaction Statistics

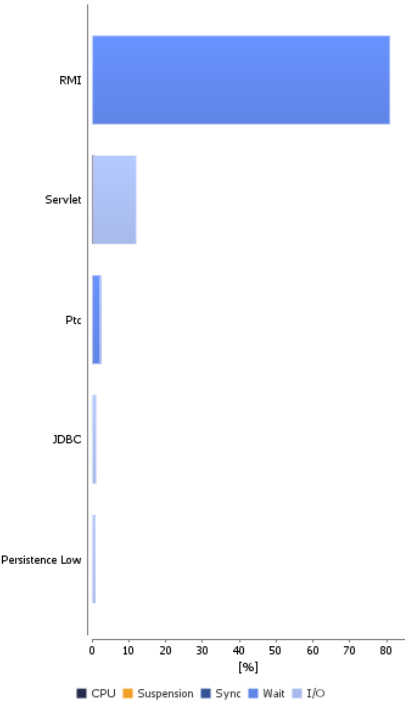
Transaction Count: 315544
Average Response Time: 200.22 ms
Failed Transactions: 53 (0.02 %)



Hotspots by Tier



Hotspots by API



Unprecedented view into End-user actions

Web Request Duration Breakdown

Name	Count	Failed %	Time [ms] Sum	Time [ms] Avg	Time [ms] Max
------	-------	----------	---------------	---------------	---------------

Splittings

Name	Count	Time [ms]	Failed %	Time [ms] Avg	Time [ms] Max
cbardoul	51	16287.14	0 %	264.61	
rkelley	51	20173.27	1.96 %	358.60	
ddenny	50	24524.00	0 %	369.21	
jrowland	48	21877.84	0 %	1255.54	
jessh	46	7430.21	0 %	324.67	
aurani	44	1718.42	0 %	598.74	
jhenry	37	602.29	0 %	14213.21	
wgraves	36	8301.02	0 %	348.36	
vtalak	36	13960.15	0 %	387.78	
jaurila	35	12409.35	0 %	310.26	
nsmoliakova	34	14964.32	17.65 %	383.83	
tngops	34	25008.82	0 %	735.55	
lwert	32	18498.25	0 %	320.98	
ampatil	31	18249.27	0 %	540.10	
shao	31	15525.30	0 %	500.82	
aciavattone	27	13532.68	0 %	442.51	
kschoonover	25	16548.63	12 %	611.74	
apiccione	24	5684.32	0 %	236.85	
adesai	22	10631.92	0 %	404.95	
rouleau	22	4883.20	0 %	166.78	
deberle	20	1911.02	15 %	34.04	
msundquist	19	4990.66	0 %	167.97	
tliebenow@eacdesign.com	18	17099.55	0 %	869.77	
agodwin	18	17468.59	0 %	868.60	

Transaction Based Dashboards

Windchill®

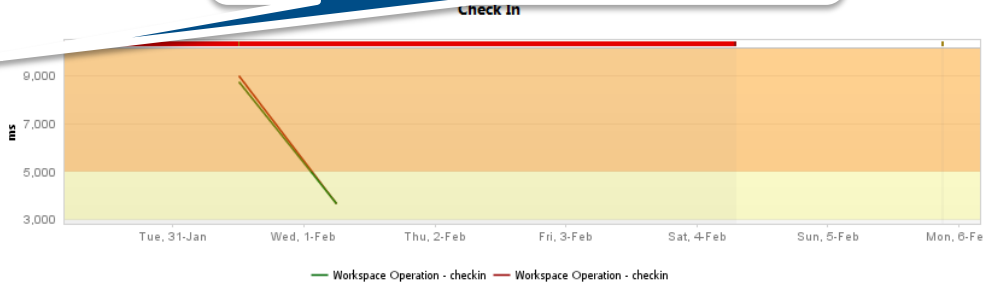
Workspace Operations (Standalone Browser)

Incident Overview

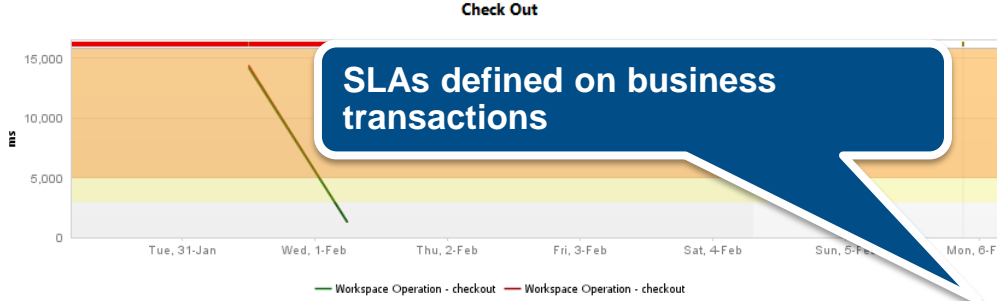
Name	Count	Incidents	Incidents per day	Incident rate [%]	Violatio...	Failed %	PurePath Respo...
Workspace Operation - checkout (split by null)	9	0	0.00	0.00	66.67	0 %	9939.94 ms
Workspace Operation - add to (split by null)	10	0	0.00	0.00	66.67	0 %	14564.08 ms
Workspace Operation - checkin (split by null)	0	0	0.00	0.00	66.67	0 %	7049.29 ms

Transaction based metrics

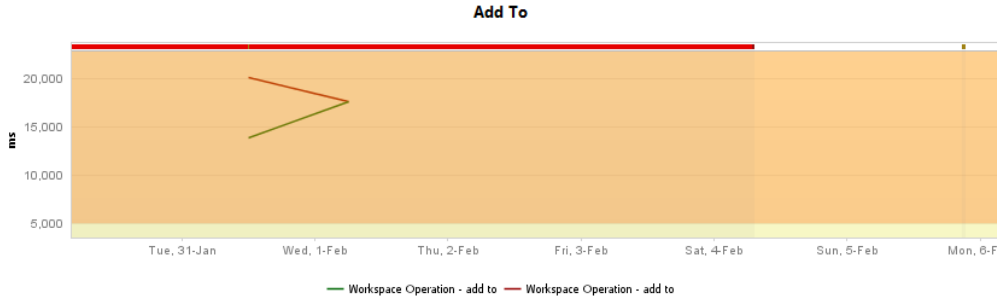
Check In



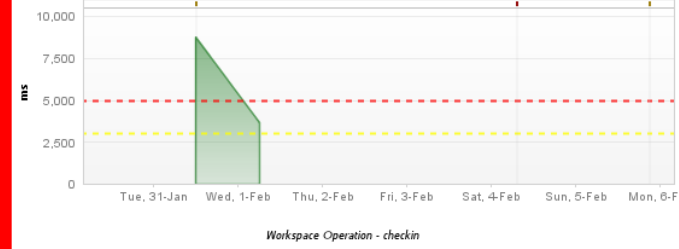
Check Out



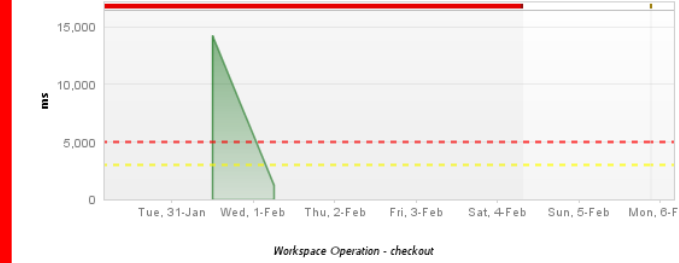
Add To



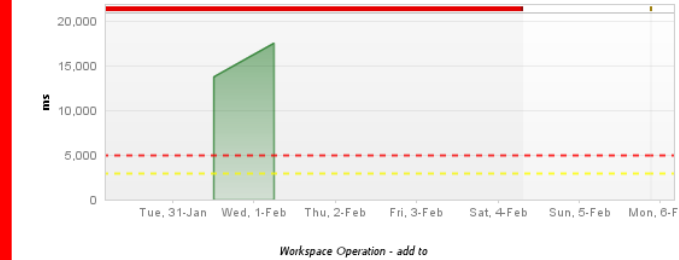
Check In SLA



Check Out SLA



Add To SLA



Powerful Diagnostic Capabilities

User Tracking - PTC.WT Response Time Hotspots PurePaths PurePaths

PurePath	Duration [ms]	Breakdown	Size	Agent	Application	Start Time	CPU Sum [ms]
/Windchill/Servlet/WindchillAuthGW/com.ptc.netmarkets...	616180.11	io (100%)	16	ptc.wt.MethodServer...	Default Applic...	2012-02-06 15:36:06.471	0.11
/Windchill/ptc1/object/export	229714.25	cpu (68%) io (32%)	86362	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:32:13.164	156335.48
/Windchill/ptc1/search/historySavedSearchDisplay	7791.39	cpu (98%) io	52	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:31:50.303	6845.94
/Windchill/ptc1/comp/folderbrowser_tree	1472.29	cpu (74%) io	359	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:31:51.351	92.45
/Windchill/ptc1/ds	1104.21	wait (95%)	14	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:31:51.747	30.06
/Windchill/ptc1/comp/folderbrowser_table	439.82	cpu (48%) io (52%)	140	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:31:51.366	218.04
/Windchill/app/	102.18	cpu (60%) io (40%)	37	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:31:45.042	61.79
/Windchill/app/	95.81	cpu (64%) io (36%)	36	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:31:45.357	61.28
/Windchill/Servlet/ActionsMenu	94.42	cpu (80%) io	50	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:31:51.991	75.44
/Windchill/ptc1/search/historySavedSearchDisplay	93.58	cpu (48%) io (52%)	35	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:36:06.010	44.71
/Windchill/ptc1/tcomp/infoPage	93.25	cpu (67%) io (33%)	83	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:31:50.315	62.19
/Windchill/app/	86.84	cpu (63%) io (37%)	34	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:36:03.559	54.75
/Windchill/ptc1/comp/folderbrowser_details	51.22	cpu (79%) io	49	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:31:51.291	40.27
/Windchill/ptc1/object/checkConsole	34.03	cpu (38%) io (62%)	28	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:36:52.833	12.77
/Windchill/ptc1/breadcrumb/	31.15	cpu (68%) io (32%)	41	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:31:50.310	21.26
/Windchill/ptc1/util/status	30.65	cpu (96%) io	19	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:36:06.016	29.38
/Windchill/ptc1/breadcrumb/	25.92	cpu (74%) io (26%)	33	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:31:50.929	19.20
/Windchill/ptc1/ds	21.54	cpu (96%) io	14	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:31:53.457	20.61
/Windchill/ptc1/breadcrumb/	16.74	cpu (79%) io	26	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:36:05.448	13.30
/Windchill/ptc1/log4jascript	14.64	cpu (60%) io (40%)	16	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:31:51.156	7.98
/Windchill/netmarkets/jsp/search/getGlobalTypes.jsp	12.69	cpu (57%) io (43%)	22	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:31:50.239	7.22
/Windchill/ptc1/log4jascript	11.42	cpu (79%) io	14	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:31:51.374	9.00
/Windchill/ptc1/projectStatusController/	11.40	cpu (78%) io	14	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:36:06.014	8.95
/Windchill/ptc1/log4jascript	10.67	cpu (93%) io	14	ptc.wt.MethodServer...	pds.ptc.com	2012-02-06 15:31:51.107	9.89

PurePath Hotspots

Time [ms]

Exec [ms]

Code path execution

Method	Argument	Exec Total [ms]	Breakdown	Class	API	Agent	Elapsed Time [ms]
doFilter(ServletRequest, ServletResponse, FilterChain)	/Windchill/Servlet...	604609.01	io (100%)	ServletRequestMo...	Servlet	ptc.wt.MethodSer...	0.00
getRemoteUser()		0.03	cpu (98%)	RequestFacade	Servlet	ptc.wt.MethodSer...	0.05
getRemoteUser()		0.01	cpu (100%)	Request	Servlet	ptc.wt.MethodSer...	0.06
getRemoteUser()		0.02	cpu (99%)	RequestFacade	Servlet	ptc.wt.MethodSer...	0.09
getRemoteUser()		0.00		Request	Servlet	ptc.wt.MethodSer...	0.09
doFilter(ServletRequest, ServletResponse, FilterChain)		604608.39	io (100%)	ServletRequestMo...	Servlet	ptc.wt.MethodSer...	-
doFilter(ServletRequest, ServletResponse)		604608.39	io (100%)	ApplicationFilterC...	Servlet	ptc.wt.MethodSer...	-
internalDoFilter(ServletRequest, ServletResponse)		604608.39	io (100%)	ApplicationFilterC...	Servlet	ptc.wt.MethodSer...	-
doFilter(ServletRequest, ServletResponse, FilterChain)	/Windchill/Servlet...	604608.39	io (100%)	RequestInterrupter	Servlet	ptc.wt.MethodSer...	0.61
doFilter(ServletRequest, ServletResponse)		604608.28	io (100%)	ApplicationFilterC...	Servlet	ptc.wt.MethodSer...	-
internalDoFilter(ServletRequest, ServletResponse)		604608.28	io (100%)	ApplicationFilterC...	Servlet	ptc.wt.MethodSer...	-
doFilter(ServletRequest, ServletResponse, FilterChain)	/Windchill/Servlet...	604608.28	io (100%)	CompressionFilter	Servlet	ptc.wt.MethodSer...	0.73
doFilter(ServletRequest, ServletResponse)		604608.11	io (100%)	ApplicationFilterC...	Servlet	ptc.wt.MethodSer...	-
internalDoFilter(ServletRequest, ServletResponse)		604608.11	io (100%)	ApplicationFilterC...	Servlet	ptc.wt.MethodSer...	-
doFilter(ServletRequest, ServletResponse, FilterChain)	/Windchill/Servlet...	604608.11	io (100%)	TrustedAuthFilter	Servlet	ptc.wt.MethodSer...	0.89
doFilter(ServletRequest, ServletResponse)		604608.02	io (100%)	ApplicationFilterC...	Servlet	ptc.wt.MethodSer...	-
internalDoFilter(ServletRequest, ServletResponse)		604608.02	io (100%)	ApplicationFilterC...	Servlet	ptc.wt.MethodSer...	-
doFilter(ServletRequest, ServletResponse, FilterChain)	/Windchill/Servlet...	604608.02	io (100%)	WTContextBeanFil...	Servlet	ptc.wt.MethodSer...	0.99
getRemoteUser()		0.03	cpu (95%)	RequestFacade	Servlet	ptc.wt.MethodSer...	1.10
getRemoteUser()		0.01	cpu (99%)	Request	Servlet	ptc.wt.MethodSer...	1.11
doWithWtContextBeanHandler(ServletRequest, ServletResponse, FilterChain)		604606.87	io (100%)	WTContextBeanFil...	Servlet	ptc.wt.MethodSer...	-
doFilter(ServletRequest, ServletResponse)		604606.87	io (100%)	ApplicationFilterC...	Servlet	ptc.wt.MethodSer...	-
internalDoFilter(ServletRequest, ServletResponse)		604606.87	io (100%)	ApplicationFilterC...	Servlet	ptc.wt.MethodSer...	-
service(ServletRequest, ServletResponse)		604606.87	io (100%)	HttpServlet	Servlet	ptc.wt.MethodSer...	-
service(HttpServletRequest, HttpServletResponse)	/Windchill/Servlet...	604606.87	io (100%)	HTTPGatewayServ...	Servlet	ptc.wt.MethodSer...	2.14

Tree Transaction Flow API Distribution