PTC® Live Global

# Improving Windchill Performance


Ram Krishnamurthy
Director Product Management and Enterprise Deployment Center

June 9-12, 2013, Anaheim, California

*All presentations are subject to change

# Other Enterprise Architecture / EDC Sessions

PTC® Live Global

| | Title | Presenter(s) | Day | Time | Location |
|---|---|---|---|---|---|
| 1 | PTC Enterprise Platform Roadmap | Jon Bachman | Monday | 3:45 PM – 4:30 PM | 201C |
| 2 | Advanced Windchill Visualization Techniques | Steve Dertien | Monday | 4:45 PM – 5:30 PM | 201C |
| 3 | PTC Windchill and Enterprise Roadmap | Will Kohler | Tuesday | 10:15 AM – 11:00 AM | 201C |
| 4 | CUST210 PTC Creo View Publishing Strategy and Implementation at John Deere | Thomas Erlemeir (John Deere) | Tuesday | 10:15 AM – 11:00 AM | 201D |
| 5 | PTC229 Ask the Expert(s): PTC Creo Visualization, Routed Systems, Sketch and Illustration | Madhavi Ramesh<br>Brian Thompson<br>PTC Product Management | Tuesday | 11:15 AM – 12:00 PM | 204B |
| 6 | PTC212 PTC Windchill: Meet the Experts | PTC Product Management | Tuesday | 1:30 PM – 2:15 PM | 201C |
| 7 | Using PTC System Monitor to Diagnose PTC Windchill Performance Problems | Steve Vaillancourt<br>Tim Atwood | Tuesday | 1:30 PM – 2:15 PM | 202A |
| 8 | CUST226 Configure and Understand Dedicated Worker and Publisher Queues | James Kerkstra (Steelcase)<br>Jamie Momber (Steelcase) | Tuesday | 4:00 PM – 4:45 PM | 201A |
| 9 | PTC203 Improving PTC Windchill Performance | Ram Krishnamurthy | Tuesday | 5:00 PM - 5:45 PM | 201D |
| 10 | PTC311 PTC Windchill Architecture Deployment and Security – Pt 1 | Steve Dertien | Wednesday | 10:00 AM – 10:45 AM | 201D |
| 11 | PTC319 PTC Windchill Architecture Deployment and Security – Pt 2 | Steve Dertien | Wednesday | 11:00 AM – 11:45 AM | 201D |
| 12 | PTC314 Ask the Expert(s): PTC Creo | PTC Product Management | Wednesday | 11:00 AM – 11:45 AM | 204B |

* Check the Official PTC Live Global 2013 Program for Updates

# Agenda



- What is Performance?
- Steps to optimize for Performance
- Baseline Optimization
- What should I monitor?
- What can I do when there is a problem?
- Important Documents and Tools

# What is Performance?



- **Performance** – the degree to which a software system or component meets its objectives for *responsiveness* and *scalability*.
  - **Responsiveness** – the ability of a system to meet its objectives for response time or throughput.
  - **Scalability** – the ability of a system to meet its response time or throughput objectives as the demand for the software functions increases.

# What is Performance?



- Performance is measured by one user but is determined by the load on the system in the environment in which the system is running
- System performance is dependent on:

Network Latency

# Active Users

End User Tasks

System Configurations

Bugs /#$!

Client Hardware

Customizations

Server Hardware

Software Versions

Network Bandwidth

Background Operations

# What is Performance?



- The different dimensions of performance:
  - Single user performance

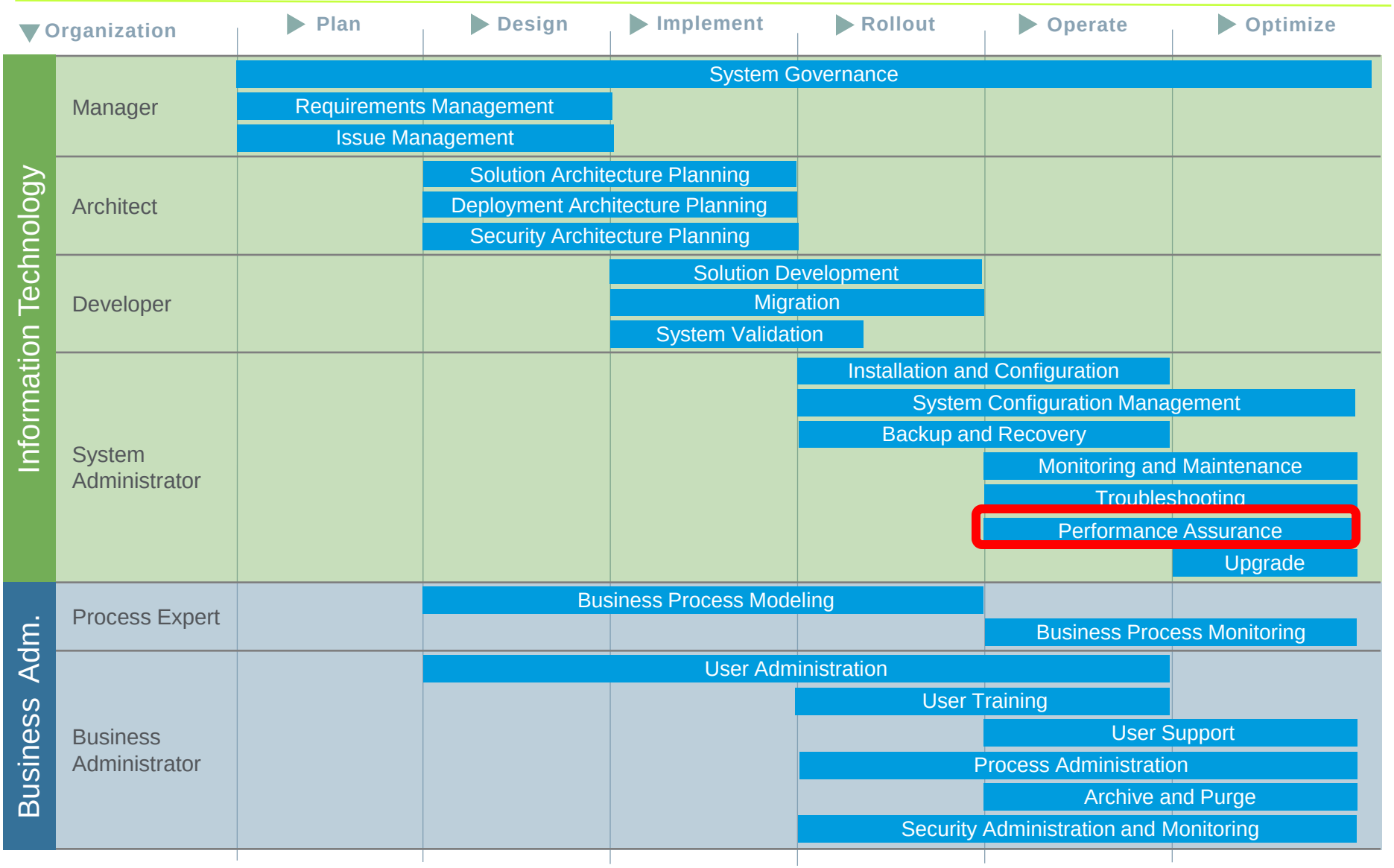
  - Multi-user performance

  - Scalability - Ensures that application scales. E.g. uses resources correctly
  - LAN/WAN

  - Time of day – variations in loading
- Productivity = Performance + Usability
  - Good training can only help!

# PTC - Administrative Process Landscape

PTC® Live Global



# Steps to optimize for Performance



START

Baseline Optimization

Performance Issue Definition

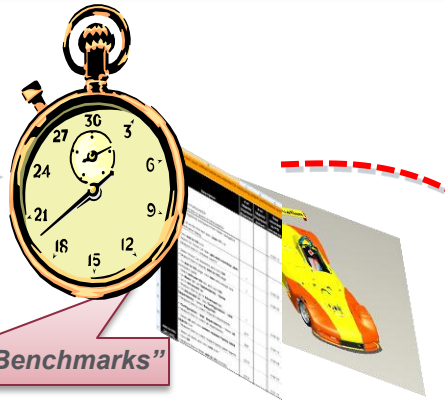
Performance Issue Troubleshooting

Stress / Load Testing

Proactive Monitoring

Proactive Maintenance

END



*"PTC or Customer Benchmarks"*

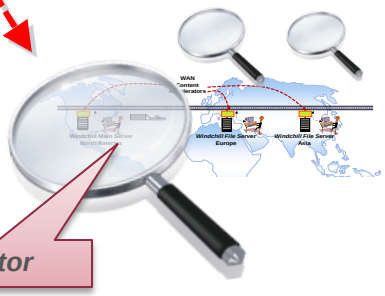
*Identify performance exceptions*

*Check baselines under load*

*Troubleshoot exceptions and document baselines*

**Pre-production**

**Production**



*Monitor*

*Maintain*

# Baseline Optimization – Installation & Configuration

PTC® Live Global

- **Server**
  - Windchill Configuration Assistant
  - Windchill Configuration Settings Which Aid in Scaling to Production
  - Fine tune WCA settings using your data and procedures (For Ex: Very Large Assemblies)

- **DB**
  - Tuning Oracle and Interpreting the Oracle Gather Info Script Output
  - Optimize instance and parameters and memory usage (SGA in Oracle and Maximum Server Memory in SQL Server)
  - Apply indexes recommended in Article **CS98135**
  - Configure for best disk I/O

- **Client**
  - Windchill Client Inspector
  - Windchill 10x Client Requirements - Technical Brief – Document being updated
  - Windchill Web Browser Comparison - Technical Brief – Document being updated

- **Other documents**
  - Windchill Deployment Planning Checklist
  - Windchill Vaulting and Replication Planning - Technical Brief
  - Optimizing Windchill Performance for Global Collaboration - Technical Brief
  - Windchill Server Hardware Sizing Guidelines

**Refer to section titled – "Important Documents and Tools" in this presentation for more information**

# Baseline Optimization - Benchmarking

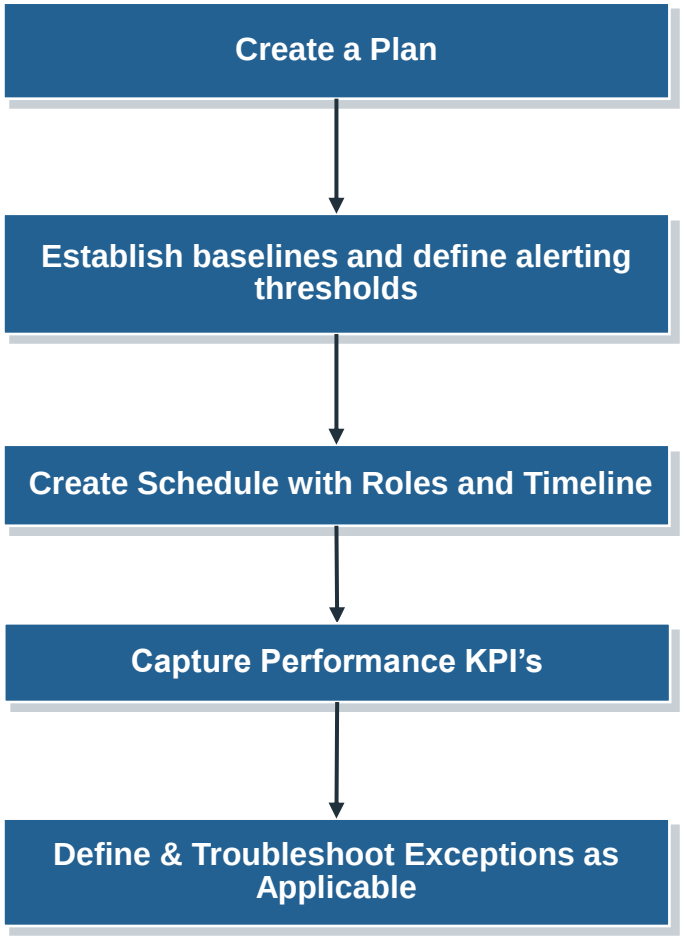
PTC® Live Global

- **Single User Benchmarks**
  - Manual Method
    - Windchill Creo Data Management Performance Benchmark Test - Instructions
    - Windchill Creo Data Management Performance Benchmark Test - Data Sheet
    - Windchill Creo Data Management Performance Benchmark Test – Preliminary Dataset (82 KB)
    - Windchill Creo Data Management Performance Benchmark Test – World Car Dataset (295 MB)
  - Automated Method
    - Windchill Single User Performance Tester for Creo Data Management Operations (SPT) - Instructions
    - Windchill Single User Performance Tester for Creo Data Management Operations (SPT) - Media
- **Stress / Load Test Validation. i.e. Multi User Benchmarks**
  - Windchill Multiuser Load Generator for CAD and Non-CAD Operations (WMLG)
  - It is important that you perform load tests for extreme data and use cases . For ex:
    - CheckIn/Out of very large assemblies
    - Very large searches
    - Very large reports

**Refer to section titled – "Important Documents and Tools" in this presentation for more information**

# What should I monitor?

# What should I monitor?




*For More Information please refer to*

Best Practice Activities for Windchill System Monitoring and Maintenance

# Create a Plan for Monitoring the System



Define criteria to meet and the tools to measure them

- Measurement & Analysis Plans or similar plans:
  - Define a means to track Business Intelligence (BI) characteristics
  - Include Key Performance Indicators (KPI's) supporting BI needs
  - Describe the owners, methods and tools used to collect KPI data
  - Prescribe the frequency and format of KPI reporting
  - Outline the strategy and specific improvement goals and thresholds
  - Define SLAs, thresholds and related alerts to automate proactive monitoring

- KPI's relating to "System Performance" are subset of all KPI's
  - **User Experience** – measured system responsiveness to users
  - **Business Productivity** – measured system throughput of business objects
  - **System Health** – measured resource utilization and overall availability

# Create Schedule with Roles and Timeline



- Monitor KPIs in live system(s)
  - **Where:** sites with important data and/or large user population
  - **When:** regular frequency and during peak usage times
  - **How:** tools embedded in Windchill tiers
- Configure & maintain automated alerts and test scripts
- Benchmark KPIs in regular testing

# Example Performance KPIs & Means To Measure Them

PTC® Live Global

| KPI Categories | Examples | Tools |
|---|---|---|
| User Experience | • Login<br>• Commonly Used Pages<br>• Basic Search<br>• Object Creation<br>• Advanced Search<br>• Checkin/Checkout<br>• Upload/Download<br>• … | • Manual<br>  • Windchill Creo Data Management Performance Benchmark Test<br>  • Customer specific scenarios & data (typical & mission critical)<br>• Automated<br>  • Windchill Single User Performance Tester for Creo Data Management Operations (SPT)<br>  • Multi-User Load Generator<br>• **PTC System Monitor** – transactional response times from live production system |
| Business Productivity | • Change Requests Processed<br>• Drawings/Documents Released<br>• Reports Generated<br>• Viewables Published<br>• Workflow Tasks Performed<br>• … | • Windchill Business Reports – Cognos, OOTB and 3rd party reports<br>• Windchill auditing Process Monitor<br>• Workflow Health report |

# Example Performance KPIs & Means To Measure Them

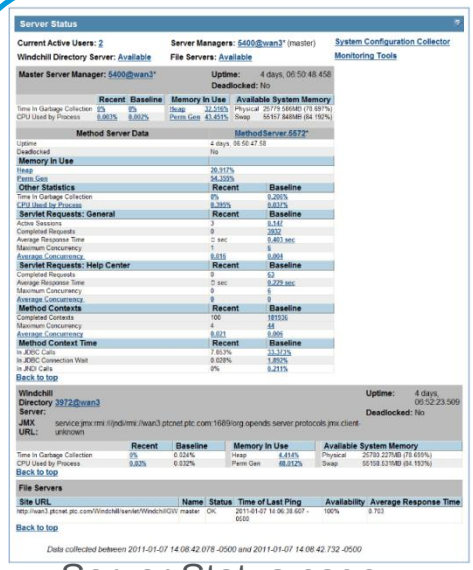
PTC® Live Global

| KPI Categories | Examples | Tools |
|---|---|---|
| System Health | • Availability and outages (planned/unplanned)<br>• Requests in application layer (methodcontexts/servlet requests)<br>• Elapsed time in application layer (methodcontexts/servlet requests)<br>• Java garbage collection (frequency and duration)<br>• CPU and memory (avg. / max) in O/S, Database and Java<br>• Network latency, Utilization (congestion) and Packet Loss<br>• Many other measurements for Application, O/S, and Database<br>• ... | • PTC System Monitor – monitor O/S and Windchill transactions together<br>• JMX – email alerts, Jconsole and VisualVM for application tier<br>• Server Status utility – OOTB embedded monitoring tools<br>• Database monitoring – Oracle OEM or SQL Server Management Studio<br>• Various 3rd Party and O/S tools are also available |

# Example Monitoring Tools

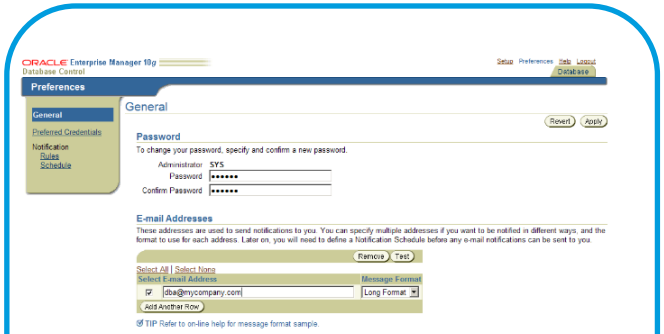
PTC® Live Global

## In addition to OS tools

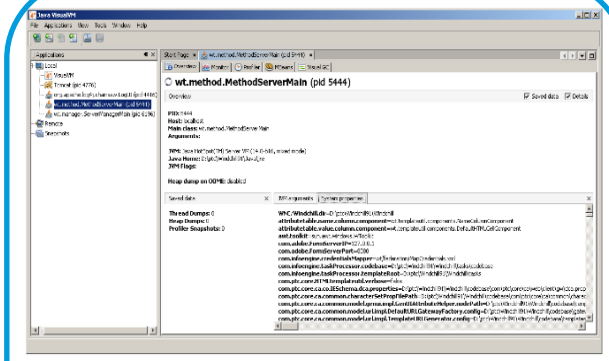



Server Status page

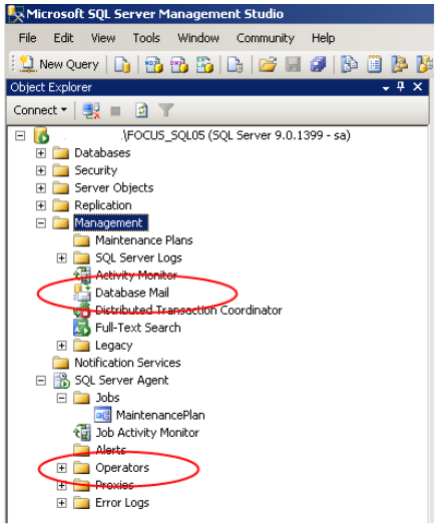

PTC System Monitor




Oracle Enterprise Manager




VisualVM



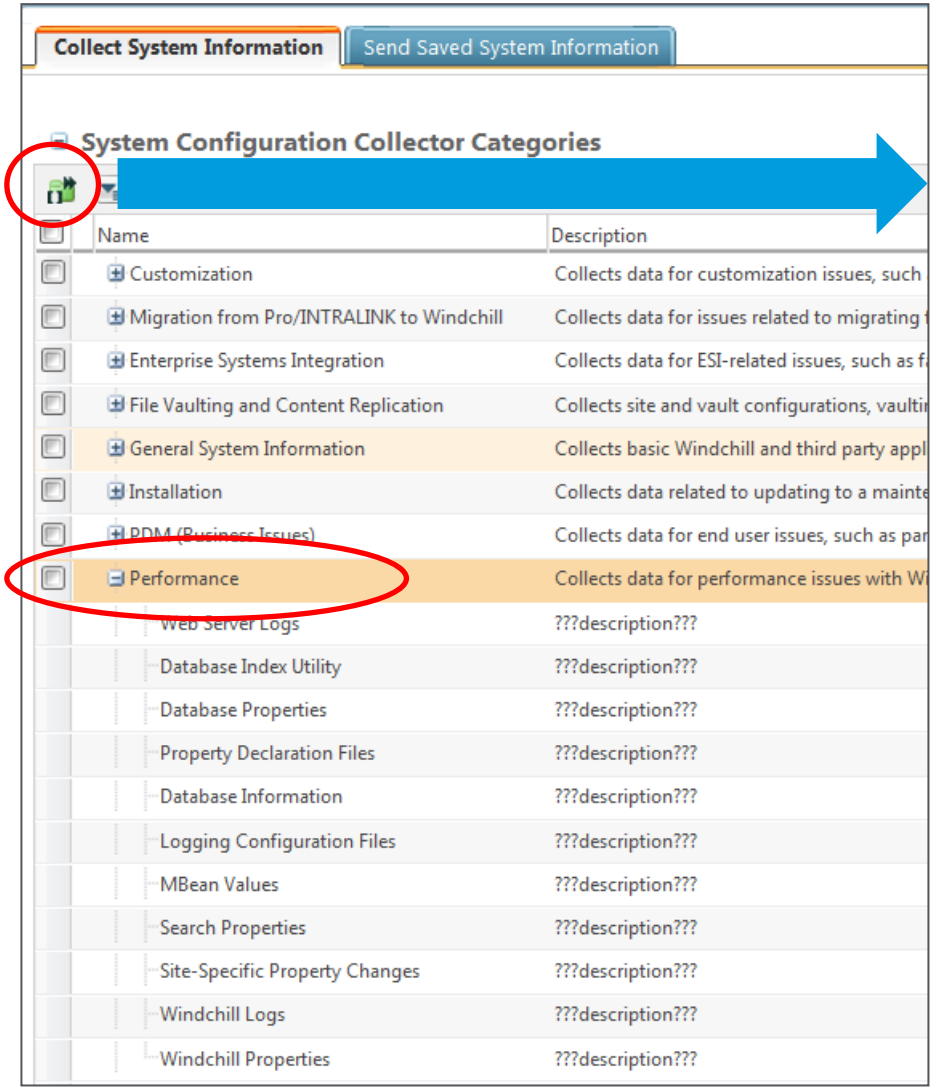

SQL Server Management Studio

# What can I do when there is a problem?

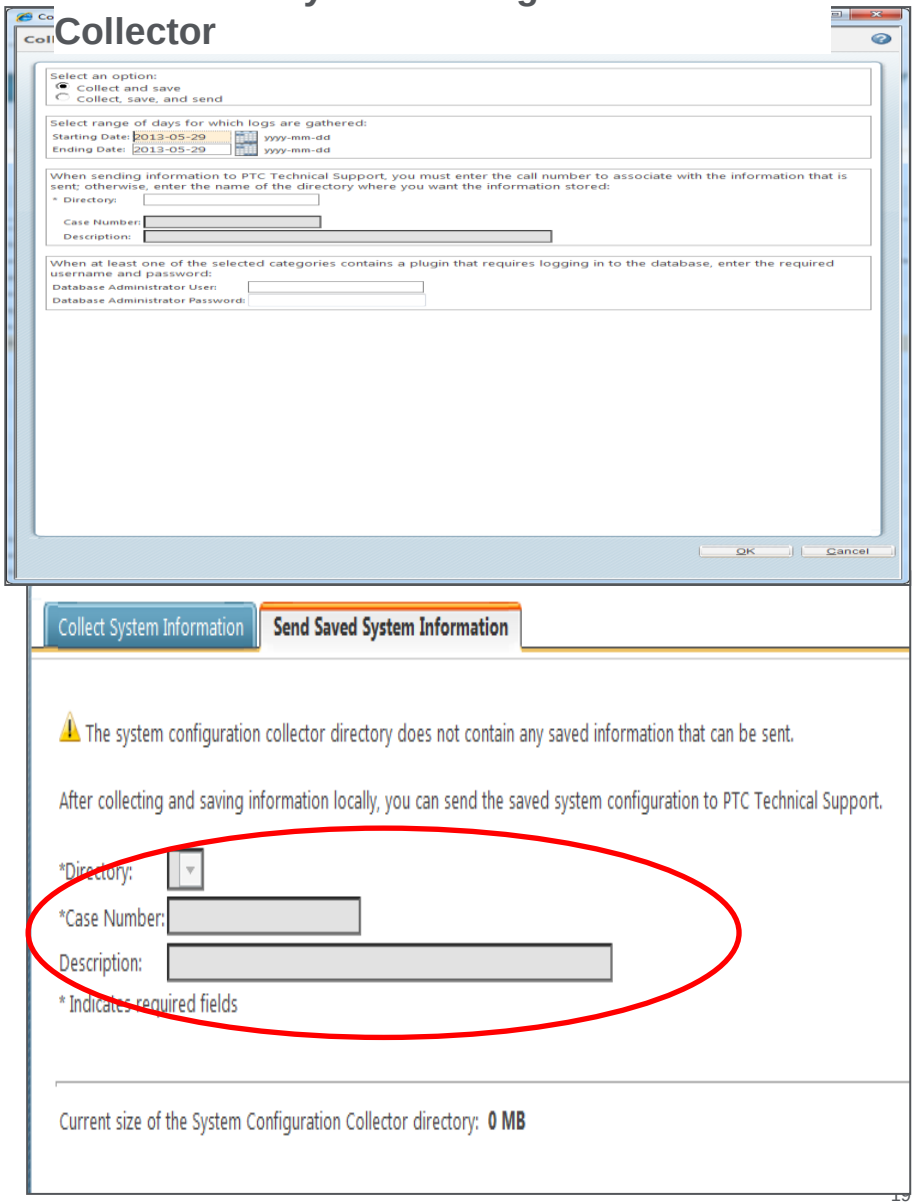
# What can I do when there is a problem?

PTC® Live Global

## Open a case with PTC Technical Support




## Site/Utilities/System Configuration Collector



# What can I do when there is a problem?



- **Article CS75095 explains how to troubleshoot performance problems and collect necessary data**
- **Refer to this article when:**
  - Windchill system performance troubleshooting or debugging
  - Windchill system gets unresponsive or very slow to respond to requests
  - Windchill Server may have phenomena of OutOfMemoryError, hang up, no response or slow performance
  - Windchill does not respond to any requests or shows very slow performance
  - Operations in client are very slow or no response
  - **Site > Utilities > Server Status** page show abnormal
- **Article contains useful links to other Articles such as:**
  - Why do Method Servers Crash
  - Understanding Method Server Health From the Log files
  - Tuning Oracle and Interpreting the Oracle Gather Info Script Output
  - Optimizing system further via Windchill Configuration Assistant
  - Capturing thread dumps (CS107636 )
  - Using the Windchill profiler

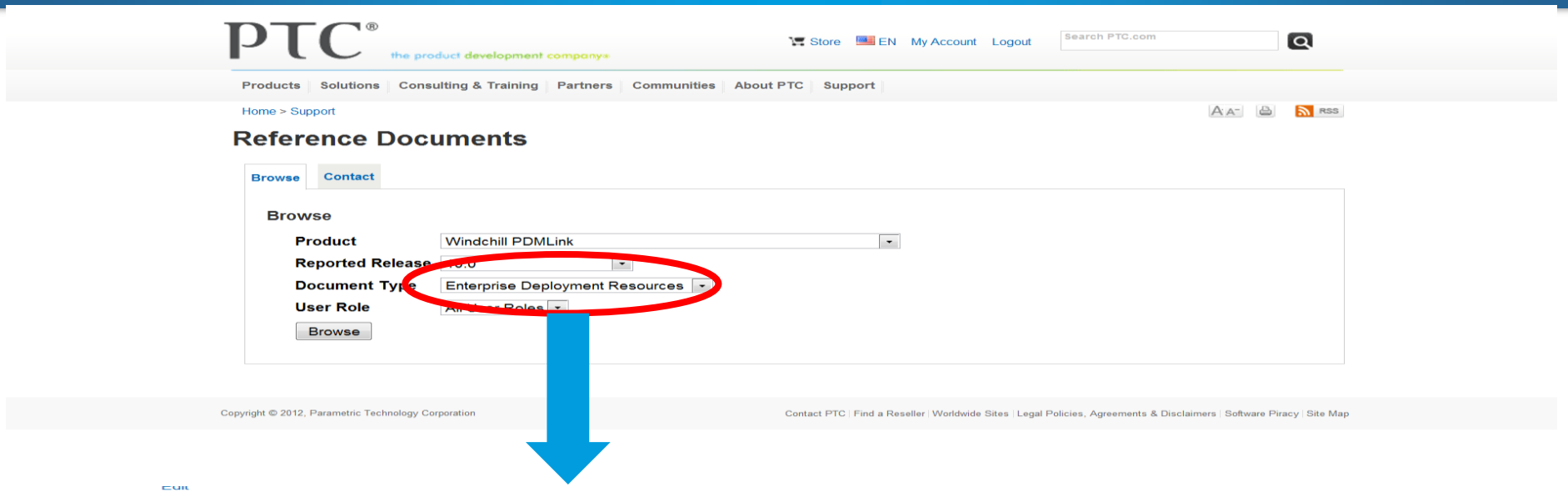
## In Summary

- Perform Baseline Optimization of your Windchill System
- Execute and capture Benchmarks for critical operations
- Periodically re-execute benchmarks to compare performance against baseline (frequency can be daily, weekly, bi-weekly and **after every system update**)
- Include Key Performance Indicators (KPI's) supporting BI needs
- Monitor KPIs using available tools
  - Server Status utility
  - PTC System Monitor
  - Oracle OEM or SQL Server Management Studio
- When Performance issues arise
  - Open a case with PTC Technical Support
  - Use the **System Configuration Collector** to collect and upload relevant information to the case
- Quick access to comprehensive collection of Windchill Product Documentation and Enterprise Deployment Resources
  - www.ptc.com/go/install-windchill
  - www.ptc.com/go/windchillcad
  - PTC Technical Support Knowledge Base - https://www.ptc.com/appserver/cs/portal/

# Important Documents and Tools

# EDC Documents and Tools

PTC® Live Global




Edit

**Windchill 10x Client Requirements - Technical Brief** - English
User Role: Administrator
Published: 09-Apr-2012
This documented was updated to reflect support for Windchill 10.1 on Monday, April 9. This document provides the minimum and recommended client requirements for CAD and non-CAD users of Windchill PDMLink, Windchill ProjectLink, and Pro/INTRALINK 10x for the Windows platform. The requirements include specifications for operating system, memory, CPU, and web browser. Windchill client tuning recommendations and the application of the Windchill Client Inspector is also discussed.
Edit

**Windchill Advanced Deployment Guide** - English
User Role: Administrator
Published: 19-Jan-2012
This document was last updated on 19 January 2012. The Windchill Advanced Deployment Guide assists Windchill system administrators by providing advanced operations and configurations (including clusters) for Windchill solutions.
*Other Languages:* Japanese
Edit

**Windchill and Pro/INTRALINK 10.x Server Hardware Sizing Guidelines - HP-UX Platform** - English
User Role: Administrator
Published: 16-Apr-2012
This document provides guidelines for how to size Windchill PDMLink, Windchill ProjectLink, and Pro/INTRALINK 10.0 and 10.1 servers as well as CAD worker hardware and a Content Cache Server for replication.
Edit

**Windchill and Pro/INTRALINK 10.x Server Hardware Sizing Guidelines - IBM AIX Platform** - English
User Role: Administrator
Published: 16-Apr-2012
This document provides guidelines for how to size Windchill PDMLink, Windchill ProjectLink, and Pro/INTRALINK 10.0 and 10.1 servers as well as CAD worker hardware and a Content Cache Server for replication.
Edit

**Windchill and Pro/INTRALINK 10.x Server Hardware Sizing Guidelines - Linux Platform with Oracle Database** - English
User Role: Administrator
Published: 12-Apr-2012
This document provides guidelines for how to size Windchill PDMLink, Windchill ProjectLink, and Pro/INTRALINK 10.0 and 10.1 servers as well as CAD worker hardware and a Content Cache Server for replication.
Edit

# Windchill Resource Pages on www.ptc.com

PTC® Live Global

Quick access to comprehensive collection of Windchill Product Documentation and Enterprise Deployment Resources

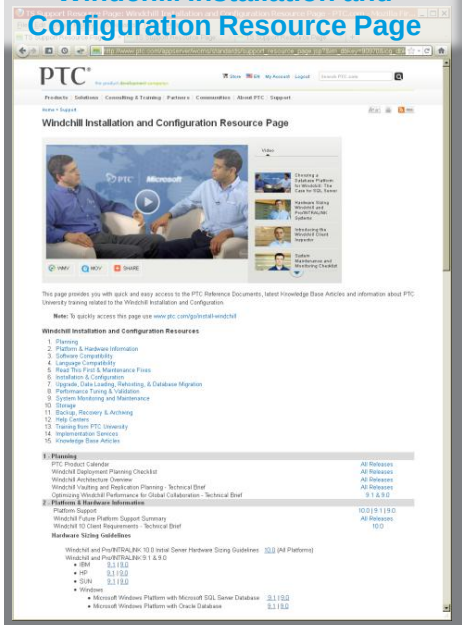
www.ptc.com/go/install-windchill

www.ptc.com/go/windchillcad

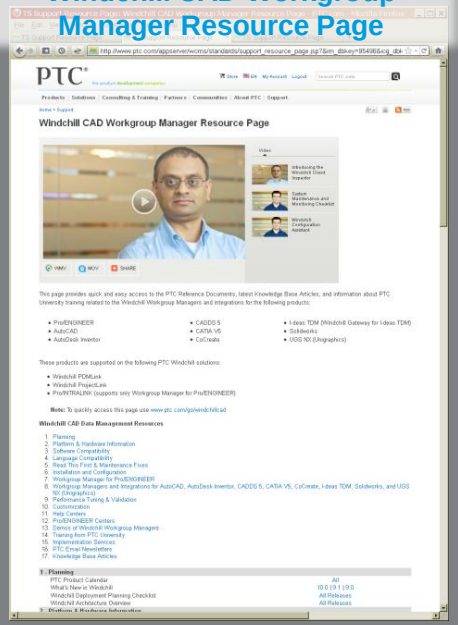
www.ptc.com/go/windchillupgrade
www.ptc.com/go/windchillmigration

www.ptc.com/go/deploycreoview

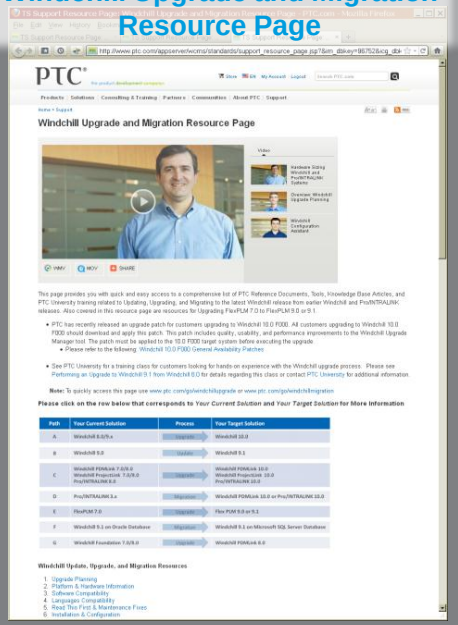
**Windchill Installation and Configuration Resource Page**



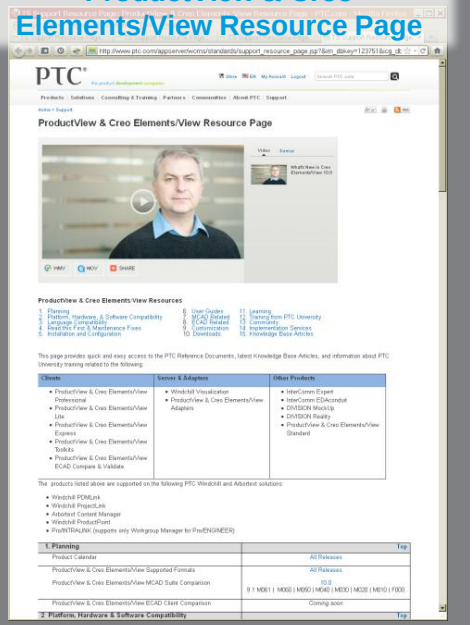

**Windchill CAD Workgroup Manager Resource Page**




**Windchill Upgrade and Migration Resource Page**




**ProductView & Creo Elements/View Resource Page**



# Examples of EDC Documents and Tools



- Documents
  - Windchill Server Hardware Sizing Guidelines
  - Windchill 10x Client Requirements - Technical Brief
  - Windchill Web Browser Comparison - Technical Brief
- Tools
  - Windchill Configuration Assistant (WCA)
  - Windchill Client Inspector (WCI)
  - Windchill Single User Performance Tester for Creo Elements/Pro Data Management Operations (SPT)
  - Windchill Multiuser Load Generator for CAD and Non-CAD Operations (WMLG)
- Benchmarks
  - Windchill Creo Data Management Performance Benchmark Test

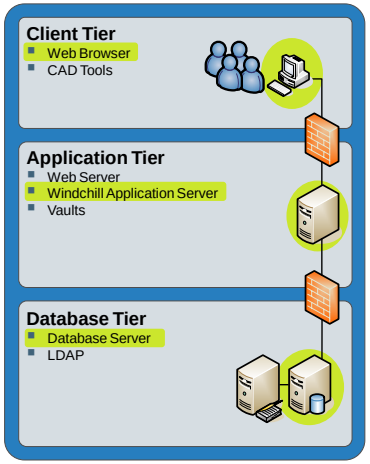
# Windchill Server Hardware Sizing Guidelines

PTC® Live Global

- The objective of Windchill hardware sizing is to determine the CPU & RAM Requirements for:
  - **Windchill Application Server**
  - **Database Server**
- PTC Windchill Server Hardware Sizing Guidelines
  - Help determine server requirements for a general Windchill PDMLink, Windchill ProjectLink, or Pro/INTRALINK 10.X installation for up to 2500 weighted active CAD and non-CAD users
  - Are available for each of the supported Windchill platforms and databases

*For More Information please refer to*

- Windchill and Pro/INTRALINK 10.x Server Hardware Sizing Guidelines - HP-UX Platform
- Windchill and Pro/INTRALINK 10.x Server Hardware Sizing Guidelines - IBM AIX Platform
- Windchill and Pro/INTRALINK 10.x Server Hardware Sizing Guidelines - Linux Platform with Oracle Database
- Windchill and Pro/INTRALINK 10.x Server Hardware Sizing Guidelines - Microsoft Windows Platform with Oracle Database
- Windchill and Pro/INTRALINK 10.x Server Hardware Sizing Guidelines - Microsoft Windows Platform with SQL Server Database
- Windchill and Pro/INTRALINK 10.x Server Hardware Sizing Guidelines - Sun Solaris Platform

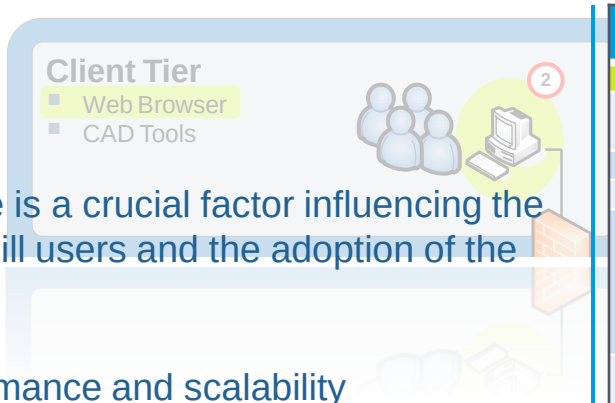



PTC determines recommendations for customers given a nominal depiction of their usage of the system compared to automated benchmark scenarios that PTC executes. Every customer workload may be considerably different from each other, and the guides will not take every usage characteristic into consideration. Therefore, the guides **provide practical minimum hardware sizing recommendations**

# Windchill 10.X Client Requirements

PTC® Live Global

## Optimizing Windchill 10.X Client Performance




- System response time is a crucial factor influencing the productivity of Windchill users and the adoption of the system
- Windchill client performance and scalability significantly influenced by
  - Client hardware
  - System configuration
- System response time of Windchill's user interface depends on
  - The operating system
  - Available memory (RAM)
  - CPU cores and speed
  - The type of web browser

*For More Information please refer to*

- Windchill 10x Client Requirements - Technical Brief
- Windchill 10.1 Software Matrices
- Windchill Future Platform Support Summary

**Non-CAD User System Requirements**

| | Minimum | Recommended |
|---|---|---|
| **Operating System** | Windows XP – 32 bit | Windows 7- 64 bit |
| **RAM** | 2 GB | 4 GB |
| **CPU** | 2 GHz | 2.5 GHz or higher |
| **Web Browser** | Microsoft Internet Explorer 7.0 | Mozilla Firefox 3.6.x<br>Microsoft Internet Explorer 8.0 (or 9.0) |
| **Preference Table size limit** | 500 rows | 3,000 rows |

**CAD User System Requ…**

| | Minimum | …ed |
|---|---|---|
| **Operating System** | Windows … 32… | …64bit[1,2] |
| **RAM** | | …GB or higher |
| **CPU** | | Quad 3 GHz or higher |
| **We…** | | |
| | …icrosoft Internet Explorer 7.0 | Mozilla Firefox 3.6.x<br>Microsoft Internet Explorer 8.0 (or 9.0)[4] |
| **Embedded** | Microsoft Internet Explorer 7.0 | Mozilla based browser<br>Microsoft Internet Explorer 8.0 (or 9.0) configured as a separate process |
| **Preference Table size limit** | Microsoft Internet Explorer 7.0: 500 rows | Mozilla Firefox 3.6.x: **3000 rows**<br>Microsoft Internet Explorer 8.0: **2000 rows**<br>Mozilla based browser:**2000 rows** |

Document being updated

# Use a 64-bit Operating System Workstation

PTC® Live Global

## Optimizing Windchill 10.X Client Performance

- Limitations of 32-bit Windows platforms
  - Your current 32-bit hardware may not be sufficient for large assembly operations
  - If currently using /3Gb switch on 32-bit hardware to support large assembly operations customers should upgrade to 64-bit hardware for these operations
  - PTC will no longer support out of memory conditions on 32-bit hardware when the /3Gb switch is on
- Upgrading to 64-bit OS will increase the Virtual Memory available to Creo from 2.7 or 3.0 GB with XP 32 to 16 TB
- NOTE: Use Internet Explorer 9.0 32-bit on Windows 7-64 bit
  - IE 9 32-bit runs javascript up to 4 times faster than IE 9 64-bit
  - IE 9 64-bit uses an older, much slower JavaScript JIT engine
  - IE 9 32-bit uses the far more efficient Chakra JIT
  - IE 9.0 Support Planned for Creo 1.0 M010, Creo Elements/Pro 5.0 M110, Pro/ENGINEER Wildfire 4.0 M210, Windchill 10.0 M020 & Windchill 9.1 M070

*For More Information please refer to*

- Creo Platform Support (Hardware Notes)
- Windchill 10.1 Software Matrices
- Windchill Future Platform Support Summary

**Non-CAD User System Requirements**

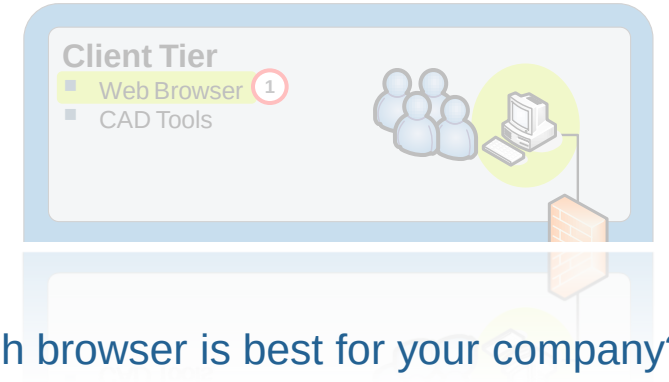
| | Minimum | Recommended |
|---|---|---|
| **Operating System** | Windows XP – 32 bit | Windows 7- 64 bit |
| **RAM** | 2 GB | 4 GB |
| **CPU** | 2 GHz | 2.5 GHz or higher |
| **Web Browser** | Microsoft Internet Explorer 7.0 | Mozilla Firefox 3.6.x<br>Microsoft Internet Explorer 8.0 (or 9.0) |
| **Preference Table size limit** | 500 rows | 3,000 rows |

**CAD User System Requ…**

| | Minimum | …ed |
|---|---|---|
| **Operating System** | Windows … 32… | …- 64bit |
| **RAM** | | …GB or higher |
| **CPU** | | Quad 3 GHz or higher |
| **Web** | | |
| | …icrosoft Internet Explorer 7.0 | Mozilla Firefox 3.6.x<br>Microsoft Internet Explorer 8.0 (or 9.0)[4] |
| **Embedded** | Microsoft Internet Explorer 7.0 | Mozilla based browser<br>Microsoft Internet Explorer 8.0 (or 9.0) configured as a separate process |
| **Preference Table size limit** | Microsoft Internet Explorer 7.0: 500 rows | Mozilla Firefox 3.6.x: **3000 rows**<br>Microsoft Internet Explorer 8.0: **2000 rows**<br>Mozilla based browser:**2000 rows** |

Document being updated

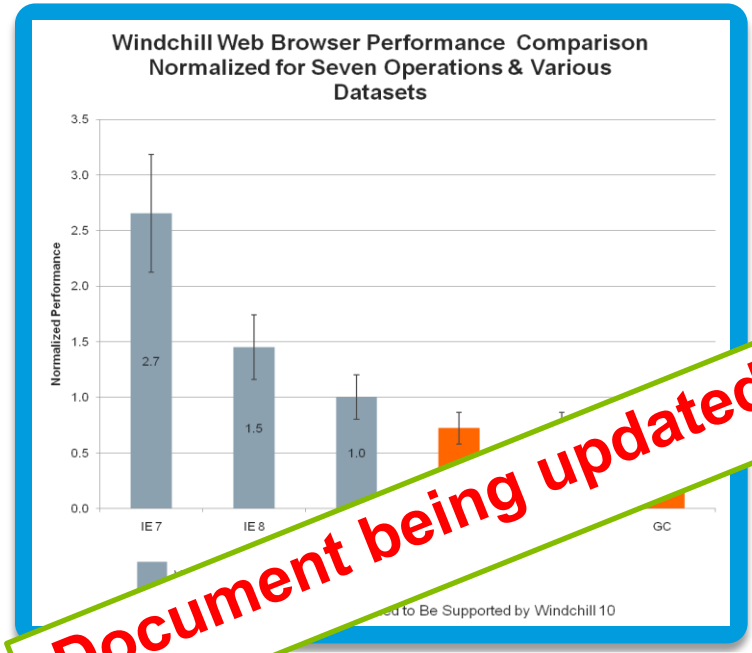
# Optimizing Windchill 10.X Client Performance




- Which browser is best for your company?
  - Provides comparative performance data for the supported web browsers for Windchill
  - Windchill 10.X Web Browser Support
    - Windchill 10.X will be supporting versions of Microsoft Internet Explorer, Firefox and Google Chrome
  - Windows Platform Support for Web Browsers
    - Not all of the supported browsers may be available on the client operating systems of your Windchill users
  - Note: Microsoft IE 9.0 Support Planned for Creo 1.0 M010, Creo Elements/Pro 5.0 M110, Pro/ENGINEER Wildfire 4.0 M210, Windchill 10.0 M020 & Windchill 9.1 M070

*For More Information please refer to*

- Windchill Web Browser Comparison - Technical Brief




Document being updated

| | Microsoft Internet Explorer | | | | Mozilla | | | Google |
|---|---|---|---|---|---|---|---|---|
| | IE 6[1] | IE 7 | IE 8 | IE 9[2] | Firefox 3.5[3] | Firefox 3.6 | Firefox 4.0[2] | Chrome[2] |
| Release Date | Aug-01 | Oct-06 | Mar-09 | Mar-11 | Jun-09 | Jan-10 | Mar-10 | Mar-11 |
| Release Schedule | | | | | | | Every 16 weeks | Every 6 weeks |
| **Windchill 10.0 Web Browser Support[4]** | | | | | | | | |
| Stand Alone Browser | No | Yes | Yes | Planned[2] | No | Yes | Planned[2] | Planned[2] |
| Workgroup Manager Browser[3] (Embedded) | No | Yes | Yes | Planned[2] | Yes | No | No | No |
| **Windows Platform Support for Web Browsers[5]** | | | | | | | | |
| Windows XP | Yes | Yes | Yes | No | Yes | Yes | Yes | Yes |
| Windows Vista | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Windows 7 | No | No | Yes | Yes | Yes | Yes | Yes | Yes |

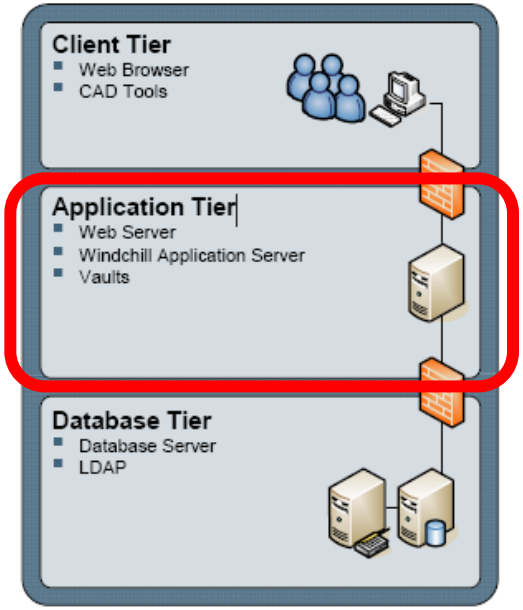
# Windchill Configuration Assistant (WCA)

PTC® Live Global

## Execute Solution Deployment Installation, Configuration, and Tuning

- Challenge
  - Optimally configuring Windchill for performance and scalability can be difficult given the amount of required knowledge of different technologies and property options

- Description
  - Examines system resource information for the server on which Windchill runs and calculates recommended values for Windchill properties to take maximum advantage of available memory and CPU resources.
    - Percentage of memory to allocate to the method server heap and server manager heap
    - Number of foreground & background method servers
    - Heap sizes
  - Additionally, the WCA can recommend configuration changes for the Tomcat servlet engine
  - Running Options
    - Initial Windchill Configuration Assistant Run
    - Manual Windchill Configuration Assistant Runs




- Benefit
  - Improves Windchill Performance and Scalability
  - Dramatically simplifies Windchill System Configuration and Performance Tuning

*For More Information please refer to*

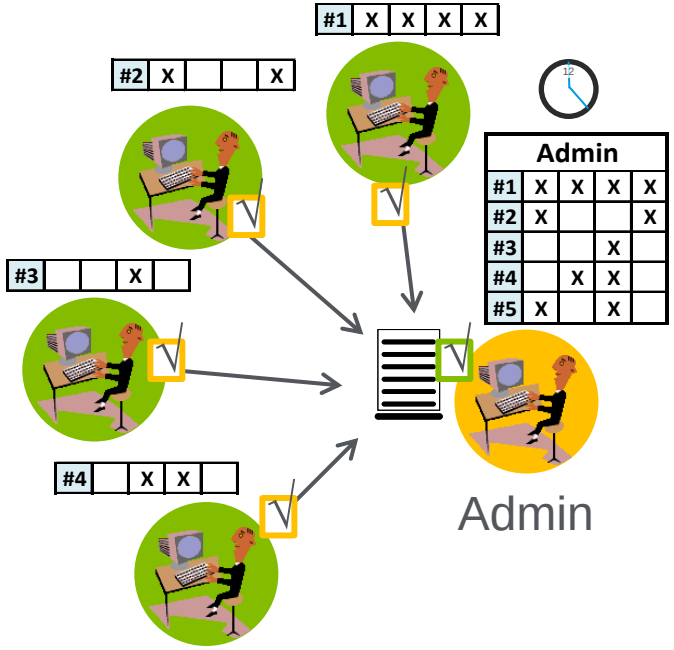
- Windchill Administration - Configuring Your Windchill Environment

# Windchill Client Inspector (WCI)

## Execute Solution Deployment Installation, Configuration, and Tuning

- Description
  - The Client Inspector is a tool that can be run on clients (local or remote) to determine client readiness for working with Creo and Windchill PDMLink

- Highlights
  - Run remotely by administrators on local and remote client machines
  - Compares a client's current settings with the settings prescribed by PTC
  - Records the results of the scan
  - Copies results from individual client machines to the administrator's central machine (from which it was deployed)
  - Merges all individual results into master excel file




*Client Property Settings (config.pro):*

| Property | Value | Location | Release or Environment | Note |
|---|---|---|---|---|
| dm_network_threads | 6 | config.pro | WAN | This controls the number of network threads (concurrent ne server. Increasing the value from the default of 3 can decre times but can also contribute to network saturation. See TPI 141292 for additional information. |
| dm_http_compression_level | 3 | config.pro | WAN | The server must be unregistered, Pro/ENGINEER restarted reregistered for setting to take effect. See TAN 136108 for issues with this property in certain bui See TPI 141292 for additional information. |
| dm_cache_size | 0 | config.pro | Wildfire 2.0 and Wildfire 3.0 M050 and earlier | Set value to 0 (disable cache limit). If not set to 0, periodically monitor how close you are to the specified by dm_cache_size (via #Tools > #Server Registry cache limit, background Wildfire processes will remove files the cache at the set limit. This setting can contribute to pe (both in the background cleanup jobs but also during retrie regeneration but deleted from cache will need to be downlo |
| dm_cache_limit | 0 | config.pro | Wildfire 3.0 M060+ | Replaces dm_cache_size. See TAN 133958. |
| dm_network_request_size | 1000000 | config.pro | All | See TPI 141292 for additional information. |

*For More Information please refer to*

- Windchill Client Inspector Deployment and Administration Guide
  Windchill Client Inspector (WCI) Software available from www.ptc.com Order or Download Software Updates page under Windchill 10.1,10.0 and 9.1

# Windchill Single User Performance Tester for Creo Data Management Operations (SPT)

PTC® Live Global

Automates single user performance tests of basic Windchill Creo data management operations - Based on the Pro/ENGINEER JLink toolkit

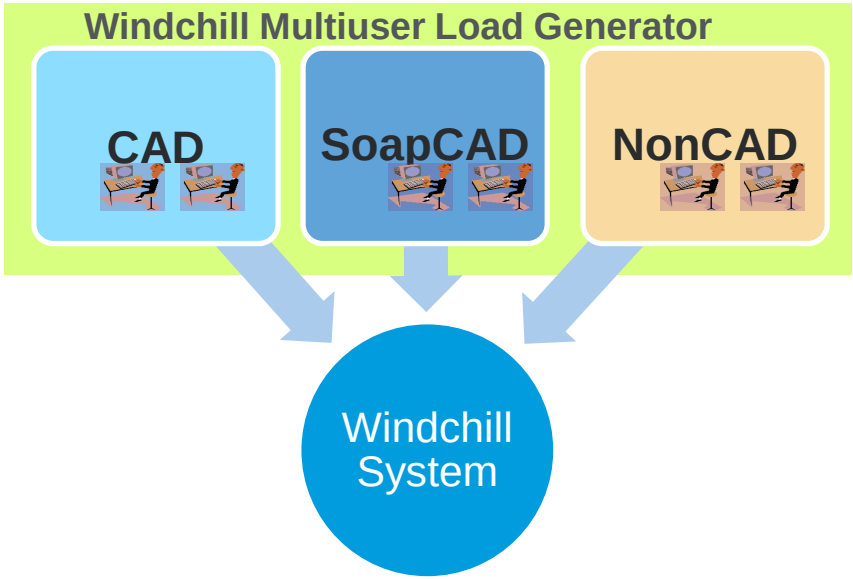
- Usage
  - Build the test case that is executed
  - Specify any working dataset so that the performance test executions are relevant to the work being done by your user community
  - Run the tester as an asynchronous session that connects to a Windchill PDMLink server and executes a Windchill interaction-based test case
- Application
  - Use to create a system performance baseline
  - Use results to determine if go live performance criteria are met
  - Use to baseline and compare the performance of one or more Windchill systems
    - Test and production systems
  - A production system before and after a release upgrade
  - A production system over time
  - LAN and WAN users of a production system

| Operations |
| --- |
| Register |
| Create Workspace |
| Import |
| Upload |
| Check In |
| Check Out |
| Download |
| Remove |
| Undo Check Out |
| Export |
| Delete Workspace |
| Unregister |

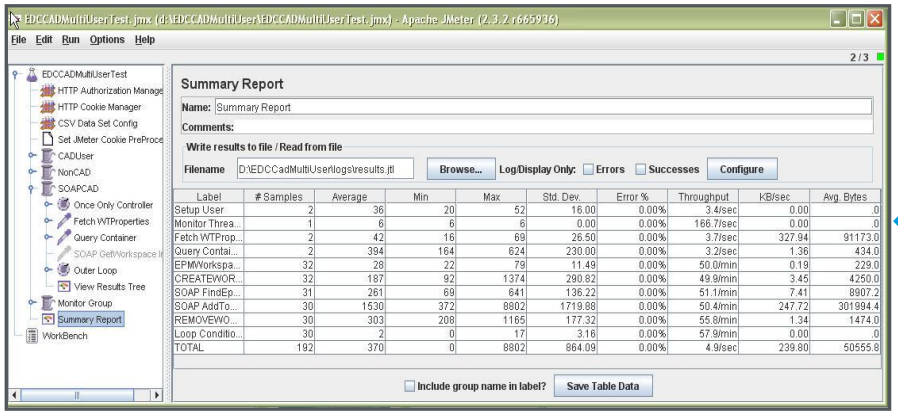
# Windchill Multiuser Load Generator for CAD and Non-CAD Operations (WMLG)

PTC® Live Global

A tool that can simulate Multi-User concurrent load on the entire technology stack (including the network, application server and database server)




- Uses JMeter
- Not directly available to customers
- Available through PTC Global Services




Summary report with response time measurements

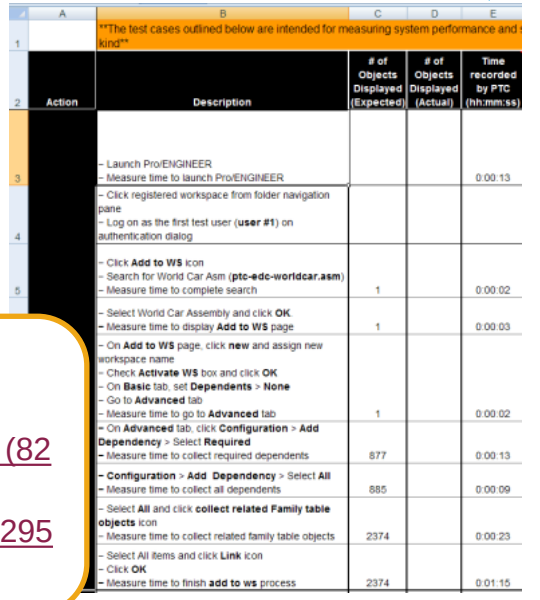
# Windchill Creo Data Management Performance Benchmark Test

PTC® Live Global

- Contents
  - PTC modeled Creo dataset
  - Test cases encompassing most frequently used Creo Data Management operations
  - Performance Benchmark Data Sheet
  - Reference Performance Results

- Benefits
  - Provides the information to conduct a performance benchmark test for Creo Data Management operations with the Windchill family of products (PDMLink, ProjectLink and Pro/INTRALINK)
  - Provides a means to assess the performance of a Windchill deployment

**Time recorded by PTC (hh:mm:ss)**



| Action | Description | # of Objects Displayed (Expected) | # of Objects Displayed (Actual) | Time recorded by PTC (hh:mm:ss) |
|---|---|---|---|---|
| | **The test cases outlined below are intended for measuring system performance and kind** | | | |
| | – Launch Pro/ENGINEER<br>– Measure time to launch Pro/ENGINEER | | | 0:00:13 |
| | – Click registered workspace from folder navigation pane<br>– Log on as the first test user (**user #1**) on authentication dialog | | | |
| | – Click **Add to WS** icon<br>– Search for World Car Asm (**ptc-edc-worldcar.asm**)<br>– Measure time to complete search | 1 | | 0:00:02 |
| | – Select World Car Assembly and click **OK**<br>– Measure time to display **Add to WS** page | 1 | | 0:00:03 |
| | – On **Add to WS** page, click **new** and assign new workspace name<br>– Check **Activate WS** box and click **OK**<br>– On **Basic** tab, set **Dependents** > **None**<br>– Go to **Advanced** tab<br>– Measure time to go to **Advanced** tab | 1 | | 0:00:02 |
| | – On **Advanced** tab, click **Configuration** > **Add Dependency** > Select **Required**<br>– Measure time to collect required dependents | 877 | | 0:00:13 |
| | – **Configuration** > **Add Dependency** > Select **All**<br>– Measure time to collect all dependents | 885 | | 0:00:09 |
| | – Select **All** and click **collect related Family table objects** icon<br>– Measure time to collect related family table objects | 2374 | | 0:00:23 |
| | – Select All items and click **Link** icon<br>– Click **OK**<br>– Measure time to finish **add to ws** process | 2374 | | 0:01:15 |

*For More Information please refer to*

- Windchill Creo Data Management Performance Benchmark Test - Instructions
- Windchill Creo Data Management Performance Benchmark Test - Data Sheet
- Windchill Creo Data Management Performance Benchmark Test – Preliminary Dataset (82 KB)
- Windchill Creo Data Management Performance Benchmark Test – World Car Dataset (295 MB)

# PTC® Live Global

liveglobal.ptc.com

PTC® PRODUCT & SERVICE ADVANTAGE®

This presentation contains forward looking information subject to change without notice