Windchill® and Pro/INTRALINK® 9.0 and 9.1 Server Hardware Sizing Guidelines - Microsoft Windows Platform with Oracle Database
February 2009

Introduction

This document is intended to help you determine the server requirements for a general Windchill PDMLink, Windchill ProjectLink, or Pro/INTRALINK 9.0 or 9.1 installation with Oracle as the database for up to 5000 weighted active CAD and non-CAD users.

The guidelines in this document are derived from simulated multi-user load tests consisting of a variety of commonly used CAD and non-CAD users operations. The loads generated during these tests, while considered realistic for the given number of users, will not, in all likelihood, represent the identical loads in your planned Windchill installation. Our hardware sizing methodology of weighted number of active users is flexible, allowing you to tailor the methodology to more closely to represent your company's general intended usage of Windchill PDMLink, Windchill ProjectLink, or Pro/INTRALINK 9.0 or 9.1.

For small to medium sized Windchill installations, follow the recommendations in this document keeping in mind that a margin of error in the final calculation is normal (particularly where peak loads are concerned).

For larger, distributed, customized, and complex Windchill installations where the loads are more difficult to predict, PTC recommends engaging PTC Global Services to assist in designing your Windchill architecture and specifying the hardware requirements.

Windchill and Pro/INTRALINK Server Hardware Sizing on Microsoft Windows Platform with Oracle Database

This document provides Windchill PDMLink, Windchill ProjectLink, and Pro/INTRALINK 9.0 & 9.1 server sizing information for the Microsoft Windows 2003 platform with Oracle as the database.

The sizing guidelines contained in this document were derived from tests using Quad-Core Intel® Xeon® E7340 Processors at 2.4 GHz and Quad-Core Intel® Xeon® 5400 Processors at 2.67GHz in a collaborative effort by PTC

and HP. PTC would expect similar scalability for equivalent models and specifications over a wide range of x86 processors from multiple vendors.

This document provides guidelines for how to size:

- Windchill PDMLink, Windchill ProjectLink, and Pro/INTRALINK 9.0 & 9.1 servers

- CAD worker hardware

- Windchill File Server (formerly referred to a "Content Cache Server" or replication server)

Note: Client hardware requirements for CAD users are dictated primarily by the CAD application (for example Pro/ENGINEER) and are therefore not discussed in this document.

Refer to the Directory of Online Information at the end of this document for more information.

Platform Support

For the latest platform support information, refer to the Windchill 9.0 & 9.1 Software Matrices, available at:

Windchill 9.0 Software Matrices http://www.ptc.com/view?im_dbkey=58031

Windchill 9.1 Software Matrices http://www.ptc.com/view?im_dbkey=77024

Hardware/Platform Partners

Visit the PTC Partner Advantage Program page to find information about PTC Hardware/Platform Partners:

http://www.ptc.com/appserver/partners/search.jsp

Sizing the Windchill PDMLink, Windchill ProjectLink, and Pro/INTRALINK 9.0 & 9.1 Servers

This section outlines how to determine the CPU core and RAM requirements for both the application tier and the database tier on the Microsoft Windows 2003 server 64 bit platform for a Windchill PDMLink, Windchill ProjectLink, or Pro/INTRALINK 9.0 or 9.1 installation.

The hardware requirements are primarily a function of the:

- Number and percentage of active users
- Type of users, specifically:
    - CAD users
    - Non-CAD users

Server Sizing Definitions

Active User

A user who has logged on to, and actively used, the system at some point. An active user is also known as a concurrent user.

Named User

- A user who has the ability to log on the system
- Active users are a subset of the named user base

Concurrent Transactions

Transactions that occur simultaneously in the system as the result of a number of active users sending a request to the server at the same time.

CAD User

A user who primarily accesses the system in order to work with CAD data.

Non-CAD User

A user who primarily accesses the system in order to use core non-CAD functionality.

Step 1 - Calculating the Weighed Number of Active Users

W — Number of CAD users that the system needs to support

X — Number of non-CAD users that the system needs to support

Y — Number of active CAD users, calculated as W × 0.30

- Thirty percent is a good starting point for specifying the percentage of active CAD users. If you have more accurate data on the working practices of your company, you can adjust this value to suit your needs. Some companies could be higher—in the 40-50% range

- One approach for developing a basis for Y is to measure the number of checked-out Pro/ENGINEER licenses and divide that number by 10.

- Data from several of our customers has indicated that an engineer using Pro/ENGINEER for 4.5 hrs per day spends about 0.5 hrs of that time doing data management (Windchill PDMLink or Pro/INTRALINK) operations; therefore, if (0.5/4.5) = 0.11, or about 10%, you can measure the average number of checked-out Pro/ENGINEER licenses and divide that number by 10 to estimate the number of CAD users working with Windchill PDMLink or Pro/INTRALINK at any one time.

Z — Number of active non-CAD users, calculated as X × 0.20

Twenty percent is a good starting point for specifying the percentage of active non-CAD users; if you have more accurate data on the working practices of your company, you can adjust this value to suit your needs.

A —Weighted number of Active users, calculated as (3 × Y) + Z

The value of 3 reflects the observation that CAD users tend to consume approximately three times more CPU core resources than non-CAD users.

Step 2 – Determining the Recommended CPU Cores and RAM for Your Server Platforms

This section outlines how to determine the number of CPU cores and the amount of RAM required to support the corresponding number of weighted number active users, calculated in the previous section.

Windchill PDMLink, Windchill ProjectLink, and Pro/INTRALINK 9.0 & 9.1 systems have two tiers:

- The application tier, which supports the Web server and method server

- The database tier, which supports the database, Oracle, or Microsoft SQL server (Microsoft Windows platform only)

Note: This document provides sizing guidelines Windchill on the Microsoft Windows Platform with Oracle Database. For sizing guidelines Windchill for the Microsoft Windows Platform with Microsoft SQL server, refer to the <u>Windchill® and Pro/INTRALINK® 9.0 and 9.1 Server</u>

Hardware Sizing Guidelines - Microsoft Windows Platform with Microsoft SQL Server Database

Note: For installations supporting large numbers of users, each tier is typically supported by separate hardware servers. If you want to have a monolithic environment, meaning you will use one server to support both the application tier and the database tier, add the number of CPU cores and RAM determined for the application tier to the number of CPU cores and RAM determined for the database tier.

Notes:

- The number of CPU cores and RAM (in GB) in the table is the total number required to support the corresponding weighted number of active users. If a load balance cluster is implemented in the application tier, then these resources should be spread evenly across all slave servers in the cluster. The cache master and background method server typically require an additional 2 to 4 cores, depending on publishing, workflow, and replication load

- This guide uses the term "CPU core" or "Core" to refer to a single core or socket or CPU. The recommendations in the sizing tables for Cores specify the number of cores recommended NOT the quad-core processors.

- Servers typically are not available as single core (or any odd number of core) configurations but we provide data for these configurations to account for virtualized server sizing.

Application Server Sizing

After calculating the weighted number of active users using the formula in step one, use the following table to determine the required number of CPU cores (or *sockets*) and the amount of RAM in GB for the application tier.

Notes:

- For smaller values of weighted active users, we recommend rounding up to the next row for any result that falls between 2 numbers in the table.

- For larger values of weighted active users, we recommend a linear extrapolation between rows in the table.

Notes:

- This guide uses the term "CPU core" or "Core" to refer to a single core or socket or CPU. The recommendations in the sizing tables for Cores specify the number of cores recommended NOT the quad-core processors.

- Servers typically are not available as single core (or any odd number of core) configurations but we provide data for these configurations to account for virtualized server sizing.

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Application Server Sizing Windchill 9.0 & 9.1	
Weighted Number of Active Users	Win 2003 Server [Quad Core Intel Xeon] (Cores*/RAM)
10	1/4
25	1/8
50	2/8
100	2/12
200	3/12
300	4/16
400	5/20
500	6/24
600	7/28
700	8/32
800	9/36
900	10/40
1000	12/48
1200	14/56
1500	17/68
2000	23/92
2500	28/112
3000	34/136
3500	39/156
4000	45/180
4500	50/200
5000	56/224

Database Server Sizing with Oracle

After calculating the weighted number of active users with the formula in step one, use the following table to determine the required number of CPU cores and amount of RAM in GB for the database tier with Oracle.

Note: We recommend rounding up to the next row for any result that falls between two numbers in the table.

Note: If you want to have a monolithic environment simply add the number of CPU cores and memory in the application tier to the number of CPU cores and memory in the database tier.

Notes:

- This guide uses the term "CPU core" or "Core" to refer to a single core or socket or CPU. The recommendations in the sizing tables for Cores specify the number of cores recommended NOT the quad-core processors.

- Servers typically are not available as single core (or any odd number of core) configurations but we provide data for these configurations to account for virtualized server sizing.

Database Server Sizing with Oracle Windchill 9.0 & 9.1	
Weighted Number of Active Users	**Win 2003 Server** [Quad Core Intel Xeon] **(Cores/RAM)**
10	1/2
25	1/4
50	2/4
100	2/8
200	2/8
300	2/8
400	3/8
500	3/8
600	4/12
700	4/12
800	5/12
900	5/12
1000	6/16
1200	7/16

Database Server Sizing with Oracle Windchill 9.0 & 9.1	
Weighted Number of Active Users	**Win 2003 Server** [Quad Core Intel Xeon] **(Cores/RAM)**
1500	8/16
2000	12/20
2500	14/24
3000	17/32
3500	20/32
4000	23/32
4500	25/32
5000	28/32

Windchill 9.0 & 9.1 Hardware Sizing Example for 1200 Users (800 non-CAD & 400 CAD)

Example 1: Company with 1200 Users

A company needs a server to support 1200 total users, of which 800 are non-CAD users and 400 are CAD users

W — CAD users that the system needs to support = **400**

X — Named non-CAD users that the system needs to support = **800**

Y — Active CAD users, calculated as $W \times 0.30$ = **120**

Z — Active non-CAD users, calculated as $X \times 0.20$ = **160**

A — Weighted number of active users, calculated as $3Y + Z$ = **520**

Application Tier Recommendation

For 520 weighed active users, the recommendation for the application tier using the Windows 2003 Server platform is 7 CPU cores and 28 GB of RAM.

Application Server Sizing Windchill 9.0 & 9.1	
Weighted Number of Active Users	**Win 2003 Server** [Quad Core Intel Xeon] **(Cores/RAM)**
400	5/20
500	6/24
600	7/28
700	8/32
800	9/36

Database Tier Recommendation

For 520 weighed active users, the recommendation for the database tier using the Windows 2003 Server [Quad Core Intel Xeon] platform is 4 CPU cores and 12 GB of RAM.

Database Server Sizing with Oracle Windchill 9.0 & 9.1

Database Server Sizing with Oracle Windchill 9.0 & 9.1	
Weighted Number of Active Users	**Win 2003 Server** [Quad Core Intel Xeon] **(Cores/RAM)**
400	3/8
500	3/8
600	4/12
700	4/12
800	5/12

Example 2: Company with 1200 Users with Higher Active User Percentages

This example uses higher active user percentages—40% for CAD users and 30% for non-CAD users—and observes the impact on the hardware recommendations.

W — CAD users that the system needs to support = **400**

X — Named non-CAD users that the system needs to support = **800**

Y — Active CAD users, calculated as W × 0.40 = **160**

Z — Active non-CAD users, calculated as X × 0.30 = **240**

A — Weighted number of active users, calculated as 3Y + Z = **720**

Application Tier Recommendation

For 720 weighed active users, the recommendation for the application tier using the Windows 2003 Server [Quad Core Intel Xeon] platform is 9 CPU cores and 36 GB of RAM.

Application Server Sizing Windchill 9.0 & 9.1	
Weighted Number of Active Users	**Win 2003 Server** [Quad Core Intel Xeon] **(Cores/RAM)**
600	7/28
700	8/32
800	9/36
900	10/40
1000	12/48

Database Tier Recommendation

For 720 weighed active users, the recommendation for the database tier using the Windows 2003 Server [Quad Core Intel Xeon] platform is 5 CPU cores and 12 GB of RAM.

Database Server Sizing with Oracle Windchill 9.0 & 9.1	
Weighted Number of Active Users	**Win 2003 Server [Quad Core Intel Xeon] (Cores/RAM)**
600	4/12
700	4/12
800	5/12
900	5/12
1000	6/16

Example 3: Company with 1200 Users with Heavier CAD User Load and Higher Active User Percentages

In this example, the system must support the load of CAD users working with larger datasets in addition to using higher active user percentages (40% for CAD users and 30% for non-CAD users).

To factor in a heavier CAD user load, use $4Y + Z$ instead of $3Y + Z$ when:

- Your users regularly average 3000+ part, assembly, drawing, or family table instances in their workspace on a regular basis.

- Your users regularly import or load data large datasets into your system as new data (for example, you regularly receive very large assemblies from your customers or outsourced design manufacturers).

A company with 1200 users needs to support 400 CAD users and 800 non-CAD users + higher active user percentage + heavier CAD user load:

W — CAD users that the system needs to support = **400**

X — Named non-CAD users that the system needs to support = **800**

Y — Active CAD users, calculated as W × 0.40 = **160**

Z — Active non-CAD users, calculated as X × 0.30 = **240**

A — Weighted number of active users, calculated as $4Y + Z$ = **880**

Application Tier Recommendation

For 880 weighed active users, the recommendation for the application tier using the Windows 2003 Server [Quad Core Intel Xeon] platform is 10 CPU cores and 40 GB of RAM.

Application Server Sizing Windchill 9.0 & 9.1	
Weighted Number of Active Users	**Win 2003 Server** [Quad Core Intel Xeon] **(Cores/RAM)**
700	8/32
800	9/36
900	10/40
1000	12/48
1200	14/56

Database Tier Recommendation

For 880 weighed active users, the recommendation for the database tier using the Windows 2003 Server [Quad Core Intel Xeon] platform is 5 CPU cores and 12 GB of RAM.

Database Server Sizing with Oracle Windchill 9.0 & 9.1	
Weighted Number of Active Users	**Win 2003 Server** [Quad Core Intel Xeon] **(Cores/RAM)**
700	4/12
800	5/12
900	5/12
1000	6/16
1200	7/16

Sizing CAD Worker Hardware

To ensure that viewables can be generated for all CAD files, the recommended CAD worker hardware is the same size and type of workstation as users (for example, power users) who open the largest assemblies that are expected to be published.

• Workstation class equipment is typically acceptable

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- Using the same workstations as your power users allows you to leverage your existing workstation platforms and configurations

Minimum Recommended CAD Worker Hardware

On-demand Publishing

- One CPU core and 2 GB RAM, minimum

- Check against the workstation requirements for loading the largest assembly; for example, if loading the largest assembly requires 3 GB to load, use 4 GB in the CAD worker

Batch Publishing

- Two CPU cores and 4 GB RAM, minimum

- If larger requirements than 4 GB, use a 64-bit Windows version or UNIX workstation

Sizing a Windchill File Server (formerly referred to as "Content Cache Server")

The minimum recommended Windchill File Server hardware is:

- 1-2 CPU cores and 2-4 GB RAM

- Storage depends on how much data is vaulted and replicated

Note: The Windchill File Server, formerly referred to as a content cache server, has also been informally referred to as a replication server.

Directory of Online Information

Windchill Installation and Configuration Resource Page

www.ptc.com/go/install-windchill

Windchill 9.1 Software Matrices

http://www.ptc.com/view?im_dbkey=77024

Windchill 9.0 Software Matrices

http://www.ptc.com/view?im_dbkey=58031

Windchill Future Platform Support Summary

http://www.ptc.com/view?im_dbkey=69784

Oracle Software Assistant Compatibility Matrices

http://www.ptc.com/view?im_dbkey=33636

TPI 132477 - Performance Tuning Recommendations for Client Systems and
Windchill Servers that Manage CAD Models

http://www.ptc.com/cs/cs_26/howto/wmp11663/wmp11663.htm

PTC Customer Service Contact Support

http://www.ptc.com/cs/doc/cont_sup.htm

Knowledge Base

http://www.ptc.com/cs/doc/cont_sup.htm

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