



Remote Site Deployment Strategies

PLM World 2006

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Teamcenter Deployment & Migration



Presentation Goals

This session will discuss the potential strategies of implementing and deploying Teamcenter when remote site connectivity is required. Content will include identifying decision criteria and developing implementation plans to accomplish expected functional and performance goals. This would be more of an How-To approach than a review of product functionality.

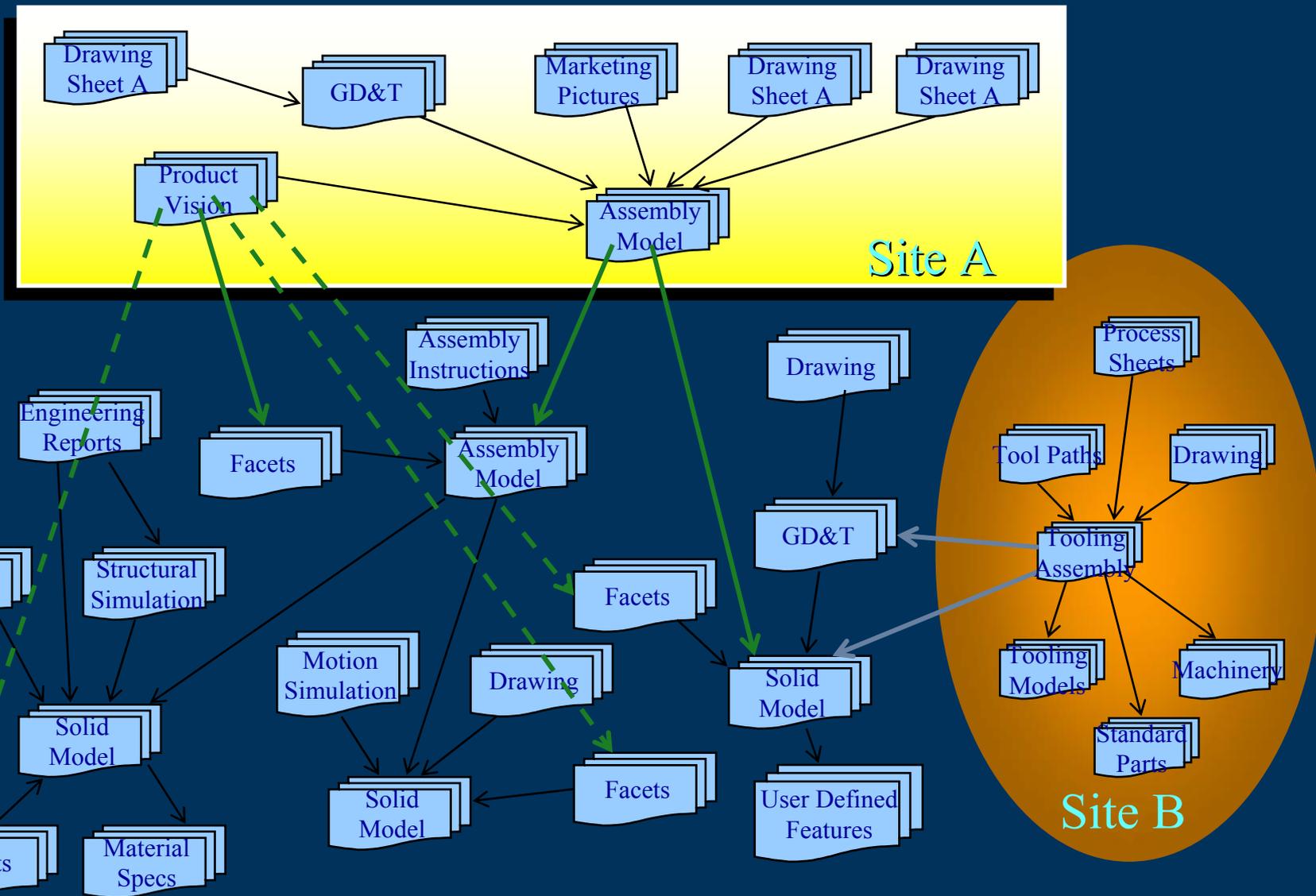


Agenda

Topics

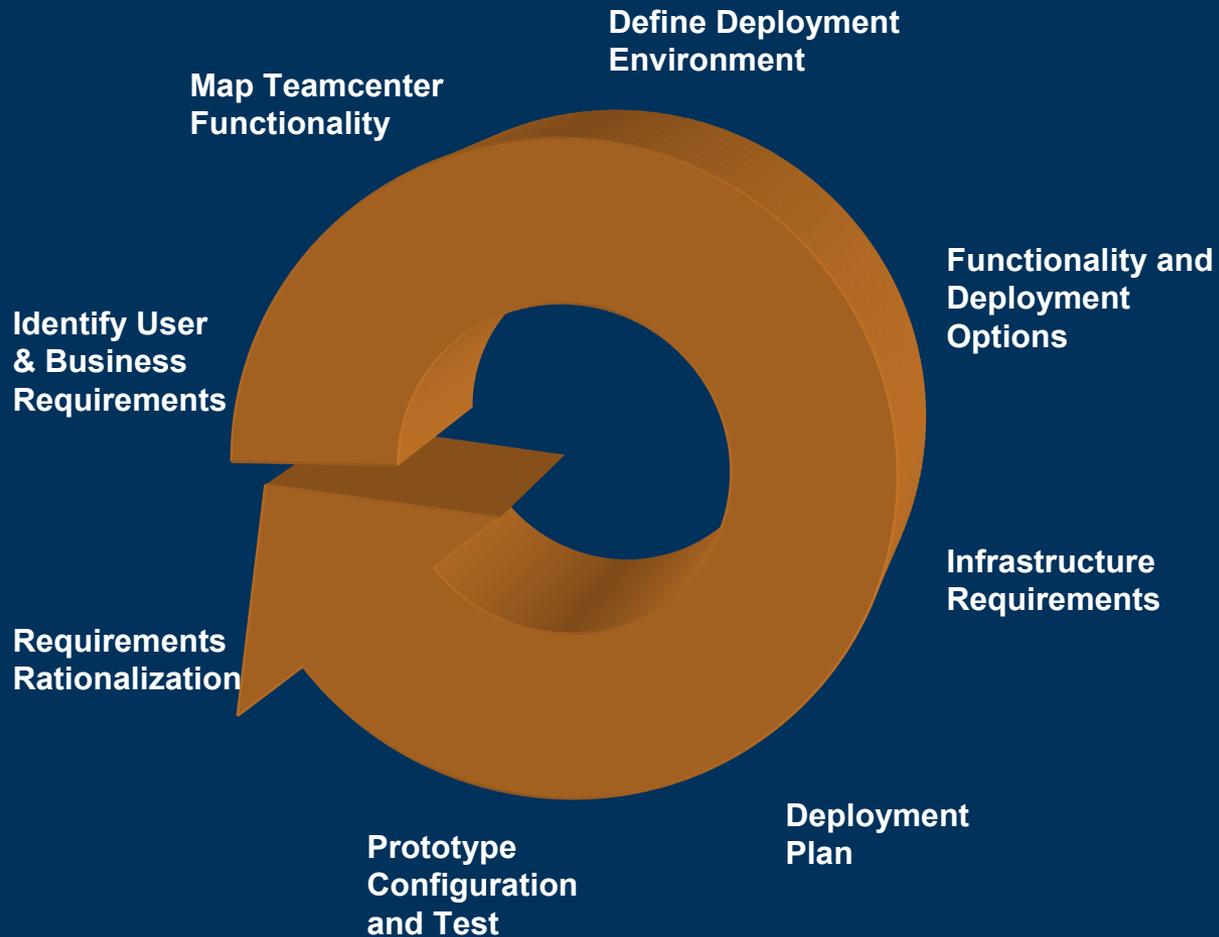
- ▶ Identifying the business and user requirements
- ▶ Deployment options and potential paths to success
- ▶ Targeting a Teamcenter configuration & version
- ▶ Getting the plan together
- ▶ Summary Review
- ▶ Q & A

Product Development Process is complex





The Deployment Process





Categorization Of Requirements

User Classes

- ▶ Engineering Design, Manufacturing
- ▶ Management
- ▶ External Customer, Partner, Supplier

Business Process Support

- ▶ Design data sharing
- ▶ Manufacturing build information, BOM etc.
- ▶ External data access for suppliers, vendors

Infrastructure

- ▶ Hardware availability
- ▶ Intra-site connectivity
- ▶ User loads and hardware scalability
- ▶ Administration





User / Process Definition

Engineering Data Management:

- ▶ NX, Catia CAD Data Management
- ▶ Teamcenter
 - ▶ Configuration Management
 - ▶ Process Management
- ▶ Visualization
 - ▶ Rich Client Viewer
 - ▶ Mockup → Reviews

Issues:

- ▶ Large assembly retrieval with visualization
 - ▶ Based on configuration
- ▶ MBD / Markup procedure
- ▶ Configuration Effectivity
- ▶ Configuration Rule procedure
- ▶ Delivery Package: CAD, Visualization, Step

External Access:

- ▶ Community is preferred access point
 - ▶ Security Access Control
- ▶ Process management support
 - ▶ Design Review
 - ▶ Bid process
- ▶ Visualization
 - ▶ Lightweight viewer capabilities sufficient?
 - ▶ Pay to publish/Free to view (Push Model)

Issues:

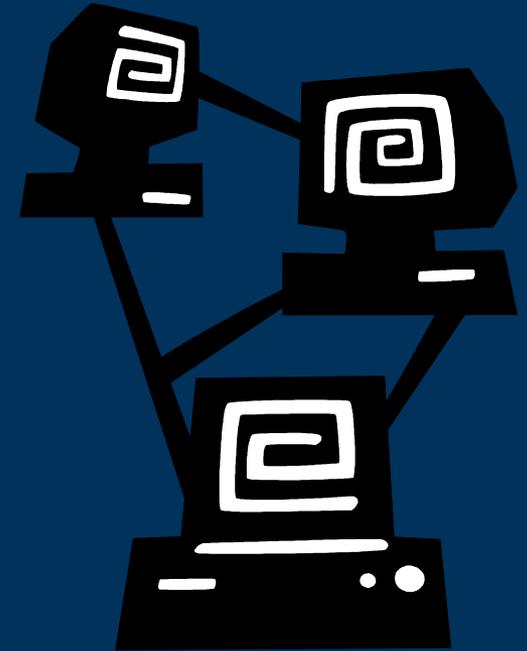
- ▶ Is a common access / process viable for all externals?



Infrastructure

Document target deployment environment

- ▶ Hardware availability
 - ▶ Sizes, models, current usage
- ▶ Connectivity LAN / WAN
 - ▶ Network connection details, loads, usage
- ▶ Expected user support
 - ▶ How many users per server, per site?
- ▶ Administration
 - ▶ Is admin support available at all sites?
- ▶ Future Hardware plans
 - ▶ Is there an exiting hardware plan?





Hardware Inventory

1) UNIX

Oracle Server Specifications

Location (Site)	Domestic
Manufacturer	Hewlet Packard
Model	HP 9000 Superdome
OS/ Version	HP-UX 11i
CPU(s) / Speed	1G(PA-RISK) * 24
RAM Memory	47G
Swap Space	50G
Network Connection	1G

2) Windows

Oracle Server Specifications

Location (Site)	Domestic
Manufacturer	HP
Model	ProLiant ML570 G2
OS/ Version	Windows 2000 Server SP4
CPU(s) / Speed	3G(Intel Xeon, HT) * 4
RAM Memory	3.5G
Swap Space	Inti 2G, Max 4G
Network Connection	400M

1) UNIX

Volume Server Specifications

Location (Site)	Domestic
Manufacturer	Hewlet Packard
Model	HP 9000 Superdome
OS/ Version	HP-UX 11i
CPU(s) / Speed	1G(PA-RISK) * 24
RAM Memory	47G
Swap Space	50G
Network Connection	1G

2) Windows

Volume Server Specifications

Location (Site)	Domestic
Manufacturer	HP
Model	ProLiant ML570 G2
OS/ Version	Windows 2000 Server SP4
CPU(s) / Speed	3G(Intel Xeon, HT) * 4
RAM Memory	3.5G
Swap Space	Inti 2G, Max 4G
Network Connection	300M



Performance

End users perception of performance is affected by:

- ▶ Database speed
- ▶ Application Performance
- ▶ Network Performance

Users see as performance two elements:

- ▶ UI interaction
- ▶ File transfer speeds



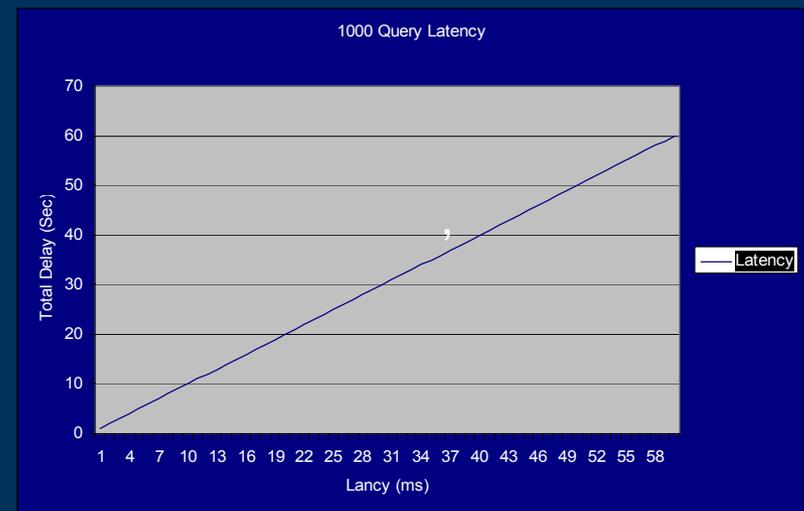
Network Latency

- ▶ Network Latency is the time it takes a packet to travel from one end of the network to the other. Typically measure as the return trip time.
- ▶ Why is it important to application like Teamcenter?
 - ▶ Multi-tier application converse by request and response packets e.g. an SQL request is responded with the query results. Network latency is added to the response time.

For example:

A simple plot of latency vs. time delay for an assembly that takes 1000 queries to retrieve

- ▶ Latency affects all network activities file transfer, file access, SQL, HTTP.





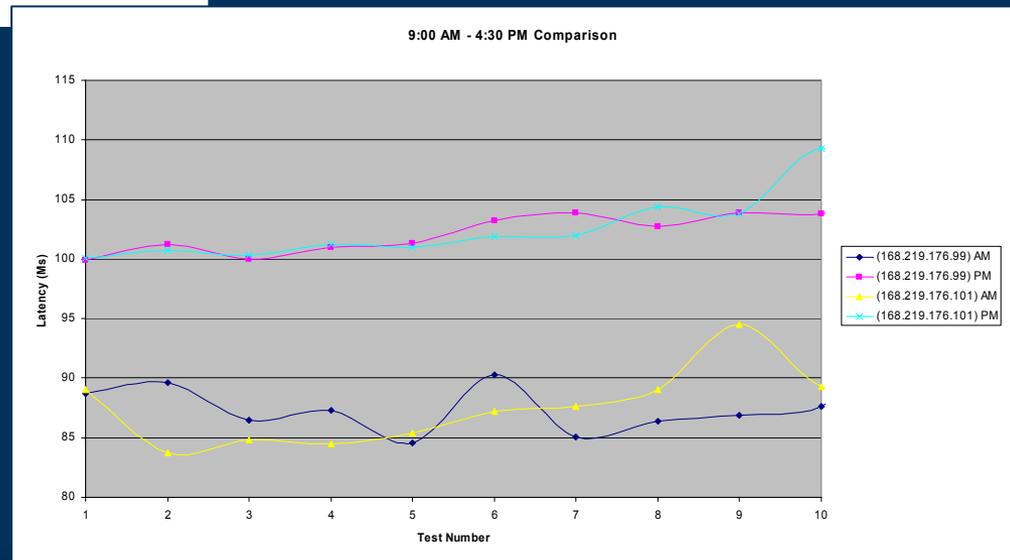
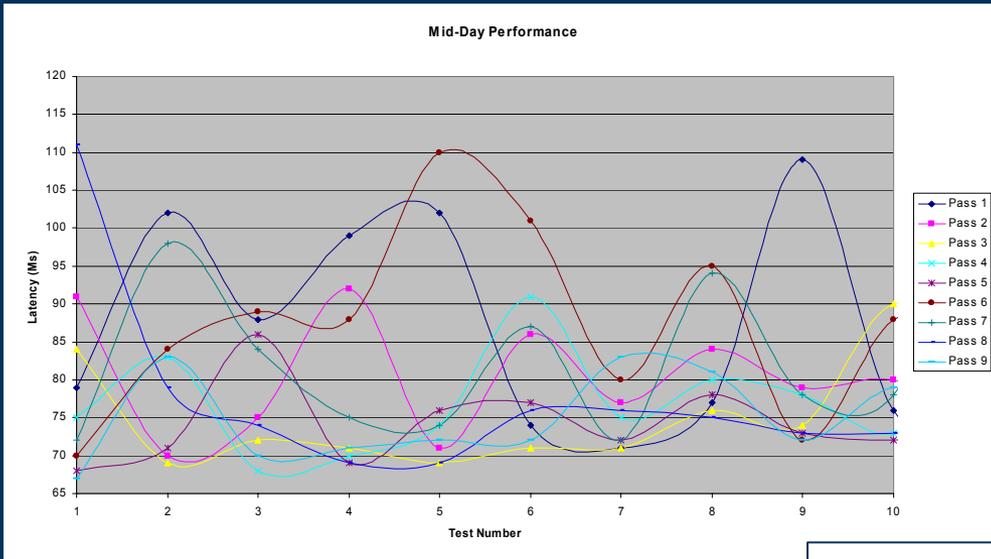
Example: MCI Latency

MCI's Intra Asia-Pacific Network Latency Guarantee consists of:

- ▶ Average round-trip transmissions of 200 milliseconds or less between a MCI-designated Hub Router in Korea and a MCI-designated Hub Router in Singapore
- ▶ Average round-trip transmissions of 155 milliseconds or less between a MCI-designated Hub Router in Korea and a MCI-designated Hub Router in Hong Kong
- ▶ Average round-trip transmissions of 80 milliseconds or less between a MCI-designated Hub Router in Korea and a MCI-designated Hub Router in Tokyo
- ▶ Average round-trip transmissions of 220 milliseconds or less between a MCI-designated Hub Router in Korea and a MCI-designated Hub Router in Australia
- ▶ Average round-trip transmissions of 300 milliseconds or less between a MCI-designated Hub Router in Korea and a MCI-designated Hub Router in India



Analyzing Network Performance



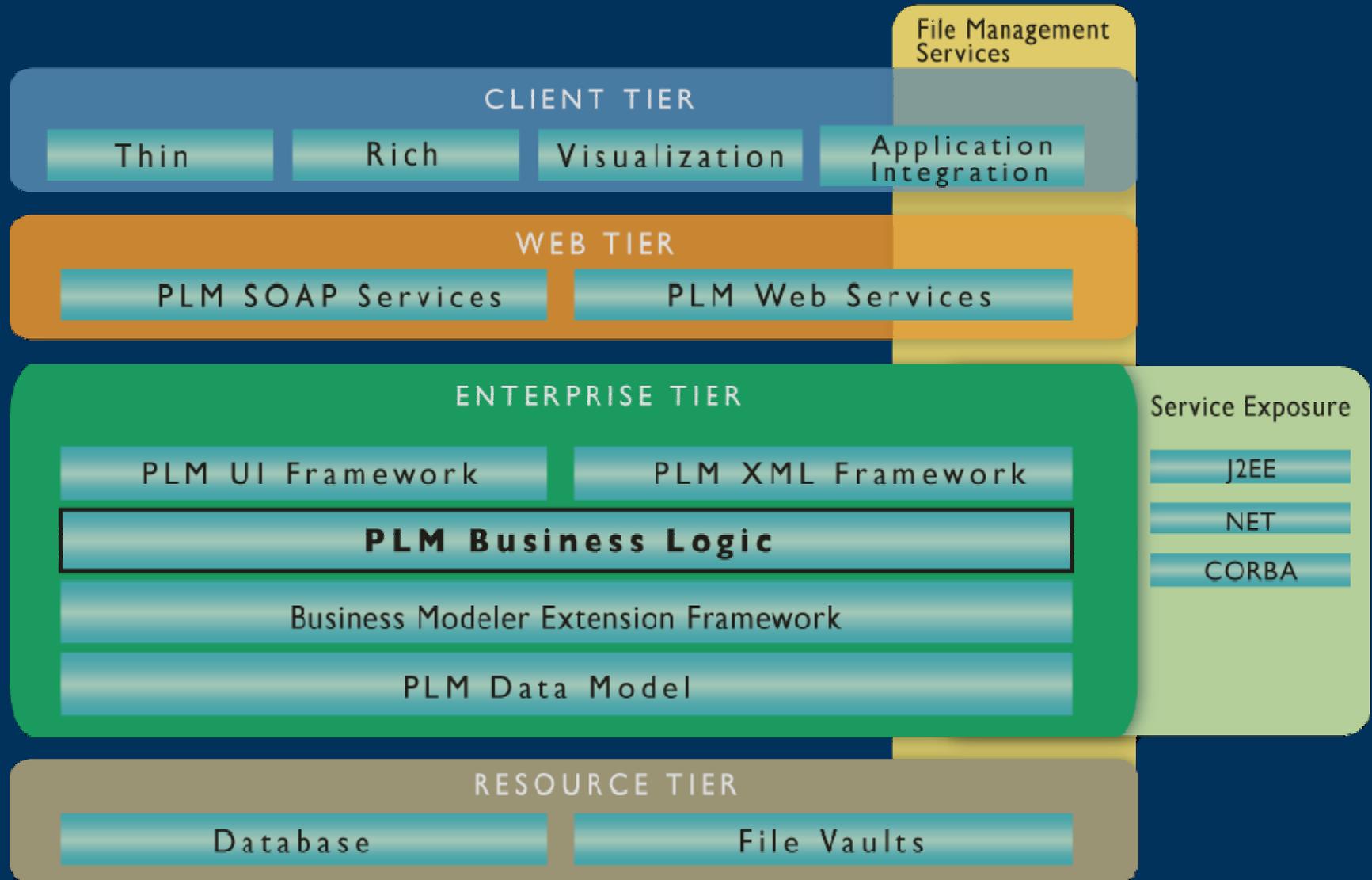


User Map

Location		Biz Unit / Division	User # (CAD)	User # (TOTAL)	Server Location	Client Location(s)
Country	City					
USA	Denver	Corporate	80	100	Den ver	Denver, Seattle, Orlando Bali, Bangkok
		Consumer	28	38	Den ver	Denver, Seattle
		Computer	78	103	Den ver	Denver, Tianjin, Bali
		Network	19	28	Den ver	Denver, New York
		Video	136	184	Den ver	Seattle, New York, Denver
		DVD	51	69	Den ver	Orlando, Denver, Suzhou
		Storage	32	43	Den ver	Denver, Seattle, Orlando Bali, Bangkok
		Printer	208	281	Den ver	Denver, Orlando
		Air Conditioner	93	128	Den ver	Denver, Seattle, Orlando Bali, Bangkok
		Mechatronics	250	260	Den ver	Orlando, Denver, Suzhou
	Audio	38	51	Den ver	New York, Denver, Seattle	
	Seattle	LCD	105	142	Seattle	Denver, Orlando
	Orlando	Wireless	124	167	Orlando	Denver, New York
	New York	Circuit Board	108	148	New York	Denver, Seattle, Orlando Bali, Bangkok
		Chip	119	161	New York	Denver, New York
Domestic Total			1467	1897		
China	Tianjin	Video	30	41	Den ver	Tianjin
		DVD	15	20	Den ver	Tianjin
	Suzhou	SSEC: Ref	100	135	Denver, China	Suzhou
		Computer	15	20	Den ver	Suzhou
Huizhou	Audio	34	48	Den ver	Huizhou	
Indonesia	Bali	LCD	7	9	Den ver	Bali
Malaysia	Pekan	Video	7	9	Den ver	Pekan
Thailand	Bangkok	Storage	38	49	Denver, China	Bangkok
Overseas Total			244	329		



Teamcenter Architecture





Hardware Sizing

Enterprise Tier Teamcenter Server

Teamcenter Server

- ▶ All calculations are dependant on usage profile
- ▶ CPU
 - ▶ Calculation based on demand rate * concurrent users
 - ▶ SPECint_rate2000 for HPux is 0.044 average 0.132 peak
 - ▶ SiR for Windows / Solaris is 0.026 average 0.062 peak
 - ▶ Demand = SiR * # concurrent users
- ▶ Memory
 - ▶ Each concurrent user requires:
 - ▶ 34mb – Windows / Solaris
 - ▶ 54mb - HPux
- ▶ Reserved Swap Space
 - ▶ Each concurrent user requires:
 - ▶ 46mb – Windows /Solaris
 - ▶ 84mb - HPux

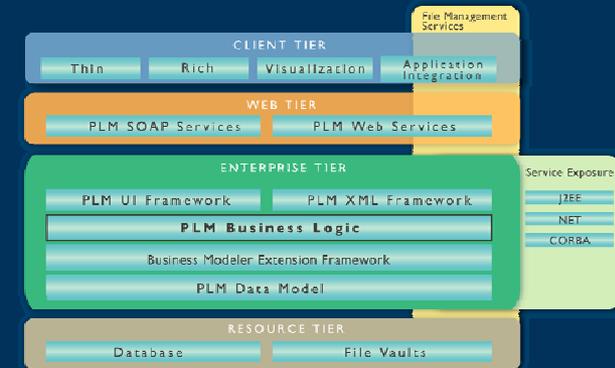
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Web Tier Web Application Server

Web Application Server (Bea WebLogic)

- ▶ All calculations are dependant on usage profile
- ▶ CPU
 - ▶ Example:
 - ▶ SPECint_rate2000=39.7 test server w/ 1000 users test
 - ▶ Consumed 2.0 SiR = .002 SiR/user
- ▶ Memory
 - ▶ Basic memory requirement for WLS Server is 1.5gb
 - ▶ Example
 - ▶ Small deployment <1000 users requires 0.2mb /user
 - ▶ Large deployment <5000 users requires 0.46mb/user
- ▶ Reserved Swap Space
 - ▶ Negligible swap size requirement

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Resource Tier Teamcenter Database Server

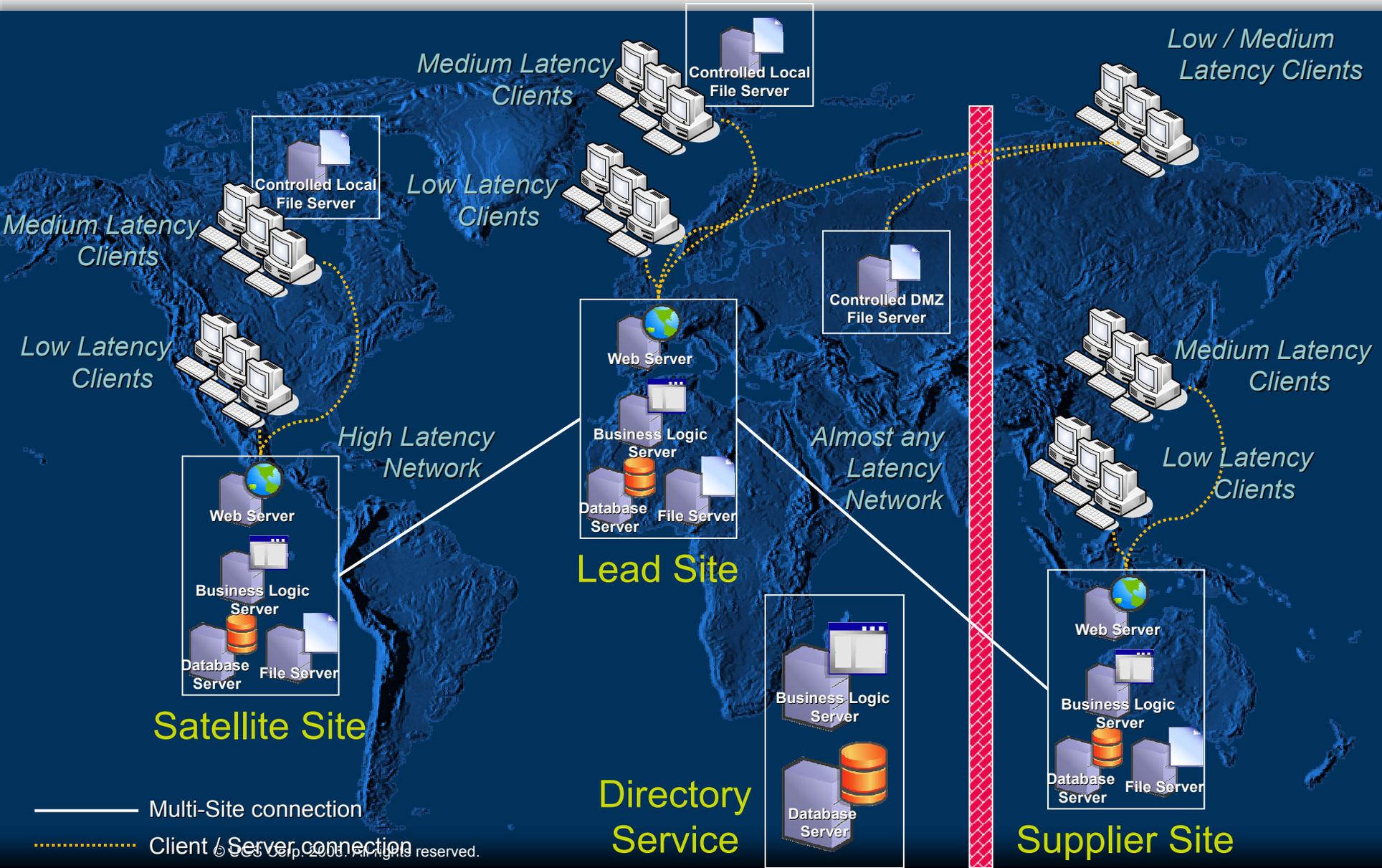
Oracle Database Server

- ▶ CPU
 - ▶ Calculation results in CPU class designation in SPECint_rate2000 industry standard.
 - ▶ $CPU = ((\# \text{ concurrent users} * .0025) * 1.2)$
- ▶ Memory
 - ▶ $RAM = (\# \text{ concurrent users} * 4.2Mb)$
- ▶ Reserved Swap Space (Unix)
 - ▶ $Swap = (\# \text{ concurrent users} * 6 Mb)$
- ▶ *Additional disk storage will be required for Oracle product installation and database storage.*

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Teamcenter Engineering Global Deployment





Four Tier Configuration

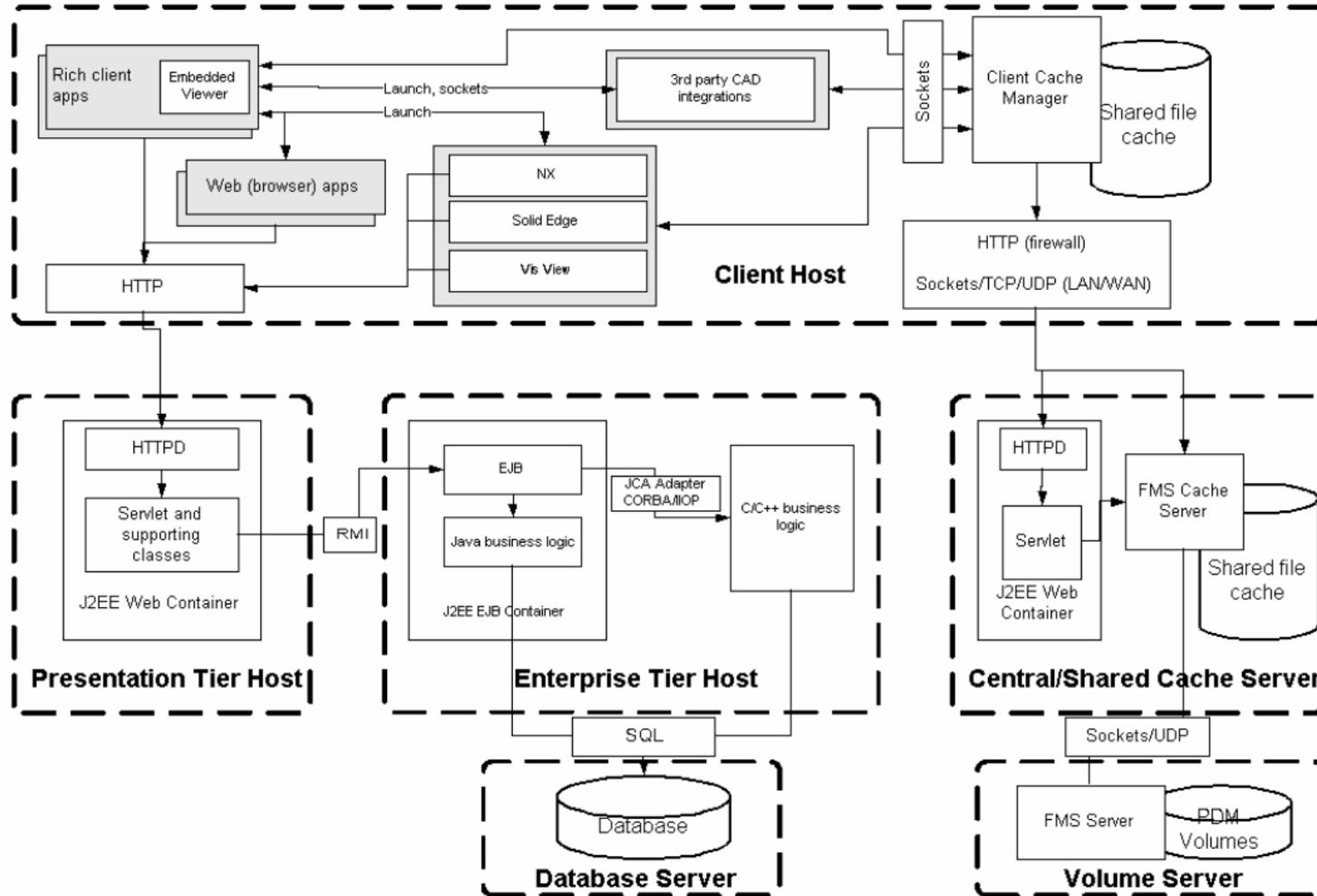


Figure 3: Four Tier Configuration



Two Tier Configuration

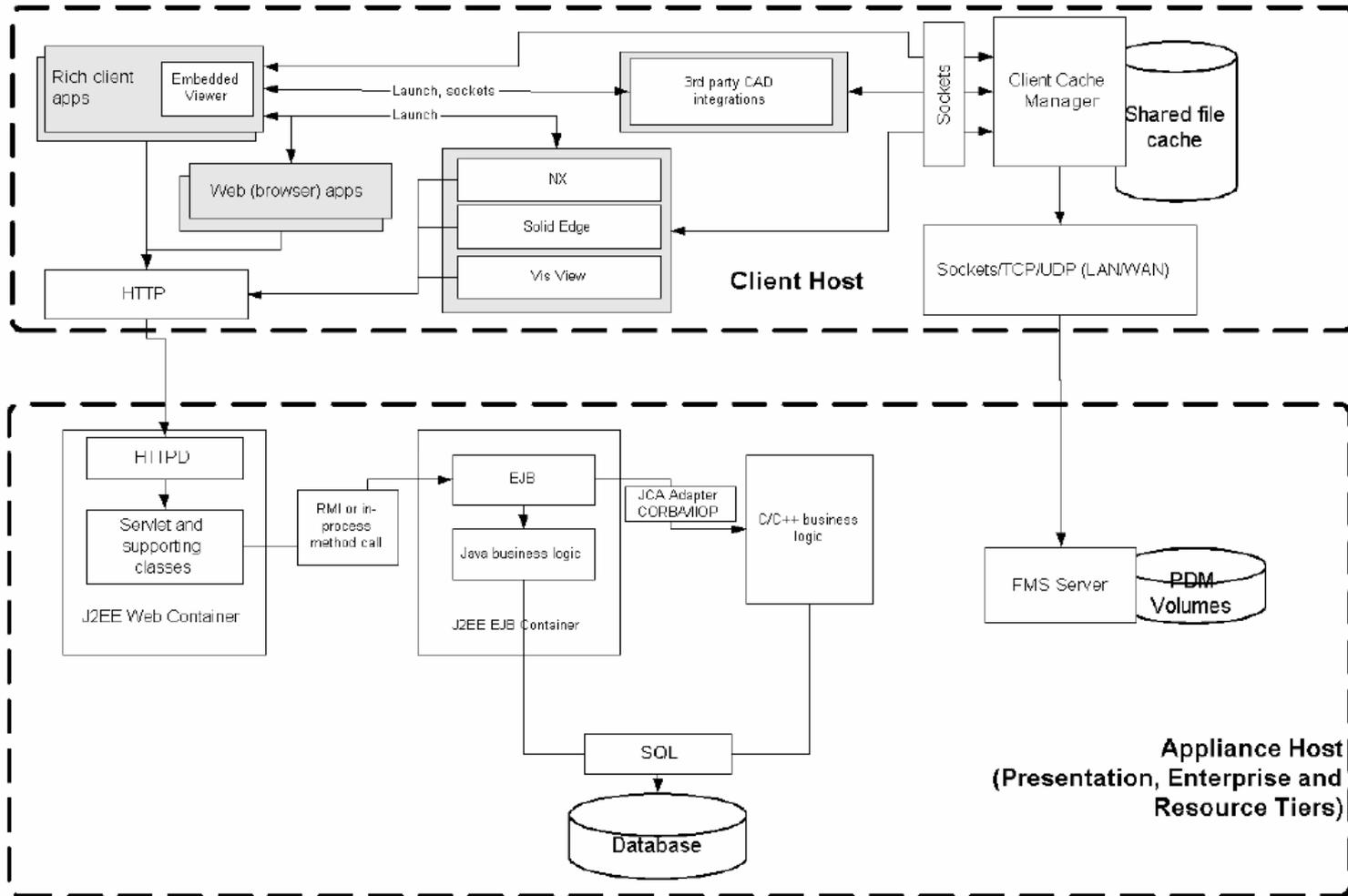
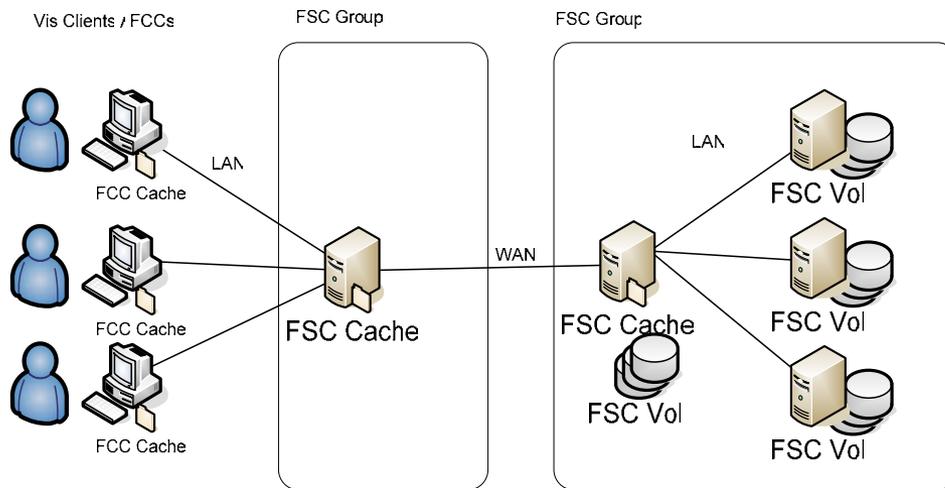


Figure 5: Two Tier Configuration "Heavy Server"



FMS Configurations

Remote File Cache



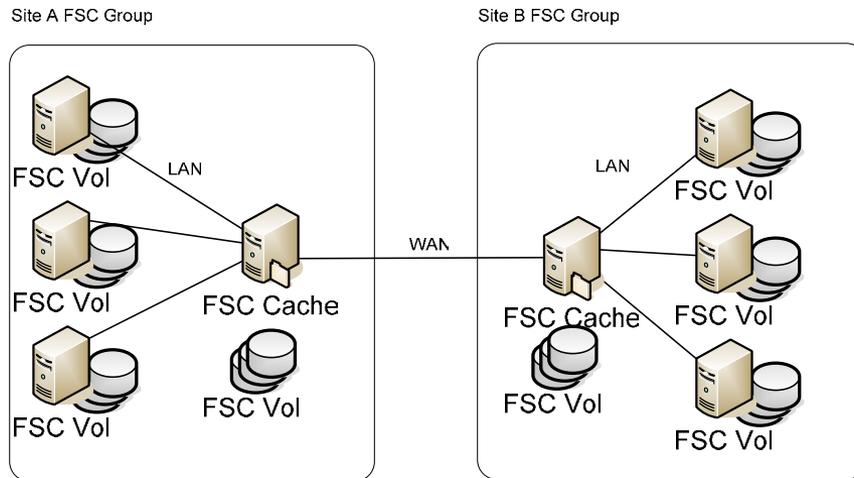
Remote FCC Cached Volume Access Operation

- ▶ Basic “cache all files” configuration
- ▶ All downloaded files are cached
- ▶ All “recent” files should be in the cache; uploaded files are also cached at the FSC
- ▶ Offers the capability to put fast file access in, while not upgrading the volume assets
- ▶ Cache server would have large capacity
- ▶ Configure Cache server with 2-4GB memory
- ▶ FSCs in a group have direct connectivity



FMS Configurations

Multi-Site



Multi-Site Volume Access Operation

- ▶ Multi-Site configuration
- ▶ Files are transferred directly between the FSC servers
- ▶ File routing between the sites configurable by the system admin
 - ▶ Channel cross site transfers between two (2) specific FSC's



Teamcenter V10 / 2005 Installations

- ▶ Completely new install mechanism and procedure for the V10 release
- ▶ Legacy (V9.1) install procedure is not available for V10 release
- ▶ Multi-tier install & configuration procedure involves multiple configuration elements:
 - ▶ Corporate Server (Foundation / Base)
 - ▶ Web Tier
 - ▶ Distribution Server
 - ▶ Rich Client



Teamcenter 2005 Installation Challenges

To become familiar with:

- ▶ New installer methods
 - ▶ Teamcenter Environment Manager (TEM)
 - ▶ Teamcenter Web Application Manager (WAM)
- ▶ New product configurations
 - ▶ 4-tier
 - ▶ FMS
- ▶ Deployment Strategies
 - ▶ Over The Web (OTW) client installs



Deployment Options

Based on business and user requirements

- ▶ Identify the supporting Teamcenter functionality
- ▶ Define Teamcenter deployment architecture based on process and functional requirements
 - ▶ Examples
 - ▶ 2-Tier RAC w/ CAD integration
 - ▶ Multi-Site Design data sharing
 - ▶ Supplier access by Web Client
- ▶ Define hardware requirements to match target functionality

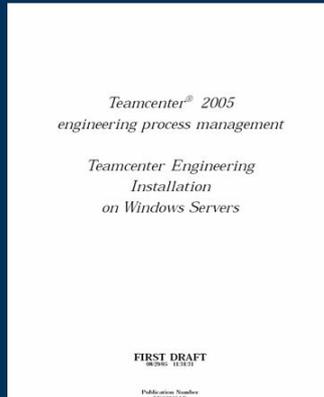


Supporting Documentation

Server Install Guide

Topics

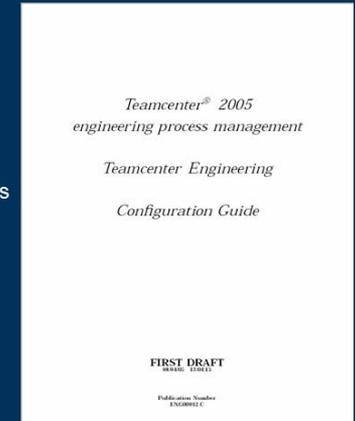
- ▶ Site Planning
- ▶ Installing
 - ▶ Database Server
 - ▶ Teamcenter Eng. Server
 - ▶ Web Application
- ▶ Deployment & Configuration
- ▶ Site Maintenance



Configuration Guide

Topics

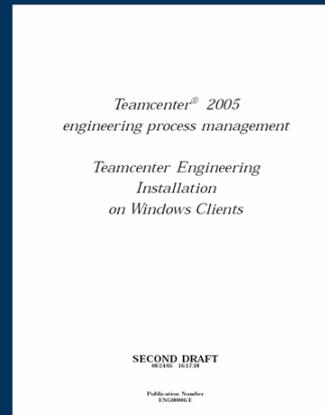
- ▶ Environment variables
- ▶ Preferences
- ▶ Configuration
 - ▶ SSO, DIS, Process Daemons
 - ▶ NX Manager
 - ▶ RDV
- ▶ Customization
- ▶ Managing Files and Volumes
 - ▶ FMS



Client Install Guide

Topics

- ▶ Software Requirements
- ▶ Installing
 - ▶ Rich Client
 - ▶ MS Application Integration
 - ▶ Teamcenter Manufacturing
 - ▶ FMS Client





Develop The Deployment Plan

The deployment plan should include

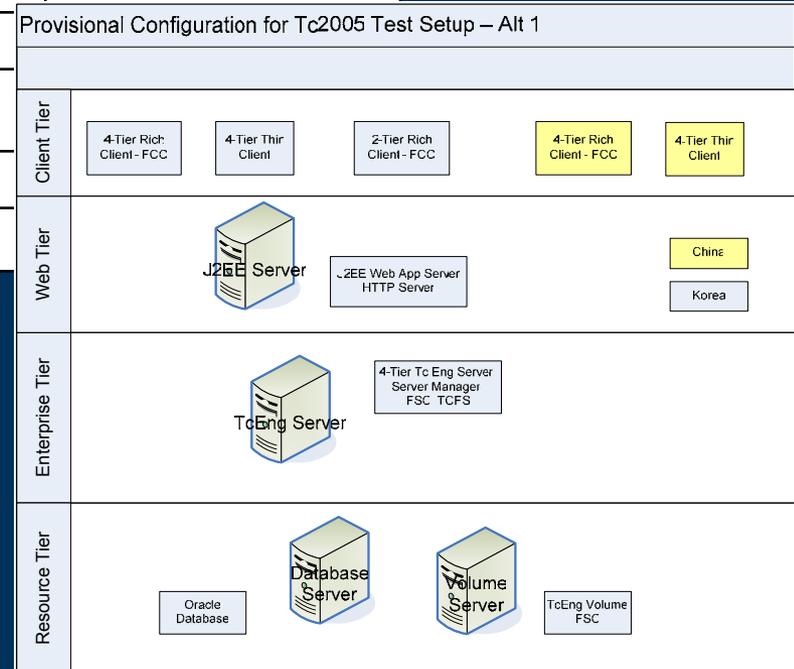
- ▶ Supported user and business cases
- ▶ Hardware and infrastructure plan
- ▶ Administration requirements
- ▶ Implementation schedule
 - ▶ Coordinated with important milestones
 - ▶ Hardware upgrades / purchases
 - ▶ Software release dates
- ▶ Test / acceptance plan





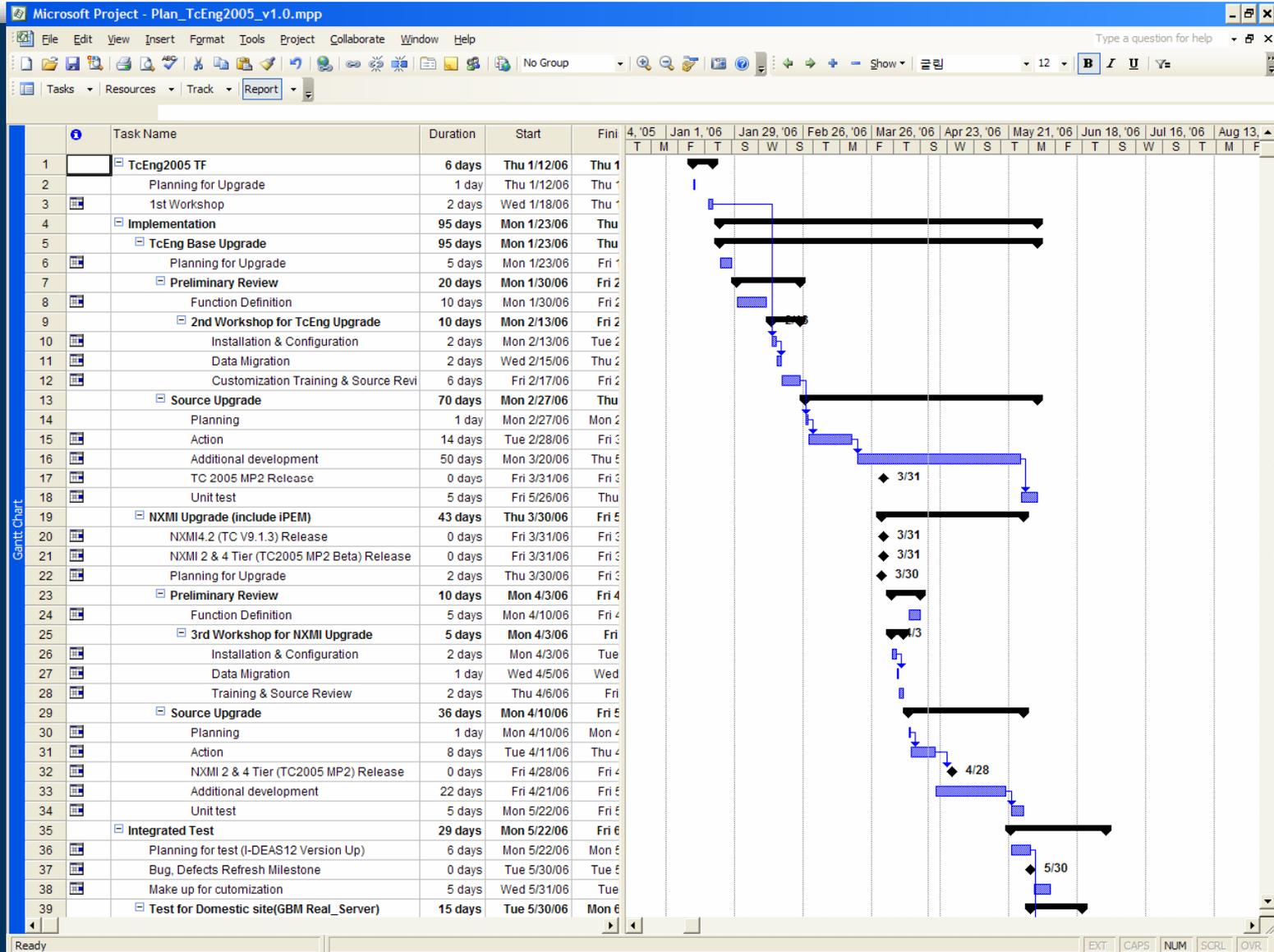
Test Plan

No	Time	Activity/Task	Responsibility
1.	Week-1	Plan and complete the installation for 4-tier. Complete remote installation of China client.	Admin Team
2.	Week-2	Start local testing. Review test results and adjust configuration parameters.	Super Users Admin Team





Deployment Schedule





Summary

Things to remember

- ▶ Define use cases and functional requirements first
- ▶ Identify intra-site infrastructure and connectivity capabilities
- ▶ Review administration capabilities and availability
- ▶ Select Teamcenter capability and release that best fits requirements and implementation environment
- ▶ Develop a workable deployment schedule that supports deployment requirements
- ▶ Document your plan, architecture design, key processes, and responsibilities



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