Windows Server 2003 on ProLiant Servers

Gary L. Olsen
Global Solutions Engineering
HP Services
Gary.olsen@hp.com

Bruce Howard
Engineering Problem Management & Analysis
Industry Standard Servers
Bruce.Howard@hp.com

Books

Windows Server 2003 on ProLiant Servers

Authors: Gary Olsen, Bruce Howard
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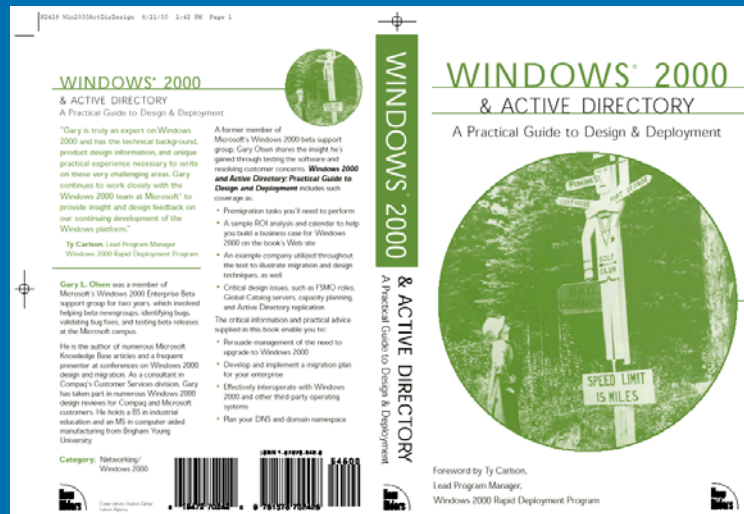
Windows 2000: Active Directory Design & Deployment

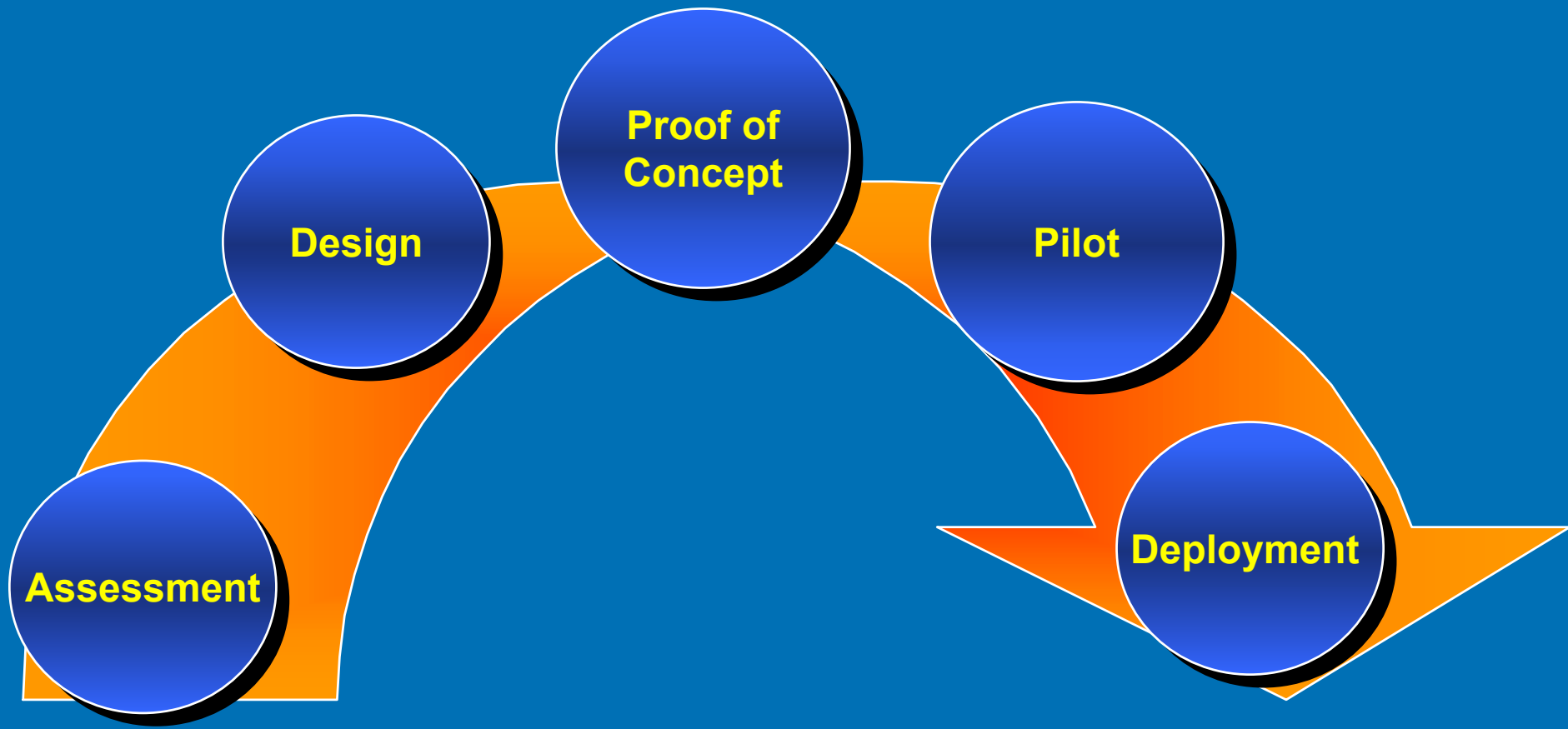
Author: Gary Olsen
Publisher: New Riders
ISBN: 1578702429



Agenda

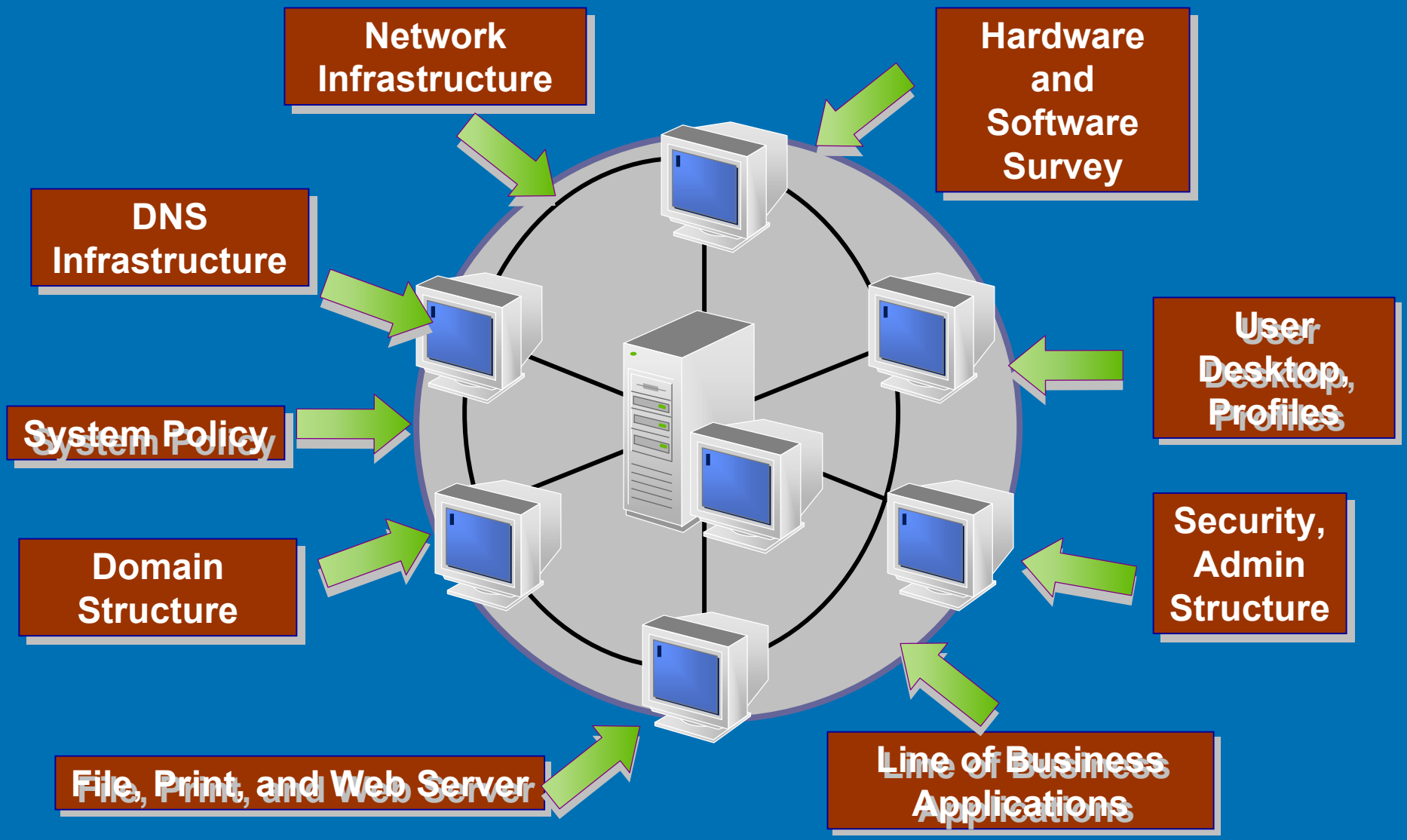
- Migration Roadmap and Planning
- Assessment
- What's New in ProLiants
- Logical &Physical Design
- Migration Paths
- Upgrading from NT4 to Windows Server 2003
- Upgrading from Windows 2000 to Windows Server 2003
- Moving from NT – Windows Server 2003 - Restructuring
- Deployment: Proliant Essentials
- Backup and Disaster Recovery

Roadmap to a successful Windows 2003 infrastructure



The Assessment

Assessment


Network Infrastructure
Hardware and Software Survey
DNS Infrastructure
User Desktop, Profiles
System Policy
Security, Admin Structure
Domain Structure
File, Print, and Web Server
Line of Business Applications

Should I upgrade now or wait for SP1?

- Some consider it not ready for deployment until SP1

- HP Deployed Windows Server 2003 in Nov. 2002 at RC2.
  - Running beta software in production network!
  - To Get Benefits
  - Improved DNS performance in Application Partitions
  - Reduced AD database size (security descriptors)
  - Install from Media reduced GC rebuild from 3-5 days to 30 min

Windows Server 2003 Improvements

Compared to Windows NT Server 4.0,

Windows Server 2003 is:

- Two times faster on average as a file server.
- Three times faster serving dynamic Web content.
- Four times faster serving static Web content.

Fundamental Improvements:

- Security, reliability, manageability
- performance & reduced administrative costs

See: ‘What’s New and Cool in Windows 2003’

& ‘Active Directory Troubleshooting’ for details

“Hard” Cost Savings
or...“How many people can I lay off?”

- Reduced Downtime
- Reduced Support Costs
  - 3rd Party
  - Help desk
- Short time to resolution
- Cost-Benefit Analysis
  - W2K3 Performance, Reliability, Support
  - ProLiant features, tools, reliability

New ProLiant Server Technologies

- X86 Processors with 64-bit extensions
- AMD Opteron Processor servers – available now
  - AMD 200 series processor (1 to 2-way) – DL145 (2 way)
  - AMD 800 series processor (up to 8-way) – DL585 (4 way)
- Intel Xeon EM64T Processors - Later in 2004
  - Nocona (future Intel® Xeon™ processor for dual processing servers and workstations)
  - Potomac (future Intel Xeon processor MP for multi-processing servers)

Windows Server 2003 for 64-Bit Extended Systems (Beta)

- Due Second half of 2004 – **BETA is Downloadable from Microsoft**
- Standard Edition: features & uses
  - Up to 4 AMD Opteron or Intel Xeon EM64T
  - Up to 32 GB RAM
    - **Terminal Services, Databases, Business Applications**
    - **Active Directory® data stores larger than 2 GB, (HPC) clusters,**
- Enterprise Edition: features & uses
  - Up to 8 AMD Opteron or Intel Xeon EM64T
  - Up to 64 GB RAM
    - **Business-critical applications**
    - **Large databases,**
    - **TS deployments that use Terminal Server Session Directory.**

Windows Server 2003 for 64-Bit Extended Systems

- Minimum System Requirements - **Standard & Enterprise Edition**
- Minimum CPU Speed:
  - AMD Opteron Model 140 (1.4 GHz)
  - Intel Xeon EM64T (clock speed TBD)
- Recommended Minimum CPU Speed:
  - AMD Opteron Model 140 (1.4 GHz)
  - Intel Xeon EM64T(clock speed TBD)
- Minimum RAM: - 512 MB
- Multiprocessor Support: Standard up to 4, Enterprise up to 8
- Minimum Disk Space for Setup: - 4 GB

ProLiant DL585 highlights

Performance

- AMD Opteron 800 series 2.2GHz, 4P capable
- Up to 64GB of 2-way interleaved PC2100 DDR
- Smart Array 5i Plus controller, with 64MB battery-backed write cache
- Dual-port Gigabit NIC
- 8 PCI-X slots - 2, 64-bit/133MHz - 6, 64-bit/100 MHz
- Support for 4 Ultra320 SCSI hot plug drives
- Support for Smart Array controllers
- Pluggable floppy drive, CD-ROM or DVD-ROM
- Redundant Hot-Plug Fans and Hot-Plug Power Supplies

Management & deployment

- Integrated Lights-Out
- SmartStart
- Systems Insight Manager
- Status LEDs including system health and UID

*Feature set subject to change

NEW
ProLiant 100 Series ML and DL servers

- Affordable entry level servers
- Different support and options than 300,500 & 700 series
- No SmartStart Support

- ML110 – 1P Pentium 4 - 3 GHz 800 MHz FSB
- DL140 – 1U, 2p Intel Xeon 3.2 GHz 533 MHz FSB
- DL145 – 1U, 2p AMD Opteron 2.2 GHz, Max. 16 GB RAM

ProLiant 300, 500 & 700 Series processor speed & cache updates

- 300 series – ML370, DL360, DL380, *ML350
  up to 3.2 GHz with 2M L3 Cache
  * **up to 2.8GHz processor 1M L3 Cache**
- 500 series – ML570, DL560, DL580
  up to 3.0 GHz with 4M L3 Cache
- 700 series – DL740, DL760 G2
  up to 3.0 GHz with 4M L3 Cache
- Larger cache size – NEW 4MB cache offers enhanced performance for (OLAP & OLTP) cache-intensive database deployments

ProLiant Blade Servers

BL10e G2 – Single Processor 1GHz-1M , 1GB RAM,
1 HDD, 2-10/100 NICs – 20, blades per enclosure

BL20p G2 - 2 Processor Xeon 3.2 GHz-2MB, 8 GB RAM,
2 Hot-Plug HDD, 5i BBWC, 3 GB NICs, iLO
2 port, 2-Gb Fibre Channel option for SAN connection
8 blades per enclosure

BL40p - 4 Processor Xeon MP 3.0GHz-4M, 12 GB RAM w/OLS
4 Hot-Plug HDD, 5i BBWC, 5 GB NICs, iLO, 2 PCI slots
Hot-Plug Fans
2 blades per enclosure

Maximum configurations listed for each server

Logical & Physical Design

Logical Structure

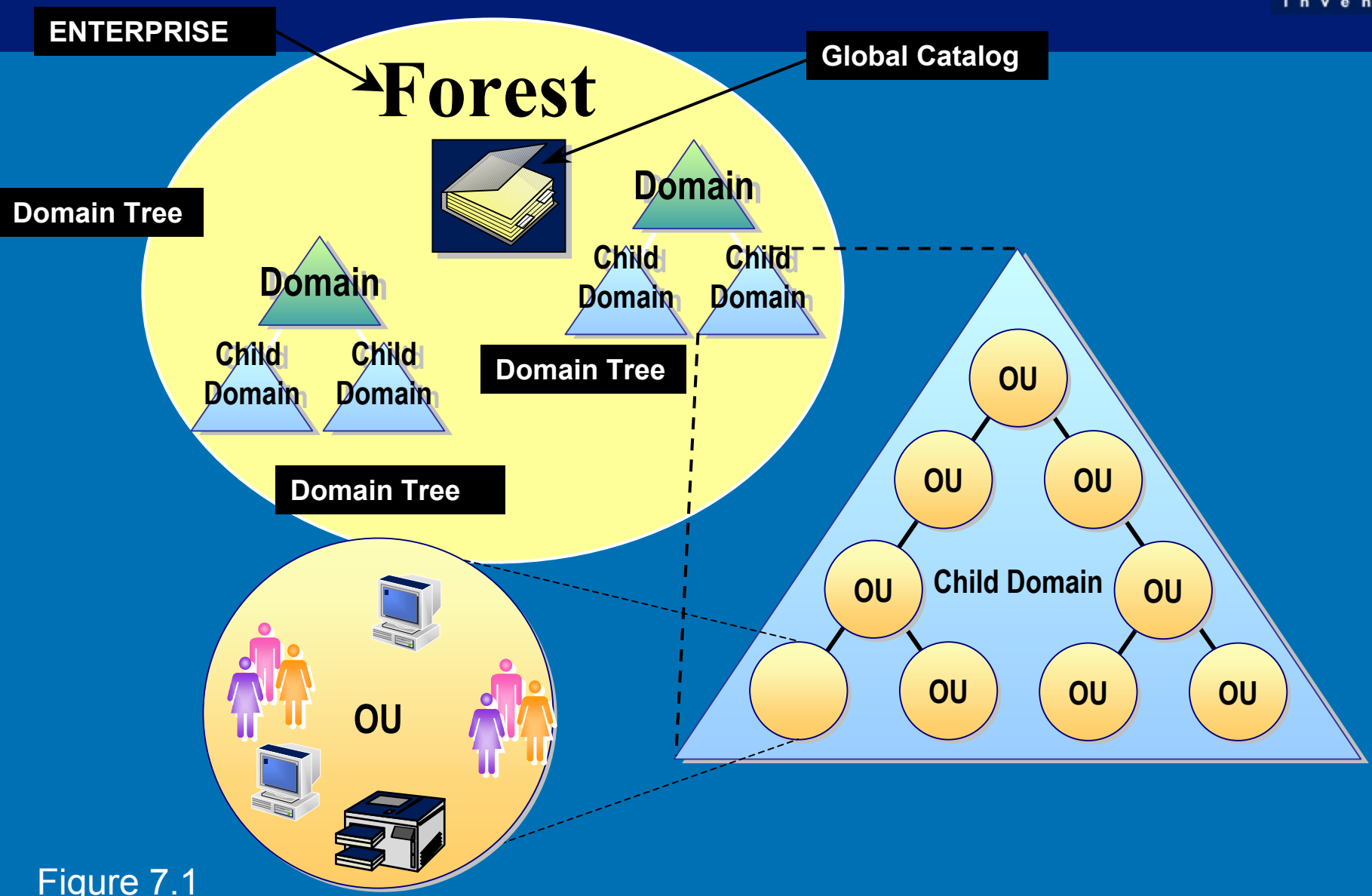
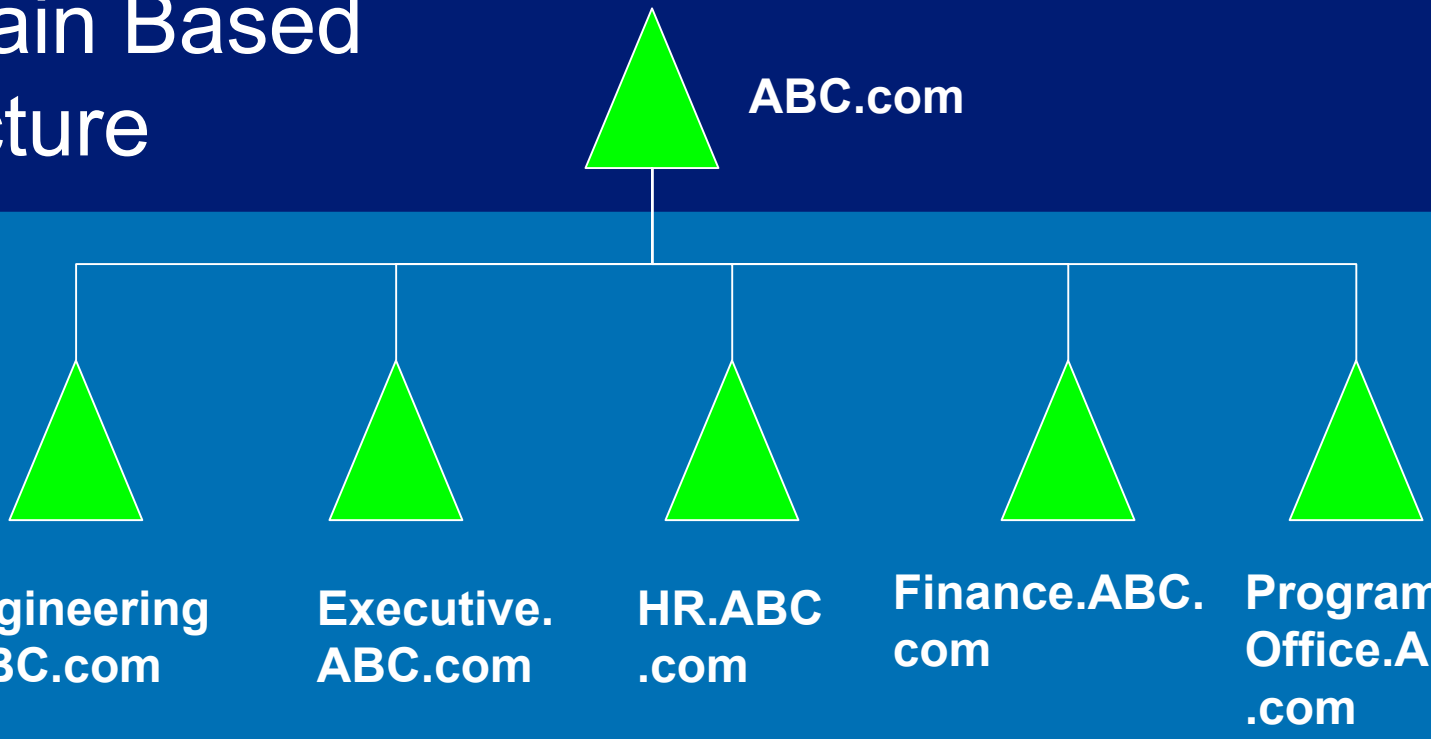
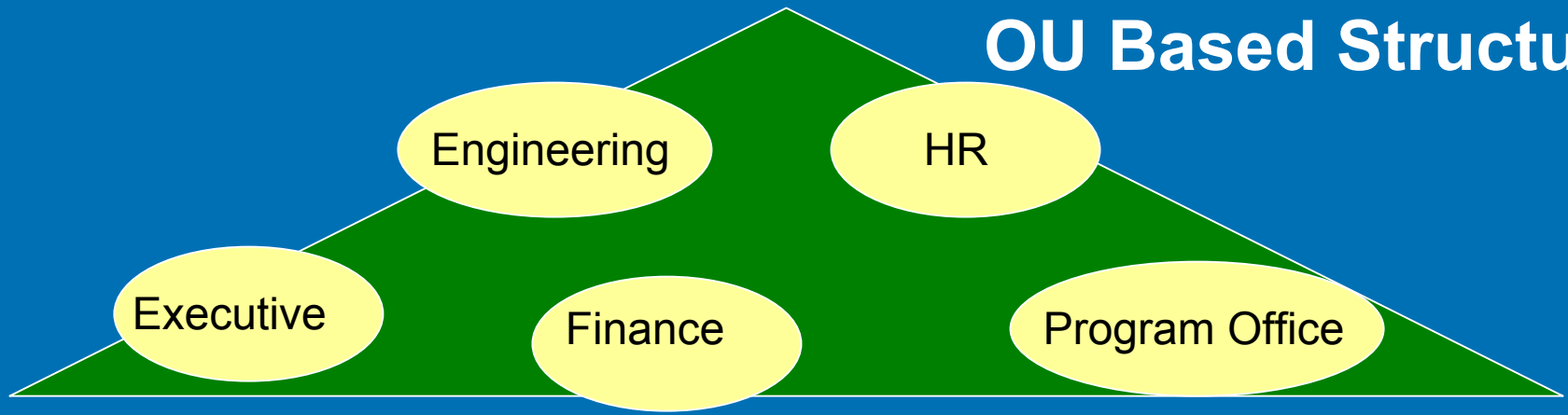


Figure 7.1

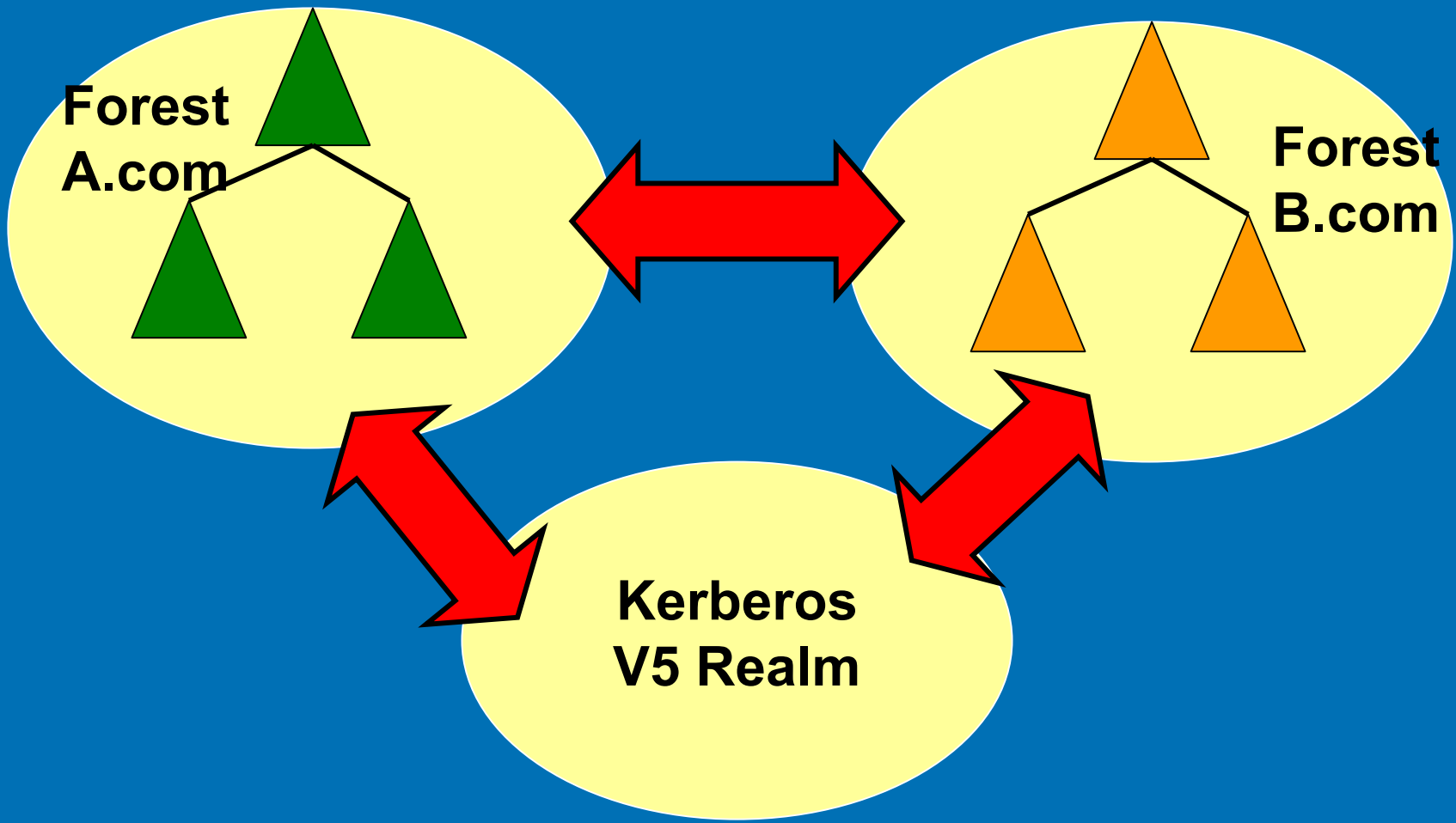
Domain Based Structure



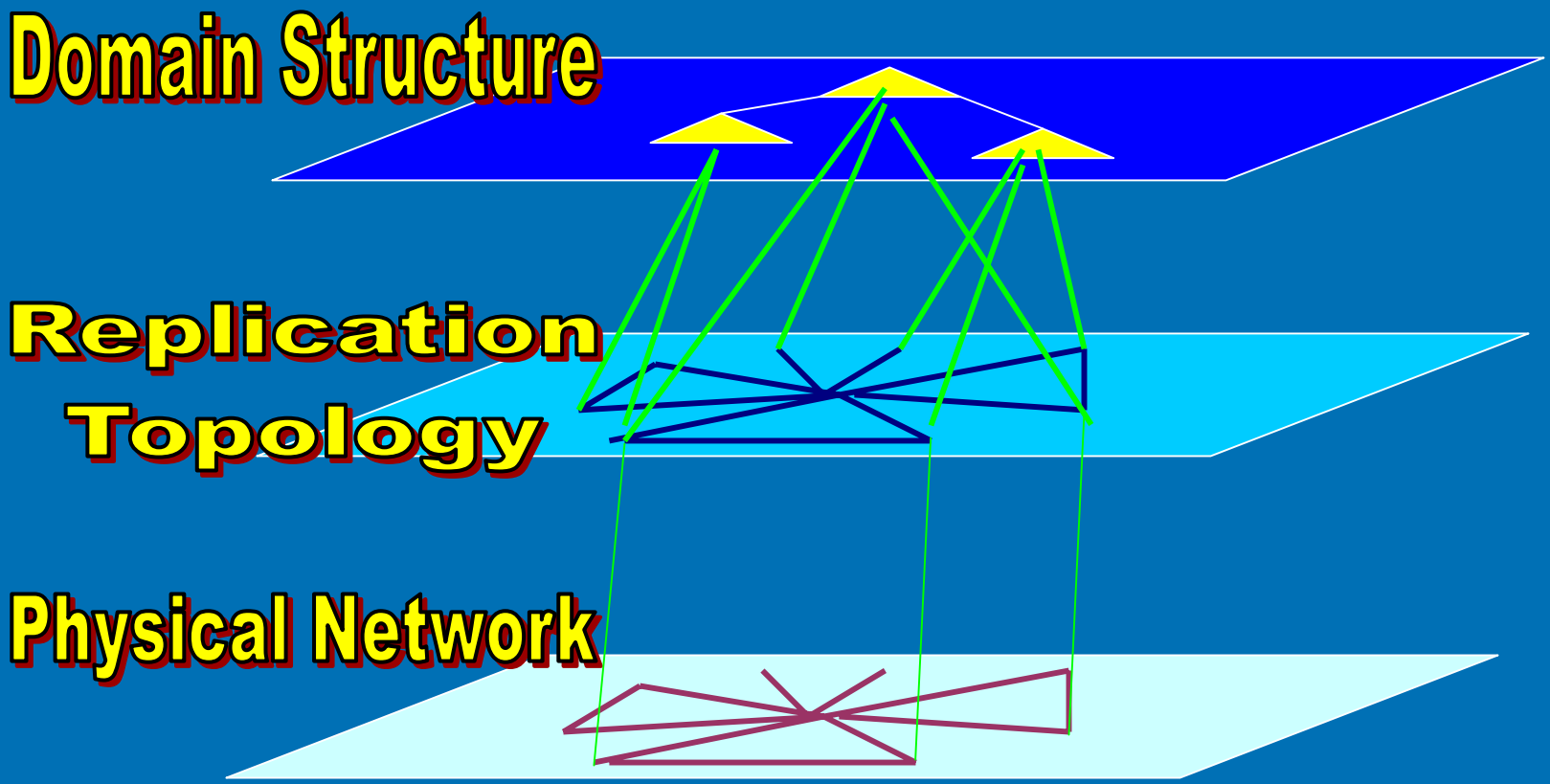
OU Based Structure



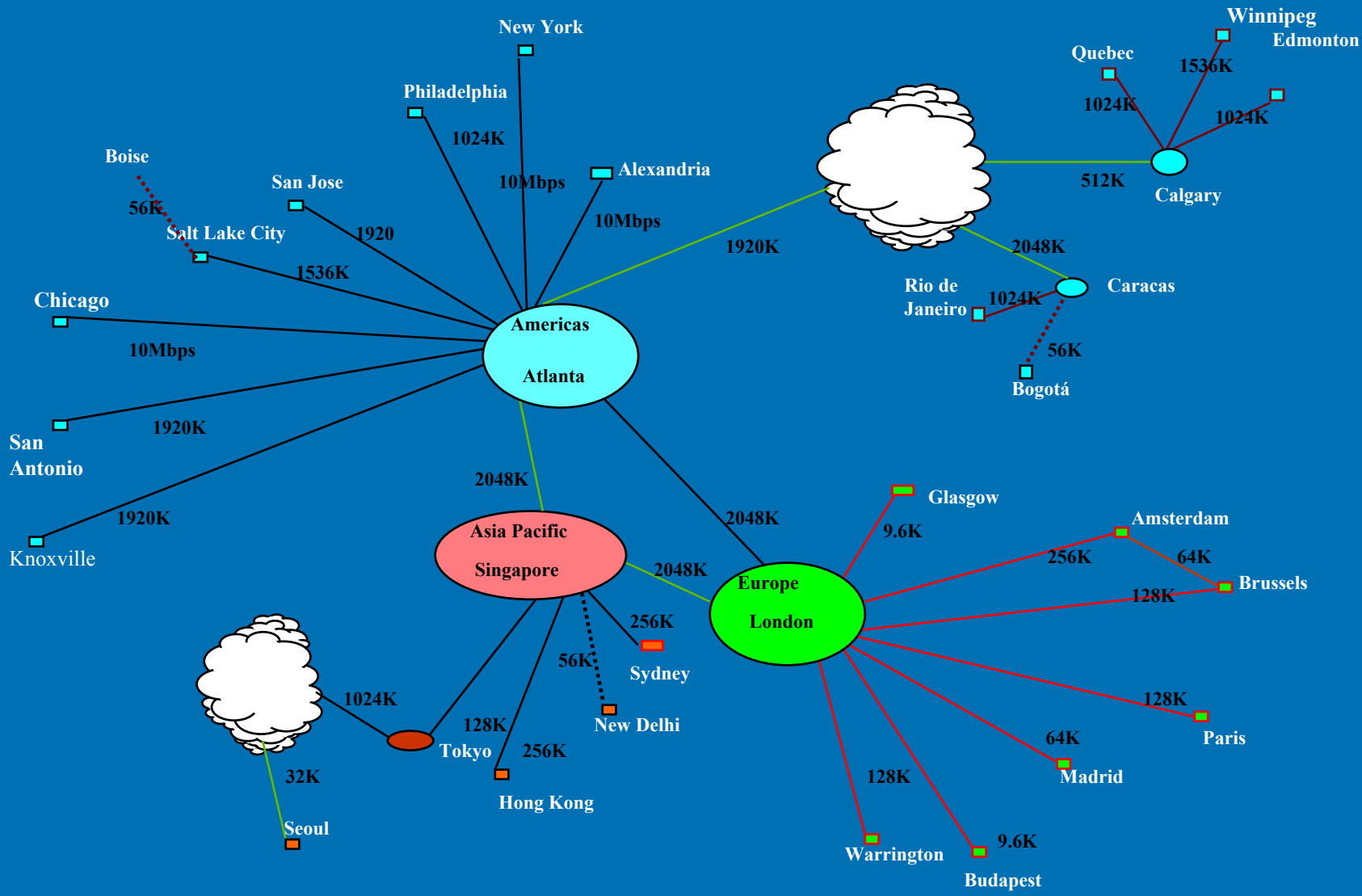
Multiple Forests in Windows 2003



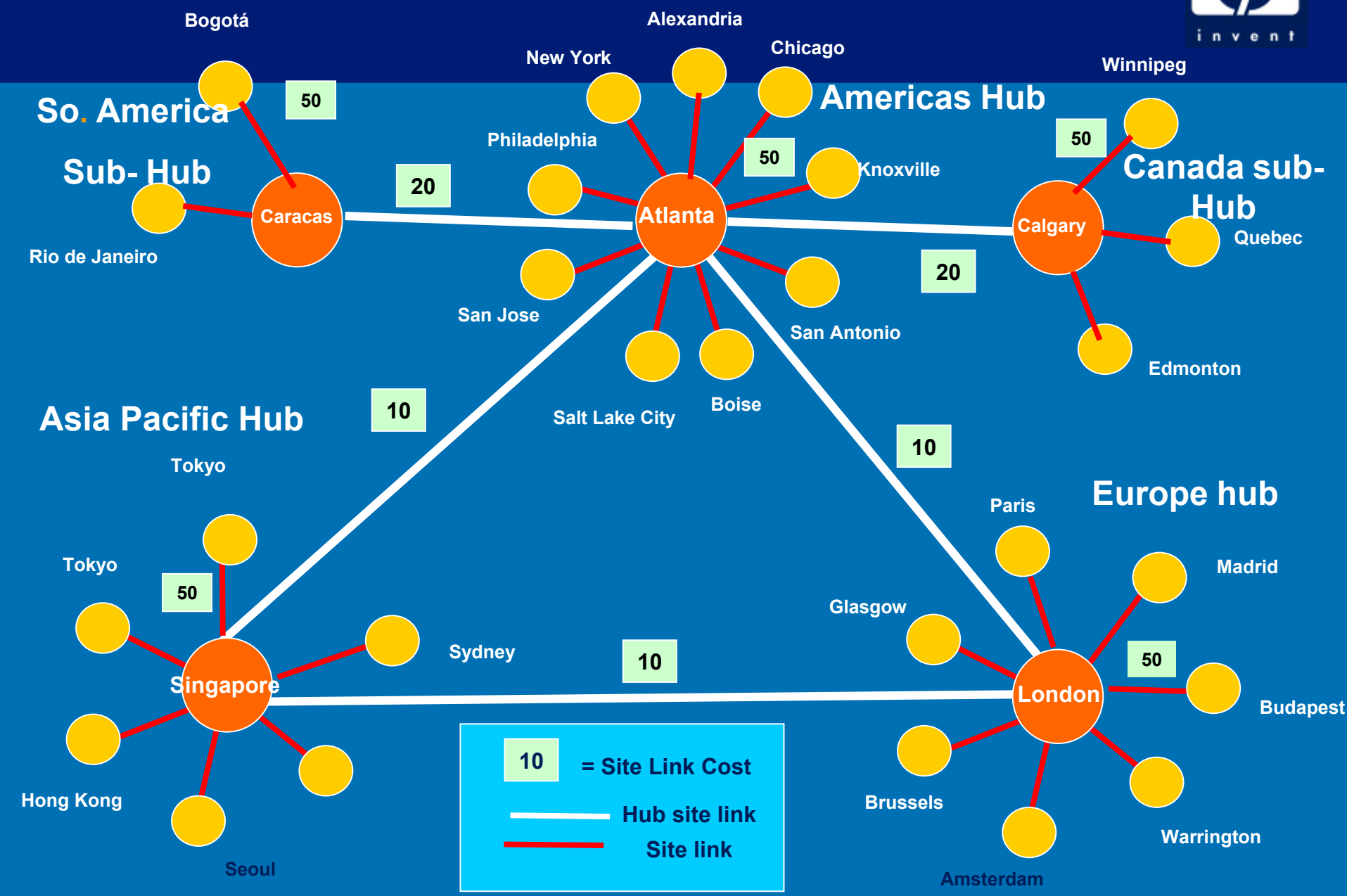
Replication Topology Design



Replication Topology Design Turns This…



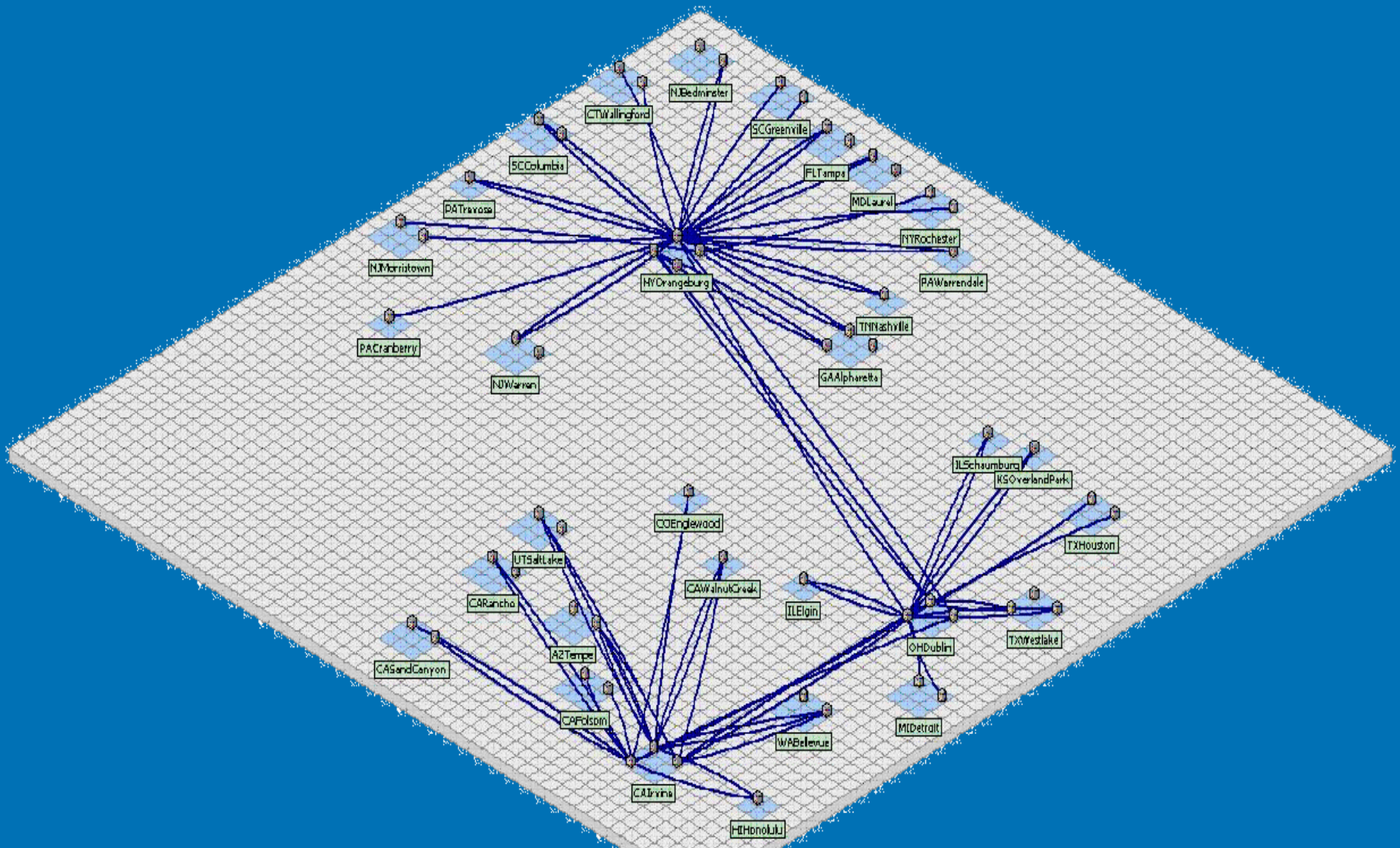
Into This!


Bogotá
50
So. America
Sub- Hub
Caracas
Rio de Janeiro
20
Alexandria
New York
Chicago
Americas Hub
Philadelphia
50
Knoxville
Atlanta
San Jose
San Antonio
Salt Lake City
Boise
Winnipeg
50
Canada sub-
Hub
Calgary
Quebec
Edmonton
20
10
Asia Pacific Hub
Tokyo
Tokyo
50
Singapore
Sydney
Hong Kong
Seoul
10
10
Europe hub
Paris
Madrid
Glasgow
50
London
Budapest
Brussels
Warrington
Amsterdam
10 = Site Link Cost
Hub site link
Site link

Replication Design

- Topology Design is Critical
  - HP OpenView for Windows
- Site Structure
  - Dramatic Improvement in Windows Server 2003
    - Windows 2000: 4 Domains, 1000 sites = 45 Min
    - Windows Server 2003: 4 domains, 5,000 sites = ~2 min.
    - Load Balancing on Bridgehead Servers
  - May want to consider a change to Windows 2000 infrastructure

HP OpenView For Windows
Active Directory Topology Viewer



Physical Design

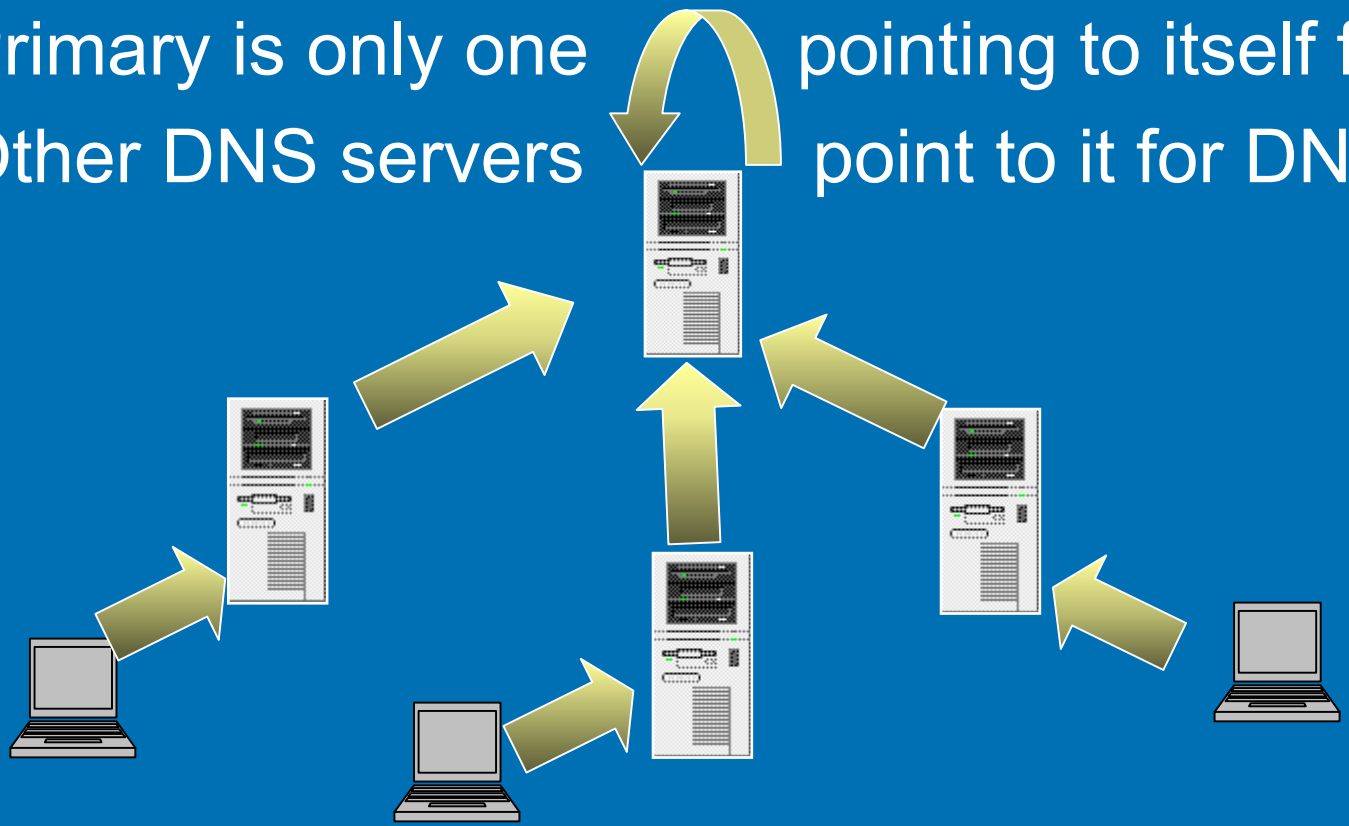
- Network Infrastructure
  - Upgrades
  - DNS
  - WINS, DHCP, RAS, IPSEC
- Time Services
  - Kerberos Authentication
  - Windows Server 2003 = NTP
  - Works out of the Box – no assembly required! (w2k3)

DNS

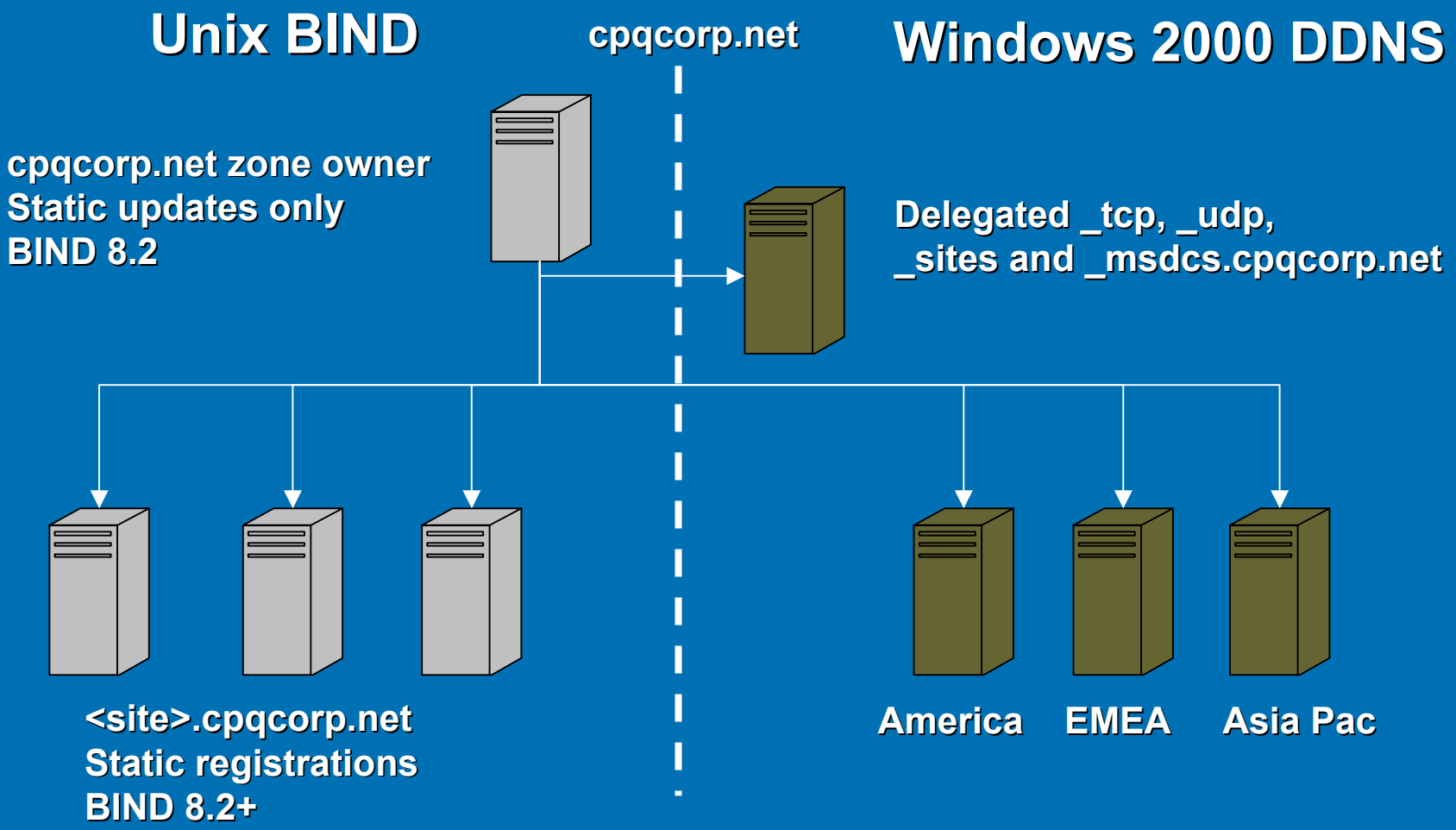
- Windows Server 2003 DCPromo will do it for you
- Active Directory Integrated (ADI) Zones
  - Reduce Replication
  - Excellent redundancy
- Delegate zones for Child domains
- Forwarders
  - Child zone to parent
  - Internet, other Internal DNS
- www.microsoft.com/dns = Cornucopia of DNS training, best practices, whitepapers, webcasts…

ADI Server Configuration

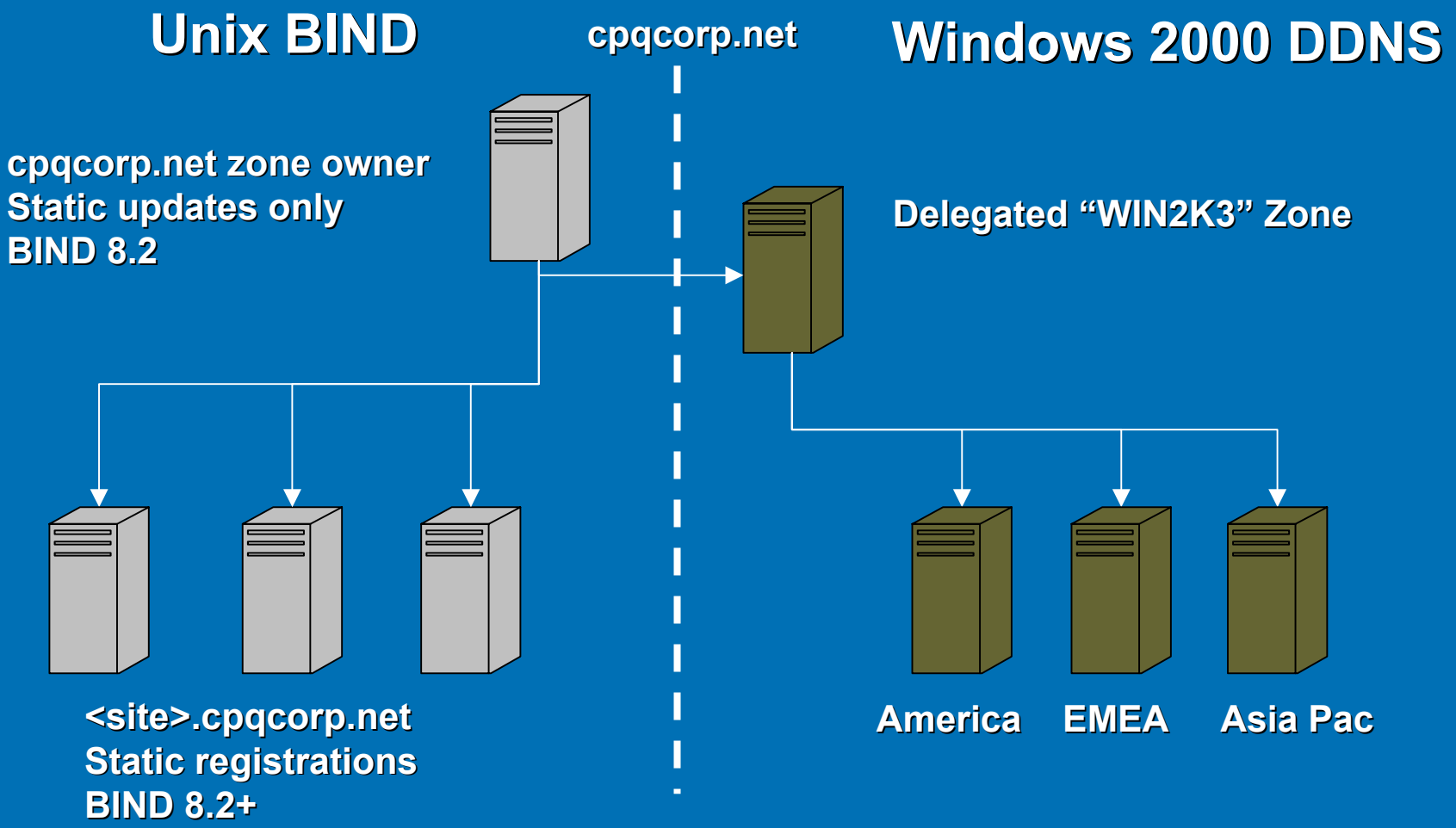
- Best Practice: Select single ADI DNS Server as the “Primary”
- Primary is only one pointing to itself for DNS
- Other DNS servers point to it for DNS



HP DNS Architecture



A more Common DNS Architecture



Migration Paths for Windows Server 2003

Windows Server NT4 & 2000 Upgrade Paths

Current Operating System	Upgraded Operating System
Windows 2000 Server	Windows Server 2003, Standard Edition
Windows 2000 Advanced Server	Windows Server 2003, Enterprise Edition
Windows 2000 Datacenter Server	Windows Server 2003, Datacenter Edition
Windows NT 4.0 Server	Windows Server 2003, Standard Edition
Windows NT 4.0 Enterprise Server	Windows Server 2003, Enterprise Edition

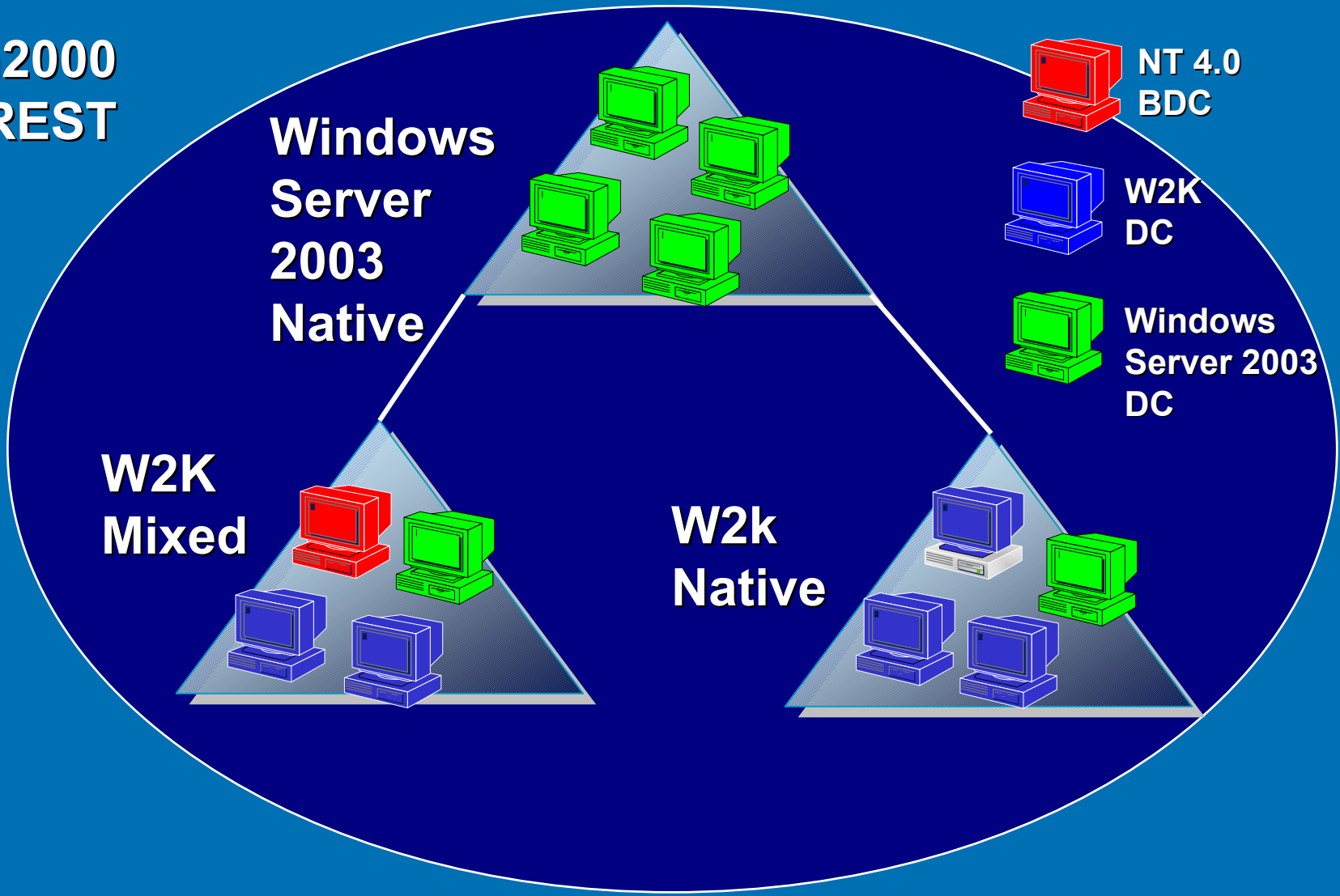
Recommended Minimum System Configuration Windows Server 2003

Parameter	Web Edition	Standard Edition	Enterprise Edition	Datacenter Edition
Processor	550 MHz	550 MHz	733 MHz	733 MHz
RAM	256 MB	256 MB	256 MB	1 GB
Monitor resolution	VGA or higher	VGA or higher	VGA or higher	VGA or higher
Free disk space	1.5 GB	1.5 GB	1.5 GB on x86 Servers	1.5 GB on x86 Servers

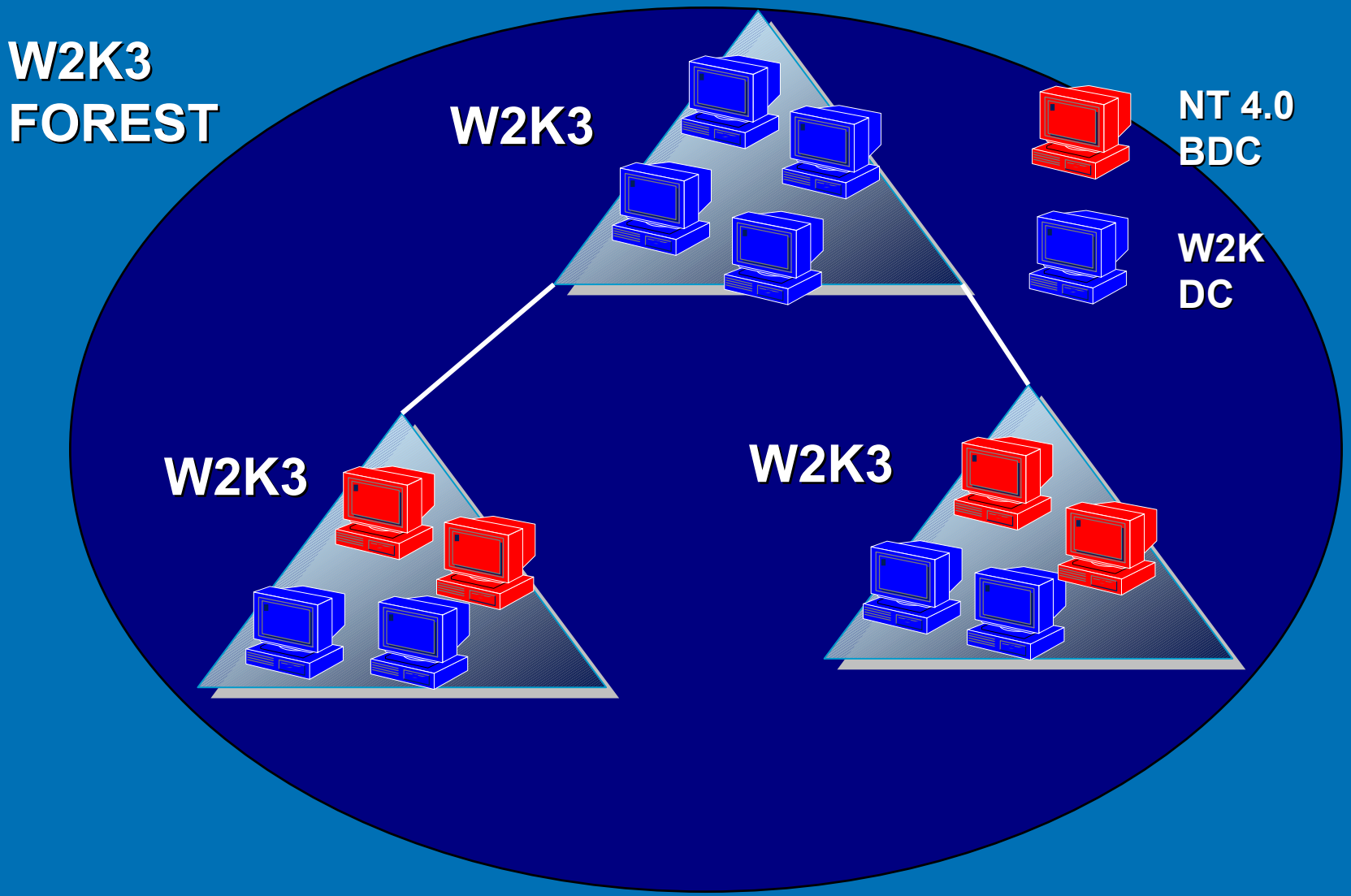
Proliant Upgrade Checklist

description	comments
Options ROM	Update all Option ROM's to current level
System ROM	Update System ROM to current level
PSP for Windows NT4 or 2000	Use release 6.30 for NT4 or later for W2K
System Configuration Utility	On SmartStart 5.50 & earlier, & HP website
SmartStart CD	Use release 6.30 for NT4 or later for W2K
Smart Array multi-path SW - v2.0	Update SW for multi-path hardware
HP Windows Server 2003 website	For the latest information and Updates
Internet access	Window Server and ProLiant Updates
Minimum HW requirements	Verify HW meets minimum requirement
Platforms supported	See hp website for tech note TC030408IN
Sufficient backup media	Run full backup prior to upgrade
Windows 2000 Primer Utility	Erases non-compatible ProLiant utilities
Windows Server 2003 CD	Retail CD or Network Installation Share
Windows 2003 support 3rd-party HW	Verify 3rd party hardware support

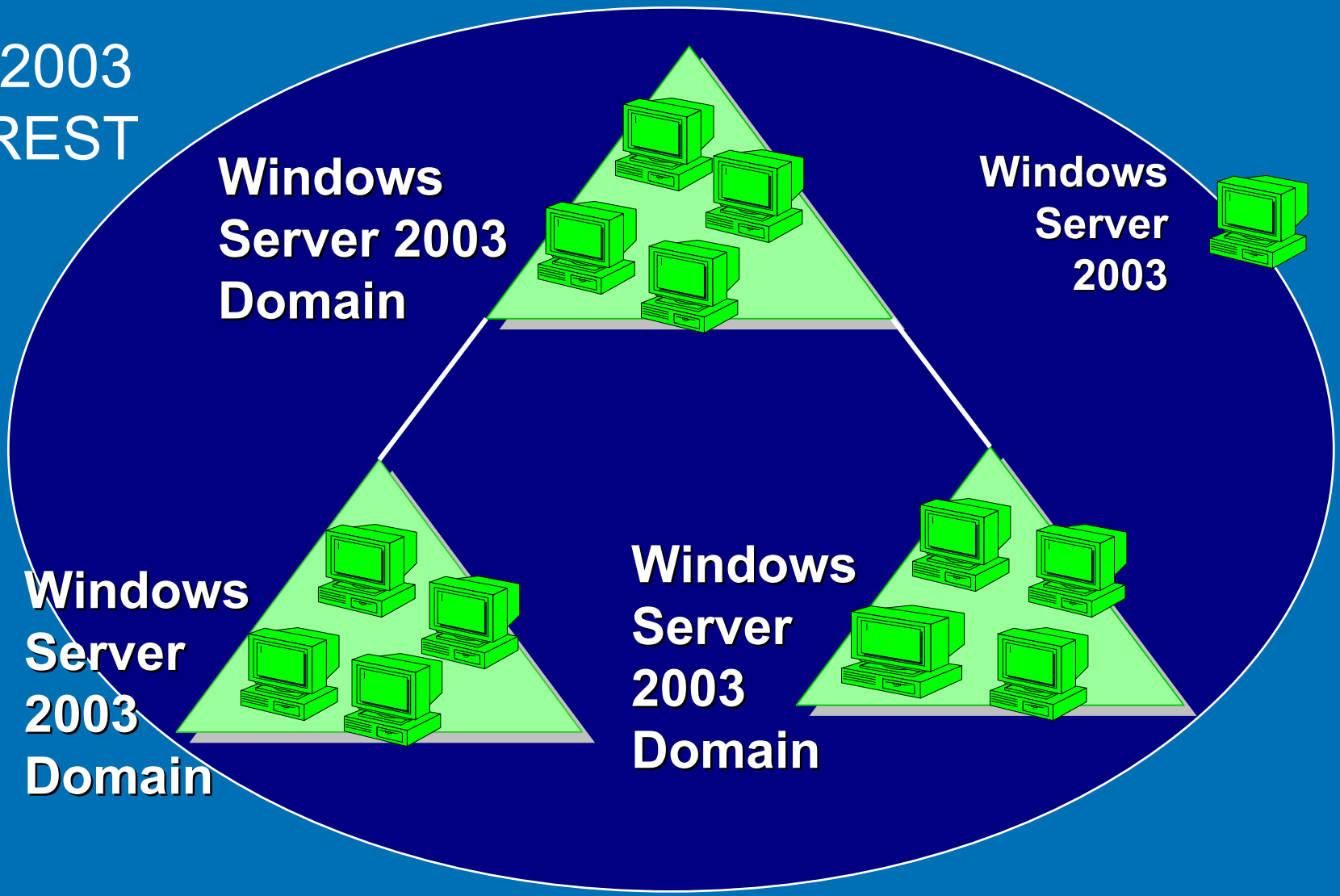
Domain Functional Levels: Windows 2003 Domain in W2K Forest



Windows 2003 “Interim” Level



Windows 2003 Forest:
Full Windows Server 2003 Functionality



Moving From Windows NT to Windows 2003: In Place Upgrade

Windows NT4.0 to Windows Server 2003 upgrade

UPGRADE PREPARATION STEPS:

- Verify the server is supported and up to date
- Record any NIC teaming configurations
- Run the Primer Utility and reboot
- Run RBSU/SCU and update the OS setting
- Reboot and perform the upgrade

Running the Windows 2000 Primer Utility

- Primer Utility removes ProLiant utilities for NT 4.0 not supported under Windows Server 2000/2003
  - Not used when upgrading from Windows 2000

Precautions:

- Dissolves Network Teaming – re-team after upgrade is complete
- Only removes Compaq Cluster Verification Utility from NT4.0 - SSD 2.12C or earlier

Windows NT4.0 to Windows Server 2003 upgrade

Manual Install

1. Run the install from within the NT4.0 OS
2. Insert the Windows Server 2003 CD to begin
3. Install SNMP **Simple Network Management Protocol**
4. After the upgrade is complete - Install the ProLiant Support Pack (PSP)
5. Re-team any NIC's teams dissolved before the upgrade

Windows NT4.0 to Windows Server 2003 upgrade

Unattended Scripted Install/Upgrade:

- See SSSTK Best Practices Guide for information on scripting
- Scripting precautions:

Update the Unattend.txt file

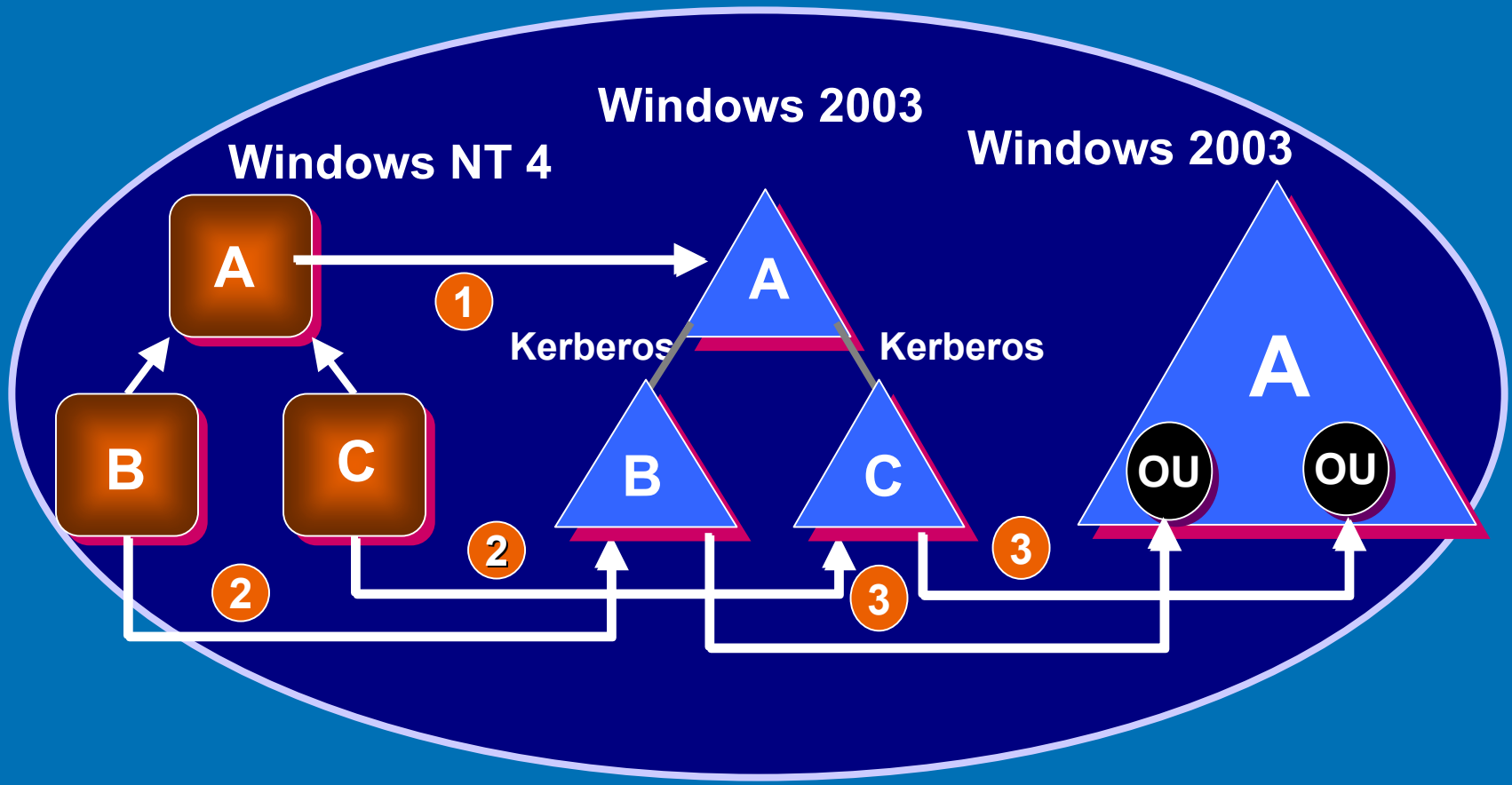
```
                [UNATTEND]
ADD:            NtUpgrade=Yes
```

Note: You must add this line or setup will do a fresh install NOT an upgrade

```
                [UNATTEND]
REMOVE:         OEMPREINSTALL=YES
```

Note: Upgrades may fail if the OEMPREINSTALL=YES option is enabled.

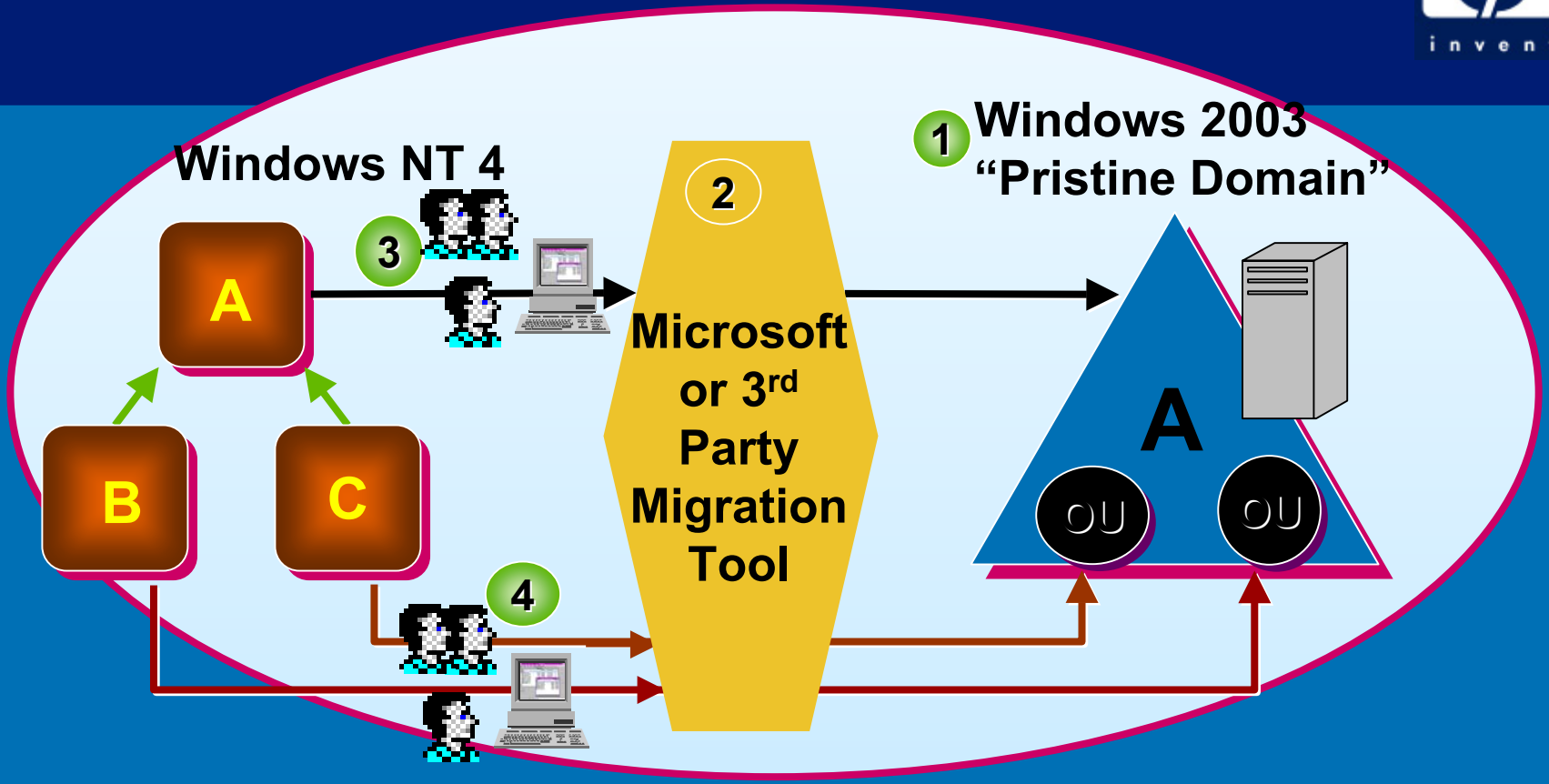
NT Domain Upgrade



Process

- Prepare DNS
- Upgrade PDC first
- Set Forest Functional level to “Interim” when running DCPROMO
- Gradually upgrade BDCs
- Switch Functional Level (forest and domain) to Windows 2003 (Native)

NT Domain Restructure



1. Create pristine Windows 2003 forest/domain/OU structure
2. Configure Microsoft or 3rd Party Migration Tool
3. Migrate global groups, machine accts and user accts from MUD
4. Migrate global groups, machine accts, user accts from Resource Domains to domain OUs

Note: Accts, Groups can migrate to any domain/OU

In-Place Upgrade vs Restructure

In-Place Upgrade

- Maintains domain model
- Retains Users, groups, trusts, settings, services, applications
- Easier, cheaper
- Higher Risk – destroys NT4 Structure

Domain Restructure

- Allows one step domain collapse
- Rebuild trusts, settings, applications,
- Expensive: Additional new hardware, tool
- Lower risk – keeps NT4 structure
- Allows Staged Migration of Users

Migration Plan: Windows 2000 to Windows Server 2003 : In-Place Upgrade

Windows 2000 to Windows Server 2003 upgrade

Upgrade prerequisites:

- Verify the system is supported and up to date
- Verify Microsoft service pack 3 or later is installed
- Verify ProLiant Support Pack 6.30 or later is installed
- Un-team any teamed NIC's
- Uninstall Smart Array multi-path software version 1.0 and shut down the servers and disconnect the redundant path

Windows 2000 to Windows Server 2003 upgrade - Manual

1. From within Windows 2000 insert Window Server 2003 CD to begin the upgrade
2. Follow all instructions for upgrading the server.
3. When prompted, choose to download updated setup files from Microsoft
4. Install ProLiant Support Pack (PSP) for Microsoft Windows Server 2003 Version 6.30A
5. After the PSP is applied NIC's may be re-teamed
6. If HP Smart Array Multi-Path Software Version 1.0 was uninstalled prior to the upgrade, install HP Smart Array Multi-Path Software Version 2.0. Then, reconnect the redundant path.

Windows 2000 to Windows Server 2003 upgrade - Scripted

1. Using *SETUPMGR.EXE*, create an answer file unattend.txt
2. Modify the [UNATTEND] section of the *unattend.txt* file:

ADD: [UNATTEND]
NtUpgrade=Yes

Note: You must add this line or setup will do a fresh install NOT an upgrade

REMOVE: [UNATTEND]
OEMPREINSTALL=YES

Note: Upgrades may fail if the OEMPREINSTALL=YES option is enabled

After the upgrade completes:

- Install the ProLiant support pack 6.30 or later
- If multi-path software was un-installed, upgrade to version 2.0

Known Issues Encountered During Upgrade

1. A Windows 2000 manual upgrade to Windows Server 2003 prompts message reporting the need for CPQTEAM.DLL. – Select cancel to continue upgrade install PSP after upgrade completes.
2. HP Smart Array Multipath Software Version 1.0 is not compatible with Windows Server 2003. – Upgrade to version 2.0
3. Software fault tolerant volumes (dynamic disks) fail during driver upgrade or rollback. – must restore from backup
4. Upgrading miniport driver for secondary device requires reboot.
5. Startup and Recovery Server options revert back to default settings after an upgrade. – change back to the desired setting
6. ProLiant Advanced System Management Controller Driver for Microsoft Windows Server 2003 (CPQASM.SYS) will not load on the ProLiant 3000, 5500, or 6500. – Use cp003476.exe

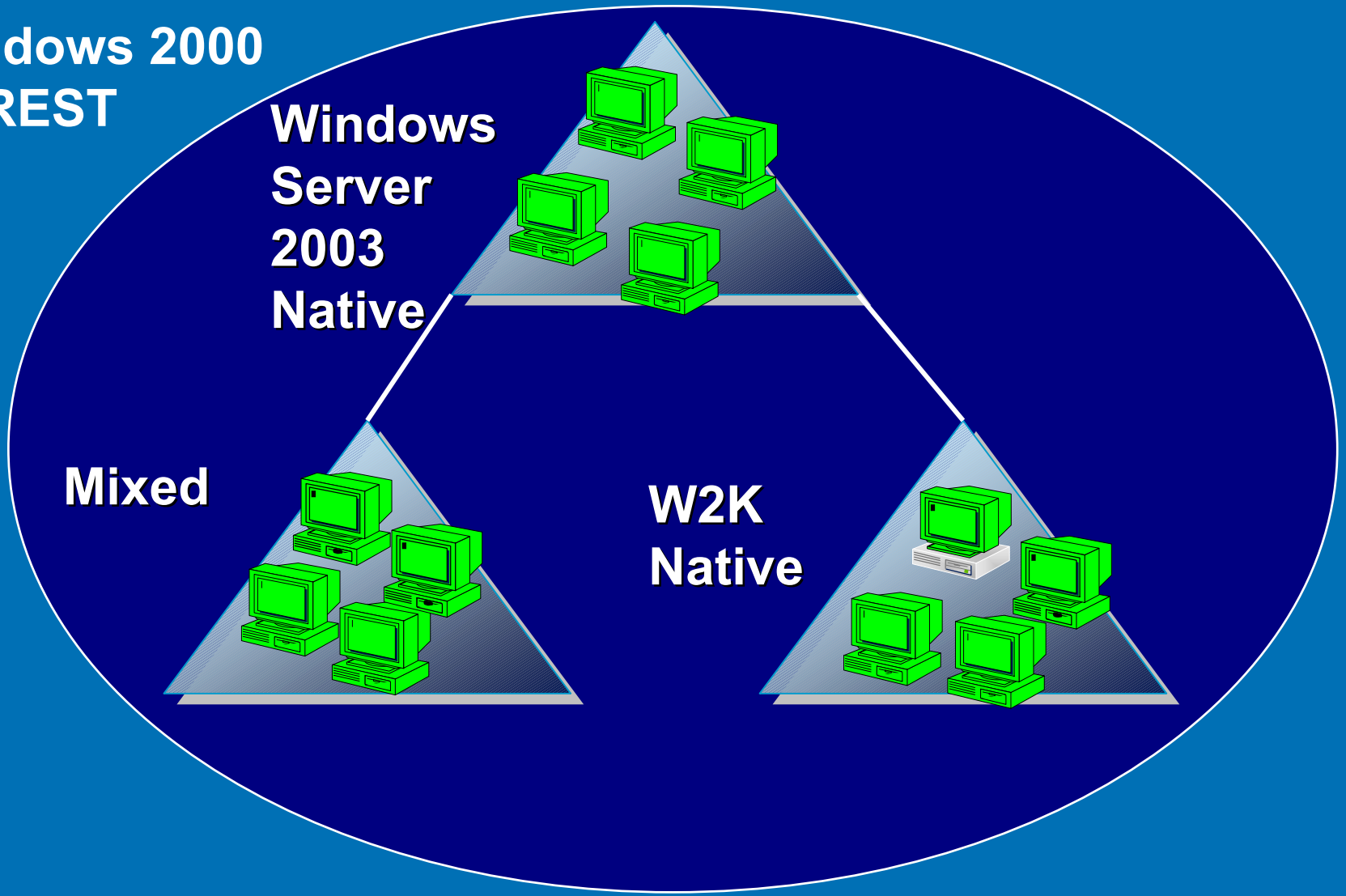
Pre-upgrade Checklist

- Check the HCL
- System State Backup
  - At least 1 DC in each domain +forest root
- Inventory Domain Controllers in the forest
  - Windows 2000 SP3 (best)
  - Windows 2000 SP2 (minimum)
- Verify end to end AD replication throughout the forest
  - W2K3 or XP: Repadmin /Replsum
- Verify FRS Replication
- FSMO role owners inventory
- Event Logs – errors, warnings of interest
- Disk Space inventory

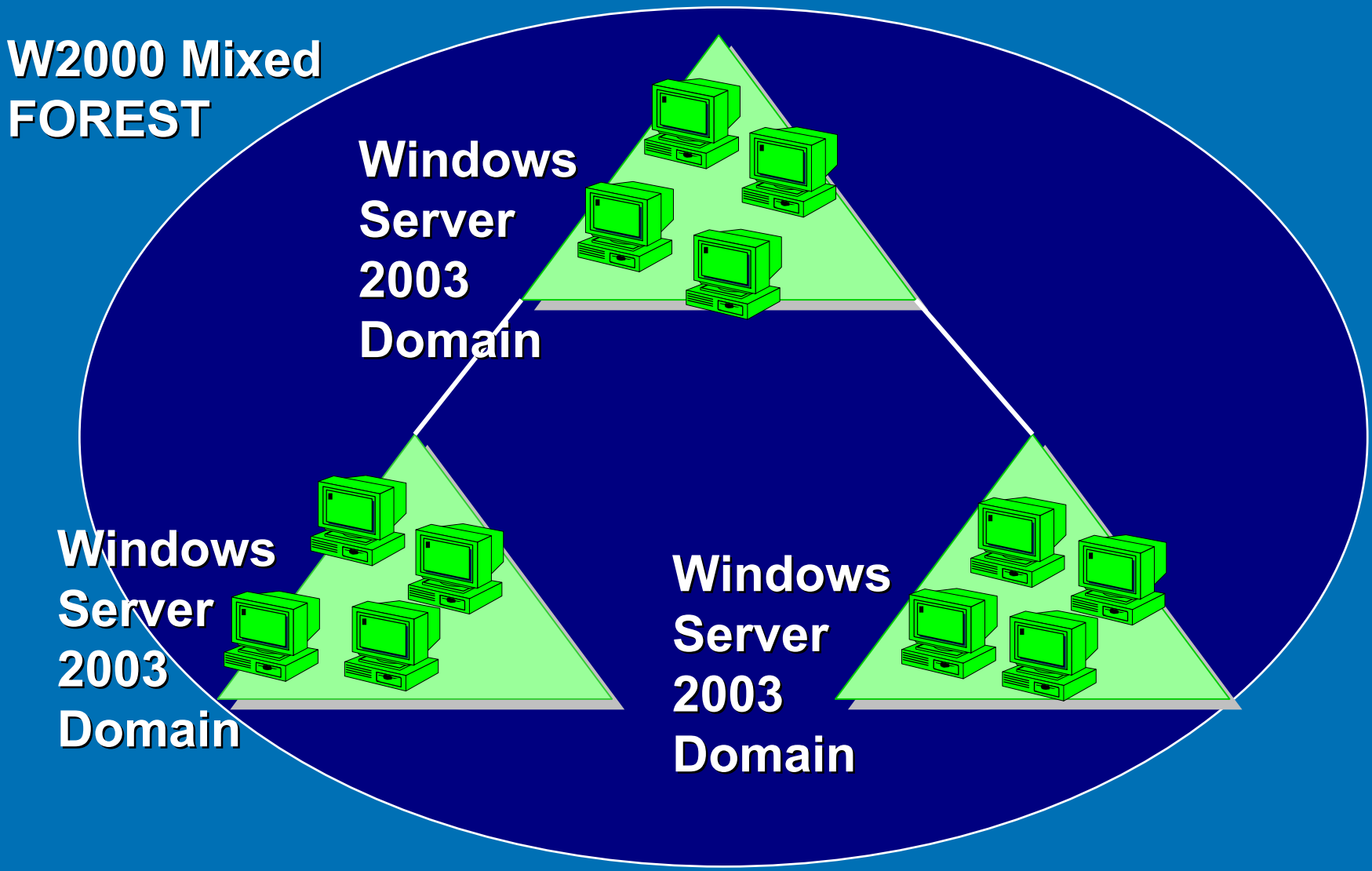
ADPrep /ForestPrep

- Windows 2000 – 2003
  - Run prior to upgrading 1st DC
  - Upgrading DC without ADPrep first = Fatal Error in upgrade
- Location: Windows 2003 Server CD \i386\adprep.exe
- Runs on the Schema Master server
- Not Forestprep, DomainPrep for Exchange
- ADPrep/ForestPrep – prep's the forest
- ADPrep/DomainPrep – on each domain
- Extends the AD schema (version 30)

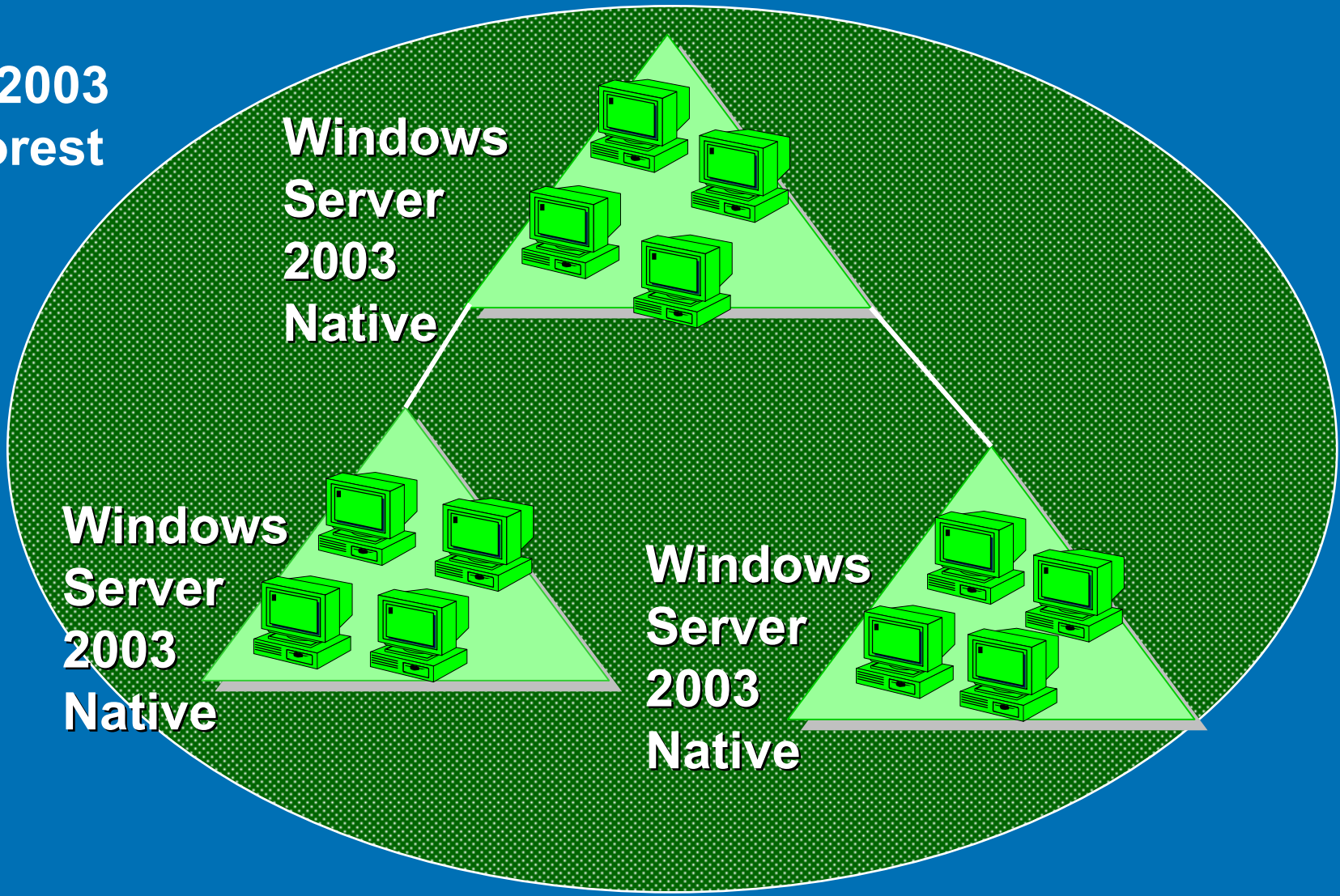
1. Upgrade all DCs in Forest to Windows Server 2003



2. Raise Domain Functional Level to Windows Server 2003

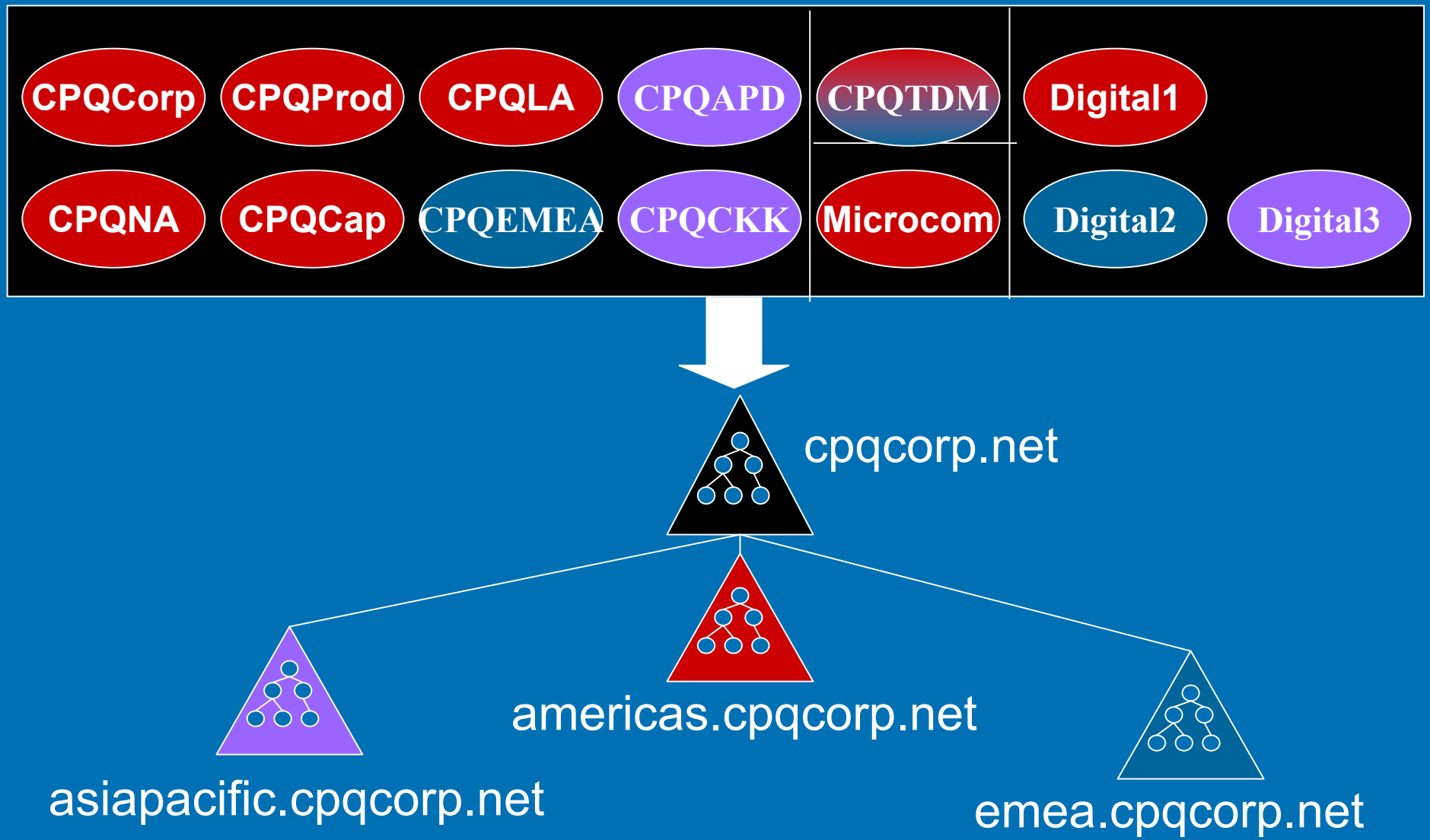


3. Raise Forest Functional Level to Windows 2003

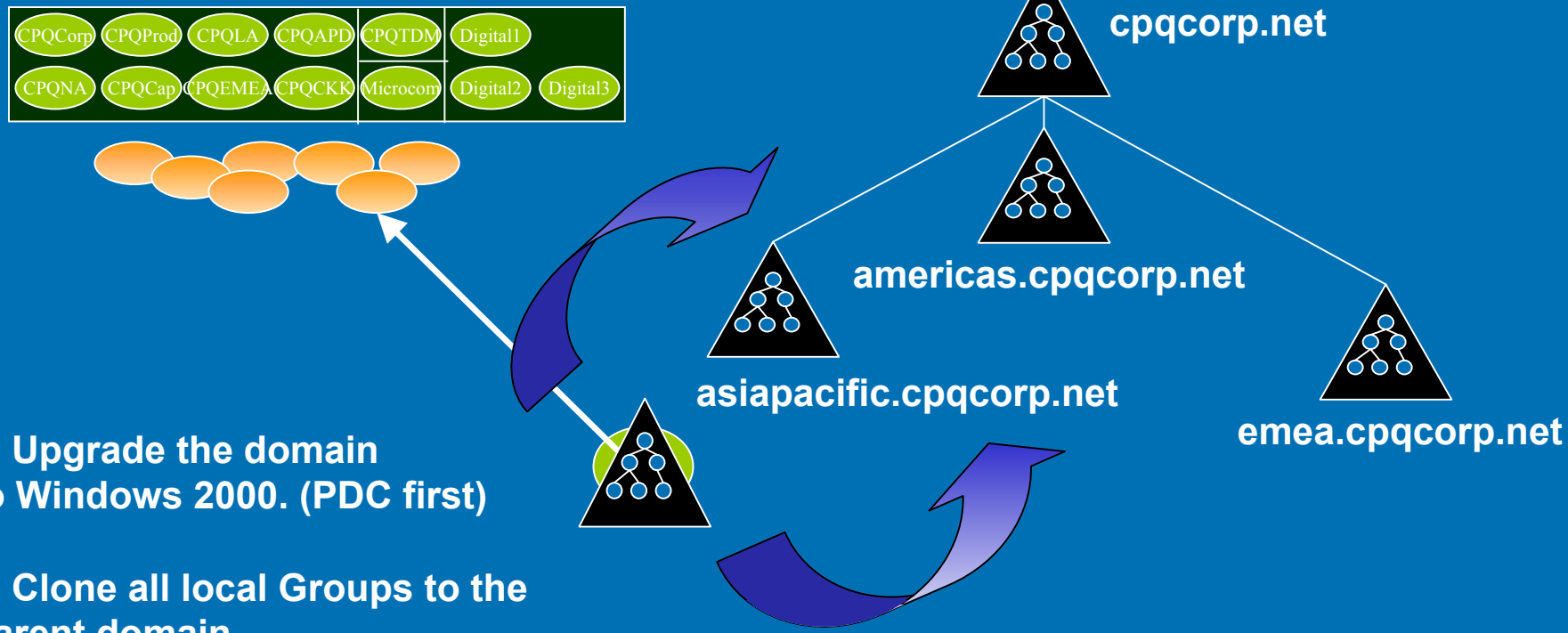


Moving From NT 4 to Windows 2003: Restructuring

Compaq's Master Domain Migration



Resource Domain Migration



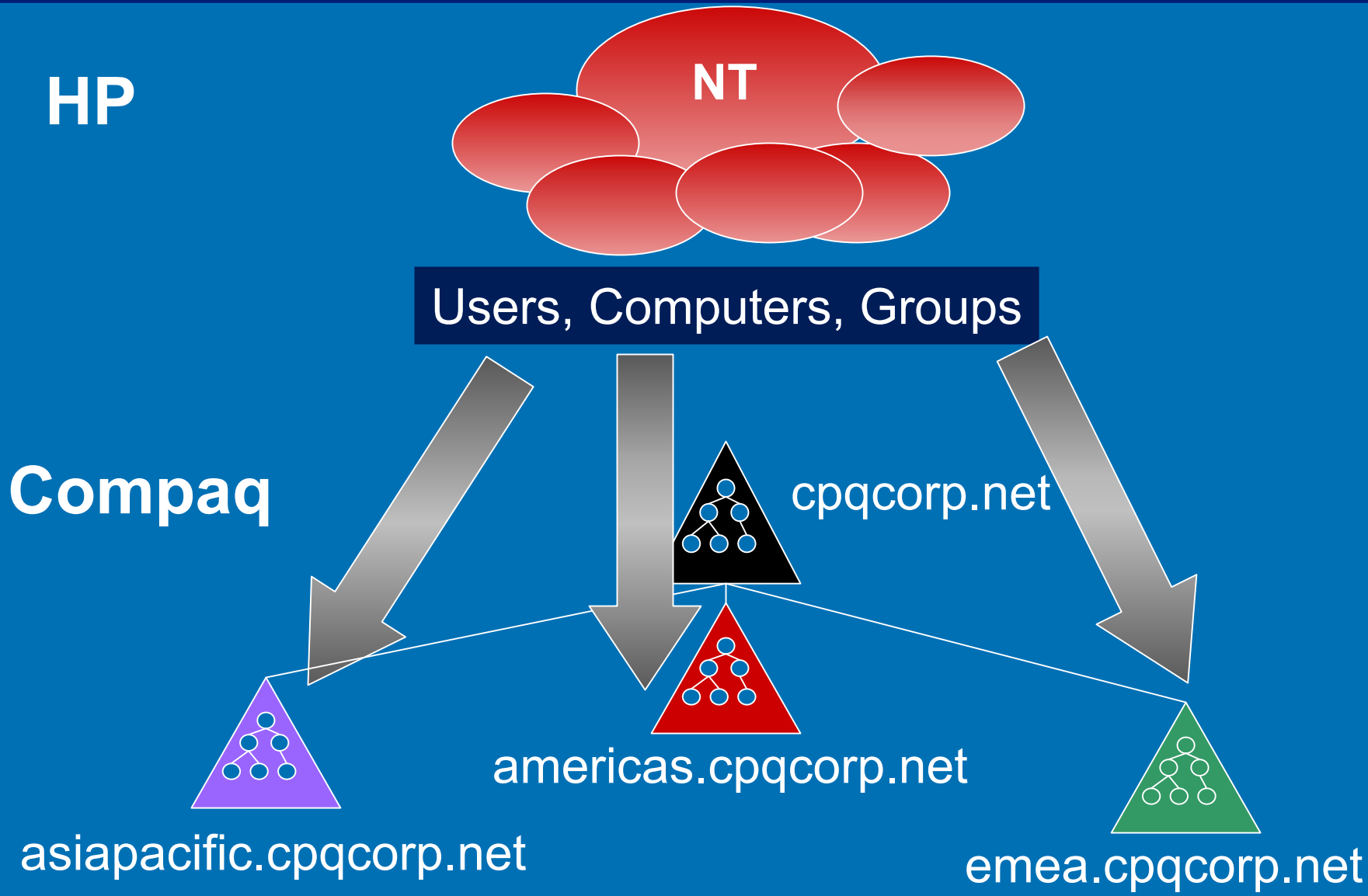
1. Upgrade the domain to Windows 2000. (PDC first)

2. Clone all local Groups to the parent domain.

3. Demote old BDCs to member servers. Keep one BDC off line - for Disaster Recovery

4. Move all Member servers to an org unit in the parent domain.

HP's Domain Migration



Proof of Concept & Conducting the Pilot

Proof of Concept

- Build “real world” Test Environment
  - Test machines in remote sites if possible
  - Same Hardware
  - Use Live Data
  - Same Domain Structure
- Test Matrix
  - Sites
  - Servers
  - Error Reports
  - Applications
  - Functionality

Conducting the Pilot

- Destructive, non-Destructive
- Select Users
  - Representative Cross Section
  - Business Units, Sites
  - Applications, Shares, etc.
  - Client HW, OS
- Deployment Schedule
- Application Test Plan
- Rollback and Contingencies
- Documentation
- Evaluation

Deployment:
ProLiant Essentials Software Foundation and Value Packs

Bruce Howard
Systems Software Engineer, HP

ProLiant Essentials Software What's New?

- ProLiant Essentials Foundation Pack
  - SmartStart CD 7.0
  - Management CD 7.0
    - Insight Manager 7 SP2.3
    - HP Systems Insight Manager 4.0
    - Version Control Repository Manager 2.0
- ProLiant Essentials Value Packs
  - Rapid Deployment Pack 1.50
  - Workload Management Pack 2.0
  - Performance Management Pack 2.1
  - iLo advanced pack

What's New for SmartStart 7.00

- Assisted OS installation for ProLiant BL20pG2 and BL40pG2
  - **Uses the USB port on the p-Class I/O cable.**
  - **Supported OS includes Windows 2000 and Windows Server 2003**
- SmartStart boot support available with systems having RILOE and ILO virtual CD
- Enhanced Software Delivery with Packaged Software CDs
  - **ProLiant Software Maintenance CD**
  - **ProLiant Firmware Maintenance CD**
- Downloadable CD Images from SmartStart website
- Enhancement to Subscription Service

Version Control Repository Manager (VCRM)

Catalogs and manages system software and firmware

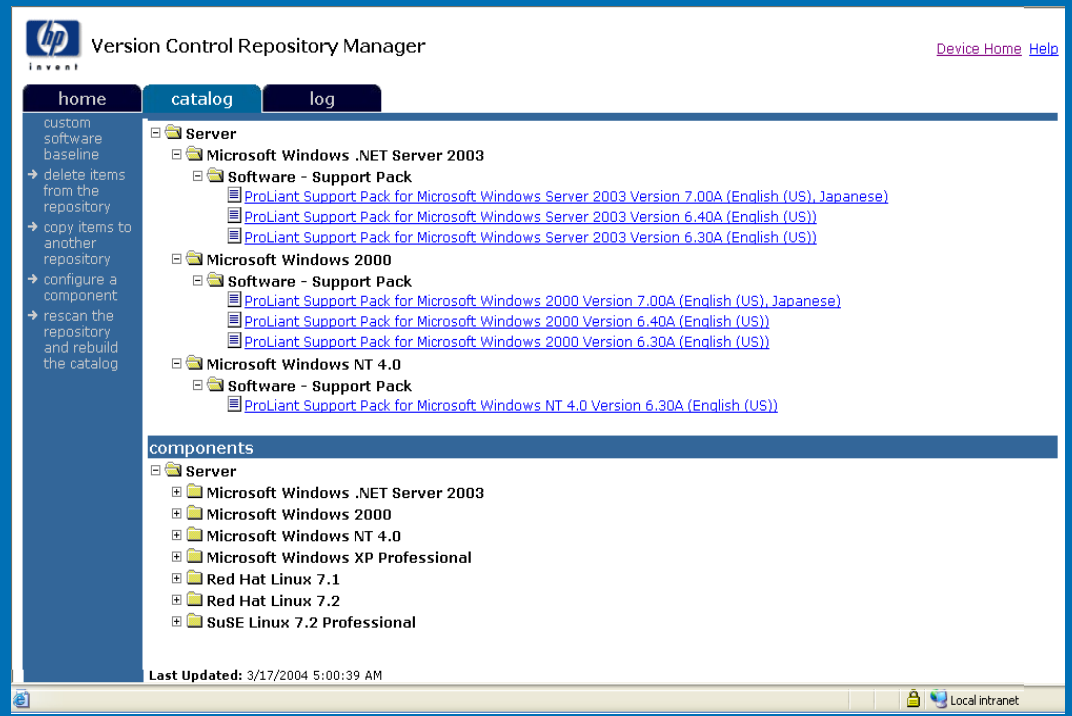
- Repository is stored where the VCRM is installed
- Point Version Control Agents (VCA) to VCRM for updates
- Create custom software baselines for groups or environment

Update Automatically from
- HP website

Update Manually from
- HP website
- SmartStart CD
- Another VCRM

Upload from a web client
- VCA Homepage

SSL security



ProLiant deployment positioning

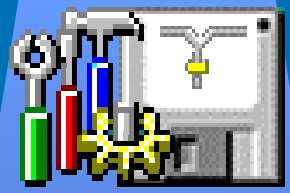
SmartStart CD

single server

interactive, assisted install

interview-based or replication

SmartStart Scripting Toolkit

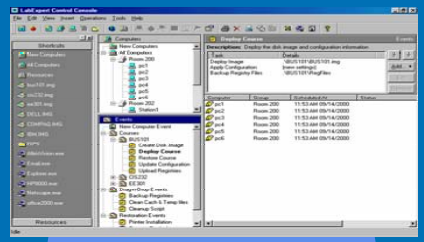


multiple server

automated with boot disk required

customer-created scripts

Rapid Deployment Pack



multiple server

automated from remote console

pre-packaged deployment events

Performance Management Pack (PMP)

- PMP detects and analyzes hardware performance issues on hp ProLiant servers. PMP provides tools to receive proactive notification of building bottleneck conditions and debug existing performance issues.

  - Uses Insight Management agents for monitoring a server
  - Detects and explains hardware bottlenecks
  - Fully integrated with Insight Manager 7 SP2 or later
  - Monitors ProLiants running Windows Server 2000/2003
  - Included on Management CD or download from HP website
  - a license for the first monitored server is included for free

ProLiant Essentials Workload Management Pack

Version 2.0 featuring

Resource Partitioning Manager (RPM)

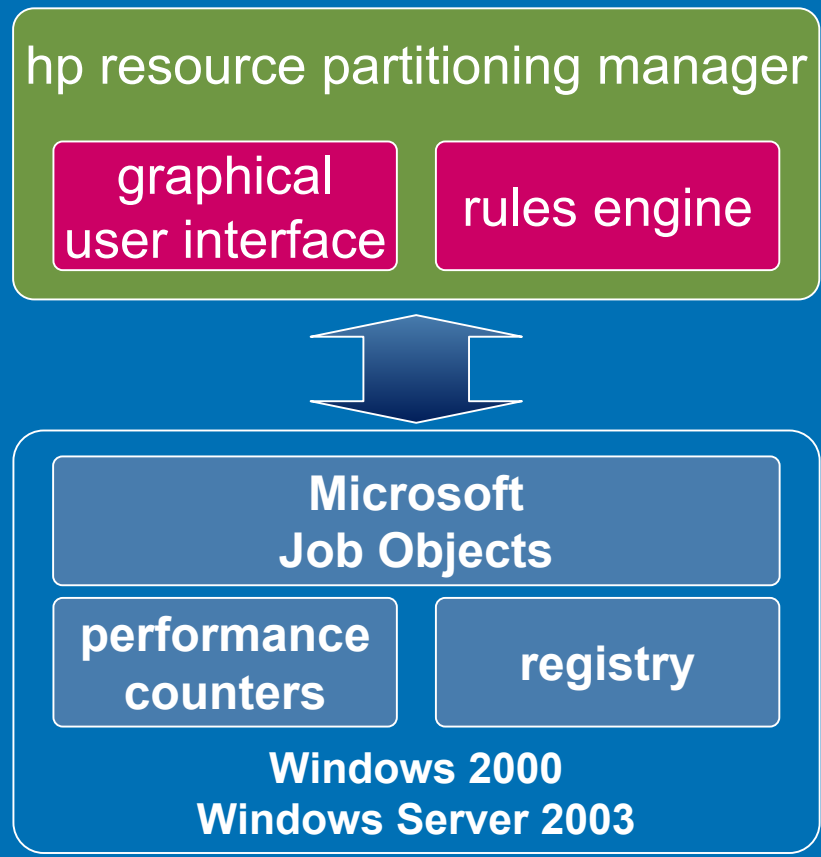
Controls and dynamically allocates system resources

Enables:

- Application consolidation
- Performance optimization
- Maximum utilization
- Lower TCO
- Improved availability

ProLiant Essentials Workload Management Pack

- **Utilizes OS-native Microsoft Job Objects to create resource partitions that contain processes within a CPU and memory context**
- **Rules engine dynamically scales resource partitions up or down based on schedule, events or demand**
- **Eliminates system crashes due to runaway processes and memory leaks enabling application stacking and server consolidation**
- **Understands Hyper-Threading (virtual processors) and is appropriate for 1 to 8 processor systems and beyond**
- **Licensed per system – not CPU**



Windows has the core technology

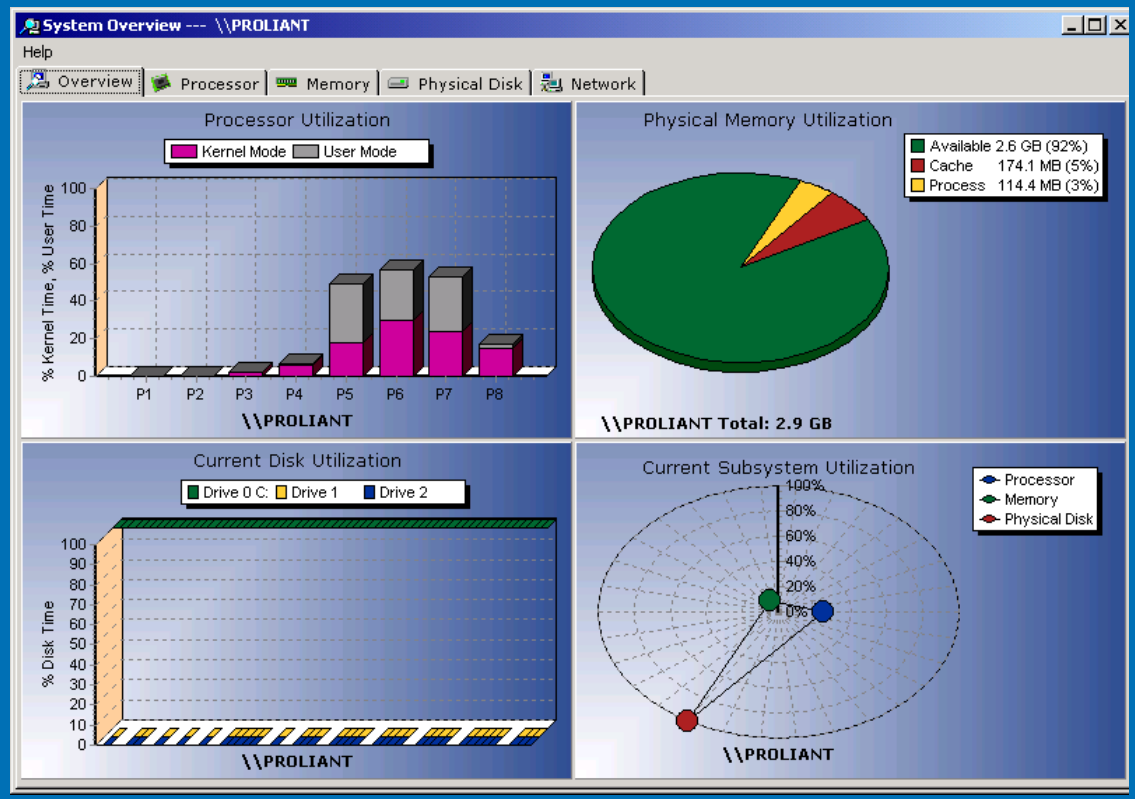
HP makes it simple to use

RPM 2.0
System overview page

Includes system and partition level views of:

- processor
- memory
- I/O performance

Used to quickly assess potential areas for improvement.



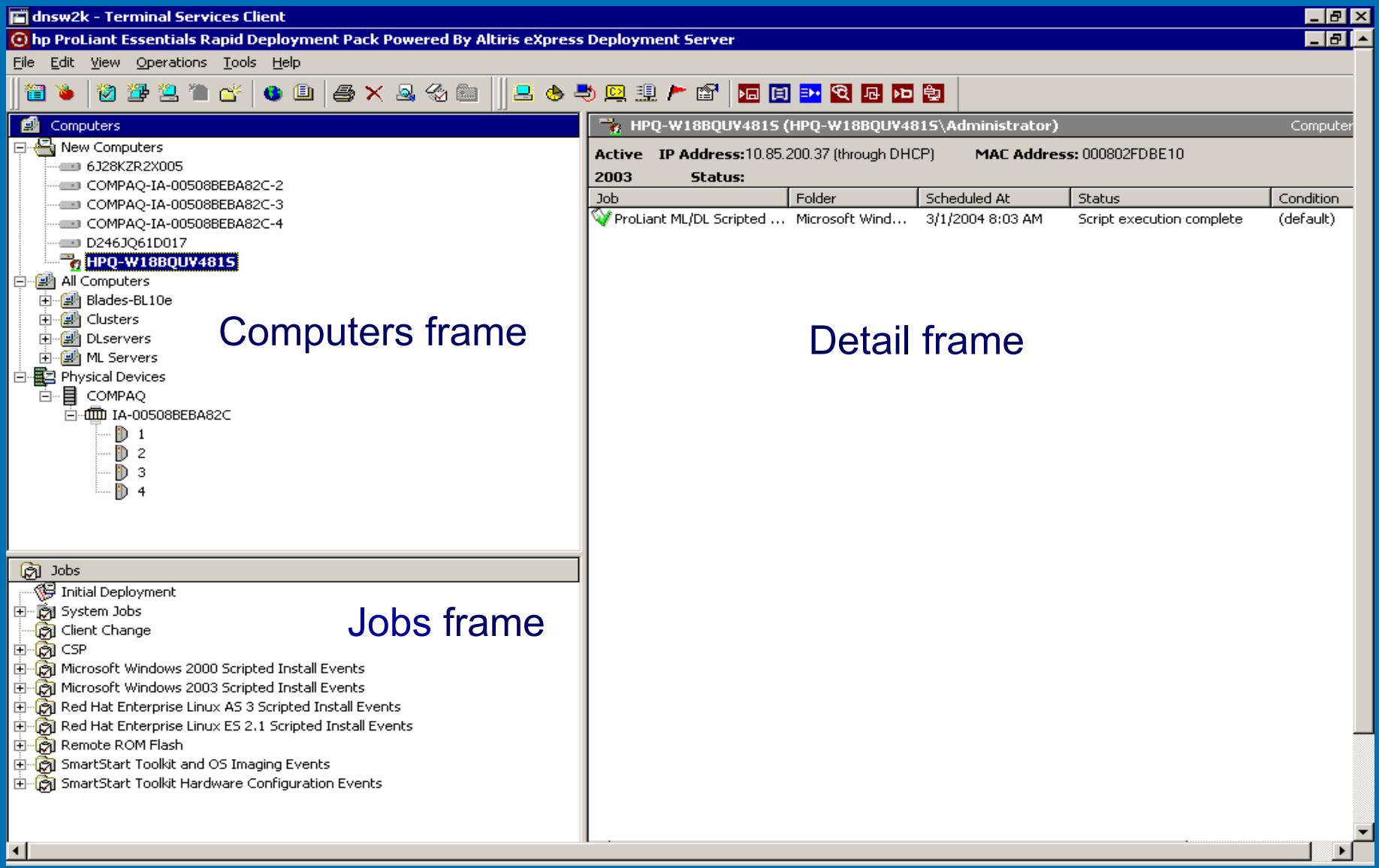
ProLiant
Automated Software Deployment

- PXE boot support for operating system installation
- Rapid Deployment Pack
  - SmartStart scripting toolkit
  - Altiris eXpress Deployment Server
- One-time boot EV for updates
- Supported operating systems
  - Windows Server 2000/2003 Advanced Server
  - Red Hat Linux
  - SuSE

ProLiant Essentials Rapid Deployment Pack

- Key benefits Saves time & money
  - Rapid, deployment of server blades and ML/DL Servers
  - Install 100 + servers with multicast
  - Remote deployment cuts time and travel costs
- Increases productivity
  - Easy to use drag and drop deployment
  - Ships with common install scripts for running out of the box
- Supported servers and OS
  - ProLiant BL ML & DL servers
  - Windows 2000/2003 & Linux
- Licensing - Licensed on a per server basis

RDP – Altiris eXpress Deployment Server console



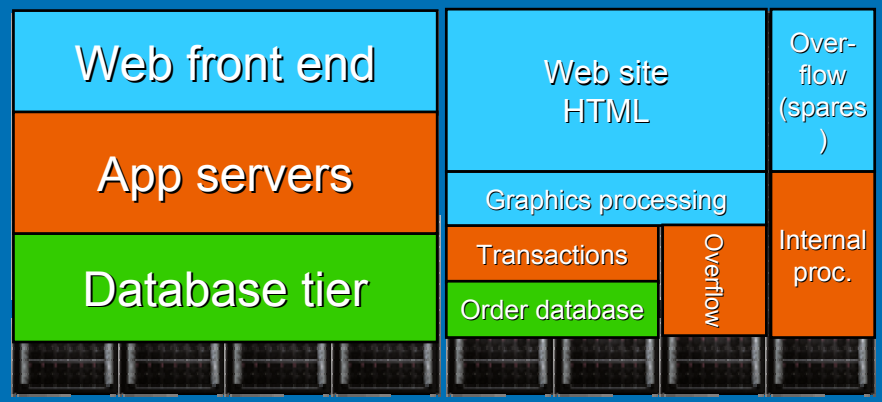
Rapid Deployment Pack (RDP)
Automated policies

- RDP enables fully automated server blade deployment
  - Based on physical location
  - (ex: “rack 5, enclosure 2, bays1-10”)

Automated policy example

  - “All server blades in this location are assigned 'standard' configuration”

- New blades added to this location can be automatically deployed
  - Set IP address and server name
  - Configure hardware and array
  - Land OS, applications and data



ProLiant Blade, ML & DL Servers Management Processors iLO & RILOE-II

- Virtual Presence:
  - Deploy, configure, monitor, update, and troubleshoot remote ProLiant servers anywhere from a standard web browser
- Active Directory integration:
  - Enable authentication, access and authorization of user privileges to iLO & RILOE II via user data stored in AD.
- Hardware based remote administration & control
  - Remote Console – even if server if in a standby or hung state
  - Virtual CDROM, Floppy, Power Button, UID
  - Diagnose before dispatch in the event of failure

Summary

Windows 2003 and ProLiant Migration

- Migration Plan
  - Assessment
    - Existing Environment – NT/2000, Network, Business requirements
    - Windows 2003 improvements
    - ProLiant new features, technology
  - Design
    - Logical
    - Physical
  - Proof of Concept
    - Validate the design in the lab
  - Deployment
    - In Place Upgrade vs Restructure
    - Windows 2003 Functional Level (Native)
    - Take advantage of ProLiant Tools

Questions?