Intermediate

Application Configurations for NetWare® Cluster Services for Netware 5

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Agenda

- Network Availability
- Storage Area Networks Overview
- NetWare Cluster Services™ (NWCS)
- GroupWise® In Depth
- Oracle8i
- ZENWorks™ for Desktops
- Netscape Enterprise Server
- FTP/DNS/LDAP
- DHCP Fail over
- Novell Distributed Print Services™ (NDPS)

“It’s not just the hardware. It’s not just the software. It’s anything that causes a customer to think that their application is unavailable.”

—Alan Wood, Tandem Computers

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“High availability is an implied commitment that every organization, large or small, makes when making its first appearance on the web. Anything less will mean lost customers and prospects.”

—Steve Bourgeois, Principle, Blue Hills Technology Corporation

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Availability

- Textbook equation
  - Time available/total time Installed (or)
  - Uptime/(uptime + downtime) (or)
  - Availability=MTBF/(MTBF + MTTR)
- Increasing availability
  - Max (MTBF)
  - Min (MTTR)
- Fewer failures and faster recovery

Availability (cont.)

- Outage minutes/year

	90%	99%	99.9%	99.99%	99.999%	100%
Minutes	50,000	5,000	500	50	5	0
	34 days	3 days	8 hours			

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What Does Downtime Really Cost?

Industry	Operation	Downtime cost range/hour	Average cost/ downtime hour
Financial	Brokerage opns	$5.6 to $7.3 million	$6.45 million
Financial	Credit card	$2.2 to $3.1 million	$2.6 million
Media	Pay Per View	$67K to $233K	$150K
Retail	Home TV shop	$87K to $140K	$113K
Retail	Catalog sales	$60K to $120K	$90K
Transportation	Airline reservation	$67K to $112K	$89K
Media	Teleticket sales	$56K to $82K	$69K
Transportation	Package shipping	$24K to $32K	$28K
Finance	ATM fees	$12K to $17K	$14K

Source: Contingency Planning Research; Dataquest

How To Avoid Downtime?

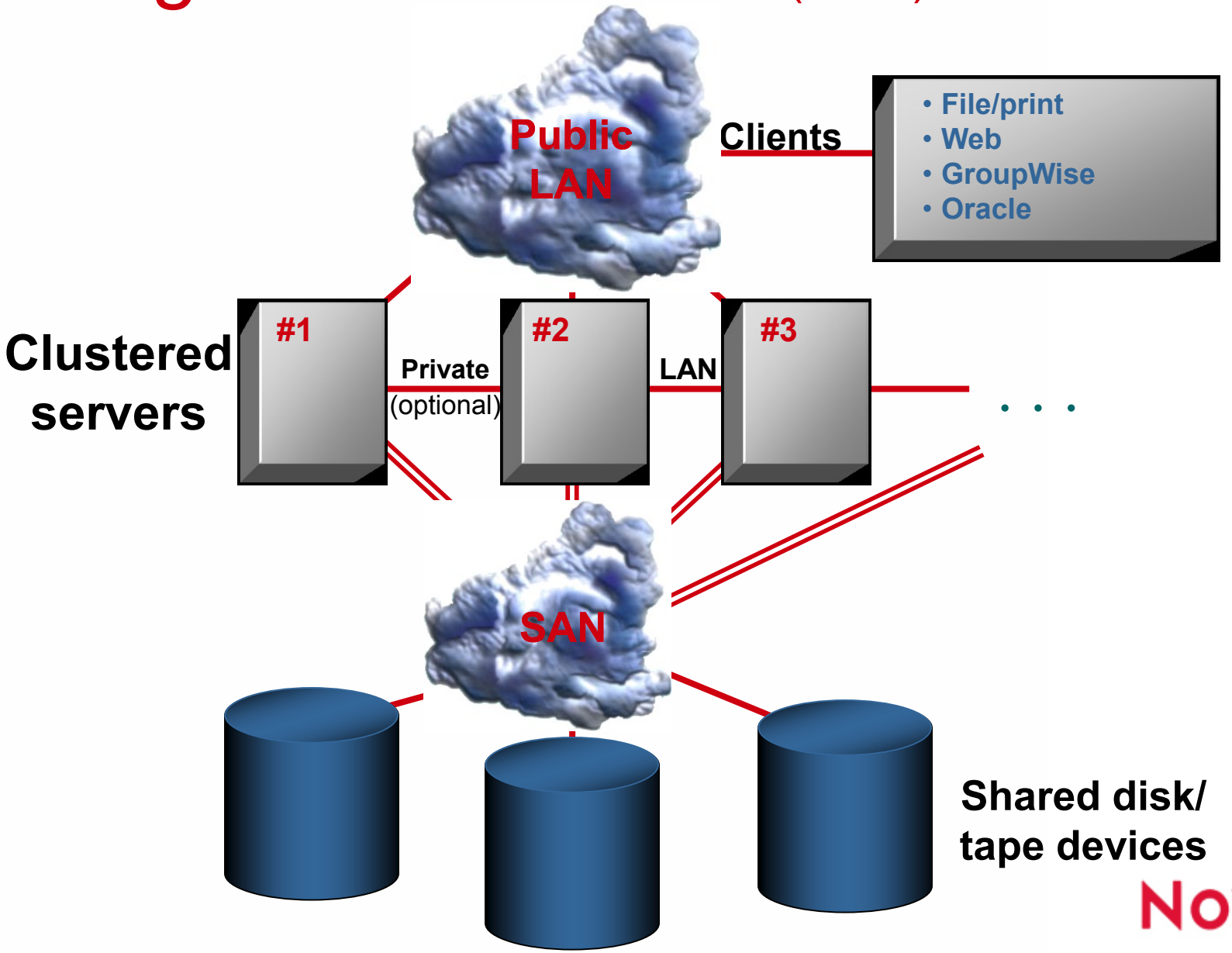
- Simple—build a network that never goes down

High Availability

Storage Area Networks

- A dedicated network connecting servers and storage peripherals
  - Improves data availability, cost of ownership, and server performance
  - Consists of servers, external storage devices, server adapters, hubs and switches, and network and storage management tools
  - Combines the flexibility, manageability and scalability of networks with the high bandwidth and reliability of storage I/O
- *http://www.3com.com/solutions/san/overview.html*

Storage Area Network (cont.)



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SAN Technology Benefits

- “Thin” Server Strategy
- Speed
- Zero Window LAN-less Backup
- Central Data Management
- Zero Wasted Space
- Expansion on the Fly

SAN Technology Benefits (cont)

- Internal Copy and Mirror
- Migration Tool
- Testing
- Separate from LAN
- Ready to Cluster

Cluster Resource vs. Cluster Volume

- Cluster resource
  - Used for client/server applications
    - Web servers
    - GroupWise
    - Databases
    - ZENWorks Inventory
- Cluster volume
  - Used for file access applications
    - Videos
    - Data
    - ZENWorks AOTs
- Each cluster object requires an IP address
  - www.novell.com/documentation/lg/ncs/docui/index.html

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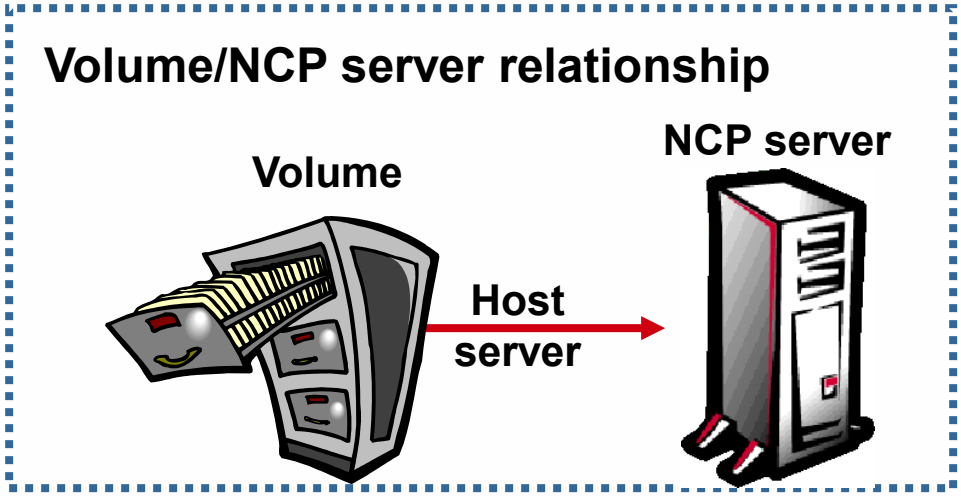
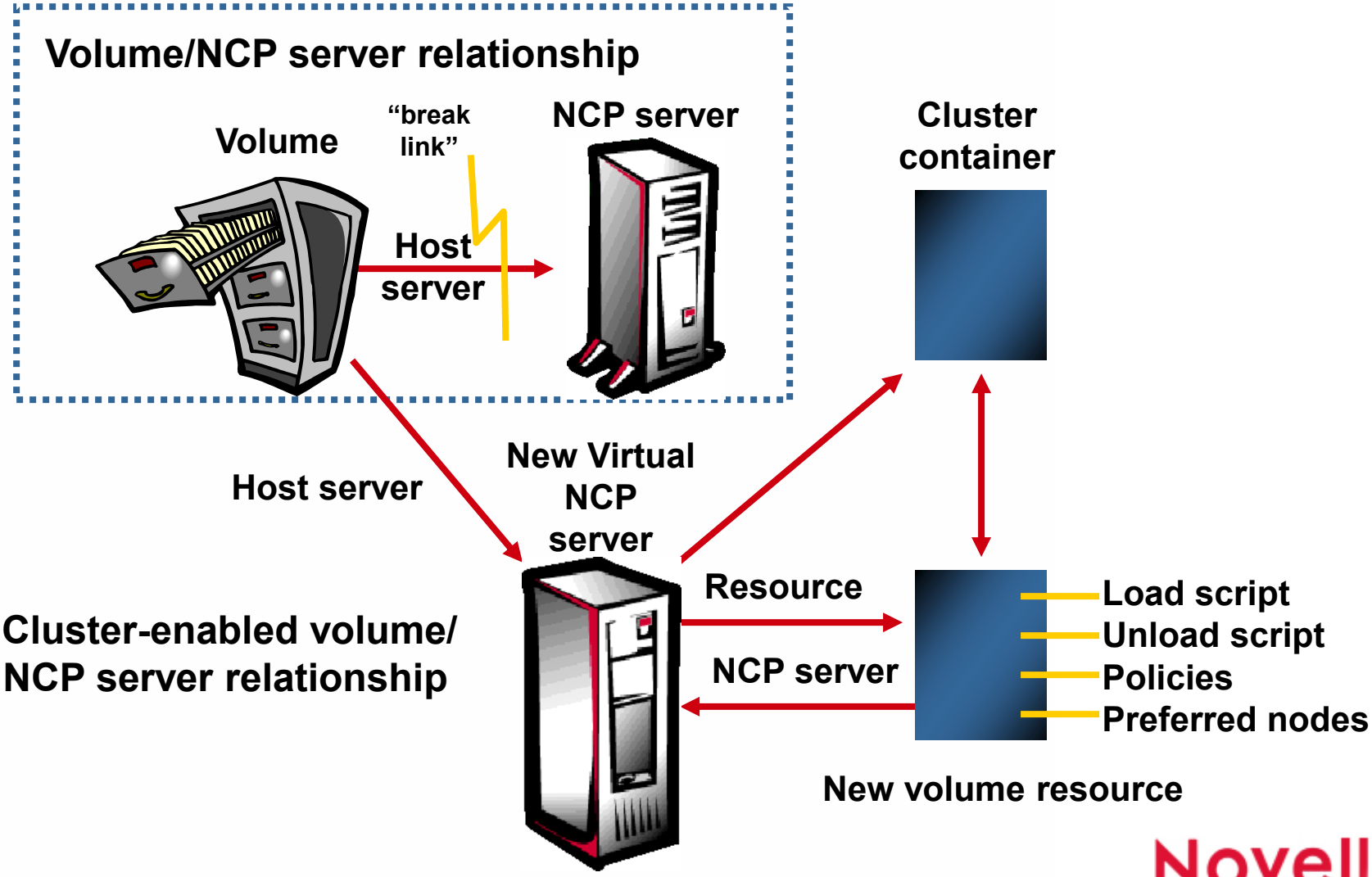
Cluster Volumes



- To get location transparency for volumes
  - Volume ID is dependant on the NCP server that created it
  - Clients need an NCP service to connect to (drive mapping)

Cluster Volumes



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Running Applications on NWCS

- Separating the data from the application
- Determine if a cluster resource or cluster volume is needed
  - Do users need access to the data?
  - Is there an administrative reason to access the data?
- Can the application be resident at all times?
  - I.e., Netscape Enterprise Server
- How will cluster volumes affect your current login scripts?

Migration of Resources

- Scheduled Maintenance
- Scheduled Hardware Upgrades
- Troubleshooting

GroupWise In Depth

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GroupWise Prerequisite Decisions

- Cluster Resource Vs. Cluster Enabled Volume
- PO/Domains Separate or Grouped
- IP and Port Assignments

Post Office/Domains Separate or Grouped

- Separate Volume/Resource for Each PO or Domain
  - More IP addresses required
  - Fan out Fail over available
  - Granular Management
- Grouped PO/Domain for each Volume/Resource
  - Fewer IP addresses required
  - All PO/Domains in Resource must Fail to same server
  - Fail over servers must have CPU headroom for larger Resource

IP and Port Assignments

- How many IP address are available?
  - Non Routable network
  - All Cluster IP addresses must be in same subnet
- Unique Port assignments
  - Each Agent should have a unique Port Assignment within the cluster
  - Consider all Fail over combinations

GroupWise Setup

- Client access must be TCP/IP
- NLM™ can be either on SYS or shared volume
- Each server needs a special /home switch
- MTA to POA communication must be TCP/IP
  - www.novell.com/documentation/lg/ncs/confgenu/data/hq0hm60m.html

GroupWise Demo

- GroupWise Installation
  - Placement of domain/post office databases on shared storage
- Create GroupWise System
  - Link configuration settings
- Startup file modifications
- Create Cluster Resource
- Failover

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GroupWise Installation

- Create NSS volume
- Mount NSS volume
- Map Drive to SYS
- Install GroupWise
- Install Software Distribution Directory on NSS volume

Creating the GroupWise System

- Run NWADMIN to create New GroupWise System
- Place Domain and Post Office Directories on NSS volume
- Assign the MTA & POA the IP of the Cluster Resource
- Assign each Agent in the Cluster a unique port
- Install the Agents to the SYS of every GW server in the cluster
- Do NOT add the GRPWISE.NCF to AUTOEXEC.NCF

GroupWise Startup Files

- Edit the POA startup file to use
  - /HOME-VOLUME_NAME:\PATH TO WPHOST.DB
- Edit the MTA startup file to use
  - /HOME-VOLUME_NAME:\PATH TO WPDOMAIN.DB

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Create a Cluster Resource

- Create a GroupWise Cluster Resource
- Edit the Load script
  - NSS /ACTIVATE=volume_name
  - Mount volume_name
  - add secondary ipaddress a.b.c.d
  - GRPWISE.NCF

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Create a Cluster Resource (Cont.)

- Edit the Unload Script
  - Unload GWMTA
  - Unload GWPOA
  - Unload GWENN2
  - DISMOUNT volume_name
  - NSS /DEACTIVATE=volume_name
  - del secondary ipaddress a.b.c.d
- Select nodes for resource

Considerations

- More Volumes
  - Allows for more granular resource control
  - Uses more IP addresses
- Smaller Post Offices
  - Limits Users affected during down time for GW rebuild
- Separate NSS volumes for each Post Office or Domain
  - Fan out Fail over
  - Troubleshooting via fail over

GroupWise Failover

- 3 node cluster
  - Server Morpheus, Neo, & Trinity
  - Server Morpheus running GroupWise 5.5
  - Policies for GroupWise Resource note:
    - Node order Morpheus, then Neo
    - Automatically start Resource

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GroupWise Failover (Cont.)

- Morpheus Fails
  - Neo and Trinity notices no heartbeat from Morpheus
- SBDs check the SAN to find Morpheus is not writing and confirms failure
- CRMs find that Neo is responsible for A's GroupWise Resource
- Trinity does nothing, Neo begins the fail over process

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GroupWise Failover (Cont.)

- Neo runs the Load Script for the GroupWise Resource
- Neo communicates its state to the cluster
- GroupWise is up & running
- Happens so quickly, users haven’t noticed a thing

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Oracle8i
ZENWorks for Desktops

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Oracle8i

- Add Secondary IP address Before the install
- Create Cluster Resource
- Install Oracle on to the shared volume (don't use a Cluster Volume)
- Store databases on shared volume
  - www.novell.com/documentation/lg/ncs/confgenu/data/hitj3jfq.html
- Create a cluster resource

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Oracle8i Demo

- Show configuration of ODBC client
- Connect to database using Oracle's ODBC test tool
- Migrate Oracle
- Re-run ODBC test

ZENWorks Application Distribution

- Create as a Cluster Volume
- Put AOTs on the Cluster Volume
- Should use Novell Directory Services® (NDS) volume name for source path
- Use of DNS names can also simplify mappings
- Can map to \\ipaddress\volume
  - Must be set as an environment variable

ZENWorks Inventory

- Create a Cluster Resource
- Install ZEN on each cluster node
  - Move the volume to the current server.
- Edit STORER.NCF to use secondary IP
- Move the ZEN commands to load script
  - Be sure to delete from AUTOEXEC.NCF
- Be careful when scripting the unload
  - Java -exit can hurt other running resources

ZENworks Demo

- Configure source path variable for
  - NDS® object name \\TREE\.Vol.context
  - DNS/IP address
- Install application while failing over the volume

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Netscape Enterprise Server
DNS/FTP/LDAP
DHCP Fail over
NDPS

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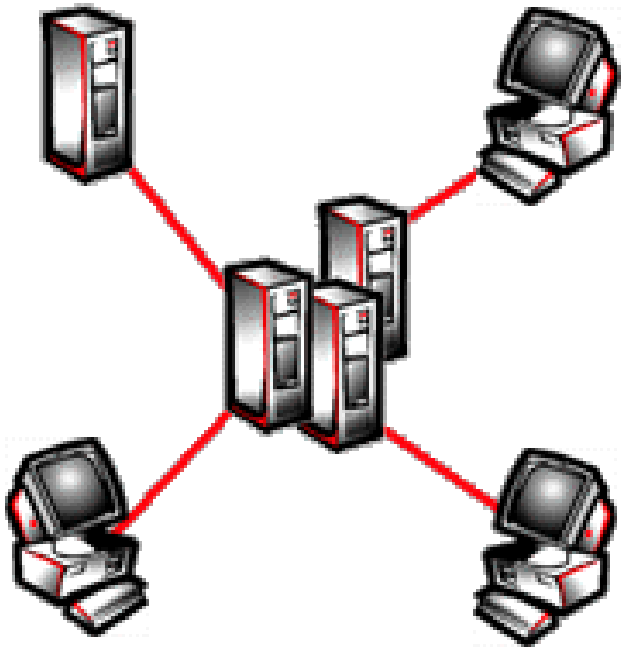
Netscape Enterprise Server

- Can use a Cluster Resource
  - but consider how you'll update the HTML
- All web servers are ACTIVE/ACTIVE
  - Web sites can be across all servers
- Shared volume/IP address floats between servers
- Create a Hardware Virtual server
- Assign Public Read/File scan rights
- www.novell.com/documentation/lg/ncs/confgenu/data/hval90xz.html

Enterprise Server Demo

- Configuration of hardware virtual server
- Demonstration of multiple website fail over
- ACTIVE/ACTIVE configuration



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DNS/FTP/LDAP

- Provides high availability of data/resources
- Bind the secondary IP address first
- Load the services
- Delete the secondary IP address
- For LDAP
  - modify the sys:etc\hosts file
- FTP requires shared volume
- DNS/LDAP don’t use shared volumes

DNS/FTP/LDAP Demo

- eGuide LDAP fail over
  - eGuide points to LDAP secondary IP address
- DNS resolution fail over
  - configure client machines to use DNS secondary IP address
- FTP access fail over

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DHCP Fail over

- Create as a Cluster Resource
- Does not use shared volume
- Maintains address assignments
- Reduces need to split IP pool in half
- Users' will always get an address
- Addresses are preserved

NEPS™

- Create a Cluster Volume
- Move SYS:NDPS\REDIR to Cluster Volume
- Establish a connection with the Cluster Volume
- Spooled print jobs will be restarted
- www.novell.com/documentation/lg/ncs/confgenu/data/hks8ibip.html

Summary

- Separate data to cluster enable applications
- Determine when to use
  - Cluster Resource
  - Cluster Volume
- Many applications can leverage NetWare Cluster Services

Q&A

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