



Virtualization

A Design Perspective

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Discussion Topics

- Planning a solid foundation
- Deployment
- Maintenance
- Best practices
- Questions

Do I even need virtualization?

- Many Aging Servers
- Dynamic Applications
- Power/Cooling Concerns
- Growing Requirements
- Not able to meet SLA's with legacy servers
- Disaster Recovery/Business Continuity

How should I plan my project?

- Work with a VAR
 - Help determine requirements
 - Help develop a complete solution, migration plan
- Work with Peers
 - Ask about their pain points
 - What would they have done different
- Research what will be best for you
 - Blogs, Datasheets, forums, etc.

Planning Best Practices

- Determine what to virtualize and what not to
- Have Capacity Planning reports preformed
 - VMware Partners have access to planning tools
 - Third party vendors such as vKernel, Quest, Veeam
- Determine what features you need/want
- Determine RPO and RTO requirements
 - On a per server/application basis
- Involve upper management
 - Where is the company going in the next 5 years?
 - What are your budget constraints?, Etc.
- Plan for the future, not just today...
You requirements WILL grow.

Planning Hints

- Don't forget licensing "gotcha's"
 - Microsoft, Backup Software, Databases, etc
- Consider 6 core CPU's and fewer servers
- Figure on having 2x your current storage
- Don't rule out 10Gig Ethernet
- Make everything as redundant as possible
- Refer to "Virtualization Design Questionnaire" page

Deployment Overview

- Work Interactively with a VAR
- Use Vendor Best Practice Docs
- Make sure you have a plan...Follow it
- Consider a pilot deployment
- Test your deployment before production use
- Don't change to many things at once

Deployment Considerations

- Networking
 - Multiple VLAN's
 - SAN Networking
 - Separate different traffic types
 - vMotion, Management, DMZ, FT Logging, iSCSI
- SAN
 - iSCSI, Fiber Channel, NFS
- Servers
 - Cores, RAM, Number of NIC's
 - 10Gbps

Networking

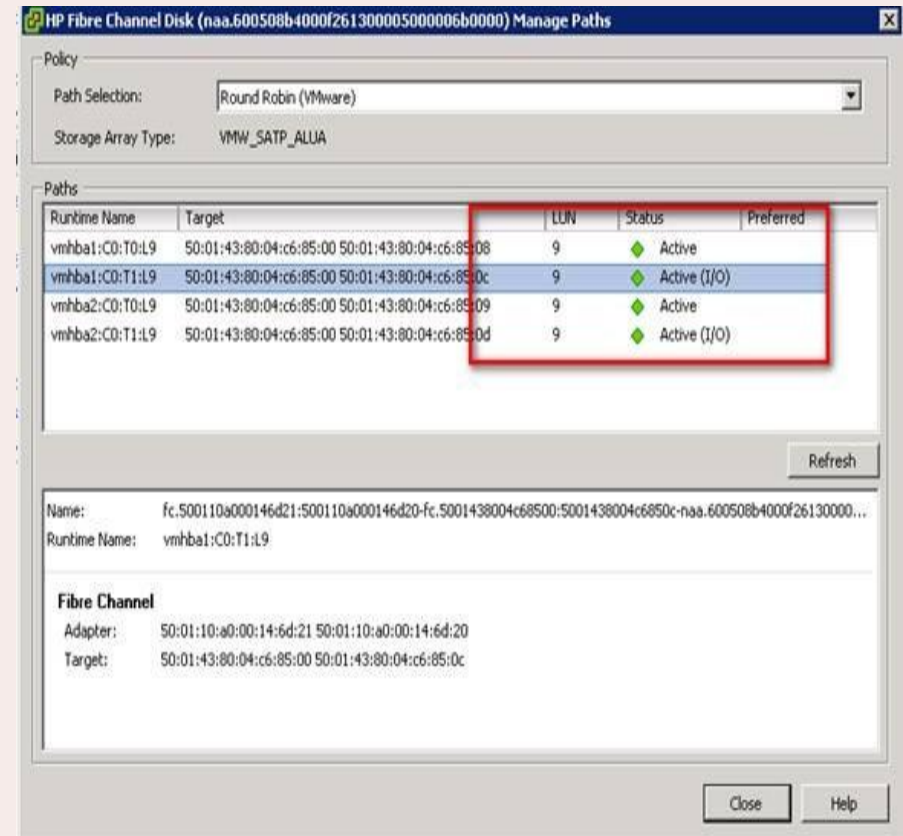
- Redundancy is key, single P.O.F is BAD
- 10Gig is the future and the future is here
- Take SAN requirements into considerations
- Make sure you have enough ports
- Use Cisco 3750g switch stacks (or comparable)
- Separate traffic types onto different VLANs

Networking

- Why Cisco 3750g Switches?
 - 32Gbps Fabric between switches (not just several 1Gbps links)
 - Single Switch Management
 - Ability to cable NIC Teams to both switches while maintaining Active/Active Teams and instantaneous failover
 - Redundancy at an affordable price point

SAN's

- Do you have an existing infrastructure?
 - If so is it extensive?
 - Worth re-using?
- Will your new SAN grow with your business?
- Software or Hardware HBA's?
- Enable multipathing
- Use Round Robin path selection
- Standardize on LUN sizes
- For small environments consider VSA software
- Vendor Best Practices guide = your SAN bible



Multi-Site SAN's

- Users at two sites, need some VM's at each?
- Do you need full SRM capabilities?
- Are offsite backup replications enough?
- Do you have a critical app that must survive even a total site loss?
- Do you have a foundation in place to support multi-site VM failover?

Servers

- Get the most dense Core-to-Socket ratio as licensing will allow
- Microsoft Datacenter licenses require at least 2 sockets per server
- RAM is cheap, overcommitting it is expensive... buy more than you need
- Plan for fail over capacity... Make sure you can lose at least 1 server
 - This will save you from buying the more expensive warranty uplifts
- Pick servers that have 100% hardware monitoring from inside hypervisor
 - HP and Dell have custom ESXi builds specific for their servers for Max compatibility

The screenshot shows the VMware ESXi Configuration page for a Hewlett-Packard ProLiant DL380 G6 server. The left sidebar lists hardware and software categories. The main area displays a table of sensors with their status and readings.

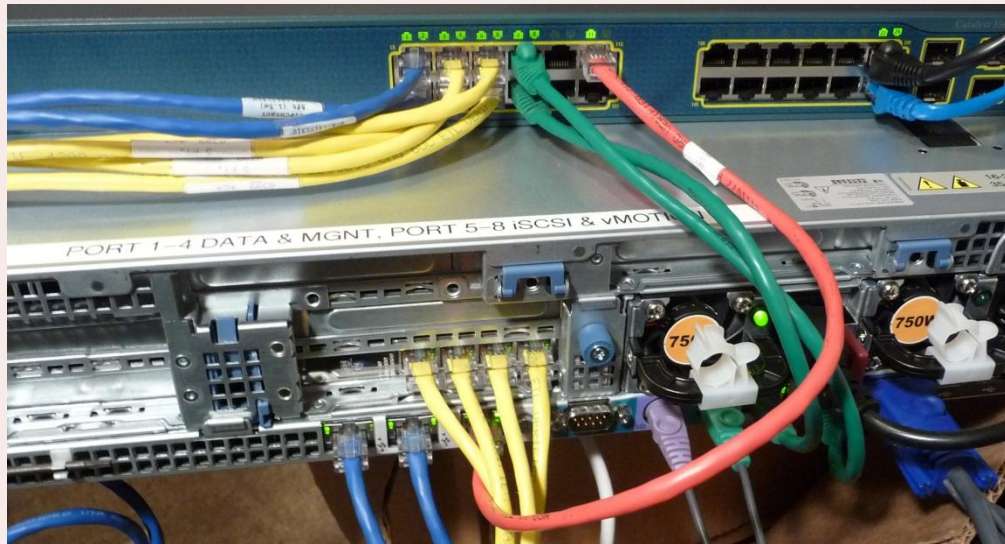
Sensor	Status	Reading
Hewlett-Packard ProLiant DL380 G6	Normal	
Processors	Normal	
Memory	Normal	
Storage	Normal	
HP Smart Array P410i Controller : ...	Normal	Firmware Version : 1.66
Battery on HPSA1	Normal	Battery Status : Fully Ch
Disk 1 on HPSA1 : Port 1I Box 1 ...	Normal	
Disk 2 on HPSA1 : Port 1I Box 1 ...	Normal	
Disk 3 on HPSA1 : Port 1I Box 1 ...	Normal	
Disk 4 on HPSA1 : Port 1I Box 1 ...	Normal	
Disk 5 on HPSA1 : Port 2I Box 1 ...	Normal	
Disk 6 on HPSA1 : Port 2I Box 1 ...	Normal	
Logical Volume 1 on HPSA1 : RAID...	Normal	
Power	Normal	
Temperature	Normal	
Fan	Normal	
Software Components	Normal	

Blades or Standard Servers

- Only use blades for large environments
 - 10 or more host servers
- Special considerations must be taken for HA settings if using blades with VMware
- Conventional servers are just as efficient and nearly as dense
 - HP DL380 with 2 CPU's, 2 HDD's, 32GB RAM uses <200watts with 100% CPU load

10Gigabit Ethernet

- Virtualization requires many gigabit ports per server, as few as 4, as many as 10.
- Increases cost of Switching infrastructure
- Complicates cabling and reduces airflow
- 2 – 10Gig ports per server
 - Subdivide the 10Gig adapter into many 1gig ports
- 10Gig works better then EtherChannel or VMWare balancing
 - Not limited by Src/Dst Hashing techniques



Maintaining your Environment

- Monitoring inside of Hypervisor (Email/SNMP)
- VMware Health Check services
 - Performed by VMware Partners
- 3rd Party Products
 - Veeam, Quest, Microsoft, SolarWinds, etc
- Vendor Training/Conferences

Best Practices

Always remember best practices are dynamic, what is today might after the next hardware or software release. Review your environment regularly with Health Checks

- Plan with failover capacity
- Use Multi-pathing to SANs
- Use similar server hardware
- Always make sure VMware or Xen Tools are up to date
- Monitor your SAN and make sure it doesn't become over provisioned
- Test Backup Images
- Use "LAN-Free" type backups if available
- Do not keep VM level snapshots for extended periods of time (VM level snapshots are for back-out, not back-up)
- Follow all vendor best practice docs that apply to your environment.



QUESTIONS