Make the move to virtualization now!

THE CLOUD AT YOUR FINGERTIPS
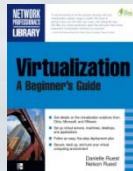
Les Entreprises **Resolutions** Ltd.
Enterprises

IT'S YOUR CLOUD
Powered by Zenith Infotech

www.Reso-Net.com   www.zentihinfotech.com

Speaker Background

- Nelson Ruest: nelson@reso-net.com

- Recent books:

  - Virtualization, A Beginner's Guide
    http://www.amazon.com/exec/obidos/ASIN/007161401X/ref=nosim/gettextbooks-20

  - 70-652: Configuring Windows Server Virtualization with Hyper-V
    http://www.microsoft.com/learning/en/us/Book.aspx?ID=13695&locale=en-us

  - 70-238: Deploying Messaging Solutions with Microsoft Exchange Server 2007
    http://www.microsoft.com/learning/en/us/book.aspx?ID=10938&locale=en-us

  - 70-640: Configuring Windows Server 2008 Active Directory 2nd edition
    http://www.microsoft.com/learning/en/us/Books.aspx?Id=14910&locale=en-us#tab1

Agenda

- State of the Union
  - What are the most influential benefits of the cloud now that it has become mainstream?
- The Cloud
  - What does a complete cloud-based organization look like?
  - Which layers should be virtualized in the organization stack?
- Affordability
  - Is the cloud at the reach of small and medium organizations?
- The Future Today
  - What is the next step?
  - Where do we go from here?

State of the Union

Original Cloud Expectations

Source: Ziff-Davis Research, February 18, 2008
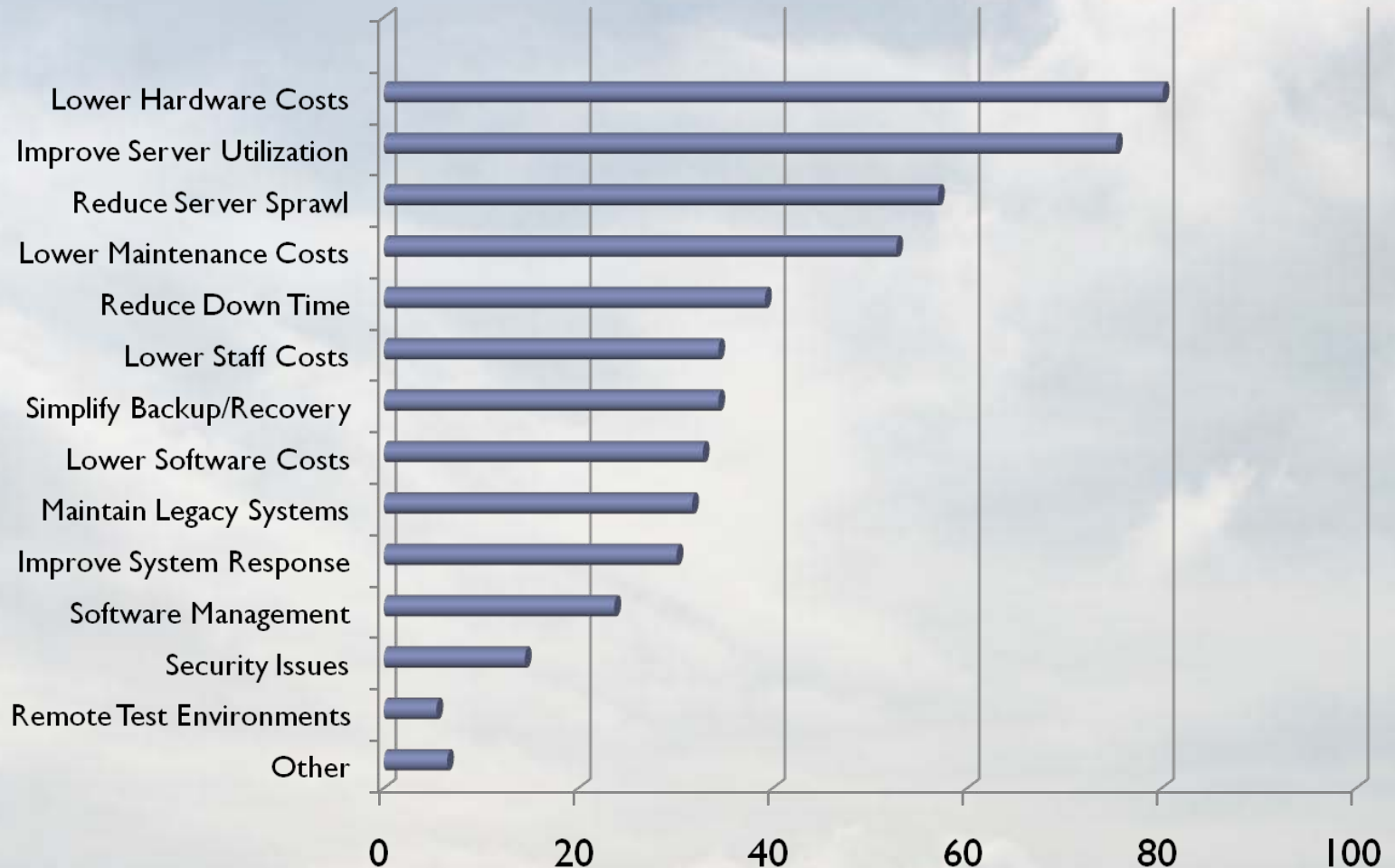
In Reality…

- Machine virtualization has been around for over a dozen years.
- Server virtualization has been mainstream for over five years.
- We now know what the most influential benefits of the cloud are:
  1. Faster response to changing business situations
  2. Easier business continuity
  3. Easier deployment strategies for complex technologies
  4. Better machine availability
  5. Lower maintenance and operating costs
  6. Smaller physical footprints
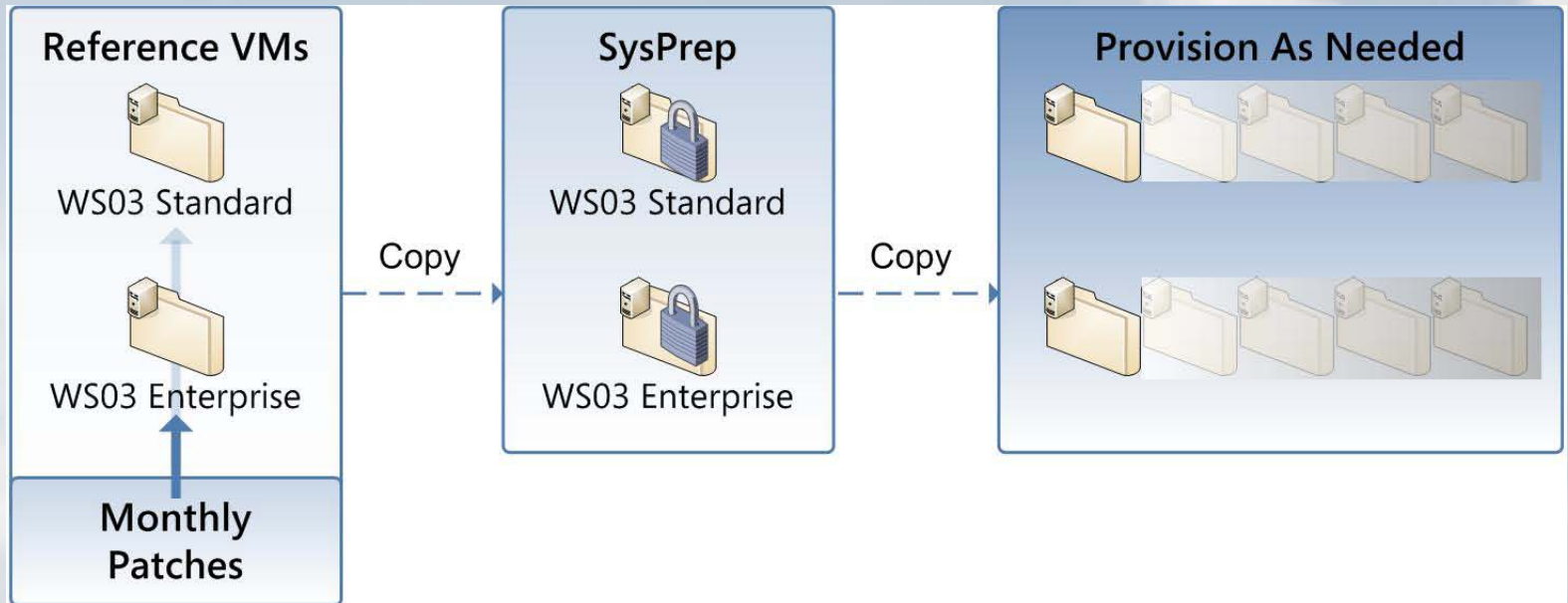 7. Maximization of physical resources

The Cloud

A Basis in Virtual Machines (VM)

- A virtual machine is self-contained operating environment that runs on top of a hypervisor and behaves as if it is a separate computer

- A VM is nothing but a "<u>set of files in a folder</u>" somewhere
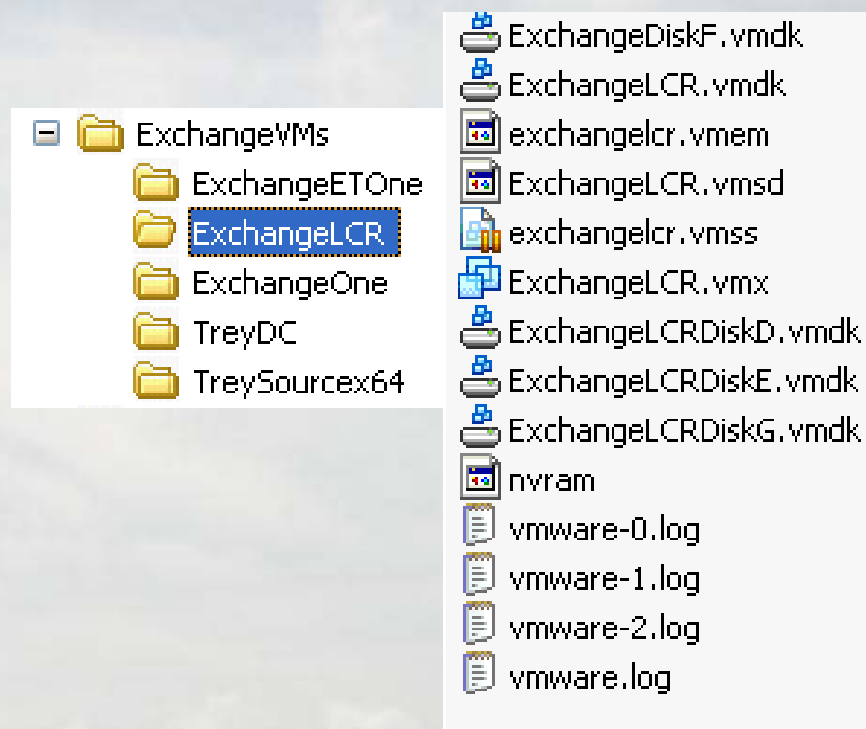
Meeting Changing Business Needs

- Use a four-step process:
  - Keep the Reference VMs on standby until patches are needed
  - Inspect and compress virtual disk(s)
  - Reapply SysPrep as needed (each time patches are applied to the reference VMs)
  - Copy and re-personalize to provision a new system
- Some tools can do this automatically

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Rely on Virtual Appliances

- Virtual appliances (VAP) are preconfigured VMs with specific applications

- Open Source VAPs are readily available (http://www.vmware.com/appliances/)

- But, when it comes to Windows, you must use a different process
  - Start with a Test Drive VHD (http://technet.microsoft.com/en-us/bb738372)
  - Try it out for a while
  - When ready, simply add a valid product key

- You no longer need to become a product expert!

Top 10 Solution Categories

Operating Systems

Networking

IT Administration

VMware Ready

ERP and CRM

Applications Infrastructure

Storage

Collaboration and Communication

Systems Infrastructure

Content Applications

Browse All Categories

The Seven Aspects of the Cloud

1. Server Virtualization
   - Convert a physical instance of an OS into a VM
2. Storage Virtualization
   - Merge physical storage from multiple devices into a single storage pool
3. Network Virtualization
   - Convert bandwidth into independent channels for specific resources
4. Management Virtualization—split into two areas:
   - Resource Pools (RP)—all hardware
   - Virtual Services Offerings (VSO)—all VMs
5. Desktop Virtualization
   - Rely on VMs to provision desktop workplaces
6. Application Virtualization
   - Decouple applications from the OS
7. User State Virtualization
   - Remove user data from within the desktop

Additional Terms and Definitions

- Host Server
  - The physical server running virtual machine workloads
- Guest OS
  - A virtualized operating system running as a workload on a host server
- Live Motion
  - Moving VMs from host to host while it is running without disrupting user operations
- Guest OS Clustering
  - Clustering machines within the virtual layer to provide high availability without Live Motion
- Policy-based Workloads
  - VSOs that are powered up on an as-needed basis through automated policies

How Do you Start?
Build a Layered Architecture

- In a cloud architecture you build different layers of virtualization and address each with a particular construct

 - The physical layer is the first and includes each component within the resource pool

1- Physical Layer

Storage Layer

– The second layer relies on storage virtualization technologies to provision just as many logical units that you need for physical and virtual resources
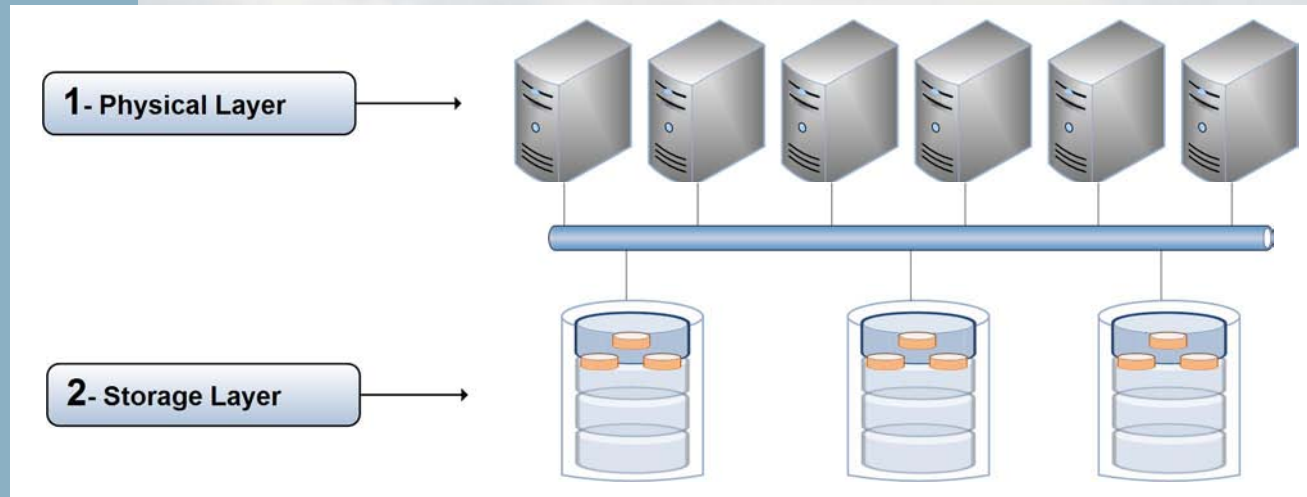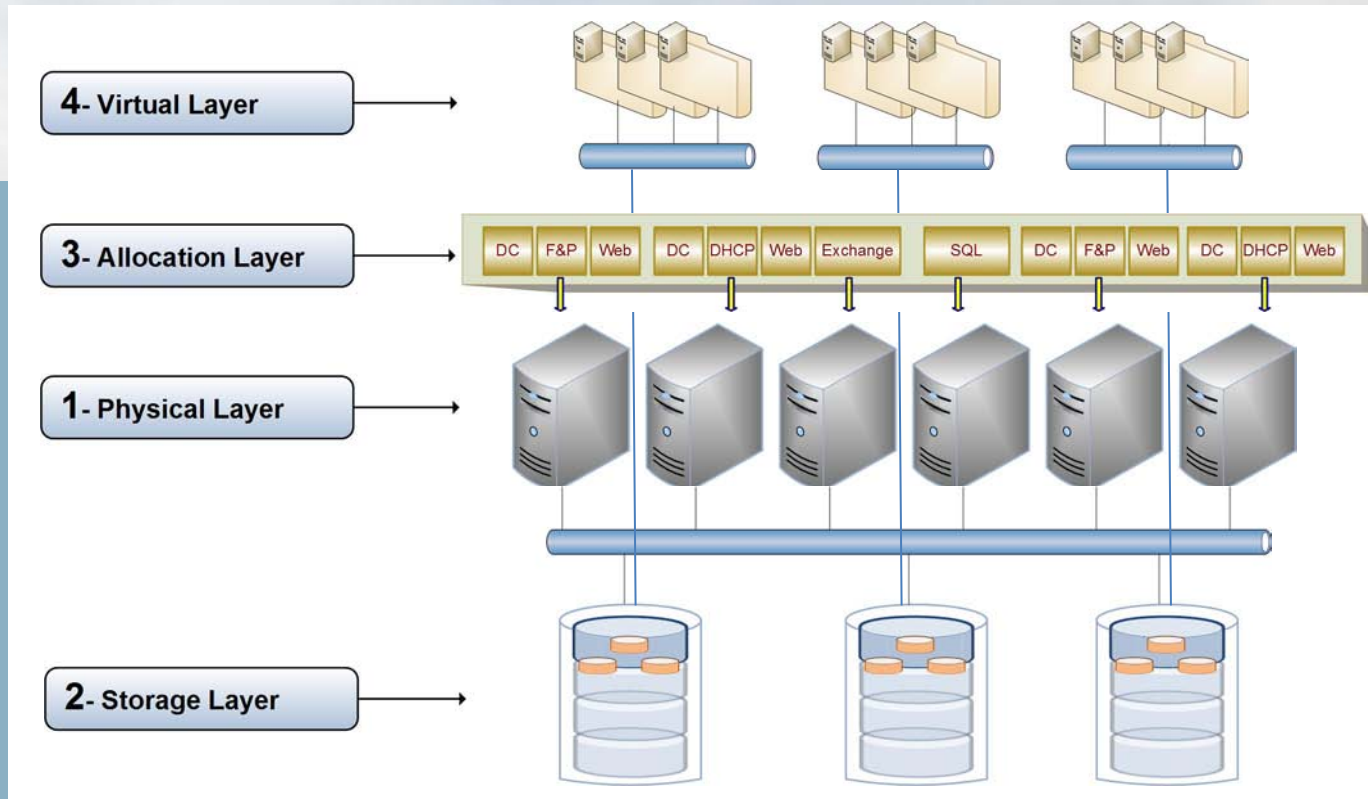
Allocation Layer

- – The third layer allows you to dynamically move the virtual service offerings from one physical host to another when additional resources are needed
- – The allocation layer transforms the datacenter from static to dynamic
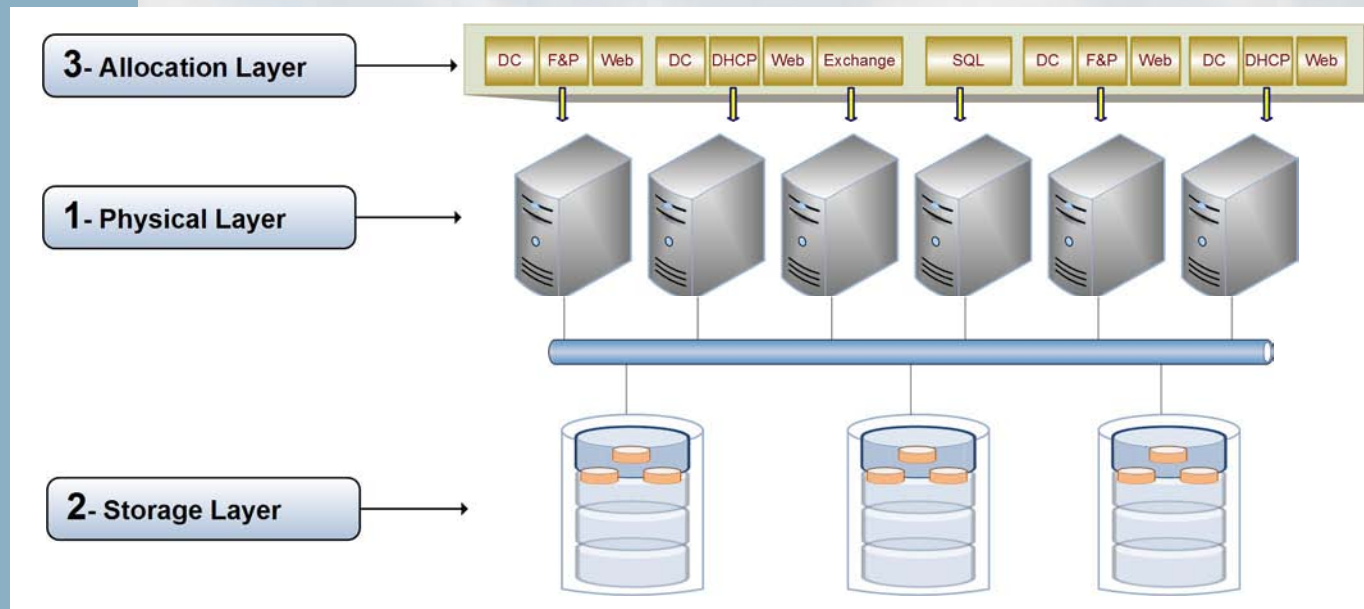
Virtual Layer
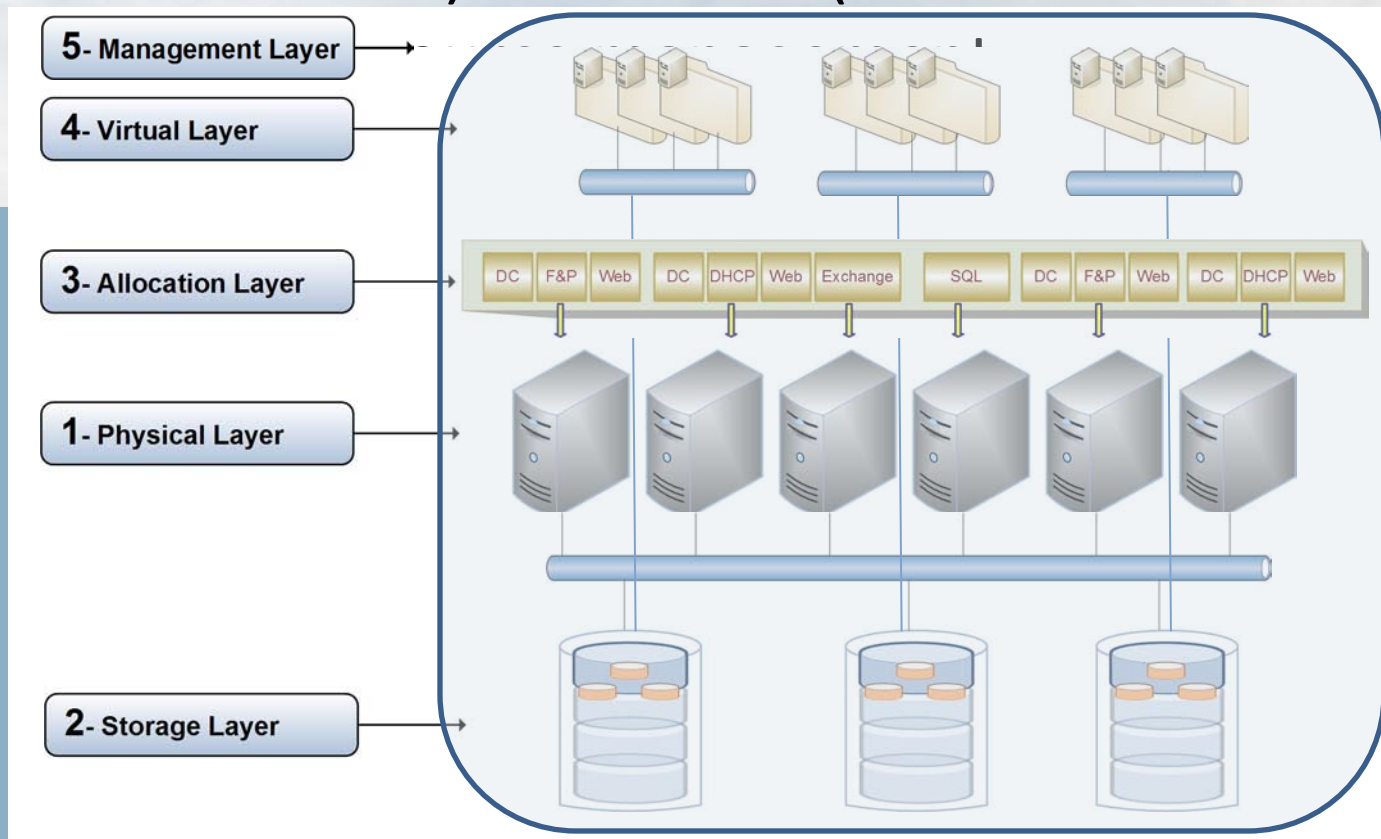
– The fourth layer will eventually contain server and desktop workloads

Management Layer

– This layer addresses both physical (Resource Pool) and virtual (Virtual Service Offerings)

5- Management Layer

4- Virtual Layer

3- Allocation Layer — DC | F&P | Web | DC | DHCP | Web | Exchange | SQL | DC | F&P | Web | DC | DHCP | Web

1- Physical Layer

2- Storage Layer

PC or Workplace Layer

– This layer includes three virtual technologies:
  • Desktop, application and user state virtualization
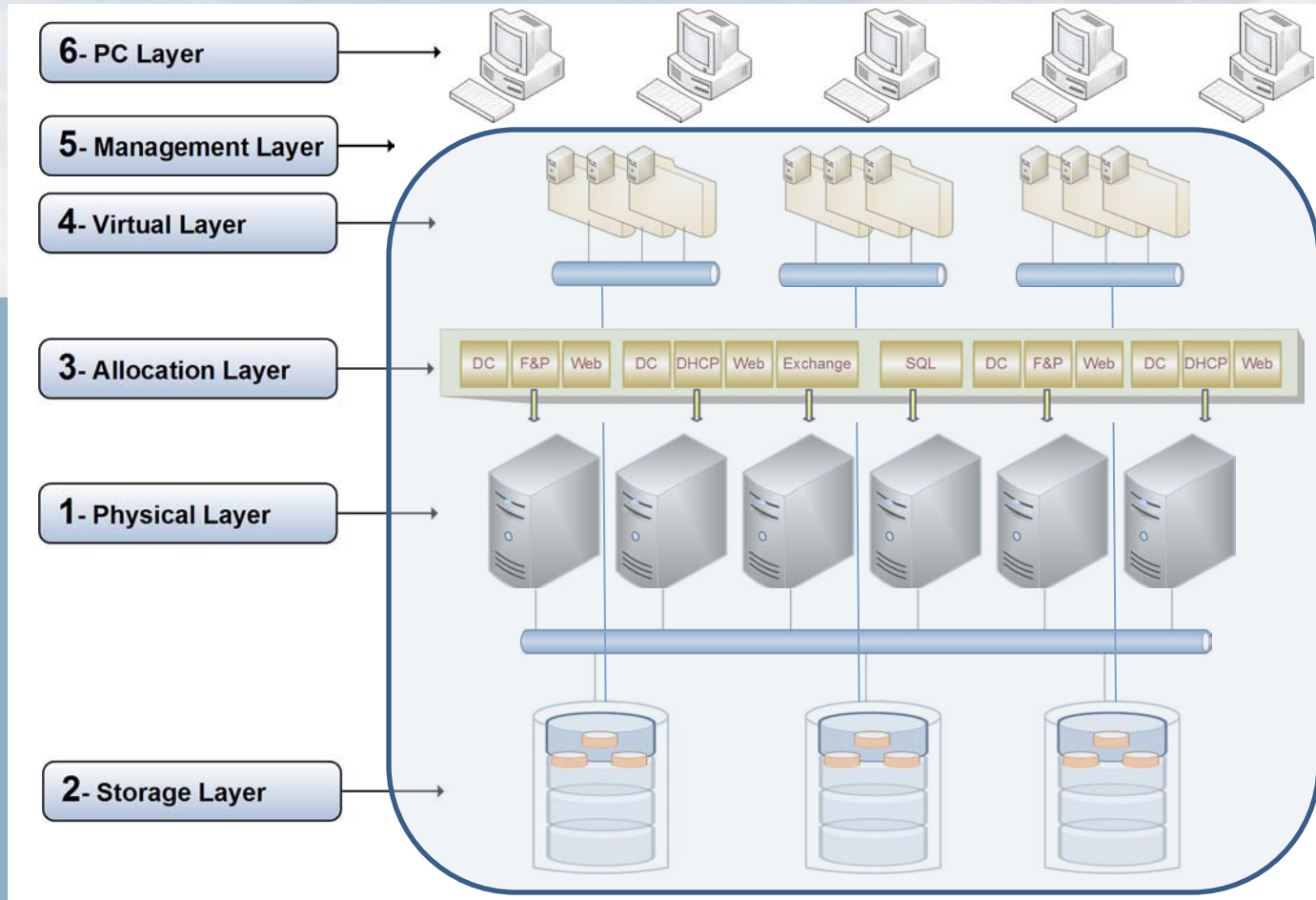
Business Continuity Layer

– The final layer relies on replication to copy the make-up of every VM to offsite locations and create a duplicate datacenter
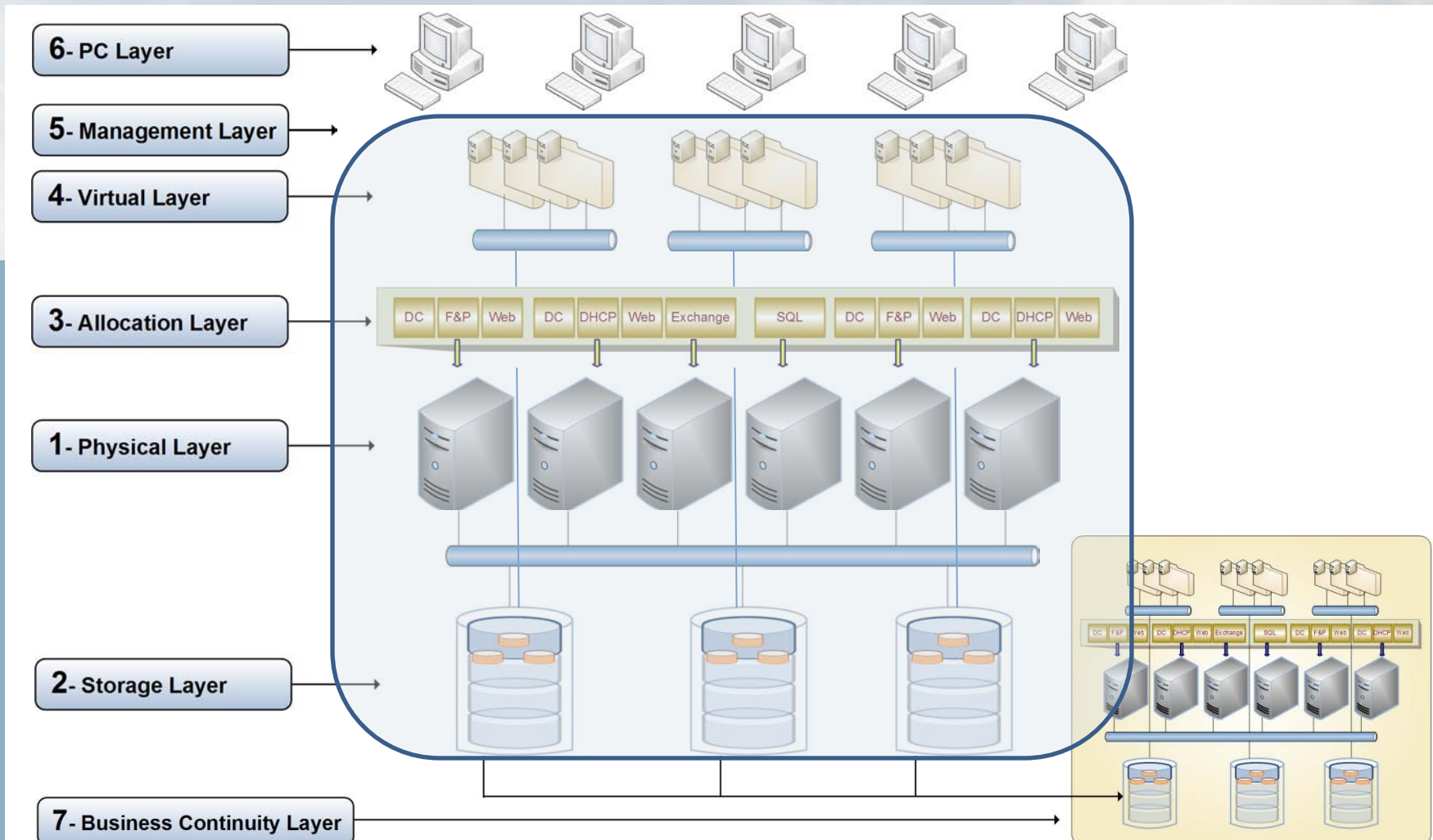
Cloud Affordability

Understand OS Licensing

- Windows Server Enterprise Edition includes 4 Virtual Instances

| Windows | Windows | Windows | Windows |

Virtualization Layer

'Any' Hypervisor

Hardware

- Old License Model
  - Total: 5 Windows Licenses
- Windows Server 2008 R2
  - Total: 1 License
- Windows Desktop Virtualization
  - Virtual Desktop Access License

- License includes physical host OS and up to 4 guests; each additional license gives you up to 4 more guests
- Windows Server Datacenter Edition allows <u>unlimited</u> guests
- Valid on any hypervisor (Windows Server Virtualization Validation Program)
- Learn about Windows Virtual Desktop Access (VDA)
- Learn about Microsoft Licensing for Virtual Environments
- Use the Windows Server Virtualization Calculators

- Open Systems licensing is easier since you only need to focus on support licensing

Potential & Real Costs Savings

Category	Potential Savings
Power Savings	$300 to $600 per virtualized server
Cooling Savings	Up to $400 per virtualized server
Hardware Savings	From $2,500 to $$$ per virtualized server
License Savings (Microsoft)	75% of Enterprise license per virtualized server
License Savings (Open Source)	Nil, except for support costs
Power Rebates (Selected Utility Firms)	Up to 50% total cost of the project
Government Rebates (Selected States)	Variable reduction rates on income tax
Space Savings	90+% space reduction (based on an average of 10 VMs per physical host)
Feel Good Ratio!	100% because you're doing something good for you and your organization!

SMB Programs Abound, Finally!

- Citrix offers several solutions
  [Citrix Products](#)

- Microsoft offers several solutions
  [Small and Medium Business Solutions](#)

- VMware offers several solutions
  [Virtualization for Small and Midsize Business](#)

- Others are also aware of the SMB market

Private or Public Cloud?

- SMBs can easily move to a public cloud
  - Exchange, SQL Server, AD, File and Print, can all be hosted in the public cloud
- Is the public cloud the solution?
  - Concerns for data security
  - Concerns for loss of control
  - Concerns for scalability
- If the cloud is the solution, then the real solution is the <u>private</u> cloud
  - Gives you complete control, complete security, and ease of scalability
  - How do you get there and what do you run it on?

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The Future Today

Recent Cloud and Virtualization Survey

- HP moved its IT infrastructure to private cloud in 2008 reducing maintenance from 72% to 20%
- SMBs can save at least 50% in hardware and power costs over time
  - There is major value in virtualizing
- However, you need a paradigm shift in the datacenter:
  - Must adopt the mentality that server, storage, and networking resources are shared across all applications regardless of department
  - All hardware must become one single resource pool
 - IT must stop taking siloed approach to support the business

Source: 2011, Symantec Corp.

SMB's Biggest Cloud Challenge: Manual Host Server Configurations

- Most important aspect of any host server configuration is: *REDUNDANCY*
  - Redundancy must be applied at different layers:
    - Host node configuration including RAM, CPUs and CPU cores, NIC and local storage
    - Networking configuration such as in VLAN redundancy
    - Shared storage configuration such as the creation of a unique VM store that can be accessed by each host node
   - Storage redundancy such as the mirroring of data among storage containers to protect vital VMs

Host Nodes with Shared Storage

- Need to create a clustered host server environment, one where multiple host nodes are connected to shared storage containers

- This can be complicated and is often completely new to SMBs
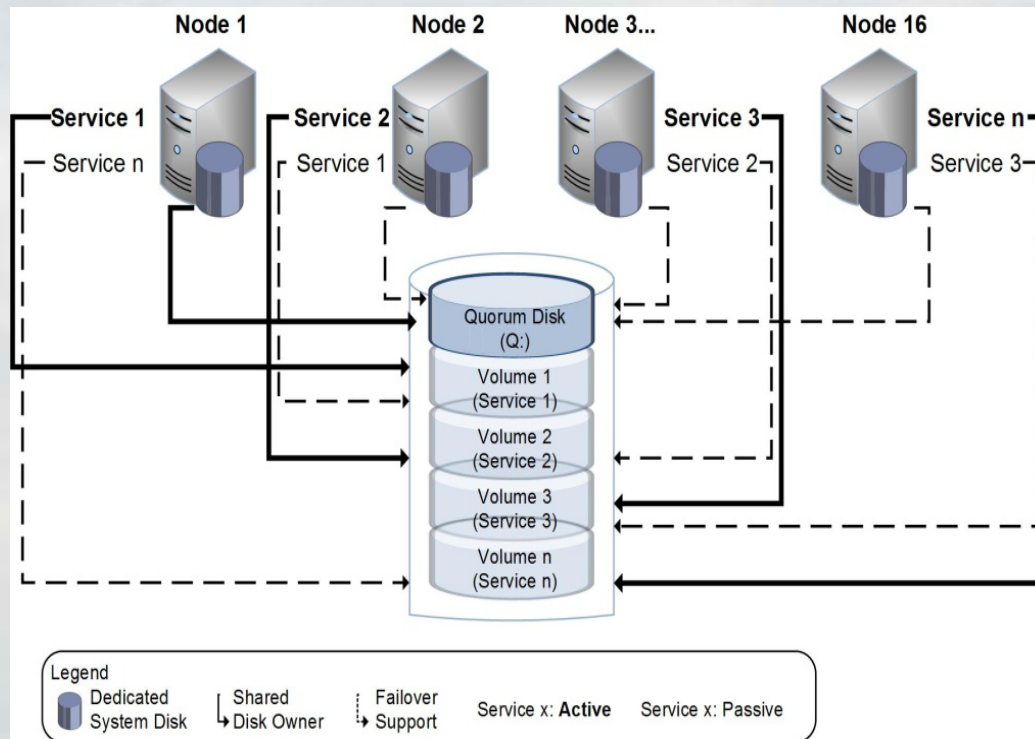
Private Cloud Architecture

- Often a show-stopper for most small to medium organizations
- Configuring clusters is no small task
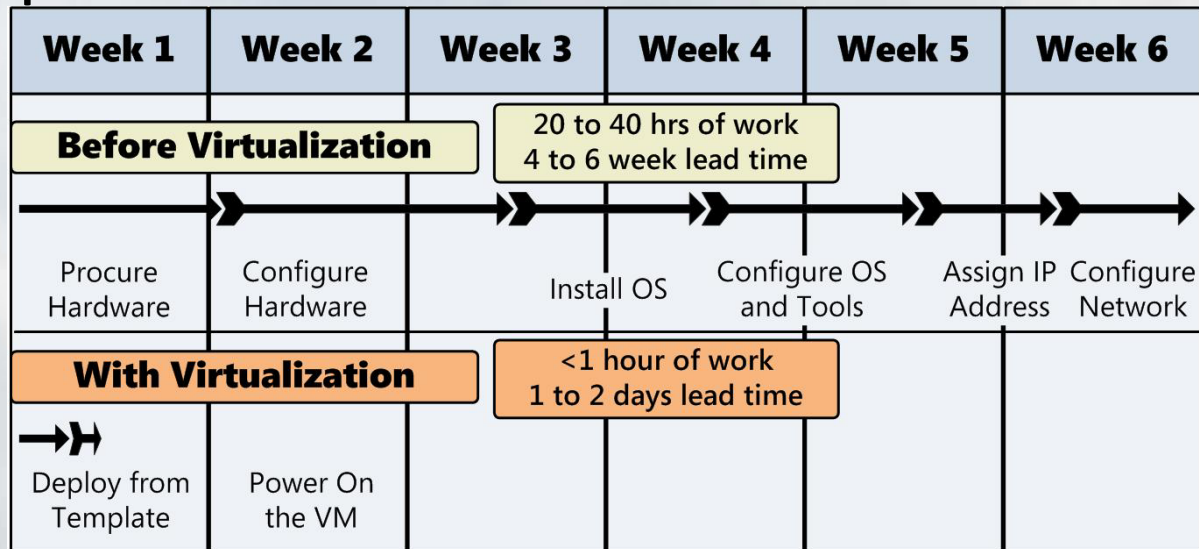- Must create a complete VM architecture
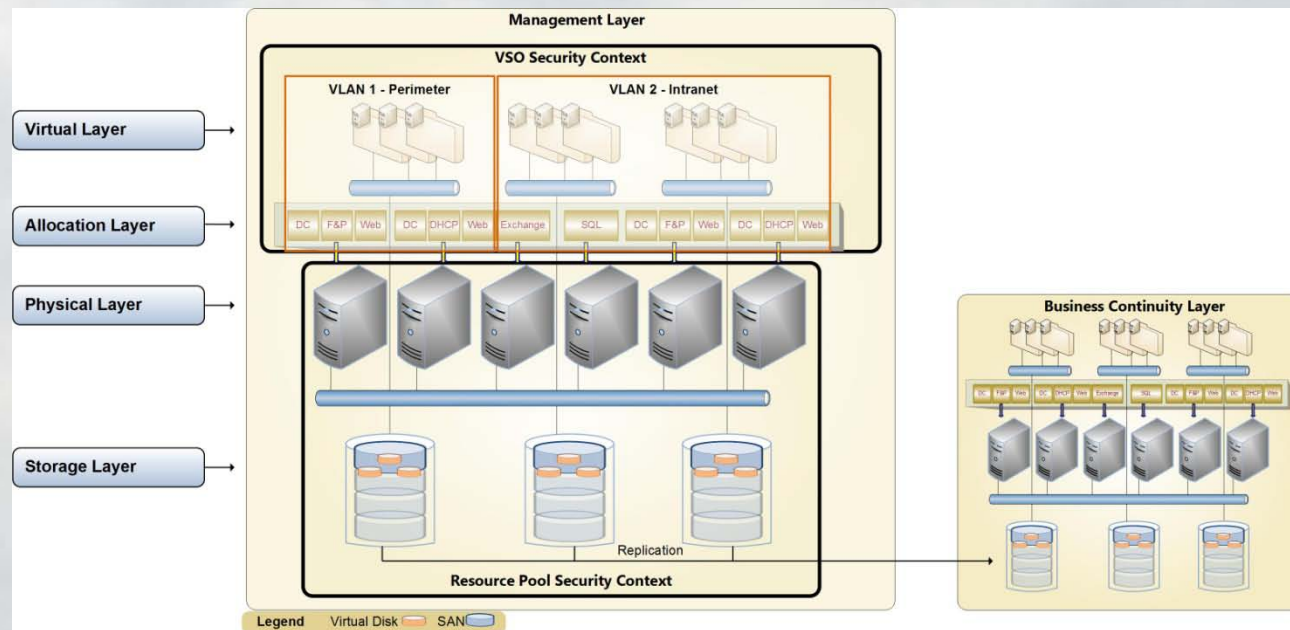
Required Skill Sets

- Remote storage implementation and management
- Hardware clustering and configuration
- Network partitioning and segmentation
- Hypervisor installation and deployment
- Virtual Machine architecture

- SMB personnel simply do not have these skills or the time to learn them!

Instant Provisioning

- Compare physical to the virtual provisioning process

| Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Before Virtualization			20 to 40 hrs of work 4 to 6 week lead time		
Procure Hardware	Configure Hardware	Install OS	Configure OS and Tools	Assign IP Address	Configure Network
With Virtualization		<1 hour of work 1 to 2 days lead time			
Deploy from Template	Power On the VM				

- What this does not cover, is the time it takes to create the proper hardware infrastructure for the private cloud: <u>Minimum 4 weeks</u>!

A Private Cloud-in-a-Box

- Smaller organizations need to have faster and easier access to host node infrastructures or resource pools to implement server virtualization

- Need to draw on all-in-one configurations that act as sever pods and can be deployed with little or no knowledge of complex clustering architectures

- Server Pods will include multiple layers of the virtual architecture directly out of the box

A Typical Server Pod

- Server pods include at least:
  - 2 host server nodes, and each node includes
    - At least 1 CPU with multiple cores
    - At least 8 GB of RAM with capacity for more
    - At least 2 NICs
    - A Host Bus Adapter or similar technology to link to shared storage
- A shared storage fabric with multiple high speed disks and some form of RAID
- A networking switch to support the creation of multiple VLANs including
  - A VLAN for direct host to host communications
  - A VLAN for VM communications independent of host servers
  - A VLAN for live migration, supporting the movement of VMs from one host to another
  - Possibly a VLAN for direct host management
- A pre-deployed hypervisor
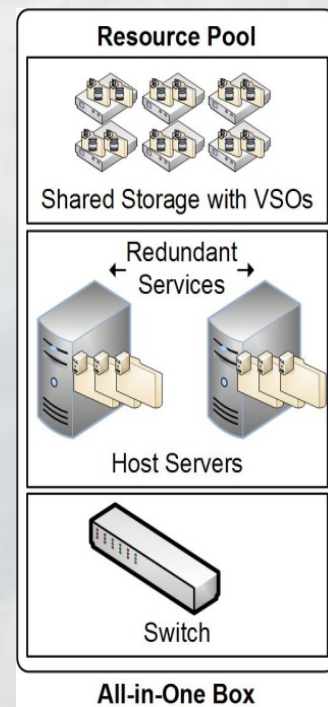
Ideal for SMBs and Remote offices

Implement the Cloud Environment

- Once the server pod is located and installed, the virtualization process can begin.
- Two steps will be involved depending on where you are in your current infrastructure:
    - If machines are in a physical state—Need to perform **P2V** migrations—capture the entire physical sever configuration and transform it into virtual disks, then connect these disks to the hypervisor as a VM
    - If already achieved some level of virtualization—Need to perform **V2V** migrations—VM disks must be converted from one to another to run properly on a new hypervisor

The Future Today!

- Private cloud-in-a-box systems are finally becoming available
- They make the move to cloud infrastructures a snap
- Some optional components that you can and should look for in the server pod:
  - Hyper-fast primary disk caching for in memory components
  - Fast secondary disk caching
  - Data spread across disks
  - A built-in hypervisor with integrated P2V and V2V
  - Simplified management
  - Integrated snapshot capabilities

Make your Move Today

- Organizations of any size can now take advantage of private cloud-in-a-box systems (server pods)
- Server pods simplify the move to virtualization
- They support the physical server transformation process
- SMBs can finally access what everyone has been doing for years without…
  - …becoming clustering experts
  - …breaking the bank for new hardware
  - …losing any productivity
- Now is the time to move your operations into the 21st Century!

Questions?

THANK YOU!

Find the presentation at
http://www.reso-net.com/presentation.asp?m=7

Find out more information at
http://itsyourcloud.tmcnet.com/resource-center.aspx

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