The Virtualized Dynamic Data Center

Presented Jointly by:
Cisco, VMware, NetApp and Intel
In cooperation with World Wide Technology
What’s In this Presentation Anyways?

- What is the Cloud?
- Top 5 Things VMware Can Do For You
- What Changes When Virtualization Is Brought In?
- Q / A
There's no need to worry about the server virtualization project.

In phase one, a team of blind monkeys will unplug unnecessary servers.

In phase two, the monkeys will hurl software at whatever is left.

Voilà!
Recent CIO Surveys Agree: Virtualization is the Top CIO Priority in a Tough Economic Environment

"The current environment has moved virtualization toward the top of the priority list for CIOs."

"Total cost of ownership (TCO) reductions will be a key driver of the acceleration in virtualization deployments as CIOs are forced to cut capital spending and reign in management, administrative and power/cooling costs."

Source: Goldman Sachs IT Spending Survey, Nov 2nd, 2008
Global Business Demands and Your Data Center

Current: ‘Accidental Architecture’
- Silo’d IT resources
- Low utilization, power inefficiency
- Branch offices ➔ ‘mini data centers’

Virtualized Infrastructure Vision
- Cloud of virtualized services
- Significant new resource demands
- Challenges with visibility, control, security
How Do We Define The Cloud?

Cloud Computing according to VMware

- Lightweight entry/exit service acquisition model
- Consumption based pricing
- Accessible over the internet

Cloud computing comes into focus only when you think about... a way to increase capacity or add capabilities on the fly without investing in new infrastructure, training new personnel, or licensing new software. Cloud computing encompasses any subscription-based or pay-per-use service that, in real time... extends IT's existing capabilities.
Value Proposition—Virtualized Dynamic Data Center

Save expense and increase ROI by focusing on applications and people

A better way to run applications

The Internal Cloud
The “Software Mainframe”

The External Cloud

Equip people, not devices

Save immediate expense by eliminating hardware and complexity

Server Consolidation

centrally provisioning desktops

Cisco | VMware | Intel | NetApp – Sharing The Common Vision
Top 5 Things Virtualization Can Do For YOU

1. Save Lots of $$$
2. Simplify the DataCenter
3. Better utilize existing infrastructure investment
4. Enable your applications
5. Enable end users
# Results you Can Measure
## Typical Gains from a Virtualized Dynamic Data Center

<table>
<thead>
<tr>
<th></th>
<th>BEFORE VMware</th>
<th>AFTER VMware</th>
</tr>
</thead>
<tbody>
<tr>
<td>Servers</td>
<td>1,000</td>
<td>100</td>
</tr>
<tr>
<td>Storage</td>
<td>Direct attach</td>
<td>Tiered SAN and NAS</td>
</tr>
<tr>
<td>Network</td>
<td>3000 cables/ports</td>
<td>400 cables/ports</td>
</tr>
<tr>
<td>Facilities</td>
<td>200 racks</td>
<td>10 racks</td>
</tr>
<tr>
<td></td>
<td>400 power whips</td>
<td>20 power whips</td>
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</table>
Decrease Capital Investment

BEFORE

<table>
<thead>
<tr>
<th>Type</th>
<th>Quantity</th>
<th>Price</th>
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<tbody>
<tr>
<td>1 CPU</td>
<td>300</td>
<td>$4,000</td>
</tr>
<tr>
<td>2 CPU</td>
<td>500</td>
<td>$6,500</td>
</tr>
<tr>
<td>4 CPU</td>
<td>200</td>
<td>$14,000</td>
</tr>
<tr>
<td>8 CPU</td>
<td>0</td>
<td>$30,000</td>
</tr>
</tbody>
</table>

AFTER

<table>
<thead>
<tr>
<th>Type</th>
<th>Quantity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 CPU</td>
<td>0</td>
<td>$4,000</td>
</tr>
<tr>
<td>2 CPU</td>
<td>38</td>
<td>$10,000</td>
</tr>
<tr>
<td>4 CPU</td>
<td>38</td>
<td>$23,000</td>
</tr>
<tr>
<td>8 CPU</td>
<td>4</td>
<td>$45,000</td>
</tr>
</tbody>
</table>

✓ $5,816 saved per workload over 3 years ($5.3M total)

Server Hardware Savings

<table>
<thead>
<tr>
<th>Year 0</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ (1,434,000)</td>
<td>$ 2,416,667</td>
<td>$ 2,416,667</td>
<td>$ 2,416,667</td>
<td>$ 5,816,000</td>
</tr>
</tbody>
</table>

NetApp  
CISCO  
vmware  
World Wide Technology, Inc.
Cut Related Data Center Requirements

**BEFORE**

- 3 network ports per server
- 3000 network ports / cables
- 200 racks and 2,000 sq ft.

**AFTER**

- 5 network ports per ESX host
- 400 network ports / cables
- 10 racks and 250 sq ft.

- $296 network savings per workload over 3 years
- $430 space savings per workload over 3 years
Ease Data Center Power Needs

- Server power requirements and costs are growing
  $759 and 355W saved per workload over 3 years
- Heat dissipation costs more than power consumption
  $949 and 444W saved per workload over 3 years
## Benefits of Consolidation

- Fewer **Servers** to Manage
- Less **Power** required
- Less **Space** needed
- Less **Cabling** required

### 3-Year Cost Savings / Workload

<table>
<thead>
<tr>
<th>Category</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server Hardware</td>
<td>$5,816</td>
</tr>
<tr>
<td>Power Costs</td>
<td>$759</td>
</tr>
<tr>
<td>Cooling Costs</td>
<td>$949</td>
</tr>
<tr>
<td>Data Center Real Estate</td>
<td>$431</td>
</tr>
<tr>
<td>Network Infrastructure</td>
<td>$296</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$8,251</td>
</tr>
</tbody>
</table>
#2: Simplify the DataCenter
Modular Approach
Design and Build based on Business Requirements

Build Point Solutions

Applications

Servers

Network

Storage

Build Infrastructure Offering

Applications

Virtualization-Aware Unified Fabric

Servers

Virtualized Storage

Virtualized Dynamic Infrastructure

Project-based Vertical Decision

IT Service Holistic Decision

Business Need

Business Need

Ethernet, FC, IB
Manage the Infrastructure like a Power Plant

Power Plant + Instant Provisioning + Easy Scaling

Resource Pooling

Compute Plant

Common Resource Pool

CRM

Exchange

File / Print

App A

App B

Bus Apps

BI Apps

Manage the Infrastructure like a Power Plant

NetApp

CISCO

vmware

World Wide Technology, Inc.
#3: Better utilize existing infrastructure investment
Virtual Infrastructure—Starts With Servers

Servers

- Save power, cooling ✓
- Save space ✓
- Improve asset utilization ✓
- Provision quickly ✓
- Manage copies efficiently ✓
- Improve QoS ✓
- Infrastructure flexibility ✓
Old Model

Old Model: Traditional x86 Architecture

- Single OS image per machine
- Software and hardware tightly coupled
- Multiple applications often conflict
- Underutilized resources

→ Old model is 1 step away from gone!
VMware Virtualization Basics – Remember the mainframe?

Before Virtualization

- Software tied to hardware
- Single OS image per machine
- One application workload per OS

Costly inflexible infrastructure

After Virtualization

- Hardware independent of OS & apps
- Pre-built VMs provisioned to any system
- Manage OS & apps as a single unit

Efficient flexible infrastructure
Reduce Capital Expenditures Through Consolidation—*Real Cost Savings, Today*

**Typical Consolidation: 10:1**

**Typical Cost Savings:**
- Reduce H/W and OpEx costs by 50%
- Reduce energy costs by 80%
- Reduce provisioning time up to 70%
- Save >$3,000 / yr per server workload

**VMware Software**
- Decouples software from hardware
- Encapsulates Operating Systems and applications into “Virtual Machines”
- Creates Virtual Infrastructure – Aggregates Servers, Storage and Network
vSphere (ESX) Server

- Deploy multiple virtual machines on a single physical server
- Market leading:
  - Performance
  - Stability
  - Scalability
  - Cross-platform support
Centralized Management

VMware VirtualCenter

Shared Storage
What kind of server does vSphere run on?

New Model: Virtualization Technology

- Partitioning of OS and hardware
- Isolation
- Encapsulation of OS and application into VMs
- Hardware independence
- Flexibility

→ Works with what you have today…
#4: Enable your applications
Can your Clustering Software do this?

- What VMware does...
  - Dynamically balances computing resources across resource pools
  - Intelligently allocates resources based on pre-defined rules

- Customer impact...
  - Aligns IT with business priorities
  - Dramatically increases system administrator productivity
  - Automates hardware maintenance
VMware Fault Tolerance (FT)

VMware FT provides zero-downtime, zero-data-loss protection to virtual machines in an HA cluster.
Unprecedented Availability

- What VMware does…
  - Automatically restarts virtual machines when server fails

- Customer impact…
  - Cost effective high availability for all applications
  - No need for dedicated stand-by hardware
  - None of the cost or complexity of clustering
VMware Update Manager

- Eliminates manual tracking of patch levels of ESX Server hosts and virtual machines
- Automates enforcement of patch standards
- Reduces risk through snapshots and offline virtual machine patching
VMware Update Manager

- **Update Manager patches entire DRS clusters**
  - Each host in the cluster enters DRS maintenance mode, one at a time
  - VMs are migrated off, host is patched & rebooted if required
  - VMs are migrated back on
  - Next host is selected
Always on, On Demand DataCenter

As virtualization matures and becomes default, the "next big thing" will be automation.

Gartner

- Automated Resource Assurance
  > Dynamic Balancing
  > Continuous Optimization

- Increased Availability
  > Automated
  > Across Applications

- On Demand Capacity
  - Non-disruptive Scaling
  - Flexible, Reconfigurable
Traditional Disaster Recovery Challenges

- **Complex recovery processes and infrastructure**
- **Dependent on perfect training, documentation, and execution**
- **Failure to meet continuity requirements**
  - Recovery takes days to weeks
  - Recovery tests often fail
  - Significant IT time and resources consumed
VMware Site Recovery Manager

**Site Recovery Manager leverages VMware Infrastructure to deliver advanced disaster recovery management and automation**

- Simplifies and automates disaster recovery workflows:
  - Setup, testing, failover
- Turns manual recovery runbooks into automated recovery plans
- Provides central management of recovery plans from VirtualCenter

> Works with VMware Infrastructure to make disaster recovery rapid, reliable, manageable, affordable
Site Recovery Manager: Key Components

Production

VirtualCenter
Site Recovery Manager
Virtual Machines
VMware Infrastructure
Servers
Storage

Disaster Recovery

VirtualCenter
Site Recovery Manager
Virtual Machines
VMware Infrastructure
Servers
Storage

Site Recovery Manager
Protected virtual machines
Replication
#5: Enable the end users
Attack Desktop Costs

Challenges

- PC Management is time consuming & inefficient
- Desktop Operating Costs are High
- Low End User Service Level Agreement (SLA) levels
- Security and Compliance Risks
A typical desktop has everything bundled into a single device with a complex intertwined collection of software and data.
Management Is Difficult on the Edge

Many individual devices must be patched, monitored, and secured – a difficult task, especially for remote users.
User data is stored on network file shares, where it can be backed up and secured.
Using Application Virtualization such as ThinApp, applications can be moved to a file share and launched without being installed locally.
The now minimized OS can be virtualized on servers in the data center, and viewed with a remote protocol.
OS Virtualization

The minimized OS can be converted to a template to create additional virtual machines.
Automatic Provisioning technology can spin up VM’s on demand. Since applications are separate, a single template can be used.
The need for full PC’s at the endpoint is eliminated and easy-to-maintain thin clients can be deployed.
VDI = Complete Freedom

VMware VDI View Solution

An end-to-end desktop virtualization solution that delivers enterprise-class desktop control and manageability while providing a familiar user experience.
## From VI3 to vSphere 4: Why Upgrade?

<table>
<thead>
<tr>
<th>Cost savings from enhanced efficiency</th>
<th>Increased operational control</th>
<th>Deeper integration with existing infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Higher consolidation ratios due to performance optimizations</td>
<td>• Continuous availability with VMware Fault Tolerance</td>
<td>• Third-party distributed virtual switch</td>
</tr>
<tr>
<td>• Up to 20% reduction in power costs with Distributed Power Management</td>
<td>• Operationally efficient security with vShield Zones</td>
<td>• Third-party multipathing</td>
</tr>
<tr>
<td>• Up to 50% reduction in storage costs with Thin Provisioning</td>
<td>• Dynamic scale up of virtual machines with “hot” add/plug/extend features</td>
<td>• VMsafe products</td>
</tr>
<tr>
<td></td>
<td>• Compliance to standardized configurations with Host Profiles</td>
<td></td>
</tr>
</tbody>
</table>
What Changes does Virtualization Bring?
• Server Way Of Life
• Storage / Backup Way Of Life
• Networking Way Of Life
• Virtual Way Of Life
• Facilities Way Of Life
Data Center Solution Areas

WWT Data Center Practice

- Servers & Blades
- Storage & Backup
- Data Center Networking
- Virtualization Technologies
- Data Center Facilities
Global Business Demands and Your Data Center

Current: ‘Accidental Architecture’

Future: Virtualized Dynamic Data Center

The Journey to The Virtualized Dynamic Data Center

Define Your Strategy
- Review current architecture
- Review business objectives
- Define end-state architecture

Identify Your Tactical Projects
- Consolidation
- Virtualization
- Automation

Execute Transform Your Data Center
- Incremental evolution
- IT as a service center
- Organizational alignment

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Technology + Expertise

Build Infrastructure Offering

Applications

Virtualization-Aware Unified Fabric

Servers

Virtualized Storage

IT Service
Holistic Decision

Engage WWT Today

- Comprehensive understanding of data center technologies allows us to architect and configure the complex solution(s)
- Deep OEM knowledge gives us the ability to identify candidates that can meet requirements and then make a recommendation on the “best fit”
- Supply Chain logistics partner with extensive inventory and asset management experience can lower your TCO and decrease the time to market
- Data center program and project management knitting together all the pieces from the design to the implementation
- 400+ Industry Standard Data Center Certifications and $350M in Data Center Revenue
- Customer liaison for OEM relationships giving you one company……and one throat to choke
Thank You!

Q & A