VMware Cloud Infrastructure & Management

Raghu Raghuram

Executive Vice President of Cloud Infrastructure and Management
This presentation contains forward-looking statements including, among other things, statements regarding growth in the software market, the number of virtualized workloads, VMs and physical server install base, the momentum of certain VMware product lines and VMware’s service provider business, potential business opportunities for VMware, opportunities VMware expects from its acquisitions of DynamicOps and Nicira, the expected benefits these acquisitions will provide to customers and VMware’s prospective positioning in the software defined networking industry. This presentation also illustrates trends in the adoption and acceleration of virtualization and the growth of workload instances that are virtualized. These forward-looking statements are subject to the safe harbor provisions created by the Private Securities Litigation Reform Act of 1995. Actual results could differ materially from those projected in the forward-looking statements as a result of certain risk factors, including but not limited to: (i) adverse changes in general economic or market conditions; (ii) delays or reductions in consumer or information technology spending; (iii) competitive factors, including but not limited to pricing pressures, industry consolidation, entry of new competitors into the virtualization and cloud computing markets, and new product and marketing initiatives by our competitors; (iv) our customers’ ability to develop, and to transition to, new products and computing strategies such as cloud computing; (v) the uncertainty of customer acceptance of emerging technology; (vi) rapid technological and market changes in virtualization software and platforms for cloud and desktop computing; (vii) changes to product development timelines; (viii) VMware’s ability to protect its proprietary technology; and (ix) VMware’s ability to attract and retain highly qualified employees. These forward looking statements are based on current expectations and are subject to uncertainties and changes in condition, significance, value and effect as well as other risks detailed in documents filed with the Securities and Exchange Commission, including our most recent reports on Form 10-K and Form 10-Q and current reports on Form 8-K that we may file from time to time, which could cause actual results to vary from expectations. The information in this presentation reflects management’s views as of the date of the presentation. VMware assumes no obligation to, and does not currently intend to, update any such forward-looking statements after the date of this release.
Top to Bottom Transformation

ACCESS

PCs

Existing Apps

APPLICATIONS

New Apps & Big Data

Servers

INFRASTRUCTURE

Clouds

Mobile Users
Total Addressable Market Opportunity

2015

$80B+
MARKET SIZE

$50B
VMW TAM
20% CAGR

Source: Industry Research and VMware
2 Growth Vectors

1. From Server Virtualization To Complete Cloud Infrastructure (SDDC)
   • Continue vSphere momentum
   • From vSphere to vCloud Suite

2. Serve Federated Pools of Infrastructure
   • Dynamic Ops
   • Nicira
From Server Virtualization To Complete Cloud Infrastructure (SDD)

Continue vSphere Momentum
Momentum in Virtualization - Rates Continue to Increase

% of Workloads Virtualized

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>19%</td>
</tr>
<tr>
<td>2010</td>
<td>31%</td>
</tr>
<tr>
<td>2011</td>
<td>44%</td>
</tr>
<tr>
<td>2012</td>
<td>59%</td>
</tr>
<tr>
<td>In 2 Years</td>
<td>73%</td>
</tr>
</tbody>
</table>

Source: VMware customer survey, Jan 2010, Jun 2011, Mar 2012
Question: Please indicate percentage of x86 server operating system instances (e.g., Windows, Linux) that run in virtual machines
Momentum - Continue Virtualizing Business Critical Apps

% of Workload Instances That are Virtualized

Source: VMware customer survey, Jan 2010, Jun 2011, Mar 2012

Question: Total number of instances of that workload deployed in your organization and the percentage of those instances that are virtualized.

- Microsoft Exchange: 38% (Jan 2010), 47% (Jun 2011), 47% (Mar 2012)
- Microsoft Sharepoint: 53% (Jan 2010), 56% (Jun 2011), 57% (Mar 2012)
- Microsoft SQL: 43% (Jan 2010), 47% (Jun 2011), 52% (Mar 2012)
- Oracle Middleware: 25% (Jan 2010), 34% (Jun 2011), 41% (Mar 2012)
- Oracle DB: 25% (Jan 2010), 28% (Jun 2011), 35% (Mar 2012)
- SAP: 18% (Jan 2010), 28% (Jun 2011), 28% (Mar 2012)
Workloads Continue to Grow

Installed Base¹ of x86 Workloads

Source(s): IDC Annual Virtualization Forecast -2012, Gartner x86 Server Virtualization Forecast -2011
¹ Installed Base totals assumes 5 year refresh
Consolidation Ratio Remains Flat

VM Density per Host Server in Installed Base¹

Forecast

VMs per Host

<table>
<thead>
<tr>
<th>Year</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
</tr>
</tbody>
</table>

IDC Data
2012 to 2015
CAGR = 7%

Source(s): IDC Annual Virtualization Forecast-2012
¹ Installed Base totals assumes 5 year refresh
VMware’s Market Share Has Remained Steady

IDC Server Virtualization Tracker
Trailing 12 Months (TTM) share of deployed virtualization hosts

Source: IDC Server Virtualization Tracker, 1Q12
Note: IDC introduced units for Oracle VM, Open-Source Xen, Red Hat KVM, Other KVM, vSphere Hypervisor starting 1Q11
Supporting Big Legacy Apps & New Apps

Cloud Infrastructure

- Mega-monster VM
  - Latency-optimized
  - 64-way VMs
  - VoIP

- Big Data VM
  - PaaS-ready VMs
  - 32 node Hadoop on local disk
vCenter Operations Momentum is Accelerating

Large Deals and Deployments Worldwide
- A large consumer electronics company purchased $10+M of VC Ops as part of a larger ELA
- Managing 120,000+ VMs and physical servers around the globe
- Fully deployed in less than 7 months

Strategic to our Customers
- A health care provider purchased $2M of VC Ops
- VC Ops prevented two outages during POC
- “VC Ops is strategic to us and helps us get to five 9’s”

Strategic to our Partners
- An international financial services provider in Europe
- Bought ~$1M of VC Ops for the biggest vBlock installation in EMEA
- ELA was a joint success in close cooperation with EMC and Cisco

VC Ops Amplifies vSphere Value

<table>
<thead>
<tr>
<th></th>
<th>IT Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without VMware</td>
<td>+28%</td>
</tr>
<tr>
<td>With vSphere</td>
<td>+59%</td>
</tr>
</tbody>
</table>

VC Ops lowers OpEx and CapEx

<table>
<thead>
<tr>
<th></th>
<th>IT Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource Consumption</td>
<td>-30%</td>
</tr>
<tr>
<td>IT Productivity Management</td>
<td>+69%</td>
</tr>
</tbody>
</table>

“VMware vCenter Operations Management gives us better visibility [...] and allows us to achieve higher service levels of our business-critical applications.”

— Matthew Cunningham,
SVP of IT, CareCore
Momentum – VMW Service Provider Business

8900+
Partners in VMware SP Program (VSPP)

Triple Digit Growth
Q2 VSPP booking growth YoY

150+
Verified public vClouds world-wide

2500+
SPs with vCloud Director Licenses

62
Countries transacting

29
Countries with at least one vCloud service
From Server Virtualization To Complete Cloud Infrastructure (SDD)

From vSphere to vCloud Suite
Software-Defined Datacenter
Virtualization Simplifies Provisioning of VMs, But Additional Steps Needed to Deploy in a Production Environment

Past

$10,000
10 weeks

Present

$1,800
5 days, 2 minutes

$300
2 minutes

Enterprise storage

VLAN networks

Firewall, load-balancer

IDS, security, monitoring

Availability

Virtualization Simplifies Provisioning of VMs, But Additional Steps Needed to Deploy in a Production Environment
Software-Defined Datacenters Simplifies Process to Define an Application and All the Resources It Needs

Future

VDC

Software-defined Datacenter Services

5 days, 2 minutes

3 minutes
In a Software-Defined Datacenter…

All infrastructure services are delivered as virtualized software

And, the control of this datacenter is entirely driven by software
# vCloud Suite Edition Lineup

<table>
<thead>
<tr>
<th>Cloud Infrastructure &amp; Management</th>
<th>vCloud Suite Standard</th>
<th>vCloud Suite Advanced</th>
<th>vCloud Suite Enterprise</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>vFabric Application Director</strong></td>
<td>$4,995</td>
<td>$7,495</td>
<td>$11,495</td>
</tr>
<tr>
<td>• Automated configuration and deployment of multi-tier cloud applications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>vCenter Operations Management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Application Awareness – discovery dependency mapping</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Chargeback – metered utilization reporting and accountability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Configuration Compliance – vSphere host &amp; VM change and configuration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Performance &amp; Capacity Optimization – analytics, dashboards and alerting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>vCenter Site Recovery Manager</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automated disaster recovery planning, testing, and execution</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>vCloud Networking and Security</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Advanced continuous availability firewall and network</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Software defined networking, security, and ecosystem integration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>vCloud Director &amp; vCloud Connector</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virtualized datacenters with multi-tenancy and public cloud extensibility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>vSphere Enterprise Plus</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virtualized infrastructure with policy-based automation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: vCloud Suite Editions are licensed per CPU; Unlimited VMs, Unlimited vRAM
**2012 vCloud Suite Lineup**

<table>
<thead>
<tr>
<th>Management</th>
<th>Private Cloud Infrastructure</th>
<th>Virtualization Platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>vSphere Standard with Operations Management</td>
<td>vC Ops Adv</td>
<td>Protect</td>
</tr>
<tr>
<td>$1,995</td>
<td>Or</td>
<td>vC Ops Adv</td>
</tr>
<tr>
<td>Std</td>
<td>vCD</td>
<td>vCD</td>
</tr>
<tr>
<td>$995</td>
<td>Ent</td>
<td>Ent+</td>
</tr>
<tr>
<td>$2,875</td>
<td>$3,495</td>
<td></td>
</tr>
<tr>
<td>$4,995</td>
<td>$7,495</td>
<td>$11,495</td>
</tr>
<tr>
<td>vCloud Suite Standard</td>
<td>vCloud Suite Advanced</td>
<td>vCloud Suite Enterprise</td>
</tr>
<tr>
<td>vCNS Std</td>
<td>vCNS Adv</td>
<td>SRM</td>
</tr>
<tr>
<td>vCD</td>
<td>vCD</td>
<td>App Dir</td>
</tr>
<tr>
<td>vCD</td>
<td>vCD</td>
<td>vC Ops Ent</td>
</tr>
<tr>
<td>vCNS Adv</td>
<td>Ent+</td>
<td>Ent+</td>
</tr>
<tr>
<td>vCNS Adv</td>
<td>Ent+</td>
<td></td>
</tr>
<tr>
<td>vCNS Adv</td>
<td>Ent+</td>
<td></td>
</tr>
</tbody>
</table>

Per CPU licensing: no vRAM, no VM restrictions (on either vSphere or vCloud suite)
vCloud Suite Drives Additional Savings On Top of vSphere

**Larger area equals more savings**
- vCloud Suite Enterprise
- vCloud Suite Advanced
- vCloud Suite Standard
- vSphere Enterprise+

1. **Capital Expense Savings**
   - ($ in millions)
   - +87% improvement over vSphere ENT+

2. **Operational Expense Savings: Facilities**
   - ($ in millions)
   - +53% improvement over vSphere ENT+

3. **Operational Expense Savings: IT Administration**
   - (Thousands of Hours per month)
   - +144% increase over vSphere ENT+

4. **Business Agility: Downtime Reduction**
   - (Thousands of Hours per Month)
   - +78% increase over vSphere ENT+

5. **Increased Business Agility**

- **Server Capacity Management**
- **Networking & Security**
- **Multi-site Disaster Recovery (DR)**
- **Standardized datacenter resources and workloads**
All vCloud Suite Editions Deliver ~4x ROI

Cumulative over 5 years

<table>
<thead>
<tr>
<th>($ in millions)</th>
<th>vCloud Suite Standard</th>
<th>vCloud Suite Advanced</th>
<th>vCloud Suite Enterprise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payback</td>
<td>0.6 years</td>
<td>0.6 years</td>
<td>0.6 years</td>
</tr>
</tbody>
</table>

SOURCE: roitco.vmware.com
## VMware vCloud Suite: The More Comprehensive Solution

<table>
<thead>
<tr>
<th>Management</th>
<th>Key Metrics</th>
<th>VMware vCloud Suite + mgmt</th>
<th>Microsoft ECI/Private Cloud</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virtual/Cloud Infra. Mgmt</td>
<td>✔️</td>
<td>~ No predictive mgmt, basic capacity mgmt, weak compliance, MS centric, scale-limited</td>
<td></td>
</tr>
<tr>
<td>App Provisioning &amp; Monitoring</td>
<td>✔️</td>
<td>~ Restricted by platform, Windows apps only</td>
<td></td>
</tr>
<tr>
<td>IT Business Management</td>
<td>✔️</td>
<td>~ No chargeback, no ITFM, legacy service desk</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cloud Infrastructure</th>
<th>Key Metrics</th>
<th>VMware vCloud Suite</th>
<th>Microsoft ECI/Private Cloud</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage</td>
<td>✔️</td>
<td>✗ No policy-based automation, manual load balancing</td>
<td></td>
</tr>
<tr>
<td>Networking</td>
<td>✔️</td>
<td>~ No native virtual distributed switch – 3rd party req’d Basic network virt. - manual load balancing Limited L4-L7 services</td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td>✔️</td>
<td>✗ No virtualization-aware security – 3rd party req’d Performance penalty due to in-guest AV</td>
<td></td>
</tr>
<tr>
<td>Datacenter-level DR</td>
<td>✔️</td>
<td>✗ Manual or custom-scripted DR, basic Hyper-V replication only</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Virtualization</th>
<th>Key Metrics</th>
<th>VMware vSphere</th>
<th>Microsoft Hyper-V 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proven Reliability</td>
<td>✔️</td>
<td>~ Exposure to Windows security issues, lower rate of virtualized tier-1 apps</td>
<td></td>
</tr>
<tr>
<td>Proven TCO Savings</td>
<td>✔️</td>
<td>~ Lower consolidation ratios, 91% higher op-ex*</td>
<td></td>
</tr>
<tr>
<td>Proven Performance for all Apps</td>
<td>✔️</td>
<td>~ Less OS supported, no Hyper-V certification program for apps, basic memory mgmt</td>
<td></td>
</tr>
</tbody>
</table>
Serve Federated Pools of Infrastructure
Growth #2: Extend Coverage of the Federated Clouds

Non-VMware Private Clouds

vSphere/VCD Private

Enterprises

• Greater control over security, compliance, QoS
• Support existing applications

Hybrid Cloud

Connect between multi-vendor and multi-platform Private & Public Clouds

vCloud Service Providers

• Low acquisition costs
• Less administrative burden
• On-demand capacity

Non-VMware Public Clouds (e.g., Amazon EC2)

vCloud Public

Customers need ubiquitous and seamless access to shared pools of infrastructure, therefore requiring a multi-vendor, multi-platform and multi-cloud automation solution.
The Cloud Infrastructure Suite is Just A Portion of the Overall Opportunity

- With only 60% of the workloads virtualized (even less for physical servers)
- IDC shows VMW at ~60% share (some are paid while others are free)...
- ~60%+ of workloads outside of Cloud Infrastructure Suite that are still opportunities for VMware

IDC, Worldwide Server Virtualization Tracker, June 29, 2012
Cloud Infrastructure & Management

Cloud Management

Cloud Business Management

Cloud Operations Management

Cloud Service Provisioning

Cloud Infrastructure

Virtual Datacenter

Software Defined Networking & Security

Software Defined Storage & Availability

Virtual Infrastructure

vCloud Service Providers

Other Service Providers

Hypervisors

Hardware
Serve Federated Pools of Infrastructure

Dynamic Ops
**DynamicOps at a Glance**

*DynamicOps* delivers an enterprise class hybrid cloud solution in the shortest amount of time at the lowest cost

- 92 total customers (300% increase YoY)
- 40% of install base expanded their implementation
- 75% private cloud, 25% VDI cloud
- Strong emphasis within financial services, expanding to broader G2000
- Strategic OEM with Dell – Dell VIS Creator
- Expanding partner program to broaden channels
- On track for a record breaking 2012
DynamicOps Customers and Routes to Market

Target Customers
- Enterprise (G-2000)
- Mid-Market

Regions
- Select North America & UK
- NA expanded & Europe

Industries
Financials, educational, media, healthcare, industrials

Sales Channels
- Direct Sales
- OEM - Dell
- Channels, resellers, integrators
Delivering A Comprehensive Multi-Platform Hybrid Cloud

Cloud Automation Center

- Security
- Service Tiers
- Policies
- Service Blueprint

vCloud Director

- VDC
- vCloud Service Providers
- Other Service Providers
- Hypervisors
- Hardware

vSphere

Software Defined Networking
Software Defined Security
Software Defined Availability

vSphere
vCloud Director
Dynamic Provisioning
Configuration
Web Portals
Applications
thin clients
laptops
tables
desktops
IT Efficiency Case Studies

***Improve Operational Efficiency***

“With DynamicOps, we have reduced the time and effort needed to deploy VMs. This is saving money by refocusing resources toward more strategic activities rather than building servers.”

*Altaf Rupani, Vice President of Global Systems Services, Dow Jones*

***Optimize Resource Utilization***

“Automated workflows for archival of inactive VMs allow the use of secondary storage at $0.50/GB instead of scarce primary storage at $5-$10/GB… deliver significant operational and cost benefits”

*Financial Service Software Vendor*

***Accelerate Virtualization Deployment***

“Without DynamicOps automated provisioning and management, we would not have been able to deploy this many desktops. DynamicOps put our stalled desktop deployment plan back on track.”

*Data Center Director, $2 Trillion Global Financial Services Firm*
Summary

- Expands VMware’s existing cloud infrastructure and management portfolio with a proven service governor solution for policy-based provisioning

- Provides capabilities for seamless provisioning and management of IT services to multiple platforms including physical systems and multiple clouds

- Helps deliver on VMware’s commitment to customer choice and flexibility

- Further strengthens VMware’s position as the infrastructure platform of choice for cloud computing
Serve Federated Pools of Infrastructure
Nicira
The Network Must Evolve To Meet Requirements Of The Cloud

- Provisioning is slow
- Placement is limited
- Mobility is limited
- Hardware dependent
- Operationally intensive
The Solution – Virtualize the Network

- Compute Virtualization Abstraction Layer
  - Programmatic provisioning
  - Place any workload anywhere
  - Move any workload anywhere
  - Decoupled from hardware
  - Operationally efficient

- Network Virtualization Abstraction Layer
  - Provisioning is slow
  - Placement is limited anywhere
  - Mobility is limited anywhere
  - Hardware dependent
  - Operationally intensive

Physical Infrastructure

Software Defined Data Center

VMware
Network Virtualization

Elements of the Network Virtualization Stack

- VDC
- Software-defined Datacenter Services

Policy Based Automation

Insertion of SDDC services: from VMware and partners

Logical Abstraction: Networks
Nicira: Multi-Cloud, Multi-Hypervisor = Any Cloud Environment

Virtual Network Platform

- vSphere Host
- KVM, HyperV
- Bare Metal

Controller

OpenStack

CMS

NVP API

VM VM VM VM VM

VM VM

VM VM VM VM
2 Growth Vectors

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   - Dynamic Ops
   - Nicira