Taking Control of Your VMware vSphere Environment with Operations Management

Daniel Ho (VMware Hong Kong Limited)
Agenda

- vSOM (vSphere Operations Management) Introduction
- What’s Operations Management
- Key Features on vCOps
- Customer Case Study
Agenda

- vSOM (vSphere Operations Management) Introduction
- What’s Operations Management
- Key Features on vCOps
- Customer Case Study
Management and Automation
Intelligent, Policy-Driven Management and Automation for the Software-Defined Data Center
SDDC On-Premises Management and Automation Products

Management and Automation
- vCloud Automation Center
- vCenter Operations Management Suite
- IT Business Management Suite
- vCenter Server and vCloud Director

Compute
- vSphere

Network / Security
- vCloud Networking and Security
- NSX

Storage / Availability
- vCenter Site Recovery Manager
- Virtual SAN
Today’s Reality in Operations Management

- Monitoring Data Overload
- Alert Storms
- Over-provisioning
- Finger Pointing
Core Management – vCenter Server

**Overview**

- Core management services for vSphere
- Enables key vSphere functionality (vMotion, DRS, HA, etc.)
- Real-time performance data
- Historical roll-up of all vSphere activities
- Plug-ins to VMware and 3rd party products

**Benefits**

- Centralized management from across the globe
  - Manage up to 10,000 virtual machine from 1 console
  - Delivers availability and load balancing for vSphere clusters
Automated Operations Management for Hybrid Cloud

Enabling Customers to proactively ensure quality of service, operational efficiency and continuous compliance

vCenter Operations Management Suite
Next Step to Accelerate your Journey to Virtualization

vSOM (vSphere + Operations Management)

vSphere

World’s most reliable virtualization platform

- Server consolidation
- Capex benefits
- High availability

vCenter Operations

Powerful Automated Operations Management

- Capex Savings – Higher Server Density
- Lower operating costs
- Maintained SLA levels
- Gain control and visibility
## vSphere with Operations Management

### Entitlements (VM / Core / vRAM)

- **vCPU / VM**: 8-way, 32-way, 64-way

### Features

- **Health Monitoring and Performance Analytics**
- **Capacity Management and Optimization**
- **Operations Dashboard and Root Cause Analysis**
- **vMotion**
- **Storage vMotion**
- **High Availability and Fault Tolerance (1 vCPU)**
- **Data Protection and vSphere Replication**
- **vShield Endpoint**
- **Distributed Resource Scheduler and Distributed Power Management**
- **Storage APIs for Array Integration, Multipathing**
- **Distributed Switch**
- **Storage DRS and Profile-Driven Storage**
- **I/O Controls (Network and Storage) and SR-IOV**
- **Host Profiles and Auto Deploy**

### Editions

- **vSphere Standard**
- **vSphere Enterprise**
- **vSphere Enterprise+**

### Entitlements

- **Unlimited**
- **vCenter Operations Management Suite Standard**
- **vCenter Operations Management Suite Standard**
- **vCenter Operations Management Suite Standard**

### New with vSOM

- **High Availability and Fault Tolerance (1 vCPU)**
- **Operations Dashboard and Root Cause Analysis**
Operations Management Delivers Real Value

SAVINGS + EFFICIENCY

Operations Management amplifies vSphere value

- Improve infrastructure and application availability
  - Reduce the downtime of applications by 36%
  - Reduce diagnostics and problem resolution time by 26%

- Reduce cost
  - Approximately double IT savings of vSphere

- Improve capacity utilization
  - Improve VMware capacity utilization by 40% and consolidation ratios by 37%

Management Insights Customer Survey, September 2012
VMware in the Leaders Quadrant for x86 Server Virtualization
Best positioned on both axes – ability to execute and completeness of vision

This Magic Quadrant graphic was published by Gartner, Inc. as part of a larger research note and should be evaluated in the context of the entire report. The Gartner report is available upon request from VMware.
# COMPETITIVE ANALYSIS

## Worldwide Cloud Systems Management Software 2012 Vendor Shares

Mary Johnston Turner

<table>
<thead>
<tr>
<th>Vendor</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2012 Share (%)</th>
<th>2011–2012 Growth (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMware</td>
<td>70.0</td>
<td>152.0</td>
<td>247.5</td>
<td>20.5</td>
<td>62.8</td>
</tr>
<tr>
<td>IBM</td>
<td>48.0</td>
<td>78.0</td>
<td>175.0</td>
<td>14.5</td>
<td>124.4</td>
</tr>
<tr>
<td>CA Technologies</td>
<td>60.0</td>
<td>137.0</td>
<td>159.0</td>
<td>13.1</td>
<td>16.1</td>
</tr>
<tr>
<td>BMC</td>
<td>35.0</td>
<td>92.0</td>
<td>135.0</td>
<td>11.2</td>
<td>46.7</td>
</tr>
<tr>
<td>Microsoft</td>
<td>57.0</td>
<td>74.0</td>
<td>120.0</td>
<td>9.9</td>
<td>62.2</td>
</tr>
<tr>
<td>HP</td>
<td>38.0</td>
<td>80.0</td>
<td>110.0</td>
<td>9.1</td>
<td>37.5</td>
</tr>
<tr>
<td>RightScale</td>
<td>7.0</td>
<td>27.0</td>
<td>49.0</td>
<td>4.0</td>
<td>81.5</td>
</tr>
<tr>
<td>Cisco</td>
<td>20.0</td>
<td>36.0</td>
<td>52.0</td>
<td>4.3</td>
<td>44.4</td>
</tr>
<tr>
<td>ServiceMesh</td>
<td>10.0</td>
<td>19.0</td>
<td>26.0</td>
<td>2.1</td>
<td>38.8</td>
</tr>
<tr>
<td>Adaptive Computing</td>
<td>5.0</td>
<td>11.0</td>
<td>17.0</td>
<td>1.4</td>
<td>54.5</td>
</tr>
<tr>
<td>Dell</td>
<td>2.0</td>
<td>4.0</td>
<td>10.0</td>
<td>0.8</td>
<td>150.0</td>
</tr>
<tr>
<td>Red Hat</td>
<td>3.0</td>
<td>6.0</td>
<td>8.0</td>
<td>0.7</td>
<td>33.3</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>355.0</strong></td>
<td><strong>716.0</strong></td>
<td><strong>1,108.5</strong></td>
<td><strong>91.6</strong></td>
<td><strong>54.8</strong></td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td><strong>54.0</strong></td>
<td><strong>38.0</strong></td>
<td><strong>101.5</strong></td>
<td><strong>8.4</strong></td>
<td><strong>167.1</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>409.0</strong></td>
<td><strong>754.0</strong></td>
<td><strong>1,210.0</strong></td>
<td><strong>100.0</strong></td>
<td><strong>60.5</strong></td>
</tr>
</tbody>
</table>

Source: IDC, June 2013
Agenda

- vSOM (vSphere Operations Management) Introduction
- What’s Operations Management
- Key Features on vCOps
- Customer Case Study
vSphere App HA *(new feature in vSphere 5.5)*

**Overview**

- Detect and recover from application or OS failure
- Supports most common packaged applications (Exchange, SQL, Oracle, SharePoint, etc.)
- vCloud Extensibility – APIs to Ecosystem

**Benefits**

- Simpler management from vCenter Server
- Tier 1 application protection at scale
- Lower TCO than traditional application specific cluster availability solutions
**vSphere Flash Read Cache: Server-based Flash to Accelerate VM Performance (new feature in vSphere 5.5)**

**Overview**
- Virtualized flash resource managed just like CPU and memory
- Per-VM hypervisor-based read caching using server flash
- Compatible with vMotion, DRS & HA

**Benefits**
- Accelerates performance for mission critical applications by up to 5-10x
- Enables efficient use of server flash in virtual environments
- Fully transparent read-caching – no host agents or application changes
VMware Virtual SAN: Software Defined Storage
With Unparalleled Efficiency & Agility

**Overview**
- Virtual SAN clusters solid state drives and hard disks from multiple servers to create shared storage
- Redefines the hypervisor to cluster compute and storage
- Policy based management for self-tuning VM-centric storage
- Scale-out architecture with built-in SSD caching

**Benefits**
- Radically simple storage designed for virtual machines
- Fast, resilient, dynamic
- Significantly lower TCO for comparable performance
- Starts small with linear scaling of performance, capacity, and cost
vCenter Operations Adds Value to vCenter Server

vCenter Operations Management Suite

vCenter Operations
- vC Ops collects the metrics from vCenter and provides a holistic view and deep insights into the health, risk and efficiency
- vC Ops catches unusual behavior and detects potential performance bottlenecks early on before end users notice

vCenter Server
- vCenter Server collects real time performance data from vSphere
- vCenter Server stores the data in vCenter database and also keeps a historical roll up of data
vCenter Operations Deployment

1. Deploy OVF Template...

2. Customizing the software solution for this deployment.

vCenter Operations Management Requirements

- 1500 VMs & 600,000 Collected Metrics

<table>
<thead>
<tr>
<th></th>
<th>UI VM</th>
<th>Analytics VM</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>vCPU</td>
<td>2 vCPU</td>
<td>2 vCPU</td>
<td>4 vCPU</td>
</tr>
<tr>
<td>Memory</td>
<td>7G Memory</td>
<td>9G Memory</td>
<td>16 G Memory</td>
</tr>
<tr>
<td>Disk</td>
<td>100GB</td>
<td>800GB (1,500 IOPS)</td>
<td>900GB</td>
</tr>
</tbody>
</table>
VMware’s Approach to Cloud Operations Management

**vCenter Operations Management Suite**

1. **Patented Analytics**
   - Self-Learning
   - Dynamic Thresholds
   - Smart Alerts

2. **Integrated Approach**
   - Performance Data
   - Capacity Consumption
   - Configuration Changes

3. **Designed for Cloud**
   - Health Model
   - Open and extensible
   - Evolutionary Approach

**VMware Components**

- vSphere vCenter Server
- Server, Storage, Network Monitoring
- OS, DB, App Monitoring
Managing Performance/Capacity in vSphere: the basic

**Is it healthy?**
- Every VM & ESX performing well? CPU, RAM, Network, Disk?
- Are they behaving expectedly?
- Any fault on any component?

**Is it enough?**
- Enough CPU, RAM, Network, Disk? Future risk?
- Time remaining?
- Capacity remaining?
- Where are the “Stress points” in time?

**Is it optimised?**
- Which VMs need adjustment?
- What are my key ratios?
- How much can I claim back from “fat” VMs?
- How many more VMs can I put without impacting performance?
Direct Mapping by vCenter Operations

Is it healthy = Health
- Workload
- Anomalies
- Faults

Is it enough = Risk
- Time remaining
- Capacity remaining
- Stress period

Is it optimised = Efficiency
- What can we reclaim?
- Density. Key ratios for management
Learn Normal Behavior and Identify Abnormalities

- Doesn’t assume IT data has a normal bell-shaped distribution
- Sophisticated Analytics – 8 different algorithms
- Learns your dynamic ranges of “Normal” without templates
- Learns patterns of behavior and identifies Abnormalities
Performance Monitoring

1. Easy Monitoring
2. Alert before problem happen
3. ESX/VM/OS/Application Monitoring (e.g. Exchange, MSSQL, Oracle, DB2, Sybase, WebSphere, Weblogic, JBOSS, etc)

VMware ESX

Guest Operating System

Guest Application / Database (Advanced / Enterprise)

Performance Metrics
Events
Logs
Alerts

Monitoring
Agenda

- vSOM (vSphere Operations Management) Introduction
- What’s Operations Management
- Key Features on vCOps
- Customer Case Study
Single View of Monitoring
Operation Management Dashboard (Bird-eye view)

- vCenter
- Virtual DC
- Cluster
- ESX
- VM
- Datastores
Resources Relationship
Search for the Web Server

Health is green, so what’s going on?
Capacity Planning
1) Capacity Planning, Reporting and Optimization

Optimize VM density (Do I need to increase resource?)

Forecast Timing
- Capacity Shortfalls
- Resource required

Forecast
- By previous usage
- By “what-if” configuration

Identify areas of reclaimable waste (optimization)

Standard out-of-the-box reports provided
Forecast by “Previous Usage” & “What-If Analysis”

- Current capacity cross-over point
- Actual VMs deployed
- VM count capacity
- New capacity shortfall if I add 10 new VMs
- Capacity state today
- Forecast by “Previous Usage” & “What-If Analysis”
“What-If” Capacity Analysis

Select whether to model hosts or VM additions or removals.

Start the what-if scenario wizard: what if I need to add 10 new VMs?

Model VM characteristics: numbers, CPU, CPU utilization, memory.
Resource Reclaim
Monitor for Reclaim Waste capacity

- Identify Reclaimable Waste in “Efficiency” Badge
  - How many reclaimable waste resources??

Reclaimable Waste
Percent of configured capacity that is reclaimable

- 7 vCPUs
- 116.3 gb Disk
- 13.8 gb vMem

20% Idle VMs
51% Powered Off VMs
27% Oversized VMs
Monitor for Reclaim Waste capacity (cont)

Identify Idle VM quickly to optimize capacity (CPU)

![Image of vCenter Operations Advanced interface with highlighted 100% CPU Idle VMs]

<table>
<thead>
<tr>
<th>Virtual Machine</th>
<th>CPU Demand</th>
<th>CPU % Idle Time</th>
<th>Disk I/O Usage</th>
<th>Disk I/O % Idle Time</th>
<th>Network I/O Usage</th>
<th>Network I/O % Idle Time</th>
<th>Memory Consumed</th>
<th>Total Virtual Disk Space Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>APM</td>
<td>262.4 MHz</td>
<td>0%</td>
<td>99.94 Kbps</td>
<td>0%</td>
<td>0.145 Kbps</td>
<td>99%</td>
<td>3,605 MB</td>
<td>24 GB</td>
</tr>
<tr>
<td>apm_probe_140</td>
<td>139.1 MHz</td>
<td>0%</td>
<td>11.37 Kbps</td>
<td>97%</td>
<td>3.824 Kbps</td>
<td>100%</td>
<td>558.3 MB</td>
<td>6.5 GB</td>
</tr>
<tr>
<td>demo_citrix</td>
<td>177.6 MHz</td>
<td>0%</td>
<td>433.1 Kbps</td>
<td>100%</td>
<td>0.1667 Kbps</td>
<td>100%</td>
<td>722.3 MB</td>
<td>48 GB</td>
</tr>
<tr>
<td>demo_vcs</td>
<td>293.1 MHz</td>
<td>6%</td>
<td>309.1 Kbps</td>
<td>100%</td>
<td>0.5033 Kbps</td>
<td>100%</td>
<td>1,631 MB</td>
<td>10 GB</td>
</tr>
<tr>
<td>sugarwebserver-1</td>
<td>511.1 MHz</td>
<td>43%</td>
<td>32.48 Kbps</td>
<td>90%</td>
<td>7.78 Kbps</td>
<td>44%</td>
<td>853.8 MB</td>
<td>4 GB</td>
</tr>
<tr>
<td>VCOPS</td>
<td>81.44 MHz</td>
<td>90%</td>
<td>95.48 Kbps</td>
<td>0%</td>
<td>1.068 Kbps</td>
<td>0.045%</td>
<td>4,670 MB</td>
<td>124 GB</td>
</tr>
<tr>
<td>VC41</td>
<td>81.39 MHz</td>
<td>92%</td>
<td>28.69 Kbps</td>
<td>35%</td>
<td>1.999 Kbps</td>
<td>39%</td>
<td>3,216 MB</td>
<td>40 GB</td>
</tr>
<tr>
<td>APM_A32</td>
<td>31.15 MHz</td>
<td>98%</td>
<td>11.37 Kbps</td>
<td>94%</td>
<td>0.06443 Kbps</td>
<td>99%</td>
<td>775.3 MB</td>
<td>40 GB</td>
</tr>
<tr>
<td>APM_hypericServ</td>
<td>73.11 MHz</td>
<td>98%</td>
<td>8.979 Kbps</td>
<td>96%</td>
<td>0.01804 Kbps</td>
<td>100%</td>
<td>1,053 MB</td>
<td>40 GB</td>
</tr>
<tr>
<td>delivvedoredb</td>
<td>42.45 MHz</td>
<td>98%</td>
<td>16.87 Kbps</td>
<td>80%</td>
<td>1.272 Kbps</td>
<td>100%</td>
<td>833.1 MB</td>
<td>40 GB</td>
</tr>
<tr>
<td>OGI_15_BETA</td>
<td>78.65 MHz</td>
<td>99%</td>
<td>23.47 Kbps</td>
<td>81%</td>
<td>0.5975 Kbps</td>
<td>94%</td>
<td>1,743 MB</td>
<td>40 GB</td>
</tr>
<tr>
<td>cliqTS_demos_v</td>
<td>85.27 MHz</td>
<td>99%</td>
<td>14 Kbps</td>
<td>99%</td>
<td>0.9185 Kbps</td>
<td>100%</td>
<td>2,152 MB</td>
<td>40 GB</td>
</tr>
<tr>
<td>cliqTS_demos_v</td>
<td>57.92 MHz</td>
<td>99%</td>
<td>8.14 Kbps</td>
<td>99%</td>
<td>0.00318 Kbps</td>
<td>100%</td>
<td>2,205 MB</td>
<td>40 GB</td>
</tr>
<tr>
<td>APM_meterClient</td>
<td>27.12 MHz</td>
<td>100%</td>
<td>1.783 Kbps</td>
<td>99%</td>
<td>0.01649 Kbps</td>
<td>100%</td>
<td>771.4 MB</td>
<td>2 GB</td>
</tr>
<tr>
<td>APM_LB</td>
<td>17.82 MHz</td>
<td>100%</td>
<td>2.047 Kbps</td>
<td>99%</td>
<td>0.000005 Kbps</td>
<td>100%</td>
<td>260.1 MB</td>
<td>2 GB</td>
</tr>
<tr>
<td>APM_YSG1</td>
<td>10.37 MHz</td>
<td>100%</td>
<td>1.79 Kbps</td>
<td>99%</td>
<td>0.000005 Kbps</td>
<td>100%</td>
<td>260.1 MB</td>
<td>2 GB</td>
</tr>
<tr>
<td>APM_YSG2</td>
<td>16.57 MHz</td>
<td>100%</td>
<td>5.726 Kbps</td>
<td>100%</td>
<td>0.000005 Kbps</td>
<td>100%</td>
<td>260.1 MB</td>
<td>2 GB</td>
</tr>
<tr>
<td>delivvedore_client</td>
<td>12.96 MHz</td>
<td>100%</td>
<td>15.94 Kbps</td>
<td>100%</td>
<td>0.000005 Kbps</td>
<td>100%</td>
<td>260.1 MB</td>
<td>2 GB</td>
</tr>
<tr>
<td>delivvedoreserver</td>
<td>17.97 MHz</td>
<td>100%</td>
<td>4.988 Kbps</td>
<td>100%</td>
<td>0.000005 Kbps</td>
<td>100%</td>
<td>260.1 MB</td>
<td>2 GB</td>
</tr>
<tr>
<td>vCenter Mobile Access</td>
<td>58.45 MHz</td>
<td>100%</td>
<td>4.564 Kbps</td>
<td>100%</td>
<td>0.000005 Kbps</td>
<td>100%</td>
<td>260.1 MB</td>
<td>2 GB</td>
</tr>
</tbody>
</table>
### Identify Idle Disk Space

![Screenshot of VMware vCenter Operations, showing a report on idle disk space.](image)

#### Table: Datastore Waste

<table>
<thead>
<tr>
<th>Datastore</th>
<th>vCenter Server</th>
<th>Datastore Disk Space Capacity</th>
<th>Datastore Disk Space Used</th>
<th>Powered-Off Disk Space Used</th>
<th>Idle Disk Space Used</th>
<th>Template Disk Space Used</th>
<th>Templates</th>
<th>Snapshots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demo Share</td>
<td>MGMT-VC</td>
<td>91.86 GB</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Demo Share 2</td>
<td>MGMT-VC</td>
<td>86.07 GB</td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Do not use. To be</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>replaced.</td>
<td>SM5 Site 1</td>
<td>337.5 GB</td>
<td>0.13 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>GLOBAL-TEMPLATES-VNX</td>
<td>Lab Management</td>
<td>1,008 GB</td>
<td>374.4 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>GLOBAL-TEMPLATES-VNX</td>
<td>vCloud</td>
<td>1,500 GB</td>
<td>371.3 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>GLOBAL-TEMPLATES-VNX</td>
<td>SM5 Site 1</td>
<td>1,500 GB</td>
<td>371.3 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>Global-TEMPLATES-VNX</td>
<td>vCloud</td>
<td>363 GB</td>
<td>374.4 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>Mgmt-Demo-01</td>
<td>MGMT-VC</td>
<td>808 GB</td>
<td>371.3 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>Mgmt-Demo-02</td>
<td>MGMT-VC</td>
<td>778.8 GB</td>
<td>371.3 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>vFabric</td>
<td>MGMT-VC</td>
<td>114.1 GB</td>
<td>371.3 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>vFabric ESGI-001-LOCAL</td>
<td>vCloud</td>
<td>274.2 GB</td>
<td>95.5 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>vFabric ESGI-002-LOCAL</td>
<td>vCloud</td>
<td>274.2 GB</td>
<td>95.5 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>vFabric ESGI-003-LOCAL</td>
<td>vCloud</td>
<td>95.5 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>vFabric ESGI-004-LOCAL</td>
<td>vCloud</td>
<td>95.5 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>vFabric ESGI-005-LOCAL</td>
<td>Lab Management</td>
<td>30.61 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>vFabric ESGI-006-LOCAL</td>
<td>Lab Management</td>
<td>1,007 GB</td>
<td>403.3 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>vFabric ESGI-007-LOCAL</td>
<td>Lab Management</td>
<td>1,007 GB</td>
<td>403.3 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>vFabric ESGI-008-LOCAL</td>
<td>Lab Management</td>
<td>1,007 GB</td>
<td>403.3 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>vFabric ESGI-009-LOCAL</td>
<td>Lab Management</td>
<td>1,007 GB</td>
<td>403.3 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>vFabric ESGI-010-LOCAL</td>
<td>Lab Management</td>
<td>1,007 GB</td>
<td>403.3 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>vFabric ESGI-011-LOCAL</td>
<td>Lab Management</td>
<td>1,007 GB</td>
<td>403.3 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>vFabric ESGI-012-LOCAL</td>
<td>Lab Management</td>
<td>1,007 GB</td>
<td>403.3 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>vFabric ESGI-013-LOCAL</td>
<td>Lab Management</td>
<td>1,007 GB</td>
<td>403.3 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>vFabric ESGI-014-LOCAL</td>
<td>Lab Management</td>
<td>1,007 GB</td>
<td>403.3 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>vFabric ESGI-015-LOCAL</td>
<td>Lab Management</td>
<td>1,007 GB</td>
<td>403.3 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
<tr>
<td>vFabric ESGI-016-LOCAL</td>
<td>Lab Management</td>
<td>1,007 GB</td>
<td>403.3 GB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
<td>0 MB</td>
</tr>
</tbody>
</table>

- **Utilization Calculation**: Every day and all hours
- **Capacity Calculation Rule**: Use best linear capacity per interval
- **Capacity Buffer Limits**
  - CPU: 10%
  - Memory: 10%
  - Disk I/O: 10%
  - Network I/O: Disabled
- **Interval Information**: Interval size: Weekly, Number of Intervals: 4
### 1.2 Capacity Optimization Candidates

#### 1.2.1 Virtual Machine Optimization - Summary

<table>
<thead>
<tr>
<th>Datacenter: RCDN9-DCI03S</th>
<th>VMs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Virtual Machines</td>
<td>479</td>
</tr>
<tr>
<td>Powered-Off Virtual Machines</td>
<td>5</td>
</tr>
<tr>
<td>Undersized Virtual Machines</td>
<td>5</td>
</tr>
<tr>
<td>Oversized Virtual Machines</td>
<td>454</td>
</tr>
<tr>
<td>Idle Virtual Machines</td>
<td>2</td>
</tr>
</tbody>
</table>

Report identifies that 95% of VMs are over-provisioned!
Monitor for Reclaim Waste capacity (cont)

Identify Oversize VM and Provide recommended configuration

<table>
<thead>
<tr>
<th>Virtual Machine</th>
<th>vCenter Server</th>
<th>Configured vCPU</th>
<th>Recommended vCPU</th>
<th>Optimal of Recommended(%)</th>
<th>Configured Memory</th>
<th>Recommended Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>AdminClient-Iwan</td>
<td>vCloud</td>
<td>2 vCPUs</td>
<td>1 vCPUs</td>
<td>23%</td>
<td>2 GB</td>
<td>896 MB</td>
</tr>
<tr>
<td>AdminClient-Vishal</td>
<td>vCloud</td>
<td>2 vCPUs</td>
<td>1 vCPUs</td>
<td>4.3%</td>
<td>2 GB</td>
<td>480 MB</td>
</tr>
<tr>
<td>Analytics VM</td>
<td>MGMT-VC</td>
<td>2 vCPUs</td>
<td>1 vCPUs</td>
<td>77%</td>
<td>9 GB</td>
<td>5,120 MB</td>
</tr>
<tr>
<td>Analytics VM</td>
<td>MGMT-VC</td>
<td>2 vCPUs</td>
<td>1 vCPUs</td>
<td>29%</td>
<td>9 GB</td>
<td>2,272 MB</td>
</tr>
<tr>
<td>CapacityIQ</td>
<td>MGMT-VC</td>
<td>4 vCPUs</td>
<td>1 vCPUs</td>
<td>10%</td>
<td>4 GB</td>
<td>448 MB</td>
</tr>
<tr>
<td>Chargeback 2.0</td>
<td>MGMT-VC</td>
<td>1 vCPUs</td>
<td>1 vCPUs</td>
<td>15%</td>
<td>4 GB</td>
<td>512 MB</td>
</tr>
<tr>
<td>CMPCONV001</td>
<td>vCloud</td>
<td>2 vCPUs</td>
<td>1 vCPUs</td>
<td>1.2%</td>
<td>2 GB</td>
<td>256 MB</td>
</tr>
<tr>
<td>CMPDBS001</td>
<td>vCloud</td>
<td>2 vCPUs</td>
<td>1 vCPUs</td>
<td>2.6%</td>
<td>2 GB</td>
<td>256 MB</td>
</tr>
<tr>
<td>CMPESXI001</td>
<td>vCloud</td>
<td>4 vCPUs</td>
<td>1 vCPUs</td>
<td>5%</td>
<td>4 GB</td>
<td>288 MB</td>
</tr>
<tr>
<td>CMPESXI002</td>
<td>vCloud</td>
<td>4 vCPUs</td>
<td>1 vCPUs</td>
<td>5.6%</td>
<td>4 GB</td>
<td>288 MB</td>
</tr>
<tr>
<td>CMPESXI003</td>
<td>vCloud</td>
<td>4 vCPUs</td>
<td>1 vCPUs</td>
<td>17%</td>
<td>4 GB</td>
<td>576 MB</td>
</tr>
</tbody>
</table>
Change Detection
Remediate: Intelligent Tools to Resolve Problems

Check related events to find any changes to the VM

<table>
<thead>
<tr>
<th>Time</th>
<th>Resource Kind</th>
<th>Object Name</th>
<th>Event Source</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb 28, 201...</td>
<td>Virtual Machine</td>
<td>iisWebServer</td>
<td>CSV/CENTOS.eng.vm...</td>
<td>Guest Info 'Tools Status' changed from 'guestToolsNotRunning' to 'guestToolsRunning'</td>
</tr>
<tr>
<td>Feb 23, 201...</td>
<td>Virtual Machine</td>
<td>iisWebServer</td>
<td>CSV/CENTOS.eng.vm...</td>
<td>Guest Info 'Tools Status' changed from 'guestToolsNotRunning' to 'guestToolsRunning'</td>
</tr>
</tbody>
</table>
Correlation of Performance and Change Events

- Collect configuration changes inside the guest OS
- Allow admin to understand and remediate performance issues (e.g. changed resource allocation)
Backup and Recovery
vSphere Data Protection Advanced for Midsize Environments

<table>
<thead>
<tr>
<th>Licensing and Pricing</th>
<th>VDP</th>
<th>VDP Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per CPU (license only)</td>
<td>Included with vSOM</td>
<td>$1,095</td>
</tr>
<tr>
<td>Max protected VMs per CPU</td>
<td>Unlimited</td>
<td>Unlimited</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scalability</th>
<th>VDP</th>
<th>VDP Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max deduplicated storage per appliance</td>
<td>2TB</td>
<td>8TB</td>
</tr>
<tr>
<td>Max supported VMs per appliance</td>
<td>100</td>
<td>400</td>
</tr>
<tr>
<td>Max appliances per vCenter instance</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Features</th>
<th>VDP</th>
<th>VDP Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agent-less backup</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable-length deduplication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CBT for backup and restore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>vSphere Web Client management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full VM and File-level recovery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dynamic provisioning 2TB→8TB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSFT Exchange Server agents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSFT SQL Server agents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Migration from VDP</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Overview**

- Deployed as a virtual appliance
- **Agent-less**, image-level backups to disk
- Integrated with the vSphere platform
- Built-in deduplication
Values of vSphere Data Protection

1. **4x More Storage-Efficient**
   - Backup storage required for 200 VMs
   - VDP/VDPA: 19 TB
   - TCO: $23,000
   - Others: 71 TB
   - TCO: $84,000

2. **6x Faster Recovery**
   - Recovery time of a 30GB VM
   - VDP/VDPA: 18.8 minutes
   - Others: 2.9 minutes

3. **Single UI admin with vSphere**

4. **File-Level Recovery**

5. **Apps-aware agents**

- Single UI admin with vSphere
- Apps-aware agents

**Backup storage required for 200 VMs**

**6x Faster Recovery**

**File-Level Recovery**
Site Recovery Manager
DR Automation (Site Recovery Manager - SRM)

- 1. DR
- 2. DR Drill
- 3. DC Relocation

Automation
- IP change
- Boot sequence
- Startup scripts

Site A
- Site B
- WAN
- Replication (internal disk / SAN)
- Press in Case of Disaster
- Net test
Set Up Multiple Recovery Plans For Partial Recoveries

**Overview**

Multiple recovery plans can be set up – for example
- One recovery plan per app
- One recovery plan for the entire datacenter

Minimum unit of recovery is the ‘protection group’
- Roughly equivalent to all the VMs on a single storage LUN / datastore

**Benefits**

Enable partial failovers and migrations
- Single app to avoid maintenance downtime
- Whole datacenter in the event of DR
Testing and Executing Recovery Plans

Steps in recovery plan

Status and time stamps

When to execute

User confirmation message
vSphere Replication Complements Storage-Based Replication

<table>
<thead>
<tr>
<th>vSphere Replication</th>
<th>Replication Provider</th>
<th>Cost</th>
<th>Management</th>
<th>Performance</th>
</tr>
</thead>
</table>
|                      | VMware               | • Low-end storage supported  
|                      |                      | • No additional replication software  
|                      |                      | • VM’ granularity  
|                      |                      | • Managed directly in vCenter  |

<table>
<thead>
<tr>
<th>Storage-based Replication</th>
<th>Replication Provider</th>
<th>Cost</th>
<th>Management</th>
<th>Performance</th>
</tr>
</thead>
</table>
|                           |                      | • Higher-end replicating storage  
|                           |                      | • Additional replication software  
|                           |                      | • LUN – VM layout  
|                           |                      | • Storage team coordination  |

- 15 min RPOs  
- Scales to 500 VMs  
- File-level consistency  
- No automated failback, FT, linked clones, physical RDM (raw device mapping)  
- Synchronous replication  
- High data volumes  
- Application consistency possible
Agenda

- vSOM (vSphere Operations Management) Introduction
- What’s Operations Management
- Key Features on vCOps
- Customer Case Study
Alert Reduction:
Instead of getting 500-1000 threshold alerts a day, we get 50-100 vCenter Operation alerts. We had so many false alerts.

Faster Troubleshooting:
We use the product for trouble shooting particular issues in our environment. Basically, this is the tool that helps us get to the problem faster than we would with other tools.

Improved Utilization:
We had a rate of 92% VM’s, that were over-provisioned. We use vCenter Operations to get back resources from over-provisioned Virtual Machine’s (VM’s).
Right-sizing VMs

• We quickly discovered many VMs had been built with much more vCPU/memory than the workload required. This was chiefly as a result of our migration from older servers to VMs running on modern hardware.

What-if scenarios

• The ability to model changes to the virtual environment before making any changes allows us to model predicted performance vs. capacity before any changes are made which could introduce risk to the apps running the business.

Helps drive our data centre strategy

• ESXi helped us achieve the first stage of our virtualisation strategy. Thousands of physical hosts migrated to virtual hosts. vCenter Operations will help us increase the virtual to physical host ratio and maintain our service levels.
License
# vSphere with Operations Management (VSOM)

<table>
<thead>
<tr>
<th>Price (per CPU, license only)</th>
<th>$1,745</th>
<th>$3,625</th>
<th>$4,245</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Entitlements (VM / Core / vRAM)</strong></td>
<td>Unlimited</td>
<td>Unlimited</td>
<td>Unlimited</td>
</tr>
<tr>
<td>• vCPU / VM</td>
<td>8-way</td>
<td>32-way</td>
<td>64-way</td>
</tr>
<tr>
<td><strong>Features</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Health Monitoring and Performance Analytics</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
</tr>
<tr>
<td>• Capacity Management and Optimization</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
</tr>
<tr>
<td>• Operations Dashboard and Root Cause Analysis</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
</tr>
<tr>
<td>• vMotion</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
</tr>
<tr>
<td>• Storage vMotion</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
</tr>
<tr>
<td>• High Availability and Fault Tolerance (1 vCPU)</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
</tr>
<tr>
<td>• Data Protection and vSphere Replication</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
</tr>
<tr>
<td>• vShield Endpoint</td>
<td>✅</td>
<td>✅</td>
<td>✅</td>
</tr>
<tr>
<td>• Distributed Resource Scheduler and Distributed Power Management</td>
<td></td>
<td>✅</td>
<td>✅</td>
</tr>
<tr>
<td>• Storage APIs for Array Integration, Multipathing</td>
<td></td>
<td>✅</td>
<td>✅</td>
</tr>
<tr>
<td>• Distributed Switch</td>
<td></td>
<td></td>
<td>✅</td>
</tr>
<tr>
<td>• Storage DRS and Profile-Driven Storage</td>
<td></td>
<td></td>
<td>✅</td>
</tr>
<tr>
<td>• I/O Controls (Network and Storage) and SR-IOV</td>
<td></td>
<td></td>
<td>✅</td>
</tr>
<tr>
<td>• Host Profiles and Auto Deploy</td>
<td></td>
<td></td>
<td>✅</td>
</tr>
</tbody>
</table>

All editions include: Thin Provisioning, Update Manager, Storage APIs for Data Protection, Image Profile, and SLES.
vSphere customers can upgrade to vSOM and vCloud Suite

Paid upgrade SKUs available

<table>
<thead>
<tr>
<th>vSOM Enterprise Plus</th>
<th>vSOM Enterprise Plus</th>
<th>vCloud Suite Any vCloud Suite</th>
</tr>
</thead>
<tbody>
<tr>
<td>vSphere Enterprise Plus</td>
<td>vSOM Enterprise Plus</td>
<td>Any vCloud Suite</td>
</tr>
<tr>
<td>vSphere Enterprise</td>
<td>vSOM Enterprise</td>
<td>Any vCloud Suite</td>
</tr>
<tr>
<td>vSphere Enterprise</td>
<td>vSOM Enterprise</td>
<td>vSphere Enterprise</td>
</tr>
<tr>
<td>vSphere Standard</td>
<td>vSOM Standard</td>
<td>vSphere Enterprise</td>
</tr>
<tr>
<td>vSphere Essentials Plus</td>
<td>Any vSOM Acceleration Kits</td>
<td>vSphere Essentials Plus</td>
</tr>
<tr>
<td>vSphere Essentials</td>
<td>Any vSOM Acceleration Kits</td>
<td>vSphere Essentials Plus</td>
</tr>
</tbody>
</table>

vmware
Summary - Key Features

- Single View of Monitoring
- Relationship & Drill Down
- ESXi Integration
- Root Cause Analysis & Recommendation
- Capacity Planning

Virtual Machine

Guest Application / Database (Ent +)

Guest Operating System

VMware ESX

Capacity Remaining

- Measures the remaining available VMs as a percent of the total VM capacity
- 12% deployed 20 VMs
- Powered on 13 VMs
- 99 More VMs

VMware ESX

Health

Risk

Efficiency

VMs in a weighted combination of Health, Risk, and Efficiency, allowing users to view the current state of their environment.

ESXi Integration

Virtual Machine

Guest Application / Database (Ent +)

Guest Operating System
Thank you