

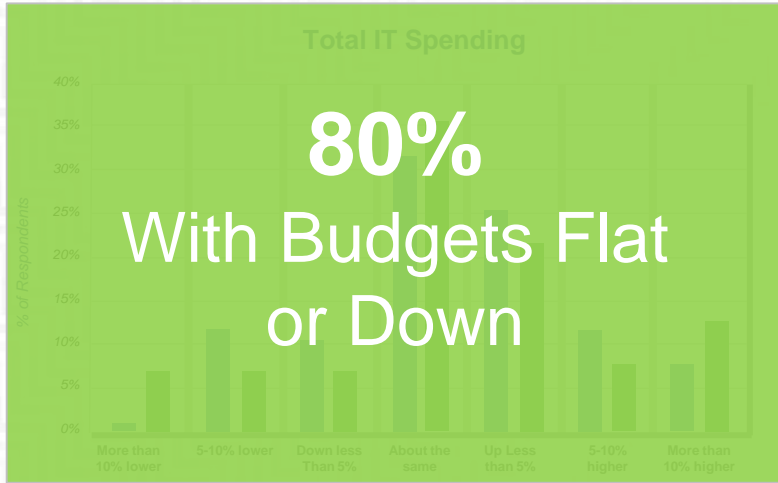
# READY FOR **ANY** vForum2015

9 December 2015 | Taipei, Taiwan

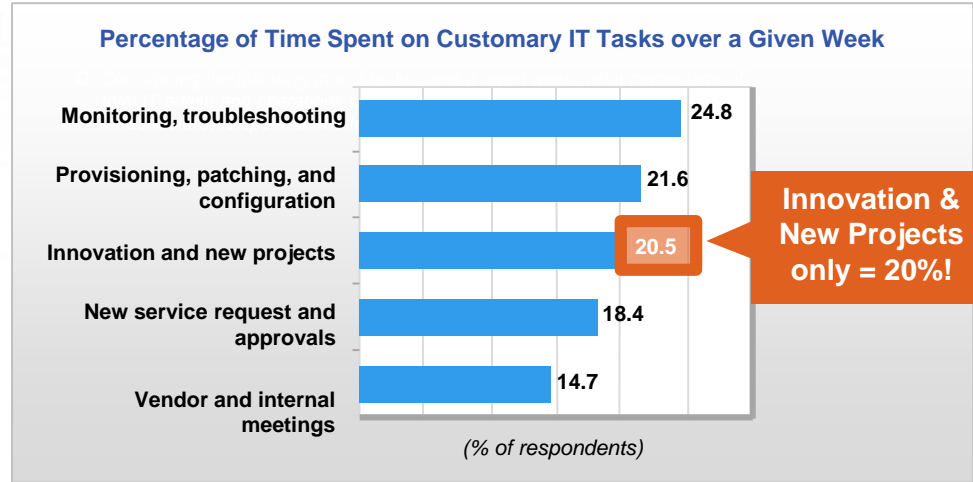
**Lenovo + VMware** Streamline Your Business

Alex Chou  
Advisory Product Manager

# +IT is Stuck



Source: Goldman Sachs



Source: IDC

“IT organizations continued to experience pressures to control spending and contain costs, emphasis has been shifting toward making investments that support **business agility, revenue growth, and improved quality of service for end users.**” – IDC

**1**

**VMware: vCloud Suite & vSphere 6.0 +  
Lenovo: servers**

**2**

**VMware: VSAN Virtual Storage +  
Lenovo: servers**

**3**

**VMware: NSX +  
Lenovo: networking + servers**

**4**

**VMware: VMware Horizon Suite (VDI)  
Lenovo: servers**

**5**

**VMware: software +  
Lenovo XClarity**

# THE IMPLEMENTATION

# + Virtualization & Cloud

## Client Needs:

- Decreased CAPEX & OPEX
- Smaller data center footprint
- Virtualization solution

## Solution:

vCloud Suite 6.0/vRealize Suite 6.0 +  
Lenovo servers featuring Intel®  
Xeon® processors

## Benefits:

- Reduced IT costs
- Increased productivity & efficiency

## KEY POINTS:

- More VMs and memory for scale-out and scale-up applications
- Lenovo infrastructure: delivers extensive storage capacity
- Lenovo: #1 enterprise server reliability
- Lenovo & VMware: #1 customer satisfaction rankings



Lenovo Flex System x240 M5 Compute  
Node  
(14 blades – 10U Chassis)

# + Virtualized Storage

## Client Needs:

- Ample storage for peak LOB workload
- Low cost solution -- No budget to purchase external SAN

## Solution:

VMware VSAN +  
Lenovo RD550, RD650, x3650 M5 &  
x3550 M5 featuring Intel® Xeon®  
processors

## Benefits:

- Enterprise-class storage performance
- Better utilization of resources
- Lower cost

## KEY POINTS:

- VSAN Ready Nodes – ready-to-go hardware solution for virtualized storage environments
- VSAN embedded in hypervisor
- Lenovo: expansive storage capacity
- Lenovo: #1 enterprise server reliability
- Lenovo & VMware:  
#1 customer satisfaction rankings



Lenovo Thinkserver RD650

# + Virtual Networking

## Client Needs:

- Deploy services quickly & seamlessly
- Reduce network provisioning for new services

## Solution:

VMware NSX architecture supported by Lenovo

## Benefits:

- Quickly deploy new services without changes to the physical network
- System administrators deploy new services without involving network administrators
- Reduce costs

## KEY POINTS:

- Lenovo supports NSX architecture
- Lenovo networking products support NSX virtual traffic (VXLAN)
- Set up virtually/remotely
- Lenovo: #1 enterprise server reliability
- Lenovo & VMware: #1 customer satisfaction rankings

# + Virtual Desktop Infrastructure

## Client Needs:

- Anywhere, anytime access
- Consistent interface & performance
- Secure environment
- Scalability

## Solution:

VMware Horizon Suite + Lenovo Thin Client + Lenovo x86 servers (Flex System x240 M5 Compute Node, x3650 M5, x3550 M5, NeXtScale) + full range of hardware support from personal technology to servers

## Benefits:

- Best-in-class VM density
- Better security

## KEY POINTS:

- Blade, rack and dense architecture for easy scale-out
- Support for graphics acceleration with NVIDIA GRID GPUs
- Lenovo:  
#1 enterprise server reliability
- Lenovo & VMware:  
#1 customer satisfaction rankings
- Lenovo: industry-unique *Trusted Platform Assurance* security



Lenovo x3650 M5

# + Virtualized Management

## Client Needs:

- Visibility and control over physical infrastructure from virtualization platforms

## Solution:

VMware software +  
Lenovo XClarity Pro

## Benefits:

- Software-defined provisioning and management of Lenovo infrastructure from VMware software
- Reduce unplanned downtime

## KEY POINTS:

- HW +vSphere Installation
- Upward integration into vCenter
- Reduce complexity
- Speed provisioning
- Enhance availability
- Extend cloud orchestration
- Lenovo & VMware:  
#1 customer satisfaction rankings



Lenovo x3850 X6

Lenovo XClarity™



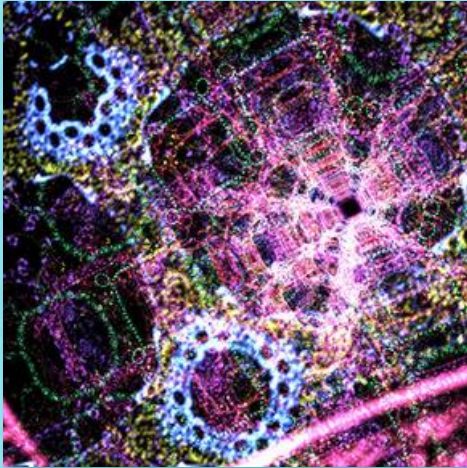
IT complexity  
is one of the  
biggest challenges  
affecting businesses

# Lenovo's Solution

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Lenovo XClarity™ is a new systems management solution that simplifies delivery of IT infrastructure and increases staff productivity

# + We Understand the Challenges



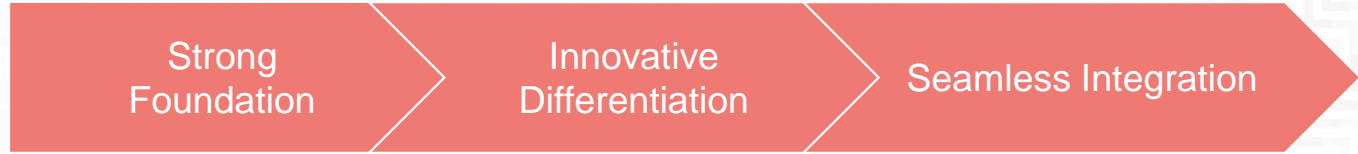
**“Some of our tools are so complex, we haven’t fully implemented”**

**“We no longer have a maintenance window”**

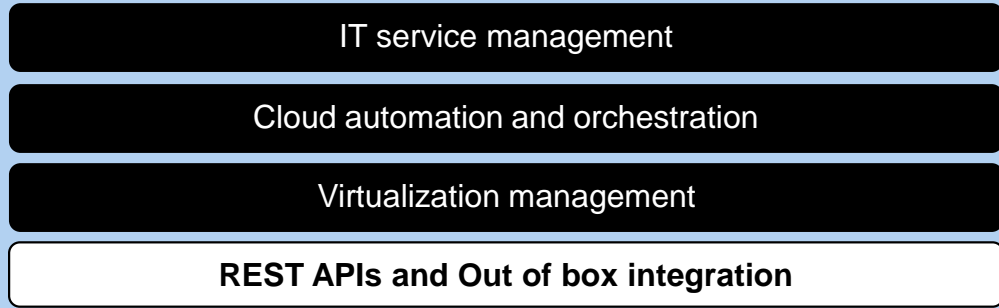
**“Updates? Our policy is: if it’s not broken, don’t fix it”**

**“It takes way too long to deploy a new server”**

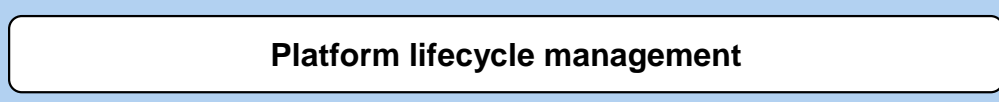
# + Systems Management Vision



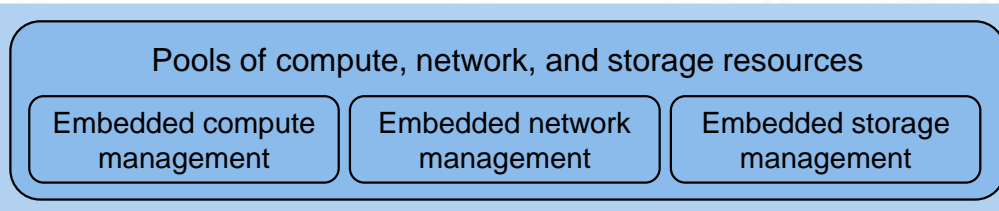
**Data center automation and IT service management**



**Simplified, scalable resource management**



**Embedded resource intelligence and management**



# + Systems Management Goals

## Simplify

- Easy to install and learn
- Standardize foundational infrastructure tasks
- Streamlined & mobile friendly user interfaces

## Automate

- Reduce steps and time
- Reuse configuration patterns and templates
- Rapidly problem identification
- Reduce or eliminate maintenance windows

## Extend

- Scriptable commands
- Manage resources from virtualization management platforms
- Automate and orchestrate cloud infrastructure
- Apply IT service management processes

# + Lenovo XClarity Extends VMware vCenter & vSphere to Centrally Manage Lenovo Data Center Hardware



- Discovery and inventory
- Monitoring
- Firmware updates
- Configurations
- Eliminate downtime in clustered environments
  - Automate rolling reboots & firmware updates
  - Automate evacuation of VMs from impacted hosts based on user-defined events

## + Available in Two Editions

Lenovo™

XClarity™ Administrator

- Centralized resource management solution
- Deploy Lenovo infrastructure faster and with less effort
- REST APIs and PowerShell support

Lenovo™

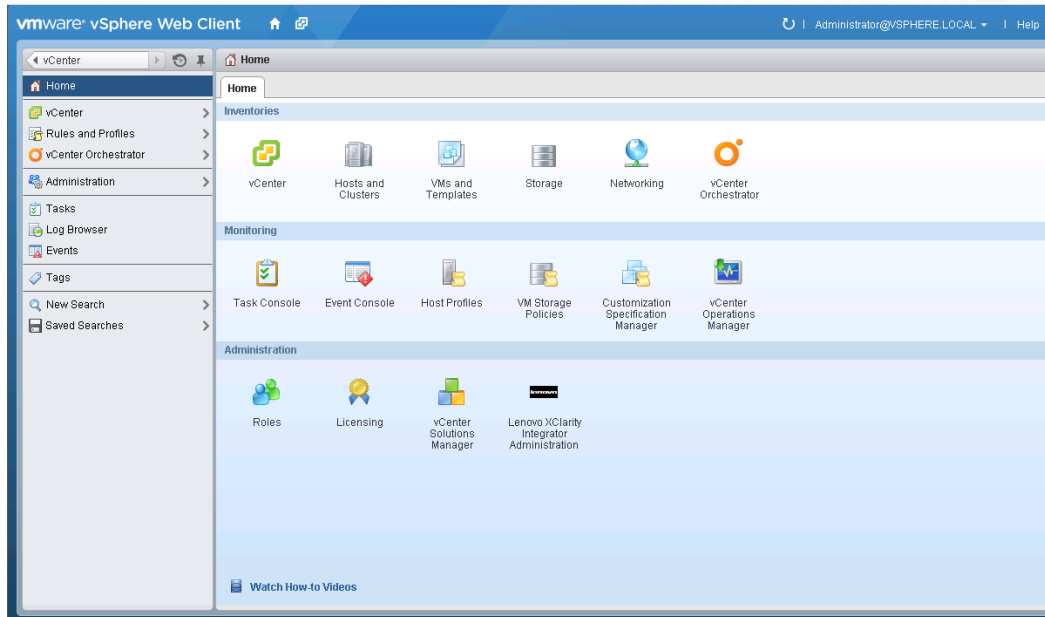
XClarity™ Pro

- Software bundle includes
  - Lenovo XClarity Administrator
  - Lenovo XClarity Integrator for Microsoft System Center
  - Lenovo XClarity Integrator for VMware vCenter
- Increases workload availability in the cluster

# + VMware vSphere Enables Users to Virtualize Any Application with a Highly Available, Resilient, On-Demand Virtual Infrastructure

- A virtualization platform used to
  - Virtualize applications
  - Simplify management of the virtual data center
  - Perform live workload migrations & maintenance
  - Build & operate cloud environments

## vSphere Web Client





# + Lenovo XClarity Integrator for VMware vCenter is a Software Plugin for vCenter Server or the vSphere Web Client

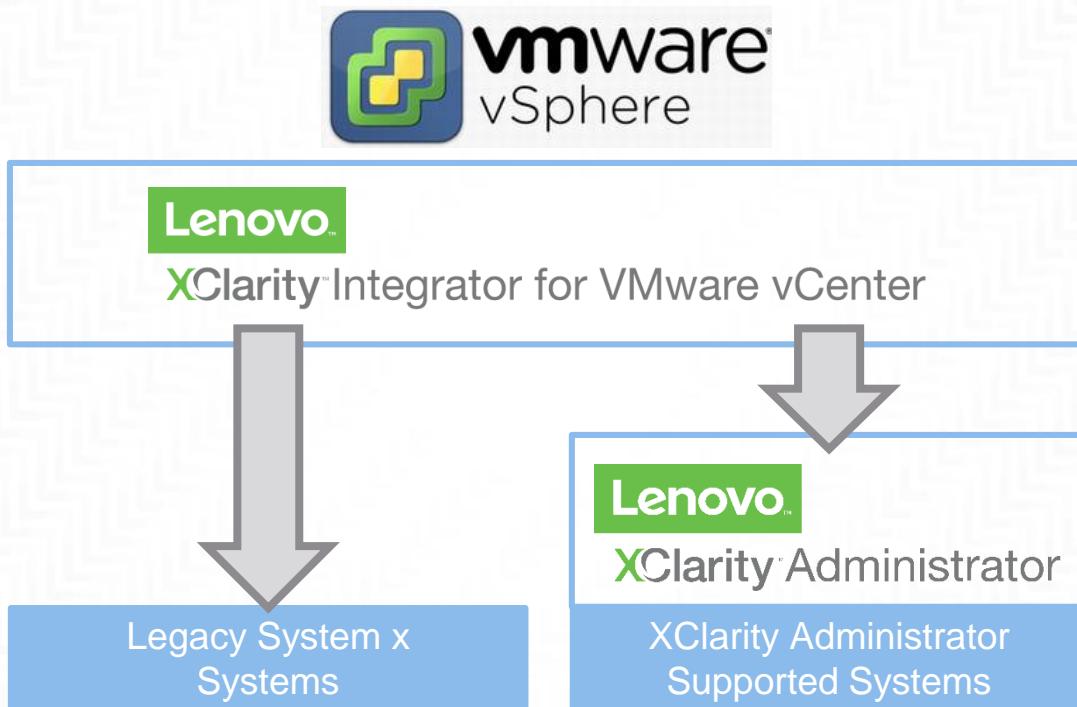


## XClarity™ Integrator for VMware vCenter

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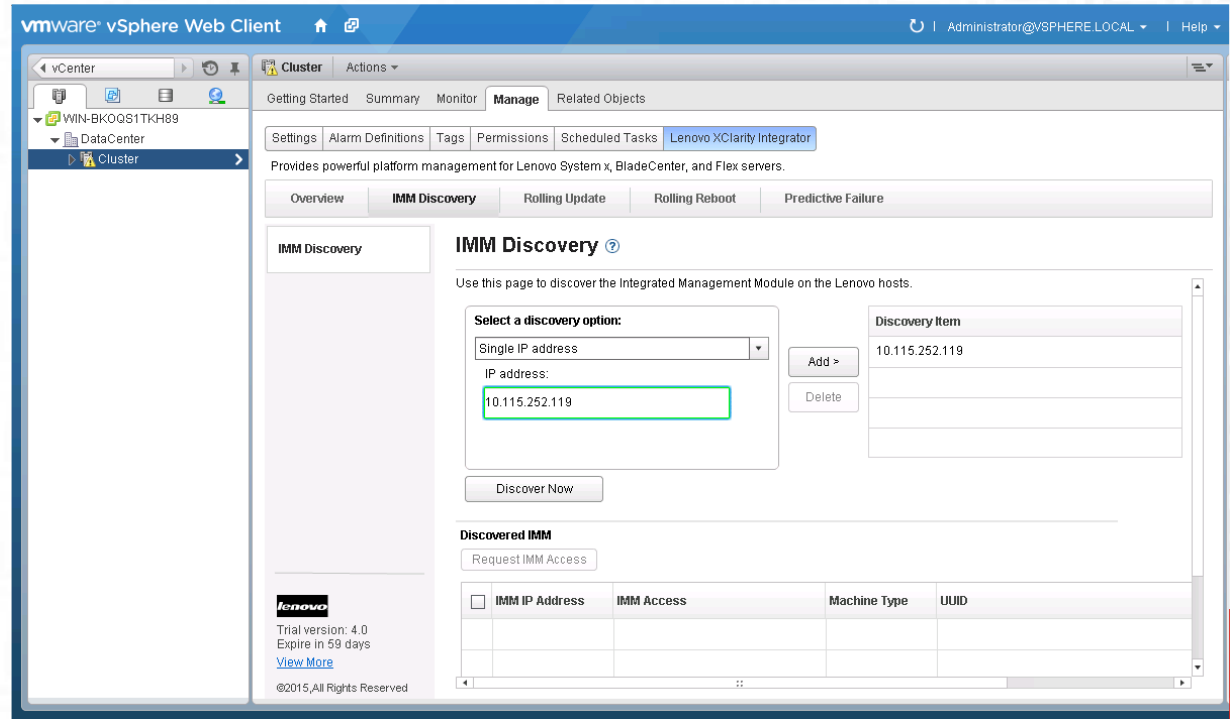
- Inventory & health status
- Cluster monitoring & alerting
- Power capping & throttling
- **New** Lenovo XClarity Administrator integration
  - Deploy configuration patterns to quickly rapidly physical hosts
  - Visualize Flex System chassis assets and status through graphical maps
- Eliminate workload downtime in vSphere clusters during
  - Hardware updates
  - **New** hardware reboots
  - User-defined platform-level events

# + Lenovo XClarity Integrator for VMware vCenter Enables Management for a Broad Range of Lenovo Servers through vSphere



# + System Discovery

- Quickly bring new systems under out-of-band management with auto-discovery



# + System Inventory

- Asset & component inventory & status information
- System event logs

The screenshot displays the VMware vSphere Web Client interface for a Lenovo server. The left sidebar shows a tree view of the environment, including Datacenter1, Cluster1, and several hosts. The main content area is titled 'System Overview' and provides detailed information about the selected server.

**System Information**

System Name: IBM Server x3650 M5 -[546225Z]-	Operating System: VMware ESXi, 5.1.0 build-1483097
Serial Number: K1X0072	Total CPU: 1 * 10 Cores, 2.25 Ghz
IMM Firmware: 9.0(TCO051E-9.00)	Total Memory: 15841.2 MB
uEFI Firmware: 1.0(TCE103DUS-1.00)	

Last Start Time: 2015/03/20 08:51:48

**System Status**

Total Events	Critical	Warning	Information
300	(1)	(29)	(270)

Click Collect to generate the categorized diagnostic data.  
Collect Get the latest system diagnostic data.

Lenovo  
Version information: 4.0  
[View More](#)

# + Visualize At-a-Glance Inventory Details and Status

- Automated mapping of the Flex System chassis
- Easily isolate critical information
- Quickly take action such as launching Chassis Management Module, Integrated Management Module, or Remote Control



# + Events and Alerts

- Real-time health and power capping events and alerts
- Also displays alerts on the VMware Host Event Console

The screenshot displays the Lenovo XClarity Integrator interface. At the top, there are navigation tabs: Getting Started, Summary, Monitor, Manage, and Related Objects. Below these, there are sub-tabs: Settings, Networking, Storage, Alarm Definitions, Tags, Permissions, and Lenovo XClarity Integrator. A description states: "Provides powerful platform management for IBM System x, BladeCenter, and PureFlex servers." The main navigation bar includes System, Alerts and Events, FW Updates, Power and Cooling, Predictive Failures, Configuration, and Help. On the left sidebar, there are sections for System Health and Power Throttling. The main content area is titled "System Health" and shows a summary: Critical(8), Warning(0), and Information(1492). Below this is a table of events with columns for Message ID, Severity, Time Stamp, and Message Detail. The table contains 12 rows of information messages, all with a severity of "Information".

Message ID	Severity	Time Stamp	Message Detail
IMM0023	Information	2011-07-37 19:51:01	ENET[sp-ethernetport] IP-Cfg:HstName=IMM-00215E380164, I
IMM0025	Information	2011-07-37 19:52:15	LAN: Ethernet[eth0] interface is now active
IMM0023	Information	2011-07-37 19:52:15	ENET[sp-ethernetport] IP-Cfg:HstName=IMM-00215E380164, I
IMM0025	Information	2011-07-37 19:53:06	LAN: Ethernet[eth0] interface is now active
IMM0023	Information	2011-07-37 19:53:06	ENET[sp-ethernetport] IP-Cfg:HstName=IMM-00215E380164, I
IMM0025	Information	2011-07-37 19:54:10	LAN: Ethernet[eth0] interface is now active
IMM0023	Information	2011-07-37 19:54:10	ENET[sp-ethernetport] IP-Cfg:HstName=IMM-00215E380164, I
IMM0025	Information	2011-07-37 19:55:47	LAN: Ethernet[eth0] interface is now active
IMM0023	Information	2011-07-37 19:55:47	ENET[sp-ethernetport] IP-Cfg:HstName=IMM-00215E380164, I
IMM0025	Information	2011-07-37 19:58:48	LAN: Ethernet[eth0] interface is now active

# + Cluster-Wide Monitoring

- At-a-glance summary visualization of cluster health
- Detailed inventory information and health status for each physical host in the cluster

The screenshot shows the VMware vSphere Web Client interface for Cluster1. The main content area displays the 'Cluster Overview' section, which includes a 'Cluster Health' summary and a table of host details.

**Cluster Health Summary:**

- 5 Total Hosts
- 0 Total Lenovo Hosts
- 5 IBM Hosts
- 0 Lenovo Hosts
- 0 Other Hosts
- 0 critical
- 0 warning
- 0 normal
- 0 unknown

**Resource Usage:**

- Disk: Used 0B / Total 47.4GB (0%)
- Memory: Used 0Hz / Total 48.2GHz (0%)
- CPU: Used 0Hz / Total 48.2GHz (0%)

**Cluster Overview Table:**

Host	Status	Machine Type	Host Access	IMM Access
<input type="checkbox"/> 10.240.252.112	<span style="color: red;">✘</span> critical	7902	<input checked="" type="checkbox"/> OK	<input checked="" type="checkbox"/> OK
<input type="checkbox"/> 10.240.197.61	<span style="color: red;">✘</span> critical	5462	<input type="checkbox"/> No Access	<input checked="" type="checkbox"/> OK
<input type="checkbox"/> 10.240.197.135	<span style="color: red;">✘</span> critical	8737	<input checked="" type="checkbox"/> OK	<input checked="" type="checkbox"/> OK
<input type="checkbox"/> 10.240.196.179	<span style="color: red;">✘</span> critical	7906	<input type="checkbox"/> No Access	<input checked="" type="checkbox"/> OK

# + Quickly Deploy Server Configuration Patterns

- Save time and scale configuration management through Patterns
- Rapidly deploy and re-deploy system configuration settings

The screenshot displays the XClarity Administrator web interface for a server at IP 10.240.197.202. The 'Manage' tab is active, and the 'Lenovo XClarity Integrator' sub-tab is selected. The main content area shows the 'Configuration Pattern' deployment screen. On the left, a sidebar lists various configuration categories: Configuration Pattern, Boot Order, IMM Serial Port, IMM Alerts, IMM Port Assignments, IMM SNMP, and IMM Security. The main area contains instructions for deploying patterns, an 'Action' section with radio buttons for 'Deploy Pattern' (selected) and 'Deactivate Pattern', a 'Pattern To Deploy' dropdown set to 'flex01', and an 'Activation' section with radio buttons for 'Full' (selected) and 'Partial'. Below this is a table for selecting servers to deploy the pattern to.

10.240.197.202 Actions ▾

Getting Started Summary Monitor **Manage** Related Objects

Settings Networking Storage Alarm Definitions Tags Permissions **Lenovo XClarity Integrator**

Provides powerful platform management for Lenovo System x, BladeCenter, and Flex servers.

System Alerts and Events Firmware Updates Power and Cooling **Configuration** ? Help

**Configuration Pattern**

Boot Order

IMM Serial Port

IMM Alerts

IMM Port Assignments

IMM SNMP

IMM Security

lenovo

To deploy the server pattern to one or more individual servers, please select patterns and target servers to deploy. No active patterns for the selected node to deactivate. To create / edit a server pattern, [click here to enter XClarity Administrator](#). To view config status on the selected node, [click here](#).

Action:  Deploy Pattern  Deactivate Pattern

\* Pattern To Deploy: flex01 [Click to show pattern details](#)

\* Activation ?  Full — Activate all settings and restart the server now.  Partial — Activate IMM settings but do not restart the server. UEFI and server settings will be active after the next restart.

Choose one or more servers to which to deploy the selected pattern.

<input checked="" type="checkbox"/>	Name	Rack Name/Unit	Chassis/Bay	Active Pattern	Managed Host?
<input checked="" type="checkbox"/>	10.240.195.56	ck, Unit 31			No



# + Reboot Clustered Physical Servers without Disruption

- Eliminate VM downtime through non-disruptive system maintenance
- Automate workload evacuation and **rolling reboots** in the cluster

The screenshot shows a web-based management interface. At the top, there are navigation tabs: 'Getting Started', 'Summary', 'Monitor', 'Manage' (selected), and 'Related Objects'. Below this is a secondary set of tabs: 'Settings', 'Alarm Definitions', 'Tags', 'Permissions', 'Scheduled Tasks', and 'Lenovo XClarity Integrator' (selected). A descriptive text block reads: 'Provides powerful platform management for Lenovo System x, BladeCenter, and Flex servers.' Below that is a row of sub-tabs: 'Overview', 'IMM Discovery', 'Rolling Update', 'Rolling Reboot' (selected), and 'Predictive Failure'. On the left side, there is a sidebar with a 'Task Manager' header. The main content area is titled 'Task Manager' with a help icon. It contains the following text: 'Use Task Manager to manage the rolling reboot tasks.' and a note: 'Make sure [Lenovo Customization Patch 8 or newer patch](#) is installed on all the esxi 5.0.x and 5.1.x hosts before performing rolling reboot.' Below the text are five action buttons: 'Create', 'Create Like...', 'Edit', 'Delete', and 'Cancel'. At the bottom is a table with the following columns: 'Task Name', 'Status', 'Progress', 'Start Time', 'End Time', and 'Task Type'. The table is currently empty.

Getting Started Summary Monitor **Manage** Related Objects

Settings Alarm Definitions Tags Permissions Scheduled Tasks **Lenovo XClarity Integrator**

Provides powerful platform management for Lenovo System x, BladeCenter, and Flex servers.

Overview IMM Discovery Rolling Update **Rolling Reboot** Predictive Failure

Task Manager

### Task Manager ?

Use Task Manager to manage the rolling reboot tasks.

Make sure [Lenovo Customization Patch 8 or newer patch](#) is installed on all the esxi 5.0.x and 5.1.x hosts before performing rolling reboot.

Create Create Like... Edit Delete Cancel

Task Name ▲	Status	Progress	Start Time	End Time	Task Type

# + Update Clustered Physical Servers without Disruption

- Eliminate VM downtime through non-disruptive system maintenance
- Automate workload evacuation and **rolling updates** in the cluster

Cluster Actions

Getting Started Summary Monitor **Manage** Related Objects

Settings Alarm Definitions Tags Permissions Scheduled Tasks **Lenovo XClarity Integrator**

Provides powerful platform management for Lenovo System x, BladeCenter, and Flex servers.

Overview **IMM Discovery** Rolling Update Rolling Reboot Predictive Failure

Task Manager

Preferences

### Preferences ?

Select one of the following update locations

**Check the Lenovo website**

Require a proxy server for Internet connection. Enter the host name and port.

Host Name:  Port:

Authenticate using the following credentials:

User Name:  Password:

Check available updates periodically

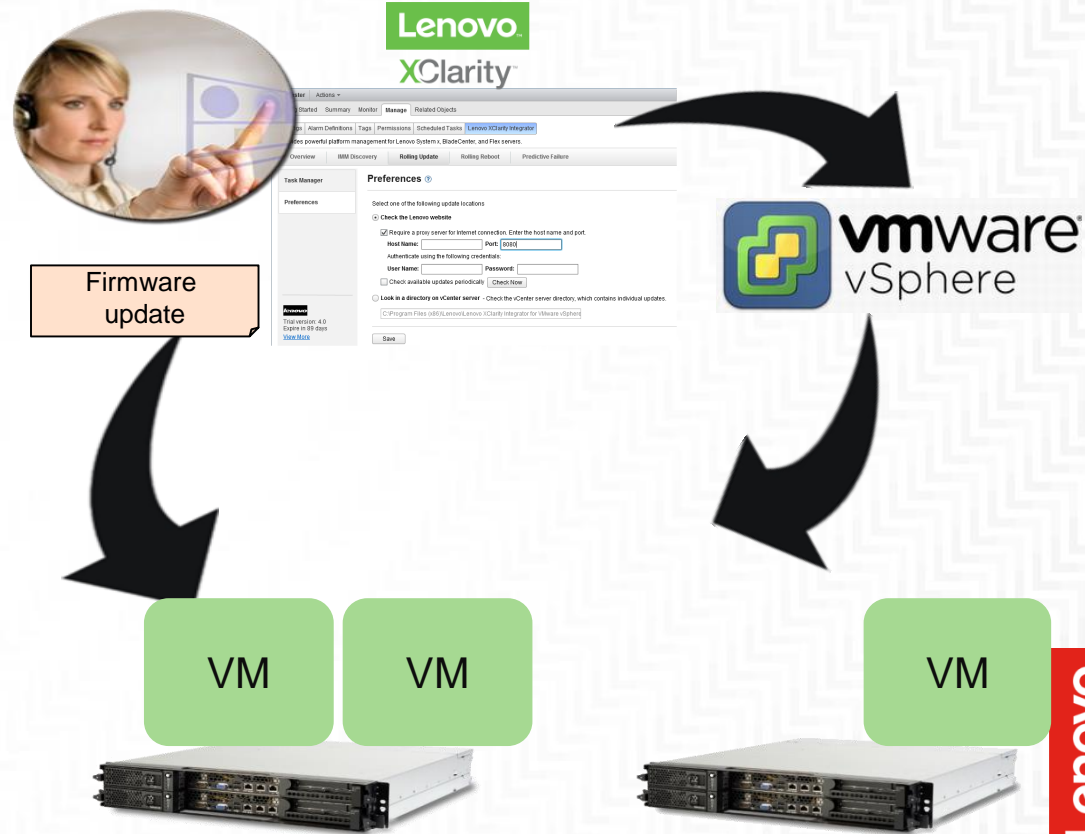
**Look in a directory on vCenter server** - Check the vCenter server directory, which contains individual updates.

**lenovo**  
Trial version: 4.0  
Expire in 89 days  
[View More](#)

# + Non-Disruptive Physical Host Updates or Reboots

**Automate VM migration prior to installing updates or rebooting to avoid downtime:**

1. Put the system in maintenance mode and evacuate all VMs to other available hosts in the cluster via VM migration
2. Update firmware and restart to take effect
3. Take the host out of maintenance mode to accept VMs
4. Process is repeated for the next system until all systems have been updated.



# + Non-Disruptive Platform Alert Management

- Eliminate VM downtime due to unplanned physical host conditions
- Automate VM evacuation during faults or user-defined thresholds

## Define Condition Policies for VM Migration

Set Policy

When you finished the setting operations, you could close this window.

Enable VM migration on hardware events

Conditions

- Migrate VM(s) on partial capacity loss
- Migrate VM(s) on predicted failures
- Migrate VM(s) on redundancy loss
- Migrate VM(s) on redundancy degrade

+ Event Categories

Restore OK

## Employ DRS or Lenovo algorithm

Cluster1 Actions

Getting Started Summary Monitor Manage Related Objects

Settings Alarm Definitions Tags Permissions Scheduled Tasks **Lenovo XClarity Integrator**

Provides powerful platform management for Lenovo System x, BladeCenter, and Flex servers.

Overview IMM Discovery Rolling Update Rolling Reboot Predictive Failure

Predictive Failures

Policy and Rules

The DRS cluster is not running in the fully automated mode, Lenovo XClarity Integrator will migrate VM(s) with its own algorithm. Or you can enable DRS with fully automated mode, in which Lenovo XClarity Integrator could migrate virtual machines by leveraging DRS. Please refer to VMware documents for the details of DRS and its fully automated mode.

Manage Policy View by:

Host	IMM IP Address	Machine Type	Policy Applied	IMM Access
10.240.197.61	10.240.195.56	5462	Not Applied	<input checked="" type="checkbox"/> OK
10.240.197.135	10.240.199.103	8737	Not Applied	<input checked="" type="checkbox"/> OK
10.240.197.202	10.240.195.56	5462	Not Applied	<input checked="" type="checkbox"/> OK

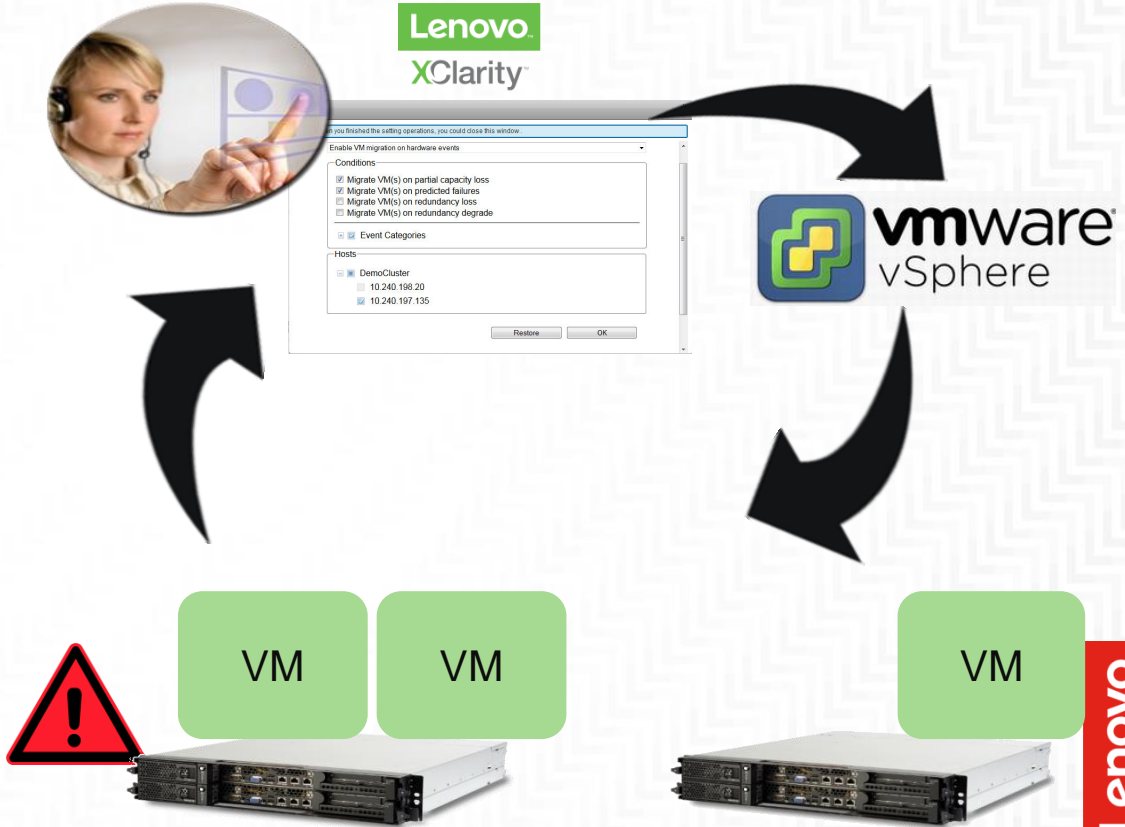
Version information: 4.0 [View More](#)

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# + Non-Disruptive Platform Alert Management

**Automated VM evacuation in response to physical host alerts to avoid unplanned downtime:**

1. Put the system in maintenance mode and evacuate all VMs to other available hosts in the cluster via VM migration
2. System maintenance, recover the hardware error
3. Take the host out of maintenance mode to accept VMs



# + Lenovo Enterprise Portfolio Overview



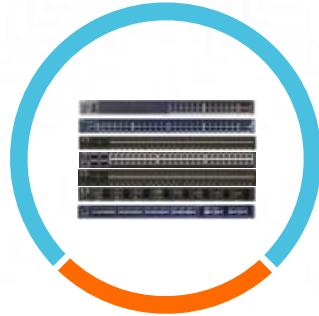
## SERVERS

Rack & Tower  
Mission Critical  
Blades  
Dense



## STORAGE

SAN  
DAS  
Archive



## NETWORK

Embedded Switches  
Top of Rack Switches



## SOLUTIONS

Big Data  
HPC  
ERP  
Cloud

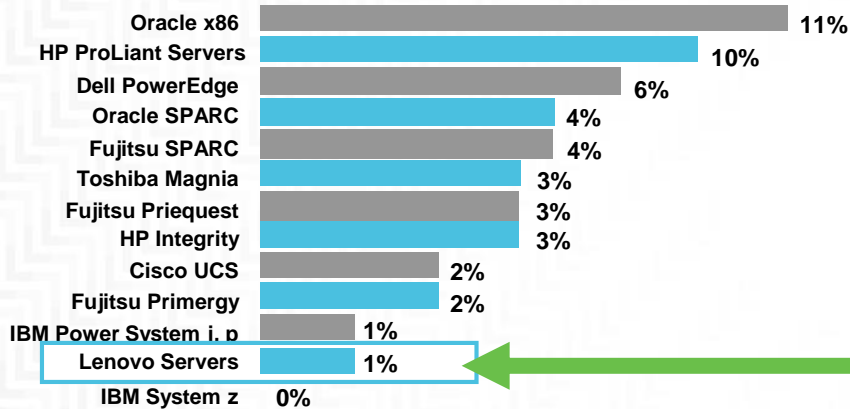


## SERVICES

Warranty  
Tech Support  
Factory Integration  
ProServices

# + Lenovo servers gain highest reliability rating

Downtime of more than four (4) hours on each server hardware platform (2015)



**#1** x86 server; #1 Reliability x86 Rating<sup>1</sup>



<sup>1</sup> ITIC 2015-2016 Reliability Survey, July 2015

<sup>2</sup> Based on percentage per install population of Lenovo servers versus percentage per install population of HP ProLiant servers

<sup>3</sup> Based on percentage per install population of Lenovo servers versus percentage per install population of Oracle x86 servers

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