



Integration and Automation with Lenovo XClarity™ Administrator

Extend Management Processes to Existing Ecosystems

Lenovo Enterprise Business Group

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Introduction

[Lenovo XClarity™ Administrator](#) is a centralized resource management solution that can reduce complexity, speed response, and enhance productivity for IT managers with Lenovo systems. The solution offers a simplified experience to automate system discovery, monitoring, firmware updates, configurations, and deployment of operating systems and hypervisors. Lenovo XClarity Administrator does not require an agent on managed systems, which further reduces complexity and maintenance time.

This paper shows the powerful integration and automation choices that are available with Lenovo XClarity Administrator, describes the benefits, and gives guidance on how the solution can be extended with customization to deliver increased efficiency.

For more information about Lenovo XClarity Administrator, such as feature details and systems supported, see the [Product Guide](#).

Lenovo XClarity Administrator Integration Overview

Lenovo XClarity Administrator is part of the Lenovo XClarity family of management solutions that also includes the following products:

- Lenovo XClarity Integrator for Microsoft System Center
- Lenovo XClarity Integrator for VMware vCenter
- Lenovo XClarity Administrator Content Pack for VMware vRealize Log Insight

Before the release of Lenovo XClarity Administrator, the Integrators were known as Upward Integration Modules. With the release of Lenovo XClarity Administrator, the Upward Integration Modules were renamed as Lenovo XClarity Integrators. Together, these solutions provide a rapid way to increase productivity in today's demanding datacenter environments.

For a more customized approach to automation and management, Lenovo XClarity Administrator also includes two methods that provide IT managers and third party developers access to data and services remotely: REST based APIs and PowerShell Cmdlets.

Optimized Integration Solutions

For rapid time to value in VMware or Microsoft environments, the Lenovo XClarity Integrators and Content Pack provide optimized integration

immediately. Lenovo XClarity Administrator and the Integrators are available by themselves, or as part of the Lenovo XClarity™ Pro bundle that includes Lenovo XClarity Administrator plus both the VMware and Microsoft integrators. Table 1 compares these editions.

Table 1 - XClarity Edition Comparison

Lenovo XClarity Feature		Lenovo XClarity Administrator	Lenovo XClarity Pro
Resource management	Auto-discovery and monitoring	✓	✓
	Firmware updates and compliance	✓	✓
	Configuration patterns	✓	✓
	OS deployment to bare metal servers	✓	✓
Extensibility	REST APIs	✓	✓
	SNMP and Syslog forwarding	✓	✓
Supported platforms	Lenovo Flex System	✓	✓
	Lenovo System x M5 and X6 rack servers	✓	✓
	Legacy System x platforms		✓
Automation and resiliency in virtual environments	Manage resources from virtualization console		✓
	Non-disruptive server updates		✓
	Non-disruptive server reboots		✓
	Evacuate workloads on predicted hardware failure		✓

Lenovo XClarity Integrator for VMware vCenter

Lenovo XClarity Integrator for VMware vCenter enables IT administrators to manage their physical and virtual infrastructure from the same interface that they are already comfortable with and use for day-to-day tasks. There is no need to learn a new tool because everything that is required for physical server management is accessible from a tab within VMware vCenter. The following functions are available:

- Automatic discovery of System x servers that are running ESXi and connected to vCenter
- A dashboard overview of the managed host or cluster system inventory and health status
- Acquire and apply the latest firmware updates to physical host systems

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- Non-disruptive rolling firmware updates , which completely automates the VM migration process for affected hosts in a cluster environment
- Non-disruptive scheduled rolling server reboots in a virtualized cluster environment
- Platform Alert Management to reduce unplanned downtime by automatically evacuating virtual machines (VMs) from hosts affected by user defined and predictive failure alerts
- Monitor and track host server energy usage, thermal history, and fan speed; enables throttling and capping of energy consumption
- Manage the current system settings on the host, including IMM, uEFI, and boot order settings
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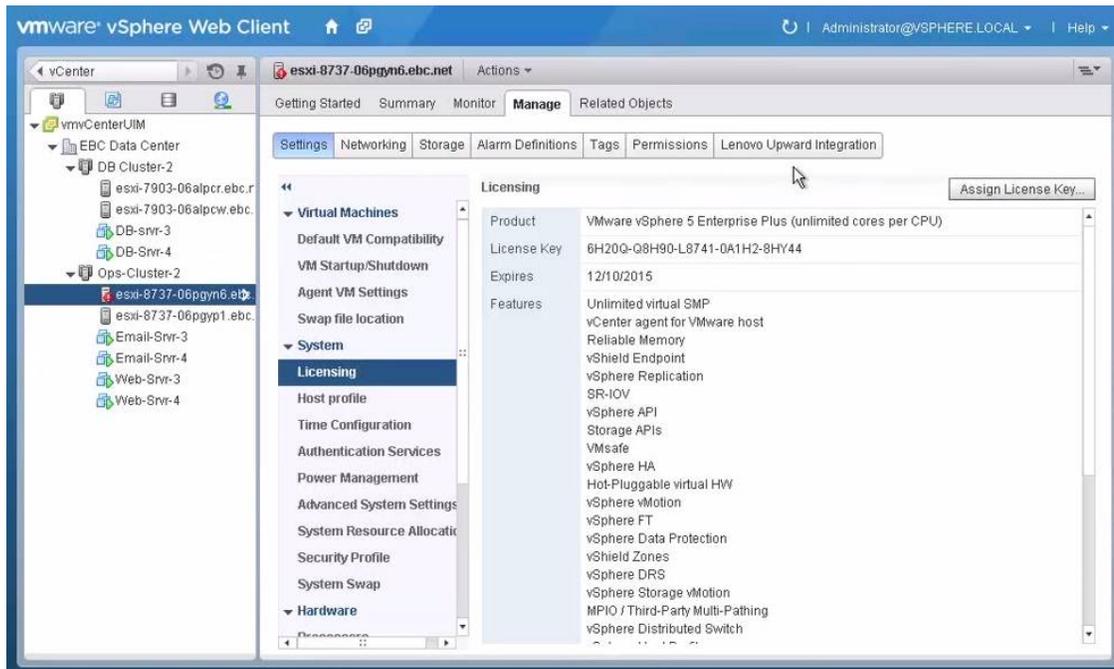


Figure 1 - vSphere Web Client with Lenovo Tab

The Integrator for VMware vCenter can be used with or without Lenovo XClarity Administrator. When used with Lenovo XClarity Administrator, the following additional features are available in vCenter:

- Visualization of Flex System chassis map
- Configuration Patterns can be deployed as profiles on server hosts

Lenovo XClarity Integrator for VMware vCenter can be downloaded [here](#) and provides a 90-day trial license. Activation licenses can be purchased by contacting your Lenovo representative or a Lenovo Business Partner.

Content Pack for VMware vRealize Log Insight

[VMware vRealize Log Insight](#) delivers real-time log management for VMware environments, with Intelligent Grouping of data, fast search, and rapid troubleshooting across physical, virtual, and cloud environments. vRealize Log Insight can collect and analyze all types of machine-generated log data, including application logs, network traces, configuration files, messages, performance data and system state dumps. With broad industry support, it can connect to most everything in the environment—operating systems, applications, storage, firewalls, network devices and more—for enterprise-wide visibility via log analytics.

Lenovo developed a content pack for vRealize Log Insight that provides a connection between Lenovo XClarity Administrator and the Log Insight tool. After Lenovo XClarity Administrator is configured to forward events via the Syslog protocol to the Log Insight server and the Lenovo Content Pack is imported into the Log Insight tool, many of Lenovo XClarity Administrator's alerts and log entries are visible to the vRealize Log Insight user. The following information is available:

- Monitoring hardware events in the Lenovo XClarity Administrator managed environment
- Auditing Lenovo XClarity Administrator logins or security changes
- Auditing Lenovo XClarity Administrator provisioning actions such as firmware updates or deployment of configuration patterns and operating systems

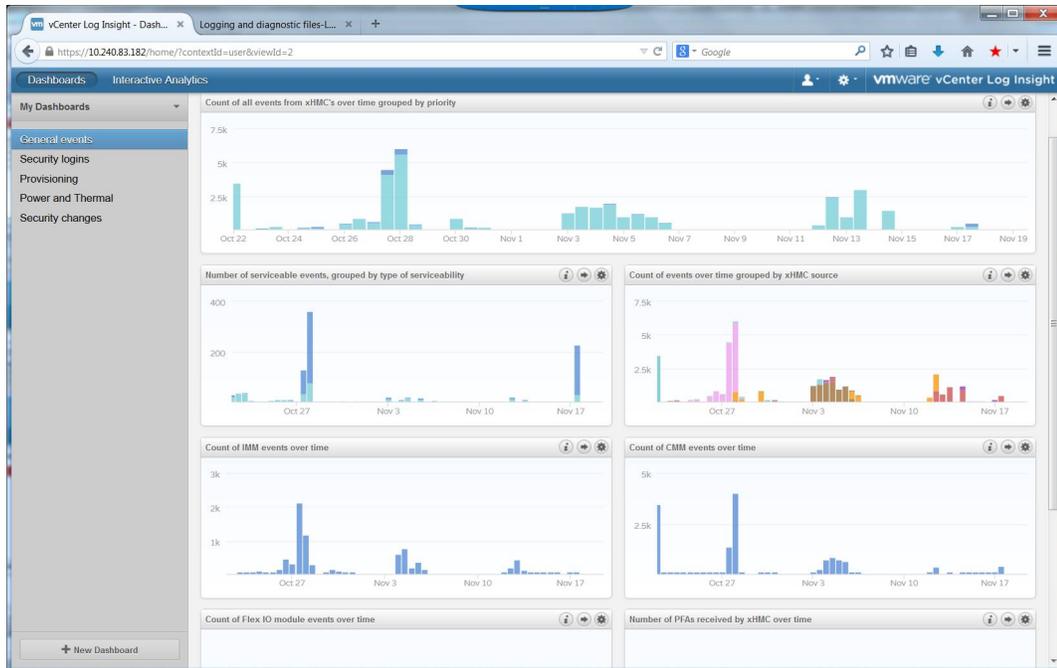


Figure 2 – VMware vRealize Log Insight console

In addition to the Lenovo XClarity Administrator Content pack, Lenovo provides a Networking Content Pack for VMware vRealize Log Insight. The Lenovo Networking Content Pack enables the VMware Log Insight solution to analyze system logs and events that are issued by the complete line of RackSwitch and Flex System Lenovo networking equipment. Both of these Content Packs are available at no cost and can be directly downloaded from the [VMware Solution Exchange marketplace](#).

Lenovo XClarity Integrator for Microsoft System Center

For integration into Microsoft System Center-managed environments, Lenovo offers the Integrator for Microsoft System Center.

Lenovo XClarity Integrator for Microsoft System Center is a suite of Management Packs enabling visibility and control of Lenovo systems from select System Center applications. The Lenovo offering includes the following Management Packs:

- Management Pack for System Center Virtual Machine Manager
- Management Pack for System Center Operations Manager
- Management Pack for System Center Configuration Manager

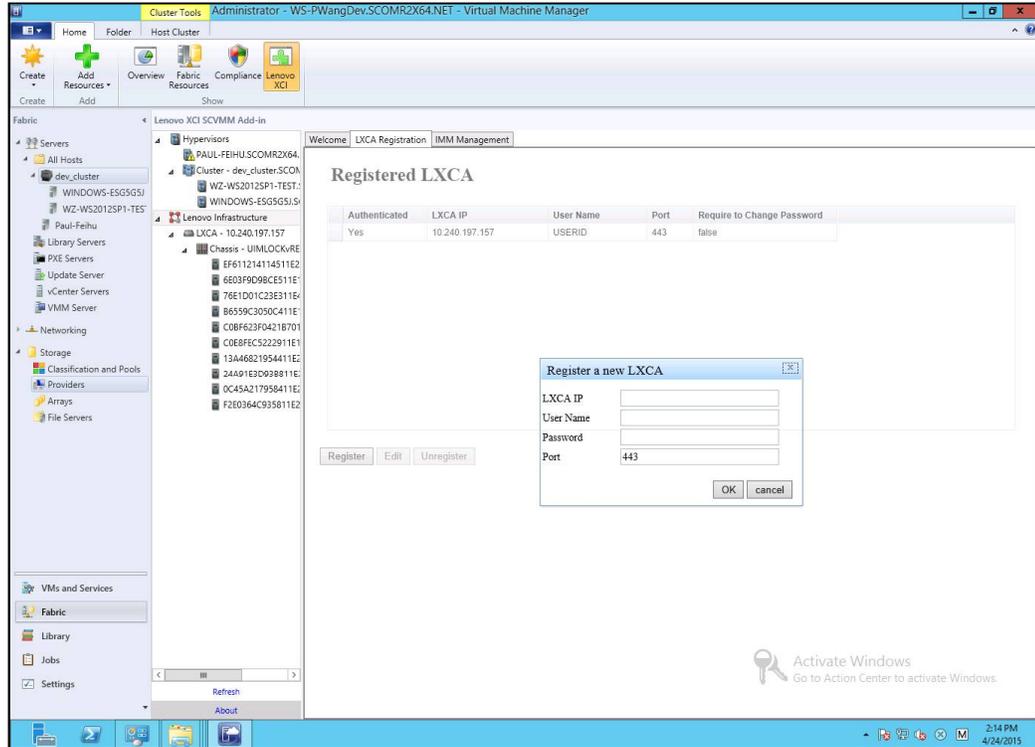


Figure 3 - Microsoft System Center Virtual Machine Manager registering Lenovo XClarity Administrator

Lenovo XClarity Integrator for Microsoft System Center provides the following features:

- Integrated end-to-end management of Lenovo server hardware with monitoring of physical and virtual server health
- Operating system deployment with the latest Lenovo firmware and drivers
- Non-disruptive rolling firmware updates that completely automate the VM migration process for affected hosts in a cluster environment
- Non-disruptive rolling server reboots in a cluster environment
- Platform Alert Management to reduce unplanned downtime by automatically evacuating virtual machines (VMs) from hosts affected by predictive hardware failure alerts
- Perform hardware configuration and firmware and driver updates, with compliance reporting
- Collect hardware inventory of System x or Flex System servers
- Manage servers remotely independent of operating system state

The Integrator for Microsoft System Center can be used with or without Lenovo XClarity Administrator. If used with Lenovo XClarity Administrator, the following additional features are available:

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- Visualization of Flex System chassis map in Microsoft System Center Virtual Machine Manager
- Configuration Patterns can be deployed as profiles on server hosts from Microsoft System Center Virtual Machine Manager

Lenovo XClarity Integrator for Microsoft System Center bundle or separate packs can be downloaded [here](#) and provide a 90-day trial license. Activation licenses can be purchased by contacting your Lenovo representative or a Lenovo Business Partner.

Customized Integration and Automation

For a more customized approach to integration and automation, Lenovo XClarity Administrator includes REST based APIs and Windows PowerShell based Cmdlets. These tools provide broader sharing and control of Lenovo XClarity Administrator data and services with ISV partner tools, IT administrators, or developers.

Lenovo XClarity Administrator REST API overview

An Application Programming Interface (API) allows one software program to work with another in a well-defined building block approach, with the goal of easing development of program interaction. The APIs that are available with Lenovo XClarity Administrator are based on the representational state transfer (REST) architecture that uses HTTPS as the underlying protocol.

With Lenovo XClarity Administrator APIs, hardware visibility and deployment functionality can be more easily extended into higher-level cloud orchestration software tools.

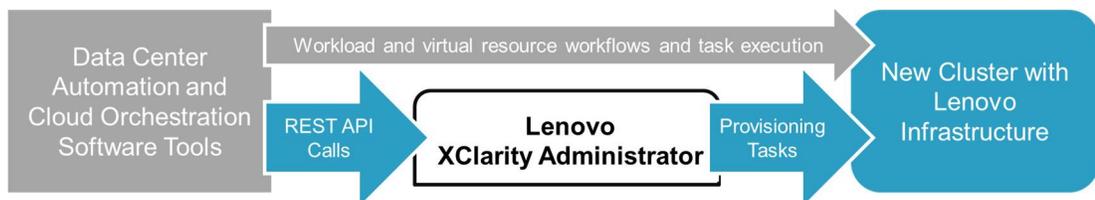


Figure 4 - Integration via API

All Lenovo XClarity Administrator resources can be accessed via API, including discovery, configuration, deployment, security, and energy metrics. An API reference is included in the [Lenovo XClarity Administrator User Guide](#).

Lenovo XClarity Administrator PowerShell “cmdlet” Overview

[Windows PowerShell](#) is a combined command-line interface and scripting environment that is included with the Microsoft Windows Server operating system. It is used for configuration management and task automation, which

enables administrators to perform tasks on local and remote Windows based systems. Cmdlets (pronounced command-lets) are Microsoft .NET programs that are designed to work within the PowerShell environment. Lenovo includes more than 60 cmdlets that use Lenovo XClarity Administrator APIs to interface with the following functions:

- Logging in to Lenovo XClarity Administrator
- Managing user accounts
- Managing servers or chassis
- Deploying an operating system image to one or more servers
- Configuring servers through the use of Configuration Patterns

To enable administrators to quickly begin using Lenovo XClarity Administrator cmdlets for task automation, several sample PowerShell scripts are available with Lenovo XClarity Administrator. The sample scripts cover tasks, such as bulk system import, firmware update, and server pattern deployment.

For a full list of the cmdlets and details on script examples, see the [Lenovo XClarity Administrator User Guide](#).

Conclusion

Lenovo XClarity Administrator is open and extensible. Using it with the optional Lenovo XClarity packaged integrators provides IT administrators rapid productivity and efficiency gains in virtualized environments.

The included APIs provide an easy way to extend LXCA to other software tools. In addition, the cmdlets provide a basis for robust automation through scripting, with the benefits of reducing errors and increasing productivity.

References

For more information, see the following resources:

- Lenovo XClarity Integrator for VMware vCenter:
<https://www-947.ibm.com/support/entry/portal/docdisplay?Indocid=LNVO-VMWARE>
- Lenovo XClarity Integrator for Microsoft System Center:
<https://www-947.ibm.com/support/entry/portal/docdisplay?Indocid=LNVO-MSUIM>
- VMware vRealize Log Insight Content Packs:
<https://solutionexchange.vmware.com/store/loginsight>

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- Windows PowerShell:
<https://technet.microsoft.com/en-us/library/dn425048.aspx>
- Lenovo Networking Content Pack for VMware vRealize Log Insight:
<https://solutionexchange.vmware.com/store/products/lenovo-networking-content-pack-for-vmware-vrealize-log-insight#.VTp6qqDD8iQ>
- Lenovo XClarity Administrator Content Pack for VMware vRealize Log Insight: <https://solutionexchange.vmware.com/store/products/lenovo-xclarity-administrator-content-pack-for-vmware-vrealize-log-insight>

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