Managing Linux Servers from Microsoft System Center with SUSE® Manager

Many organisations have a mix of Windows and Linux servers, but few have a similar mix of Windows- and Linux-trained admins. SUSE® Manager Management Pack for Microsoft System Center Operations Manager lets admins familiar with Microsoft System Center use what they know to manage their Linux servers.

<table>
<thead>
<tr>
<th>Table of Contents</th>
<th>page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>2</td>
</tr>
<tr>
<td>Challenges</td>
<td>2</td>
</tr>
<tr>
<td>Microsoft System Center Operations Manager</td>
<td>3</td>
</tr>
<tr>
<td>SUSE Manager</td>
<td>3</td>
</tr>
<tr>
<td>SUSE Manager Management Pack for Microsoft System Center Operations Manager</td>
<td>3</td>
</tr>
<tr>
<td>System Center Operations Manager</td>
<td>3</td>
</tr>
<tr>
<td>Installation Notes</td>
<td>4</td>
</tr>
<tr>
<td>Provisioning and Managing Linux Servers from System Center Operations Manager</td>
<td>5</td>
</tr>
<tr>
<td>Managing Virtual Machines in the Cloud</td>
<td>7</td>
</tr>
<tr>
<td>Adding Virtual Machines to the Cloud</td>
<td>8</td>
</tr>
<tr>
<td>Conclusion</td>
<td>8</td>
</tr>
</tbody>
</table>
Introduction

The days of monolithic Windows data centres are mostly in the past. Many organisations today have a mix of Windows and Linux servers. Unfortunately, few organisations have staff who are sufficiently familiar with both Windows and Linux.

This means organisations are less cost-effective and productive than they might be. Because they have multiple kinds of servers, they end up with multiple teams, multiple management consoles, multiple patching schedules—multiple everything.

Microsoft System Center Operations Manager is Microsoft’s management console for Windows-based servers. SUSE Manager is a management solution for Linux servers, both SUSE Linux Enterprise and Red Hat Enterprise Linux. With the SUSE Manager Management Pack for Microsoft System Center Operations Manager, the two products work together seamlessly. The management pack helps you lower costs and increase your server administration team’s productivity by letting them manage both Windows and Linux servers from Microsoft System Center.

This paper discusses the challenges faced by a modern data centre, then introduces the management pack and explains its benefits. The paper focuses on how you may use System Center Operations Manager to manage Linux servers. The primary audience for this paper is administrators and IT architects familiar with System Center. This paper will help them understand how to manage their Linux servers most efficiently.

Challenges

Modern data centres face four major challenges arising from modern heterogeneous infrastructures.

Controlling Cost and Time

Running cost effectively and efficiently is extremely challenging for data centres. Even in the smallest data centres, manually updating, patching and configuring servers may be a time-consuming task filled with opportunities for costly errors.

Automation is the key to reducing the IT costs associated with server management. Microsoft System Center Operations Manager and SUSE Manager both automate server management and provisioning, allowing you to perform these tasks faster and more accurately—but using multiple management solutions lowers the positive impact automation can have. You need a way to automate Windows and Linux server tasks from one console.

Managing Complexity

Administrators today work with a variety of hardware and software. Often, the same software might appear in different modes, either running on physical hardware, as a virtual machine or in a cloud. This complexity makes accomplishing necessary tasks much more difficult.

Though management solutions may help automate tasks and eliminate some complexity, they are often quite complex themselves. Installing and configuring them is not easy. The perfect solution would allow administrators to work from a single console, no matter the complexity of the data centre itself. Most modern
cloud dashboards offer this unified view regardless of operating system or application, and the same should be achievable for traditional data centres.

**Finding the Right IT Staff Skills**

Large data centres can afford to have one or more admins who specialise in each system. Most organisations, however, have to rely on their admins to care for multiple platforms and systems. Obviously, it may be very difficult to find individuals with the proper skills and it is very expensive to train those individuals. Certification programmes, like the SUSE Certified Linux Professional offering, may help solve this problem ([www.suse.com/training](http://www.suse.com/training)), but simplifying management is also necessary.

**Limiting Risk**

The challenges we have just mentioned make it even more difficult for administrators to accomplish important security tasks. For instance, when admins have two, three or four different kinds of systems to care for, it is not surprising they sometimes miss patches. This exposes the organisation to risk.

When facing challenges as serious as these, data centre managers have only two options. One is to spend a lot more money. In a world of limited IT budgets, that is very unlikely. The other solution is to find software vendors and products that offer true interoperability. That is exactly what SUSE Manager Management Pack for Microsoft System Center Operations Manager provides by bridging the gap between Windows and Linux management.

**Microsoft System Center Operations Manager**

Microsoft System Center provides a common management toolset to help you configure, provision, monitor and operate your IT infrastructure. The integrated physical, virtual, private and public cloud management capabilities in Microsoft System Center 2012 can help you ensure efficient IT management of those resources. Operations Manager is the infrastructure monitoring portion of System Center. Microsoft System Center Operations Manager is commonly referred to as SCOM. Using SCOM, you may monitor both Windows and Linux servers, and manage and provision Windows servers.

Management packs are additions to System Center that typically contain monitoring settings for applications and services, though they may add other functionality to SCOM as well. After you import a management pack into a management group, the monitoring or functionality contained in the management pack is immediately available through the SCOM console.

**SUSE Manager**

SUSE Manager automates Linux server management, allowing you to monitor, provision and maintain your Linux environment faster and more accurately. With SUSE Manager you may comprehensively manage your Linux servers across physical, virtual and cloud environments while improving the efficiency of your data centre.

SUSE Manager comes as a software appliance for easy installation on physical hardware or as a virtual appliance for installation on a range of hypervisors. SUSE Manager is available with a PostgreSQL database and may also leverage existing Oracle 10g or 11g databases to store all data related to managed Linux servers.

A SUSE Manager installation consists of at least one SUSE Manager Server and the SUSE Manager Lifecycle Management entitlement for each managed system that has an active SUSE Linux Enterprise subscription. SUSE offers SUSE Manager Monitoring entitlements as well, but because SCOM performs the server monitoring in the arrangements discussed in this paper, you do not need monitoring entitlements for these particular implementations. You may also deploy SUSE Manager Proxy Servers on an as-needed basis to scale in large or distributed environments.

**SUSE Manager Management Pack for Microsoft System Center Operations Manager**

SUSE Manager Management Pack for Microsoft System Center Operations Manager enables Windows systems administrators to view server health information, provision and perform both Windows and Linux patching duties through the SCOM console. It maintains the user experience Windows system administrators are familiar with.
Through tight integration between SUSE Manager and Microsoft System Center, the system administrator can:

- Quickly check the update status of all Linux servers to ensure their health and security
- Auto-install Linux servers
- Schedule a maintenance window to run updates on a specific Linux server or a group of Linux servers
- View a list of all Linux servers entitled for a selected list of critical and optional updates and patches
- Get alerts for all outdated or critical updates available for Linux servers

![Diagram](image)

Figure 1. The management pack sits between System Center and SUSE Manager and communicates between them using an application programming interface (API).

**Installation Notes**

SUSE Manager Management Pack for Microsoft System Center Operations Manager requires you to install SUSE Manager version 1.7 or higher and Microsoft System Center Operations Manager 2007 R2 or later. Installing and configuring management software can be very complex, and is largely outside the scope of this document.

See the Microsoft documentation\(^1\) for instructions on installing SCOM. You will also need to have monitoring agents on your Linux servers. You may install the agents using a wizard or the command line. Both methods are described in the Microsoft SCOM documentation\(^2\).

Refer to the SUSE Manager Install Guide\(^3\) for instructions on installing SUSE Manager. You will need a SUSE Manager Lifecycle Management entitlement for each Linux server you plan to manage. See “Client Setup” in the SUSE Manager Quick Start Guide\(^4\) for details on that process.

Note: You may also manage Red Hat Linux Enterprise Servers using SUSE Manager. To do so, you will need SUSE Linux Enterprise Server with Expanded Support.

The actual installation of SUSE Manager Management Pack for Microsoft System Center Operations Manager is considerably easier than setting up your management software. Once successfully installed, the management pack creates a desktop icon that enables you to view the connection parameters to SUSE Manager such as server name and login credentials.

---

In addition, best practices for the SUSE Manager Management Pack call for you to install these three additional management packs in SCOM if you wish to monitor CentOS computers:

- Microsoft.Linux.Universal.Library.mp
- Microsoft.Linux.Universal.Monitoring.mp
- Microsoft.Linux.UniversalR.1.mp

Once you have installed these management packs, additional managed systems RPMs will be added to this location on the Microsoft server:

C:\Program Files\Microsoft System Center 2012 R2\Operations Manager\Server\AgentManagement\UnixAgents\DownloadedKits

This is valuable as some Linux distributions are otherwise considered unsupported by SCOM and cannot be automatically discovered by it. This location on the SCOM file system will now contain RPMs that administrators may manually install to make Linux systems visible and monitored by SCOM.

All systems must be discovered, visible and managed by SCOM before they may be patched and managed by SUSE Manager via the management pack. They must also belong to the SUSE Manager system group assigned to the credentials used by the SUSE Manager Management Pack. You will have to provide these credentials during installation of the management pack.

We recommend you create a specific group in SUSE Manager for systems you plan to manage in SCOM. Then, create a user in SUSE Manager with authorisation to this system group. This user’s authentication information is what you should use with the SCOM connector, not the SUSE Manager superuser or global system administrator information.

Provisioning and Managing Linux Servers from System Center Operations Manager

Both SCOM and SUSE Manager provide the ability to monitor Linux servers. Using SCOM, you may monitor the following aspects of UNIX and Linux computers:

- Services and applications
- File system, disk space, swap space, system memory
- Network interfaces

Core processes and attributes
Key configurations
System patch and update status

Because SCOM already provides this functionality, this paper will not discuss these monitoring tasks. Instead, we will focus on the Linux provisioning and management tasks the management pack makes possible. Below we cover the following topics:

- Auto-installing Linux servers
- Running remote commands
- Patching Linux servers

The real benefit of adding SUSE Manager to your SCOM installation is the ability to provision and patch your Linux servers. Here is how to perform those tasks using the management pack.

Auto-Install Linux Servers

To auto-install Linux servers, you first need to create auto-installation profiles in SUSE Manager. You may do this using AutoYaST for SUSE or through Kickstart for Red Hat. You cannot create these files directly from SCOM.

First, you will need to create the AutoYaST profile as described in the SUSE Manager Reference Guide. Admins then have access to the profiles in SCOM via the management pack. Under Patch

Management you will see all managed machines. If the managed machine you select has a provisioning or lifecycle management entitlement, you may select the provisioning tab in SCOM. You may then click the Schedule Auto-installation button to schedule your install.

Running Remote Commands from SCOM
You may use remote commands to perform most maintenance and provisioning tasks on Linux servers. Running a remote command from SCOM is relatively simple. All you need to know is the remote command you wish to execute and some details about when and how you wish to run that command.

1. First, click the Remote Command tab in SCOM.
2. Select a system where you are going to run the remote command.
3. Provide credentials, a time-out value and your script.
4. Schedule the action.

Patching
You may see available patches for your SUSE Linux Enterprise Servers in the Patch Management page in SCOM.

Apply all applicable patches to a system by clicking on the name of an entitled system. Then in the Detailed View page click the Relevant Patches tab. When the relevant patch list appears, click Select All then Apply Selected Patches. Only patches not scheduled, scheduled but failed, or cancelled patches are listed. Pending updates are excluded.

You may also apply a specific patch to one or more systems. Locate the patch in the list and click on the number of systems affected, which takes you to the Affected Systems tab of the Patch Details page. Select the individual systems to be updated and click the Apply Patches button.

To apply more than one patch to one or more systems, select the systems from the Systems list and click the Update List button. Click the System Set Manager link, then click the Systems tab. After ensuring the appropriate systems are selected, click the Patch tab, select the patches to apply and click the Apply Patch button.

You may click on each patch to see the Patch Details view and learn more about the patch.

Figure 3. The Patch Management page in SCOM.

Apply all applicable patches to a system by clicking on the name of an entitled system. Then in the Detailed View page click the Relevant Patches tab. When the relevant patch list appears, click Select All then Apply Selected Patches. Only patches not scheduled, scheduled but failed, or cancelled patches are listed. Pending updates are excluded.

You may also apply a specific patch to one or more systems. Locate the patch in the list and click on the number of systems affected, which takes you to the Affected Systems tab of the Patch Details page. Select the individual systems to be updated and click the Apply Patches button.

To apply more than one patch to one or more systems, select the systems from the Systems list and click the Update List button. Click the System Set Manager link, then click the Systems tab. After ensuring the appropriate systems are selected, click the Patch tab, select the patches to apply and click the Apply Patch button.

You may click on each patch to see the Patch Details view and learn more about the patch.

Figure 4. The Patch Management page in SCOM, with the Patch Details section showing the CVE information for the selected patch.

The Patch Details page displays the patch report issued by SUSE. It provides a synopsis of the patch first, including the severity (for security updates), issue date and any update dates. This is followed by a description of the patch and the steps required to resolve the issue. Security updates list the specific vulnerability as tracked by http://cve.mitre.org. This information is listed below the CVEs tab.
The Patch Details > Affected Systems subtab lists systems affected by the patches. You may apply updates here. To determine whether an update has been scheduled, refer to the Status column in the affected systems table. Possible values are: None, Pending, Picked Up, Completed and Failed. This column identifies only the last action related to a patch. For instance, if an action fails and you reschedule it, this column shows the patch status as pending with no mention of the previous failure.

Managing Virtual Machines in the Cloud
With System Center 2012 R2 Operations Manager, you may monitor Linux machines that exist in Microsoft Azure, or any other cloud provider, as persistent virtual machines. This allows you to monitor your cloud infrastructure as you do your physical or virtual infrastructure. With the SUSE Manager Management Pack for SCOM, you may also manage those Linux machines in the cloud.

There are multiple ways to monitor and manage your cloud machines in Azure or in another cloud provider’s site.

If you have SUSE Manager and SCOM deployed in your on-premises data centre, you may use a site-to-site VPN connection to the Azure virtual network where the Linux virtual machines are deployed. Alternative network solutions will work as long as both SCOM and SUSE Manager can communicate with each other and with the managed virtual machines.

Figure 5. This image shows one way of managing Windows and Linux servers in a public cloud such as Microsoft Azure. In this image SCOM and SUSE Manager exist within the on-premises data centre and manage the cloud machines through a virtual private network (VPN) connection.

www.suse.com
Or, you may deploy SUSE Manager proxy server and the Operations Manager Management Server in Microsoft Azure, with virtual network connectivity between the Operations Manager Management Server and the Linux virtual machines. Information on setting up the SUSE Manager proxy server is available in the Proxy Quick Start section of the documentation.

Depending on your particular situation, another alternative could be to deploy one of the management solutions directly in Azure. (We performed our testing in Azure, but this option should work similarly for any cloud provider). This method allows you to keep both environments separate. For example, you could keep all Windows systems in Azure and all Linux on premises, or the other way around. If you choose such a scenario, you have to configure the proper networking between the SCOM and SUSE Manager servers.

**Adding Virtual Machines to the Cloud**

Adding additional public-cloud-based Linux workloads managed by SCOM may be as easy as selecting SUSE Linux Enterprise Server from the Azure Gallery. Servers are usually up in a few minutes and you may then install applications or apply templates from SUSE Manager.

Another easy way of accomplishing the same goal is using SUSE Studio™—it allows for step-by-step configuration of SUSE Linux Enterprise Server. Admins may pre-populate SUSE Studio virtual machines with custom network and configuration settings and other files. They may also connect SUSE Studio to their Azure account. Once they build the virtual machine in SUSE Studio, admins may choose the support level for the machine (such as ability to open service requests or just get patches and maintenance) and deploy it directly into Azure.

To ensure you set up the proper permissions for SUSE Studio virtual machines that you will manage with SCOM, you may add a user in SUSE Studio for Azure and the proper sudoers file in `/etc/sudoers.d/`.

**Conclusion**

You have now seen how SUSE Manager Management Pack for Microsoft System Center Operations Manager can allow you to provision and manage Linux servers through SCOM itself. With the management pack you may auto-install and patch Linux physical and virtual machines on premises and in a cloud environment. This interoperability allows you to manage heterogeneous data centres more efficiently and gain maximum benefit from your IT staff’s time and skills.


Contact your Solutions Provider, or call:

Australia
1-800-500-164

China
400-120-3101

Hong Kong
800-906-194

India
91-80-4002-2300

Japan
0800-100-5575

Malaysia
60-3-7722-6100

New Zealand
0800-474-014

Singapore
65-6395-6888

South Korea
8210-5315-1464

Taiwan
866-2-2376-0017

SUSE
Maxfeldstrasse 5
90409 Nuremberg
Germany