Virtualization Management with SUSE Manager

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SUSE Manager 4 is a best-in-class, open source infrastructure management solution that lowers costs, enhances availability and reduces complexity for life-cycle management of Linux systems in large, complex and dynamic IT landscapes. You can use SUSE Manager to configure, deploy and administer thousands of Linux systems running on hypervisors; as containers; and on bare metal systems, IoT devices and third-party cloud platforms. SUSE Manager also enables you to manage virtual machines (VMs).

Virtualization is the means by which IT administrators create virtual resources, such as hardware platforms, storage devices, network resources and more. There are quite a few tools that enable the creation of virtual resources (such as Xen and KVM), but what about the management of those tools? That's where SUSE Manager comes in.

The current iteration of SUSE Manager enables an admin to work with VMs via the following feature set:

- *Creating VMs*
- *Updating and editing the hardware settings for the hosting platform*
- *Stopping, pausing and deleting VMs*
- *Displaying the Virtual Network Computing (VNC) or Spice console via a web-based interface*

Why Use VMs?

Before we dive too deeply into SUSE Manager's Virtualization Management, let's first pose the question, "Why would an admin choose to create virtual resources, as opposed to the real thing?"

Resource Optimization

Imagine having to deploy a single server for every service you offer. Your data center could wind up with hardware dedicated to various websites, databases, user authentication, network optimization, security and much more. By deploying services on dedicated hardware, chances are that those services won't be making the best use of those resources. And with the low cost of storage, RAM and CPUs today, your business could do a much better job of optimizing that hardware.

VMs enable you to easily deploy multiple services (even multiple platforms) on a single server, thereby making the most of the hardware you've purchased.

Better Uptime

So you've chosen SUSE Linux Enterprise Server as your operating system of choice. Why? Because it is one of the most rock-solid and reliable platforms on the market. But that software doesn't ensure that your hardware will always be up to the task. By employing VMs, failover and redundancy become exponentially easier. Should something go wrong with a VM, you can quickly spin up a clone such that no one would know the difference. And with the right tools in place, you can even make this happen

automatically. This redundancy makes the quest for 100 percent uptime almost achievable.

Retain Legacy Systems

Your business might still depend upon legacy systems. If that's the case, what do you do when one of those legacy servers fails and is no longer on the market? Deploy a VM with considerably more power than the original hardware. By employing VMs, those legacy systems can live on long enough to give your business time to eventually migrate the systems to more modern iterations.

Security

When a VM is deployed, it is typically done in such a way that it is isolated from the hosting hardware. And with the help of state recording, transience and mobility, those VMs offer your business added layers of security. Because of this, you are able to isolate the fingerprint of your host OS. And even VM users with admin privileges aren't capable of breaching the layer of isolation between the VM and the host. VMs also enable you to easily create isolated networks, making it more challenging for malicious users to access your company data.

With an understanding of what a VM is, where does SUSE Manager fit in?

Multiple Location Management

Imagine that you have multiple locations, each of which will be deploying numerous VMs to cover various areas of business. You could have locations A, B, C and D that all require a combination of LAN- and WAN-facing websites, database servers, document and print servers, authentication servers and more. How would you manage those with any level of consistency if each location's IT department were tasked with the job? You wouldn't.

Currently, SUSE Manager offers an add-on subscription that enables VM management (so long as the server hosting SUSE Manager supports either KVM or Xen). For retail infrastructure, the current iteration of SUSE Manager offers a separate piece that augments the retail branch server with monitoring and VM management. The retail-specific component can work with the branch server, as well as POS devices.

What if you are a customer with hundreds of locations? In each location, a server is deployed to run the exact same virtual managers. With the help of SUSE Manager (and Salt States), you would be able to easily manage that entire estate, or even add new VMs, update existing VMs or delete old VMs.

How SUSE Manager Manages VMs

SUSE Manager enables the administrator to manage virtualized clients. In this type of installation, a virtual host is installed on the SUSE Manager Server to manage any number of virtual guests. Both Xen and KVM hosts (and their guests) can be managed directly in SUSE Manager, whereas VMware hosts (including VMware vSphere) first require the setup of a virtual host manager (VHM, Figure 1), which will use the VMware Gatherer module.
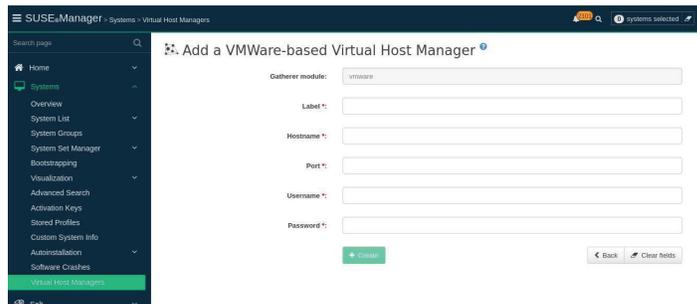

Figure 1. *Creating a VHM for a VMware host.*

Once your virtual hosts are ready, you can then auto-install hosts and guests using AutoYaST or Kickstart and manage guests in the web UI.

For VMware, including VMware vSphere, SUSE Manager requires you to set up a VHM to control the VMs. This gives you control over the hosts and guests, but in a more limited way than is available with Xen and KVM. Unlike creating a VHM for VMware hosts, Xen and KVM virtualization management happens within the system's Virtualization tab (Figure 2).
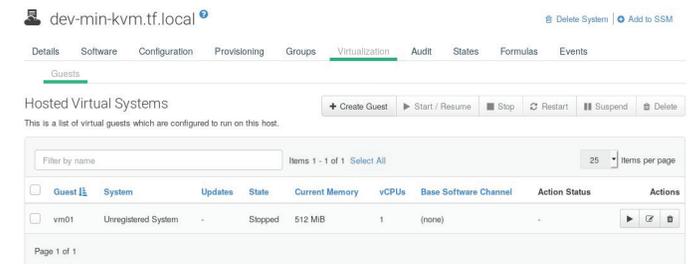

Figure 2. *The Virtualization tab with SUSE Manager.*

The Virtualization tab only shows up on bare metal machines, after adding the "Virtualization Host" entitlement to the system. This task can be handled either on the activation key level or in the system's Properties page. Once Virtualization is available, you can (with the click of a button) create a new guest and start, resume, stop, restart, suspend and delete VMs. One other feature found within the Virtualization tab is a graphical display of the VM.

An important note to know is that the auto-installation of VM guests works only if they are configured as Traditional clients. Salt clients can be created using a template disk image or using Kiwi (an application for making a wide variety of image sets for Linux), but not by using AutoYaST or Kickstart. These image-building actions can also be chained with VM creation, within SUSE Manager, using the Action Chains feature.

Customizing Your VMs

Once your host and guest are up and running, you can then customize the guest to perfectly fit your needs. Say, for instance, you need to set up a MySQL database server. From the System page, click on the Software tab and click Install New Packages. Then run a search for mysql and you will see all of the related packages that can be installed (Figure 3).
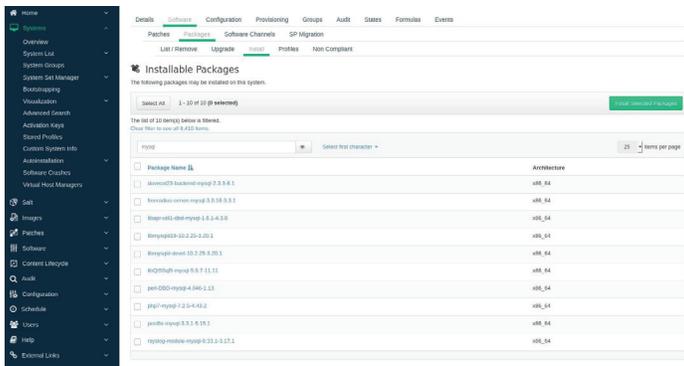

Figure 3. *Installing MySQL packages to a host.*

With SUSE Manager, you can deploy custom VMs that can take on just about any number of tasks. And once those machines have been deployed, you can control and manage them from a single point of entry. The SUSE Manager web UI enables you to configure, provision, audit, upgrade and patch your VMs. From within that same tool, you can create Salt States/Formulas, view events and much more.

Creating with Salt States

Users can also leverage the SUSE Manager scripting possibilities found with Salt States. Using these tools, it is possible to create specific VMs. A Salt State is a configuration template that enables you to describe what each of your systems should look like, including the applications and services that are installed and running. Imagine, by simply creating/editing a Salt State file, you can even automate the creation of your virtual guests. This, of course, is a feature that requires a full understanding of Salt State files; but once you have a grasp of how they work, there's no limit to what you can do with VMs and SUSE Manager.

VM Management

The management of your VMs is handled from System List | Virtual Systems. From that tab (Figure 4), click on the host in question to begin working.
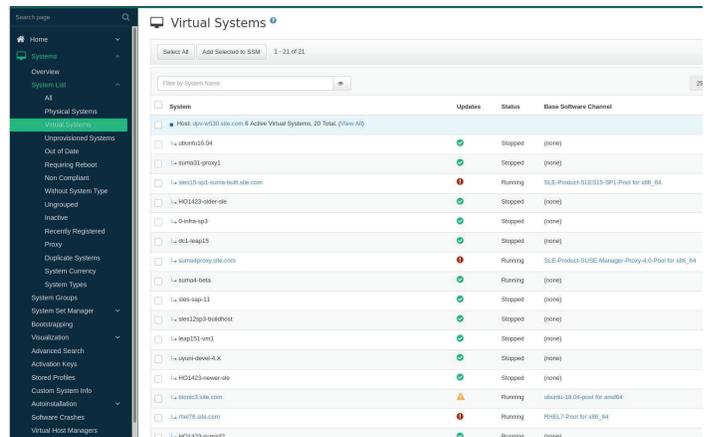

Figure 4. *Virtual systems from with SUSE Manager.*

Some of the more crucial tasks you can undertake on your VMs are:

- *Software management: add/remove software, upgrade packages, compare packages and manage package states*
- *Customize power management settings*
- *Join system groups*
- *Send remote commands (Figure 5)*
- *Run OpenSCAP audit scans*
- *Manage States*
- *Select Salt Formulas to be saved as High States, which can then be applied*
- *Manage pending events*

Figure 5. *Running a command on a VM.*

The Current Model

Virtualization Management within SUSE Manager should not be confused with a full-blown virtualization solution. Instead, SUSE Manager should be thought of as "just enough virtualization."

You might have forward-deployed/edge IT or SAP clusters where you want to roll out virtualization for the sole purpose of backing up and restoring workloads (independent of the hardware). In these cases, SUSE Manager makes administering those VMs (via a centralized web-based interface) exponentially easier. This can be key to a successful deployment, where speed and accuracy of control is tantamount to keeping those systems communicating with one another.

Perhaps your company is about to embrace Kubernetes as its container orchestration platform. For that, you might need to manage the Kubernetes cluster nodes' VMs, where the ability to stop, start, pause and delete the hosting VMs with a high level of efficiency is key to managing that ecosystem.

Either way, SUSE Manager has your VM needs covered.

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