

SUSE Best Practices

Systems Management

Deploying SUSE Linux Enterprise Products with SUSE Manager on IBM PowerVM

SUSE Manager

Olivier Van Rompuy, Senior System Engineer and Technical Consultant (IRIS)





The document at hand provides an overview of how to deploy SUSE Linux Enterprise products with SUSE Manager on IBM Power Systems. SUSE Manager enables you to manage and maintain your enterprise Linux system deployments across physical, virtual and cloud environments via one centralized tool. Described is a base deployment of SUSE Manager 3.1 on IBM PowerVM LPARs, including Autoinstallation, AutoYaST and Netboot Integration.

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Contents

- 1 Installing SUSE Manager on IBM Power Systems 4
- 2 SUSE Manager Setup 15
- 3 Create and Configure the Organization **19**
- 4 Create the Software Channel Hierarchy 23
- 5 Creating System Groups 27
- 6 Bootstrap Configuration 28
- 7 Configure the DHCP Server with Bootstrap Protocol Support 49
- 8 Autoinstall Configuration 53
- 9 GRUB2 Custom Configuration for IBM PowerVM Netboot 60
- 10 Netboot and Autoinstall Procedure 64
- 11 Conclusion 67
- 12 Resources 68
- 13 Legal notice 69
- 14 GNU Free Documentation License 70

1 Installing SUSE Manager on IBM Power Systems

First, you need to perform several actions related to the IBM PowerVM architecture (refer also to the IBM documentation at https://www.ibm.com/support/knowledgecenter/ ↗):

- 1. Create a new Logical Partition (LPAR) for SUSE Manager on an IBM Power System with POWER8 or higher processors.
- 2. Configure the infrastructure for this LPAR: LAN, SAN, storage LUNs, zoning, etc..
- 3. Create a virtual DVD drive for this LPAR on one of the VIO servers (learn more about VIO servers here: https://www.ibm.com/support/knowledgecenter/en/POWER8/p8hb1/p8h-b1_vios_virtualioserveroverview.htm ?).
- 4. Add the SUSE Linux Enterprise Server 12 ISO files to the virtual optical device (DVD) repository on this VIO server.
- 5. Using the command **cfgassist** on the VIO server loads the first DVD in the virtual drive.
- **6.** Activate the LPAR, enter the **System Management Services** (SMS) menu and choose to boot from the DVD.

Now choose to add the SUSE Manager Server extension as shown on the screen below, and enter **Next**:



FIGURE 1: YAST INSTALLATION - EXTENSIONS AND MODULE SELECTION

Accept the SUSE End User License Agreement (EULA) and enter Next:



FIGURE 2: YAST INSTALLATION - SUSE END USER LICENSE AGREEMENT

Provide the correct registration code delivered with your SUSE Manager subscription, and enter **Next**:



FIGURE 3: YAST INSTALLATION - SUSE MANAGER REGISTRATION CODE

No additional Add-On Product needs to be installed. Skip this screen and enter Next:

YaST2 - ins	tallation @ install		
Add On Pro	luct	[Release N	otes]
		[Network configura	
	Lyould like to install an	additional Add On Product	
	I would like to install and	additional Add On Product	
[Help]	[Back]	[Abort]	[Next]
F1 Help F8	Back F9 Abort F10 Next		

FIGURE 4: YAST INSTALLATION - ADD-ON PRODUCT

The next screen provides the partitioning options:



FIGURE 5: YAST INSTALLATION - PARTITIONING OPTIONS

Select Expert Partitioner:

[Expert Partitioner...]

FIGURE 6: YAST INSTALLATION - EXPERT PARTITIONER

Execute Rescan Devices to clear the auto-suggested partitioning:

[Rescan Devices]

FIGURE 7: YAST INSTALLATION - RESCAN DEVICES

In the particular scenario at hand, a reinstallation has been performed. In this case, follow the steps below. If partitioning and/or LVM settings are already present, choose to import these settings into the installer, and select **Import Mount Points**:

[Import Mount Points...]

FIGURE 8: YAST INSTALLATION - IMPORT MOUNT POINTS



Note: Fresh Installation

If you perform an installation from scratch, configure your partitions and LVM settings following the recommendations below:

Minimum 100 GB for root / partition Minimum 50 GB for <u>/var/lib/pgsql</u> Minimum 50 GB per SUSE product and 100 GB per Red Hat product for /var/spacewalk When you are finished, continue with the partitioning step, and enter Next:



FIGURE 9: YAST INSTALLATION - SUGGESTED PARTITIONING

Provide the correct time zone settings, and confirm them with **Next**:

YaST2 - installation @ install				
Clock and Time Zone [Release Notes]				
rRegion	rTime Zone			
Africa	Aaland Islands T			
Argentina	Albania			
Asia	Andorra			
Atlantic	Austria			
Australia	Azores			
Brazil	Belarus			
Canada	Belgium			
Central and South America	Bosnia & Herzegovina			
Etc	Bulgaria			
Europe	Canary Islands			
Global	Croatia			
Indian Ucean	Czech Republic			
Mexico Decific	Denmark Estenio			
Pacific	Estonia			
	France			
	Germany			
	Gibraltar			
	Greece			
	Guernsey			
	Hungary			
	Iceland			
	Ireland			
	Isle of Man			
	Italy			
	Jersey			
	Latvia			
	Liechtenstein			
	Lithuania			
	Luxembourg			
	Macedonia			
	Malta			
	Milder			
	Monaco			
	Montopogra			
	Notherlands			
	Nonvay			
	Poland			
	Portugal			
	Romania			
	Russia (Kaliningrad)			
	Russia (Moscow)			
	Russia (Samara)			
	Russia (Volgograd) 🛛 📕			
	San Marino			
	Serbia			
	Slovakia			
	Slovenia			
	Spain			
Sweden				
	Switzertand			
Date and Time				
2018-02-19 - 12:50:30	[Other Settings]			
[Help] [Back]	[Abort] [Next]			
F1 Help F8 Back F9 Abort F10 Next				

FIGURE 10: YAST INSTALLATION - CLOCK AND TIME ZONE

At this stage you can choose to skip the creation of an initial user. Enter **Next**:

YaST2 - installa	ation @ install	
Local User		[Release Notes]
) Create New User	
		administrator
(X.) Skip User Creation	
[Help]	[Back] [Abo	ort] [Next]
F1 Help F8 Back	k F9 Abort F10 Next	

FIGURE 11: YAST INSTALLATION - LOCAL USER

Verify the settings overview and make further changes or customizations where needed. Start the installation with **Install**:

Click a headline to make changes or use the "Change" menu below. Siftware * Product: SUSE Linux Enterprise Server 12 SP3 * Product: SUSE Manager Server * Help and Support Documentation * Base System * AppArmor * Minimal System (Appliances) * YaST2 configuration packages * GMOME Desktop Environment * X Window System * SUSE Manager Server * Size of Packages to Install: 3.5 Gi8 Downloading from Remote Repositories: 706.6 MiB Booting * Boot Loader Type: GRUB2 * Enable Trusted Boot: no * Status Location: //dev/disk/by-id/scsi-36005076400810179a80000000000000049-part1 Firewall will be enabled (disable) * SSH service will be locked (open) * SSH service will be enabled (disable) Kdump * Warning! There might not be enough free space. 12 GiB required, but only 4 GiB are available. * Kdump status: enabled * Value(s) of crashkernel option: 272M * Dump format: 120 * Target of dumps: file:///var/crash * Number of dumps: S Default system target * Graphical mode Import SSH Host Keys and Config	Ya	ST2 - installation @ install
<pre>Software Product: SUSE Linux Enterprise Server 12 SP3 Product: SUSE Manager Server Product: SUSE Manager Server Product: SUSE Manager Server Patterns: + Help and Support Documentation + Base System + AppArmor + Minimal System (Appliances) + YaT2 configuration packages + GNOME Desktop Environment + X Window System + SUSE Manager Server Size of Packages to Install: 3.5 GiB Downloading from Remote Repositories: 706.6 MiB Booting Boot Loader Type: GRUB2 Enable Trusted Boot: no Status Location: /dev/disk/by-id/scsi-36005076400810179a80000000000049-part1 Firewall and SSH Firewall will be enabled (disable) SSH service will be enabled (disable) SSH service will be enabled (disable) SSH service will be enabled (disable) Kdump warning! There might not be enough free space. 12 GiB required, but only 4 GiB are available. Value(s) of crashkernel option: 272M Dump format: zo Target of dumps: file:///var/crash Number of dumps: 5 Default system target Graphical mode Import SSH host Keys and Configuration sSH host keys will be copied from SUSE Linux Enterprise Server 12 SP3 System system and Hardware Settings </pre>	1	Installation Settings [Release Notes] Click a headline to make changes or use the "Change" menu below.
<pre>* Product: SUSE Linux Enterprise Server 12 SP3 * Product: SUSE Manager Server * Help and Support Documentation * Base System * AppArmor * Minimal System (Appliances) * Ya572 configuration packages * GNOWE Desktop Environment * X Window System * SUSE Manager Server * Size of Packages to Install: 3.5 GiB Booting * Boot Loader Type: GRUB2 * Enable Trusted Boot: no * Status Location: //dev/disk/by:id/scsi-36005076400810179a80000000000049-part1 Firewall and SSH * Firewall will be enabled (disable) * SSH port will be blocked (open) * SSH service will be enabled (disable) Kdump * Warning! There might not be enough free space. 12 GiB required, but only 4 GiB are available. * Kdump status: enable4 * Value(s) of crashkernel option: 272M * Dump format: Izo * Target of dumps: file:///var/crash * Number of dumps: 5 Default system target * Graphical mode Import SSH Host Keys and Configuration * SSH host keys will be copied from SUSE Linux Enterprise Server 12 SP3 System * System and Hardware Settings </pre>		Software
<pre>Booting * Boot Loader Type: GRUB2 * Enable Trusted Boot: no * Status Location: /dev/disk/by-id/scsi-36005076400810179a80000000000049-part1 Firewall and SSH * Firewall will be enabled (disable) * SSH port will be blocked (open) * SSH service will be enabled (disable) Kdump * Warning! There might not be enough free space. 12 GiB required, but only 4 GiB are available. * Kdump status: enabled * Value(s) of crashkernel option: 272M * Dump format: 1zo * Target of dumps: file:///var/crash * Number of dumps: 5 Default systemd target * Graphical mode Import SSH Host Keys and Configuration * SSH host keys will be copied from SUSE Linux Enterprise Server 12 SP3 System * System and Hardware Settings # Log 1 [Rack] [Abort] [Install] # Help 168 Back F9 Abort F10 Install </pre>		 Product: SUSE Linux Enterprise Server 12 SP3 Product: SUSE Manager Server Patterns: Help and Support Documentation Base System AppArmor Minimal System (Appliances) YaST2 configuration packages GNOME Desktop Environment X Window System SUSE Manager Server Size of Packages to Install: 3.5 GiB Downloading from Remote Repositories: 706.6 MiB
<pre>* Boot Loader Type: GRUB2 * Enable Trusted Boot: no * Status Location: //dev/disk/by-id/scsi-36005076400810179a8000000000049-part1 Firewall and SSH * Firewall will be enabled (disable) * SSH port will be enabled (disable) * SSH service will be enabled (disable) Kdump * Warning! There might not be enough free space. 12 GiB required, but only 4 GiB are available. * Kdump status: enabled * Value(s) of crashkernel option: 272M * Dump format: lzo * Target of dumps: file:///var/crash * Number of dumps: 5 Default systemd target * Graphical mode Import SSH Host Keys and Configuration * SSH host keys will be copied from SUSE Linux Enterprise Server 12 SP3 System * System and Hardware Settings // Melp 1 [Rack] [Abort] [Install] Help F8 Back F9 Abort F10 Install</pre>		Booting
<pre>Firewall and SSH * Firewall will be enabled (disable) * SSH port will be blocked (open) * SSH service will be enabled (disable) Kdump * Warning! There might not be enough free space. 12 GiB required, but only 4 GiB are available. * Kdump status: enabled * Value(s) of crashkernel option: 272M * Dump format: lzo * Target of dumps: file:///var/crash * Number of dumps: 5 Default systemd target * Graphical mode Import SSH host keys and Configuration * SSH host keys will be copied from SUSE Linux Enterprise Server 12 SP3 System * System and Hardware Settings # lelp 1 [Back 1 [Abort] [Install] </pre>		 Boot Loader Type: GRUB2 Enable Trusted Boot: no Status Location: /dev/disk/by-id/scsi-36005076400810179a800000000000049-part1
<pre>* Firewall will be enabled (disable) * SSH port will be blocked (open) * SSH service will be enabled (disable) Kdump * Warning! There might not be enough free space. 12 GiB required, but only 4 GiB are available. * Kdump status: enabled * Value(s) of crashkernel option: 272M * Dump format: lzo * Target of dumps: file:///var/crash * Number of dumps: 5 Default systemd target * Graphical mode Import SSH Host Keys and Configuration * SSH host keys will be copied from SUSE Linux Enterprise Server 12 SP3 System * System and Hardware Settings [Help] [Back] [Abort] [Install]</pre>		Firewall and SSH
<pre>Kdump * Warning! There might not be enough free space. 12 GiB required, but only 4 GiB are available. * Kdump status: enabled * Value(s) of crashkernel option: 272M * Dump format: lzo * Target of dumps: file:///var/crash * Number of dumps: 5 Default systemd target * Graphical mode Import SSH Host Keys and Configuration * SSH host keys will be copied from SUSE Linux Enterprise Server 12 SP3 System * System and Hardware Settings [Melp] [Back] [Mort] [Install] </pre>		 * Firewall will be enabled (disable) * SSH port will be blocked (open) * SSH service will be enabled (disable)
<pre>* Warning! There might not be enough free space. 12 GiB required, but only 4 GiB are available. * Kdump status: enabled * Value(s) of crashkernel option: 272M * Dump format: 1zo * Target of dumps: file:///var/crash * Number of dumps: 5 Default systemd target * Graphical mode Import SSH Host Keys and Configuration * SSH host keys will be copied from SUSE Linux Enterprise Server 12 SP3 System * System and Hardware Settings [Help] [Back] [Abort] [Install]</pre>		Kdump
<pre>* Kdump status: enabled * Value(s) of crashkernel option: 272M * Dump format: lzo * Target of dumps: file:///var/crash * Number of dumps: 5 Default systemd target * Graphical mode Import SSH Host Keys and Configuration * SSH host keys will be copied from SUSE Linux Enterprise Server 12 SP3 System * System and Hardware Settings [Help] [Back] [Abort] [Install] E1 Help F8 Back F9 Abort F10 Install</pre>		* Warning! There might not be enough free space. 12 GiB required, but only 4 GiB are available.
Default systemd target * Graphical mode Import SSH Host Keys and Configuration * SSH host keys will be copied from SUSE Linux Enterprise Server 12 SP3 System * System and Hardware Settings [Help] [Back] [Abort] [Install] F1 Help F8 Back F9 Abort F10 Install		 Kdump status: enabled Value(s) of crashkernel option: 272M Dump format: lzo Target of dumps: file:///var/crash Number of dumps: 5
<pre>* Graphical mode Import SSH Host Keys and Configuration * SSH host keys will be copied from SUSE Linux Enterprise Server 12 SP3 System * System and Hardware Settings [Help] [Back] [Abort] [Install] E1 Help F8 Back F9 Abort F10 Install</pre>		Default systemd target
<pre>Import SSH Host Keys and Configuration * SSH host keys will be copied from SUSE Linux Enterprise Server 12 SP3 System * System and Hardware Settings [Help] [Back] [Abort] [Install] F1 Help F8 Back F9 Abort F10 Install</pre>		* Graphical mode
<pre>* SSH host keys will be copied from SUSE Linux Enterprise Server 12 SP3 System * System and Hardware Settings [Change1] [Help] [Back] [Abort] [Install] F1 Help F8 Back F9 Abort F10 Install</pre>		Import SSH Host Keys and Configuration
System * System and Hardware Settings [Change] [Help] [Back] [Abort] [Install] Help F8 Back F9 Abort F10 Install		* SSH host keys will be copied from SUSE Linux Enterprise Server 12 SP3
* System and Hardware Settings [Change:] [Help] [Back] [Abort] [Install] F1 Help F8 Back F9 Abort F10 Install		System
[Changeı] [Help] [Back] [Abort] [Install] F1 Help F8 Back F9 Abort F10 Install		* System and Hardware Settings
	[[Changeı] Help] [Back] [Abort] [Install] Help F8 Back F9 Abort F10 Install



After the installation is finished, verify whether all aspects of the operating system have been installed correctly.

2 SUSE Manager Setup



Important: DNS

After the installation make sure you configure your hosts DNS settings and add an entry to DNS. This ensures that the host name can be correctly resolved.

Open an SSH session to the new SUSE Manager host and start YaST:

```
# yast2 susemanager_setup
```

Choose to configure SUSE Manager from scratch:

(x) Set up SUSE Manager from scratch() Migrate a SUSE Manager compatible serve

FIGURE 13: YAST INSTALLATION - SETTING UP SUSE MANAGER

Enter a correct administrator e-mail address:

SUSE Manager Administrator E-mail Address

[] Advertise SUSE Manager via SLP

FIGURE 14: YAST INSTALLATION - E-MAIL ADDRESS

Provide details for the certificate generation:

Certificate Setup
Organization
Organization Unit
City
State
Country
SSL Password
Report Password
BELLEAL CASSWOLD

FIGURE 15: YAST INSTALLATION - CERTIFICATE GENERATION

Provide database authentication settings:



FIGURE 16: YAST INSTALLATION - DATABASE SETTINGS

Provide your SUSE Manager SCC organization user name and password:



FIGURE 17: YAST INSTALLATION - SCC SETTINGS

Perform an authentication test toward the SUSE Customer Center:



FIGURE 18: YAST INSTALLATION - TEST DETAILS



Confirm to run the setup process with Yes:

FIGURE 19: YAST INSTALLATION - SETUP PROCESS CONFIRMATION

Now the setup process is started:



FIGURE 20: YAST INSTALLATION - WRITE SETTINGS

Wait until the setup process is completed. Then enter Finish:



FIGURE 21: YAST INSTALLATION - SETUP COMPLETED

Verify that you can access the new SUSE Manager URL using a browser.



Important:

At time of writing this document, in SUSE Linux Enterprise Server 12 SP3 a minor workaround needs to be applied to the Apache configuration file to use spacewalk:

Add the following file with the following line of content:

```
# vi /etc/apache2/conf.d/zipp-fix.conf
HttpProtocolOptions Unsafe
```

Restart Apache to activate the change:

systemctl restart apache2.service

3 Create and Configure the Organization

After the SUSE Manager setup is finished, you must create your organization on the SUSE Manager Web user interface.

Provide all the requested details including an initial administrator user and password:

■ SUSE _® Mar	nager>			Ab
Search page	۲	📽 Create Organization	1	
Create First User		Organization Details		
> 3 About	o	Organization Name*:		
> 🗞 External Links	o		Tip: Between 3 and 128 characters	
		Create SUSE Manager Administrator		
		Create the first SUSE Manager Administrator users and delegate permissions to them.	r account. This account will have access to all resources on this SUSE Manag	er. This account will also be able to create new
		Desired Login*:	admin	
			Tip: Between 5 and 64 characters	
		Desired Password *:	•••••	•
		Confirm Password *:	•••••	•
		Password Strength:		
		Email*:		
		First Name*:	- Instant	
		Last Name*:	Markan Carlos Ca	
			Required Field	
			Create Organization	
Copyright Notice SUSE Manager release	SUSE.			

FIGURE 22: SUSE MANAGER WEB UI - CREATE ORGANIZATION

Confirm with Create Organization. The following message appears on the screen:



FIGURE 23: SUSE MANAGER WEB UI - ORGANIZATION CREATED SUCCESSFULLY

Navigate to the **Setup Wizard** in the left pane:



FIGURE 24: SUSE MANAGER WEB UI - SETUP WIZARD

Select the Organization Credentials tab:

Organization Credentials

FIGURE 25: SUSE MANAGER WEB UI - ORGANIZATION CREDENTIALS

Click Add a new credential:



FIGURE 26: SUSE MANAGER WEB UI - ADD CREDENTIAL

Enter your correct organization credentials from the SCC portal and save them:

Edit credential	S	×
Username:	Usemame	
Password:		
	Cancel Save	

FIGURE 27: SUSE MANAGER WEB UI - EDIT CREDENTIALS

Now navigate to the **SUSE Products** tab and select the SUSE products you need. In this example, SUSE Linux Enterprise Server for SAP Applications 12 SP3 has been selected:



FIGURE 28: SUSE MANAGER WEB UI - SUSE PRODUCTS

Do not forget to also check the sub-channels you need for each product:

	: wee and Scripting module 12	ррсо4іе		+
	SUSE Linux Enterprise Server for SAP Applications 12 SP3	ppc64le	:=	+
	: Advanced Systems Management Module 12	ppc64le	:	+
	: Containers Module 12	ppc64le		+
	: IBM DLPAR sdk for SLE 12	ppc64le	:=	+
	: IBM DLPAR Utils for SLE 12	ppc64le	:=	+
	: Legacy Module 12	ppc64le	:=	+
	: Public Cloud Module 12	ppc64le	:=	+

FIGURE 29: SUSE MANAGER WEB UI - SUB-CHANNELS

When your selection is done, confirm it with Add products:



FIGURE 30: SUSE MANAGER WEB UI - ADD PRODUCTS

Navigate to **Manager Configuration** in the left pane, and select **Bare-metal systems** as indicated below:



FIGURE 31: SUSE MANAGER WEB UI - BARE-METAL SYSTEMS

Now enable **Bare-metal systems**; click the green box **Enable adding to this organization**:



FIGURE 32: SUSE MANAGER WEB UI - ENABLE BARE-METAL SYSTEMS

4 Create the Software Channel Hierarchy

The following section describes how to create the software channel hierarchy.

Log on as root using SSH. Install the spacewalk-utils package with the following command:

```
# zypper install spacewalk-utils
```

Check whether the available channels correspond with selections made before:

```
# spacewalk-manage-channel-lifecycle --list-channels
Spacewalk Username: admin
Spacewalk Password:
Channel tree:
1. sle12-sp2-sap-pool-ppc64le
      \__ ibm-dlpar-utils-sap-sp2
      \__ sle-12-sp2-sap-updates-ppc64le
      \___ sle-ha12-sp2-pool-ppc64le-sap-sp2
      \___ sle-ha12-sp2-updates-ppc64le-sap-sp2
      \ sle-manager-tools12-pool-ppc64le-sap-sp2
      \___ sle-manager-tools12-updates-ppc64le-sap-sp2
      \___ sle-module-adv-systems-management12-pool-ppc64le-sap-sp2
      sle-module-adv-systems-management12-updates-ppc64le-sap-sp2
      \___ sle-module-legacy12-pool-ppc64le-sap-sp2
      \___ sle-module-legacy12-updates-ppc64le-sap-sp2
      \___ sles12-sp2-pool-ppc64le-sap-sp2
      \__ sles12-sp2-updates-ppc64le-sap-sp2
 sle12-sp3-sap-pool-ppc64le
      \__ ibm-dlpar-utils-sap-sp3
      \____sle-12-sp3-sap-updates-ppc64le
      \___ sle-ha12-sp3-pool-ppc64le-sap-sp3
      \___ sle-ha12-sp3-updates-ppc64le-sap-sp3
      \__ sle-manager-tools12-pool-ppc64le-sap-sp3
      \ sle-manager-tools12-updates-ppc64le-sap-sp3
      \__ sle-module-adv-systems-management12-pool-ppc64le-sap-sp3
      \ sle-module-adv-systems-management12-updates-ppc64le-sap-sp3
      \___ sle-module-legacy12-pool-ppc64le-sap-sp3
      \___ sle-module-legacy12-updates-ppc64le-sap-sp3
      \ sles12-sp3-pool-ppc64le-sap-sp3
      \__ sles12-sp3-updates-ppc64le-sap-sp3
```

Synchronize the ibm-dlpar repository and import the GPG key.

```
14:38:14 | Channel: ibm-dlpar-utils-sap-sp2
14:38:14 ==========
14:38:14 Sync of channel started.
Do you want to import the GPG key 0x3E6E42BE "Linux on POWER (IBM Linux Technology
Center) <poweryum@linux.vnet.ibm.com>" from http://public.dhe.ibm.com/software/server/
POWER/Linux/yum/OSS/SLES/12/ppc64le//repodata/repomd.xml.key? [y/n]:
У
14:38:20 Repo URL: http://public.dhe.ibm.com/software/server/POWER/Linux/yum/OSS/SLES/12/
ppc64le/
14:38:20 Packages in repo:
                                       36
14:38:20 Packages already synced:
                                        0
14:38:20 Packages to sync:
                                       30
14:38:20 New packages to download:
                                       30
14:38:20 Downloading 30 files.
14:38:22 1/30 : DynamicRM-2.0.5-1.ppc64le.rpm
14:38:22 2/30 : IBMinvscout-3.1.0-2.ppc64le.rpm
......
14:38:29 29/30 : rsct.core-3.2.2.3-17144.ppc64le.rpm
14:38:47 30/30 : esagent.pLinux-4.2.0-9.noarch.rpm
14:38:54 Linking packages to channel.
14:38:55 Transferred 100 orphaned vendor packages to the default organization
14:38:55 Repo http://public.dhe.ibm.com/software/server/POWER/Linux/yum/OSS/SLES/12/
ppc64le/ has 0 patches.
14:38:55 Sync completed.
14:38:55 Total time: 0:00:40
# spacewalk-repo-sync --channel ibm-dlpar-utils-sap-sp3
Synchronize the base channel :
# spacewalk-repo-sync --channel sle12-sp2-sap-pool-ppc64le
. . .
# spacewalk-repo-sync --channel sle12-sp3-sap-pool-ppc64le
```

In the specific setup at hand, the lifecycle phases are limited to "dev" and "prod" ("test" has been removed).

```
vi ~/.spacewalk-manage-channel-lifecycle/settings.conf
phases = dev, prod
exclude channels =
```

This can be customized as required, which means you can add and remove phases at this stage of the procedure.

Generate the "dev" channels by promoting the SUSE channels. The same command is used to fully synchronize the "dev" channels with the online repositories:

```
# spacewalk-manage-channel-lifecycle -c sle12-sp2-sap-pool-ppc64le --init
INF0: Cloning dev-sle12-sp2-sap-pool-ppc64le from sle12-sp2-sap-pool-ppc64le
INFO: Cloning dev-ibm-dlpar-utils-sap-sp2 from ibm-dlpar-utils-sap-sp2
INFO: Cloning dev-sle-12-sp2-sap-updates-ppc64le from sle-12-sp2-sap-updates-ppc64le
INFO: Cloning dev-sle-ha12-sp2-pool-ppc64le-sap-sp2 from sle-ha12-sp2-pool-ppc64le-sap-
sp2
INF0: Cloning dev-sle-ha12-sp2-updates-ppc64le-sap-sp2 from sle-ha12-sp2-updates-ppc64le-
sap-sp2
INFO: Cloning dev-sle-manager-tools12-pool-ppc64le-sap-sp2 from sle-manager-tools12-pool-
ppc64le-sap-sp2
INFO: Cloning dev-sle-manager-tools12-updates-ppc64le-sap-sp2 from sle-manager-tools12-
updates-ppc64le-sap-sp2
INFO: Cloning dev-sle-module-adv-systems-management12-pool-ppc64le-sap-sp2 from sle-
module-adv-systems-management12-pool-ppc64le-sap-sp2
INFO: Cloning dev-sle-module-adv-systems-management12-updates-ppc64le-sap-sp2 from sle-
module-adv-systems-management12-updates-ppc64le-sap-sp2
INFO: Cloning dev-sle-module-legacy12-pool-ppc64le-sap-sp2 from sle-module-legacy12-pool-
ppc64le-sap-sp2
INFO: Cloning dev-sle-module-legacy12-updates-ppc64le-sap-sp2 from sle-module-legacy12-
updates-ppc64le-sap-sp2
INFO: Cloning dev-sles12-sp2-pool-ppc64le-sap-sp2 from sles12-sp2-pool-ppc64le-sap-sp2
INF0: Cloning dev-sles12-sp2-updates-ppc64le-sap-sp2 from sles12-sp2-updates-ppc64le-sap-
sp2
```

Now the "dev" channel can be promoted to generate and synchronize the "prod" channels with **dev**:

spacewalk-manage-channel-lifecycle -c dev-sle12-sp2-sap-pool-ppc64lepromote
<pre>INF0: Cloning prod-sle12-sp2-sap-pool-ppc64le from dev-sle12-sp2-sap-pool-ppc64le</pre>
INFO: Cloning prod-ibm-dlpar-utils-sap-sp2 from dev-ibm-dlpar-utils-sap-sp2
<pre>INFO: Cloning prod-sle-12-sp2-sap-updates-ppc64le from dev-sle-12-sp2-sap-updates-ppc64le</pre>
INFO: Cloning prod-sle-ha12-sp2-pool-ppc64le-sap-sp2 from dev-sle-ha12-sp2-pool-ppc64le-
sap-sp2
<pre>INF0: Cloning prod-sle-ha12-sp2-updates-ppc64le-sap-sp2 from dev-sle-ha12-sp2-updates-</pre>
ppc64le-sap-sp2
<pre>INFO: Cloning prod-sle-manager-tools12-pool-ppc64le-sap-sp2 from dev-sle-manager-tools12-</pre>
pool-ppc64le-sap-sp2
INFO: Cloning prod-sle-manager-tools12-updates-ppc64le-sap-sp2 from dev-sle-manager-
tools12-updates-ppc64le-sap-sp2
<pre>INFO: Cloning prod-sle-module-adv-systems-management12-pool-ppc64le-sap-sp2 from dev-sle-</pre>
module-adv-systems-management12-pool-ppc64le-sap-sp2
<pre>INF0: Cloning prod-sle-module-adv-systems-management12-updates-ppc64le-sap-sp2 from dev-</pre>
<pre>sle-module-adv-systems-management12-updates-ppc64le-sap-sp2</pre>

```
INF0: Cloning prod-sle-module-legacy12-pool-ppc64le-sap-sp2 from dev-sle-module-legacy12-
pool-ppc64le-sap-sp2
INF0: Cloning prod-sle-module-legacy12-updates-ppc64le-sap-sp2 from dev-sle-module-
legacy12-updates-ppc64le-sap-sp2
INF0: Cloning prod-sles12-sp2-pool-ppc64le-sap-sp2 from dev-sles12-sp2-pool-ppc64le-sap-
sp2
INF0: Cloning prod-sles12-sp2-updates-ppc64le-sap-sp2 from dev-sles12-sp2-updates-
ppc64le-sap-sp2
```

The same steps need to be performed for any additional product or version:

```
# spacewalk-manage-channel-lifecycle -c sle12-sp3-sap-pool-ppc64le -promote
...
# spacewalk-manage-channel-lifecycle -c dev-sle12-sp3-sap-pool-ppc64le -promote
```

For all of the <u>-ibm-dlpar-utils-</u> child channels, deactivate the GPG check as it requires an external GPG key from IBM. To do so, navigate to **Software** in the left pan. Then go to **Manage Software Channels** and choose **Overview**:



FIGURE 33: SUSE MANAGER WEB UI - MANAGE SOFTWARE CHANNELS

A list of all of the -ibm-dlpar-utils- child channels appears:



🖦 dev-ibm-dlpar-utils-sap-sp2

FIGURE 34: SUSE MANAGER WEB UI - LIST OF CHILD CHANNELS

Make sure the check box for **Enable GPG Check** is not marked:

Enable GPG Check	
	Update Channel

FIGURE 35: SUSE MANAGER WEB UI - ENABLE GPG CHECK

Alternatively you can download the GPG key locally and configure a local URL.

5 Creating System Groups

Optionally you can configure system groups to distinguish different types of systems. In this example the system groups "development" and "production" are configured.

Navigate to Systems on the left pane, and select System Groups:



FIGURE 36: SUSE MANAGER WEB UI - SYSTEM GROUPS

Click Create Group:



FIGURE 37: SUSE MANAGER WEB UI - BUTTON CREATE GROUP

Enter the required information and confirm by clicking **Create Group**:

🖘 Create System Group	
Create a system group using the form provided. Note that the group	will be empty until systems are joine
Name *:	
Description *:	
	Create Group

FIGURE 38: SUSE MANAGER WEB UI - CREATE SYSTEM GROUPS

Now you see the newly created groups:

🔁 System Groups ⁰					
Select All Work With Union Work With Intersection 1 - 2 of 2 (0 selected)					
Filter by System Group Name:	Select first character	er 🕶		25 items per page	
Updates	Group Name	Systems	Use in SSM		
•	Development	0	Use in SSM		
•	Production	0	Use in SSM		
				Download CSV	

FIGURE 39: SUSE MANAGER WEB UI - SHOW SYSTEM GROUPS

6 Bootstrap Configuration

Navigate to Manager Configuration on the left pane, and select Bootstrap Script.



FIGURE 40: SUSE MANAGER WEB UI - MENU MANAGER CONFIGURATION

Click the **Bootstrap Script** tab on top. Enter the required information to create the general client bootstrap script configuration:

General Bootstrap Script Organizations	estart Cobbler Bare-metal systems
Client Bootstrap Script Configuration	
SUSE Manager server hostname	to approximate with a fifty and an
SSL cert location	/srv/www/htdocs/pub/rhn-org-trusted-ssl-cert-1.0-1.noarch.rpm
Bootstrap using Sa	
Enable SS	
Enable Client GPG checkin	
Enable Remote Configuration	
Enable Remote Command	•
Client HTTP Prov	
Client HTTP Proxy usernam	,
Client HTTP Proxy passwor	I
	Update

FIGURE 41: SUSE MANAGER WEB UI - TAB BOOTSTRAP SCRIPT

Provide the correct Fully-Qualified Domain Name (FQDN) for the SUSE Manager host name.

Now create the activation keys. Navigate to **Systems** on the left pane and choose **Activation Keys**:



FIGURE 42: SUSE MANAGER WEB UI - ACTIVATION KEYS

Click Create Key:



FIGURE 43: SUSE MANAGER WEB UI - BUTTON CREATE KEY

Create a universal activation key first:

Description:	universal				
	Use this to describe what kind of settings this key will reflect on systems that use it. If left blank, this field will be filled in 'None'.				
Key:	1- universal				
	Activation key can contains only numbers [0-9], letters [a-z A-Z], '+, '_' and '.'				
	Leave blank for automatic key generation. Note that the prefix is an indication of the SUSE Manager organization the key is associated with.				
Usage:					
	Leave blank for unlimited use.				
Base Channel:	SUSE Manager Default				
	Choose "SUSE Manager Default" to allow systems to register to the default SUSE Manager provided channel that corresponds to the installed SUSE Linux version. Instead of the default, you may choose a particular SUSE provided channel or a custom base channel, but if a system using this key is not compatible with the selected channel, it will fall back to its SUSE Manager Default channel.				
Add-On System Types:	Container Build Host				
	Virtualization Host				
Configuration File Deployment:	Deploy configuration files to systems when they are registered with this activation key.				
Contact Method:	Default				
Universal Default:	Tip: Only one universal default activation key may be set for this organization. By setting this key as universal default, you will remove universal default status from the current universal default key if it exists. If this key is set as universal default, then newly-registered systems to your organization will inherit the properties of this key.				

FIGURE 44: SUSE MANAGER WEB UI - UNIVERSAL KEY

After that, create a key you will use for the autoinstall procedure. For the example at hand, the "dev" channel has been selected as base channel.

Description:	dev-sle12-sp2-sap-pool-ppc64le					
	Use this to describe what kind of settings this key will reflect on systems that use it. If left blank, this field will be filled in 'None'.					
Key:	1- dev-sle12-sp2-sap-pool-ppc64le					
	Activation key can contains only numbers [0-9], letters [a-z A-Z], '-, '_' and '.'					
	Leave blank for automatic key generation. Note that the prefix is an indication of the SUSE Manager organization the key is associated with.					
Usage:						
	Leave blank for unlimited use.					
Base Channel:	dev-sle12-sp2-sap-pool-ppc64le					
	Choose "SUSE Manager Default" to allow systems to register to the default SUSE Manager provided channel that corresponds to the installed SUSE Linux version. Instead of the default, you may choose a particular SUSE provided channel or a custom base channel, but if a system using this key is not compatible with the selected channel, it will fall back to its SUSE Manager Default channel.					
Add-On System Types:	Container Build Host					
	Virtualization Host					
Configuration File Deployment:						
	Deploy configuration files to systems when they are registered with this activation key.					
Contact Method:	Default					
Universal Default:						
	Tip: Only one universal default activation key may be set for this organization. By setting this key as universal default, you will					
	newly-registered systems to your organization will inherit the properties of this key.					

FIGURE 45: SUSE MANAGER WEB UI - CREATE KEY FOR "DEV" CHANNEL

Click the **Child Channels** tab on top. The appropriate channels should be linked here:

Cetails	V-SIe12-Sp2-	Sap-pool· Packages	-ppc64le	Groups	Activated Systems	
Any system The followin	Any system registered using this activation key will be subscribed to the selected child channels. The following child channels of dev-sle12-sp2-sap-pool-ppc64le can be associated with this activation key.					
dev-ib	✓ dev-ibm-dlpar-utils-sap-sp2					
🗹 dev-sle	e-12-sp2-sap-updates-p	pc64le				
🗹 dev-sle	e-ha12-sp2-pool-ppc64	le-sap-sp2				
I dev-sl∉	e-ha12-sp2-updates-pp	c64le-sap-sp2				
🕑 dev-sle	✓ dev-sle-manager-tools12-pool-ppc64le-sap-sp2					
✓ dev-sle-manager-tools12-updates-ppc64le-sap-sp2						
dev-sle-module-adv-systems-management12-pool-ppc64le-sap-sp2						
dev-sle	dev-sle-module-adv-systems-management12-updates-ppc64le-sap-sp2					
✓ dev-sle-module-legacy12-pool-ppc64le-sap-sp2						
✓ dev-sle-module-legacy12-updates-ppc64le-sap-sp2						
✓ dev-sles12-sp2-pool-ppc64le-sap-sp2						
dev-sles12-sp2-updates-ppc64le-sap-sp2						
					Update Activation Key	

FIGURE 46: SUSE MANAGER WEB UI - CHILD CHANNELS

Click the **Packages** tab on top, and add the following values as packages:

a, dev	-sle12-sp2-	sap-pool [,]	-ppc64le 🕫			
Details	Child Channels	Packages	Configuration	Groups	Activated Systems	
Any system r one package	registered with this ac name included per lin	tivation key will h e.	ave the packages lis	sted below inst	alled, if those packages are	available. Package
threfs threfs threfs-settic threfs-settic threfs-settic	kage names beid ns it ation-host	2W				etivation Key

FIGURE 47: SUSE MANAGER WEB UI - PACKAGES

Click Update Activation Key.

Now add the development group to this key. Click the **Groups** tab on top and choose **List** / **Leave**:

a, dev	v-sle12-sp2-	sap-pool	-ppc64le 🕫		
Details	Child Channels	Packages	Configuration	Groups	Activated Systems
List /	Leave Join				
🗣 Syst	tem Groups				
Below are all the system groups that have been added to this activation key. Any system registering with this activa "Leave Selected Groups" button when you are finished with your changes.					
Select All 1 - 1 of 1 (0 selected)					
Filter by	Group Name:			۲	Select first character 👻
Grou	p Name 崖				
Deve	lopment				

FIGURE 48: SUSE MANAGER WEB UI - GROUPS - LIST/LEAVE

Optionally you can also create and add configuration channels.

Perform the same configuration for a **prod** key:

listed below.
prod-sle12-sp2-sap-pool-ppc64le
Use this to describe what kind of settings this key will reflect on systems that use it. If left blank, this field will be filled in 'None'.
1- prod-sle12-sp2-sap-pool-ppc64le
Activation key can contains only numbers [0-9], letters [a-z A-Z], '_' and \'
Leave blank for automatic key generation. Note that the prefix is an indication of the SUSE Manager organization the key is associated with.
Leave blank for unlimited use.
prod-sle12-sp2-sap-pool-ppc64le
Choose "SUSE Manager Default" to allow systems to register to the default SUSE Manager provided channel that corresponds to the installed SUSE Linux version. Instead of the default, you may choose a particular SUSE provided channel or a custom base channel, but if a system using this key is not compatible with the selected channel, it will fall back to its SUSE Manager Default channel.
Container Build Host
Virtualization Host
Default
Tip: Only one universal default activation key may be set for this organization. By setting this key as universal default, you will remove universal default status from the current universal default key if it exists. If this key is set as universal default, then newly-registered systems to your organization will inherit the properties of this key.
Create Activation Key

FIGURE 49: SUSE MANAGER WEB UI - CREATE KEY FOR "PROD" CHANNEL

You also need to create a bootstrap repository. Use the command:

mgr-create-bootstrap-repo -c SLES4SAP-12-SP2-ppc64le

Bootstrap scripts are usually generated automatically, but you can manually generate them for each key using the following CLI syntax:

```
# mgr-bootstrap --activation-keys=1-dev-sle12-sp2-sap-pool-ppc64le --script bootstrap-
dev-sle12-sp2-sap-pool-ppc64le.sh --no-up2date --allow-config-actions --allow-remote-
commands
```

```
# mgr-bootstrap --activation-keys=1-prod-sle12-sp2-sap-pool-ppc64le --script bootstrap-
prod-sle12-sp2-sap-pool-ppc64le.sh --no-up2date --allow-config-actions —allow-remote-
commands
```

The default path where the bootstrap scripts reside is /srv/www/htdocs/pub/bootstrap.

An already installed SUSE Linux Enterprise Server host can be bootstrapped using the following syntax from that host:

```
curl -Sks https://hostname.domain/pub/bootstrap/bootstrap-scriptname.sh | /bin/bash
```

You can also copy and past the script below and execute it.

Custom Bootstrap Script

The following script blueprint can be used to create a custom bootstrap script. Modify the SUSE Manager host name and the activation key according to your requirements.

```
#!/bin/bash
echo "SUSE Manager Server Client bootstrap script v4.0"
echo
echo
echo "MINOR MANUAL EDITING OF THIS FILE MAY BE REOUIRED!"
echo
echo "If this bootstrap script was created during the initial installation"
echo "of a SUSE Manager Server, the ACTIVATION_KEYS, and ORG_GPG_KEY values will"
echo "probably *not* be set (see below). If this is the case, please do the"
echo "following:"
echo " - copy this file to a name specific to its use."
echo "
         (e.g., to bootstrap-SOME_NAME.sh - like bootstrap-web-servers.sh.)"
echo " - on the website create an activation key or keys for the system(s) to"
echo "
        be registered."
echo " - edit the values of the VARIABLES below (in this script) as"
echo " appropriate:"
echo " - ACTIVATION_KEYS needs to reflect the activation key(s) value(s)"
echo "
         from the website. XKEY or XKEY,YKEY"
echo " - ORG_GPG_KEY needs to be set to the name(s) of the corporate public"
echo "
           GPG key filename(s) (residing in /srv/www/htdocs/pub) if appropriate. XKEY or
XKEY, YKEY"
echo
echo "Verify that the script variable settings are correct:"
echo "
        - CLIENT_OVERRIDES should be only set differently if a customized"
         client-config-overrides-VER.txt file was created with a different"
echo "
echo "
          name."
         - ensure the value of HOSTNAME is correct."
echo "
         - ensure the value of ORG_CA_CERT is correct."
echo "
echo
echo "Enable this script: comment (with #'s) this block (or, at least just"
echo "the exit below)"
echo
ACTIVATION_KEYS=1-dev-sle12-sp2-sap-pool-ppc64le
```
```
ORG_GPG_KEY=
CLIENT_OVERRIDES=client-config-overrides.txt
HOSTNAME=[SUMA FQDN]
ORG CA CERT=RHN-ORG-TRUSTED-SSL-CERT
ORG_CA_CERT_IS_RPM_YN=0
USING SSL=1
USING_GPG=1
REGISTER_THIS_BOX=1
ALLOW_CONFIG_ACTIONS=1
ALLOW REMOTE COMMANDS=1
FULLY UPDATE THIS BOX=0
PROFILENAME=""
               # Empty by default to let it be set automatically.
DISABLE_LOCAL_REPOS=1
DISABLE_YAST_AUTOMATIC_ONLINE_UPDATE=1
Z_CLIENT_REPOS_ROOT=
MYNAME=`hostname -f`
LCMYNAME=`echo $MYNAME | tr '[:upper:]' '[:lower:]'`
LCHOSTNAME=`echo $HOSTNAME | tr '[:upper:]' '[:lower:]'`
if [ $LCMYNAME == $LCHOSTNAME ]; then
   echo "Name of client and of SUSE Manager server are the same."
   echo "Do not try to register a SUSE Manager server at itself!"
   echo "Aborting."
   exit 1
fi
if [ -f "/var/adm/autoinstall/cache/SUSE Manager keys" ]; then
    . /var/adm/autoinstall/cache/SUSE_Manager_keys
   if [ "x$redhat_management_key" != "x" ]; then
       ACTIVATION_KEYS="$ACTIVATION_KEYS, $redhat_management_key"
    fi
   if [ "x$registration_key" != "x" ]; then
       ACTIVATION_KEYS="$ACTIVATION_KEYS, $registration_key"
    fi
   ACTIVATION_KEYS=${ACTIVATION_KEYS#,}
fi
if [ -x /usr/bin/wget ] ; then
   output=`LANG=en US /usr/bin/wget --no-check-certificate 2>&1`
   error=`echo $output | grep "unrecognized option"`
   if [ -z "$error" ] ; then
        FETCH="/usr/bin/wget -nv -r -nd --no-check-certificate"
   else
        FETCH="/usr/bin/wget -nv -r -nd"
    fi
elif [ -x /usr/bin/curl ] ; then
   output=`LANG=en_US /usr/bin/curl -k 2>&1`
```

```
error=`echo $output | grep "is unknown"`
   if [ -z "$error" ] ; then
       FETCH="/usr/bin/curl -ksSOf"
   else
       FETCH="/usr/bin/curl -sSOf"
   fi
else
   echo "To be able to download files, please install either 'wget' or 'curl'"
   exit 1
fi
HTTP_PUB_DIRECTORY=http://${HOSTNAME}/pub
HTTPS_PUB_DIRECTORY=https://${HOSTNAME}/pub
if [ $USING_SSL -eq 0 ] ; then
   HTTPS_PUB_DIRECTORY=${HTTP_PUB_DIRECTORY}
fi
INSTALLER=up2date
if [ -x /usr/bin/zypper ] ; then
   INSTALLER=zypper
elif [ -x /usr/bin/yum ] ; then
   INSTALLER=yum
fi
if [ ! -w . ] ; then
   echo ""
   echo "*** ERROR: $(pwd):"
   echo "
            No permission to write to the current directory."
   echo "
             Please execute this script in a directory where downloaded files can be
stored."
   echo ""
   exit 1
fi
echo
echo "UPDATING RHN REGISTER/UP2DATE CONFIGURATION FILES"
echo "-----
                                    ----"
echo "* downloading necessary files"
echo " client_config_update.py..."
rm -f client config update.py
$FETCH ${HTTPS_PUB_DIRECTORY}/bootstrap/client_config_update.py
echo " ${CLIENT_OVERRIDES}..."
rm -f ${CLIENT_OVERRIDES}
$FETCH ${HTTPS_PUB_DIRECTORY}/bootstrap/${CLIENT_OVERRIDES}
if [ ! -f "client_config_update.py" ] ; then
   echo "ERROR: client_config_update.py was not downloaded"
   exit 1
```

```
fi
if [ ! -f "${CLIENT_OVERRIDES}" ] ; then
   echo "ERROR: ${CLIENT_OVERRIDES} was not downloaded"
   exit 1
fi
echo
echo "PREPARE GPG KEYS AND CORPORATE PUBLIC CA CERT"
echo "-----"
if [ ! -z "$ORG GPG KEY" ] ; then
    echo
   echo "* importing organizational GPG keys"
   for GPG_KEY in $(echo "$ORG_GPG_KEY" | tr "," " "); do
        rm -f ${GPG KEY}
       $FETCH ${HTTPS_PUB_DIRECTORY}/${GPG_KEY}
        res=$(LC_ALL=C rpm -q --queryformat '%{version}' up2date | sed -e 's/\..*//g')
       if [ "x$res" == "x2" ] ; then
           gpg $(up2date --gpg-flags) --import $GPG KEY
       else
           rpm --import $GPG_KEY
        fi
    done
else
    echo "* no organizational GPG keys to import"
fi
echo
if [ $USING_SSL -eq 1 ] ; then
   echo "* attempting to install corporate public CA cert"
   test -d /usr/share/rhn || mkdir -p /usr/share/rhn
    rm -f ${ORG_CA_CERT}
   $FETCH ${HTTP_PUB_DIRECTORY}/${ORG_CA_CERT}
   if [ $ORG_CA_CERT_IS_RPM_YN -eq 1 ] ; then
        rpm -Uvh --force --replacefiles --replacepkgs ${ORG_CA_CERT}
        rm -f ${ORG_CA_CERT}
   else
       mv ${ORG_CA_CERT} /usr/share/rhn/
    fi
   if [ "$INSTALLER" == zypper ] ; then
     function suseVersion() {
        rpm --eval "%{suse version}"
     }
     function sslCertDir() {
```

if [[\$(suseVersion) -ge 1315]]; then

```
echo "/etc/pki/trust/anchors"
       else
         echo "/etc/ssl/certs"
       fi
     }
     function targetCertPath() {
       echo "$(sslCertDir)/${ORG_CA_CERT}.pem"
     }
     function updateCertificates() {
       if [[ $(suseVersion) -ge 1315 ]]; then
         test -x /usr/sbin/update-ca-certificates && /usr/sbin/update-ca-certificates
       else
         test -x /usr/bin/c_rehash && /usr/bin/c_rehash /etc/ssl/certs/ | grep
 "${ORG_CA_CERT}"
       fi
     }
     function symlinkCertificate() {
       if [ $ORG_CA_CERT_IS_RPM_YN -eq 1 ] ; then
         ORG_CA_CERT=$(basename $(sed -n 's/^sslCACert *= *//p' "${CLIENT_OVERRIDES}"))
       fi
       test -e "$(targetCertPath)" || {
         test -d $(sslCertDir) || mkdir -p $(sslCertDir)
         ln -s "/usr/share/rhn/${ORG_CA_CERT}" "$(targetCertPath)"
       }
     }
      symlinkCertificate
     updateCertificates
   fi
else
   echo "* configured not to use SSL: don't install corporate public CA cert"
fi
if [ "$INSTALLER" == zypper ]; then
 echo
 echo "CHECKING THE REGISTRATION STACK"
 echo "------"
 function getZ_CLIENT_CODE_BASE() {
   local BASE=""
   local VERSION=""
   local PATCHLEVEL=""
   test -r /etc/SuSE-release && {
     grep -q 'Enterprise' /etc/SuSE-release && BASE="sle"
```

```
eval $(grep '^\(VERSION\|PATCHLEVEL\)' /etc/SuSE-release | tr -d '[:blank:]')
   }
   Z CLIENT CODE BASE="${BASE:-unknown}"
   Z CLIENT CODE VERSION="${VERSION:-unknown}"
   Z_CLIENT_CODE_PATCHLEVEL="${PATCHLEVEL:-0}"
 }
 function getZ_MISSING() {
    local NEEDED="spacewalk-check spacewalk-client-setup spacewalk-client-tools zypp-
plugin-spacewalk"
   if [ "$Z CLIENT CODE BASE" == "sle" -a "$Z CLIENT CODE VERSION" == "10" ]; then
     which 'xsltproc' || NEEDED="$NEEDED libxslt"
   fi
   Z MISSING=""
    for P in $NEEDED; do
      rpm -q "$P" || Z_MISSING="$Z_MISSING $P"
   done
 }
 function getZ_ZMD_TODEL() {
    local ZMD_STACK="zmd rug libzypp-zmd-backend yast2-registration zen-updater zmd-
inventory suseRegister-jeos"
    if rpm -q suseRegister --qf '%{VERSION}' | grep -q '^\(0\.\|1\.[0-3]\)\(\..*\)\?$';
then
     # we need the new suseRegister >= 1.4, so wipe an old one too
     ZMD STACK="$ZMD STACK suseRegister suseRegisterInfo spacewalk-client-tools"
   fi
   Z_ZMD_TODEL=""
   for P in $ZMD_STACK; do
      rpm -q "$P" && Z_ZMD_TODEL="$Z_ZMD_TODEL $P"
   done
 }
 echo "* check for necessary packages being installed..."
 getZ_CLIENT_CODE_BASE
 echo "* client codebase is ${Z_CLIENT_CODE_BASE}-${Z_CLIENT_CODE_VERSION}-sp
${Z_CLIENT_CODE_PATCHLEVEL}"
 getZ MISSING
 if [ -z "$Z_MISSING" ]; then
   echo " no packages missing."
 else
    echo "* going to install missing packages..."
    Z_CLIENT_REPOS_R00T="${Z_CLIENT_REPOS_R00T:-https://${HOSTNAME}/pub/repositories}"
    Z_CLIENT_REP0_URL="${Z_CLIENT_REP0S_R00T}/${Z_CLIENT_CODE_BASE}/
${Z_CLIENT_CODE_VERSION}/${Z_CLIENT_CODE_PATCHLEVEL}/bootstrap"
```

```
test "${Z_CLIENT_CODE_BASE}/${Z_CLIENT_CODE_VERSION}/${Z_CLIENT_CODE_PATCHLEVEL}" =
"sle/11/1" && {
    Z CLIENT REPO URL="${Z CLIENT REPOS ROOT}/susemanager-client-setup"
  }
  Z_CLIENT_REPO_NAME="susemanager-client-setup"
  Z CLIENT REPO FILE="/etc/zypp/repos.d/$Z CLIENT REPO NAME.repo"
  $FETCH $Z_CLIENT_REP0_URL/repodata/repomd.xml
  if [ ! -f "repomd.xml" ] ; then
       echo "Bootstrap repo '$Z CLIENT REPO URL' does not exist."
       Z CLIENT REPO URL=""
  fi
   rm -f repomd.xml
  if [ "$Z_CLIENT_CODE_BASE" == "sle" ]; then
    if [ "$Z_CLIENT_CODE_VERSION" = "10" ]; then
         echo "* check whether to remove the ZMD stack first..."
        getZ_ZMD_TODEL
         if [ -z "$Z ZMD TODEL" ]; then
           echo " ZMD stack is not installed. No need to remove it."
         else
           echo " Disable and remove the ZMD stack..."
           if [ -x /usr/sbin/rczmd ]; then
             /usr/sbin/rczmd stop
           fi
           rpm -e --nodeps $Z_ZMD_TODEL || {
            echo "ERROR: Failed remove the ZMD stack."
             exit 1
           }
         fi
     fi
   fi
  if rpm -q zypper --qf '%{VERSION}' | grep -q '^0\(\..*\)\?$'; then
    if [ -n "$Z CLIENT REPO URL" ]; then
       echo " adding client software repository at $Z CLIENT REPO URL"
       zypper --non-interactive --no-gpg-checks sd $Z_CLIENT_REP0_NAME
       zypper --non-interactive --no-gpg-checks sa $Z_CLIENT_REP0_URL
$Z CLIENT REPO NAME
       zypper --non-interactive --no-gpg-checks refresh "$Z_CLIENT_REPO_NAME"
     fi
     zypper --non-interactive --no-gpg-checks in $Z_MISSING
     for P in $Z MISSING; do
         rpm -q "$P" || {
           echo "ERROR: Failed to install all missing packages."
           exit 1
         }
```

```
done
     if [ -n "$Z_CLIENT_REP0_URL" ]; then
       cat <<EOF >"$Z_CLIENT_REP0_FILE"
[$Z CLIENT REPO NAME]
name=$Z_CLIENT_REP0_NAME
baseurl=$Z_CLIENT_REP0_URL
enabled=1
autorefresh=1
keeppackages=0
gpgcheck=0
E0F
      fi
   else
     if [ -n "$Z_CLIENT_REP0_URL" ]; then
        echo " adding client software repository at $Z_CLIENT_REPO_URL"
        cat <<EOF >"$Z_CLIENT_REP0_FILE"
[$Z CLIENT REPO NAME]
name=$Z_CLIENT_REP0_NAME
baseurl=$Z_CLIENT_REP0_URL
enabled=1
autorefresh=1
keeppackages=0
gpgcheck=0
E0F
        zypper --non-interactive --gpg-auto-import-keys refresh "$Z_CLIENT_REP0_NAME"
     fi
      zypper --non-interactive in $Z_MISSING || {
           echo "ERROR: Failed to install all missing packages."
            exit 1
          }
   fi
 zypper rr "$Z_CLIENT_REP0_NAME"
 fi
 if [ "$Z_CLIENT_CODE_BASE" == "sle" ]; then
   if [ "$Z_CLIENT_CODE_VERSION" = "10" ]; then
     test -e "/usr/share/zypp/migrate/10-11.migrate.products.sh" && {
          echo "* check whether we have to to migrate metadata..."
          sh /usr/share/zypp/migrate/10-11.migrate.products.sh || {
            echo "ERROR: Failed to migrate product metadata."
            exit 1
          }
     }
    fi
 fi
fi
```

```
echo "* running the update scripts"
if [ -f "/etc/sysconfig/rhn/rhn_register" ] ; then
   echo " . rhn register config file"
   /usr/bin/python -u client_config_update.py /etc/sysconfig/rhn/rhn_register
${CLIENT OVERRIDES}
fi
if [ -f "/etc/sysconfig/rhn/up2date" ] ; then
 echo " . up2date config file"
 /usr/bin/python -u client config update.py /etc/sysconfig/rhn/up2date
${CLIENT OVERRIDES}
fi
echo
echo "REGISTRATION"
echo "-----"
if [ -z "$ACTIVATION_KEYS" ] ; then
   echo "*** ERROR: in order to bootstrap SUSE Manager Server clients, an activation key
or keys"
   echo "
                   must be created in the SUSE Manager Server web user interface, and
the"
                  corresponding key or keys string (XKEY,YKEY,...) must be mapped to"
   echo "
   echo "
                    the ACTIVATION KEYS variable of this script."
   exit 1
fi
if [ $REGISTER_THIS_BOX -eq 1 ] ; then
   echo "* registering"
   files=""
   directories=""
   if [ $ALLOW_CONFIG_ACTIONS -eq 1 ] ; then
        for i in "/etc/sysconfig/rhn/allowed-actions /etc/sysconfig/rhn/allowed-actions/
configfiles"; do
            [ -d "$i" ] || (mkdir -p $i && directories="$i $directories")
        done
        [ -f /etc/sysconfig/rhn/allowed-actions/configfiles/all ] || files="$files /etc/
sysconfig/rhn/allowed-actions/configfiles/all"
        [ -n "$files" ] && touch $files
   fi
   if [ -z "$PROFILENAME" ] ; then
       profilename_opt=""
   else
        profilename opt="--profilename=$PROFILENAME"
   fi
   /usr/sbin/rhnreg_ks --force --activationkey "$ACTIVATION_KEYS" $profilename_opt
   RET="$?"
```

```
[ -n "$files" ] && rm -f $files
```

```
[ -n "$directories" ] && rmdir $directories
   if [ $RET -eq 0 ]; then
     echo
     echo "*** this system should now be registered, please verify ***"
     echo
   else
     echo
     echo "*** Error: Registering the system failed."
     echo
     exit 1
    fi
else
   echo "* explicitly not registering"
fi
if [ $ALLOW_CONFIG_ACTIONS -eq 1 ] ; then
   echo
   echo "* setting permissions to allow configuration management"
   echo " NOTE: use an activation key to subscribe to the tools"
   if [ "$INSTALLER" == zypper ] ; then
        echo "
                     channel and zypper install/update rhncfg-actions"
   elif [ "$INSTALLER" == yum ] ; then
       echo "
                    channel and yum upgrade rhncfg-actions"
   else
        echo "
                    channel and up2date rhncfg-actions"
   fi
   if [ -x "/usr/bin/rhn-actions-control" ] ; then
        rhn-actions-control --enable-all
        rhn-actions-control --disable-run
   else
        echo "Error setting permissions for configuration management."
        echo " Please ensure that the activation key subscribes the"
       if [ "$INSTALLER" == zypper ] ; then
           echo " system to the tools channel and zypper install/update rhncfg-
actions."
        elif [ "$INSTALLER" == yum ] ; then
                     system to the tools channel and yum updates rhncfg-actions."
            echo "
        else
           echo " system to the tools channel and up2dates rhncfg-actions."
        fi
        exit
   fi
fi
if [ $ALLOW_REMOTE_COMMANDS -eq 1 ] ; then
   echo
   echo "* setting permissions to allow remote commands"
```

```
echo " NOTE: use an activation key to subscribe to the tools"
   if [ "$INSTALLER" == zypper ] ; then
       echo "
                   channel and zypper update rhncfg-actions"
   elif [ "$INSTALLER" == yum ] ; then
                  channel and yum upgrade rhncfg-actions"
       echo "
   else
                   channel and up2date rhncfg-actions"
       echo "
   fi
   if [ -x "/usr/bin/rhn-actions-control" ] ; then
       rhn-actions-control --enable-run
   else
       echo "Error setting permissions for remote commands."
       echo " Please ensure that the activation key subscribes the"
       if [ "$INSTALLER" == zypper ] ; then
           echo "system to the tools channel and zypper updates rhncfg-actions."
       elif [ "$INSTALLER" == yum ] ; then
           echo " system to the tools channel and yum updates rhncfg-actions."
       else
           echo " system to the tools channel and up2dates rhncfg-actions."
       fi
       exit
   fi
fi
echo
echo "OTHER ACTIONS"
echo "------"
if [ $DISABLE_YAST_AUTOMATIC_ONLINE_UPDATE -eq 1 ]; then
   YAOU_SYSCFGFILE="/etc/sysconfig/automatic_online_update"
   if [ -f "$YAOU_SYSCFGFILE" ]; then
     echo "* Disable YAST automatic online update."
     sed -i 's/^ *AOU_ENABLE_CRONJOB.*/AOU_ENABLE_CRONJOB="false"/' "$YAOU_SYSCFGFILE"
     for D in /etc/cron.*; do
         test -L $D/opensuse.org-online_update && rm $D/opensuse.org-online_update
     done
   fi
fi
if [ "$INSTALLER" == zypper ] ; then
 test -d /var/lib/suseRegister && touch /var/lib/suseRegister/neverRegisterOnBoot
fi
if [ $DISABLE_LOCAL_REPOS -eq 1 ]; then
   if [ "$INSTALLER" == zypper ] ; then
         echo "* Disable all repos not provided by SUSE Manager Server."
         zypper ms -d --all
         zypper ms -e --medium-type plugin
         zypper mr -d --all
         zypper mr -e --medium-type plugin
```

```
zypper mr -e "$Z_CLIENT_REP0_NAME"
   elif [ "$INSTALLER" == yum ] ; then
       echo "* Disable all repos not provided by SUSE Manager Server.";
         for F in /etc/yum.repos.d/*.repo; do
           test -f "$F" || continue
           awk '
             BEGIN
                            { saw=0 }
             /^ *[[]/
                            { if ( saw==1 ) print "enabled=0"; else saw=1 }
             /^ *enabled *=/ { print "enabled=0"; saw=2; next }
                                 { print }
             END
                             { if ( saw==1 ) print "enabled=0" }
            ' "$F" > "$F.bootstrap.tmp" && mv "$F.bootstrap.tmp" "$F"
           test -f "$F.bootstrap.tmp" && {
             echo "*** Error: Failed to process '$F'; check manually if all repos inside
are disabled."
             rm "$F.bootstrap.tmp"
           }
         done
   fi
fi
if [ $FULLY_UPDATE_THIS_BOX -eq 1 ] ; then
   if [ "$INSTALLER" == zypper ] ; then
       echo "zypper --non-interactive up zypper zypp-plugin-spacewalk; rhn-profile-sync;
 zypper --non-interactive up (conditional)"
   elif [ "$INSTALLER" == yum ] ; then
       echo "yum -y upgrade yum yum-rhn-plugin; rhn-profile-sync; yum upgrade
 (conditional)"
   else
       echo "up2date up2date; up2date -p; up2date -uf (conditional)"
    fi
else
   if [ "$INSTALLER" == zypper ] ; then
       echo "zypper --non-interactive up zypper zypp-plugin-spacewalk; rhn-profile-sync"
   elif [ "$INSTALLER" == yum ] ; then
       echo "yum -y upgrade yum yum-rhn-plugin; rhn-profile-sync"
   else
       echo "up2date up2date; up2date -p"
   fi
fi
echo "but any post configuration action can be added here. "
echo "-----"
if [ $FULLY_UPDATE_THIS_BOX -eq 1 ] ; then
   echo "* completely updating the box"
else
   echo "* ensuring $INSTALLER itself is updated"
fi
if [ "$INSTALLER" == zypper ] ; then
```

```
zypper lr -u
   zypper --non-interactive ref -s
   zypper --non-interactive up zypper zypp-plugin-spacewalk
   if [ -x /usr/sbin/rhn-profile-sync ] ; then
       /usr/sbin/rhn-profile-sync
   else
       echo "Error updating system info in SUSE Manager Server."
       echo " Please ensure that rhn-profile-sync in installed and rerun it."
   fi
   if [ $FULLY UPDATE THIS BOX -eq 1 ] ; then
       zypper -- non-interactive up
   fi
elif [ "$INSTALLER" == yum ] ; then
   yum repolist
   /usr/bin/yum -y upgrade yum yum-rhn-plugin
   if [ -x /usr/sbin/rhn-profile-sync ] ; then
       /usr/sbin/rhn-profile-sync
   else
       echo "Error updating system info in SUSE Manager Server."
       echo " Please ensure that rhn-profile-sync in installed and rerun it."
   fi
   if [ $FULLY_UPDATE_THIS_BOX -eq 1 ] ; then
        /usr/bin/yum -y upgrade
   fi
else
   /usr/sbin/up2date up2date
   /usr/sbin/up2date -p
   if [ $FULLY_UPDATE_THIS_BOX -eq 1 ] ; then
       /usr/sbin/up2date -uf
   fi
fi
echo "-bootstrap complete"
```

7 Configure the DHCP Server with Bootstrap Protocol Support

Open an *SSH* session to the SUSE Manager server with *X11 Forwarding* enabled (on Microsoft Windows, use *PuTTY* (https://www.putty.org/) and *Xming* (https://sourceforge.net/projects/ xming/) ?):

						Adminis	trator Settin	igs (on svsap	ocavr003)						
														٩	
٢	** #	×				_	1A	Ø							
Bootloader	Datum en tijd	/etc/ sysconfig editor	Kernel Kdump	Netwerkinst ellingen	Online migratie	Partitionerin g	Servicesbeh eerder	Taal							
Network Service	ces														
Beheer gebruikersa anmelding	DHCP- server	- 💽 DNS-server	Extern beheer (VNC)	FTP-server	Hostnamen	- HTTP-server	iSCSI- initiator	-C- ISNS Server	LDAP- en Kerberos- client	Mailserver	Netwerkserv ices (xinetd)	NFS-client	NFS-server	NIS-client	- NIS-server
NTP- configuratie	OpenLDAP MirrorMode	(T) Proxy	- 5 Samba- server	S quid	- 🔂 SUSE Manager Setup	TFTP-server	Verificatiese rver	VPN Gateway and Clients	Wake-on- LAN	Windows- domeinlidm aatschap					
Security and U	sers														
	R		-	<u> </u>	8	er de la companya de la compa	\otimes								
AppArmor- configuratie	Beveiligings centrum en verharding	CA-beheer	Common Server- certificaat	Firewall	Gebruikers- en groepenbeh eer	Linux Audit Framework (LAF)	Sudo								
Support															
Ondersteuni ng	Uitgavenotiti es														
Miscellaneous															
Autoinstallat ion Cloning System	Autoinstallat ion Configuratio n	Installatiese rver	Leverancier- cd met stuurprogra mma	Snapper	Systeemlog boek										

FIGURE 50: SUSE MANAGER WEB UI - ADMINISTRATOR SETTINGS

Click the icon for the DHCP server:



FIGURE 51: SUSE MANAGER WEB UI - ICON DHCP SERVER

A window appears listing the packages that need to be installed:

YaST2
These packages need to be installed: dhcp-server
<u>C</u> ancel <u>I</u> nstall

FIGURE 52: SUSE MANAGER WEB UI - PACKAGES TO INSTALL

Install the required packages.

Select the interface(s) for the DHCP service and click **Next**:

YaST2	- • ×
DHCP Server Wizard (1 of 4): Card Selection	
Network Cards for DHCP Server	
eth1	
Select Deselect	
Help	Abo <u>r</u> t <u>B</u> ack <u>N</u> ext

FIGURE 53: SUSE MANAGER WEB UI - DHCP SERVER WIZARD: CARD SELECTION

Provide the global settings and click **Next**:

	YaST2 - • ×
DHCP Server Wizard (2 of 4): Global Settings	
LDAP Support	DHCP Server Name (optional)
Domain Name	NTP Time Server
PROVING THE PROVINCE	
Primary Name Server IP	Print Server
42.1.98	
Secondary Name Server IP	WINS Server
Default Gateway (Router)	Default Lease Time Units
10.11	4 Hours
Help	Abort Back Next

FIGURE 54: SUSE MANAGER WEB UI - DHCP SERVER WIZARD: GLOBAL SETTINGS

Provide the information for Dynamic DHCP and click Next:

DHCP Server Wizard (3 of 4): Dynamic DH	CP			
Subnet Information				
IP Address Range				
First IP Address	Last	IP Address		
10. S 10.				
✓ Allow Dynamic BOOTP				
Lease Time				
Default	Units		Maximum	Uni <u>t</u> s
5	Seconds	•	1	Hours 💌
Help				Abo <u>r</u> t <u>B</u> ack <u>N</u> ext

FIGURE 55: SUSE MANAGER WEB UI - DHCP SERVER WIZARD: DYNAMIC DHCP

Now select when and how to start the service:

```
Service Start

When Booting
Manually
```

FIGURE 56: SUSE MANAGER WEB UI - START SERVICE

Finish the basic configuration. Continue by customizing the DHCP configuration file manually for *bootp* netboots.

The example below shows how static netboot and DHCP can be configured:

```
# vi /etc/dhcpd.conf
option domain-name "[Domain name]";
option domain-name-servers [DNS IP];
option routers [Gateway ip];
default-lease-time 60;
ddns-update-style none;
host [netboot client hostname] {
 hardware ethernet [MAC address lower case];
 fixed-address [client ip];
 next-server [suse manager ip];
 allow bootp;
 server-name "[susemanager FQDN]";
 filename "boot/grub2/powerpc-ieee1275/core.elf";
}
subnet [Network] netmask [Subnet] {
  range dynamic-bootp [range lowest ip] [range highest ip];
 default-lease-time 5;
 max-lease-time 3600;
 filename "boot/grub2/powerpc-ieee1275/core.elf";
 next-server [suse manager server];
 }
```

Restart the DHCP daemon with the following command:

systemctl restart dhcpd.service

Add additional host entries for each new LPAR you want to be able to netboot.

Important: IBM Power Systems Firmware

When performing a *bootp* boot through the IBM Power Systems firmware, a static IP address is used to load the initial boot image. Because of the nature of the SUSE installation tool YaST, the network configuration in the first phase of the SUSE installer will use DHCP to acquire an IP.

8 Autoinstall Configuration

To enable Autoinstallation, you first need to create a subdirectory where you copy the contents of the SUSE product installation DVDs:

```
# mkdir -p /srv/www/htdocs/install/SLES12SP2SAP_PPC64LE
# mount /dev/sr0 /mnt
# cd /mnt
# cp -r * /srv/www/htdocs/install/SLES12SP2SAP_PPC64LE
...
```

Now navigate to Systems on the left pane. Select Autoinstallation and then Distributions:



FIGURE 57: SUSE MANAGER WEB UI - AUTOINSTALLATION

Add a new distribution:

Create Autoinstallable Distribution

The following details are needed to define an autoinstallable distribution. The tree path field should be a valid path to an installation tree located on this SUSE Manager server.

The Distribution Label field should contain only letters, numbers, hyphens, periods, and underscores. It must also be at least 4 characters long.

The Tree Path, Base Channel, and Installer Generation should always match. This generally means that the versions for each field should be from the same version of SUSE Linux Enterprise.

The Tree Path must be a local disk path on your SUSE Manager server containing the entire autoinstallable tree for a distribution including kernel, initrd, and repo information, but excluding any rpms. This users. If you have media located on the SUSE Manager server at: /var/distro-trees/sles-11-server/ you would specify that path as your Tree Path value.

Create Autoinstallable Distribution

Distribution Label*:	dev-sle12-sp2-sap-pool-ppc64le
Tree Path*:	/srv/www/htdocs/install/SLES12SP2SAP_PPC64LE
Base Channel*:	dev-sle12-sp2-sap-pool-ppc64le
Installer Generation*:	SUSE Linux Enterprise 12
Kernel Options:	2-sp2-sap-pool-ppc64le install=http:// //ss/dist/dev-sle12-sp2-sap-pool-ppc64le self_update=0 pt.options=+self_update
Post Kernel Options:	
	Create Autoinstallable Distribution

FIGURE 58: SUSE MANAGER WEB UI - CREATE DISTRIBUTION

Provide the following custom kernel options:

```
lang=en_US repo=http://[SUMA IP]/ks/dist/dev-sle12-sp2-sap-pool-ppc64le
install=http://[SUMA IP]/ks/dist/dev-sle12-sp2-sap-pool-ppc64le self_update=0
pt.options=+self_update
```

The "Tree path" is the local path where the SUSE install DVD content resides. The URLs should contain the name of the correct base channel.

Navigate to Autoinstallation Snippets:

- Autoinstallation Snippets

FIGURE 59: SUSE MANAGER WEB UI - AUTOINSTALLATION SNIPPETS

"Autoinstallation Snippets" is used to add the bootstrap process to the autoinstallation postinstall process. Click **Create Snippet**:

+ Create Snippet

FIGURE 60: SUSE MANAGER WEB UI - CREATE SNIPPET

Fill in the required information as shown on the screen below:

tickstart Snippet: bootstrap-dev-sles12-sp2

Snippet Details						
	Snippet Name*	bootstrap-dev-sles12-sp2				
		Tip: The snippet name is the name of a file that will reside in this organization's snippet directory. Any standard unix file name characters are acceptable. Snippet names containing slash character or snippet names beginning with period are not allowed.				
		Warning: Changing this snippet's name will require updating any kickstart profiles that refer to it so that they can continue to access the content of this snippet.				
	File Path:	/var/lib/cobbler/snippets/spacewalk/1/bootstrap-dev-sles12-sp2				
		Tip: This is where the snippet resides on the SUSE Manager file system.				
	Snippet Macro:	\$SNIPPET('spacewalk/1/bootstrap-dev-sles12-sp2')				
		Tip: Copy and paste the snippet macro into your profiles to make the full snippet appear in that profile.				
	Snippet Type:	Custom				
		Tip: Custom kickstart snippets will be only available to the CIRB-CIBG organization.				
Kickstart Snippet Contents						
	Contents*	Shell v 1 #raw 2 curl -Sks https:// 3 4 zypper ref -y;zypper -n patch -l -y;zypper -n patch -l -y;zypper -n up -l -y 5 #end raw				

FIGURE 61: SUSE MANAGER WEB UI - KICKSTART SNIPPET

In the **Contents** field, enter the following:

```
#raw
curl -Sks https://[SUMA FQDN]/pub/bootstrap/bootstrap-dev-sle12sp2-sap.sh | /bin/bash
zypper ref -y;zypper -n patch -l -y;zypper -n up -l -y
#end raw
```

This script will automatically execute the bootstrap script and directly perform all patch updates.

You also created a *Production* snippet "bootstrap-prod-sles12-sp2" which points to the production bootstrap script. This is the custom bootstrap script you created earlier.

Navigate to System on the left pane. Select Autoinstallation" and then Profiles":



FIGURE 62: SUSE MANAGER WEB UI - PROFILES

Now you can create an autoinstallation profile. Click Upload Kickstart/Autoyast File:

1 Upload Kickstart/Autoyast File

FIGURE 63: SUSE MANAGER WEB UI - BUTTON UPLOAD KICKSTART/AUTOYAST FILE

The screen below opens. Provide the required details and an AutoYaST script:

✓ Create Autoinstallation Profile	
Autoinstallation Details	
Each autoinstallation file you upload to SUSE Manager will need a l	abel so that you can refer to it later - please choose a label for this autoinstallation and enter it below. Entries marked with an asterisk
Label*:	dev-sle12-sp2-sap-pool-ppc64le
Autoinstall Tree*:	dev-sle12-sp2-sap-pool-ppc64le
	Always use the newest Tree for this base channel. "Newest" is determined by the date it was last modified.
Virtualization Type:	None -
File Contents:	<pre>XHL </pre>

FIGURE 64: SUSE MANAGER WEB UI - CREATE AUTOINSTALLATION PROFILE

To create a baseline AutoYaST profile, perform a reference manual install on an LPAR. Configure the Linux installation to the point where you are satisfied and where it can serve as a base setup for new LPARs. Then generate the <u>autoyast.xml</u> file using the command <u>yast2</u> clone_system.

This AutoYaST file can be used as is. However, for the document at hand, choose to add variables to it to easily customize an installation from the SUSE Manager GUI. Also, add the post install snippet.

Below find "copy and paste" segments of the example profile. These segments indicate where changes need to be or can be applied. Parameterization must be customized in synchronization with the needs of the environment.

```
<?xml version="1.0"?>
<!DOCTYPE profile>
<profile xmlns="http://www.suse.com/1.0/yast2ns" xmlns:config="http://www.suse.com/1.0/</pre>
configns">
<scripts>
<init-scripts config:type="list">
     <script>
        <filename>postinstall.sh</filename>
        <interpreter>shell</interpreter>
        <debug config:type="boolean">false</debug>
        <feedback config:type="boolean">true</feedback>
        <source><![CDATA[
#!/bin/sh
$SNIPPET('spacewalk/1/bootstrap-dev-sles12-sp2')]]>
        </source>
      </script>
</init-scripts>
</scripts>
......
```

To enforce a specific *LUN* to be formatted and used for the operating systems file systems, use a variable <u>\$lunserial</u> that contains the actual serial number of the LUN as indicated on the storage controller interface.

Network settings are also replaced with variables:

```
-----
<dns>
    <dns>
        <dhcp_hostname config:type="boolean">true</dhcp_hostname>
        <domain>mrbc-mbhg.intra.net</domain>
        <hostname>$hostname
```

```
<nameservers config:type="list">
      <nameserver>$dns1</nameserver>
 <nameserver>$dns2</nameserver>
  <nameserver>$dns3</nameserver>
   </nameservers>
   <resolv_conf_policy>auto</resolv_conf_policy>
   <searchlist config:type="list">
     <search>iriscorporate.com</search>
    </searchlist>
   <write_hostname config:type="boolean">false</write_hostname>
  </dns>
 <interfaces config:type="list">
   <interface>
     <bootproto>static</bootproto>
     <device>eth1</device>
     <ipaddr>$ipaddr1</ipaddr>
     <name>Virtual Ethernet card 1</name>
      <netmask>$subnet1</netmask>
     <startmode>auto</startmode>
     <usercontrol>no</usercontrol>
    </interface>
<net-udev config:type="list">
     <rule>
       <name>eth1</name>
       <rule>ATTR{address}</rule>
        <value>$mac1</value>
     </rule>
    </net-udev>
   <routing>
      <ipv4_forward config:type="boolean">false</ipv4_forward>
     <ipv6_forward config:type="boolean">false</ipv6_forward>
     <routes config:type="list">
        <route>
          <destination>default</destination>
          <device>-</device>
         <gateway>$gateway</gateway>
          <netmask>-</netmask>
        </route>
     </routes>
    </routing>
    </networking>
```

Replace the NTP server addresses by variables:

Deploying SUSE Linux Enterprise Products with SUSE Manager on IBM PowerVM

```
<peer>
<address>$ntp1</address>
<comment/>
<options> iburst</options>
<type>server</type>
</peer>
<address>$ntp2</address>
<comment/>
<options> iburst</options>
<type>server</type>
</peer>
</peer>
</peers</pre>
```

Partitioning is done as follows:

You used variables to make ad-hoc customization of the AutoYaST profile easy through the SUSE Manager Web interface. As an overview, the following lines are affected in the above profile:

```
<boot_custom>/dev/disk/by-id/scsi-3$lunserial-part1</boot_custom><hostname>$hostname</hostname></boot_custom><br/><hostname>$hostname</hostname></br/><nameserver>$dns1</nameserver><br/><nameserver>$dns2</nameserver><br/><ipaddr>$ipaddr1</ipaddr><br/><netmask>$subnet1</netmask><br/><value>$mac1</value><br/><gateway>$gateway</gateway><address>$ntp1</address><br/><address>$ntp2</address><br/><device>/dev/mapper/3$lunserial</device>
```

Now go to the Variables tab and provide the correct values:



FIGURE 65: SUSE MANAGER WEB UI - VARIABLES

mac1 = [MAC address in lowercase with : separators] hostname = [Hostname] ipaddr1 = [IP address] subnet1 = [Netmask] gateway = [GATEWAY] dns1 = [DNS1] dns2 = [DNS2] dns3 = [DNS3] ntp1 = [NTP1] ntp2 = [NTP2] org = 1 lunserial = [Disk serial nr]

In this particular example a Fibre Channel (FC) connected storage (IBM) is used which can be identified in /dev/disk/by-id and /dev/mapper by its LUN serial number.

Verify that the syntax of the profile and variables is correct by checking the **Autoinstallation File** tab. It should show the final script where the variables and snippets have been replaced by their values. If this tab presents an error, you might have an issue in your syntax.

9 GRUB2 Custom Configuration for IBM PowerVM Netboot

At this point you need to access a SUSE Linux Enterprise Server 12 ppc64le host with the same SP and kernel version as the one you want to deploy through autoinstallation. A good possibility is to use the reference installation host where you based the AutoYaST template on.

Here you need to generate the GRUB2 netboot files. Connect via *SSH* to the host and type the following command:

grub2-mknetdir -net-directory=/srv/tftpboot

Copy the files to the /root home:

scp -r /srv/tftpboot/boot/grub2 root@[suse manager host]:/root/

On SUSE Manager, create a custom grub.cfg file to go with these netboot files :

```
# vi /root/grub2/grub.cfg
with_gfx=0
gfxmode=auto
locale dir=$prefix/locale
lang=en_US
set default='dev-sle12-sp2-sap-pool-ppc64le:1:IRIS'
insmod gettext
if sleep --interruptible 0 ; then
 timeout=30
fi
menuentry 'dev-sle12-sp2-sap-pool-ppc64le:1:IRIS' --class opensuse --class gnu-linux --
class gnu --class os {
insmod http
insmod tftp
set root=tftp,[suma ip]
echo 'Loading kernel ...'
linux /images/dev-sle12-sp2-sap-pool-ppc64le_1_IRIS/linux ksdevice=bootif lang=en_US
pt.options=+self_update repo=http://[suma ip]/ks/dist/dev-sle12-sp2-sap-pool-ppc64le
install=http://[suma ip]/ks/dist/dev-sle12-sp2-sap-pool-ppc64le self_update=0 textmode=1
autoyast=http://[suma ip]/cblr/svc/op/ks/profile/dev-sle12-sp2-sap-pool-ppc64le:1:IRIS
echo 'Loading initial ramdisk ...'
initrd /images/dev-sle12-sp2-sap-pool-ppc64le_1_IRIS/initrd
}
menuentry 'local' {
 exit
}
submenu 'Other options...' {
menuentry 'Reboot' {
reboot
}
menuentry 'Exit to Open Firmware' {
exit
}
```

You can base this configuration off the auto-generated /srv/tftpboot/grub/grub.cfg.

Cobbler is a Linux installation server that allows for rapid setup of network installation environments (see http://cobbler.github.io/ . It is used to generate the content of the /srv/tftpboot path. As it wipes the path every time a synchronization is triggered, you need to put in place the workaround below. This guarantees your custom GRUB files for IBM PowerVM are recopied in the tftpboot directory each time the configuration is resynchronized:

```
# vi /var/lib/cobbler/triggers/sync/post/grub2.sh
#!/bin/sh
cp -r /root/grub2 /srv/tftpboot/boot/
```



}

Note: Example Path

In this example <u>/root/grub2</u> is only used as an example path to place your base versions of the GRUB configurations. You can choose a different location.

Next, enter the command:

```
# chmod u+x /var/lib/cobbler/triggers/sync/post/grub2.sh
```

The Cobbler post-synchronization script now copies the GRUB2 files over to the TFTP boot directory with every synchronization.

You can synchronize Cobbler with the command:

```
# cobbler sync
```

Alternatively, you can use the SUSE Manager Web interface. Navigate to **Manager Configuration** and select **Cobbler**:



FIGURE 66: SUSE MANAGER WEB UI - COBBLER

Now run the Cobbler synchronization and click Update:

Run Cobbler Sync	
Run Cobbler Sync	Update

FIGURE 67: SUSE MANAGER WEB UI - COBBLER SYNCHRONIZATION

Verify after a synchronization that the following files have been generated:

- Subdirectory structure /srv/tftpboot/images with the Linux and initrd images is available
- /srv/tftpboot/boot/grub2 files have been copied over during synchronization

10 Netboot and Autoinstall Procedure

First collect the following details:

```
mac address =
hostname =
ipaddr1 =
subnet1 =
gateway =
dns1 =
dns2 =
dns3 =
ntp1 =
ntp2 =
org = 1
lunserial =
```

Via the SUSE Manager Web interface, customize the variables for the AutoYaST profile you created earlier using the collected values above. Go to **Systems** on the left pane, select Autoinstallation", and then **Profile**. Choose **specific profile** and click the **Variables** tab. Here you can enter the variables.

The LPAR details needed, which you can retrieve from the Hardware Management Console (HMC), are:

LPAR id = LPAR name = LPAR profile = Power system name =

Now you have all required details and you can launch the LPAR netboot via the HMC.

Via *SSH* connection, log in to the correct HMC host. Use the following command to execute the LPAR netboot and immediately open the serial console:

```
> lpar_netboot -v -f -D -m [MAC] -i -t ent -T off -s auto -d auto -S [SUMA IP] -
G [GATEWAY IP] -C [LPAR IP] -K [NETMASK] "[LPAR NAME]" "[LPAR PROFILE]" "[SYSTEM NAME]";
rmvterm -m [SYSTEM NAME] --id [LPAR ID] ; mkvterm -m [SYSTEM NAME] --id [LPAR ID]
```

Important: Values

Replace the above [...] fields in the command with the following values:

[MAC] = bootp client mac address without ':' separators and in uppercase [SUMA IP] = SUSE Manager IP [GATEWAY IP] = default gateway ip [LPAR IP] = client lpar ip [NETMASK] = subnet mask [LPAR NAME] = lpar name as seen on the HMC [LPAR PROFILE] = default lpar profile configured on the HMC for this LPAR [SYSTEM NAME] = system name of the power server that hosts the lpar [LPAR ID] = the LPAR ID number (check the HMC)

If everything is correct, the GRUB menu should load:

GNU GRUB version 2.02~beta2	
*dev-sle12-sp2-sap-pool-ppc64le:1:CIRB-CIBG local Other options	
 +	 +
Use the ^ and v keys to select which entry is highlighted. Press enter to boot the selected OS, `e' to edit the commands before booting or `c' for a command-line. The highlighted entry will be executed automatically in Os.	

FIGURE 68: GRUB MENU

When the default <u>grub</u> option is loaded, the installation will start automatically and perform all the installation steps.

baring System for Automated Installation	[Release Notes
forming Installation	
tails—SLE-12-SP2-SAP Release Notes————	
Actions performed:	
Deleting logical volume /dev/system/varopt	
Deleting logical volume /dev/system/varlog	
Deleting logical volume /dev/system/var	
Deleting logical volume /dev/system/usr	
Deleting logical volume /dev/system/tmp	
Deleting logical volume /dev/system/swap	
Deleting logical volume /dev/system/not	
Deleting logical volume /dev/system/opt	
Deleting logical volume /dev/system/home	
Removing volume group system	
Deleting device mapper volume /dev/mapper/3600	5076400810179a8000000
~000006a-part2 Deleting device mapper volume /dev/mapper/3600	5076400810179a8000000
<pre>~ oooooda-parti Setting disk label of /dev/mapper/360050764008 ~to MSDOS</pre>	10179a80000000000006a
Creating multipath partition 36005076400810179	a80000000000006a-part
Setting type of multipath partition 3600507640	0810179a8000000000000
~a-part1 to 41	
Creating multipath partition 36005076400810179	a80000000000006a-part
Setting type of multipath partition 3600507640	0810179a8000000000000
~a-part2 to 8E	(1
creating volume group system (119.98 G1B) from	/dev/mapper/360050/6
<pre>~ 000101/9d00000000000000-pdft2</pre>	
Creating logical volume /dev/system/nome	
Creating logical volume /dev/system/nmon	
Creating logical volume /dev/system/opt	
Creating logical volume /dev/system/root	
reating logical velume (dev(system(system)	
realing togical volume /dev/system/swab	
0%	
۲eparing disks	

FIGURE 69: PERFORMING INSTALLATION

If the bootstrap section in the AutoYaST profile was successful, the new host should appear in the "Physical Systems»" list. Navigate to **Systems** in the left pane, and select **Physical Systems**.



FIGURE 70: SUSE MANAGER WEB UI - PHYSICAL SYSTEMS

All physical systems are listed here:

Physical Systems ⁹							
Select All 1 - 1 of 1							
Filter by System Name: Select first character - 25 Items per page							
System JE	Updates	Patches	Packages	Configs	Base Channel	System Type	
	٢	0	0	0	dev-sle12-sp2-sap-pool-ppc64le	Management	

FIGURE 71: SUSE MANAGER WEB UI - LIST OF PHYSICAL SYSTEMS

Your installed host is now be available for use:





11 Conclusion

SUSE Manager was designed to manage Linux systems across a variety of hardware architectures, hypervisors and container and cloud platforms with a single tool. It helps your enterprise DevOps and IT Operations teams reduce complexity and regain control of your IT assets. It automates Linux server provisioning, patching and configuration for faster, consistent and repeatable server deployment. Thus you can optimize operations and reduce costs. With automated monitoring, tracking, auditing and reporting of your systems, VMs, and containers across your entire IT environment, you can ensure compliance with internal security policies and external regulations.

SUSE Manager 3 is an ideal platform to centralize package repositories and configuration management on many platforms, including IBM Power. Through auto-deployment via AutoYaST and Netboot you can reduce hands-on time needed to perform deployments of new LPARs, reinstalls or even disaster-recovery scenarios without the need of an AIX based Network Install Manager. Also, the methodology displayed in this document allows you to netboot little-endian kernels through GRUB2 which is required to support SUSE Linux Enterprise Server 12 and up on IBM Power.

When you run a production PowerVM environment with applications such as SAP HANA or other ERP or database systems, spread over several PowerVM LPARs (VMs) and physical IBM Power systems, SUSE Manager is tremendously useful to centrally manage Linux software levels and configurations to satisfy the changing requirements posed by the application vendors.

12 Resources

For more information, refer to:

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- SUSE Manager documentation: https://documentation.suse.com/suma/3.2/ 🗗
- IBM Knowledge Center: https://www.ibm.com/support/knowledgecenter/ 🗖
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- Netbooting on POWER An Introduction (IBM community article): https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/W51a7f-fcf4dfd_4b40_9d82_446ebc23c550/page/Netbooting+on+POWER+-+An+Introduction
- Cobbler resources: http://cobbler.github.io/ ₽

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