



Linux操作系统 变迁之旅

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2019.08

SUSE"专家日"2019

中国 广州



Linux Kernel

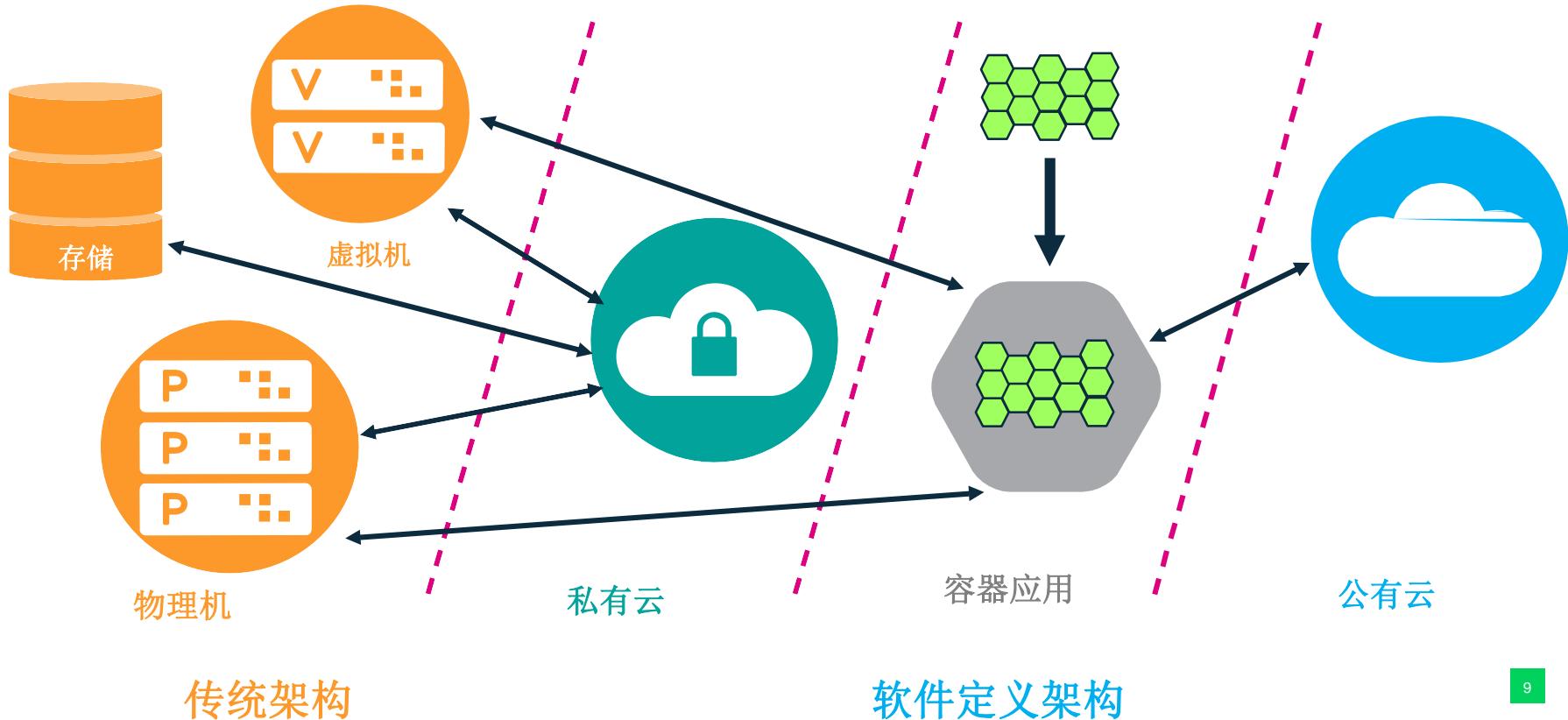
哪年发布第一个版本? **1991年8月26日**

0.01版本的代码量: **10229行**

目前最新的稳定版本号? **5.x**

目前最新版本的代码量? **2600万**

混合 IT 环境应用部署场景

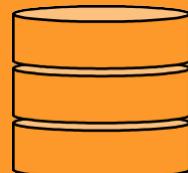
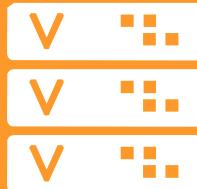


多模操作系统

传统架构

软件定义架构
SDI

SUSE Linux
Enterprise 15



容器

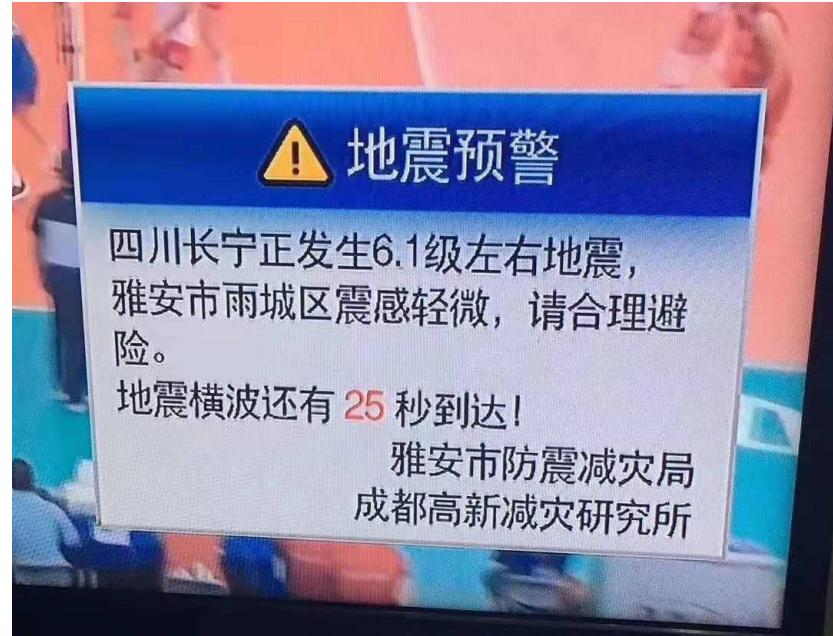


传统架构

地震预警系统

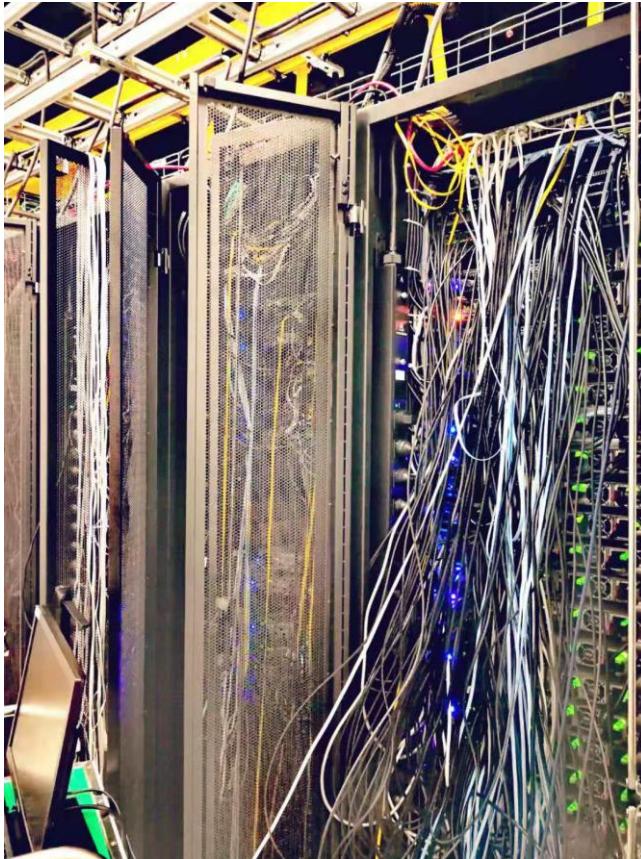


2008.05.12

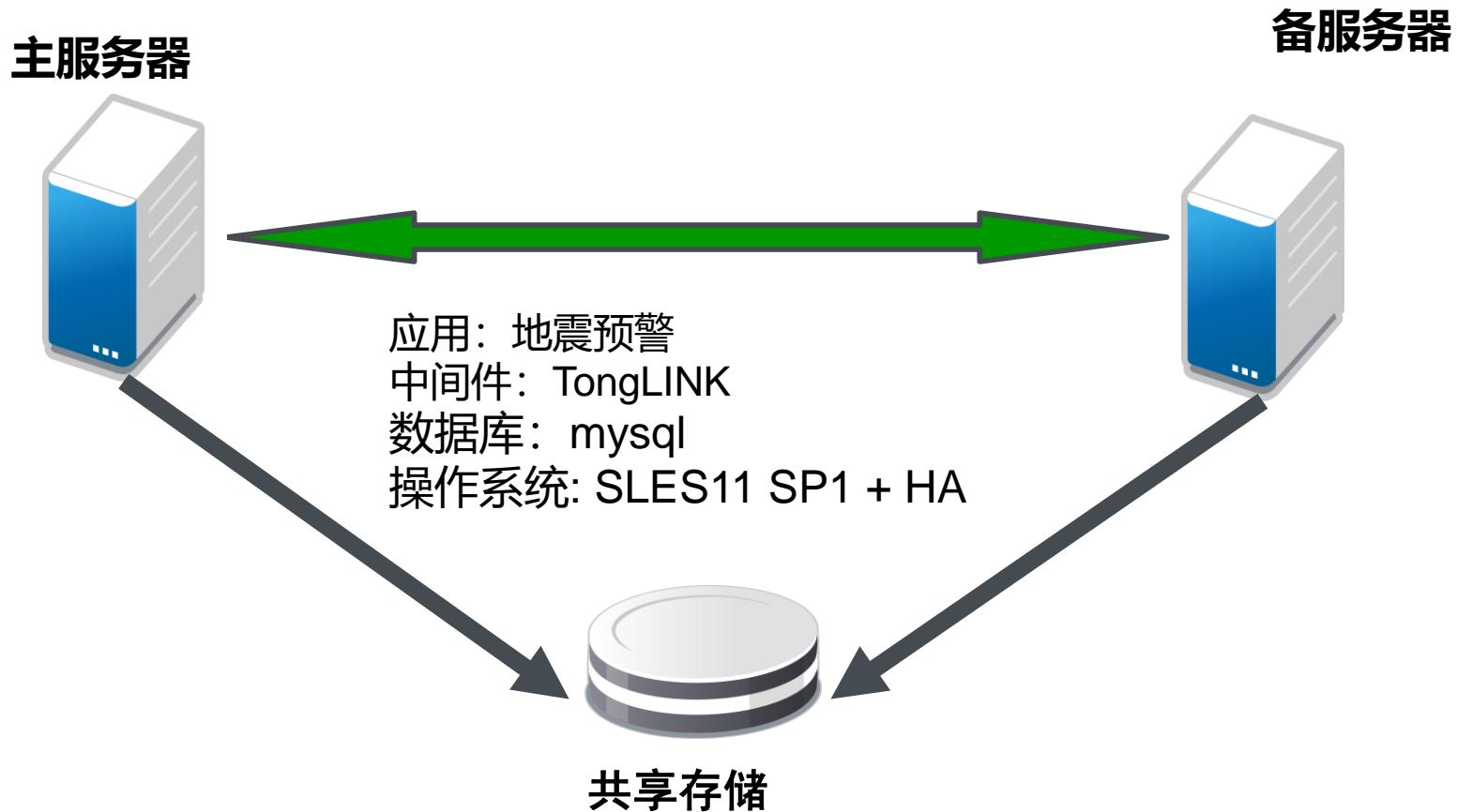


2019.06.17

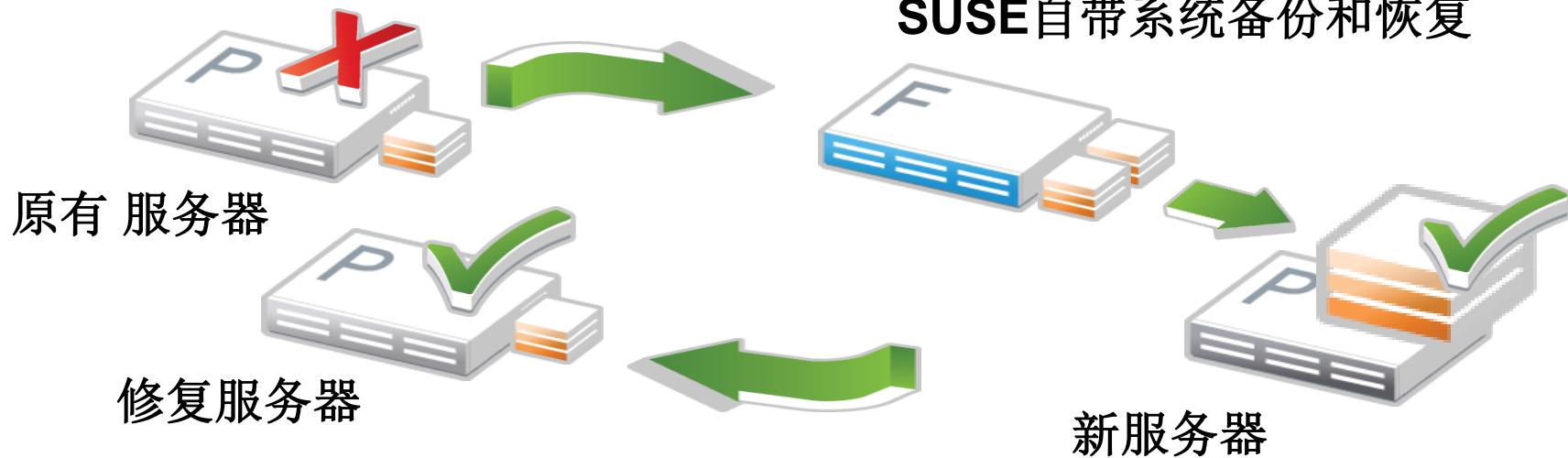
数据中心



高可用-HA



一键部署和恢复





Boot from Hard Disk

Installation

一键安装

Upgrade

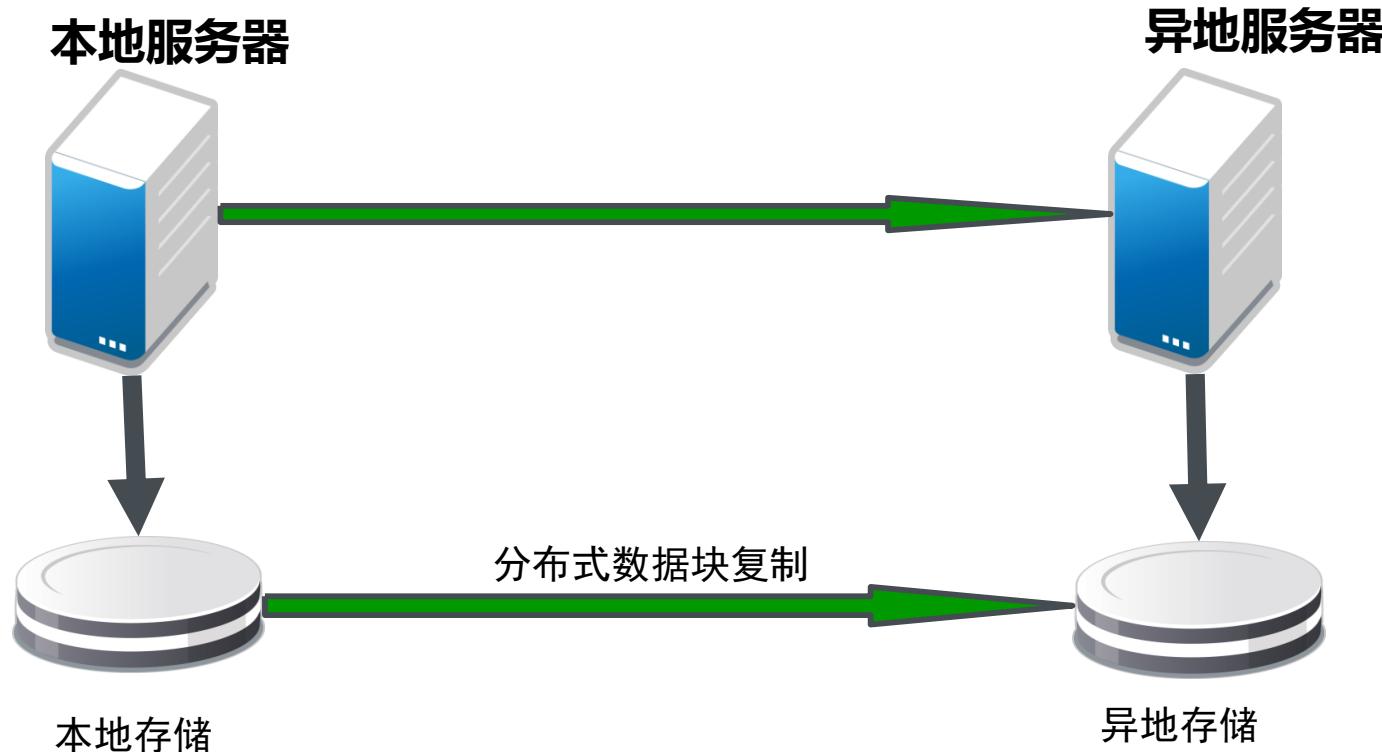
More ... ▶

Boot Options |

F1 Help F2 Language F3 Video Mode F4 Source F5 Kernel F6 Driver
English (US) Default DVD Default No



数据灾难备份



多种硬件架构支持



IBM大型机



IBM Power
Openpower

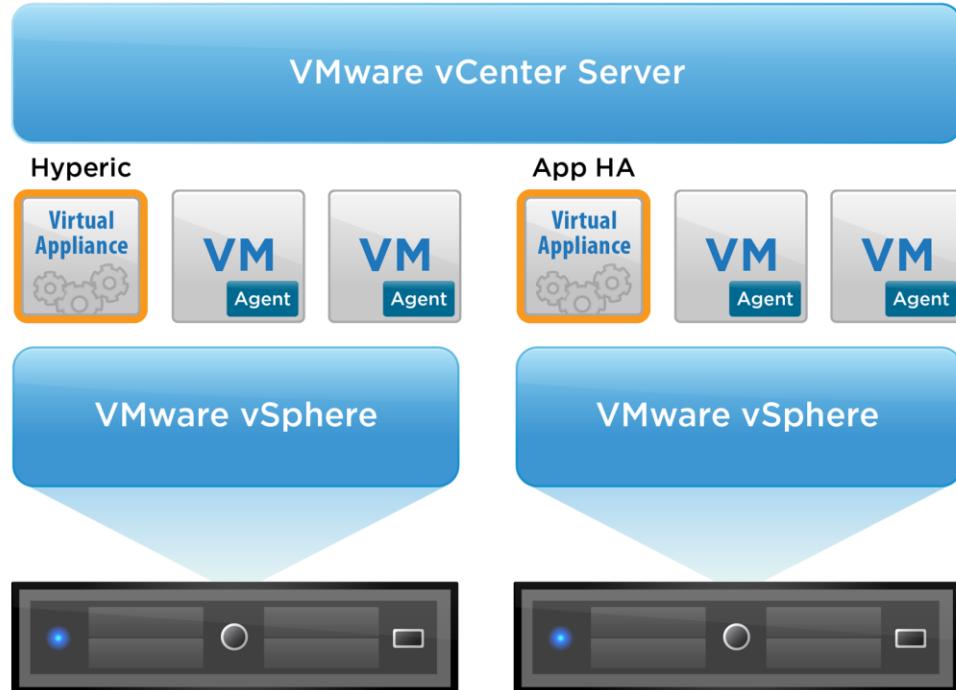


x86服务器



ARM服务器

定制虚拟机基础镜像



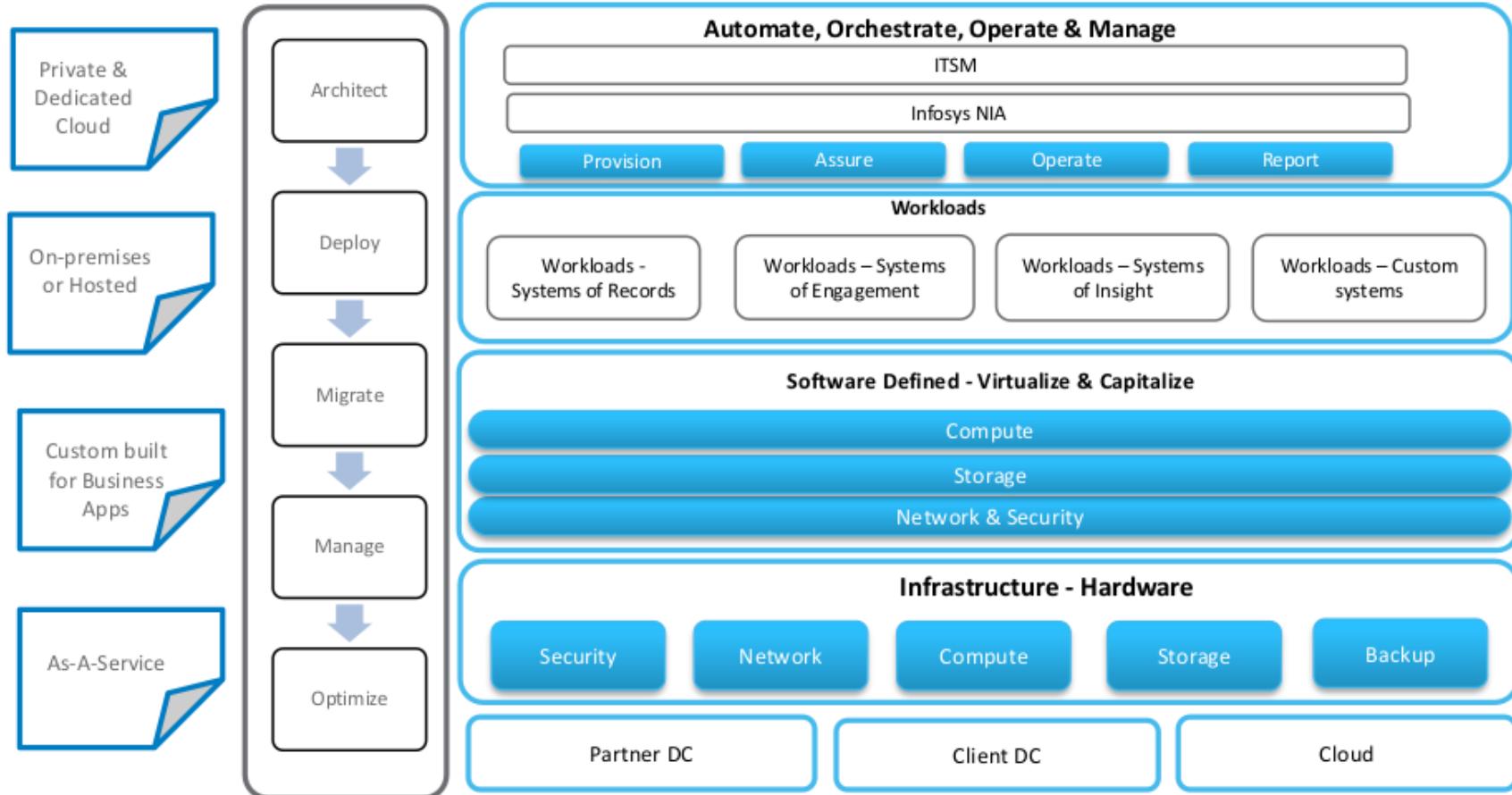
基础镜像要求：

- 最小化安装
- 安全加固
- 基础参数可配置

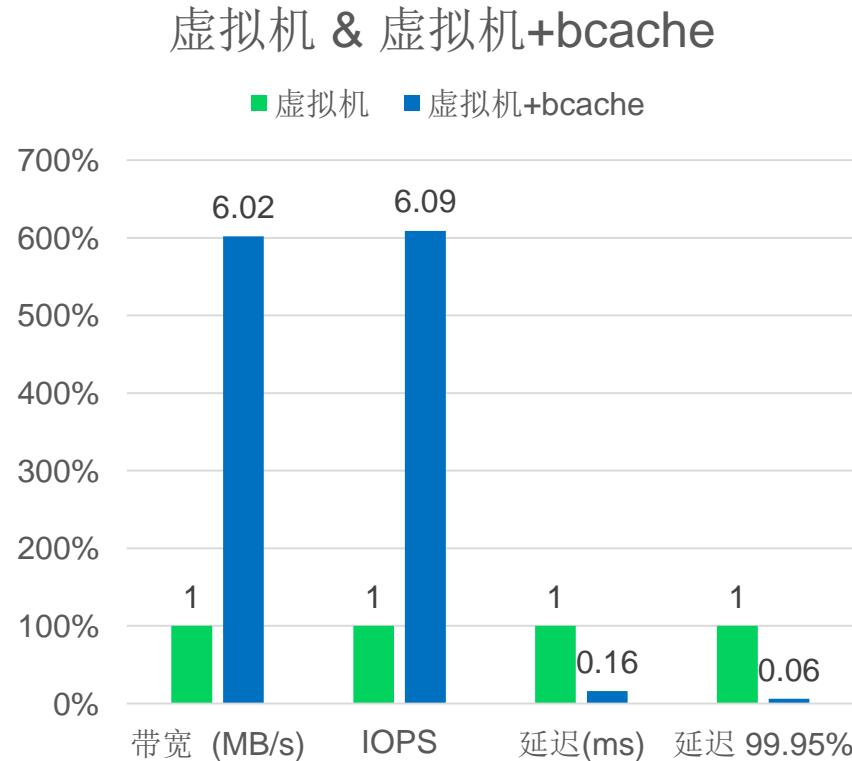


软件定义架构

Infosys – 从VMWare迁移到OpenStack



虚拟机性能提升 - 缓存加速bcache



Expert Partitioner

System View

- └─  linux-mnbw
 - └─  Hard Disks
 - └─ vda
 - vda1
 - vda2
 - vdb
 - └─  RAID
 - └─  Volume Management
 - └─ system
 - home
 - root
 - swap
 - └─  Bcache
 - bcache0
 -  NFS
 -  Btrfs
 -  Device Graphs
 -  Installation Summary
 -  Settings

 Bcache

Bcache Devices		Caching Set Devices	
Caching Device	Size	UUID	Used By
/dev/vdb	100.00 GiB		/dev/bcache0

[Help](#)[Abort](#)[Next](#)

工作负载上云 - 公有云

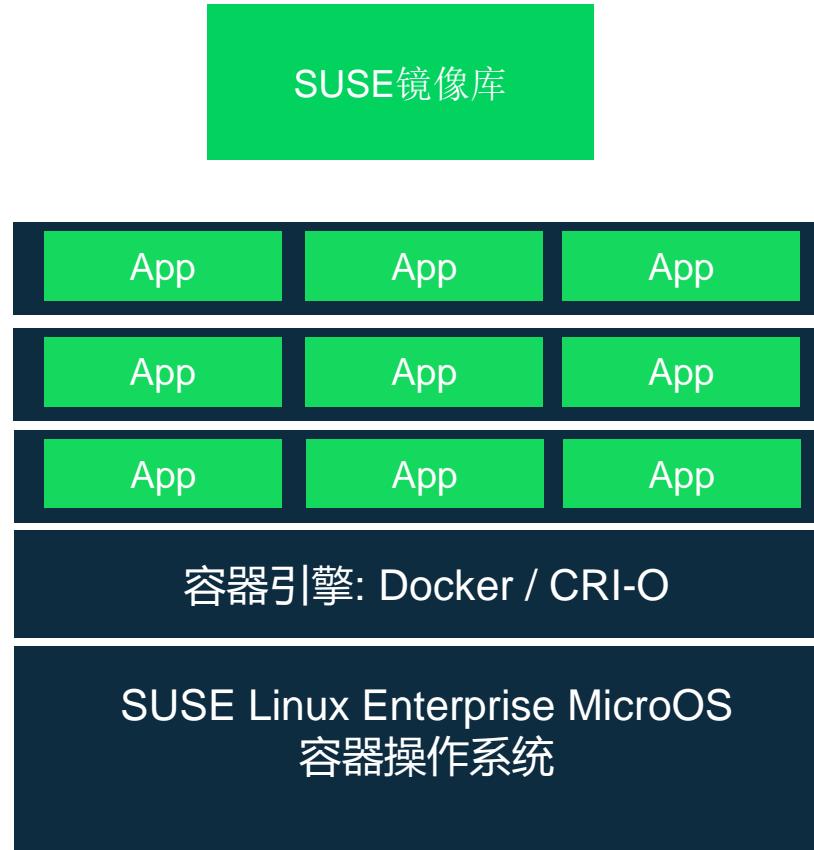


腾讯云

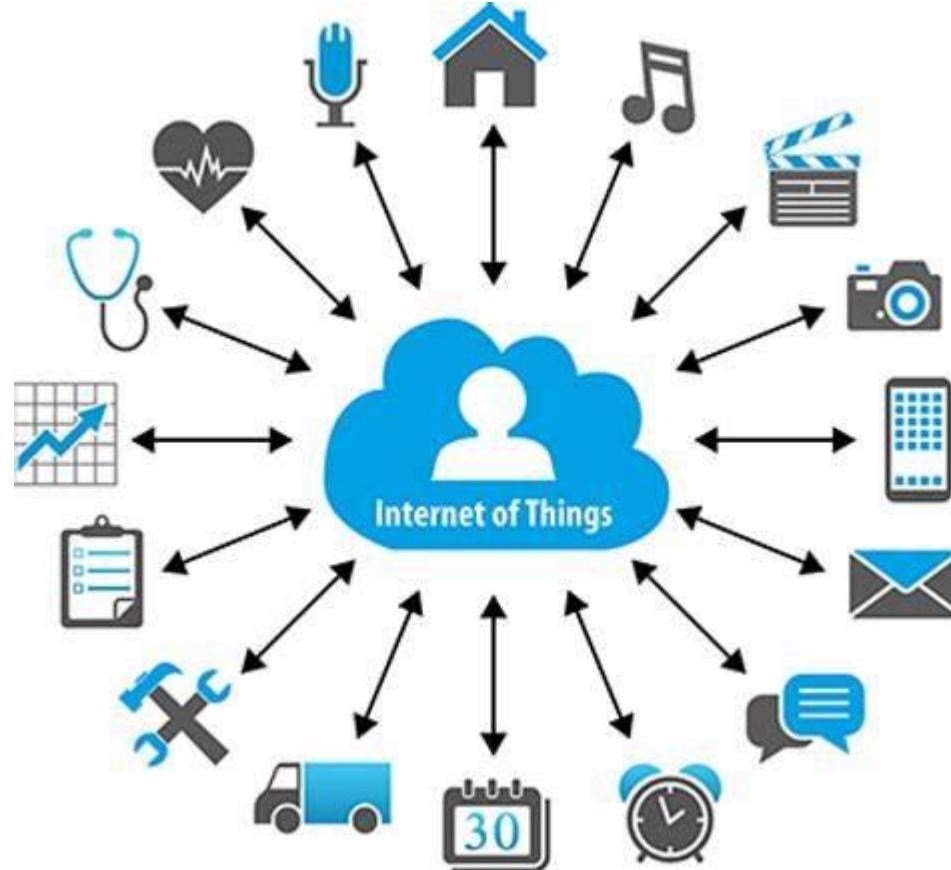
公有云最佳实践

SLES 12	SLES for SAP 12	SLES 11	SLES 15	Other
SLES12-SP3-EC2 -> EC2 PV on-demand	SLES12-SP2-SAP-EC2-HVM -> EC2 SLES4SAP on-demand	SLES11-SP4-EC2-BYOS -> EC2 PV BYOS	SLES15-EC2-ECS-HVM	SLES12-SP3-CaaSP-2-1-Admin-EC2-HVM-BYOS -> EC2 CaaSP Admin BYOS
SLES12-SP3-EC2-BYOS -> EC2 PV BYOS	SLES12-SP2-SAP-EC2-HVM-BYOS -> EC2 SLES4SAP BYOS	SLES11-SP4-EC2-HVM -> EC2 HVM on-demand	SLES15-EC2-HVM	SLES12-SP3-CaaSP-2-1-Cluster-EC2-HVM-BYOS -> EC2 CaaSP Cluster BYOS
SLES12-SP3-EC2-ECS-HVM -> EC2 on-demand for ECS	SLES12-SP3-SAP-EC2-HVM -> EC2 SLES4SAP on-demand	SLES11-SP4-EC2-HVM-BYOS -> EC2 HVM BYOS	SLES15-EC2-HVM-BYOS	
SLES12-SP3-EC2-HVM -> EC2 HVM	SLES12-SP3-SAP-EC2-HVM-BYOS -> EC2 SLES4SAP BYOS	SLES11-SP4-EC2-RightScale -> EC2 PV BYOS	SLES15-SAP-EC2-HVM	
SLES 12	SLES for SAP 12	SLES 11	SLES 15	Other
SLES12-SP3-Azure -> Azure on-demand (basic)	SLES12-SP1-Azure-SAPCAL -> Azure on-demand for SAPCAL	SLES11-SP4-Azure -> Azure on-demand (basic)	SLES15-Azure-Basic	SLES12-SP3-CaaSP-2-1-Admin-Azure-HVM-BYOS
SLES12-SP3-Azure-Standard -> Azure on-demand (STD)*	SLES12-SP2-SAP-Azure -> Azure SLES4SAP on-demand	SLES11-SP4-Azure-BYOS -> Azure BYOS	SLES15-Azure-Standard	SLES12-SP3-CaaSP-2-1-Cluster-Azure-HVM-BYOS
SLES12-SP3-Azure-Priority-> Azure on-demand (priority)	SLES12-SP2-SAP-Azure-BYOS -> Azure SLES4SAP BYOS	SLES11-SP4-Azure-Priority -> Azure on-demand (Priority)	SLES15-Azure-Priority	
SLES12-SP3-Azure-BYOS -> Azure BYOS	SLES12-SP3-SAP-Azure -> Azure SLES4SAP on-demand	SLES11-SP4-Azure-SAPCAL -> Azure on-demand for SAPCAL	SLES15-Azure-BYOS	
SLES12-SP3-Azure-HPC-Priority -> Azure on-demand HPC (priority)	SLES12-SP3-SAP-Azure-BYOS -> Azure SLES4SAP BYOS		SLES15-Azure-HPC-Standard*	
			SLES15-Azure-HPC-Priority*	
			SLES15-SAP-Azure	

容器化是趋势



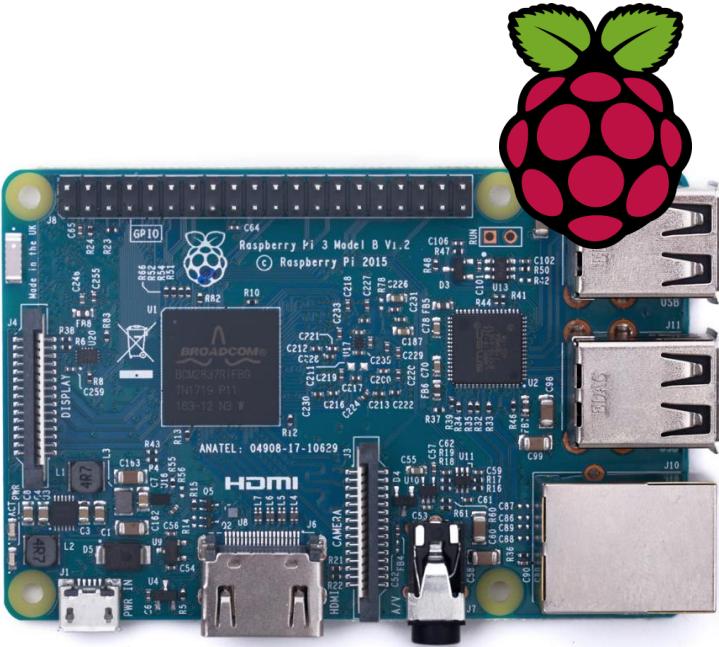
IoT物联网 - Linux无处不在



某大型仓库物流状态监控



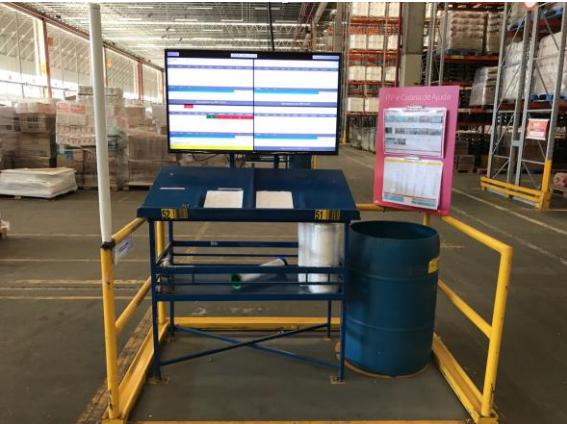
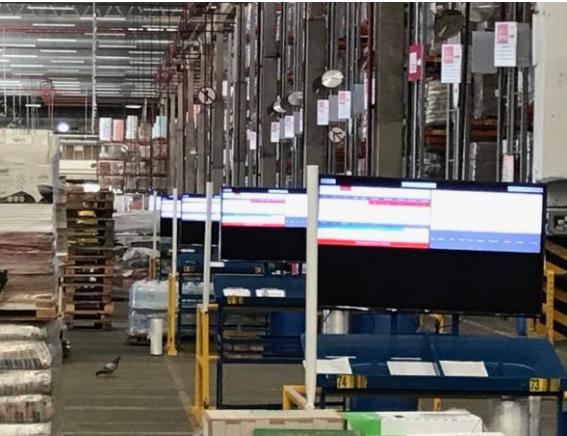
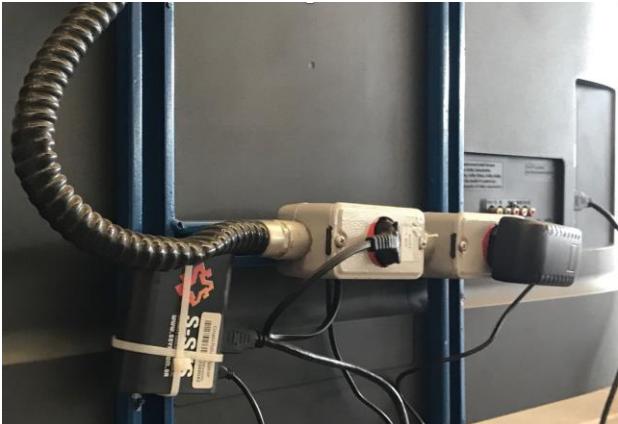
Windows CE



SLES for Raspberry Pi

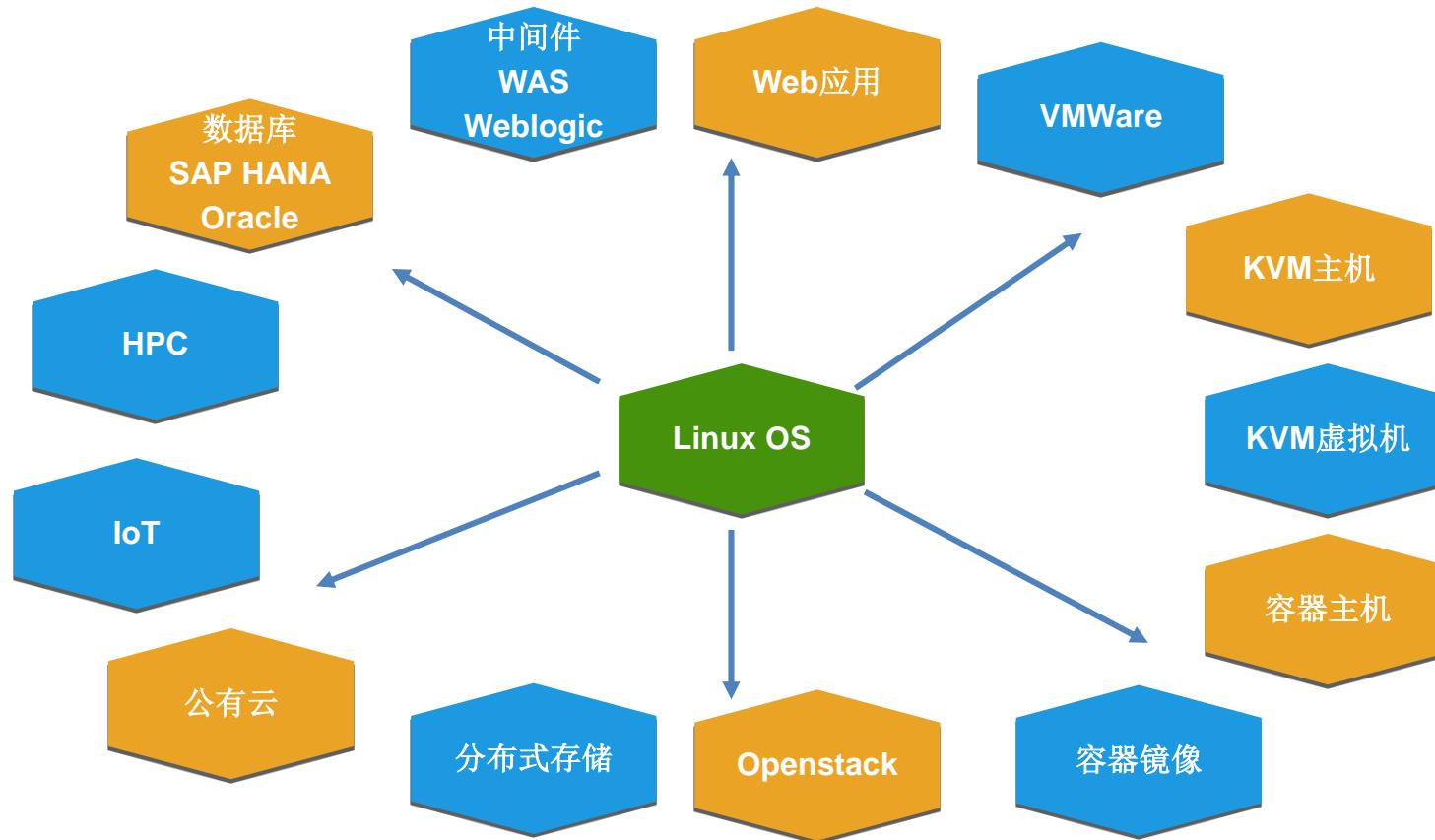
名称	Raspberry Pi 3B	Raspberry Pi 3B+	Raspberry Pi 4B
芯片	Broadcom BCM2837	Broadcom BCM2837B0	Broadcom BCM2711
CPU	64位 - 1.4GHz四核	64位 - 1.4GHz四核	64位 - 1.5GHz四核
蓝牙	蓝牙4.1	蓝牙4.2	蓝牙5.0
WiFi	802.11n无线 2.4GHz	802.11AC无线 2.4GHz/5G双频WiFi	802.11AC无线 2.4GHz/5G双频WiFi
USB接口	USB2.0*4	USB2.0*4	USB3.0*2 USB2.0*2
有线网络	10/100MB/s以太网	千兆以太网	千兆以太网
HDMI	标准HDMI	标准HDMI	Micro HDMI*2 支持双屏
电源接口	Micro USB	Micro USB	Type-C (5V 3A)
外形尺寸	85mm*56mm	85mm*56mm	85mm*56mm
多媒体	H.264, MPEG-4 decode (1080p30); H.264 encode(1080p30); OpenGL ES 1.1,2.0 graphics	H.264, MPEG-4 decode (1080p30); H.264 encode(1080p30); OpenGL ES 1.1,2.0 graphics	H.265 (4Kp60 decode); H.264 (1080p60 decode, 1080p30 encode); OpenGL ES, 3.0 graphics
以太网POE	无	通过额外的Hat以太网 (POE供电)	通过额外的Hat以太网 (POE供电)

大型仓库物流状态监控

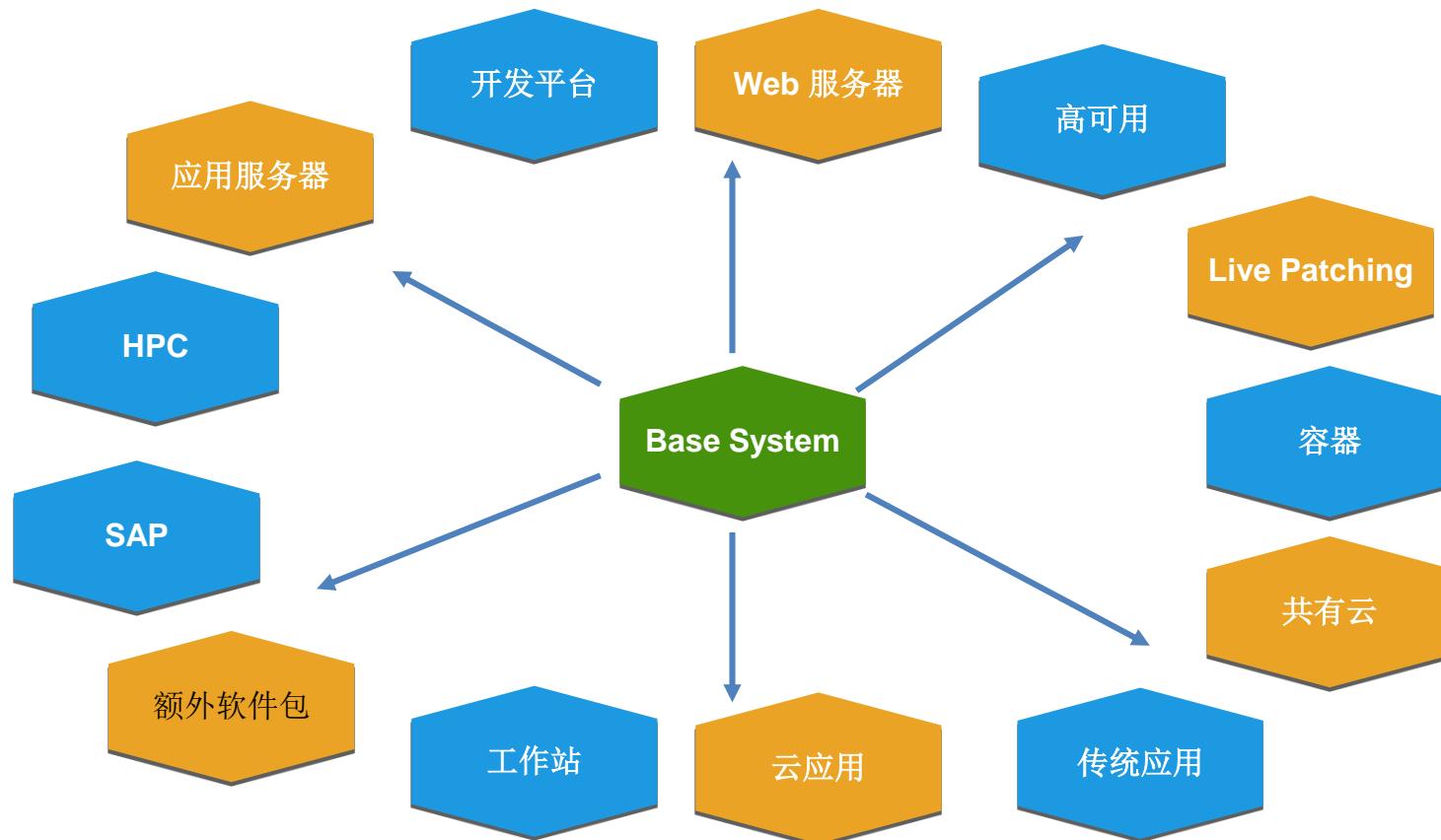


多模操作系统

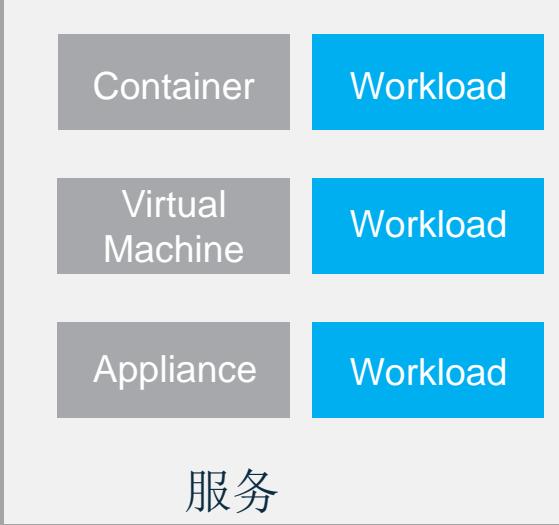
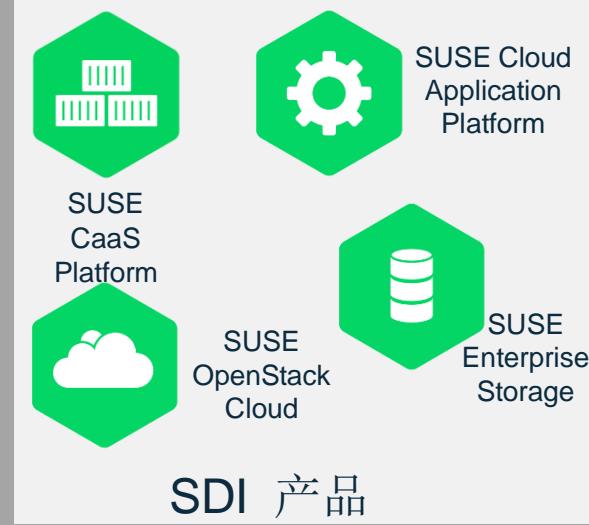
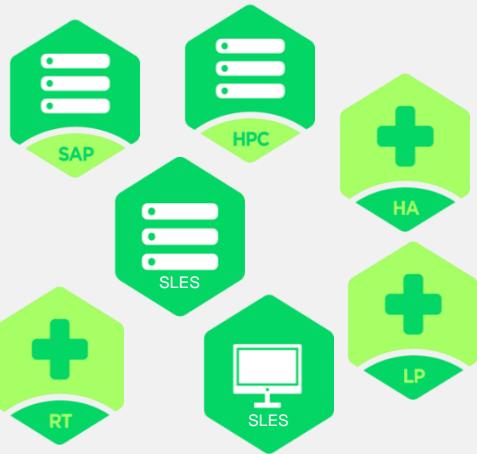
一个OS镜像能满足所有需求吗？



SUSE Linux Enterprise 15多模操作系统



多模架构



传统架构

软件定义架构 (SDI)



公共代码库 **Common Code Base**
所有硬件架构 (x86-64, Arm, POWER, IBM Z)

“IDC认为， SUSE Linux Enterprise 15 的
多模操作系统使产品成为一种适合异构计算
环境的多平台OS。”

– IDC市场报告，2018 年

自动化运维最佳实践

护网行动

- 远程登录可以使用**root**权限
- 用户密码太简单
- 端口扫描
- 有些安全漏洞**CVE**还存在
- 启动不必要的服务：**VNC, telnet, ftp**

运维人员之痛



IT team before going on holiday

SUSE Manager

解决运维人员的烦恼



配置文件集中管理

配置文件版本管理

支持编辑shell, xml, ruby, python, perl文件

文件版本差异对比

批量创建文件, 目录, 链接

支持编辑shell, xml, ruby, python, perl文件

版本统计
硬件规格统计
位置信息统计

架构信息
运行参数统计
操作记录

系统状态记录
系统状态回滚
图形化操作

定时任务
消除重复操作
一键注册

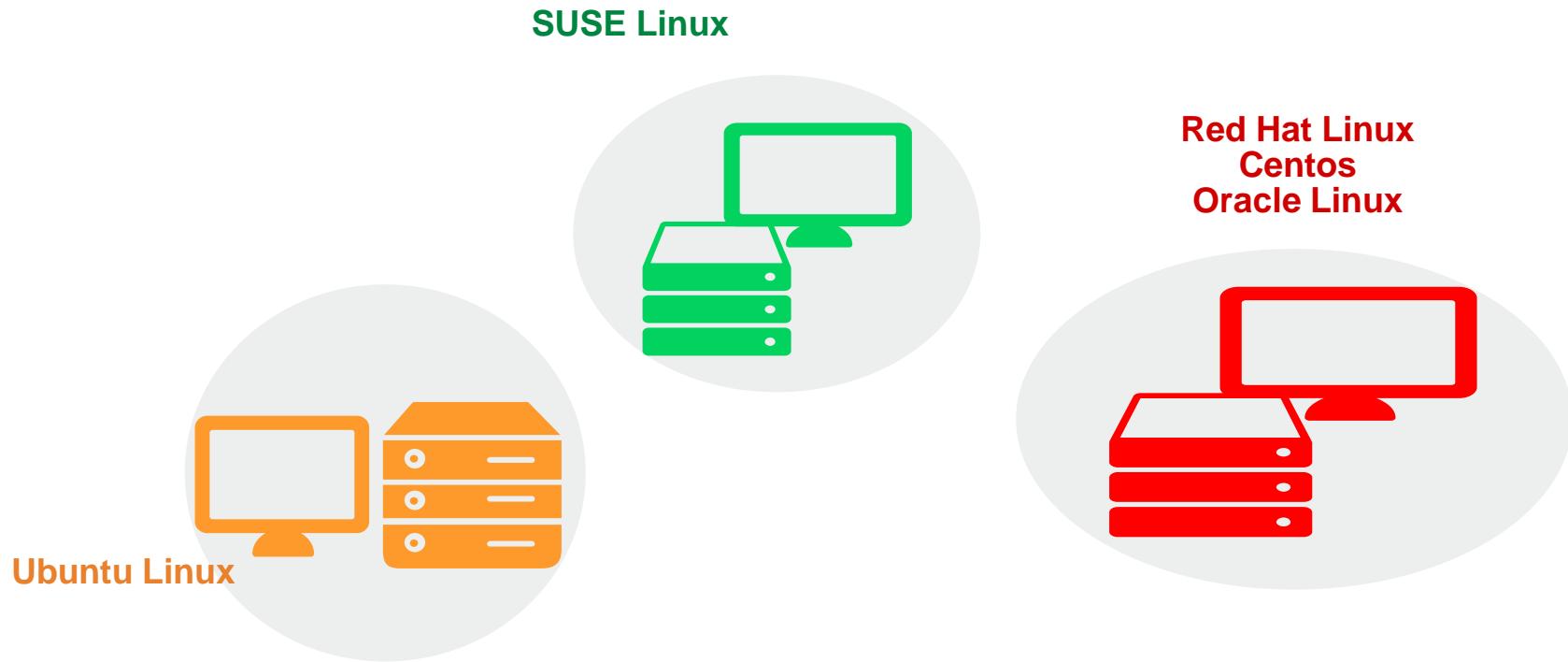
补丁分类
批量补丁下发
详细信息
按补丁包索引

CVE索引
基线扫描

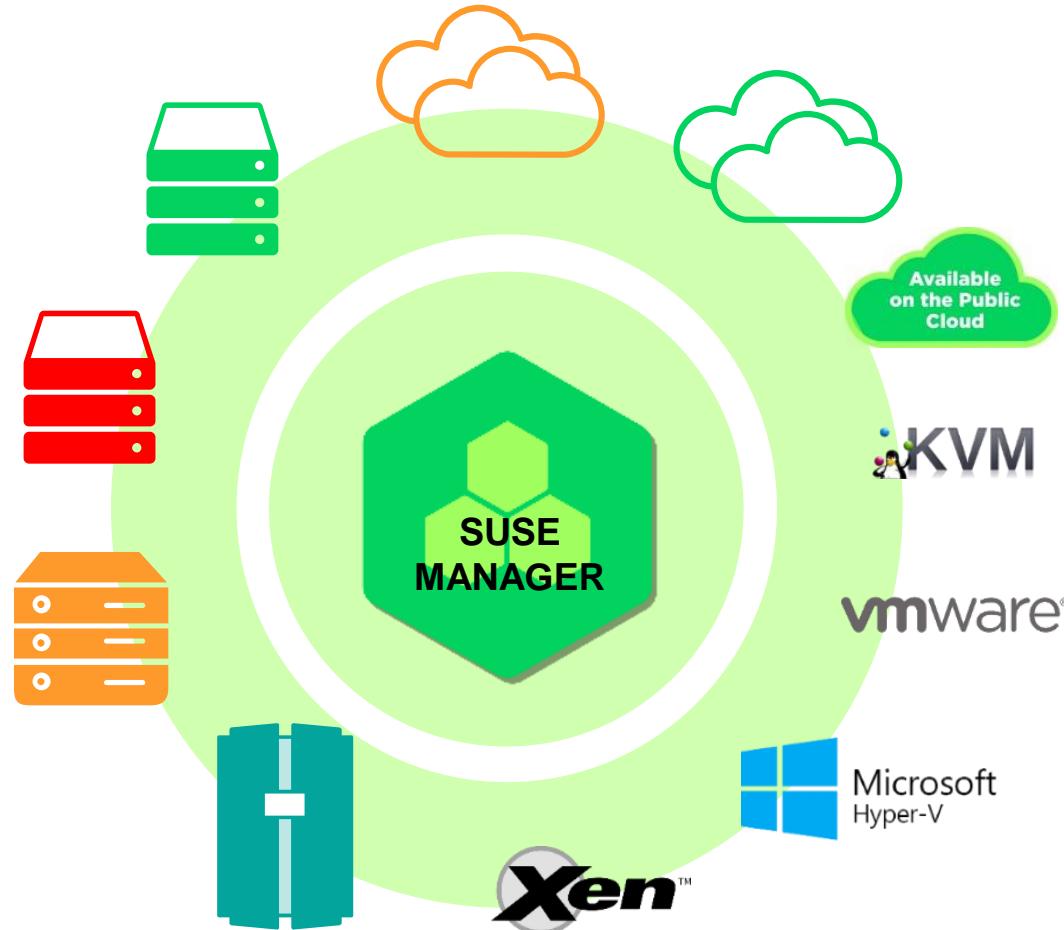
软件包版本统计
详细信息
依赖性记录

自定义软件源
软件包平行对比
SP升级

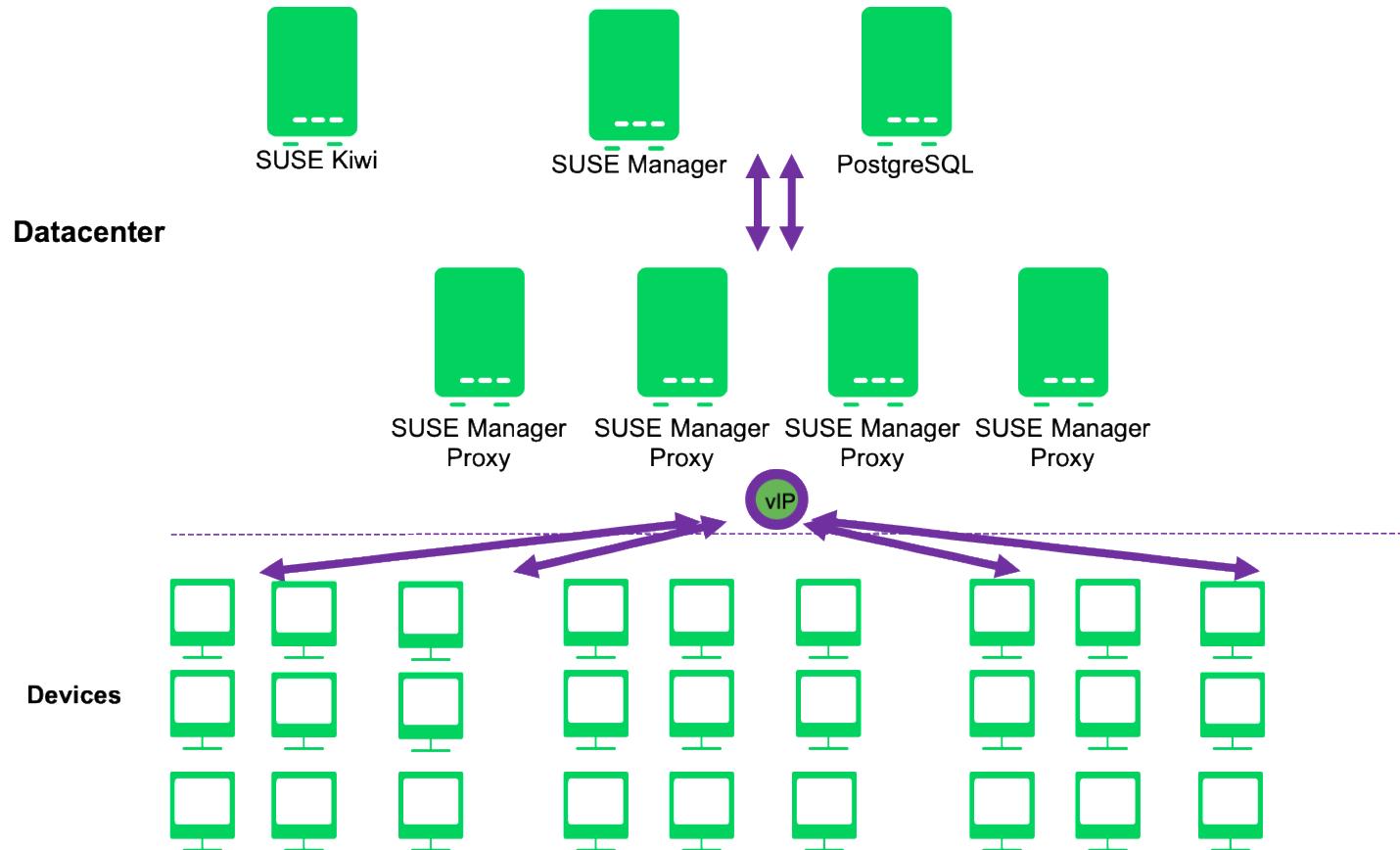
操作系统运维场景之- 主流Linux



操作系统运维场景之- 复杂IT环境



操作系统运维场景之- 大规模管理



操作系统运维场景之- 系统管理

System Info	
Hostname:	hqpg-11sp4-51
IP Address:	172.16.0.4
IPv6 Address:	unknown
Virtualization:	Hyper-V
UUID:	8ae44ad1761f47f19664092e1cbeaf0e
Kernel:	3.0.101-68-default
SUSE Manager	1000010255
System ID:	
Activation Key:	11-11sp4-x86_64
Installed Products:	<ul style="list-style-type: none">SUSE Linux Enterprise Server 11 SP4SUSE Linux Enterprise Software Development Kit 11 SP4

System Events	
Checked In:	Today at 10:47 AM
Registered:	03/06/2018
Last Booted:	5 months ago (Schedule System Reboot)

System Properties (Edit These Properties)	
System Types:	[Salt]
Contact Method:	Default
Auto Patch Update:	No
System Name:	hqpg-11sp4-51
Description:	Initial Registration Parameters: OS: sles-release Release: 11.4 CPU Arch: x86_64
Location:	(none)

Subscribed Channels (Alter Channel Subscriptions)	
<ul style="list-style-type: none">SLES11-SP4-Pool for x86_64SLES11-SP4-SUSE-Manager-Tools x86_64SLES11-SP4-Updates for x86_64	

^

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操作系统运维场景之- 批量安装

SUSE Manager - Systems - Autoinstallation - Distributions - Mozilla Firefox

SUSE Manager - Syst... +

https://smgr.susemgr.com/rhn/kickstart/TreeCreate.do

Search

SUSE Manager > Systems > Autoinstallation > Distributions

0 systems selected

admin

Widgets-4-U

Search page

Home

Systems

- Overview
- Systems
- System Groups
- System Set Manager
- Bootstrapping
- Visualization
- Advanced Search
- Activation Keys
- Stored Profiles
- Custom System Info
- Autoinstallation

i 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 directory should be readable by the apache and tomcat 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*: sles12-sp3-x86_64

Tree Path*: /srv/www/htdocs/pub/distribution/sles12-sp3-x86_64

Base Channel*: test-SLES12-SP3-Pool for x86_64

Installer Generation*: SUSE Linux

Kernel Options:

操作系统运维场景之- 第三方软件管理

SUSE Manager - Software - Manage Software Channels - Mozilla Firefox

SUSE Manager - Soft... +

https://smgr.susemgr.com/rhn/channels/manage/Edit.do

Search

SUSE®Manager > Software > Manage Software Channels

0 systems selected admin Widgets-4-U

Search page

Home Systems Salt Images Patches Software Channels Package Search Manage Software Channels Overview Manage Software Packages Manage Repositories

Create Software Channel

Basic Channel Details

Create or edit software channels from this page.

If the parent channel is set to 'none', the channel is a base channel. Otherwise, the channel is a child of the specified channel.

Channel name and label are required.

They each must be at least 6 characters in length.

Channel name must not be longer than 256 characters and channel label must not be longer than 128 characters.

Channel name must begin with a letter and channel label may begin with a letter or digit.

They each must not begin with rhn, redhat or red hat.

They each must contain only lowercase letters, hyphens ('-'), periods ('.'), underscores ('_'), and numerals.

Channel name may also contain spaces, parentheses () and forward slashes ('/').

Channel summary is also required and must not exceed 500 characters.

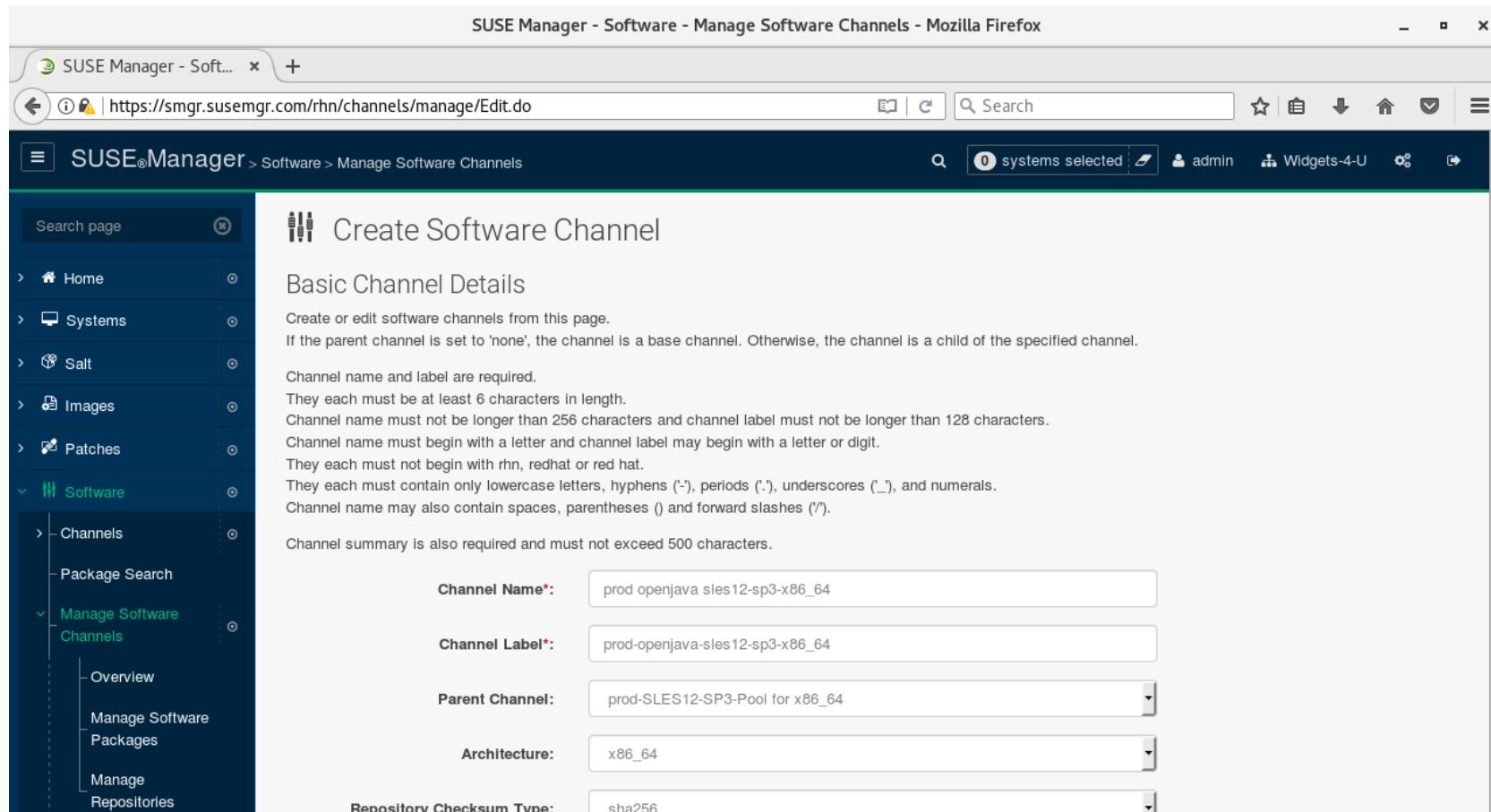
Channel Name*: prod openjava sles12-sp3-x86_64

Channel Label*: prod-openjava-sles12-sp3-x86_64

Parent Channel: prod-SLES12-SP3-Pool for x86_64

Architecture: x86_64

Repository Checksum Type: sha256



操作系统运维场景之- 配置管理

This is a feature preview: On this page you can select [Salt formulas](#) for this group/system, which can then be configured on group and system level. This allows you to automatically install and configure software. We would be glad to receive your feedback via the [forum](#).

Formulas

Choose formulas:

- General System Configuration
- Bind
- Dhcpcd
- Locale
- Tftpd
- Vsftpd

Dhcpcd

Domain Name: example.org

Domain Name Servers: example.org

Listen Interfaces: em2

Max Lease Time: 20001

Default Lease Time: 20000

Save Remove all Reset Changes

操作系统运维场景之- 补丁管理

SUSE Manager - Systems - Systems - All - Mozilla Firefox

SUSE Manager - Syst... +

https://smgr.susemgr.com/rhn/systems/SystemList.do

Search

SUSE®Manager > Systems > Systems > All

0 systems selected

admin Widgets-4-U

Search page

Home Systems

Overview Systems

All Physical Systems Virtual Systems Unprovisioned Systems Out of Date Requiring Reboot Non Compliant Without System Type Ungrouped

Systems

Select All 1 - 2 of 2

<input type="checkbox"/>	System	Updates	Patches	Packages	Configs	Base Channel	System Type
<input type="checkbox"/>	srv1.susemgr.com	!	2	4	0	test-SLES12-SP3-Pool for x86_64	Salt
<input type="checkbox"/>	srv2.susemgr.com	✓	0	0	0	prod-SLES12-SP3-Pool for x86_64	Salt

Filter by System Name: Select first character 25 items per page

Download CSV

操作系统运维场景之- 安全漏洞CVE扫描

it > CVE Audit

ound

ound

2018

2017

2016

2015

2014

2013

2012

2011

2010

2009

2008

2007

2006

2005

2004

2003

2002

2001

2000

1999

2018

systems selected

Filter by System Name:

Select first character ▾ 25 items per page

Affected, patches available in channels which are not assigned

Affected, at least one patch available in an assigned channel

Not affected

Patched

System Currency Report [?](#)

1 - 7 of 7

System	Security (Critical)	Security (Important)	Security (Moderate)	Security (Low)	Bug Fixes	Enhancements	Score
hpg-12sp1-58	4	208	116	4	504	76	5484
testingpg-12sp2-53	0	84	150	6	840	12	4260
hpg-cent7-vm1	5	80	50	15	705	155	3465
hpg-11sp4-51	3	99	114	0	81	0	2754
testingpg-sap-12sp2-49	0	72	112	4	240	0	2544
hpg-12sp3-55	0	36	72	0	120	0	1392
testingpg-12sp1-50	0	15	48	3	273	33	1215

操作系统运维场景之- 安全合规性检查

sles12sp1.test.demo ?

Delete System | Add to SSM

Details Software Groups Audit States Formulas Events

List Scans Schedule

OpenSCAP Scans

Xccdf Test Result Diff Completed

This system has not yet reported any SCAP results.

Tip: Compliance column represents unweighted pass/fail ration. Compliance = P/(Total - S)

Title	Rule	Result
sysctl net.ipv4.ip_forward must be 0	rule-sysctl-ipv4-forward	pass
sysctl net.ipv4.tcp_syncookies must be 1	rule-sysctl-ipv4-tcpsyncookies	pass
sysctl net.ipv6.conf.all.forwarding must be 0	rule-sysctl-ipv6-all-forward	pass
sysctl net.ipv6.conf.default.forwarding must be 0	rule-sysctl-ipv6-default-forward	pass
kernel config CONFIG_SYN_COOKIES must be y	rule-kernel-syncookies	fail
file /etc/login.defs must have a line that matches ^PASS_MAX_DAYS.*99999	rule-pwd-maxdays	pass

操作系统运维场景之- 容器管理

SUSE Manager > Images > Build

Build Image

Version: latest

Build Profile: suse_real_key

Build Host: headref-minsles12sp2.tfl.local

Schedule no sooner than: 4/4/17 2.02 pi CEST

Build

Profile Summary

Label	suse_real_key
Image Type	Dockerfile
Image Store	galaxy-registry
Path	https://gitlab.suse.de/galaxy/suse-manager-containers.git/test-donot-remove-test-profile/serverhost
Activation Key	1-MINION-TEST
Software	test-channel-x86_64
Channels	

Actions

- Images
- Build
- Profiles
- Stores
- Patches
- Channels
- Audit
- Configuration
- Schedule
- Users

SUSE Manager > Images > Profiles

Image Profiles

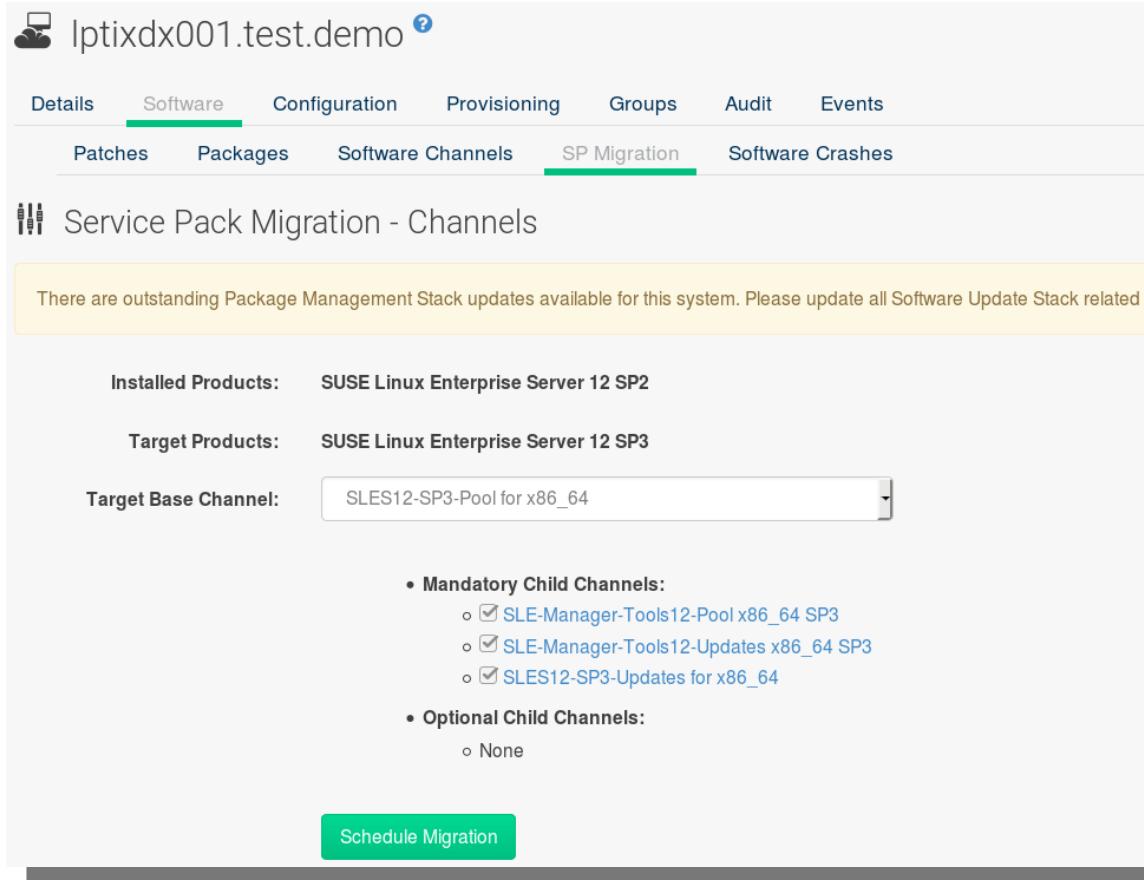
Label	Build Type	Actions
suse_simply	Dockerfile	
suse_real_simply	Dockerfile	
suse_key	Dockerfile	
suse_real_key	Dockerfile	

Page 1 of 1

Images

Name	Version	Updates	Patches	Packages	Status	Last Modified	Actions
suse_real_key	fac	▲	2	2		21 minutes ago	
suse_simply	latest	●	0	0		2 hours ago	
suse_real_key	i69hBsnipSmayA	▲	2	2		10 hours ago	
suse_real_key	N6JnYebBrQkjHg	▲	2	2		10 hours ago	
suse_real_key	NQfFNsd658QoQxA	▲	2	2		10 hours ago	
suse_real_key	KbHk5aVownJc5Q	▲	2	2		10 hours ago	
suse_real_key	9QRKg30NOpkQ	▲	2	2		10 hours ago	
suse_real_key	BLbb6Fhk79S6g	▲	2	2		10 hours ago	
suse_real_key	DbGlmxAdo1xIQ	▲	2	2		10 hours ago	

操作系统运维场景之- 批量升级



The screenshot shows a software management interface for a system named `lptixdx001.test.demo`. The interface has several tabs: **Details**, **Software** (which is selected), **Configuration**, **Provisioning**, **Groups**, **Audit**, and **Events**. Under the **Software** tab, there are sub-tabs: **Patches**, **Packages**, **Software Channels**, **SP Migration** (which is selected), and **Software Crashes**.

The main content area is titled **Service Pack Migration - Channels**. A yellow warning box states: **There are outstanding Package Management Stack updates available for this system. Please update all Software Update Stack related**.

Configuration details:

- Installed Products:** SUSE Linux Enterprise Server 12 SP2
- Target Products:** SUSE Linux Enterprise Server 12 SP3
- Target Base Channel:** SLES12-SP3-Pool for x86_64

Channel selection options:

- Mandatory Child Channels:**
 - SLE-Manager-Tools12-Pool x86_64 SP3
 - SLE-Manager-Tools12-Updates x86_64 SP3
 - SLES12-SP3-Updates for x86_64
- Optional Child Channels:**
 - None

Schedule Migration button at the bottom left.

操作系统运维场景之- 执行远程命令

The screenshot shows the SaltStack web interface with the following details:

- Left Sidebar:** A navigation menu with the following items:
 - Search page
 - Home
 - Systems
 - Salt** (selected)
 - Keys
 - Remote Commands
 - State Catalog
 - Formula Catalog
 - Images
 - Patches
 - Software
 - Audit
 - Configuration
 - Schedule
 - Users
 - Admin
 - Help
- Top Bar:** A search bar with the placeholder "Remote Commands" and a "Stop waiting" button.
- Content Area:** A table titled "Target systems (3)" showing the results of the command "ls -lha" executed on three systems:

System	Output
sles12sp1.test.demo	<pre>total 124K drwx----- 6 root root 4.0K Jul 4 07:40 . drwxr-xr-x 22 root root 4.0K Jul 3 13:36 .. -rw----- 1 root root 1.8K Jul 4 08:17 .bash_history drwx----- 2 root root 4.0K Jul 3 13:38 .gnupg drwxr-xr-x 3 root root 4.0K Jul 3 13:44 .local -rw----- 1 root root 2.2K Jul 3 15:52 .viminfo -rw-r--r-- 1 root root 31K Jul 3 13:39 autoinst.xml drwxr-xr-x 2 root root 4.0K Sep 21 2014 bin -rw-r--r-- 1 root root 27K Jul 3 15:52 bootstrap.sh -rw-r--r-- 1 root root 617 Jul 3 15:51 client-config-overrides.txt -rw-r--r-- 1 root root 6.4K Jun 20 01:09 client_config_update.py drwxr-xr-x 5 root root 4.0K Jul 3 13:34 inst-sys -rw-r--r-- 1 root root 20K Jul 3 13:47 sles12sp1.sh</pre>
client2.test.demo	pending

操作系统运维场景之- 定时任务

SUSE Manager - Admin - Task Schedules - Mozilla Firefox

SUSE Manager - Admin... [+ New](#)

[Back](#) [Home](#) [SSL](#) <https://smgr.susemgr.com/rhn/admin/SatSchedules.do> [Edit](#) [Search](#) [Star](#) [Bookmark](#) [Download](#) [Home](#) [More](#)

SUSE Manager > Admin > Task Schedules

0 systems selected | [admin](#) | [Widgets-4-U](#) | [Help](#)

Search page [Help](#)

SUSE Manager Schedules [?](#) [+ create schedule](#)

Below is a list of defined schedules. A schedule defines frequency, how often a predefined bunch shall be triggered.

1 - 23 of 23

25 items per page

Schedule name	Frequency	Active From	Bunch
auto-errata-default	0 5/10 * * ?	2017-08-11 13:21:02 CEST	auto-errata-bunch
channel-repoadata-default	0 * * * ?	2017-08-11 13:21:02 CEST	channel-repoadata-bunch
cleanup-data-default	0 0 23 ? * *	2017-08-11 13:21:03 CEST	cleanup-data-bunch
clear-tasklogs-default	0 0 23 ? * *	2017-08-11 13:21:03 CEST	clear-tasklogs-bunch
cobbler-sync-default	0 * * * ?	2017-08-11 13:21:02 CEST	cobbler-sync-bunch
compare-configs-default	0 0 23 ? * *	2017-08-11 13:21:03 CEST	compare-configs-bunch
cve-server-channels-default	0 0 23 ? * *	2017-08-11 13:21:03 CEST	cve-server-channels-bunch

Admin

- Setup Wizard
- Organizations

操作系统运维场景之- 快照和回滚

Snapshot Tags

The following list of tags mark moments in time when the latest system snapshot was noted. Clicking the links below will allow you to rollback to that point in time.

Select All

1 - 1 of 1 (0 selected)

Filter by Tag name:

2018-03-08 17:18:29 Snapshot - RPM Packages

Below is a comparison of the current package profile and the snapshot package profile.

1 - 25 of 26 << < > >>

Tag name

patch at 2018/03/08-20:00

Filter by Package Name:



Select first character ▾

Package	Architecture	Current Version	Snapshot Version
aaa_base	x86_64	13.2+git20140911.61c1681-32.1	13.2+git20140911.61c1681-28.1
aaa_base-extras	x86_64	13.2+git20140911.61c1681-32.1	13.2+git20140911.61c1681-28.1
apparmor-docs	noarch	2.8.2-54.1	2.8.2-45.1
apparmor-parser	x86_64	2.8.2-54.1	2.8.2-45.1
apparmor-profiles	noarch	2.8.2-54.1	2.8.2-45.1
apparmor-utils	noarch	2.8.2-54.1	2.8.2-45.1

操作系统运维场景之-拓扑图

SUSE Manager > Systems > Visualization > Systems Grouping

Search page

Home Systems Overview Systems System Groups System Set Manager Bootstrapping Visualization Virtualization Hierarchy Proxy Hierarchy Systems Grouping Advanced Search Activation Keys Stored Profiles Custom System Info Autoinstallation Software Crashes

Toggle filters

Filter by system name: e.g., client.nue.sles

Show systems with:

- security advisories
- bug fix advisories
- product enhancement advisories

Filter by system base channel: e.g., SLE12

Filter by system installed products: e.g., SLES

Split into groups

Add a grouping level

- San Francisco
- PROD**
- London
- Joe's Systems

Remove this level

- San Francisco
- PROD**
- London
- Joe's Systems

Remove this level

cb-minsles.tf.local

System details page	
Type	system
Add/remove system from SSM	+ -
Base entitlement	salt_entitled
Base channel	SLES12-SP1-Pool for x86_64
Checkin time	an hour ago
Installed products	SLES
Patch status	84 security advisories 113 bug fix advisories 1 product enhancement advisories

操作系统运维场景之- 项目管理





0 systems selected

admin

SUSE PM



Search page



Home



Systems



Salt



Images



Patches



Software



Content Lifecycle



Projects

Filters

+ Create a new Content Lifecycle Project

+ Create

Project Properties

Label *:

web_servers

Name *:

Web Servers

Description:

My web servers

Search page

- Home
- Systems
- Salt
- Images
- Patches
- Software
- Content Lifecycle
- Projects
- Filters
- Audit
- Configuration
- Schedule
- Users
- Admin

Copyright Notice

SUSE Manager release
4.0 RC1

Sources

Type:

Channel

New Base Channel

SLE-Product-SLES15-SP1-Pool for x86_64

Choose the channel to be elected as the new base channel

Child Channels (8)

 SLE-Product-SLES15-SP1-Pool for x86_64 (8) include recommended SLE-Product-SLES15-SP1-Updates for x86_64 ⓘ mandatory 🔍 SLE-Module-Basesystem15-SP1-Updates for x86_64 ⓘ recommended 🔍 SLE-Module-Basesystem15-SP1-Pool for x86_64 ⓘ recommended 🔍 SLE-Manager-Tools15-Pool for x86_64 SP1 ⓘ recommended 🔍 SLE-Manager-Tools15-Updates for x86_64 SP1 ⓘ recommended 🔍 SLE-Module-Server-Applications15-SP1-Pool for x86_64 ⓘ recommended 🔍 SLE-Module-Server-Applications15-SP1-Updates for x86_64 ⓘ recommended 🔍 SLE-Module-Containers15-SP1-Updates for x86_64 ⓘ 🔍 SLE-Module-Containers15-SP1-Pool for x86_64 ⓘ 🔍 SLE-Module-Python2-15-SP1-Updates for x86_64 ⓘ 🔍 SLE-Module-Python2-15-SP1-Pool for x86_64 ⓘ 🔍

Search a channel 🔍

- Vendors
- Custom
- Clones

Cancel

Save

Attach/Detach Sources

Attach/Detach Filters

Build (0)

▼ Environment Lifecycle

+ Add Environment

dev

+ Edit

Description: Development Environment
Version: Version 3: With emergency bug fixes from June 15
Status: Generating repositories data 

↓
Promote
↓

qa

+ Edit

Description: QA Environment
Version: Version 2: Latest Build from June 11
Status: Built

↓
Promote
↓

prod

+ Edit

Description: Production Environment
Version: Version 1: Initial build ...
Status: Built

^

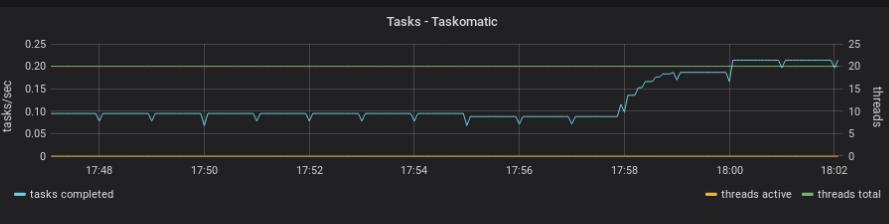
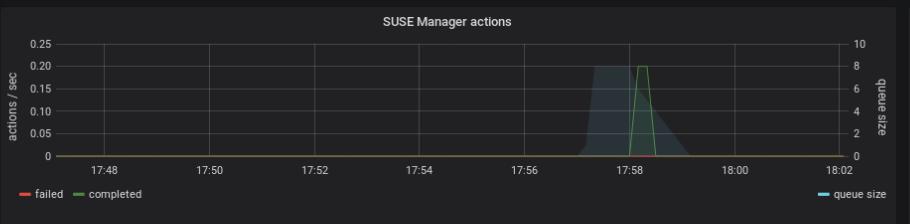
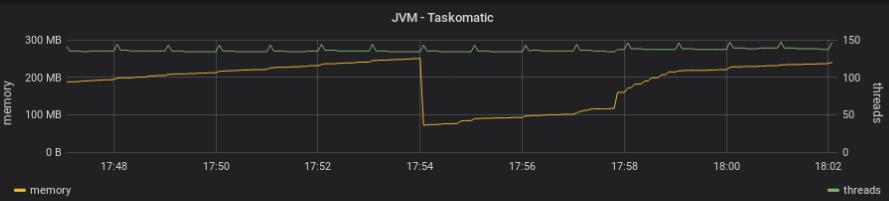
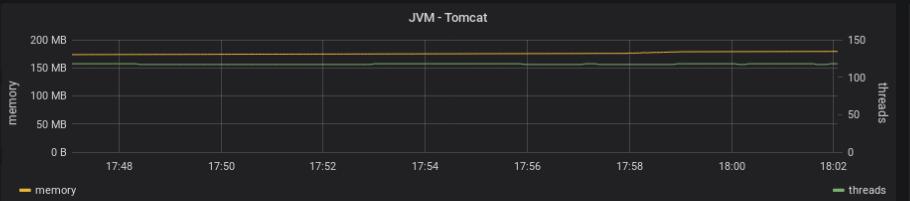
操作系统运维场景之- 监控





server server:tf.local ▾

SUSE Manager





Search page



SUSE Manager Configuration - Monitoring [?](#)

Setup your SUSE Manager server monitoring.

General Bootstrap Script Organizations Restart Cobbler Bare-metal systems

Monitoring

Monitoring

- System
 PostgreSQL database
 Taskomatic (Java JMX)
 Tomcat (Java JMX)

Server Monitoring

The server uses [Prometheus](#) exporters to expose metrics about your environment.

Refer to the [documentation](#) to learn how to consume these metrics.

Enabling services...

Home



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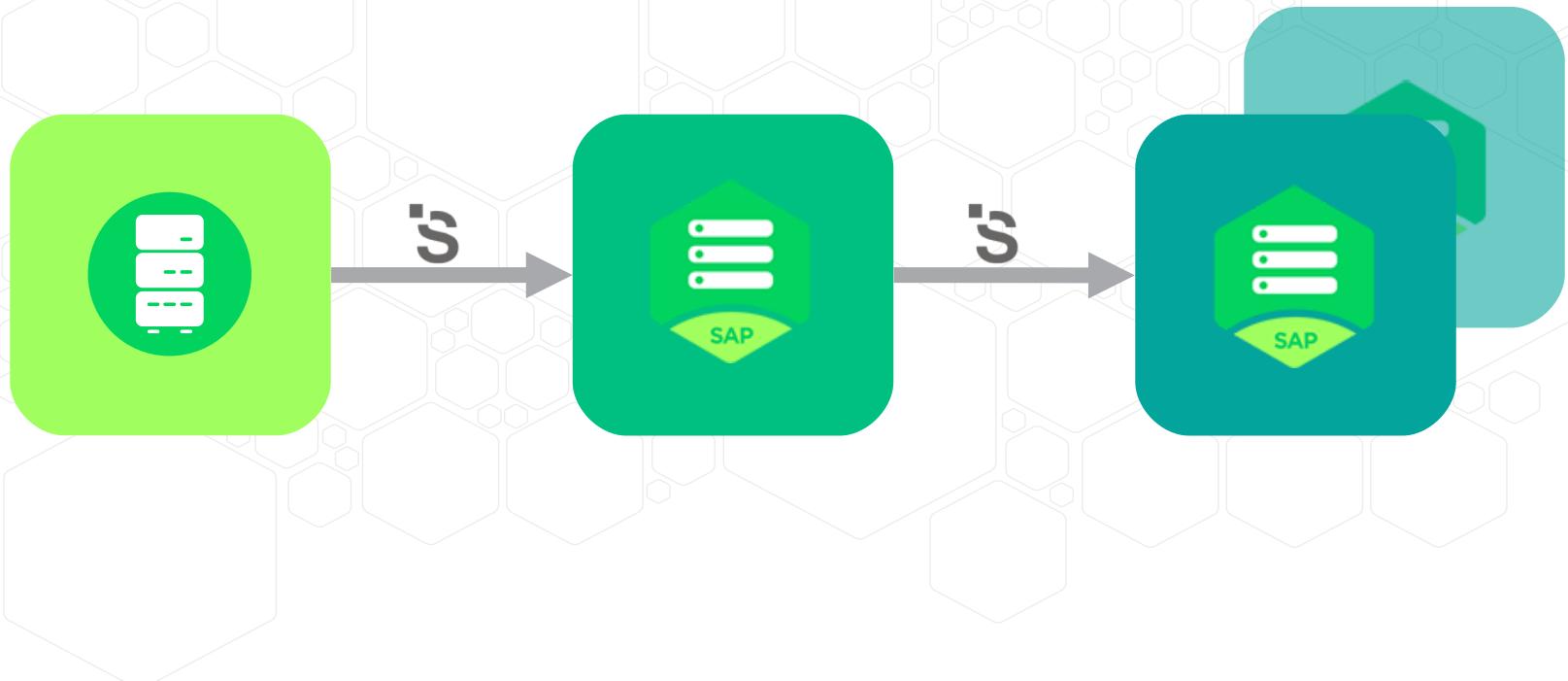
▼

▼

▼

Setup Wizard

操作系统运维场景之- SLES for SAP HANA



Search page



min1.su.se

Delete System

Home

Systems

Overview

System List

System Groups

System Set Manager

Bootstrapping

Visualization

Advanced Search

Activation Keys

Stored Profiles

Custom System Info

Autoinstallation

Software Crashes

Virtual Host
Managers

Salt

Copyright Notice

SUSE Manager release

[Details](#)[Software](#)[Configuration](#)[Provisioning](#)[Groups](#)[Audit](#)[States](#)[Formulas](#)[Events](#)[Formulas](#)[Locale](#)[Prometheus Exporters](#)

On this page you can select [Salt Formulas](#) for this group/system, which can then be configured on group and system level. This allows you to automatically install and configure software.

Save

Remove all

Reset Changes

Formulas

Choose formulas:

 No group Webserver Cluster Cluster Sap Hana Deployment Hana

On this page you can configure [Salt Formulas](#) to automatically install and configure software.

[← Prev](#)[Next →](#)

Save Formula

Clear values

Cluster

Cluster name: hacluster**First node:****Unicast:** **Interface:** wlan0**Ntp:** pool.ntp.org

Watchdog configuration

Watchdog module to load: softdog**Watchdog device:** /dev/watchdog

SBD configuration

Diskless SBD (If device is set this option is skipped): **SBD device url:** /dev/vdb

操作系统运维场景之- 虚拟化管理



Hosted Virtual Systems

This is a list of virtual guests which are configured to run on this host.

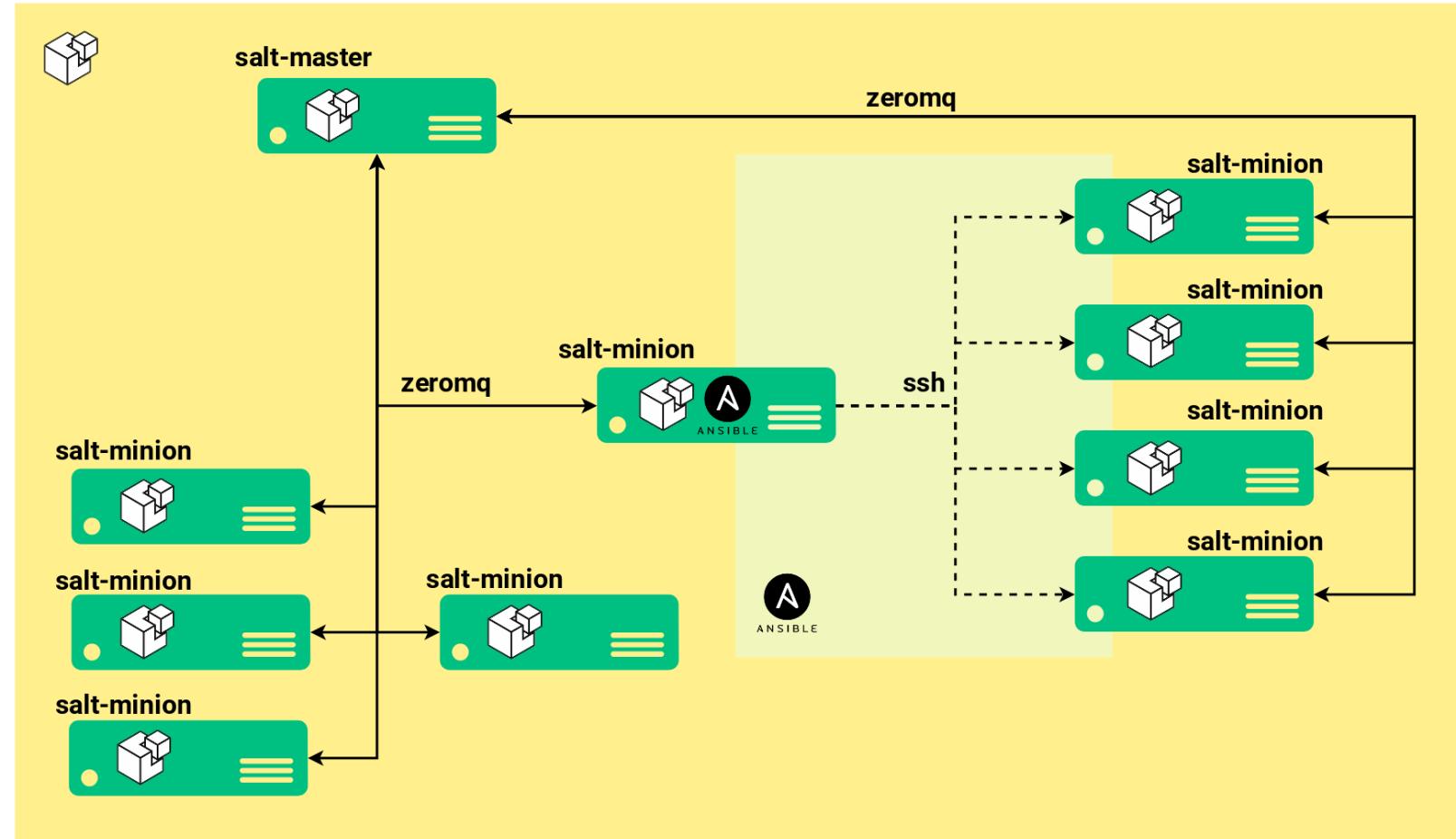
 Create Guest  Start / Resume  Stop  Restart  Suspend  Delete

Filter by name

Items 1 - 5 of 5 [Select All](#)25  items per page

  Guest	System	Updates	State	Current Memory	vCPUs	Base Software Channel	Action Status	Actions
 client3	Unregistered System	-	Stopped	2048 MiB	2	(none)	-	  
 suma-client1	Unregistered System	-	Stopped	2048 MiB	2	(none)	-	  
 suma-client2	Unregistered System	-	Stopped	2048 MiB	2	(none)	-	  
 sumaadmin	Unregistered System	-	Stopped	4096 MiB	4	(none)	-	  
 win10	Unregistered System	-	Running	4096 MiB	4	(none)		    

操作系统运维场景之- 二次开发



自动化运维关键

- 标准化
- 标准化
- 标准化

自动化运维关键

- 操作系统标准化
- 应用上线标准化
- 安全合规性标准化
- 变更流程标准化
- 故障处理标准化

演示

为IoT用例轻松部署SUSE Linux Enterprise Server

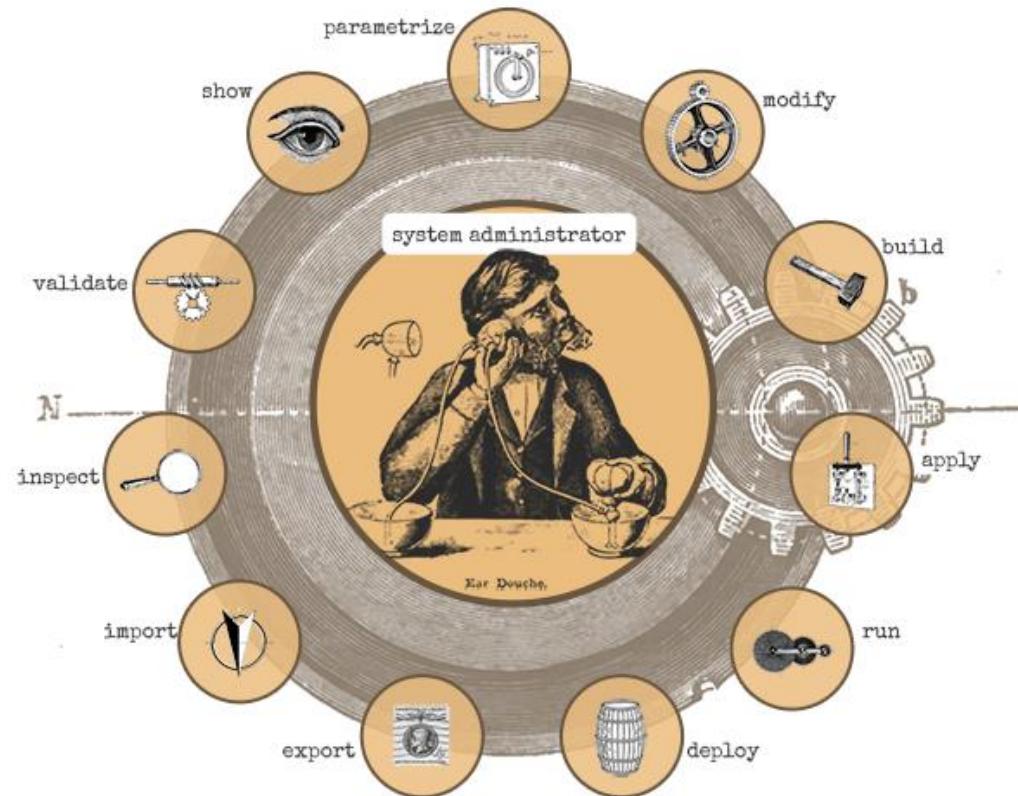
工具

- **Machinery** – 系统机械学习工具，在Package Hub中提供
- **kiwi**开放构建服务 – 在本地或<https://build.opensuse.org/>提供

任务

- 通过**machinery**智能学习系统
- 导出为**Kiwi**或**Autoyast**
- 构建镜像
- 部署

Machinery



```
Linux-7a4s:/home/cliddle # machinery inspect 172.16.147.216 --name SLES15-ED19 --extract-files -r root
Inspecting 172.16.147.216 for os, packages, patterns, repositories, users, groups, services, changed-config-files, changed-managed-files, unmanaged-files...

Note: There are filters being applied during inspection. (Use `--verbose` option to show the filters)

Inspecting os...
-> Found operating system 'SUSE Linux Enterprise Server 15' version '15'.
Inspecting packages...
-> Found 1589 packages.
Inspecting patterns...
-> Found 13 patterns.
Inspecting repositories...
-> Found 34 repositories.
Inspecting users...
-> Found 24 users.
Inspecting groups...
-> Found 43 groups.
Inspecting services...
-> Found 249 services.
Inspecting changed-config-files...
-> Extracted 18 changed configuration files.
Inspecting changed-managed-files...
-> Extracted 25 changed managed files.
Inspecting unmanaged-files...
-> Extracted 1734 unmanaged files and/or trees.

Hint: To show the data of the system you just inspected run:
machinery show SLES15-ED19
```

Select a description from the list below to show its details.

Type to filter Reset

Name	Host	Scopes	Last update
SLES15-ED19	172.16.147.216	os, packages, patterns, repositories, users, groups, services, changed-config-files (extracted), changed-managed-files (extracted), unmanaged-files (extracted)	2019-04-29 01:56:09 UTC

SLES15-ED19



No description selected for comparison



[Collapse all](#)

Type To Filter

Reset

Scopes

0

PH

PT

R

U

G

S

CF

11

1

inspection details

created by Machinery
Machinery documentation

OS

Operating System (inspected host: '172.16.147.216', at: 2019-04-29 01:56:09)

Name SUSE Linux Enterprise Server 15

Version 15

Architecture x86_64

PK

Packages 1589 packages (inspected host: '172.16.147.216', at: 2019-04-29 01:56:09)

Name	Version	Release	Arch	Vendor	Checksum
AppStream	0.11.8	1.39	x86_64	SUSE LLC	df3212a69a44d9c3d6145e0511368ac1
AppStream-lang	0.11.8	1.39	noarch	SUSE LLC	af995f68d06f699ae370b353715f041a
GeoIP	1.6.11	1.19	x86_64	SUSE LLC	e6a4320c2e7e5cb98423559967810cd8
GeoIP-data	1.6.11	1.19	noarch	SUSE LLC	7577ca5258600dccfd56c67df8caf017
Mesa	18.0.2	27.3.1	x86_64	SUSE LLC	ecb6e47ee48d0d731021f32726fc1a69
Mesa-dri	18.0.2	27.3.1	x86_64	SUSE LLC	50752f400c7f685d638f8f28b4ea8cb2
Mesa-gallium	18.0.2	27.3.1	x86_64	SUSE LLC	4e368abfceaffa19534a2d492590119

```
linux-7a4s:/ # machinery export-autoyast SLES15-ED19 --autoyast-dir /tmp
```

Unmanaged files following these patterns are not exported:

```
var/lib/rpm/*
etc/passwd*
etc/shadow*
etc/group*
etc/fstab
lib/mkinitrd
etc/udev/rules.d/70-persistent-net.rules
var/log/*
etc/default/grub*
etc/zypp/repos.d/*
```

Note: The permissions of the AutoYaST directory are restricted to be only accessible by the current user. Functions are provided by the README.md in the exported directory.

Exported to '/tmp/SLES15-ED19-autoyast'.

```
linux-7a4s:/ # cd /tmp/SLES15-ED19-autoyast/
```

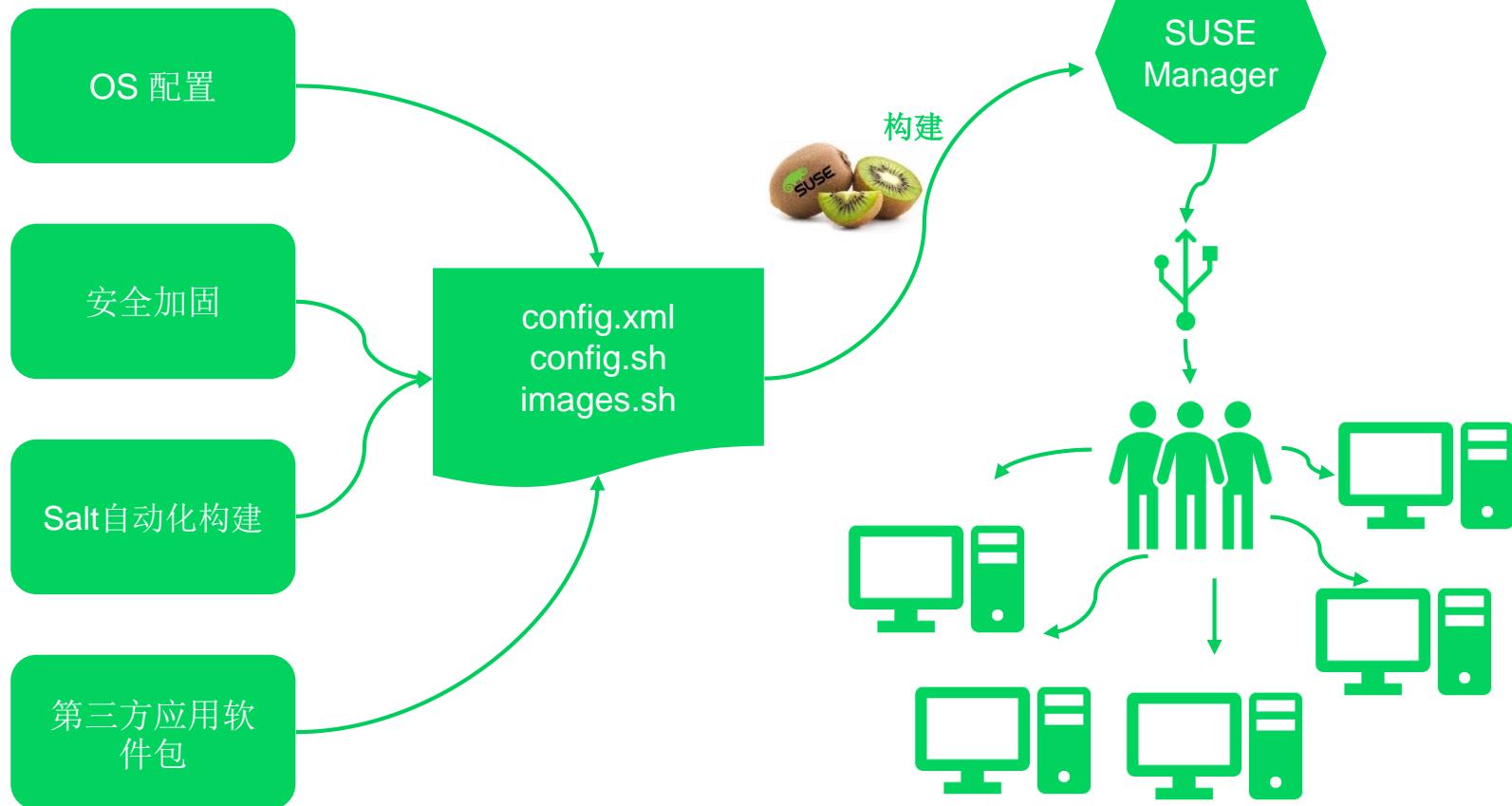
```
linux-7a4s:/tmp/SLES15-ED19-autoyast # ls
```

```
README.md      changed_config_files  manifest.json      unmanaged_files_autoyast_excludes
autoinst.xml   changed_managed_files unmanaged_files
```

```
linux-7a4s:/tmp/SLES15-ED19-autoyast # █
```

```
linux-7a4s:/temp # kiwi system build --description SLES15-ED19-kiwi --target-dir /tmp
[ INFO    ]: 01:36:28 | Loading XML description
[ INFO    ]: 01:36:29 | --> loaded SLES15-ED19-kiwi/config.xml
[ INFO    ]: 01:36:29 | --> Selected build type: vmx
[ INFO    ]: 01:36:29 | Preparing new root system
[ INFO    ]: 01:36:29 | Setup root directory: /tmp/build/image-root
[ INFO    ]: 01:36:30 | Setting up repository https://updates.suse.com/SUSE/Products/SLE-Module-Basesystem/15/x86_64/product?4Ep1mH5ghj4EfETIoawTmZcH-nrkkyoLGXF0roqYkGJ9UYFPLBKMItImkU0rh2mpMX-v6XGgSRADrKJBbwo4fSJsv_FsYL4T_DxysN3D8wL00qVBiNFMKsokXOPSPpU2JKNhNMB9Rx5xumsNwI1Vcg0cic
[ INFO    ]: 01:36:30 | --> Type: rpm-md
[ INFO    ]: 01:36:30 | --> Priority: 99
[ INFO    ]: 01:36:30 | --> Translated: https://updates.suse.com/SUSE/Products/SLE-Module-Basesystem/15/x86_64/product?4Ep1mH5ghj4EfETIoawTmZcH-nrkkyoLGXF0roqYkGJ9UYFPLBKMItImkU0rh2mpMX-v6XGgSRADrKJBbwo4fSJsv_FsYL4T_DxysN3D8wL00qVBiNFMKsokXOPSPpU2JKNhNMB9Rx5xumsNwI1Vcg0cic
[ INFO    ]: 01:36:30 | --> Alias: Basesystem_Module_15_x86_64:SLE-Module-Basesystem15-Pool
[ INFO    ]: 01:36:30 | Setting up repository https://updates.suse.com/SUSE/Updates/SLE-Module-Basesystem/15/x86_64/update?nZ7QxoEU7F2Eqsw2CJDDxv2RrqADcI1RSnKnWGiRLp5Spxo5FaBckLjX77yzDSVD-SwLSnU-oimNaNcf2JgnYaxvzE15QNbMfH1IFX2kcHFki_C076w9GMyhRPaUNUJept9QfzmhSsd7o1TuvfTwAd-
[ INFO    ]: 01:36:30 | --> Type: rpm-md
[ INFO    ]: 01:36:30 | --> Priority: 99
[ INFO    ]: 01:36:30 | --> Translated: https://updates.suse.com/SUSE/Updates/SLE-Module-Basesystem/15/x86_64/update?nZ7QxoEU7F2Eqsw2CJDDxv2RrqADcI1RSnKnWGiRLp5Spxo5FaBckLjX77yzDSVD-SwLSnU-oimNaNcf2JgnYaxvzE15QNbMfH1IFX2kcHFki_C076w9GMyhRPaUNUJept9QfzmhSsd7o1TuvfTwAd-
[ INFO    ]: 01:36:30 | --> Alias: Basesystem_Module_15_x86_64:SLE-Module-Basesystem15-Updates
[ INFO    ]: 01:36:30 | Setting up repository https://updates.suse.com/SUSE/Products/SLE-Module-Desktop-Applications/15/x86_64/product?X2QKBvZAXr0HBdcVjKHKwVzv35oxMGu-gPpYxm_oTsYD9Ekm56Sk1ljpfnKL1LXZDRjQRhtIv_8h0JM55qCn0ZmII0WeSoR_N9V4nHXfwlj57Fr0g34-HQOF6pAgGiRrHUIB-kqNc1pZDIf0Lqr4HA9kpfEYx6zrp53pEx0w
[ INFO    ]: 01:36:30 | --> Type: rpm-md
[ INFO    ]: 01:36:30 | --> Priority: 99
[ INFO    ]: 01:36:30 | --> Translated: https://updates.suse.com/SUSE/Products/SLE-Module-Desktop-Applications/15/x86_64/product?X2QKBvZAXr0HBdcVjKHKwVzv35oxMGu-gPpYxm_oTsYD9Ekm56Sk1ljpfnKL1LXZDRjQRhtIv_8h0JM55qCn0ZmII0WeSoR_N9V4nHXfwlj57Fr0g34-HQOF6pAgGiRrHUIB-kqNc1pZDIf0Lqr4HA9kpfEYx6zrp53pEx0w
[ INFO    ]: 01:36:30 | --> Alias: Desktop_Applications_Module_15_x86_64:SLE-Module-Desktop-Applications15-Pool
[ INFO    ]: 01:36:30 | Setting up repository https://updates.suse.com/SUSE/Updates/SLE-Module-Desktop-Applications/15/x86_64/update?T0Wi8SNwWl_6RdbZen_us_9C1EIes75UFjUx2rNxrpfspJ18xBcmX000nxfEoZ6loNlYubaNqx_YB71MaXWfzvC_EyEK-K7JQVX5MfbwI0p7cJ8nYAm_p7cJ8nYAm_xVVKfllLDEz_1ubiabnvzzk-88TI1CZntSj9CZntJzVg9MAcw
[ INFO    ]: 01:36:30 | --> Type: rpm-md
```

镜像制作



Q & A