Aktuelles zu SUSE Linux Enterprise

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Agenda

- Wie profitiert SUSE Linux Enterprise von neuem OpenSUSE Releasemodell
- Stand SLES12 SP1, Module
- KVM und Virtual Machine Driver Pack für Windows Gäste



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OpenSUSE Release Modell

openSUSE®

- Open Source Community Project sponsored by SUSE®
- "Promotes the use of Linux everywhere"
- Produces the openSUSE distributions
- Oct 2005 first openSUSE release: SUSE Linux 10.0
- Dec 2006 openSUSE Build Service
- Apr 2008 Collaboration within Build Service
- Jul 2012 Introducing OpenSUSE Review Team -OpenSUSE Development is community handled
- Jul 2014 openSUSE Factory becomes rolling release

C⁄O Tumbleweed

snapper

wicked





openQA







Leap









What is a Rolling Release?

- No Release Schedule
- Frequent Updates to all Packages
- Updates delivered "when they're ready"



openSUSE® Tumbleweed

- Originally 'rolling updates' based on stable releases created by Greg Kroah-Hartman
- Merged with the 'Factory' rolling release on November 4th 2014
- Now a 'true' rolling release
- Provides the latest updates 'at the pace of contribution', without the risk of major system issues
- Tested by openQA continuously
- Factory is still the name of the 'devel project'
- User focus: Developer, Contributor & Enthusiast





A 'Perfect' Regular Release?

- Stable
- Well Maintained
- Enterprise Base System
- Lifecycle of 3 years (or more)
- Wide Selection of Packages

More Stable

Modern, relevant Userspace for Users & Developers



"With our powers combined"





openSUSE Leap

- openSUSE Leap new name for openSUSE's regular releases previously just 'openSUSE'
- first version that uses source from SUSE Linux Enterprise
- Advantage: provides high level of stability
- Major Leap Releases (eg. 42.x) expected to be supported for at least 36 months
 - until next major version of Leap
- Leap Minor Release (eg. 42.1, 42.2 ..) expected to be released annually
 - users expected to upgrade to latest minor release within 6 months of its availability
 - support life cycle: 18 months
- Previous openSUSE regular releases (13.2 and earlier) have a lifetime of 2 releases + 2 months overlap

Development Benefits



The openSUSE/SUSE Family

C⁄Q Tumbleweed

>8000 Packages

- Community Developed
- Rolling Updates

Leap
Over 6000 Packages
Community Developed

Shared Core

Rolling Base System

Stable Base System

• Regular Updates

SUSE® Linux Enterprise

Enterprise PackagesSUSE Developed

openSUSE® & SLE - Developing Together



Open Build Service(OBS) openSUSE Leap 42.2

openSUSE Leap 42.2 No description set & Request role addition 3	(1) 87 b (1) 364 (1) 2 lint	87 build errors364 open requests2 linking projects			
Packages (7851)	Build Result	s 🗳			
Show 25 v entries Search:	images	🚚 i586	disabled: 13 excluded: 7838		
00Meta 2ping		🚉 local	succeeded: 5 disabled: 7 excluded: 7839		
389-ds		🚚 ×86_64	disabled: 7		
4ti2	ports	🚚 aarch64	disabled: 7850 excluded: 1		
_product _product:openSUSE-Addon-NonOss-cd-addon-nonoss-i586_x86_64		🚚 ppc64le	disabled: 7850 excluded: 1		
_product:openSUSE-Addon-NonOss-ftp-if586_x86_64 _product:openSUSE-Addon-NonOss-release _product:openSUSE-cd-mini-x86_64 _product:openSUSE-dvd5-dvd-x86_64	standard	🚚 i586	succeeded: 7679 failed: 14 unresolvable: 54 disabled: 13 excluded: 91		
_product:openSUSE-ftp-ftp-x86_64 _product:openSUSE-release a2ps		🚚 x86_64	succeeded: 7714 failed: 20 unresolvable: 56 disabled: 7 excluded: 54		
a2ps-h aaa_base					
aalib					
abcde					
abook					

openSUSE Leap 43.0



openSUSE Leap A 'Perfect' Regular Release?

- Stable
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- · Lifecycle of 3 years (or more)
- Wide Selection of Packages
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OpenSUSE Evergreen

- Evergreen is a community effort to prolong maintenance of openSUSE beyond their normal life cycle
 - Security and stability fixes after the regular 18-month lifespan
 - openSUSE 13.1 is current Evergreen release
 - Official support for openSUSE 13.1 ended November 2016
 - Additional 18 to 30 months

Factory is growing – a lot!

Packages in Factory



osc14: Stephan Kulow, A Ring of Fire live on Stagings https://www.youtube.com/watch?v=K-wTVGqKFR8

A lot of Changes every week

Number of Factory Requests



osc14: Stephan Kulow, A Ring of Fire live on Stagings https://www.youtube.com/watch?v=K-wTVGqKFR8

Testing: Additional Introduced Mechanisms

- First line of defense (review) are bots now:
- Factory-auto reviewing sources
- Legal-auto checking changed licenses
- Repo-checker checking build status
- Repo-checker reviewing dependency errors
- Humans doing source reviews only as last step



Introducing Rings and Stagings

- $\boldsymbol{\cdot}$ Needed a way to limit the impact
- Split Factory into 4 rings

Ring 0: bootstrap cycle (96 packages)

Ring 1: minimal X installation (990 packages)

Ring 2: KDE and GNOME desktop (867 packages)

Ring X: the rest (5602 packages and growing)

 Added "Staging Projects" for interim building and testing

https://en.opensuse.org/openSUSE:Factory_development_model



Rings: collection of deeply interconnected packages

openSUSE Build Service > Projects > openSUSE:Factory:Rings > Subprojects							
Overview	Repositories	Requests	Users	Subprojects	Advance	d	
Parent projects of openSUSE:Factory:Rings							
	F	arent proj	ect				Description
openSUS	Ξ					openSUSE Project	
openSUS	E:Factory		The next openSUSE distribution				
Subprojects of openSUSE:Factory:Rings							
	Subproject					Description	
0-Bootstra	ъp		The bootstrap cycle of factory				
1-Minimal	X		2nd ring based on Bootstrap and building minimalX DVD				
2-TestDVE)		A pretty much complete DVD				

openSUSE:Factory > Staging projects

) 🖨 https://build.opensuse.org/project/dashboard/openSUSE:Factory	Search							
C Downloads Support Community Development								
openSUSE Build Service > Projects > openSUSE:Factory > Dashboard	openSUSE Build Service > Projects > openSUSE:Factory > Dashboard							
E Staging Projects								
D acceptableC review 73%E testing 89%H building 99%J building 99%A building 99%G building building 97%I building 81%	B building 43%							
O Ring Projects								
0-Bootstrap: DONE 1-MinimalX: 97% (49 errors) 2-TestDVD: 94% (15 errors)								
Repositories of openSUSE:Factory								
standard: 99% (125 errors) live: 68% images: 60%								
✓ Open Reviews								
 openSUSE Review Team: 25 Factory Repo Checker: 49 Legal Team: 63 								

openSUSE:Factory > Staging projects



Working with staging projects



https://progress.opensuse.org/workflow/factory-proposal.html

Overview Rep	ositories Monitor Requests Users Subprojects	Advanced					
Parent projects of openSUSE:Factory:Staging							
	Parent project 🔺	Description	\$				
openSUSE		openSUSE Project					
openSUSE:Fa	ctory	The next openSUSE distribution					
Subprojects of openSUSE:Factory:Staging							
Subproject 🔺		Description	*				
А	gcc, java-1_7_0-openjdk, java-1_8_0-openjdk, k	exec-tools, opencv, xen					
A:DVD							
adi:1	leechcraft, mininet						
В	kiwi, net-snmp, perl, perl-Module-Build, vim						
B:DVD							
С	libixion, liborcus, mdds-1_2, perl-Capture-Tiny, p shadow	erl-Carp-Clan, perl-Config-Crontab, perl-Net-DNS, perl-NetAddr-IP, perl-Path-Tiny, perl-Readonly,					
C:DVD							
D	adwaita-icon-theme, bluez, gnome-terminal, libim python3-coverage, python3-pyserial, python3-vc	obiledevice, libstorage, libusbmuxd, pacemaker, pcsc-lite, postfix, powertop, python3-Twisted, /ersioner, valgrind, wicked, xorg-x11-driver-input,					
D:DVD							
E	desktop-file-utils, evince, gdm, kernel-firmware, l yast2-firewall, yast2-installation, yast2-network, y	bsolv, nfs-utils, publicsuffix, rubygem-byebug, rubygem-cfa, tigervnc, yast2, yast2-bootloader, ast2-ruby-bindings					
E:DVD							
F	lilo, lvm2						
F:DVD							
G	ColPack, LibVNCServer, ModemManager, MozillaFirefox, MozillaThunderbird, NetworkManager-gnome, amarok, cdrdao, cluster-glue, crda, devilspie, enblend-enfuse, espeak, gdb, gstreamer-plugins-bad, k3b, kdebase4-workspace, kyotocabinet, libmusi						
G:DVD							
Gcc6							
Н	Mesa, apache2, dos2unix, graphviz, hdf5, hunsp	ell, indic-fonts, patterns-openSUSE, perl-DBI, perl-MailTools, python3-setuptools					
H:DVD							
1	installation-images-openSUSE, kernel-source						
I:DVD							
J	akonadi-calendar, akonadi-search, akonadi-serv grantleetheme, gwenview5, incidenceeditor, kaco	er, ark, baloo5-widgets, calendarsupport, dolphin, dragonplayer, eventviews, gpgmepp5, grantlee5, ounts-integration, kaccounts-providers, kalarmcal					
J:DVD							
PIE	global PIE default						



SLE12 is just the final step

Requests OBS vs IBS





♦ ♦			C Q Search		
	Downloads	Supp	ort Community Development		
≜ ∘r	enQA > Test results :	> Build201	60512183403@openSUSE Leap 42.1 Test Updates > Test 176979	Login	
Res	ults for opensuse-42.1	-UpdateTe	est-x86_64-Build20160512183403-textmode@uefi-2G		
Res	Result: failed finished 5 days ago (14:13 minutes) Details Logs & Assets Settings Comments (0) Previous results (10)				
Deta					
Test		Result	References		
🗯 ins	stallation				
	bootloader_uefi 🖋	passed			
	welcome #	passed			
	good_buttons 🖋	passed			
	installation_mode #	passed			
	partitioning #	passed			
	partitioning_finish #	passed			
	installer_timezone #	passed			
	setup_online_repos يو	passed		955. 955.	
	logpackages ø	passed	al wait_sen al		
install	er_desktopselection	passed	Reach r Base		

https://openqa.opensuse.org



SUSE Linux Enterprise Lifecycle and Schedule

SUSE Linux Enterprise Server 12 Life Cycle and Policies

	G	Extended Support		
	Years 1-5	Years 6-7	Years 8-10	Years 11-13
Self Support	Yes	Yes	Yes	Yes
Maintenance Patches	Yes	Yes	Yes	Ltd. ¹ , LTSS ²
Technical Support	Yes	Yes	Yes	Ltd. ³ , LTSS ⁴
Security Patches	Yes	Yes	Yes	LTSS ⁵
Defect Resolution	Yes	Yes	Ltd. ⁶	LTSS ⁷
Service Packs	Yes	Yes	No	No
Additional Hardware Enablement and Software Enhancements	Yes	Ltd. ⁸	No	No

Source: https://www.suse.com/support/policy.html

1 Access to previously released patches with an active subscription.

2 Access to patches for earlier product versions possible with optional Long Term Service Pack Support (LTSS).

3 Limited migration and configuration assistance provided with standard or priority subscription.

4 More comprehensive installation, migration, configuration and break fix technical support available with optional LTSS.

5 Only available with LTSS.

6 Limited to severity level 1 and 2 defects.

7 Only available with LTSS. Limited to severity level 1 and 2 defects.

8 Discretionary, based on customer and partner requests.

SUSE Linux Enterprise Server 12 Life Cycle Model



13-year lifecycle

- 10 years general support
- 3 years extended support

Different Lifecycle for Desktop and Modules. Not committed. Dates subject to change.

Long Term Service Pack Support (LTSS)

- Available for all versions, including GA
- Up to 3 years extended support


SUSE Linux Enterprise Server 12 Life Cycle and Code Streams



Current work in progress:

- Planning for SUSE Linux Enterprise 12 SP2
- Long term planning (SLE 12 SPs and SLE 13)

Heads Up:

• For SLE 12 SP2 we are planning a Kernel version upgrade

Not committed. Dates subject to change.

https://www.suse.com/lifecycle

♦ A https://www.suse.com/lifecycle/					
	Þ	SUSE Linux Enterprise Server 12	31 Oct 2024	31 Oct 2027	<u>SUSE Linux</u> ↓ <u>Enterprise Server</u> <u>12 SP1</u>
	SUS	Service Pack ReleaseFCS DateSE Linux Enterprise Server 1227 Oct 2014SE Linux Enterprise Server 12 SP115 Dec 2015	General Ends 30 June 2016 6 months after SP2 release	LTSS Ends 01 July 2019 N/A	
	Þ	SUSE Linux Enterprise Server with Expanded Support	Click for Details	Click for Details	SUSE Linux ↓ Enterprise Server <u>12</u>
	l				0.105 · ·
	Þ	SUSE Linux Enterprise Server 11	31 Mar 2019	31 Mar 2022	SUSE Linux ↓ Enterprise Server <u>11 SP4</u>
	SUS SUS SUS SUS	Service Pack ReleaseFCSE Linux Enterprise Server 1124 MarSE Linux Enterprise Server 11 SP102 JunSE Linux Enterprise Server 11 SP229 FebSE Linux Enterprise Server 11 SP301 JulSE Linux Enterprise Server 11 SP415 Jul	S Date General Ends 2009 31 Dec 2010 2010 31 Aug 2012 2012 31 Jan 2014 2013 31 Jan 2016 2015 31 Mar 2019	LTSS Ends N/A 30 Aug 2015 30 Jan 2017 30 Jan 2019 31 Mar 2022	

Modules

Customers demand ...

- Hardware Enablement
 - Kernel, GCC / Binutils
 - Demand is often not explicit, just "expected"
- Regular Updates
- Constant Innovation
- Support
- Predictability of
 - Lifecycles, Package availability, Support commitments



How to meet these *conflicting* demands?



Modules



SUSE Linux Enterprise 12 Modules



Name	Content	Life cycle	Agility %
Legacy	Sendmail, old IMAP, old Java	Until 09/2017	0
Certifications	FIPS 140-2	Frozen versions	0
Web and Scripting	PHP, Python. Future: Node.js	3 years; overlap: 18 month	60
Toolchain	GCC	Yearly delivery	90
Advanced Systems Management	"Machinery" cfengine, puppet	Continuous Integration	90
Public Cloud	Initialization code and tools	Continuous Integration	100
Containers	Docker, Tools, Images	Continuous Integration	100

Module definition



- A module
 - is a collection of software packages,
 - has packages with logical functional cohesion
 - packages have L3 support, possibly scope limited
 - is independent of other modules,
 - delivered as a repository,
 - addition to a "base product" (SUSE Linux Enterprise Server),
 - considered part of the distribution,
 - may have different life-cycle than the core product
 - overall life-cycle
 - package life-cycle

Module - Implementation



- Delivered as repository, add
 - during installation or
 - to the installed system (YaST or SUSEConnect)
- Available online
 - Pool repository (state of packages at initial release)
 - Update repository
- Not
 - a pattern, but may provide patterns
 - a product with SKU for purchase

SUSE Linux Enterprise Server



JeOS and Containers

	SUSE Linux Enterprise Server	JeOS (Hypervisor Guest OS)	Application Container "Docker"
Size	XXXL	М	XS
Download size (MiB)	2800	300	23
Typical on disk size (MiB)	1500	300	102
Additional packages included	•		
Installer	•		
Docker host	•		
Cloud Init	•	О	
Kernel, Bootloader, Init System, Users	٠	•	
System Registration	•	•	
System update via zypper	•	•	
System Libraries	•	•	٠
Download	download.suse.com	download.suse.com	SCC, SMT, SUSE Manager
SUSE delivery	SLES	JeOS	Container Module

SUSE Package Hub uncovering hidden gems

openSUSE Build Service

	SLE 12	openSUSE 13.2	Tumbleweed
Source Packages	3000	7500	8000
Maintenance	SUSE	SUSE+Community	no
Support	SUSE	no	no
Life Time	10 years	2 years	none



SUSE Package Hub

- OBS Project to Coordinate and Consolidate Useful Packages for SUSE customers.
- **Policies** and **Checks** to **Protect** Customer's Investment in SUSE Support Services.
- Community Maintained | Community Supported
- Easy Access For Customers



Additional SLE Packages via SCC





Packaging Policies in SUSE Package Hub

- Follow openSUSE Policies
- Packages must be derived from Factory
- No conflicts with SUSE Linux Enterprise packages
- Version updates up to community maintainers
- Security issues

https://en.opensuse.org/openSUSE:Backports_Packaging_Policy



SUSE Linux Enterprise 12 SP1

SUSE Linux Enterprise 12 SP1 **Scope**

Consolidation release

- Stability of APIs and ABIs
- No Kernel version change

Expand leadership areas of SUSE Linux Enterprise

Docker support

Hardware support

- Follow customer needs
- Incremental, non-intrusive changes on all architectures
 - -x86-64, IBM System z (z13), IBM Power8
- Selective Driver Updates

https://www.suse.com/releasenotes/x86_64/SUSE-SLES/12-SP1/

Improve Operational Efficiency **Docker**



- Until now:
 - Only as TechPreview available
- Starting with 12 SP1:
 - Fully supported
 - Moved from 'main media' to module ("Containers Module")
 - yast2-docker for easier managing docker images
 - => "Faster" lifecycle than core iso
 - => SLE 11 SP3, SP4 and SLE 12 images available



Improve Operational Efficiency JeOS – Just Enough Operating System

- Not everybody wants/needs a full-blown OS
- Solution: Provide something that is "just enough"
- Small image size for download (<300MB, bigger for VMware)
- \cdot Bigger when put on media
- "basic" system
- Updateable (after registration)
 - => Currently available for SLES 12, upcoming: SP1
- Note: This is a separate delivery!



SUSE Linux Enterprise 12 SP2

SUSE Linux Enterprise 12 SP2 Scope

Refresh release

- Kernel version upgrade
- Systemd version upgrade
- Significant Hardware Enablement
- Data Plane Development Kit with openVSwitch
- ISV certifications remain
- Stability of userland APIs and ABIs: core libraries and system compiler remain backward compatible
- FIPS: do not touch certified security modules (except Kernel)



SUSE Linux Enterprise 12 SPs Public Betas

SUSE wants to become even more open

→ We are planning public betas, tentatively for SUSE Linux Enterprise 12 SP2 already

If you want to join, contact us at **beta-programs@lists.suse.com**









Which OpenStack Compute (Nova) hypervisors are in use?





KVM(Kernel-based Virtual Machine)

- KVM: full virtualization solution for Linux on x86 hardware containing virtualization extensions (Intel VT or AMD-V)
 - kvm.ko: loadable kernel module
 - provides core virtualization infrastructure and processor specific module, kvm-intel.ko or kvm-amd.ko
- run multiple VMs of unmodified Linux or Windows images
- each VM has private virtualized hardware: a network card, disk, graphics adapter, etc.
- KVM is open source software
- kernel component of KVM included in mainline Linux 2.6.20
- userspace component of KVM included in mainline **QEMU 1.3**

http://www.linux-kvm.org/page/Main_Page



KVM Virtualization Architecture





I/O Virtualization via VFIO

- Virtual Function I/O
- replaces traditional KVM PCI Pass-Through
- VFIO driver exposes direct device access to userspace in a secure memory (IOMMU) protected environment
- VM Guests directly access HW devices on VM Host Server (pass-through)
 - does not allow to share devices
 - each device can only be assigned to a single VM Guest
 - needs support from VM Host Server CPU, chipset and BIOS/EFI
- Advantages:
 - Resource access is compatible with secure boot
 - Device is isolated and its memory access protected
 - Offers a userspace device driver with more flexible device ownership model
 - independent of KVM technology, and not bound to x86 architecture only

SR-IOV

- Single Root I/O Virtualization
- performance and ability to share a device with several VM Guests
 - requires special I/O devices, capable of replicating resources to appear as multiple separate devices
 - "pseudo" device can be directly used by a single guest



Management of VM guests, virtual storage/networks

- $\boldsymbol{\cdot} \text{QEMU tools}$
 - qemu-system-ARCH, QEMU monitor, qemu-img, qemu-ndb
- Libvirt-based tools
 - libvirt, virsh, virt-manager, virt-install, virt-viewer



Paravirtualized OS support

Operating System	FV Support (Xen/KVM)	PV Support (Xen)
SLES 12 SP1	Full	Full
SLES 12	Full	Full
SLES 11 SP4	Full	Full
SLES 11 SP3	Full	Full
SLES 10 SP4	Full	Full
SLED 12	Technology preview ¹	Technology preview ¹
SLED 12 SP1	Technology preview ¹	Technology preview ¹
OES 11 SP1	None	Full ^{2, 3}
OES 11 SP2	None	Full ^{2, 3}
Netware 6.5 SP8	None	Full (32-bit only) ²
RHEL 5.11 +	Full/best effort ⁴	Full/best effort ⁴



Paravirtualized OS support

Operating System	FV Support (Xen/KVM)	PV Support (Xen)
RHEL 6.7 +	Full/best effort ⁴	Full/best effort ⁴
RHEL 7.2+	Full/best effort ⁴	Full/best effort ⁴
Windows Server 2003 SP2+	Full	None
Windows Server 2008 SP2+	Full	None
Windows Server 2008 R2 SP1 +	Full	None
Windows Server 2012+	Full	None
Windows Server 2012 R2+	Full	None
Windows 7 SP1 +	Best effort	None
Windows 8+	Best effort	None
Windows 8.1+	Best effort	None
Windows 10	Best effort	None



Qemu I

- KVM is implemented as linux kernel modules, which enables the linux kernel to function as an integral part of the KVM hypervisor
- The hypervisor-guest interaction is controlled by QEMU through the /dev/kvm ioctl interface
- The linux host assists in the virtualization of storage, networking and display resources as well as direct hardware passthrough of PCI and USB devices
- Linux memory and cpu management features are used by both KVM and QEMU to enable guests to share host resources as efficiently as possible



Qemu II

- QEMU is a primary component of KVM based virtualization
- The legacy qemu-kvm program is provided for continuity with pre SLES 12 usage, including in libvirt xml references
- The QEMU emulator binaries qemu-system-x86_64 and qemu-system-i386 (x86 host), qemu-system-s390x (System z host), and qemu-system-aarch64 (ARM64) are now the primary programs to use to enable KVM virtualization
- When using these programs, the -machine option accel=kvm (or its alias -enable-kvm) must be specified for KVM acceleration to be active
- Note that Xen virtualization also relies on QEMU components for various aspects of its guest support
- Libvirt is the preferred means of accessing QEMU/KVM functionality



virt-manager hardware component setup





Under the hood: virsh start sles12sp1

- /usr/bin/qemu-system-x86_64 -name sles12sp1-S
 -machine pc-i440fx-2.1,accel=kvm,usb=off
 - -cpu SandyBridge
- -m 2048
- -realtime mlock=off
- smp 1, sockets=1, cores=1, threads=1
- -uuid 45eb3eae-73b2-4961-ad43-02dac2436809
- -no-user-config
- -nodefaults
- -chardev socket,id=charmonitor,path=/var/lib/libvirt/qemu/ sles12sp1.monitor,server,nowait
- -mon chardev=charmonitor,id=monitor,mode=control
- -rtc base=utc,driftfix=slew
- -global kvm-pit.lost_tick_policy=discard
- -no-hpet
- -no-shutdown
- -boot strict=on
- -device ich9-usbehci1,id=usb,bus=pci.0,addr=0x4.0x7
- -device ich9-usbuhci1,masterbus=usb.0,firstport=0,bus=pci.0,multi function=on,addr=0x4

- -device ich9-usb-uhci2, masterbus=usb.0,firstport=2,bus=pci.0,addr=0x4.0x1
- -device ich9-usb-uhci3, masterbus=usb.0,firstport=4,bus=pci.0,addr=0x4.0x2
- -drive file=/dev/mapper/vmvg-sles12sp1, if=none, id=drivevirtio-disk0, format=raw, cache=none, aio=native
- -device virtio-blk-pci, scsi=off, bus=pci.0,addr=0x5,drive=drive-virtio-disk0,id=virtiodisk0,bootindex=2
- -drive file=/install/SLE-12-SP1-Server-DVD-x86_64-DVD1.iso, if=none,id=drive-ide0-1-0,readonly=on,format=raw
- -device ide-cd,bus=ide.1,unit=0,drive=drive-ide0-1-0,id=ide0-1-0,bootindex=1
- -netdev tap,fd=24,id=hostnet0,vhost=on,vhostfd=25
- -device virtio-net-pci,netdev=hostnet0, id=net0,mac=52:54:01:6a:c1:98,bus=pci.0,addr=0x3
- -chardev pty,id=charserial0
- -device isa-serial, chardev=charserial0, id=serial0
- -device usb-tablet,id=input0
- -vnc 127.0.0.1:0
- -device cirrus-vga,id=video0,bus=pci.0,addr=0x2
- -device virtio-balloon-pci,id=balloon0, bus=pci.0,addr=0x6
- -object rng-random,id=rng0,filename=/dev/random
- -device virtio-rng-pci,rng=rng0,bus=pci.0,addr=0x
SUSE Linux Enterprise Virtual Machine Driver Pack(VMDP)

- The SUSE Linux Enterprise Virtual Machine Driver Pack is a fee-based bundle of paravirtualized disk, network and balloon drivers
- It allows customers to run fully-virtualized Windows workloads on SUSE Linux Enterprise Server with near-native performance
- It does this by opening additional channels of communication between the Xen and KVM hypervisors in SUSE Linux Enterprise and the unmodified guest operating systems running in a virtual environment
- Accelerates network and storage input/output and improves overall efficiency

- Note: Windows guests need the VMDP to provide ballooning

Platforms for drivers

- Windows Server 2012 R2
- Windows Server 2012
- Windows Server 2008 R2
- Windows Server 2008
- Windows 10
- Windows 8.1
- Windows 8
- Windows 7 SP1
- Windows Vista SP2



Windows specific

- Hyper-V Emulation Support
 - Windows guests can optionally be accelerated with QEMU/KVM provided Hyper-V hypercalls(partly emulate a Hyper-V environment)



Appendix



- The Tumbleweed distribution is a pure rolling release version of openSUSE containing the latest stable versions of all software instead of relying on rigid periodic release cycles. The project does this for users that want the newest stable software.
- Tumbleweed is based on Factory, openSUSE's main development codebase. Tumbleweed is updated once Factory's bleeding edge software has been integrated, stabilized and tested. Tumbleweed contains the latest stable applications and is ready and reliable for daily use.
- This idea has been discussed in mailing lists for a long time and was conceived into action by Greg Kroah-Hartman, originally as an 'add-on' set of rolling updates which could be layered on top of a regular openSUSE release. On November 4th 2014 the Tumbleweed rolling release and Factory rolling release merged, leaving the single openSUSE Tumbleweed rolling release we have today

Modules in detail

Life-cycle details

- Continuous Integration
 - Integration of new features through version upgrades
 - Bug fixes possible through version upgrades
 - Not "version of the day", i.e. not a continuous stream
 - Updates delivered through the update repository
- Yearly
 - A new version is delivered once a year
 - Once you start you need to keep moving

Advanced Systems Management Module



- Continuous Integration
- Includes configuration management tools
 - Puppet
 - CFEngine
 - Not Chef \rightarrow in Base used by other SUSE functionality
- Dependencies unique to this module

Container Module

- Continuous Integration
- Container management tools
- \cdot Container integration tools
- \cdot Container images

Legacy Module



- 3 year life-cycle
 - Module (packages within) will no longer be supported after 3 years
- Provide packages
 - to ease application migration
 - support "older" technology
 - functionality people should really not use anymore

Public Cloud Module



- Continuous Integration
- Packages for
 - instance initialization
 - Cloud management
 - CSPs
- Dependencies unique to this module

Tool Chain Module



- Yearly life-cycle
 - Delivers a new version once a year
 - Does not replace system compiler, it is additional
 - Once you start using it you need to continue to move forward with every release

Web and Scripting Module

- 3 Years with 18 month overlap
 - Works analogous to SLES life-cycle, just different timing
- Python 3 interpreter
 - Python 2.7 is in Base

Useful Links

- https://lists.opensuse.org/opensuse-factory/
- https://en.opensuse.org/Portal:Tumbleweed
- https://openqa.opensuse.org/
- https://en.opensuse.org/openSUSE:Release_process
- https://en.opensuse.org/Portal:Backports
 - FAQ Tumbleweed Oct 2014:
 - http://article.gmane.org/gmane.linux.suse.opensuse.devel/60280
- https://www.suse.com/support/programs
- https://www.suse.com/products/server

KVM

- https://www.suse.com/documentation/sles-12/pdfdoc/book_virt/book_virt.pdf
- https://www.suse.com/products/vmdriverpack
- /usr/share/doc/packages/qemu-kvm/kvm-supported.txt
- https://www.suse.com/communities/blog/virtualizing-windows-made-fast-easy/
- VMDP Pricing:



- https://www2.suse.com/products/vmdriverpack/frequently-asked-questions/



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