

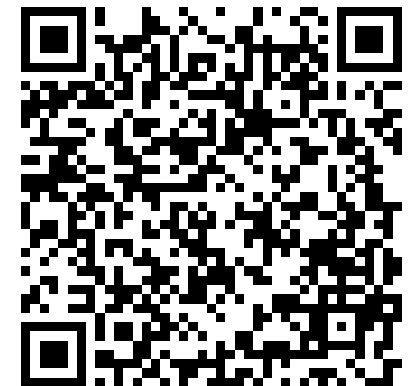
SUSE Linux Enterprise Server for System z Current & Future Features

Marcus Kraft
SUSE

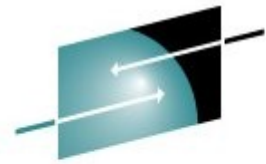
John Jolly
SUSE

March 10th, 2014
Session 14542

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Agenda



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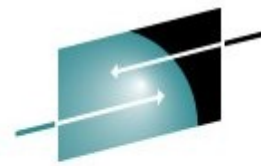
Technology • Connections • Results

- SUSE Linux Enterprise Server for System z Roadmap Update



http://www-03.ibm.com/press/us/en/attachment/40318.wss?fileId=ATTACH_FILE2&fileName=Enterprise%20Familylores.jpg



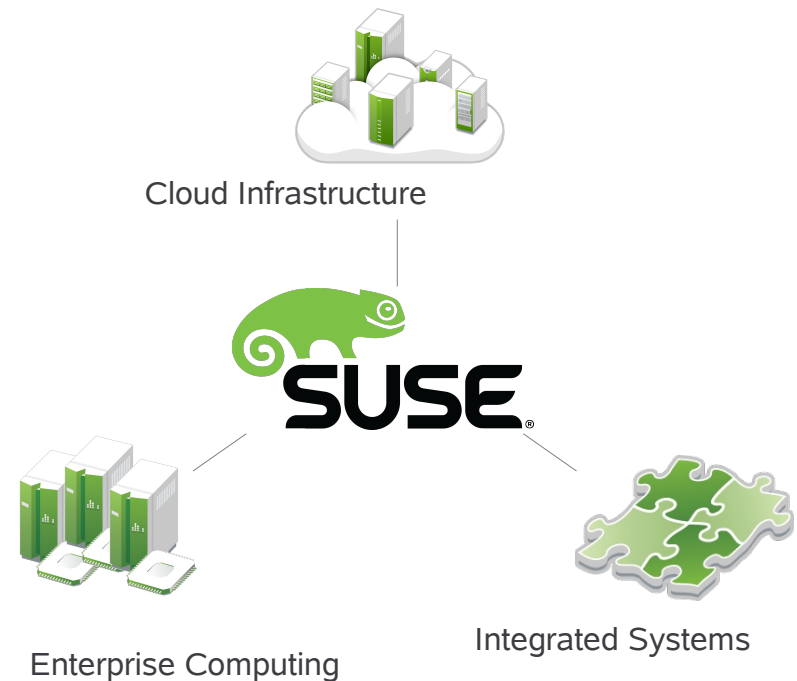


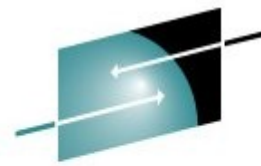
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SUSE and the Attachmate Group

- **SUSE**, headquartered in Nürnberg / Germany, is an independently operating business unit of The Attachmate Group, Inc.
- The Attachmate Group is a privately held 1 billion+ \$ revenue software company with four brands:





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SUSE Linux Enterprise Server

A highly reliable, scalable and secure server operating system, built to power physical, virtual and cloud-based mission-critical workloads.



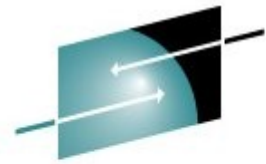
Linux you can rely on—for years to come

Run more mission-critical applications—physical, virtual and cloud



SUSE Linux Enterprise Server 11 SP3

SUSE® Linux Enterprise Build Service*

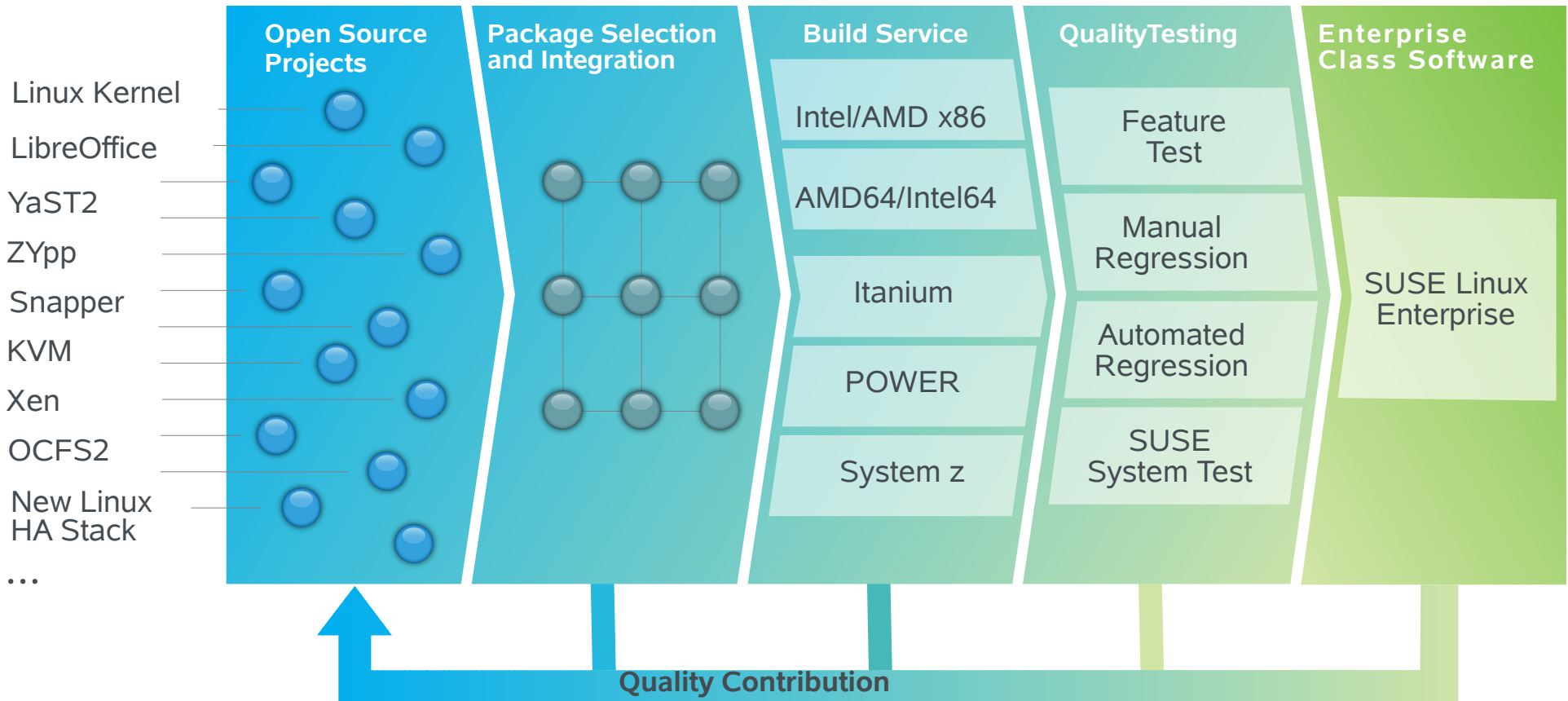


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Development Contribution

Infrastructure Contribution

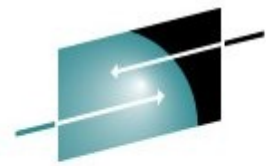


* SUSE Build Service is the internal entity of the Open. Build Service

- Reduces production problems
- Consolidates IT skills across disparate systems
- Delivers critical updates in hours – not days or weeks

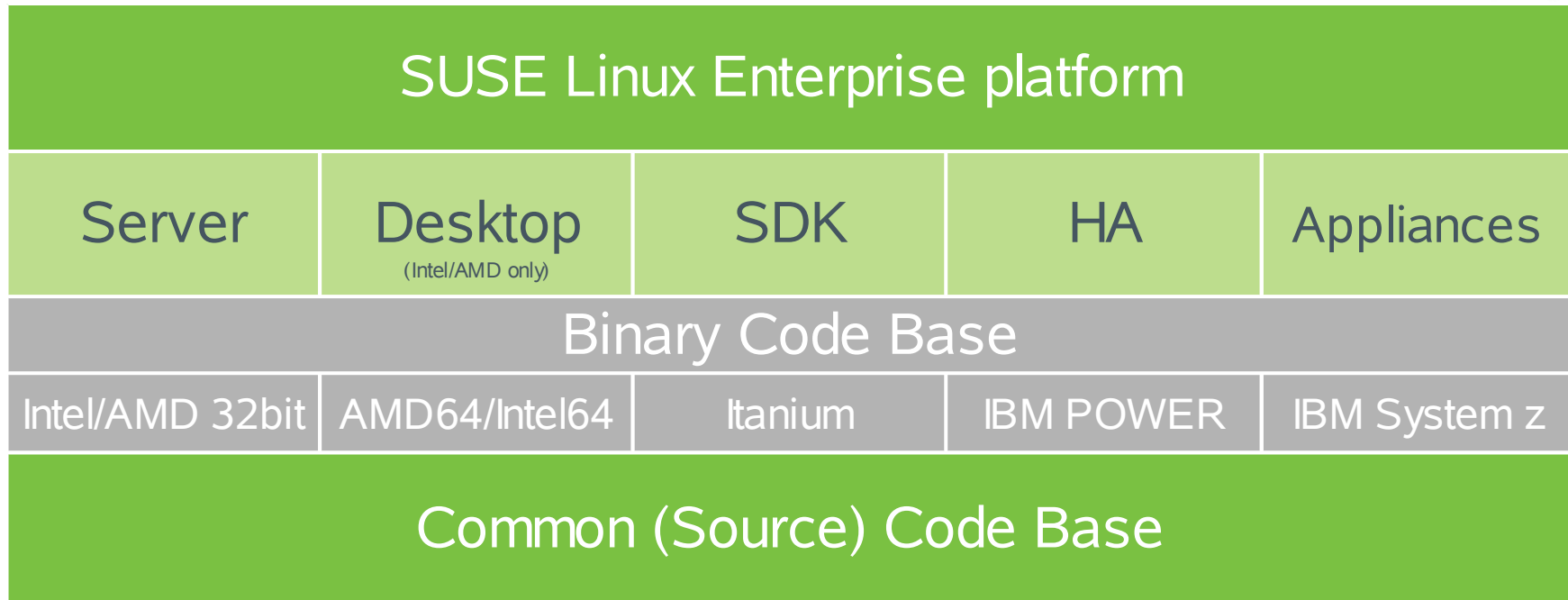


SUSE® Linux Enterprise How We Combine It

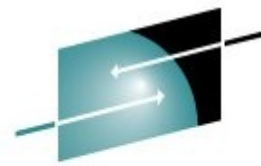


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- Foundation for all SUSE® products
- Fully supported core system
- Choose the right architecture for your workload



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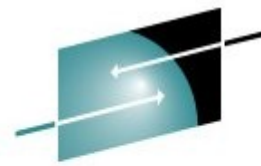
Unique Tools Included

- AppArmor Security Framework
 - Application confinement
- High Availability Extension
 - Cluster Framework, Cluster FS, DRBD, GEO-cluster*
- YaST2 systems management
 - Install, deploy, and configure every aspect of the server
- Subscription Management Tool
 - Subscription and patch management, proxy/mirroring/staging
- Starter System for System z
 - A pre-built installation server, deployable with z/VM tools



AppArmor: usr.sbin.vsftpd

/etc/apparmor/profiles/extras/



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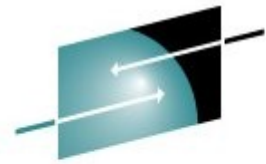
```
#include <tunables/global>

/usr/sbin/vsftpd {
  #include <abstractions/base>
  #include <abstractions/nameservice>
  #include <abstractions/authentication>

  /dev/urandom                r,
  /etc/fstab                   r,
  /etc/hosts.allow             r,
  /etc/hosts.deny              r,
  /etc/mtab                    r,
  /etc/shells                  r,
  /etc/vsftpd.*                r,
  /etc/vsftpd/*                r,
  /usr/sbin/vsftpd             rmix,
  /var/log/vsftpd.log          w,
  /var/log/xferlog              w,
  # anon chroots
  /                             r,
  /pub                          r,
  /pub/**                       r,
  @{HOMEDIRS}                   r,
  @{HOME}/**                     rwl,
}
```



SUSE® Linux Enterprise High Availability Extension



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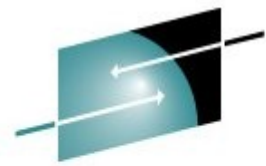
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- **Service availability 24/7**
 - Policy driven clustering
 - Messaging and membership layer
 - Pacemaker cluster resource manager
- **Sharing and Scaling data-access by multiple nodes**
 - Cluster file system
 - OCFS2
 - Clustered Logical Volume Manager
- **Disaster tolerance**
 - Data replication via IP
 - Distributed Replicated Block Device
 - Node recovery
- **Scale network services**
 - IP load-balancing
- **User friendly tools**
 - Graphical user interface
 - Unified command line interface



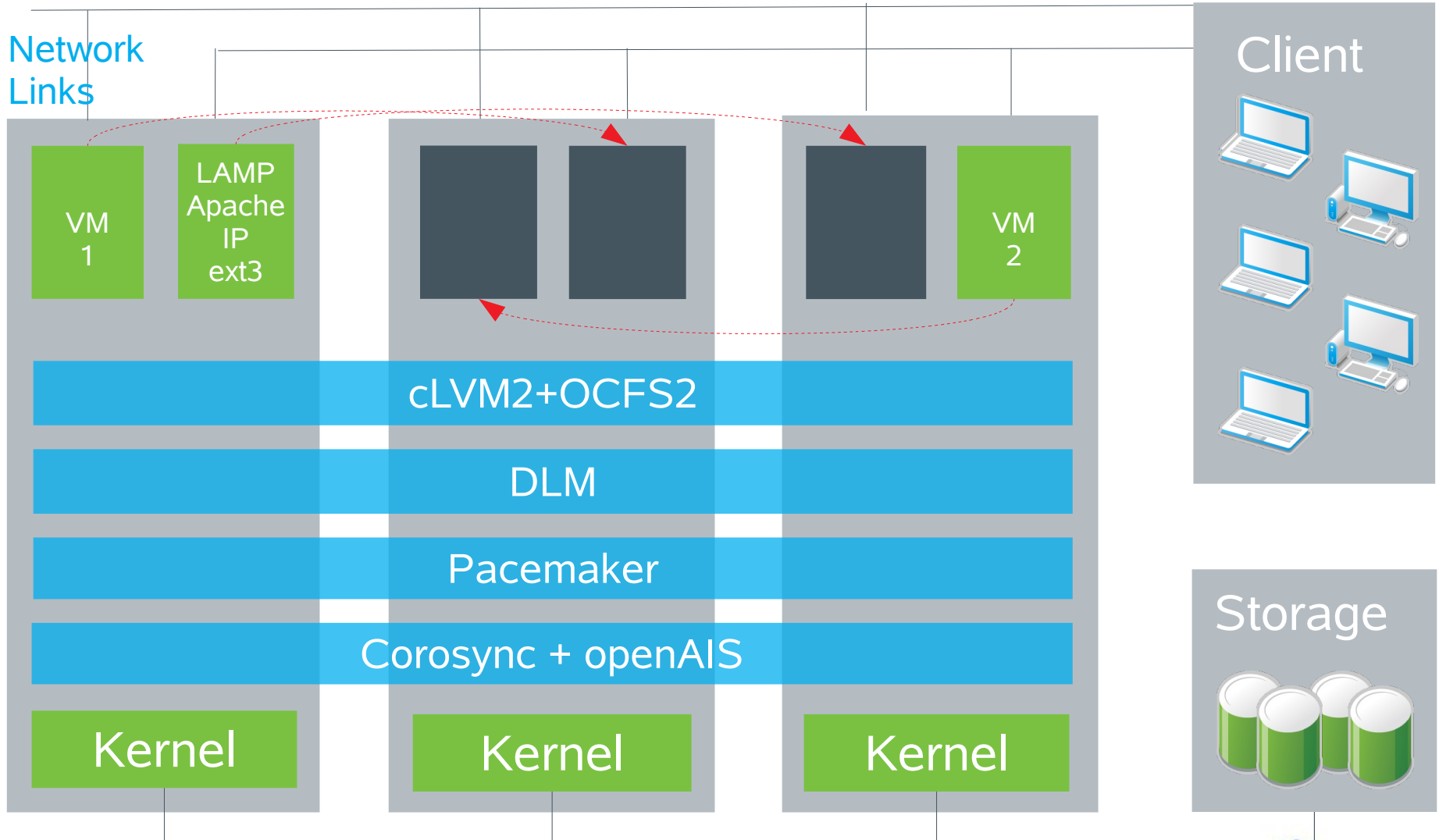
Cluster Example

SUSE® Linux Enterprise High Availability Extension

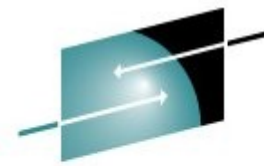


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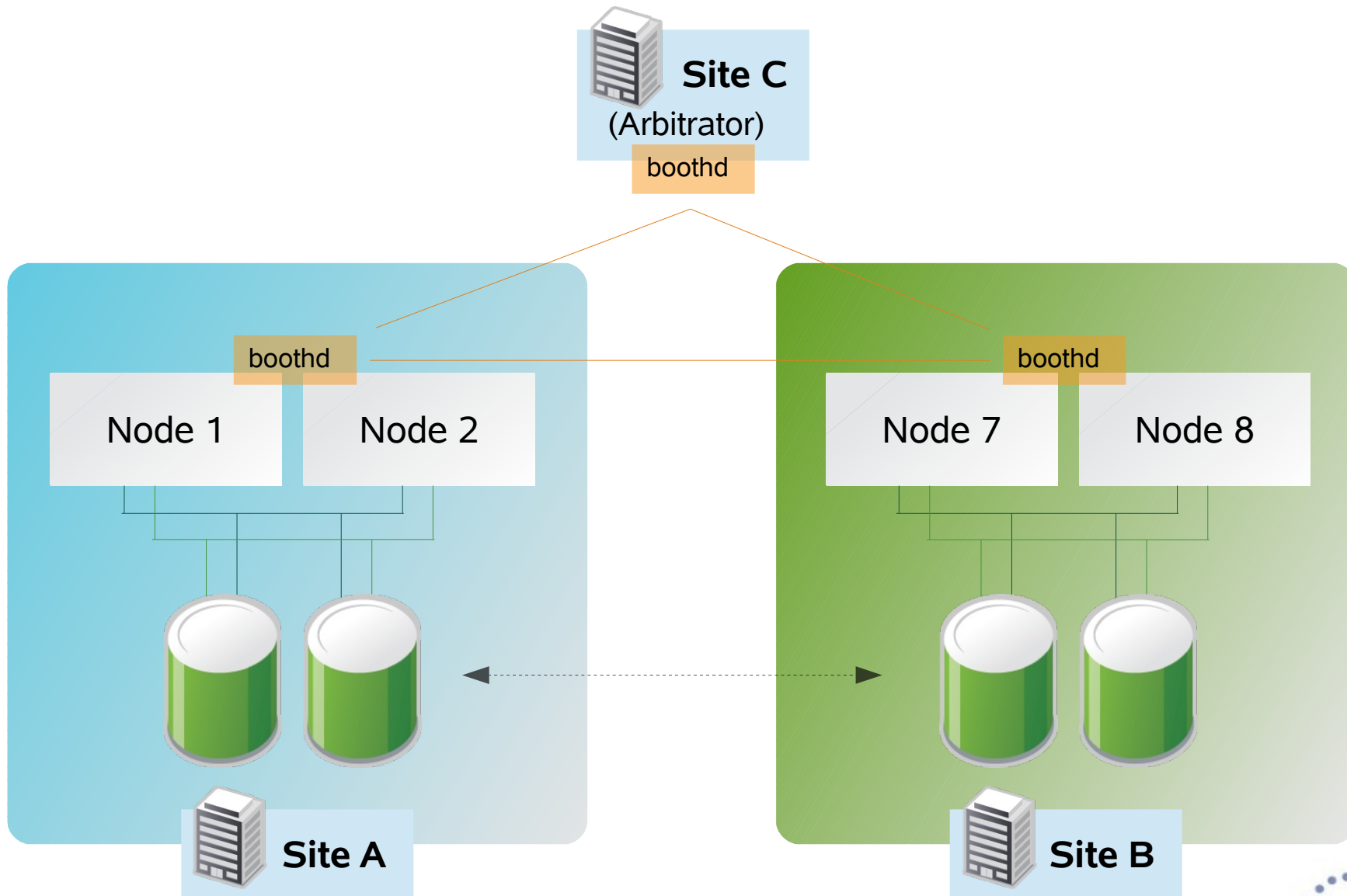


Geo Cluster – Setup

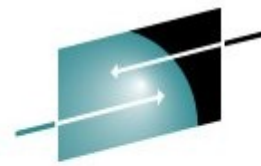


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btrfs



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Why btrfs?

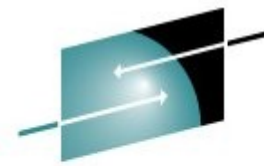
Btrfs – Features

- Scalability (16 EiB) including effective shrink
- Supports offline in-place migration from ext2, ext3
- Support for Copy on Write
- Powerful Snapshot capabilities
- Other Capabilities:
 - SSD optimization (TRIM support)
 - Data integrity (checksums)



Technology Overview

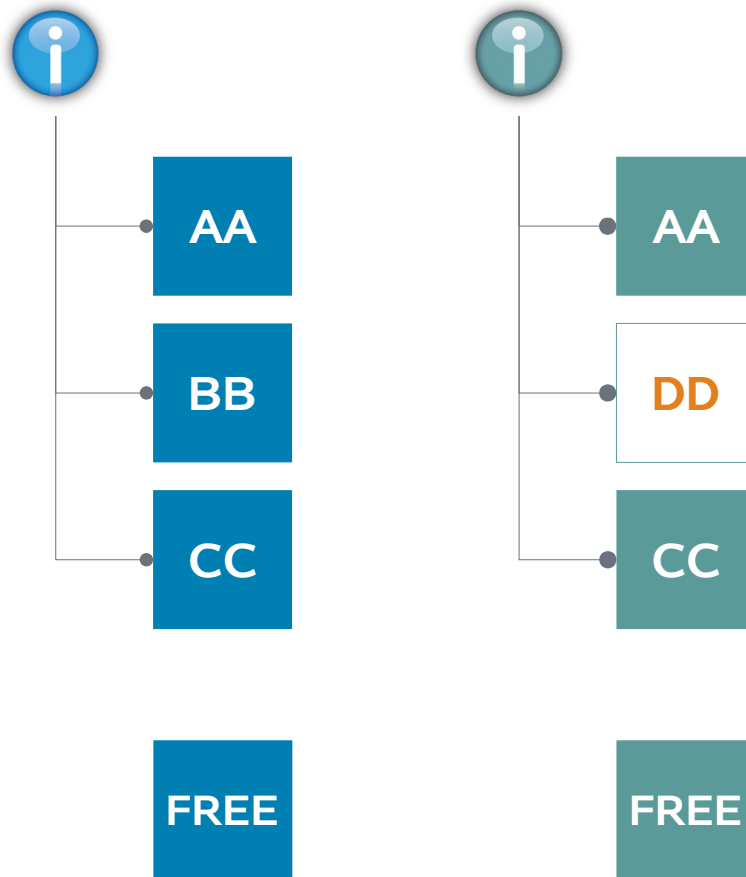
Copy on Write



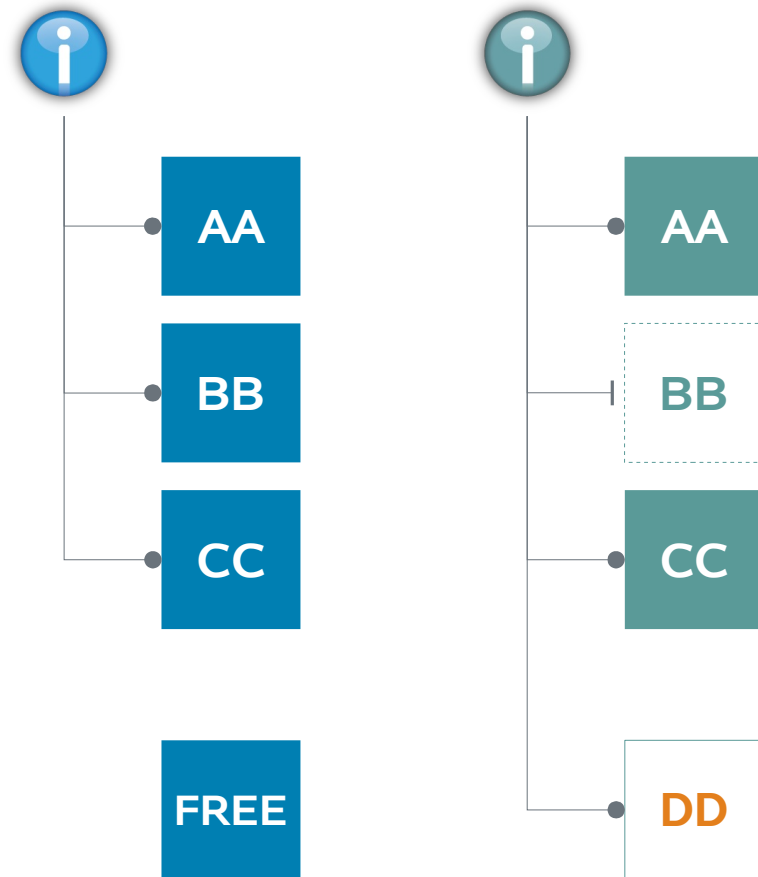
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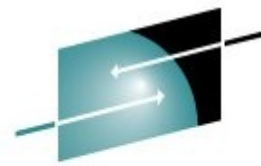
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“Normal” Write



Copy on Write





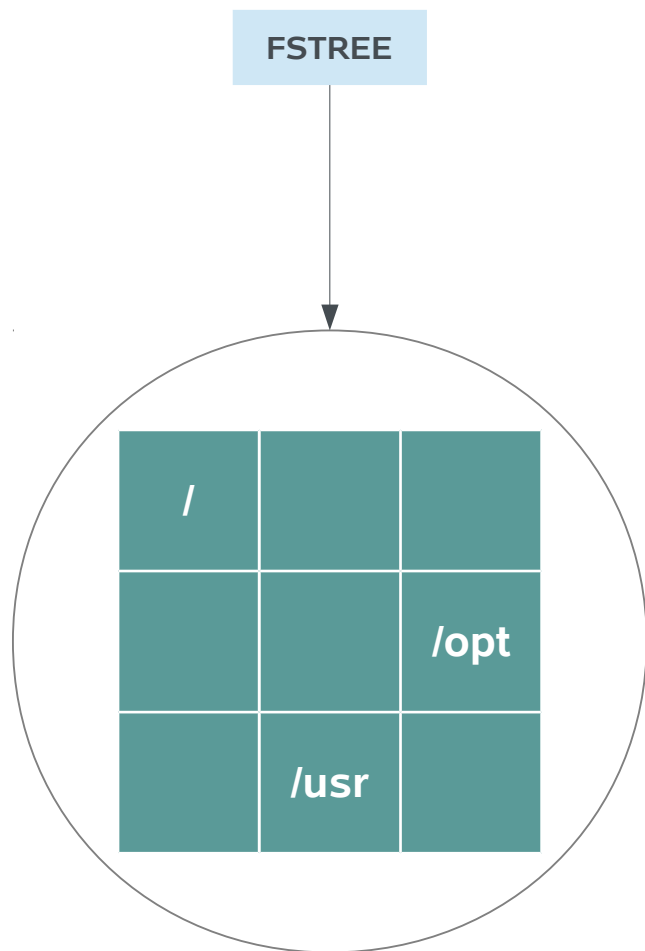
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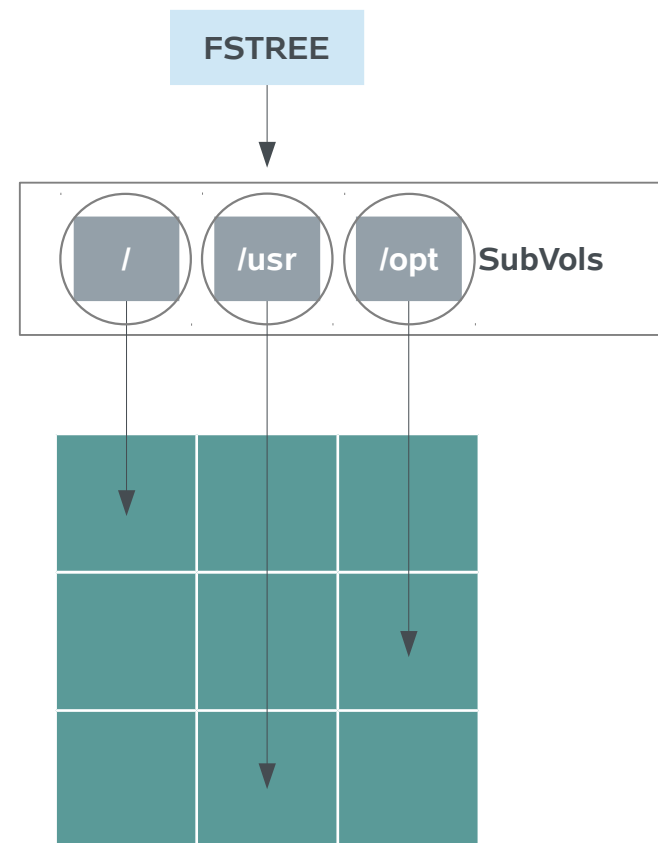
Technology Overview

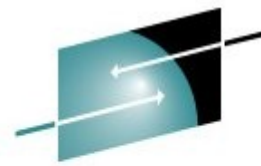
Subvolume

Normal Filesystem



With Subvolumes

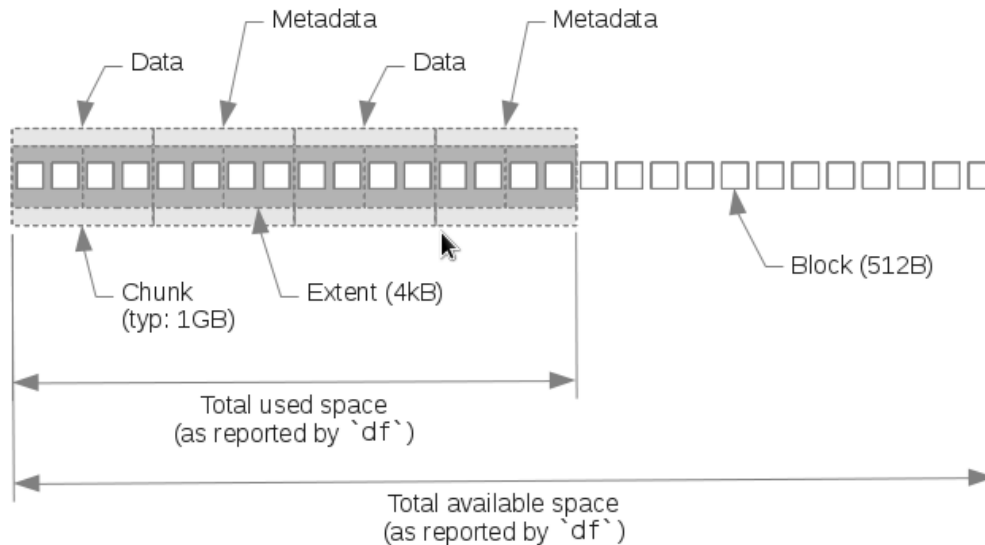




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Btrfs Disk Space And Extents



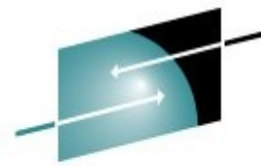
In case of a Btrfs filesystem on a single underlying block device

```
# btrfs filesystem df /
Data: total=14.50GB, used=12.20GB
System, DUP: total=8.00MB, used=12.00KB
System: total=4.00MB, used=0.00
Metadata, DUP: total=1.75GB, used=904.11MB

# df -h /
Filesystem      Size  Used Avail Use% Mounted on
/dev/sda7       20G   14G   4.3G   77% /
#
```

Disk utilization

12,2GB + 2x 0,9GB + = 14 GB



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Snapshots in SUSE Linux Enterprise 11 SP3 YaST2 Management

The screenshot shows the YaST2 Snapshots window with a list of snapshots. The 'Selected Snapshot Overview' dialog is open, showing a file tree with 'printers.conf' selected. The dialog also displays options to compare snapshots and the content of the selected file.

ID	Type	Start Date	End Date	Description
1	Single	Wed 17 Aug 2011 04:30:01 PM CEST		timeline
2 - 3	Pre & Post	Wed 17 Aug 2011 04:31:54 PM CEST	Wed 17 Aug 2011 04:32:46 PM CEST	yast lan
4 - 5	Pre & Post	Wed 17 Aug 2011 04:32:48 PM CEST	Wed 17 Aug 2011 04:32:59 PM CEST	yast lan
6 - 7	Pre & Post	Wed 17 Aug 2011 04:32:59 PM CEST		
8 - 9	Pre & Post	Wed 17 Aug 2011 04:32:59 PM CEST		
10 - 11	Pre & Post	Wed 17 Aug 2011 04:32:59 PM CEST		
12	Single	Wed 17 Aug 2011 04:32:59 PM CEST		
13	Single	Wed 17 Aug 2011 04:32:59 PM CEST		
14	Single	Wed 17 Aug 2011 04:32:59 PM CEST		
15	Single	Wed 17 Aug 2011 04:32:59 PM CEST		
16	Single	Wed 17 Aug 2011 04:32:59 PM CEST		
17	Single	Wed 17 Aug 2011 04:32:59 PM CEST		
18	Single	Wed 17 Aug 2011 04:32:59 PM CEST		
19	Single	Thu 18 Aug 2011 04:32:59 PM CEST		
20	Single	Thu 18 Aug 2011 04:32:59 PM CEST		

Selected Snapshot Overview

10 - 11

- etc
 - cups
 - printers.conf**
 - printers.conf.O
 - var

Show the difference between first and second snapshot
 Show the difference between first snapshot and current system
 Show the difference between second snapshot and current system

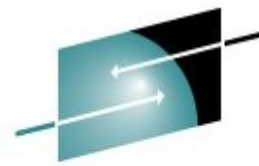
File content was modified.

```
--- /.snapshots/10/snapshot/etc/cups/printers.conf 2011-08-17 16:20:38.325347599 +0200
+++ /.snapshots/11/snapshot/etc/cups/printers.conf 2011-08-17 16:36:54.936184604 +0200
@@ -1,12 +1,12 @@
# Printer configuration file for CUPS v1.3.9
-# Written by cupsd on 2011-08-17 16:20
+# Written by cupsd on 2011-08-17 16:36

Info HP LaserJet 4050 Series Postscript (recommended)
```

Buttons: Restore From First, Restore From Second, Cancel, Restore Selected

SLES for System z 11 SP3



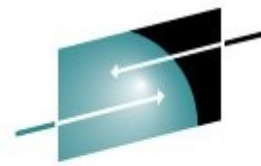
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SUSE® Linux Enterprise Server for System z 11 SP3

- zEC12 + zBX = IBM zEnterprise exploitation continued
 - **zBC12, z/VM 6.3**, zBX HX5 support (blade center extension)
 - z9 EC, z10 EC, z196 EC, z9 BC, z10 BC, z114 BC support
 - Java 7 and supportive kernel enhancements
 - Flash Express SC Memory support (/dev/scm)
 - GCC 4.7 for applications targeting zEC12 processor
- Improved RAS tools and System z specific support
 - 2 stage dump & network storage sharing with compression
 - Robust disk mirroring for large pools of DASDs (MD RAID10)
 - Enhanced DASD statistics for PAV & HPF
 - IUCV terminal server client & server setup support
 - s390-tools update





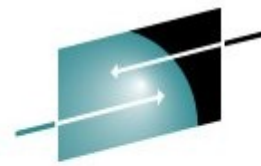
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zEC12 Exploitation

- Kernel support to improve Java performance (Transactional Execution)
 - Middleware & applications using Java will benefit
 - Inclusion of latest Java 7
- Storage class memory – Flash Express
 - Support for storage device: /dev/scm
 - Provides low latency and high throughput for block I/O
- Support for Crypto Express 4S cards
- Leverage Cross Memory Attach Functionality
 - Speedy middleware data exchange via shared main storage
- Backport GCC 4.7.x patches (SDK)
 - Add new instructions to the compiler (z196, zEC12)
 - Added new pipeline description to generate optimized code





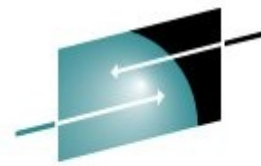
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Enhanced Dump Capabilities

- Two Stage Dumper framework
 - More flexible and efficient handling of dumps
- Compression of kernel dumps
 - More efficient use of disk storage, lower space requirements
- Fuzzy live dump
 - Extract current memory state of the kernel for debugging
- Allow to compare dump system with boot system
 - Did the dump occurred on the system it was IPLed ?
- Add option to mkdumprd to clean up older initrd's
 - Dump and initrd handling in /boot
- FICON DASD sanity check
 - Detect path connection errors





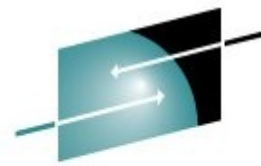
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Misc

- Enhanced DASD statistics for PAV and HPF
 - Improved diagnosis and analysis
 - Supports recommendations on the use of eg aliases
- Optimized compression library zlib
 - Enhanced to speed up Java, report generation, backup and installation
- ZYpp transaction auditing
 - Track transaction id also for client side
- libhugetlbf support
 - Allow applications to benefit from hugetbls w/o recompile
- Enable larger shm segments than 256GB
 - Allows data bases to share larger areas

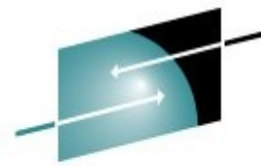




Technical Preview: KVM for s390x

- Kernel Based Virtual Machine
 - KVM (for Kernel-based Virtual Machine) is a virtualization solution for Linux on x86, POWER and z/Architecture hardware containing virtualization extensions.
 - It consists of a loadable kernel module, `kvm.ko`, that provides the core virtualization infrastructure and a processor specific module (eg. `kvm-intel.ko` or `kvm-amd.ko`)
 - KVM also requires a modified QEMU to connect to the I/O world of the hosting system.
 - Lowers the entry barrier for non-mainframe, but Linux skilled users to explore hardware and virtualization options of the mainframe

Tools / SDK



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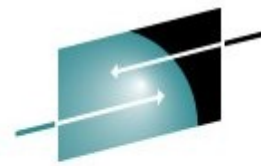
zPDT

IBM System z Personal Development Tool

https://www.ibm.com/partnerworld/page/pw_com_zpdt

- zPDT is a software-based application tool
 - IBM System z platform for ISV application development, testing, demo
 - A virtual System z architecture environment that allows select mainframe operating systems, middleware and software to run unaltered on x86 processor-compatible platforms.
 - Portable System z platform for training & education of applications and operating system environments
 - Supports openSUSE 11+, SLES 11 SP3+ x86_64, and others
 - SUSE's evaluation versions for x86_64 and s390x available at <http://www.suse.com/products/server/eval.html>





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Developer Tools In SDK

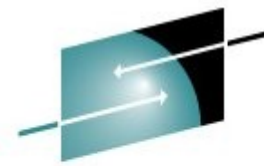
Dynamic analysis tools

- valgrind
 - Memcheck
 - Cachegrind
 - Massif
 - Helgrind
 - DRD
 - None
 - Exp-ptrcheck
 - Callgrind
- <http://valgrind.org>



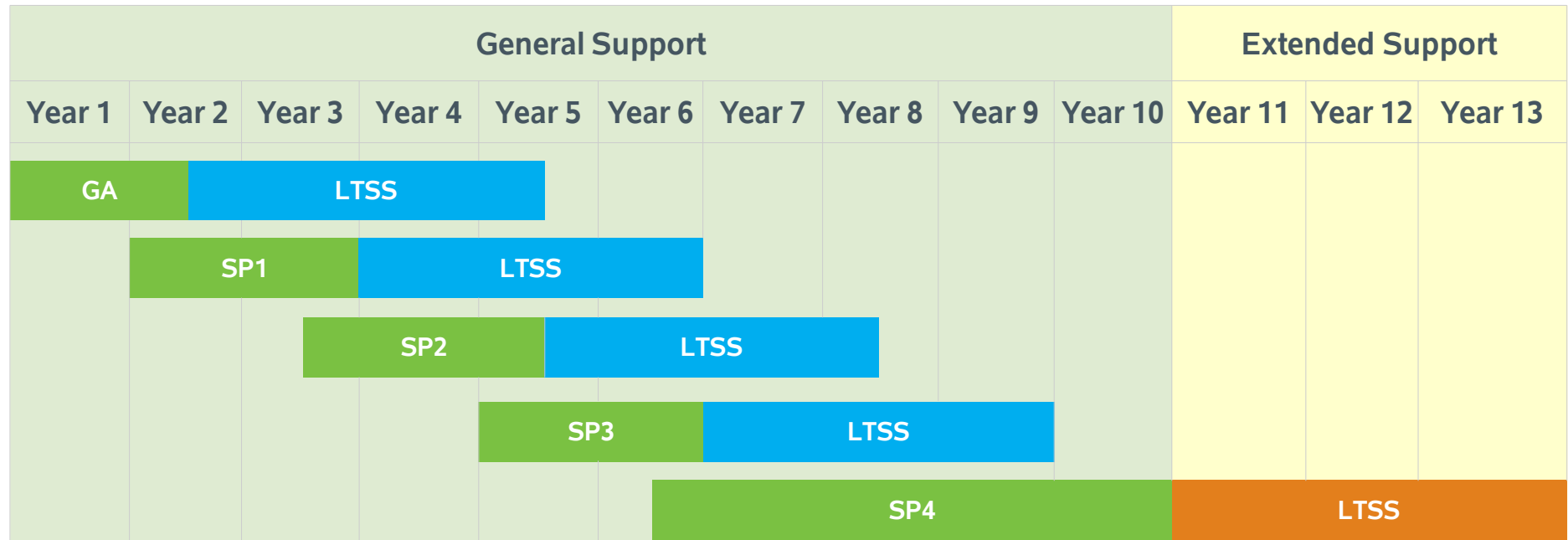
Lifecycle

SUSE® Linux Enterprise Server 11 Lifecycle Model



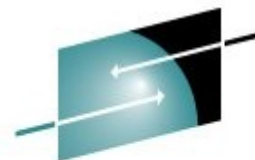
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- **13-year lifecycle** (10 years general support, 3 years extended support)
- **5-year lifecycle per Service Pack** (2 years general + 3 years extended support)
- Long Term Service Pack Support (LTSS) available for all versions, including GA





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http://www.suse.com/lifecycle/

Product Support Lifecycle

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- [Products exiting Extended Support within 90 days](#)

Product Support Lifecycle Details

PRODUCT RELEASE	GENERAL SUPPORT ENDS	EXTENDED SUPPORT ENDS	SELF-SUPPORT ENDS	CURRENT VERSION	REPLACEMENT PRODUCT
▶ SUSE Linux Enterprise Server 11	31 Mar 2019	31 Mar 2022	31 Mar 2022	SUSE Linux Enterprise Server 11 SP3	SUSE Linux Enterprise Server 11
Service Pack Release		FCS Date	General Ends		
SUSE Linux Enterprise Server 11		24 Mar 2009	31 Dec 2010		
SUSE Linux Enterprise Server 11 SP1		02 Jun 2010	31 Aug 2012		
SUSE Linux Enterprise Server 11 SP2		29 Feb 2012	31 Jan 2014		
SUSE Linux Enterprise Server 11 SP3		01 Jul 2013	TBD		

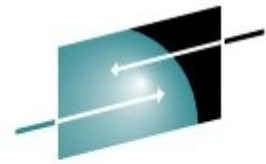
[Read more](#)



SUSE Linux Enterprise Server 12

Hardware

SUSE Linux Enterprise 12 is 64-bit



S H A R E

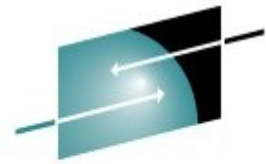
Technology • Connections • Results

- 64-bit hardware is the future
 - 64-bit kernels only
 - Execution of 32-bit applications fully supported via 32-bit execution environment on top of 64-bit kernel
- Virtualization
 - KVM, Xen, z/VM, LPAR support (depends on architecture)
 - 64-bit host; 64-bit and 32-bit guests
- Hybrid Computing
 - Platform specific workloads, GPUs, special purpose PUs
- Device Driver Innovation
 - SUSE Solid Driver Program (SSDP)



Technology

Systems Management

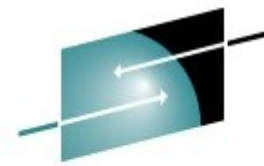


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Technology • Connections • Results

- Made for **Cloud**
 - Integration of SLES and SUSE Cloud
 - Best Guest → Best Cloud OS
- Overhaul of **network management**
 - Address the increased complexity of IaaS
- Improve monitoring support
- **Systemd** replaces SysVinit
- Standardize bootloader to **Grub2**





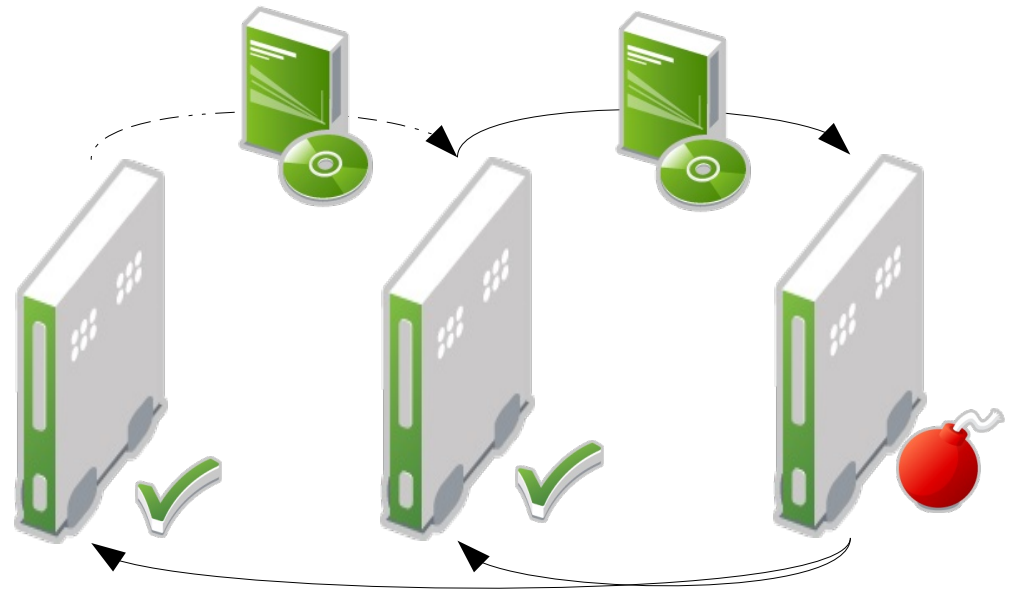
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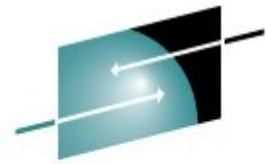
SUSE Linux Enterprise

Continuously Running Systems (1)

- Snapshot & Rollback For Full System
- Restore the whole system to a **known state** that is working
- Reduce upgrade risk
- Components
 - ZYpp
 - Btrfs
 - Snapper
 - Grub2 Bootloader integration



Local Systems Management – Benefits



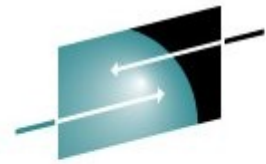
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Technology • Connections • Results

- **Best managed** Linux operating system
 - Familiar and consistent **User Interface**
 - during installation
 - for administrative tasks in the installed system
- **Reduced training costs**
 - Fast learning curve for people new to SUSE Linux Enterprise from other Operating Systems
- High grade of **Automation**



SUSE Linux Enterprise 12 Installer



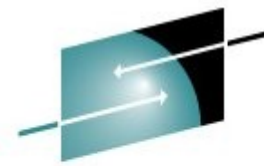
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- **Reduced installation time** and effort
 - Possibility to install directly with updates thanks to early registration
- Manual Installation
 - **Improved Workflow**, no second stage
 - Network configuration at the beginning of the installation process → network connection “everywhere” during installation
 - Multiple UI options
- Automated
 - AutoYaST
- Customized
 - Write your own modules in Ruby



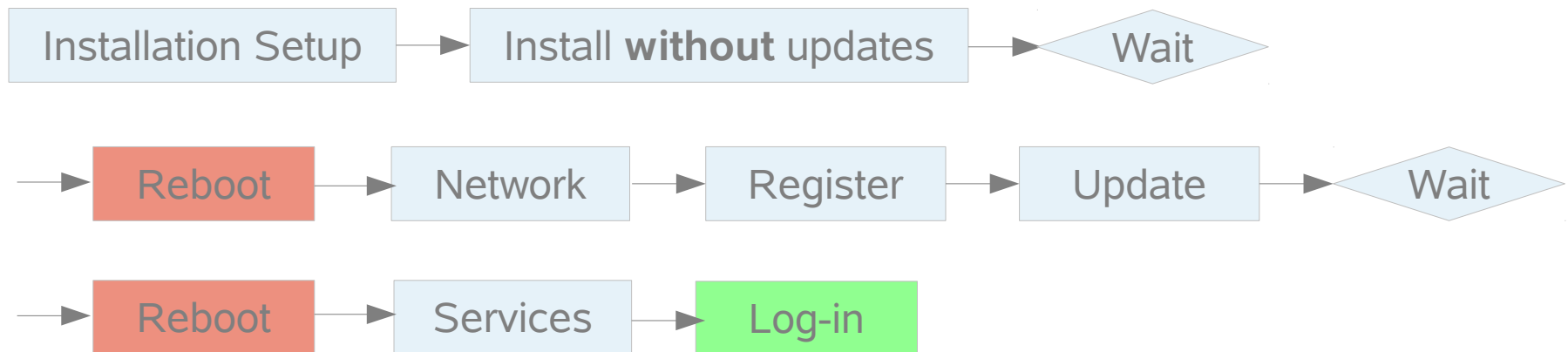
SUSE Linux Enterprise 12 Installer – Workflow



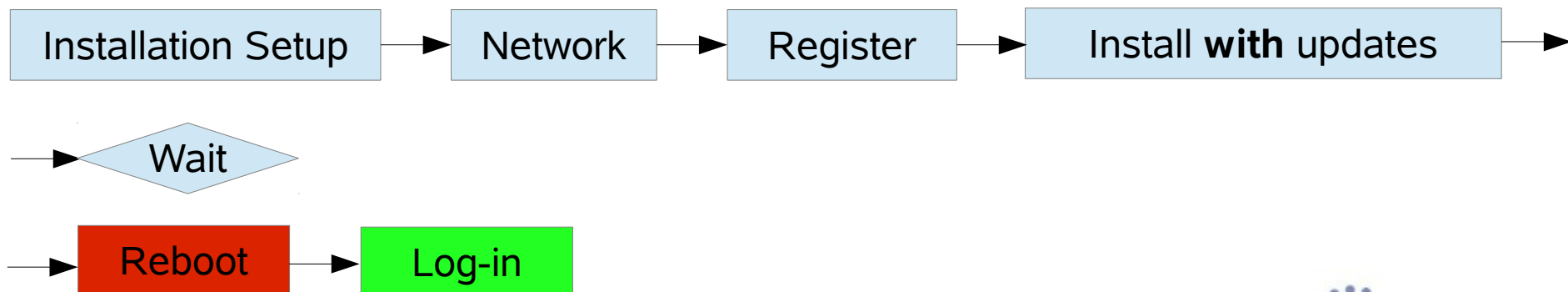
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SUSE Linux Enterprise 11



SUSE Linux Enterprise 12

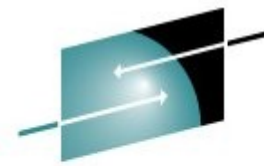


Overhaul Network Management

SUSE Linux Enterprise 12

Network Management

The “Wicked” Project



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Goal

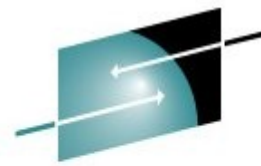
- Cope with increasingly complex configurations
- Data Center and End Users
- Benefit
 - Network configuration as a service
 - Smooth adoption & migration

Technical Attributes

- Architecture-independent
- Extensible
- Small footprint
- Event based



Overhaul System Initialization



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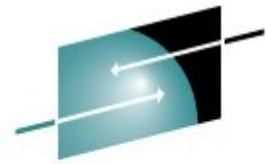
Technology – Systemd

- Init Replacement – bring up system and start services
 - Integrate system wide ulimit settings and CGroups
 - Activation via Socket and d-bus
 - Command line “systemctl”
- **Compatibility** with SystemV init scripts
 - Provide infrastructure for existing ISV applications
 - LSB compatibility
- **SUSE specific usability enhancements**
 - Keep insserv, chkconfig and /sbin/service
 - Old style (calling “rc...”) redirected to systemctl
 - LSB compatibility for targets like \$network...



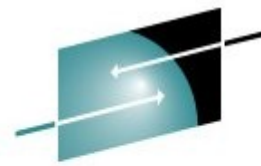
Made for Cloud

Made for Cloud – Hypervisor Support



Virtualization Technology Support

- **z/VM**
 - Full support and exploitation of z/VM related features
 - Proven mission critical track record
- **LXC**
 - Linux Containers & Control Groups
 - “OS level partitioning”
- **KVM – technical preview**
 - *I/O improvements, storage and network device hotplugging*



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Technical Preview: KVM for s390x

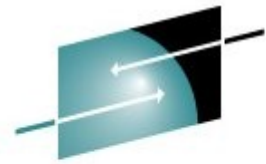
- **Kernel Based Virtual Machine**
 - KVM (for Kernel-based Virtual Machine) is a virtualization solution for Linux on x86, POWER and z/Architecture hardware containing virtualization extensions.
 - It consists of a loadable kernel module, `kvm.ko`, that provides the core virtualization infrastructure and a processor specific module (eg. `kvm*.ko`)
 - KVM also requires a modified QEMU to connect to the I/O world of the hosting system.
 - Lowers the entry barrier for non-mainframe, but Linux skilled users to explore hardware and virtualization options of the mainframe



Interoperability

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Interoperability - Vision



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- Network
 - IPv6 (USGv6)



- Virtualization and Cloud



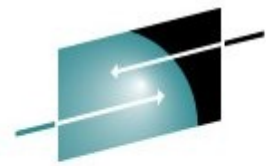
- Operating Systems Interop
 - Windows
 - UNIX
 - Linux



- Standards Compliance
 - Accessibility
 - Security (NIST, BSI)

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Interoperability - IPv6



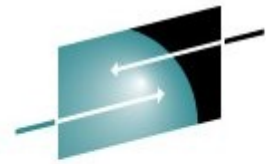
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- **Leading OS – IPv6** compatibility and certification (USGv6)
 - <https://www.iol.unh.edu/services/testing/ipv6/usgv6tested.php>
- Tested scenarios
 - DHCP6 server and client
 - IPv6 support in NFS
 - Ensure IPv6 capabilities with UEFI network boot
- Network services
- System Installation & Patching over IPv6 Benefit
 - Deploy and use in pure IPv6 environment
 - Scale networks beyond IPv4 limitations
 - Answer compliance needs



Interoperability – Samba 4



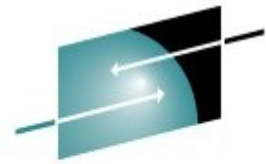
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- Better **Distributed Filesystem** (DFS) capabilities
- File Server Remote VSS Protocol (FSRVP)
 - Server: integration with btrfs and Snapper
 - Client
- Server-side copy enhancements (btrfs backend)
- Protocol enhancements
 - Encryption
 - SMB 3.0 negotiation
 - Benefit
 - Authentication with recent Windows / AD Servers
 - Linux Server behaves as expected (FSRVP)

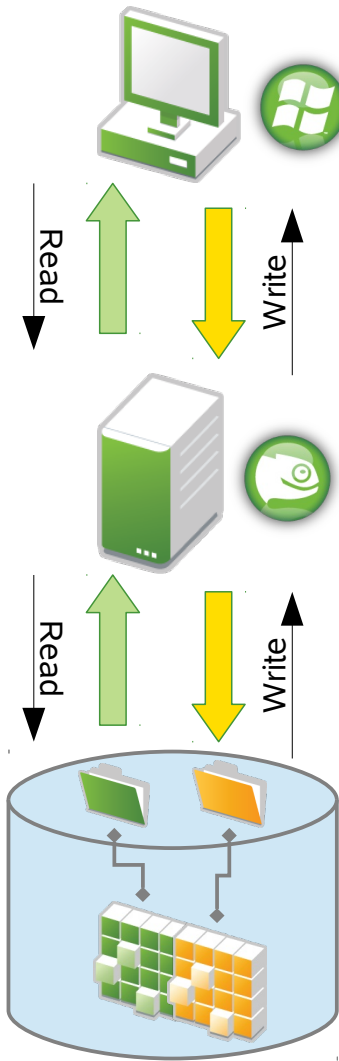


SUSE Linux Enterprise 12 Interoperability – Samba 4

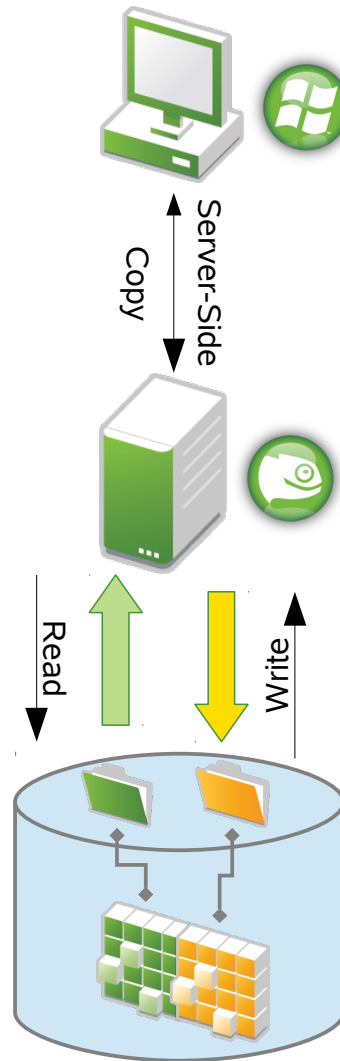


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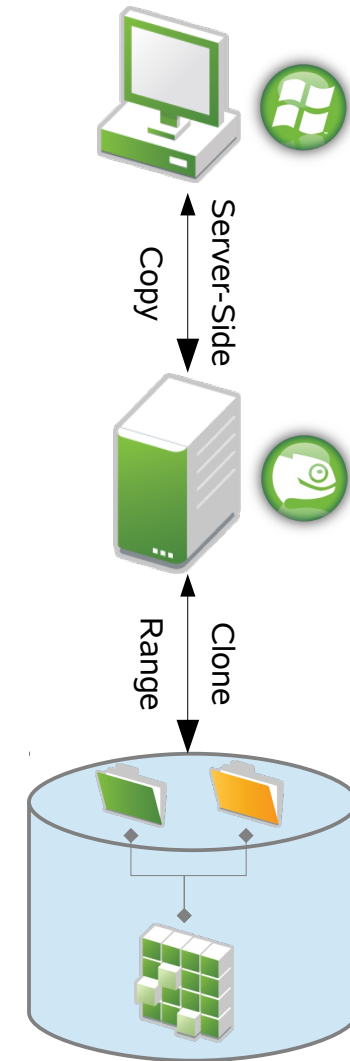
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Traditional Copy

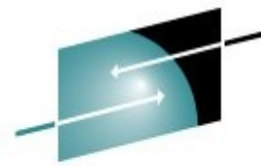


Server-Side Copy



Btrfs Enhanced
Server-Side Copy



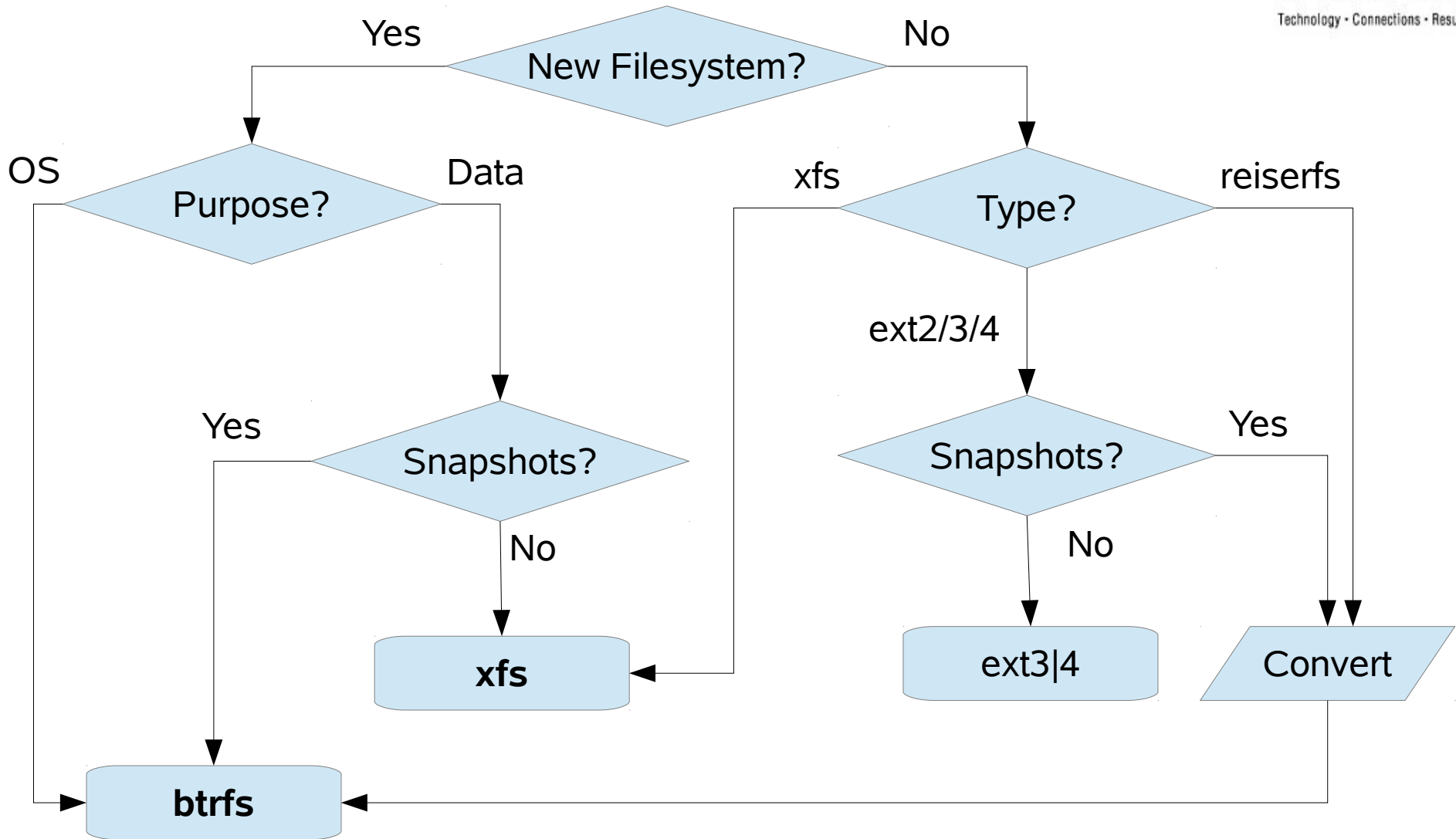


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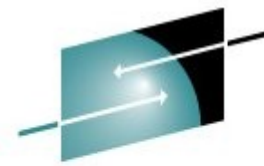
Filesystem recommendations



Note: the conversion to btrfs from ext2/3 leaves a copy of the old file system which should be deleted at some point



Security And Certifications



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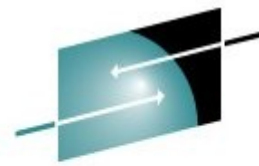
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Security and Certifications

- **Standards and Certifications**
 - Preparation for
 - Common Criteria certification and
 - FIPS 140-2/-3 validation
- NIST (SP) 800-131a compliance
- **Linux Security Modules**
 - SELinux support
 - including MLS policy
 - SELinux not default due to performance impact (~7%)
- AppArmor support
- **Research**
 - Next level of Trusted Computing / Attestation



SLES for System z 12



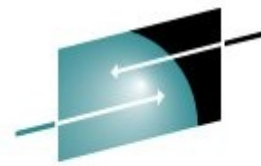
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SUSE® Linux Enterprise Server for System z 12

- IBM zEnterprise exploitation continued
 - zEC12, zBC12, z/VM 6.3, z196 EC, z114 BC support
 - Architecture Level Set (ALS)
 - zBX support (blade center extension)
- Improved RAS tools and System z specific support
 - kdump based stand-alone dumper
 - Dump to zfcps/SCSI partition
 - CryptoExpress4 support
 - Disk mirroring with RT enhancement (DASD/mdadm)
 - ...





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CEX4 - zcrypt device driver changes for exploitation of EP11

Fate 315299 / LTC 92996

- **Description:** This feature provides an updated zcrypt device driver to support of the Enterprise PKCS#11 (EP11) features of the CEX4S crypto adapter that implement certified PKCS#11 mechanisms.

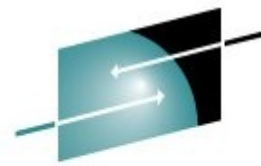
- **Customer benefit**

technical	business
<ul style="list-style-type: none"> • See above 	<ul style="list-style-type: none"> • Enable customer that need certified PKCS#11 implementations to use the EP11 (Enterprise PKCS#11) features of the System z CEX4S crypto card

SLES	11	12
SP0	-	yes
SP1	-	tbd
SP2	-	tbd
SP3	-	tbd
SP4	tbd	tbd

yes = included / no = not included
tbd = to be done





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Fill entropy pool with hwrandom for z10

Fate 310591 / [LTC -]

- **Description:** z10 processor and successors have a random number generator built in, that can be accessed at /dev/hwrng if active. However, with z90crypt device driver and crypto express cards /dev/random delivers hardware generated random numbers at high rate.

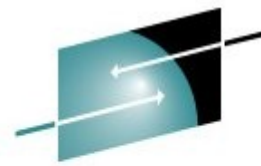
• Customer benefit

technical	business
<ul style="list-style-type: none"> • Use /dev/random as a source of random numbers generated by hardware at a high rate • Avoids stalling of processes querying for randomness 	<ul style="list-style-type: none"> • Better scalability for workloads with lots of processes requiring randomness to execute or proceed • Improved security if using a CEX card (larger keys at a faster rate)

SLES	11	12
SP0	-	yes
SP1	-	tbd
SP2	yes	tbd
SP3	yes	tbd
SP4	tbd	tbd

yes = included / no = not included
 tbd = to be done





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Improve performance of dasdfmt

Fate 315312 / LTC 92766

- **Description:** This feature improves the speed of the DASD formatting process. The kernel internal handling of format requests is reorganized and the usage of the PAV feature is enabled to accelerate format requests.

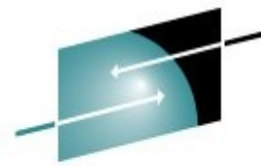
- **Customer benefit**

technical	business
<ul style="list-style-type: none"> • The dasdfmt tool gets a new command line option to specify the request size that is passed to the kernel interface. • Part of s390-tools package 	<ul style="list-style-type: none"> • Lowers administrative time and effort • Support larger future DASDs

SLES	11	12
SP0	-	yes
SP1	-	tbd
SP2	-	tbd
SP3	-	tbd
SP4	tbd	tbd

yes = included / no = not included
 tbd = to be done





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Kernel support for concurrent Flash MCL updates

Fate 315317 / LTC 92770

- **Description:** This feature is to ensure that concurrent microcode level upgrades (MCL) can be applied without impacting I/O operations to the Flash storage media and to notify users of the changed Flash hardware service level.

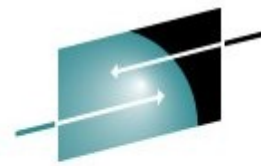
- **Customer benefit**

technical	business
<ul style="list-style-type: none"> • Non disruptive MCL upgrades, concurrent service. 	<ul style="list-style-type: none"> • No downtime

SLES	11	12
SP0	-	yes
SP1	-	tbd
SP2	-	tbd
SP3	-	tbd
SP4	tbd	tbd

yes = included / no = not included
tbd = to be done





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Multiple netiucv paths between z/VM guests

Fate 315290 / LTC 92750

- **Description:** This feature allows to establish multiple netiucv connections between the same two z/VM guests, by using IUCV userdata (in addition to the VM userid) to identify a network interface.

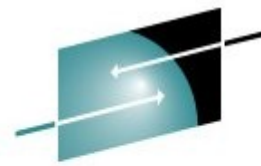
- **Customer benefit**

technical	business
<ul style="list-style-type: none"> • Allows to improve networking performance between Linux on System z z/VM guests. 	<ul style="list-style-type: none"> • Improved performance

SLES	11	12
SP0	-	yes
SP1	-	tbd
SP2	-	tbd
SP3	-	tbd
SP4	tbd	tbd

yes = included / no = not included
tbd = to be done





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src_vipa: IPv6 Enablement

Fate 315295 / LTC 93371

- **Description:** This feature adds support for IPv6 addresses to the src_vipa tool. src_vipa provides IP address virtualization for Linux guests (eg. For failover for IP based services).

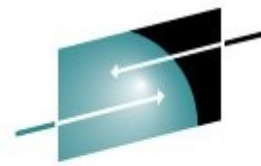
- **Customer benefit**

technical	business
<ul style="list-style-type: none"> • Choice of IPv4 or IPv6 failover. 	<ul style="list-style-type: none"> • Allow choice depending on business need

SLES	11	12
SP0	-	yes
SP1	-	tbd
SP2	-	tbd
SP3	-	tbd
SP4	tbd	tbd

yes = included / no = not included
 tbd = to be done





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Disk mirroring with real-time enhancement for System z

Fate 315976 / LTC 95619

- **Description:** Improve storage operation to enable continuous operation even in case of a temporary DS8000/ESS failure or timeout.

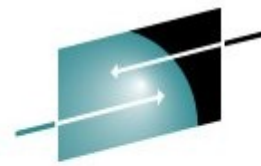
- **Customer benefit**

technical	business
<ul style="list-style-type: none"> • Improve storage operation to enable continuous operation even in case of a temporary DS8000/ESS failure or timeout • Based on enhanced RAID 10 / md driver implementation 	<ul style="list-style-type: none"> • RAS, availability of service

SLES	11	12
SP0	-	yes
SP1	-	tbd
SP2	yes	tbd
SP3	yes	tbd
SP4	tbd	tbd

yes = included / no = not included
tbd = to be done





QSAM Access Method for Data sharing with z/OS

Fate 315314 / LTC 92768

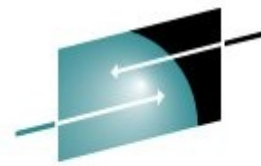
- **Description:** enhances the functionality of the s390-tools to allow to access z/OS legacy data directly on the DASD storage devices from a Linux system. Stage 1 comprises non-concurrent access, that is Linux access to z/OS data occurs regardless of z/OS processing (user needs to ensure data is not modified during Linux reading it).
- **Customer benefit**

technical	business
<ul style="list-style-type: none"> • NOTE: be aware of the consequences regarding sharing data on disk between system • Uses new filesystem zdsfs 	<ul style="list-style-type: none"> • By avoiding FTP or NFS transfer of data from z/OS the turnaround time for batch processing is significantly reduced.

SLES	11	12
SP0	-	yes
SP1	-	tbd
SP2	-	tbd
SP3	-	tbd
SP4	tbd	tbd

yes = included / no = not included
tbd = to be done





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Support of transparent large pages

Fate 315302 / LTC 92758

- **Description:** Transparent large pages promise a considerable speedup for applications that access large amounts of anonymous memory, e.g. heap for Java programs, caching area for databases.

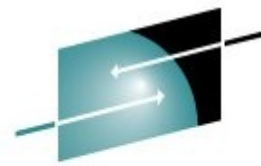
- **Customer benefit**

technical	business
<ul style="list-style-type: none"> • More efficient handling of large memory 	<ul style="list-style-type: none"> • Improved performance

SLES	11	12
SP0	-	yes
SP1	-	tbd
SP2	-	tbd
SP3	-	tbd
SP4	tbd	tbd

yes = included / no = not included
tbd = to be done





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Provide PCHID mapping

Fate 315316 / LTC 92769

- **Description:** Enable Linux users to determine the physical channel-ID (PCHID) associated with a CHPID. The ability to map CHPID to PCHID values is important for maintenance and error determination processes.

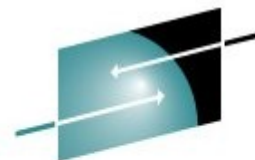
- **Customer benefit**

technical	business
<ul style="list-style-type: none">• The CHPID is a logical channel-path identifier unique in a single LPAR.• The PCHID is a machine-wide unique channel-path identifier which can be used to determine the actual hardware associated with a CHPID or I/O device.	<ul style="list-style-type: none">• Improved RAS capabilities

SLES	11	12
SP0	-	yes
SP1	-	tbd
SP2	-	tbd
SP3	-	tbd
SP4	tbd	tbd

yes = included / no = not included
tbd = to be done

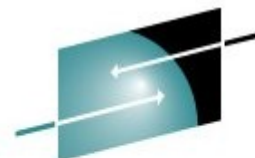




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- Find Local Numbers
- Request call
- Buy

These are the systems that are activated against your subscriptions. Double-click on any line item to view details.

Filter this view ▶ - +

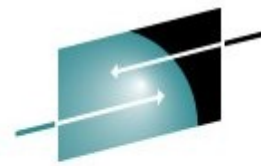
My Groups	System Name	Updates	Location	OS	Last Checked In	Edit
All	d11sp1test	No Data		sle-11-i586	N/A	▶
Needs Activation	da2400	No Data		sle-11-x86_64	20 Oct 2011, 8:38 AM	▶
	utila	No Data		sle-11-i586	27 Oct 2011, 12:16 PM	▶
+ 3 Items						

- Export CSV file of this list

System Legend

- Active
- Evaluation
- Needs Activation
- Expired





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<http://scc.suse.com>

SUSE Customer Center *Beta* Deutsch ▾

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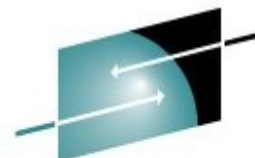
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Dashboard Organization Subscriptions **Systems**

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Systems List

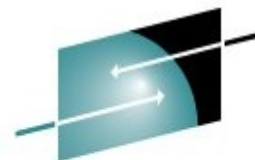
All **5** Physical **5** Virtualized **0**

▲ Hostname	Hardware	Subscriptions
nas	Processor: x86_64, Platform: x86_64	SUSE Linux Enterprise Server 10 for X86 and for AMD64 & Intel EM64T/Itanium & IBM Power ✕
nas	Processor: x86_64, Platform: x86_64	SUSE Linux Enterprise Server 10 for X86 and for AMD64 & Intel EM64T/Itanium & IBM Power ✕
s390t06.suse.de	Processor: s390x, Platform: s390x	SUSE Linux Enterprise Server 10 for System z ✕
utila	Processor: i586, Platform: i386	SUSE Linux Enterprise Desktop 1-Instance 3-Year Subscription ✕
x201	Processor: x86_64, Platform: x86_64	SUSE Linux Enterprise Server 10 for X86 and for AMD64 & Intel EM64T/Itanium & IBM Power ✕
Displaying all 5 systems		



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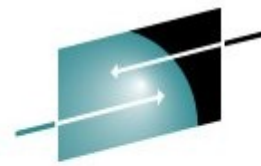




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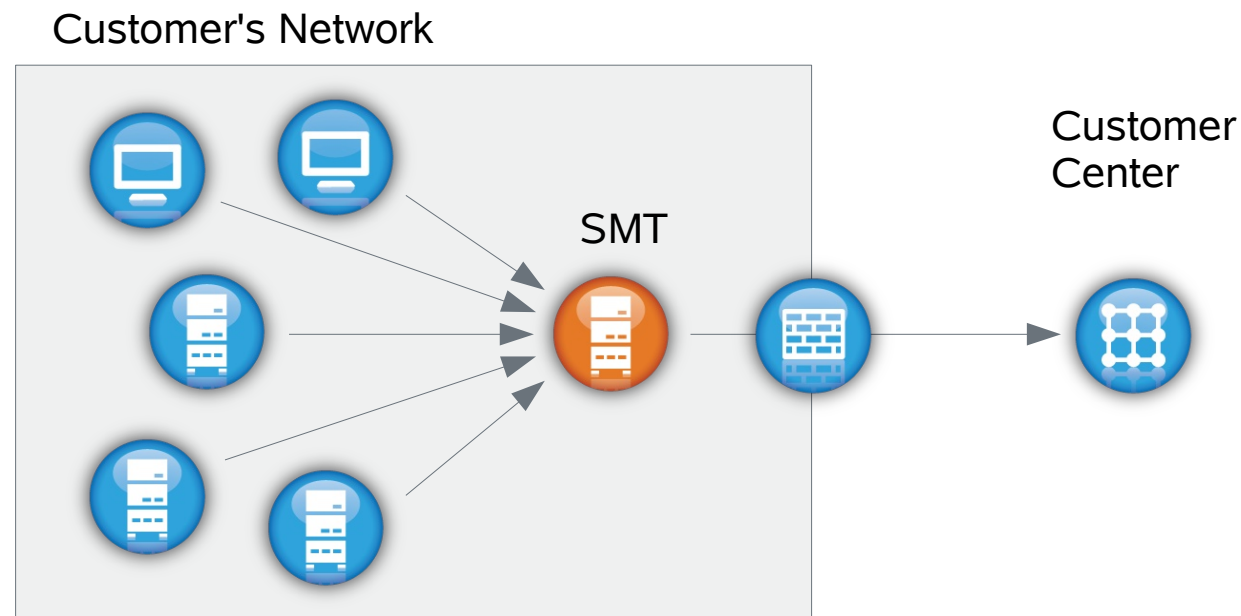
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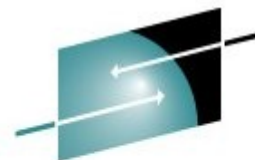
Subscription Management Tool

Overview

SMT is a proxy and auditing tool that mirrors the Customer Center and tightly integrates with it.

It allows you to accurately register and manage an entire SUSE® Linux Enterprise deployment, guaranteeing the subscription compliance and secure IT process flow organizations require.



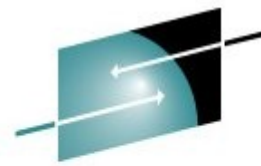


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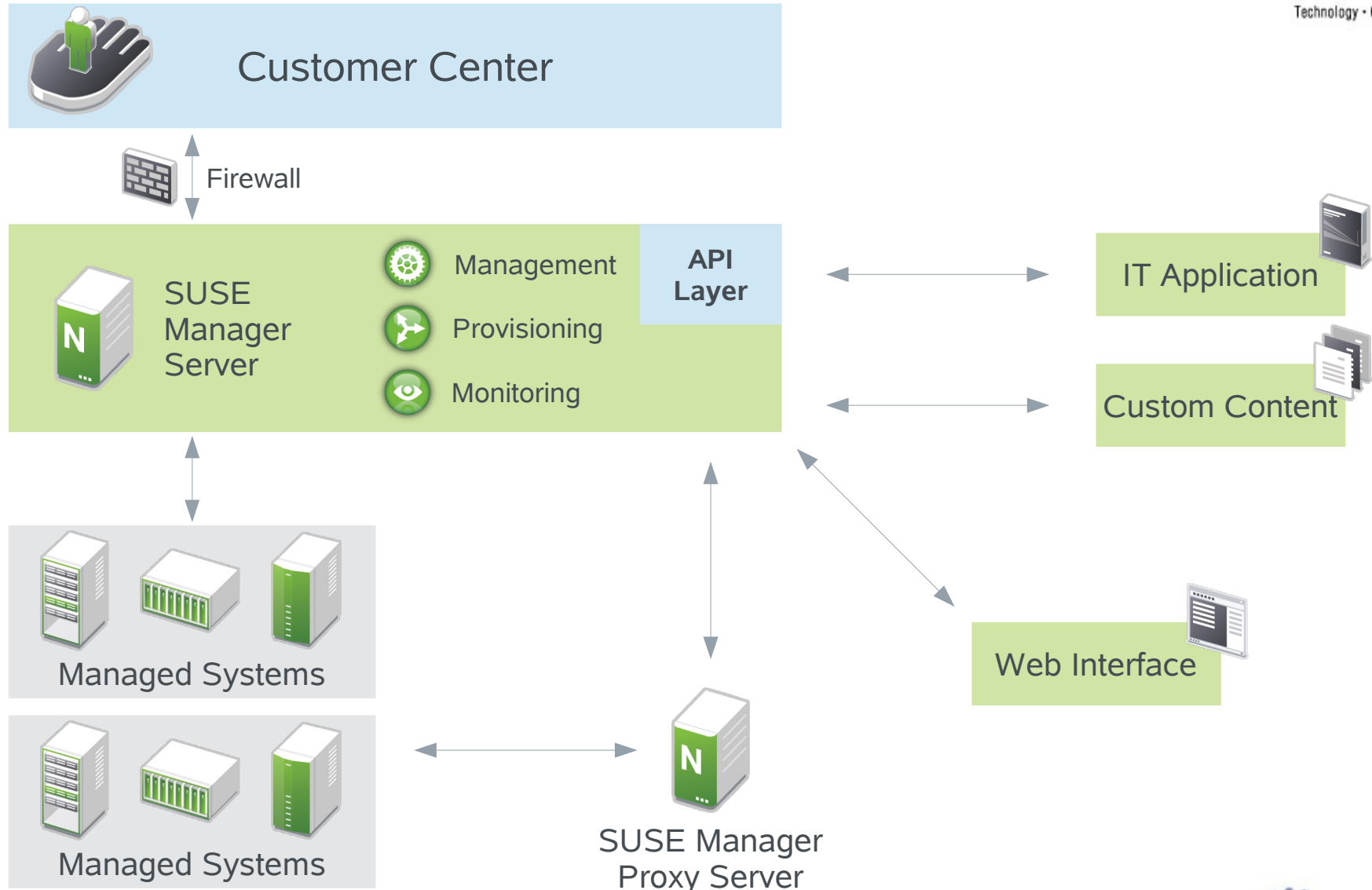
SUSE Manager

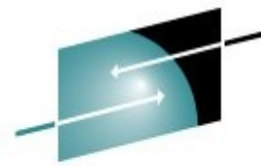


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How Does SUSE Manager Work?





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SUSE® Manager Management Module

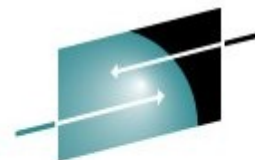
- NCC integration
- ZYpp update stack
- Server groups
- Custom repositories
- SUSE Manager API
- Scheduler
- Role-based access control
- Search
- Virtual guest, appliance and System z management

The screenshot shows the SUSE Manager web interface. At the top, there is a navigation bar with the SUSE Manager logo, user information (User: admin, Organization: Spacewalk Default Organization), and links for Documentation, Preferences, and Sign Out. Below the navigation bar, there are tabs for Overview, Systems, Patches, Channels, Configuration, Schedule, Users, Admin, and Help. The main content area is titled "Package Search" and includes a search form with the following fields:

- Search For:** A text input field with a "Search" button.
- What to search:** A dropdown menu currently set to "Name and Summary".
- Where to search:** A section with three radio button options:
 - Only channels relevant to your systems
 - Specific channel you have access to (with a dropdown menu showing "SLES11-SP1 x86_64 Channel")
 - Packages of a specific architecture in any channel you have access to (with a list box showing architectures: *IA-32, *IA-32 Debian, *IA-64, *IA-64 Debian, *Sparc Debian)

At the bottom of the search form, there is a note: "* means one or more channel architectures are not synchronized." Below the search form, there is a "Copyright Notice" for SUSE Manager release 1.2.

Summary



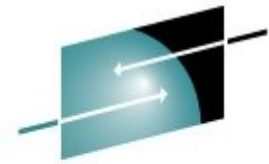
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SUSE® Building Blocks

for the Linux OS Lifecycle



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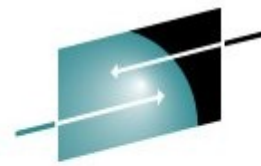
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More SHARE LVM sessions

- 14545: Experiences with Linux and System z - Customer Panel
- 14802: Linux Bootloaders on System Z - Current and Future Implementations
- 14559: What's New in Linux on System z
- 14546: Exploiting System z Cryptographic Hardware on Linux for System z
- 14809: Make Your Linux System More Secure
- 14794: How To Make Databases on Linux on System z Highly Available

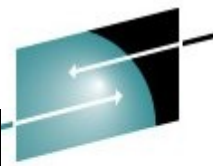
- 14479: KVM for System z
- 14764: KVM Customer Experience
- 14540: Alternatives to Solaris Containers and ZFS for Linux on System z



Thank you !

Appendix

Lifecycle



<http://www.suse.com/lifecycle/policy.html>

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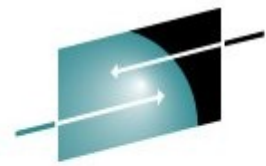
Product Support Lifecycle for SUSE Linux Enterprise Platform Solutions

	General Support			Extended Support
	Years 1-5	Year 6-7	Years 8-10	Years 11-13
Enhancement Requests	yes	yes ¹	no	no
Hardware Enablement/Optimization	yes	yes ¹	no	no
Defect Resolution	yes	yes	yes ²	<u>optional</u>
Critical Security Updates	yes	yes	yes	<u>optional</u>
Installation and Configuration Support	yes	yes	yes	<u>optional</u>
Access to Patches and Fixes	yes	yes	yes	yes
Access to SUSE Knowledgebase	yes	yes	yes	yes
Access to Support Forums	yes	yes	yes	yes
Technical Subscriptions	yes	yes	yes	yes
Access to Documentation	yes	yes	yes	yes

¹ Limited. Based on partner and customer requests.

² Limited. Severity Level 1 and 2 defects only.

Long Term Service Pack Support (LTSS)



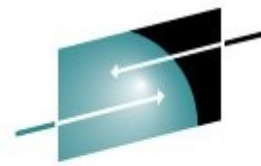
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- Use Cases
 - I want to run my software stack unchanged for a very long time
 - Updating OS does not improve my business process
 - Updates can be very expensive to deploy
 - Any change may impose additional risk
- I need more time to move to the next Service Pack
 - Approval process from stake holders
 - QA processes
 - Very large and/or distributed environment



systemd



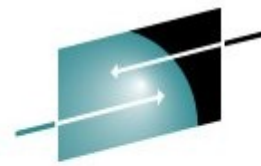
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What is systemd ?

- systemd is a system and session manager for Linux, compatible with SysV and LSB init scripts.
- systemd
 - Provides aggressive parallelization capabilities,
 - Uses socket and D-Bus activation for starting services,
 - Offers on-demand starting of daemons,
 - Keeps track of processes using Linux cgroups,
 - Supports snapshotting and restoring of the system state,
 - Maintains mount and automount points
 - Implements an elaborate transactional dependency-based service control logic.
- It can work as a drop-in replacement for sysvinit.





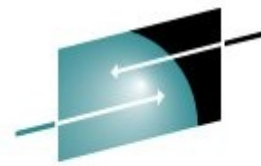
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Systemctl: Start / Stop Service

- `systemctl start|stop|restart|try-restart|reload foobar.service`
- `systemctl kill foobar.service`
- `systemctl kill -s SIGKILL foobar.service`
- `systemctl kill -s HUP --kill-who=main crond.service`





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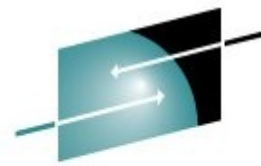
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Systemctl: Service status

- systemctl : give you a list of all started services and their status
- systemctl status foobar.service : status for one specific service

```
$ systemctl status icecream.service
icecream.service - LSB: icecc
  Loaded: loaded (/etc/init.d/icecream)
  Active: active (running) since Fri, 2013-04-19 09:27:31 CEST; 4 days ago
  CGroup: name=systemd:/system/icecream.service
          └─ 4786 /usr/sbin/icecc-scheduler -d -l /var/log/icecc_sch...
             └─ 4791 /usr/sbin/iceccd -d -l /var/log/iceccd --nice 5 -u...
```

```
Apr 19 09:27:31 foobar systemd[1]: Starting LSB: icecc...
Apr 19 09:27:31 foobar icecream[4777]: Starting Distribut...
Apr 19 09:27:31 foobar systemd[1]: Started LSB: icecc.
```



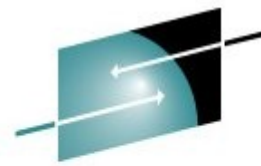
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Unit file

- Generic term used by systemd for the following:
 - Service (ends with .service)
 - Targets (ends with .target)
 - Sockets (ends .socket)
 - Path (ends with .path, used to trigger other units)
 - Timer (ends with .timer)
 - Mount point (ends with .mount), usually autogenerated by fstab generator
 - Automount point (ends with .automount)
 - Swap (ends with .swap)
 - Device (ends with .device)
 - Scope / Slice (ends with .scope/.slice, introduced in v205)





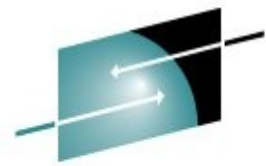
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Journal

- Logs facilities bundled in systemd since v38
- Structured logs (stored in binary format on disk, supports compression, rotation)
- Each record is associated with emitting services: allow to see “last log output” when checking a service status
- Can be configured to have persistent (on disk) journal or not (for embedded)
- Allow unprivileged users to have their own separate journal
- Each entry is cryptographically hashed along hash of previous entries (à la git)
- Can work peacefully with various syslog implementations
- Stored on disk by default (use `systemd-logger` package and `/var/log/journal` directory)





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File Server Remote VSS Protocol

- Overview

- The File Server Remote VSS Protocol is designed to remotely create shadow copies of file shares hosted on a file server. This facilitates applications hosting their data on a file server to back up and restore their application state.

The client-side implementation of this protocol typically runs on an application server and the server-side implementation runs on a file server.

This protocol is modeled in such way that the client-side and server-side implementation can be integrated with existing volume shadow copy creation utilities.

See also <http://msdn.microsoft.com/en-us/library/hh554852.aspx>



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