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This document (7018288) is provided subject to the disclaimer at the end of this document. Environment SUSE Linux Enterprise Server 15SUSE Linux Enterprise Server 12 Situation SUSE Package Hub consists of packages that are built and maintained by a community of users and packagers using the SUSE Open Build Service. Thus, it is possible to install such packages in a SUSE Linux Enterprise Server and Desktop systems; there is no need to build everything alone.Such packages are not officially supported by SUSE, but the SLES and SLED systems remain supported and supportable when using these packages.The Package Hub packages should not replace or update SUSE supported packages. Resolution Using SUSE Package Hub is simple: Register your SUSE product: SLES12: SLES15: the SUSE Package Hub extension This is possible either with the YaST2 Registration Module or with the SUSEConnect tool. * With YaST2 Do the following: yast -> software   -> Add-on Products   -> Add   -> Extensions and Modules from Registration Server...   -> SUSE Package Hub * With SUSEConnect The following command line can be used (replace the architecture and the SLES version with the appropriate one for your platform) SUSE Linux Enterprise 15 SP2: SUSEConnect -p PackageHub/15.2/x86_64 SUSE Linux Enterprise 15 SP1: SUSEConnect -p PackageHub/15.1/x86_64 SUSE Linux Enterprise 12 SP5: SUSEConnect -p PackageHub/12.5/x86_64 SUSE Linux Enterprise 12 SP4: SUSEConnect -p PackageHub/12.4/x86_64 Cause SUSE provides packages via Package Hub to allow SUSE customers to easily install community packages and have their SUSE Linux Enterprise Servers remain fully supported. Hint: Use the following command to list all available modules and extensions: SUSEConnect --list-extensions Search for and install packages: zypper se sushi zypper in sushi   The primary goals with SUSE Package Hub are: Provide quality packages   Protect customer investment in SUSE support   Ease of use Regarding support: No commercial support from SUSE   Community maintained/supported   SUSE does NOT support the packages themselves nor any issues related to the packages KDE is one of the most interesting examples in Package Hub for customers. The only required architecture is x86_64, all others are optional (although they are usually available).More information is available at ://packagehub.suse.com/support/While the packages from the SUSE Package Hub are not officially supported by SUSE, SUSE Linux Enterprise Server remains supported and supportable when using these packages.The software delivered by the SUSE Package Hub comes without guarantees of functionality and without commercial support services from SUSE. That means that while we hope the software is useful for our customers, we are not offering support in the context of "how to use" the software, or resolving any defects. On the other hand we want SUSE Package Hub to be useful and based on user feedback will do our best to keep it that way.While there is no commercial support from SUSE, can I file a bugreport ?Yes! Since the packages in SUSE Package Hub are community maintained your feedback is always welcome. Feel free to open a bugreport at SUSE Bugzilla for Package Hub related issues.The bugreport should contain: Problem related to a software package from SUSE Package HubTroubleshooting steps taken related to the software package from SUSE Package HubSuggestion for an enhancement This Support Knowledgebase provides a valuable tool for SUSE customers and parties interested in our products and solutions to acquire information, ideas and learn from one another. Materials are provided for informational, personal or non-commercial use within your organization and are presented "AS IS" WITHOUT WARRANTY OF ANY KIND. Document ID:7018288 Creation Date: 18-Nov-2016 Modified Date:15-Aug-2022 SUSE Linux Enterprise Server For questions or concerns with the SUSE Knowledgebase please contact: tidfeedback[at]suse.com NOTE:This installer update has been superceded by the 4.0 release. It's recommended to use the 4.0 release. 4.0 installation notes version 3.0 details This installer update provides fixes to various issues found with the default installation medium for SUSE Linux Enterprise 12 Service Pack 3 based products. NOTE: The images on this site only include the SUSE installer environment. To complete the installation, the original SUSE media is required in addition to to the updated installer image provided here. The following issues are fixed with this update: Installation kit is required to avoid installer crash due to qedi probe error when iSCSI offload is configured with Qlogic QL41262HMKR Mezz card. Installation kit is required to enable support for FCoE Storage on Cavium or QLogic Storage Controllers with FCoE Offload. platforms SUSE Linux Enterprise Server 12 Service Pack 3 architectures media Installation Kit ISO Image File: suse_installer_update-sle12sp3-x86_64-3.0.iso · [download] Size 382 MB MD5 Checksum ca4aedf555bbb04e4ccd622478e95c2c SHA256 Checksum daf84977014ea590e06d6d4bb462c62a17318886aa6008b6f642d606de7b8031 installation Media installation Burn the ISO image above to an empty CD/DVD media. Start the installation using the new CD/DVD media, having the standard SUSE Linux Enterprise media at hand or a URL to a network installation server. If doing a network install, enter the URL of the network install source on the boot command line using the 'install=' option. If doing installation from optical media the installer will first boot from the driver kit and then ask to insert CD1 of the SUSE Linux Enterprise product. An initrd containing updated drivers will be used for installation. PXE boot installation Download the ISO image above. Mount the ISO image for access to the contents. Copy the kernel and initrd images from the driver kit iso image to the appropriate location on your tftp boot server. The initrd and kernel image are found under the ./install/boot/x86_64/loader directory. Download links for the kernel and initrd images can also be found in the table below. Copy the contents of the ISO image to a location on your installation server. (The /boot directory may be omitted) Add the URL of the driver kit location on the installation server to the boot command of the pxelinux config file using the 'addon=' option. An updated kernel will be used for installation and installed onto the system. Example pxelinux config file section: # Install SLES 12 SP3 with Installation Kit label install-kit kernel linux-kit append initrd=initrd-kit splash=silent vga=0x314 showopts install= addon= Kernel Image Name linux · [download] Size 5.74 MB MD5 Checksum 017c59f255076ba30dcefec0f17b1cba SHA256 Checksum 796945d81cb86e673282f0693f1c4494c046e98a0832a5afb11084fce86f9b81 Initrd Image Name initrd · [download] Size 67.0 MB MD5 Checksum e00c279f4c5c38f535d997a37d1a6bdd SHA256 Checksum ae99642f09eeb6052224153cb64f5c68a9352625d75e310ef9fcaaba45bb9a4e package names and versions The following packages are provided with this installation kit: packagehub@suse.com @SUSEPackageHub Impressum project This awesome site is generated using © 2023 - SUSE, All Rights Reserved This document (7014489) is provided subject to the disclaimer at the end of this document. Environment SUSE Linux Enterprise Server 15SUSE Linux Enterprise Server 12SUSE Linux Enterprise Server 11 Situation Repository of SLES missing from serverNo repository is defined Repositories are added to SLES automatically when a system is registered to the SUSE Customer Center (SCC), SUSE Manager, or SMT/RMT. If you need to manually add a repository or iso as a repository: Please make sure to have the SLES ISO or DVD to add as a repository to the server. Launch YaST | Software | Software RepositoriesSelect Add Select Media Type and press Next Browse to the ISO or insert the DVD and press Next Finish adding the repository, and close YaST This Support Knowledgebase provides a valuable tool for SUSE customers and parties interested in our products and solutions to acquire information, ideas and learn from one another. Materials are provided for informational, personal or non-commercial use within your organization and are presented "AS IS" WITHOUT WARRANTY OF ANY KIND. Document ID:7014489 Creation Date: 31-Jan-2014 Modified Date:31-Mar-2021 SUSE Linux Enterprise Desktop SUSE Linux Enterprise Server < Back to Support Search For questions or concerns with the SUSE Knowledgebase please contact: tidfeedback[at]suse.com This document provides guidance and an overview to high level general features and updates for SUSE Linux Enterprise Server 12 SP3. Besides architecture or product-specific information, it also describes the capabilities and limitations of SUSE Linux Enterprise Server 12 SP3. General documentation can be found at: . Publication Date: 2021-12-10, Version: 12.3.202112081 About the Release Notes # These Release Notes are identical across all architectures, and the most recent version is always available online at . Some entries may be listed twice, if they are important and belong to more than one section. Release notes usually only list changes that happened between two subsequent releases. Certain important entries from the release notes documents of previous product versions are repeated. To make these entries easier to identify, they contain a note to that effect. However, repeated entries are provided as a courtesy only. Therefore, if you are skipping one or more service packs, check the release notes of the skipped service packs as well. If you are only reading the release notes of the current release, you could miss important changes. 2 SUSE Linux Enterprise Server # SUSE Linux Enterprise Server is a highly reliable, scalable, and secure server operating system, built to power mission-critical workloads in both physical and virtual environments. It is an affordable, interoperable, and manageable open source foundation. With it, enterprises can cost-effectively deliver core business services, enable secure networks, and simplify the management of their heterogeneous IT infrastructure, maximizing efficiency and value. The only enterprise Linux recommended by Microsoft and SAP, SUSE Linux Enterprise Server is optimized to deliver high-performance mission-critical services, as well as edge of network, and web infrastructure workloads. 2.1 Interoperability and Hardware Support # Designed for interoperability, SUSE Linux Enterprise Server integrates into classical Unix as well as Windows environments, supports open standard interfaces for systems management, and has been certified for IPv6 compatibility. This modular, general purpose operating system runs on four processor architectures and is available with optional extensions that provide advanced capabilities for tasks such as real time computing and high availability clustering. SUSE Linux Enterprise Server is optimized to run as a high performing guest on leading hypervisors and supports an unlimited number of virtual machines per physical system with a single subscription, making it the perfect guest operating system for virtual computing. 2.2 Support and Life Cycle # SUSE Linux Enterprise Server is backed by award-winning support from SUSE, an established technology leader with a proven history of delivering enterprise-quality support services. SUSE Linux Enterprise Server 12 has a 13-year life cycle, with 10 years of General Support and 3 years of Extended Support. The current version (SP3) will be fully maintained and supported until 6 months after the release of SUSE Linux Enterprise Server 12 SP4. If you need additional time to design, validate and test your upgrade plans, Long Term Service Pack Support can extend the support you get an additional 12 to 36 months in twelve month increments, providing a total of 3 to 5 years of support on any given service pack. For more information, check our Support Policy page or the Long Term Service Pack Support Page . SUSE Linux Enterprise Server 12 introduces many innovative changes compared to SUSE Linux Enterprise Server 11. Here are some of the highlights: Robustness on administrative errors and improved management capabilities with full system rollback based on Btrfs as the default file system for the operating system partition and the Snapper technology of SUSE. An overhaul of the installer introduces a new workflow that allows you to register your system and receive all available maintenance updates as part of the installation. SUSE Linux Enterprise Server Modules offer a choice of supplemental packages, ranging from tools for Web Development and Scripting, through a Cloud Management module, all the way to a sneak preview of upcoming management tooling called Advanced Systems Management. Modules are part of your SUSE Linux Enterprise Server subscription, are technically delivered as online repositories, and differ from the base of SUSE Linux Enterprise Server only by their life cycle. For more information about modules, see Section 2.10.1, “Available Modules”. New core technologies like systemd (replacing the time-honored System V-based init process) and Wicked (introducing a modern, dynamic network configuration infrastructure). The open-source database system MariaDB is fully supported now. Support for open-vm-tools together with VMware for better integration into VMware-based hypervisor environments. Linux Containers are integrated into the virtualization management infrastructure (libvirt). Docker is provided as a fully supported technology. For more details, see . Support for the AArch64 architecture (64-bit ARMv8) and the 64-bit Little-Endian variant of the IBM POWER architecture. Additionally, we continue to support the Intel 64/AMD64 and IBM Z architectures. GNOME 3.20 gives users a modern desktop environment with a choice of several different look and feel options, including a special SUSE Linux Enterprise Classic mode for easier migration from earlier SUSE Linux Enterprise Desktop environments. For users wishing to use the full range of productivity applications of a Desktop with their SUSE Linux Enterprise Server, we are now offering SUSE Linux Enterprise Workstation Extension (requires a SUSE Linux Enterprise Desktop subscription). Integration with the new SUSE Customer Center, the new central web portal from SUSE to manage Subscriptions, Entitlements, and provide access to Support. If you are upgrading from a previous SUSE Linux Enterprise Server release, you should review at least the following sections: 2.4 Documentation and Other Information #2.4.1 Available on the Product Media # Read the READMEs on the media. Get the detailed change log information about a particular package from the RPM (where .rpm is the name of the RPM): rpm --changelog -qp .rpm Check the ChangeLog file in the top level of the media for a chronological log of all changes made to the updated packages. Find more information in the docu directory of the media of SUSE Linux Enterprise Server 12 SP3. This directory includes PDF versions of the SUSE Linux Enterprise Server 12 SP3 Installation Quick Start and Deployment Guides. Documentation (if installed) is available below the /usr/share/doc/ directory of an installed system. 2.6 Support Statement for SUSE Linux Enterprise Server # To receive support, you need an appropriate subscription with SUSE. For more information, see . The following definitions apply: L1 Problem determination, which means technical support designed to provide compatibility information, usage support, ongoing maintenance, information gathering and basic troubleshooting using available documentation. L2 Problem isolation, which means technical support designed to analyze data, reproduce customer problems, isolate problem area and provide a resolution for problems not resolved by Level 1 or alternatively prepare for Level 3. L3 Problem resolution, which means technical support designed to resolve problems by engaging engineering to resolve product defects which have been identified by Level 2 Support. For contracted customers and partners, SUSE Linux Enterprise Server 12 SP3 and its Modules are delivered with L3 support for all packages, except the following: SUSE will only support the usage of original (that is, unchanged and un-recompiled) packages. 2.8 Software Requiring Specific Contracts # The following packages require additional support contracts to be obtained by the customer in order to receive full support: PostgreSQL Database LibreOffice 2.9 Technology Previews # Technology previews are packages, stacks, or features delivered by SUSE which are not supported. They may be functionally incomplete, unstable or in other ways not suitable for production use. They are included for your convenience and give you a chance to test new technologies within an enterprise environment. Whether a technology preview becomes a fully supported technology later depends on customer and market feedback. Technology previews can be dropped at any time and SUSE does not commit to providing a supported version of such technologies in the future. Give your SUSE representative feedback, including your experience and use case. 2.9.1 Technology Previews for All Architectures #2.9.1.1 Support for KVM Guests Using NVDIMM Devices # As a technology preview, KVM guests can now use NVDIMM devices. 2.9.1.2 QEMU: NVDIMM and Persistent Memory # As a technical preview, QEMU now supports NVDIMM. To use NVDIMM, create a memory device with model=nvdimm. This functionality can be used directly with the qemu command line tool or using libvirt. However, this functionality is not yet exposed through virt-manager. NVDIMM supports two access modes: PMEM: NVDIMM is mapped into the CPU's address space, so that the CPU can directly access it like normal memory BLK: NVDIMM is used as a block device, this avoids occupying the CPU address space. 2.9.2 Technology Previews for IBM Z (s390x) #2.9.2.1 Exploitation of Shared Memory Communications # As a technology preview, SLES 12 SP3 enables communication through shared memory segments with the 10 GB Ethernet RoCE card: Support for the networking card itself is included in the kernel. The package smc-tools contains additional user-space tools. This technology should only be used in a trusted network infrastructure. 2.9.3 Technology Previews for POWER (ppc64le) #2.9.3.1 Support for KVM # With SLES 12 SP3, KVM is now available as a technology preview on OpenPower S822LC systems running OPAL firmware. 2.9.3.2 Inclusion of IBM TPM 2.0 Stack # IBM has developed a TPM 2.0 TSS stack that can exist and be used in parallel to the Intel TPM 2.0 stack. It is not clear at this time which of them will be the preferable solution on all TPM supporting platforms. The general guideline of SUSE Linux Enterprise is having one preferred tool to do the job. The IBM TPM 2.0 stack is shipped as a Technology Preview in addition to the supported Intel TPM 2.0 stack. 3 Installation and Upgrade # SUSE Linux Enterprise Server can be deployed in several ways: Physical machine Virtual host Virtual machine System containers Application containers This section includes information related to the initial installation of SUSE Linux Enterprise Server 12 SP3. For information about installing, see Deployment Guide at . 3.1.2 Installing Systems from Online Repositories # To install SLES, you need the installation media. If you also mirror the repositories, for example with SMT, this means that effectively you need to download all packages twice: once as a part of the media and additionally from the online repository. For such scenarios, we provide packages named tftpboot-installation-* in the product repositories. These packages include an installer prepared for a network boot environment (PXE). To use them, configure the PXE environment (DHCP, TFTP servers) and install the package for the respective product and architecture. Make sure to adjust the included configuration, so that the correct local URLs are passed to the installer. 3.1.3 Network Interfaces Configured via linuxrc Take Precendence # This entry has appeared in a previous release notes document. For some configurations with many network interfaces, it can take several hours until all network interfaces are initialized (see (. In such cases, the installation is blocked. SLE 12 SP1 and earlier did not offer a workaround for this behavior. Starting with SLE 12 SP2, you can speed up interactive installations on systems with many network interfaces by configuring them via linuxrc. When a network interface is configured via linuxrc, YaST will not perform automatic DHCP configuration for any interface. Instead, YaST will continue to use the configuration from linuxrc. To configure a particular interface via linuxrc, add the following to the boot command line before starting the installation: In the parameter, replace eth0 with the name of the appropriate network interface. The ifcfg option can be used multiple times. 3.1.4 Warning When Enabling Snapshots on Small Root File Systems # Btrfs file system snapshots take up extra disk space. Previous versions of SLE did not check during installation whether a custom root file system size was appropriate for enabling snapshots. For Btrfs root file systems with snapshotting, the SLE installer now verifies that the size of the file system at least matches the value of root_base from the product's control.xml. For example, for a default SLES installation, the root file system size is 12 GB. If the file system is smaller, the installer will display a warning - which can be ignored. 3.1.5 SMT: Upgrading Database Schema and Engine # This entry has appeared in a previous release notes document. SMT 12 comes with a new database schema and is standardized on the InnoDB database back-end. In order to upgrade SMT 11 SPx to SMT 12, it is necessary that SMT 11 is configured against SCC (SUSE Customer Center) before initializing the upgrade of SLES and SMT to version 12 SP1 or newer. If the host is upgraded to SLES 12 SP1 or newer without switching to SCC first, the installed SMT instance will no longer work. Only SMT 11 SP3 can be configured against SCC. Older versions need to be upgraded to version 11 SP3 first. Whether the schema or database engine must be upgraded is checked during package upgrade and displayed as an update notification. Back up your database before doing the database upgrade. Both the schema and database engine upgrade are done by the utility /usr/bin/smt-schema-upgrade (can be called directly or via systemctl start smt-schema-upgrade) or are done automatically after smt.target restart (computer reboot or via systemctl restart smt.target). However, manual database tuning is required for optimal performance. For details, see (3.1.6 SMT Supports SCC Exclusively # This entry has appeared in a previous release notes document. Support for NCC (Novell Customer Center) was removed from SMT. SMT can still serve SLE 11 clients, but must be configured to receive updates from SCC. Before migrating from SMT 11 SP3, SMT must be reconfigured against SCC. Migration from older versions of SMT is not possible. 3.1.7 Installing with LVM2, Without a Separate /boot Partition # This entry has appeared in a previous release notes document. SUSE Linux Enterprise 12 and newer generally supports the installation with a linear LVM2 without a separate /boot partition, for example to use it with Btrfs as the root file system, to achieve full system snapshot and rollback. However, this setup is only supported under the following conditions: Only linear LVM2 setups are supported. There must be enough space in the partitioning "label" (the partition table) for the grub2 bootloader first stage files. If the installation of the grub2 bootloader fails, you will have to create a new partition table. CAVEAT: Creating a new partition table destroys all data on the given disk! For a migration from an existing SUSE Linux Enterprise 11 system with LVM2 to SUSE Linux Enterprise 12 or newer, the /boot partition must be preserved. 3.2 Upgrade-Related Notes # This section includes upgrade-related information for SUSE Linux Enterprise Server 12 SP3. For information about general preparations and supported upgrade methods and paths, see the documentation at . 3.2.1 Product Registration Changes for HPC Customers # For SUSE Linux Enterprise 12, there was a High Performance Computing subscription named "SUSE Linux Enterprise Server for HPC" (SLES for HPC). With SLE 15, this subscription does not exist anymore and has been replaced. The equivalent subscription is named "SUSE Linux Enterprise High Performance Computing" (SLE-HPC) and requires a different license key. Because of this requirement, a SLES for HPC 12 system will by default upgrade to a regular "SUSE Linux Enterprise Server". To properly upgrade a SLES for HPC system to a SLE-HPC, the system needs to be converted to SLE-HPC first. SUSE provides a tool to simplify this conversion by performing the product conversion and switch to the SLE-HPC subscription. However, the tool does not perform the upgrade itself. When run without extra parameters, the script assumes that the SLES for HPC subscription is valid and not expired. If the subscription has expired, you need to provide a valid registration key for SLE-HPC. The script reads the current set of registered modules and extensions and after the system has been converted to SLE-HPC, it tries to add them again. The script cannot restore the previous registration state if the supplied registration key is incorrect or invalid. To install the script, run zypper in switch_sles_sle-hpc. Execute the script from the command line as root: switch_sles_sle-hpc -e -r The parameters -e and -r are only required if the previous registration has expired, otherwise they are optional. To run the script in batch mode, add the option -y. It answers all questions with yes. For more information, see the man page switch_sles_sle-hpc(8) and README.SUSE. 3.2.2 FreeRADIUS Configuration Needs to Be Merged Manually # When upgrading a SLES installation that includes freeradius-server and a non-standard /etc/raddb/radiusd.conf configuration file to SLES 12 SP3, make sure to manually merge the new radiusd.conf configuration section into the custom configuration before running the FreeRADIUS server. In particular, pay attention to the parameter correct_escapes: The default behavior did not change, but the new default /etc/raddb/policy.d/filter only functions with the setting correct_escapes=true. 3.2.3 Error on Migration From SP2 to SP3 When HPC Module Is Selected # When the High Performance Computing module is selected, the following error message may be encountered during Migration from SLES 12 SP2 to SLES 12 SP3: Can't get available migrations from server: SUSE::Connect::ApiError: The requested products '' are not activated on the system. '/usr/lib/zypper/commands/zypper-migration' exited with status 1 The problem can be resolved by re-registering the HPC module using the following two commands: rpm -e sle-module-hpc-release-POOL sle-module-hpc-release SUSEConnect -p sle-module-hpc/12/x86_64 These commands can also be performed before migration as a preventive measure. 3.2.4 Automatic Log Rotation Will Be Disabled After Upgrade # If the package logrotate was installed or updated before systemd-presets-branding-SLE, automatic log rotation will be disabled after the upgrade to SLES 12 SP3. Enable the logrotate systemd timer manually. To do so, run the following commands as root: systemctl enable logrotate.timer systemctl restart logrotate.timer 3.2.5 Online Migration with Live Patching Enabled # The SLES online migration process reports package conflicts when Live Patching is enabled and the kernel is being upgraded. This applies when crossing the boundary between two Service Packs. To prevent the conflicts, before starting the migration, execute the following as a super user: zypper rm $(rpm -qa kgraft-patch-*)3.2.6 Online Migration: Checking the Status of Registered Products # It is common that during the lifecycle of a system installation, registered extensions and modules are removed from the system without also deactivating them on the registration server. To prevent errors and unexpected behavior during an online migration, the status of installed products needs to be checked before the migration to allow reinstalling or deactivating products. A new step has been added to the current online migration workflow, it will check the registered products that are not currently installed in the system and allows: Trying to install the products from the available repositories (Install). Deactivating the products in SCC (Deactivate). 3.2.7 Updating Registration Status After Rollback # This entry has appeared in a previous release notes document. When performing a service pack migration, it is necessary to change the configuration on the registration server to provide access to the new repositories. If the migration process is interrupted or reverted (via restoring from a backup or snapshot), the information on the registration server is inconsistent with the status of the system. This may lead to you being prevented from accessing update repositories or to wrong repositories being used on the client. When a rollback is done via Snapper, the system will notify the registration server to ensure access to the correct repositories is set up during the boot process. If the system was restored any other way or the communication with the registration server failed for any reason (for example, because the server was not accessible due to network issues), trigger the rollback on the client manually by calling snapper rollback. We suggest always checking that the correct repositories are set up on the system, especially after refreshing the service using zypper ref -s. 3.2.8 /tmp Cleanup from sysconfig Automatically Migrated into systemd Configuration # This entry has appeared in a previous release notes document. By default, systemd cleans temporary directories daily, and systemd does not honor sysconfig settings in /etc/sysconfig/cron such as TMP_DIRS_TO_CLEAR. Thus, it is needed to change sysconfig settings to avoid data loss or unwanted behavior. When updating to SLE 12 or newer, the variables in /etc/sysconfig/cron will be automatically migrated into an appropriate systemd configuration (see /etc/tmpfiles.d/tmp.conf). The following variables are affected: MAX_DAYS_IN_TMP MAX_DAYS_IN_LONG_TMP TMP_DIRS_TO_CLEAR LONG_TMP_DIRS_TO_CLEAR CLEAR_TMP_DIRS_AT_BOOTUP OWNER_TO_KEEP_IN_TMP4 Architecture Independent Information # Information in this section pertains to all architectures supported by SUSE Linux Enterprise Server 12 SP3. 4.1.1 Unprivileged eBPF usage has been disabled # A large amount of security issues was found and fixed in the Extended Berkeley Packet Filter (eBPF) code. To reduce the attack surface, its usage has been restricted to privileged users only. Privileged users include root. Programs with the CAP_BPF capability in the newer versions of the Linux kernel can still use eBPF as-is. To check the privileged state, you can check the value of the /proc/sys/kernel/unprivileged_bpf_disabled parameter. Value of 0 means "unprivileged enable", and value of 2 means "only privileged users enabled". This setting can be changed by the root user: to enable it temporarily for all users by running the command sysctl kernel.unprivileged_bpf_disabled=0 to enable it permanently by adding kernel.unprivileged_bpf_disabled=0 to the /etc/sysctl.conf file. 4.1.2 Support for Scalable MCA (SMCA) # As more functionality is added to hardware beginning with family 0x17, being able to track it requires an enhanced approach to MCA. SLE 12 SP3 now supports AMD's Scalable MCA (SMCA). SMCA is a specification which enriches the error information logged by the hardware to allow for improved error handling, better diagnosability, and future scalability. 4.1.3 Update Repositories for kGraft Live Patching Are Now Specific to Service Packs # Starting with SLE 12 SP3, the update repositories supplying kernel patches that can be applied using kGraft are split up by Service Pack version. This allows for easier maintenance and reduces the chance of complications during Service Pack upgrades. 4.1.4 Support for Intel Kaby Lake Processors # SLE 12 SP3 now contains support for Intel processors from the generation code-named Kaby Lake. 4.1.5 Support for Intel Xeon Phi Knights Landing Coprocessors # SLE 12 SP3 now supports Intel Xeon Phi coprocessors from the product line code-named Kights Landing. 4.1.6 NVDIMM: Support for Device DAX (Direct Access) # SLE 12 SP3 now supports Device DAX. Device DAX is the device-centric analogue of File System DAX: It allows memory ranges to be allocated and mapped without need of an intervening file system. This feature can improve the performance of both KVM guests and databases like MSSQL using raw I/O access to NVDIMM. An important requirement for every enterprise operating system is the level of support available for specific environments. Kernel modules are the most relevant connector between hardware (“controllers”) and the operating system. For more information about the handling of kernel modules, see the SUSE Linux Enterprise Administration Guide. 4.2.1 Support for Matrox G200eH3 Graphics Chips # SLE 12 SP3 includes a driver to enable Matrox G200eH3 graphics chips that will be used in HPE Gen10 servers. 4.2.2 hpwdt Driver (HPE Watchdog) Has Been Updated # SLE 12 SP3 includes an updated version of the HPE watchdog driver hpwdt to enable support for the upcoming HPE Gen10 Servers. 4.2.3 Direct Access to Files in Non-Volatile DIMMs # This entry has appeared in a previous release notes document. The page cache is usually used to buffer reads and writes to files. It is also used to provide the pages which are mapped into userspace by a call to mmap. For block devices that are memory-like, the page cache pages would be unnecessary copies of the original storage. The Direct Access (DAX) kernel code avoids the extra copy by directly reading from and writing to the storage device. For file mappings, the storage device is mapped directly into userspace. This functionality is implemented in the XFS and Ext4 file systems. Non-volatile DIMMs can be "partitioned" into so-called namespaces which are then exposed as block devices by the Linux kernel. Each namespace can be configured in several modes. Although DAX functionality is available for file systems on top of namespaces in both raw or memory modes, SUSE does not support use of the DAX feature in file systems on top of raw mode namespaces as they have unexpected quirks and in future releases the feature is likely to go away completely. 4.3.1 SELinux Enablement # This entry has appeared in a previous release notes document. SELinux capabilities have been added to SUSE Linux Enterprise Server (in addition to other frameworks, such as AppArmor). While SELinux is not enabled by default, customers can run SELinux with SUSE Linux Enterprise Server if they choose to. SELinux Enablement includes the following: The kernel ships with SELinux support. We will apply SELinux patches to all “common” userland packages. The libraries required for SELinux (libselinux, libsepol, libsemanage, etc.) have been added SUSE Linux Enterprise. Quality Assurance is performed with SELinux disabled—to make sure that SELinux patches do not break the default delivery and the majority of packages. The SELinux-specific tools are shipped as part of the default distribution delivery. SELinux policies are not provided by SUSE. Supported policies may be available from the repositories in the future. Customers and Partners who have an interest in using SELinux in their solutions are encouraged to contact SUSE to evaluate their necessary level of support and how support and services for their specific SELinux policies will be granted. By enabling SELinux in our code base, we add community code to offer customers the option to use SELinux without replacing significant parts of the distribution. 4.3.2 TPM-Capable UEFI Bootloader # SLES 12 SP3 has TPM support in the bootloader used on UEFI systems. 4.4.1 Support for the IDNA2008 Standard for Internationalized Domain Names # The original method for implementing Internationalized Domain Names was IDNA2003. This has been replaced by the IDNA2008 standard, the use of which is mandatory for some top-level domains. The network utilities wget and curl have been updated to support IDNA2008 through the use of libidn2. This update also affects consumers of the libcurl library. 4.4.2 No Support for Samba as Active Directory-Style Domain Controller # This entry has appeared in a previous release notes document. The version of Samba shipped with SLE 12 GA and newer does not include support to operate as an Active Directory-style domain controller. This functionality is currently disabled, as it lacks integration with system-wide MIT Kerberos. 4.4.3 New GeoIP Database Sources # The GeoIP databases allow approximately geo-locating users by their IP address. In the past, the company MaxMind made such data available for free in its GeoLite Legacy databases. On January 2, 2019, MaxMind discontinued the GeoLite Legacy databases, now offering only the newer GeoLite2 databases for download. To comply with new data protection regulation, since December 30, 2019, GeoLite2 database users are required to comply with an additional usage license. This change means users now need to register for a MaxMind account and obtain a license key to download GeoLite2 databases. For more information about these changes, see the MaxMind blog (. SLES includes the GeoIP package of tools that are only compatible with GeoLite Legacy databases. As an update for SLES 12 SP3, we introduce the following new packages to deal with the changes to the GeoLite service: geoipupdate: The official Maxmind tool for downloading GeoLite2 databases. To use this tool, set up the configuration file with your MaxMind account details. This configuration file can also be generated on the Maxmind web page. For more information, see . geolite2legacy: A script for converting GeoLite2 CSV data to the GeoLite Legacy format. geoipupdate-legacy: A convenience script that downloads GeoLite2 data, converts it to the GeoLite Legacy format, and stores it in /var/lib/GeoIP. With this script, applications developed for use with the legacy geoip-fetch tool will continue to work. 4.5.1 Salt Has Been Updated to Version 3000 # Salt has been upgraded to upstream version 3000, plus a number of patches, backports and enhancements by SUSE. In particular, CVE-2020-11651 and CVE-2020-11652 fixes are included in our release. As part of this upgrade, cryptography is now managed by the Python-M2Crypto library (which is itself based on the well-known OpenSSL library). We intend to regularly upgrade Salt to more recent versions. For more details about changes in your manually-created Salt states, see the Salt 3000 upstream release notes (. Salt 3000 is the last version of Salt which will support the old syntax of the cmd.run module. 4.5.2 System Clone AutoYaST XML Reflects Btrfs Snapshot State # In previous versions of SLE 12, when using yast clone_system, AutoYaST would always enable snapshots for Btrfs Volumes, regardless of whether they were enabled on the original system. Starting with SLE 12 SP3, yast clone_system will now create an AutoYaST XML file that accurately reflects snapshot state of Btrfs volumes. 4.5.3 "Register Extensions or Modules Again" Has Been Removed from YaST # The button Register Extensions or Modules Again has been removed from the YaST registration module. This option was redundant: It is still possible to register modules or extensions again with a different SCC account or using a different registration server (SCC or SMT). Additionally, the option to filter out beta versions is now only visible if the server provides beta versions, otherwise the check box is hidden. 4.5.4 The YaST Module for SSH Server Configuration Has Been Removed # The YaST module for configuring an SSH server which was present in SLE 11, is not a part of SLE 12. It does not have any direct successor. The module SSH Server only supported configuring a small subset of all SSH server capabilities. Therefore, the functionality of the module can be replaced by using a combination of 2 YaST modules: The /etc/sysconfig Editor and the Services Manager. This also applies to system configuration via AutoYaST. 4.5.5 Sudo Has Been Updated from 1.8.10p3 to 1.8.19p2 # Sudo has been updated from version 1.8.10p3 to 1.8.19p2. This update fixes many bugs and security vulnerabilities and also brings several enhancements. For more information, read the changelog file in /usr/share/doc/packages/sudo/NEWS. 4.5.6 YaST: Default Auto-Refresh Status for Local Repositories Is "Off" # In previous versions of SLE 12, when installing from a USB drive or external disk, the repository linking to the installation media was set to auto-refresh. This means that when the USB drive or the external disk had been removed and you are trying to work with YaST or Zypper, you were asked to insert the external medium again. In the YaST version shipped with SLE 12 SP3, we have changed the default auto-refresh status for local repositories (USB drives, hard disks or dir://) to off which avoids checking the now usually unnecessary repository. 4.5.7 All Snapper Commands Support the Option --no-dbus # Normally, the snapper command line tool uses DBus to connect to snapperd which does most of the actual work. This allows non-root users to work with Snapper. However, there are situations when using DBus is not possible, for example, when chrooted on the rescue system or when DBus itself is broken after an update. This can limit the usefulness of Snapper as a disaster recovery tool. Therefore, some Snapper commands already supported the --no-dbus option, bypassing DBus and snapperd. In the version of Snapper shipped with SLE 12 SP3, all Snapper commands support the --no-dbus option. 4.5.8 blogd Boot Log Daemon Available as an Alternative to Plymouth # The blogd boot log daemon (package blog and blog-plymouth) can be used as a replacement for Plymouth in situations where a splash screen or usage of a frame buffer is unwanted. blogd is also a Plymouth agent. That means, it can handle requests for a password prompt by the system password service of systemd. The blogd daemon writes out boot log messages to every terminal device used for /dev/console and to the log file /var/log/boot.log. When halting or rebooting the system, it moves the log file to /var/log/boot.old and appends all log messages up to the point at which the file systems becomes unavailable. This entry has appeared in a previous release notes document. ntp was updated to version 4.2.8. The ntp server ntpd does not synchronize with its peers anymore and the peers are specified by their host name in /etc/ntp.conf. The output of ntpq --peers lists IP numbers of the remote servers instead of their host names. Name resolution for the affected hosts works otherwise. Parameter changes# The meaning of some parameters for the sntp command-line tool have changed or have been dropped, for example sntp -s is now sntp -S. Please review any sntp usage in your own scripts for required changes. After having been deprecated for several years, ntpdc is now disabled by default for security reasons. It can be re-enabled by adding the line enable mode7 to /etc/ntp.conf, but preferably ntpq should be used instead. 4.5.10 Support for Setting Kdump Low-Memory and High-Memory Allocation on the YaST Command Line # In the past, YaST supported setting a high-memory and low-memory amounts for the kernel parameter crashkernel only from the ncurses or Qt interfaces. You can now set these memory amounts on the command line too. To do so, use, for example, yast kdump startup enable alloc_mem=256,768. The first number represents the low-memory amount, the second number represents the high-memory amount. Therefore, the example is equivalent to setting crashkernel=256,low crashkernel=768,high on the kernel command line. 4.5.11 Salt Configuration with AutoYaST # With SLE 12 SP3, it is possible to configure Salt clients using AutoYaST. To use this feature, you need the package salt-minion which is not available in the standard SLES product. However, you can install this dependency from the SLE Module Advanced Systems Management. 4.5.12 Zypper Option --plus-content Has Been Enhanced # The zypper option --plus-content was enhanced to allow specifying disabled repositories by name or alias also. Additionally, it can now be used with the zypper refresh command, to refresh either specified or all disabled repositories without the need to enable them. 4.5.13 YaST: iSCSI Authentication Has Been Redesigned # In the past, the user interface for iSCSI authentication offered by YaST was not optimal. Additionally, not every option was explained in the help. In SLE 12 SP3, the YaST module iSCSI Initiator and Target has with the following enhancements: Clearer terminology: For discovery sessions, No Authentication is now called No Discovery Authentication. For login sessions, Use Authentication is now called Use Login Authentication, whereas No Authentication is now called No Login Authentication. Incoming Authentication is now called Authentication by Initiators on the initiator side, whereas it is called Authentication by Targets on the target side. Outgoing Authentication is now called Authentication by Targets on the initiator side, whereas it is called Authentication by Initiators on the target side. No Login Authentication can now be used to log in to targets without authentication. The help now explains password options. This entry has appeared in a previous release notes document. SLE 12 has moved to systemd, a new way of managing services. For more information, see the SUSE Linux Enterprise Admin Guide, Section The systemd Daemon (. 4.6.1 Compatibility of Newly Created XFS File Systems With SLE 11 # This entry has appeared in a previous release notes document. XFS file systems created with the default settings of SLES 12 SP2 and later cannot be used SLE 11 installations. In SLE 12 SP2 and later, by default, XFS file systems are created with the option ftype=1 that changes the superblock format. Among other things, this helps accommodate Docker. However, this option is incompatible with SLE 11. To create a SLE 11-compatible XFS file system, use the parameter ftype=0. For example, to format an empty device, run: : mkfs.xfs -m crc=0 -n ftype=0 [DEVICE]4.6.2 Automatic Cleanup of Snapshots Created by Rollbacks # In SLES 12 SP2 and before, you had to manually delete snapshots created by rollbacks at an appropriate time to avoid filling up the storage. Starting with SLE 12 SP3, this process has been automated. During a rollback, Snapper sets the cleanup algorithm number for the snapshot corresponding to the previous default subvolume and for the backup snapshot of the previous default subvolume. For more information, see (4.6.3 Establishing an NVMe-over-Fabrics Connection # To be able to establish an NVMe-over-Fabrics connection with the Linux kernel provided with the SLE 12 SP3 media, you need to delete or rename the file /etc/nvme/hostid. To restore this file when the kernel update that fixes this issue is released, generate a new host ID by running: uuidgen > /etc/nvme/hostid4.6.4 Root File System Conversion to Btrfs Not Supported # This entry has appeared in a previous release notes document. If it is not the root file system and if the file system has at least 20 % free space available, in-place conversion of an existing Ext2/Ext3/Ext4 or ReiserFS file system is supported for data mount points. SUSE does not recommend or support in-place conversion of OS root file systems. In-place conversion to Btrfs of root file systems requires manual subvolume configuration and additional configuration changes that are not automatically applied for all use cases. To ensure data integrity and the highest level of customer satisfaction, when upgrading, maintain existing root file systems. Alternatively, reinstall the entire operating system. 4.6.5 /var/cache on an Own Subvolume for Snapshots and Rollback # This entry has appeared in a previous release notes document. /var/cache contains very volatile data, like the Zypper cache with RPM packages in different versions for each update. As a result of storing data that is mostly redundant but highly volatile, the amount of disk space a snapshot occupies can increase very fast. To solve this, move /var/cache to a separate subvolume. On fresh installations of SLE 12 SP2 or newer, this is done automatically. To convert an existing root file system, perform the following steps: Find out the device name (/dev/sda2, /dev/sda3 etc.) of the root file system: df / Identify the parent subvolume of all the other subvolumes. For SLE 12 installations, this is a subvolume named @. To check if you have a @ subvolume, use: btrfs subvolume list / | grep '@'. If the output of this command is empty, you do not have a subvolume named @. In that case, you may be able to proceed with subvolume ID 5 which was used in older versions of SLE. Now mount the requisite subvolume. If you have a @ subvolume, mount that subvolume to a temporary mount point: mount -o subvol=@ /mnt If you don't have a @ subvolume, mount subvolume ID 5 instead: mount -o subvolid=5 /mnt /mnt/var/cache can already exist and could be the same directory as /var/cache. To avoid data loss, move it: mv /mnt/var/cache /mnt/var/cache.old In either case, create a new subvolume: btrfs subvol create /mnt/var/cache If there is now a directory /var/cache.old, move it to the new location: mv /var/cache.old/* /mnt/var/cache. If that is not the case, instead do: mv /var/cache/* /mnt/var/cache/ Optionally, remove /mnt/var/cache.old: rm -rf /mnt/var/cache.old Unmount the subvolume from the temporary mount point: umount /mnt Add an entry to /etc/fstab for the new /var/cache subvolume. Use an existing subvolume as a template to copy from. Make sure to leave the UUID untouched (this is the root file system's UUID) and change the subvolume name and its mount point consistently to /var/cache. Mount the new subvolume as specified in /etc/fstab: mount /var/cache 4.6.6 Support for Arbitrary Btrfs Subvolume Structure in AutoYaST # To set up a system with a non-default Btrfs subvolume structure with AutoYaST, you can now specify an arbitrary Btrfs subvolume structure in autoinst.xml. 4.6.7 Snapper: Cleanup Rules Based on Fill Level # This entry has appeared in a previous release notes document. Some programs do not respect the special disk space characteristics of a Btrfs file system containing snapshots. This can result in unexpected situations where no free space is left on a Btrfs filesystem. Snapper can watch the disk space of snapshots that have automatic cleanup enabled and can try to keep the amount of disk space used below a threshold. If snapshots are enabled, the feature is enabled for the root file system by default on new installations. For existing installations, the system administrator must enable quota and set limits for the cleanup algorithm to use this new feature. This can be done using the following commands: snapper setup-quota snapper set-config NUMBER_LIMIT=2-10 NUMBER_LIMIT_IMPORTANT=4-10 For more information, see the man pages of snapper and snapper-configs. 4.7.1 Supported Offline Migration Scenarios # The following host operating system combinations will be fully supported (L3) for migrating guests from one host to another for SLES 12 SP3: SLES 12 GA to SLES 12 SP3 SLES 12 SP1 to SLES 12 SP3 SLES 12 SP2 to SLES 12 SP3 4.7.2 SUSE Virtual Machine Driver Pack 2.5 # SUSE Linux Enterprise Virtual Machine Driver Pack is a set of paravirtualized device drivers for Microsoft Windows operating systems. These drivers improve the performance of unmodified Windows guest operating systems that are run in virtual environments created using Xen or KVM hypervisors with SUSE Linux Enterprise Server 11 SP4 and SUSE Linux Enterprise Server 12 SP3. Paravirtualized device drivers are installed in virtual machine instances of operating systems and represent hardware and functionality similar to the underlying physical hardware used by the system virtualization software layer. SLE now comes with SUSE Linux Enterprise Virtual Machine Driver Pack 2.5. 4.7.3.1 KVM Now Supports up to 288 vCPUs # KVM now supports up to 288 vCPUs in a virtual machine. 4.7.3.2 Support for AVIC (Advanced Virtual Interrupt Controller) # In the past, LAPIC interrupts (Local Advanced Interrupt Controller) on AMD processors had to be virtualized with software which did not yield optimal performance. The version of KVM shipped with SLE 12 SP3 can use AVIC (Advanced Virtual Interrupt Controller), a hardware feature in recent AMD processors, to provide a virtualized LAPIC to the guest. This improves the virtualization performance. AVIC is a set of components to present a virtualized LAPIC to guests, thus allowing most LAPIC accesses and interrupt delivery to the guests directly. The AVIC architecture also leverages the existing IOMMU interrupt redirection mechanism to deliver peripheral device interrupts to guests directly. 4.8.1 Virtual Users support in vsftpd # Previously, this functionality was provided by the pam_userdb module that was part of the general pam package. This module has been removed and the functionality is now provided as part of the pam-extra package. 4.8.2 GNOME: Support for Chinese, Japanese, Korean Installed and Configured Automatically # When first logging in to GNOME on SLES 12 SP3 with the Workstation Extension or SLED 12 SP3, gnome-initial-setup will ask Chinese, Japanese, and Korean users for their preferred input method. Because gnome-initial-setup is set up to run directly after the first login, it is also set up to not run before the GDM interface starts. This behavior is configured in the GDM configuration file /etc/gdm/custom.conf with the line

InitialSetupEnable=False. Do not change this setting, otherwise a system without a normal user will not be able to provide the expected GDM log-in window. 5 AMD64/Intel 64 (x86_64) Specific Information # Information in this section pertains to the version of SUSE Linux Enterprise Server 12 SP3 for the AMD64/Intel 64 architectures. 5.1 System
and Vendor Specific Information #5.1.1 Intel* Omni-Path Architecture (OPA) Host Software # Intel Omni-Path Architecture (OPA) host software is fully supported in SUSE Linux Enterprise Server 12 SP3. Intel OPA provides Host Fabric Interface (HFI) hardware with initialization and setup for high performance data transfers (high bandwidth, high
message rate, low latency) between compute and I/O nodes in a clustered environment. For instructions on installing Intel Omni-Path Architecture documentation, see . 5.1.2 Support for Both TPM 1.2 and 2.0 # Over the recent years TPM 2.0 variants have become more common. With a different API this needs new libraries, tools and bootloader
support. SLE 12 SP2 and also SP3 provide equal support for TPM 1.2 and TPM 2.0 utilities and booting. 6 POWER (ppc64le) Specific Information # Information in this section pertains to the version of SUSE Linux Enterprise Server 12 SP3 for the POWER architecture. 6.1 Support for ibmvnic Networking Driver # The kernel device driver ibmvnic
provides support for vNIC (Virtual Network Interface Controller) which is a PowerVM virtual networking technology that delivers enterprise capabilities and simplifies network management on IBM POWER systems. It is an efficient high-performance technology. When combined with SR-IOV NIC, it provides bandwidth control Quality of Service (QoS)
capabilities at the virtual NIC level. vNIC significantly reduces virtualization overhead resulting in lower latencies and fewer server resources (CPU, memory) required for network virtualization. For a detailed support statement of ibmvnic in SLES, see . 6.2 QEMU-virtualized PReP Partition # On POWER, the PReP partition which contains the
bootloader has no unique identifier other than the serial number of the disk on which it created. When virtualized with QEMU, QEMU does not provide any disk serial number unless you explicitly specify one. This means that when running under QEMU, the PReP partition of an installation does not have any unique identification. In consequence, the
partition name can change when a disk is added or removed from the virtual machine or when the storage configuration otherwise changes. This can lead to system errors when reinstalling or updating the bootloader. If you expect the storage configuration of a QEMU virtual machine on POWER to change over the lifetime of the installation, we
recommend sidestepping this issue: Before the initial installation, assign a unique serial number to each disk in a QEMU virtual machine. 6.3 512 TB Virtual Address Space on POWER # Certain workloads require a large virtual address space for a single process The virtual address space limit has been increased from 64 TB to 512 TB on the POWER
architecture. To maintain compatibility with older software and hardware, processes are limited to 128 TB virtual address space unless they explicitly map memory above 128 TB. This functionality is supported starting with kernel 4.4.103. We always recommend using the latest kernel update to get fixes for any issues found over the product lifetime.
6.4 kdump: Shorter Time to Filter and Save /proc/vmcore # The updated makedumpfile tool shipped SLES 12 SP3 supports multithreading. This can be leveraged to reduce the time spent in the capture kernel by following the below steps: Set KDUMP_CPUS=[CPUS] in the file /etc/sysconfig/kdump. Replace [CPUS] with the number of CPUs to use in
the Kdump kernel. Set MAKEDUMPFILE_OPTIONS="--num-threads [CPUs-1]". Using one CPU less than there are total active CPUs can improve performance. Set KDUMPTOOL_FLAGS=NOSPLIT in the file /etc/sysconfig/kdump. Restart kdump.service. 6.5 Parameter crashkernel Is Now Used for fadump Memory Reservation # Starting with SLE 12
SP3, to reserve memory for fadump, use the parameter crashkernel parameter instead of the deprecated parameter fadump_reserve_mem. The offset for fadump is calculated in the kernel. Therefore, if you provide an offset in the parameter crashkernel=, it will be ignored. 6.6 Encryption Improvements Using Hardware Optimizations # The
performance of kernel XTS mode on POWER platforms has been improved in SLES 12 SP3 by exploiting instruction set enhancements. On POWER8, it now runs up to 20 times faster than in SLES 12 SP2. Kernel CBC and CTR modes were already optimized in a previous release. To ensure that your kernel is using the accelerated POWER kernel
crypto implementations, verify that the module vmx_crypto has been loaded: 6.7 Ceph Client Support on IBM Z and POWER # On SLES 12 SP2 and SLES 12 SP3, IBM Z and POWER machines can now function as SUSE Enterprise Storage (Ceph) clients. This support is possible because the kernels for IBM Z and POWER now have the relevant
modules for CephFS and RBD enabled. The Ceph client RPMs for IBM Z and POWER are included in SLE 12 SP3. Additionally, the QEMU packages for IBM Z and POWER are now built against librbd. 6.8 Memory Reservation Support for fadump in YaST # Memory to be reserved for firmware-assisted dumps (also known as fadump, available on the
POWER architecture) can now be specified in the Kdump module of YaST. 6.9 Speed of ibmveth Interface Not Reported Accurately # The ibmveth interface is a paravirtualized interface. When communicating between LPARs within the same system, the interface's speed is limited only by the system's CPU and memory bandwidth. When the virtual
Ethernet is bridged to a physical network, the interface's speed is limited by the speed of that physical network. Unfortunately, the ibmveth driver has no way of determining automatically whether it is bridged to a physical network and what the speed of that link is. ibmveth therefore reports its speed as a fixed value of 1 Gb/s which in many cases
will be inaccurate. To determine the actual speed of the interface, use a benchmark. 7 IBM Z (s390x) Specific Information # Information in this section pertains to the version of SUSE Linux Enterprise Server 12 SP3 for the IBM Z architecture. For more information, see IBM zEnterprise 196 (z196) and IBM zEnterprise 114 (z114) further on referred
to as z196 and z114. 7.1.1 Support for New Hardware Instructions in Toolchain # Support for new hardware instructions in binutils, GCC and GDB is available through the Toolchain Module. 7.2.1 qeth Device Driver Has Accelerated set_rx_mode Implementation # Improved initialization of qeth network devices in layer 2 and layer 3 allows for faster
booting Linux instances. 7.3.1 parted Augmented with Partitioning Functionality as Provided by IBM Z Tools # The partitioning utility parted now includes partitioning functionality for FBA and ECKD DASDs. This brings parted up to par with the functionality provided by IBM Z tools. 7.3.2 DASD Channel Path-Aware Error Recovery # The DASD
driver can now exclude paths from normal operation if other channel paths are available. 7.3.3 New dasdfmt Quick Format Mode # With the new quick format mode, you can define DASD volumes with a pre-formatted track layout. This significantly reduces the deployment time of DASD volumes. 7.3.4 Ceph Client Support on IBM Z and POWER # On
SLES 12 SP2 and SLES 12 SP3, IBM Z and POWER machines can now function as SUSE Enterprise Storage (Ceph) clients. This support is possible because the kernels for IBM Z and POWER now have the relevant modules for CephFS and RBD enabled. The Ceph client RPMs for IBM Z and POWER are included in SLE 12 SP3. Additionally, the QEMU
packages for IBM Z and POWER are now built against librbd. 7.3.5 GPFS Partition Type in fdasd # The new partition type "GPFS" in the fdasd tool supports fast identification and handles partitions that contain GPFS Network Shared Disks. 7.3.6 LUN Scanning Enabled by Default # This entry has appeared in a previous release notes document.
Unlike in SLES 11, LUN scanning is enabled by default in SLES 12 and newer. Instead of having a user-maintained whitelist of FibreChannel/SCSI disks that are brought online to the guest, the system now polls all targets on a fabric. This is especially helpful on systems with hundreds of zFCP disks and exclusive zoning. However, on systems with few
disks and an open fabric, this can lead to long boot times or access to inappropriate disks. It can also lead to difficulties offlining and removing disks. To disable LUN scanning, set the boot parameter zfcp.allow_lun_scan=0. For LUN Scanning to work properly, the minimum storage firmware levels are: DS8000 Code Bundle Level 64.0.175.0 DS6000
Code Bundle Level 6.2.2.108 Secure connections for snIPL enable Linux to remotely handle a greater variety of environments. 7.5.1 libica with DRBG Random Number Generation # The package libica now includes a DRBG (Deterministic Random Bit Generator) that is compliant with the updated security specification NIST SP 800-90A for pseudo-
random number generation. 7.5.2 Toleration Support for New Cryptography Hardware # SLES 12 SP3 includes support for using new cryptography hardware in toleration mode. This allows performing cryptographic operations as on older hardware which means an easier migration to new hardware. 7.6 Reliability, Availability, Serviceability (RAS)
#7.6.1 Stable PCI Identifiers Using UIDs # To maintain persistent configurations for PCI devices, SLES 12 SP3 now provides stable and unique identifiers for PCI functions for as long as the I/O configuration (IOCDS and HCD) remains stable. 7.6.2 Hardware Breakpoint Support in GDB # When code needs to be treated as read-only, software
breakpoints cannot be used. GDB can now use hardware breakpoints for debugging. 7.7.1 Support for 2 GB Memory Pages # Applications with huge memory sets can use 2 GB large memory pages for improved memory handling. 7.7.2 Extended CPU Topology to Support Drawers # Addressing CPUs across drawers improves scheduling and
performance analysis on IBM z Systems z13 and later hardware. 8 ARM 64-Bit (AArch64) Specific Information # Information in this section pertains to the version of SUSE Linux Enterprise Server 12 SP3 for the AArch64 architecture. 8.1 Boot and Driver Enablement for Raspberry Pi 3 Model B # The Raspberry Pi 3 Model B is a single-board
computer based on the Broadcom BCM2837 chipset. SUSE provides a preconfigured image, SUSE Linux Enterprise Server for ARM 12 SP3 for the Raspberry Pi and a Kiwi template to derive custom appliances, kiwi-templates-SLES12-RPi. The following sections describe requirements and support limitations of custom and modified images. Boot
Requirements# To boot SUSE Linux Enterprise Server 12 SP3 on the Raspberry Pi 3 Model B, a special MBR partitioning scheme must be used. Firmware files for the VideoCore IV processor must be installed into a FAT-formatted partition (type 0x0C) that should be mounted as /boot/efi (alternatively /boot/vc if separate from /boot/efi). To provide a
UEFI-compatible environment for booting, as on regular server systems, configure the Raspberry Pi firmware to load the U-Boot bootloader. U-Boot in turn can then boot GRUB either from an FAT-/Ext4-formatted SD card or USB device (Btrfs is not supported by U-Boot) or via network. Driver Enablement# Not all connectors or functions of the
Raspberry Pi are supported in this version: VideoCore IV GPU 3D acceleration needs to remain disabled. The SUSE image provides a configuration file to that effect. Built-in audio is not supported, neither via HDMI nor via audio jack. The CSI camera connector (for example, the Raspberry Pi Camera Module) is not supported. The DSI display
connector (for example, the Raspberry Pi Touch Display) is not supported. Expansion Boards# The Raspberry Pi 3 Model B offers a 40-pin General Purpose I/O connector, with multiple software-configurable functions such as UART, I^2C and SPI. This pin mux configuration along with any external devices attached to the pins is defined in the Device
Tree which is passed by the bootloader to the kernel. In the SUSE image, HATs and other expansion boards attached to the GPIO connector are not enabled by default and SUSE does not provide support for their use. However, insofar as drivers for pin functions and for attached chipsets are included in SUSE Linux Enterprise, they can be used. SUSE
does not provide support for making changes to the Device Tree but successful changes will not affect the support status of the operating system itself. Be aware that errors in the Device Tree can stop the system from booting successfully or can even damage the hardware. In SUSE Linux Enterprise Server for ARM 12 SP3 for the Raspberry Pi, the
Device Tree is provided by the U-Boot bootloader (not by the Raspberry Pi firmware), and Device Tree Overlays are not supported in this version of U-Boot. The recommended way to override the Device Tree in SUSE Linux Enterprise Server for ARM 12 SP3 for the Raspberry Pi is to place a customized bcm2837-rpi-3-b.dtb file into one of the
directories U-Boot searches on the second partition of the boot medium (U-Boot environment variable efi_dtb_prefixes). For example, /boot/dtb/bcm2837-rpi-3-b.dtb from within the system. This requires the second partition to be readable by U-Boot, hence in the SUSE Linux Enterprise Server for ARM 12 SP3 for the Raspberry Pi image that partition
does not use Btrfs. The source package u-boot-rpi3 includes the corresponding Device Tree sources. For convenience, you can also access the current Flat Device Tree binary as /sys/firmware/fdt and use the Device Tree Compiler tool (dtc which is not part of SUSE Linux Enterprise Server for ARM 12 SP3) to convert the Device Tree binary to source.
To generate a suitable bcm2837-rpi-3-b.dtb file: Modify the obtained sources as needed, adding or changing Device Tree nodes according to the Device Tree Bindings in the kernel documentation. Do not forget about pinctrl settings! Compile them into the Flat Device Tree binary format. This recommendation is expected to change for future versions.
For More Information# For more information on how to get started, see the SUSE Best Practices documentation for the Raspberry Pi at . 8.2 Raspberry Pi 3 Shows Blurry HDMI Output on Some Monitors # On some HDMI monitors, the Raspberry Pi will show blurry output on the screen. You may also see a thin purple line at the edge of the screen.
To work around this issue, perform the following: Blacklist the vc4 kernel module: Add the line blacklist vc4 to /etc/modprobe.d/50-blacklist.conf Delete the kernel mode setting configuration: rm /etc/X11/xorg.conf.d/20-kms.conf 8.3 AppliedMicro X-C1 Server Development Platform (Mustang) Firmware Requirements # In between SUSE Linux
Enterprise Server 12 SP2 and SP3, some AppliedMicro X-Gene drivers and the corresponding Device Tree bindings were changed in an incompatible way. X-C1 devices that successfully boot SUSE Linux Enterprise Server 12 SP2 may be unable to install SP3 without changes. Symptoms include a crash in the mdio-xgene network driver. The updated
X-Gene drivers in SP3 require the Device Tree provided by the vendor's firmware version 3.06.25 or later. To install SLES 12 SP3, first need to ensure that the AppliedMicro TianoCore bootloader firmware is updated according to the instructions provided by the vendor. For any questions about obtaining and upgrading this firmware, contact the
hardware vendor. After updating the firmware to a new version, it may in turn no longer be possible to run SLES 12 SP2, unless the firmware is downgraded to a lower version again. 8.4 New System-on-Chip Driver Enablement # Drivers for the following additional System-on-Chip platforms have been enabled in the SP3 kernel: AppliedMicro X-Gene
3 Cavium ThunderX2 CN99xx HiSilicon Hi1616 Marvell Armada 7K/8K Qualcomm Centriq 2400 series Rockchip RK3399 8.5 Support for OpenDataPlane on Cavium ThunderX and Octeon TX Platforms # This release supports OpenDataPlane (ODP) API version 1.11.0.0, also known as Monarch LTS. Platform Compatilibility# This release is compatible
with the generic AArch64 platforms and the following Cavium platforms: ThunderX (CN88XX) Octeon TX (CN81XX, CN83XX) System Requirements# Your system needs to meet certain requirements before ODP can be used. The general requirements are as follows: Cunit shared library in rootfs (for running unit tests and proper configure) vfio,
thunder-nicpf and BGX modules loaded into the kernel (typically no driver needs to be loaded since all mentioned modules are compiled into kernel image) Hugetlbfs must be mounted with considerable amount of pages added to it (minimum 256 MB of memory). ODP ThunderX uses huge pages for maximum performance by eliminating TLB misses.
For some hardware-related cases, physically contiguous memory is needed. Therefore the ODP ThunderX memory allocator tries to allocate contiguous memory area. If the ODP application has startup problems, we recommend increasing the hugepage pool by adding more pages to the pool than required. NIC VFs need to be bound to the VFIO
framework This entry has appeared in a previous release notes document. KVM virtualization has been enabled and is supported on some system-on-chip platforms for mutually agreed-upon partner-specific use cases. It is only supported on partner certified hardware and firmware. Not all QEMU options and backends are available on AArch64. The
same statement is applicable for other virtualization tools shipped on AArch64. 8.7 Toolchain Module Enabled in Default Installation # This entry has appeared in a previous release notes document. The system compiler (gcc4.8) is not supported on the AArch64 architecture. To work around this issue, you previously had to enable the Toolchain
module manually and use the GCC version from that module. On AArch64, the Toolchain Module is now automatically pre-selected after registering SLES during installation. This makes the latest SLE compilers available on all installations. You now only need to make sure to also use that compiler. Be aware that when using AutoYaST to install, you
have to explicitly add the Toolchain module into the XML installation profile. 9 Packages and Functionality Changes # This section comprises changes to packages, such as additions, updates, removals and changes to the package layout of software. It also contains information about modules available for SUSE Linux Enterprise Server. For
information about changes to package management tools, such as Zypper or RPM, see Section 4.5, “Systems Management”. 9.2.2 PostgreSQL Has Been Upgraded to Version 10 # SLES 12 SP4 and SLES 15 ship with PostgreSQL 10 by default. To enable an upgrade path for customers, SLE 12 SP3 now includes PostgreSQL 10 in addition to
PostgreSQL 9.6 (the version that was originally shipped). To upgrade a PostgreSQL server installation from an older version, the database files need to be converted to the new version. Neither SLES 12 SP4 nor SLES 15 include PostgreSQL 9.6. However, availability of PostgreSQL 9.6 is a requirement for performing the database upgrade to the
PostgreSQL 10 format. Therefore, you must upgrade the database to the PostgreSQL 10 format before upgrading to the desired new SLES version. Major New Features# The following major new features are included in PostgreSQL 10: Logical replication: a publish/subscribe framework for distributing data Declarative table partitioning: convenience
in dividing your data Improved query parallelism: speed up analyses Quorum commit for synchronous replication: distribute data with confidence SCRAM-SHA-256 authentication: more secure data access PostgreSQL 10 also brings an important change to the versioning scheme that is used for PostgreSQL: It now follows the format major.minor. This
means that minor releases of PostgreSQL 10 are for example 10.1, 10.2, ... and the next major release will be 11. Previously, both the parts of the version number were significant for the major version. For example, PostgreSQL 9.3 and PostgreSQL 9.4 were different major versions. For the full PostgreSQL 10 release notes, see (. Upgrading# Before
starting the migration, make sure the following preconditions are fulfilled: The packages of your current PostgreSQL version must have been upgraded to their latest maintenance update. The packages of the new PostgreSQL major version need to be installed. For SLE 12, this means installing postgresql10-server and all the packages it depends on.
Because pg_upgrade is contained in the package postgresql10-contrib, this package must be installed as well, at least until the migration is done. Unless pg_upgrade is used in link mode, the server must have enough free disk space to temporarily hold a copy of the database files. If the database instance was installed in the default location, the
needed space in megabytes can be determined by running the following command as root: du -hs /var/lib/pgsql/data. If there is little disk space available, run the command VACUUM FULL SQL command on each database in the PostgreSQL instance that you want to migrate. This command can take very long. Upstream documentation about
pg_upgrade including step-by-step instructions for performing a database migration can be found locally at file:///usr/share/doc/packages/postgresql10/html/pgupgrade.html (if the postgresql10-docs package is installed), or online at (. The online documentation explains how you can install PostgreSQL from the upstream sources (which is not
necessary on SLE) and also uses other directory names (/usr/local instead of the update-alternatives based path as described above). 9.2.3 GnuTLS Has Been Updated to Version 3.3 # Some programs require GnuTLS version 3.3 or newer to work. The upgrade from GnuTLS 3.2 to GnuTLS 3.3 is an update which does not change of the major version of
libgnutls28, so existing programs will continue to work. The library libgnutls-xssl.so was not used by other programs and has been removed. 9.2.5 Open vSwitch Has Been Updated to Version 2.7.0 # Open vSwitch has been updated to 2.7.0. Important changes include: Various OpenFlow bug fixes Improved support for OpenFlow Support for new
OpenFlow extensions Performance improvements Support for IPsec tunnels has been removed Changes relating to DPDK: Support for DPDK 16.11 Support for jumbo frames Support for rx checksum offload Support for port hotplugging For more detailed information about changes between version 2.6.0 and 2.7.0, see (. 9.2.6 Upgrading PostgreSQL
Installations from 9.1 to 9.4 # This entry has appeared in a previous release notes document. To upgrade a PostgreSQL server installation from version 9.1 to 9.4, the database files need to be converted to the new version. Note: System Upgrade from SLE 11 On SLE 12, there are no PostgreSQL 8.4 or 9.1 packages. This means you must first migrate
PostgreSQL from 8.4 or 9.1 to 9.4 on SLE 11 before upgrading the system from SLE 11 to SLE 12. Newer versions of PostgreSQL come with the pg_upgrade tool that simplifies and speeds up the migration of a PostgreSQL installation to a new version. Formerly, it was necessary to dump and restore the database files which was much slower. To work,
pg_upgrade needs to have the server binaries of both versions available. To allow this, we had to change the way PostgreSQL is packaged as well as the naming of the packages, so that two or more versions of PostgreSQL can be installed in parallel. Starting with version 9.1, PostgreSQL package names on SUSE Linux Enterprise products contain
numbers indicating the major version. In PostgreSQL terms, the major version consists of the first two components of the version number, for example, 9.1, 9.3, and 9.4. So, the packages for PostgreSQL 9.3 are named postgresql93, postgresql93-server, etc. Inside the packages, the files were moved from their standard location to a versioned location
such as /usr/lib/postgresql93/bin or /usr/lib/postgresql94/bin. This avoids file conflicts if multiple packages are installed in parallel. The update-alternatives mechanism creates and maintains symbolic links that cause one version (by default the highest installed version) to re-appear in the standard locations. By default, database data is stored under
/var/lib/pgsql/data on SUSE Linux Enterprise. The following preconditions have to be fulfilled before data migration can be started: If not already done, the packages of the old PostgreSQL version (9.3) must be upgraded to the latest release through a maintenance update. The packages of the new PostgreSQL major version need to be installed. For
SLE 12, this means installing postgresql94-server and all the packages it depends on. Because pg_upgrade is contained in the package postgresql94-contrib, this package must be installed as well, at least until the migration is done. Unless pg_upgrade is used in link mode, the server must have enough free disk space to temporarily hold a copy of the
database files. If the database instance was installed in the default location, the needed space in megabytes can be determined by running the following command as root: du -hs /var/lib/pgsql/data. If space is tight, it might help to run the VACUUM FULL SQL command on each database in the PostgreSQL instance to be migrated which might take
very long. Upstream documentation about pg_upgrade including step-by-step instructions for performing a database migration can be found under file:///usr/share/doc/packages/postgresql94/html/pgupgrade.html (if the postgresql94-docs package is installed), or online under (. The online documentation explains how you can install PostgreSQL from
the upstream sources (which is not necessary on SLE) and also uses other directory names (/usr/local instead of the update-alternatives based path as described above). For background information about the inner workings of pg_admin and a performance comparison with the old dump and restore method, see . 9.2.7 MariaDB Replaces MySQL # This
entry has appeared in a previous release notes document. MariaDB is a backward-compatible replacement for MySQL. If you update from SLE 11 to SLE 12 or later, it is advisable to do a manual backup before the system update. This can help if a start of the database has issues with the storage engine's on-disk layout. After the update to SLE 12 or
later, a manual step is required to actually get the database running (this way you quickly see if something goes wrong): touch /var/lib/mysql/.force_upgrade rcmysql start # => redirecting to systemctl start mysql.service rcmysql status # => Checking for service MySQL: # => ...9.3 Removed and Deprecated Functionality #9.3.1 libcgroup1 Removed
From SLE 12 SP4 and Later # Most functionality of libcgroup1 is also provided by systemd. In fact, the cgroup handling of libcgroup1 can conflict with that of systemd. Starting with SLE 12 SP4, libcgroup1 has been removed. Migrate to the equivalent functionality in systemd. For more information, see . 9.3.2 Docker Compose Has Been Removed
from the Containers Module # Docker Compose is not supported as a part of SUSE Linux Enterprise Server 12. While it was temporarily included as a Technology Preview, testing showed that the technology was not ready for enterprise use. SUSE's focus is on Kubernetes which provides better value in terms of features, extensibility, stability and
performance. 9.3.3 Nagios Monitoring Server Has Been Removed # This entry has appeared in a previous release notes document. The Nagios monitoring server has been removed from SLES 12. When upgrading to SLES 12 or later, installed Nagios configuration may be removed. Therefore, we recommend creating backups of the Nagios
configuration before the upgrade. 9.3.4 Packages and Features to Be Removed in the Future #9.3.4.1 Use /etc/os-release Instead of /etc/SuSE-release # This entry has appeared in a previous release notes document. Starting with SLE 12, the /etc/SuSE-release file has been deprecated. Do not use it to identify a SUSE Linux Enterprise system
anymore. This file will be removed in a future Service Pack or release. To determine the release, use the file /etc/os-release instead. This file is a cross-distribution standard to identify Linux systems. For more information about the syntax, see the os-release man page (man os-release). 9.4 Changes in Packaging and Delivery #9.4.1 OFED-related
Packages Replaced by Packages From New Upstream # In SLE 12 SP2 and earlier, the OFED (OpenFabric Enterprise Distribution) stack came directly from OFED. Since the release of SLES 12 SP2, most of this stack has been upstreamed to the Linux RDMA project. This has resulted in an influx of contributions to the project and much improved
source. With SLE 12 SP3, we have updated the OFED stack to the version from the new upstream. This has brought the following package changes: The package rdma is now called rdma-core All -rdmav2 (providers for specific RDMA hardware) are integrated into the libibverbs package libibverbs itself is in the libibverbs1 package mlx4 and mlx5 are
still shipped as separate packages, under the name libmlx4-1 and libmlx5-1, as they can be used standalone libibcm-devel, libibumad-devel, librdmacm-devel and libibverbs-devel are all provided by the rdma-core-devel package The static libraries are not provided anymore. 9.4.2 Support for Intel OPA Fabrics Moved to mvapich2-psm2 Package # This
entry has appeared in a previous release notes document. The version of the package mvapich2-psm originally shipped with SLES 12 SP2 and SLES 12 SP3 exclusively supported Intel Omni-Path Architecture (OPA) fabrics. In SLES 12 SP1 and earlier, this package supported the use of Intel True Scale fabrics instead. This issue is fixed by a
maintenance update providing an additional package named mvapich2-psm2 which only supports Intel OPA, whereas the original package mvapich2-psm only supports Intel True Scale fabrics again. If you are currently using mvapich2-psm together with Intel OPA fabrics, make sure to switch to the new package mvapich2-psm2 after this maintenance
update. 9.4.3 Kernel Firmware Only Shipped as Part of the kernel-firmware Package # In past releases, the kernel-default package used to contain firmware for in-kernel drivers. Starting with SLES 12 SP3, such firmware is now delivered as part of the package kernel-firmware. This section contains information about important changes to modules.
For more information about available modules, see Section 2.10.1, “Available Modules”. 9.5.1 Support for New Hardware Instructions in Toolchain # Support for new hardware instructions in binutils, GCC and GDB is available through the Toolchain Module. 9.5.2 libgcrypt11 Available from the Legacy Module # The Legacy module now provides a
package for libgcrypt11. This enables running applications built on SLES 11 against libgcrypt11 on SLES 12. SUSE makes no representations or warranties with respect to the contents or use of this documentation, and specifically disclaims any express or implied warranties of merchantability or fitness for any particular purpose. Further, SUSE
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disclaimer at the end of this document. SUSE Linux Enterprise Server 15 (All versions with LTSS)SUSE Linux Enterprise Server 12 (All versions with LTSS)SUSE Linux Enterprise Server 11 (All versions with LTSS)SUSE Linux Enterprise Server 10 (All versions with LTSS) Once a new service pack for SUSE Linux Enterprise based products has been
released, SUSE starts a six months dual support phase for both the previous and new version. After these six months, support for the previous service pack will end and no further recommended or security related updates will be released.If a requirement for a longer transition period persists or perhaps 3rd party applications prevent to upgrade to
the next service pack, then a Long Term Service Pack Support (LTSS) contract may be an option to maintain a secure SUSE Linux Enterprise based setup.This knowledgebase article will explain how LTSS repositories may be added to systems which fetch updates from SUSE directly or are connected to a SMT, SUSE Manager or SUSE Studio
installation. Direct connectionSLES 10 SPx / SLES 11 SPxWhen the server is connected directly to the internet, the system needs to be registered using a LTSS activation code which can be located in the SUSE Customer Center account. Please note, LTSS activation codes are product dependent. Registering a SLES11SP1 with an LTSS code for
SLES10SP2 will not succeed. Make sure the correct activation code is selected when registering the system.In this situation the usual procedures for registering a SLES server apply. Please see for details how to register a SLES server using YaST2. If a scripted approach is necessary, the command suse_register might be used to accomplish the
registration: suse_register -a email=EMAILADDR -a regcode-sles=LTSS-ACTIVATIONCODE While adding the option "-d 3" to the command above, the following output should be seen when the repositories are added: Adding repository 'SLE11-SDK-SP1-Updates' [......done] Adding repository 'SLE11-SDK-SP1-Pool' [......done] Adding repository
'SLES11-SP1-Updates' [......done] Adding repository 'SLES11-SP1-Pool' [......done] Adding repository 'SLE11-SP1-Debuginfo-Updates' [......done] Adding repository 'SLE11-SP1-Debuginfo-Pool' [......done] Adding repository 'SLES11-Extras' [......done] Adding repository 'SLE11-WebYaST-SP1-Pool' [......done] Adding repository 'SLE11-WebYaST-SP1-
Updates' [......done] Adding repository 'SLES11-SP1-LTSS-Updates' [......done] Please adjust EMAILADDR and LTSS-ACTIVATIONCODE accordingly. To change the registration on any SUSE Linux Enterprise based system please follow hereUpdates via Subscription Management Tool(SMT)Environments using a SMT server to download and provide
updates locally will have to enable the appropriate LTSS channels they are entitled to either by using the YaST2 smt module or the smt-catalogs command: rizzo:~ # smt-catalogs -e SLES11-SP1-LTSS-Updates .---. | Mirror? | ID | Type | Name |
Target | Description | Can be Mirrored | Staging | +---------+----+------+------------------------+---------------+--+-----------------+---------+ | No | 1 | nu | SLES11-SP1-LTSS-Updates | sle-11-i586 | SLES11-SP1-LTSS-Updates for sle-11-i586 | Yes | No | | No | 2 | nu | SLES11-SP1-LTSS-Updates |
sle-11-s390x | SLES11-SP1-LTSS-Updates for sle-11-s390x | No | No | | No | 3 | nu | SLES11-SP1-LTSS-Updates | sle-11-x86_64 | SLES11-SP1-LTSS-Updates for sle-11-x86_64 | Yes | No | '---------+----+------+------------------------+---------------+--+-----------------+---------' Select repository number (or all) to
change, (1-3,a) :3 1 Repo(s) enabled. After finishing the repository sync, please re-run suse_register to have the machine fetch the new channels from the SMT server.Systems maintained via SUSE ManagerFor systems operating a SLES11SP1 patch level and connected to SUSE Manager verify first if the Channel sles11-sp1-ltss-updates- is available
and can be mirrored.Please run the following command : mgr-sync list channels and check for the channel availability below sles11-sp1-pool-. In case that the LTSS subscription was recently added to the account, it might be needed to refresh the subscription. It is mandatory that the subscription for the LTSS channel is in an account whose
credentials are already added in SUSE Manager. This can be checked by running: mgr-sync list credentials If the correct subscription is not listed with the previous command, the appropriate credentials can be added (SUSE Manager can handle more than one set of credentials) in the SUSE Manager web-UI: Admin --> Setup Wizards -->
Organization Credentials If, as said before, the mentioned refresh is needed (for a new subscription that was recently added) the refresh can be done by running: mgr-sync refresh Enable the channel for the x86_64 architecture using : mgr-sync add channel sles11-sp1-ltss-updates-x86_64 or as below for the x86_64 architecture, or 32bit installations :
mgr-sync add channel sles11-sp1-ltss-updates-i586 A repository sync will be triggered automatically. When the sync is finished, create a new activation code specifically for SLES11SP1 or adjust any existing one - just ensure the key that is about to get changed does not contain any SP2 repositories. The SP1 key needs to contain the following child
channels: SLES11-SP1-Updates- SLES11-SP1-LTSS-Updates- Save the key and generate a bootstrap file. Adjust this file to your needs and re-register the client using the bootstrap script to enable the LTSS repositories.Please notice that SUSE Manager does not support the rather new product called "LTSS EXTREME CORE", introduced in 2023 for
SLES 11 SP4, whose repository URL is as follows: Studio Onsite Login to SUSE Studio as admin Click Admin user in the upper right corner Click Advanced Click the Repositories link Here you can enter a name and URL to access the LTSS repository Once the settings are done, you can manually add the LTSS repositories to your appliances as
follows:Login to SUSE Studio with your user account, select an existing SLES 11 SP1 appliance, then go to the "Software Tab", then select "Add repositories". Here you can add the LTSS repository to your appliance. After that, you need to (re-)build the appliance.SLES 12Starting with SLES 12 (SP0) LTSS has been made an extension that must be
installed on the system.This is a two-step process :1) Register the system against an update service (registration server).2) Install the SLES 12 LTSS extension/add-on/module, which also sets up the repository.The list of installable SLE 12 extensions is based on the active registrations of the system and what is available on the registration server,
which can be either the SUSE Customer Center (SCC) or an SMT server.This means that the system needs to be registered before the installation of the LTSS product can be performed.Step 1 - Registering the systemSystems connected to the internet and not using an internal Subscription Management Tool (SMT) serverLike SLES 11 servers
connected directly to the internet, the system needs to be registered using a LTSS activation code which can be located in the SUSE Customer Center account. Please note, LTSS activation codes are product dependent. Registering a SLES 12 with an LTSS code for SLES 11 SP3 will not succeed. Make sure the correct activation code is selected when
registering the system.In SLE 12, the suse_register command has been replaced by the more feature-rich SUSEConnect command, but otherwise the usual procedures for registering a SLES server apply. Please see for details how to register a SLES server using YaST2. If a scripted approach is desired, the command SUSEConnect can be used to
accomplish the registration: SUSEConnect --email EMAILADDR --regcode SLES-ACTIVATIONCODE Please adjust EMAILADDR and SLES-ACTIVATIONCODE accordingly. To change the registration on any SUSE Linux Enterprise based system, please follow hereSystems using a local Subscription Management Tool (SMT) serverThe systems must be
registered against the SMT server as described in Configuring Clients to Use SMT.It is a pre-requisite that the SLES12-LTSS-Updates (and optionally SLES12-LTSS-Debuginfo-Updates) repositories are enabled for mirroring on the SMT server.Provided the credentials to to download and provide updates locally will have to enable the appropriate
LTSS channels they are entitled to either by using the YaST smt module or an smt-catalogs command like this : smt-repos -e SLES12-LTSS-Updates sle-12-x86_64 Step 2 - Installing the LTSS extension/add-on/moduleEnsure that the system is patched to a level where at least the SUSEConnect package is capable of listing the available extensions
(version 0.2.34 or higher).The extension can either be installed with the YaST add-on module of from the command-line with the SUSEConnect command.YaSTLaunch the yast(2) add-on module and select- Add- Extensions and Modules from Registration Server...- SUSE Linux Enterprise Server 12 LTSS 12If the system is registered against SCC, the
user is at this point prompted to enter the LTSS-activation code. Enter that and select Next.Complete the installation and registration processCommand-lineVerify that the LTSS is available and get the command to installed returned for free by entering this command : SUSEConnect --list-extensions | grep LTSS The registration code not relevant for
systems registered against an SMT server, so here the output will be limited to : SUSE Linux Enterprise Server 12 LTSS 12 x86_64 Install with: SUSEConnect -p SLES-LTSS/12/x86_64Now go ahead and install the extension with the applicable command depending on your environment (SMT or SCC), e.g. : SUSEConnect -p SLES-LTSS/12/x86_64
which should return something like Registered SLES-LTSS 12 x86_64 To server: https:// Finally verify that the SLES12-LTSS-Updates repository has been enabled for the client with\ zypper lr -E | grep LTSS The output should be a line like the following : 2 | SMT-http_t440_nts_com:SLES12-LTSS-Updates | SLES12-LTSS-Updates | Yes | (r) Yes |
Yes SLES 15For all versions of SLES 15, please see the Upgrade Guide section 2.7 Enabling LTSS support. 15 SP1: SP2: SP3: SP4: via Repository Mirroring Tool:Environments using a RMT server to download and provide updates locally will have to enable the appropriate LTSS channels they are entitled to either by using the RMT
command line tools.Here is an example to enable SLES15-SP4 LTSS: # rmt-cli sync # rmt-cli products list --all|grep -i ltss|grep "15 SP4" 2696 | SUSE Linux Enterprise Server LTSS | 15 SP4 | x86_64 | Mirror # rmt-cli products enable 2696 # rmt-cli mirror product 2696 or # rmt-cli sync # rmt-cli repos list --all | grep -i LTSS|grep 15-SP4 6717 | SLE-
Product-SLES15-SP4-LTSS-Updates for sle-15-x86_64 | Mandatory | Mirror # rmt-cli repo enable 6717 # rmt-cli mirror repo 6717 LTSS Registration in the Public CloudStarting with cloud-regionsrv-client version 10.3.4 and above, LTSS can be added to an existing cloud workload using the registercloudguest script for both BYOS and PAYG (on-
demand) instances.The following command enables LTSS for the instance: # registercloudguest -r LTSS_REGISTRATION_CODE SLES9SP4In order to patch a SLES9SP4 with LTSS packages, adjustments in /var/adm/YaST/ProdDB/prod_0000000* need to be made as these files define the directory on the update server where to check for new
packages. Change the last line in any prod_* file from e.g. =YouPath: i386/update/SUSE-SLES/9 to =YouPath: i386/update/SUSE-SLES/9-LTSS Please note: SLES9SP4 systems need to be fully patched to the latest patch level before changing the update source path. This Support Knowledgebase provides a valuable tool for SUSE customers and parties
interested in our products and solutions to acquire information, ideas and learn from one another. Materials are provided for informational, personal or non-commercial use within your organization and are presented "AS IS" WITHOUT WARRANTY OF ANY KIND.