What's New with SUSE Linux Enterprise Server for z Systems

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SUSE Linux Enterprise

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

The advanced foundation for your success

innovation

Increase uptime

Improve operational efficiency

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### SUSE Linux Enterprise Lifecycle & Codestreams

<table>
<thead>
<tr>
<th>Year</th>
<th>SLE10</th>
<th>SLE 11</th>
<th>SLE 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>SP4</td>
<td>SP2</td>
<td>GA</td>
</tr>
<tr>
<td>2012</td>
<td></td>
<td>SP3</td>
<td>SP1</td>
</tr>
<tr>
<td>2013</td>
<td></td>
<td></td>
<td>SP2</td>
</tr>
<tr>
<td>2014</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **13-year lifecycle**
  - For SLES 11 and SLES 12, 10 years general support, +3 years Long Term Support
- **SUSE Linux Enterprise 12 Long Term Service Pack**
  - Support for every Service Pack

Tentative – Dates subject to change

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SUSE® Linux Enterprise Server 12

Lifecycle Model

10 years lifecycle + 3 years Extended Support

<table>
<thead>
<tr>
<th>General Support</th>
<th>Extended Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>Year 11</td>
</tr>
<tr>
<td>GA</td>
<td>Year 12</td>
</tr>
<tr>
<td>Year 2</td>
<td>Year 13</td>
</tr>
<tr>
<td>LTSS</td>
<td></td>
</tr>
<tr>
<td>Year 3</td>
<td></td>
</tr>
<tr>
<td>SP1</td>
<td></td>
</tr>
<tr>
<td>LTSS</td>
<td></td>
</tr>
<tr>
<td>Year 4</td>
<td></td>
</tr>
<tr>
<td>SP2</td>
<td></td>
</tr>
<tr>
<td>LTSS</td>
<td></td>
</tr>
<tr>
<td>Year 5</td>
<td></td>
</tr>
<tr>
<td>SP3</td>
<td></td>
</tr>
<tr>
<td>LTSS</td>
<td></td>
</tr>
<tr>
<td>Year 6</td>
<td></td>
</tr>
<tr>
<td>SP4</td>
<td></td>
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<tr>
<td>LTSS</td>
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<tr>
<td>Year 7</td>
<td></td>
</tr>
<tr>
<td>Year 8</td>
<td></td>
</tr>
<tr>
<td>Year 9</td>
<td></td>
</tr>
<tr>
<td>Year 10</td>
<td></td>
</tr>
<tr>
<td>Year 11</td>
<td></td>
</tr>
<tr>
<td>Year 12</td>
<td></td>
</tr>
<tr>
<td>Year 13</td>
<td></td>
</tr>
</tbody>
</table>

- **13-year lifecycle** (10 years general support, 3 years extended support)
- **Long Term Service Pack Support** (LTSS) available for all versions, including GA
SUSE® Linux Enterprise Server for System z 11 SP4

- z support continued
  - z13, zEC12, zBC12, z/VM 6.3, zBX support
  - z196 EC, z114 BC, z10 EC, z10 BC, z9 EC, z9 BC, support

- Improvements at a glance
  - s390-tools and performance monitoring updated
  - OFED introduction
  - Crypto support refresh
  - Networking enhancements
  - Update to IBM Java 7.1
## Tested Platforms

http://www-03.ibm.com/systems/z/os/linux/resources/testedplatforms.html  
https://www.suse.com/yessearch/Search.jsp  
z13, EC12, z196, z10, z9

<table>
<thead>
<tr>
<th>Distribution</th>
<th>z13</th>
<th>zEnterprise - zBC12 and zEC12</th>
<th>zEnterprise - z114 and z196</th>
<th>System z10 and System z9</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLES 12</td>
<td>(2,3)</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
</tr>
<tr>
<td>SLES 11</td>
<td>(2,3)</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
</tr>
<tr>
<td>SLES 10 (*)</td>
<td>x</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>SLES 9 (*)</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>✓</td>
</tr>
<tr>
<td>RHEL 7</td>
<td>(1,3)</td>
<td>✓</td>
<td>✓</td>
<td>(4)</td>
</tr>
<tr>
<td>RHEL 6</td>
<td>(1,3)</td>
<td>✓</td>
<td>✓</td>
<td>(5)</td>
</tr>
<tr>
<td>RHEL 5</td>
<td>(1,3)</td>
<td>✓</td>
<td>✓</td>
<td>(6)</td>
</tr>
<tr>
<td>RHEL 4 (*)</td>
<td>x</td>
<td>x</td>
<td>✓</td>
<td>(3)</td>
</tr>
</tbody>
</table>

* Indicate that the distribution (version) has been tested by IBM on the hardware platform, will run on the system, and is an IBM supported environment. Updates or service packs applied to the distribution are also supported. Please check with your service provider which kernel-levels are currently in support.
Accelerate Innovation

Hardware 64-Bit

- 64-bit hardware is the future
  - 64-bit kernels only
  - Executing of 32-bit applications fully supported via 32-bit execution environment on top of 64-bit kernels

- Virtualisation
  - KVM, Xen, z/VM, LPAR support (depends on architecture)
  - 64-bit host; 64-bit and 32-bit guests

- Hybrid Computing
  - Platform specific workloads, GPUs, special purpose PUs

- Device Driver Innovation
  - SUSE Solid Driver Program (SSDP)

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Grub 2 Boot Process

zIPL Stage

zIPL Boot → Mount zIPL Partition → Launch grub2-emu

grub2-emu Stage

Load grub.cnf → Interactive Grub Menu → Timeout or Select Option → kexec Kernel
Improve Operational Efficiency
Installer - Workflow

SUSE Linux Enterprise 11

Installation Setup → Install **without** updates → Wait

| Reboot | Network | Register | Update | Wait |

| Reboot | Services | Log-in |

SUSE Linux Enterprise 12

Installation Setup → Network → Register → Install **with** updates → Wait

| Reboot | Log-in |
SUSE Linux Enterprise 12

Modules

- Components of SUSE Linux Enterprise
  - Flexible lifecycle (different from the base product)
  - Delivered on-line
  - Fully supported

- List of modules
  - Web and Scripting
  - Legacy
  - Toolchain
  - Public Cloud
  - Advanced Systems Mgmt
## Accelerate Innovation
### Modules: A Closer Look

<table>
<thead>
<tr>
<th>Module Name</th>
<th>Content</th>
<th>Lifecycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web and Scripting Module</td>
<td>“PHP”, “Python”, “Ruby on Rails”</td>
<td>3 years</td>
</tr>
<tr>
<td>Legacy Module</td>
<td>Sendmail, old IMAP stack, old Java etc.</td>
<td>3 years</td>
</tr>
<tr>
<td>Public Cloud Module</td>
<td>Public cloud initialization code and tools</td>
<td>Continuous Integration</td>
</tr>
<tr>
<td>Toolchain Module</td>
<td>GCC</td>
<td>Yearly delivery</td>
</tr>
<tr>
<td>Advanced Systems Management Module</td>
<td>the configuration management tools cfengine, puppet and the new &quot;machinery&quot; tool</td>
<td>Continuous Integration</td>
</tr>
</tbody>
</table>

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Improve Operational Efficiency

Systemd: System/Service Manager

Init Replacement
- Bring up system and start services
- Integrate system wide ulimit settings and Cgroups
- Activation via Socket and d-bus
- Command line “systemctl”

Compatibility with SystemV init scripts
- Provide infrastructure for exiting ISV Applications
- LSB compatibility

SUSE specific usability enhancements
- Keep insserv, chkconfig and /sbin/servic
- Old style (calling “rc...”) redirected to systemctl
- LSB compatibility for targets like $network

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SUSE® Linux Enterprise Server for System z 12 SP1

• Support for z13
  – SIMD support (toolchain, kernel)
  – Crypto Express 5S (CEX5S) support
• In-kernel support of the DRBG (Deterministic Random Bit Generator)
• LPAR Watchdog support
• Enable OFED for System z
• MD-mirror (RAID 10) for DASD
• gcc 5.1 as addon compiler (docker support)
Downtime isn’t an option.
Towards Zero Downtime with SUSE.

www.suse.com/zerodowntime
Increase Uptime

Full System Rollback

Rollback to a good state with one click for faster recovery from planned or unplanned downtime

Support for service pack rollback

Support for kernel upgrade

Based on btrfs and Snapper, bootloader integration
Increase Uptime

Service Availability with Clustering

SUSE Linux Enterprise High Availability Extension

- Meet *Service Level Agreements*
- Increase *service availability* for mission-critical systems and data
- Enable *rolling software updates*
- Quickly and easily install, configure and manage clustered Linux servers
- Transparent to *Virtualization* – nodes can be virtual, physical or mixed! *Integrated* with SUSE Linux Enterprise Server

Geo Clustering for SUSE Linux Enterprise High Availability Extension

- Business continuity, anywhere in the world

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Local Cluster For Rolling Updates

SLES
SLE HA

Clients

SLES
SLE HA

SLES
SLE HA

SLES
SLE HA

SLES
SLE HA

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SUSE Manager
Security Patch Audit

This page will display a list of systems with their patch status regarding a given CVE (Common Vulnerabilities and Exposures) number.

Please note that underlying data subscriptions have been updated nightly. If systems were registered very recently or channel hours it is recommended that an extra CVE data update is scheduled in order to ensure consistent results.

- Affected, patch available in a channel which is not assigned
- Affected, patch available in an assigned channel
- Not affected
- Patched

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Increase Uptime

Outlook: Ready for Live Patching

SUSE Linux Enterprise Live Patching

– Kernel live patching designed and developed by SUSE Labs
– Ease of use: Builds on well-known update processes

Use Cases

– Mission-critical systems: Improve general availability and run until the next “maintenance window”
– Massive, time-critical deployment

Advantage

– Works with zero execution interruption
– Other implementation stop the whole system (milliseconds to seconds range) when patching

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KVM

17489 KVM for z Systems, Tue 3:15 pm, Europe 11

SUSE Manager

17220 SUSE Manager at a large scale, Thu 4:30 pm, Americas Seminar

Live Kernel Patching

17194 Linux Live Kernel Patching, Fri 8:30 am, Oceanic 8

Thank you

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