Hewlett Packard Enterprise

SUSE ON HPE

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SUSE Labs 2023

Hewlett Packard Enterprise





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Let's talk about

- SUSE+HPE Partnership
- HPE SUSE/Linux deliverables
- Hardware management
- New servers!

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- SUSE Advanced Linux Platform & HPE
- Futures, collaboration ideas



Partnership



Technical reference forums Shared engineering resources Solid Driver Program Share product road maps Full integration testing before product launch SUSE Yes certification OEM Reseller agreement Buy entitlements directly from HPE First and Second Level support by HPE

Entitlement/support purchase obligatory



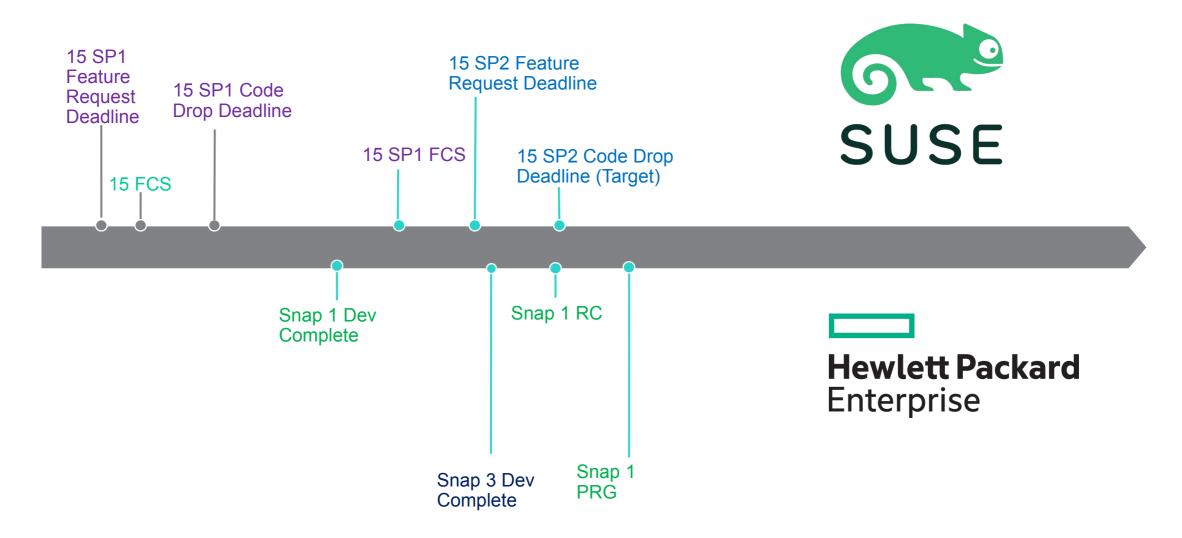
Community engagement Upstream commits Some sanity testing

No certification nor support





HPE / SLES release cadence example





HPE+SUSE Yes Certification

724 Servers Yes Certified



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Bulletin	Company	Product	Category	OS	Date 2023-04-17	
<u>152035</u>	Hewlett Packard Enterprise	Synergy 480 Gen11 Compute Module (Xeon 8480+, 2.0Ghz, 56c)	Network Server	SUSE® Linux Enterprise Server 15 for AMD64 & Intel64 with KVM Service Pack 4 for SUSE® SLES 15		
152034	Hewlett Packard Enterprise	Synergy 480 Gen11 Compute Module (Xeon 8480+, 2.0Ghz, 56c)	Network Server	SUSE® Linux Enterprise Server 15 for AMD64 & Intel64 Service Pack 4 for SUSE® SLES 15	2023-04-17	
152004	Hewlett Packard Enterprise	Alletra 4110 (Xeon Platinum 8468, 2.1 GHz, 48c)	Network Server	SUSE® Linux Enterprise Server 15 for AMD64 & Intel64 with KVM Service Pack 4 for SUSE® SLES 15	2023-03-31	
152003	Hewlett Packard Enterprise	Alletra 4110 (Xeon Platinum 8468, 2.1 GHz, 48c)	Network Server	SUSE® Linux Enterprise Server 15 for AMD64 & Intel64 Service Pack 4 for SUSE® SLES 15	2023-03-31	
52000	Hewlett Packard Enterprise	Alletra 4120 (Xeon Platinum 8468, 2.1 GHz, 48c)	Network Server	SUSE® Linux Enterprise Server 15 for AMD64 & Intel64 with KVM Service Pack 4 for SUSE® SLES 15	2023-03-30	
151999	Hewlett Packard Enterprise	Alletra 4120 (Xeon Platinum 8468, 2.1 GHz, 48c)	Network Server	SUSE® Linux Enterprise Server 15 for AMD64 & Intel64 Service Pack 4 for SUSE® SLES 15	2023-03-30	
151984	Hewlett Packard Enterprise	ProLiant DL380a Gen11 (Xeon 8480+, 2.0Ghz, 56c)	Network Server	SUSE® Linux Enterprise Server 15 for AMD64 & Intel64 with KVM Service Pack 4 for SUSE® SLES 15	2023-03-17	
151983	Hewlett Packard Enterprise	ProLiant DL380a Gen11 (Xeon 8480+, 2.0Ghz, 56c)	Network Server	SUSE® Linux Enterprise Server 15 for AMD64 & Intel64 Service Pack 4 for SUSE® SLES 15		
151982	Hewlett Packard Enterprise	ProLiant DL320 Gen11 (Xeon Gold 6454S , 2.2Ghz, 32c)	Network Server	SUSE® Linux Enterprise Server 15 for AMD64 & Intel64 with KVM Service Pack 4 for SUSE® SLES 15	2023-03-10	
<u>151981</u>	Hewlett Packard Enterprise	Alletra 4120 (Xeon Platinum 8468, 2.1 GHz, 48c)	Network Server	SUSE® Linux Enterprise Server 15 for AMD64 & Intel64 Service Pack 4 for SUSE® SLES 15	2023-03-10	
151933	Hewlett Packard Enterprise	HPE Cray XD220v Xeon 8480+ 2.0GHz 56 Core Processor (XD2000)	Network Server	SUSE® Linux Enterprise Server 15 for AMD64 & Intel64 with KVM Service Pack 4 for SUSE® SLES 15	2023-03-07	
151932	Hewlett Packard Enterprise	HPE Cray XD220v Xeon 8480+ 2.0GHz 56 Core Processor (XD2000)	Network Server	SUSE® Linux Enterprise Server 15 for AMD64 & Intel64 Service Pack 4 for SUSE® SLES 15	2023-03-07	
1 <u>51978</u>	Hewlett Packard Enterprise	ProLiant DL365 Gen11 (EPYC 9654P - 2.4Ghz, 96c)	Network Server	SUSE® Linux Enterprise Server 15 for AMD64 & Intel64 Service Pack 4 for SUSE® SLES 15	rvice 2023-03-07 rvice 2023-03-07	
151977	Hewlett Packard Enterprise	ProLiant DL345 Gen11 (EPYC 9654P - 2.4Ghz, 96c)	Network Server	SUSE® Linux Enterprise Server 15 for AMD64 & Intel64 Service Pack 4 for SUSE® SLES 15	2023-03-07	
151973	Hewlett Packard Enterprise	ProLiant DL385 Gen11 (EPYC 9654P - 2.4Ghz, 96c)	Network Server	SUSE® Linux Enterprise Server 15 for AMD64 & Intel64 Service Pack 4 for SUSE® SLES 15	2023-03-02	
<u>151972</u>	Hewlett Packard Enterprise	ProLiant DL325 Gen11 (EPYC 9654P - 2.4Ghz, 96c)			2023-03-02	
151969	Hewlett Packard Enterprise	ProLiant ML350 Gen11 (Xeon 8480+, 2.0Ghz, 56c)	Network Server	SUSE® Linux Enterprise Server 15 for AMD64 & Intel64 with KVM Service Pack 4 for SUSE® SLES 15	AMD64 & Intel64 with 2023-02-28	
	Hewlett Packard Enterprise	ProLiant DL360 Gen11 (Xeon 8480+, 2.0Ghz, 56c)	Network Server	SUSE® Linux Enterprise Server 15 for AMD64 & Intel64 with KVM Service Pack 4 for SUSE® SLES 15	2023-02-28	



https://www.suse.com/yessearch/

Service Pack for ProLiant





Drivers



Firmware



Management Software

- Enable SLES on ProLiant
- kmp-packaged driver rpms as needed
- Bootable driver kit
- Solid driver program
- rpm and fwpkg packaged firmware
- ILO/BMC hardware integration
- Hardware management



HPE Linux Enablement Software

- amsd reports OS information back to ILO/bmc, snmp
- **ssacli** smart array command line interface
- **storcli** broadcom megaraid command line interface
- hponcfg configure ILO card from OS (hponcfg -f myilo.cfg)
- sum Smart Update Manager
- ilorest Configure ILO/BMC via command line (Redfish® api)
- mellanox OFED/VPI drivers
- intel_opa Intel omnipath fabric software suite
- IP Intelligent Provisioning (sles in firmware, 1GB rom)
- sglx Service Guard for Linux, clustering
- **stk** Scripting toolkit, installation/configuration
- foundation SGI utilities, MPI, acellerate, dmfsuite



Hewlett Packard Enterprise

http://downloads.linux.hpe.com

The days of burning ISO media are more or less over for the Linux community

Subscribe to one or more HPE repositories

Use built-in Linux software configuration manager to acquire/install all packages

zypper, chef, puppet, ansible

zypper install be2net-kmp-default



😵 HPE Software Delivery	Repository - Br	ave <2>				✓ ^ X
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HPE Software Delivery Re × + Image: Comparison of the com						
Hewlett Packard	Solutions	Services	Products	About Us	Support	۹
Software Delivery Repository						

The HPE Software Delivery Repository hosts <u>dnf</u>, <u>yum</u>, <u>zypper</u>, and <u>apt</u> repositories for Linux-related software packages. Much of this content is also available from various locations at <u>hpe.com</u> in iso or tgz format, but if you would prefer to use your Linux-native software configuration manager, you may subscribe your systems to some or all of these repositories for quick and easy access to the latest rpm/deb packages from HPE.

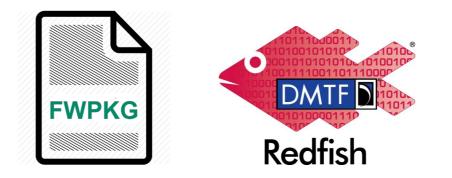
Project Repositories

Browse	Subscribe	Contents	
spp-gen11	Service Pack for ProLiant (gen11)	Drivers and age	
spp-gen10	Service Pack for ProLiant (gen10)	Drivers and ager	
spp-gen9	Service Pack for ProLiant (gen9)	Drivers and age	
spp-gen8	Service Pack for ProLiant (gen8)	Drivers and age	
fwpp-gen11	Firmware Pack for ProLiant (gen11)	Firmware update	
fwpp-gen10	Firmware Pack for ProLiant (gen10)	Firmware update	
fwpp-gen9	Firmware Pack for ProLiant (gen9)	Firmware update	
fwpp-gen8	Firmware Pack for ProLiant (gen8)	Firmware update	
тср	Management Component Pack for ProLiant	Agent software f Zypper/y ProLiant Gen9/C High availability repositor	a
ilorest	RESTful Interface Tool	ProLiant Gen9/G	
sglx	Serviceguard for Linux	High availability I COSILO	IE
sut	HP Smart Update Tools	HPE OneView u	
intel_opa	Intel Omni-Path Fabric Software	Intel Omni-Path	
lsrrb	Linux Software RAID Redundant Boot	Tools to manage	
l4fame	Fabric Attached Memory Emulator	Software for exp	
hexane	Secure Boot key update	Secure Boot DB/DBX hashes and keys from HPE	
mInx ofed	Mellanox OFED VPI Drivers	Mellanox OFED VPI for Red Hat and SUSE	

Hewlett Packard Enterprise

Leveraging Redfish® & iLO to manage firmware Opening management API's to devops community

- Redfish/EFI flashes firmware
- No OS-native flashers required
- Any redfish-aware code can flash firmware
- Enable .fwpkg files with Ansible, Chef, ALP, docker, etc
- Firmware available in searchable online repositories downloads.linux.hpe.com





List flashable firmware via RedFish



ilorest rawget \
 /redfish/v1/UpdateService/FirmwareInventory/

iLO 5

2.72 Sep 04 2022 4764a662-b342-4fc7-9ce9-258c5d99e815 c0bcf2b9-1141-49af-aab8-c73791f0349c

System ROM

U30 v2.10 (05/21/2019) 0000000-0000-0000-0000-00000000249 0000000-0000-0000-0000-00001553330



Search for firmware repositories with fwget

fwget search dl380

U30-2.04_2019_04_18.fwpkg HPE ProLiant DL380 Gen10 (U30) Servers firmware P89-2.72_2019_03_25.fwpkg HPE ProLiant DL380 Gen9/DL360 Gen9 (P89) Servers

fwget download U30-2.04_2019_04_18.fwpkg

Downloading: firmware-system-p89-2.72_2019_03_25-1.1.i386.fwpkg

json firmware repository index

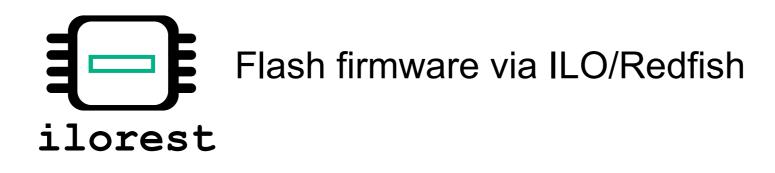
"U63_1.22_01_18_2023.fwpkg": {
 "date": "20230218",
 "description": "HPE ProLiant DL380 Gen11 (U63) Servers",
 "deviceclass": "aa148d2e-6e09-453e-bc6f-63baa5f5ccc4",
 "minimum_active_version": "null",
 "reboot_required": "yes",
 "target": "00000000-0000-0000-0000-00000000249",
 "version": "1.22_01-18-2023"
}

fwget

https://downloads.linux.hpe.com/SDR/project/fwpp-gen11/fwget.html



Flash firmware with ilorest/RedFish



ilorest flashfwpkg P89-2.72 2019 03 25.fwpkg

Uploading firmware: P89_1.46_10_02_2018.signed.flash [200] The operation completed successfully. Component U32_1.46_10_02_2018.signed.flash uploaded successfully Waiting for iLO UpdateService to finish processing the component 0 hour(s) 1 minute(s) 28 second(s) Firmware has successfully been flashed and a reboot is required.

Hewlett Packard Enterprise

Jen HPE ProLiant RL300

Ampere AltraMax CPU

Arm Architecture (aarch64)

128 cores, 180 watts, constant clock

AMPERE. Altra Max.

First Gen11 Server

ILO6 or OpenBMC management

HPE is first tier1 vendor

Simplified options, Mellanox, NVME, m.2

Certifying on SLES15-SP4









DI580 droped, use DL560

What's new DL380/DL385

Powered by the 4th Generation Intel® Xeon® Scalable Processors with next-generation technology that support up to 60 cores at 350W and 16 DIMMs for DDR5 memory at speeds up to 4800 MHz.

Powered by the 4th Generation AMD EPYCTM 9004 Series Processors with 5nm technology that supports up to 96 cores at 400W, 384 MB of L3 Cache, and 24 DIMMs for DDR5 memory up to 4800 MT/s.

Support for up to 8 TB total DDR5 memory with 16 DIMM channels per processor delivers increased performance, lower power requirements, and High Bandwidth Memory (HBM) support.

Support for PCIe Gen5, resulting in improved bandwidth, advanced data transfer rates, and higher network speeds from the PCIe Gen5 serial expansion bus.

Includes the new HPE Integrated Lights-Out 6 (iLO 6) server management software that enables you to securely configure, monitor, and update your HPE ProLiant Gen11 servers seamlessly, from anywhere.

Supports hot-pluggable, high-availability RAID M.2 boot options.

Supports up to 8 single wide (SW) or 3 double wide (DW) GPUs to accelerate graphic intense workloads.

Processor family4th Generation Intel® Xeon® Scalable Processors

Processor core available16 to 60 core, depending on processor.

Processor cache22.5 MB to 112.5 MB L3, depending on processor.

Maximum memory8 TB with 256 GB DDR5

Memory slots32 Hewlett Packard Enterplaiseory typeHPE DDR5 SmartMemory

Mamory protoction factures DAC Advanced ECC online oners, mirroring, combined channel (lacksten) functionality, and UDE East Fault Televant Memory (ADDDC); Intel Ontone Dereistant Memory

Pushing drivers upstream

HW partners find it difficult to submit pull requests to upstream k

Some full-featured drivers are out-of-distro only *"this is how Microsoft does it"* Restricted ioctl's Missing hardware off-loading features Missing firmware-update features

Each kernel subsystem maintainer has different standards for co

We owe it to ourselves to make this easy so SUSE/HPE doesn't side-load drivers

□ Submitting patches: the essential guide to getting your code into the kernel 0) Obtain a current source tree 1) diff -up Describe your changes 3) Separate your changes Style-check your changes 5) Select the recipients for your patch 6) No MIME, no links, no compression, no attachments. Just plain text 7) E-mail size 8) Respond to review comments Don't get discouraged - or impatient 10) Include PATCH in the subject 🗄 11) Sign your work - the 🛛 Developer's Certificate of 12) When to use Acked-by:, Cc:, and Co-Developed-by:

I3) Using Reported-by:, Tested-by:, Reviewed-by:, Suggested-by: and Fixes:

14) The canonical patch format

15) Explicit In-Reply-To headers

16) Sending git pull requests

References



https://www.kernel.org/doc/html/v4.20/process/submitting-patches.html

SUSE Adaptable Linux Platform (ALP) / Micro

- Containerized workloads
- Immutable filesystem
- Transactional OS updates

How do we

- Install drivers? (kmp)
- Flash firmware? (fwpkg)

Industry standard hardware management container? Priviledged? Access to all driver ioctl's?

- Install hardware management software? (amsd)
- Configure arrays? (ssacli)
- Communicate with iLO/BMC? (hpilo.ko)



SUSE



SUSE + HPE Futures

Leverage SLES in management rom?Currently used for raid config, initial OS installation

Collaborate on features

Mutual customer projects





QUESTIONS?

THANK YOU

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