Hewlett Packard Enterprise

SUSE ON HPE

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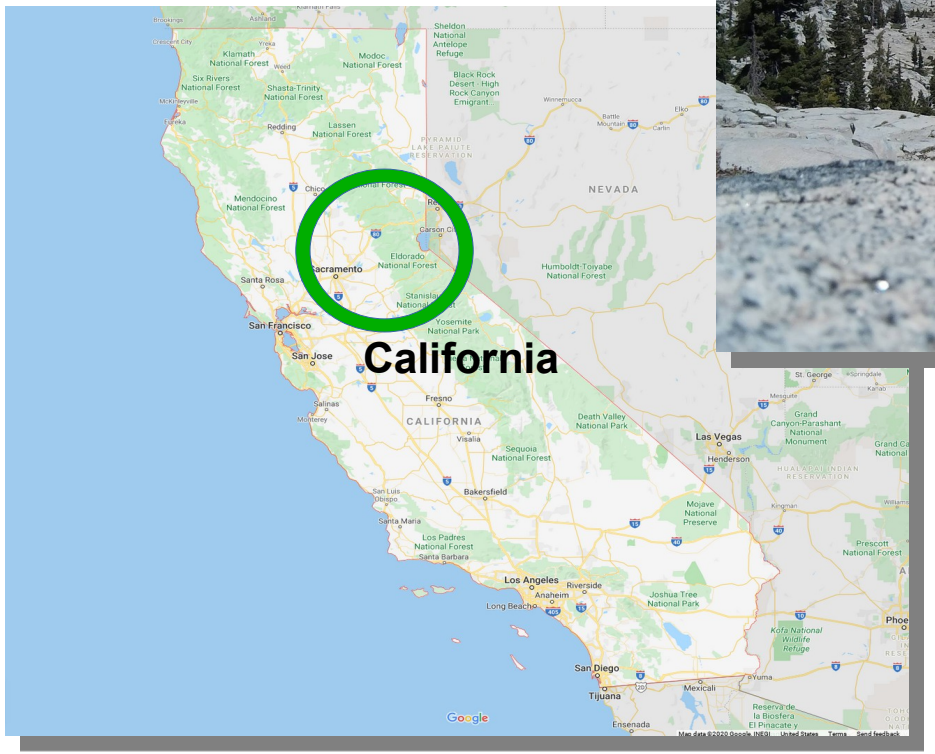
SUSE Labs 2023

Hewlett Packard Enterprise



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Let’s talk about

- SUSE+HPE Partnership
- HPE SUSE/Linux deliverables
- Hardware management
- New servers!
- SUSE Advanced Linux Platform & HPE
- Futures, collaboration ideas

Hewlett Packard Enterprise

Partnership

SLES

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

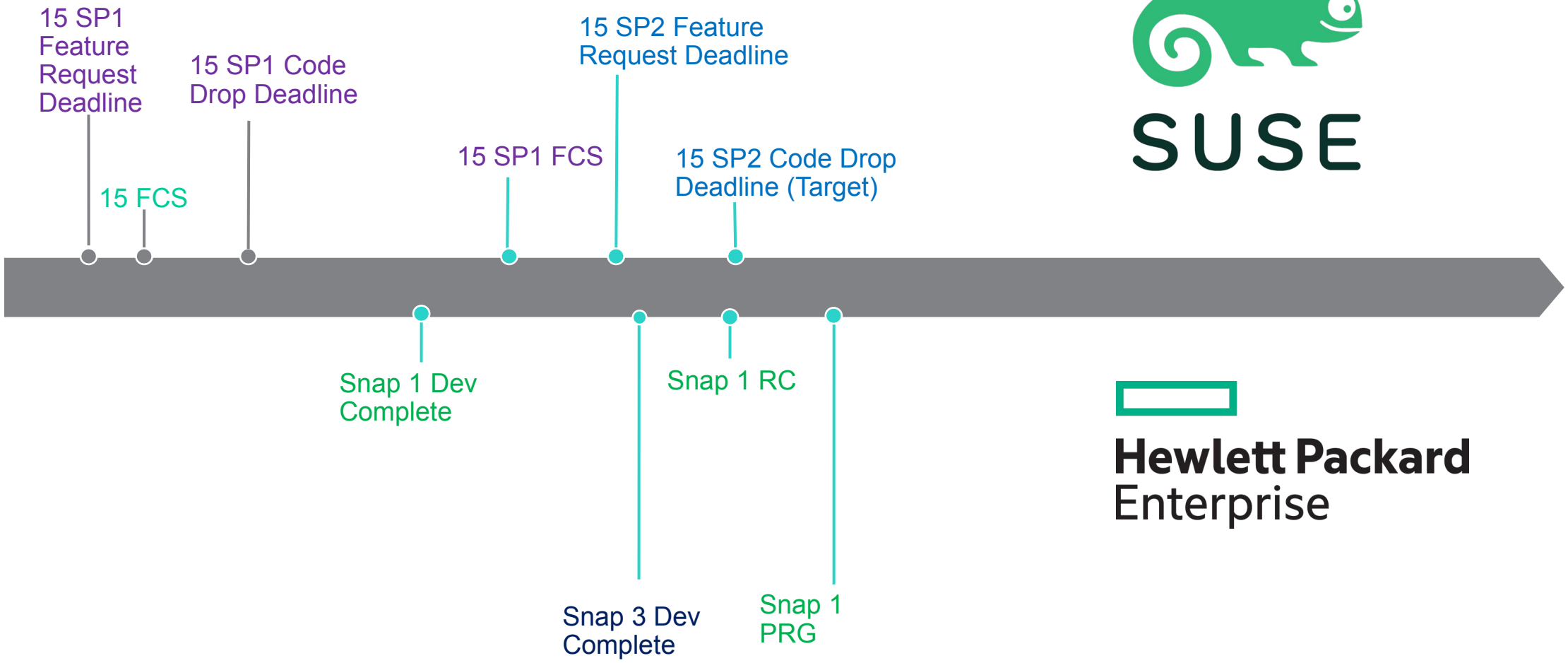
openSUSE Leap / Tumbleweed

Community engagement
Upstream commits
Some sanity testing

No certification nor support

Hewlett Packard Enterprise + SUSE

HPE / SLES release cadence example



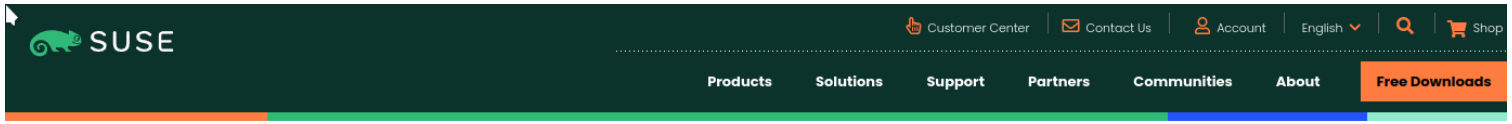
SUSE

Hewlett Packard Enterprise

HPE+SUSE Yes Certification

724 Servers
Yes Certified

Hewlett Packard Enterprise + SUSE



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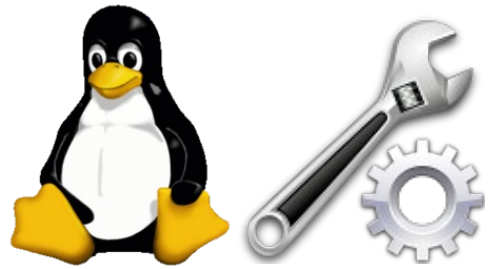
Bulletin	Company	Product	Category	OS	Date
152035	Hewlett Packard Enterprise	**Synergy 480 Gen11 Compute Module (Xeon 8480+, 2.0Ghz, 56c)**	Network Server	SUSE® Linux Enterprise Server 15 for AMD64 & Intel64 with KVM Service Pack 4 for SUSE® SLES 15	2023-04-17
152034	Hewlett Packard Enterprise	**Synergy 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
152000	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	2023-03-17
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
151981	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
151978	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	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
151972	Hewlett Packard Enterprise	**ProLiant DL325 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
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	2023-02-28
151968	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

http://downloads.linux.hpe.com

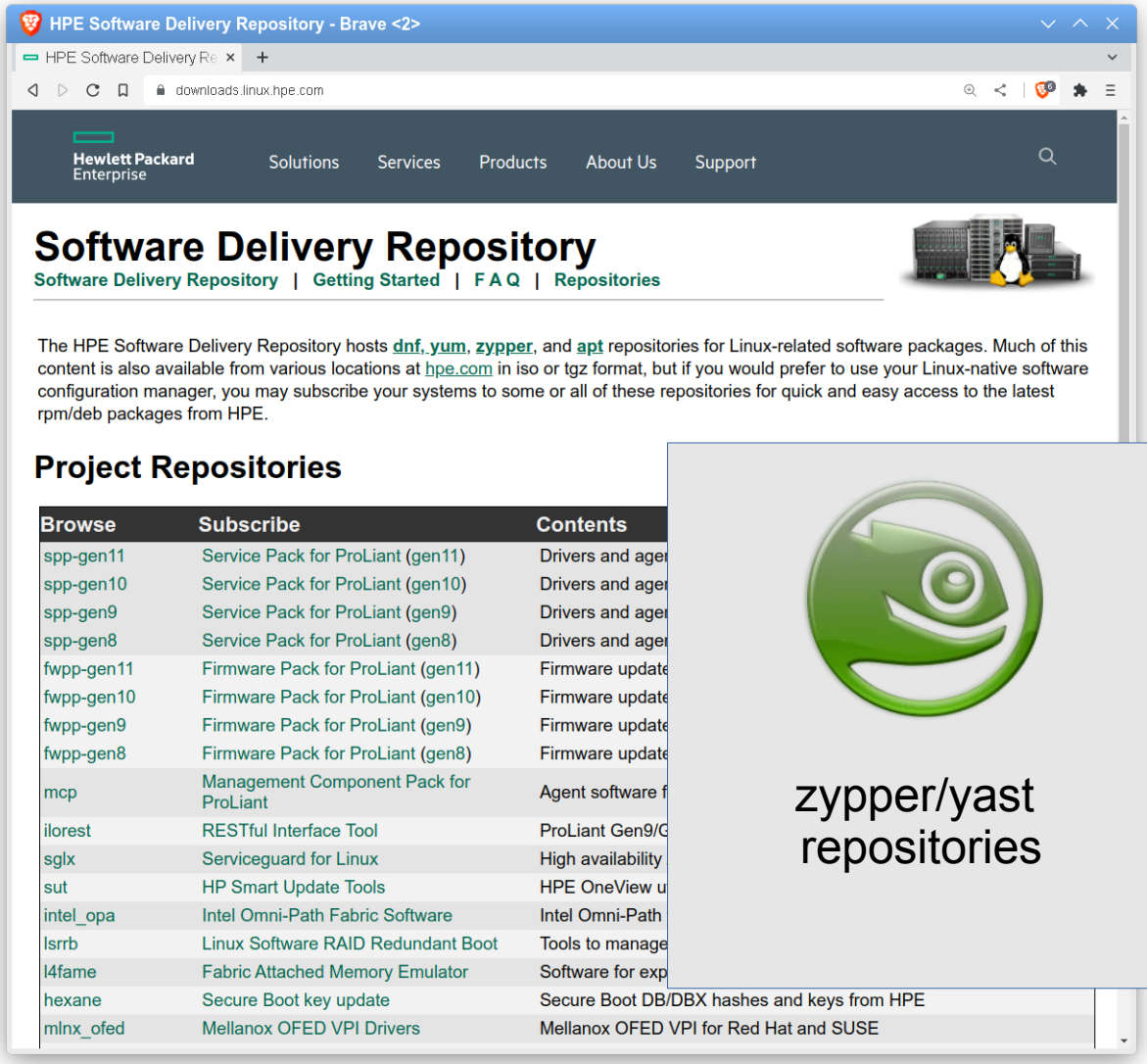
The days of burning ISO media are more or less over for the Linux community

Subscribe to one or more HPE repositories

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

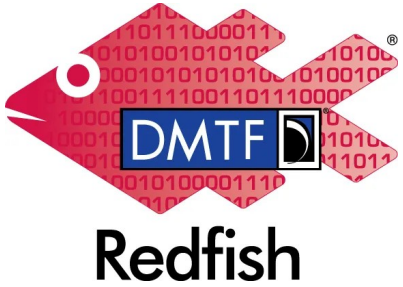
zypper, chef, puppet, ansible

```
# zypper  install be2net-kmp-default
```



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)
00000000-0000-0000-0000-000000000249
00000000-0000-0000-0000-000001553330

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": "00000000-0000-0000-0000-000000000249",
  "version": "1.22_01-18-2023"
},
```


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

Flash firmware with ilorest/RedFish

Flash firmware via ILO/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.
```

New!

HPE ProLiant RL300

Ampere AltraMax CPU

Arm Architecture (aarch64)

128 cores, 180 watts, constant clock

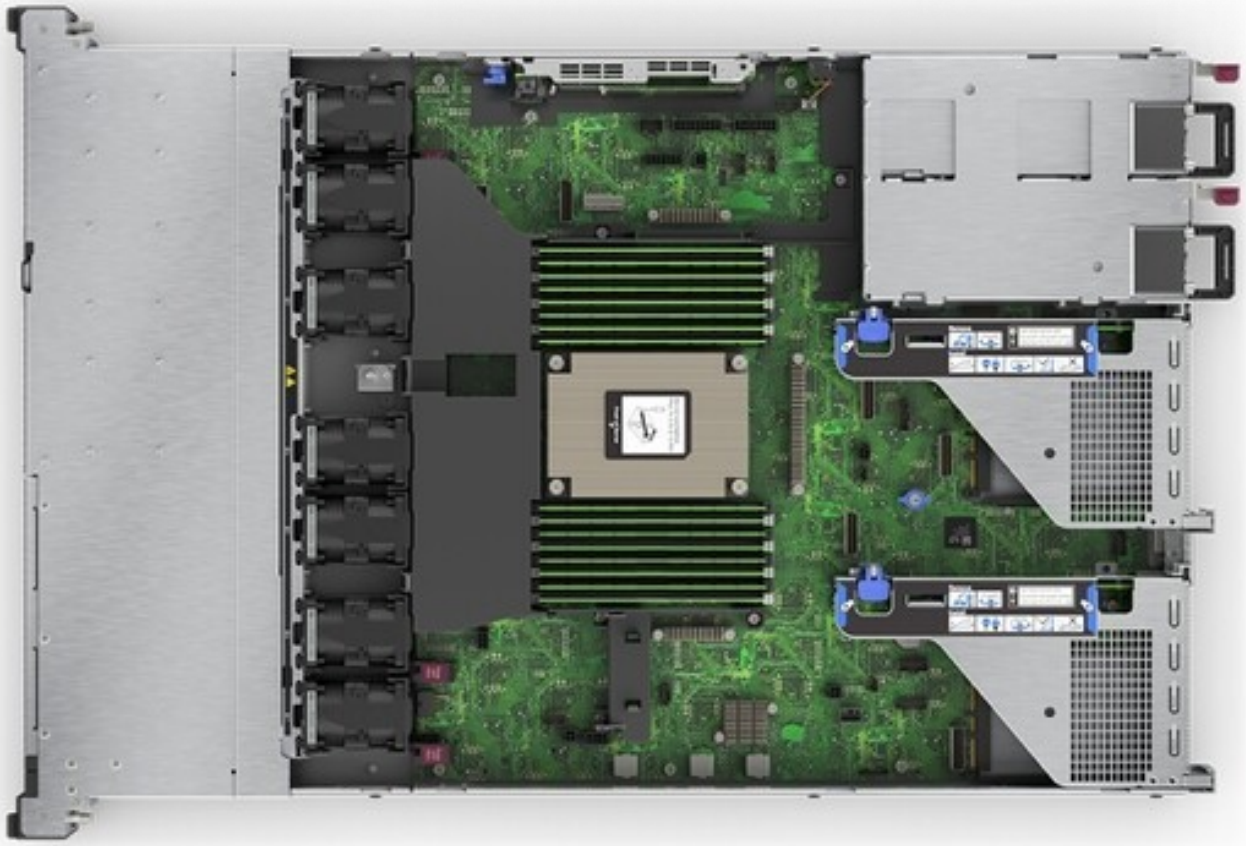
First Gen11 Server

ILO6 or OpenBMC management

HPE is first tier1 vendor

Simplified options, Mellanox, NVME, m.2

Certifying on SLES15-SP4



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New!

Gen11 Place holder

Dl580 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 EPYC™ 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 family	4th Generation Intel® Xeon® Scalable Processors
Processor core available	16 to 60 core, depending on processor.
Processor cache	22.5 MB to 112.5 MB L3, depending on processor.
Maximum memory	8 TB with 256 GB DDR5
Memory slots	32
Memory type	HPE DDR5 SmartMemory
Memory protection features	RAS—Advanced ECC, online spare, mirroring, combined channel (lockstep) functionality, and HPE Fast Fault Tolerant Memory (ADDDC); Intel Optane Persistent Memory

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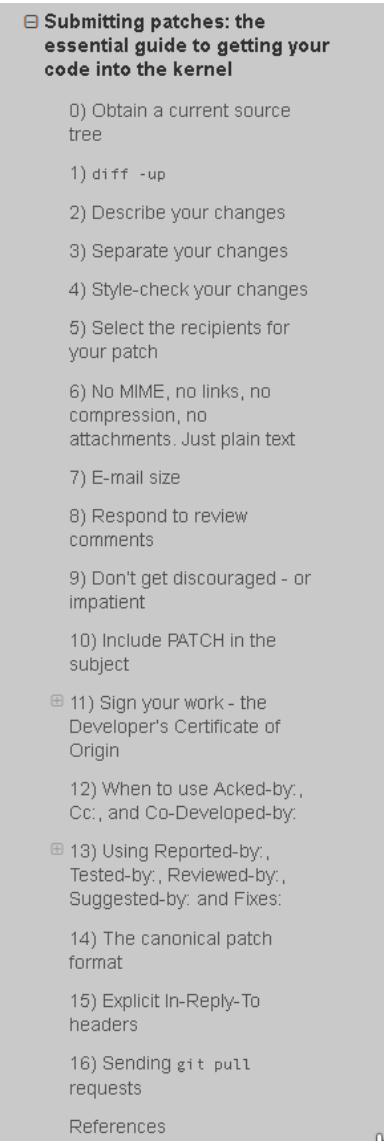
Pushing drivers upstream

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



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

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

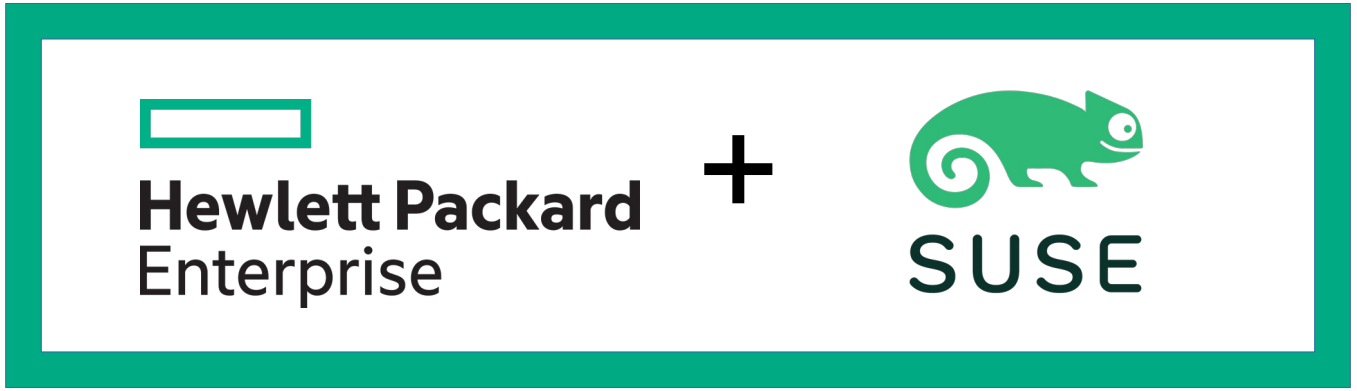
SUSE + HPE Futures

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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