Hewlett Packard Enterprise

SLES ON HPE

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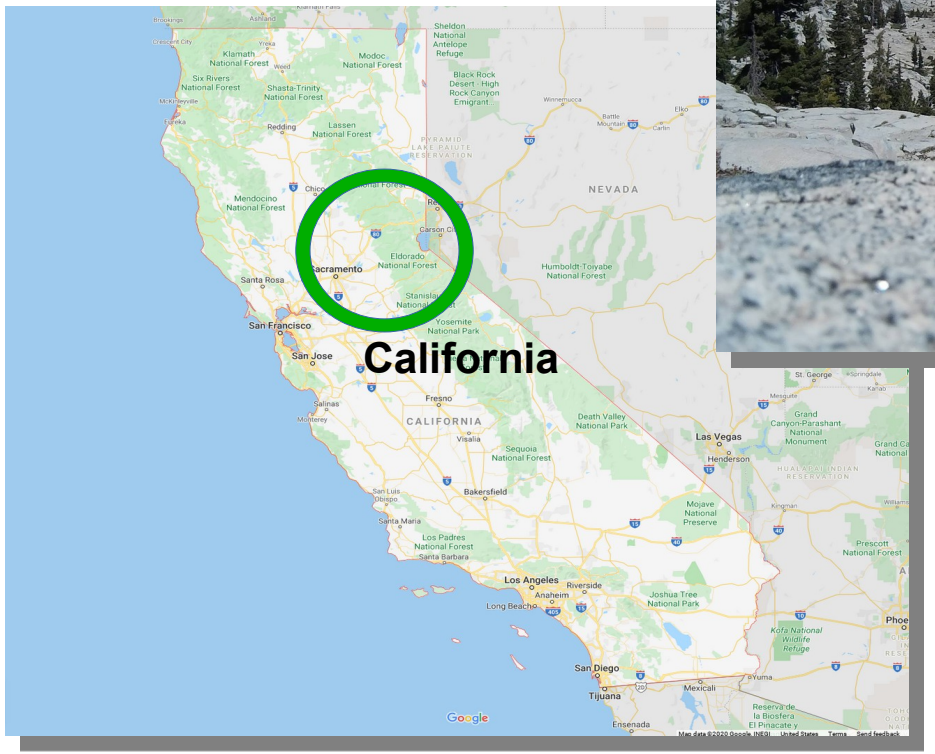
SUSE Labs 2023

Hewlett Packard Enterprise



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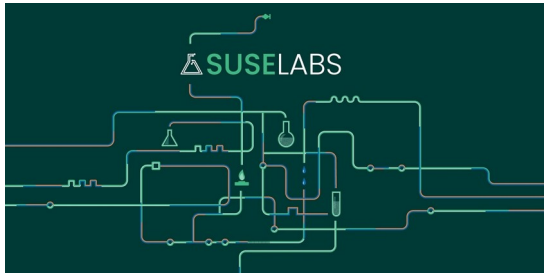
Let’s talk about



- SUSE+HPE Partnership
- New HPE ProLiant Gen11 servers
- HPE drivers/software/firmware
- Hardware management
- SUSE Adaptable Linux Platform & HPE
- Community, collaboration

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

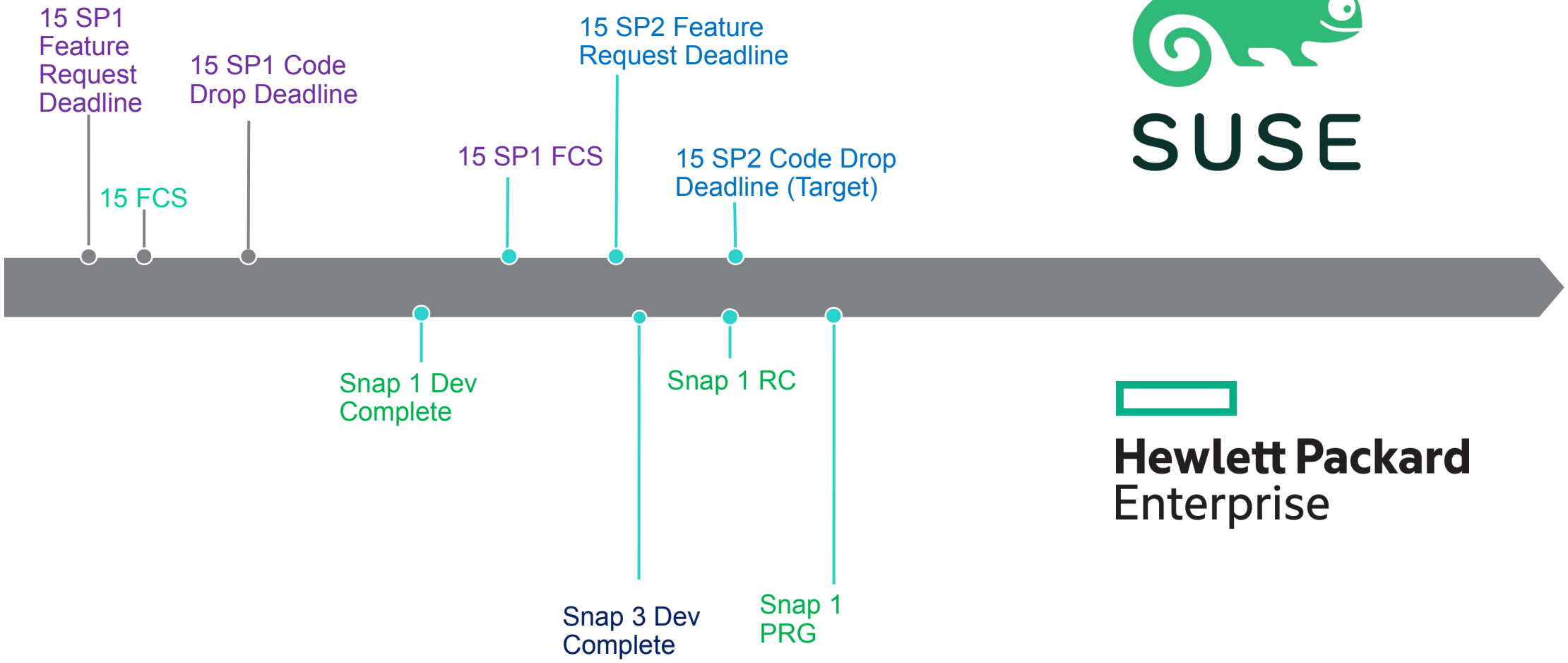
openSUSE Leap / Tumbleweed

Community engagement
Upstream commits
Some sanity testing

No certification nor support

Hewlett Packard Enterprise + SUSE

HPE / SLES release cadence example



SUSE

Hewlett Packard Enterprise

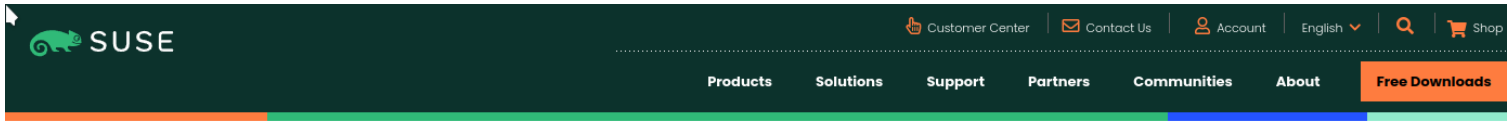
SUSE *Yes* Certification

724

HPE 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/

New!

HPE ProLiant RL300

Ampere AltraMax CPU

Arm Architecture (**aarch64**)

128 cores, 180 watts, constant clock

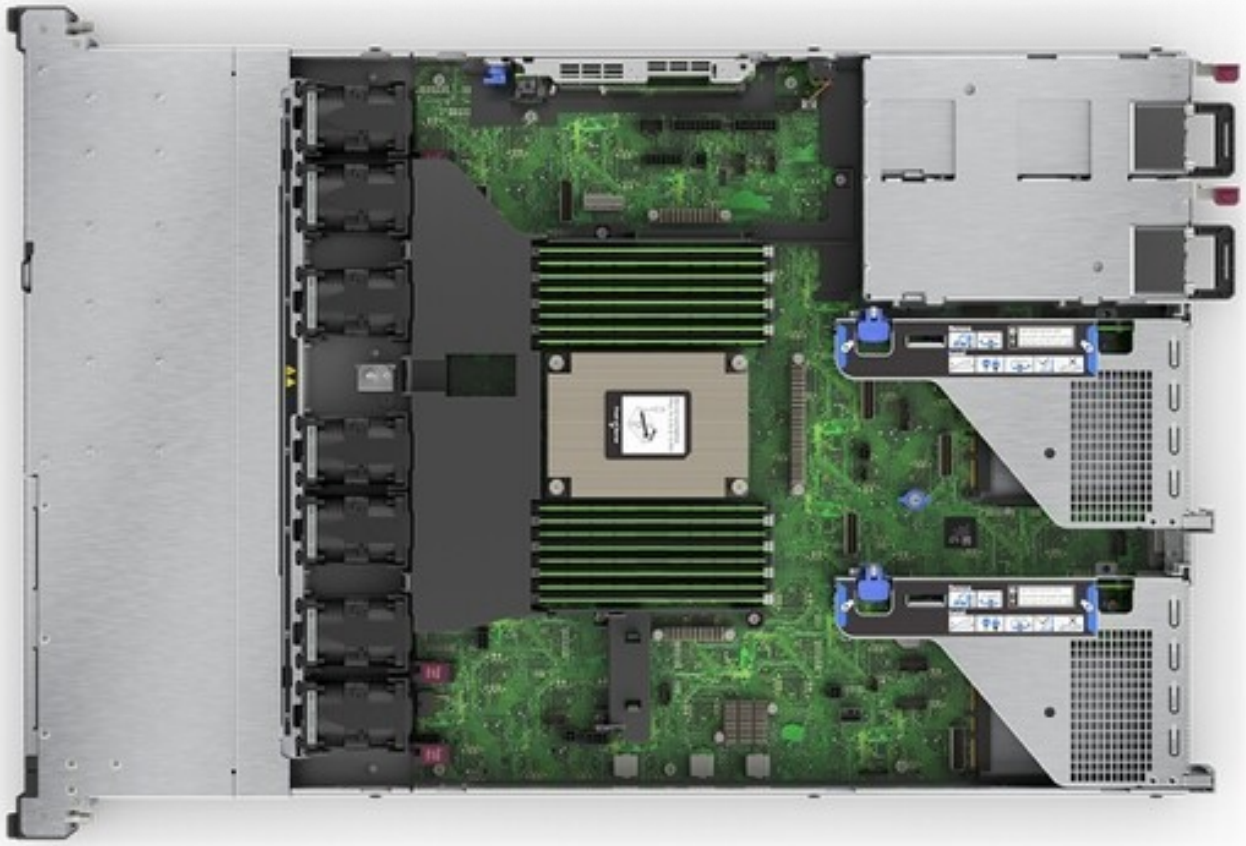
First Gen11 Server

ILO6 or OpenBMC management

HPE is first tier1 vendor

Simplified options, Mellanox, NVME, m.2

Certifying on SLES15-SP4



Hewlett Packard Enterprise

New!

HPE ProLiant Gen11 Servers

DL360/365/320/325

What's new (DL380/DL385)

4th Generation **Intel**® Xeon® 60 cores and 16 DIMMs for DDR5 4800 MHz.

4th Generation **AMD** EPYC™/Genoa, 96 cores 24 DIMMs for DDR5 4800 MT/s.

8 TB total DDR5 memory with 16 DIMM channels per processor

PCIe Gen5

New HPE Integrated Lights-Out 6 (iLO 6) BMC, silicon root of trust

Hot-pluggable, high-availability RAID M.2 boot options.

Up to 8 single wide (SW) or 3 double wide (DW) GPUs

Power supply t800W, 1000W, or 1600W Dual hot-plug redundant 1+1 Power Supplies

Expansion SlotsUp to 8 PCIe Gen5, and 2 OCP 3.0

Network Controller1 Gb, 10 Gb, 10/25 Gb, 100 Gb, or 200 Gb,

Storage HPE SR932i-p HPE MR216i-o HPE MR416i-o HPE MR216i-p HPE MR416i-p HPE MR408i-o,

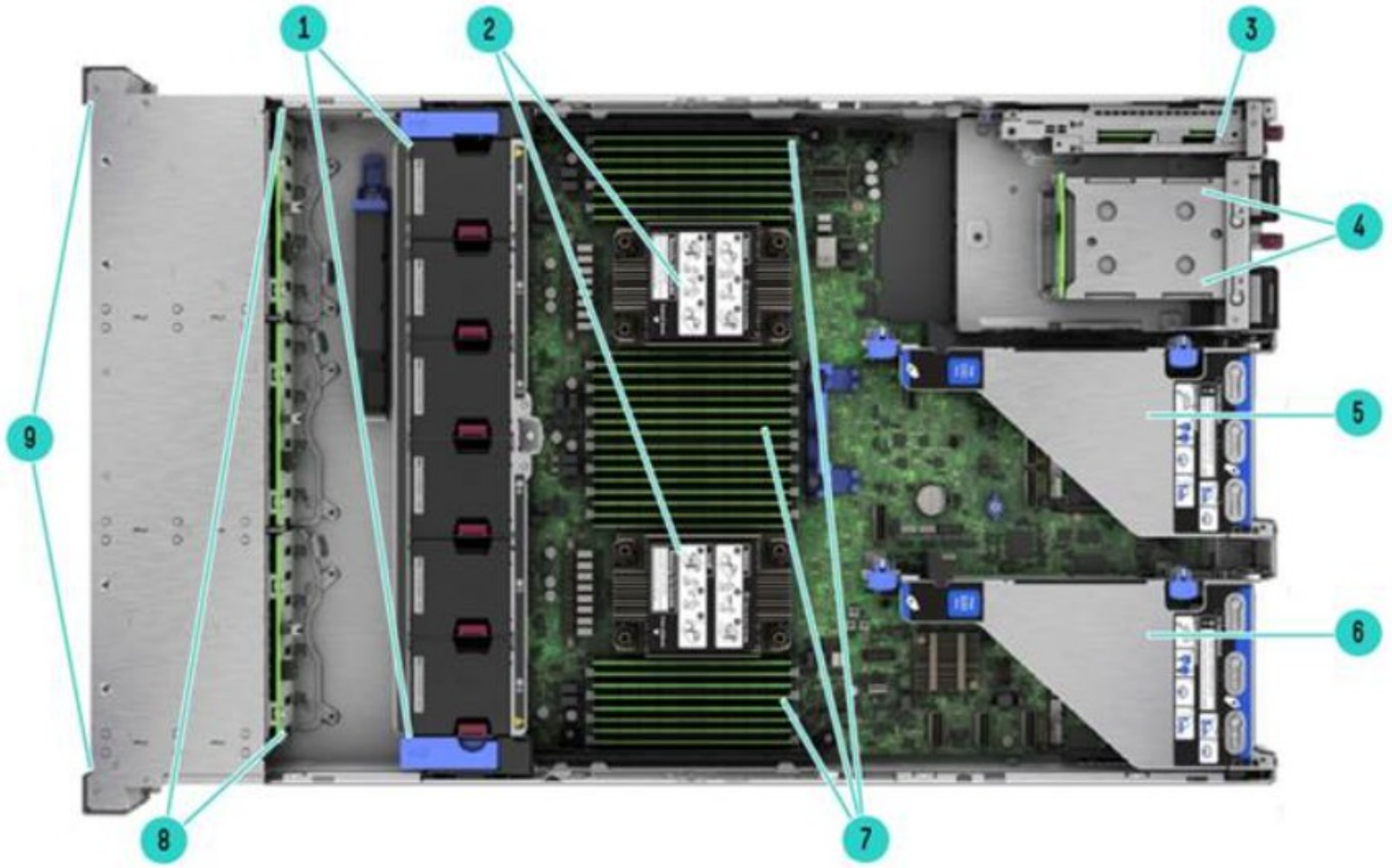
\d\d5 == AMD
\d\d0 == Intel

DL380/385/345

ML350

Hewlett Packard
Enterprise

HPE ProLiant DL380 Gen11

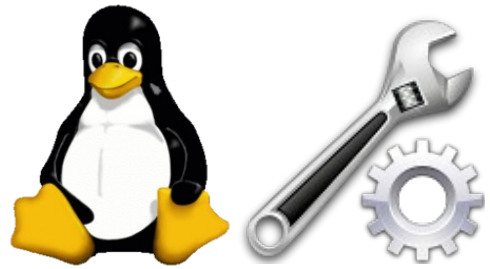


Internal View 8SFF chassis

1. Hot Plug Fans[1]
2. Processors, heatsinks showing
3. Optional NS204i-u Boot Device
4. Hot Plug redundant HPE Flexible Slot Power Supplies
5. Secondary Riser (Optional) (Requires second processor)
6. Primary Riser
7. DDR5 DIMM slots, shown fully populated in 32 slots[2]
8. Drive Backplanes
9. Drive Cages

Hewlett Packard Enterprise

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

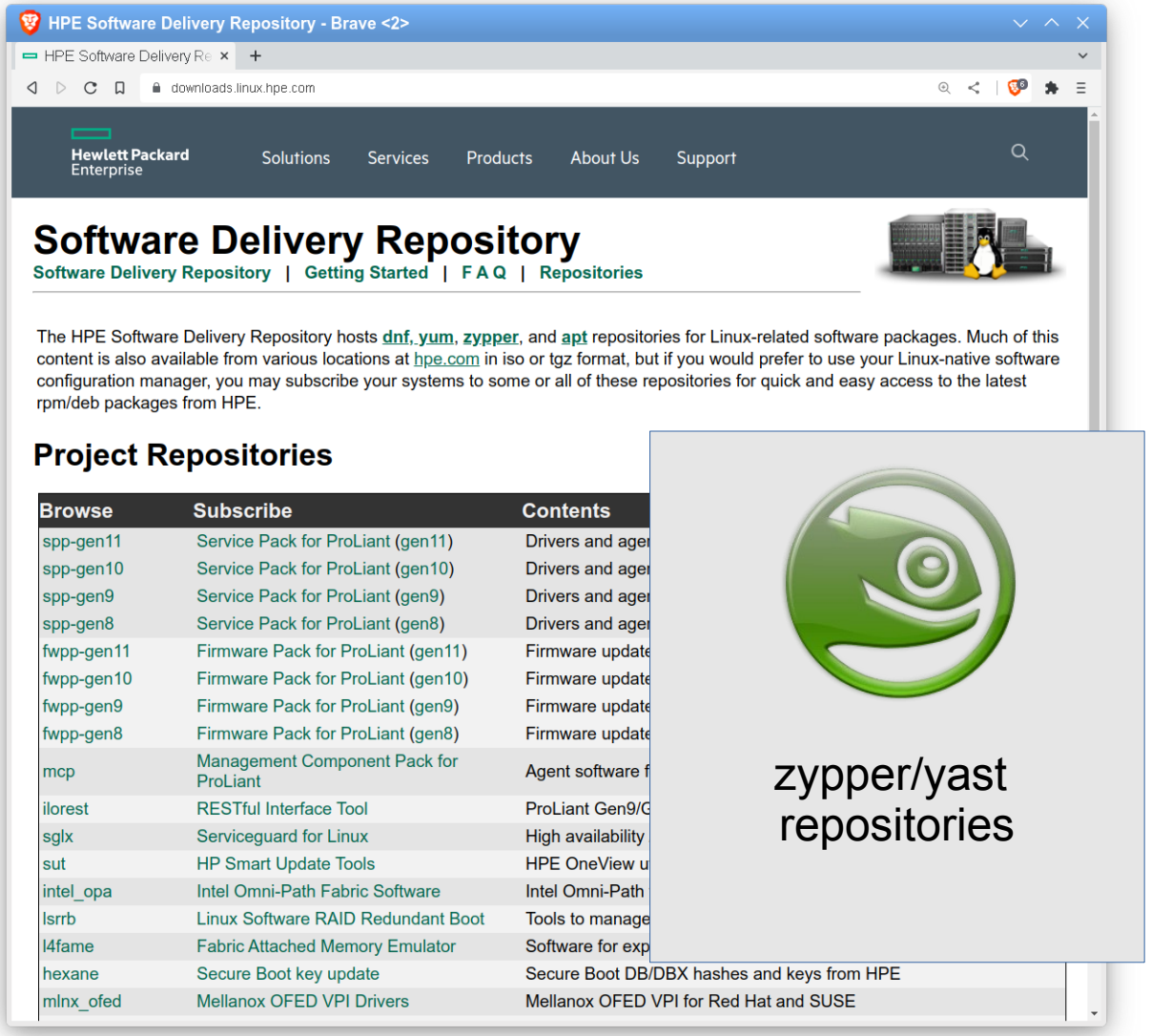
The days of burning ISO media are more or less over for the Linux community

Subscribe to one or more HPE repositories

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

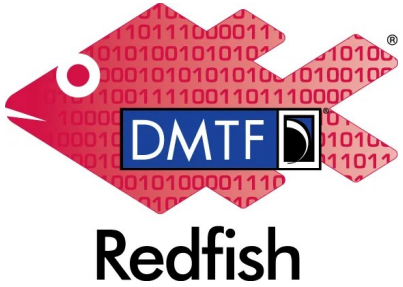
zypper, chef, puppet, ansible

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

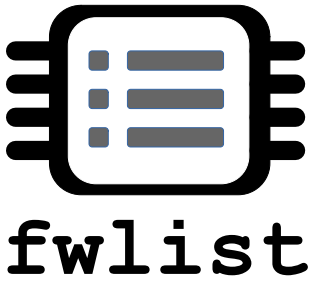


Leveraging Redfish® & iLO to manage firmware
Opening management API's to devops community

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



List flashable firmware via RedFish




```
ilorest  \
   /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
```

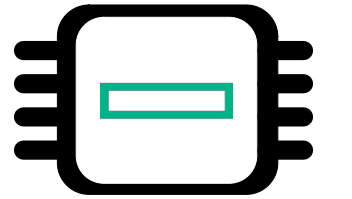
```
# fwget download U30-2.04_2019_04_18.fwpkg
Downloading:
firmware-system-p89-2.72_2019_03_25-1.1.i386.fwpkg
```

```
"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"
},
```

json firmware online repository index

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

Flash firmware with ilorest/RedFish



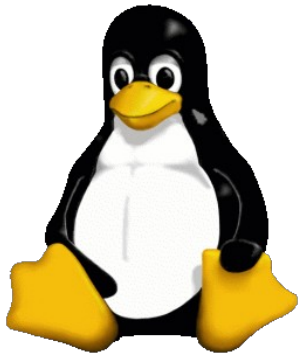

```
# ilorest flashfwpkg P89-2.72_2019_03_25.fwpkg
Uploading firmware: P89_1.46_10_02_2018.signed.flash
[200] The operation completed successfully.
Component U32_1.46_10_02_2018.signed.flash uploaded successfully
Waiting for iLO UpdateService to finish processing the component
0 hour(s) 1 minute(s) 28 second(s)
Firmware has successfully been flashed and a reboot is required.
```

https://downloads.linux.hpe.com/SDR/project/ilorest/

Pushing drivers upstream

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

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 commits

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

Submitting patches: the essential guide to getting your code into the kernel

- 0) Obtain a current source tree
- 1) `diff -up`
- 2) Describe your changes
- 3) Separate your changes
- 4) 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
- 9) Don't get discouraged - or impatient
- 10) Include PATCH in the subject
- 11) Sign your work - the Developer's Certificate of Origin
- 12) When to use Acked-by:, Cc:, and Co-Developed-by:
- 13) 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

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

How do we...

- Install drivers? (kmp)
- Flash firmware? (fwpkg)
- Install hardware management software? (amsd)
- Configure arrays? (ssacli)
- Communicate with iLO/BMC? (hpilo.ko)
- Driver disc? boot essential drivers?

SUSE + HPE Futures

Leverage SLES in management rom?

- Currently used for raid config, initial OS installation

Collaborate on features

Mutual customer projects

Community

- *proliantlinux.org*?

Hewlett Packard Enterprise + SUSE

QUESTIONS?

THANK YOU

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https://people.linux.hpe.com/~craiger/suselabs2023/slesonhpe.pdf