



Hewlett Packard
Enterprise

LINUX DISTRIBUTIONS



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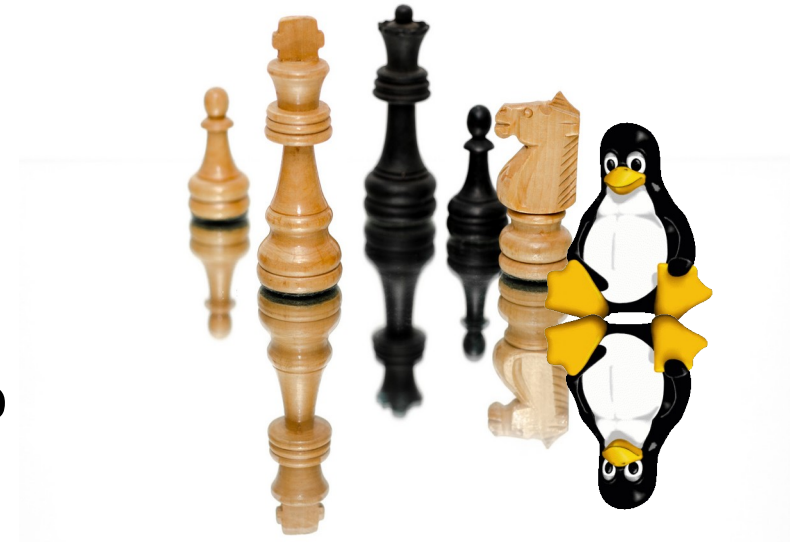
HPE Developer Community September, 2023

distrowatch.com - 272 Linux Distributions

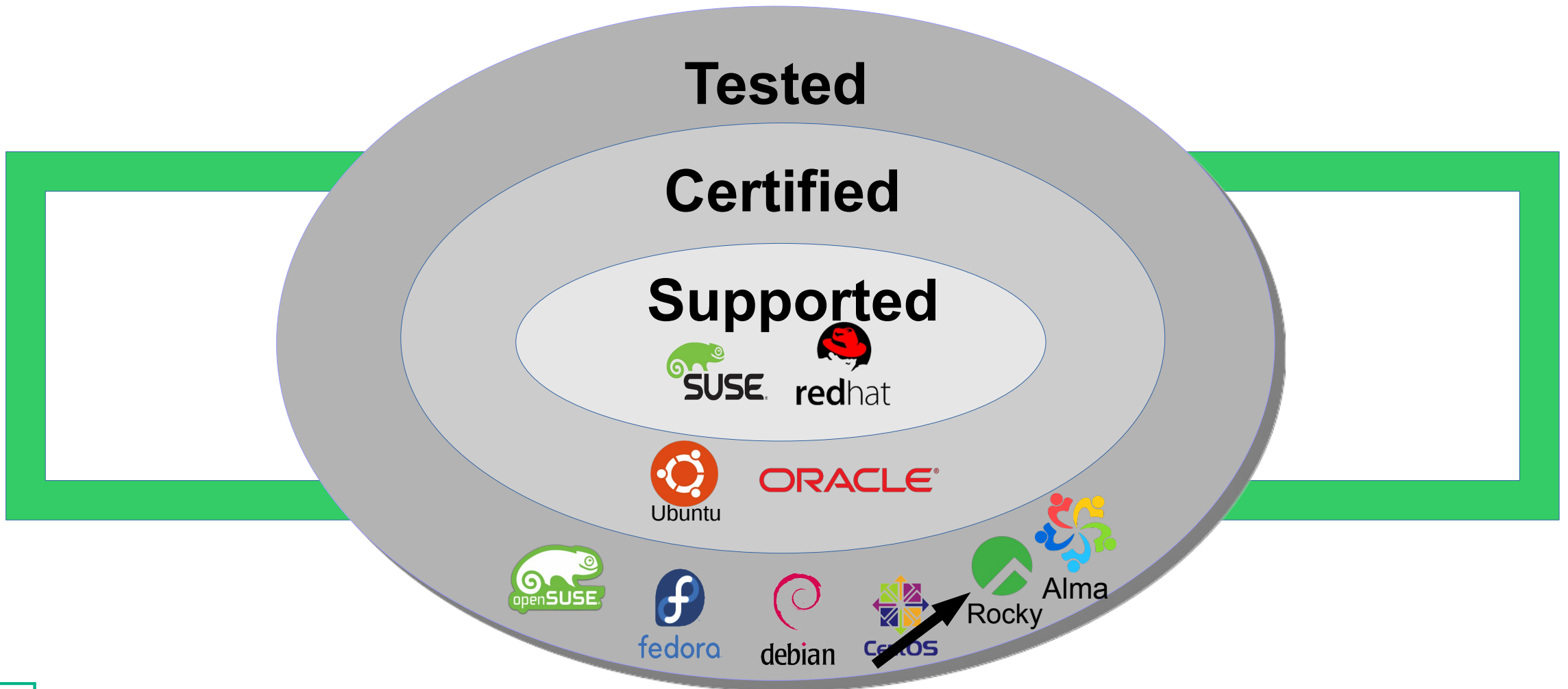
51	PureOS	205	1	MX Linux	2700
52	OpenMandriva	204	2	Mint	2083
53	CentOS	200	3	EndeavourOS	2015
54	Xubuntu	199	4	Debian	1419
55	Murena	197	5	Manjaro	1317
56	Linuxfx	187	6	Ubuntu	1067
57	Gentoo	182	7	Pop!_OS	1048
58	Qubes	174	8	Fedora	1035
59	Red Hat	174	9	openSUSE	799
60	Neptune	169	10	Lite	664
61	KaOS	168	11	Zorin	651
62	Tiny Core	168	12	Garuda	619
63	EuroLinux	167	13	KDE neon	529
64	Arch	165	14	elementary	479
65	Photon	164	15	antiX	458
66	TrueNAS	159	16	Mageia	428
67	Athena	158	17	Kali	407
68	Archman	155	18	Puppy	394
69	NixOS	155	19	AlmaLinux	382
70	wattOS	154	20	Nobara	381
71	Mabox	152	21	PCLinuxOS	380
72	ReactOS	152	22	Vanilla	377
73	Clear	151	23	SparkyLinux	373
74	4MLinux	150	24	EasyOS	367
75	Endless	150	25	ArcoLinux	361
76	RebornOS	149	26	Alpine	341
77	deepin	148	27	Q4OS	339
78	Artix	147	28	FreeBSD	338
79	Ubuntu MATE	144	29	NixOS	334
80	ALI	143	30	CachyOS	323
81	MakuluLinux	143	31	Peppermint	315
82	Nitrux	143	32	blendOS	290
83	GhostBSD	142	33	Voyager	285
84	hellosystem	140	34	Bodhi	270
85	Feren	138	35	Solus	265
86	Void	138	36	Bluestar	264
87	Oracle	137	37	Devuan	264
88	Proxmox	137	38	Kubuntu	264
89	OpenBSD	135	39	Lubuntu	258
90	Ubuntu Studio	135	40	Gnoppix	257
91	Haiku	131	41	Tails	247
92	LXLE	131	42	SmartOS	245
93	Absolute	130	43	TUXEDO	244
94	ROSA	130	44	Regata	236
95	ExTiX	129	45	Rocky	234
96	Gecko	129	46	Slackware	232
97	Spiral	129	47	siduction	217
98	Emmabuntüs	127	48	Archcraft	214
99	Kodachi	127	49	Parrot	206
100	AV Linux	121	50	Xerolinux	206

HPE's Linux Strategy

- Listen to customers
- Select & prioritize several distros based on demand
- Partner with company or community behind each distro
- Enable HPE hardware features upstream, trickle down
- Deliver drivers, agent software and firmware
- Certify distro+platform combinations
- Provide hardware and software support with distro partner a/o community
- Adapt to fast changes



Supported / Certified / Tested



Supported / Certified / Tested

Supported / Certified / Tested

Entitlement payments are obligatory (not free/gratis)
Software support agreements available for purchase from HPE
HPE provides first and second level phone support, level 3 to partner
Dedicated engineering, cross funding for enablement, marketing
HPE provides drivers, firmware and management software.



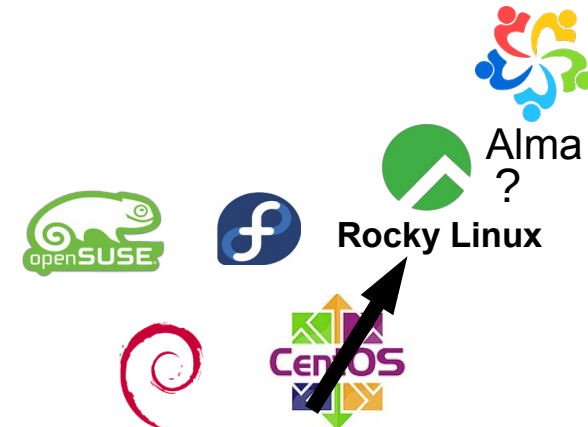
Certified / Tested

Entitlement payments obligatory for Oracle Linux
HPE & partner to “certify” hardware (often upon customer request)
maas is required for Ubuntu certification, including pxe/legacy bios mode
Ubuntu automatically certified on all volume servers
Software support agreement available from partner on “certified” hardware
HPE provides management software, firmware available, no drivers



Tested

Smoke-test conducted by HPE
Hardware/distribution combo known-to-work
HPE provides management software, firmware available, no drivers
Software support provided by community



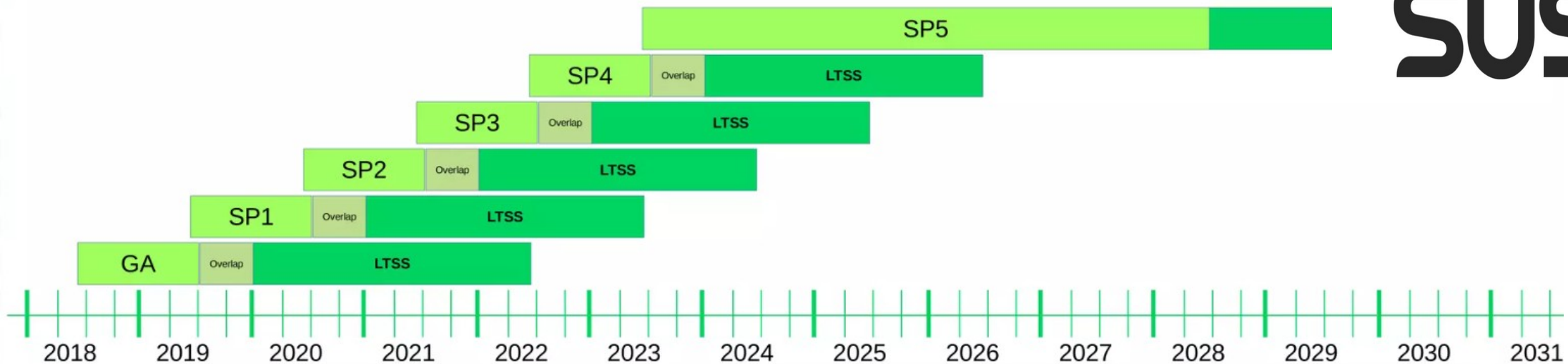
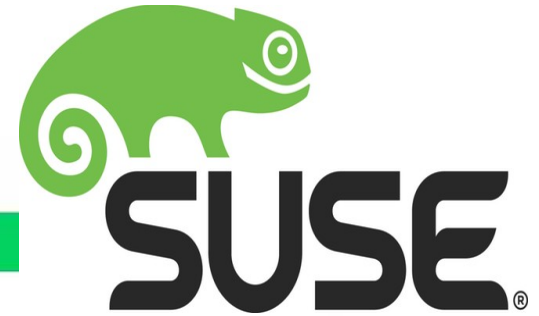
Fluid area, based on demand
These can change at any time

partner

partner

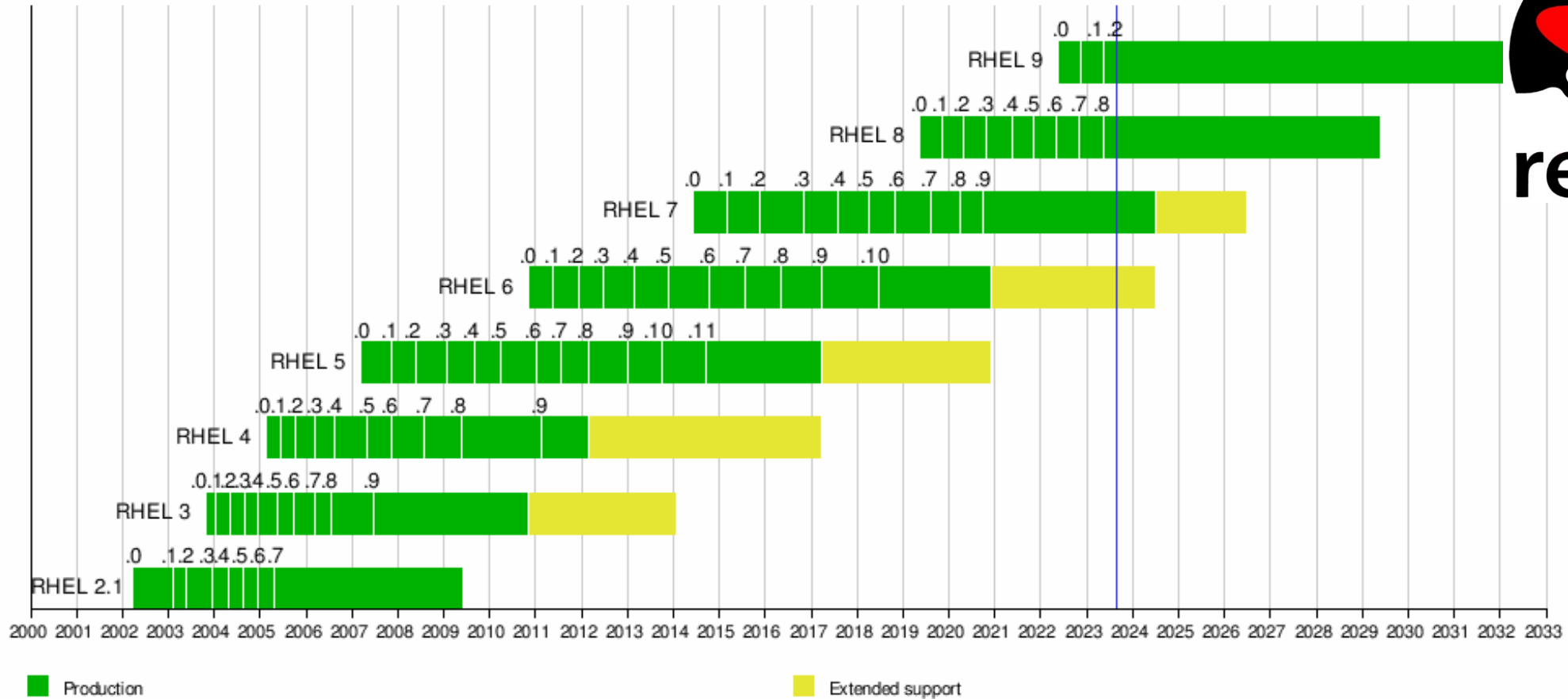
community

Lifecycle – SUSE Linux Enterprise 15



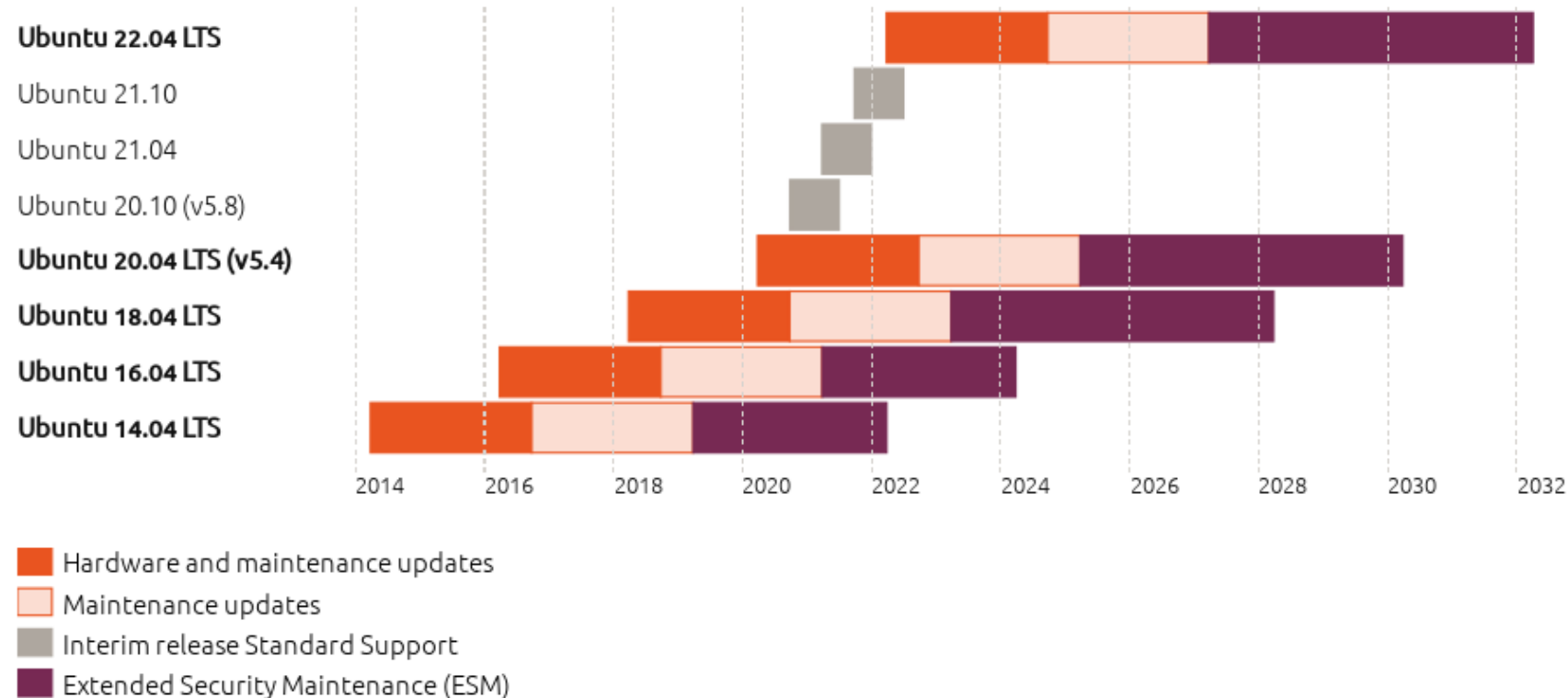
- 13 years total lifecycle
- Updates to next service pack (n+1) and skip-a-service-pack (n+2)
- Service Pack Overlap Support: 6 months
- Long Term Service Pack Support: up to 3 years after generic end of support

Red Hat Enterprise Linux release timeline





Ubuntu



New release every April and October
Long Term Support released April of even years
Only LTS is certified by HPE and Canonical

What happened to CentOS?



Red Hat Enterprise Linux recompile/respin
Was a ~33% of Linux install base
Owned then ended by IBM/RedHat

CentOS 7 end-of-life	June 30 th , 2024
CentOS 8 end-of-life	December 31 st , 2021

Industry impact?

Migration path?



Red Hat stops posting source code, Changes EULA



“does not intend to interfere with ‘your rights to software code under the terms of an open source license.’”

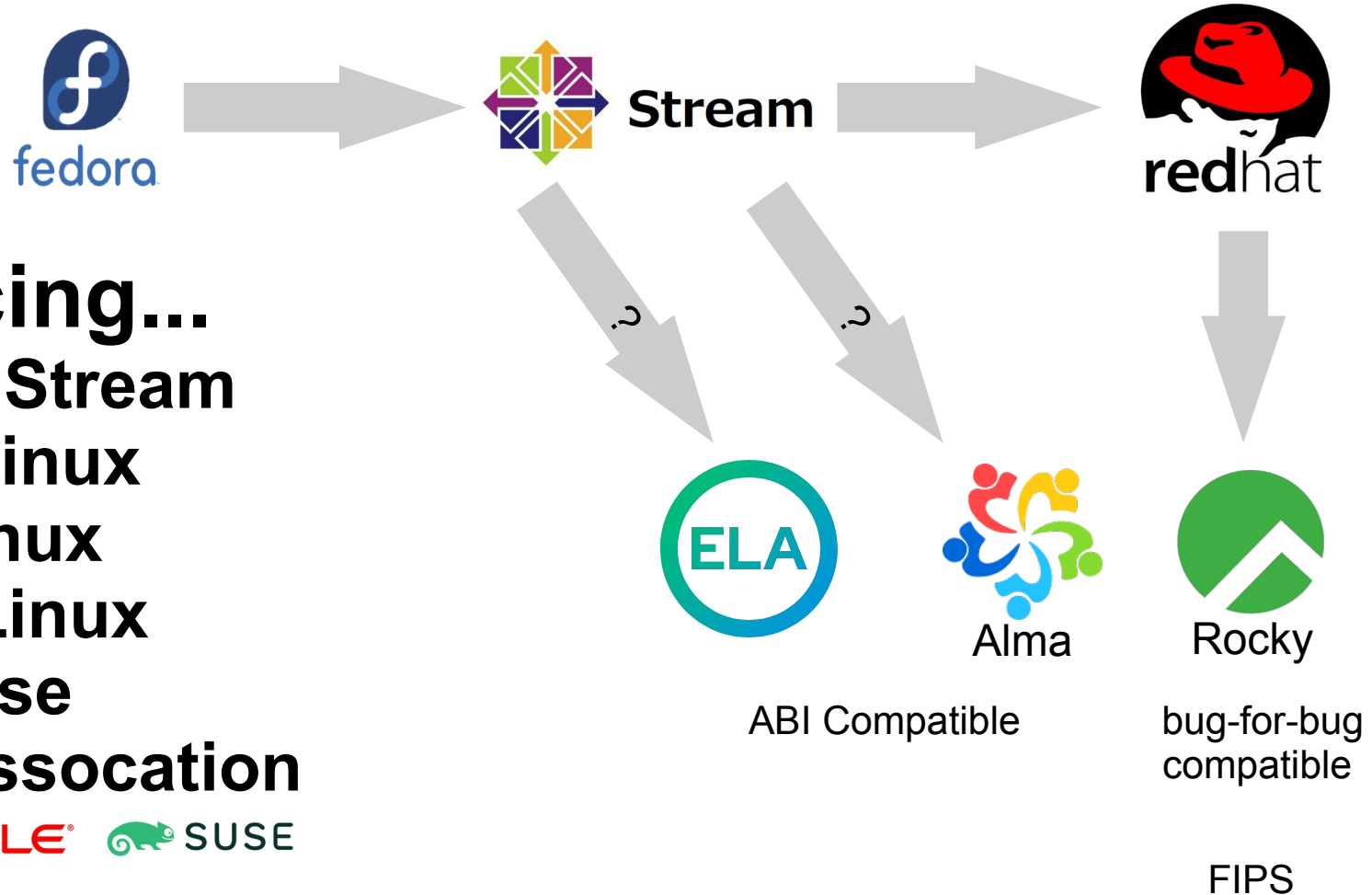
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 -
- "using Subscription Services in connection with any redistribution of Software is a violation of the agreement."*

Community Enterprise Linux (CEL)

Introducing...

- CentOS Stream
- Rocky Linux
- Alma Linux
- Oracle Linux
- Enterprise Linux Association

CIQ ORACLE® SUSE

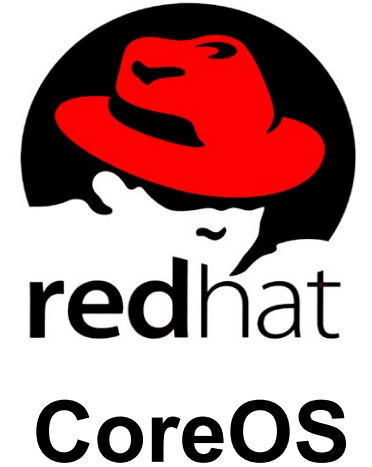


Container Engines

Red Hat Open Shift

CoreOS

- Single purpose container operating system
- Immutable filesystem images
- rpm-ostree transactional update (no yum), reboot required
- Based on RedHat components
- Not a standalone product
- Managed by OpenShift Container Platform cluster
- Kubernetes container orchestration, Docker
- Provisioned with *Ignition* (like kickstart)
- *“directly logging into a RHCOS machine is discouraged”*



Container Engines



SLE Micro

- Minimal OS for containerized workloads
- Immutable filesystem, transactional updates
- Mature product, HPE skews
- K3S/Rancher container orchestration

SUSE Adaptable Linux Platform (ALP) “*Dolomite*”

- Framework for future SUSE products, similar to SLE Micro
- Designed for containerized workloads
- Rancher container orchestratrution, Podman
- Immutable filesystem, transactional updates, btrfs snapshots
- Appliance-like, minimize entropy
- Similar, but different to SLE-Micro (will be a different product)



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Container Engine Challenges

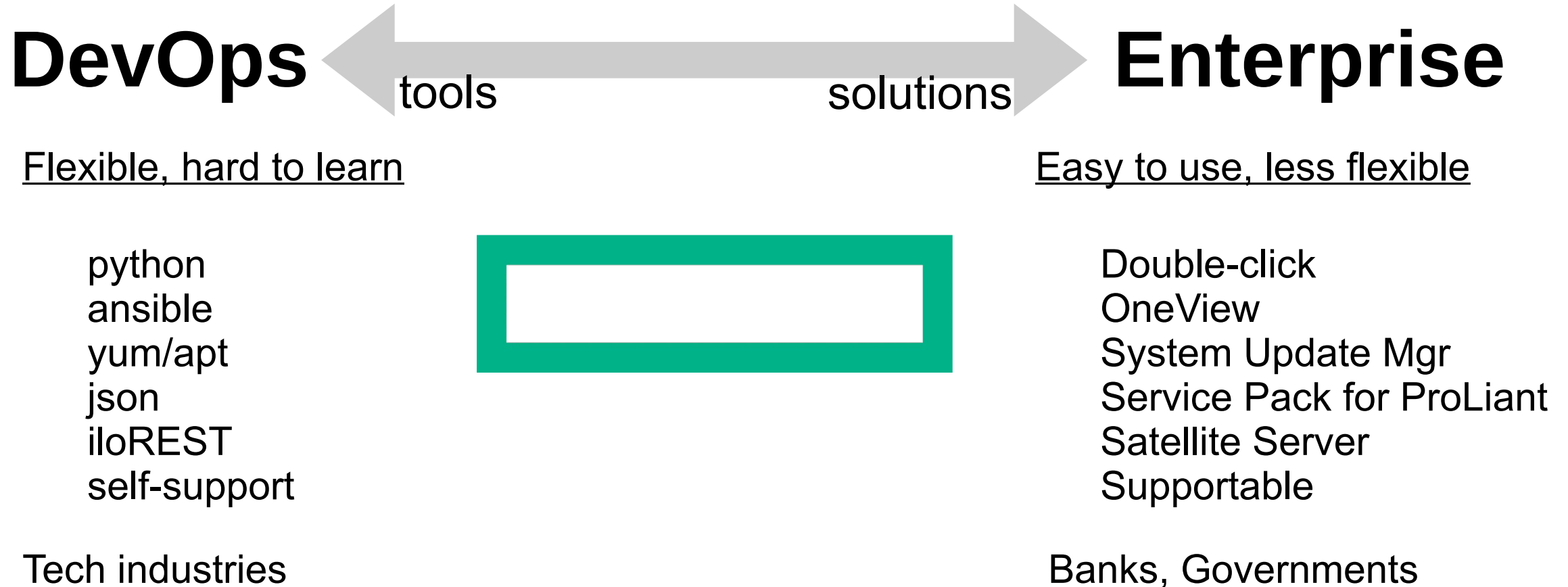
HPE Hardware Management?

- Install drivers, new hardware enablement
 - HostOS monitoring, amsd, ILO connectivity
 - RAID configuration
 - Support for HPE System Update Manager, OneView
 - Contrary to some Enterprise Management techniques
-
- HPE tools need to manage “read-only linux”
 - Hardware management isn’t *containerizeable*
 - All ioctl() and kernel access is required from user space



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Linux system management styles



http://downloads.linux.hpe.com

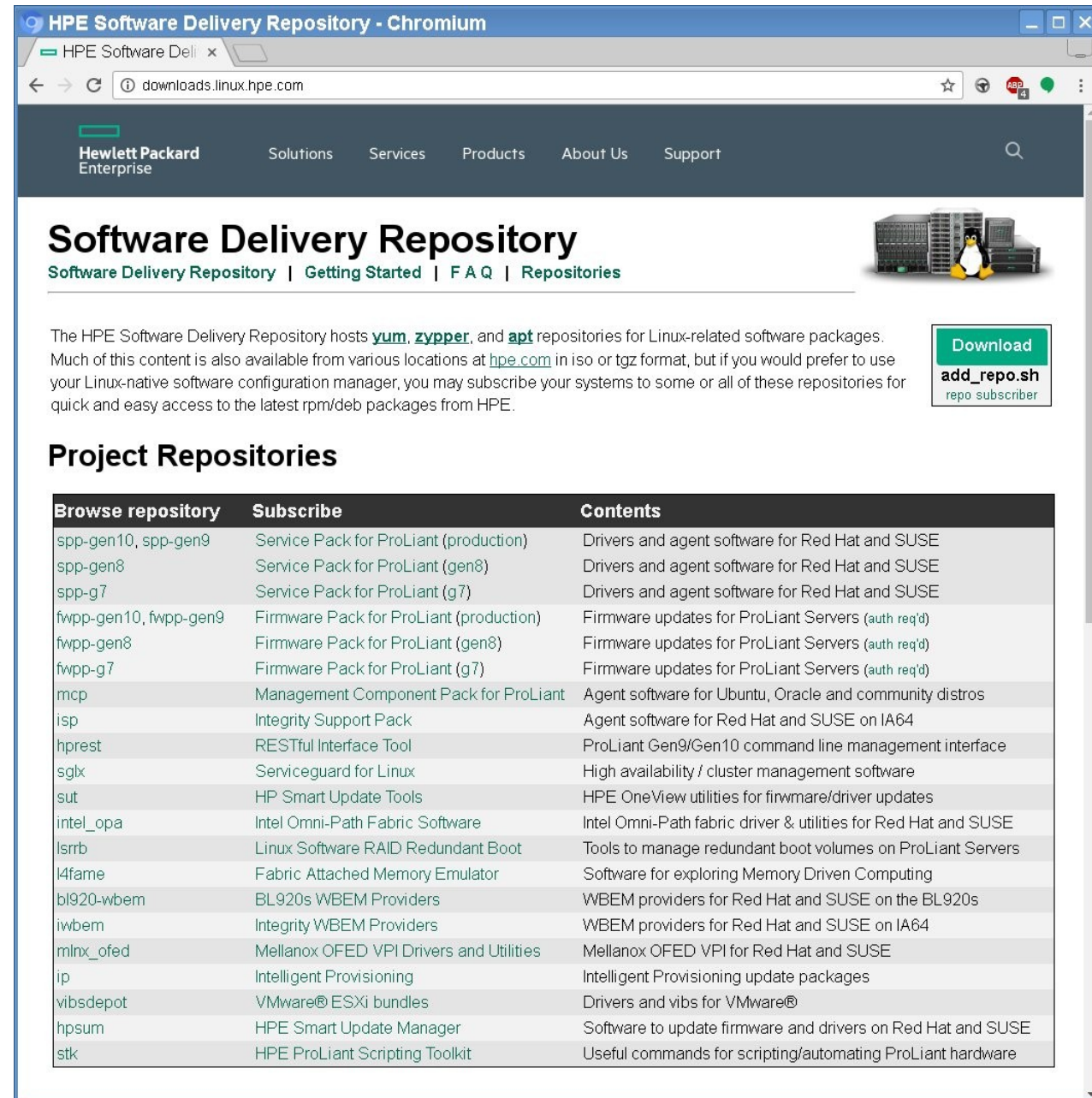
The days of burning ISO media are more or less over for the Linux community

Subscribe to one or more HPE repositories

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

zypper, apt, yum, dnf, fwget, chef, puppet,

```
# zypper install be2net-kmp-default
# yum install firmware-nic-qlogic
# apt-get install ssaccli
# fwget download firmware-p89
```



The screenshot shows the HPE Software Delivery Repository website. The browser window title is "HPE Software Delivery Repository - Chromium". The address bar shows "downloads.linux.hpe.com". The website has a dark blue header with the HPE logo and navigation links: Solutions, Services, Products, About Us, and Support. Below the header, the main heading is "Software Delivery Repository" with sub-links: Software Delivery Repository, Getting Started, F A Q, and Repositories. A small graphic of server racks and a penguin is to the right. A green button labeled "Download add_repo.sh repo subscriber" is on the right. The main text describes the repository's purpose and lists supported package managers. Below this is a section titled "Project Repositories" containing a table with three columns: Browse repository, Subscribe, and Contents.

Browse repository	Subscribe	Contents
spp-gen10, spp-gen9	Service Pack for ProLiant (production)	Drivers and agent software for Red Hat and SUSE
spp-gen8	Service Pack for ProLiant (gen8)	Drivers and agent software for Red Hat and SUSE
spp-g7	Service Pack for ProLiant (g7)	Drivers and agent software for Red Hat and SUSE
fwpp-gen10, fwpp-gen9	Firmware Pack for ProLiant (production)	Firmware updates for ProLiant Servers (auth req'd)
fwpp-gen8	Firmware Pack for ProLiant (gen8)	Firmware updates for ProLiant Servers (auth req'd)
fwpp-g7	Firmware Pack for ProLiant (g7)	Firmware updates for ProLiant Servers (auth req'd)
mcp	Management Component Pack for ProLiant	Agent software for Ubuntu, Oracle and community distros
isp	Integrity Support Pack	Agent software for Red Hat and SUSE on IA64
hprest	RESTful Interface Tool	ProLiant Gen9/Gen10 command line management interface
sglx	Serviceguard for Linux	High availability / cluster management software
sut	HP Smart Update Tools	HPE OneView utilities for firmware/driver updates
intel_opa	Intel Omni-Path Fabric Software	Intel Omni-Path fabric driver & utilities for Red Hat and SUSE
lsrrb	Linux Software RAID Redundant Boot	Tools to manage redundant boot volumes on ProLiant Servers
l4fame	Fabric Attached Memory Emulator	Software for exploring Memory Driven Computing
bl920-wbem	BL920s WBEM Providers	WBEM providers for Red Hat and SUSE on the BL920s
iwbem	Integrity WBEM Providers	WBEM providers for Red Hat and SUSE on IA64
mlnx_ofed	Mellanox OFED VPI Drivers and Utilities	Mellanox OFED VPI for Red Hat and SUSE
ip	Intelligent Provisioning	Intelligent Provisioning update packages
vibsdepot	VMware® ESXi bundles	Drivers and vibs for VMware®
hpsum	HPE Smart Update Manager	Software to update firmware and drivers on Red Hat and SUSE
stk	HPE ProLiant Scripting Toolkit	Useful commands for scripting/automating ProLiant hardware

Increased focus on RESTful APIs, json, Redfish, DevOps

```
# 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 P89-2.72_2019_03_25.fwpkg
```

```
Downloading:
```

```
firmware-system-p89-2.72_2019_03_25-1.1.i386.fwpkg
```

```
# 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)
```

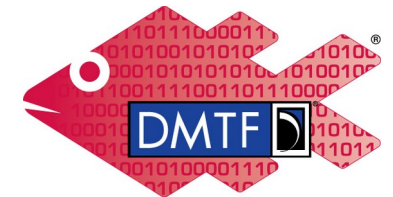
```
Firmware has successfully been flashed and a reboot is required for this firmware to take effect.
```



fwget



ilorest



Redfish

RESTful, json, python

<https://downloads.linux.hpe.com/SDR/repo/fwpp-gen11/current/fwrepopdata/fwrepo.json>

```
"U54_1.22_01_18_2023.fwpkg": {
  "date": "20230218",
  "description": "ROM Flash Firmware Package - HPE ProLiant ML350/DL360/DL380 Gen11 (U54) Servers",
  "deviceclass": "aa148d2e-6e09-453e-bc6f-63baa5f5ccc4",
  "minimum_active_version": "null",
  "reboot_required": "yes",
  "target": "00000000-0000-0000-0000-000000000235",
  "version": "1.22_01-18-2023"
},
"U54_1.30_03_01_2023.fwpkg": {
  "date": "20230302",
  "description": "ROM Flash Firmware Package - HPE ProLiant ML350/DL360/DL380 Gen11 (U54) Servers",
  "deviceclass": "aa148d2e-6e09-453e-bc6f-63baa5f5ccc4",
  "minimum_active_version": "null",
  "reboot_required": "yes",
  "target": "00000000-0000-0000-0000-000000000235",
  "version": "1.30_03-01-2023"
},
```




```
.      firmware_list = json.load(json_index_file)
:      for fw in firmware_list:
:          print( json_index[fw]["description"] )
:          Print( json_index[fw]["date"] )
```



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QUESTIONS?



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Poll questions

What is the most popular Linux distribution with your customers?

- SUSE
- RedHat
- Ubuntu
- Rocky
- Alma
- Debian
- Other

Are your customers using more community-supported Linux than commercial Linux?

- Yes
- No

Do your customers think HPE understands Linux and Open Source principles?

- Yes
- No

What is your customers' IT management style?

- Enterprise
- DevOps