

RED HAT
SUMMIT

RED HAT ENTERPRISE LINUX ROADMAP

Transforming Application Delivery While Protecting
Your Application Investments

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May 2, 2017

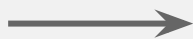
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MARKET REQUIREMENTS

“Light up my hardware.”



“Enable my *operations*.”

Circa 2002

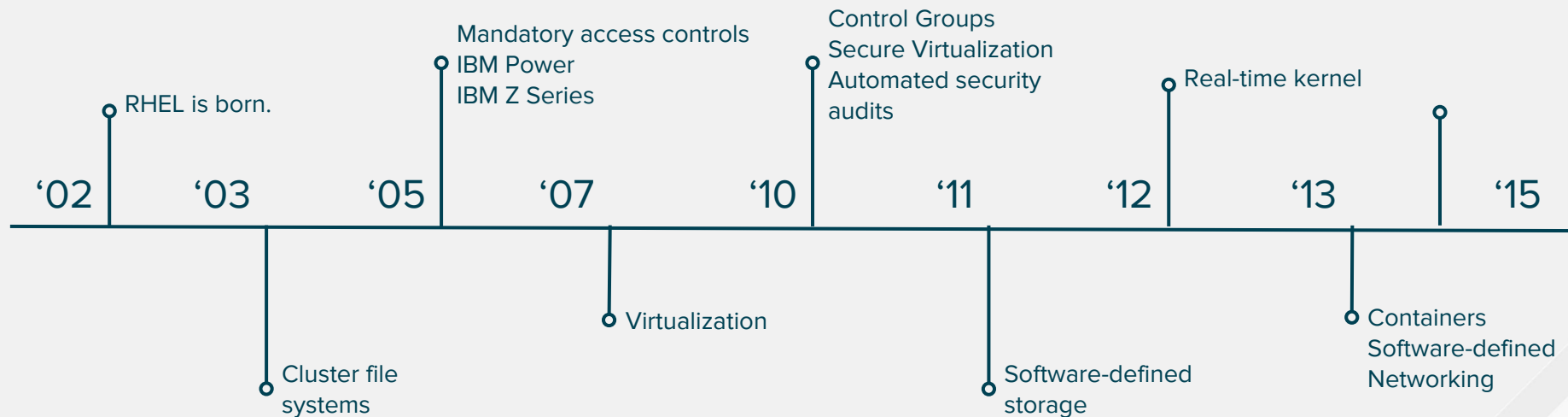
- Light up my hardware
- Award winning support
- Vast ecosystem
- Peerless security
- Lifecycle options

Circa 2017

- Everything I’m used to and...
- **More** software available
- **Less** software installed
- **Non-disruptive** updates
- More **automation**

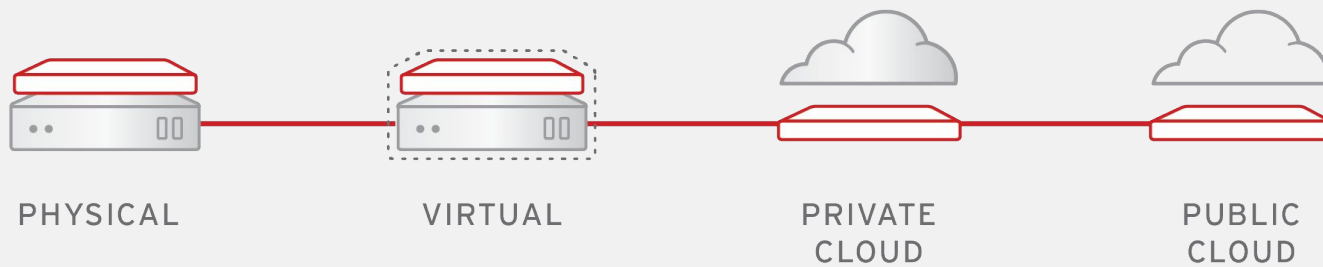
BRIEF HISTORY OF RED HAT ENTERPRISE LINUX

Not pictured: tens of thousands of incremental improvements



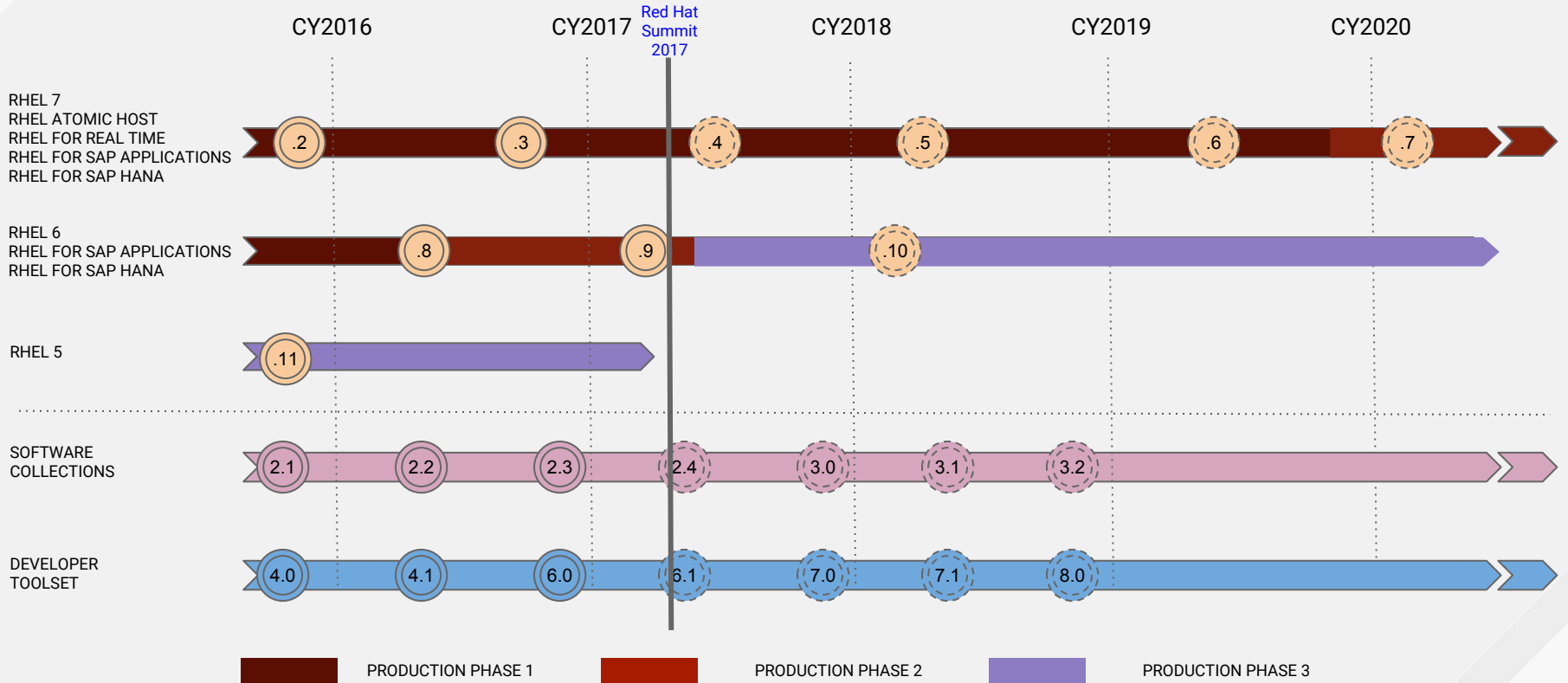
FLEXIBILITY ACROSS DEPLOYMENT TARGETS

via a Trusted, Consistent Host Environment



RED HAT ENTERPRISE LINUX IS THE FOUNDATION

RED HAT ENTERPRISE LINUX ROADMAP



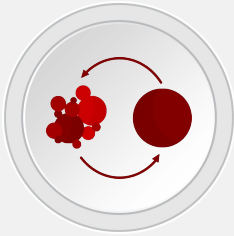
RED HAT ENTERPRISE LINUX LIFE CYCLE STATUS

Summary

- Red Hat Enterprise Linux 5 is retired as of March 31, 2017
 - Extended Life Support Add-On subscription available until March 31, 2020
- Red Hat Enterprise Linux 6 transitioned to *Production Phase 2* with RHEL 6.8
- Red Hat Enterprise Linux 7 is in active development and in *Production Phase 1*

<https://access.redhat.com/support/policy/updates/errata>

WHAT RED HAT BRINGS TO YOUR BUSINESS



Technology

Secure. Stable. Reliable.



Assurance

Enterprise-grade certainty.



Expertise

Experience you can trust.

LET'S DIVE INTO THE DETAILS!

Support for Multiple Architectures

Red Hat Enterprise Linux delivers support for commercially supported architectures of interest to you, our customers

- x86_64
- Power
- s390x
- ARM (Developer Preview)



Stability & Ecosystem Enablement

Why the world trusts RHEL for enterprise applications

- Stable ABI - RHEL updates designed to not break your environment
 - kABI for 10 years - no one has to recertify hardware with every minor release
 - Consistent set of compilers, libraries and tools
 - KVM guest ABI - stable machine types allow a VM created on RHEL 7.2 to live migrate to 7.3 host (X86_64, now in RHV 4 for Power)
- Red Hat engineering works closely with ecosystem to develop and test platform support
 - Hardware partners such as Intel, IBM, AMD and many others have dedicated on-site engineers that work behind the Red Hat firewall
 - Help backporting and testing of their platform code in RHEL long before customers see GA hardware

Stability & Ecosystem Enablement

Select features in RHEL 7.3 and planned for RHEL 7.4

- RHEL 7.3:
 - Kernel: processor trace logger, perf tools update
 - Kernel: TPM 2.0 trusted keys support, PCI subsystem update
 - Intel: CLWB - cache line write back instruction, VT-d posted interrupts
 - Intel: Enhancements for Intel HW in core runtime libraries
 - IBM: Power 8 tuning and code generation enhancements to compilers
 - Networking: Support for latest VXLAN features including including IPv6
- RHEL 7.4 (plan):
 - Kdump-kexec: hw_iscsi, ibft, fcoe, persistent memory, MCE support
 - IBM: RHEL HA support extended to IBM Power 8
 - vGPU: using kernel VFIO/mdev (mediated device) framework

Ecosystem Enablement - Public Cloud

RHEL in the Public Cloud: ~500 global CCSPs offering RHEL virtual machines

RHEL 7.3:

- Microsoft/Azure:
 - SR-IOV enablement and support for Intel NICs
 - Network/storage performance updates, VMBus improvements
 - TSC page clocksource
 - Fibre Channel enhancements

RHEL 7.4 (plan):

- Microsoft/Azure: TimeSync v4.0, WALA auto-update, cloud-init
- Amazon/AWS: ENA (Elastic Network Adapter) driver

Security Enhancements

Select features in RHEL 7.3 and planned for RHEL 7.4

RHEL 7.3:

- Standards Compliance: OpenSCAP scans containers at build time, more content
- Identity Management: DNS locations, topology management, access control, certificate management, interoperability and Active Directory Integration
- Hardware: USBGuard tool to enforce policies for USB-connected devices

RHEL 7.4 (planned):

- Standards Compliance: OpenSCAP scanner NIST certified, DISA STIG profile included
- Kernel: KASLR, YAMA security module, AVX-512, more entropy sources
- Containers: SELinux on Overlayfs, IdM and SSSD in containers, User Namespaces

Performance

Always enhancing RHEL for better performance out of the box

RHEL 7.3

- Kernel: SLUB allocator enhancements for 10G-40G networks run at near line rate
- Intel: VT-d posted interrupts
- Auditd and firewalld: more performant

RHEL 7.4 (plan)

- Kernel: qspinlock, several real-time and Linux kernel fixes
- Intel: Cache Allocation Technology
- NVME over Fabric: lower latency than traditional SAN
- Persistent memory storage technologies: NVDIMM
- File systems: NFSoRDMA, NFS copy-offload

Scalability

Larger single systems and large data centers

RHEL 7.3

- Kernel: parallel NUMA Node memory allocation during boot, hugepage migration
- Modular Service based Network Management - NetworkManager 1.2
- Identity Management: Server/Client performance improvements, Managed Topology & Replica promotion, SubCA feature to create dedicated CA with just a few commands

RHEL 7.4 (plan)

- Max supported vCPUs increased to 288
- Network: QinQ 802.1ad, great performance and HW offload
- Persistent memory: block mode available for unmodified applications, byte mode for code tailored to make use of mmap, DAX for file systems to bypass page cache

Performance & Scalability

Results!

Scale up: RHEL 7.3 w/RHV 4 - SAP HANA OLTP Cert Series

- Large 136 vCPU guest, 1GB huge pages, vcpupin, NUMA
- On 144 CPU Intel Xeon E7, 4 socket, 512 GB memory, 2 PCI NVME cards

Scale out: Deploying 2048 OpenShift nodes on the CNCF Cluster (Mar'17)

- Cluster of 2048 VM nodes on RHOSP 10 & cluster of 100 nodes on bare metal
- OpenShift SDN based on Open vSwitch + VXLAN, Overlay2 with SELinux

RHEL is the foundation of the infrastructure!

Performance, Scalability & Interoperability

#1 performance and price/performance on non-clustered TPC-H@1000GB

HPE, Microsoft, and Red Hat deliver first-ever result with SQL Server 2017 Enterprise Edition

Winning partnerships!

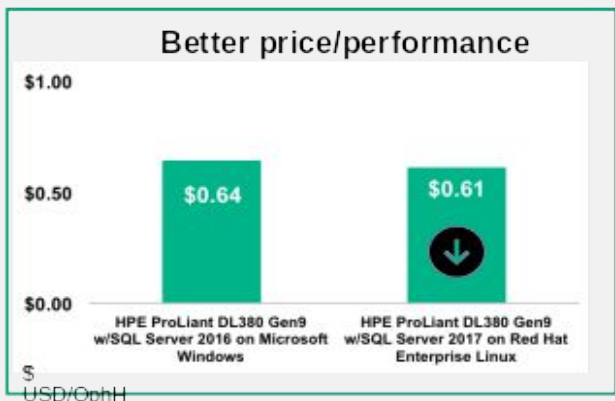
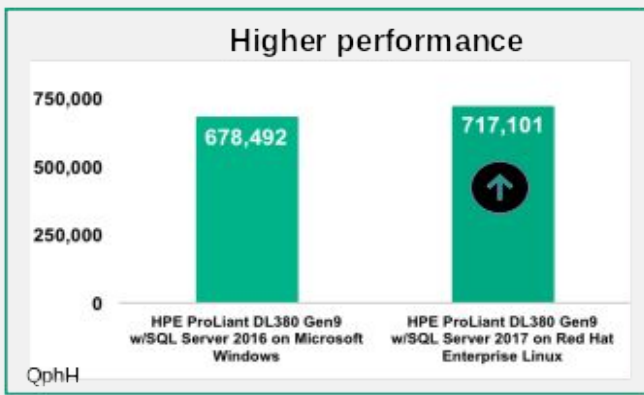


HPE ProLiant DL380 Gen9

SQL Server 2017 Enterprise Edition

Red Hat Enterprise Linux 7

- Key performance takeaways**
- SQL Server 2017 on Red Hat Enterprise Linux surpasses the previous #1 TPC-H@1000GB result achieved with SQL Server 2016
 - 6% higher performance
 - 5% better price/performance
 - The first and only result with Microsoft SQL Server 2017 Enterprise Edition
 - Results achieved on similarly configured servers with two Intel® Xeon® E5-2699 v4 processors



Read the performance brief at [http://www.hpe.com/go/tpchmarks](#).
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**SO THAT'S A SAMPLE OF WHAT
WE'VE DELIVERED IN RHEL 7.3 &
PLANNING FOR RHEL 7.4**

HERE'S SOME FOOD FOR THOUGHT...

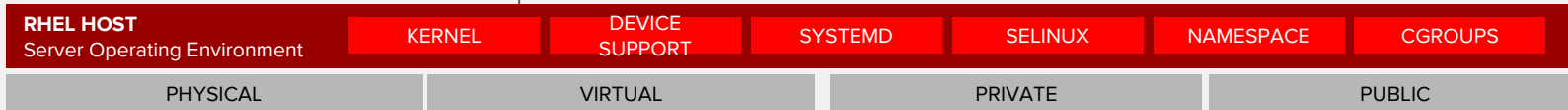
LINUX IS CONTAINERS

CONTAINERS ARE LINUX



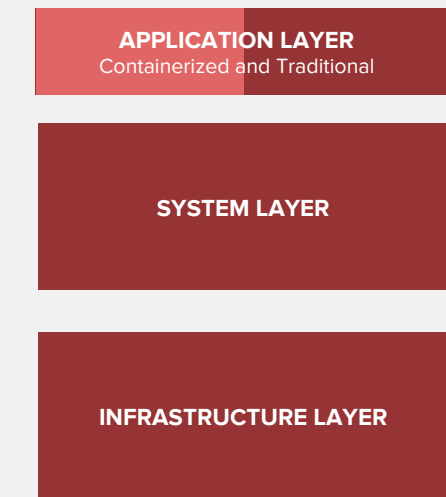
CONTAINERS

- Next-generation application platform for existing and new apps
- Portable across the hybrid cloud
- Container companies must be Linux companies



TO A MODULAR, FLEXIBLE DISTRIBUTION

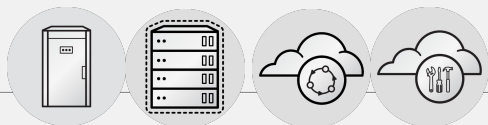
Flexible Distribution



Incorporate software innovation as soon as it debuts.
Consume as RPMs or Containers - your choice.

Stable interfaces to your infrastructure and applications

Decouple hardware enablement so it's non-disruptive.



Deploy RHEL easily & consistently wherever you want:
Physical, virtual, public or private cloud.

SESSION FEEDBACK & ADDITIONAL RHEL SESSIONS



Please rate us Session [S102081](#) using the Red Hat Summit Mobile App, which is powered by RHEL and Red Hat Mobile!

- S103001 - Performance analysis and tuning of Red Hat Enterprise Linux Tues 3:30 PM
- L101558 - Bring your performance and scale problems to the experts - Tues 5:30 PM
- S105084 - Security-Enhanced Linux for mere mortals - Wed - 10:15 AM
- S105099 - High-availability clustering in Red Hat Enterprise Linux - Wed - 4:30 PM
- S103870 - Demystifying Systemd - Thurs - 10:15 AM
- S102399 - Mastering Red Hat Enterprise Linux 7 - Thurs 11:30 AM
- L103745 - Hands on with the pros and the latest RHEL capabilities daily at 3:30 PM

Daily in Red Hat Booth in the Partner Pavilion

- Ask the Experts Bar, IT Optimization Zone, Ecosystem Partners, Several solutions demos
- User eXperience - give us your feedback!

Also - Come Tell Us Your Story!

Comics Coffee Booth - Level 1 Northeast Lobby



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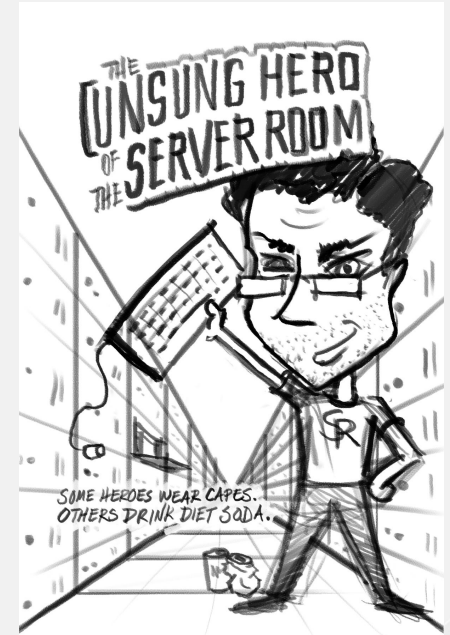
COMICS & COFFEE

Create your own comic.
And caffeinate.

Brought to you by **RED HAT**
ENTERPRISE LINUX



A red promotional sign for the Red Hat Summit Comics & Coffee booth. The sign features the Red Hat Summit logo at the top left, followed by the text 'COMICS & COFFEE' in large white letters. Below this, it says 'Create your own comic. And caffeinate.' and 'Brought to you by RED HAT ENTERPRISE LINUX'. At the bottom left is the Red Hat logo. On the right side of the sign is a graphic of a red coffee cup with a white lid and a white speech bubble containing three dots, indicating a conversation or story.



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THANK YOU



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facebook.com/redhatinc



linkedin.com/company/red-hat



twitter.com/RedHatNews



youtube.com/user/RedHatVideos

The logo consists of a red speech bubble shape pointing downwards, containing the text "RED HAT" in a smaller font above "SUMMIT" in a larger font, both in white.

RED HAT
SUMMIT

**LEARN. NETWORK.
EXPERIENCE
OPEN SOURCE.**