

# Hyperscale SIG update

August 2024

# Agenda

- SIG recap
- Deliverables and recent work
- Coming up

# Hyperscale SIG

- CentOS Stream focus
- Large-scale infrastructure
- Foster cross-company collaboration on packages and tooling
- Bring in-house development out in the open
- Open to anybody interested in working in this space

# SIG health

- Established in Jan 2021 with 6 founding members
- 36 members as of August 2024, steadily growing
- `#centos-hyperscale:fedoraproject.org` on Matrix
- Bi-weekly Matrix meetings:  
<https://sigs.centos.org/hyperscale/internal/meetings>
- Monthly hackathons / video hangouts
- Meetups!

# Documentation

- Charter: <https://sigs.centos.org/hyperscale/sig/charter/>
- User documentation: <https://sigs.centos.org/hyperscale>
- Activity reports: <https://sigs.centos.org/hyperscale/communication/reports/>
- Conference talks: <https://sigs.centos.org/hyperscale/internal/talks>
- Issue tracker: <https://pagure.io/centos-sig-hyperscale/sig>

# Hyperscale SIG scope

- Faster moving package backports
- Policy and configuration alternatives
- Large-scale testing enablement
- Kernel
- Live DVD ISOs
- Cloud images

# Package backports

- Delivered to the Hyperscale main repository
  - `dnf install centos-release-hyperscale`
- Drop in replacements for stock CentOS packages
- File bugs on <https://pagure.io/centos-sig-hyperscale/package-bugs>
- Built against (and requiring) EPEL
- Targeting x86\_64 and aarch64
- Recently added: awscli2, sysstat, linux-firmware, rfind, socat, pmix, slurm
  - c10s: <https://cbs.centos.org/koji/packages?blocked=0&tagID=2917>
  - c9s: <https://cbs.centos.org/koji/packages?blocked=0&tagID=2378>
- Work in progress: openssh, qemu

# Package updates

- Automated tracking for packages that need to be updated
- Files issues whenever a new upstream build supersedes a SIG package
- Leverages MQTT notifications
- Running in the OpenShift CI
- <https://pagure.io/centos-sig-hyperscale/package-updates>
- In the future: automated rebuilds?

# systemd

- SIG branch tracking the latest upstream (currently 256)
- Builds for CentOS Stream 9 and 10 available
- Defaults to unified hierarchy (cgroup2)
- systemd-oomd (needs PSI)
- systemd-networkd, systemd-resolved
- systemd-journald improvements (including CoW optimizations)
- Experimental SELinux enablement
- <https://github.com/systemd/systemd/blob/main/NEWS>

# systemd

- Public repo to track development and stage patches
  - <https://pagure.io/centos-sig-hyperscale/systemd>
- Public repo for releng tools and scripts
  - <https://gitlab.com/CentOS/Hyperscale/releng/systemd-releng>
  - Moved to GitLab to leverage Pipelines
- Contbuild on CentOS CI
  - Based on the current Hyperscale packaging
  - Daily rebuilds of the upstream git main for CentOS Stream 9 and CentOS Stream 10
  - In the future: End-to-end testing with openQA
- Contribution guide
  - <https://sigs.centos.org/hyperscale/internal/systemd/>

# Intel-optimized packages

- Intel-Zlib backport with SSE2 optimized slide hash function
  - <https://github.com/intel/zlib>
  - Major deflate performance improvement on x86\_64
- Experimental glibc backport with perf improvements and bugfixes
- ABI and API compatible drop-in replacement
- <https://blog.centos.org/2023/05/high-performance-zlib-compression/>
- <https://sigs.centos.org/hyperscale/content/repositories/intel/>

# CentOS Stream 9

- Hyperscale is primarily targeting CentOS Stream 9
  - CentOS Stream 8 efforts have been phased out
  - CentOS Stream 10 efforts are ramping up
- Upstream feature contributions
  - systemd-oomd package and default configuration
  - Packaging macros for third-party nginx modules
  - PipeWire with WirePlumber and JACK compatibility
  - Wayland support for the GNOME Classic session
  - SDL2 support for GNOME Wayland
  - libva and wayland updates
  - libdvdnav-devel addition to CRB
  - ethtool 5.16 rebase

# Large-scale testing

- Provide a way to test distro-wide changes in production settings
- DNF/RPM Copy-on-Write
  - <https://fedoraproject.org/wiki/Changes/RPMCoW>
  - Requires patched packaging stack
  - Currently deployed in production at FB
- Released to a dedicated “experimental” repo
  - `dnf install centos-release-hyperscale-experimental`
- Ongoing development
  - <https://hackmd.io/@chantra/BJ1Hedw0F>
  - <https://github.com/rpm-software-management/rpm/discussions/2057>
  - <https://github.com/rpm-software-management/rpm/pull/2378>
  - <https://github.com/rpm-software-management/rpm/pull/2416>
  - <https://github.com/rpm-software-management/rpm/pull/2557>
  - <https://git.centos.org/rpms/rpm/pull-request/18>

# Kernel

- 6.8 kernel based on the Fedora kernel with a RHEL-ish config
  - Previously 5.14 based derived from the CentOS Stream 9 kernel
- Development tree: <https://gitlab.com/CentOS/Hyperscale/src/kernel-ark>
- Build for CentOS Stream 9
- Btrfs support
- Secure boot is still outstanding: <https://pagure.io/centos-infra/issue/307>
- Available in the experimental repo

# Kernel collaboration work

- CentOS Stream 9 kernel contributions
  - zstd sync with 5.16 and configuration enablement
  - CONFIG\_CRYPTOLIB\_BLAKE2B
  - Build fixes
- Contribution guide: <https://sigs.centos.org/hyperscale/internal/kernel-rhel/>
- kmod-btrfs for CentOS Stream 9
  - Targeting the stock CentOS Stream 9 / RHEL 9 kernel
  - Published by the CentOS Kmods SIG

# Kernel userspace

- Btrfs
  - btrfs-progs backported from Fedora, currently at 6.7
  - compsize 1.5
  - Restored btrfs support in the storage stack and installer
    - Anaconda installer development tree: <https://pagure.io/centos-sig-hyperscale/anaconda>
    - Released to dedicated “spin” repo for media
    - Used for Hyperscale spin media
- kpatch 0.9.8
  - Includes `kpatch-build`
  - Backported clang PGO support and other fixes

# Container image

- Minimal container image based on Hyperscale repos and packages
- <https://quay.io/centos hyperscale/centos>
- Build from scratch and automatically published from OpenShift CI
  - <https://pagure.io/centos-sig-hyperscale/containers-releng>
- CentOS Stream 9

```
podman run -a stdin,stdout,stderr -t quay.io/centos hyperscale/centos:stream9
```

# Live media spin

- Two CentOS Stream 9 spins: GNOME and KDE Plasma
  - Building using [kiwi](https://pagure.io/centos-sig-hyperscale/kiwi-descriptions/tree/c9s) with descriptions in CBS:  
<https://pagure.io/centos-sig-hyperscale/kiwi-descriptions/tree/c9s>
  - A product of collaboration with the [Alternative Images SIG](#)
- Live DVD ISO images with Hyperscale repos and packages
- Leveraging our kernel with btrfs support out of the box
- Download: <https://sigs.centos.org/hyperscale/spins/workstation/>
- Report issues: <https://pagure.io/centos-sig-hyperscale/spin-bugs>
- CentOS Stream 8 spins phased out
  - Built using livecd-creator from [livecd-tools](#) with kickstarts:  
<https://pagure.io/centos-sig-hyperscale/spin-kickstarts/tree/c8s>

# Cloud images

- Two CentOS Stream 9 images: OpenStack/Generic and AWS EC2
  - Building using [kiwi](https://pagure.io/centos-sig-hyperscale/kiwi-descriptions/tree/c9s) with descriptions in CBS:  
<https://pagure.io/centos-sig-hyperscale/kiwi-descriptions/tree/c9s>
- Cloud images with Hyperscale repos and packages
- Leveraging our kernel with btrfs support out of the box
- Influenced Fedora Cloud development of kiwi-based cloud images
- Download: <https://sigs.centos.org/hyperscale/spins/cloud/>
- Report issues: <https://pagure.io/centos-sig-hyperscale/spin-bugs>

# What's new

- CentOS Stream 10!
- Virtualization stack
- linux-distros

# Coming up

- Kernel for CentOS Stream 10
- CentOS Stream Hyperscale Spin 10 images
- Updated QEMU package in EPEL
- Btrfs transactional updates

# Resources

- <https://sigs.centos.org/hyperscale>
- #centos-hyperscale:fedoraproject.org on Matrix
- Bi-weekly meetings and monthly VC hangout
  - <https://www.centos.org/community/calendar>
- <https://pagure.io/centos-sig-hyperscale/sig> issue tracker
- centos-devel mailing list

Questions?