Open Infrastructure Project Updates
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OSF projects

- **2010**: openstack
  - Programmable infrastructure for VMs, containers and bare metal
  - OpenStack.org
  - IaaS

- **2017**: kata containers
  - Secure, lightweight CRI compatible virtualized containers
  - KataContainers.io
  - CONTAINER SECURITY

- **2018**: airship
  - Making lifecycle management for open infrastructure simple, repeatable & resilient
  - AirshipIt.org
  - TELECOM (5G)

- **2018**: StarlingX.io
  - Edge cloud computing Infrastructure for high performance, ultra-low latency applications
  - StarlingX.io
  - EDGE COMPUTING

- **2018**: Zuul-CI.org
  - CI/CD platform for gating changes across multiple systems/repos
  - Zuul-CI.org
  - CI/CD
OpenStack
10 million OpenStack Compute Cores
Overview of Information Sources

➡ Current release cycle is Victoria
  • Release planned for the week of October 12, 2020
  • https://releases.openstack.org/victoria/schedule.html

➡ Latest stable release is Ussuri
  • Release highlights: https://releases.openstack.org/ussuri/highlights.html

➡ Project specs folder
  • https://specs.openstack.org/openstack/<project_name>-specs/
  • eg: https://specs.openstack.org/openstack/ironic-specs/
Overview of Information Sources

- **Launchpad**
  - Many projects track blueprints and bugs in this tool
  - https://launchpad.net/<project_name>
  - eg: [https://launchpad.net/nova](https://launchpad.net/nova)

- **StoryBoard**
  - Open source task tracking tool
  - Some OpenStack projects switched over already
  - [https://storyboard.openstack.org](https://storyboard.openstack.org)
  - eg: Ironic project - [https://storyboard.openstack.org/#!/project_group/75](https://storyboard.openstack.org/#!/project_group/75)
Nova Highlights

➡ Ussuri highlights

• Support for cold migrating and resizing servers between Nova cells
• Finalized Cyborg integration: create servers with accelerator devices via Cyborg
• Enhanced support for moving server with minimum bandwidth guarantees

➡ Victoria highlights

• Use pCPU (dedicated) and vCPU (shared) in one instance
• Scheduling support for routed networks
Neutron Highlights

➡ Ussuri highlights
• OVN is now a new in-tree ML2 driver
• Role Based Access Control (RBAC) for address scopes and subnet pools
• Support for tagging resources during creation
  • Improving the performance of Kubernetes network operations
➡ Victoria highlights
• Port NUMA affinity policy - make the policy available on all ports
• Floating IPs for routed networks
  • https://specs.openstack.org/openstack/neutron-specs/specs/victoria/index.html
Ironic Highlights

➡ Bare Metal as a Service project

➡ Ussuri highlights
  • Support for a hardware retirement workflow
  • Multitenancy concepts and additional policy options

➡ Victoria highlights
  • DHCP-less deployments - supply networking configuration in the virtual media being attached
  • ISO Boot media pass-through - boot a machine with a special virtual media image
  • https://specs.openstack.org/openstack/ironic-specs/priorities/victoria-priorities.html#

➡ Bare metal program/SIG
  • https://etherpad.openstack.org/p/bare-metal-sig
Ironic Highlights

Features under development - highlights

- Metal Kubed
  - Bare metal host provisioning for Kubernetes utilizing Ironic
  - CNCF Sandbox project
  - Ongoing cluster-api integration
  - Works as a Kubernetes application - runs on Kubernetes and is managed through Kubernetes interfaces

- [https://metal3.io](https://metal3.io)
- [https://github.com/metal3-io/](https://github.com/metal3-io/)
Cyborg Highlights

➡️ Framework to manage and utilize hardware accelerator resources

➡️ Finalized the v2 API in Ussuri to improve functionality and user experience
  • API endpoints for Nova integration to support discovery, scheduling and instance operations
  • Improved query and management options for accelerator and device inventory

➡️ Victoria highlights
  • Role Based Access Control (RBAC) enhancements - part of the community-wide goals
  • Inspur FPGA driver support to manage specific Inspur FPGA devices
  • Driver for Intel’s QuickAssist Technology (QAT) for enhanced security and performance
OSF Edge Computing Group

- A top level working group supported by the OpenStack Foundation
- Focusing mainly on the IaaS layer
- Collecting use cases and requirements in the edge computing area
- Working on reference models and architectures
  - Building blocks from the wide open source ecosystem
- Not limited to any technology or industry segment
- Testing the reference architectures to identify gaps and areas to improve
- Group resources: https://wiki.openstack.org/wiki/Edge_Computing_Group
- White papers
  - https://www.openstack.org/edge-computing/edge-computing-next-steps-in-architecture-design-and-testing
Edge Architectures

- There is no one-size-fits-all solution
  - Various workloads have very different requirements
    - New industry segments with dependency on IT
  - Infrastructures are organically growing
  - Focus is on the connection

- Current solutions need to evolve
  - Centralized Control Plane
  - Distributed Control Plane

- Do you have one that doesn’t fit any of the above?
  - Share it with us!

Airship
Overview

- Deployment and lifecycle management tool
- Collection of components to configure and deploy software infrastructure in a declarative way
  - Yaml files
  - Kubernetes
  - OpenStack on Kubernetes
- https://www.airshipit.org
Airship 2.0

- Currently at Beta
- 2.0 release is planned for the end of 2020 / early 2021
- Rearchitecting
  - Utilize more projects from the CNCF ecosystem
    - Drydock —> Kubernetes Cluster API (CAPI)
    - Promenade —> CAPI KubeADM
    - Deckhand —> Kustomize
    - Shipyard —> CRDs
    - Armada —> Flux Helm Operator
  - Smaller footprint
- Support for CNF requirements, e.g.: Multus or DANM
Airship 2.0

- Support for multiple Cluster API providers
  - Metal Kubed, Docker
  - OpenStack, Azure and GCP provider support are on their way
- Open Infrastructure Summit sessions:
StarlingX Overview

- Top-level OpenStack Foundation project
- Software stack providing high performance, low latency, and high availability for Edge Cloud applications
- Frequent releases
  - https://git.starlingx.io/
  - http://mirror.starlingx.cengn.ca/mirror/starlingx/release/
- Growing community
  - Inviting users, operators and developers to try out the software and participate in the community
Intent of the StarlingX Project

Re-Configure Proven Cloud Technologies for Edge Compute

- Orchestrate system-wide
  - Deploy and manage Edge clouds, share configurations
- Simplify deployment to geographically dispersed, remote Edge regions

*Other names and brands may be claimed as the property of others*
Distributed Edge Cloud Native Platform

Hosted Container Workloads
- Container
- Container
- Container

Containerized OpenStack for VM Workloads
- openstack
- KVM

Infrastructure Orchestration
- Kubernetes
- Docker Registry
- Armada
- Helm

Distributed Edge Cloud

Host Management
- Fault Management
- Software Management
- Configuration Management
- Service Management

Low Latency Linux
- IPMI Redfish
- TPM
- HTTP HTTPS
- Apache
- Horizon
- CEPH
- Keystone
- ETCD
- Docker
- Calico
- PostgreSQL
Distributed Cloud Overview

- Introduced in StarlingX 3.0
- Heterogeneous Distribution of Kubernetes and OpenStack Clouds
- Central Cloud (System Controller)
  - Hosting shared services
  - System-wide infrastructure orchestration functions
- Remote, geographically dispersed edge clouds
  - Communication with the System Controller node through REST APIs/L3
  - Running a control plane for autonomous operation
- In line with the Distributed Control Plane reference architecture model defined by the OSF Edge Computing Group
StarlingX 4.0

- Released in August, 2020
- Support for Kata Containers
  - One of the supported container runtimes
  - Support for Time Sensitive Networking (TSN) with Kata
    - Provides support for determinism in delivering time-sensitive traffic
- Support for Redfish Virtual Media Controller
- Certification Manager
  - Automated certification issuance
  - Monitoring of certification expiration dates
- More information in the release notes and project documentation
Events
Join the Global Community for the Next OSF Events

Open Infrastructure Summit
October 19-23
Register now
https://www.openstack.org/summit/2020

Project Teams Gathering
October 26-30
Register now
https://www.openstack.org/ptg/
Get Involved

Help build the next 10 years of Open Infrastructure

openstack.org/join

Need help building your open source community?
Email: ecosystem@openstack.org
Thank you!