OSF OpenStack Foundation

Open Infrastructure Project Updates

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OSF projects

2010	2017	2018	2018	2018

openstack®

Programmable infrastructure for VMs, containers and bare metal

OpenStack.org

IaaS

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kata containers

Secure, lightweight CRI compatible virtualized containers

KataContainers.io

CONTAINER SECURITY

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airship

Making lifecycle management for open infrastructure simple, repeatable & resilient

AirshipIt.org

TELECOM (5G)

STARLINGX

Edge cloud computing Infrastructure for high performance, ultra-low latency applications

StarlingX.io

EDGE COMPUTING

ZUUL
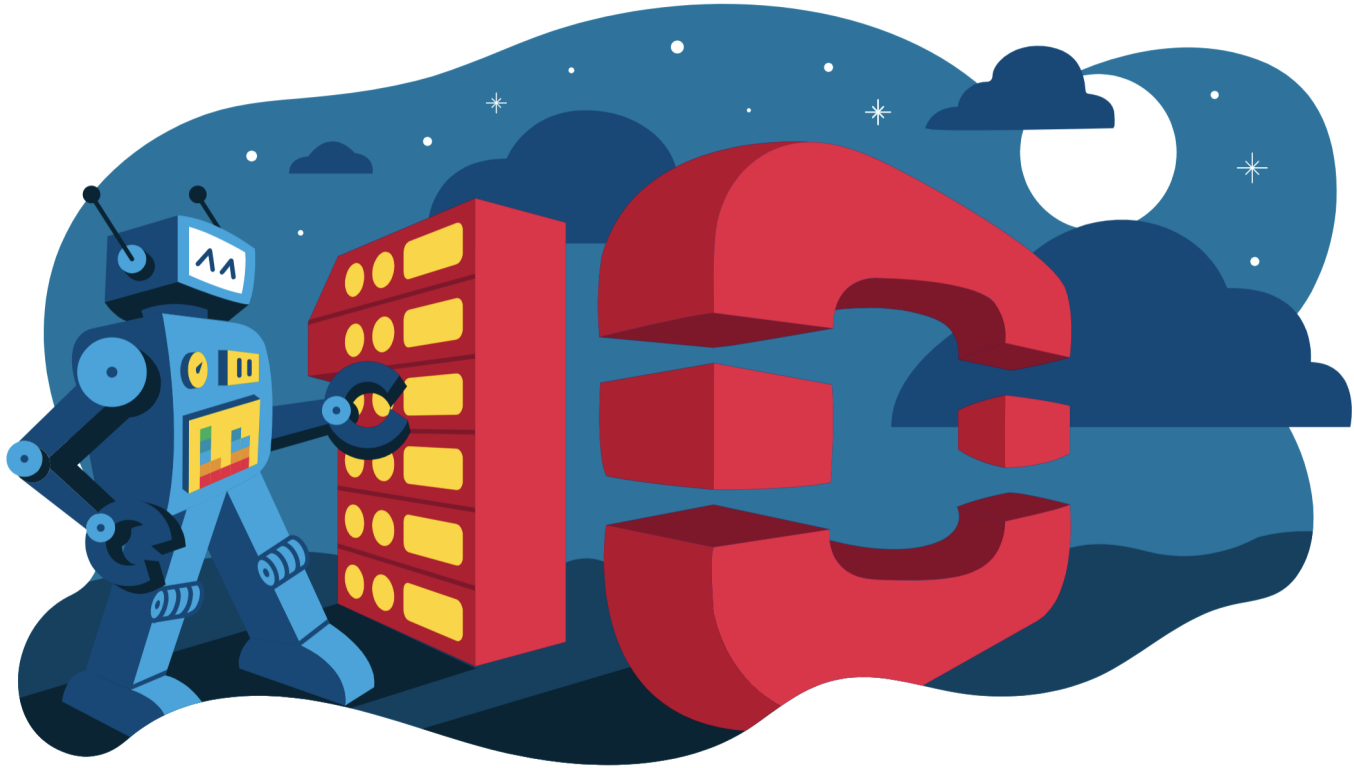
CI/CD platform for gating changes across multiple systems/repos

Zuul-CI.org

CI/CD

OpenStack

10 million OpenStack Compute Cores

RETAIL/E-COMMERCE · FINANCIAL SERVICES · ACADEMIC/RESEARCH · TELECOM · ENERGY/TRANSPORTATION/GOVERNMENT · MANUFACTURING · WEB & ENTERTAINMENT · PUBLIC CLOUD

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

➡ StoryBoard

- Open source task tracking tool

- Some OpenStack projects switched over already

- https://storyboard.openstack.org

- eg: Ironic project - 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

- https://specs.openstack.org/openstack/nova-specs/specs/victoria/index.html

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://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

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/cloud-edge-computing-beyond-the-data-center?lang=en_US
  - 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!
- https://wiki.openstack.org/wiki/Edge_Computing_Group#Minimal_Reference_Architectures
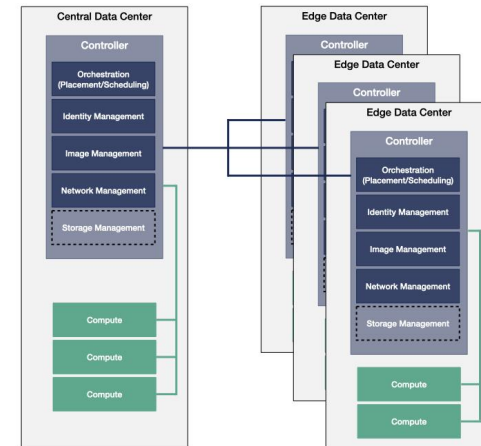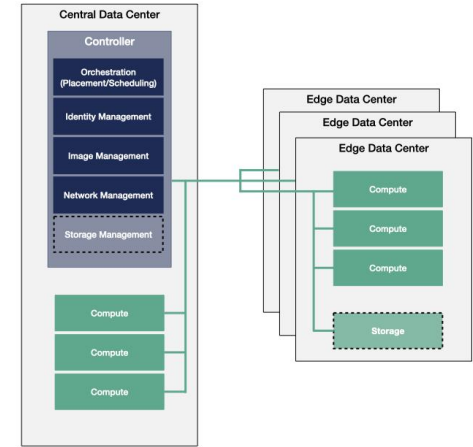
Airship

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**
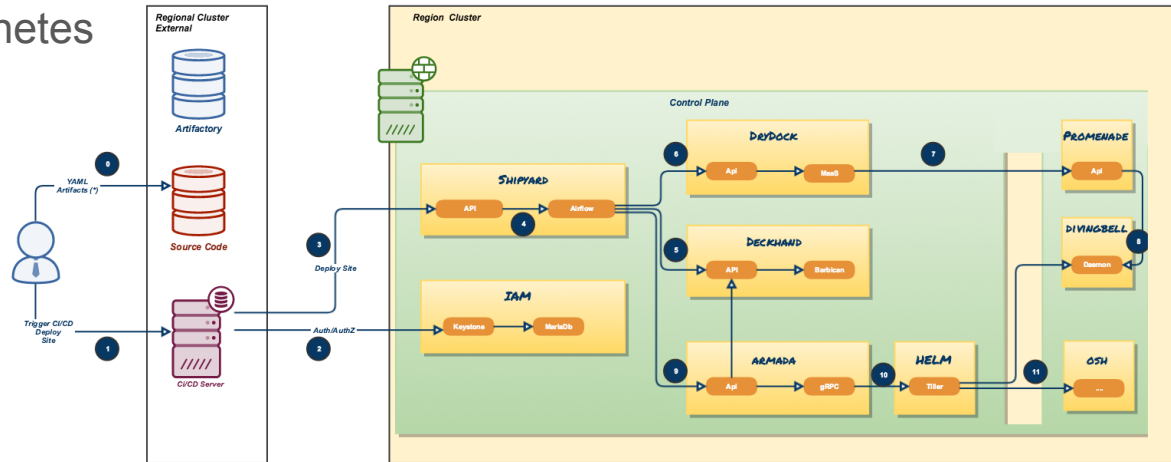
ARCHITECTURE

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:

  - https://www.airshipit.org/blog/airship-featured-at-virtual-open-infrastructure-summit-in-october/

StarlingX

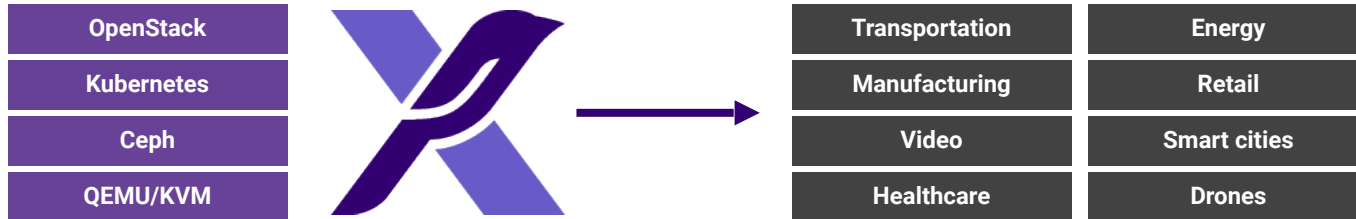# StarlingX Overview

- 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

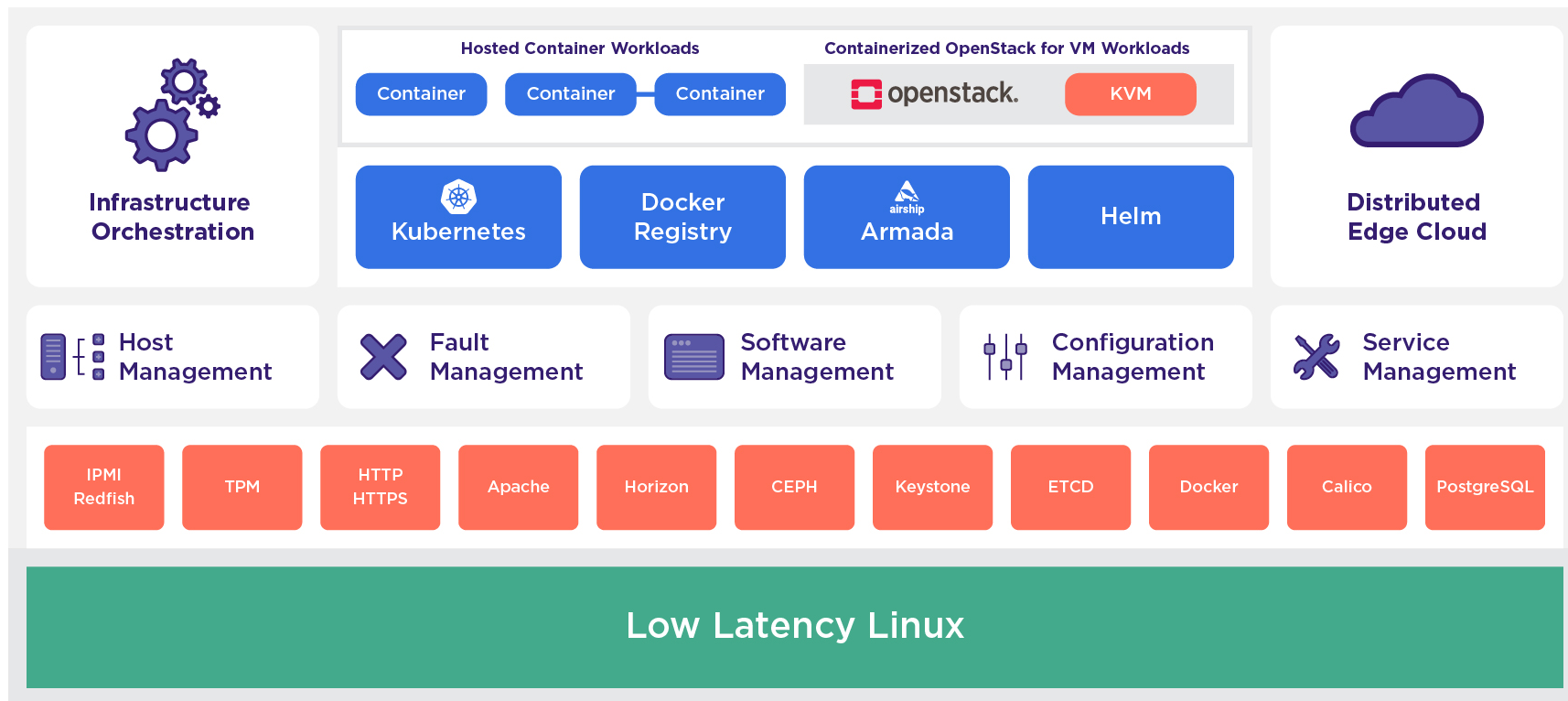# Intent of the StarlingX Project

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

| OpenStack |
| Kubernetes |
| Ceph |
| QEMU/KVM |

Transportation	Energy
Manufacturing	Retail
Video	Smart cities
Healthcare	Drones

Distributed Edge Cloud Native Platform

STARLINGX

Infrastructure Orchestration

Hosted Container Workloads

Container — Container — Container

Containerized OpenStack for VM Workloads

openstack. | KVM

Kubernetes | Docker Registry | airship Armada | Helm

Distributed Edge Cloud

Host Management | Fault Management | Software Management | Configuration Management | Service Management

| IPMI Redfish | TPM | HTTP HTTPS | Apache | Horizon | CEPH | Keystone | ETCD | Docker | Calico | PostgreSQL |

Low Latency Linux

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**

OSF OpenStack Foundation

Thank you!

OpenStack Foundation