Airship Confirmation Review
OSF Board of Directors
October 22, 2019

Matt McEuen, Airship Working Committee
Alex Hughes, Airship Technical Committee
Kaspars Skels, Airship Working Committee
Jay Ahn, Airship Operator & Developer Community
Strategic Focus
Mission Statement

Openly **collaborate** across a diverse, global **community** to provide and integrate a collection of loosely coupled but interoperable, **open source** tools that declaratively automates cloud lifecycle management.
Airship is

... an open source community. Everyone is welcome to join and encouraged to contribute in variety of ways – use cases, code, test cases, documentation, reviews, ... or simply ideas.

... a project guided by the OpenStack Foundation principles since its formation, even before acceptance as an OSF project
Airship

• Supports the OSF’s strategic focus area related to datacenter cloud & container infrastructure

• Deploys OSF projects and is used by other OSF projects

• Manages the full lifecycle of data center infrastructure

• Allows operators to manage their infrastructure deployments and lifecycle through declarative YAML documents
Developer Roles

**Contributor**

- Has had changes merged within the last 12 months
- Eligible to vote in the election of Technical Committee
- Able to propose changes and give +1/-1 reviews on changes from other contributors

**Core Reviewer**

- Nominated and approved by the established Core, following established OpenStack processes
- Can be Cores of multiple Airship components
- Able to merge changes and give +2/-2 reviews on changes from other contributors
Technical Committee

• Responsible for the road map, vision and use cases for Airship

• Ensures Airship projects are adhering to the projects core principles, promote standardization, define and organizes the Airship versioning and release process

• 5 Members elected by Contributors

• Elections take place once per year.

• Anyone who has demonstrated commitment to the Airship project in the last 12 months is eligible to run

• No term limits for TC seats

• No more than 2 of the 5 seats can be filled by any one organization
Working Committee

• The WC committee cares for day to day functioning of Airship community
• WC intends to:
  • Help influence the project strategy
  • Help arbitrate when there is a disagreement between Core Reviewers within a single project or between Airship projects
  • Perform marketing and communications
  • Help provide product management as well as ecosystem support
• 5 Members elected by Core Reviewers
• Elections take place once per year
• Any Contributor is eligible to run
• No term limits for WC seats
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Current Committee Members

**Technical Committee**
- James Gu, *independent*
- Alexander Hughes, Accenture
- Jan-Erik Mångs, Ericsson
- Alexey Odinokov, Mirantis
- Ryan van Wyk, AT&T

**Working Committee**
- Nishant Kumar, Ericsson
- Matt McEuen, AT&T
- Kaspars Skels, Ericsson
- Drew Walters, AT&T
- Stas Egorov, Mirantis
Technical Best Practices
Technical Best Practices: Documentation

Documentation includes:

- Overview, Architecture, Getting Started
- Site Authoring and Deployment Guides
- Contributor / Review Guide
- Component and Integration Testing Docs
- Dev and Ops-focused Guides
- More on the way…

Documentation is accessible via [https://www.airshipit.org/](https://www.airshipit.org/)
Technical Best Practices: Code Review

Code Review Follows Established OSF Community Norms

• Core Reviewer teams per Airship project, nominated/ratified by those core teams
• Two +2s, WF +1, and Zuul gating required for merge
• +1s from non-cores (and cores) strongly encouraged
• Documentation and CICD are reviewed as code

Review metrics available at: https://www.stackalytics.com/?project_type=all&module=airship-group&metric=marks
Technical Best Practices: Testing & CICD

Airship has multi-faceted testing:

- Linting and unit testing, via Zuul
- Lightweight integration testing per change, via Zuul
- Voting and non-voting checks
- VM-based 3\textsuperscript{rd}-party integration run per Treasuremap change
- Nightly 3\textsuperscript{rd}-party bare metal deployment testing
- Developer documentation for local testing
Open Collaboration
Open Collaboration

Airship community believes in and follows “The Four Opens” governing principles:

- Open Source
- Open Design
- Open Development
- Open Community

- Adheres to the OpenStack Foundation Community Code of Conduct

- Airship code is distributed under the Apache 2 license

- Meetings and discussions are held in public open forums

  - One open dev IRC meeting, one JIRA meeting, two open design meetings, and three open SIG meetings every week.
Open Design

Airship follows an inclusive design process

• Open agenda etherpads
• Open design documents
• Opt-in SIG design sessions
• Weekly scope grooming
• All meetings recorded
Expanding Contributor Base and Growth of Community

All Time Metrics

- 3,862 commits in 25 repos
- 174 authors representing 20+ companies

Contribution Metrics Available at https://www.stackalytics.com/?project_type=openstack-others&module=airship-group&metric=commits
Airship Contributor Growth (cumulative)
Airship Contributor & User Announcements

May 2018

AT&T Working With SKT and Intel to Launch a New Open Infrastructure Project, Airship, Through the OpenStack Foundation, to Accelerate Cloud Deployments

By Amy Winter, vice president of Cloud and Networked Platform Integration

As part of our ongoing commitment to open and collaborative innovation, we’re working with Intel Corporation and the OpenStack Foundation to launch a new open infrastructure project, Airship. This project builds on the foundation set by the OpenStack project to put a cloud operator’s entire stack at every stage of its life cycle through rigorous testing and best practices. It also allows a cloud operator’s entire stack, from the network infrastructure and cloud-native platforms.

November 2018

February 3, 2019

AT&T using OpenStack and Airship to deploy the 5G core over its Network Cloud

Mirantis Joins OpenStack Foundation’s Airship to Bring Kubernetes to Telcos

February 9, 2019

Silicon Valley, CA — Today, Mirantis announced that it is joining Airship, a project originally founded by AT&T, on a mission to bring Kubernetes technology to telcos.

April 2019

Elevating DevOps and Enabling 5G with Airship

Two years ago, AT&T Communications CTO and then CTO of Technology and Operations teams used Kubernetes to launch mobile standards-based 5G core, faster than any other vendor. For its second 5G network, AT&T again used Kubernetes to enable rapid innovation and deployment. No doubt. No delay. Many teams moving together with a single purpose. It was the only way to achieve that goal.

August 2019

SUSE OpenStack Cloud Technology Preview Takes Flight

By Thomas R. M. ( @bassmer | 375 views)

June 2019

Dell Technologies and AT&T Collaborate on Open Source Edge Computing and 5G Software Infrastructure

Why Airship

Two years ago, AT&T Communications CTO and then CTO of Technology and Operations teams used Kubernetes to launch mobile standards-based 5G core, faster than any other vendor. For its second 5G network, AT&T again used Kubernetes to enable rapid innovation and deployment. No doubt. No delay. Many teams moving together with a single purpose. It was the only way to achieve that goal.
Active Engagement
Community Participation


- OpenStack and Open Infrastructure Days & Meetup events:
  - June 28-29 2018: OpenInfra Days, Seoul, South Korea
  - June 11-12, 2019: OpenInfra Days, Krakow City, Poland
  - June 21-23, 2019: IISc Global Conference, Palo Alto, CA
  - July 18-19, 2019: OpenInfra Days, Seoul, South Korea

- KubeCon San Diego: November 2019
Collaborations and Integrations
Airship Early Adoption
“More than 20 Network Cloud regions deployed and managed by Airship to date, and 5G Core deployments in flight.”

“Airship has been an important part of SK Telecom’s cloud native infrastructure development. SK Telecom is integrating Airship not only with telco network, but also with innovative services like AI, Media, and Mobile Edge Computing systems.”

“Aside from contributing to Airship upstream and collaborating with AT&T on key roadmap features, Mirantis is integrating much of the code into Mirantis Cloud Platform (MCP), Mirantis’s core product that empowers telcos and enterprises to efficiently run Kubernetes on-premises.”

“Ericsson is positive of an alignment between Airship and CNCF. We are increasing our upstream investments to the related opensource projects, and will work closely with AT&T and the Airship and CNCF communities to align and evolve capabilities in both communities.”

“StarlingX uses Airship Armada for orchestrating the deployment of multiple Helm charts.”

“Airship is core to realizing high-availability cloud services optimized for edge computing systems and applications.”
Future Plans
Future Plans

**November 2019**
- Bootstrap First Host
- Ephemeral Cluster
- Target Cluster
- Baremetal Provisioning
- Kubernetes Provisioning

**February 2020**
- Workflows for Software LCM
- MVPs for Most other Features
- Demonstrate at least one alternative to Baremetal

**May 2020**
- Full Feature Set
Community Channels

Mailing Lists: lists.airshipit.org

Freenode IRC: #airshipit

Website: www.airshipit.org

OpenDev: https://opendev.org/airship

YouTube: https://www.youtube.com/user/OpenStackFoundation/

AT&T and Mirantis Airship Webinar: Elevate Your Infrastructure Using Airship
Technical Overview

MOTIVATIONS FOR AIRSHIP:

The Airship Community wants to accelerate the growth of SDN as a whole, and we believe the Open Infrastructure needs to be simpler, faster and cheaper to do so.

Cloud Operators experience challenges in creating, updating, and managing the entire lifecycle of their own private cloud infrastructure, such as:

1) Lengthy and complicated processes;
2) The need for custom development to enable an ecosystem of various open source and proprietary software integrated into one cloud platform;
3) Demands for resources with a wide array of deep skillsets;
4) Difficulties keeping up with the cadence of new open source releases due to the slow process of deployment and upgrades; and
5) Challenges of scalability and security.
AIRSHIP AS AN ANSWER:

When AT&T, SKT and Intel set out to apply the learnings from years of building and managing Open Infrastructure at scale, we set clear goals to solve these very challenges:

1) Open Source Orchestration with Batteries Included
2) Simplified Singular Deployment Method
3) Predictable Fast and Seamless Deployments and Upgrades of the End-to-End Platform
4) Resiliency and Enterprise-Grade Security Built In From the Ground Up
5) Not Be Opinionated on the Use Case (wide adoption)
Technical Overview

Airship 1.0 Core Principles

Focus

The focus is a declarative platform to introduce OpenStack on Kubernetes (OOK), and the lifecycle mgmt. of the resulting cloud, with the scale, speed, resiliency, flexibility & operational predictability demanded of network clouds.

Key Tenets

**DECLARATIVE**

Sites are declared using YAML, including both hard assets & soft assets. You manage the document and Airship implements it.

**CONTAINER BASED**

Containers are the unit of software delivery for Airship. This allows progress from dev, to testing, and production with confidence.

**ONE WORKFLOW**

One workflow that handles both initial deployments and future site updates with virtually no difference in interacting with the two

**ARCHITECTURALLY FLEXIBLE**

Airship to manages our entire cloud platform, not just OpenStack including small and large environments.
Technical Overview

Airship 1.0 Architecture
## Technical Overview

### Airship 1.0 Core Components

<table>
<thead>
<tr>
<th>Component</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drydock</td>
<td>Declarative Baremetal Provisioning</td>
</tr>
<tr>
<td>Deckhand</td>
<td>Customization of YAML (Layering, Substitution, ...)</td>
</tr>
<tr>
<td>Promenade</td>
<td>Declarative Kubernetes + etcd HA Cluster Bootstrapping and LCM</td>
</tr>
<tr>
<td>Armada</td>
<td>Declarative Helm Chart Orchestration</td>
</tr>
<tr>
<td>Shipyard</td>
<td>Orchestration Engine for Airship Workflows</td>
</tr>
<tr>
<td>Pegleg</td>
<td>Configuration Organization Tool</td>
</tr>
<tr>
<td>DivingBell</td>
<td>Declarative Host OS Management and LCM</td>
</tr>
</tbody>
</table>
How do we use Airship | What do we mean by declarative

Ingress

Mariadb

Keystone

Nova

Horizon

Cinder

Memcached

Etcd

Swift

Glance

Neutron

Rabbitmq

Nova compute

Openvswitch

Libvirt chart

Docker

Kubelet

Swift

Nova compute

Openvswitch

Flow

Elastisrch

Collector

Promenade

Divingbell

Shipyard

Prometheus

Alertmgr

Kibana

Elasticsearch

Collector

Grafana

Kube Exporter

Node Exporter

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Prometheus

Alertmgr

Kibana

Elasticsearch

Collector

Grafana

Kube Exporter

Node Exporter

Chart
How do we use Airship? How do we bootstrap the cloud?

Press the button

Cloud Harbour(**)

Build Genesis.sh

Prepare Manifest

Generate

Promenade Artifactory Jenkins Kubernetes

Pegleg Docker

Docker

Genesish

Deliver

Kubelet

Tiller

Ceph mon

Shipyard

K8s api

Armada

Cloud

Genesis Done – Airship available

Armada Apply Bootstrap manifest

EXECUTE

genesis.sh

Iam

drill
drydock
armada
cloud

Ceph rbd

Ceph osd

tiller

Calico

Till

Calico shipyard

armada

Diving bell

Drydock

docker

Docker

Kubelet

Kubernetes

Genesis.sh

Genesis Done – Airship available

How do we bootstrap the cloud?
How do we use Airship? How do we deploy a cloud?

Press to deploy

Deliver Manifest documents

Cloud

Host

OS

Docker

Kubernetes

Jenkins

Artifactory

K8s api

K8s sched

K8s contrl

Ceph mon

Ceph rbd

Ceph osd

Calico etcd

Calico armada

torre

Commit Docs

Fluentd collect

Nova compute

K8s proxy

K8s Scheduler

Glance

Neutron

Ingress

Nginx

MariaDB

Liveness

Deployment

Deploy Compute Host groups

Hardware

IAM

(Keyst)

Chart

Nova

Horizon

Elastic Search

Fluentd

SDS (Ceph)

CNI (Calico)

Barem etal

Commit

Docs

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Kubernetes

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