

# Architecture

- Blueprint overview/Introduction
  - Use Case
  - Where on the Edge
- Overall Architecture
- Platform Architecture
- Software Platform Architecture
- APIs
- Hardware and Software Management
- Licensing

## Blueprint overview/Introduction

Tungsten Fabric is an open source network virtualization solution for providing connectivity and security for virtual, containerized or bare-metal workloads.

This blueprint implements Network Cloud blueprint with Tungsten Fabric as an SDN Controller that support CNI for Kubernetes as well Neutron plugin for OpenStack. This allows the operators to take the advantage of the advanced networking feature offered by Tungsten Fabric. This blueprint uses the latest version of Regional Controller to deploy the edge sites that uses Airship as the deployment tool. This enables telco operators to take control of their infrastructure, by providing a declarative framework for defining and managing the life cycle of the infrastructure

The NC TungstenFabric blueprint is based on the original code provided by Juniper Networks for the Akraino Network Cloud Blueprint Family. The NC TungstenFabric blueprint supports only a single server deployment (Rover) at the moment

The blueprint uses the Network Cloud family tools (Release 2). It can be deployed from Regional Controller and creates a single server Edge Site running Openstack with TungstenFabric.

Regional Controller is necessary part of Akraino Release 2 deployment procedure. It's Akraino approved blueprint which is common for all of Release 2 blueprints and which is using for Edge Site, Blueprint and POD deployment.

For more information please see the section [Akraino Regional Controller](#)

### Use Case

- Enable Platform-as-a-Service and Software-as-a-Service with high scalability and flexibility in OpenStack-managed datacenters
- Virtual networking with Kubernetes container management system, including with Red Hat OpenShift
- Allow new or existing virtualized environment running VMware vCenter to use Tungsten Fabric virtual networking between virtual machines
- Connect Tungsten Fabric virtual networks to physical networks using gateway routers with BGP peering with networking overlays, and directly through the data center underlay network

### Where on the Edge

The Tungsten Fabric blueprint can be deployed at any location in a network where a single server Openstack service is required to support applications.

## Overall Architecture

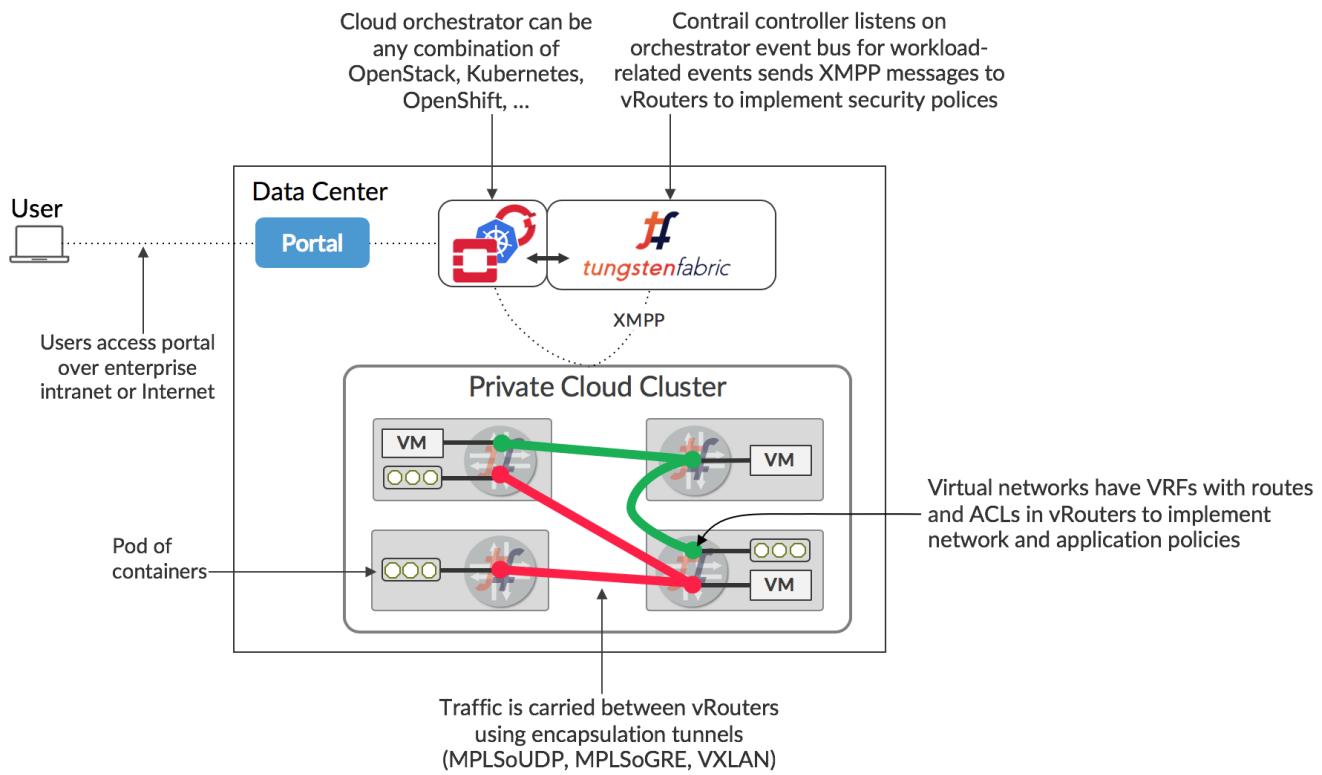
The Tungsten Fabric controller integrates with cloud management systems such as OpenStack or Kubernetes. Its function is to ensure that when a virtual machine (VM) or container is created, it is provided with network connectivity according to the network and security policies specified in the controller or orchestrator.

Tungsten Fabric consists of two primary pieces of software

Tungsten Fabric Controller— a set of software services that maintains a model of networks and network policies, typically running on several servers for high availability

Tungsten Fabric vRouter— installed in each host that runs workloads (virtual machines or containers), the vRouter performs packet forwarding and enforces network and security policies.

A typical deployment of Tungsten Fabric is shown below.



For more information please see [Tungsten-Fabric Architecture](#)

## Platform Architecture

At the moment AWS instances are used.

- Regional Controller AWS instance t2.medium
- Airship+TF node - AWS instance m5.4xlarge

## Software Platform Architecture

- Regional Controller (latest)
- Airship-in-a-bottle v.1.13

## APIs

APIs with reference to Architecture and Modules

High Level definition of APIs are stated here

## Hardware and Software Management

TODO

## Licensing

- Apache License Version 2.0, January 2004