

# StarlingX OPNFV Nokia Paris-Saclay

Pilot Project Supported by the OpenStack Foundation 

A fully featured Cloud for the distributed Edge



# Project Overview



openstack®



# The OpenStack Project For Edge Devices

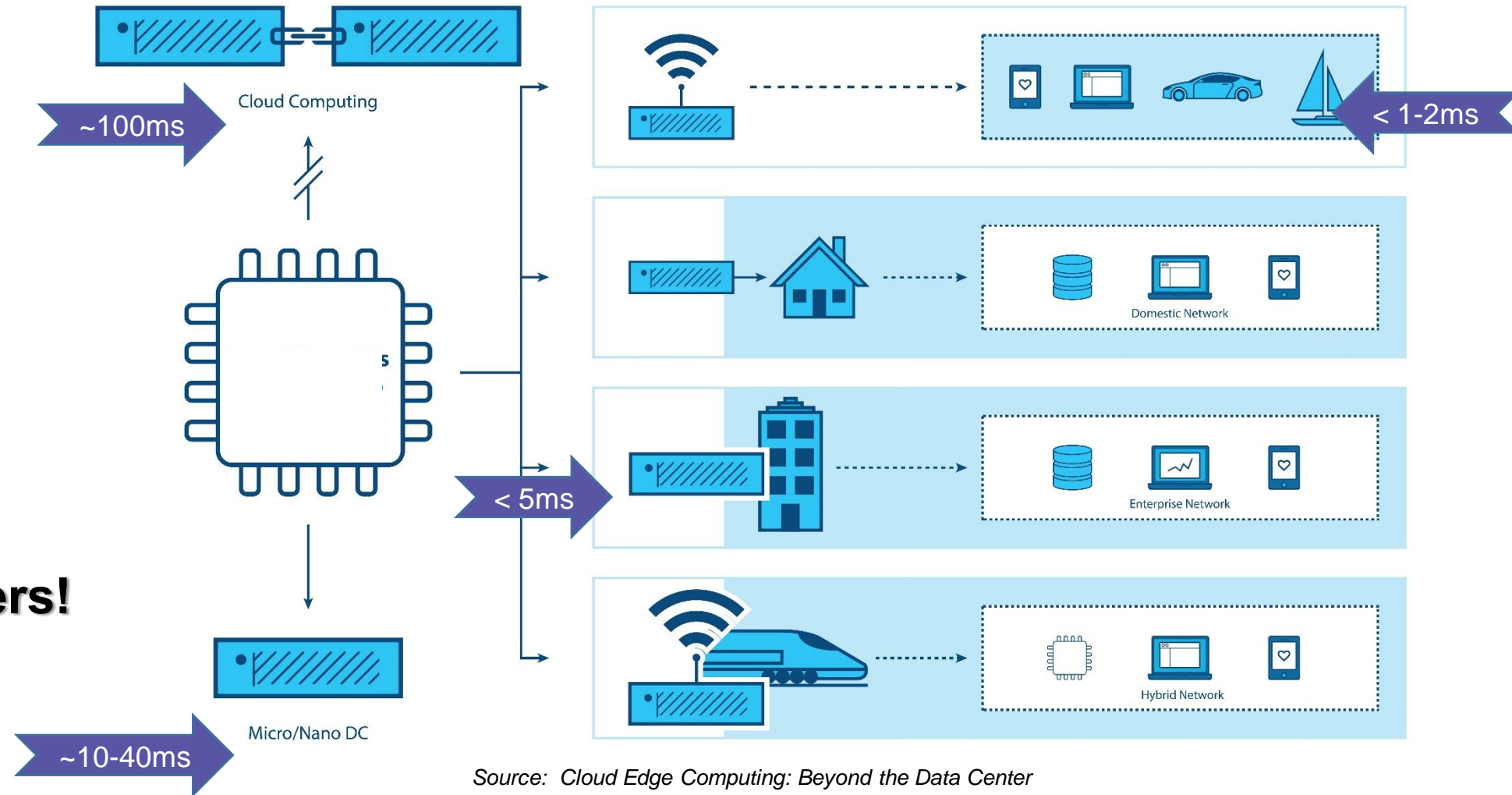
StarlingX is a project under the governance of the OpenStack Foundation with an Apache 2.0 license

- Released two times per year
  - The first StarlingX release is [stx.2018.10](#)
  - Next release is scheduled on May 20-24 2019 (2019.05.0)
- <https://wiki.openstack.org/wiki/StarlingX> all-in-one StarlingX wikipage
- CENGN Mirror: <https://www.cengn.ca/starlingx-mirror-site/>

# What Is Edge Computing?

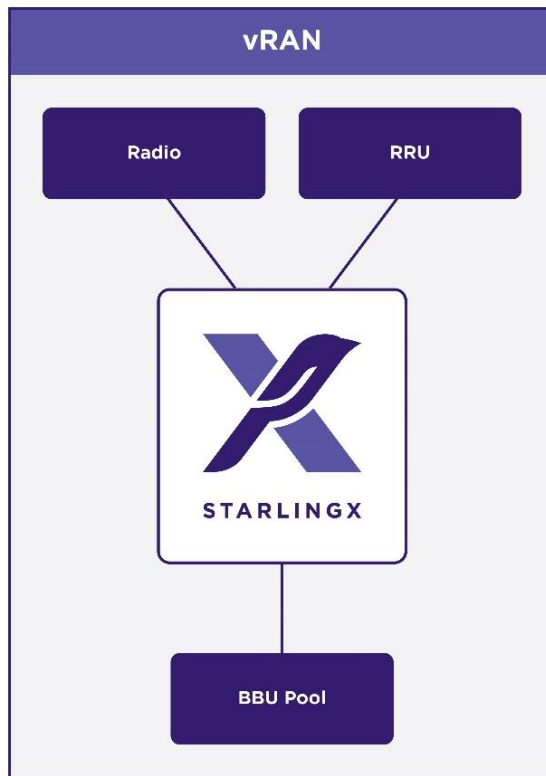
- A. **Latency**
- B. **Bandwidth**
- C. **Security**
- D. **Connectivity**

**“WHERE” Matters!**

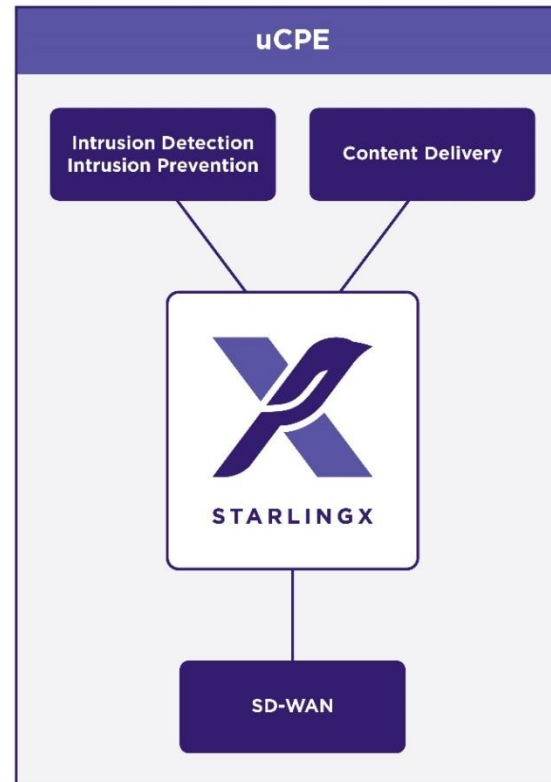


Source: *Cloud Edge Computing: Beyond the Data Center*  
[https://www.openstack.org/edge-computing/cloud-edge-computing-beyond-the-data-center?lang=en\\_US](https://www.openstack.org/edge-computing/cloud-edge-computing-beyond-the-data-center?lang=en_US)

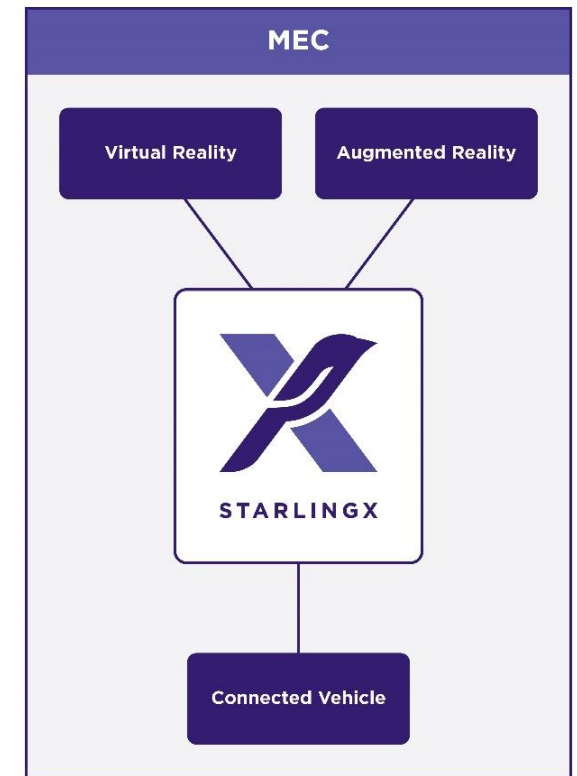
# Edge Computing Use Cases



*vRAN = virtual Radio Access Network*



*uCPE = Universal Customer Premises Equipment*



*MEC = Multi-access Edge Computing*

# StarlingX Technology

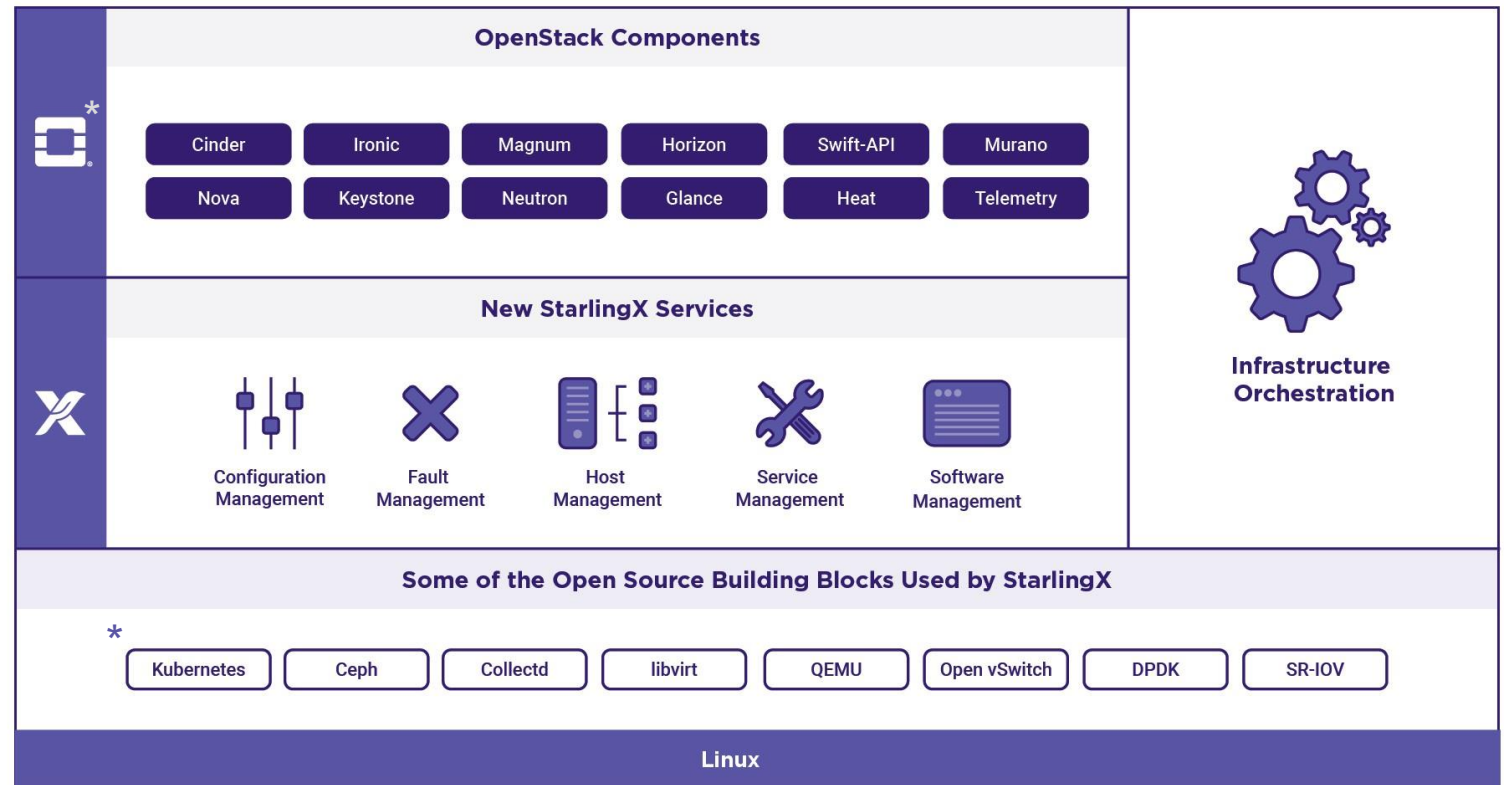
# StarlingX – Edge Virtualization Platform

StarlingX provides a deployment-ready, scalable, highly reliable Edge infrastructure software platform

Services from the StarlingX virtualization platform provide:

- Easy deployment
- Low touch manageability
- Rapid response to events
- Fast recovery

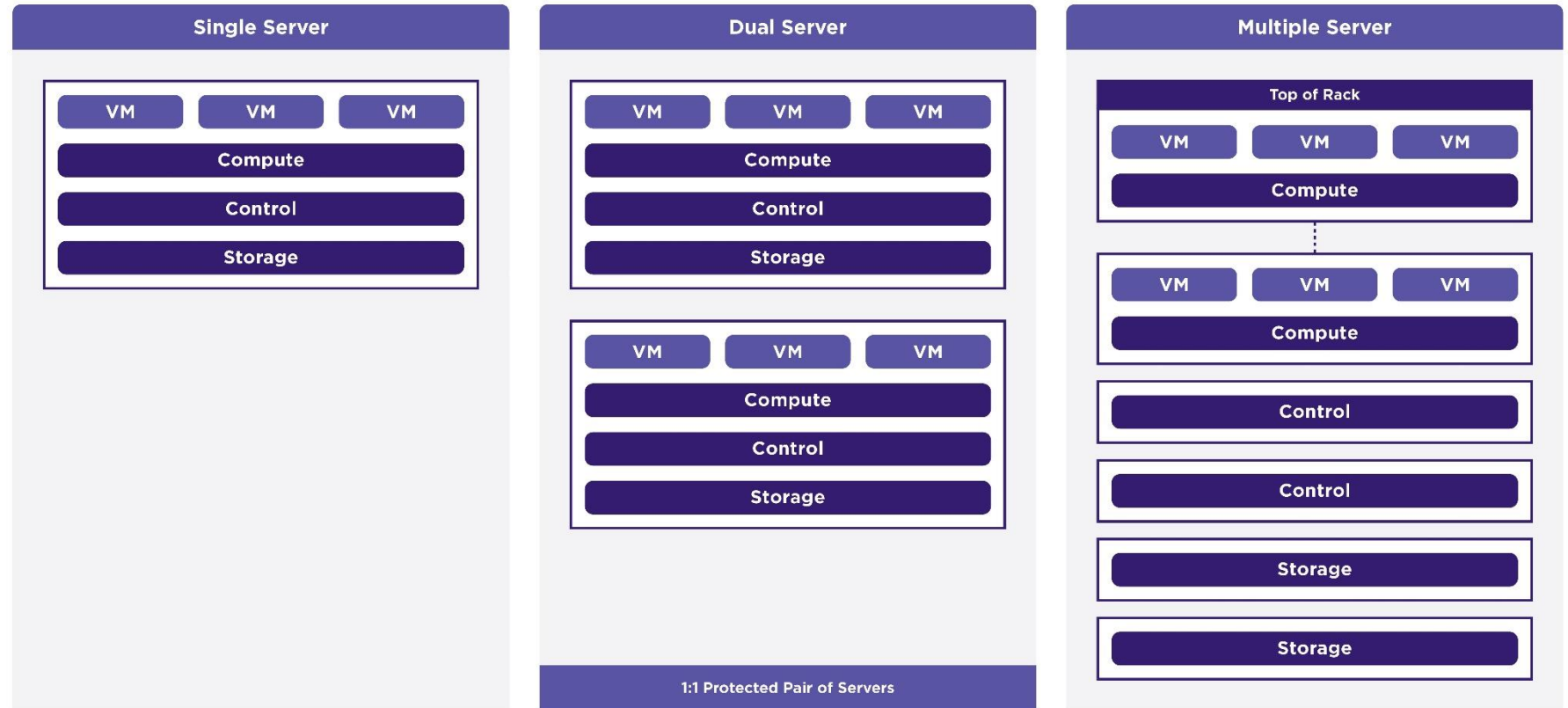
Think control at the Edge, control between IoT and Cloud, control over your virtual machines.



# StarlingX Scalability

- **Single Server**  
- Runs all functions
- **Dual Server**  
- Redundant design
- **Multiple Server**  
- Fully resilient and geographically distributable

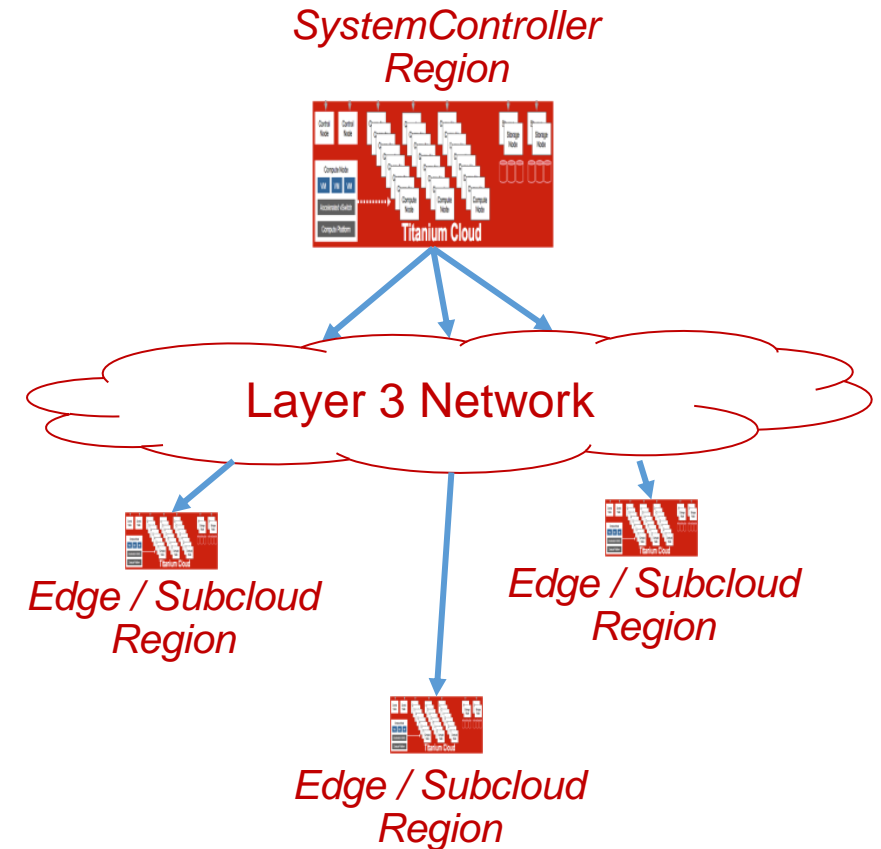
## Scalability For The Edge





# Distributed Cloud - Solution Overview

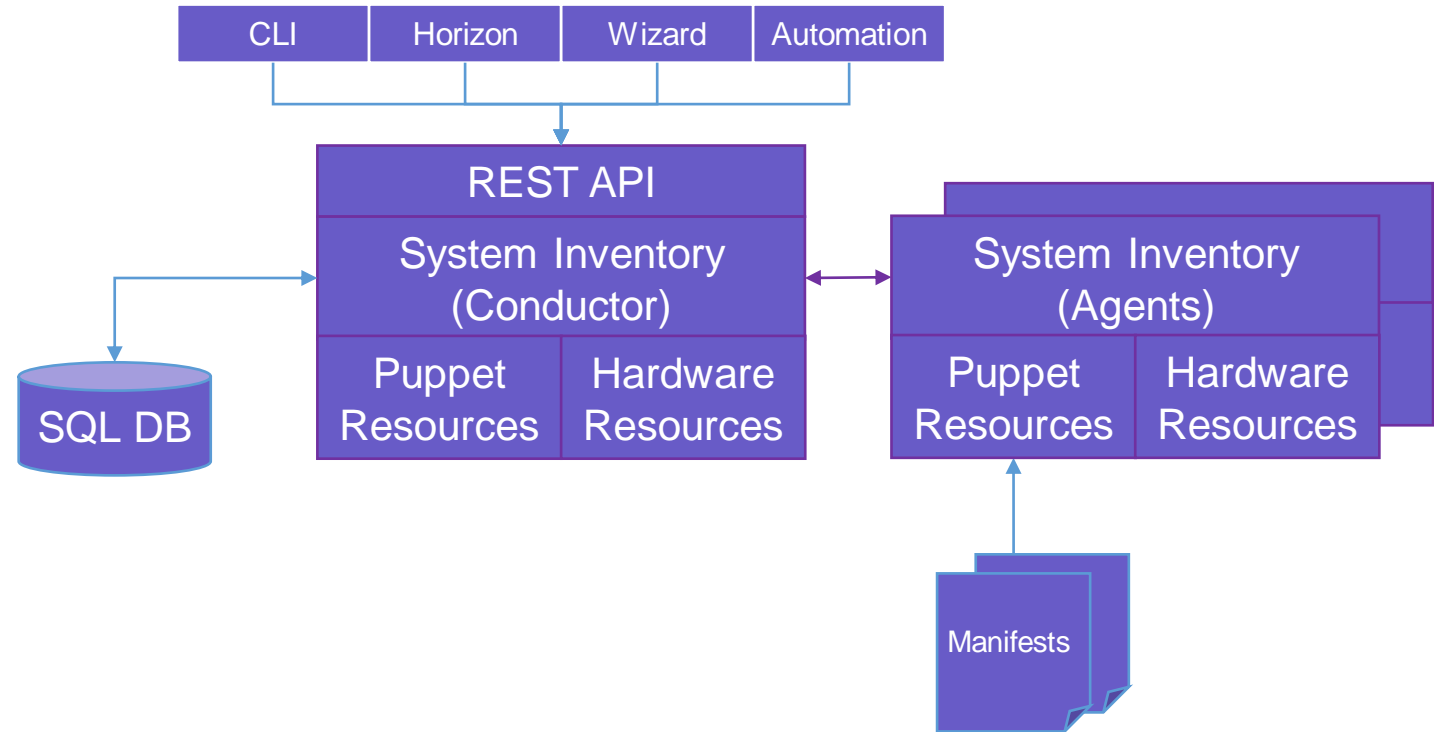
- Based on OpenStack Regions,
- Central SystemController Region:
  - Hosting Shared Services
  - System-wide Infrastructure Orchestration functions:
    - Deployment and Management of Subclouds,
    - Configuration portal for shared configuration across all Subclouds,
    - Fault aggregation,
    - Patching orchestration.
- Remote Edge / Subcloud Regions:
  - Geographically dispersed,
  - Connected via L3 network,
  - Running reduced Control Plane.
- Inter-Region Communications strictly **REST APIs** / L3.



# StarlingX – Configuration Management



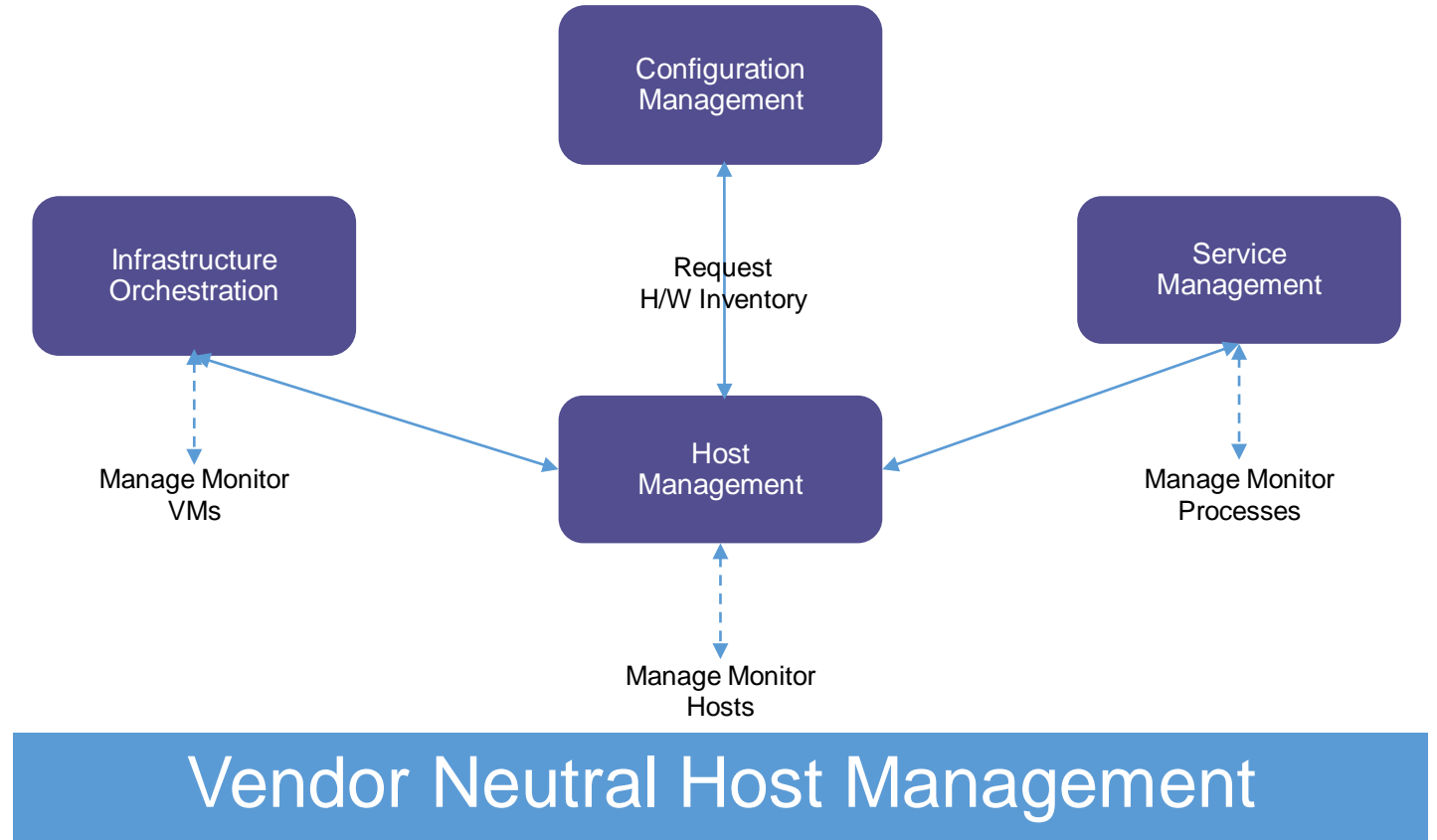
- **Manages Installation**
  - Auto-discover new nodes
  - Manage installation parameters (i.e. console, root disks)
  - Bulk provisioning of nodes through xml file
- **Nodal Configuration**
  - Node role, role profiles
  - Core, memory (including huge page) assignments
  - Network Interfaces and storage assignments
- **Inventory Discovery**
  - CPU/cores, SMT, processors, memory, huge pages
  - Storage, ports
  - GPUs, storage, Crypto/compression H/W



## System Configuration and Setup

# StarlingX – Host Management

- Full life-cycle management of the host
- Detects and automatically handles host failures and initiates recovery
- Monitoring and alarms for:
  - Cluster connectivity, critical process failures
  - Resource utilization thresholds, interface states
  - H/W fault / sensors, host watchdog
  - Activity progress reporting
- Interfaces with board management (BMC)
  - For out of band reset
  - Power-on/off
  - H/W sensor monitoring
- Manage the host via REST API



Vendor Neutral Host Management

# StarlingX – Software Management



- Automated deploy of software updates for security and/or new functionality
- Integrated end-to-end rolling upgrade solution
  - Automated, low number of steps
  - No additional hardware required for upgrade
  - Rolling Upgrade across Nodes
- In-service and reboot required patches supported
  - Reboot required for kernel replacement etc.
  - For patches that require a reboot, VM's are live migrated off of node
- Manages Upgrades of all Software
  - Host OS changes,
  - New / upgraded StarlingX Service Software,
  - New / Upgraded OpenStack Software.



Software Upgrades and Patching

# StarlingX OVP (Verified Program)

- Intel PHAROS POD-14
  - <https://wiki.opnfv.org/display/pharos/Intel+POD14>
- Intel PHAROS POD-20
  - <https://wiki.opnfv.org/display/pharos/Intel+POD20>
- PHAROS VPN Access: <https://wiki.opnfv.org/display/INF/Infra+Lab+Support>

# Community and Contributing

# Get Involved

- Code and documentation are available through git
  - [git.starlingx.io](https://git.starlingx.io)
- Apache 2 license
- IRC: #starlingx@Freenode
- Mailing List for daily discussions
  - <http://lists.starlingx.io/cgi-bin/mailman/listinfo/starlingx-discuss>
- Weekly meetings:
  - Zoom calls
  - <https://wiki.openstack.org/wiki/StarlingX/Meetings>

# Where to Contribute?

- Bugs are tracked in Launchpad
  - <https://bugs.launchpad.net/starlingx>
- New ideas are introduced in the specs repository
  - <https://git.openstack.org/cgit/openstack/stx-specs/>
- Design and implementation work is tracked in StoryBoard
  - [https://storyboard.openstack.org/#!/project\\_group/86](https://storyboard.openstack.org/#!/project_group/86)





# Invitation to Join the Community

- We cordially invite you to join the StarlingX community
  - Please try out the code and read the documents on [StarlingX.io](https://starlingx.io)
  - Please sign up for the [mailing list](#)
  - Please attend [community meetings](#)
  - Please consider joining as a member

Thank you!