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02.14.2019

OSF Edge Computing Overview

ILDIKO VANCSA - OPENSTACK FOUNDATION, ILDIKO@OPENSTACK.ORG

History of Edge Activities

- OpenStack Summit, Boston, 2017 May
  - Verizon keynote on Taking OpenStack out to the Network Edges
- OpenDev, San Francisco, 2017 September
  - Presentations and working sessions with ~200 participants
  - Steps towards identifying ‘edge computing’ and initial use cases
- Sydney Summit, 2017 November
  - Edge related presentations and Forum sessions with discussions on the term ‘edge computing’
- PTG, Dublin, 2018 February
  - Detailed discussions on use cases and requirements
  - Focus on synchronization and transaction management

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History of Edge Activities

- OpenStack Summit, Vancouver, 2018 May
  - Discussions in the area of identity, image management and hardware acceleration and introducing StarlingX
- PTG, Denver, 2018 September
  - Working sessions on reference architecture and work items for identity and image management
- StarlingX First Release, 2018 October
- OpenStack Summit, Berlin, 2018 November
  - Dedicated track for Edge Computing on the conference
- Open Infrastructure Summit, Denver, 2019 April (https://www.openstack.org/summit/denver-2019/)
  - Conference and Forum sessions
- PTG, Denver, 2019 May (right after the Summit)

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Edge Computing Whitepaper

- https://www.openstack.org/edge-computing/cloud-edge-computing-beyond-the-data-center?lang=en_US
- Defining the basics starting from Cloud Edge Computing
- Sample scenarios
  - Cloud in a box
  - Mobile connectivity
  - Network-as-a-Service
  - Universal Customer Premises Equipment (uCPE)
  - Satellite enabled communication
- Common requirements

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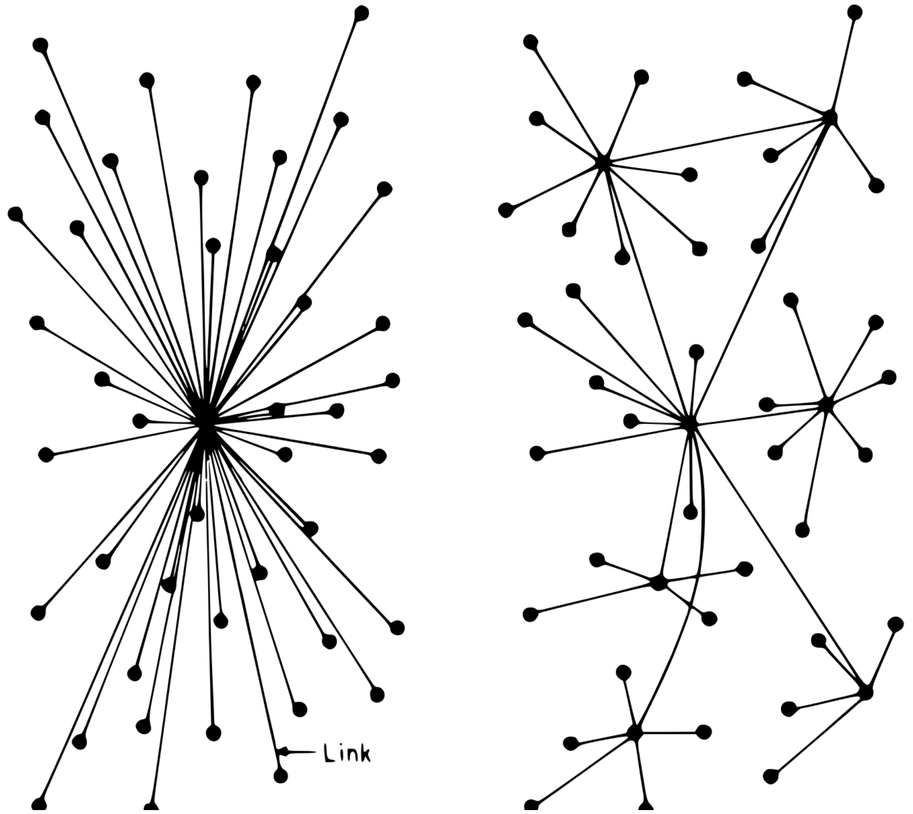
Scope for the Edge Computing Group

- Identify use cases and scenarios related to edge computing
- Focus on challenges and solutions in the IaaS layer
  - Find common requirements
  - Define common edge computing reference architectures
  - Design and implement
    - Enhancements to existing projects and services to provide a better fit for edge
    - New projects and services to implement missing functionality
- Emphasize the importance of open infrastructure
- Encourage industry-wide collaboration

Deployment architectures

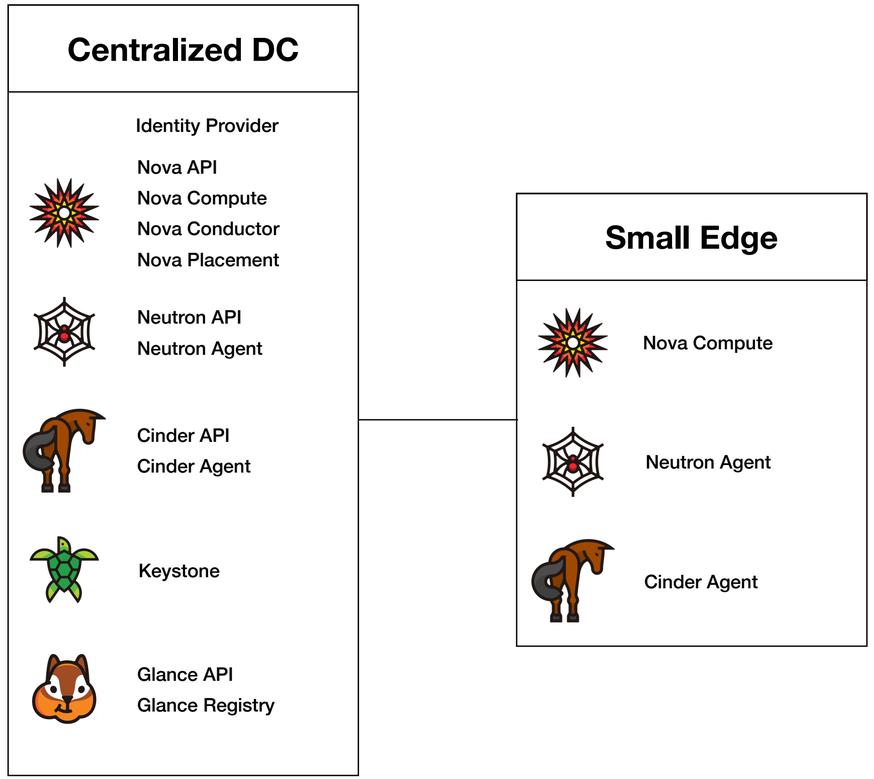
- Edge is not a one-size fits all topic, flexibility and scale drive implementation
- Keeping it simple and knowing that Control plane requirements change
  - Per site in each architecture
  - By scale

Requiring both **centralized** and **distributed** models



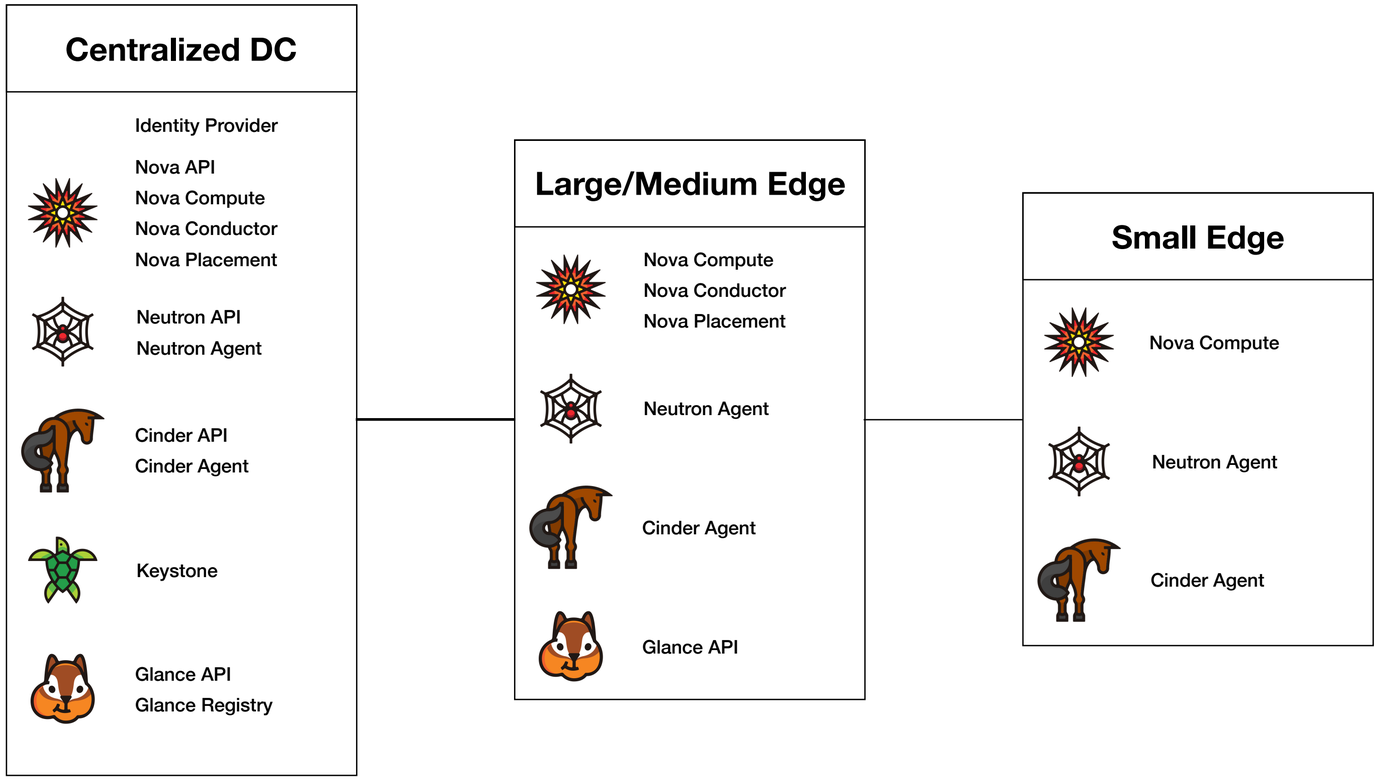
Centralized control plane

- Fully functional central sites
- Authoritative, implementing all cloud services
- Remote sites implemented with an operational control plane
  - Dependent on central sites for authority & information
  - Able to continue to operate when isolated from the central site



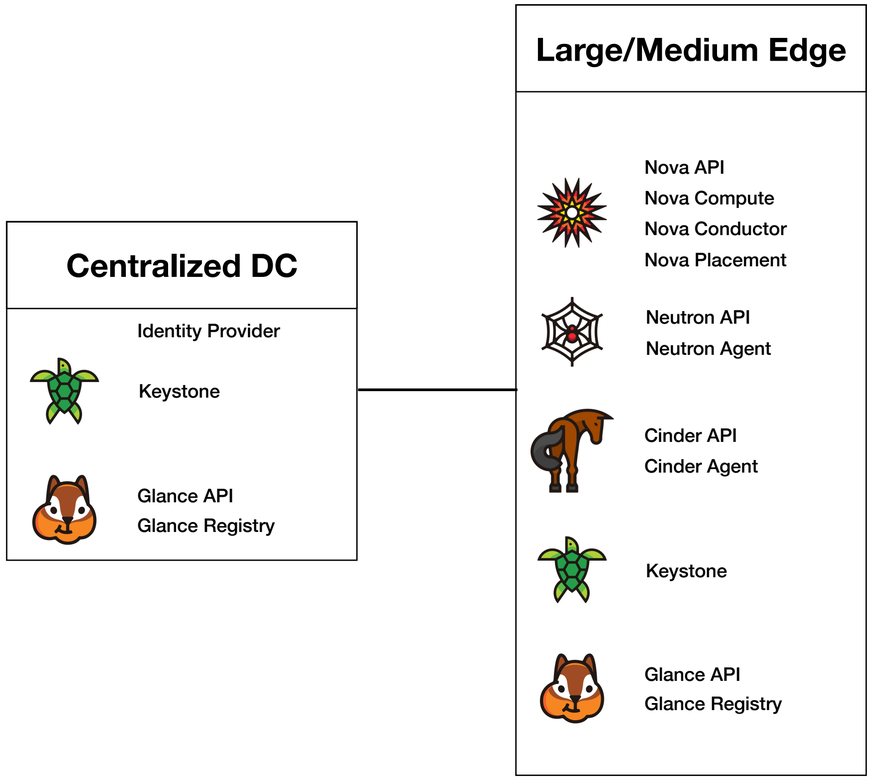
Large scale centralized control plane

- Fully functional central sites
- Remote sites implemented with an operational control plane
- Small edge sites implemented as execution machinery
  - Dependent on the edge site for control
  - Can operate existing functions when isolated



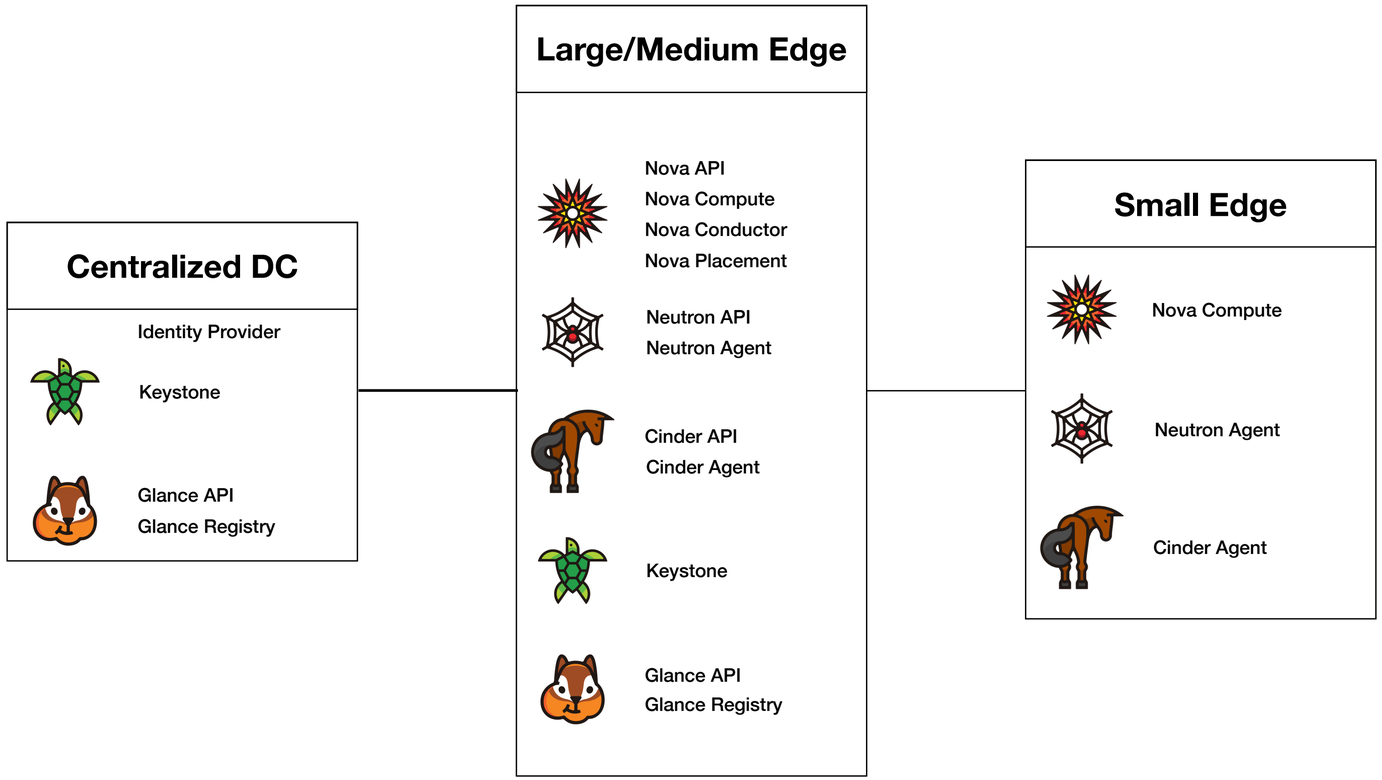
Distributed control plane

- Central sites are not operational
- Remote sites implemented with an authoritative and operational control plane
  - Leverages central sites for authority, image & security



Large scale distributed control plane

- Non operational central sites
- Remote sites implemented with a fully operational control plane
- Small edge sites implemented as execution machinery
  - Dependant on the control edge site
  - Can operate existing functions when isolated



Current Activities

- Use Cases sub-group
  - https://wiki.openstack.org/wiki/Edge_Computing_Group/Use_Cases
  - Template for describing use cases in a standard manner
  - Involving all industry segments
  - Collecting characteristics, business cases and requirements and identify mappings to reference architectures
- Keystone Edge architectures
  - https://wiki.openstack.org/wiki/Keystone_edge_architectures
  - Cross-project work involving the Keystone team and the OPNFV Edge Cloud Project
  - Discussing architecture options
  - Keystone federation testing activities

Current Activities

- Glance Edge architectures discussion
  - https://wiki.openstack.org/wiki/Image_handling_in_edge_environment
  - Cross-project work involving the Glance team
  - Design and implementation work on image and metadata caching
- Weekly meetings
  - https://wiki.openstack.org/wiki/Edge_Computing_Group
  - Cross-community collaboration
  - Following up on the sub-group activities
  - Bringing up new topics and use cases for further evaluation

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Collaboration

- Weekly meetings
  - Zoom calls and/or IRC meetings
  - https://wiki.openstack.org/wiki/Edge_Computing_Group
- mailing list
- IRC - #edge-computing-group on Freenode

https://www.openstack.org/edge-computing/

A Fully Featured Cloud
For The Distributed Edge

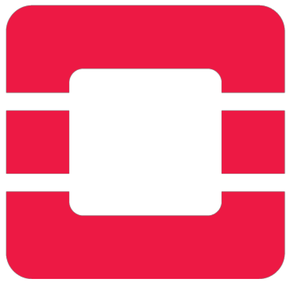
Let Me Introduce StarlingX

- New, top-level OpenStack Foundation pilot project
- Software stack providing high performance, low latency, and high availability for Edge Cloud applications
- First release on October 24
- 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



Transportation	Energy
Manufacturing	Retail
Video	Smart cities
Healthcare	Drones

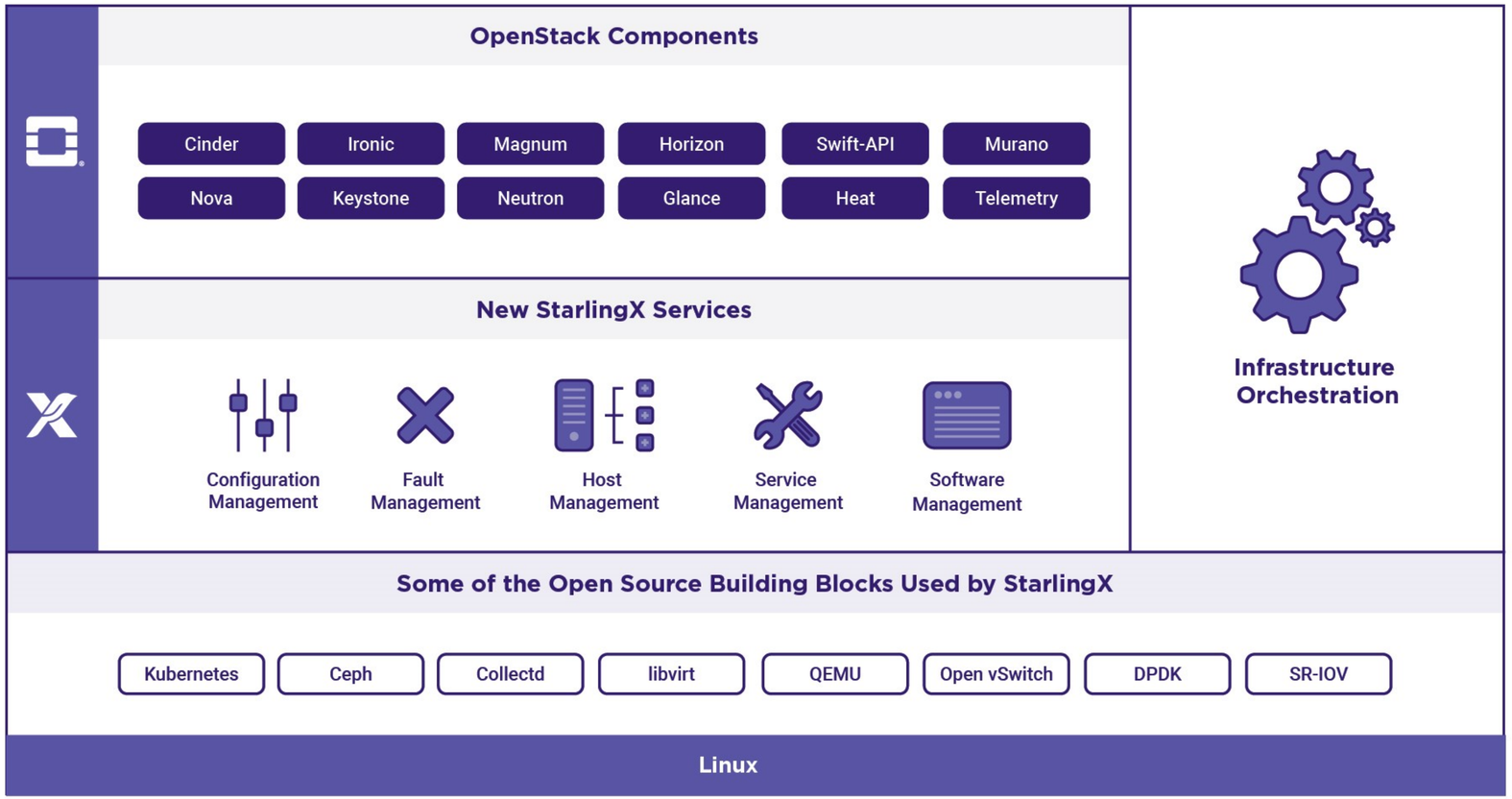
StarlingX – Edge Virtualization Platform

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

Services from the StarlingX virtualization platform focus on

- **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.



https://www.starlingx.io

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Thank You!

Questions?

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