

Central Office Re-architected as a Datacenter (CORD)

Open Networking Lab
In collaboration with AT&T

– See Demo at the ONS Showcase –

Telco Central Office

Large number of complex facilities

- AT&T alone operates 4-5k Central Offices

- Each serves 10-100k residential, enterprise & mobile customers

Evolved piecemeal over the past 40-50 years

- Source of huge CAPEX/OPEX costs

- Difficult to introduce new services

Especially when compared to OTT cloud providers!

- Want the economies of commodity infrastructure

- Want the agility of scalable services

CORD = SDN x NFV x Cloud

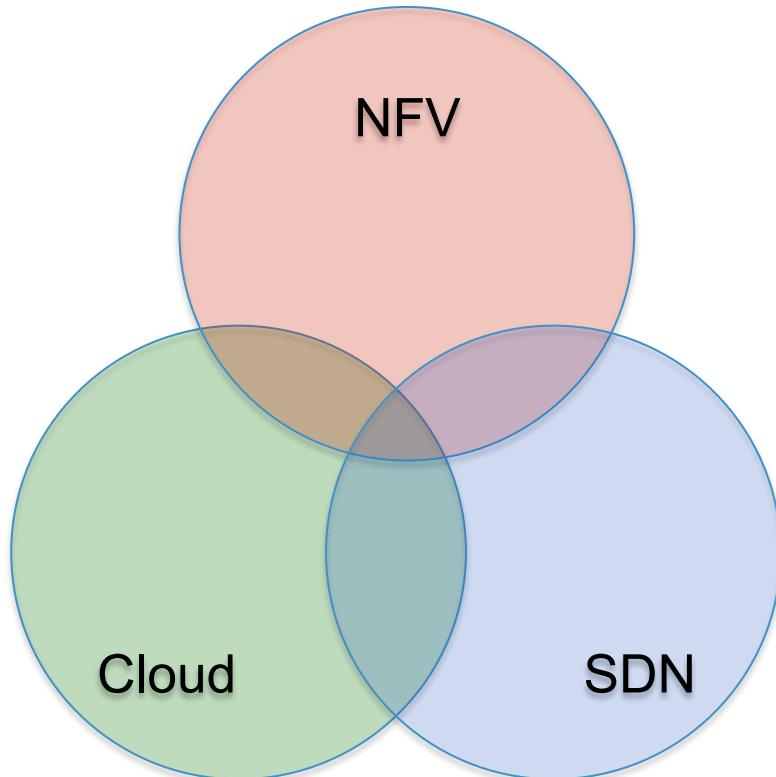


SDN
NFV
Cloud



Commodity Hardware + Software

CORD = SDN x NFV x Cloud



Exploits both NFV and SDN

- Some VNFs run in VMs

- Some VNFs “run in” WhiteBox Switches

Catalyzes function disaggregation

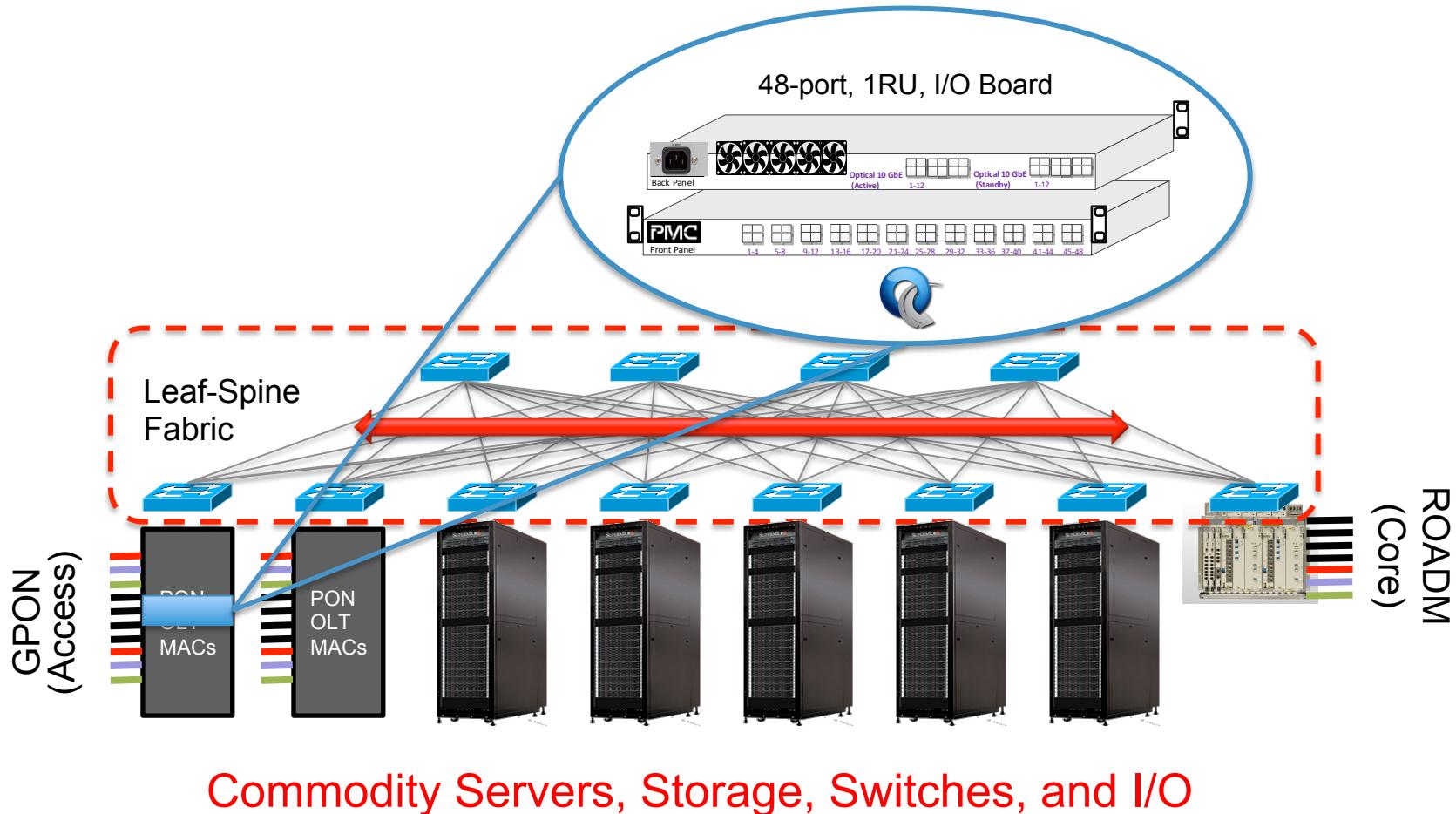
- Clean-slate approach to “function bundles”

Exploits Cloud Best-Practices

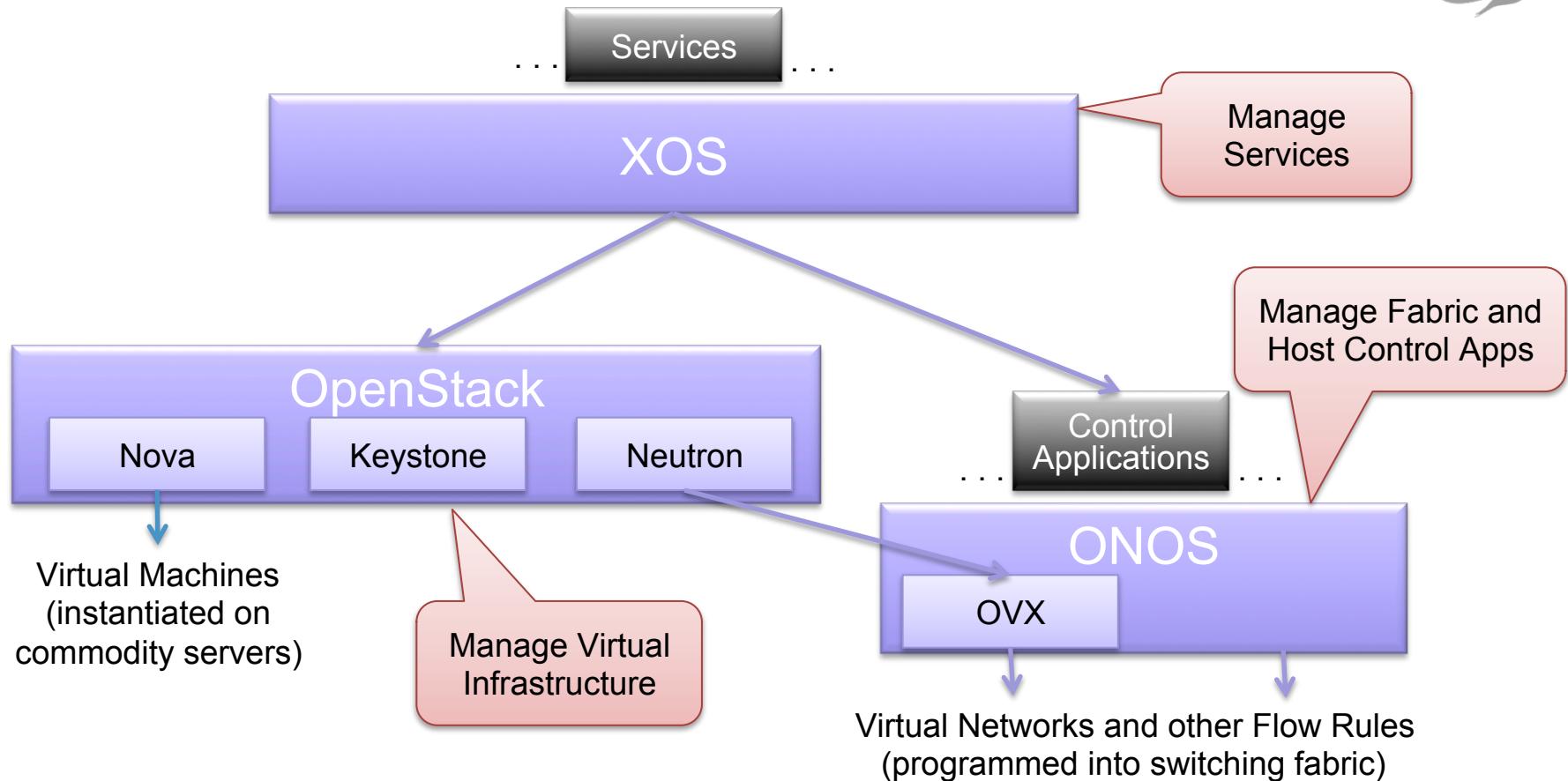
- Services are the “unit of orchestration”

- Both “global” and “local” functionality

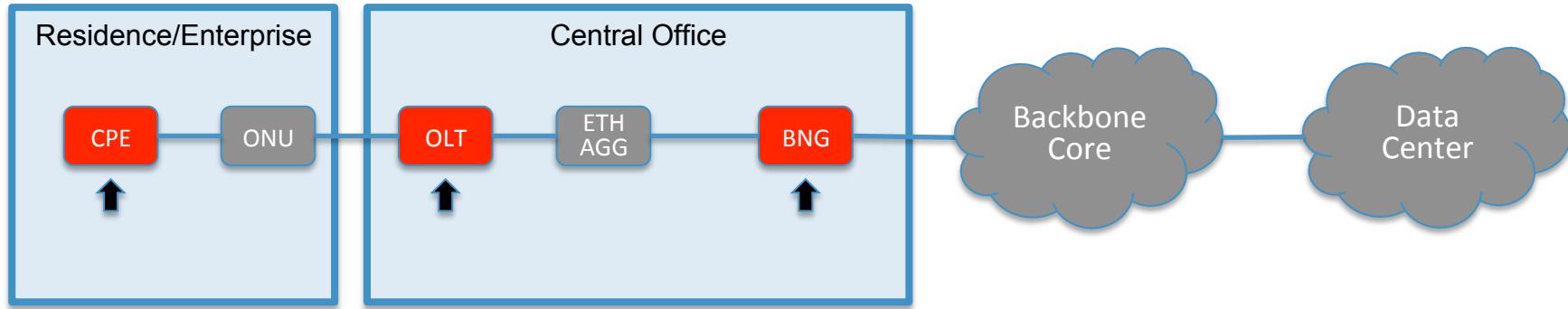
CORD – Hardware Architecture



CORD – Software Architecture



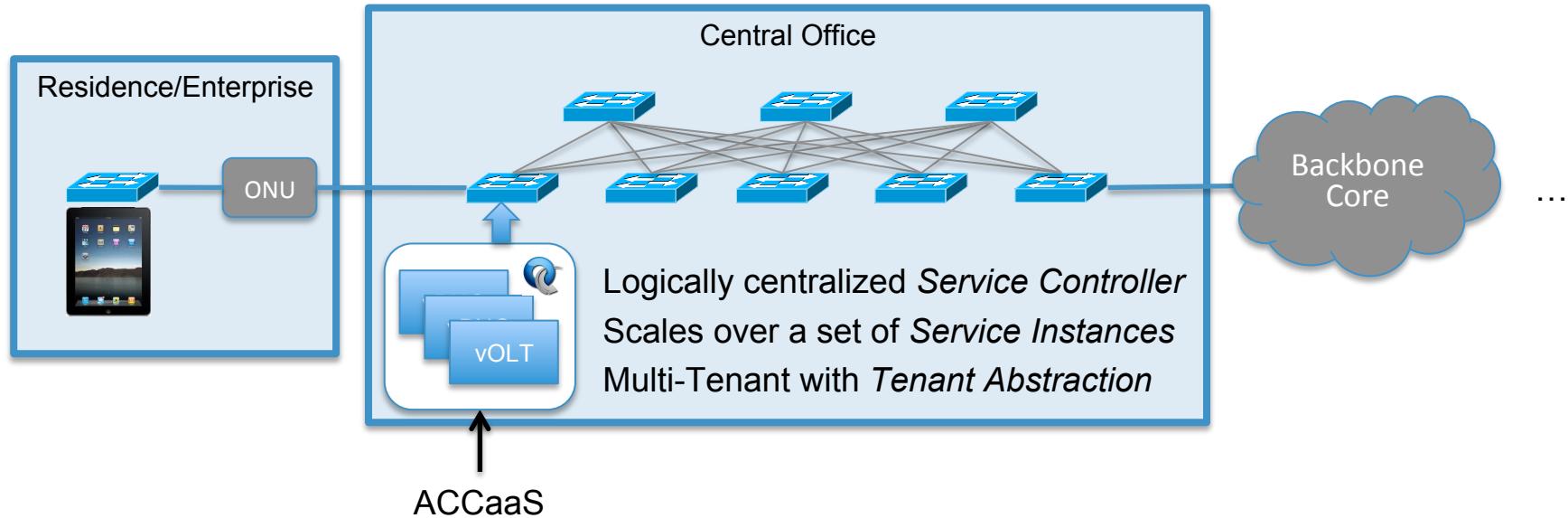
Legacy Central Office



Acronyms

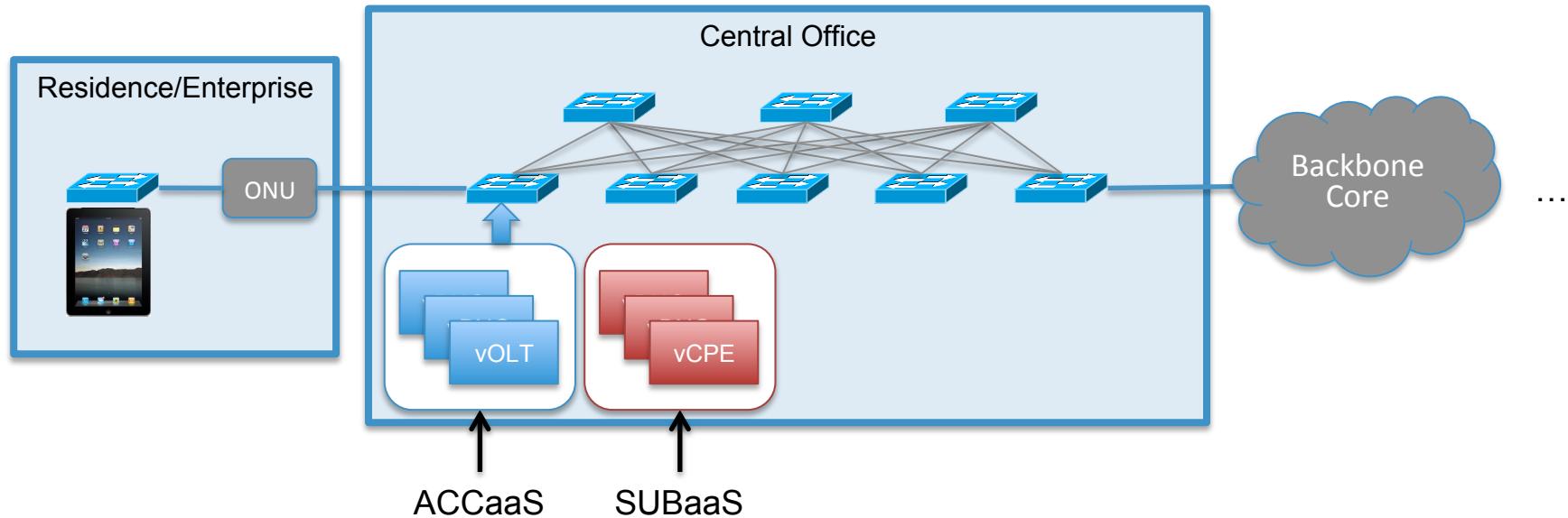
- CPE – Customer Premises Equipment
- OLT – Optical Line Termination
- BNG – Broadband Network Gateway

CORD



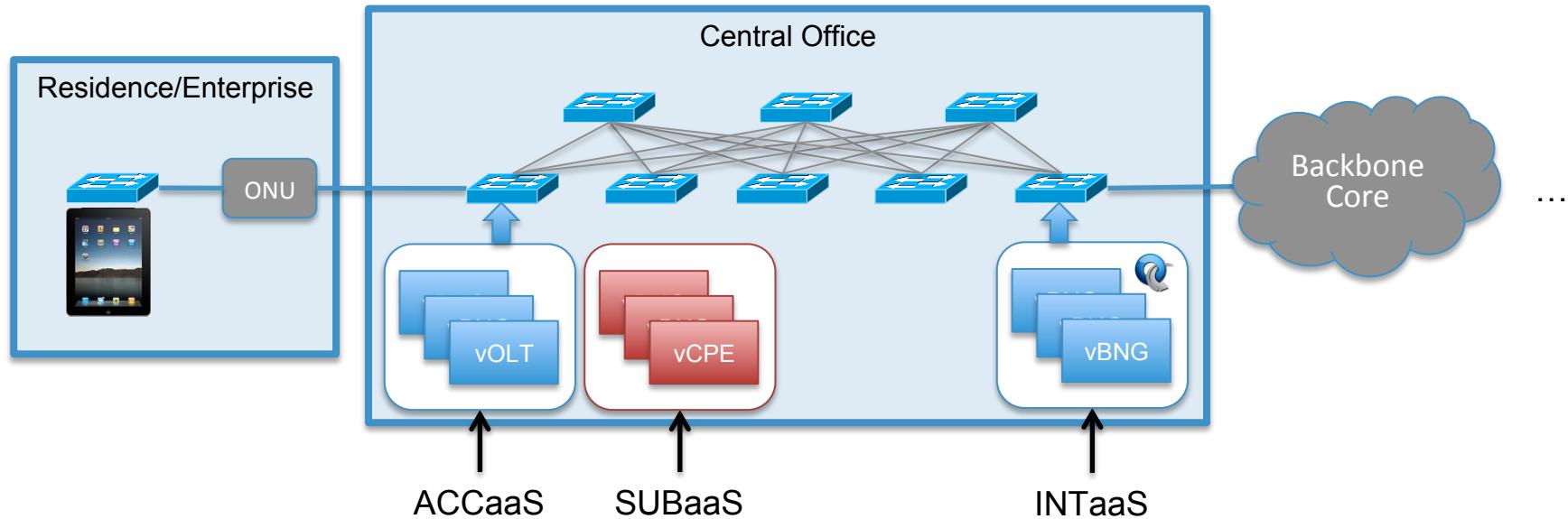
Access-as-a-Service (ACCaaS) – Implemented by an ONOS control application (**vOLT**), where each tenant corresponds to a **Subscriber VLAN**.

CORD



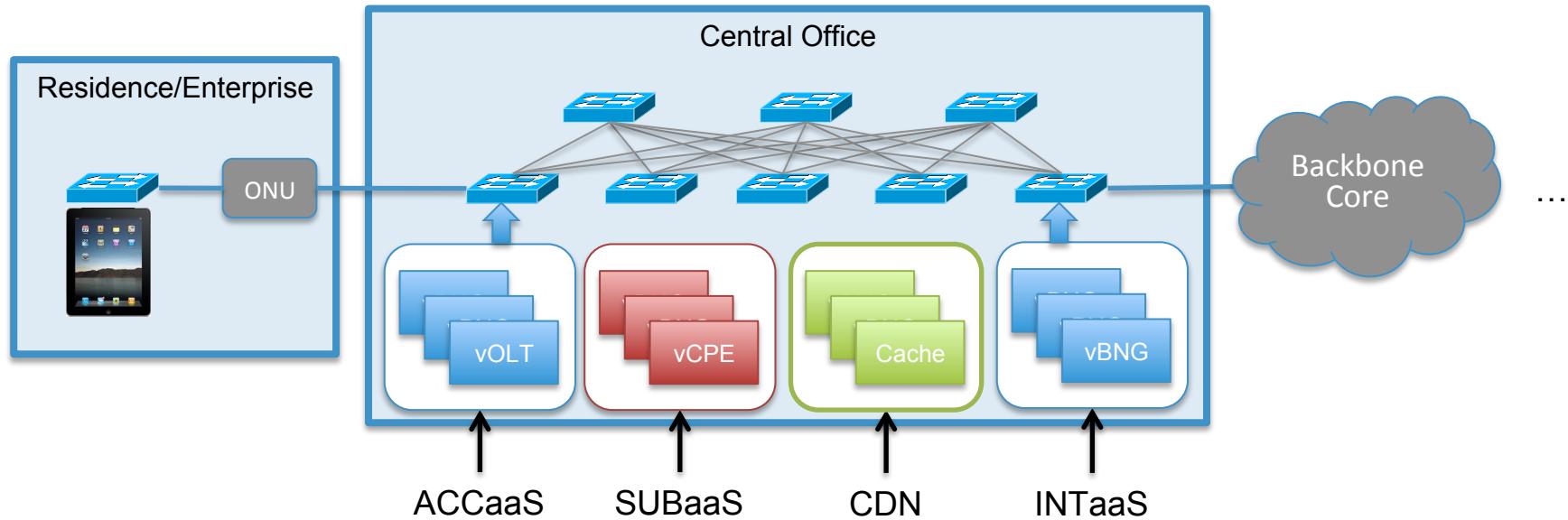
Subscriber-as-a-Service (SUBaaS) – Implemented by a Docker container (vCPE), where each tenant corresponds to a **Subscriber Bundle**.

CORD



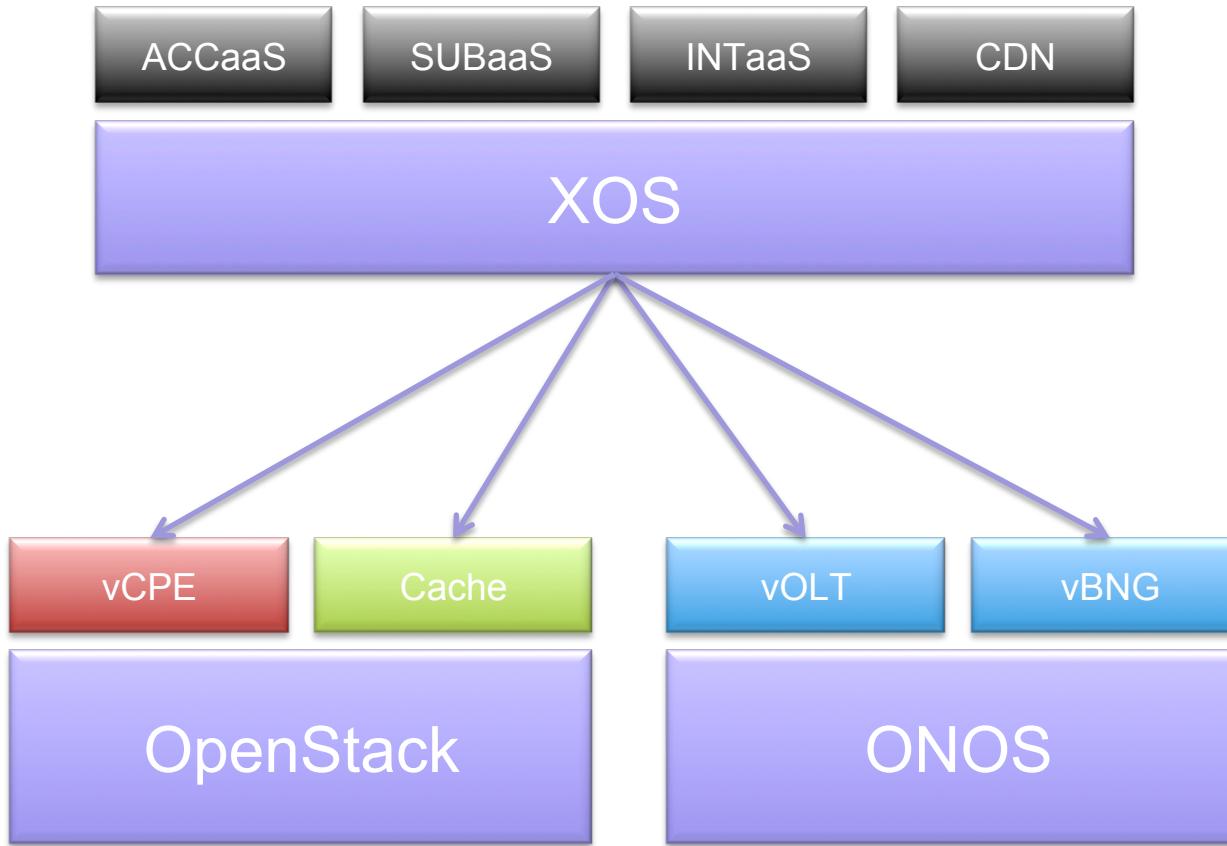
Internet-as-a-Service (INTaaS) – Implemented by an ONOS control application (**vBNG**), where each tenant corresponds to a **Routable Subnet**.

CORD

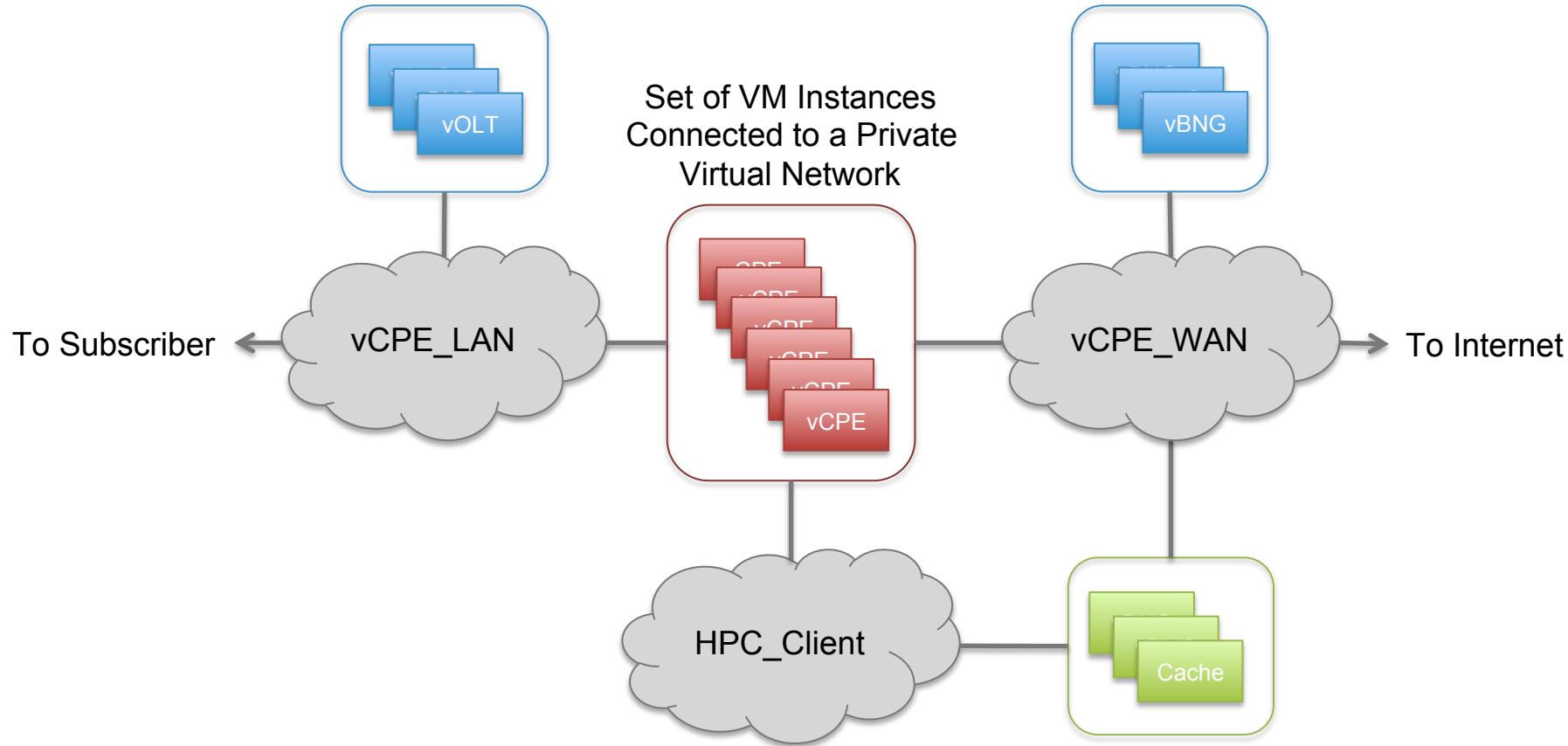


Content Distribution Network (CDN) – Implemented by a global caching hierarchy (including local caches), where each tenant corresponds to a **Content Provider**.

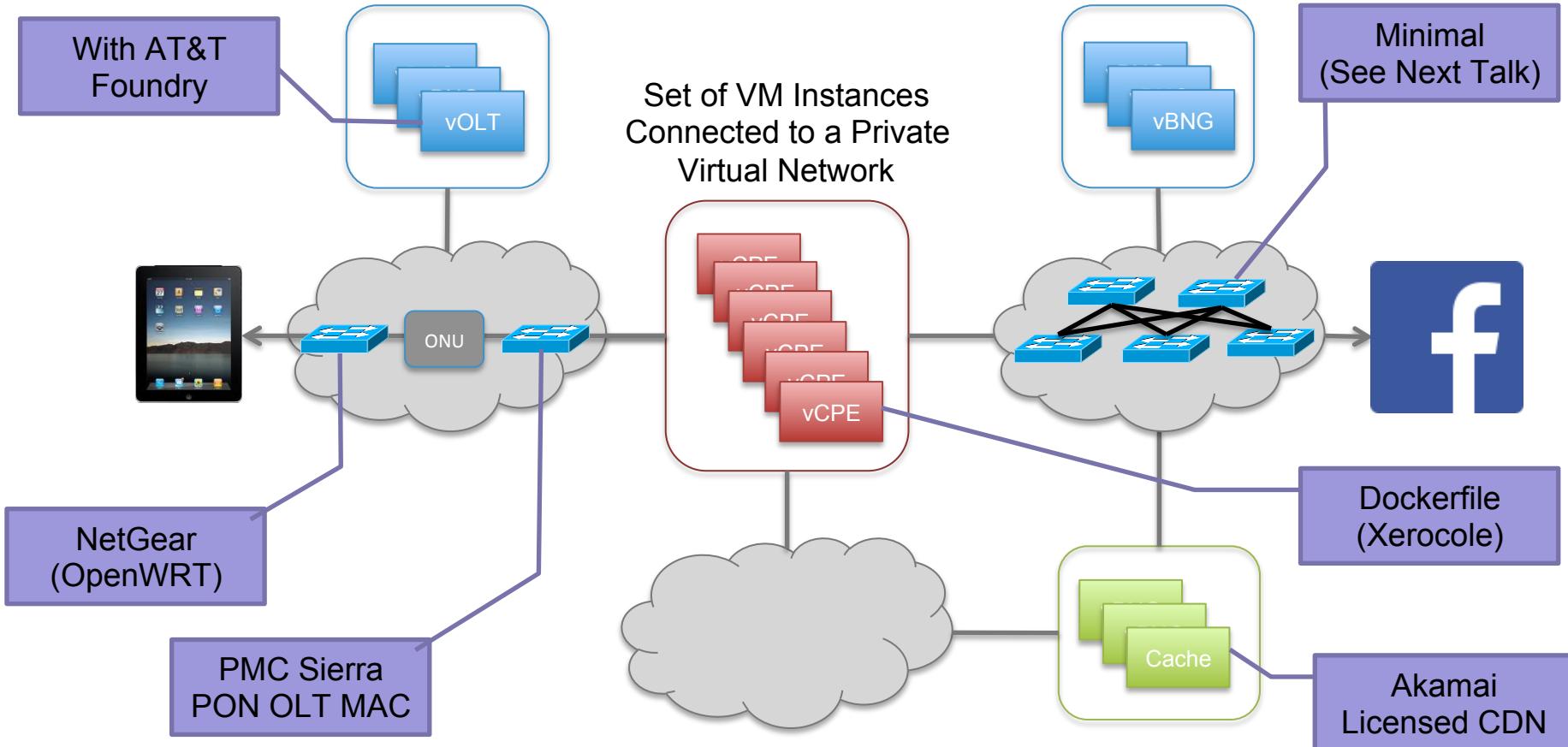
Software Architecture



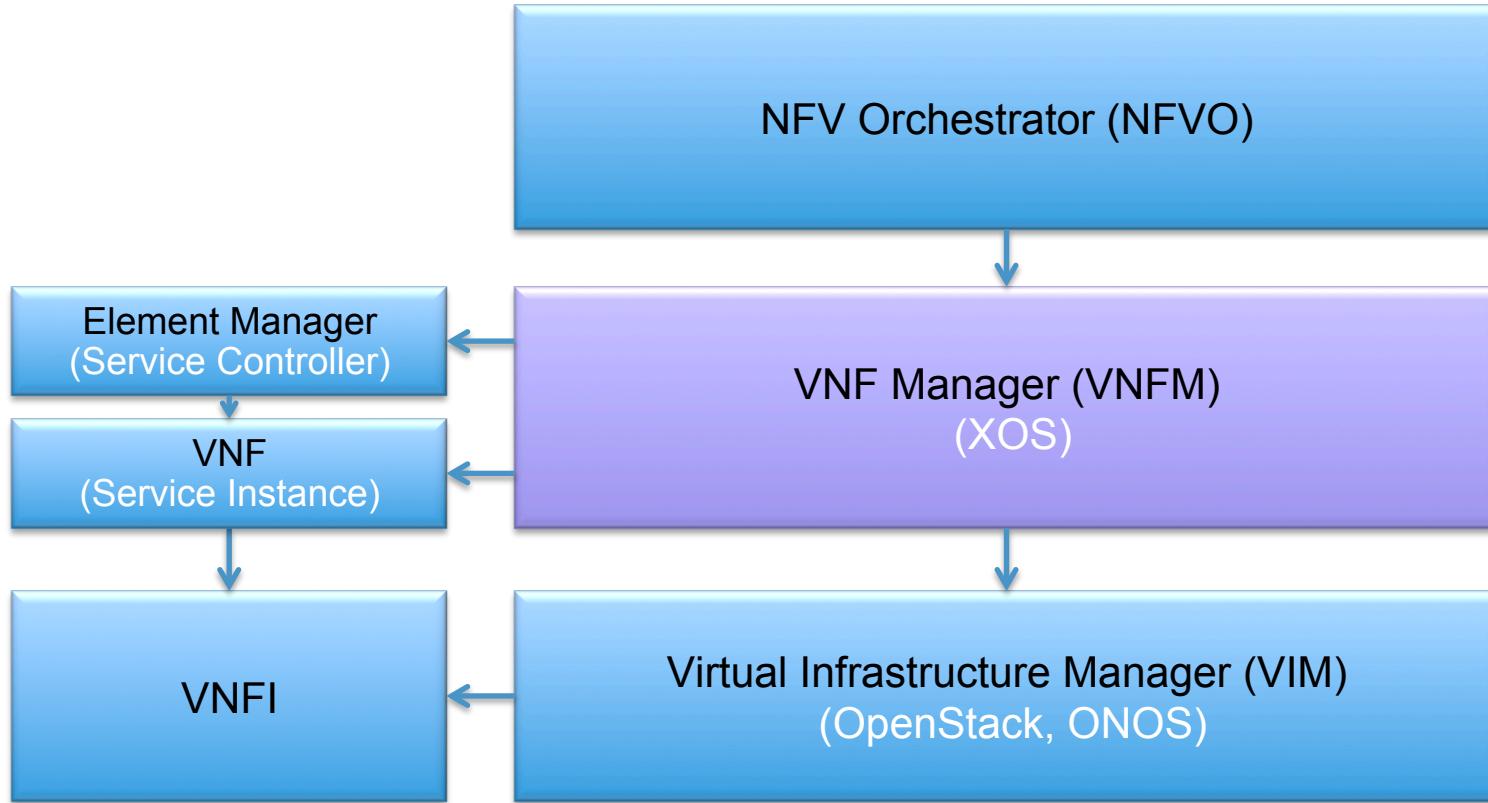
Service Composition Details



Service Composition Demo



ETSI NFV Architecture



Summary

Transform legacy C.O. into CORD

Replace closed/proprietary hardware with “Commodity + Software”
Orchestrate software as “Scalable Services”

Leverage Open Source Software

OpenStack – Provision virtual infrastructure
ONOS (ON.Lab) – Host control apps and manage switching fabric
XOS (ON.Lab) – Manage services with XaaS as unifying principle

Path to Deployment

Demonstrating Proof-of-Concept at ONS (Visit the Showcase)
Complete CORD POD for Field Trials (December 2015)



Join the journey @ onosproject.org