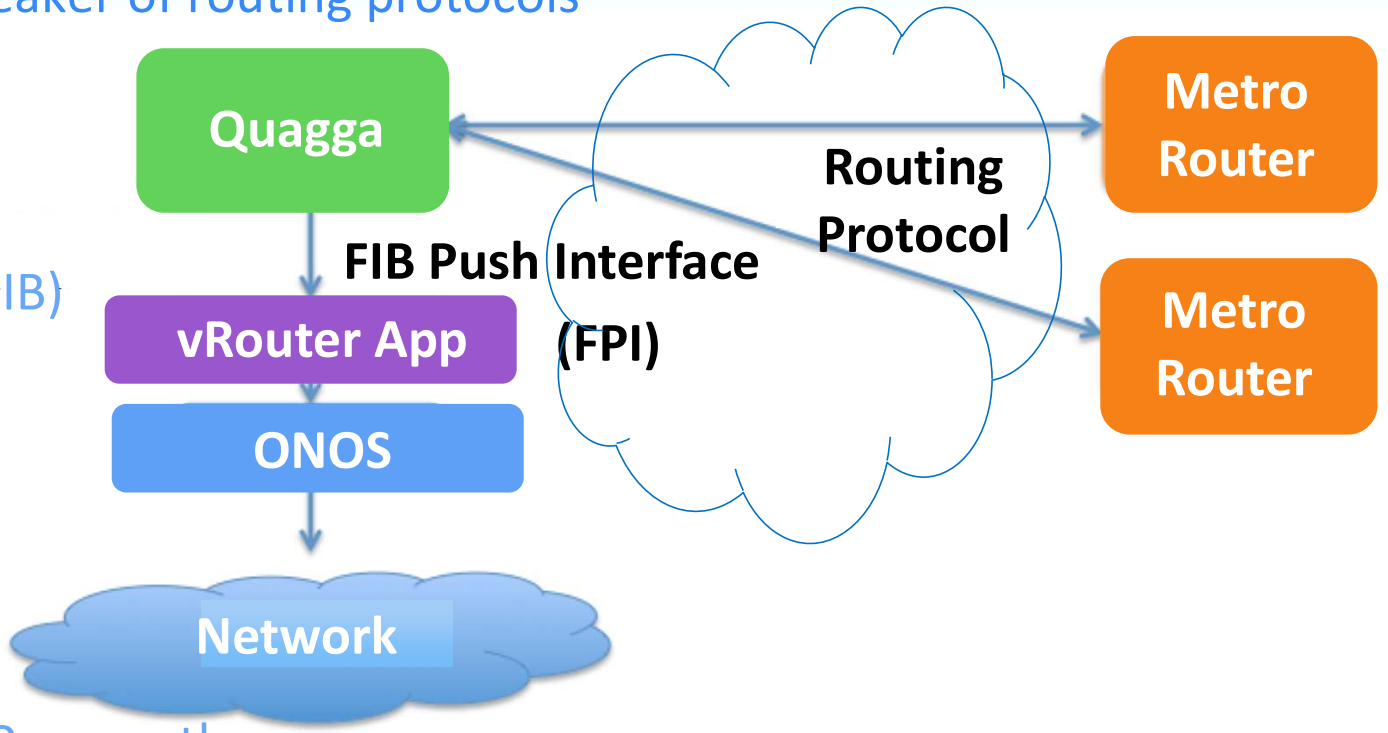
# ONOS vRouter Overview

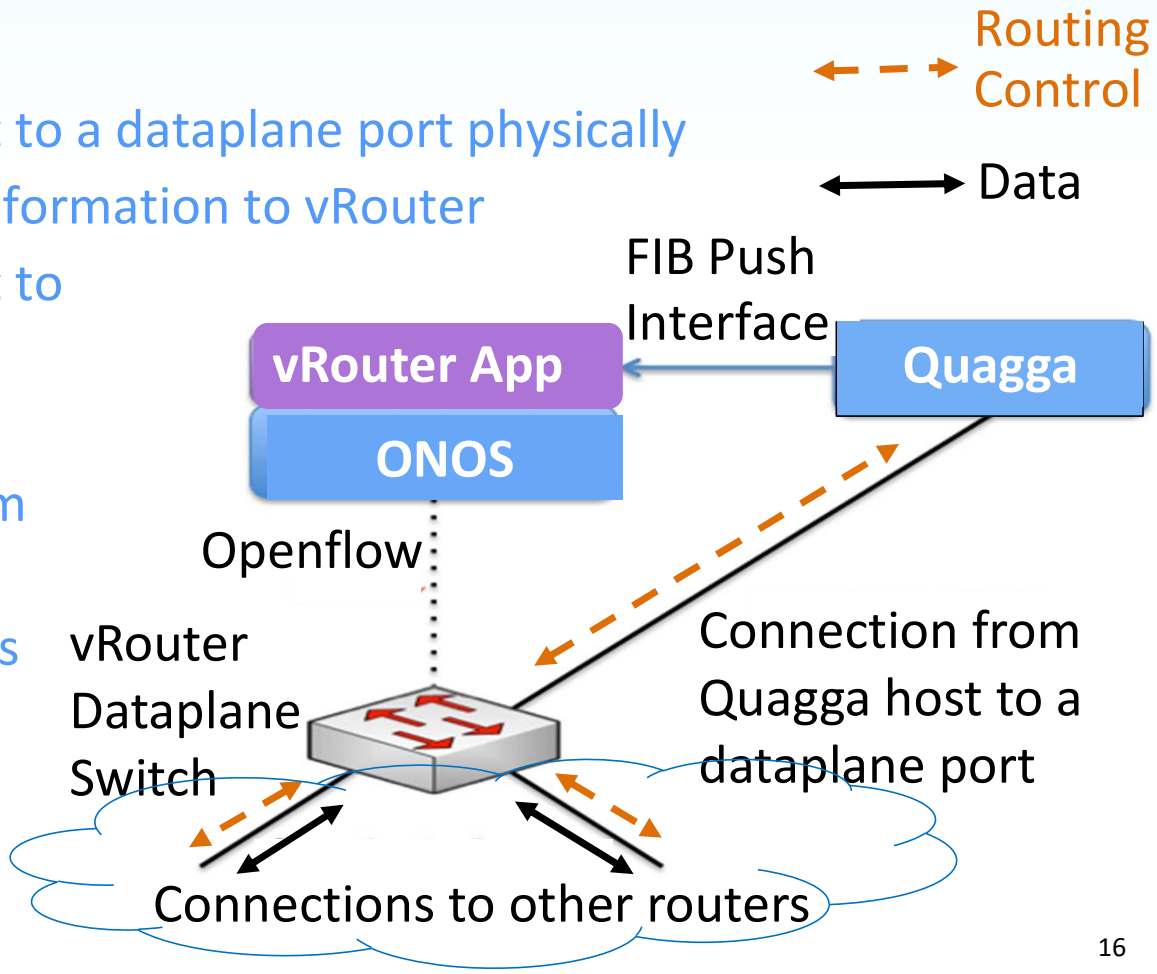
ONOS: Open Network Operating System

- An ONOS application that is responsible for configuring routes in the switch.
- Leverages Quagga as the speaker of routing protocols
  - Quagga:
    - Run routing protocol to collect routing info (RIB)
    - Compute best routes (in FIB)
    - Provides FPI for pushing routes to vRouter.
  - vRouter App
    - Acts as an FPM,
    - Decode FIB into routes
      - Supports OSPF and BGP currently
    - Use ONOS Service to install flow rules



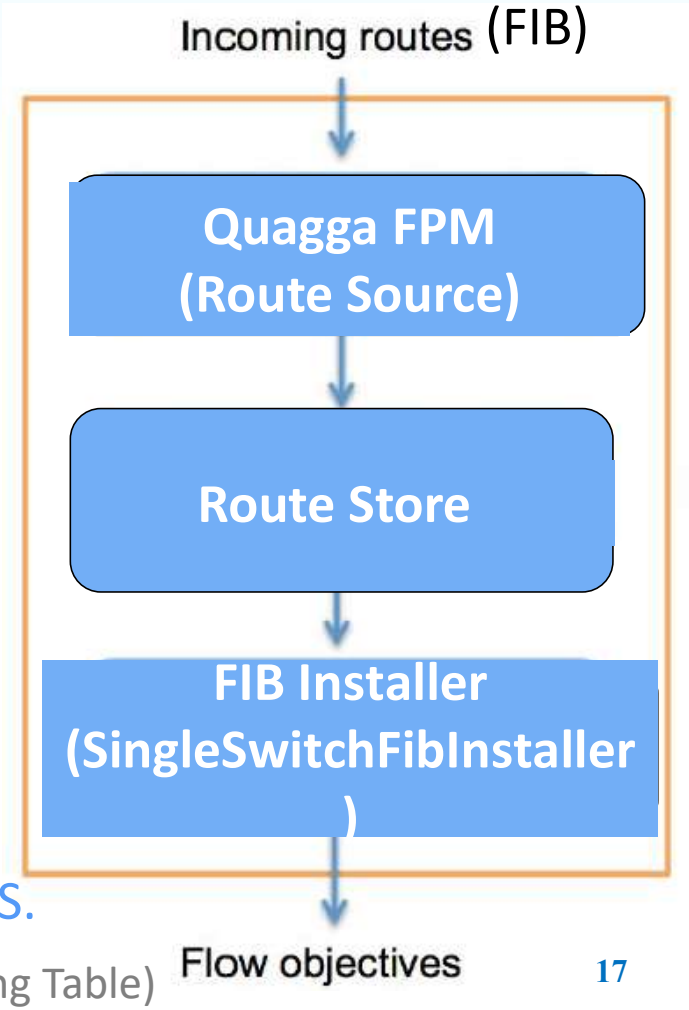
# RIB Collection and Flow Rule Installation

- Quagga (on a host)
  - Runs routing protocol
    - Quagga host needs to connect to a dataplane port physically
  - Use FPI over TCP to push route information to vRouter
    - Quagga host needs to connect to ONOS host physically
- vRouter App: acts as an FPM
  - Receives and decodes routes from Quagga.
  - Use ONOS service to install routes
    - Must handles both
      - Routing control traffic and
      - Data traffic



# Architecture of vRouter Application

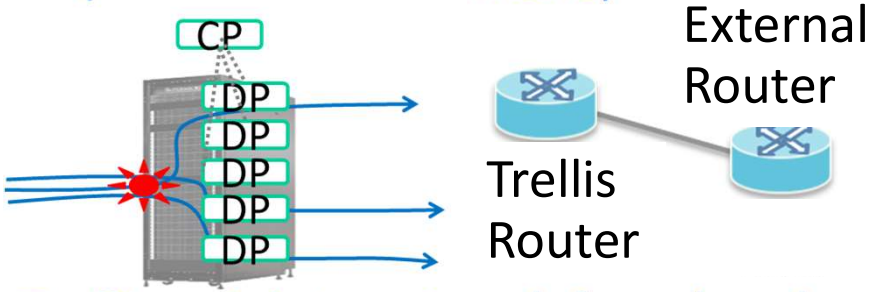
- Quagga FPM
  - Receives routes info (FIB) from Quagga (via netlink)
  - Decodes routes from FIB
  - Pushes those routes into ONOS RIB.
- Route Store
  - Resolves the MAC address of the next hop, and
  - Pushes a FIB update to FIB installer component.
- FIB installer
  - Initially reuse SingleSwitchFibInstaller
    - which was developed for ONOS BgpRouter APP
    - designed to install routes into **a single switch**,
      - ➢thereby turning that switch into an IP router.
  - Will generate FlowObjectives and submit them to ONOS.



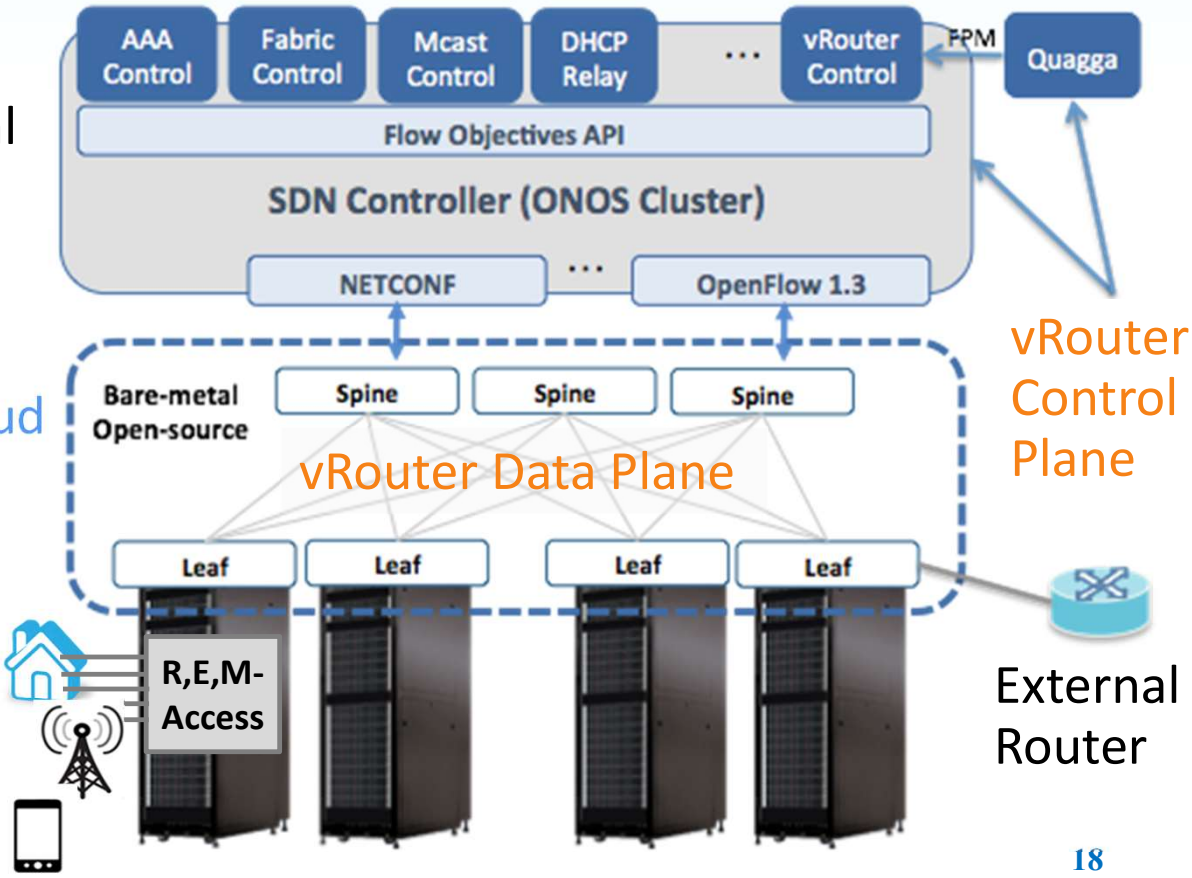
# Disaggregation (Final Look): Trellis vRouter in CORD

CORD: Central Office Rearchitected as a Datacenter

- Simple CUPS vRouter possesses Monolithic Data Plane Problem
  - Control plane of the router, i.e., routing protocols, runs in a VM
  - Data plane is entirely in hardware (Monolithic Data Plane)



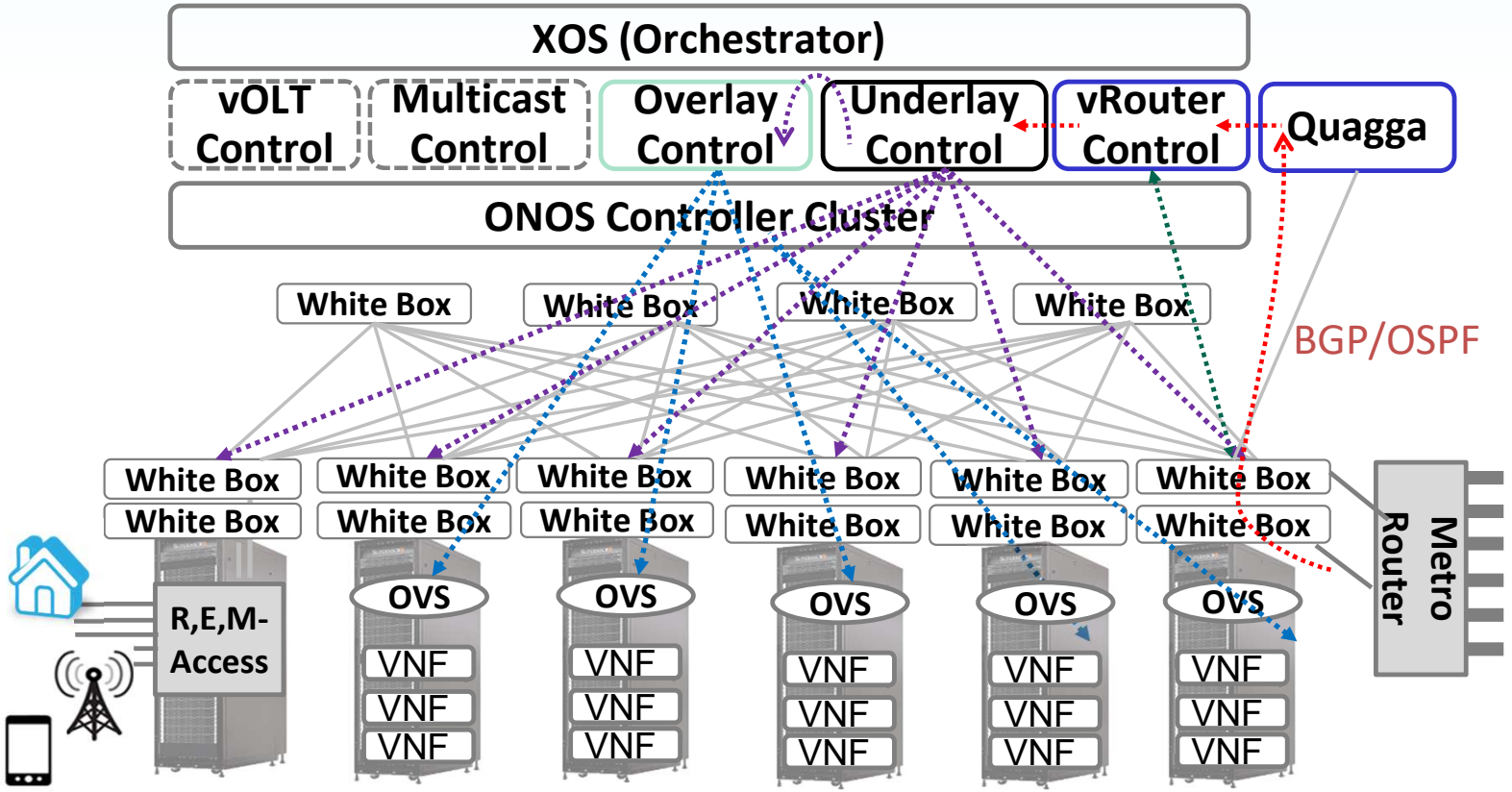

- Trellis: a fabric network for edge cloud
- Trellis vRouter:
  - Implemented as a big **distributed** router
  - ➢ **Entire Trellis Fabric** acts as **a single router** to outside world



# Trellis vRouter in CORD

CORD: Central Office Rearchitected as a Datacenter

- Quagga acts as a BGP/OSPF speaker
  - exchange routes with external routers



# Multicast in CORD

- Multicast video streams never need to go through **any software switch** or **VNF**