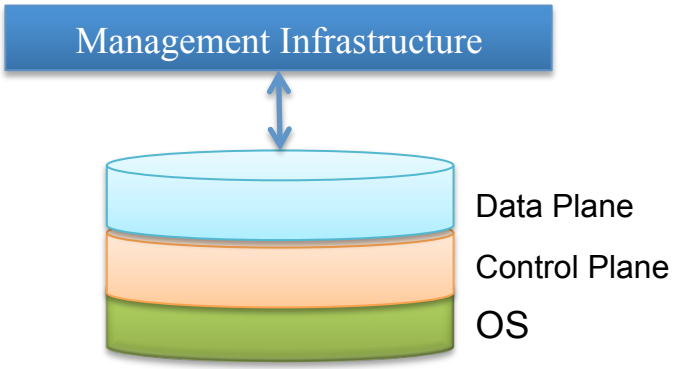
Software Defined Networking (SDN) Basics

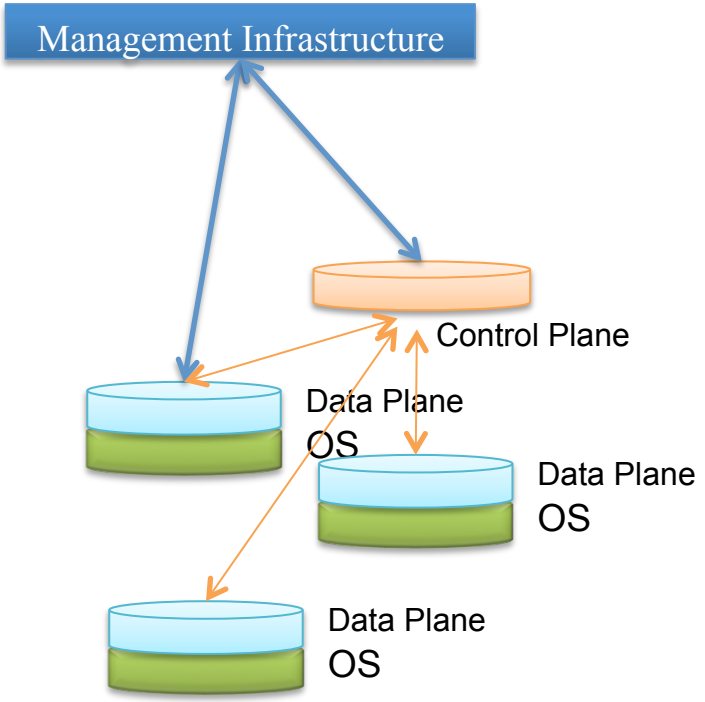
Traditional Networking

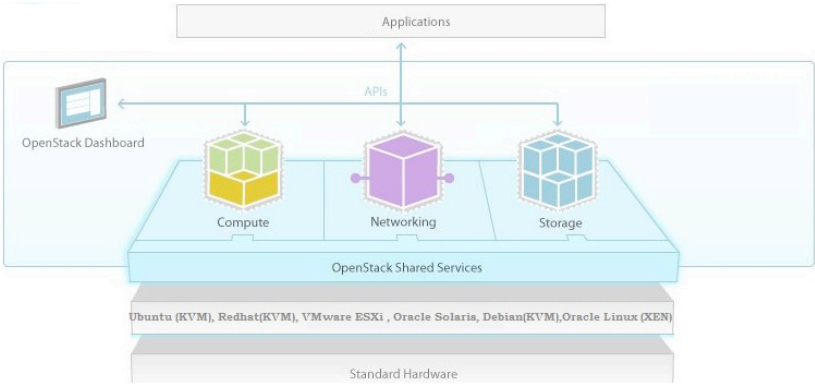
- Traditionally networking required:
  1. Preparatory specialized equipment such as hubs, switches, bridges, routers, gateways, …
  2. Network Interfaces to connect to other devices
  3. Transmission Media, such as coax, RJ45 or optical cable
  4. Preparatory Network Operating System which contained:
     - Operating system kernel
     - Control Plan protocol, such as IGP, BGP and others
     - Data Plane or forwarding infrastructure
     - Management and configuration control, such as CLI, XML or SNMP
  5. Servers
  6. Storage



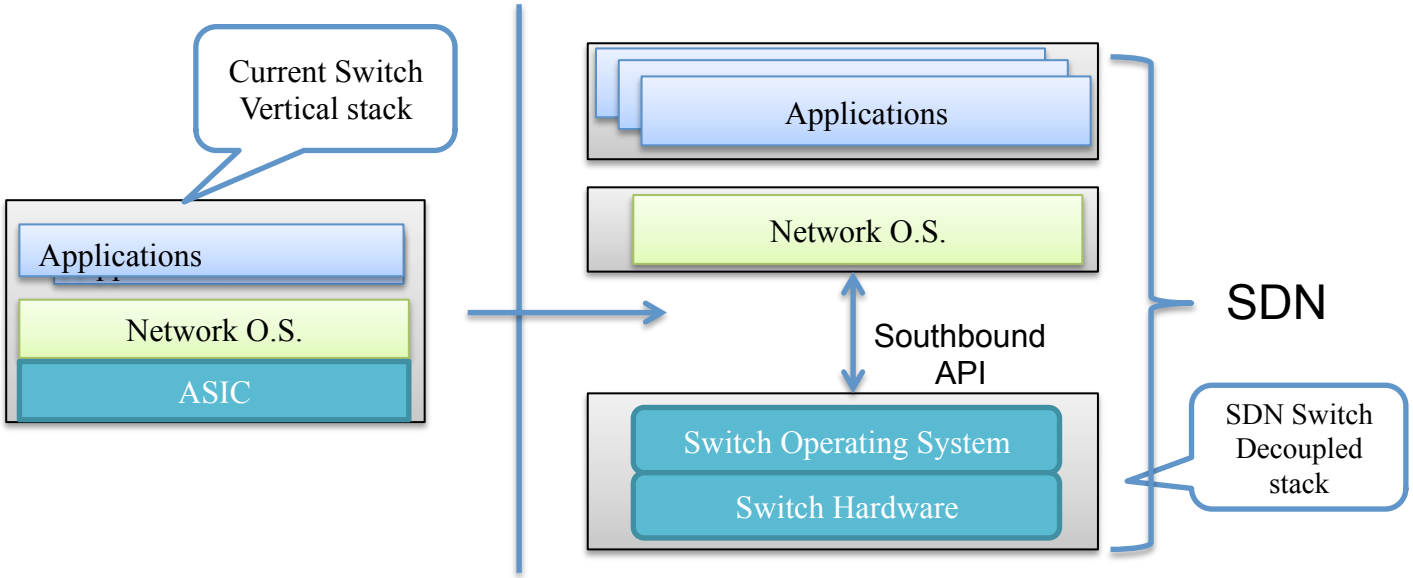
Software Defined Networking (SDN)

- Software-defined networking (SDN) is a new model to design, build, and manage networks
- At a high-level, SDN is an umbrella term encompassing:
  1. Move of networking equipment from preparatory to standard CPU, from Intel, AMD, and other supplies along with a standard network processor unit (NPU) from Broadcom, Cavium, Barefoot …
  2. Moving Network Operating System (NOS) to open-source software
  3. Separating control plane from data plane
  4. Making forwarding programmable through OF-DPA or Open Virtual Switch (OVSDB), or FORCES
  5. Making switch configuration and management programmable and standard through NetCONF, RESTAPI …
  6. Move network components to Virtual Machines (VM), such as firewall, encryption as Network Function Virtualization (NFV)





Transition to SDN



- Transition to SDN is in four general fronts
  1. Hardware and White-Box switches and routers
  2. Network Operating Systems (NOS)
  3. Programmability and Separation of Control and Data Plane
  4. Programmability of control and management through NetCONF and REST

- Customer Network Transitions from simpler devices to more complex
  1. SD-WAN at the edge of the network
  2. Management network switches
  3. Top of Rack (ToR) and CPE devices

Key Organizations Defining SDN

- Open Networking Foundation (ONF)
- Open Network Install Environment (ONIE)
- Open Compute Project (OCP)
- Open Networking User Group (ONUG)
- Open Network Operating System (ONOS)
- Open Flow Data Plane Abstraction
- Open Stack
- Apache Software Foundation
- 3rd Generation Partnership Project (3GPP)

Key Open-Source NOS options

- Broadcom FastPath/ICOS
- Ipinfusion OcNOS
- Cumulus Linux
- SnapRoute FlexSwitch
- Big Switch Open Network Linux (ONL)
- On.LAB ONOS
- Pica8 PicOS

For more information please contact us through:

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