Shift to White-box and Disaggregation

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Service Provider Network Trends

Speed

100G ▶️ 400G ▶️ 1T ▶️ LTE ▶️ 5G
Switching: 3T ▶️ 6T ▶️ 12T

Architecture

“Off-the-shelf” Hardware; Open Software NFV, Cloud & Edge Computing, AI, Intent-based

Services

Software-defined, On-demand, Real-time SD-WAN
Open, Modular, Flexible

Software

Hardware

Software

Open Interfaces
Data Models

Hardware

Hardware
Why Disaggregate?

Cost
Cycle time
Innovation
Interoperability
Optimization
Ecosystem

Hardware:
Open, standard design

Software:
Disaggregated Network Operating System
Optical Layer: ROADM Disaggregation

- Disaggregate the ROADM into controllable pieces (ROADM, Transponder, Pluggable optics, etc.)
- Define and publish common interfaces among the pieces
- Define and publish common interfaces to the SDN controller
Packet Layer: Router Disaggregation

Today’s Routers

Applications, NOS Hardware

Disaggregated Routers

Applications, Shared Data, Forwarding Abstraction, Packet Forwarding

• Disaggregate the Router into subsystems
• Define and publish common data models and APIs
• Create Open Source Community
DANOS (Disaggregated Network Operating System)

Current Situation
- Barrier to entry for NOS
- Gaps in existing Open NOS
- Slow growth of commercial network applications

DANOS Benefits
- Faster development of new technology
- Reduce capex
- Reduce opex
DANOS Requirements

- Service Provider requirements differ from data center
- Distributed Intelligence for Global Routing Fabric
- Centralized control for Configuration, Fault and Performance Management
- Support VNFs, merchant silicon, and general purpose compute
- Linux-based
DANOS Use Cases

- CE – Customer Edge Router
  - uCPE
  - Cell Site Backhaul Router
- GRF – Global Routing Fabric
  - P Router
  - PE Router (L2 and L3)
- LRF – Local Routing Fabric
  - Leaf/Spine
DANOS Plan

• Main focus is Service Provider
  • Distributed intelligence
  • Common OS for all Service Provider use cases

• Key Objectives
  • Feature rich
  • Easy to deploy
  • Binary availability
  • VNF support

Build a user community first

A large user community creates incentive for hardware vendors and software developers
We are pleased to welcome DANOS to The Linux Foundation community of open, collaborative innovation. DANOS will provide an open NOS framework that leverages existing open source resources and complementary platforms such as switches and white box routers. We invite others in the broader ecosystem to join the effort to accelerate innovation and creation of an industry-standard disaggregated NOS.”

- Arpit Joshipura, LF General Manager of Networking