Distributed NFV in Scattered Premises

draft-geng-nfvrg-distributed-nfv-00

Liang Geng (China Mobile)

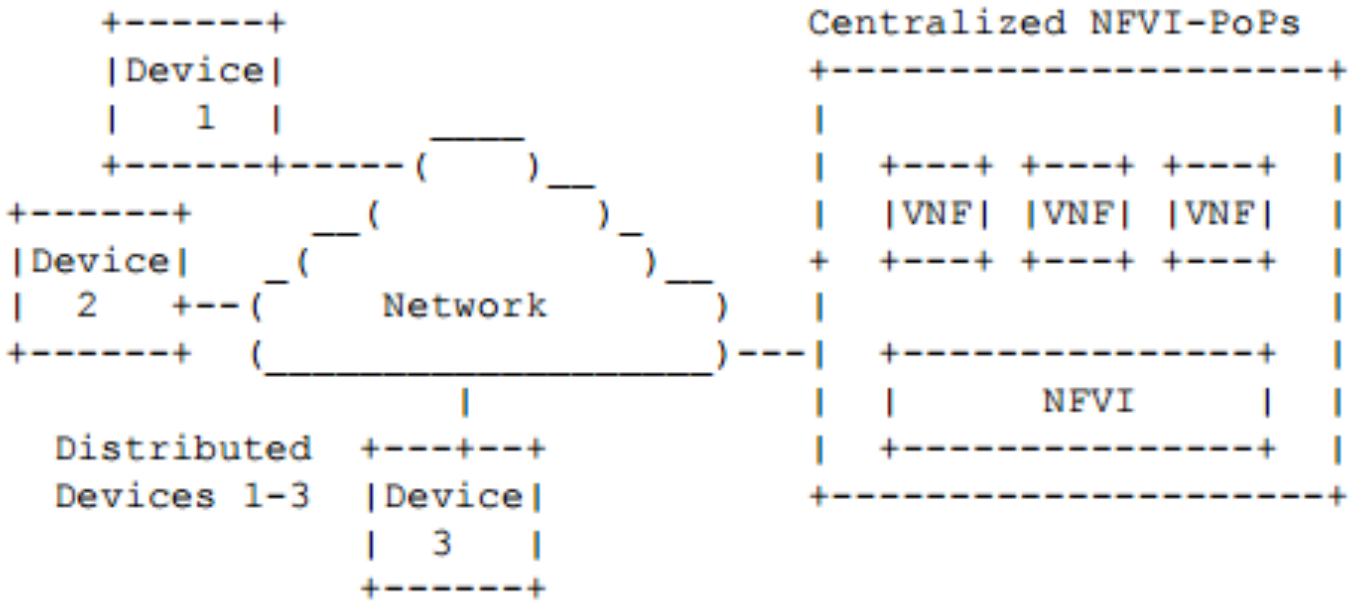
Background

- New services emerge
  - Higher flexibility, greater security and reliable service quality guarantee
  - Customer end to service provider core

- How NFV helps
  - Software/Hardware de-coupling – Flexibility
  - Isolated instances on NFVI – Security
  - Dedicated computing/storage allocation – Performance Guarantee

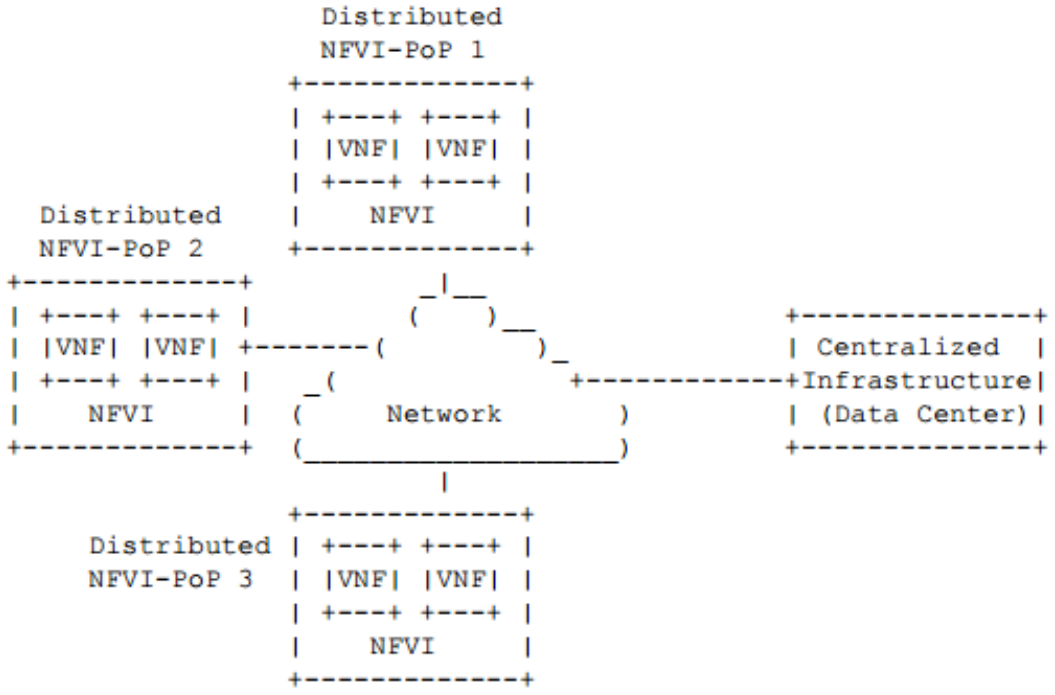
NFV – Centralized or Distributed

- Centralized NFV
  - Well studied, commercialization seen in service provider
  - Strong computing and storage resources
  - Scalable and elastic
  - Conventionally centralized NFs in virtualized forms
  - Some virtualized CP under CP/DP separation concept



NFV – Centralized or Distributed

- Distributed NFV
  - Interests start to show
  - Fair computing and storage resources
  - ARM compatibility
  - Dedicated system resources for mission critical services
  - New business model -mini PaaS and User-end “network slicing”



NFV – Centralized or Distributed

- Centralize what you can
  - Conventionally centralized instances for flexibility and implement-as-you-grow
- Distribute what you must
  - We are seeing more and more “musts”
    - Extremely low latency in mission critical services
    - Efficient local processing (WAN acceleration, firewalls etc.)
    - End-to-end resource dedication – or network slicing
    - Customer data privacy
    - Resilience and high reliability (i.e. Industrial internet)
    - Multi-homing and multiple provisional domain – isolated system
    - Providing edge/scatter PaaS to maximize service flexibility – walled garden won’t work - do what you are good at

Examples of Distributed NFV-PoPs

- Customer Premise Devices
  - Per service provider or per application isolation
  - Dedicated resource allocation for service guarantee
  - Support local processing
  - Enabling extreme low latency services
  - Mini PaaS – new business model
- Scattered transport network elements
  - CP may be separated, centralized and virtualized, “CP clients” remain
  - Enabling isolated multiple provisioning domains
  - Enabling network slicing management/maintainence

Use cases of Distributed NFV

- VNFaaS and VNPaaS in Residential and Enterprise Network
- Mission Critical Services
- End-to-end Network Slicing Management
- Managed Multiple Provisioning for Network Elements
- Elastic VPN

Other Issues

- Rethinking VNFs in Distributed NFV
  - Application specific
  - High efficiency
  - Computing-hungry VNFs are not preferred
- Virtualization Technologies in Distributed NFV
  - ARM compatibility
  - Container vs VMs
  - Finer granularity
- Management and Orchestration of Distributed NFV
  - Scattered NFVIs
  - Mass number of managed NFVIs
  - Various CPU Arch, NFVI vendors

Discussions

- Draw interests of the community
  - Collaboration is welcome
- Is this an interesting topic for IRTF community?
- What can be taken by NFVRG for further investigation?
  - Architecture & Use cases?
  - MANO for widely distributed NFVIs?