The NFV Move in Network Function/Service/…
Chaining/Graph/…

Telefónica
Network Function Virtualization

- Network Functions Virtualisation is about implementing network functions in software - that today run on proprietary hardware - leveraging (high volume) standard servers and IT virtualization
- Supports multi-versioning and multi-tenancy of network functions
  - Allows use of a single physical platform for different applications, users and tenants
- Enables new ways to implement resilience, service assurance, test & diagnostics and security surveillance
- Facilitates innovation towards new network functions and services that are only practical in a pure software network environment
- Applicable to any data plane and control plane functions, (fixed or mobile networks)
- Opportunities for pure software players
- New methods for interlinking virtualized services & functions
- NFV aims to ultimately transform the way network operators architect and operate their networks
  - Change will be incremental
The NFV Group

- Global operators-initiated Industry Specification Group (ISG) under the auspices of ETSI
  - > 100 members
- Open membership
  - ETSI members sign the “Member Agreement”
  - Non-ETSI members sign the “Participant Agreement”
- Operates by consensus (formal voting only when required)
- Deliverables: White papers addressing challenges and operator requirements, as input to standardisation bodies
- Face-to-face meetings quarterly
NF Forwarding Graphs

- An end-to-end network service can be defined as a forwarding graph of network functions and end points/terminals
  - “What” an operator provides to customers.
NFV Forwarding Graphs

- **Efficiency**: Compute resources assigned to function and network capacity sized to current load and shareable across functions.
- **Resiliency**: In some cases, backup function and network capacity can be shared.
- **Agility**: Shorter deployment intervals for upgrades and new features since functions are software based.
- **Expressiveness**: Virtualised switching functions and/or configuration of VNFs can implement forwarding graphs in a more straightforward and efficient manner.
- **Flexibility**: Reduce configuration complexity. Support new service and business models: deployments in other operator’s network, third-party datacenters...
The General Picture
The Challenges

- Migration and coexistence of virtualized and non-virtualized NFs
  - Orchestration
  - Management
  - Interfacing
- Means for specifying the attributes of a VNFG
  - Measurement methods to validate these
- Means for specifying the attributes of each VNF contribution to the overall VNFG
  - Measurement, testing, and/or validation methods to validate these
- Mechanisms needed to implement resilient VNFGs
- Aspects involving multiple administrative domains in terms of operation, interworking, and migration
The Concluding Trinity

• NFV intends to bring the advantages of virtualization into network functions

• Network Service Chaining (VNFG in NFV jargon) is key for the NFV service model

• NFV does not intend to build standards on its own, but to provide input and requirements to standards bodies

So here we are…