



# Network Function Virtualization and Cloud Computing Key Subjects

Dr. Azad Ravanshid

---

## I. Cloud Computing Principals

- A. Server and Network Virtualization
  - B. Software-defined Virtual Data Centers (DCs)
    - 1. Cloud-Connectivity (Inter-DC Communication)
    - 2. DC Virtualization Platform
  - C. Deployment Models
  - D. Overall Service Types (XaaS)
- 

## II. Cloudification (Cloud-NFV)

- A. Costs and Benefits
- B. Functional delivery from Appliance to Orchestrated VNFs
- C. NFV Evolution
  - 1. ETSI Architecture and Standardisation
- D. NFV Security
- E. ETSI Management and Orchestration

F. NFV Use cases and virtualised Customer Premises Equipment (vCPE)

G. Industry Groups and Projects

1. ETSI
2. OPNFV
3. ONAP
4. OVS

---

### **III. Cloud Management and Orchestration**

A. ETSI MANO Architectural Framework

1. VNF and Service Life-cycle Management
2. Service Description
3. YAML, YANG and TOSCA

B. Carrier-grade MANO Platforms and Products

1. OSM
2. OpenBaton
3. ONAP

C. OpenStack

---

### **IV. Migration to the Cloud**

A. Business Case Drivers

B. Enthusiasm for Migration

C. Migration Steps

1. Application identification
2. Trust Boundaries

D. Legal Considerations

E. Risks and Mitigation

F. Security

## G. Providing Justified Migration Road-map

---

### V. Telco-cloud

- A. Deployment Challenges
    - 1. Traditional IT Clouds
    - 2. Interoperability
  - B. The Required Enhancements
    - 1. Carrier-grade VNFs
    - 2. NFVI Specifications
    - 3. Fault Management and Maintenance
  - C. Carrier-grade Solutions
    - 1. Leading Operators Initiatives
    - 2. Leading Vendor Activities
  - D. Mobile Network Use Cases
    - 1. Cloud-RAN
    - 2. Multi-access Edge Computing (MEC)
    - 3. vEPC
- 

### VI. The Telecoms Cloud Marketplace

- A. Cloud Market Maturity
- B. Telco Cloud Services positioning and focus
- C. Market Entry considerations
  - 1. Customer Demand
  - 2. Customer Expectations
- D. Segmentation and Revenues
- E. Major Players as Telco Cloud enablers

## F. Leading Telco Cloud Case Studies

---

## VII. Cloud Native Orchestration Platform

- A. Technology Trends
    - 1. From NFV to Cloud-native Microservices
  - B. Cloud-native 5G Mobile Networks
    - 1. UNICA Platform
    - 2. 5G Cloud-native EPC
  - C. Network Slicing in a Multi-cloud Design
-