



# Satellites in Next Generation Networks

## QoS issues

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# Content



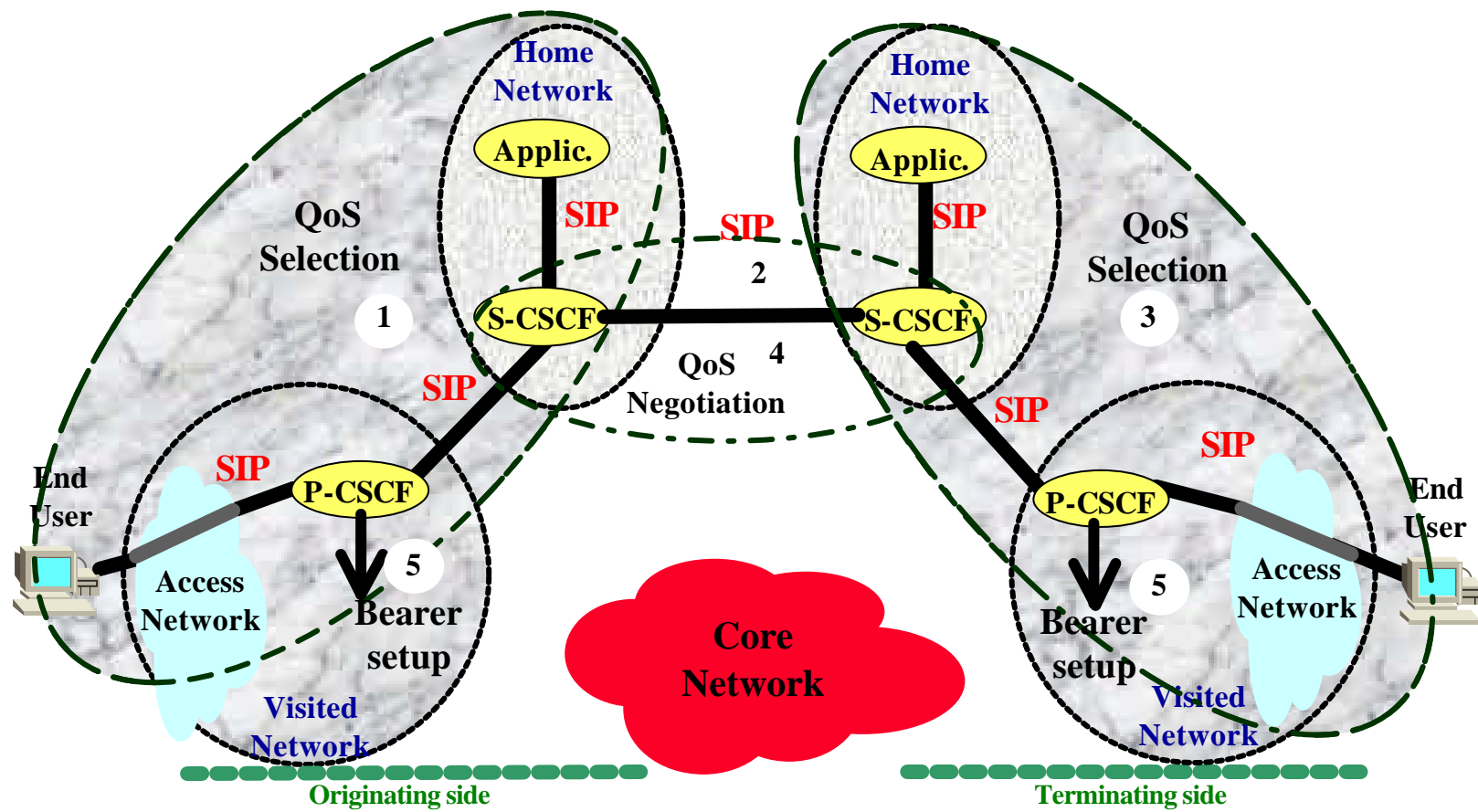
- > **What NGN and QoS mean ?**
  - End-to-end QoS
  - Layered model
- > **Current Satellite Systems**
  - Access network architectures
  - QoS
- > **Enhancing the current situation**
  - Expected improvement
  - Architectures
- > **Satellite in NGN**
  - Status
  - Future Activities

# NGN In Short

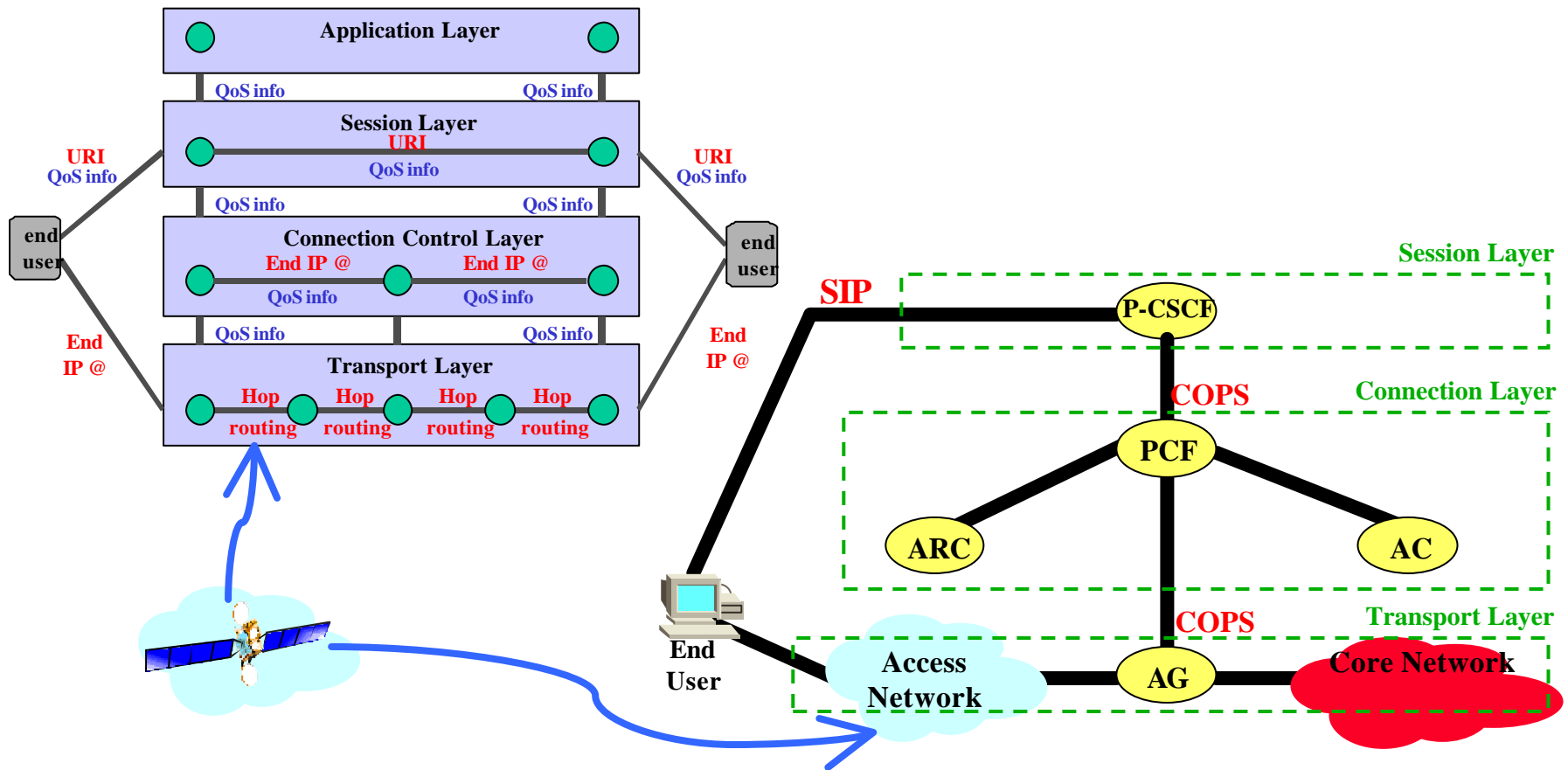


- > **NGN (Next Generation Networks) means**
  - Uncoupling services and transport provision (like IN)
  - Multimedia/multi-services/multi-networks
  - Packet-based (IP)
  - QoS and security are **MUST** !
  
- > **QoS for NGN means**
  - QoS aware network equipment
  - Admission control mechanisms
  - Interaction between call signalling, resources management and admission control

# NGN End-to-End QoS



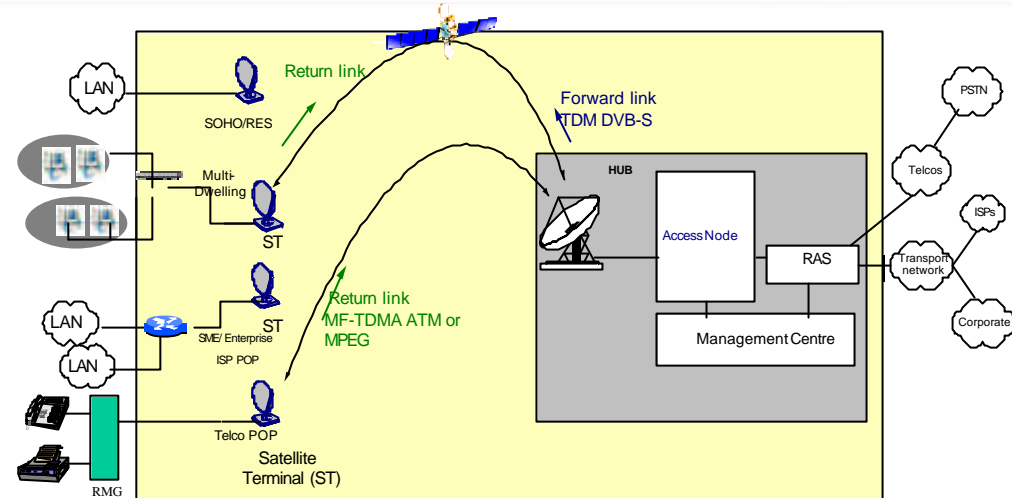
# NGN General Layered QoS Model



# Current Satellite Systems Access Network Architectures

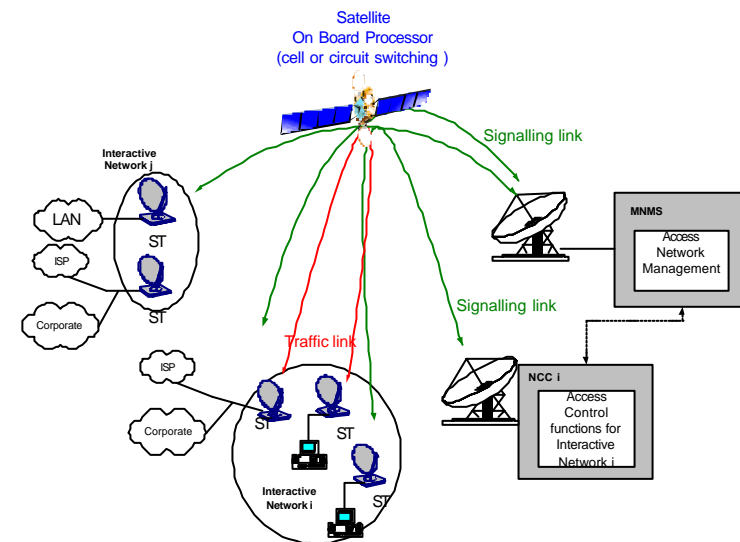
## > DVB-RCS architecture

- 2-way multimedia
- IP based
- DVB-S forward link
- MF-TDMA return link
- ATM or MPEG segmentation
- Packet based DAMA



## > Regenerative Satellite architecture

- Multi-Gateway
- Mesh: direct ST-to-ST
- ATM or MPEG on-board switching
- DVB-S downlink
- DVB-RCS uplink



# Current Satellite Systems

## QoS



- > **Service Level Agreement (SLA)**
  - **Satellite network operator** grants a given bandwidth (usually constant) to each service provider for its pool of STs
  - **Service providers** grant subscribers a per ST traffic contract:
    - Best effort with peak rate
    - Minimum guaranteed rate with a peak rate
- > **Static Admission Control**
  - At ST log-on
  - Upon management action
- > **Traffic Contract Enforcement**
  - **Return link:** DAMA algorithms using capacity categories defined in DVB-RCS: CRA, RBDC, VBDC, FCA
  - **Forward link:** IP and/or ATM traffic management (policy, shaping) in the Hub



## Enhancing the current situation

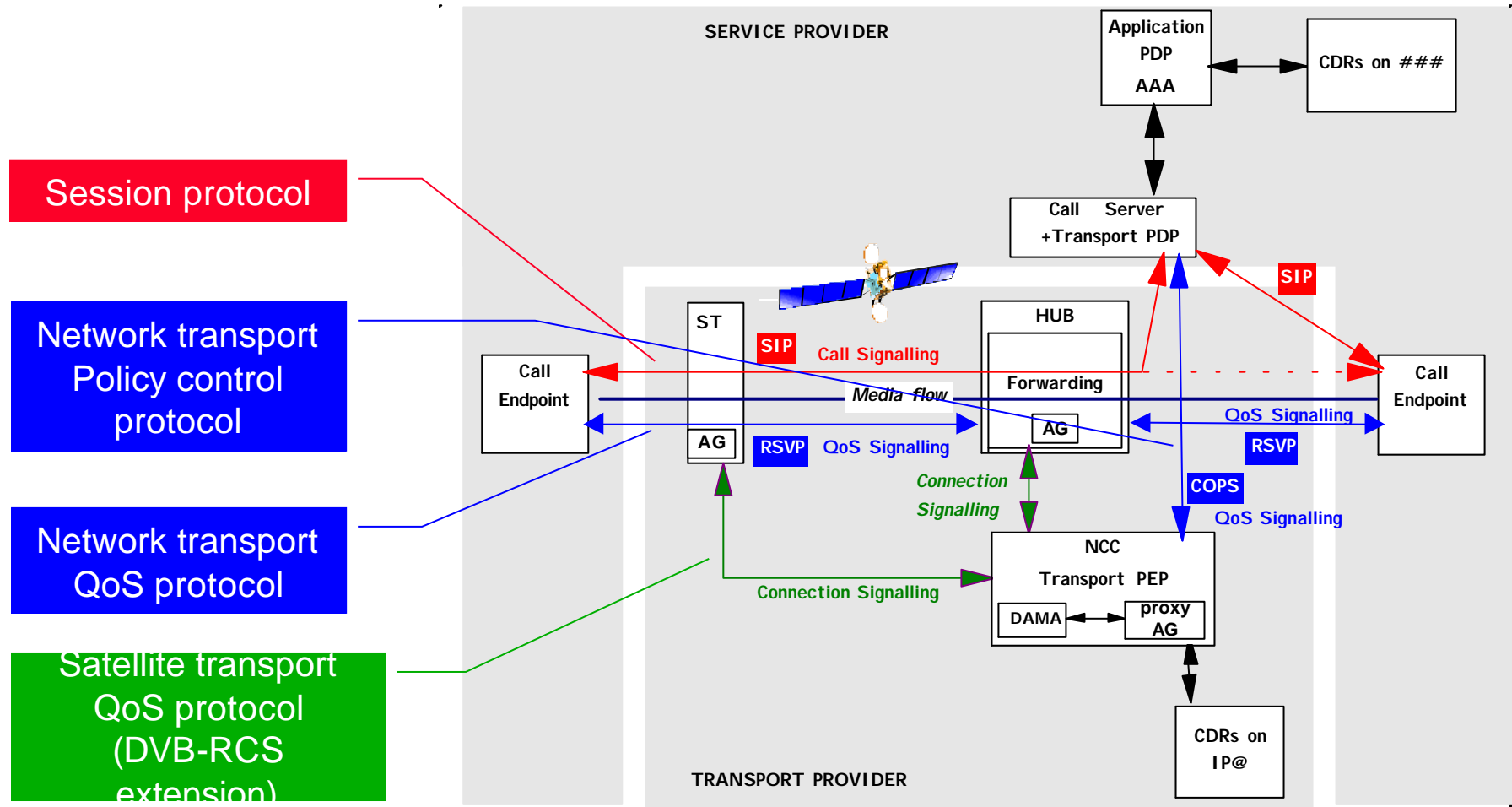
### Expected improvements



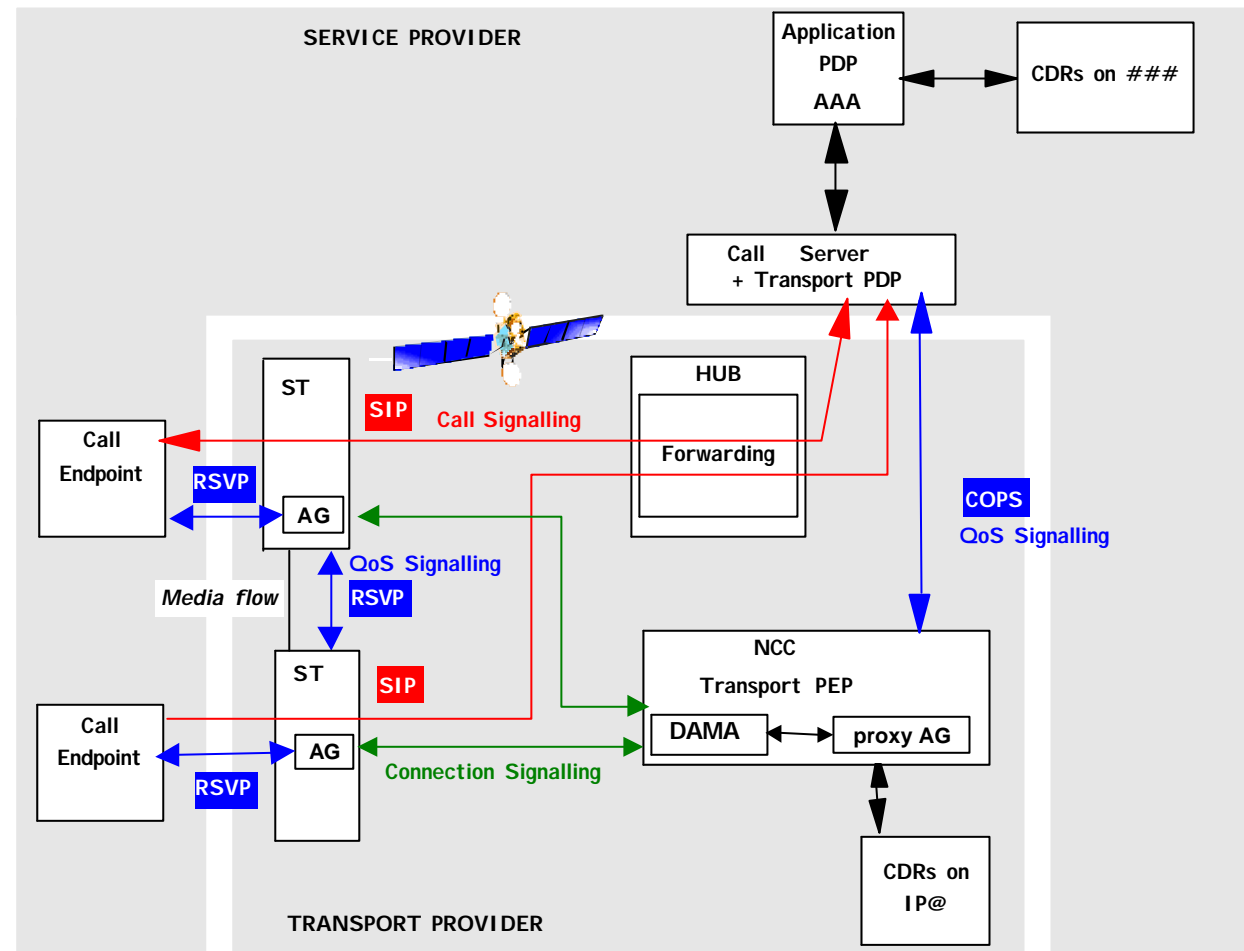
- > **STEP 1 - Adding flexibility & better QoS in the access**
  - Priority mechanisms between Real-Time and non Real-Time applications according to IP CoS indications (DiffServ DSCP)
  - Coupling between IP and MAC processes in ST
  - Traffic contract modification of the ST from NMC or upon user's request (e.g. using a Web-based interface)
  
- > **STEP 2 - Interworking between access and core NGN enabled networks**
  - Dynamic admission control based on specific satellite signalling mechanisms
  - Dynamic admission control and resource reservation coupled with call signalling protocols (SIP, H323)



# Enhancing the current situation Star Architecture



# Enhancing the current situation Mesh architecture



# Satellite in NGN Status



- > **Current NGN-related terrestrial network activity is huge**
  - Standards : IETF, ITU, ETSI
  - Planned roll-out for Cable, UMTS and DSL access networks
  
- > **Satellite system is weak in NGN picture**
  - Only pure physical/access layer standards (DVB-RCS)
  - No QoS support definition
  - No satellite/terrestrial interworking defined
  - Current proprietary solutions and weak QoS
  - May slow down the up-taking of NGN and their associated services through satellite

## Satellite in NGN Future Activities



- > Determine typical **applications/services scenarios** requiring QoS support and their requirements for integration of Broadband Multimedia systems
- > Define **QoS architectures**, identify functional entities and interfaces. Analyse call signalling/resources management/admission control interactions
- > Guarantee **interoperability** with terrestrial NGN protocols or propose extensions/profiles. Analyse specific processing or adaptations required in satellite access equipment at adaptation & access layers
- > Propose potential **extensions or adaptations** to satellite access standards such as DVB-RCS : transparent +OBP based meshed systems