



Progress on the ‘Network coding and satellites’ draft

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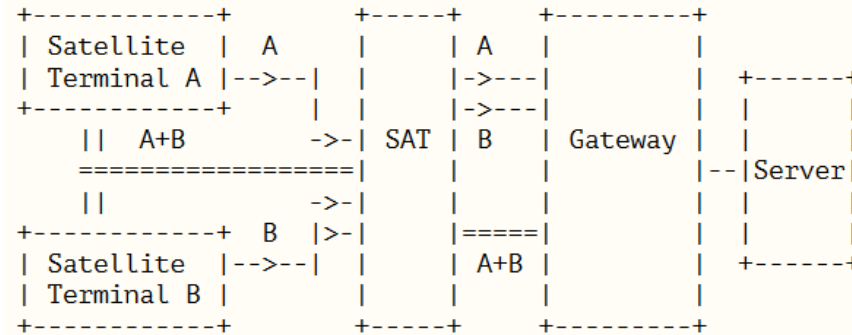
Objectives of the draft

- **Initial objectives of the draft:**
 - Synthesize numerous activities in this context
 - Provide input to build an architecture-oriented document
 - Contributing to a more generic document
- **What the document is actually doing:**
 - Present the current deployment of network coding in some satellite telecommunications systems
 - Discuss the multiple opportunities to introduce these techniques at a wider scale

From *-01 to *-03

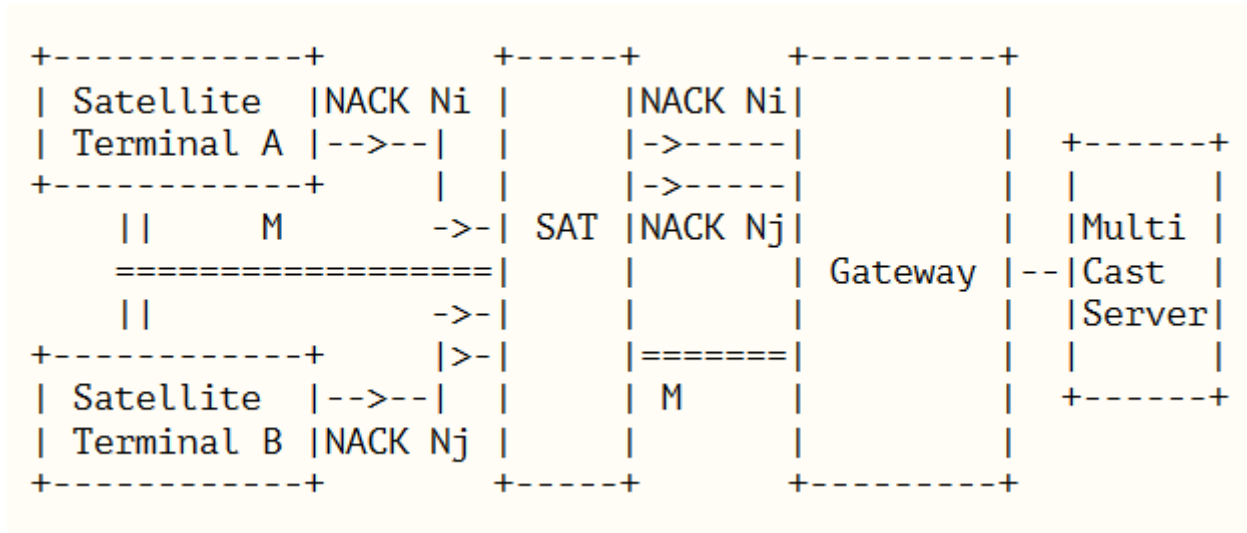
- **Review from Tomaso**
- **Provided content for some use-cases**
 - Two way relay channel
 - Reliable multicast
 - Hybrid access
 - Dealing with varying capacity
 - Gateway handovers
- **Discussed the deployability of the NC in SATCOM**

Two way relay channel



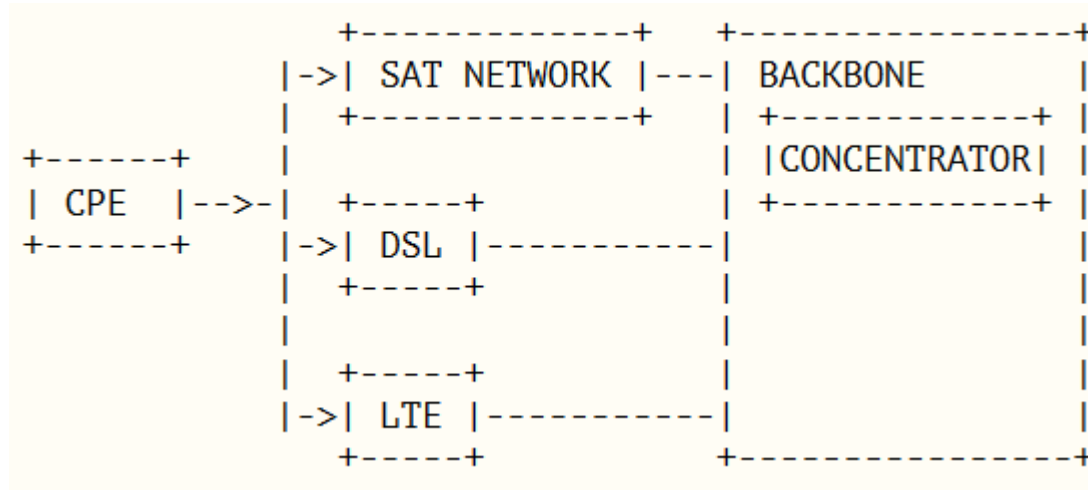
- Two-way communication between end users
- The NC can be either at the ground or satellite level
- Demonstrated at ASMS2010

Reliable multicast



- Adding redundancy to a multi-cast flow
- Could be achieved with NORM but it does not consider other network coding schemes such as sliding window

Hybrid access

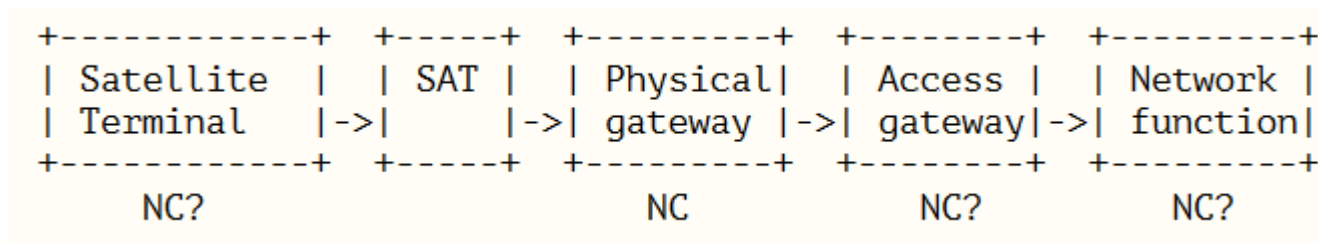


- Use of multiple path management with network coding at the transport level to either increase the reliability or the total bandwidth
- To cope from packet loss (due to either end-user movements or physical layer impairments), network coding could be introduced in both the CPE and at the concentrator

Delay Tolerant Network architecture

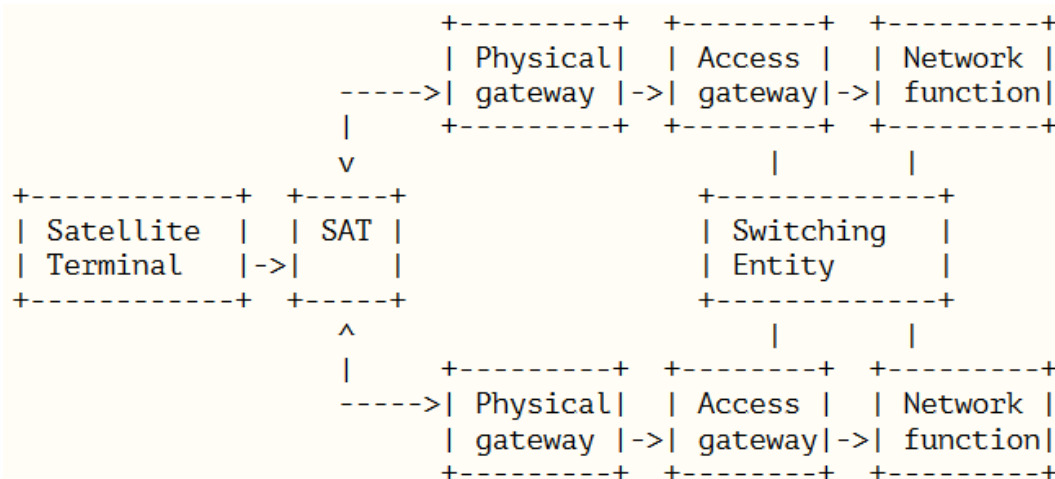
- TBD

Dealing with varying capacity



- **Use network coding to overcome cases**
 - where the wireless link characteristics quickly change overtime
 - where the physical layer codes could not be made robust in time

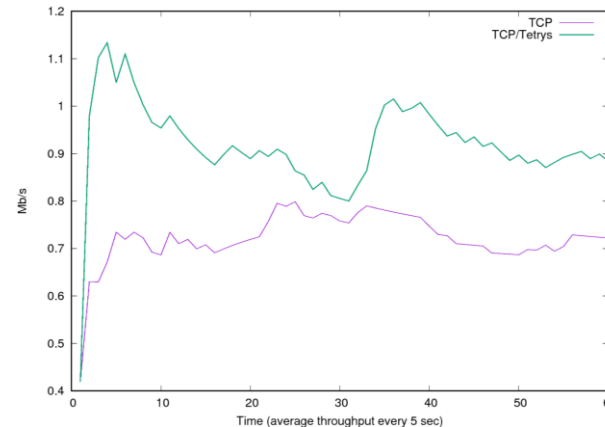
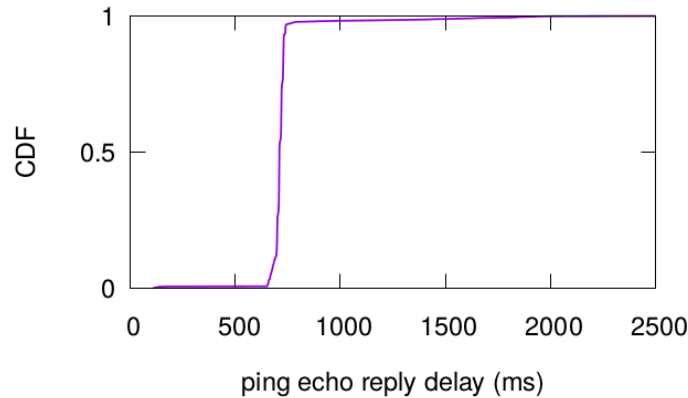
Gateway handovers



- Gateways may not be properly synchronized => packet loss
- Network coding can be added to improve the reliability of the transmission and propose a seamless gateway handover

TETRYS PERFORMANCE EVALUATION

- **CESARS: CNES platform for hosting SATCOM related experiments**
- **TETRYS evaluation with a fixed public SATCOM Internet Access**



- **TCP/TETRYS results in better exploitation of the available satellite resource**

Deployability of the NC in SATCOM (and not only)

- **NC level applicability (OSI) : depends on the use-case**
- **What NC to apply : depends on the use-case**
- **Architecture for hosting NC functions: depends on the use-case**
- **For one selected use-case:**
 - Virtualized infrastructure could help to deploy NC schemes
 - Interactions with other working groups ?

What is next?

- **Initial objectives of the draft:**
 - Synthetize numerous activities in this context
 - Provide input to build an architecture-oriented document
 - Contributing to a more generic document
- **What the document is actually doing:**
 - Complicated exercice due to the variability of the use-cases
- **Next:**
 - Further detail the use-cases ? (we need to have consistency in the level of details in the different use-cases)
 - Map what WG's NC proposals are relevant for the proposed use-cases?
 - Any industrial interest ? (SATCOM equipment provider, SATCOM operators)