



**Integrated Project 26950 : SatSix**  
**Deliverable 2000-2**  
*Satellite Access Architecture*



**Contractual Date of Delivery to the CEC: December 2006**

**Actual Date of Delivery to the CEC: February 2007**

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**Workpackage: 2000**

**Est. person months: 64**

**Security: P**

**Nature: R**

**Version: 01**

**Total number of pages: 3**

**Abstract:**

This deliverable describes the SATSIX satellite access architecture. This complies to the requirements set out in WP1400, and supports the corporate application, residential application and collective access terminal scenarios that have been defined in WP1000.

The deliverable specifies an overall satellite access architecture with functional architectures and its application to specified scenarios. This is followed by the definition of the DVB-S2/DVB-RCS adaptive physical layer for both transparent and regenerative payload. Then, the corresponding adaptive Radio Resource Management, adaptive Connection Acceptance Control algorithm and MAC QoS architecture are introduced. New Layer 2 Security framework is then defined to enhanced the protection of future satellite systems. IP over DVB-S2 encapsulation scheme and header compression techniques are described to ensure an optimized support of IP traffic. The SI-SAP section summarizes the interface of the SATSIX ground equipments, with a particular focus on cross layer issues. Finally, the Connection Control Protocol is described, and its relation with the other access and network functionalities highlighted. The conclusions summarises the adopted satellite architecture to be used in the SATSIX Project and relates this to the on-going work of the Project activities.

**Keyword list:** DVB-RCS, DVB-S2, RRM, CAC, QoS, SatIPSec, GSE, ULE, ROHC, SI-SAP, C2P

## Executive Summary

Based on the requirements and scenarios defined in WP1000, this document focuses on the definition of the SATSIX satellite access architecture.

The overall satellite access architectures have been presented for both transparent and regenerative/hybrid payload. These architectures are based on several key techniques, aiming to provide optimized performances as well as rich features.

The following advanced access techniques are defined and described in details in this document:

- Adaptive physical layer
  - a complete definition of the adaptive return and forward physical layer is provided, meeting scenarios and systems requirements.
- RRM and CAC
  - QoS at MAC layer including its links with IP QoS is defined, providing the layer 2 part of an efficient and integrated global QoS framework
  - An enhanced RRM supporting adaptive physical layer is defined to optimized the satellite resources
  - CAC issues in a adaptive physical layer environment are identified and several solutions are proposed
- Low layer security
  - A layer 2 security framework is defined providing an very high security level to satellite applications
- Encapsulation and header compression
  - ULE and GSE are introduced to provide an efficient way to transport IP traffic over satellite systems.
  - GSE scheduling algorithm aiming to optimize the filling of DVB-S2 frames taken into account QoS constraints is described
  - Introduction of ROHC in satellite systems is presented in order to reduced the overhead
- SI-SAP
  - An overview of SI-SAP definition and evolution is provided, with a particular focus on QoS, RRM, security and IPv6.
- C2P
  - C2P is a key component of the SATSIX architecture, providing services to others access and network functionalities

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