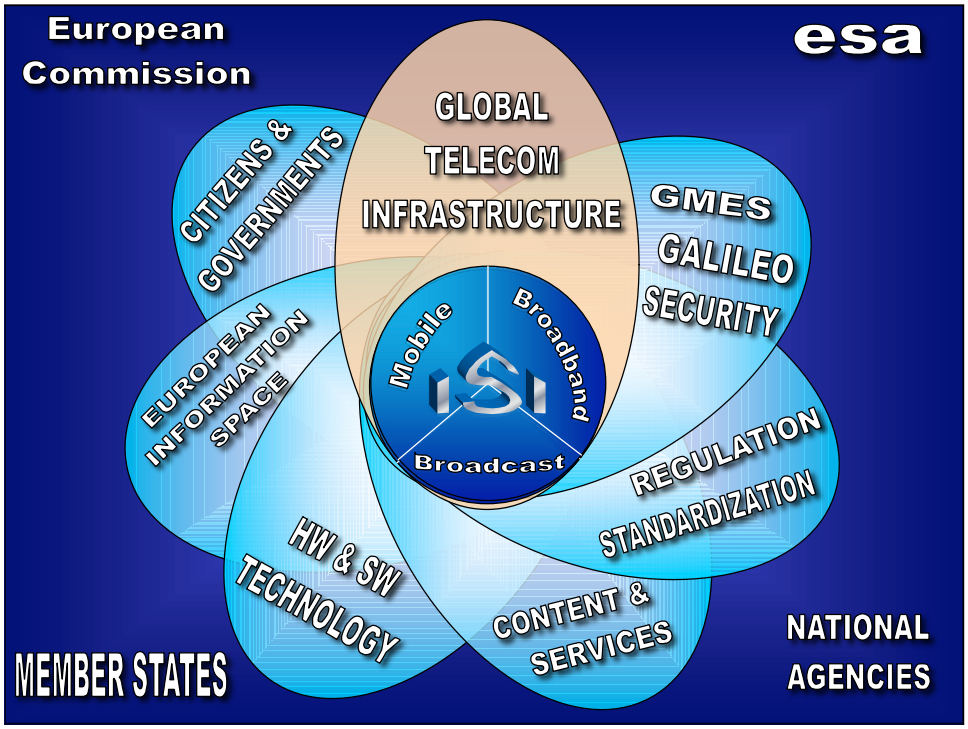
The Integral Satcom Initiative

European Technology Platform for Satellite Communications

Euro-ICT Africa Concertation meeting
Brussels, 26th June 2008
Dr. Julián Seseña, ISI ViceChair, jsesena@rose.es

1



ISI Constituency

The ISI European Technology Platform has more than 170 Member Organisations, covering 29 Countries and representing all the Stakeholders of the European Satellite Communications sector.

ISI defines and implements the Strategic Research Agenda for Satellite Communications. The ISI SRA implementation permits European Industry and Academia to develop all capabilities required to design, develop, launch and operate the Satellite Communication Systems of the Future.

ISI has elaborated innovative ideas and initiated to develop its SRA through internally funded coordinated activities: unfortunately it has not been possible so far to implement the SRA through FP 7, since no satellite communications projects have been funded yet.

3

Satellite Communications as fundamental European asset

Satellite Communications represent a fundamental part of the Space industry and, in particular, are essential to allow for GMES and Galileo applications to be distributed in real-time to all of the European citizens.

Satellite Communications importance for the Space sector can be clearly appreciated by mentioning that 20 out of 21 satellites placed in orbit by Ariane 5 and Soyuz in the last year are Telecommunications Satellites; furthermore more than 50% of the turnover of the European Satellite Industry derives from Telecommunications Satellites.

The evolution of the technology and market scenario is moving towards interoperability of satellite communications systems with the terrestrial communications networks: without satellite communications there could be no successful development of the Global Communications Networks of the Future.

4

The Role of SatCom within the Communication Networks of the Future

New advanced paradigms and models, together with the need of communicating anywhere and within a plurality of very different contexts, require innovative architectural approaches, adding a further layer of network intelligence and depicting hybrid end-to-end telecommunication networks, fully exploiting the main added-value features of satellites.

Satellites are key elements of the Future Internet scenario, represent an essential part of broadband and broadcast infrastructures and provide innovative mobile services to the transport community (e.g. trains).

In addition to commercial applications, the unique coverage and flexibility advantages of satellite systems position them as key players in the frame of security and crisis management applications for institutional, government, security and defence purposes.

5

The European Scenario and the Global Challenges

Security threats

- European countries committed to dealing peacefully with disputes and to co-operating through common initiatives
- However, Europe still faces security threats and challenges, inside and outside its boundaries
- Continuous cooperation between European security forces is essential to maintain global peace and stability

Disaster management

- Climate changes seem to accelerate the number of natural catastrophes worldwide, resulting in high losses of lives and massive damages, also affecting the availability of vital natural resources
- It is the role and the responsibility of Europe to define and support the deployment of the most appropriate solutions guaranteeing the safety of EU citizens and internationally cooperating to disaster prevention and mitigation

Ubiquitous access to ICT infrastructures and services

- Telecommunications infrastructures have become a foundation of the modern Society
- Still, the digital gap remains a reality for several millions of European citizens located in areas underserved by terrestrial network infrastructures

6

Space-based communication systems help facing Global Challenges (1)

- Central enabling agents in building the Future Information Society:
  - Global Connectivity
  - Seamless continuity of service
- Space-based systems open up many capabilities complementary to ground systems:
  - Ubiquitous access to information for all of the citizens
  - Enhanced mobility
  - Interoperability capabilities
  - Cost-effective and economically competitive broadcasting and multicasting of video, voice and data
  - Improved disaster protection and security management
  - Quick set-up and infrastructure restoration capabilities of satellite-based systems in emergency situations
  - Monitoring of emerging threats and crisis management
- Based on these key added values of satellite, Europe has made research in the areas of space, security and monitoring of environment a priority for the coming years

7

Space-based communication systems help facing Global Challenges (2)

Limited coordination among European Countries has been experienced in the past years

- Development of national based civilian and dual use satellite-based communication systems
- Costly exercise made at Country level
- Limiting interoperability capabilities of security teams in case of pan-European actions.

→ Better coordination among Member States is fundamental in the near future to:

- Study and Define,
- Develop,
- Use space-based technology as a support tool to global Cooperation

8

ISICOM helping Europe to be a Global Player

Europe is aiming to play the role of a Global Player, in particular in vital sectors like security and emergency management: to this aim a European global communication capability should be put in place.

In support to this European role and on the basis of capabilities of Satellite Communications, the ISI European Technology Platform has recently conceived the innovative ISICOM system concept.

ISICOM (Integrated Space Infrastructure for global Communications) is intended to be the ISI proposal for an advanced European Satellite Communications System fully integrated with the Global Communications Network of the Future and able to complement Galileo and GMES by adding important value and functionalities

The ISICOM global communication capability will provide the necessary connectivity network for real time monitoring, threat anticipation, crisis management and on-field operation worldwide, to support the implementation of related European Policies (like the ESDP).

9

ISICOM: main features

- ISICOM must be regarded both as:
  - a self-standing solution
  - and a space-based element of an integrated communication network, to which the satellite component adds innovative features and performance
- Use of a mix of high-capacity RF and optical technologies in space
  - To support data rates up to tens Mbps and laser communication user data rates in the Gbps range
  - To ensure global and safe end-to-end connectivity
  - Direct connectivity among LEO and GEO satellites, as well as with terminals located anywhere within the coverage either onboard aircrafts, ships, on-ground fixed or handheld
- Use of Internet Protocol routing to enable the connection of thousands of users through networks

10

ISICOM Innovation priorities

Some basic technological building blocks are already available, but a number of more advanced key technologies, permitting the full development of the entire ISICOM system, are still to be developed through an innovation and R&D path.

Technologies left to be developed are included in the areas of

- Inter-satellite optical communications,
- Advanced on-board IP routing, fast packet switching, bulk and packet encryption/decryption,
- Advanced multi-beam or steerable communication antennas,
- Radiation hardened on-board components,
- Software defined radio, dynamic bandwidth and resource allocation techniques, protected bandwidth efficient modulation.
- Complementary Ground Component
- Smooth integration with all IP global telecom infrastructure

11

ISICOM as a major European Programme

- ISICOM should become a major programme within the European Space policy framework and a driving force for the development of advanced critical space technologies, paving the way for new rich space based institutional and commercial services.
- To this end, it is also essential to define and implement a proper regulatory and legislative framework and to ensure that the needed spectrum resources are made available and protected for all the different portions of the spectrum where satellites operate today and will operate in the future.
- ISI asks the European Commission to devote increased attention to Satellite Communications issues, in particular through considering and supporting the ISICOM developments aiming at positioning Satellite Communications as an important part of the Global Communication Networks of the Future and of the European Space Policy/Programme.

12

ISICOM: the way ahead

- ISICOM is one main focus of the ISI Strategic Research Agenda
- ISICOM is an integral part of the European R&D strategy being linked and synergic with the main initiatives of the other relevant ETPs (such as eMobility, NESSI, Eposs and NEM in the Future Internet domain).
- ISICOM has been presented and debated during the recent Satellite Communications Consultation Event, jointly organised by the European Commission (INFSO) and ISI.
- First R&D elements have been identified for the next ICT Work Programme 2009-2010 (under elaboration)
- Mid-long term ISICOM Roadmap is under definition, at present, in ISI, including identifications of options for implementation.
- Inclusion of ISICOM in the European Space Policy/Programme.

13