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A Thales / Finmeccanica Company *Space*

# Satellite Mobile Services

The Satellite role in the Mobile Communications arena  
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**THALES**

## Agenda

- Mobility Services:
  - What is mobility?
- A history of success and fails:
  - Thuraya
  - GlobalStar
  - Iridium
  - SiriusXM
  - Solaris W2A
- Future Solutions
  - Iridium NEXT
  - Global Xpress
- Key tips for future mobility Services
  - Broadcasting
  - Interactive services
  - 3G / 4G Convergence



# Mobility Services

**From a communications perspective,**

**Mobility** means being able to move freely while staying connected

*“as when engaging in the increasingly socially unacceptable practice of using a cell phone while driving”*

**Ubiquity**, on the other hand, means universal connectivity,

*“the ability to count on the presence of a connection of one kind or another from the bottom of the beach to the top of Mount Everest and everywhere in between”*

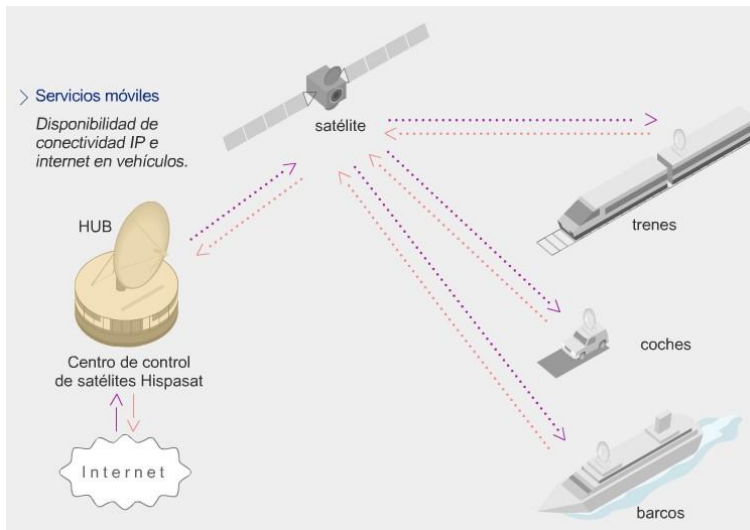
## So, what is the real need?

## Well... It depends

## Mobile satellite services (MSS)

Refers to communications satellite networks satellites intended for use with mobile and portable devices. There are three major types:

- AMSS (Aeronautical MSS),
- LMSS (Land MSS), and
- MMSS (Maritime MSS).



Source: Hispasat



# A history of success and fails



## Thuraya

- “Cellular-style” devices with dual-mode satellite and terrestrial mobile network.
- The coverage area is most of Europe, the Middle East, North, Central and East Africa, Asia and Australia, by land and at sea, including huge rural communities and vertical industries.
- The number of subscribers in March 2006 was around 250,000.
- 360,000 Thuraya handsets have been put in service since launch in 2001.



## A history of: Success

- About **95%** of Thuraya subscribers are connected using the company’s **pre-paid service**.
- Calls made from one **Thuraya phone to another** are charged at **50 US cents** per minute while those from a **Thuraya phone to a land-line** or a mobile number is charged at **50 cents per minute+local connection fees**.
- The satellite phones offered by Thuraya had gained immense popularity in war torn countries such as **Iraq and Afghanistan** where years of conflict and the resultant neglect have obliterated the telecommunications networks.

## GlobalStar

- The Globalstar system is based on LEO satellites constellation.
- 1998 Launch of 1st Globalstar satellites
- On F 2000, Initial prices were \$1.79/minute.
- On 2002 Globalstar filed voluntary petitions of Bankruptcy
- In 2004, restructuring of the old Globalstar was completed.
- In 2007 Globalstar launched eight additional first-generation spare satellites into space.
- In 2008, with over 315,000 subscribers ,
- The Company's products include mobile and fixed satellite telephones, simplex and duplex satellite data modems and satellite airtime packages.

Globalstar™



## A history of: Well... Success

- Global **customer segments** include: oil and gas, government, mining, forestry, commercial fishing, utilities, military, transportation, heavy construction, emergency preparedness, and business continuity as well as individual recreational users.
- Globalstar data solutions are used for a variety of asset and personal tracking, data monitoring and "Supervisory Control and Data Acquisition" or **SCADA applications**.
- In 2011 has over **425,000 subscribers** for the company's mobile satellite voice and data services.



## First Iridium

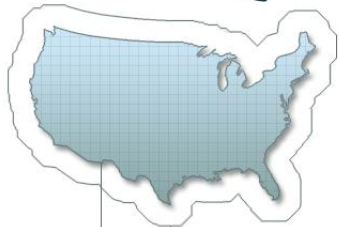
- Iridium is the name of a constellation of 66 communications satellites orbiting the Earth in low orbit **LEO** 6 at an approximate height of 780 km of land.
- Iridium constellation was designed by **Motorola** to provide services Mobile Satellite Services (MSS) with global coverage.
- The system aims to provide **voice and data** communication using portable devices in areas outside the coverage of traditional communication systems such as fixed or mobile.
- **Operation** on 1 November 1998
- **Broke** financially August 13, 1999.
  
- This failure was due largely to the high cost of mobile handsets, approximately \$ 3,500 and the service itself, about 7 USD per minute
- Prices for land mobile, considerably cheaper, and the emergence of roaming agreements for the **GSM** system during the decade that brought the construction of Iridium,
- Currently solutions Iridium, which was bought and relaunched by new partners, are actively used in vertical markets such as oil, mining, ecotourism and military.

## A history of: Well... Success

- The Iridium network is unique in that it covers the whole Earth, including poles, oceans and airways.
- Iridium Satellite LLC has approximately 320,000 subscribers as of the end of December **2008** (compared to 203,000 in July **2007**).
- 500.000 subscribers at **2011**
- The system is being used extensively by the U.S. **DoD**
- The DoD pays \$36 million a year for unlimited access for up to **20,000** users.

**SiriusXM** = American broadcasting company that provides two satellite radio services (SDARS) operating in the US, Sirius Satellite Radio and XM Satellite Radio.

It's Wherever You Go



3,717,792

Square miles of seamless coast to coast coverage

200 Miles off shore  
And your radio will still work

By Contrast

Terrestrial radio reception range is generally limited to about 50-100 miles

It's Wherever You Are

[Browse All Radios](#)



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Mobile and Free Internet trials  
Get Internet Radio



**On the Go**  
Portable radios when you're on the go  
Portable Radios



**Water / Air**  
Safe, informed and entertained  
Sirius Marine Weather  
XM Marine Weather  
Aviation Applications



**At Home**  
Radios for your home  
Home Radios



**In Your Car**  
Radios for your car  
Pre-installed Radios  
Get a Radio



**For Your Business**  
100% Commercial free music  
Business Subscriptions



Found in Many New and Used Vehicles, Including:



[See a Full List](#)



## Solaris Mobile W2A

- Solaris Mobile is a joint venture company between SES Astra and Eutelsat
- First geostationary satellite systems in Europe for broadcasting video, radio and data to in-vehicle receivers and to mobile devices, such as mobile phones, portable media players and PDAs.
- Based on the DVB-SH Standard.
- Present in the Eutelsat W2A satellite, which contains an S-band payload,
- Successful launch on April 3, 2009,
  
- But the S-band payload was found to show "an anomaly" with the 12-meter diameter S-band Antenna.

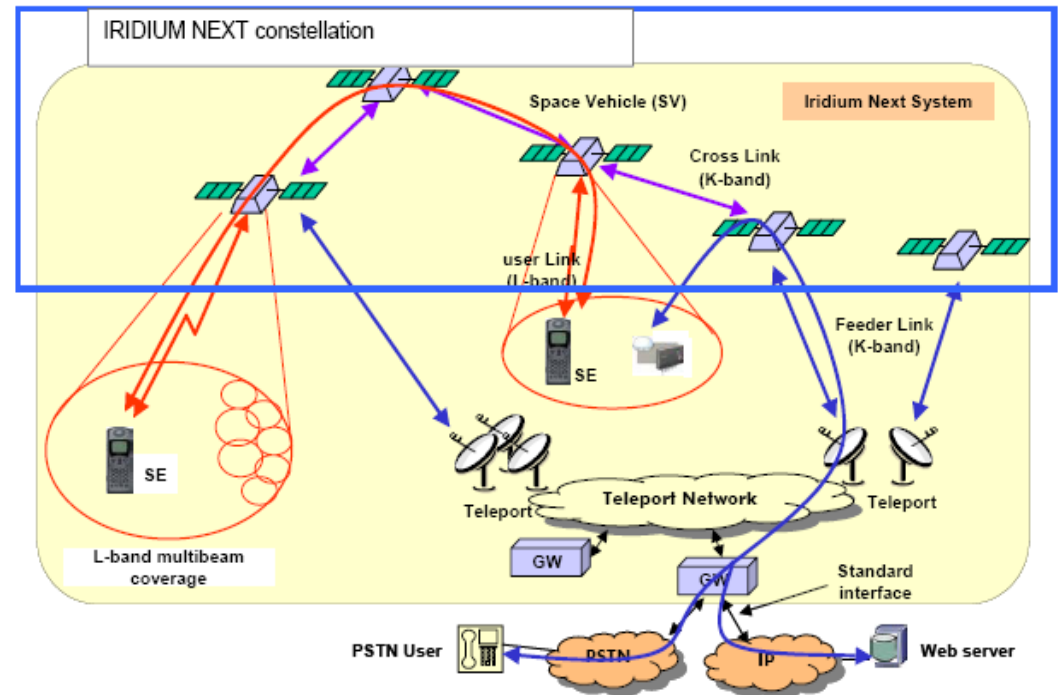
## A history of: Well... Success

- The company has built a hybrid network based on satellite and terrestrial mobile technology in **Paris**.
- On 21st April 2010, Solaris Mobile Ltd has announced it is expanding its Paris-based network to cover **Rennes and Nancy** and the surrounding areas.
- In September 2011 Solaris Mobile has today announced the launch of EUR RADIO - a new, free, pan-European digital satellite radio **demonstration** platform which will serve the European Union region.

# Future Solutions

## IRIDIUM NEXT

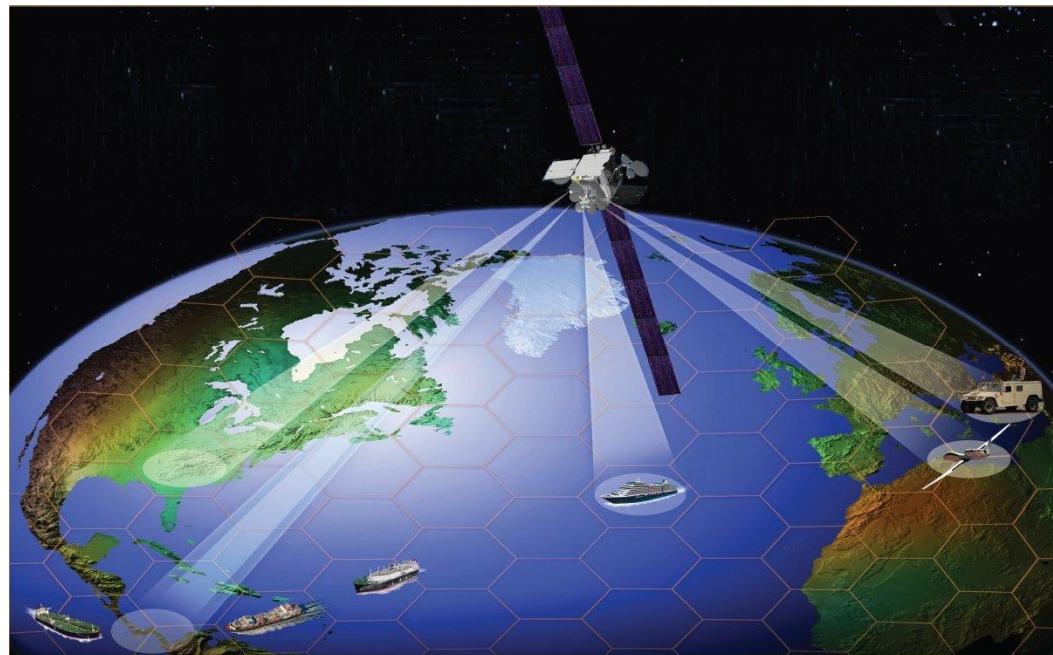
- Iridium is currently in the design and development procurement process for "NEXT,"
- Flexible array of services: Voice and Data
- Initial launch in **2015**.
- 66 cross-linked satellite OBP based LEO constellation (780Km),
- Distributed among 6 orbital planes, covering 100% of the globe.
- **Thales AleniaSpace** will lead the full end-to-end system definition of Iridium second generation constellation.





## Inmarsat 5 / Global Xpress

- Support to Ka-band only or L/Ka-band hybrid services
- Deliver a step-change in efficiency (cost/bit) and service quality (50Mbps to a **60cm antenna**)
- **Planned to launch in 2013**



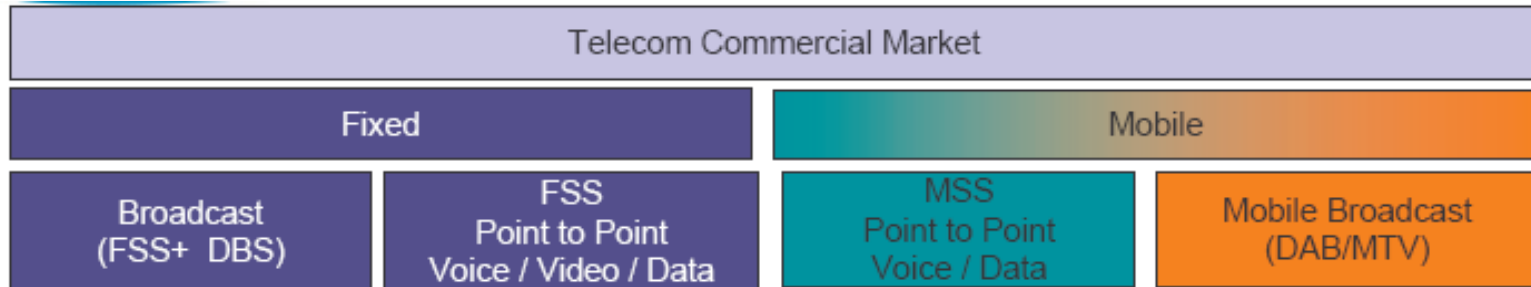


# Key tips for Future mobility services

Broadcasting

Interactivity

3G / 4G Convergence



### Core market segment for satellite industry

- Driven by TV broadcast, and HDTV growth
- Backhauling is a growing market especially in emerging regions (GSM backhaul)
- On-demand TV requires return link satellite architecture improvement
- **Broadband services stimulate the satellite capacity needs**

- Traditional MSS : led by INMARSAT
- 2 LEO constellations : Iridium & Globestar
- New initiatives, new entrants (ICO, Terrestar, MSV..)

**Hybrid terrestrial solutions have generated strong expectations and multiple programs**

**One of the most dynamic market for the satellite industry**

**Mobile & broadband initiatives driving innovation**

## Market main dynamics

- Traditional satcom market will continue to be the main market driver (HDTV/3DTV, Telecom...) : ~70% of the satellite procurement
- Other business segments & drivers : broadband, mobile broadcast, reverse BSS, government, UAV...
- LEO constellation are back, mainly renewal ...targeting niche market

## Services trends

- Smaller devices, decreased cost of ownership
  - BSS: from 60/80 cm diameter to A5 size
  - FSS: from 2.4 m to 60 cm diameter (next step down to A5 size)
  - MSS : towards cellular handset form factor (voice & messaging), from A4 to A5 size (broadband)
- Broadband services (>1 Mb/s return, several 10 Mb/s forward)
- Service convergence
- Mobility / transportability

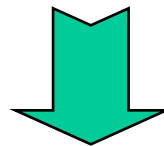
# Broadcasting

**Mobile TV : boom on existing cellular infrastructures.**

- BUT in point to point mode

**Next step: massive access to mainstream TV channels on mobile, overlay broadcast networks. BUT requires:**

- Good business model based on attractive subscription plan allowing unlimited usage
- Good performance similar to the one offered by cellular network
- Harmonized technology and frequency framework to prevent market fragmentation



**NEW CONCEPT: SMART HYBRID SATELLITE /  
TERRESTRIAL MOBILE BROADCAST**

# Interactive Services



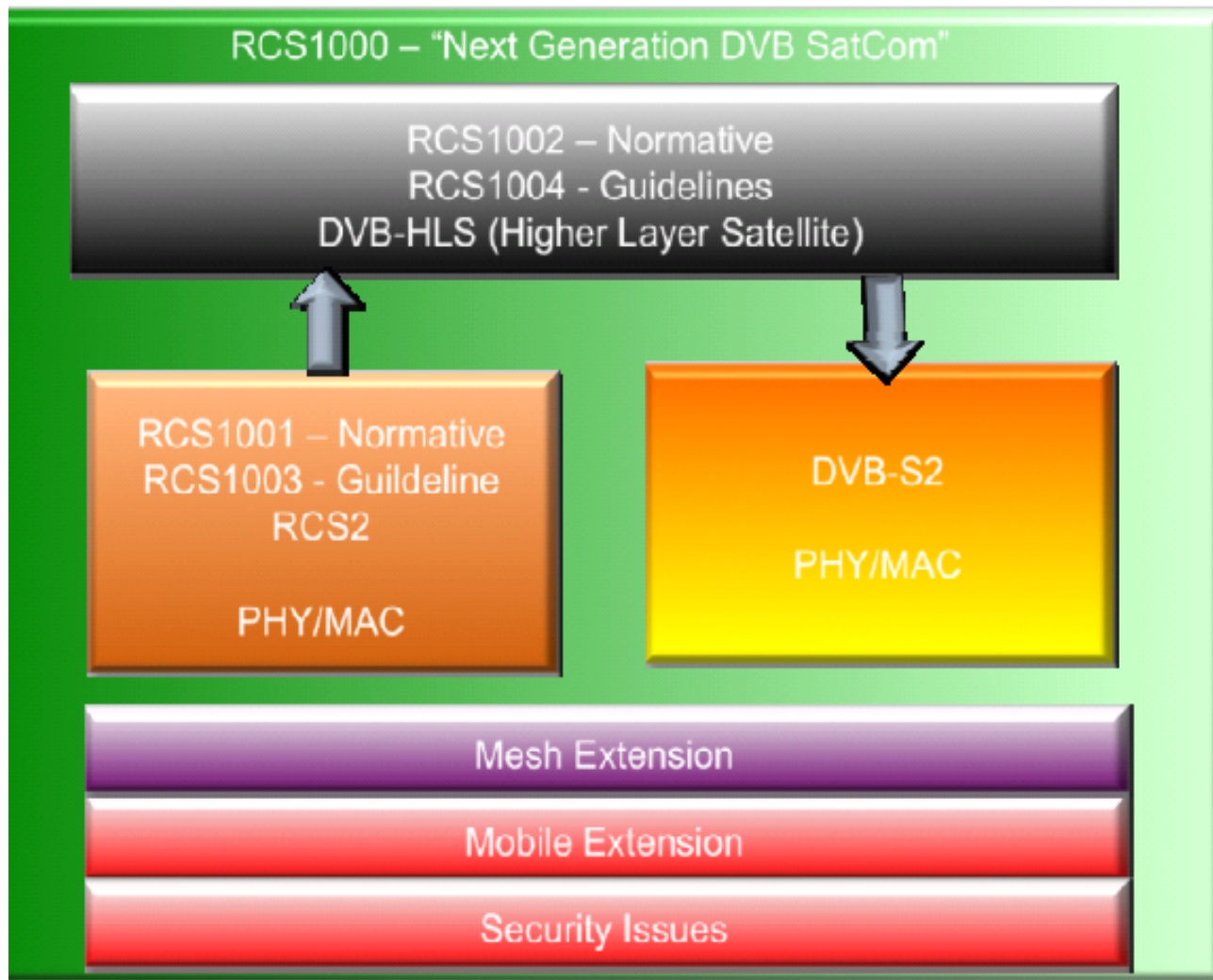
## DVB-RCS+M = ETSI EN 301 790 Version 1.5.1

- Mesh systems
- **Mobile systems!**
- Consolidated implementation
  - Mesh
    - AmeHis System
    - AmerHis II System
    - REDSAT System
  - Mobile
    - HISPASAT will provide its mobile Internet service by satellite to the new Italian fleet of trains of high Italo speed.
    - The fleet high-speed train Thalys connects Amsterdam, Brussels, Paris and Cologne.
    - HISPASAT was thus the first service provider managed IP satellite connectivity to more than 350km / h in a commercial setting and technology and open standards (DVB-RCS).

## DVB-RCS2 (New!)

- « Vertical » specification for Interoperability
- Focused on IP transport
- Terminals profiles for different markets:
  - Consumer,
  - SCADA,
  - corporate,
  - backhaul,
  - military,
  - multi-dweling

**No mobility patches. It has been thought for Mobile**  
**The mobile extension is well-defined**



## **ETSI TS 101 545-1**

**Digital Video Broadcasting (DVB); Second Generation DVB Interactive Satellite System; Part 1: Overview and System Level specification**

## **ETSI TS 101 545-2**

**Digital Video Broadcasting (DVB); Second Generation DVB Interactive Satellite System; Part 2: Lower Layers for Satellite standard**

## **ETSI TS 101 545-3**

**Digital Video Broadcasting (DVB); Second Generation DVB Interactive Satellite System; Part 3: Higher Layer for Satellite standard**

# 3G/4G Integration

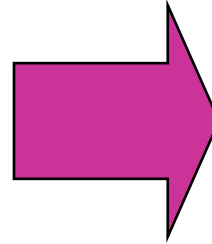
More connected

More data and more mobile

Same on-demand access  
and Internet multimedia  
experience

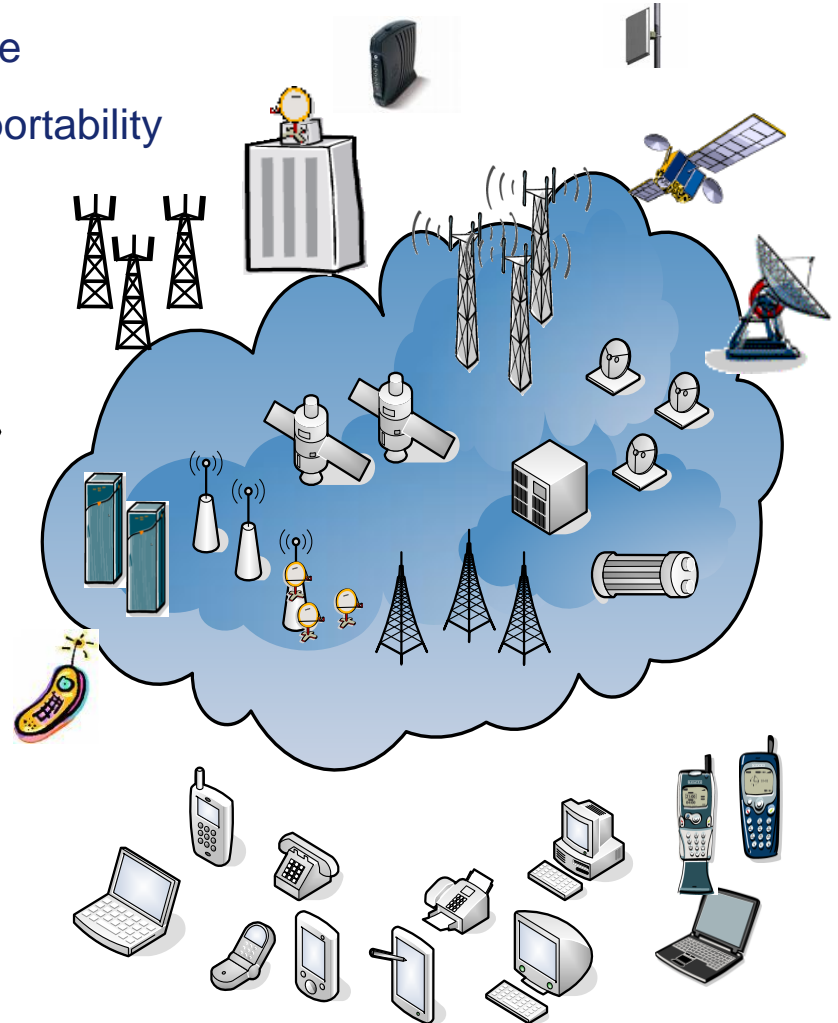
Content anywhere

From any device



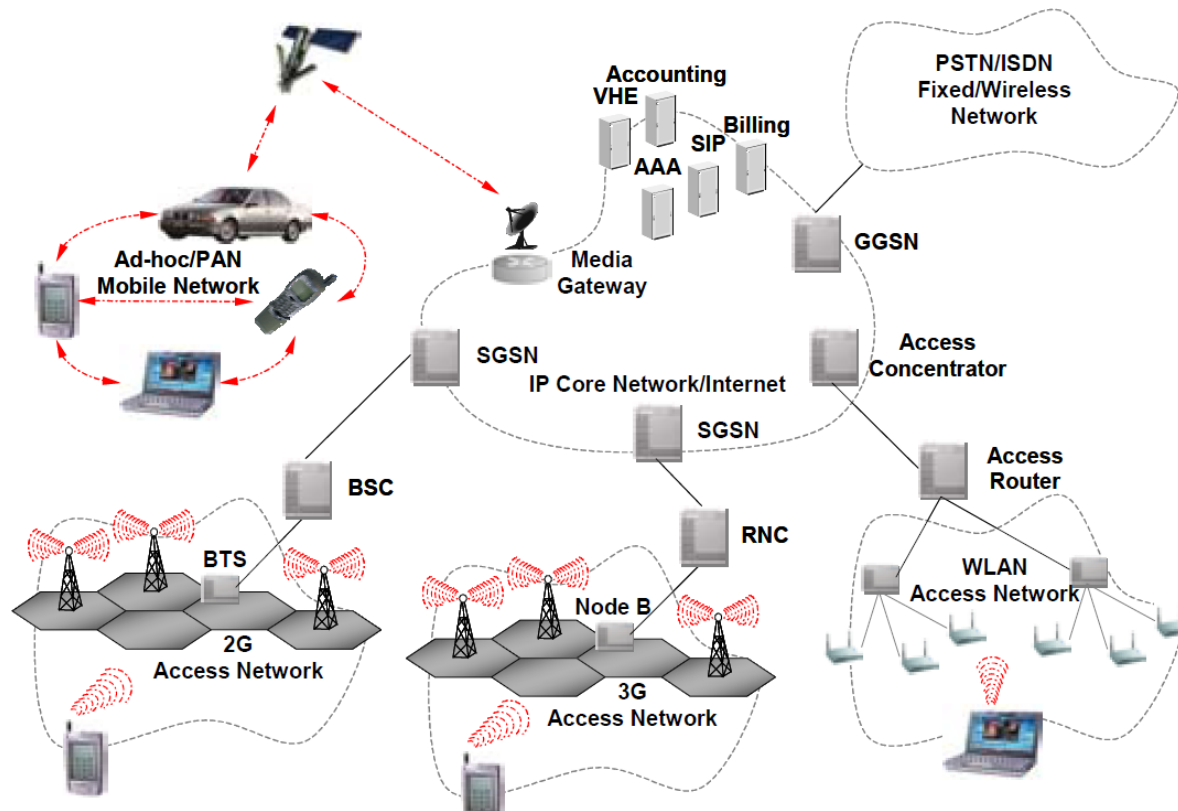
Flat price

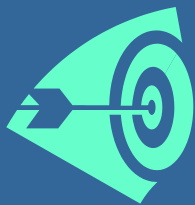
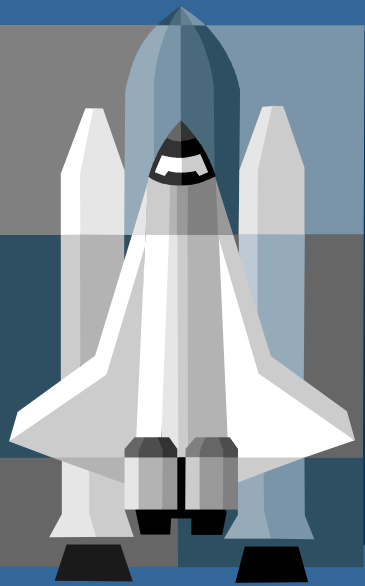
Mobility / transportability





## Satellite is a key element to provide ubiquitous access





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