
OSB
Opportunity Solution and Business

Introduction

OSB at a glance

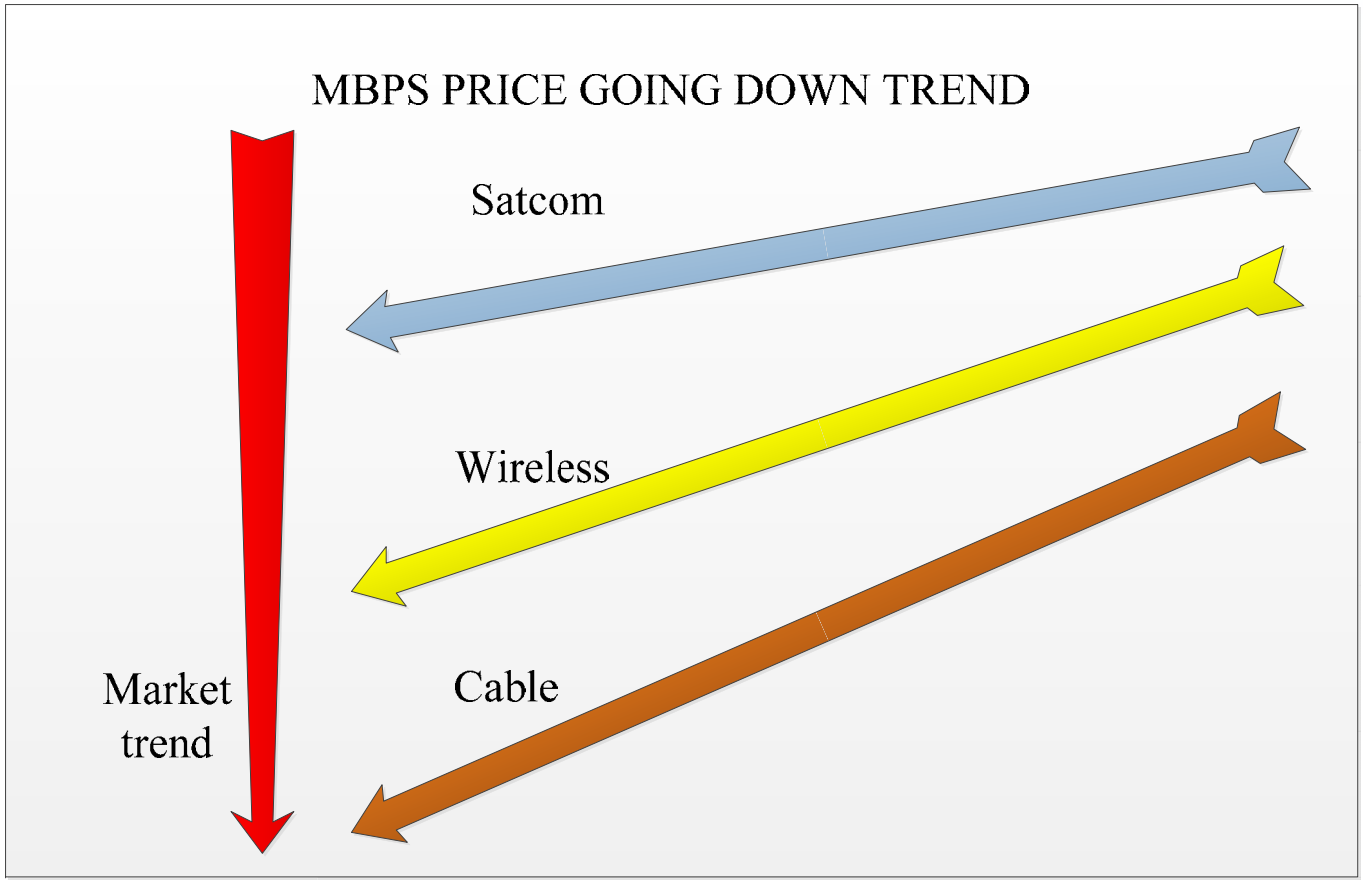
- Founded in August 2007.
- Headquarter in Hanoi and 2 branches in Ho Chi Minh City and VungTau
- Joint venture company in Myanmar (Satcom Business)
- Working in Satcom industry as
  - System Integrator
  - VSAT Service Operator (Licensed in Vietnam)

Content

- Challenges in the Satcom Market
- New Technologies & Applications
- Questions and Discussion

CHALLENGES IN THE SATCOM MARKET

Challenges


MBPS PRICE GOING DOWN TREND
Satcom
Wireless
Cable
Market trend

Challenges

Market demand	Limitation of Satcom
High Speeds and High Volumes Data	High cost
Terminal toward personal perspective	Terminal size bigger than others
Real time and multimedia Applications	High latency
Increasing demand for services and application	Exhausted of resources (Orbit slot/ Spectrum)

Challenges


What Happens in an Internet Minute?
639,800 GB of global IP data transferred
20
New victims of identity theft
204 million
Emails sent
47,000
App downloads
$83,000
In sales
61,141
Hours of music
20 million
Photo views
3,000
Photo uploads
320+
New Twitter accounts
100,000
New tweets
135
Botnet infections
6
New Wikipedia articles published
1,300
New mobile users
100+
New Linkedin accounts
277,000
Logins
6 million
Facebook views
2+ million
Search queries
30
Hours of video uploaded
1.3 million
Video views
And Future Growth is Staggering
Today, the number of networked devices
=
the global population
By 2015, the number of networked devices
=
2x
the global population
In 2015, it would take you 5 years
IP
to view all video crossing IP networks each second

Challenges

Broadcasting sector?

- SD TV is changing to HDTV and UHDTV.
- 3D TV starting in demand.
- Interactive TV needed.
- Mobility in favor.

NEW TECHNOLOGIES & APPLICATIONS

New Technologies and Applications

Satcom responses to Market by improving Technologies

1. Higher bandwidth efficiency
2. Lower latency
3. Smaller terminal
4. Enrich resources

New Technologies and Applications

1. Higher bandwidth efficiency

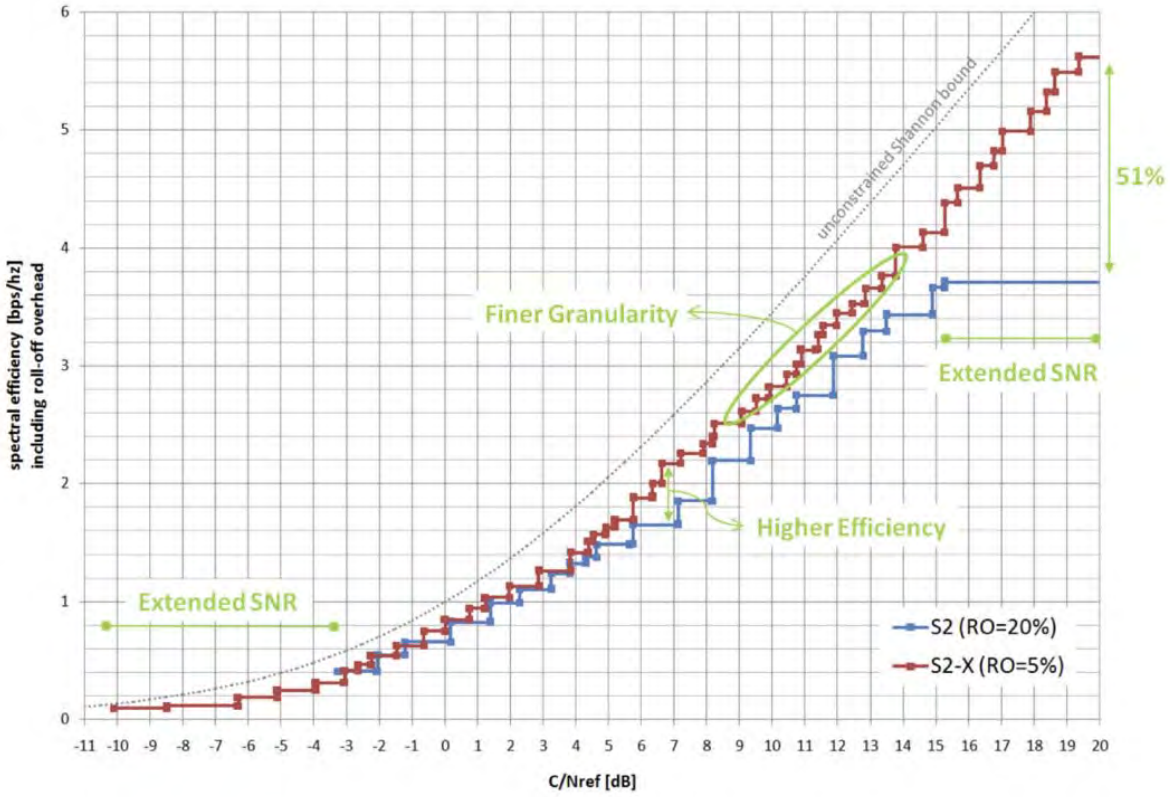
- High modulation scheme
- Carrier in carrier

High modulation scheme

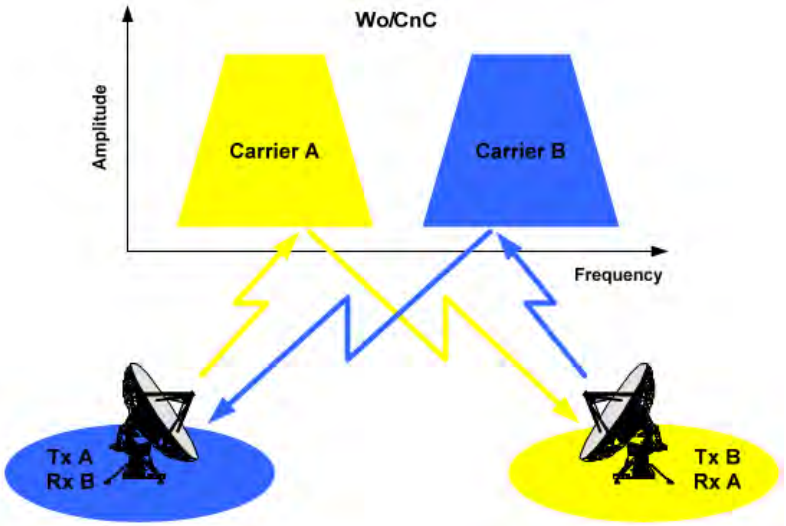
- Lower roll-offs (5%, 10%, 15%)
- High modulation scheme (adding 64, 128 and 256APSK)
- Adaptive Coding and Modulation (ACM)

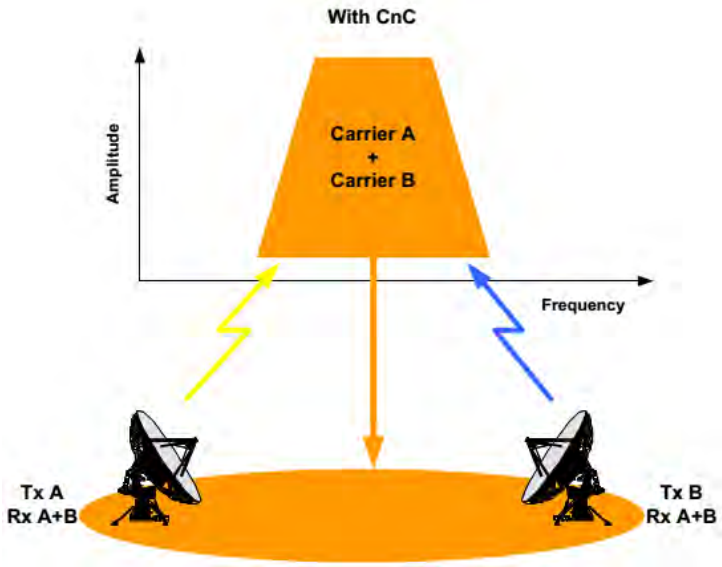
New Technologies and Applications

High modulation scheme: efficiency gains up to 51%



Carrier in Carrier



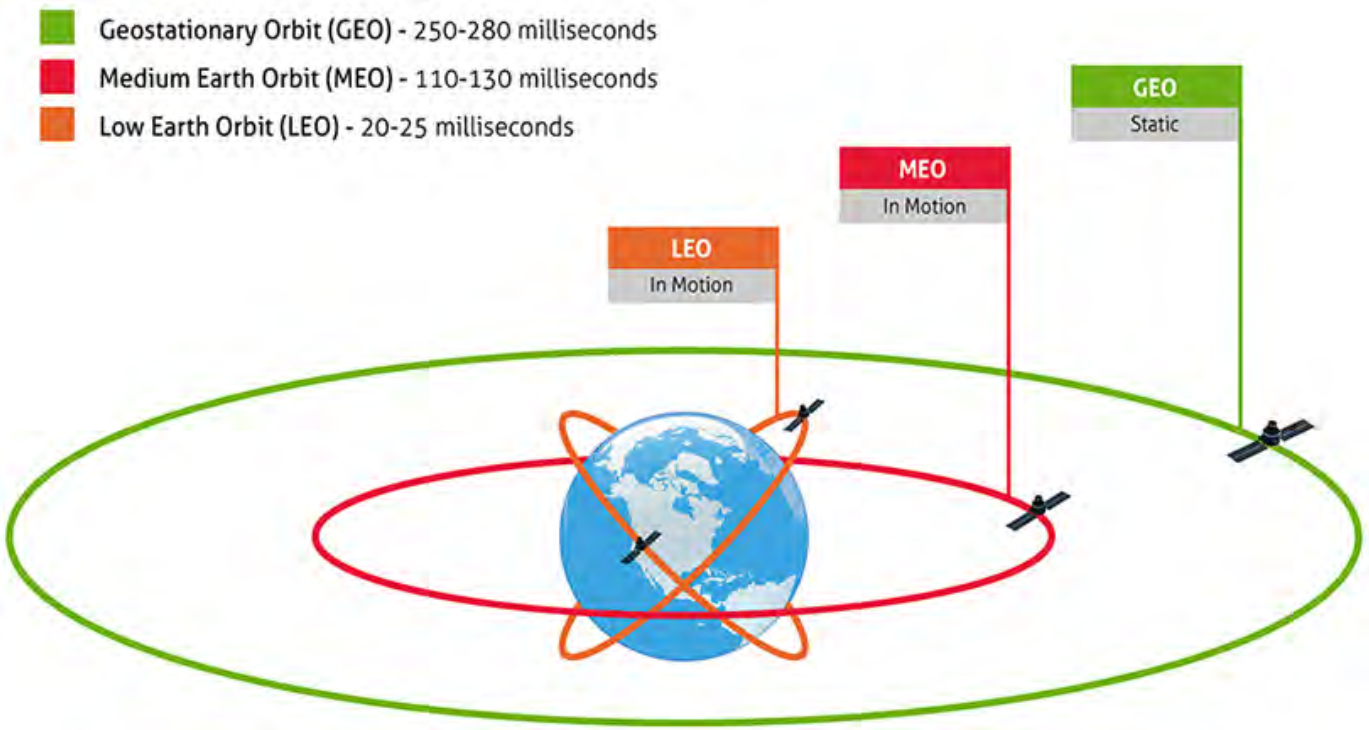


Carrier in Carrier

- Bandwidth saving
- Reduce BUC/HPA and/or antenna size
- Reduce power requirement
- More power on satellite needed

2. Lower latency

- Lower height of Obit: more and more MEO used nowadays.



New Technologies and Applications

3. Smaller terminal

- Smaller antenna
- Smaller HPA
- Smaller Modem

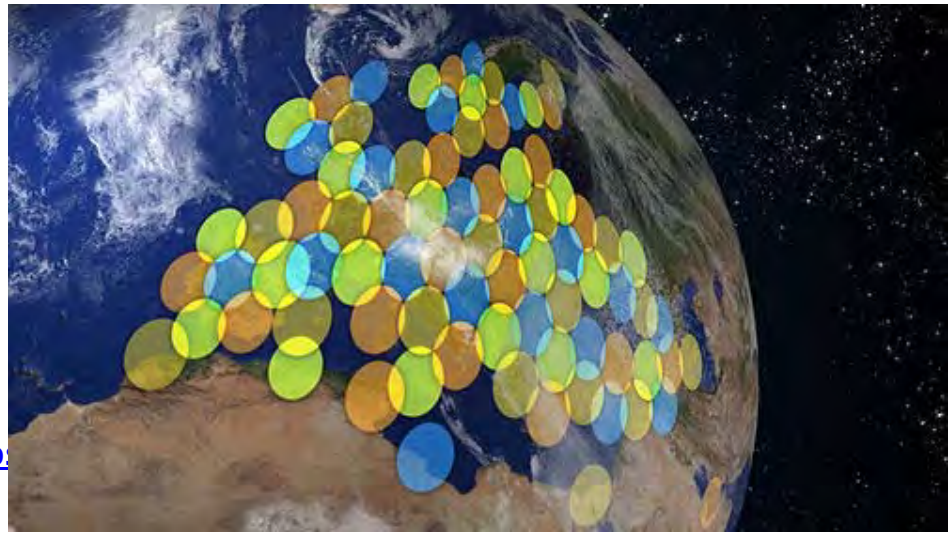
4. Enrich resources

- HTS (High Throughput Satellite)
- Higher frequency & Wider bandwidth
- Encourage utilization of existing allocated spectrum

New Technologies and Applications

HTS (High Throughput Satellite)

- Gigabit of throughput
- High-level frequency re-use and spot beam technology
- Mostly Ka-band



http://www.os

New Technologies and Applications

Higher frequency & Wider bandwidth

- Ka-band: Uplink 26.5 – 40 GHz; Downlink 18 – 20 GHz
- Bandwidth is up to several hundreds of MHz

New Technologies and Applications

Encourage utilization of existing allocated spectrum

- Encourage usage of planed bands that allocated to satellite communication
- Use maximum frequency band that allocated to satellite communication (for example Extended C-band etc…)

New Technologies and Applications

Encourage utilization of existing allocated spectrum

- Equipment available for planed and extended bands
- New satellites with planned and extended bands

New Technologies and Applications

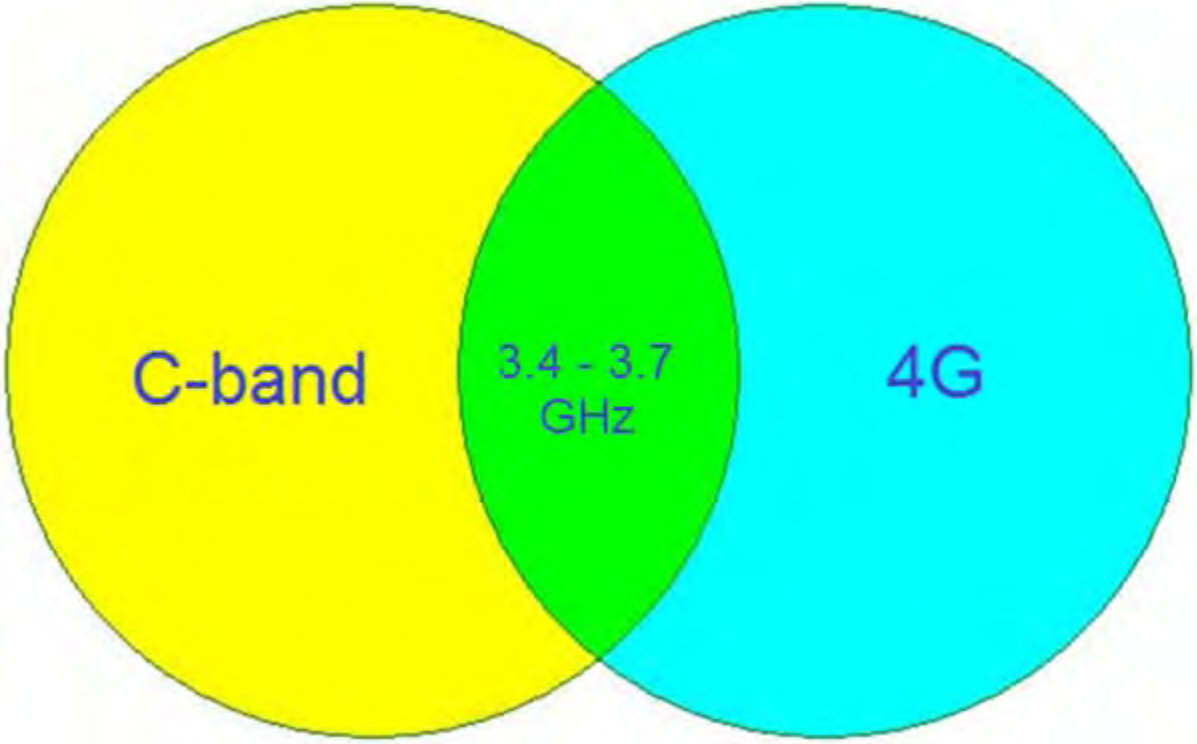
C-band ext frequency allocation

- Downlink: 3.4 – 3.700 GHz

4G frequency allocation

- FDD band number 22: Uplink: 3.410 – 3.500 GHz; Downlink: 3.510– 3.600 GHz
- TDD band number 42: 3.4 – 3.6 GHz; number 43: 3.6 – 3.8 GHz

Overlap frequency



New Technologies and Applications

Mobility

- Aeronautical
- Mobile Land
- Maritime

New Technologies and Applications

Aeronautical

Commercial

Military

New Technologies and Applications

Mobile Land

Military

DSNG

Mobile Land

Passenger Transportation
(Rail, Buses, Ferrier…)

Maritime

Cargo

Passenger Vessel

New Technologies and Applications

Maritime

Military

Oil rig support vessel

QUESTIONS & DISCUSSION

Question for Discussion

- What are coming technologies that meet the market's demand and support competitive price (per Mbps)?
- Which can be killer applications by Satcom ?
- How to further improve bandwidth utilization?

THANK YOU FOR LISTENING