SES
your satellite company

CASBAA – 16th June 2014

Increasing our Relevance in a Time of Transition

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Agenda

Increasing our Relevance in a Time of Transition

1 Market Dynamics

2 Market Enablers

1

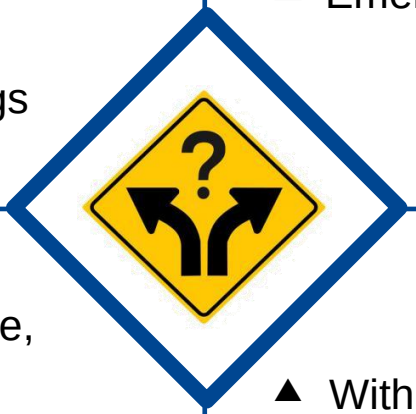
Satellite World is in Transition

New Usage and Applications

- Non-linear media and “Next Generation Video”, OTT
- Mobile data and video
- Multi-play, mobility, disaster recovery, M2M - Internet of Things

New Ecosystems

- Very significant increase of complexity of most ecosystems
- Emergence of new players and segments



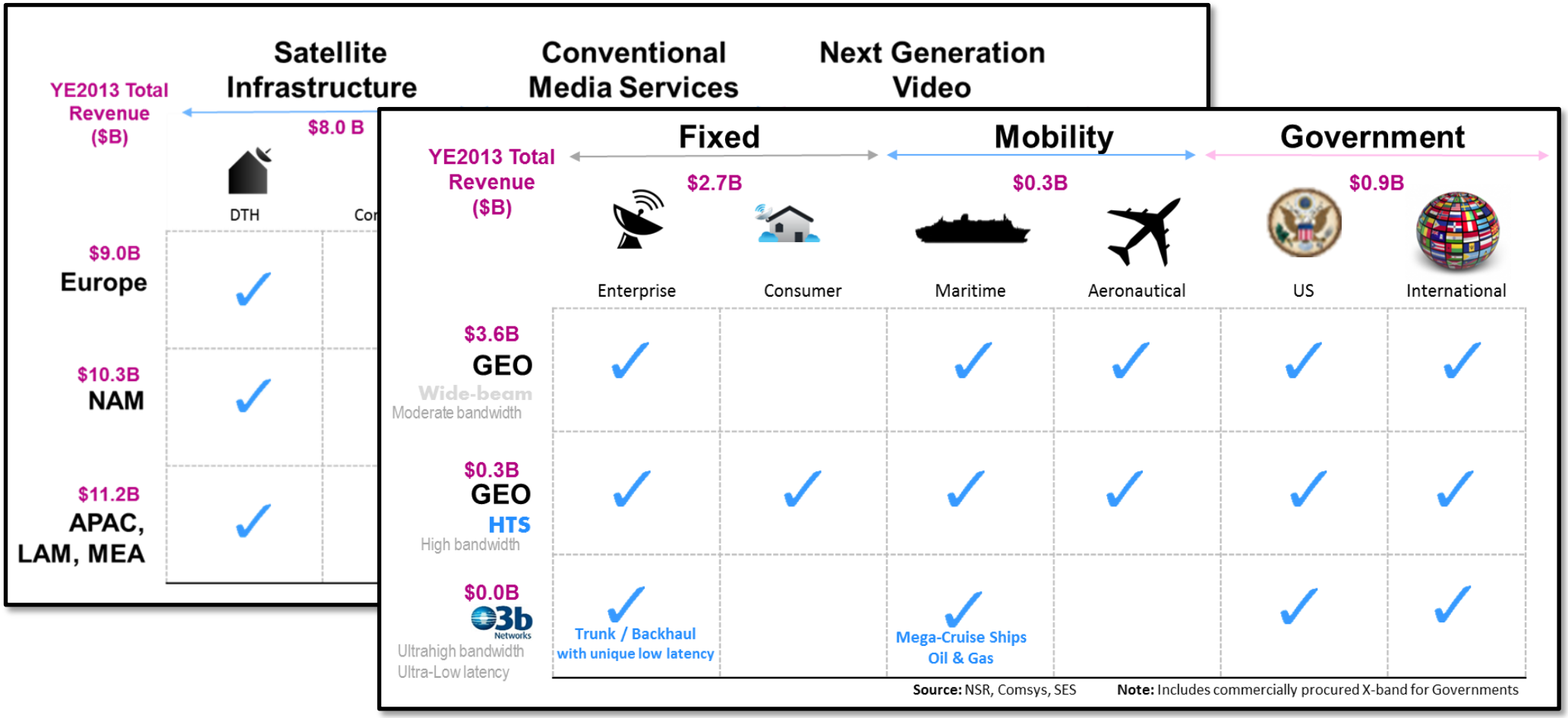
More Delivery Technologies

- Next Generation Access, FTTx
- LTE, LTE-A, WiFi, TV white space, 5G
- MEO S-HTS, GEO HTS
- LEO constellations, High Altitude Platforms

New Competitors, Potential Displacement

- Within and external to our industry
- Moving us to much larger trillion USD ICT arenas – playing with different rules

1 Growth in Most Media and Data Segments



Conventional segments continue to provide growth
Additional opportunities arise e.g. in the highly competitive NGV environment

Back-end Enabler: CDN, IP contribution, Asset Management, Online Video Platform. Ancillary Services
Experience Provider: Advertising and Subscription Video on Demand revenues generated from online video consumption
Sources: IHS, Euroconsult, NSR

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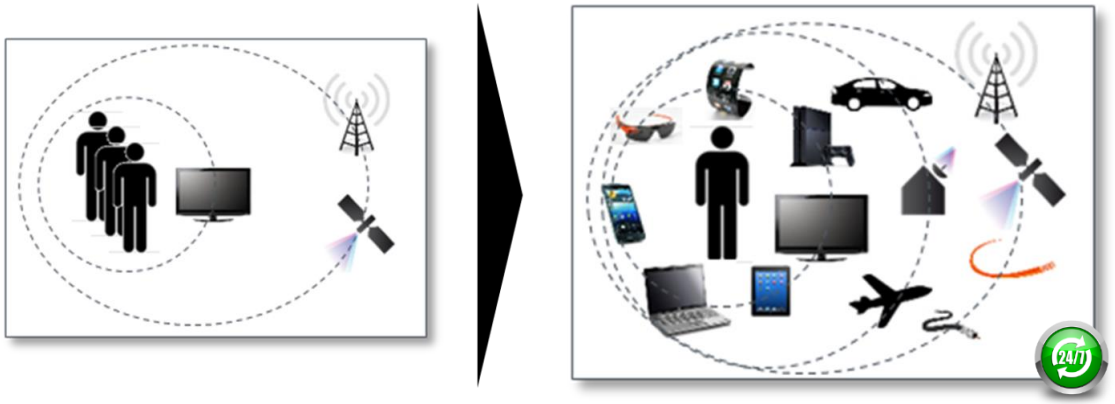
Media Growth Drivers

"Next Generation Video"



- ▲ **Next Generation Video** (NGV) is emerging as a nearly infinite and personalized choice of linear and non-linear content
- ▲ Anytime, anywhere and on any device is fostering a new ecosystem

	Developed Markets and Global	Emerging Markets
Traditional Media	✓ Increasing HD penetration today, Ultra-HD tomorrow ✓ Emerging simulcasting and hybrid opportunities ✗ Improving coding and modulation mitigates the scale of satellite bandwidth surge	✓ Growth of Pay-TV, number of channels and TV Homes driven by analogue switch-off and growing income ✓ Emerging simulcasting and hybrid opportunities ▲ Improving economics with technical reach
New Media	✓ Emerging opportunity for content push ✓ Limited ability of terrestrials to deliver a ubiquitous mass market high quality OTT experience ✗ Emerging OTT-only viewership, albeit limited and incomplete experience-wise particularly for mobile users	✓ Positioning of satellite from the start as an integral element of the NGV experience ✓ Integration of satellite into OTT-enabled ecosystems to overcome limitations of terrestrial networks ▲ Go-to-market approach requires partnerships

Data Growth Drivers

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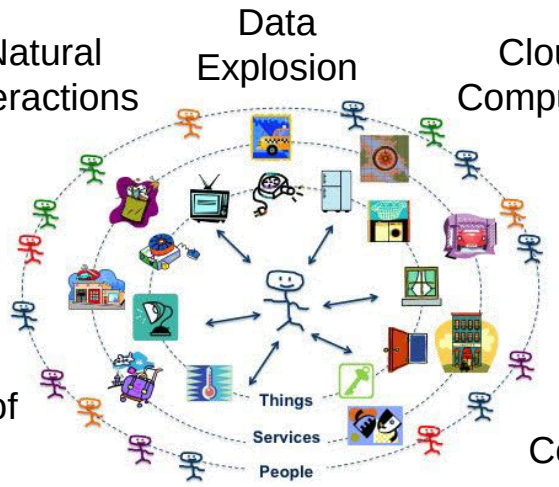

- **Next Generation Data** (NGD) is emerging through the exploding use of connected devices
- Mass digitization creates ever-escalating data transmission requirements
- Limitation of land-based infrastructures in many areas continue to present sustainable opportunities for satellites
- Next generation satellites are a game changer in creating & expanding markets (e.g. O3b, GEO HTS)

	Developed Markets and Global	Emerging Markets
Enterprise	✓ Increasing demand for disaster recovery and back-up for global businesses ✓ Booming professional usage × Prevalence of terrestrial substitution risk	✓ Digitization and overall growth in volume ✓ Relevance of Universal Service Obligations in MNO rollouts in rural areas × Demanding standards for costs-per-bit and latency
Mobility	✓ Improving technologies ✓ Booming professional and private usage ✓ Limited substitution threat outside CONUS × Terrestrial substitution risk; LEOs and HAPs	✓ Low broadband substitution risk in emerging markets ✓ Complementary role of satellite to NGV experience, complementing deficient terrestrial
Government and Institutions	✓ Nascent demand for connected devices ✓ Cyclical geographic demand × Volatility of budget appropriations	✓ Potential for digitization-related business × Generally unstructured demand and budgets

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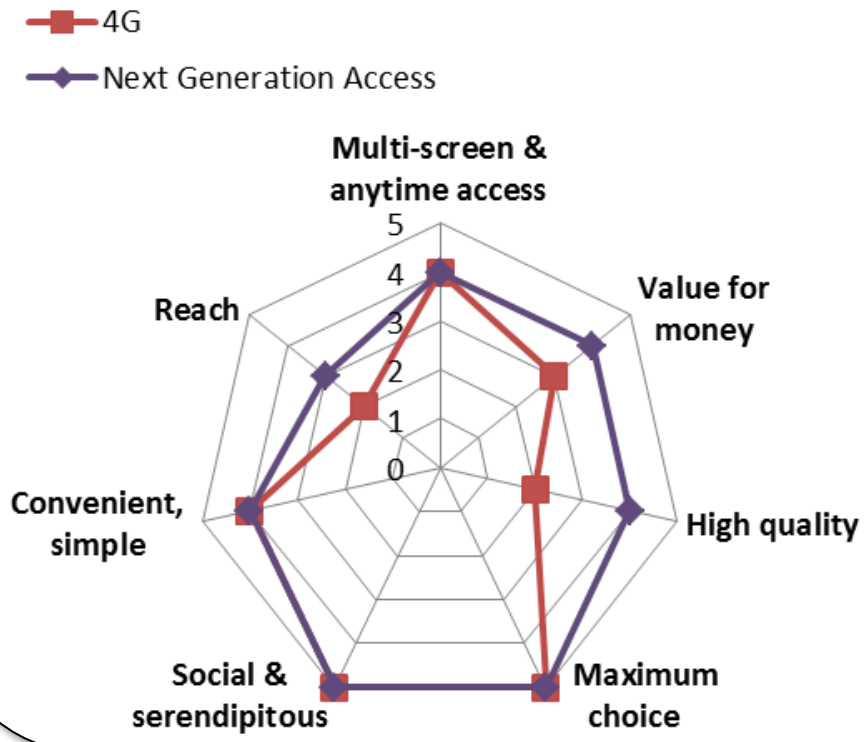
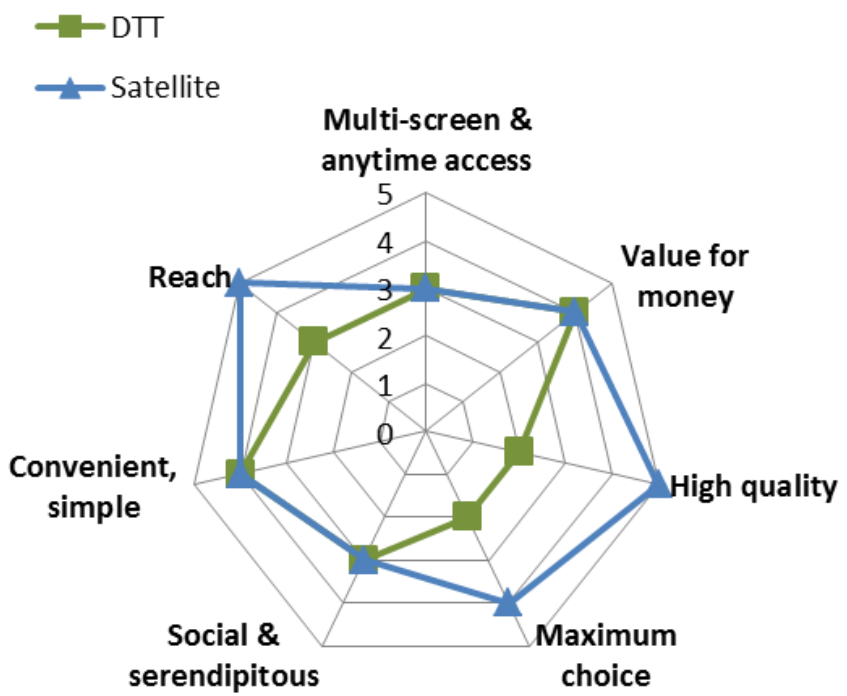
Delivery Technologies

Bringing the benefits of an “all connected” future to all requires networks capable of enabling and supporting all required broadband and video-related features

Broadband Technologies



Broadcast Technologies



No single technological answer ticks all the boxes

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Terrestrial Delivery Limitations

Case: Individualized HD-quality full OTT video consumption in the EU

35x (1) requires **700 Gbytes per month /HH**,
where EU's current average consumption is ~20 Gbytes /HH

4x (2) requires a **sustainable peak-time 20Mbit/s** access /HH,
where EU's current observed average speed is 4.6Mbit/s

54% (3) would hence theoretically only reach 54% HHs currently passed for NGA, **creating another divide**

Ultra HD

100x
2.2TB / month (4)

10x
50Mbit/s (5)

20% (6)

Dramatic upgrades would be required to go terrestrial only

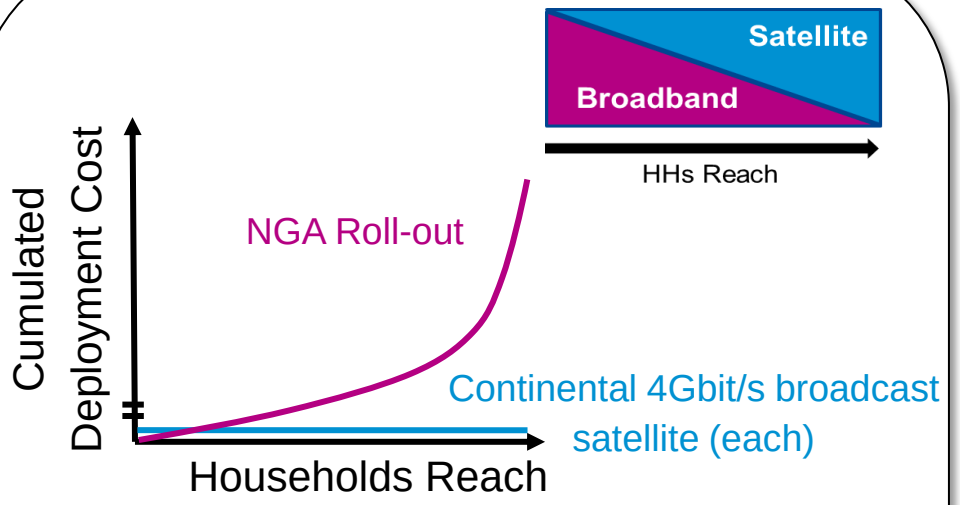
Notes:

(1) 2.3 persons/HH, 140h/month/person, 30% family viewing, mixing HD in H.265 at 3.5 Mbit/s and H.264 at 7Mbit/s
(2) Mixing H.264 and H.265 , up to 3 concurrent streams + regular Internet access
(3) Current advertised NGA reach
(4) 2.3 persons/HH, 140h/month/person, 30% family viewing, 20Mbit/s Ultra-HD stream in H.265
(5) Up to 2 concurrent Ultra-HD streams at 20Mbit/s HEVC + regular Internet browsing
(6) SES interpolation

Sources: IDATE, Sandvine, Cisco VNI, Akamai, Analysis Mason, Nielsen, EC,

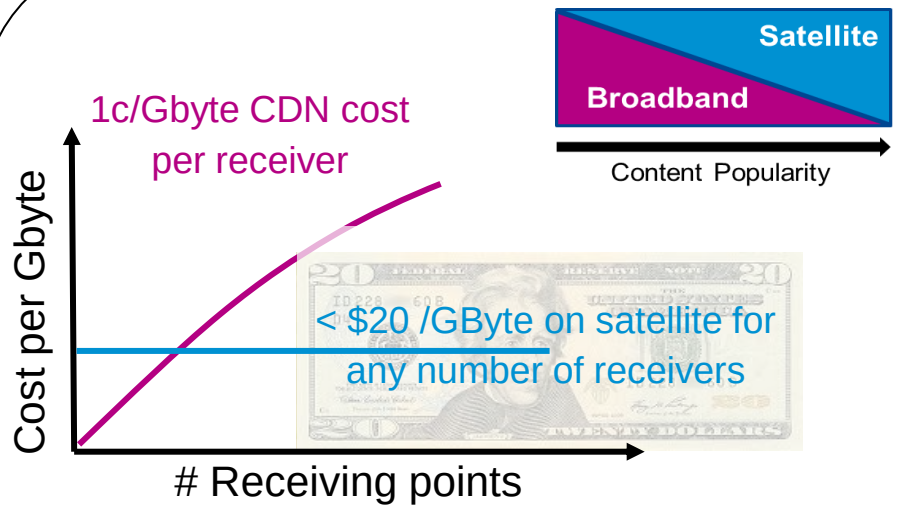
1 Reach and Cost Remain our Main Strengths

Reach



- NGA deployment cost going exponential
- Incremental satellite cost is independent from where households are located and from the number of receiving points

Distribution Cost



- Illustrating satellite's cost efficiency for content distribution: Satellite to stream and push most popular content (video + others) to the edge; terrestrial for interactivity, long tail and time-critical access

Satellite will get its share of this digitization process as terrestrial networks lack reach and their economics don't close in less dense areas or for highly popular content

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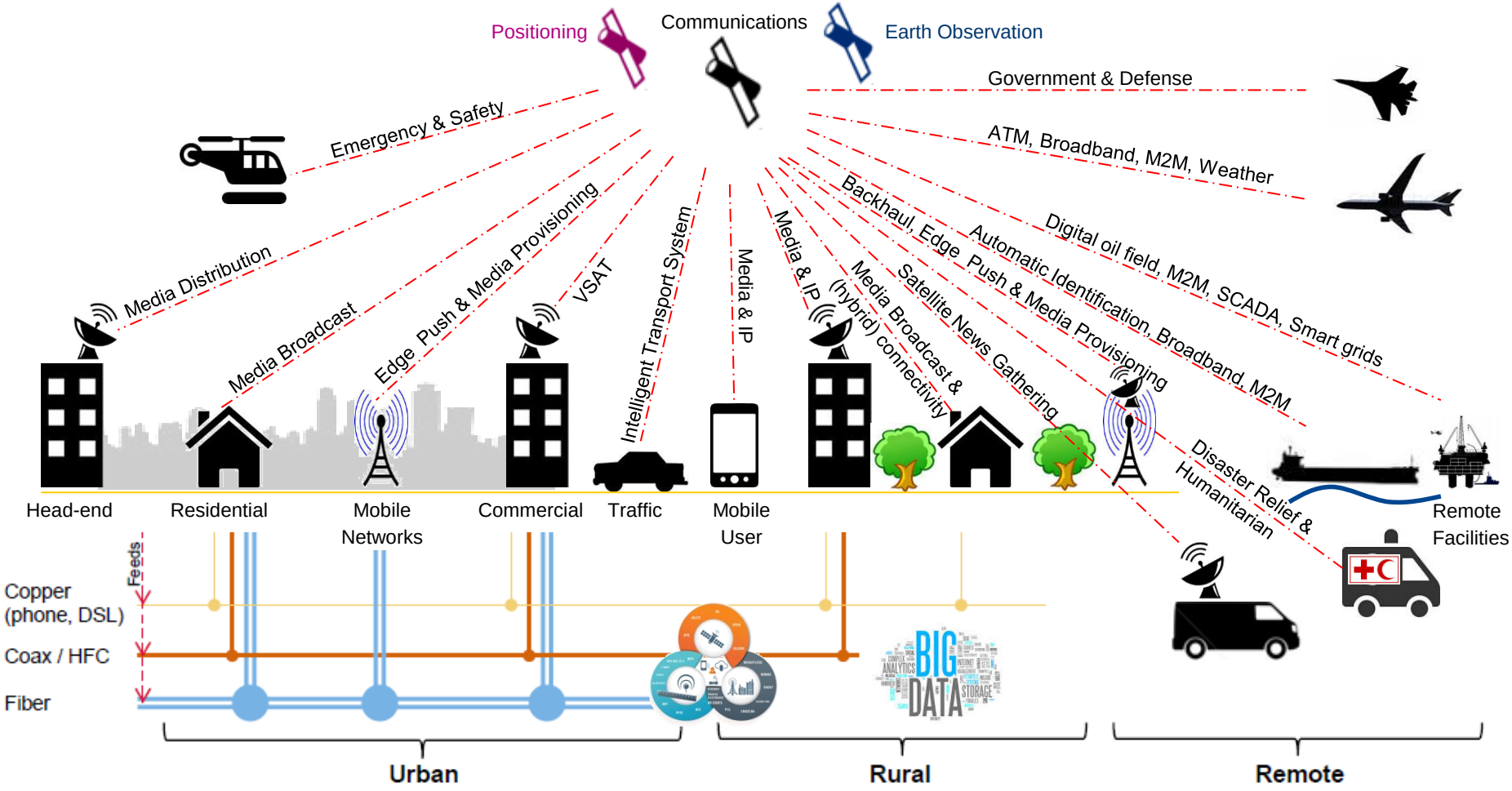
Maintaining Satellites' Right-to-Play



…but on basis of a smarter presence :
create **smarter hybrid networks** enabling **smarter applications**

1 In Markets where Others are also Challenged

Traditional Pay-TV operators

In some markets, traditional operators significantly suffer from the introduction of new delivery mechanisms and consumption modes

- Competition from IPTV and OTT operators : subscription cutting or “shaving”
- No or poor connectivity limits additional ARPU opportunities and ability to adapt to NGV behavior. OTT complement, where offered, suffers from poor Quality of Experience
- Content prices going up driven by new entrants
- Piracy

Traditional telecom and cellular operators

In some markets, traditional telecom and cellular operators face challenging conditions

- Exacerbated competition in all markets and slowed growth in saturated markets
- Traffic explosion, video driven, while ARPU saturates or decreases stressing all networks, impacting profitability levels and making NGA / 4G CapEx barely sustainable
- “Traditional” IPTV often delivering very low or no profitability
- Limited differentiation opportunities
- Regulatory pressure in most markets

Limited short and medium term growth perspectives for some traditional operations, creating opportunities for new cooperation and solutions


Market Enablers

2

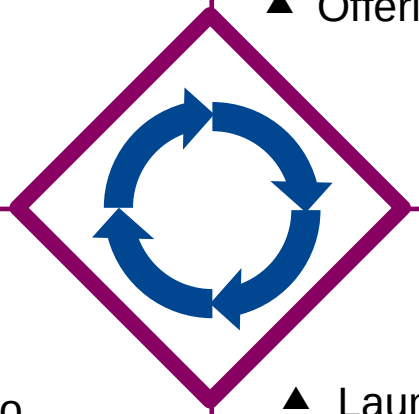
Aligning Capabilities

Spectrum – Our core resource

- Defending and augmenting our spectrum assets
- Further optimizing usage of our current resources

Flexibility – Adapting to new requirements

- Adapting to each traffic types requirements
- Improving QoS handling
- Offering hybrid solutions



Applications – Creating new value

- Scaling up rapidly our innovation efforts in the applications arena to fully exploit the capabilities of our infrastructure investments and differentiate our industry

Innovation – Sustaining our advantage

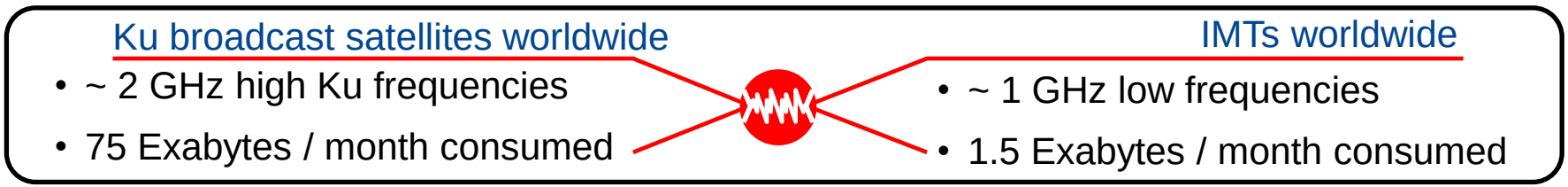
- Launchers
- Spacecrafts and orbits
- Ground and solutions

2 Spectrum

Case: Ku broadcast global spectral efficiency compared to IMT

25x

Satellite Ku broadcast spectrum - despite using much less favorable bands - is **25x** better used than mobile spectrum when considering the actual global spectral efficiency



1.7B

Broadcast satellites directly bring information and edutainment to 1.7 B people in 470 Mio households. Satellites also feed cable head-ends serving beyond another 500 Mio households

Satellite is the most spectrum efficient technology – a resource we cannot compromise on

- IMTs have an average of 1GHz allocation to relay an average of 1.5 Exabytes of content monthly (Cisco VNI, data for Dec 2013)
- Ku broadcasts satellites roughly have an average of 2 GHz allocation (region / country dependent), out of which a maximum of 1.5 GHz are exclusive to satellite to distribute 75 Exabytes of content actually consumed monthly (140 hours of monthly TV to 470 Mio HHs at 2.8 Mbit/s): 50x more total volume consumed on 2x more spectrum as compared to IMT

2 Flexibility

- As applications multiply and usages evolve, the spread of SLAs and requirements complexity significantly increases – calling for flexible and hybrid solutions combining optimized infrastructures
- Customers must be enabled to dynamically route their traffic to the most efficient delivery infrastructure (GEO Ku or C or MSS, GEO HTS, MEO, Terrestrial) with a routing decision logic integrating
  - Cost per bit delivered
  - Reach
  - Latency tolerance
  - Content popularity
  - Multicast / Broadcast / Unicast, for instant consumption or push to storage
  - Security

Evolving requirements call for maximal flexibility, combining infrastructures and allowing granular service depth

2

Flexibility – Latency as an Illustration

- Recognizing the increasing importance of latency in communications…

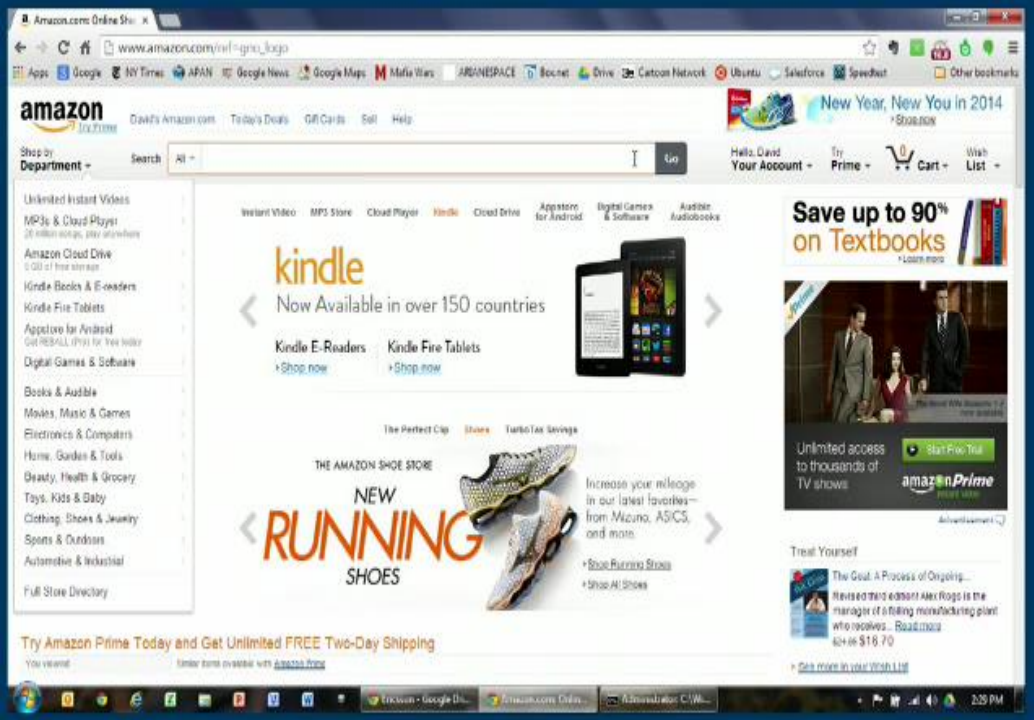
  … Led us to add low latency capabilities to our portfolio

Source: O3b networks

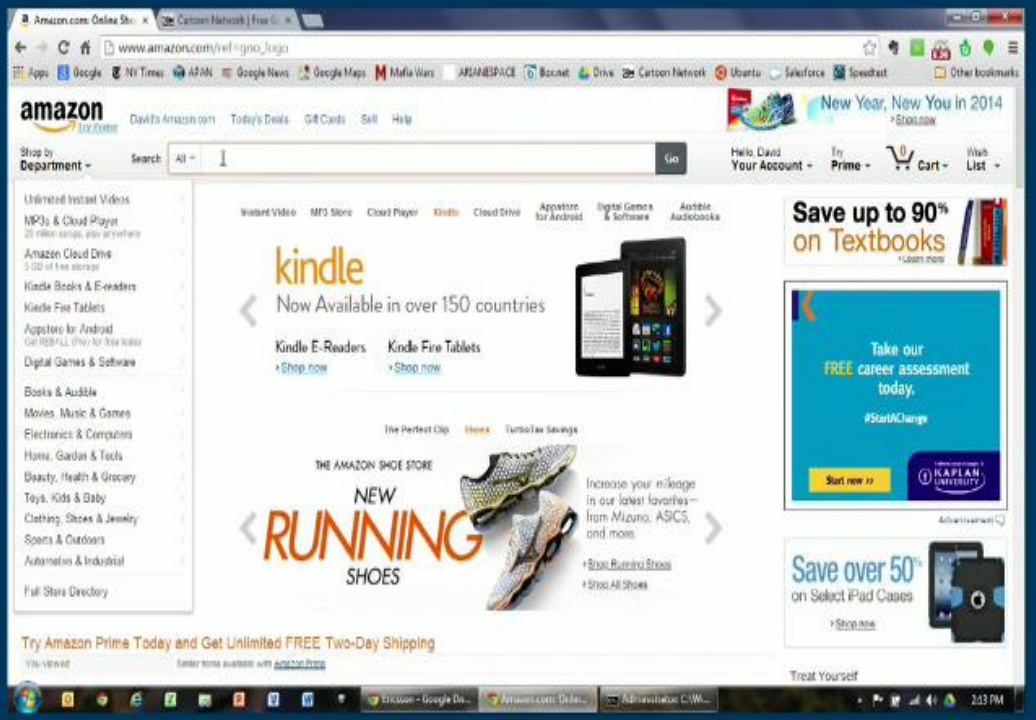
GEO

E-Commerce/Online Shopping

MEO



(10Mb link - Riverbed Acceleration)



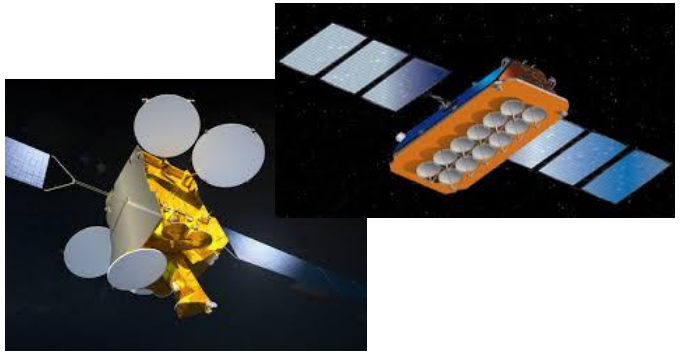
(10Mb link – no acceleration)

Not “just” about comfort - Amazon found every 100ms of latency cost them 1% in sales

2 Innovation

Launches

- Launch cost reduction
- Launch diversity increase
- Electrical propulsion transfer optimization



Satellites and Orbits

- Improving time-to-market
- Optimizing cost per bit delivered
- Optimizing QoE by combining satellites at different orbits (e.g. O3b) and terrestrial assets

Ground and Solutions

- Seamless and smart integration with terrestrial networks
- Further improving satellite reception / transmission

Faster innovation in infrastructure, integration and solutions is key to affirm our relevance

Applications

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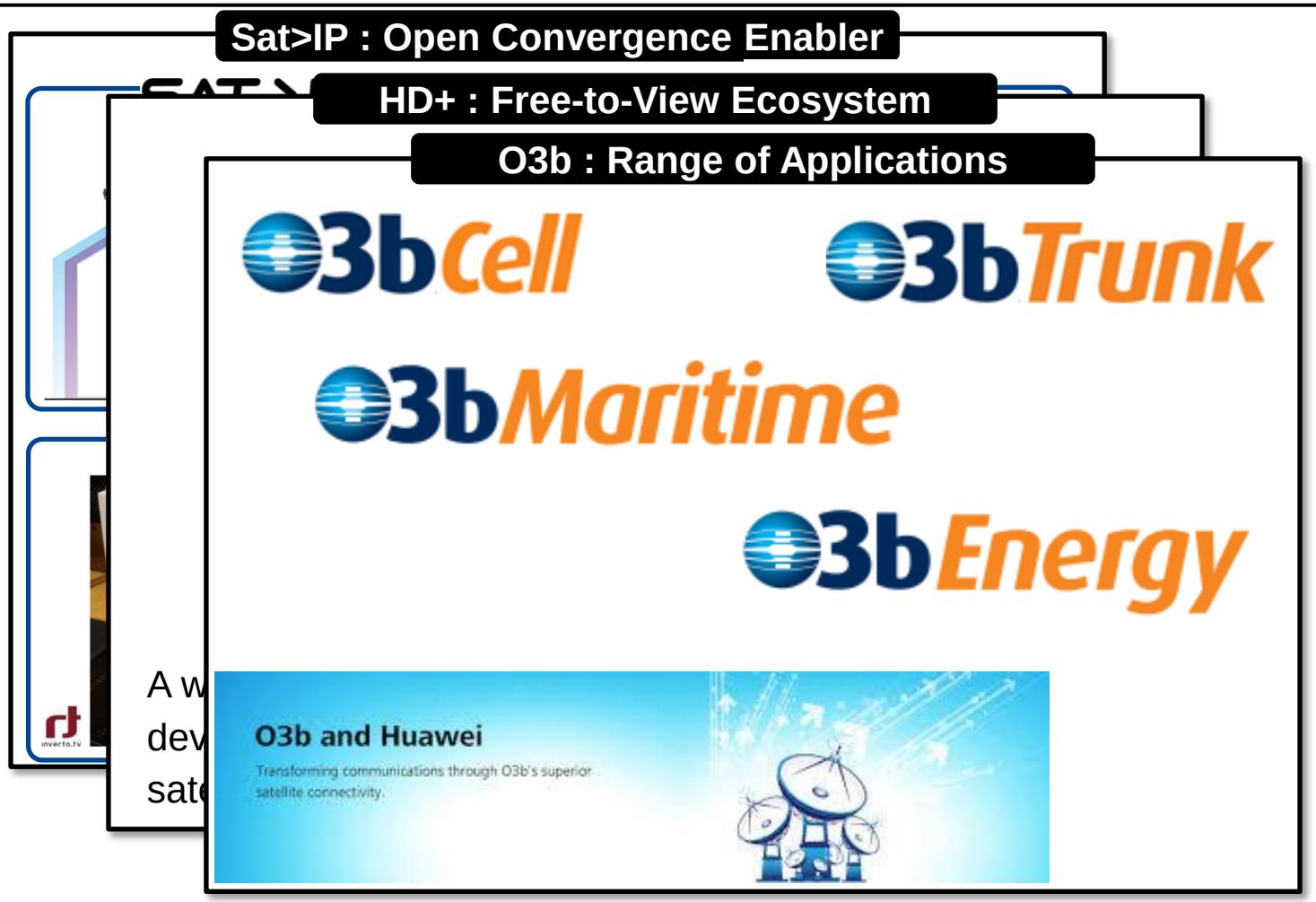

Shaping entire application-centric ecosystems is required to ensure effective use of satellite access to provide wide-ranging solutions

2

Conditions Precedent to Satellite's Right-to-Win

▲ Secure our Spectrum

- ▲ Efficient use of spectrum
- ▲ Under attack, starting with lower L, S and C satellite bands

▲ IMT lobby

- ▲ Trillion USD industry
- ▲ Regulatory influence
- ▲ Eyeing satellite Ku and Ka bands

▲ Coopetition & Collaboration

- ▲ Spectrum defense and optimization
- ▲ Building more cost effective sats, standardizing solutions, sharing orbital slots
- ▲ Leveraging joint scale

▲ Tragedy of the commons

- ▲ Further fragmentation of our industry and averseness to partnerships dramatically impairs our right-to-win

▲ Globalization

- ▲ Sustaining innovation, investments to deliver highly adaptive solutions to increasingly global customers

▲ ICT arena

- ▲ Multi-trillion USD industry, forcing satellite out of silo thinking
- ▲ Managed services culture


Thank You !