

Satellite in the Ecosystem of 5G and Beyond

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Generation	Device	Specifications
1G		<p>1G</p> <p>Year early 80s</p> <p>Standards AMPS, TACS</p> <p>Technology Analog</p> <p>Bandwidth -</p> <p>Data rates -</p>
2G		<p>2G</p> <p>Year 1991</p> <p>Standards GSM, GPRS, EDGE</p> <p>Technology Digital</p> <p>Bandwidth Narrow Band</p> <p>Data rates < 80 - 100 Kbit/s</p>

Satellite Vision for 5G

⇒ 5G is not just the next “G”

⇒ 5G is a *Network of Networks* unleashing new markets & driving growth

⇒ A Paradigm Shift in Connectivity enabled through heterogeneous networks



Evolution of Satellite Operators • Innovation Across the Value Chain

From Intergovernmental Organisations

To listed companies with diverse (& terrestrial) investors

From wholesale providers of bandwidth

To value-added partners

From a proprietary, non-interoperable technology

To working on standards for integration with terrestrial networks

SPACE SEGMENT

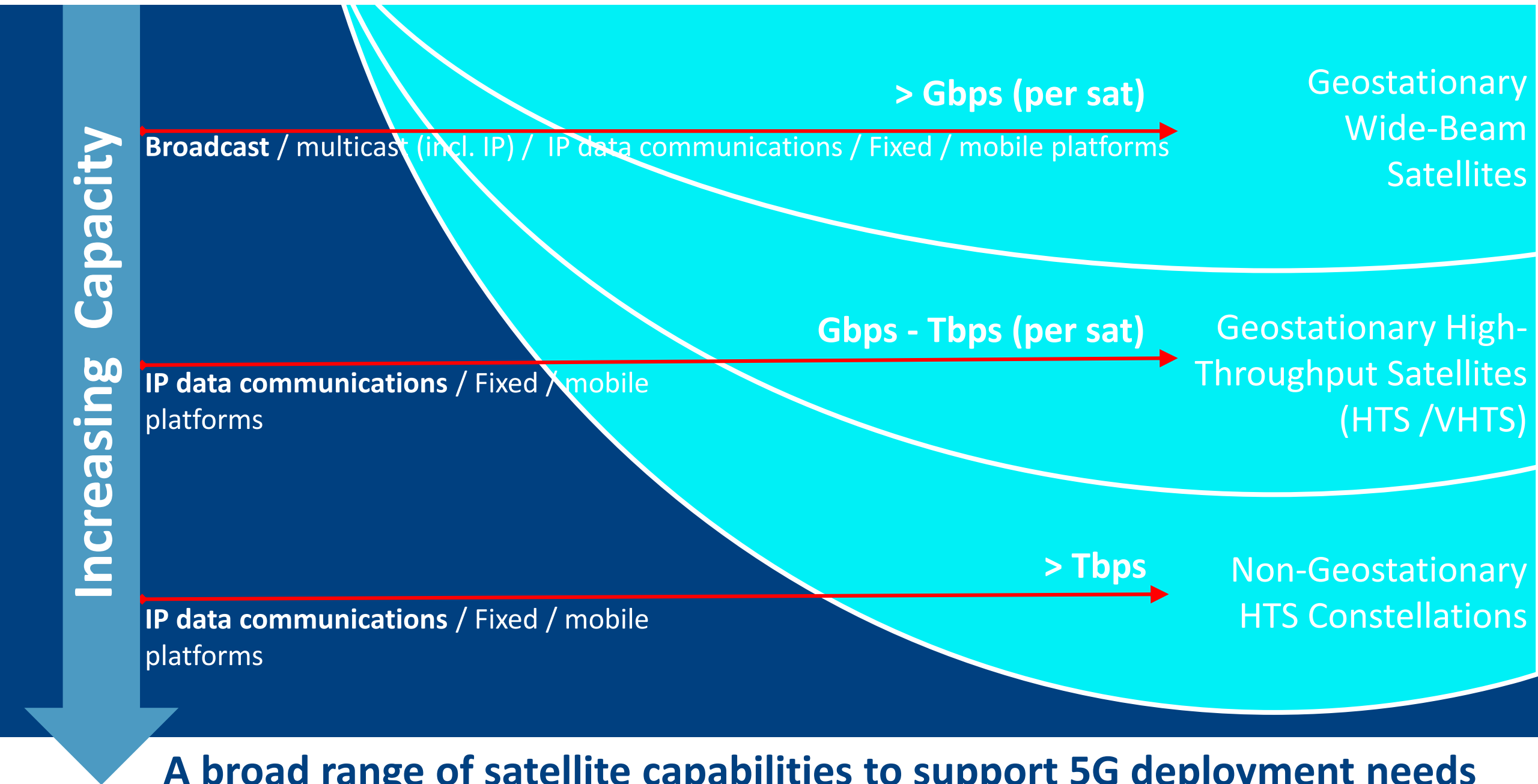
- ◆ More throughput in different orbits reduces cost per bit & increases satellite capabilities
- ◆ Increased Payload Flexibility using open 'all IP' Architecture

GROUND SEGMENT

- ◆ Smaller, lighter, DIY antennae - no moving parts, flat panels, etc.
- ◆ Electronic steering: 'Broadband Comms on Move' (portable/vehicular/aero/maritime)



SPACE SEGMENT: Massive increase in available bandwidth



⇒ More than just about the Digital Divide

⇒ Contribute to overcoming fundamental challenges faced by land-based technologies whether in delivering the SDGs or 5G

⇒ Global connectivity requirements need existing & emerging strengths of satellite technologies

➔ **Collaboration is the only way forward for both satellite & terrestrial operators to *deliver future services & grow our markets***

Investment economics

Reliability

Coverage

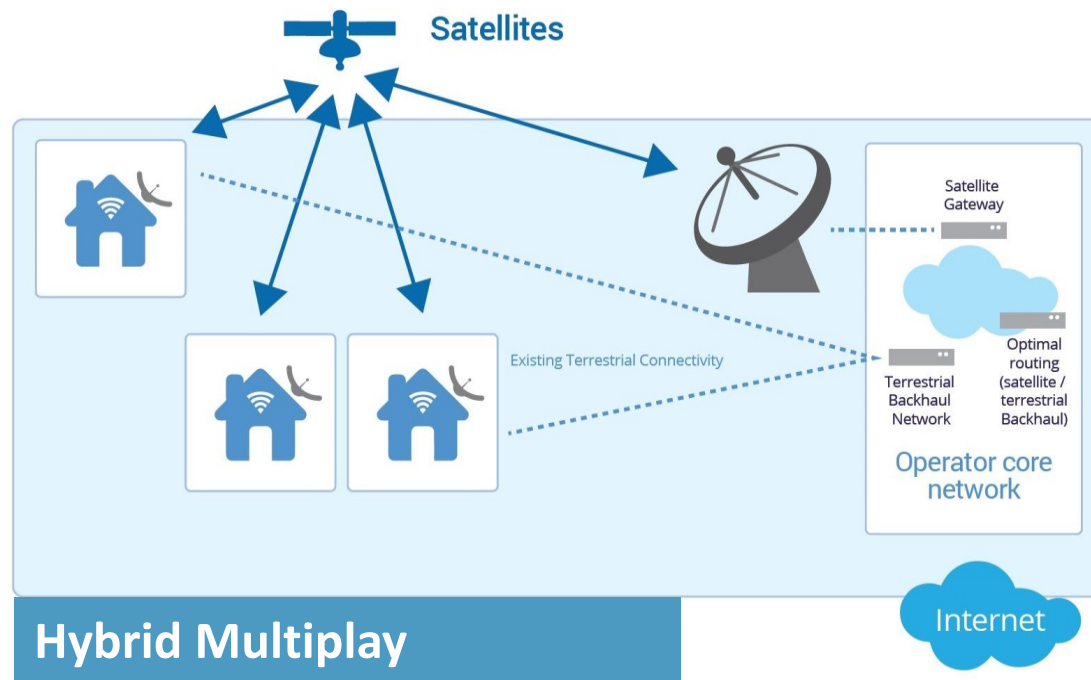
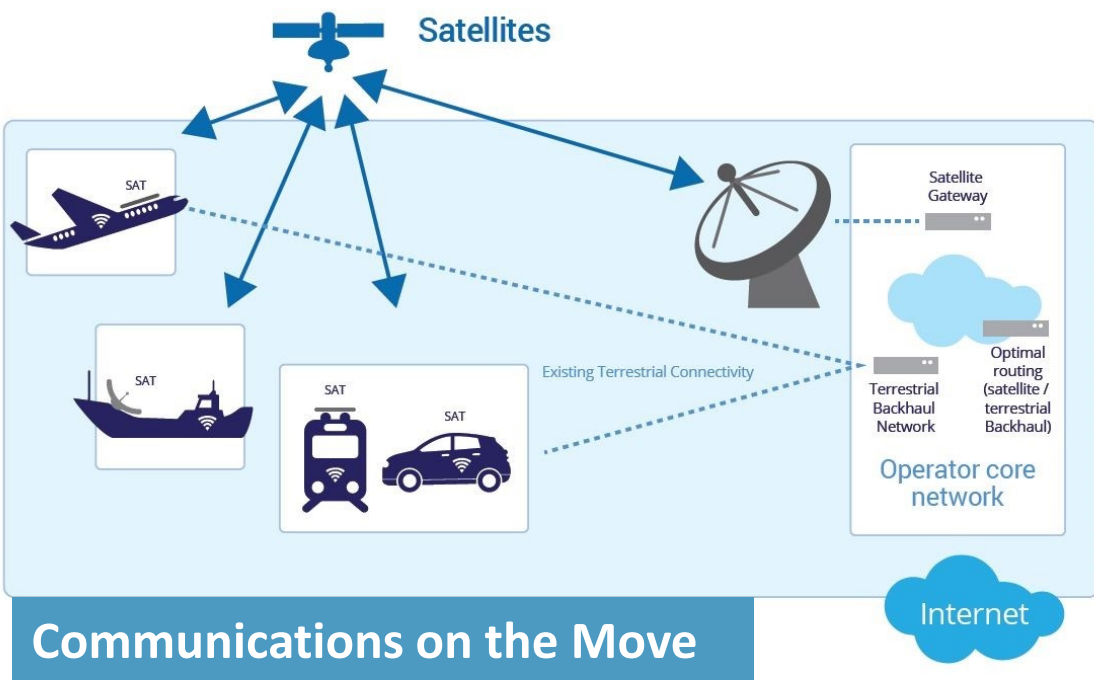
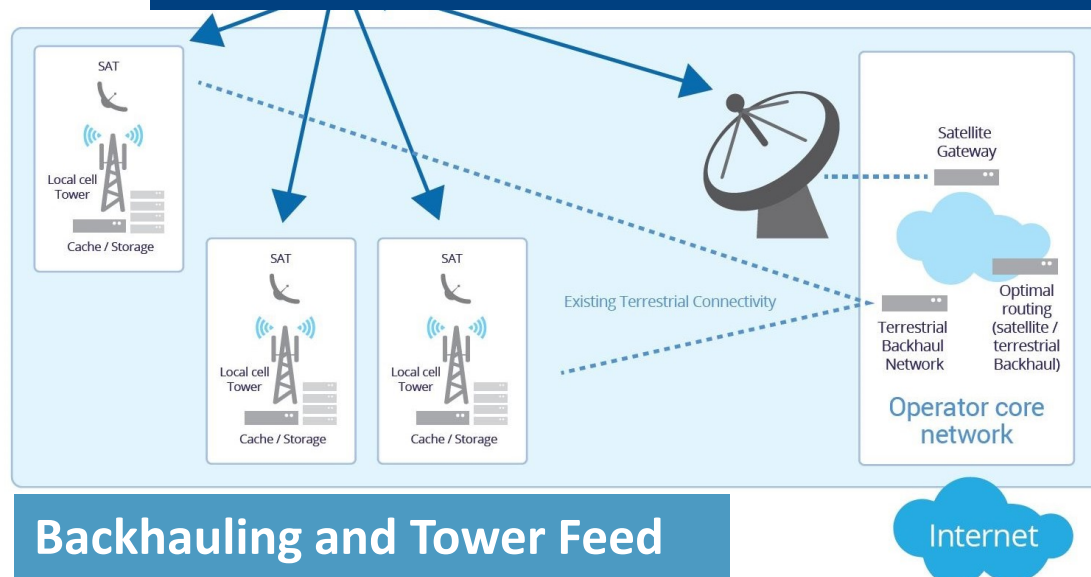
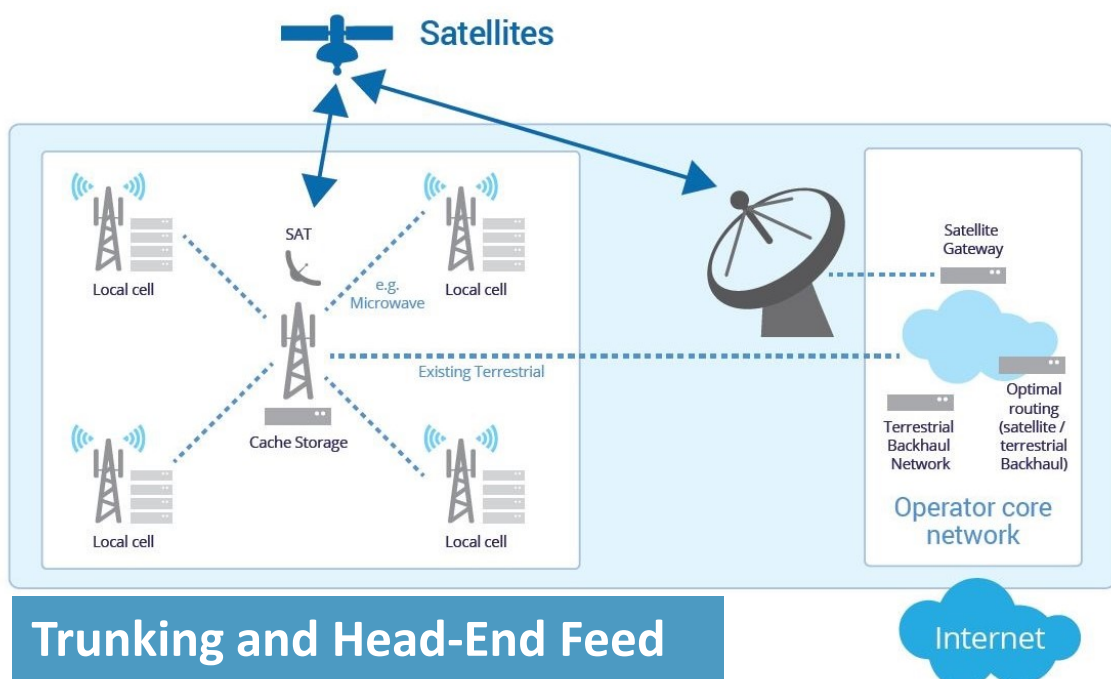
Capacity

Continuity of Service

Quality of Service

Network Stability

Satellite Use Case Categories for 5G





ESOA is 3GPP's latest Market Representation Partner
19 October 2018

Providing political support to ongoing technical work items:

- ❖ Radio Access Network
- ❖ System Architecture

Feeding 3GPP with satellite operator requirements to support technical work