Commercial Operator Perspective on In-Orbit Servicing

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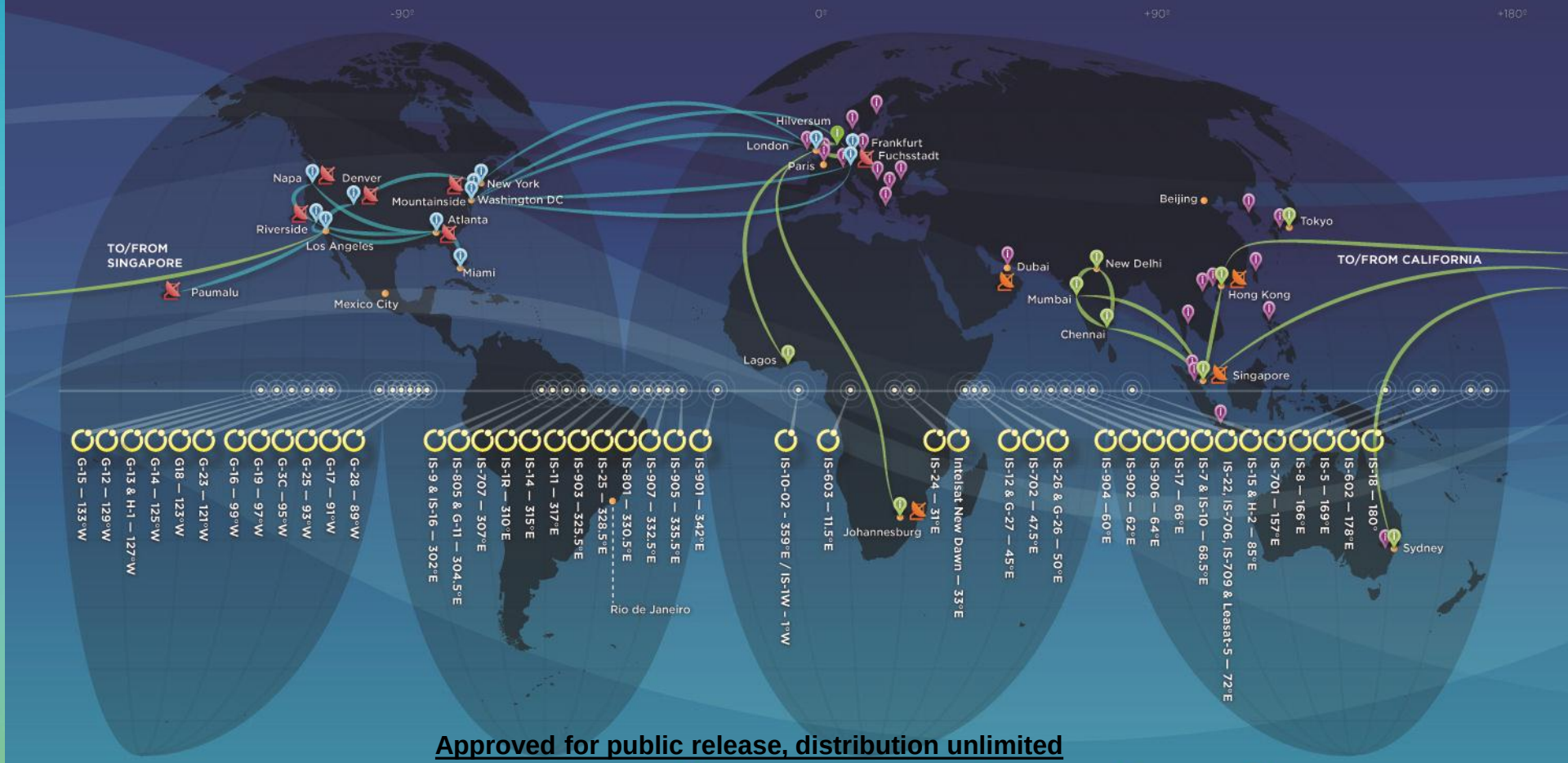
Intelsat: Global Communication Infrastructure



Global fleet of 52 geostationary satellites

IntelsatONE^{SM}: 58,000 km of fiber, IP/MPLS Cisco technology, global partners peering

Customer access to Intelsat network in over 200 major cities worldwide

Providing Mission-Critical Communications Services

Media

- Distribution of television programming–regionally and globally
- Direct-to-home platforms for service providers
- Worldwide event broadcasting

Network Services

- Completing global infrastructure
  - Cellular backhaul
  - Highly reliable enterprise networks
  - Telecom backbone
- Ubiquitous broadband for emerging regions and mobility

Government

- Reliable and secure global bandwidth
- Ground, sea and air mobile applications
- Customized end-to-end network solutions, hosted payloads

Intelsat is the Choice of Blue-chip Customers Worldwide

Media

Network Services

Government

Australian Government
Department of Defence
Defence Science and
Technology Organisation

Mission-critical services rely on superior satellite service availability

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Intelsat Launch Program

- **IS-22 was 36th consecutive Intelsat launch success, 118th launch since Early Bird**
- **Five Intelsat launches in 2012**
- **Constant Flow of Payload Hosting opportunities (UHF on IS-22)**

Sea Launch

IS-19: Q2 2012
IS-21: Q3 2012

Proton

IS-22: March 25th, 2012
IS-23: Q3 2012

Ariane 5

IS-20: Q3 2012

End of Fuel life is still #1 driver of satellite replacement

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Fleet Management: The Case for In-Orbit Servicing

- **Importance of fuel life extension**
  - **Satellites have proven robust & adaptable (IS-603 still in service)**
  - **Spacecraft technology evolutions support life extension (e.g EP)**
  - **In-orbit refueling can focus on assets most relevant to business**
  - **In-orbit "fueling" may further increase payload launch capabilities**
- **Potential for commercial or government in-orbit servicing**
  - **In-orbit servicer can help restore service after certain anomalies**
  - **Better ability to adapt fleet to fast changing market conditions**
  - **May support safe utilization of impaired assets (towing capability)**
- **Ensuring long term sustainability of human utilization of space**
  - **Protecting such unique assets as the geostationary orbit through safe, collision-free, interference-free environment (SDA) and future management of potential debris**

In-Orbit Servicing: Constraints and Requirements

- It comes down to economics for the commercial satellite operators and for the service provider
- For commercial fleet managers, advanced planning is key
  - Commercial operators need to rely on fully proven solutions
  - Qualification risks and the opportunistic nature of some of the services are not an easy fit in a commercial business plan (e.g. MDA)
- Mission safety and 100% service availability are the norm: Both opportunity and challenge for in-orbit servicing
- Multi-mission capability may drive servicing business success: Importance of advanced robotics in providing mission flexibility

Seems to call for government-supported development, qualification, launch and demo of initial in-orbit servicing capabilities

Thank You

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