

OOS Information Sharing, Operational Considerations & Safety Challenges

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Perspectives of a Geo Commercial Space Operator



FOSTERING SUSTAINABLE SATELLITE SERVICING

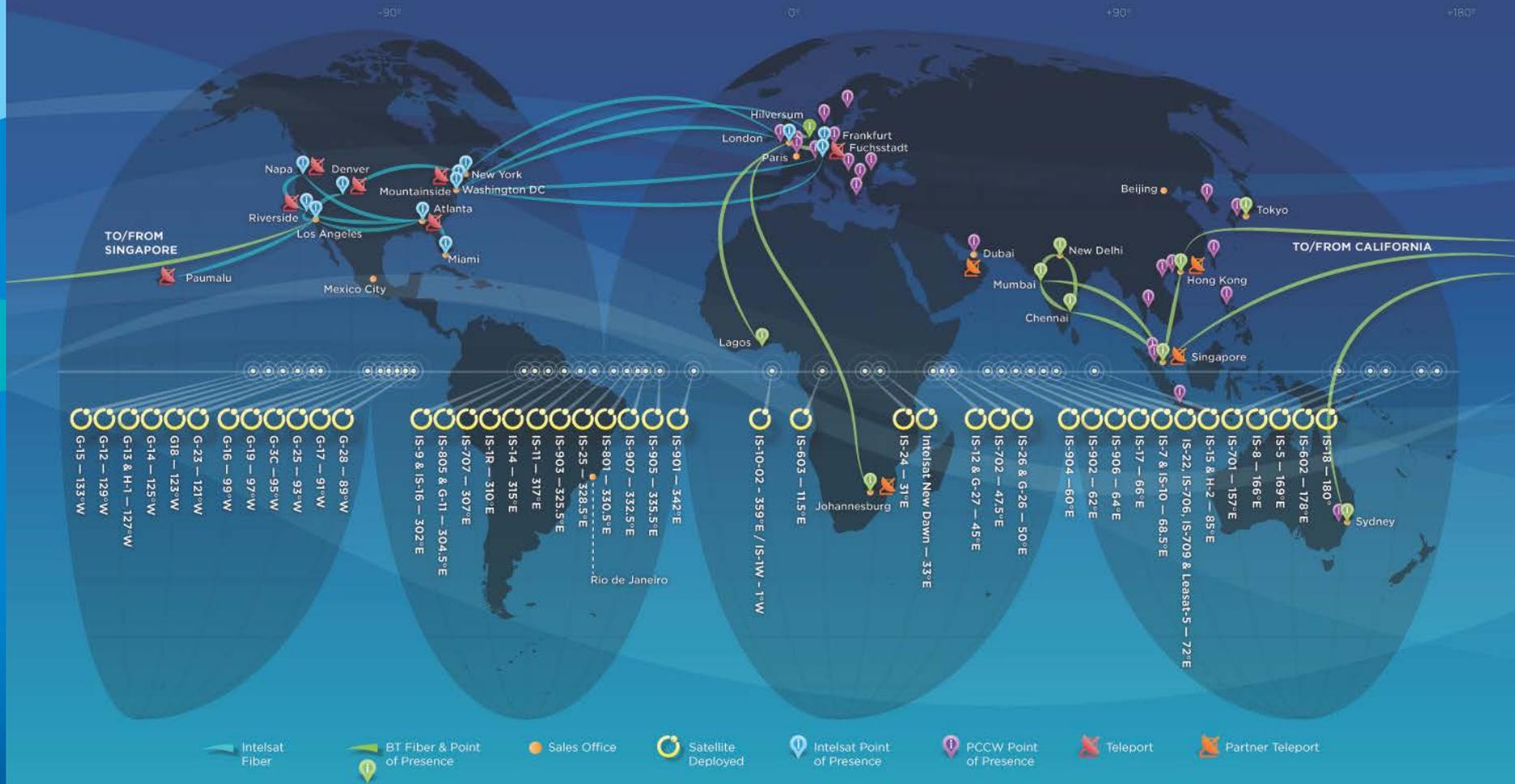
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Arlington, VA

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Intelsat: Global Communication Infrastructure



- Global fleet of 53 geostationary satellites → launch tempo 3 / year
- World-wide points of presence / teleports → leveragable for OOS
- IntelsatONESM : 48,000 km of fiber connectivity
- Considerable interest in benefits of OOS (Galaxy-15, NewDawn, Intelsat-19)

Satellite Operations Experience

- Currently 73 satellites operated
 - 53 Intelsat, 20 Third Party



Astrium E3000

Boeing 376

Boeing 381

Boeing 393

Boeing 393+

Boeing 601

Boeing 601HP

Boeing 702

Boeing 601MEO

IAI Amos 1

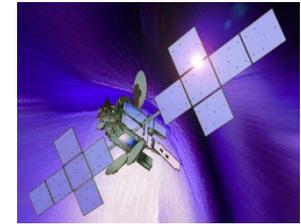
LM 7000

OSC Star 2

SSL 1300 Omega

SSL FS1300

Thales Spacebus 3000B



Significant Expertise Accumulated Since Intelsat's First Launch in 1965

Commercial Perspectives Regarding OOS

- **Return on Investment**
 - Life extension, towing
 - Rescue and inspection missions
- **Procured Services versus Procured Servicer**
 - Investment, business case challenges
 - Liability
 - Legal / policy considerations
 - Timing
- **CONOPS**
 - Servicers and hardware hosting
 - Command and control network
 - Proximity operations, rendezvous/docking, heritage?
 - Orbital debris considerations
- **Commercial objective: uninterrupted client services**
- **SDA & HPA offer conduits to commercial operators**

Operators Are Concerned About Flight Safety



SPACE DATA
ASSOCIATION

- SDA is a formal, non-profit association of satellite operators that supports the controlled, reliable and efficient sharing of data that is critical to the safety and integrity of satellite operations.
- Seeks and facilitates improvements in the safety and integrity of satellite operations through wider and improved coordination among satellite operators and to facilitate improved management of the shared resources of the space environment and the RF spectrum.
- Formed in 2009 by Inmarsat, Intelsat and SES. Now includes over a dozen owner/operators.
- SDA's automated space situational awareness system (AGI) designed to reduce the risks of on-orbit collisions and radio frequency interference leveragable for OOS.
 - Conjunction assessments
 - RF interference and geo-location support
 - Authoritative contact information for a given space object

Satellite Owner/Operators Work Together to Provide Hosted Solutions / Information to USG

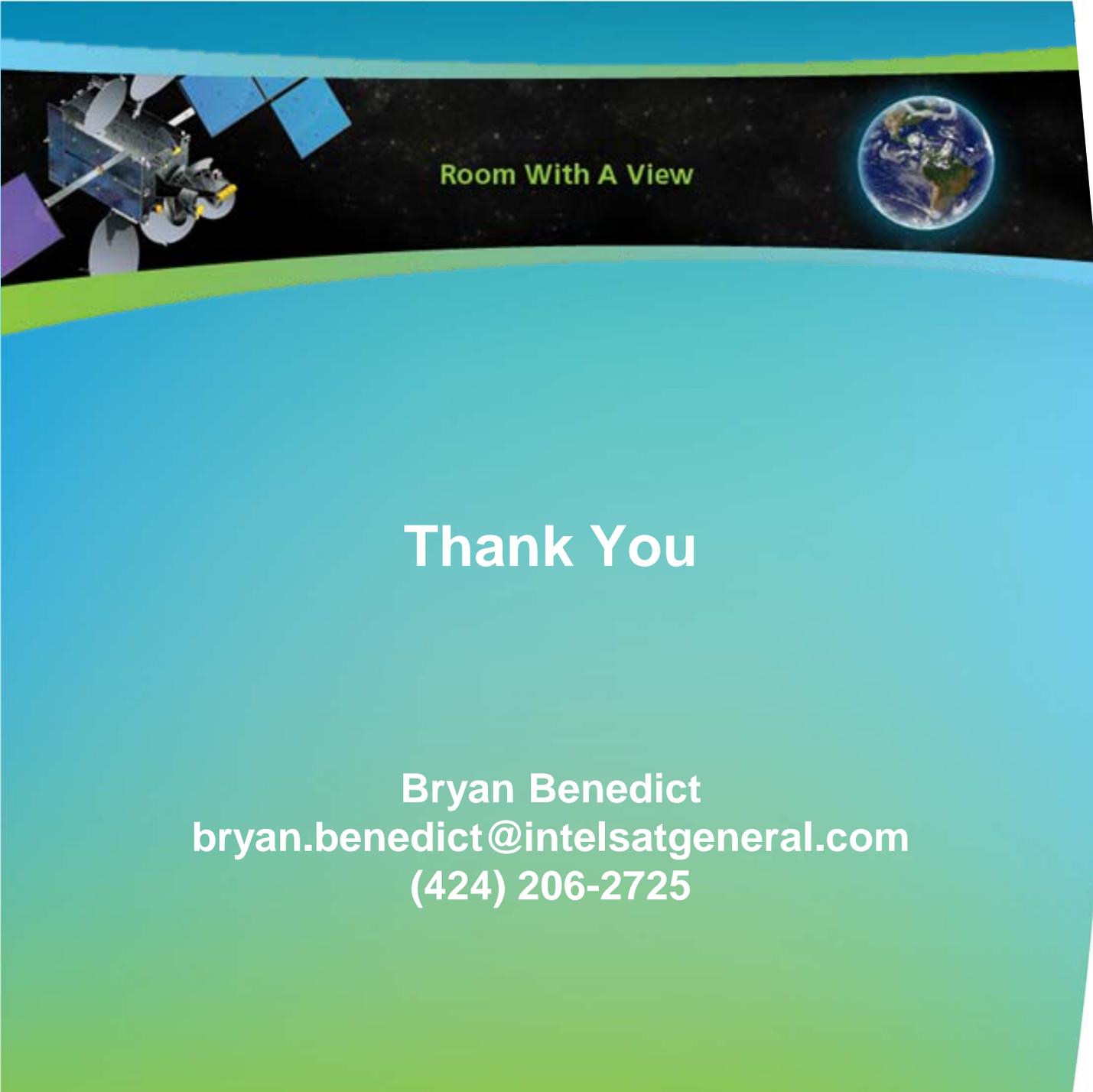


- Established in 2011, the HPA is a satellite industry alliance (owners/manufacturers/users) whose purpose is to increase awareness of the benefits of hosted government payloads on commercial satellites.
- HPA seeks to bring together government and industry in an open dialogue to identify and promote the benefits of hosted payloads.
- The U.S. National Space Policy encourages public-private partnerships with the commercial space industry (such as payload hosting) which can provide cost-effective options to meet government requirements.
- Phoenix PODS are essentially ejected hosted “hardware”, which can take advantage of frequent commercial access to geo space.
- Goal would be to develop an open technology which could be used by all spacecraft manufacturers for both their large and small satellite customers → maximize hosted opportunities.

Closing Perspectives



- About 4% of all satellites launched could benefit by early-life “attention”. Almost all could benefit by life extension at EOL (business case driven).
- On-orbit servicing can and eventually will provide solutions for a number of on-orbit issues. First agency/company with demonstrated IOC will likely pick up bulk of commercial business.
- Only when OOS becomes “heritage” will commercial operators permit dependency on servicing for mission execution.
- SDA & HPA possible paths to reach out to commercial sector.
- With the largest number of Geo spacecraft and the greatest quantity of launches, Intelsat has a vested interest in the success of this technology → looking for service providers to step forward.
- Without the commitment of major satellite owner-operators and the advocacy/support of the USG, risks/unknowns associated with commercial OOS may inhibit timely realization of full potential.



Room With A View



Thank You

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