Challenges in Providing Satellite Services for Today's Mobility Markets

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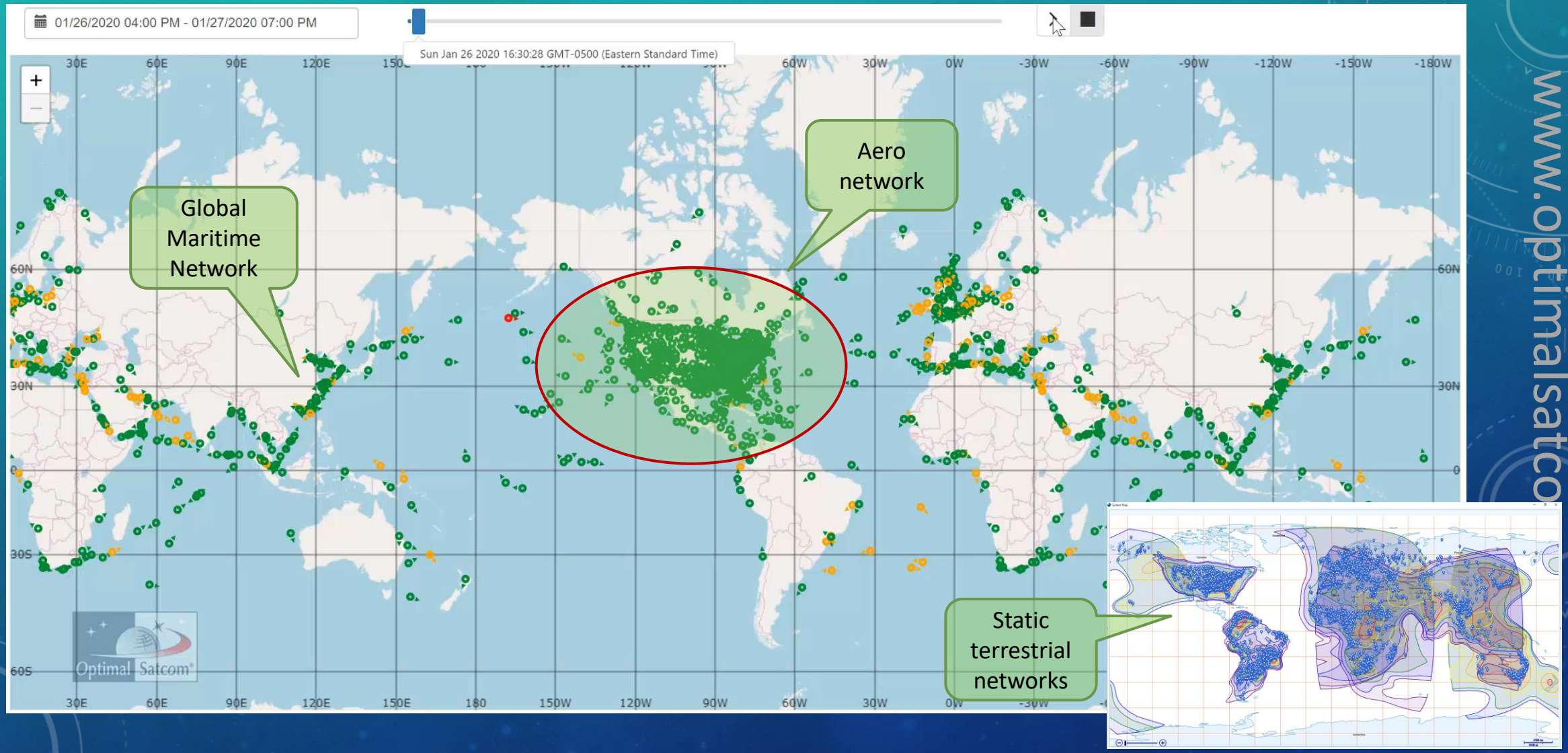
Introduction

- Mobility is increasingly a driver for the commercial satellite communications market
- Increasing bandwidth demands from individual terminals mean that traditional approaches to providing services are no longer feasible – there is too much aggregate demand and the demand is too dynamic:
  - Spatial variation – terminals and demand moves to different geographical areas
  - Temporal variation – demand changes substantially over time, including time-of-day variations

Challenges of Providing Services in Today's Environment



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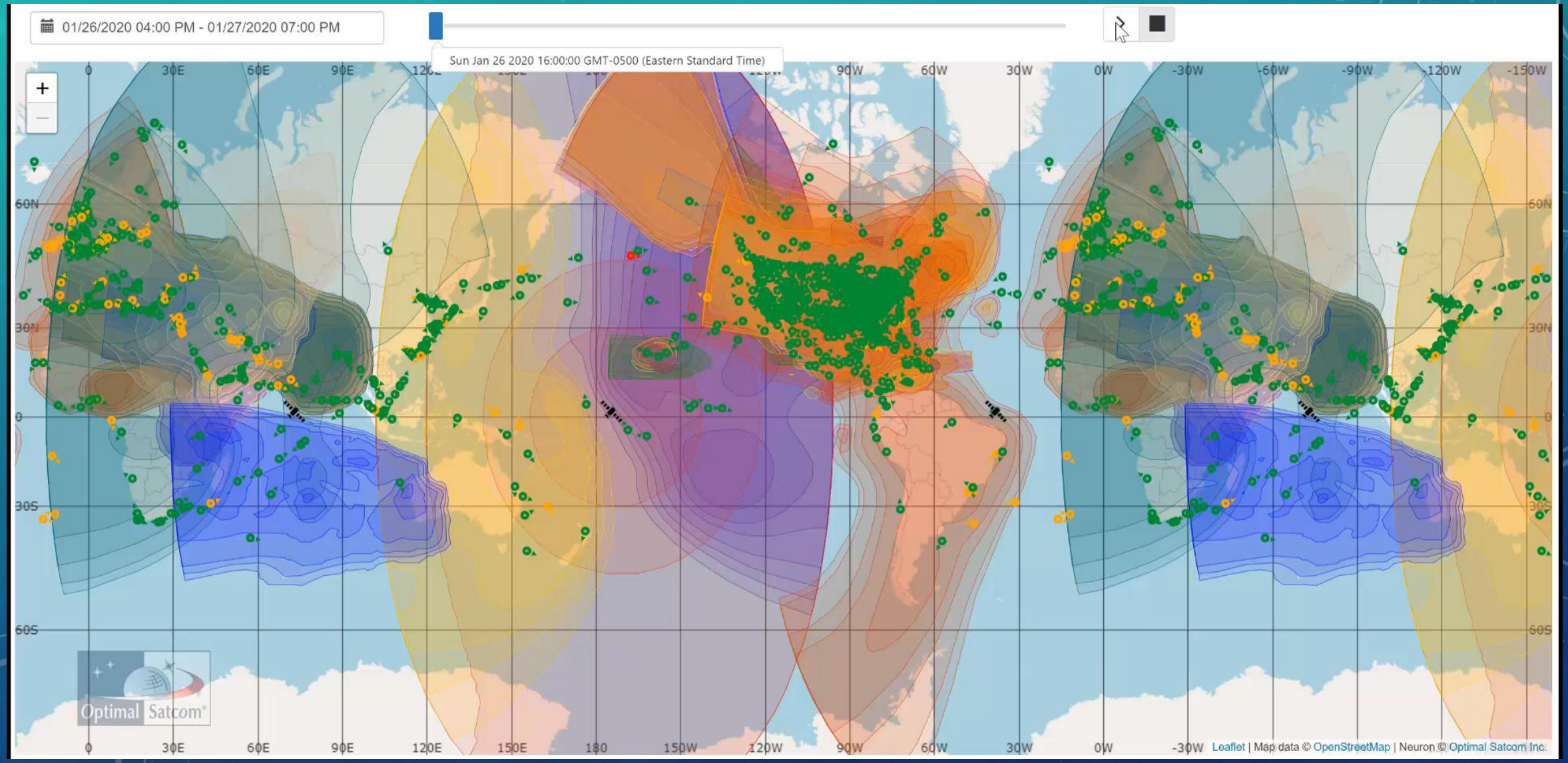
Services on a Global Wide-Beam Satellite Network



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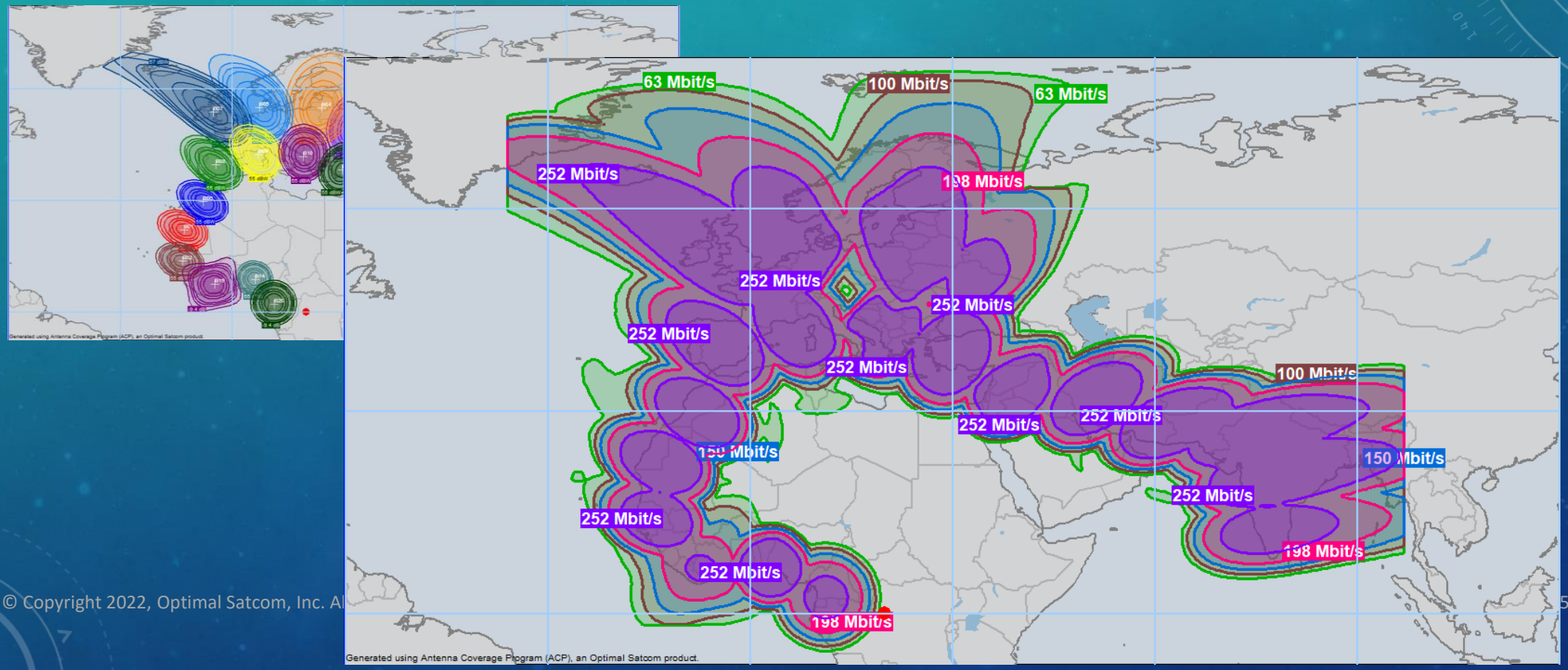
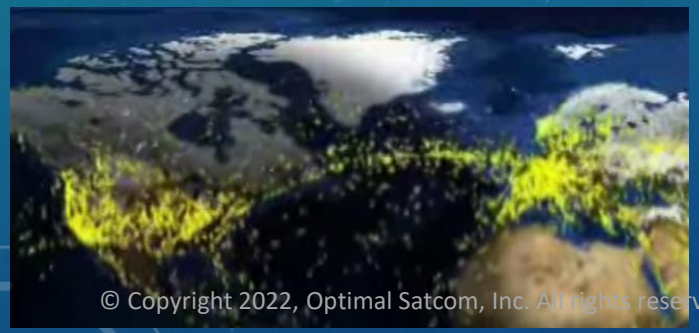
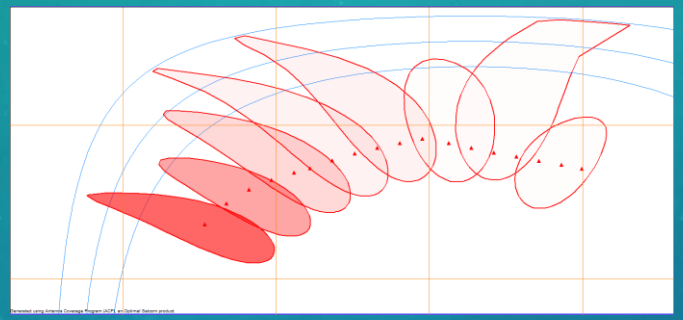
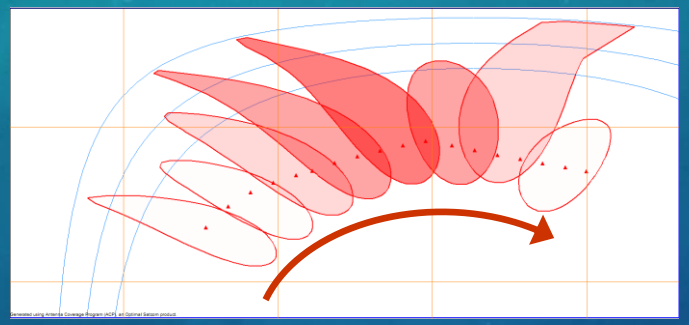
Spectral Efficiency:
HTS Beams Provide Much Higher Throughput But Services Often Need to Span Multiple Beams

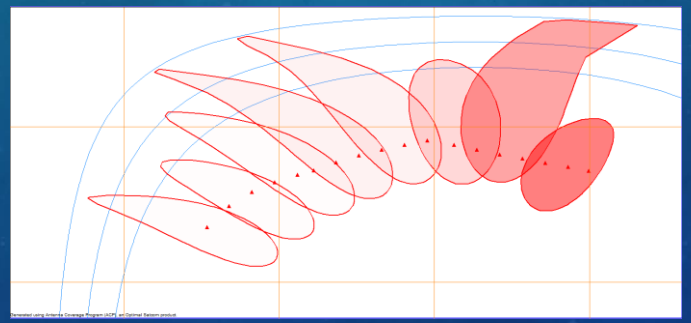


Changing Traffic Patterns Require Dynamic Reallocation of Capacity

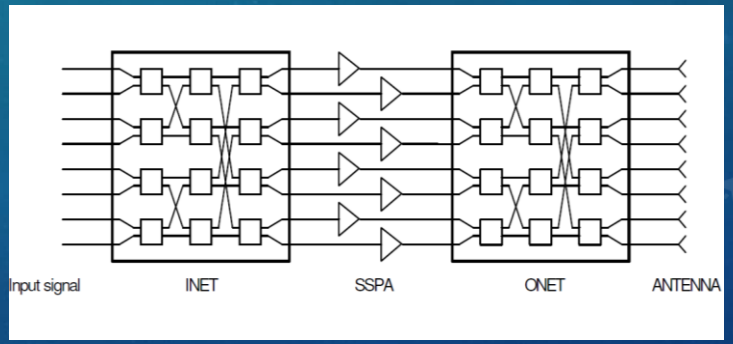






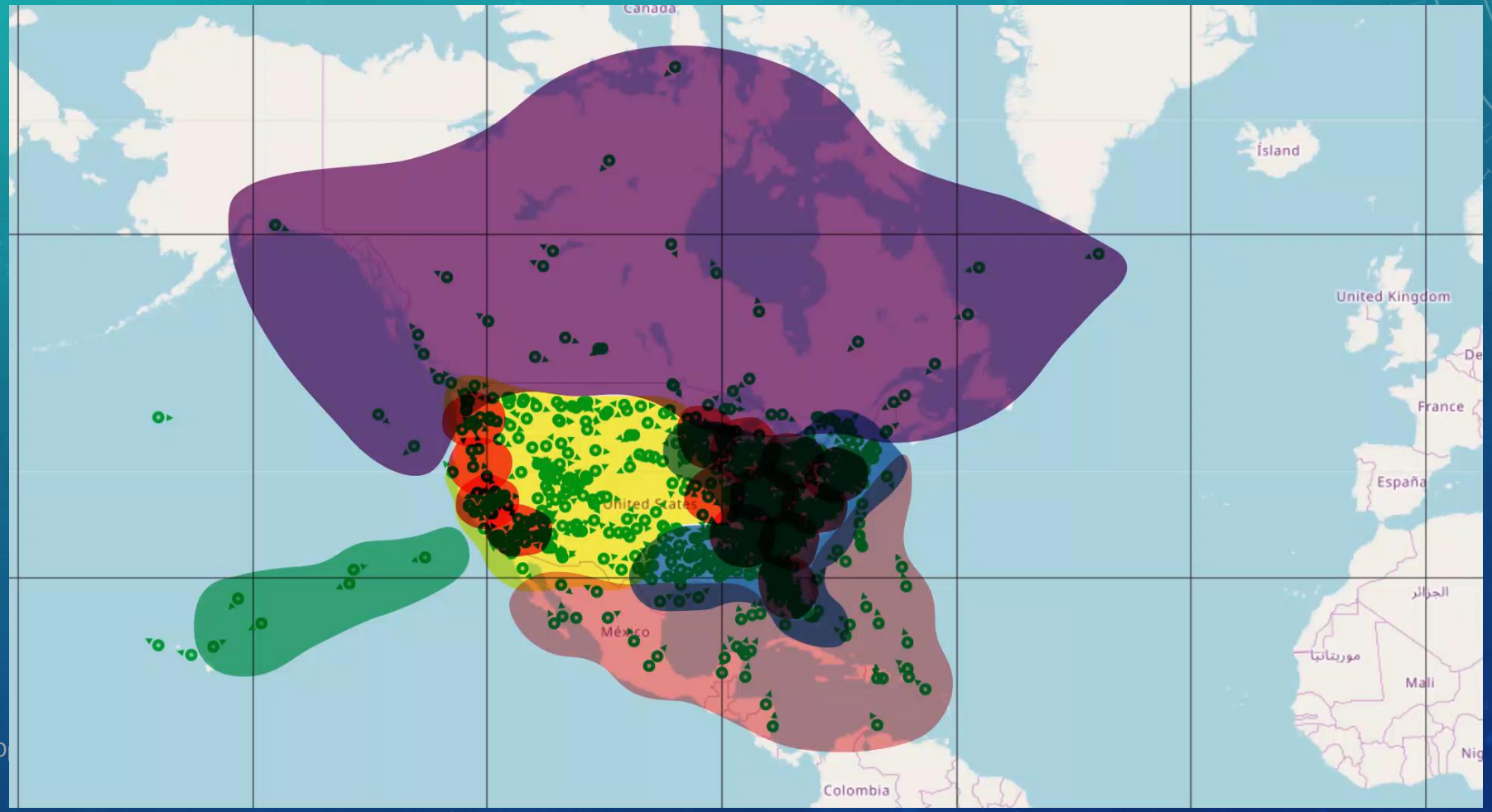


As demand changes, capacity is dynamically moved to higher-demand areas following traffic patterns



Passive approaches like multi-port amplifiers can redistribute power across beams for simple cases.

Service-Responsive Software Defined Satellite Configurations Can Dynamically Adapt Coverage to Meet Service Requirements



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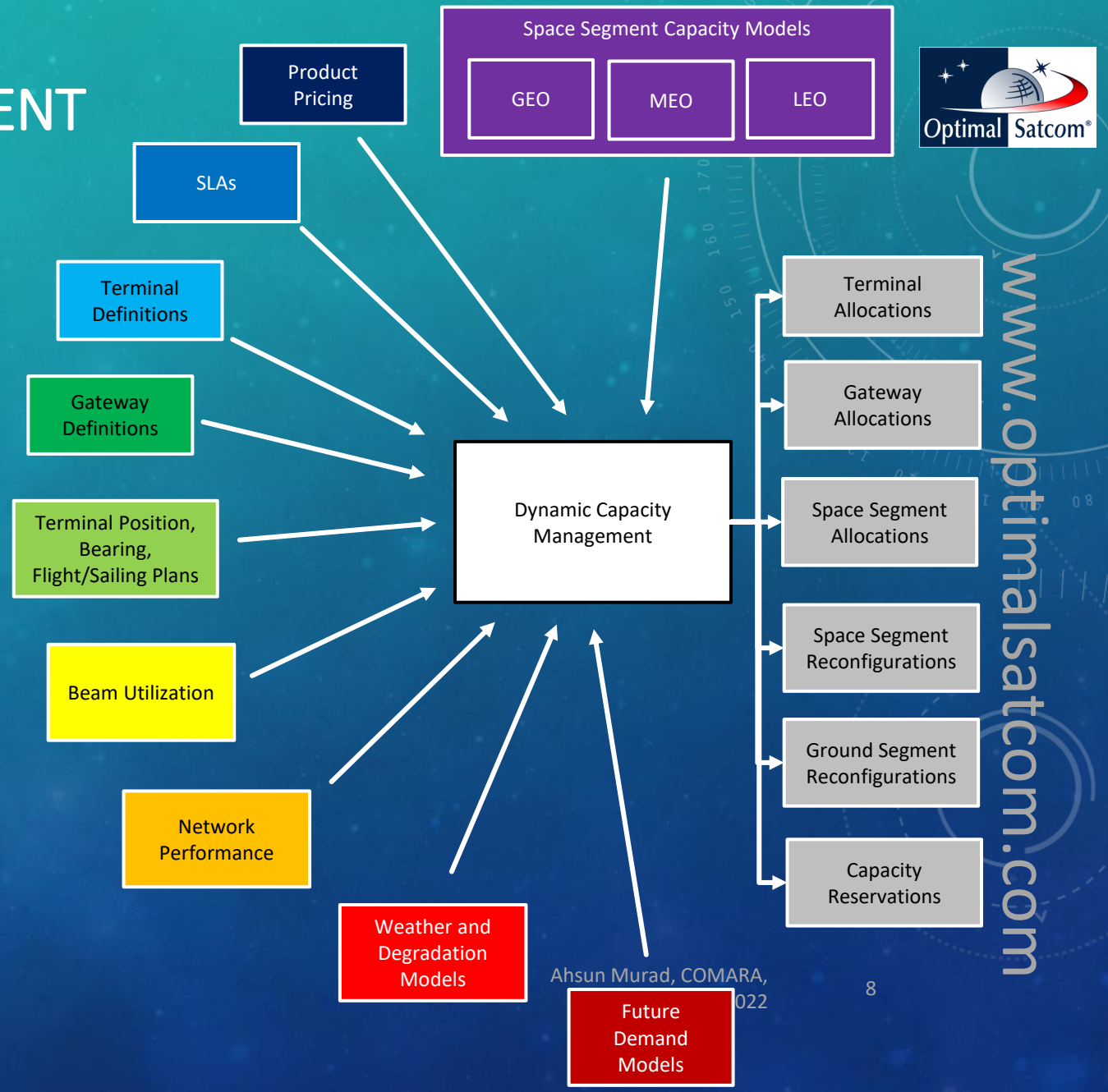
Dynamic Capacity Management

- Dynamic capacity management systems take into account:
  - Real-time demand
  - Capacity availability
  - Terminal compatibility, SLAs and service compatibility
  - Network performance
  - Beam congestion
  - Weather degradation predictions
  - Capacity costs
- To dynamically allocate terminals to networks, and reconfigure space segment to optimally allocate capacity across diverse capacity:
  - GEO Wide Beams
  - GEO HTS Multi-Beam
  - MEO and LEO constellations



THANK YOU!