CONNECTED
AVIATION SUMMIT® 2023

Digital Transformation, AI & Innovation

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Market Insights Unveiled - NetForecast Overview

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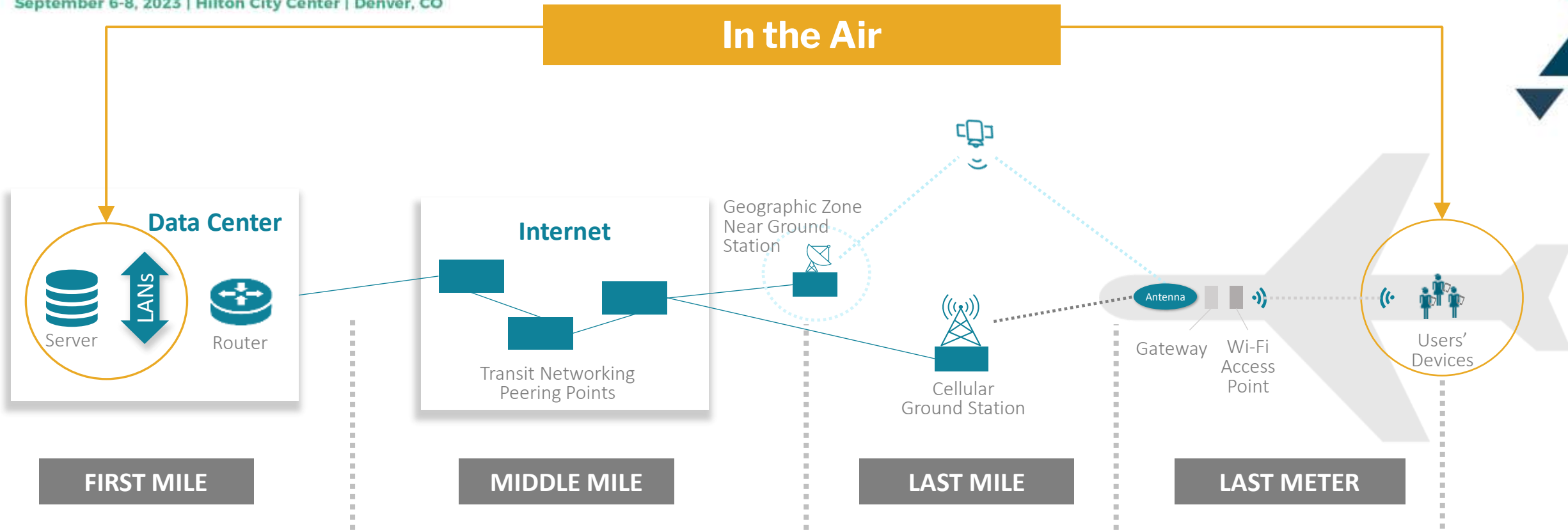Director of Business Development - Transportation

NetForecast – Who We Are

- NetForecast has been <u>independently</u> measuring, assessing, and reporting internet customer quality of experience (QoE) for over 25 years

- Our founder was literally "in the room where it happened" in the early days of the Internet – the ARPANET

- We currently focus on three areas of Internet usage

  - Residential

  - Inflight Connectivity (IFC)

  - Airport Ground Cellular Services

We Measure the End-to-End Experience

In the Air

Data Center

Server | LANs | Router

Internet

Transit Networking Peering Points

Geographic Zone Near Ground Station

Cellular Ground Station

Antenna | Gateway | Wi-Fi Access Point

Users' Devices

FIRST MILE

MIDDLE MILE

LAST MILE

LAST METER

Challenges with GeoSat IFC Performance - Insights

Demanding IFC Environment

IFC networks are subject to significant service interruptions that adversely affect the user experience

60% of flights show service interruptions and 7% of flights have such frequents failures that QoE cannot be calculated

Low Upstream (aka Return) Bandwidth

Based on data collected from multiple IFC service providers, upstream bandwidth is usually so slow it adversely impacts some passenger activities

Many flights experience average upstream speeds of .06mbps or slower
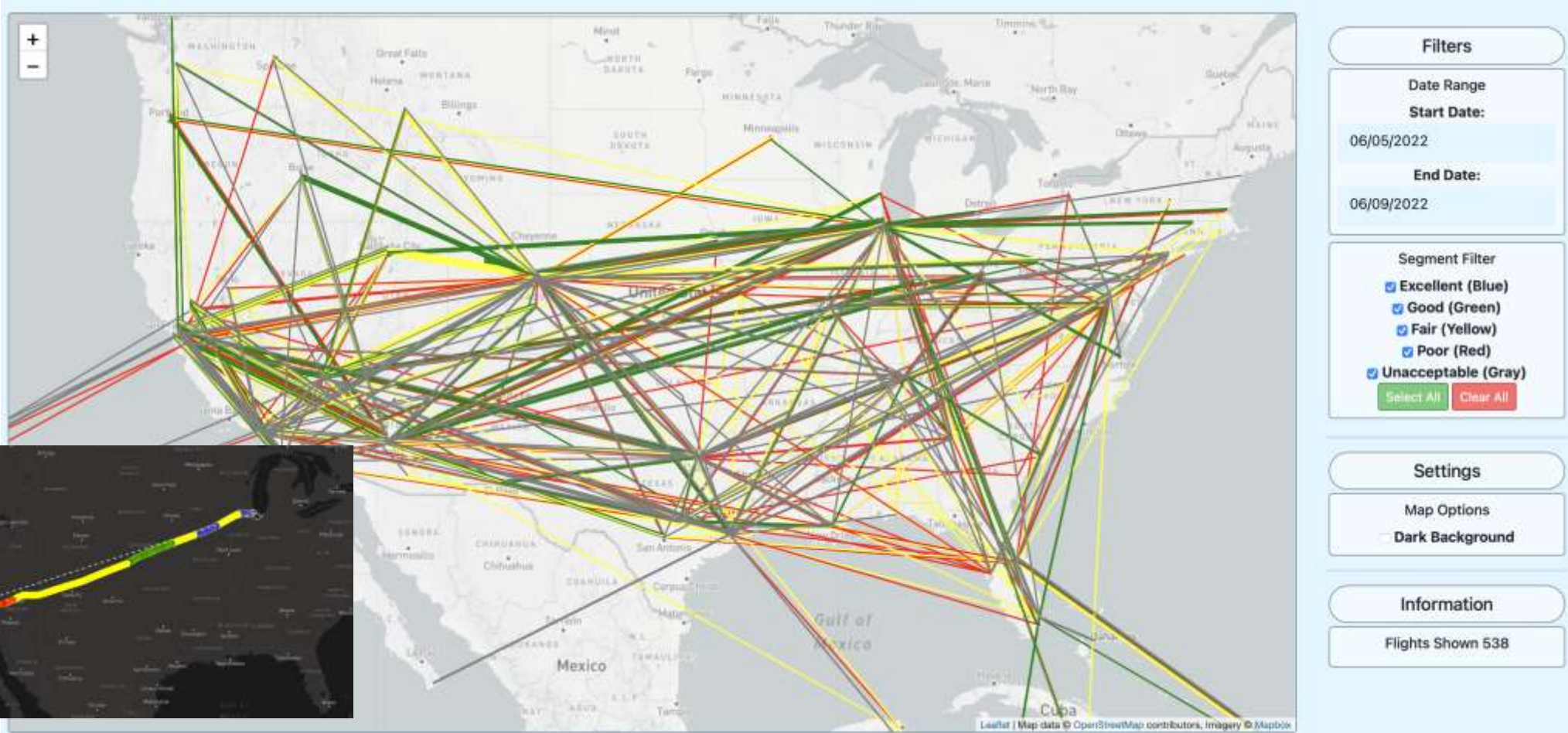
Multiple Latency Sources

Geosynchronous orbits contribute to long latency

IFC provider network routing and peering choices can increase latency by 10% to 15%

Performance-enhancing proxies and traffic shaping can also increase latency

Sample QoE Flight Map

Benefits of End-to-End Testing
In the Air

- Enables airlines and service providers to identify weaknesses in the network – from cabin to last data center

- Supports airlines in making business decisions regarding the selection of new services / upgrades to current systems

- Provides a simple to communicate QoE score for analysis and comparison by airline management
  - Airlines with multiple services installed on aircraft can use QoE scores to compare services and identify areas for improvement

- Near-Real-Time information can inform airline employees of issues enabling proactive communications to inflight crew and customers
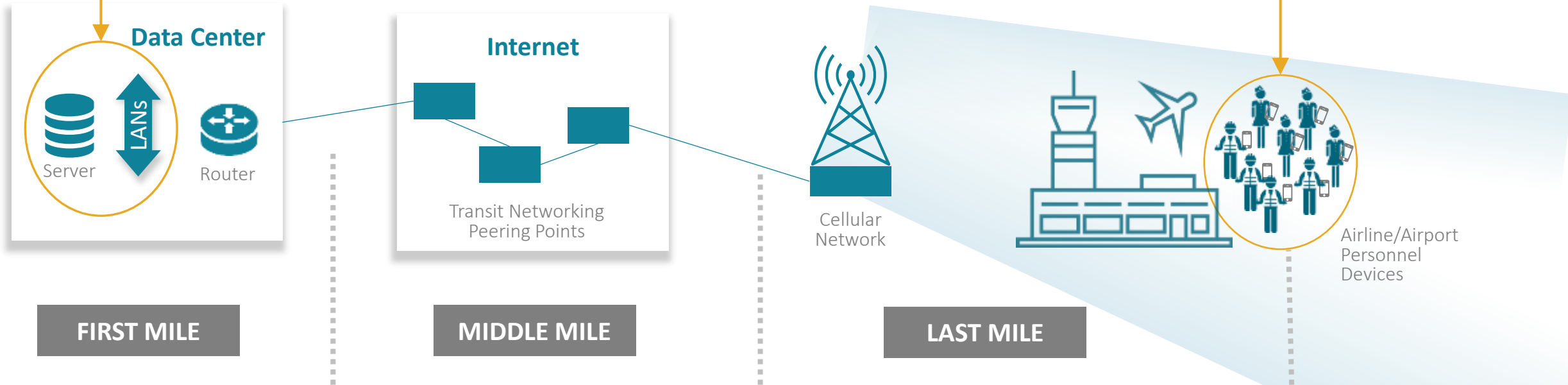
Sample Airport Cellular Coverage Maps

- Improved cellular services enable airlines to improve ground operations
- QMap Airport app can be installed on multiple types of devices used at airport
  - Baggage Handlers
  - Tech Ops
  - Pilots
- Supports airlines and airports in making business decisions regarding the selection and oversight of cellular service providers at airports
- Provides a simple to communicate score for analysis and comparison by airline management
  - Airlines using multiple services to support ground operations can use data to compare services and identify areas for improvement