

# IoT1937 - Splunk at the Speed of Flight – Delivering Critical Passenger Cabin Services

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# Why Are We Here?

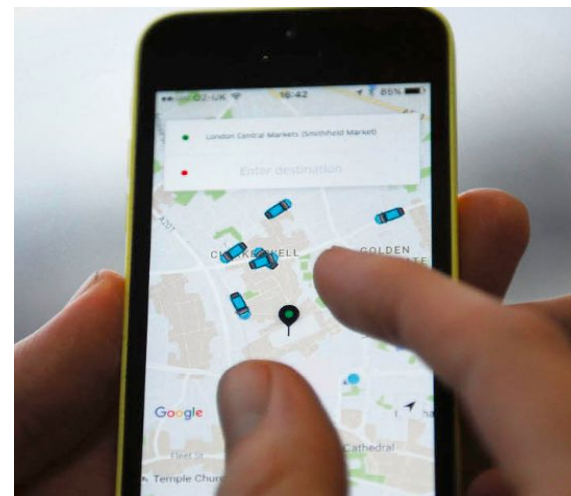
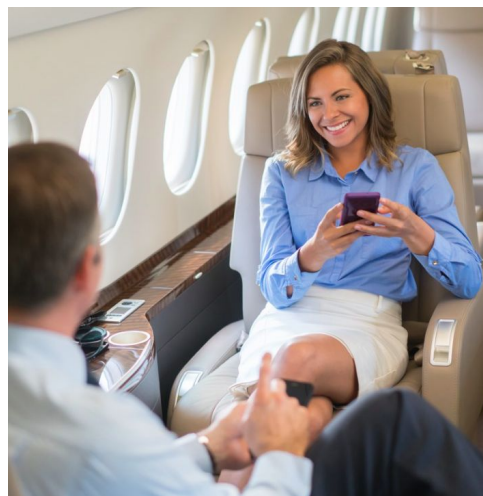
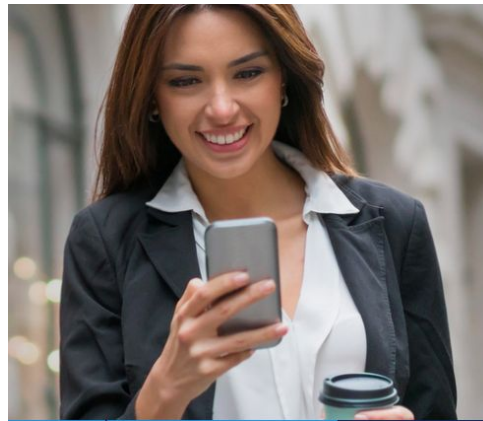
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Internet Everywhere

# The Internet is Everywhere

On the street ...

- On the street...
- In our homes ...
- To plan our travel ...
- When we travel...



# SD Xperience Video



# Customer Expectations Are No Different Inflight

- Private owners
- Charter companies
- Fortune 100 flight operations
- Users on the aircraft

**Exceedingly high expectations of internet  
access while traveling!**

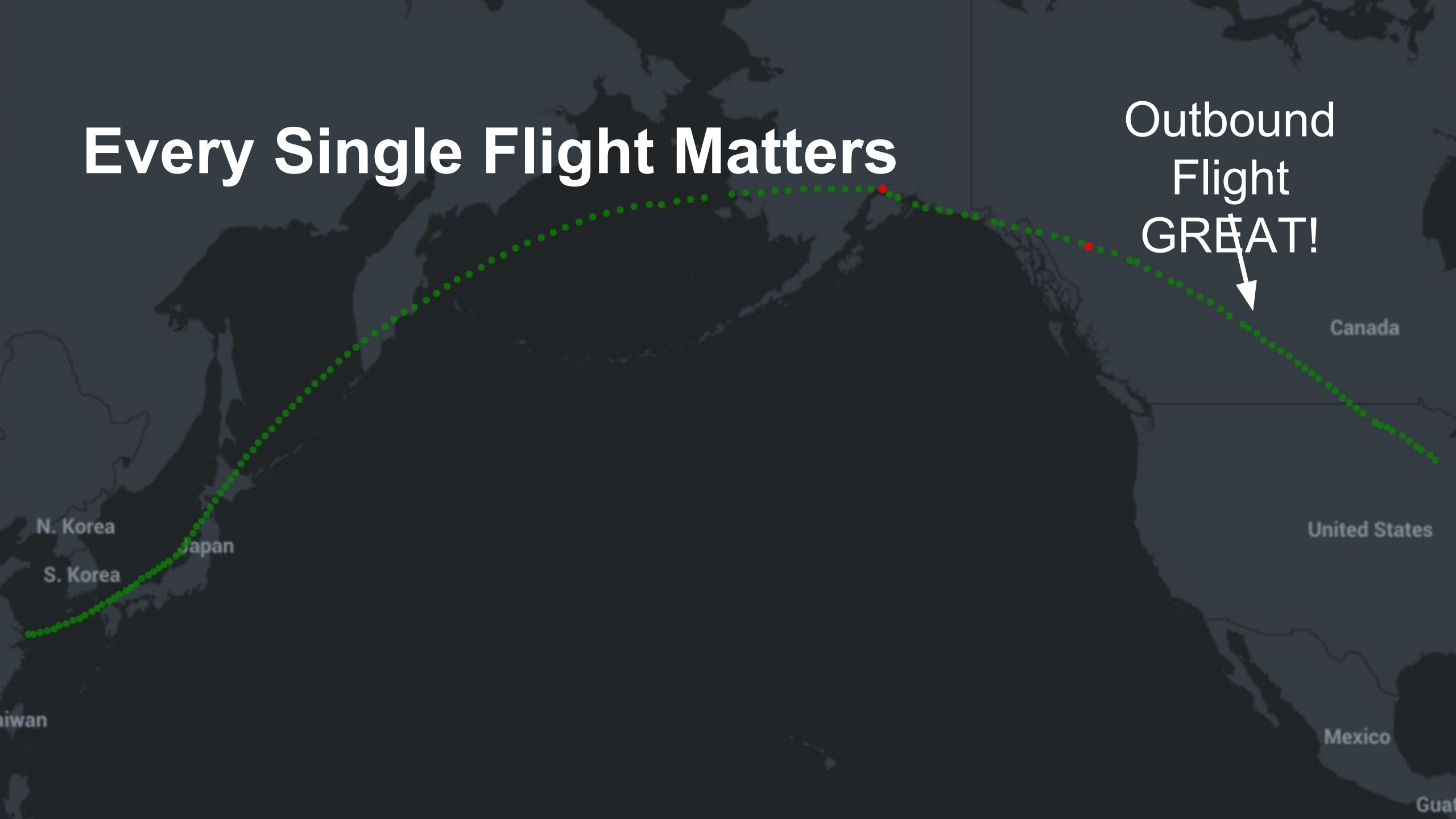


[illegible]



# Every Single Flight Matters

Outbound  
Flight  
**GREAT!**



# Every single flight matters



Outbound  
Flight  
**GREAT!**



Canada

United States

Mexico

Guatemala

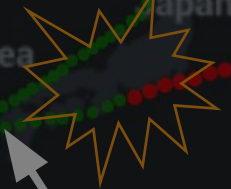
N. Korea

S. Korea

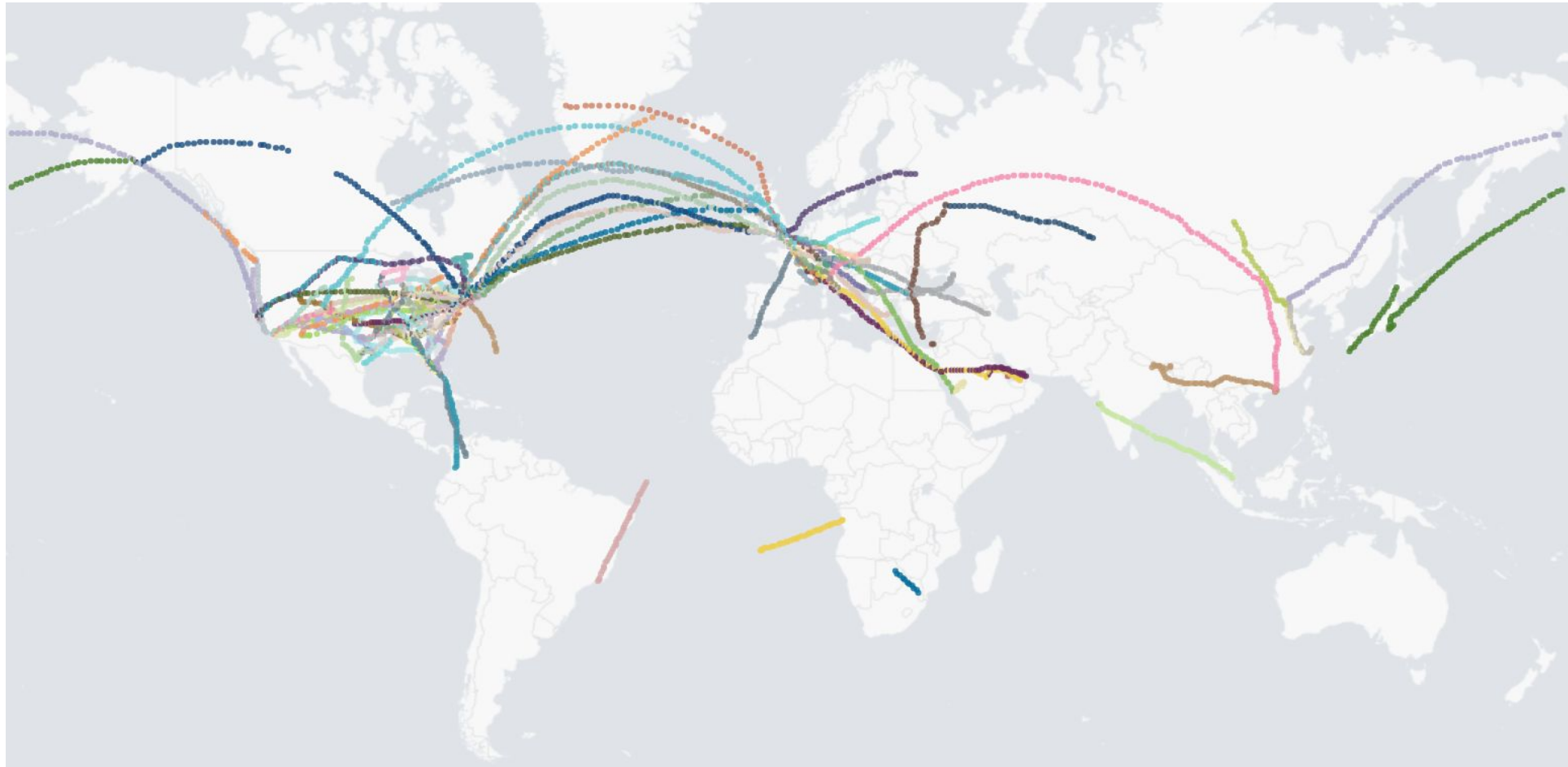
Japan

Taiwan

Return Flight **OUCH!**

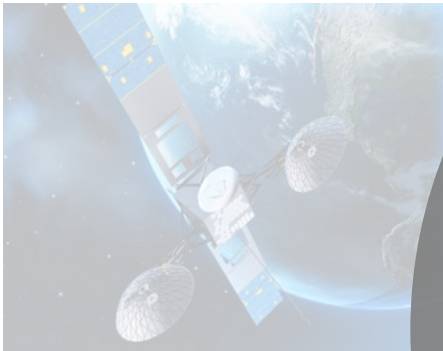


# Where's the problem?





# Who Is Responsible?



## Satellite Operators

- Inmarsat
- Intelsat
- ViaSat



## Aircraft Manufacturers

- Gulfstream
- Dassault
- Bombardier

# Initial Effort

## Availability Centric

Very Manual,  
Not Scalable

```
cdamiano@R90N7BH9-2955-L ~  
$ ping airplane1
```

```
cdamiano@R90N7BH9-2955-L ~  
$ ping 192.16.81.17
```

```
pinging 192.16.81.17 with 32 bytes of data:  
request timed out.  
request timed out.  
request timed out.  
request timed out.
```

```
ping statistics for 192.16.81.17:  
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss)
```

```
cdamiano@R90N7BH9-2955-L ~  
$
```

# Automated ICMP Ping with Splunk

# Total Active Aircraft			# Aircraft InFlight and InNetwork				# Aircraft InFlight & Terminal Offline			
43			16				2			
Tail ↕	ACM ↕	Status ↕	TailNumber ↕	FlightStatus ↕	IP ↕	Status ↕	TailNumber ↕	FlightStatus ↕	IP ↕	Status ↕
XX - XX.XX.XX.XX	XX	PING OK - Packet loss = 0%, RTA = 848.78 ms	XX	InFlight	X.X.X.X	PING OK - Packet loss = 0%, RTA = 848.78 m	XX	InFlight	X.X.X.X	CRITICAL - Plugin timed out
XX - XX.XX.XX.XX		PING OK - Packet loss = 0%, RTA = 736.81 ms	XX	InFlight	X.X.X.X	PING OK - Packet loss = 0%, RTA = 726.81 m	XX	InFlight	X.X.X.X	CRITICAL - Plugin timed out
XX - XX.XX.XX.XX	XX	PING OK - Packet loss = 0%, RTA = 726.81 ms	XX	InFlight	X.X.X.X	PING OK - Packet loss = 0%, RTA = 808.72 m				
XX-XX-XX - XX.XX.XX.XX		PING OK - Packet loss = 0%, RTA = 942.29 ms	XX	InFlight	X.X.X.X	PING OK - Packet loss = 0%, RTA = 665.25 m				
XX - XX.XX.XX.XX	XX	PING OK - Packet loss = 0%, RTA = 915.90 ms	XX	InFlight	X.X.X.X	PING OK - Packet loss = 0%, RTA = 919.83 m				
XX - XX.XX.XX.XX	XX	PING OK - Packet loss = 0%, RTA = 808.72 ms	XX	InFlight	X.X.X.X	PING OK - Packet loss = 0%, RTA = 811.93 m				
XX - XX.XX.XX.XX	XX	PING OK - Packet loss = 0%, RTA = 689.39 ms	XX	InFlight	X.X.X.X	PING OK - Packet loss = 0%, RTA = 650.21 m				
XX - XX.XX.XX.XX	XX	PING OK - Packet loss = 0%, RTA = 684.67 ms	XX	InFlight	X.X.X.X	PING OK - Packet loss = 20%, RTA = 783.06 m				
XX - XX.XX.XX.XX	XX	PING OK - Packet loss = 0%, RTA = 711.11 ms	XX	InFlight	X.X.X.X	PING OK - Packet loss = 0%, RTA = 828.27 m				
XX - XX.XX.XX.XX	XX	PING OK - Packet loss = 0%, RTA = 771.03 ms	XX	InFlight	X.X.X.X	PING OK - Packet loss = 0%, RTA = 693.24 m				
XX - XX.XX.XX.XX	XX	PING OK - Packet loss = 0%, RTA = 737.12 ms	XX	InFlight	X.X.X.X	PING OK - Packet loss = 0%, RTA = 642.25 m				
XX - XX.XX.XX.XX	XX	PING OK - Packet loss = 0%, RTA = 665.25 ms	XX	InFlight	X.X.X.X	PING OK - Packet loss = 0%, RTA = 755.73 m				
XX - XX.XX.XX.XX	XX	PING OK - Packet loss = 0%, RTA = 919.83 ms	XX	InFlight	X.X.X.X	PING OK - Packet loss = 0%, RTA = 810.84 m				
XX - XX.XX.XX.XX	XX	PING OK - Packet loss = 0%, RTA = 674.47 ms	XX	InFlight	X.X.X.X	PING OK - Packet loss = 0%, RTA = 648.15 m				
XX - XX.XX.XX.XX	XX	PING OK - Packet loss = 0%, RTA = 850.93 ms	XX	InFlight	X.X.X.X	PING OK - Packet loss = 0%, RTA = 755.80 m				
XX - XX.XX.XX.XX	XX	PING OK - Packet loss = 0%, RTA = 916.46 ms	XX-XX	InFlight	X.X.X.X	PING OK - Packet loss = 0%, RTA = 960.77 m				
XX - XX.XX.XX.XX	XX	PING OK - Packet loss = 0%, RTA = 811.93 ms								
XX - XX.XX.XX.XX	XX	PING OK - Packet loss = 0%, RTA = 807.50 ms								
XX - XX.XX.XX.XX	XX	PING OK - Packet loss = 0%, RTA = 677.88 ms								
XX - XX.XX.XX.XX	XX	PING OK - Packet loss = 20%, RTA = 857.26 ms								
XX - XX.XX.XX.XX	XX	PING OK - Packet loss = 0%, RTA = 779.83 ms								



# A Universal Quality of Experience “Standard”

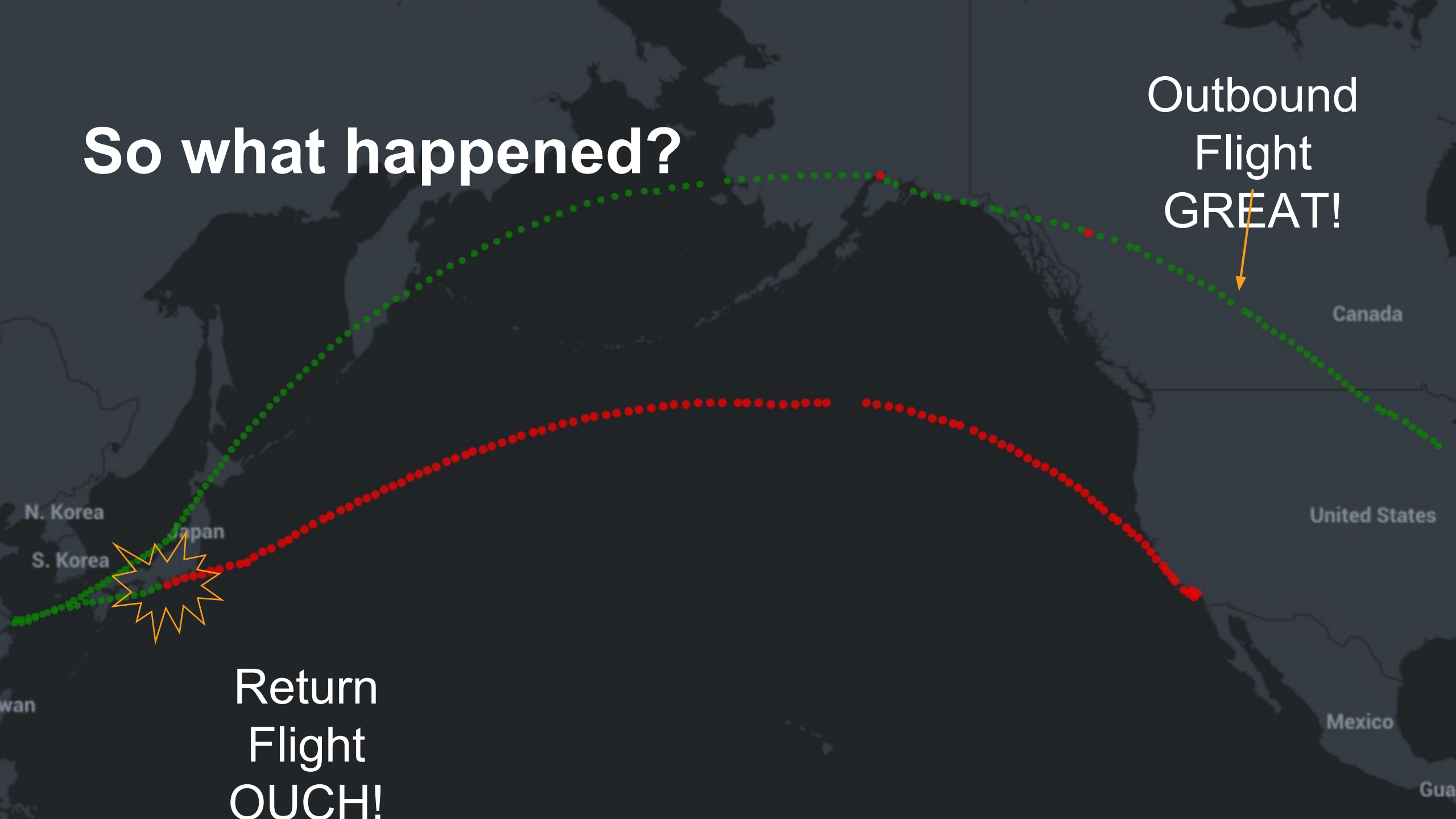


# So what happened?

Outbound  
Flight  
GREAT!



Return  
Flight  
OUCH!



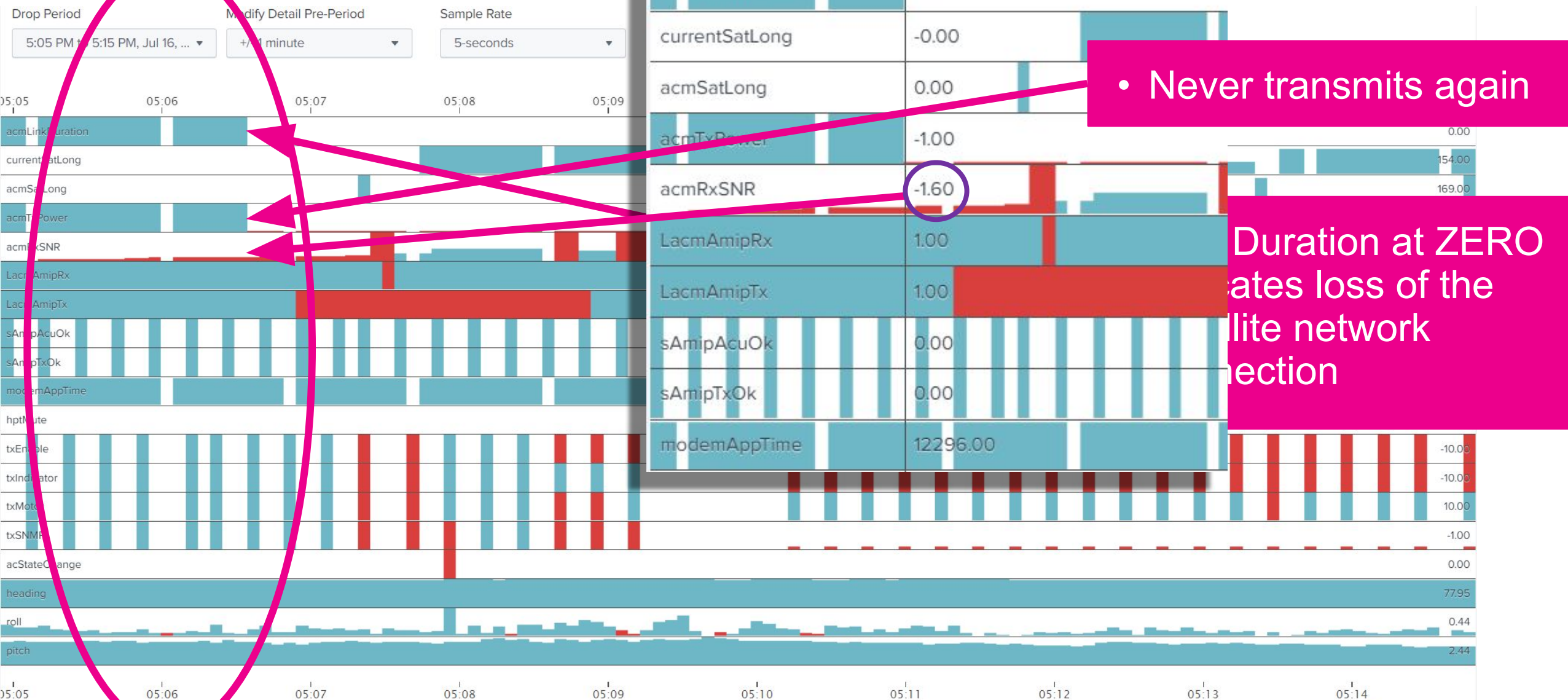
# Align Everyone – Shift to Time History of





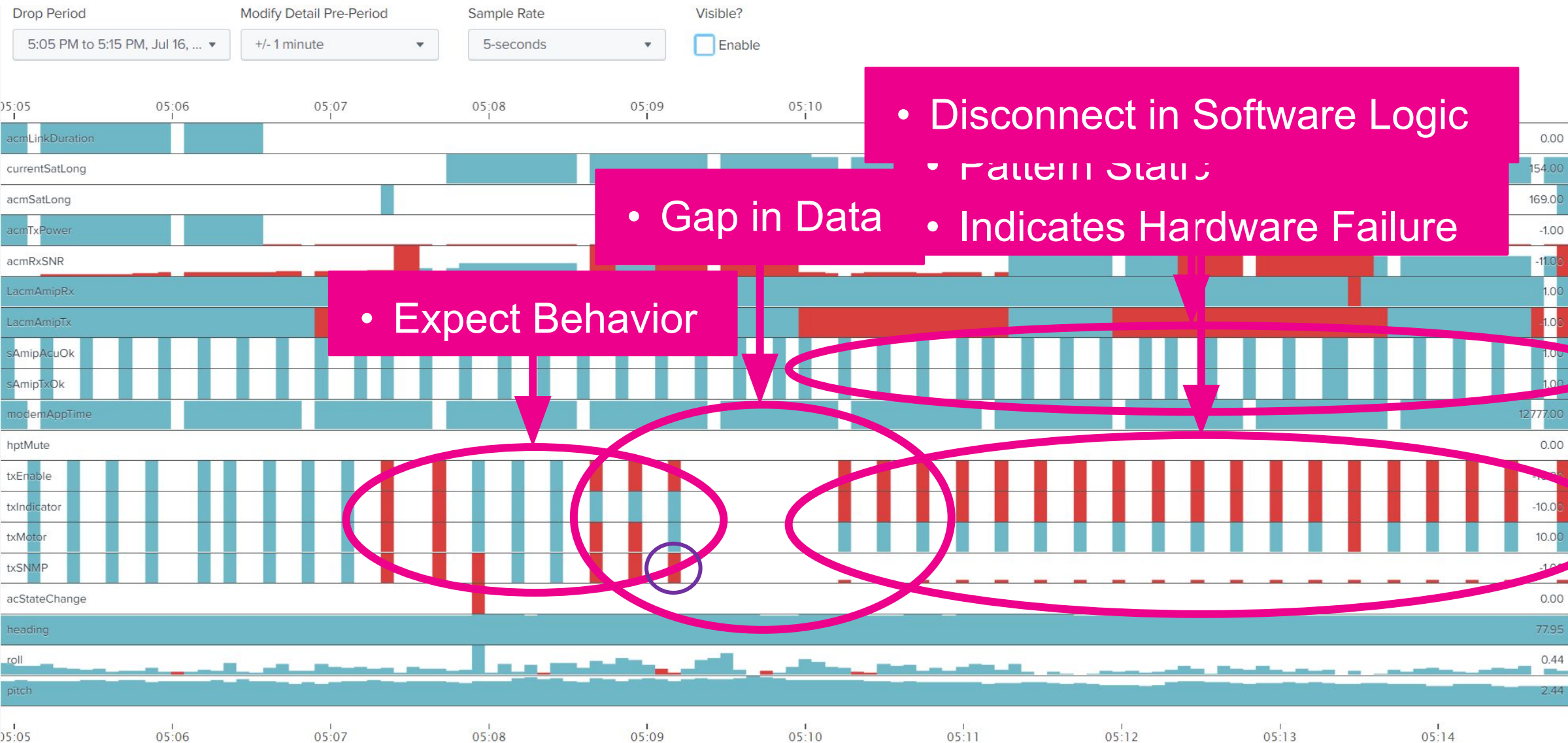
# So What Does This

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# So What Does This Tell Us?

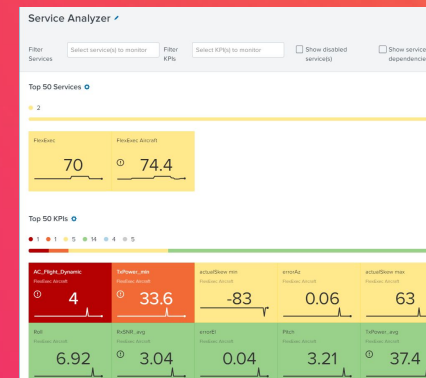
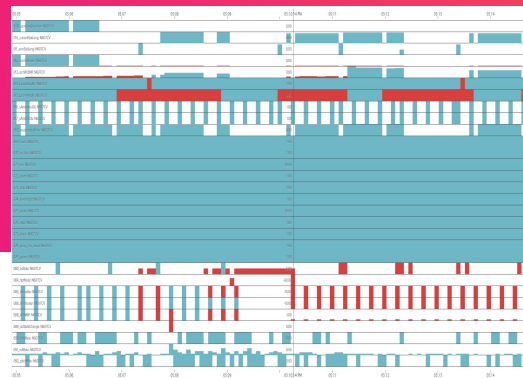
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# Challenge: How to Empower Tier 1?

Restore Service Sooner to the Customers – Queue ITSI





# ITSI Implementation Methodology

## SERVICE DECOMPOSITION

What is the service to be monitored?

What are the components of the service?

What are the KPIs per service?

Define KPI Thresholds

**Identify data sources for each KPI**

**Onboard missing data into Splunk**

*Pre Workshop  
Prep*

*2<sup>nd</sup> Day  
Session*

Show value!  
(Executive Presentation)

Realtime Service Insights

Multi KPI Alerts

Create Glass Tables

Create Deep Dives

Create KPIs, tune thresholds

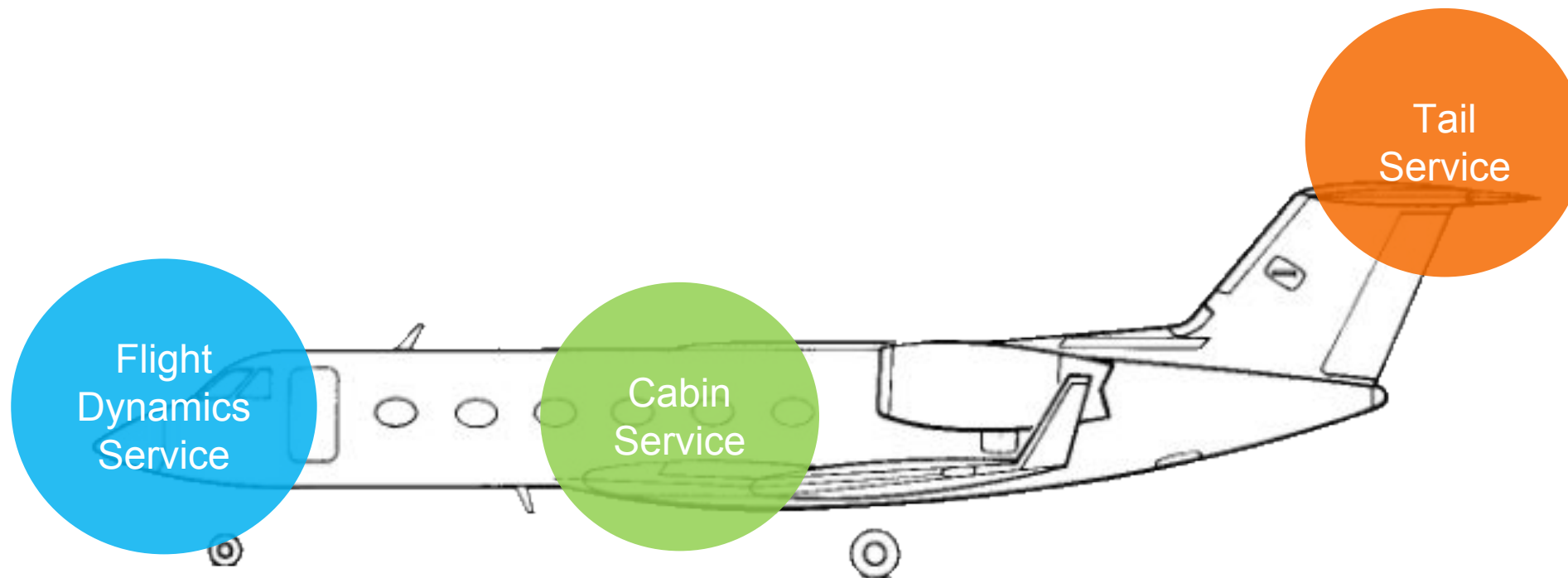
Create Services, Dependencies

Service Decomposition w/stakeholders *1<sup>st</sup> ½ Day Session*

Ready for ITSI

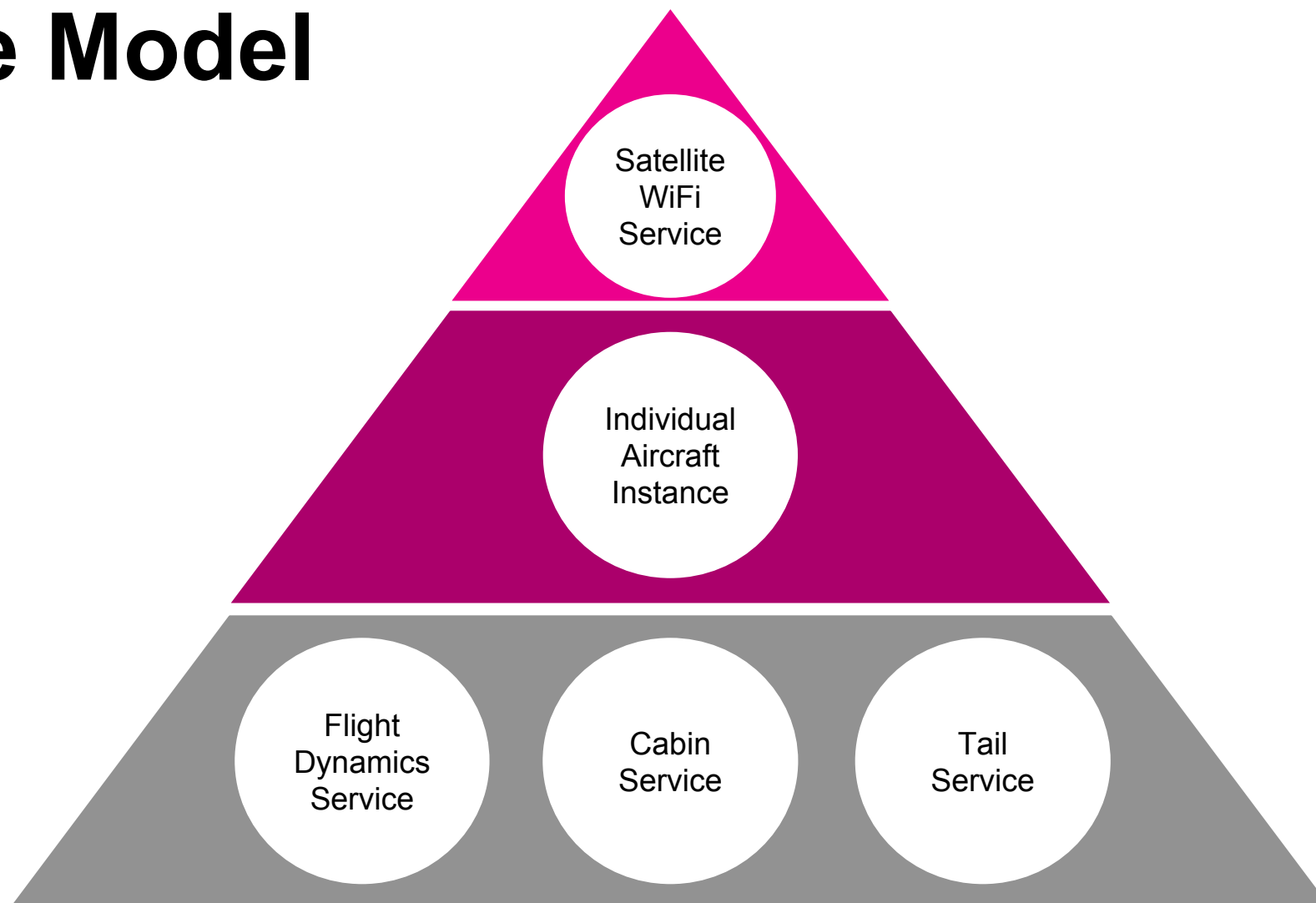


# Service Analysis



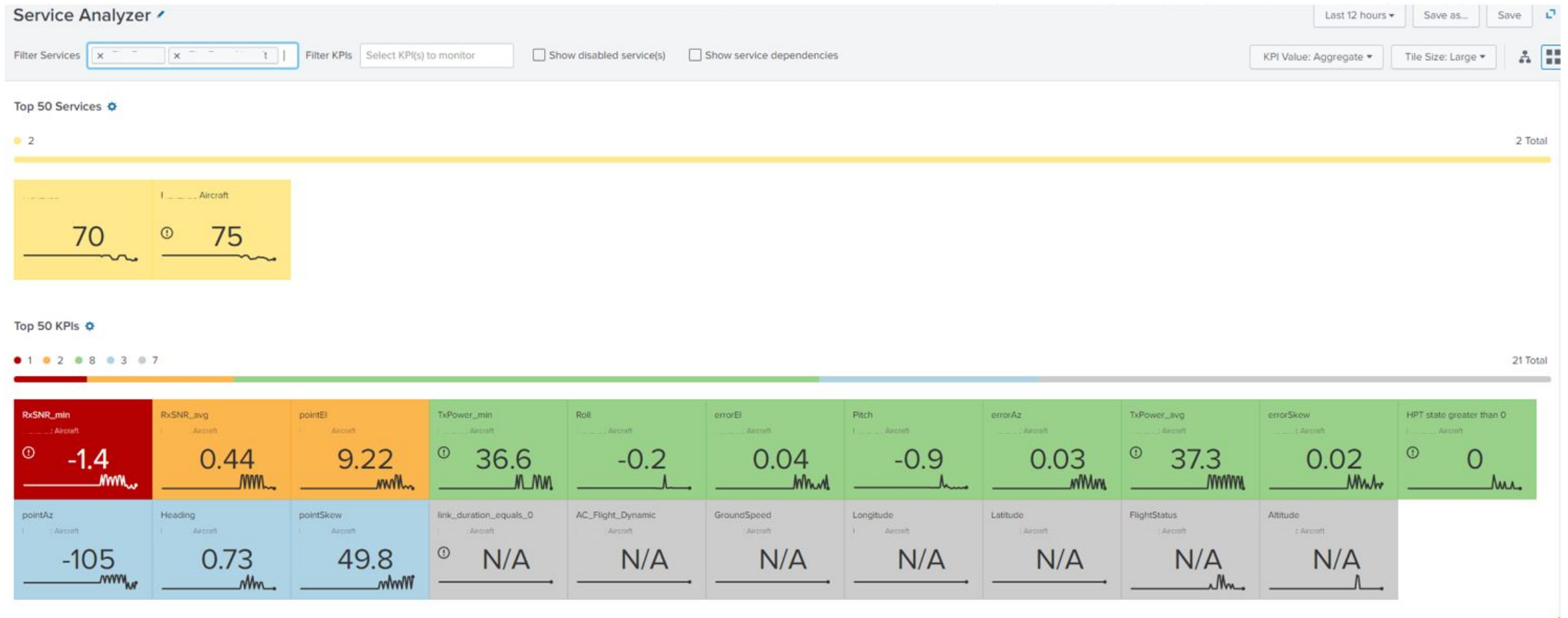
Modem  
LinkAntenna  
AlignmentFlight  
Dynamics

# Service Model

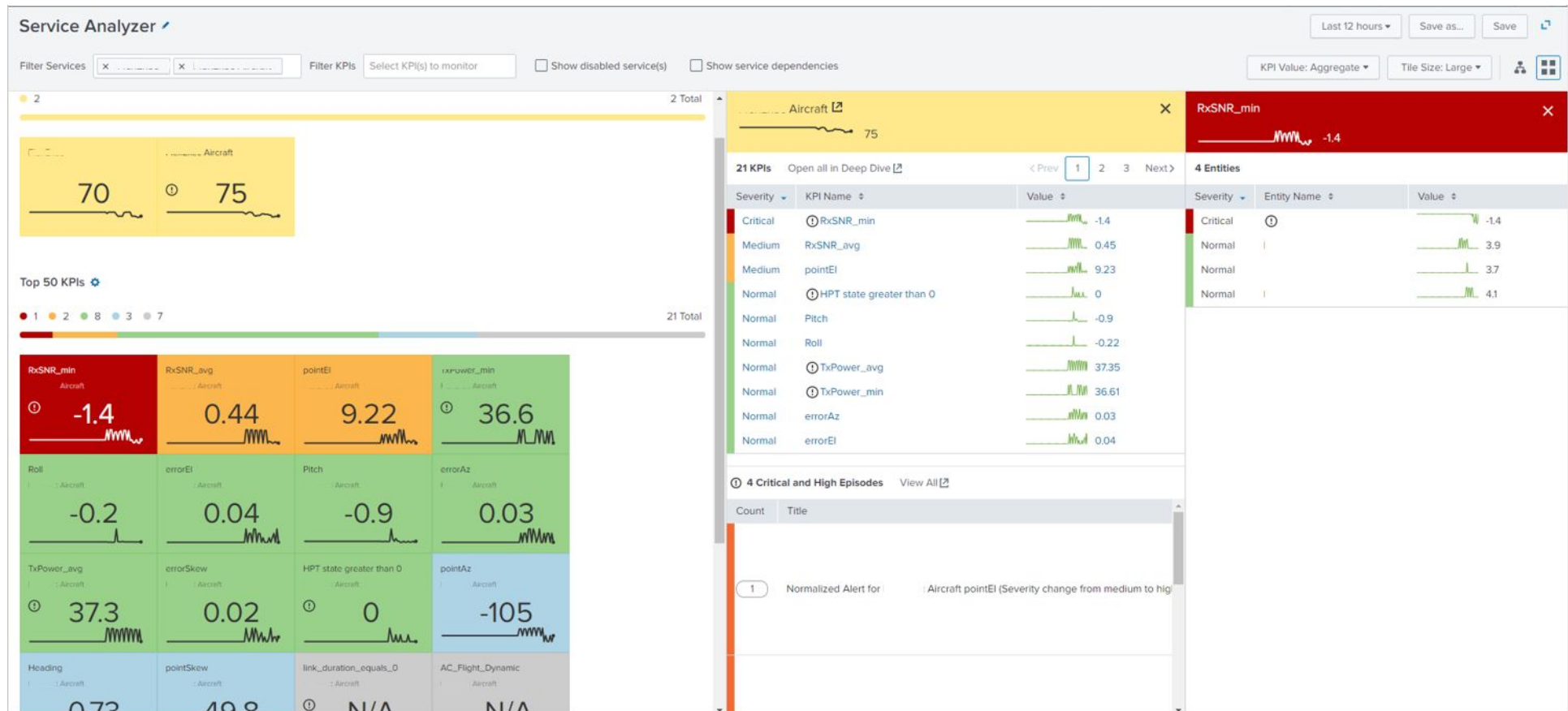




# Service Health Analysis – Macro View



# Service Health Analysis – Summary View



# Key Takeaways

What Did We Learn?

1. ITSI can be utilized for IoT use cases
2. RCA in a day versus 10 days
3. Actionable steps for level 1 analysts, prevent the 'over escalation' to level 3
4. Everyone looks through the same holistic lens
5. Shifted thinking from technical problem to meaningful business discussion with partners



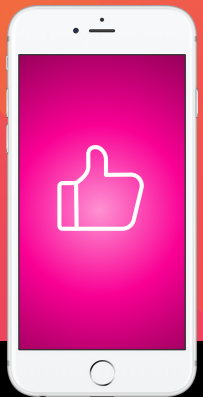
# Thank

# You



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# Q&A

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