



# Path Tracing Analytics

unleashing underlay visibility

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# ECMP Analytics

- Detects
  - Blackholing paths
  - An ECMP path that is not expected (routing/dataplane corruption)
  - Incoherent latency between ECMP paths
- Measures
  - End-to-end latency of each path (60μsec in WAN, 200ns in DC)
- Current technique of sending probes from anywhere to anywhere without any PT data requires AI processing of huge data sets

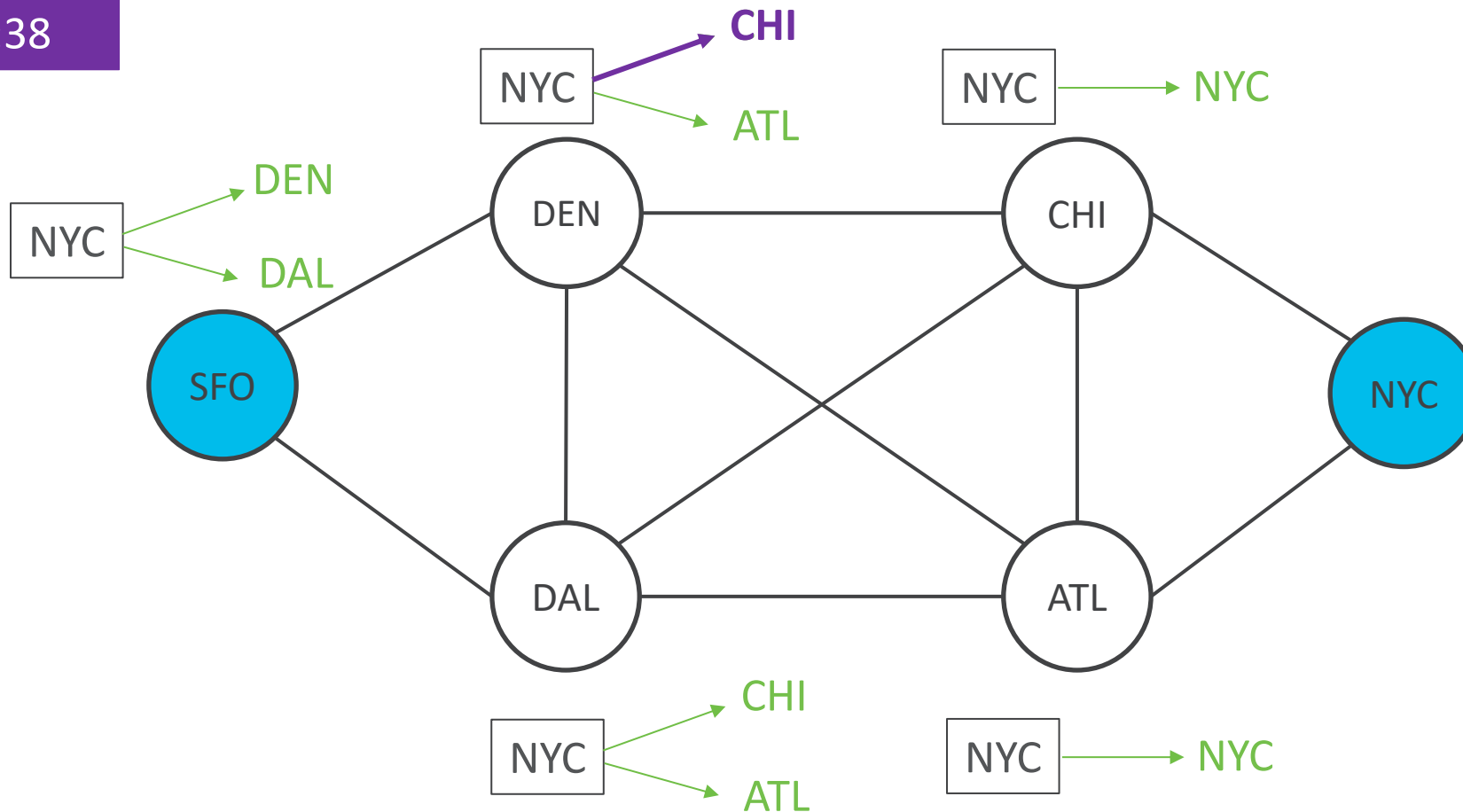
# Demo

# Blackholing Path Detection

# Corruption causing blackholes

- Hardware corruption on DEN
  - Traffic to NYC via CHI is dropped.

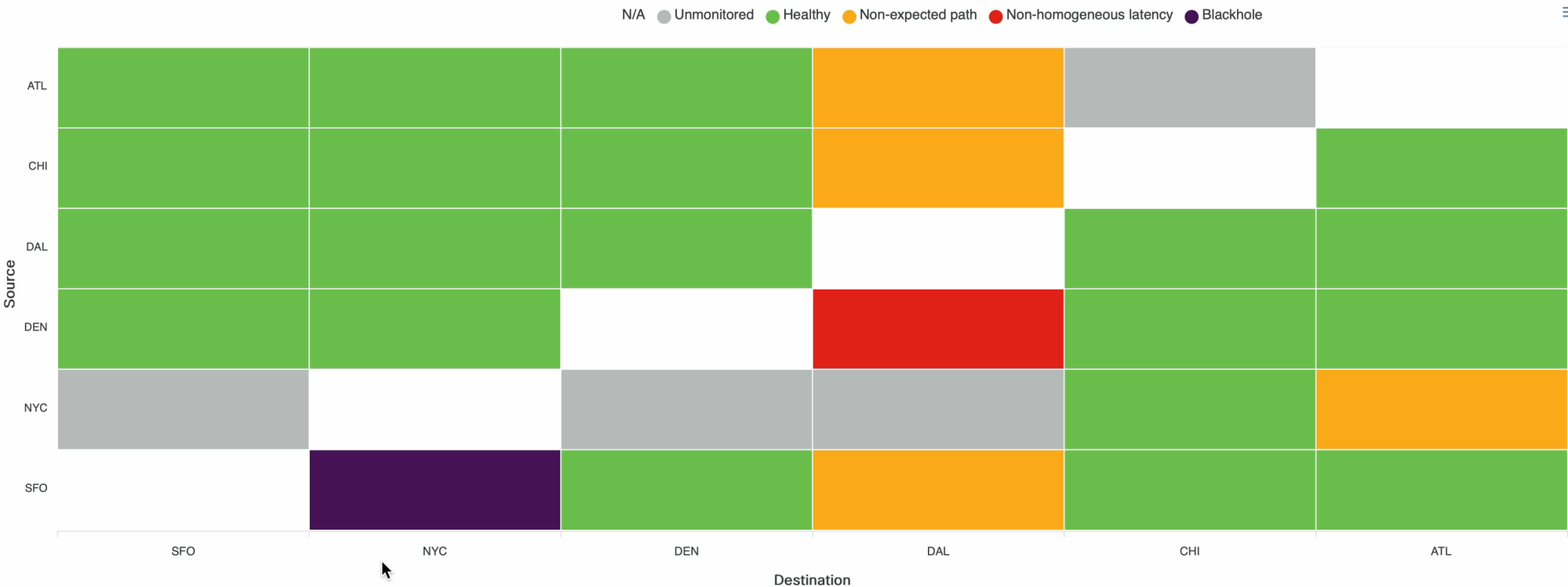
At 8:38



# ECMP Analytics SFO -> NYC

25% of ECMP paths are blackholing.

Last period From/To Time



Blackholes

ECMP non-homogeneous latency

Non-expected forwarding path

Last 1 hour

3% (1)  
Blackholes

3% (1)  
Non-homogeneous latency

13% (4)  
Non-expected paths

67% (20)  
Good

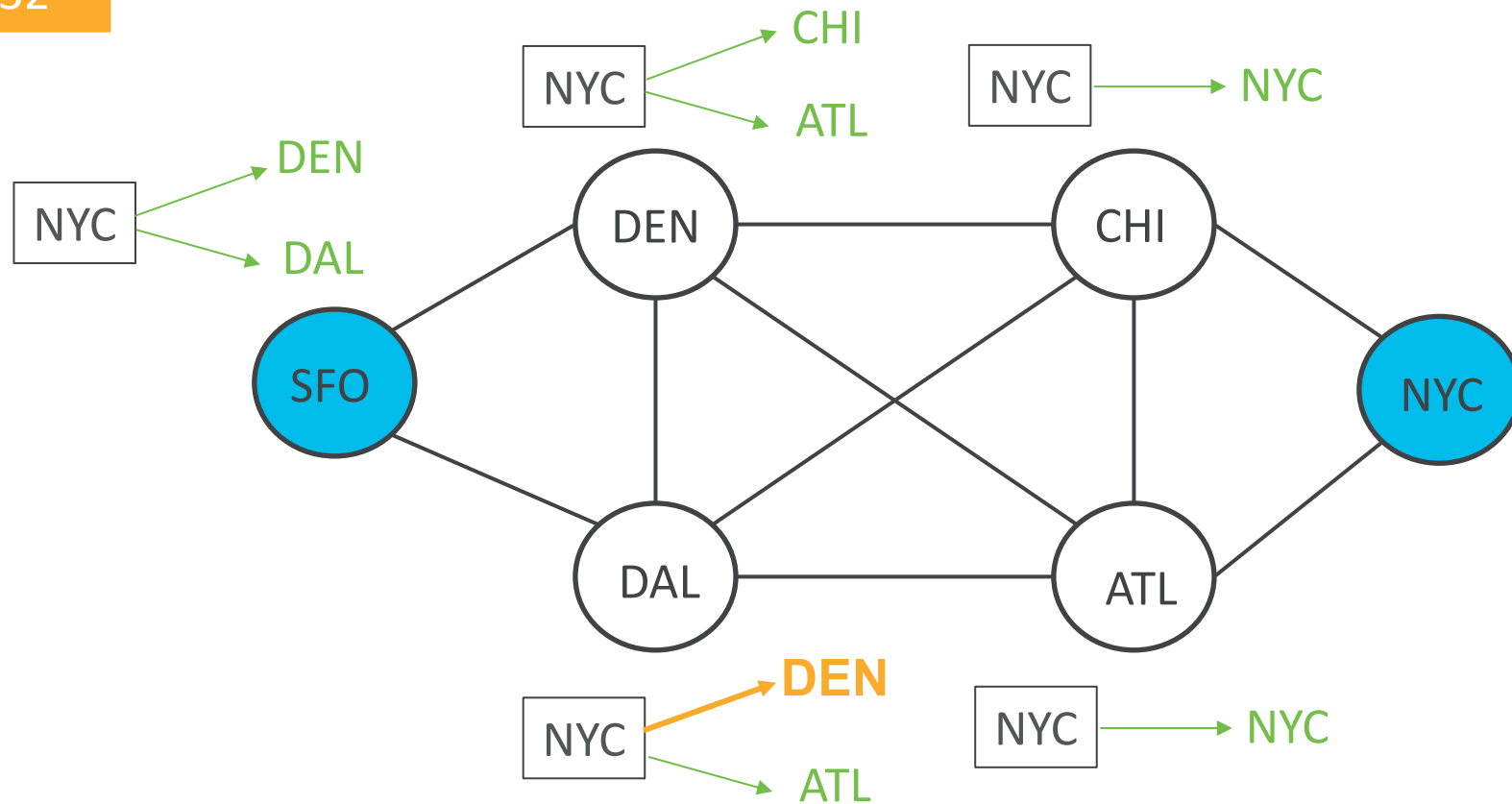
13% (4)  
Unmonitored

# Non-expected/Wrong path Detection

# Corruption causing non-expected path

- Hardware/FIB corruption on DAL.
  - Traffic to NYC is taking a wrong path.

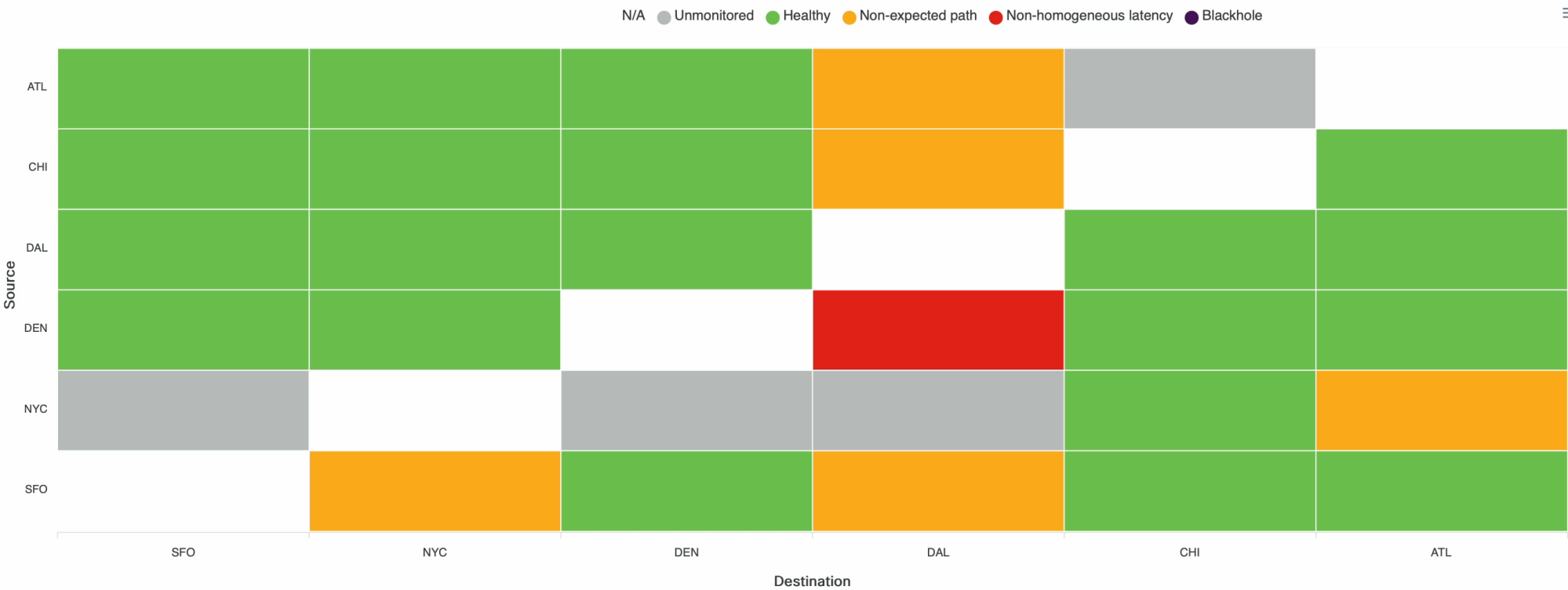
At 10:32





# ECMP Analytics SFO -> NYC

Last period From/To Time



Last 1 hour

0% (0)  
Blackholes

3% (1)  
Non-homogeneous latency

17% (5)  
Non-expected paths

67% (20)  
Good

13% (4)  
Unmonitored

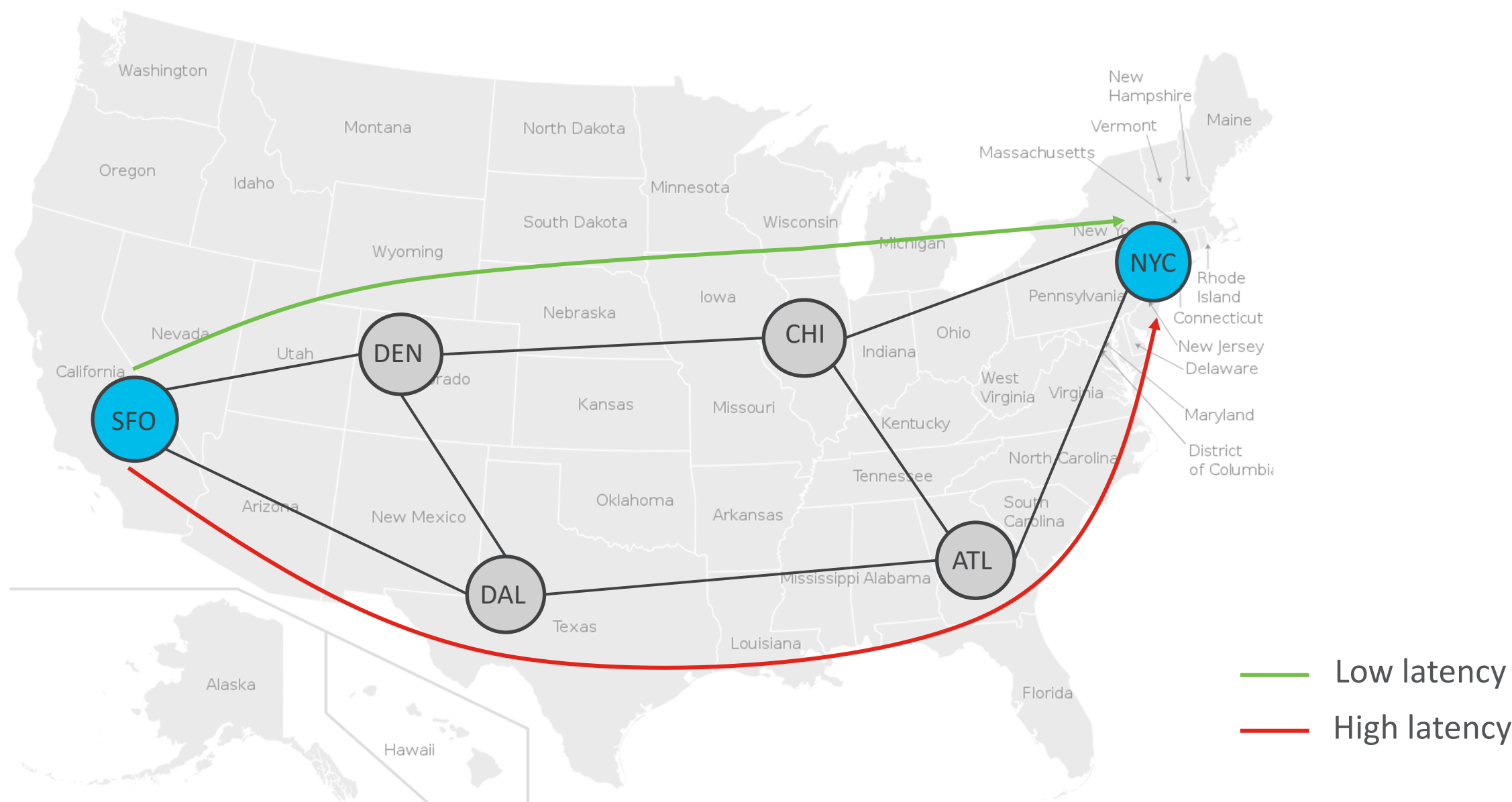
Blackholes

ECMP non-homogeneous latency

Non-expected forwarding path

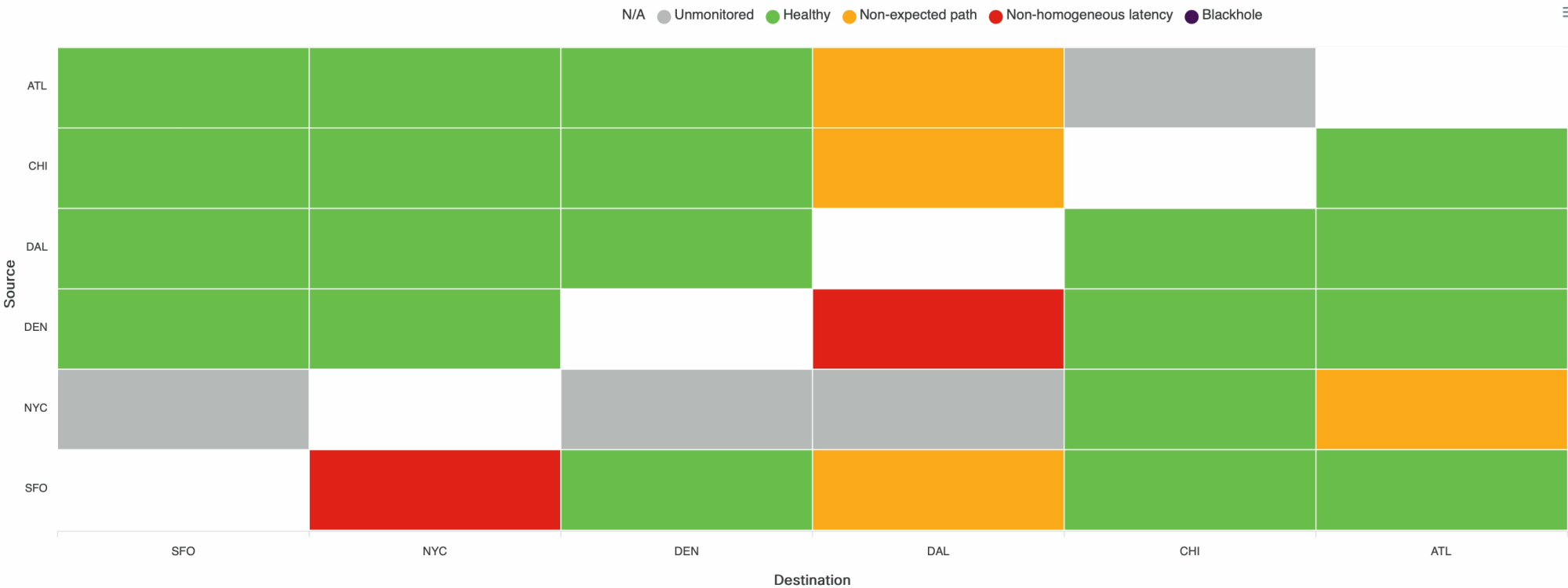
# Non-homogeneous latency Detection

# Corruption causing non-homogeneous latency



# ECMP Analytics SFO -> NYC

Last period   From/To Time



Blackholes

ECMP non-homogeneous latency

Non-expected forwarding path

Last 1 hour

0% (0)  
Blackholes

7% (2)  
Non-homogeneous latency

13% (4)  
Non-expected paths

67% (20)  
Good

13% (4)  
Unmonitored

# Conclusion

- Path Tracing is another innovation solving a 40-year problem
- Significant applicability: transport assurance
  - Latency & Jitter
- Shipping and in deployment
- Rich Eco-System
  - Opensource implementations available
- Path Tracing Analytics :
  - Many use-cases
  - ECMP demo ready



The bridge to possible