Evolution of Global Traffic Management

Aaron Heady, Bing.com, Microsoft

SREcon 2016

https://www.usenix.org/conference/srecon16

- Disclaimer 1… Not representing a specific technology.

- Disclaimer 2… Short talk, big topic. I will gloss over a few things.

User Representative for Bing

Current:

- Responsible for Availability and Server Latency for Bing.com

Before that:

- 5 years designing, implement and running global traffic management for Bing.com
- Several years as an Incident Manager
- Created the Incident Management system for Bing
- Couple years writing software as a defense contractor
- Owned a very nice restaurant for about a year (hurricane destroyed it)
- 12 years in the US Army, mostly as a Special Forces Medic and Comms NCO

Caveat: As with all things, I had a lot of help and worked with great people to achieve what's listed above. No one succeeds alone.

aheady@Microsoft.com   me@aaronheady.com   www.linkedin.com/in/aaronheady

Survey

- Quick awkward low arm raise that you're half committed to acknowledging that you are or have been significantly responsible for the design or operation of traffic routing for your company's global traffic?

PLEASE TAKE MY SURVEY
memegen.com

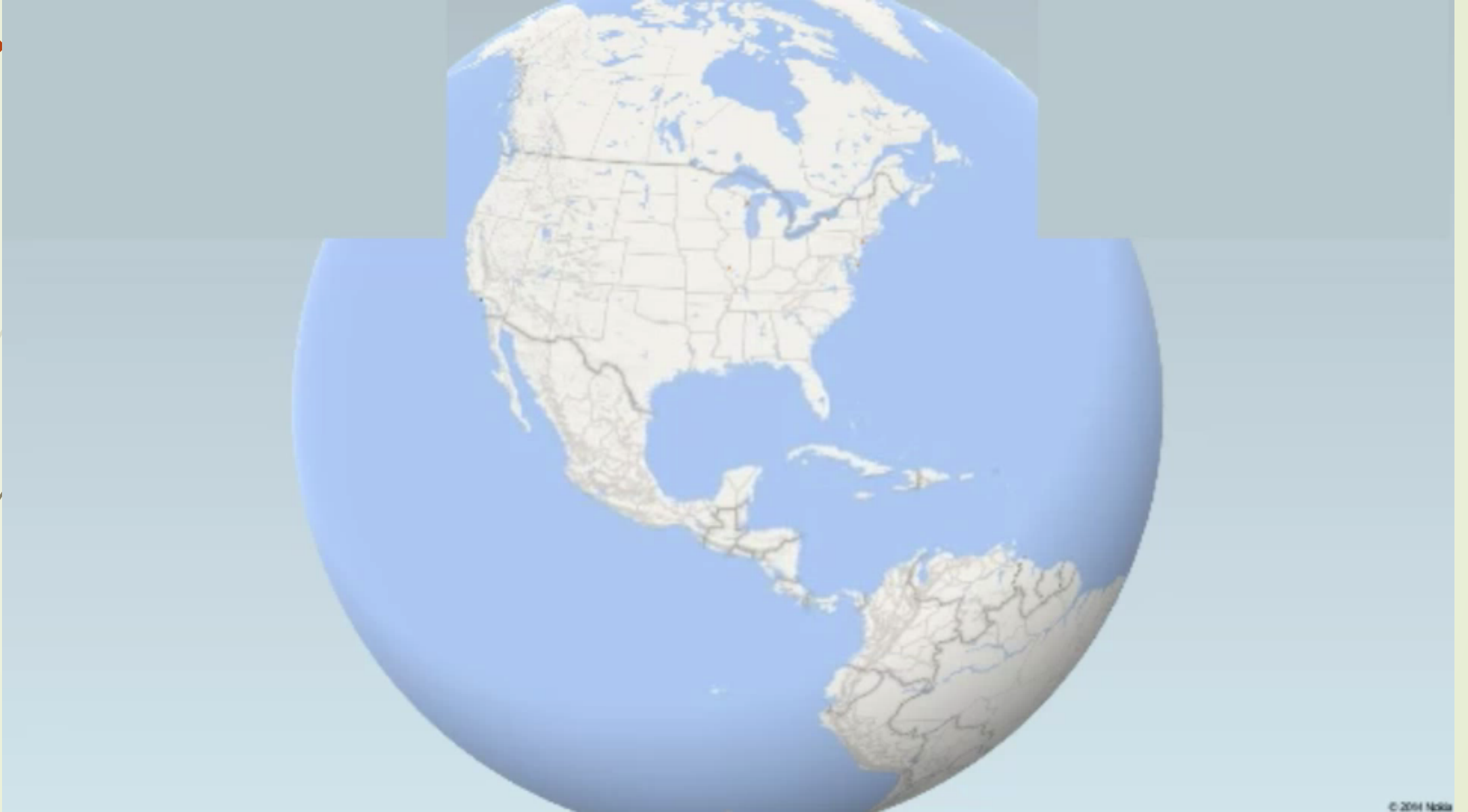Global Traffic Management

Availability

Correctness of Response

Users…

Reality, for many users, is defined by the information they get from the services run by people in this room.

Let's look at one 'reality'.

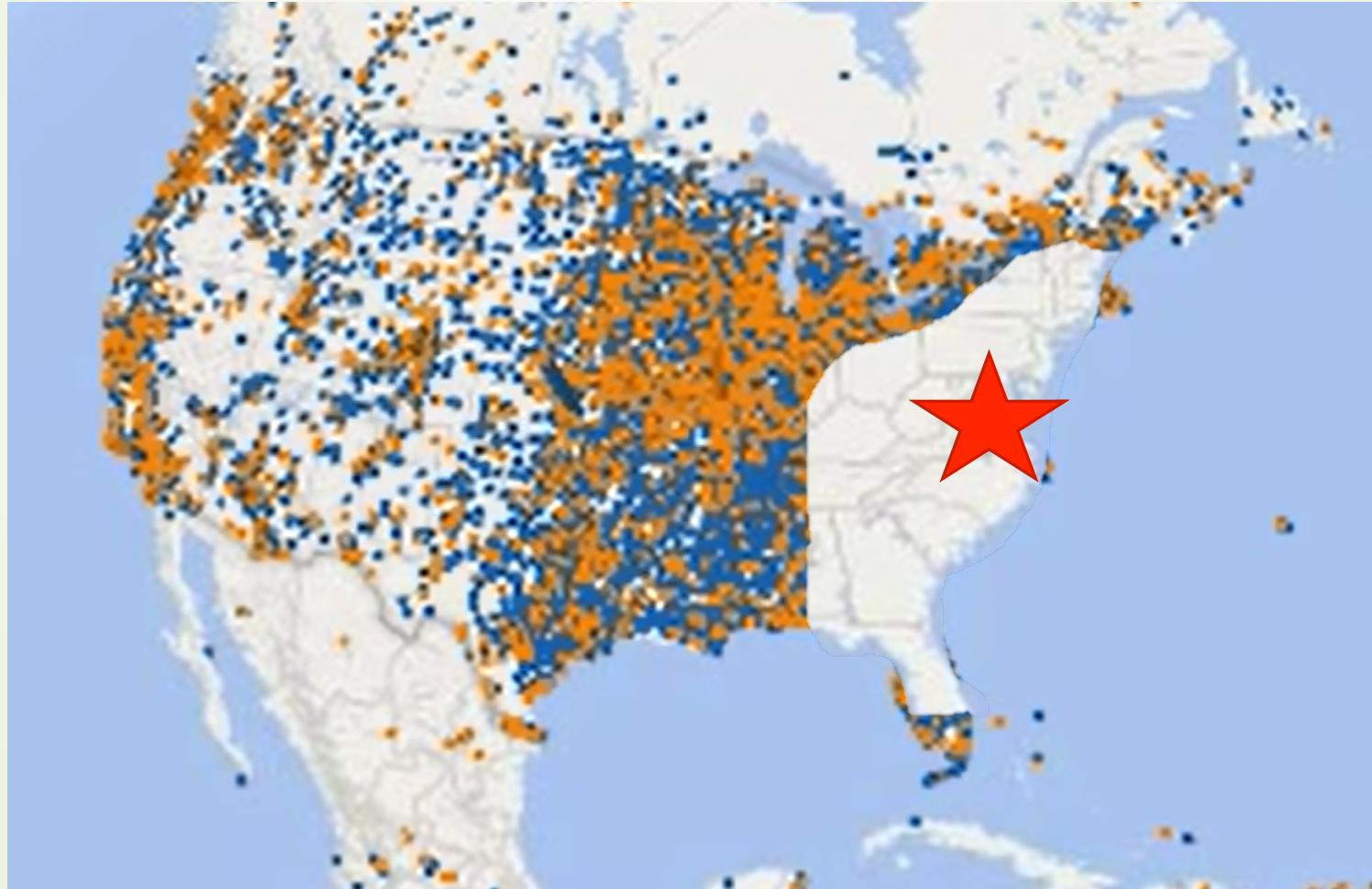- A tragic event that happened a few years ago, but that is still in the news today.
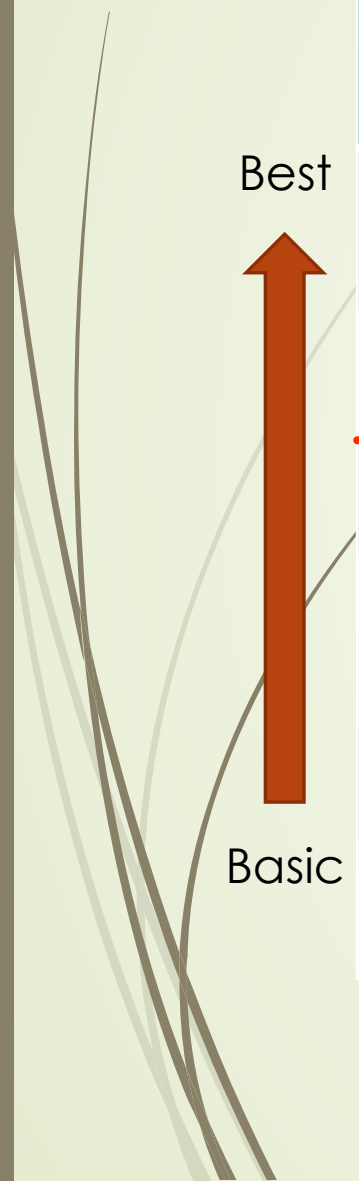
But Aaron, what's that got to do with traffic management?

Let's talk about our Users and Correctness of Response.

News, with poor availability.

Traffic Routing Maturity Matrix

Maturity Level	Fundamental Idea	Defining Characteristics
5	Isolation & Protection	Multiple service providers. Advanced internet awareness
4	Privacy & Legal	Geopolitical routing zones
3	Availability	GTM + Load Feedback
2	Load Management	Basic GTM
1	Redundancy	Round robin DNS, Multiple Origins
0	Initial	Basic DNS, Single A Record, Single Origin

Best

Basic

Then things actually get complicated…

"My service has users in, like, 42 countries! OMG!"

and

"My service operates legally in every country."

"*I just use Azure, it's global and has availability zones and can't go down, jeesh!*"

and

"*We leverage multiple clouds, and some on premises, to ensure we can get the best pricing, meeting local legal requirements, and don't create a single vendor lock-in that could hamper future growth.*"

Level 4: Legal, privacy, financial, etc.…

So you want to handle private data of German citizens?

DNS Lookup for
www.example.com

If (RevIP.Country == 'Germany')
　　{use Germany GTM config}
　　else
　　{use Global GTM config}

Global Config:

USA Origin #1, Keepalive.aspx, LFB
USA Origin #2, keepalive.aspx, LFB
Else, fail.

German Config:

German Origin #1, Keepalive.aspx, LFB
German Origin #2, keepalive.aspx, LFB
Else, fail.

Traffic Routing Maturity Matrix

Best

Basic

Maturity Level	Fundamental Idea	Defining Characteristics
5	Isolation & Protection	Multiple service providers. Advanced internet awareness
4	Privacy & Legal	Geopolitical routing zones
3	Availability	GTM + Load Feedback
2	Load Management	Basic GTM
1	Redundancy	Round robin DNS, Multiple Origins
0	Initial	Basic DNS, Single A Record, Single Origin

Level 5: Isolation, protection, network aware, etc...
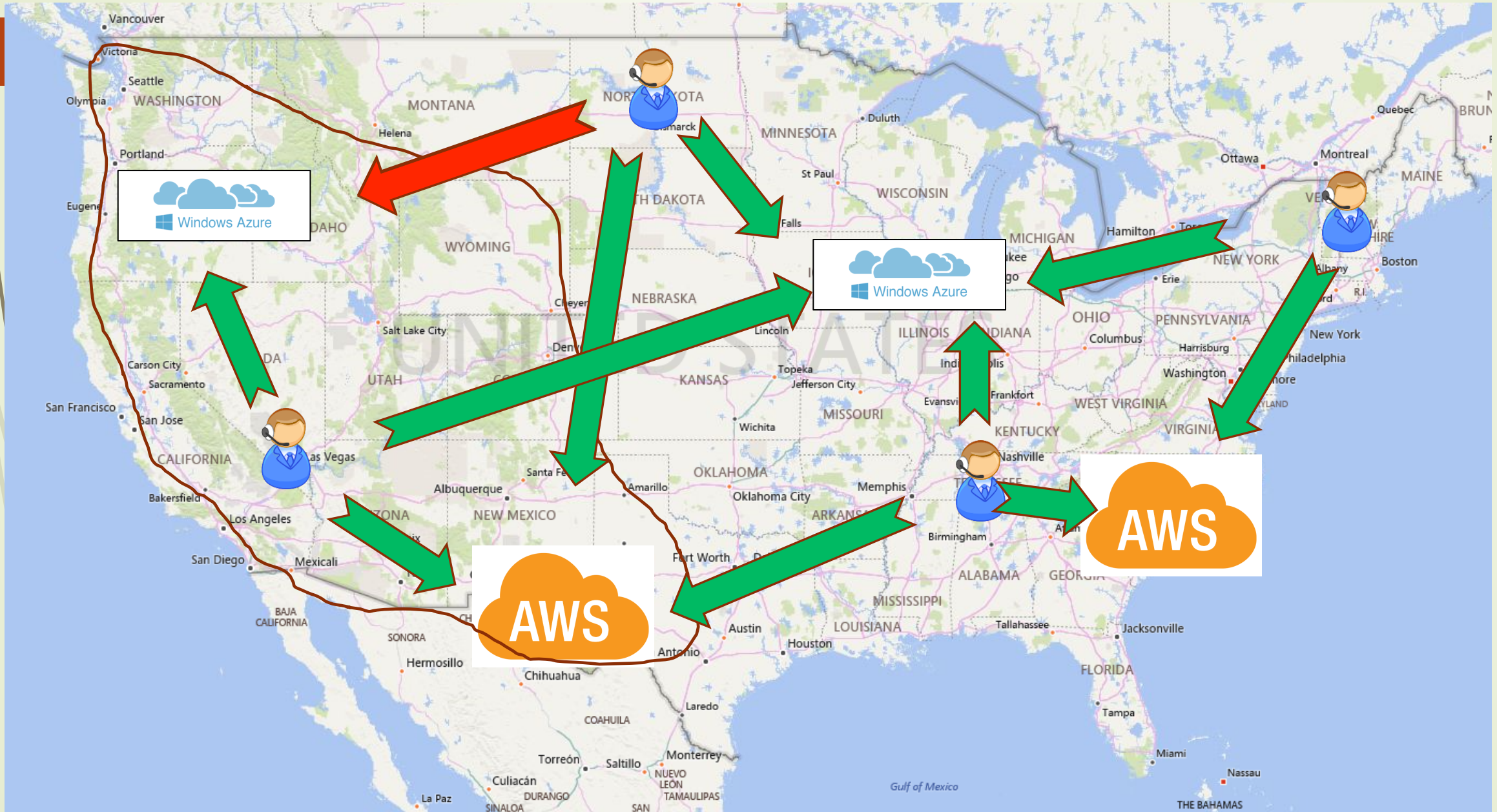
Level 5: Isolation, protection, network aware, etc...
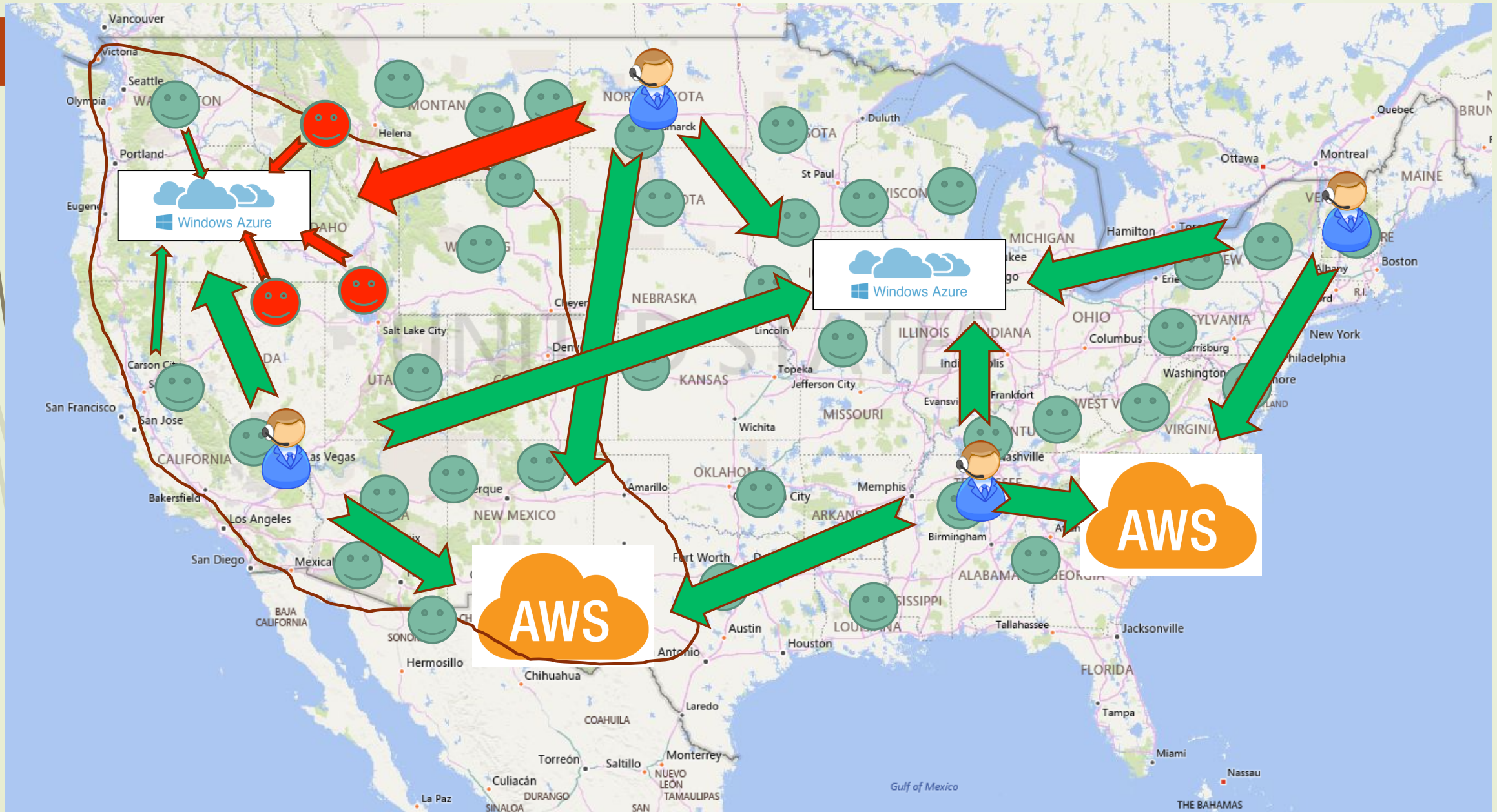
So what's next?

Put myself out of a job.☺

Anycast, when you don't want to deal with DNS based traffic management any longer.

➡ For more information on our Anycast:

➡ Nick Holt, Principal Architect of our Anycast Traffic Management System, presented at NANOG 66 https://youtu.be/40MONHHF2BU.

Questions?

Reminder… I'm reasonably deaf. Please speak up.

Thanks for listening!