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panagenda

WEBINAR

Seeing the Unseen: Deep Visibility into Microsoft 365 Client Connectivity

Thursday, November 5th 2026 | 16:00 CET / 10:00am EST

Before we start

A few housekeeping notes so you get the most out of the next minutes.

All attendee lines are muted

This is to prevent interruptions during the presentation.

Please submit questions via Chat or Q&A

Your questions will be addressed directly during the webinar, or in the Q&A section after the presentation.

The webinar is being recorded

Afterwards we will send you a mail giving you access to the recording and the presentation slides.

Share your feedback with us

Please let us know what we can do better.

YOUR TEAM TODAY

Presenting this session



Stefan Fried

Senior Program Manager & Senior Consultant

stefan.fried@panagenda.com

Today's agenda

01

How users actually get into M365?

Teams, Exchange Online and Copilot take different doors into Microsoft

02

What steers and influences the path?

DNS, proxies, VPN… and Microsoft itself

03

Real-world cases

Real connectivity patterns from real networks: good, bad and surprising

04

Fix or escalate

What is yours, what is your ISP's, what is Microsoft's

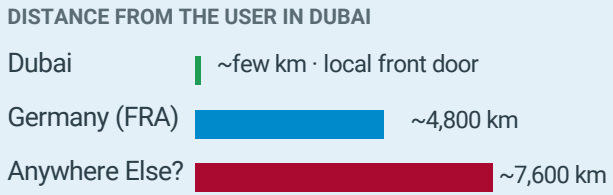
Every connection is a chain of decisions

Several decisions happen before Microsoft 365 is reached. Here is what one of them did to a real user.

→ Most organizations know where users sit. Far fewer know where they enter Microsoft's network.

A FIRST STORY

A German user in Dubai. Where does he enter Microsoft?



Same user, same laptop. We come back to it in Case 03.

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SECTION 01

How users get into M365?

Three services examples..... three different doors into Microsoft's network

Teams | Exchange Online | Copilot

Enter early and ride the backbone

Once traffic is on Microsoft's network, Microsoft controls the path.



Public internet: your egress, DNS and ISP decide

Microsoft's network: Microsoft decides

AZURE REGIONS

80+

Connected by Microsoft's own backbone.

DATACENTERS

500+

In 34 countries worldwide.

NETWORK POPS

190+

Where your traffic can enter Microsoft.

FIBRE

800k+ km

Terrestrial and subsea network fibre.

Your responsibility: get users onto the **nearest** edge site as fast as possible. Microsoft does the rest.

Source: Microsoft Datacenters, Azure global infrastructure (datacenters.microsoft.com), November 2026

THREE SERVICES

Same tenant but different entries (doors)

How Teams, Exchange Online and Copilot pick their entry point.

Teams

Anycast (52.112.0.0/14, 52.122.0.0/15). Your ISP's routing picks the nearest edge. (Except Media Relays!)

Exchange Online

Geo-DNS. outlook.office365.com resolves to a regional front door, based on who asks.

Copilot

Geo-DNS, like Exchange. *.cloud.microsoft and substrate.office.com resolve to a front door based on who asks.

Which door a service uses decides what you need to check first.

Who decides where the user land?

Two steering mechanisms, two different things to check.

GEO-DNS-STEERED

Exchange Online, SharePoint, Copilot

- → The resolver's location picks the front door
- → Breaks when DNS and egress are far apart > see next slide
- → Front door code shows the city (LHR, CPT…)
- → Check: nslookup outlook.office365.com

Potential fix lives in your DNS design.

ANYCAST / BGP-STEERED

Teams (except Media Relays)

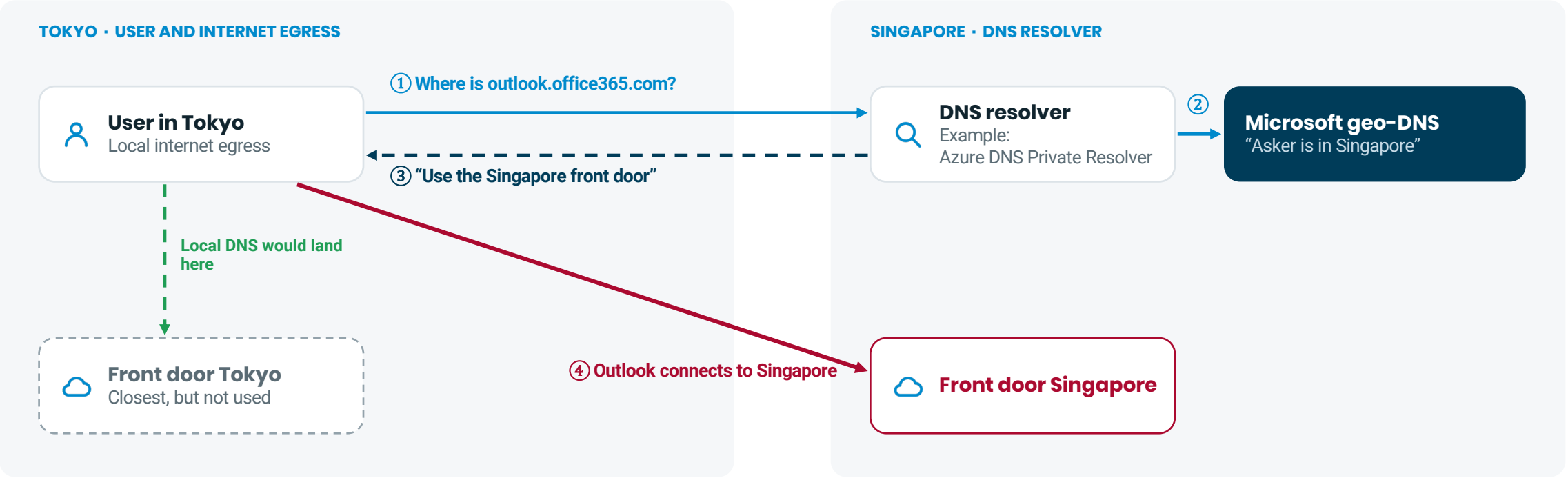
- → Same IP ranges announced worldwide
- → Your ISP's routing picks the edge
- → DNS location barely matters
- → Check: traceroute to the service

Potential fix lives in your egress and ISP path.

That's why Teams can look perfect while Outlook crawls. Same user, different doors.

When DNS lives somewhere else

A user in Tokyo, a resolver in Singapore: Microsoft answers for the resolver, not for the user.



Note: Microsoft's connectivity test flags a DNS resolver more than 800 km (500 miles) from the user.

Source: Microsoft Learn, Microsoft 365 network connectivity test tool

MICROSOFT'S TARGETS

What Microsoft recommends

Example: Teams

ROUND TRIP

< 100 ms

Client to Microsoft edge, incl. local network.

EDGE TO EDGE

< 60 ms

Your network edge to Microsoft's edge.

PACKET LOSS

< 1%

Client to edge, in any 15-second interval.

JITTER

< 30 ms

Client to edge, in any 15-second interval.

Round-trip targets, not setup targets: a new connection first pays TCP (1 RTT) plus TLS (1 RTT with TLS 1.3).

Sources: Microsoft Learn, Prepare your network for Teams · IETF RFC 9293 (TCP) · RFC 8446 (TLS 1.3) · RFC 5246 (TLS 1.2)

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SECTION 02

What steers and influences the path

DNS

Proxy & Security Solutions

Microsoft

OWNERSHIP

Every team owns a part. Nobody owns the chain

UC trusts network …network trusts security….

01	**Device & Network**	**Desktop or network team**. Wired vs. Wi-Fi
02	**DNS resolver**	Often set via domain controllers, basically owned by **the server tean** Sometimes by the network team,…
03	**Proxy, Security Solutions & VPN**	**Security team.** Zscaler, Palo Alto Prisma Access, Netskope & co. decide where traffic leaves and DNS resolves.
04	**Front door**	**Microsoft.** Can change without anything changing on your side.

- 01 **Local resolver, local egress**
- 02 **Google Public DNS 8.8.8.8**
- 03 **Cloudflare 1.1.1.1**
- 04 **Azure DNS Private Resolver**

Routing is one thing. Opening the connection is another. Both need to be measured.

The admin center view: a good start to look into

Health › Network connectivity in the Microsoft 365 admin center + the connectivity test tool

WHAT YOU GET

Free ;built in; Microsoft's own data

- ✓ Used vs. best Exchange and SharePoint front doors
- ✓ Distance to egress, DNS resolver and proxy
- ✓ Comparison with others
- ✓ On demand: VPN split tunnel, TLS interception, Copilot WSS

Great for office / branch questions.

WHAT'S MISSING

Sampled, aggregated, location-bound

- → Tests run at most once a day per machine
- → Needs Windows Location Services or LAN subnets
- → Office or city level, no per-user, per-connection view
- → TCP latency only: no cold vs. warm, no path history

Weak for "why was it slow at 10:14?"

Use it to find the problem office. Finding the cause needs continuous data from the endpoint.

Sources: Microsoft Learn, "Network connectivity in the Microsoft 365 Admin Center" and "Microsoft 365 network connectivity test tool"

Not every service takes the same route

A typical ZIA setup

TEAMS

Bypassed, goes direct – "still can get overrides for DNS"

- → Leaves via the local ISP
- → Lands on a nearby anycast relay
- → DNS location is "Irrelevant"
- → Usually looks healthy

Teams looks fine.

EXCHANGE / SHAREPOINT

Through the ZIA node

- → No SSL inspection, no auth (One Click)
- → DNS resolved at the Zscaler node
- → Front door follows the node's location
- → Distant node, distant front door

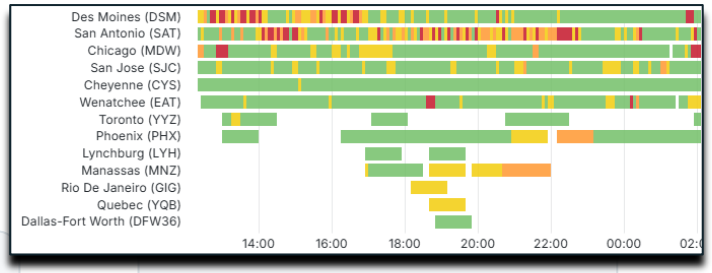
Check which node users really hit.

Microsoft principle "Avoid network hairpins" calls out cloud-based security services as a potential cause.

Source: Microsoft Learn, "Microsoft 365 network connectivity principles" – Avoid network hairpins

Your ingress can change without you

Three recent incidents where Microsoft's rerouted traffic.



OCT 2025

Azure Front Door

MO1181369
A config defect crashed AFD edge servers for about 8 hours.

JAN 2026

Load rebalancing

MO1221364
A rebalancing change created new traffic imbalances.

JUL 2026

Path rerouting

MO1437424
Traffic rerouted, resolved by reverting a network update.

SO WHAT

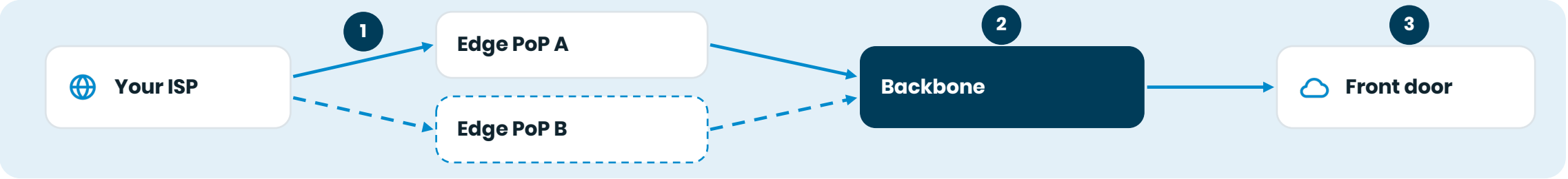
Baseline first

Without a baseline you can't tell their change from yours.

⚠ Check Microsoft Service Health before you open a ticket with your ISP.

Behind the curtain

From Microsoft's own description of how it runs its global network.



At the edge: BGP

Microsoft changes the routes it announces to ISPs. You enter at a different edge.

On the backbone: SWAN

Software recomputes backbone paths around failures and congestion.

In DNS: front doors

Load balancing changes which front door a name resolves to.

From your side all three look the same: a different path, and nothing changed on your end.

Source: Microsoft Azure Blog, "Advancing global network reliability through intelligent software – part 2" (Mahesh Nayak, Umesh Krishnaswamy)

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SECTION 03

Real-world cases

Connectivity patterns we see again and again

- DNS
- Ingress
- Cold vs. warm

CASE 01

Teams looks fine, Outlook doesn't

Same users, same office, two very different experiences.

What users felt

Calls sound great. Outlook hangs on "Trying to connect", search and attachments are slow.

What the data showed

Teams lands on a nearby pop. Exchange Online resolves to a distant front door.

Root cause & fix

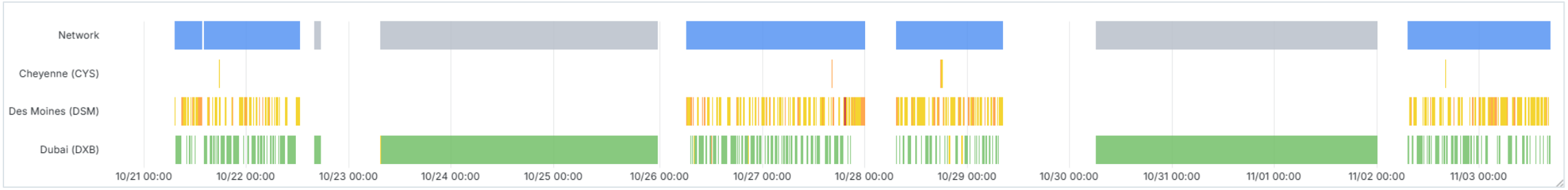
- SSE provides wrong DNS
- DNS and egress misaligned. Align the resolver with the egress point.

Anycast hides the problem for Teams. Geo-DNS exposes it for Exchange.

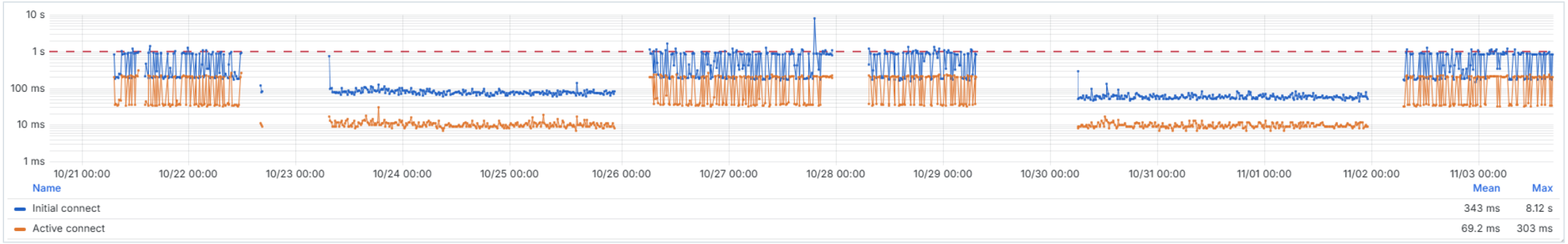
Exchange: the DNS answer keeps flipping

Dubai user over two weeks: on one network Exchange alternates between Dubai and Des Moines.

EXCHANGE ONLINE · MICROSOFT INGRESS OVER TIME



CONNECTION TIME · INITIAL VS. ACTIVE CONNECT (LOG SCALE)



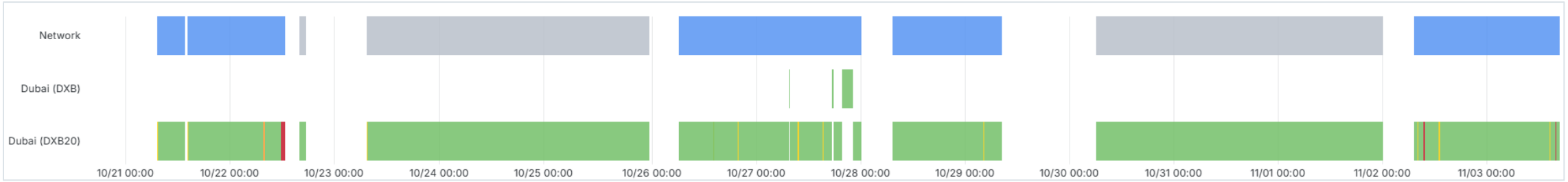
Blue network: Dubai and Des Moines take turns. Grey network: Dubai only, and connect times drop.

CASE 01

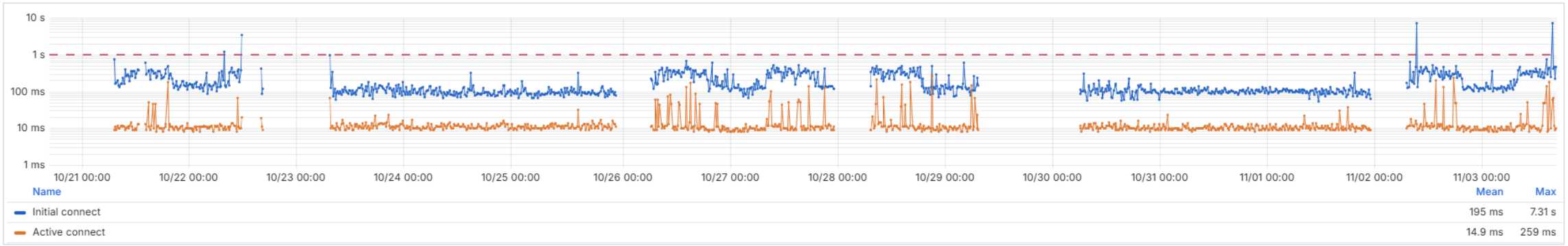
Teams: one PoP, every time

Same user, same two weeks: Teams always enters Microsoft in Dubai (DXB20).

TEAMS · MICROSOFT INGRESS OVER TIME



CONNECTION TIME · INITIAL VS. ACTIVE CONNECT (LOG SCALE)



Anycast keeps Teams in Dubai on both networks. The blue network is still slower: that part is the network itself.

The proof is in the DNS answer

Same user, same afternoon, every lookup logged. Columns trimmed to what matters.

EXCHANGE ONLINE · GEO-DNS

Time (UTC)	Microsoft ingress	Distance	Initial connect (ms)	DNS resolved IP
11/3/2026 4:41:03 PM	Des Moines	Distance - Poor	854	52.98.61.34
11/3/2026 4:27:03 PM	Dubai	Distance - Good	175	40.99.70.210
11/3/2026 4:13:04 PM	Des Moines	Distance - Poor	851	40.104.189.50
11/3/2026 3:59:04 PM	Dubai	Distance - Good	183	40.99.32.114
11/3/2026 3:45:04 PM	Des Moines	Distance - Poor	1,001	40.99.70.226
11/3/2026 3:25:28 PM	Des Moines	Distance - Poor	906	52.96.182.162
11/3/2026 3:11:04 PM	Des Moines	Distance - Poor	856	40.104.230.226
11/3/2026 2:56:04 PM	Dubai	Distance - Good	187	52.98.61.50

IN 8 LOOKUPS
8 different IPs

Two front doors: Dubai ~180 ms, Des Moines 850–1,000 ms initial connect.

TEAMS · ANYCAST

Time (UTC)	Microsoft ingress	Distance	Initial connect (ms)	DNS resolved IP
11/3/2026 4:41:03 PM	Dubai	Distance - Optimal	482	52.123.128.14
11/3/2026 4:27:03 PM	Dubai	Distance - Optimal	229	52.123.128.14
11/3/2026 4:13:04 PM	Dubai	Distance - Optimal	471	52.123.128.14
11/3/2026 3:59:04 PM	Dubai	Distance - Optimal	415	52.123.128.14
11/3/2026 3:45:04 PM	Dubai	Distance - Optimal	7,264	52.123.128.14
11/3/2026 3:25:28 PM	Dubai	Distance - Optimal	251	52.123.128.14
11/3/2026 3:11:04 PM	Dubai	Distance - Optimal	438	52.123.128.14
11/3/2026 2:56:04 PM	Dubai	Distance - Optimal	418	52.123.128.14

IN 8 LOOKUPS
1 IP

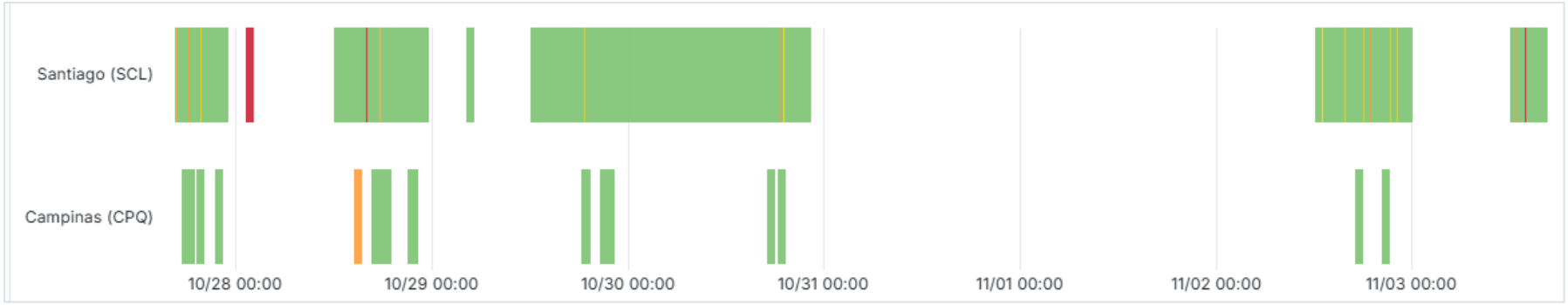
52.123.128.14, Dubai (DXB20), every single time.

Geo-DNS gives a new answer per lookup. Anycast keeps one address and lets routing decide.

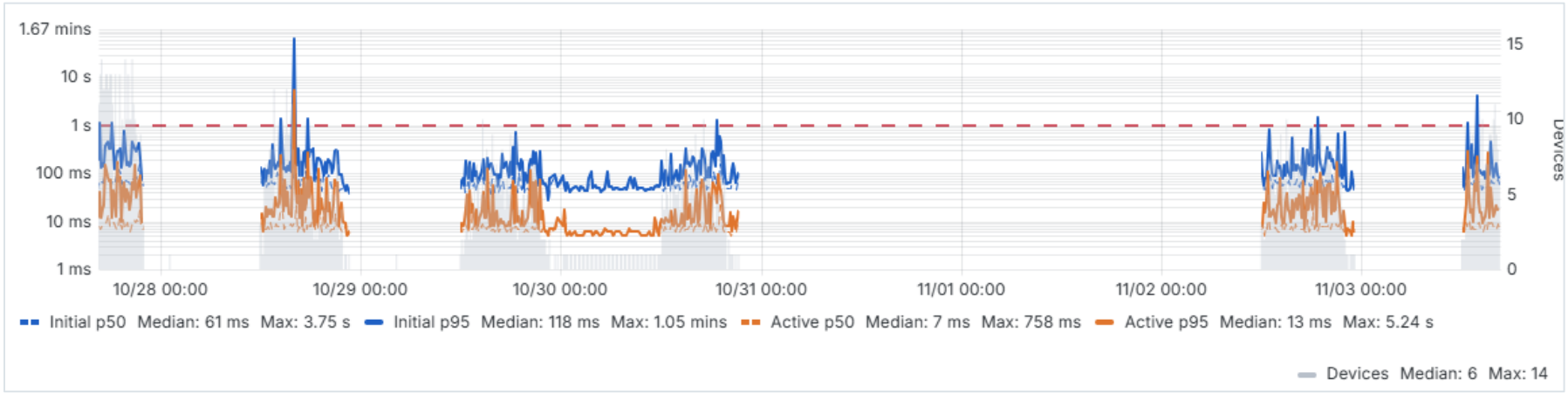
Chile: how it should look

A site in Chile only enters Microsoft in South America.

MICROSOFT INGRESS OVER TIME



CONNECTION TIME · ALL DEVICES AT THE SITE (LOG SCALE)



FRONT DOORS

2

Santiago and Campinas, both in South America.

INITIAL CONNECT

61 ms

median (p50) for the site.

ACTIVE CONNECT

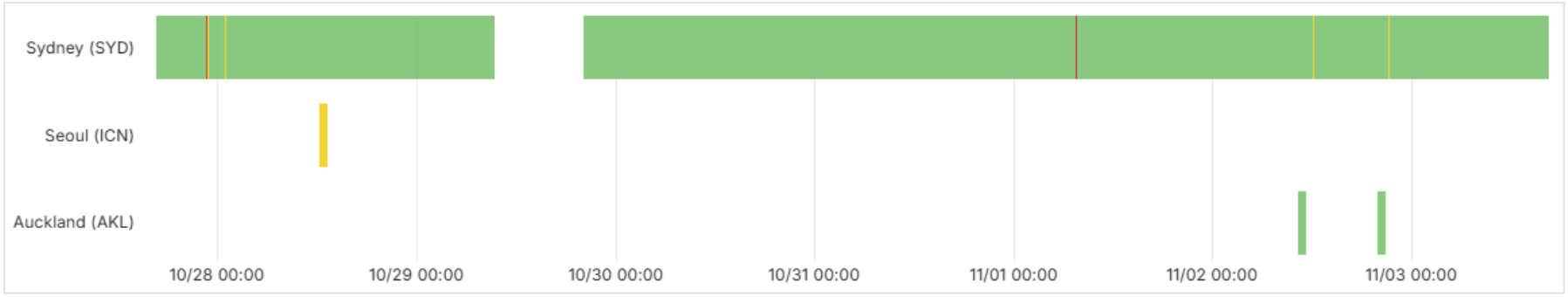
7 ms

median (p50) for the site.

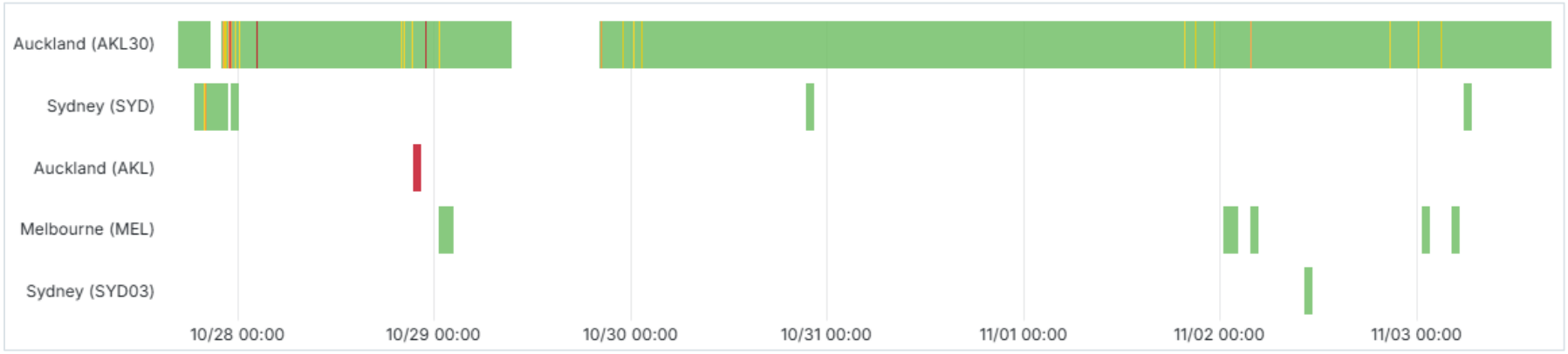
Auckland: close, with small detours

Exchange and Teams take slightly different entry points from the same branch.

EXCHANGE ONLINE · GEO-DNS



TEAMS · ANYCAST



EXCHANGE

Sydney

most of the time. Auckland and Seoul only rarely.

TEAMS

Auckland

mostly AKL30. Sydney and Melbourne now and then.

CASE 02

Hong Kong users, Singapore DNS

An Azure DNS Private Resolver in Singapore serving users in Hong Kong.

What users felt

Outlook and SharePoint noticeably slower in HK than at other APAC sites.

What the data showed

Exchange front doors in Singapore, although Taiwanese front doors are closer.

Root cause & fix

The resolver's location decides. Resolve Microsoft 365 names locally in HK.

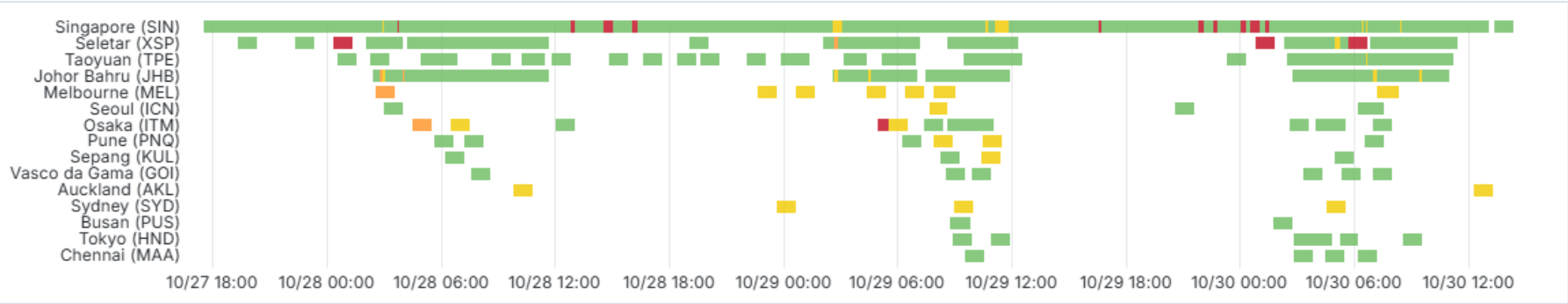
Central DNS is convenient. For geo-DNS services, it moves your users.

CASE 02

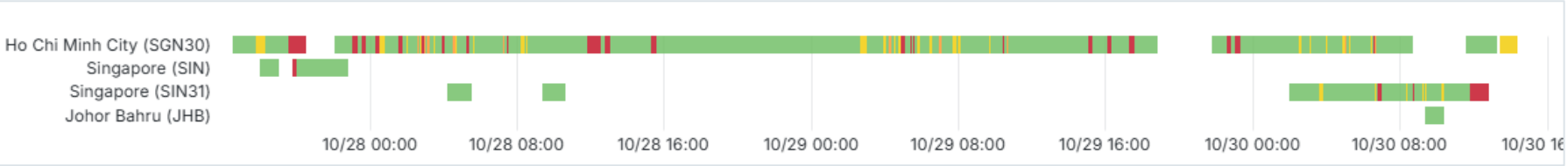
Exchange fluctuates, Teams stays

Same Hong Kong users, same three days: Microsoft ingress per service.

EXCHANGE ONLINE · GEO-DNS



TEAMS · ANYCAST



EXCHANGE

15

front doors, from Singapore to Chennai and Auckland.

TEAMS

4

PoP's, mostly one: Ho Chi Minh City (SGN30).

The resolver in Singapore spreads Exchange across APAC. Teams barely moves.

CASE 03

Your SSE is moving you around

A German user in Dubai: through the SSE usually Frankfurt, then suddenly Cape Town.

What users felt

Inbox and calendar suddenly slow, with nothing changed on the laptop.

What the data showed

While connected to the SSE, ingress jumped from Frankfurt to Cape Town.

Root cause & fix

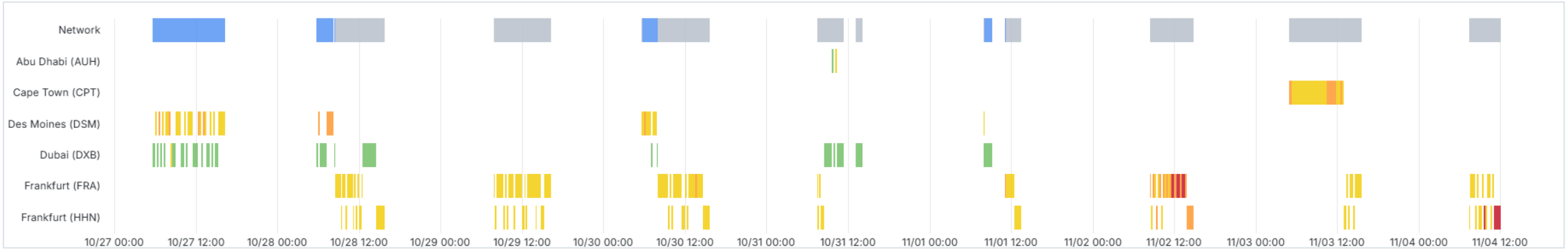
A misconfigured SSE policy. Fixed in the SSE, not in the network.

Disconnect from the SSE and ingress is back to normal. That is your evidence.

What it looks like in the data

Through the SSE: usually Frankfurt. On 3 November: Cape Town, until the user disconnected.

EXCHANGE ONLINE · MICROSOFT INGRESS OVER TIME



DNS LOOKUPS · FRANKFURT VS. CAPE TOWN

Time (UTC) ↓	Microsoft ingress	DC	DNS server(s)	Initial connect (ms)
11/3/2026 6:01:30 AM	Cape Town	CPT	1 .26.1	726
11/3/2026 5:47:56 AM	Cape Town	CPT	1 .26.1	711
11/3/2026 5:37:04 AM	Cape Town	CPT	1 .26.1	731
11/3/2026 5:16:21 AM	Cape Town	CPT	1 .26.1	737
11/2/2026 1:50:56 PM	Frankfurt	HHN	1 .4.1	1,025
11/2/2026 1:35:55 PM	Frankfurt	FRA	1 .4.1	1,208
11/2/2026 1:18:06 PM	Frankfurt	FRA	1 .4.1	4,684

CONNECTION TIME · INITIAL VS. ACTIVE (LOG SCALE)



Cape Town came with a different DNS server (…26.1).

CASE 04

Same building, different network

Several networks at one location: only one is slow to open a connection to Microsoft.

What users felt

Slow M365 Services, but only for users on one of the networks.

What the data showed

One network: p95 initial connect 1,206 ms vs. 624–769 ms elsewhere. Warm is fine everywhere.

Root cause & fix

Not the entry point: TrueDEM flags a likely middlebox / TLS inspection on that network.

The front door isn't always the problem. Sometimes it's how a network opens the connection.

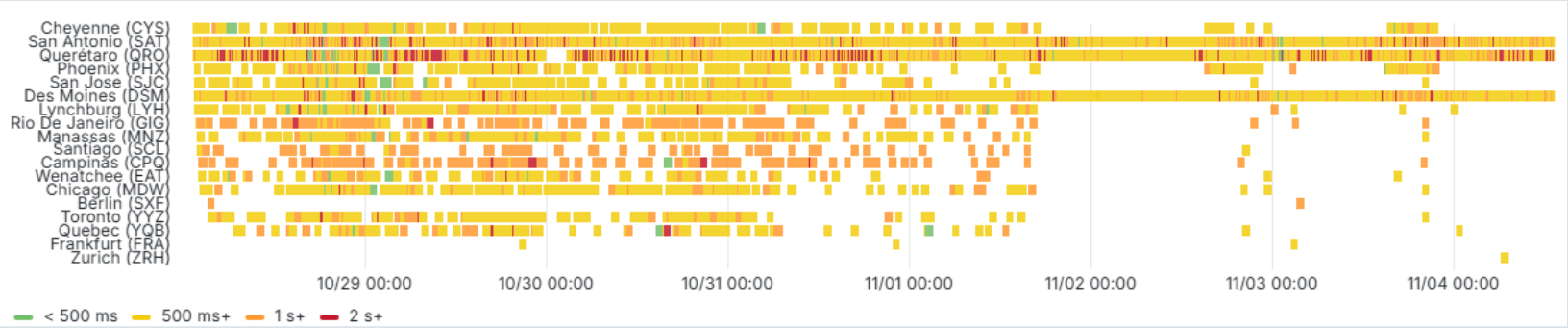
Further reading: (Microsoft), "Top 10 tips for optimising & troubleshooting your Office 365 network connectivity"

CASE 04

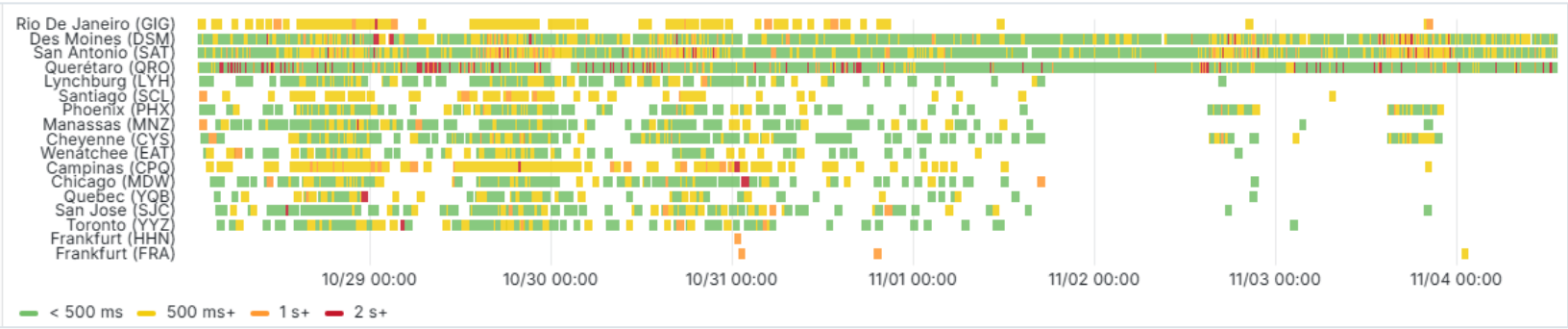
Cold connections tell the networks apart

Initial connect (cold) per Microsoft ingress, same building, same days.

NETWORK A · INITIAL CONNECT (COLD)



NETWORK B · INITIAL CONNECT (COLD)



NETWORKS AT THIS LOCATION

…164.0/23 174 users
p95 initial **1,206 ms** · active **152 ms**

…184.0/24 203 users
p95 initial **624 ms** · active **87 ms**

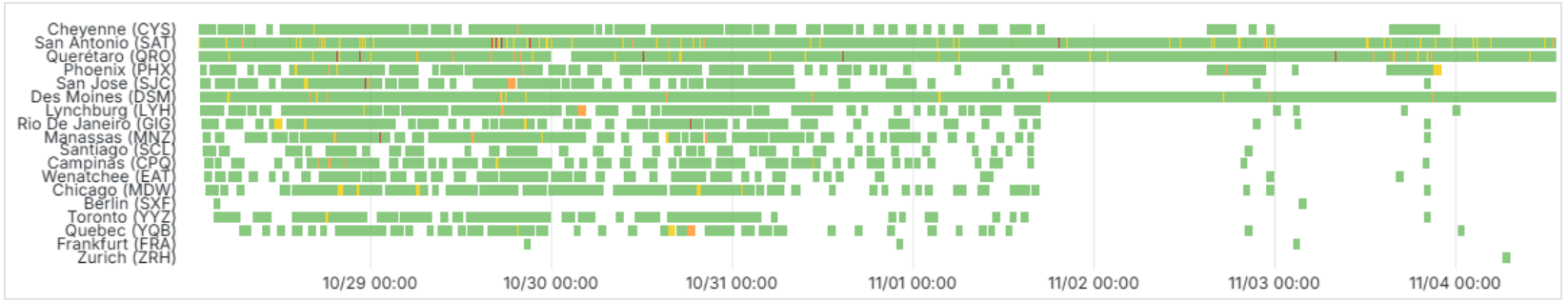
…163.0/24 174 users
p95 initial **769 ms** · active **163 ms**

CASE 04

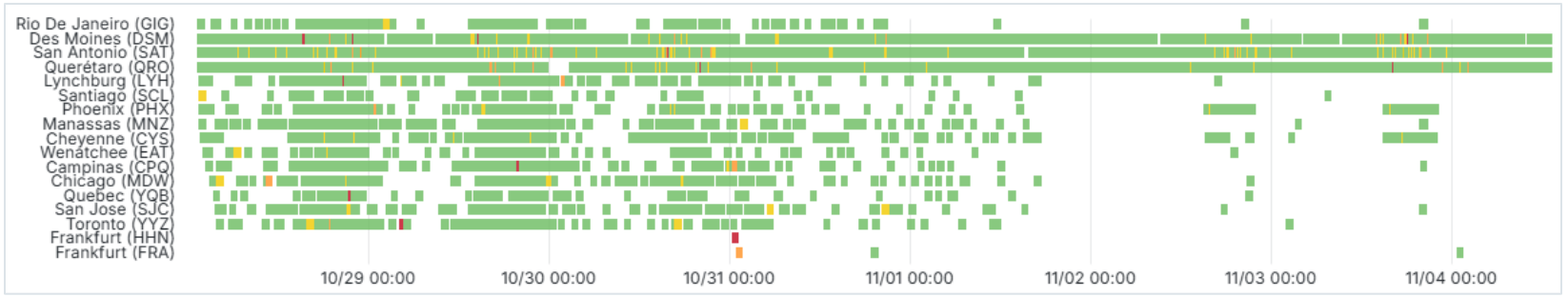
Warm looks good on every network

Active connect (warm), same networks, same days.

NETWORK A · ACTIVE CONNECT (WARM)



NETWORK B · ACTIVE CONNECT (WARM)



P95 ACTIVE (WARM)

87–163 ms

across the three networks at this location.

Once the connection is open, every network looks fine. The difference is in opening it.

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SECTION 04

Fix or escalate

Know whose problem it is before you open a ticket

You

Your ISP

Microsoft

FIX VS. ESCALATE

Whose problem is it?

Microsoft's own split: client to edge, and your edge to Microsoft's edge.

Measure both segments separately. First your network up to the edge, then the path beyond it.

Yours to fix

Wi-Fi, DNS resolver, egress design, proxy bypass, VPN split tunnel.

Escalate to your ISP

Distant handover to Microsoft; odd peering.

Microsoft's side

Incidents and rebalancing. Check Service Health, compare to baseline.

Escalate with evidence: front door per site, initial vs. active connect, timestamps and traceroutes.

By hand, or on every connection

Manual-Simple Tests, and what TrueDEM runs continuously from the endpoint.

STEP 01

Find the front door

ping or nslookup outlook.office365.com shows which front door DNS hands you.

STEP 02

Time the handshake

psping -n 20 <ip>:443 times the TCP handshake: one RTT, even where ICMP is blocked.

STEP 03

Split at the proxy

Measure client to proxy, then proxy to Microsoft: internal vs. external RTT.

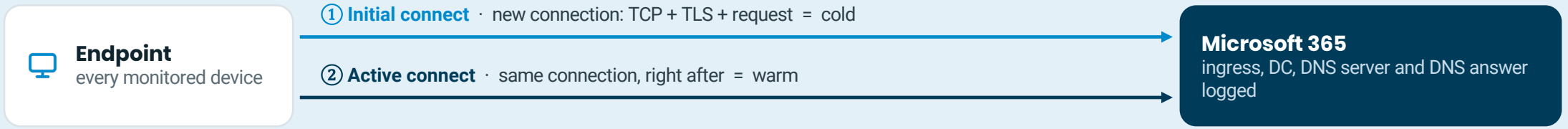
RESULT

Baseline & evidence

Repeat in normal operation. When users complain, compare segment by segment.

Source: (Microsoft), “How to measure the Network Round Trip Time to Office 365”

WHAT TRUEDEM AUTOMATES · TWO CONSECUTIVE HTTPS CALLS AGAINST MICROSOFT 365 ENDPOINTS



→ Per network, per front door, all day long.

KEY TAKEAWAYS

What to take away

Four things worth repeating to your network, client and security teams.

01 **Know your front door**

02 **Align DNS and egress**

03 **Measure cold, not just warm**

04 **Baseline before you blame**

Visibility turns “EXO is slow” into a ticket for the right team.

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Questions?

TAKE A LOOK

Want to learn more about TrueDEM?



More Info

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Thank you!



Stefan Fried

Senior Program Manager & Senior Consultant

stefan.fried@panagenda.com