



Microsoft

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129,000 organizations use Teams

87 Fortune 100 companies use Teams

19 May

day

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 <p>BCD 5th NOV 2020 TRACK APPS #BCD5NOV20 7:41:04</p> <p>[Live Event 05-11-2020] BeConnected day 2020 Live... 161 visualizzazioni • 5 mesi fa</p>	 <p>BCD 5th NOV 2020 TRACK SEC #BCD5NOV20 8:00:52</p> <p>[Live Event 05-11-2020] BeConnected day 2020 Live... 197 visualizzazioni • 5 mesi fa</p>	 <p>BCD 5th NOV 2020 TRACK COM #BCD5NOV20 5:40:59</p> <p>[Live Event 05-11-2020] BeConnected day 2020 Live... 216 visualizzazioni • 5 mesi fa</p>	 <p>BE CONNECTED DAY #BCD2020 3:25:28</p> <p>[Live Event 02-07-2020] BeConnected day 2020 Live... 77 visualizzazioni • 9 mesi fa</p>
 <p>BE CONNECTED DAY #BCD2020 02 - 03 APRILE 5:30:00</p> <p>[Live Event 02-04-2020] BeConnected day 2020 Live... 290 visualizzazioni • 1 anno fa</p>	 <p>BeConnected day 4:05:15</p> <p>[Live Event 13-11-2019] BeConnected day Live Even... 110 visualizzazioni • 1 anno fa</p>	 <p>BE CONNECTED DAY 11 APRILE 4:55:48</p> <p>[Evento COPERNICO 11-04-2019] BeConnected day 2019 197 visualizzazioni • 2 anni fa</p>	 <p>10 Ottobre www.ucug.it 4:58:20</p> <p>[Evento MS House 10-10-2018] BeConnected day 2018 219 visualizzazioni • 2 anni fa</p>





Roberto Ferazzi



Business & Technology Advisor @FAR Networks

BCD 19 May 2021



Luca Vitali



Cloud Collaboration & Security PM @Centro Computer

Tutto quello che avreste voluto sapere sul Media Flow di Teams e non avete mai osato chiedere

DISCLAIMER



SMODATO TASSO DI CONTENUTI TECNICI



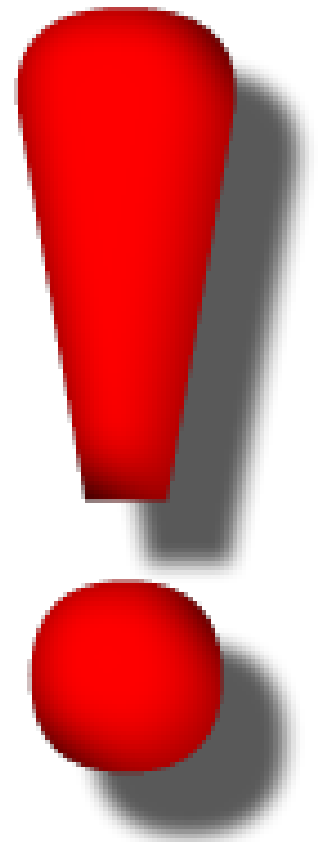
SCONSIGLIATA A CHI HA PROBLEMI DI IPERTENSIONE E
CARDIACI IN GENERE



PER REALIZZARE QUESTA SESSIONE NON SONO
STATI MALTRATTATI INGEGNERI MICROSOFT



Le comunicazioni realtime come
la voce e il video sono applicazioni
ad elevata aspettativa di qualità



Un po' di teoria



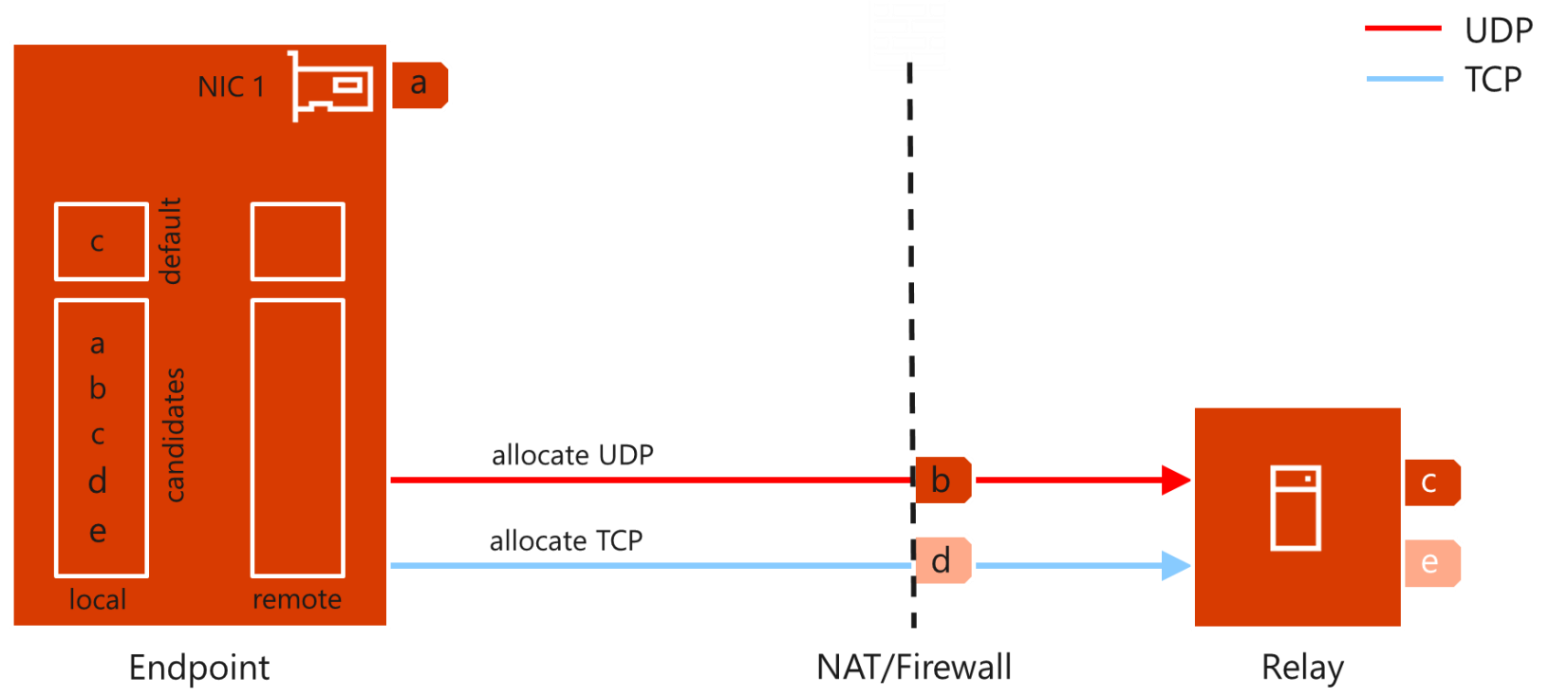
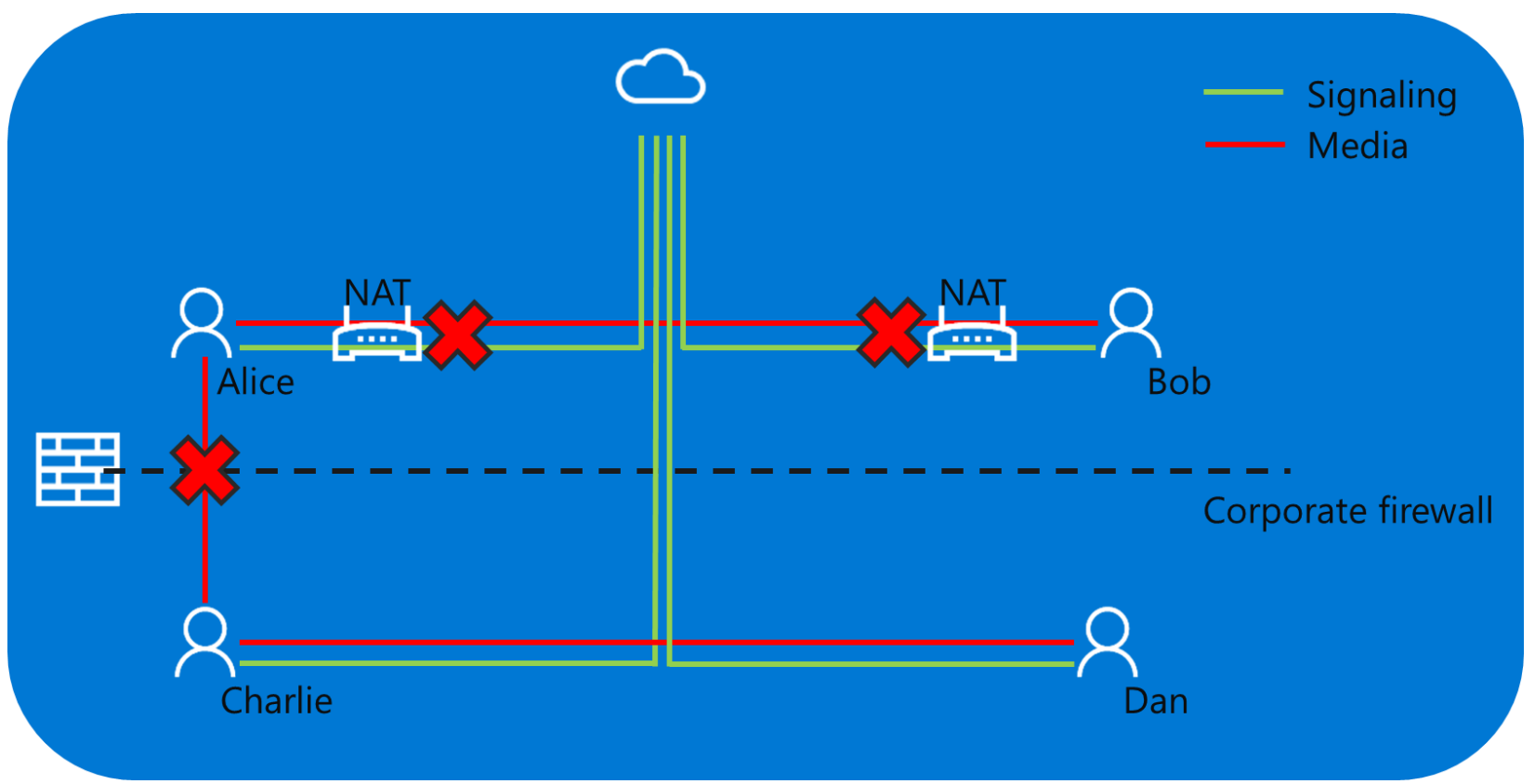
I problemi legati al traffico Media

- Problema 1: NAT
- Problema 2: Corporate Firewalls
- Problema 3: HTTP Proxy Servers

Le soluzioni

- Soluzione: ICE, STUN, TURN
- Il Signaling passa sempre attraverso il Cloud
 - Il Traffico Media segue un percorso diverso: il protocollo ICE individua gli Indirizzi IP candidati, li scambia tra gli Endpoint e determina il percorso ottimale

Il ruolo dei Transport Relay è diventato fondamentale nell'epoca del Cloud

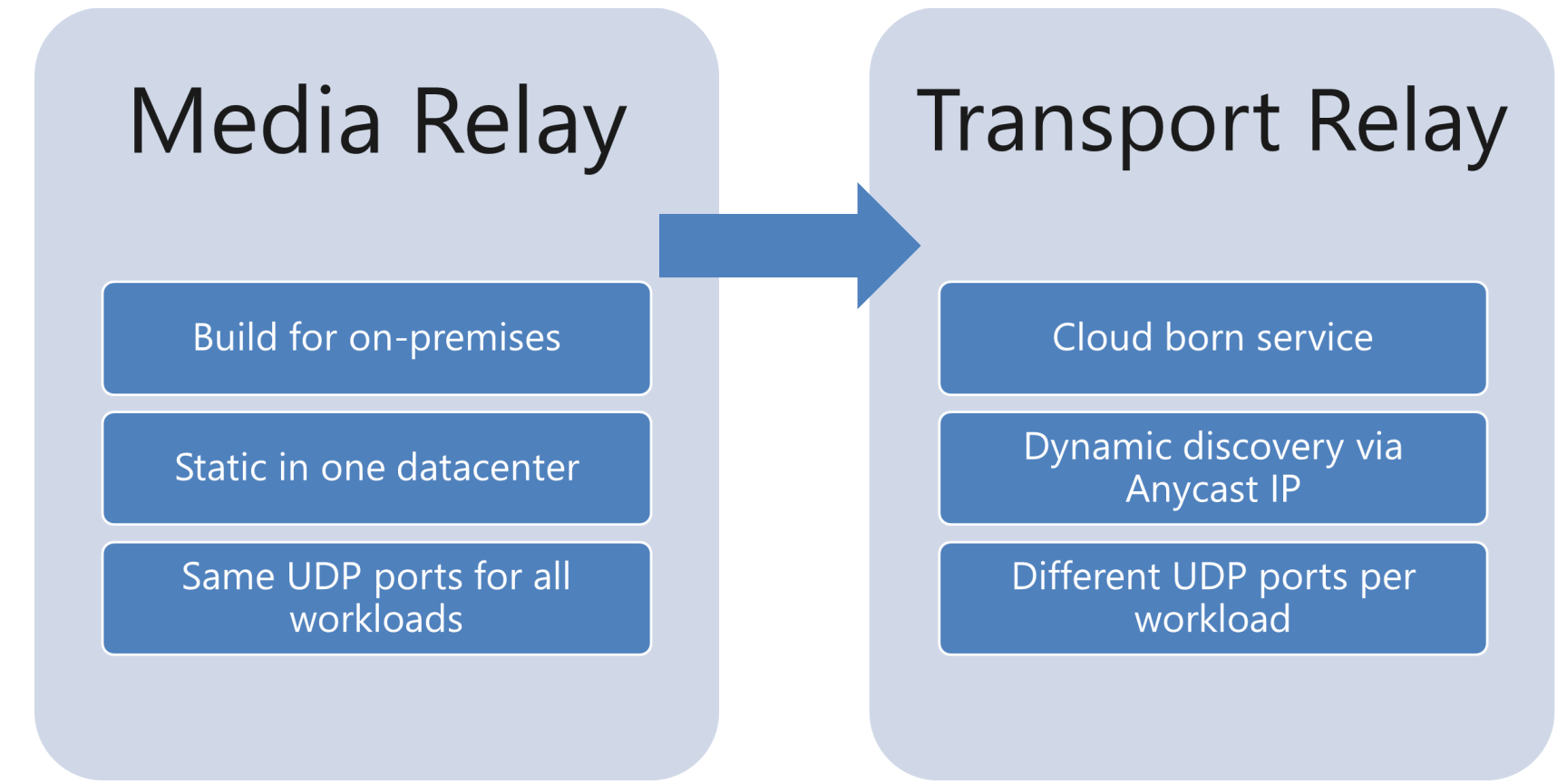




Relay

- 1. UDP Direct connection is preferred
- 2. Transport Relay is used as fallback to establish connection to second endpoint
- 3. Provides STUN and TURN
- 4. Does not terminate any media
- 5. Is not an ICE endpoint
- 6. Client to TR can be UDP, TCP and native HTTP for proxy support
- 7. TR will only offer UDP candidates even when you establish session over TCP or HTTP

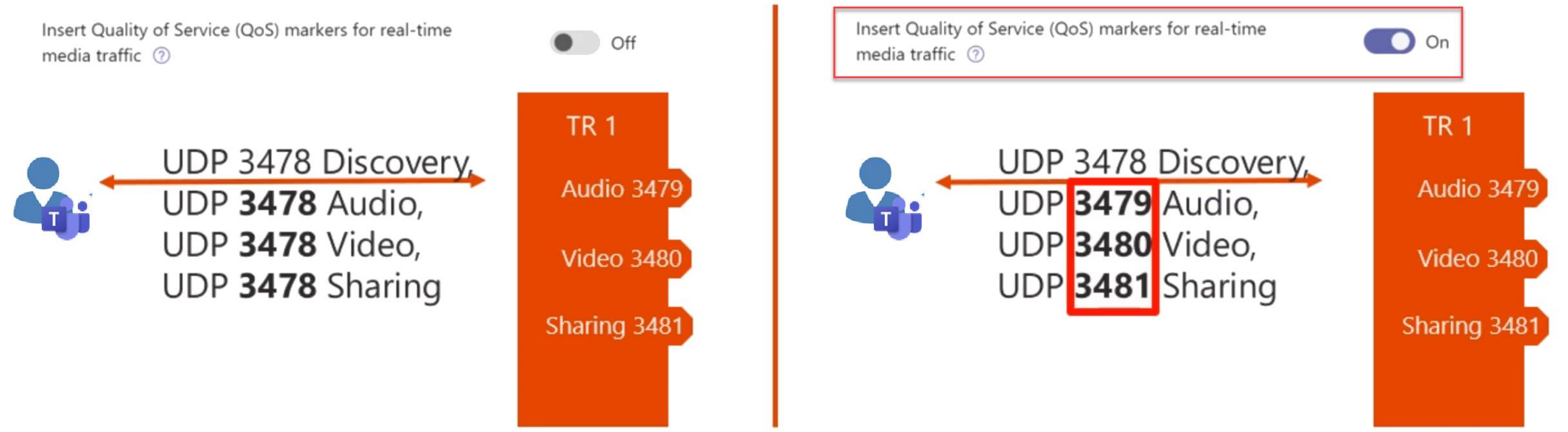
L'evoluzione dei Relay



8. UDP 3478 is always used for initial communication with TR

9. TR always allocates workload specific UDP ports

10. Client-to-TR uses service-specific workloads only if QoS is enabled

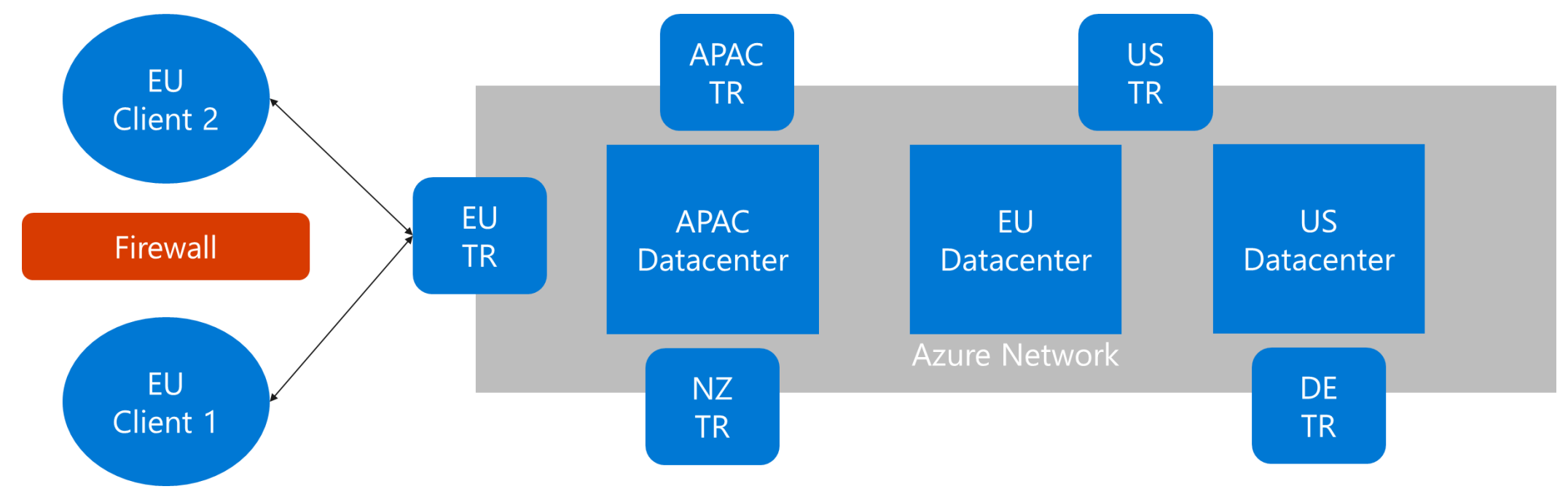


Anycast IP address

Same IP assigned to geographical dispersed servers
IP routing ensures to always use the “closest” instance

“Closest” available Transport Relay will receive traffic

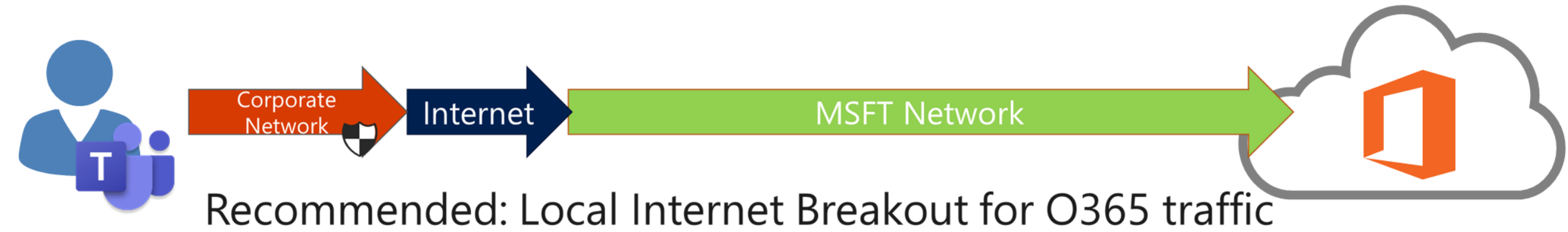
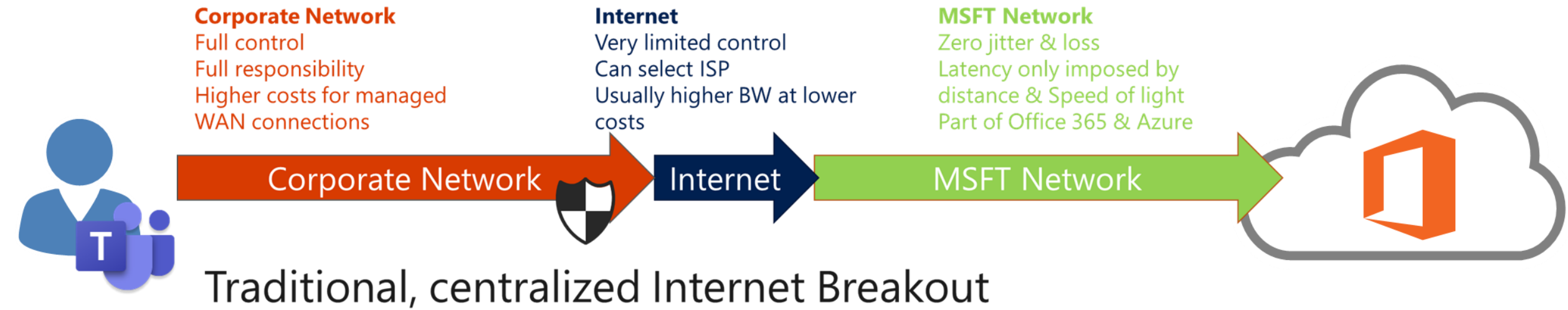
- Based on actual endpoint location
- And based on privacy boundaries
 - Sovereign tenants users use local infrastructure
 - EU tenants use Transport Relay in EU and US
 - Other tenants use Transport Relays world wide



Routing schemes

- Unicast**
- Broadcast**
- Multicast**
- Anycast**
- Geocast**

V·T·E



Egress network connections to “optimize category” locally

<https://aka.ms/O365endpoints>

Skype for Business Online and Microsoft Teams

ID	Category	ER	Addresses	Ports
11	Optimize Required	Yes	13.107.64.0/18, 52.112.0.0/14, 52.120.0.0/14	UDP: 3478, 3479, 3480, 3481

Un caso reale



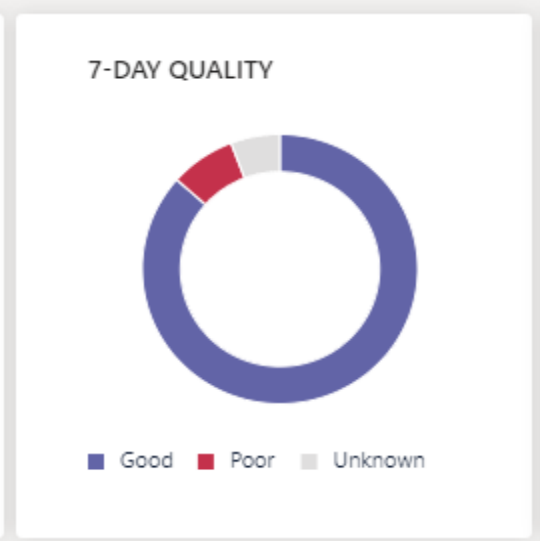
1. Azienda multinazionale presente in 50 country
2. Adozione massiva di Microsoft Teams come strumento di communication e collaboration
3. Problemi di qualità nella voce riscontrati in alcune country



- Dashboard
- Teams
- Devices
- Locations
- Users**
- Meetings
- Messaging policies
- Teams apps
- Voice
- Policy packages
- Analytics & reports
- Org-wide settings
- Planning
- Call quality dashboard

Users \ [User Name]

Profile card for [User Name] showing contact icons (phone, chat, email), location (Australia), and fields for Phone number (+61...), Email, and Directory status (-).



7-DAY ACTIVITY

12 Meetings

40 Calls

- Account
- Voice
- Meetings & calls**
- Policies

Past meetings 251 meetings & calls

Meeting or call ID	Start time ↓	When	Participants	Duration	Activity type	Audio quality
be9ef0e3-7971-43bf-a0fe-eb6307043953	Mar 23, 2021, 8:40 AM GMT+1	12 days ago	2 Participants	00:01:03	Call.	Poor
ce0b17cb-1e19-4e64-8155-908d93c766ce	Mar 23, 2021, 8:39 AM GMT+1	12 days ago	2 Participants	00:01:08	Call.	Poor
56432ed7-8015-4a83-a641-686bf915f429	Mar 23, 2021, 8:37 AM GMT+1	12 days ago	2 Participants	00:00:39	Call.	Good
6055ee4b-a8f6-456f-ae9e-7e0fbde18525	Mar 23, 2021, 8:35 AM GMT+1	12 days ago	2 Participants	00:00:39	Call.	Poor
295f2337-95c3-4292-85dd-68c45369d0f5	Mar 23, 2021, 8:34 AM GMT+1	12 days ago	2 Participants	00:00:26	Call.	Poor
70194691-5ab8-4ec8-9e34-a67b4e64f422	Mar 23, 2021, 8:29 AM GMT+1	12 days ago	2 Participants	00:00:53	Call.	Poor
ee473df6-8467-44c6-9aad-034c9fb2a6b7	Mar 23, 2021, 8:25 AM GMT+1	12 days ago	2 Participants	00:02:21	Call.	Good
fc8ec74c-1711-45bf-b25e-acd25bb304e8	Mar 23, 2021, 8:24 AM GMT+1	12 days ago	2 Participants	00:00:38	Call.	Good

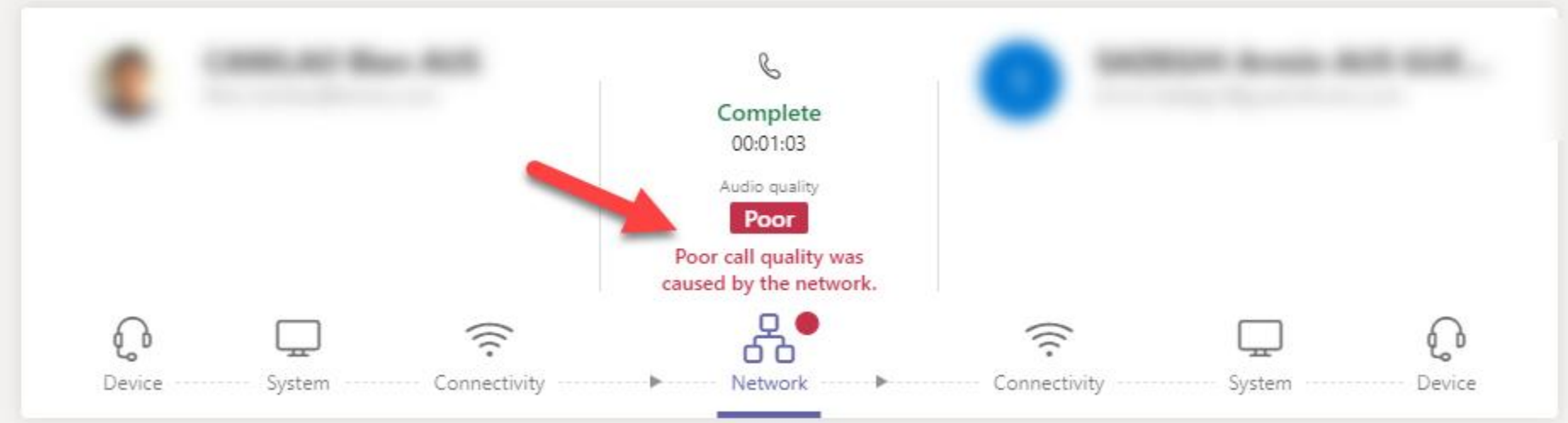
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Users \ [User] \ Session

Mar 23, 2021, 8:40 AM GMT+1

Export report

Overview Advanced Debug



Network stream from [User] to [User]

Average round-trip time	555 ms
Maximum round-trip time	842 ms
Average jitter	2 ms
Maximum jitter	6 ms
Average packet loss rate	0.00%
Maximum packet loss rate	0.00%

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Inbound network

Average jitter	9 ms	2 ms
Maximum jitter	20 ms	6 ms
Average round-trip time	555 ms	576 ms
Maximum round-trip time	842 ms	834 ms
Average packet loss rate	0.00%	0.00%
Maximum packet loss rate	0.00%	0.00%
Maximum compressed samples	0	0
Compressed sample ratio	0.90%	0.00%
Concealed sample ratio	0.53%	1.10%
Stretched sample ratio	0.13%	0.06%
Payload type	108	108
Payload description	SATIN	SATIN
Sample rate	16,000 Hz	16,000 Hz

Outbound network

Average jitter	2 ms	9 ms
Maximum jitter	6 ms	20 ms
Average round-trip time	555 ms	576 ms

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Users \ \ Session

Mar 23, 2021, 8:40 AM GMT+1

Export report

Overview **Advanced** Debug

Report

Report time	Mar 23, 2021, 8:41 AM GMT+1
source	DB41E17FES09.infra.lync.com
reason	Protocol Stack Telemetry data
component	SIPStack
INVITE_received	Tuesday, March 23, **** 07:40:59 AM
Setup_Time	0
telemetry-id	33FA68A4-E0DA-5F05-B261-FD4CE6600F56

Connectivity_BaseAddress	10.34.64.164:50016
--------------------------	--------------------

Connectivity_RemoteAddress	1.144.107.20:39640
----------------------------	--------------------

Connectivity_LocalSite	27.33.159.98:12151
------------------------	--------------------

Connectivity_RemoteSite	1.144.107.20:39640
-------------------------	--------------------

Connectivity_LocalMR	52.113.200.34:50828
----------------------	---------------------

Connectivity_RemoteMR	52.115.98.171:3479
-----------------------	--------------------

Connectivity_BaseAddress	10.34.64.164:50016
--------------------------	--------------------

Connectivity_LocalSite	27.33.159.98:12151
------------------------	--------------------



27.33.159.98 LOOK UP

- ip: "27.33.159.98"
- type: "ipv4"
- continent_code: "OC"
- continent_name: "Oceania"
- country_code: "AU"
- country_name: "Australia" ←
- region_code: "VIC"
- region_name: "Victoria"
- city: "Melbourne"
- zip: 3000

Connectivity_LocalIMR	52.113.200.34:50828
-----------------------	---------------------



52.113.200.34 LOOK UP

- ip: "52.113.200.34"
- type: "ipv4"
- continent_code: "EU"
- continent_name: "Europe"
- country_code: "GB"
- country_name: "United Kingdom" ←
- region_code: "ENG"
- region_name: "England"
- city: "Blackheath"
- zip: EC1M

Connectivity_RemoteAddress	1.144.107.20:39640
----------------------------	--------------------

Connectivity_RemoteSite	1.144.107.20:39640
-------------------------	--------------------



1.144.107.20 LOOK UP

- ip: "1.144.107.20"
- type: "ipv4"
- continent_code: "OC"
- continent_name: "Oceania"
- country_code: "AU"
- country_name: "Australia" ←
- region_code: "NSW"
- region_name: "New South Wales"
- city: "Parramatta"
- zip: 2138

Connectivity_RemoteMR	52.115.98.171:3479
-----------------------	--------------------



52.115.98.171 LOOK UP

- ip: "52.115.98.171"
- type: "ipv4"
- continent_code: "OC"
- continent_name: "Oceania"
- country_code: "AU"
- country_name: "Australia" ←
- region_code: "NSW"
- region_name: "New South Wales"
- city: "Sydney"
- zip: 2000

Microsoft 365 network connectiv x +

← → ↻ 🏠 🔒 https://connectivity.office.com

Microsoft

- Network connectivity test
- Reports
- Network health status
- FAQs
- Community forum

Microsoft 365 network connectivity test

When you run this test, we measure the connectivity between your device and the internet, and from there to Microsoft's network.

Insights from these measurements help you discover and understand connectivity problems for individual office locations and how you can update your network architecture to improve connections to Microsoft 365. This can dramatically increase productivity and satisfaction for people in your organization.

When you select **Run test**, we'll begin with your web browser connectivity and then test your device connections. [Learn what happens at each step](#)

Automatically detect location
Bing Maps provides street address suggestions and geo-coding for your location.

Add your location
Enter your location if you don't want us to detect it automatically.

Run test

More information

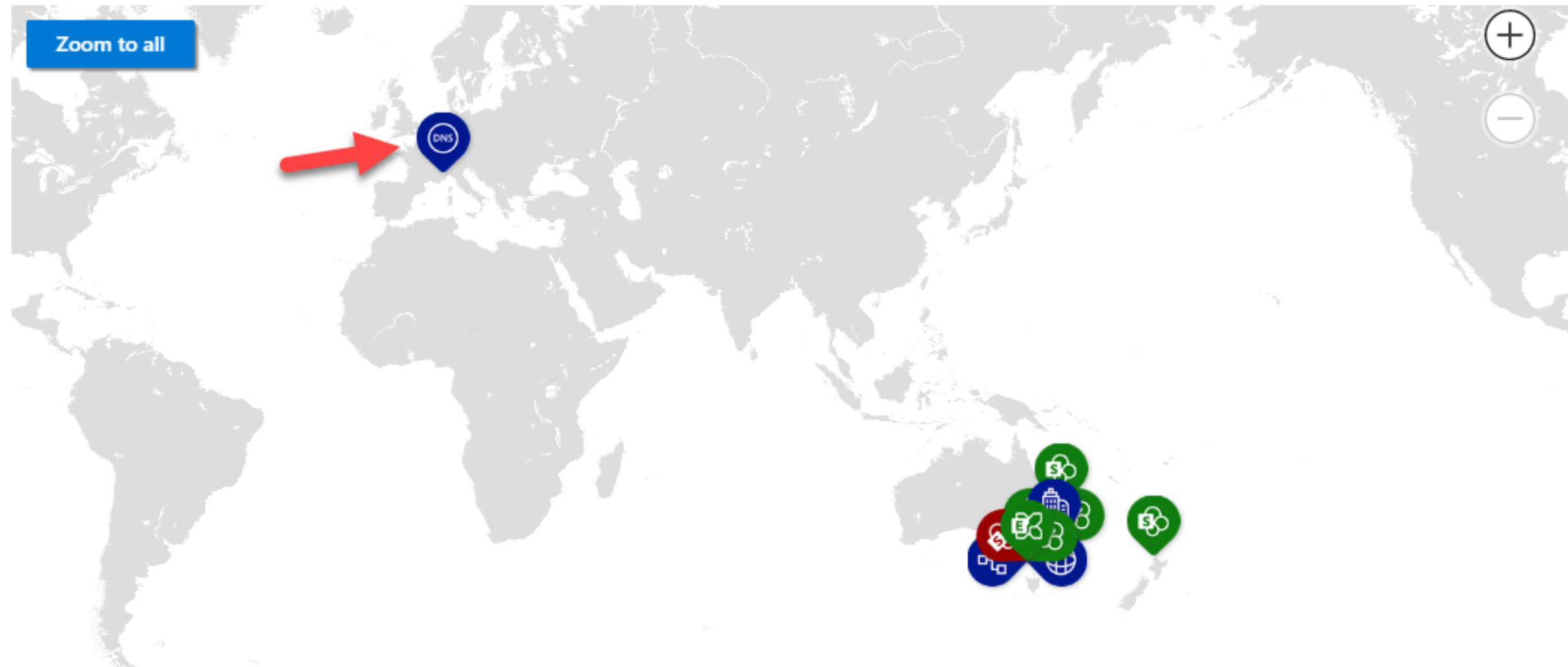
- [Read about location services](#)
- [Read about Microsoft 365 network connectivity tests](#)
- [Privacy statement](#)
- [Trademarks](#)

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Network Plan for Sydney, NSW, Australia

Summary Details History

Network perimeter for this office location



© 2021 Microsoft Corporation

-  Office location
-  Network perimeter
-  Exchange optimal front door
-  Exchange sub-optimal front door
-  SharePoint optimal front door
-  SharePoint sub-optimal front door
-  DNS recursive resolver server
-  Your proxy server

Network Plan for Sydney, NSW, Australia

Summary **Details** History

Below are the results of your network services for this location.

Test	User-submitted
Location info (9)	
Network egress location (the location where your network connects to your ISP)	Melbourne, VIC, Australia
✓ Distance from the network egress location	443 miles (713 km)
✓ Percentage of people in this area who have a better network connection to Microsoft 365	There are not a significant number of customers with better performance
Time to make a DNS request on your network	10.34.0.26 (270 ms) 10.34.64.9 (7 ms)
Your distance from and/or time to connect to a DNS recursive resolver	85.32.241.90 - Turin, Piedmont, Italy
If you use a proxy server, distance from your location and time to connect	165.225.226.14:10065 [12 ms] - Melbourne, VIC, Australia
✓ Virtual private network (VPN) you use to connect to your organization	No VPN detected
Estimated number of users ⓘ	Less than 10
Egress IP address ranges	165.225.226.0/24.
Exchange Online (3)	
✓ Exchange service front door location	Melbourne, VIC, Australia (17 ms). Potential 10 ms improvement
Best Exchange service front door(s) for this location	Melbourne, VIC, Australia Sydney, NSW, Australia
▲ Service front door recorded in the client DNS	outlook.office365.com -> MRS-efz.ms-acdc.office.com [40.101.92.18]

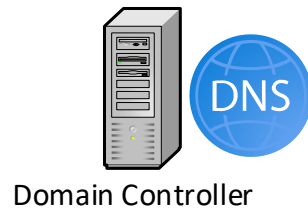
Microsoft Teams (4)

✓ Media connectivity (audio, video, and application sharing)	No error
✓ Packet loss	0.00% (target < 1% during 15 s)
▲ Latency	241 ms (target < 100 ms)
▲ Jitter	96 ms (target < 30 ms)

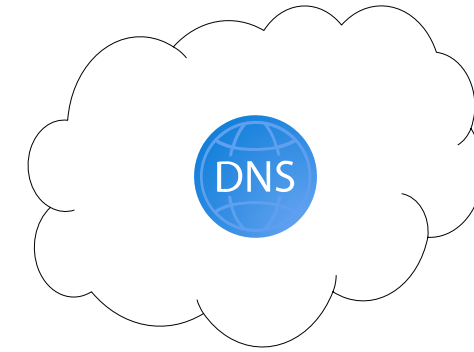


Query DNS nome privato

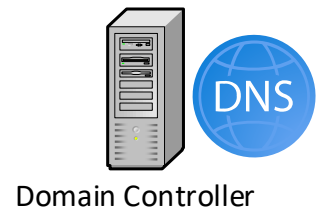
Germania



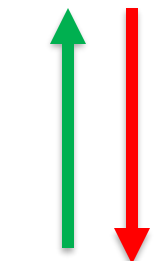
Domain Controller



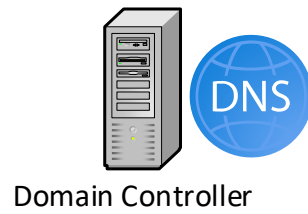
Australia



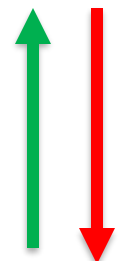
Domain Controller



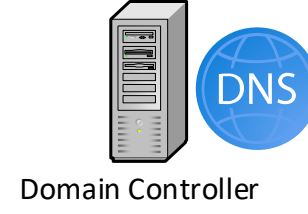
Grecia



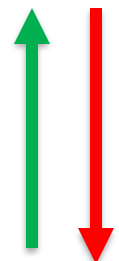
Domain Controller

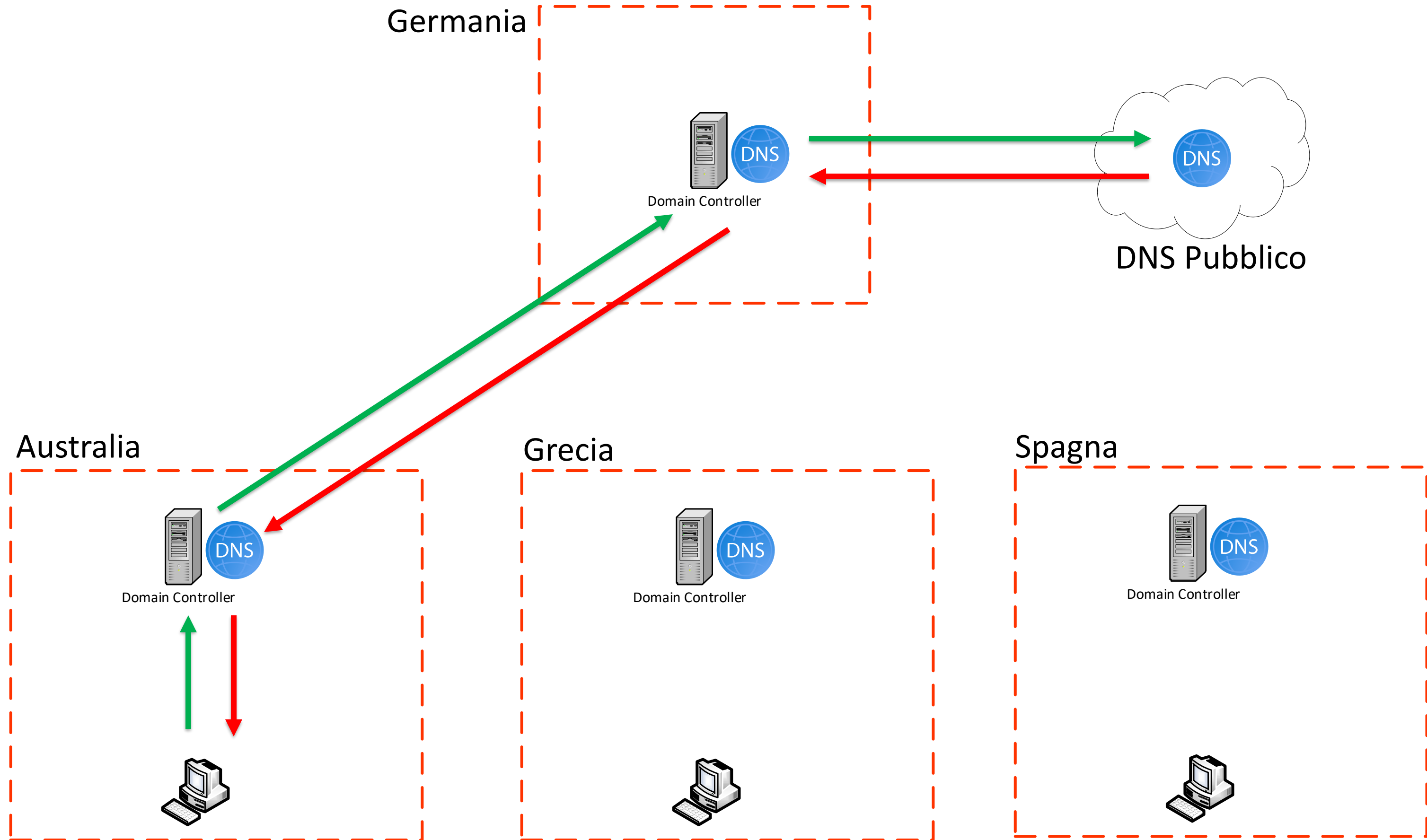


Spagna



Domain Controller





Approfondiamo il ruolo del
DNS



Query significative da parte del Client Teams
DNS Centralizzato in Germania

Query: tr.teams.microsoft.com

▼ Answers

- > tr.teams.microsoft.com: type CNAME, class IN, cname worldaz.tr.teams.microsoft.com
- > worldaz.tr.teams.microsoft.com: type CNAME, class IN, cname worldaz.tr.teams.trafficmanager.net
- > worldaz.tr.teams.trafficmanager.net: type CNAME, class IN, cname a-tr-teams-ukso-03.uksouth.cloudapp.azure.com
- > a-tr-teams-ukso-03.uksouth.cloudapp.azure.com: type A, class IN, addr 52.113.200.4

Query significative da parte del Client Teams
DNS Locale in Australia

Query: tr.teams.microsoft.com

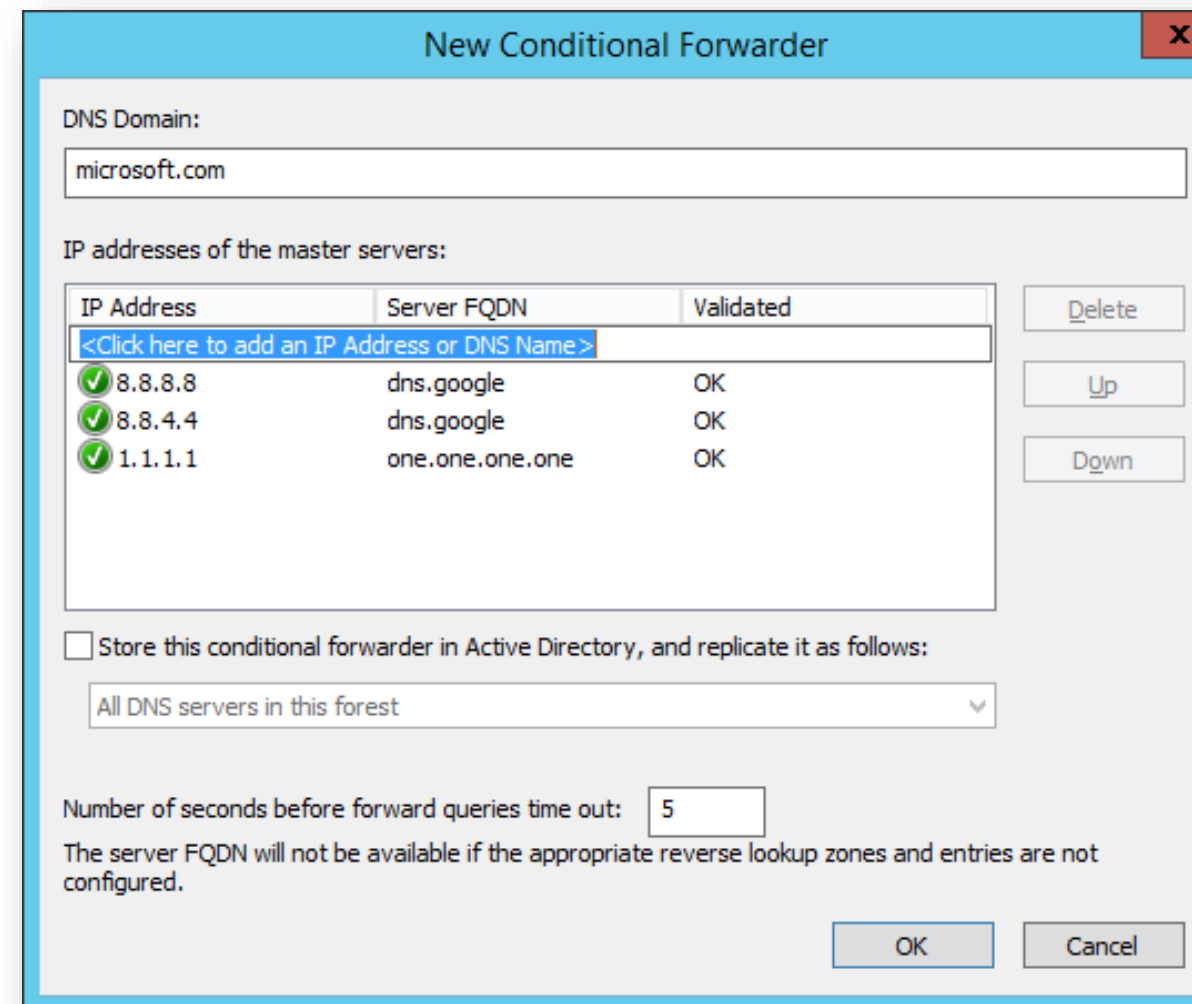
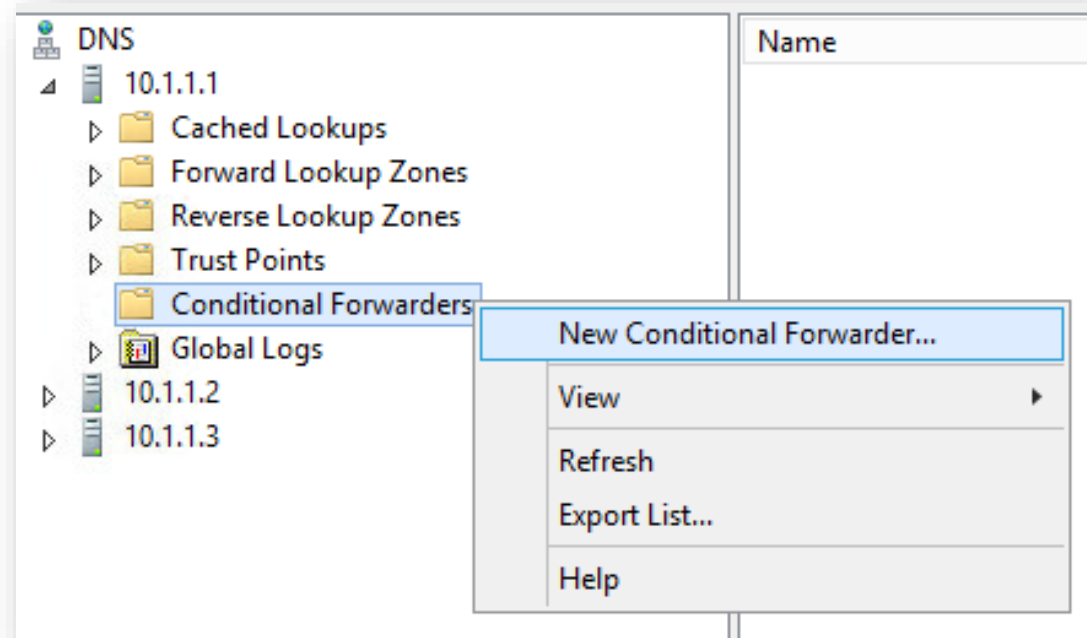
▼ Answers

- > tr.teams.microsoft.com: type CNAME, class IN, cname worldaz.tr.teams.microsoft.com
- > worldaz.tr.teams.microsoft.com: type CNAME, class IN, cname worldaz.tr.teams.trafficmanager.net
- > worldaz.tr.teams.trafficmanager.net: type CNAME, class IN, cname b-tr-teasc-aeua-01.australiaeast.cloudapp.azure.com
- > b-tr-teasc-aeua-01.australiaeast.cloudapp.azure.com: type A, class IN, addr 52.115.98.6

La soluzione a questo problema è molto semplice (una volta capito il problema)

E' sufficiente creare sui DNS Server una nuova regola di Conditional Forward, facendo risolvere tutti le Query DNS per «microsoft.com» a un DNS Server pubblico

In questo modo i client all'interno delle reti aziendali possono continuare a usare i DNS Interni senza nessun impatto, ma al contempo iniziare a sfruttare i vantaggi dell'Egress locale per tutti i servizi in Cloud




Problema risolto



- Dashboard
- Teams
- Devices
- Locations
- Users**
- Meetings
- Messaging policies
- Teams apps
- Voice
- Policy packages
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- Planning
- Call quality dashboard

Users \ [User Name]



[User Name]
Australia

Phone number: +61 [Redacted]
Email: [Redacted]
Directory status: -



7-DAY ACTIVITY

12 Meetings
40 Calls

- Account
- Voice
- Meetings & calls**
- Policies

Past meetings 251 meetings & calls ⓘ

Meeting or call ID	Start time ↓	When	Participants	Duration	Activity type	Audio quality
b2d33647-1387-4916-938e-fe74d76fa019	Mar 30, 2021, 7:58 AM GMT+2	5 days ago	12 Participants	01:31:55	Conference.	Good
a6f2f486-a11b-4042-9510-8e4691a40a75	Mar 30, 2021, 6:43 AM GMT+2	5 days ago	2 Participants	00:00:06	Call.	Good
a4179178-652f-48d3-bd9c-2a2018dfa4cf	Mar 30, 2021, 6:43 AM GMT+2	5 days ago	2 Participants	00:00:35	Call.	Good
429f580e-6baa-48f2-ba9e-bead953f77ae	Mar 30, 2021, 6:38 AM GMT+2	5 days ago	2 Participants	00:00:12	Call.	Good
6dd33c0f-0f1d-4799-a54d-70a77a69050b	Mar 30, 2021, 6:25 AM GMT+2	5 days ago	2 Participants	00:01:48	Call.	Good
3c607f48-ddaf-468c-86bd-1e57d2217c80	Mar 30, 2021, 6:22 AM GMT+2	5 days ago	2 Participants	00:01:27	Call.	Good
7c040d7b-503d-42c4-a709-0a324987abe6	Mar 30, 2021, 6:13 AM GMT+2	5 days ago	2 Participants	00:04:37	Call.	Good
2a5f61e6-9d8f-422a-ad67-d10de596c8d9	Mar 30, 2021, 6:11 AM GMT+2	5 days ago	2 Participants	00:01:09	Call.	Good

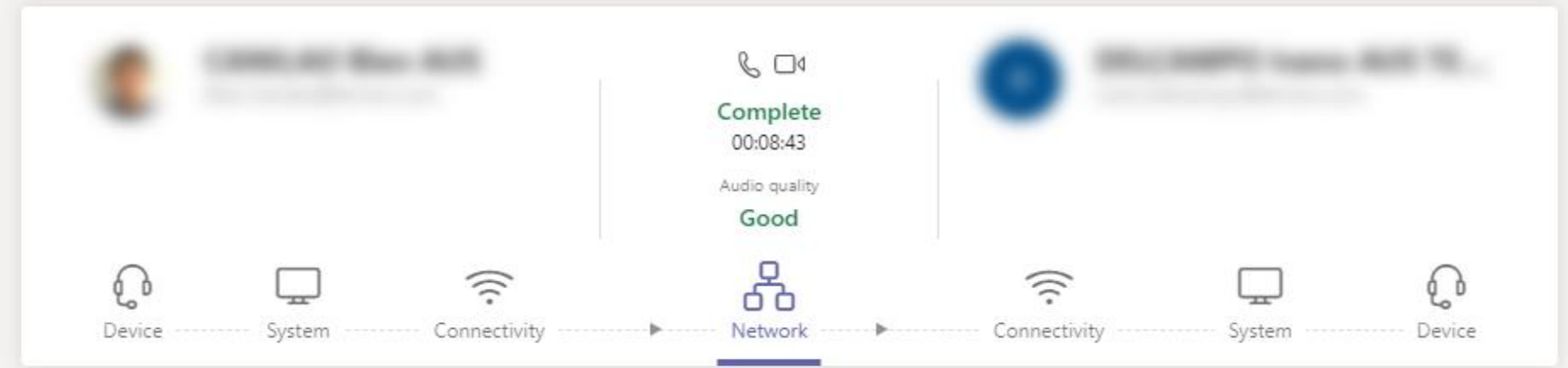
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Users \ [User] \ Session

Mar 30, 2021, 1:49 AM GMT+2

Export report

Overview Advanced Debug



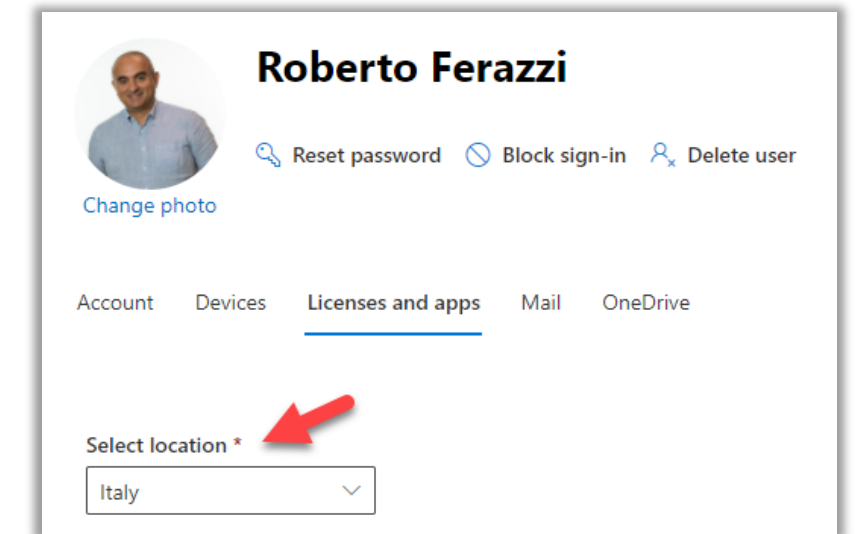
Network stream from [User] to [User]

Average round-trip time	91 ms
Maximum round-trip time	414 ms
Average jitter	7 ms
Maximum jitter	15 ms
Average packet loss rate	0.01%
Maximum packet loss rate	0.74%

Conclusioni



1. Local Internet Breakout
2. Local Internet Name Resolution
3. La location non ha influenza con il processo di localizzazione del Transport Relay
4. Microsoft 365 network connectivity principles
 - a. <https://docs.microsoft.com/en-us/microsoft-365/enterprise/microsoft-365-network-connectivity-principles?view=o365-worldwide>
5. Office 365 URLs and IP address ranges
<https://aka.ms/O365endpoints>



ID	Category	ER	Addresses	Ports
11	Optimize Required	Yes	13.107.64.0/18, 52.112.0.0/14, 52.120.0.0/14	UDP: 3478, 3479, 3480, 3481

DOMANDE?

BCD

19 May
2021



Mentre pensate alle domande,
iscrivetevi al nostro
Canale YouTube BeConnected Day



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Teams is the fastest growing business...
129,000 organizations use Teams
87 Fortune 100 companies use Teams

19 May

day

BeConnected 2021

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