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What’s new in AVD and W365: GPU and Protocol Improvements

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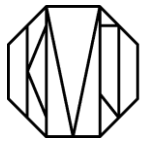
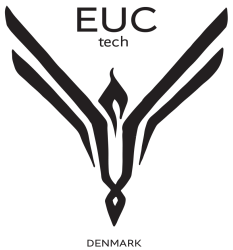
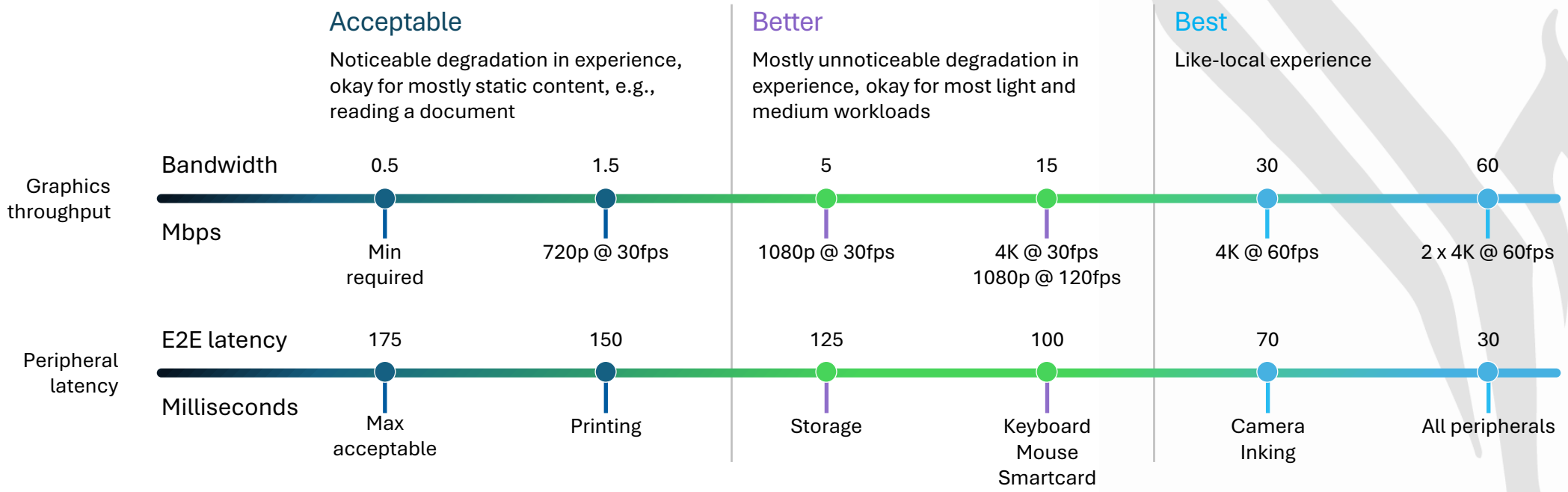




Agenda

- RDP transport – connection reliability
- Connectivity improvements & simplification
- RDP graphics
- Connection & sign-in experience
- Redirections
- New streaming capabilities

Delivering like-local experiences—adapts to user environment



CONNECTION SUCCESS ≥ 99.9% | RELIABILITY ≥ 8HOURS MTTF

ENDPOINT REQUIREMENTS MINIMIZED TO WHAT'S NECESSARY FOR PERIPHERALS

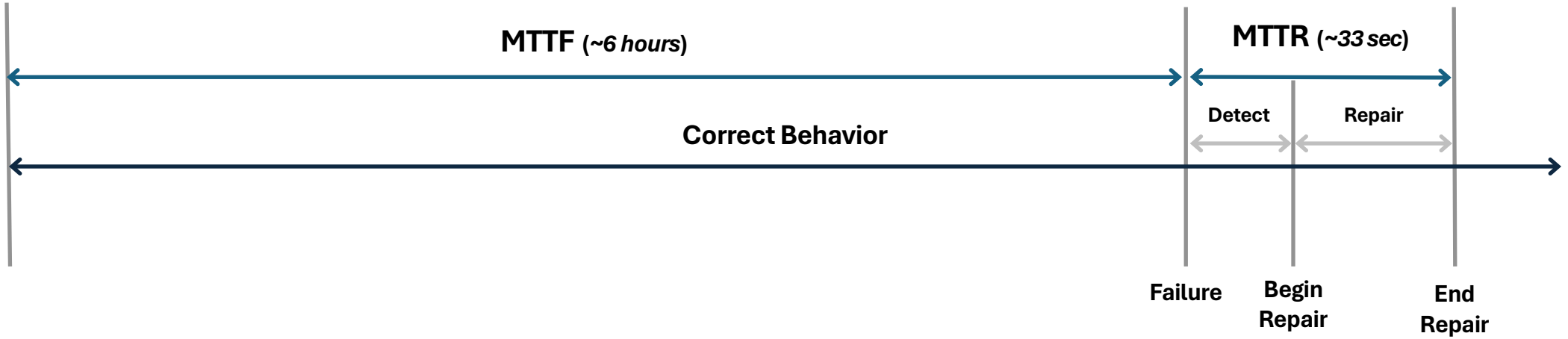
Note: Designed to deliver performance with minimal cloud hardware. Graphics throughput improves with additional hardware.

Innovation at every layer

- Streaming
- Windows cloud solutions
  Windows 365 & Azure Virtual Desktop
- Windows
- Systems
- Silicon

RDP transport – connection reliability

Staying connected metric



MTTF → Mean time to failure

- Time until user noticeable connection disruption.
- Single metric doesn't exist yet, being worked on. Current time calculated from existing data.

MTTR → Mean time to recovery

- Time for the system to restore the user's connection.
- Composed of time to detect + time to repair

What gets marked as a ‘failure’ today?

Any time the user loses its connection to their VM., e.g., connect from WiFi to VPN, and the full connection must get re-established through VPN.

User’s home Internet goes out and must connect back.

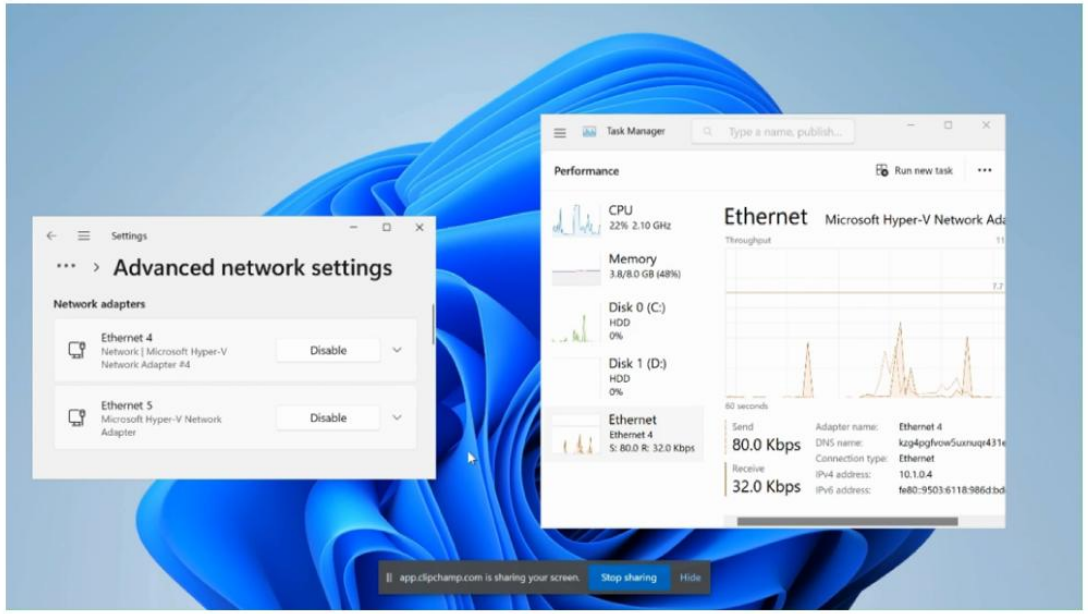
Azure WAN flap that cuts off the connection and user must re-establish.

Global TURN relay expansion

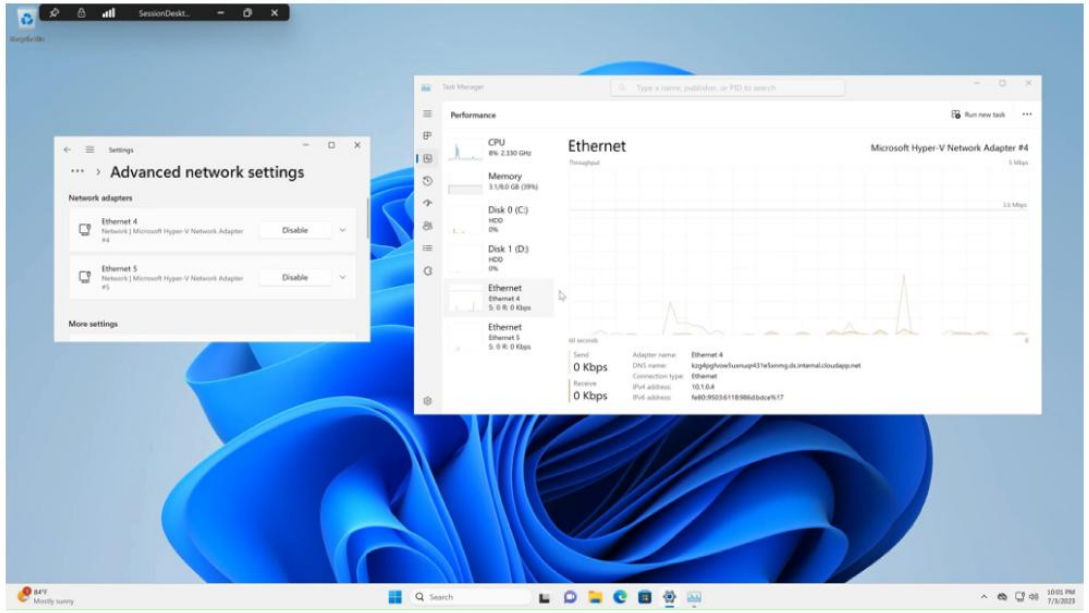
Enhancing reliability and optimizing Windows 365 and Azure Virtual Desktop traffic

Demo: RDP Multipath

Time to recover when network drops



~53 seconds



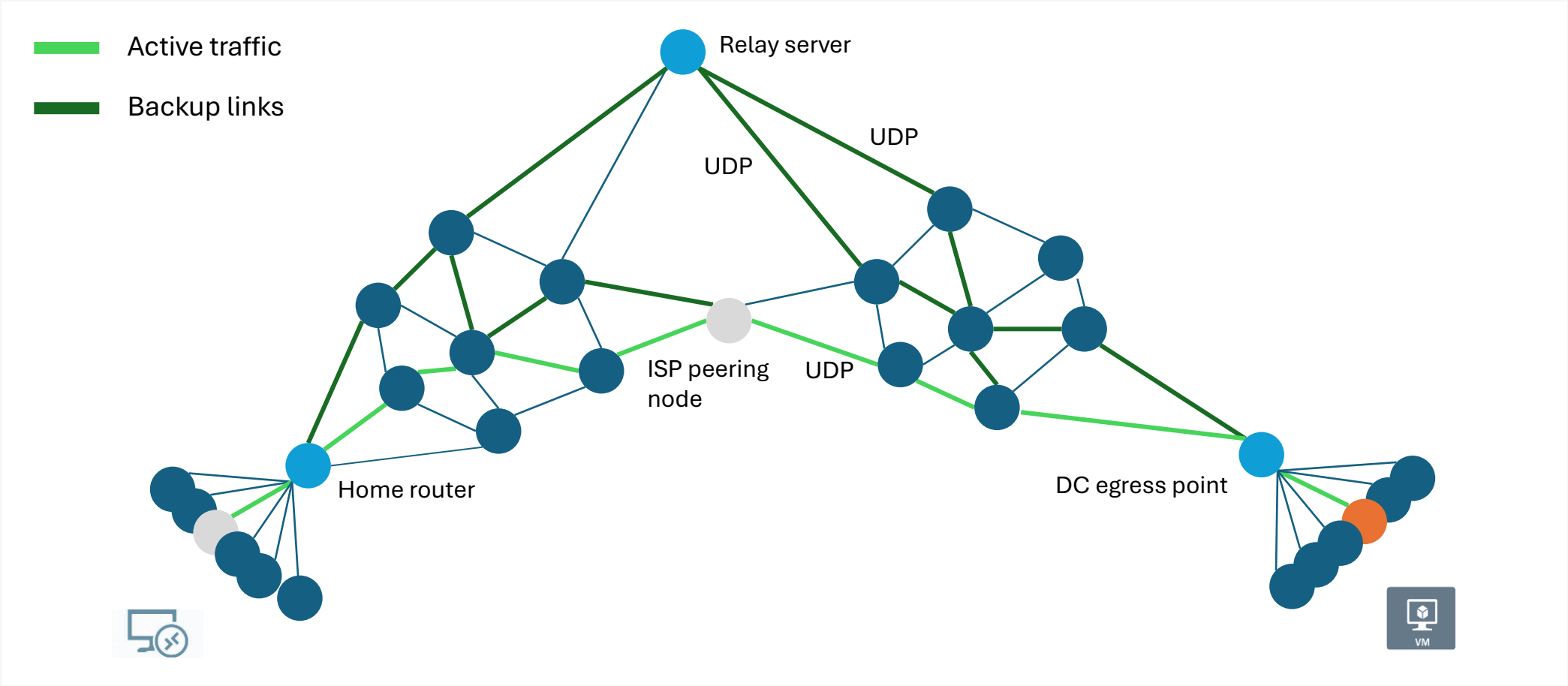
< 1 second

IDEA of SMILES

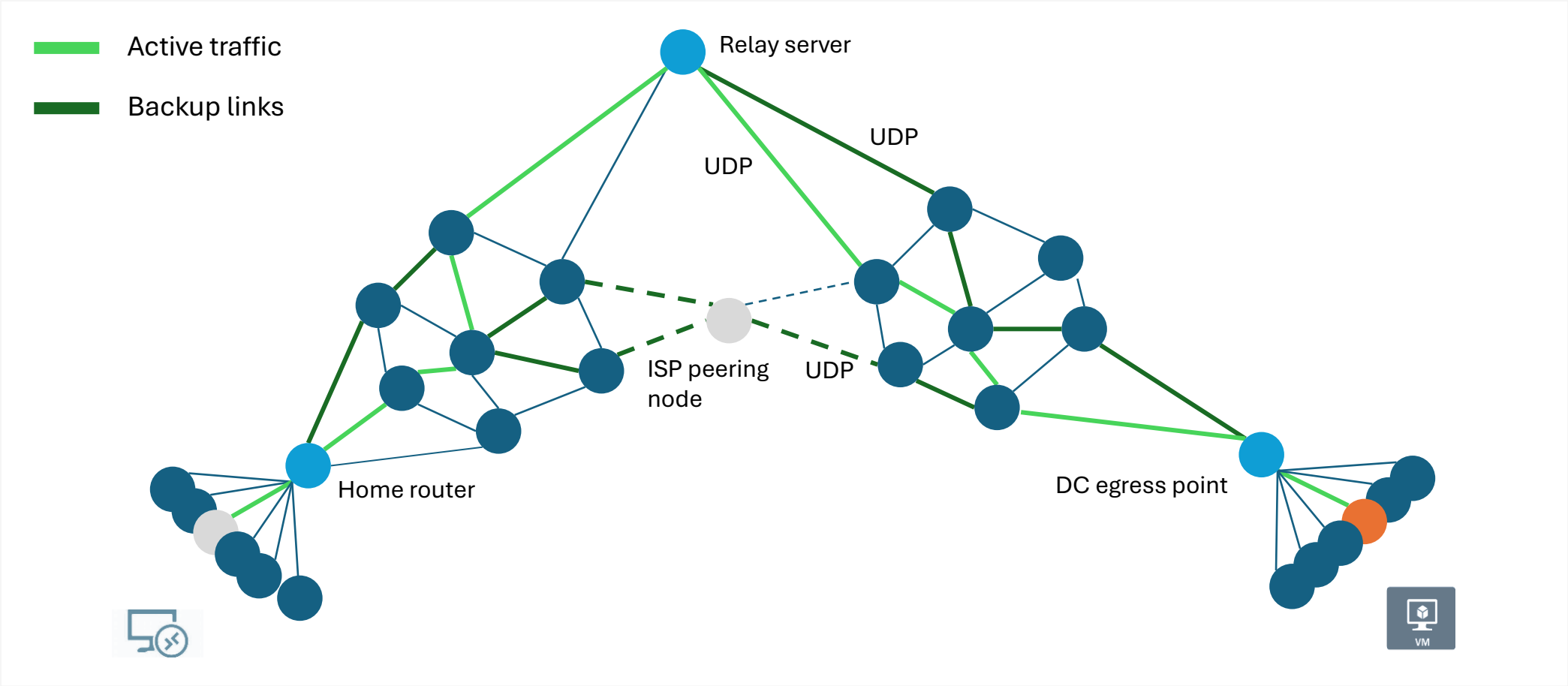
Simple Multiple Independent Links Evaluation and Switching

- No change needed to get SMILES.
- Evaluate multiple paths at the same time and switch active path at runtime behind the scene.
- Avoid single points of failure.
- If single point of failure breaks, then only one of the paths is affected.
- UDP paths are discovered using ICE.
- Supports TCP and UDP paths.

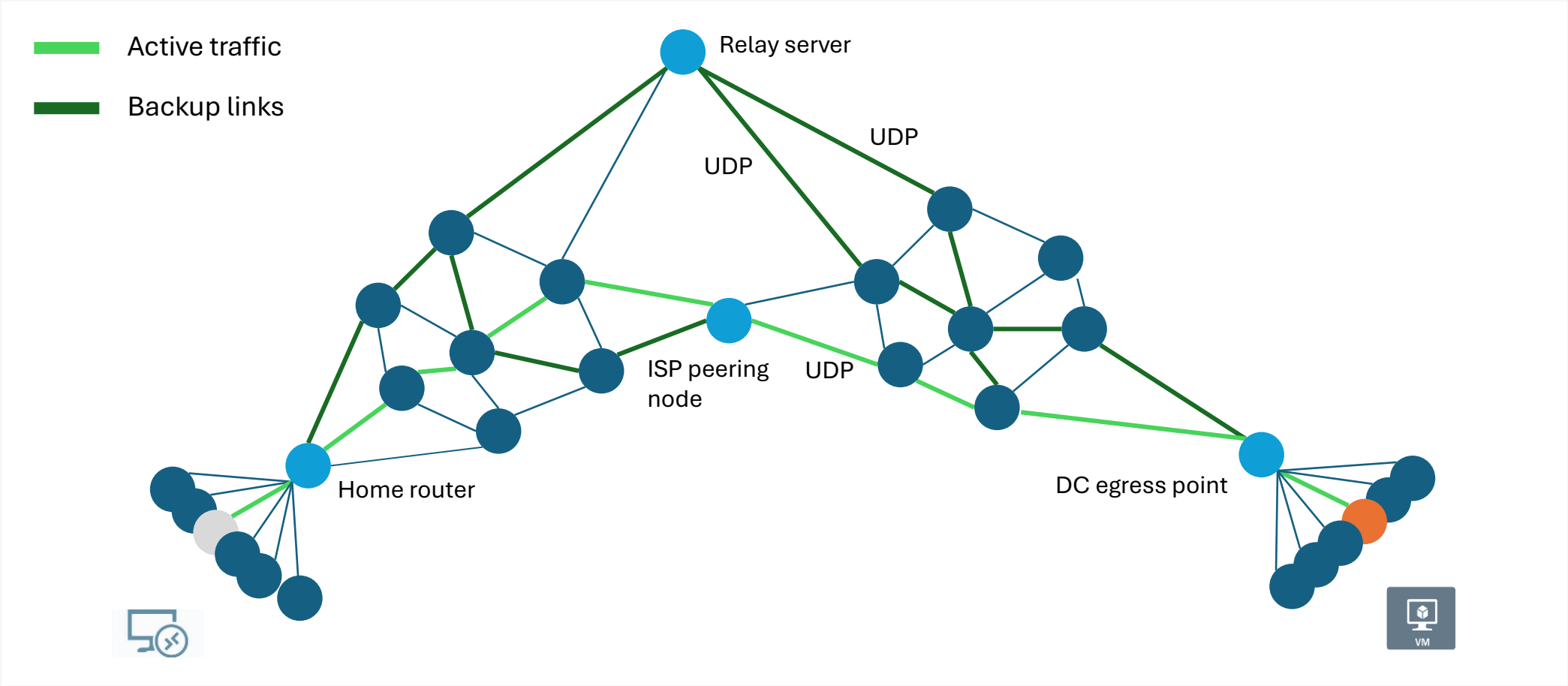
SMILES in action - 1



SMILES in action - 2



SMILES in action - 3



Rendezvous protocol

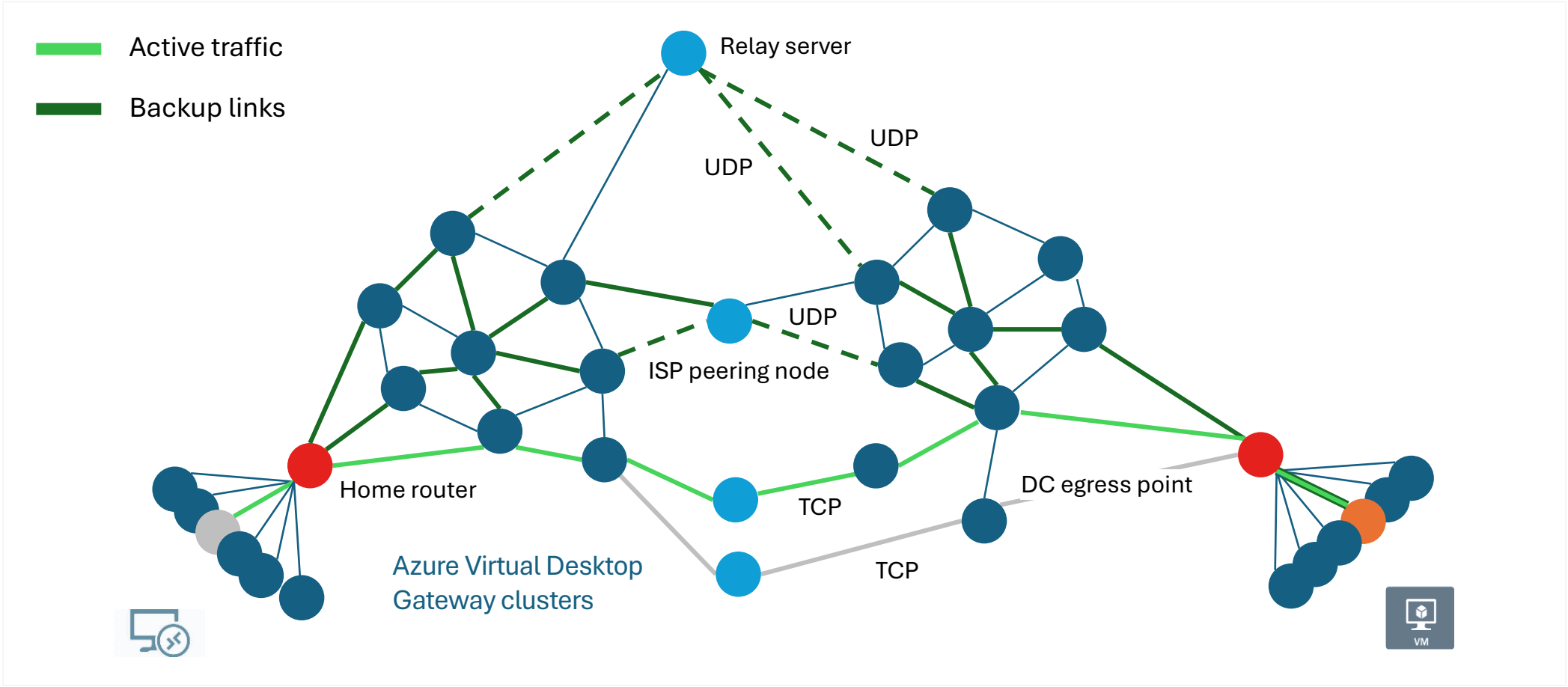
Improve connection reliability by providing additional paths through Azure Virtual Desktop gateway

Rendezvous REST API implemented by Azure Virtual Desktop service

Allows server and client to find additional paths through Azure Virtual Desktop gateway

Can be used to improve both MTTF and MTTR

SMILES + Rendezvous in action



SMILES + Rendezvous

Rendezvous REST API URL is provided to client and server during orchestration

Plug in Rendezvous paths into SMILES

- Substantially different path compared to ICE paths
- Switch between UDP–WebSocket depending on what works best at runtime
- Allows SMILES to be usable regardless of UDP availability

Enables quick connection recovery on connection disruption

Connectivity improvements & simplification

Windows 365 & Azure Virtual Desktop: RDP connectivity optimization challenges - 1

#	Problem	Customer impact	Solution	Resulting benefit	ETA
1	High number of IPs required for RDP bypass/Optimization (~380)	• Very hard for customers to bypass/optimize in Zscaler, VPNs etc. due to the large number of entries. Impossible in some cases • Easy to misconfigure	Reduced to a single subnet (40.64.144.0/20)	• Greatly simplified configuration of optimization • Much lower risk of misconfiguration	Delivered Feb 2025
2	High change rate of endpoint requirements for optimization	• Easy to miss changes in requirements • High cost to the customer in terms of change management	The new subnet is anticipated to cover our needs for a considerable amount of time	• The single subnet removes the need for regular change on the customer side	Delivered Feb 2025
3	Difficulty configuring bypass in Zscaler	• Zscaler is the biggest provider of Secure Web Gateways to WCX customers. We receive constant requests for assistance from customers with Zscaler integration	Zscaler have agreed to create a 'oneclick' bypass button for Windows 365/Azure Virtual Desktop. Only the third-ever service they have agreed to do this for	• This will vastly simplify bypass configuration and allow for automation of any change in future	Delivered February 2025
4	Endpoint requirements are listed on static docs pages	• Makes it impossible to automate requirement ingestion and easy to miss requirements • No automatic update mechanism • Easy to miss requirements	Onboarding to Microsoft 365 Endpoint API	• Endpoint data accessible from machine readable API which is already integrated into many 3rd party network solutions • Simple update method on a known cadence • Lowered risk of missing requirements	H1 CY 2025

Windows 365 & Azure Virtual Desktop: RDP connectivity optimization challenges - 2

#	Problem	Customer impact	Solution	Resulting benefit	ETA
5	TURN relays on non dedicated infrastructure & IP subnet	• Difficulty configuring bypass due to non dedicated nature of the range • Not available globally	• Moving to Windows 365/Azure Virtual Desktop dedicated infrastructure and dedicated single IP range	• Simple bypass for all RDP, 1 subnet for TCP and 1 subnet for UDP connectivity, both dedicated to Windows 365/Azure Virtual Desktop • Much higher global coverage	April 2025
6	Windows 365 and Azure Virtual Desktop Docs are unclear on connectivity guidance, scattered in different locations and some essential content in TechCommunity	• Great difficulty in understanding the requirements in full • Easy to miss guidance and requirements • Guidance outside of Docs can be viewed as 'non-official'	• New Connectivity section in docs to tell the story in a single location • Improved, more prescriptive guidance	• Simple 'one-stop' location for all connectivity guidance • Prescriptive guidance removing ambiguity • Coverage of all common customer questions to reduce field and WCX workload	Through H1 CY 25
7	Difficult for customers to diagnose where guidance such as Zscaler bypass, TLS inspection etc is incorrectly configured	• Poor connectivity • Lengthy troubleshooting • High case volume • Frequent disconnects • Poor user experience	• Connectivity tooling to highlight where connectivity does not align to best practice	• Easy to check best practice is configured • Easy for a customer to isolate where an issue lies and where they need to go to fix the issue • Higher performance and service reliability • Better user experience	Starting H1 CY25

Connectivity simplification & improvement timeline

February 2025

TCP RDP IP Consolidation

- Reduction of IP subnets from 380 to 1 single subnet
- No regular expected changes thereafter
- Makes it much simpler to configure bypass/Optimization

Zscaler ‘OneClick’ bypass

Single click option for configuring Zscaler to bypass of Windows 365/ Azure Virtual Desktop RDP traffic (TCP and UDP)

From March 2025

Updated Docs with optimization guidance

Revamped connectivity docs in a cohesive ‘story’ in one location with service specific selection tab available. To be linked with Self-Help in Windows App where possible

April 2025

TURN Relays on dedicated infrastructure

Windows 365/Azure Virtual Desktop dedicated TURN relays available with dedicated single subnet

H1 CY 2025

Onboard to Microsoft 365 Endpoint API

- Windows 365 & Azure Virtual Desktop endpoints listed in Microsoft 365 endpoint API under new service area
- Allows for scripting & automation of access rules

H1 CY 2025

Other network vendor integration

Work with other VPN/network vendors to implement simple bypass options & guidance

H1 CY 2025

Network Connectivity tooling

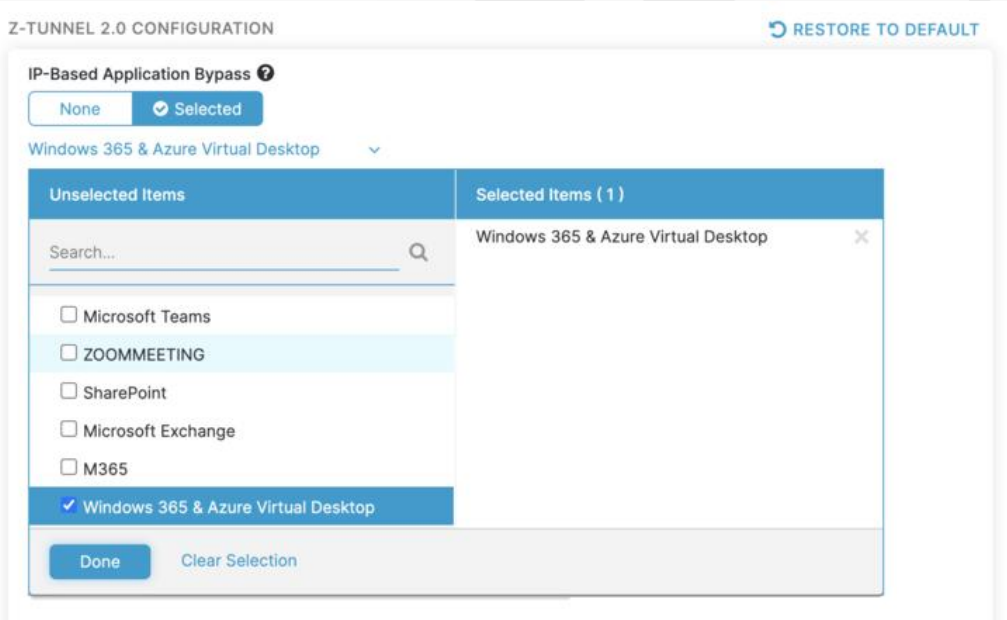
Inbuilt tooling to check for best practice configuration and other network issues to allow customers to isolate issues easily

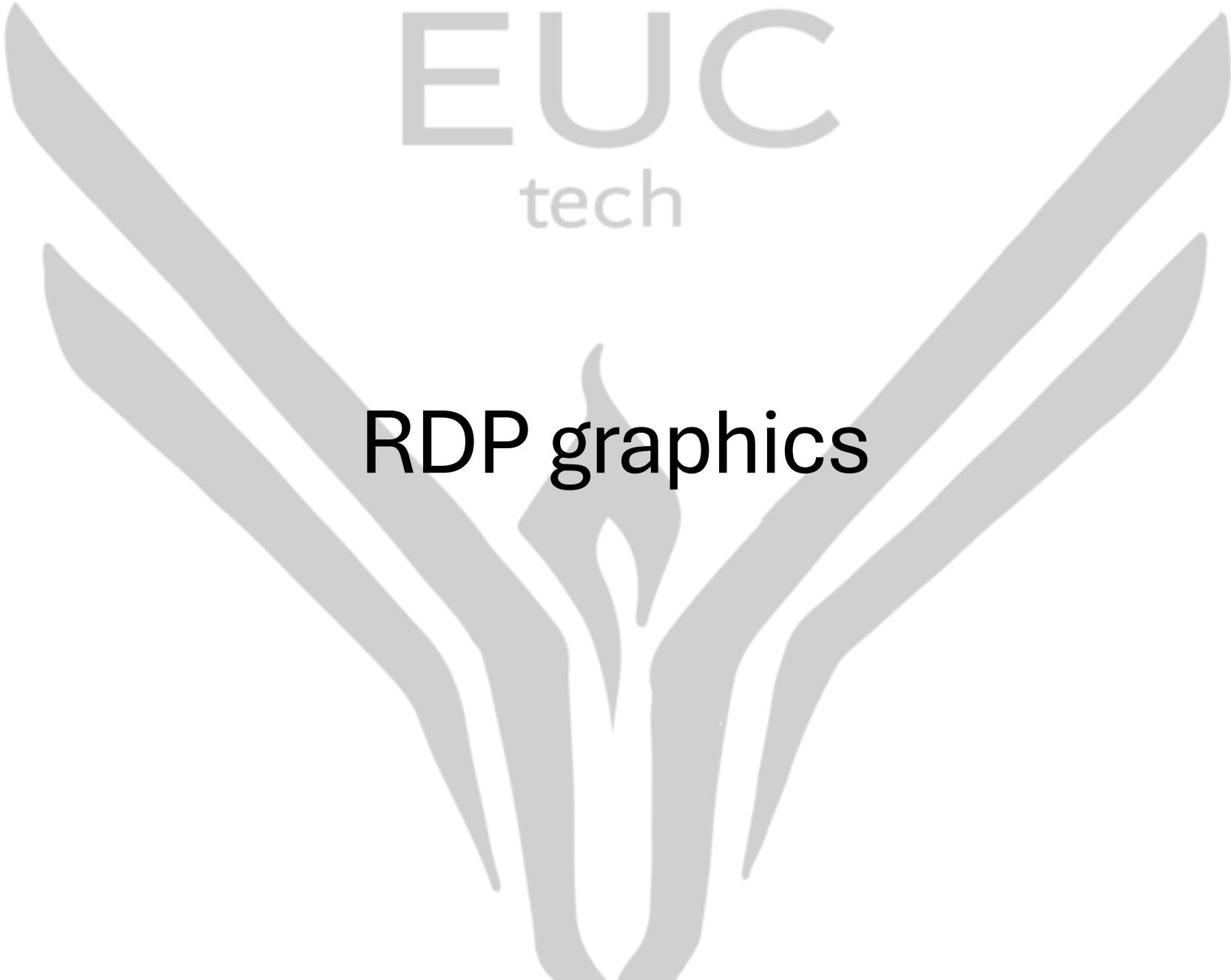
RDP optimization

- Traditionally complex due to no support for wildcard FQDN
- Needed to bypass 380 regularly changing IPs
- High complexity and high risk of error/issues

Now solved!

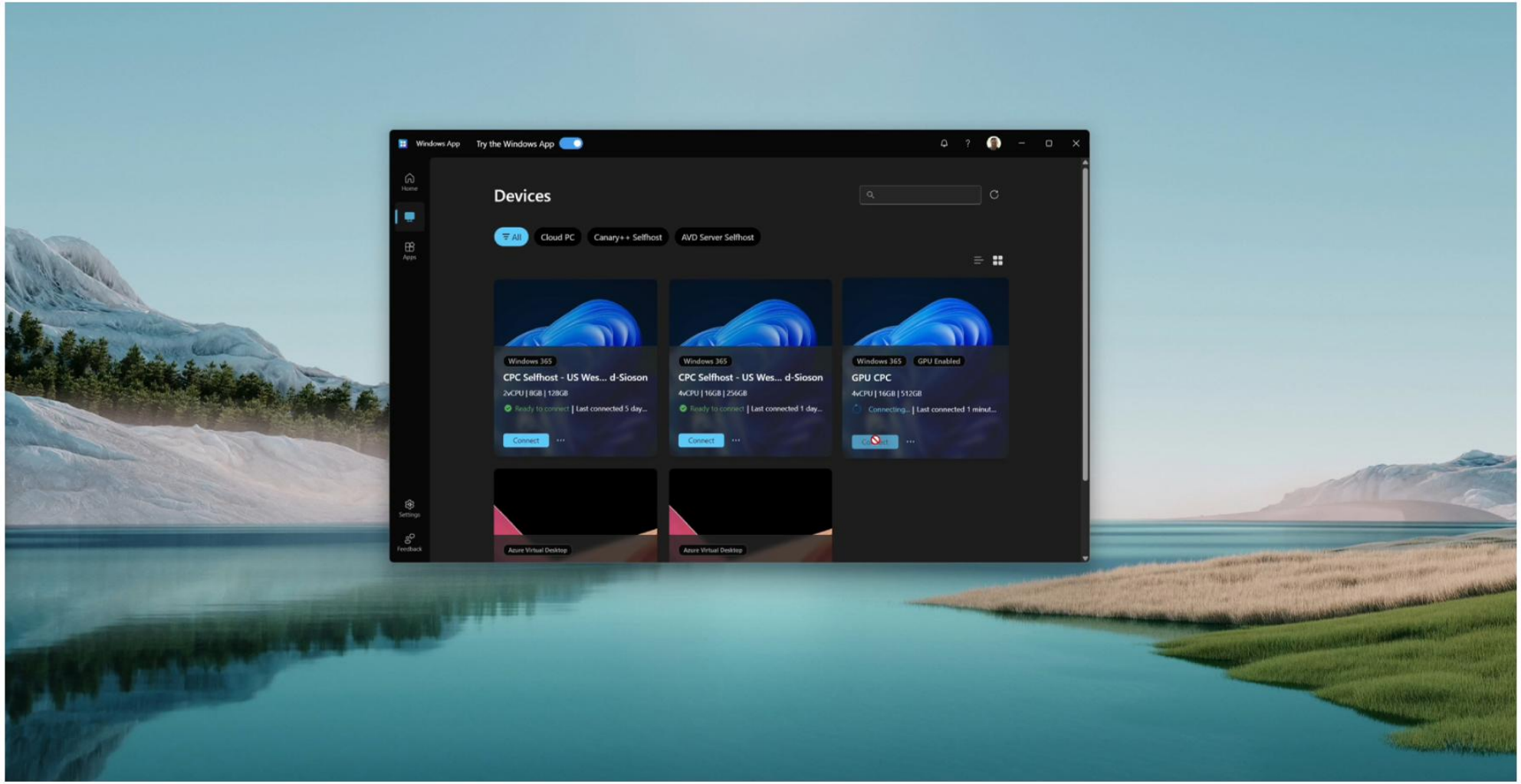
1. Move to single subnet 40.64.144.0/20 (Now complete!)
2. OneClick bypass config within Zscaler portal (Now complete!)
3. Work with other vendors ongoing
4. Tooling in Windows App being worked on to check bypass is correctly configured

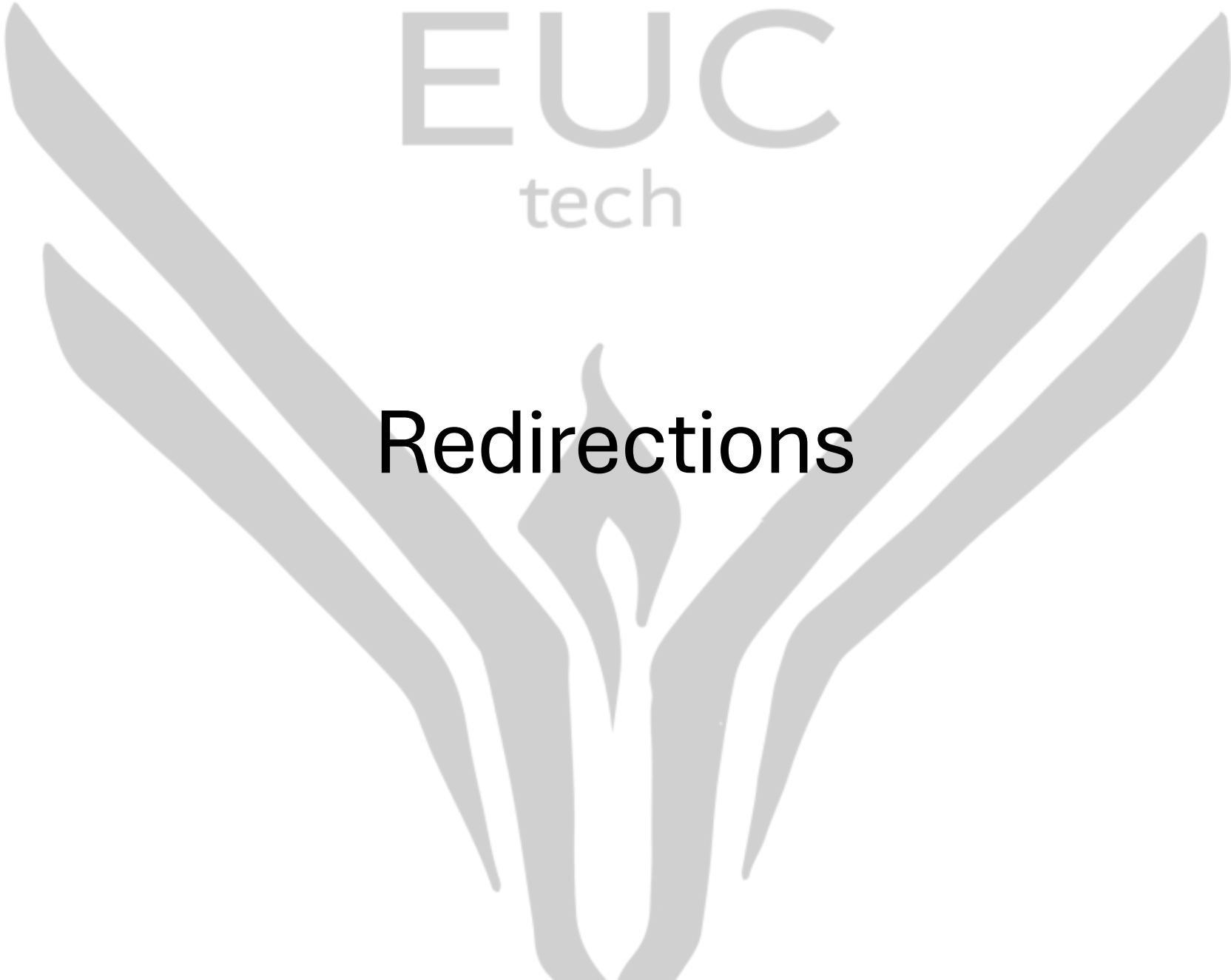




RDP graphics

Demo: 4K60 with HEVC/H.265 encode using GPU h/w





Redirections

Peripheral strategy

Goal

Any peripheral that works with local Windows works in remote

1. High-level redirection
2. Peripheral OEM does additional work to enable performant redirection
    I. Today, DVC integration
    II. The ideal long term future state would leverage WDK, HLK, HDC and WHCP to update the driver for remote awareness
3. Opaque low-level redirection

Upcoming redirections features

#	Feature	Description	PuP ETA
1	USB removeable drive redirection AKA no more network drive	Enable USB removeable drives to be recognized in remote Windows as removeable drives rather than network drives. • DLP policies assume devices will be removeable not network.	~25Q2
2	TWAIN redirection AKA better scanner support	Create a new high-level redirection for enabling any TWAIN device connected to endpoint to redirect into remote session.	25Q2
3	DVC libraries	While DVC examples already exist, most OEMs/ISVs do not have experience in COM marshalling with ATL and other coding paradigms. We will release easy to consume libraries that will enable easier DVC creation for OEMs/ISVs for building more performant redirections.	25Q2

New streaming capabilities

New streaming capabilities

Build shared Azure infrastructure

To power our new streaming capabilities, we are using the next generation of GPUs in Azure. In parallel we are driving improvements to the Azure management, allocation and oversubscription capabilities related to these GPUs.

Create new unified streaming capabilities

Our new streaming capabilities will offer high graphic throughput (2x 4K 60 FPS) and low end-to-end latencies (<70ms)*. They will combine the best technology from Mixed Reality, Teams (IC3), Windows 365/Azure Virtual Desktop (RPD), and Surface (NXT).

Deliver like-local experience

The new capabilities offer low added/encoder latency (<30ms) for a seamless “like-local” experience. They ensure high reliability at 99.9% for consistent 4K60 streaming. They also offer graceful degradation from 2x4K@60FPS to 1080P@60FPS as network conditions downgrade.

How to use new hardware capabilities

'Like-local' experience and power efficient

NPU on client to improve performance

Use client-side models running on NPU

Power efficient denoising

Use GPUs to power encoding server-side

Bandwidth reduction

- Can GPU and NPU reduce bandwidth?
- Improve RDP on limited network bandwidth
- Reducing egress cost

New user profiles

Roaming

Teams (4 hours)

- Video playback windowed (2)
- Video full screen (2)

Static/dynamic pages in Edge (2 hours)

- Idle (1)
- Email (1)

Video streaming (1 hour)

Productivity (1 hour)

- Microsoft Outlook (0.5)
- Microsoft Word (0.15)
- Microsoft PowerPoint (0.15)
- Microsoft Excel (0.15)
- OneNote (0.15)

In-office

Productivity (4.5 hours)

- Microsoft Outlook (3)
- Microsoft PowerPoint (0.5)
- Microsoft Excel (0.5)
- Microsoft Word (0.5)

Teams (1.5 hours)

- Meeting windowed (0.75)
- Meeting full screen (0.75)

Static/dynamic pages – Edge (1 hour)

- Idle (0.5) 0%
- Web browsing (0.5)

Video streaming (1 hour)

Power/Creator

Productivity (4 hours)

- Microsoft PowerPoint (0.5)
- Microsoft Excel (0.5)
- Microsoft Word (0.5)
- Autodesk (1)
- Android Studio (1.5)

Teams (1 hours)

- Meeting windowed (0.5)
- Meeting full screen (0.5)

Static/dynamic pages – Edge (1.5 hours)

- Idle (0.75) 0%
- Web browsing (0.75)

Video streaming (1.5 hours)

1 x 2K @ 30 FPS	1 x 4K @ 60 FPS	2 x 4K @ 60 FPS

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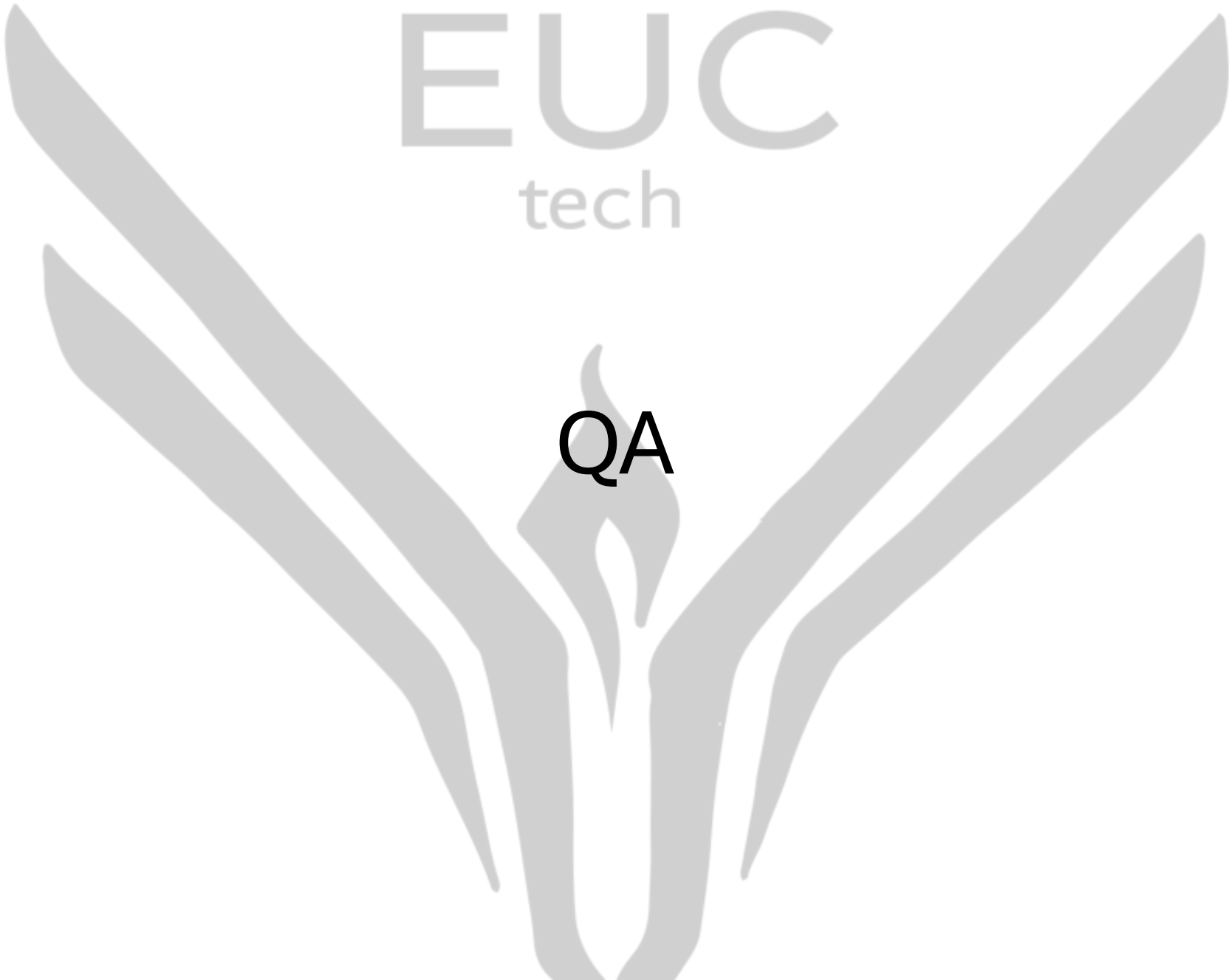

QA

Thank you