TEAMRGE EVENT 2024
WHERE FUTURE OF END USER COMPUTING MEETS REALITY

10+ community sessions around GPUs, VDI, DaaS, DEX, Remoting Protocols and AI

15th February 2024
16:00 CEST / 10:00AM EDT / 07:00AM PDT

Register Now

www.teamrge.com/events

Dr. Benny Tritsch
Managing Director at
Dr. Tritsch IT Consulting

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Wolfs IT Solutions

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Principal Product Manager
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at Citrix

Esther Barthel
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PMTS, Solutions Architect, Cloud
Graphics at AMD

Johan van Amersfoort
Technologist EUC & AI
at ITQ

Magnar Johnson
Manager | Solution Architect
Sopra Steria

Rody Kossen
Senior Principal Quality
Engineer at Citrix

Ruben Spruijt
Field CTO
at Dizzion

Ryan Ververs-Bijkerk
Technical Evangelist
at GO-INIT

Shawn Bass
Start-up advisor and
former EUC CTO of Desktop
Technologies at VMware

Thomas Poppelgaard
Independent Consultant and
Technology Evangelist at
Poppelgaard.com

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PUSHING THE BOUNDARIES

EXPLORING THE SCIENCE OF USER EXPERIENCE AND LATENCY LIMITS IN REMOTE DESKTOP

Magnar Johnsen
Solution Architect
Sopra Steria

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HOW FAR CAN YOU GO AND STILL HAVE A GOOD UX?

- Customer case: Company with datacenter in Norway and the clients in all continents,
- Can Virtual Desktops deliver apps with good user experience on such a distance?
- Where does the limit go and why?
- How can we measure it?
- Does it apply to all kinds of apps?

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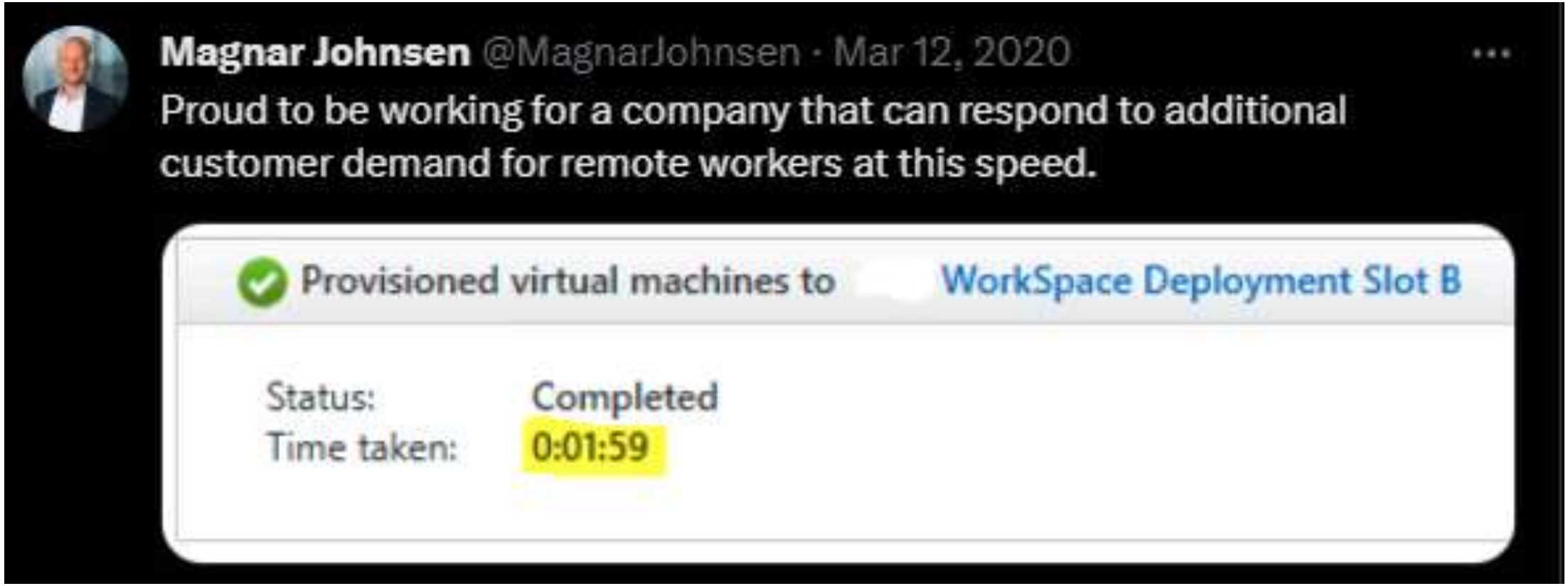
12 MACH 2020


Magnar Johnsen @MagnarJohnsen · Mar 12, 2020
Proud to be working for a company that can respond to additional customer demand for remote workers at this speed.
Provisioned virtual machines to WorkSpace Deployment Slot B
Status: Completed
Time taken: 0:01:59

WHAT IS USER EXPERIENCE?

- Response time!
- The time it takes from clicking the mouse button until the screen updates.

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SOME FACTS ABOUT DISTANCES, SPEED AND ROUND TRIP TIMES

- Earth circumference is about 40 000 KM
- Norway – Australia is 14 000 KM one way
- 47 ms with the speed of light one way
- Speed of light in fiber is slower than in vacuum, about 70ms through fiber
- Round Trip Time (RTT) is 140ms in theory

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LIMITS ACCORDING TO CITRIX

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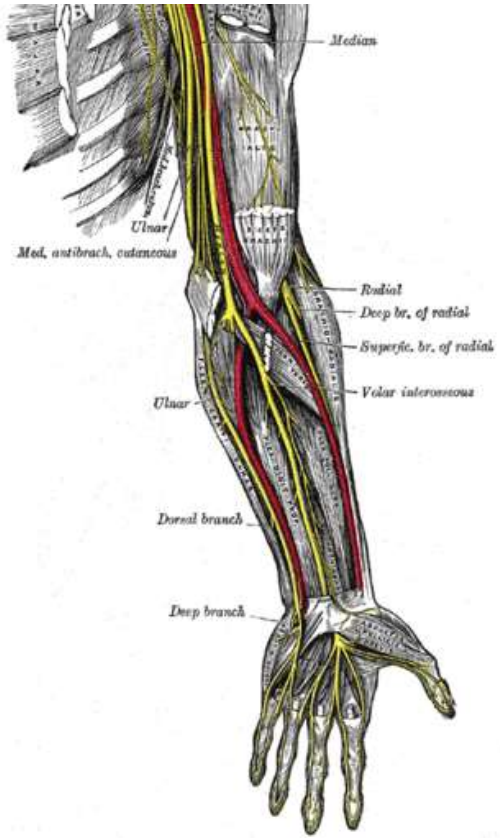
THE HUMAN NERVOUS SYSTEM



- 120 Meter per second
- 150-300 ms «responsetime» (Varies with age etc)
- Equals to 15 000 – 30 000 KM of fibercables
- Our subjective experience exists in the past! The half-second delay: what follows (ucl.ac.uk))
- In theory, possible to have a good UX within a 15 000 km distance (Norway – Australia).

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BUT FIBERS DOESN'T GO IN A STRAIGHT LINE

- Measured latency on the connection was 350-400 ms. (almost twice the distance) ?
- How can we optimize it? And what can be optimized?
- To be able to optimize, you need to be able to measure it.

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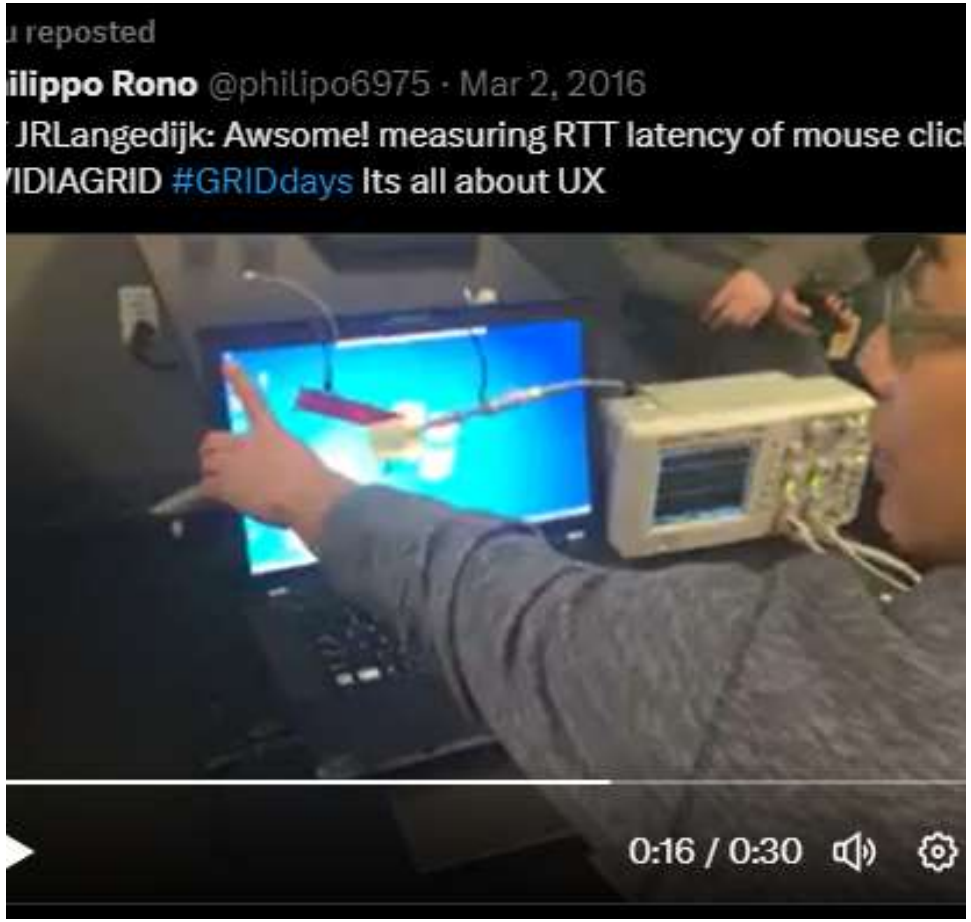
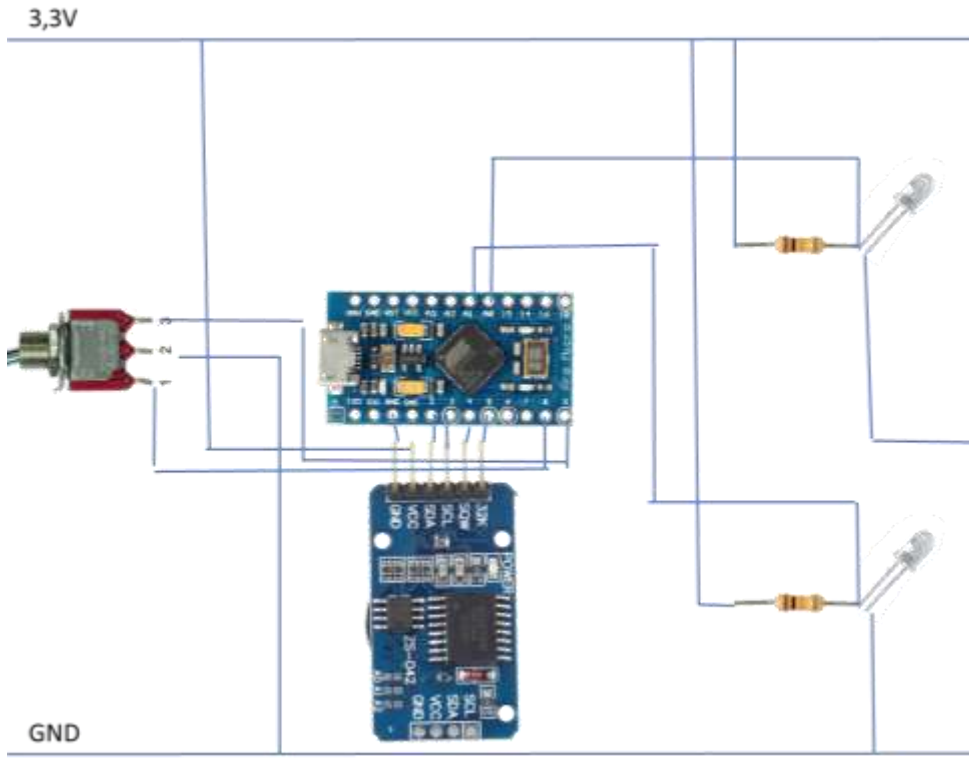
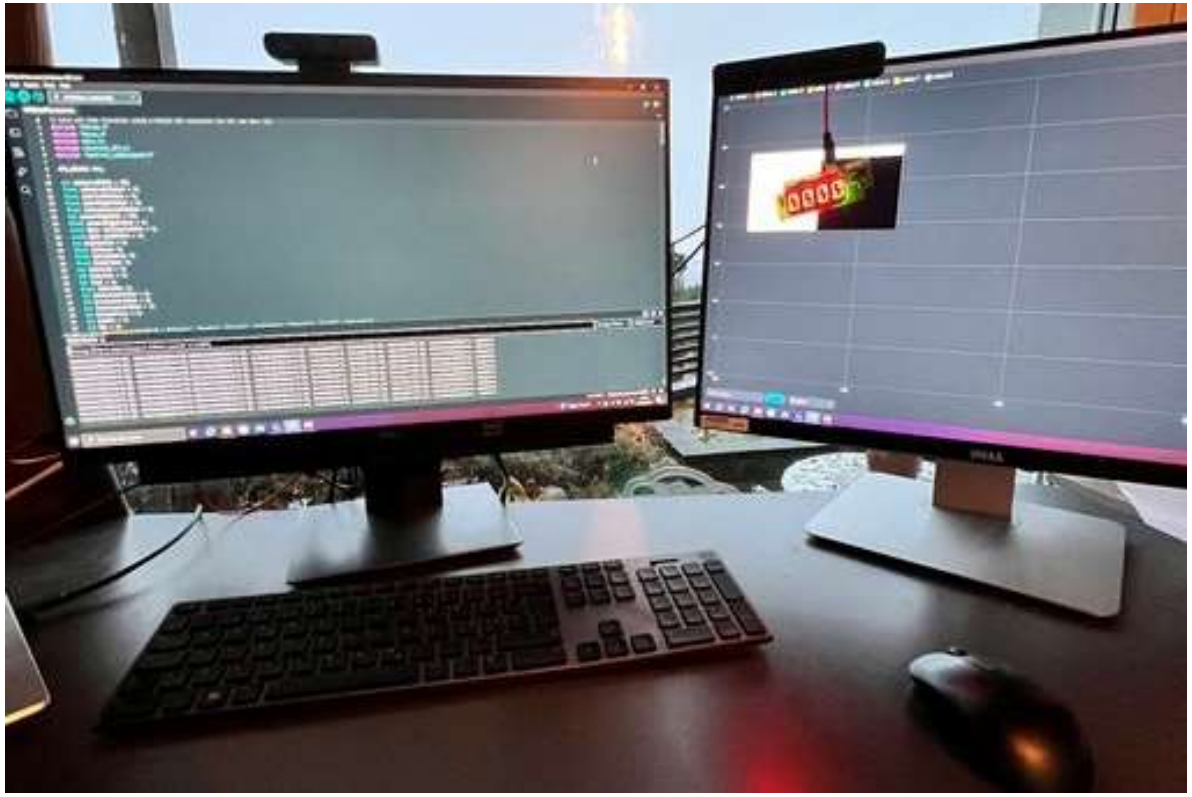
HOW CAN YOU MEASURE THE WHOLE END TO END RTT?



- Click-to-photon by nVidia

TEAMRGE COMMUNITY PROJECT: UXMETER





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RESPONSTIME ON A LOCAL VIRTUAL DESKTOP

«Encoding»: 10 ms

Server Latency: 5 ms

Network latency
1 ms

Total latency = 46 ms

Client latency: Ca 30 ms

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RESPONSTIME ON A LOCAL VIRTUAL DESKTOP

«Encoding»: 10 ms

Server Latency: 5 ms

Network latency
350 ms

Total latency = 395 ms

Client latency: Ca 30 ms

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ROOT CAUSE ANALYSIS

- Internet routing took a return route around the globe!

- RTT to Singapore office was about 200ms.
- MPLS from Singapore to Australia was about 50ms
- «Forcing the traffic through MPLS to an office in Singapore
- ISP had to change routing vectors
- SD-Wan to benefit from multiple carriers
- Network latenct down to 250ms

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NEW RESPONSE TIME WITHIN

«Encoding»: 10 ms

Server Latency: 5 ms

Network latency
250 ms

Total latency = 295 ms

Client latency: Ca 30 ms

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DOES IT APPLY TO GRAPHICAL APPS?

- Traditional CRM/ERP apps are good. Mostly click and text input.
- Large graphical motions are more difficult to fool the brain.
- Our eyes can detect sideways motion delays quite easily.
- Extreme example, VR streaming.

VR STREAMING – WHERE LATENCY COUNTS

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SUMMARY

- Our human «LATENCY» makes remote desktops over extreme distances possible – Up to 150 ms or «almost half across the globe»
- Graphical apps are much more latency sensitive.
- Focus on optimizing network route.
- GPU hardware encoding can help a tiny bit, but cost $$$. Can be worth it for graphical workloads.
- Monitor response time over time. Most remote protocols has performance counters for this or dedicated analytics tools.
- You can measuer RTT with tools like RemoteDisplayAnalyser. ->Physical layer not measured.
- You can build your own UXMeter with a simple arduino, some sensors, soldering iron and a lot of time.

THANK YOU

Magnar Johnsen
Solution Architect
Sopra Steria

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