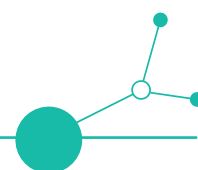


Testing of a mobile VR lab concept

Pilot action



March 2025 | version 1.0





Executive summary

The pilot action **Testing of a mobile VR lab concept** presents the methodology developed for evaluating the mobile VR lab concept and demonstrates its suitability for everyday use. It details the testing approach and includes the results obtained by the partners JVTP (CZ), OTH (DE), and SZE (HU), who each established a VR laboratory. The document concludes with a summary of these findings.

It also introduces two fundamental approaches for creating collaborative and interactive virtual reality (VR) environments. Within the project, these approaches are used to interconnect the VReduMED laboratories and to pilot-test educational applications. The tested solutions include both third-party software and application prototypes developed during the project.

Following the completion of the pilot phase, the results indicate that the technical configurations of all partner VR laboratories comply with the defined requirements. Based on these findings, the document further provides recommendations on the technical specifications to consider when setting up a new VR laboratory.



Introduction

The pilot action **Testing of a mobile VR lab concept** describes the developed methodology for testing the mobile VR lab concept and how to prove that the concept is applicable in everyday use. The document describes the methodology and it contains the results of the tests carried out by the partners JVTP (CZ), OTH (DE), and SZE (HU) who established the three virtual reality (VR) Laboratories.

The document covers two basic methods of setting up a cooperative and interactive environment for virtual reality (VR). Within the VReduMED project, these methods have been utilized to connect the VReduMED laboratories, in order to pilot-test the applications used for educational purposes. The tested applications are both third-party software as well as the application prototypes developed within the project framework.

The document freely combines the terms ‘virtual reality’ and ‘VR’, meaning the same thing. Augmented or combined reality (AR, XR) are not considered in this document since they are technically slightly different and, most importantly, work with completely different setups which include interaction (both digital and physical) with outside, real world.

Aim of the pilot action

The tests shown in this document were carried out in order to check the technical requirements which must be met in order to provide users a good user experience during the the use of VR applications (both other applications and applications developed in the project). This testing is tightly connected to the establishment of the VR laboratories and testing the laboratory equipment among the 3 regions.

The Pilot action was defined as follows: Technical setup of laboratories, its mobility, virtual connectivity and developed VR/AR applications will be tested with regional stakeholders in labs in Czechia, Hungary and Germany, as well as in our project regions connected to these labs virtually. JVTP led this task in cooperation with partners from Germany (OTH) and Hungary (SZE).

Therefore the tests and measurements described in this document are the results of this pilot action to test the mobile lab concept and conduct testing in order to prove the usability of the concept. By conducting the tests, we ensured that collaborative VR applications such as VRChat, as well as the remote supervision features of VR CPR and VRoom of Horror, can be used while providing an adequate user experience. The applications were tested during selected measurements, and the results consistently showed that with appropriate headsets and network parameters, a good user experience can be achieved.

Test methodology and guidelines

1. Technical requirements

We defined the minimum and recommended technical requirements by assessing the devices that may already be available at partner organizations, the devices available on the market, the expected



requirements of the applications planned during implementation, and by taking into account the partners' previous experience with the products of different manufacturers. Following this assessment, we jointly established the minimum and recommended requirements, which are presented below.

1.1. VR hardware

Minimum requirements

- Meta Quest 2, 1 piece

Recommended requirements

- Meta Quest 2 or Meta Quest 3, 3 pieces
- Any other VR equipment compatible with Open XR¹

1.2. Wireless and internet connectivity

Minimum requirements

- Wireless access point supporting 802.11n (2.4GHz or 5GHz), supporting at least 2 connected devices at full speed
- at least 25Mbit/s (down) / 5 Mbit/s (up) internet connection
- avg. 50ms RTT² to 13.248.68.72 (Amazon Zürich)

Recommended requirements

- Wireless access point supporting 802.11ac (5GHz), supporting at least 5 connected devices at full speed
- at least 200Mbit/s (down) / 50Mbit/s (up) internet connection
- avg. 30ms RTT to 13.248.68.72 (Amazon Zürich)

1.3. Physical space

Minimum requirements

- at least 2x2 meters of free space (single user)³

¹ <https://www.khronos.org/openxr/>

² Can be measured with the ping tool: <https://linux.die.net/man/8/ping>

³ <https://www.meta.com/help/quest/articles/getting-started/getting-started-with-quest-2/space-to-use-quest-2/>



Recommended requirements

- 3x 2x2 meters of free space (for collaborative work, parallel usage)

1.4. Recommended additional equipment for lab mobility

- Laptop or PC per VR headset setup with the following specs:
 - Intel Core i5-10600K or AMD Ryzen 5 3600 or better
 - NVIDIA GeForce RTX 3070 or AMD Radeon RX 6700 XT or better
 - 16GB RAM
 - HDMI output
 - at least one USB3.2 interface
- Portable projector or large-size display for broadcasting VR environment outside the headsets
- Batteries for headsets (specifically the handheld controllers), USB-C power banks (for some VR equipment it is part of the package)
- Cellular/mobile data portable modem capable of providing local Wi-fi coverage, with the following specs:
 - 5G technology
 - Providing Wi-fi with the above-mentioned specifications (download/upload 200/50 Mbit)
- Transport boxes are highly recommended, especially for cases when the headsets are to be transported on regular basis. Plastic boxes with foam padding have proven suitable for the task.
- Spare USB A-C cables or other connection cables for VR headset with PC connection and/or recharging the devices.
- Power extension cords

2. Test Methodology

The test methodology aims to ensure that these requirements are met in all VR laboratories at all times in order to ensure the usability of the laboratory and to provide a good user experience.

The test methodology consists of the following steps:

1. Ensure that the laboratory has the required amount of equipment (number of VR headsets)
2. Ensure that the laboratory provides the required amount of physical space for VR usage
3. Ensure that the network connection in the laboratory meets the predefined requirements as these are crucial to have a good user experience both in an interconnected laboratory session and when using the mobile lab setup.

The detailed description of these steps are the following:



1. The first test is to enumerate the amount of equipment, present in the laboratory and meant to be used for the pilot actions, demonstrations, TtT workshops (as described in D3.2.1) and for lending out to interested stakeholders.
2. The laboratory should provide adequate physical space for safe and effective VR usage by meeting specific spatial, safety, and design requirements. A VR setup typically should allocate at least 1.5x1.5 meter clear area per user for basic standing or seated VR experiences. For room-scale VR involving free movement, a 3x3 meter space per station should be ensured. In our project, we settled to have at least 2x2m as all applications we use and demonstrate through the project could be used in a standing setup. This can be checked by simply measuring the amount of free space that could be provided in the laboratory. It should be noted that this free space need not be ensured to be available at all times (e.g. furniture is the way) but it should be ensured that this free space could be freed up when necessary for VR sessions.
3. The laboratory network must be verified to ensure it meets the predefined performance and reliability requirements, as these are essential for maintaining a smooth user experience both during interconnected laboratory sessions and when operating the mobile laboratory setup. The verification begins with a physical inspection of cabling, connectors, and switch ports to confirm proper installation and configuration. Afterward, the network configuration is checked by confirming successful communication with a common server (geographically located in a reasonable distance from each VR laboratory) and the laboratory network. Network performance is then evaluated by measuring latency, packet loss, bandwidth, and jitter using appropriate diagnostic tools. These tools were chosen in a way that tests could be carried out both from desktop computers or laptops and also directly from VR equipment in order to mimic real usage conditions. For the mobile laboratory setup, wireless signal strength and connection stability is crucial to ensure a smooth user experience. These tests were carried out on different days dates during the pilot period and in business hours in order to ensure that conditions are within the required limits at all times.

Summary of tests

During the pilot period, tests were carried out in each of the three VR laboratories. The description of results are the following.



Results from the VR Lab at JVTP | Czechia

Equipment

Headsets

3x Meta Quest 2

2x Meta Quest 1

Other

Dedicated wifi router (200Mbit) + 5G Router for external events + dedicated laptop + portable projector

Available space

2x: 2x2 metres

Mobility

During the pilot action, the VR lab was used outside the company building, using a 5G router for connectivity. Also, a portable projector was used to cast the video stream from inside the VR headsets.





Summary of results of VR Lab at JVTP

- the amount of VR equipment is sufficient
- the physical space is sufficient
- Network parameters were within the recommended ranges, except latency, which when measured with speedtest was higher than the recommended, especially in upload direction. However the measurements by the ping command shows that to a server in the same geographical region produced better values, which were within the recommended range. In some cases this could impact the user experience when using collaborative applications, however it depends on the servers used by the application in question.

Measurement Aspect	Observation (Summary)	Compliance with Requirements
Download speed	~71-201 Mbit/s	Mostly meets recommended values
Upload speed	~47-172 Mbit/s	Mostly meets recommended values
Latency (speedtest)	Often higher (21-391 ms)	Frequently exceeds recommended
RTT (ping)	~18-26 ms	Within recommended range
Jitter	Very low (0.06-0.54 ms)	Good
Stability	Variable (affected by load and external factors)	Acceptable
Notes	Wi-Fi load significantly affects performance	Critical factor

Overall, the VR Laboratory located at JVTP fulfills the defined criteria set.



Results from the VR Lab at OTH | Germany

Equipment

Headsets

15x Meta Quest 3

2 x HTC VIVE PRO 2

Other

8 Router

One setup with one class. A setup normally includes three VR headsets. See Appendix 1 for more information

Available space

1x: 4x4 metres

3x: 2x2 metres

Mobility

In addition to internal testing in the project countries, OTH also tested it in 35 nursing schools and at external conferences and meetings. Mobile lending was made possible in 21 institutions over a trial period of six weeks.





Summary of results of VR Lab at OTH

- the amount of VR equipment is sufficient
- the physical space is sufficient
- Network parameters were within the recommended ranges, except in some cases where the mobile lab setup were used. In one occasion, the testing was not finished because the network was unusable. This aligns with the preliminary assumption that the mobile lab setup could be used in the same way as the fixed IT infrastructure in the laboratory.

Measurement Aspect	Observation (Summary)	Compliance Requirements	with
Download speed	182-810 Mbit/s (fixed network)	Exceeds recommended	
Upload speed	34-744 Mbit/s	Mostly meets or exceeds	
Latency	~28-109 ms	Variable	
RTT (ping)	~12-18 ms	Within recommended range	
Jitter	Very low (~0.009-0.24 ms)	Excellent	
Mobile setup	Often weak or unusable	Not reliable	
Stability	Good on fixed network, unstable on mobile	Mixed	

Overall, the VR Laboratory located at OTH fulfills the defined criteria set.



Results from the VR Lab at SZE | Hungary

Equipment

Headsets

2x Meta Quest 2

3x Meta Quest 3

Available space

1x: 3x3 metres

Mobility

Portable mobile routers can be lent for network coverage. These, together with the headsets and optional equipment (dummy for VR-CPR) can be relocated to elsewhere.





Summary of results of VR Lab at SZE

- the amount of VR equipment is sufficient
- the physical space is sufficient
- Network parameters were within the recommended ranges at all times, with the fixed IT infrastructure provided in the laboratory.

Measurement Aspect	Observation (Summary)	Compliance with Requirements
Download speed	~995-1281 Mbit/s	Significantly exceeds recommended
Upload speed	~539-1038 Mbit/s (sometimes higher)	Significantly exceeds recommended
Latency	~12-32 ms	Within recommended range
RTT (ping)	~20-23 ms	Within recommended range
Jitter	~0.25-0.90 ms	Good
Stability	Very stable across all measurements	Excellent
Notes	Fixed infrastructure performs reliably	

Overall, the VR Laboratory located at SZE fulfills the defined criteria set.



Recommendations

For institutions planning to deploy a professional and scalable VR solution, we recommend selecting the **Meta Quest 3** or **Meta Quest 3S** as the primary hardware platform. These headsets provide an optimal balance between performance, usability, and cost-efficiency, making them well suited for educational, medical, research, and development environments.

Recommended Accessories

To ensure uninterrupted operation during extended sessions, additional **external battery packs** or **battery-equipped head straps** are strongly recommended. This enables continuous usage without downtime caused by charging cycles, which is particularly important in classroom or laboratory environments.

For hygiene and durability in multi-user settings, **antibacterial** or **medical-grade face covers** should be used. These improve user comfort, simplify cleaning procedures, and extend the lifespan of the device.

For users requiring vision correction, prescription lens inserts are recommended as an optional accessory. These provide a safer and more comfortable alternative to wearing glasses inside the headset and reduce the risk of damaging the headset lenses.

PC Hardware Requirements (for Link, Air Link, and Live Workflows)

Although the Quest headsets function as standalone devices, PC connectivity significantly expands their capabilities for development, high-fidelity rendering, and Live Link workflows (e.g., Unreal Engine or other real-time engines).

For stable PC-VR usage, the following minimum hardware configuration is recommended:

- **Operating System:** Windows 11 (latest stable version recommended)
- **CPU:** Modern multi-core processor (Intel Core i5 / AMD Ryzen 5 or higher)
- **GPU:** Dedicated graphics card such as NVIDIA GeForce RTX 20-series or newer (RTX 3060 or higher recommended for demanding workflows) or equivalent AMD Radeon RX 6000-series or newer
- **Memory:** Minimum 16 GB RAM (32 GB recommended for development environments)
- **Storage:** SSD (NVMe preferred) for fast asset loading
- **Connectivity:** USB 3.2 port (for wired Link) or high-quality network interface for wireless workflows

This configuration ensures smooth rendering performance, low latency, and stable development workflows when using PC-tethered VR.

Network Requirements for Casting and Air Link

For wireless casting and Air Link applications, network quality is critical. The following setup is strongly recommended:

- **Wi-Fi Standard:** 5 GHz Wi-Fi (802.11ac minimum; Wi-Fi 6 or Wi-Fi 6E preferred)
- **Dedicated Router:** A dedicated mobile or standalone router exclusively used for the VR setup
- **Network Topology:**



- PC connected to the router via wired Gigabit Ethernet
- Headset connected via 5 GHz Wi-Fi
- Both devices on the same local network and subnet
- **Channel Width:** 80 MHz or higher (where supported) for stable high-bandwidth streaming
- **Low Interference Environment:** Avoid congested networks or shared institutional Wi-Fi

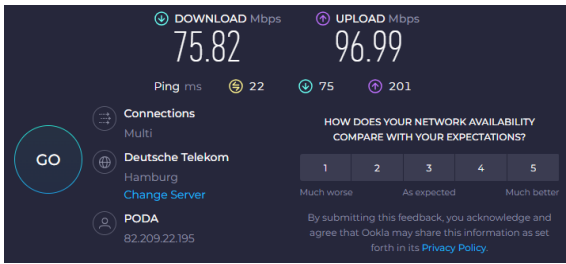
Under these conditions, casting to external displays and Live Link streaming to real-time engines can operate with minimal latency and stable frame rates.



Annex 1. Connection measurement results

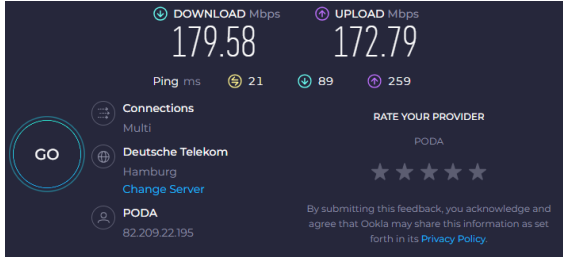
VR Lab at JVTP

Date: 23rd September 2025 @ 9:30 CEST

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	 <p>75.82 / 96.99 Mbit Down/Up</p>
Latency	50 ms 30 ms	75/201 ms Down/Up
Jitter	Not set	<pre> Connecting to host iperf3.mojl.fr, port 5201 [5] local 192.168.100.68 port 57243 connected to 45.147.210.189 port 5201 [ID] Interval Transfer Bitrate Total Datagrams [5] 0.00-1.01 sec 12.4 MBytes 103 Mbits/sec 8895 [5] 1.01-2.00 sec 12.2 MBytes 102 Mbits/sec 8708 [5] 2.00-3.01 sec 12.2 MBytes 102 Mbits/sec 8708 [5] 3.01-4.01 sec 10.9 MBytes 91.9 Mbits/sec 7845 [5] 4.01-5.01 sec 10.1 MBytes 84.6 Mbits/sec 7251 [5] 5.01-6.01 sec 10.9 MBytes 92.2 Mbits/sec 7832 [5] 6.01-7.01 sec 9.60 MBytes 79.8 Mbits/sec 6897 [5] 7.01-8.01 sec 9.83 MBytes 82.9 Mbits/sec 7063 [5] 8.01-9.01 sec 10.8 MBytes 89.9 Mbits/sec 7724 [5] 9.01-10.01 sec 11.6 MBytes 97.6 Mbits/sec 8345 ----- [ID] Interval Transfer Bitrate Jitter Lost/Totl Datagrams [5] 0.00-10.01 sec 111 MBytes 92.6 Mbits/sec 0.000 ms 0/79393 (0%) sender [5] 0.00-10.06 sec 111 MBytes 92.2 Mbits/sec 0.084 ms 0/79391 (0%) receiver </pre> <p>0.084 ms</p>
Ping / Round Trip Time	50 ms 30 ms	<pre> Pinging 13.248.68.72 with 32 bytes of data: Reply from 13.248.68.72: bytes=32 time=21ms TTL=244 Reply from 13.248.68.72: bytes=32 time=22ms TTL=244 Reply from 13.248.68.72: bytes=32 time=18ms TTL=244 Reply from 13.248.68.72: bytes=32 time=25ms TTL=244 Ping statistics for 13.248.68.72: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 18ms, Maximum = 25ms, Average = 21ms </pre> <p>RTT avg: 21 ms</p>



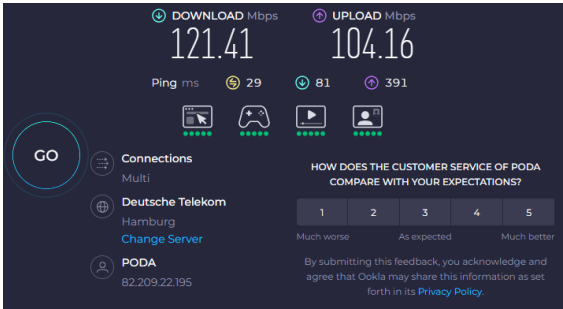
Date: 17th October 2025 @ 11:50 CEST

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	 <p>179.58 / 172.79 Mbit Down/Up</p>
Latency	50 ms 30 ms	21/89 ms Down/Up
Jitter	Not set	<pre> Connecting to host iperf3.mojl.fr, port 5200 [5] local 192.168.100.78 port 63803 connected to 45.147.210.189 port 5200 [ID] Interval Transfer Bitrate Total Datagrams [5] 0.00-1.01 sec 17.6 MBytes 146 Mbits/sec 12640 [5] 1.01-2.00 sec 18.3 MBytes 155 Mbits/sec 13154 [5] 2.00-3.02 sec 18.7 MBytes 155 Mbits/sec 13431 [5] 3.02-4.00 sec 17.0 MBytes 145 Mbits/sec 12239 [5] 4.00-5.01 sec 17.7 MBytes 148 Mbits/sec 12691 [5] 5.01-6.01 sec 18.4 MBytes 154 Mbits/sec 13217 [5] 6.01-7.01 sec 17.6 MBytes 147 Mbits/sec 12638 [5] 7.01-8.01 sec 17.8 MBytes 149 Mbits/sec 12794 [5] 8.01-9.01 sec 17.2 MBytes 144 Mbits/sec 12371 [5] 9.01-10.01 sec 17.4 MBytes 146 Mbits/sec 12487 ----- [ID] Interval Transfer Bitrate Jitter Lost/Total Datagrams [5] 0.00-10.01 sec 178 MBytes 149 Mbits/sec 0.080 ms 0/127662 (0%) sender [5] 0.00-10.06 sec 178 MBytes 148 Mbits/sec 0.076 ms 0/127661 (0%) receiver </pre> <p>0.076 ms</p>
Ping / Round Trip Time	50 ms 30 ms	<pre> Pinging 13.248.68.72 with 32 bytes of data: Reply from 13.248.68.72: bytes=32 time=21ms TTL=244 Reply from 13.248.68.72: bytes=32 time=20ms TTL=244 Reply from 13.248.68.72: bytes=32 time=23ms TTL=244 Reply from 13.248.68.72: bytes=32 time=20ms TTL=244 Ping statistics for 13.248.68.72: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 20ms, Maximum = 23ms, Average = 21ms </pre> <p>RTT avg: 21 ms</p>



Date: 20th November 2023 @ 11:30 CEST

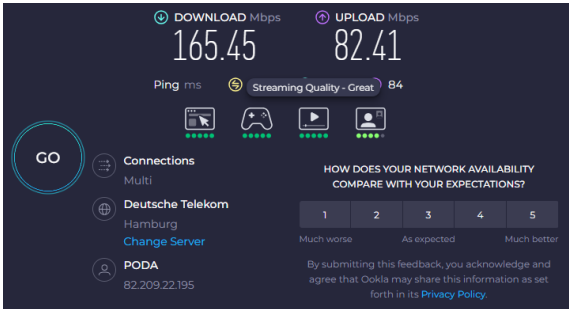
Note: the day after Cloudflare outage

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	 <p>121.41 / 104.16 Mbit Down/Up</p>
Latency	50 ms 30 ms	81/391 ms Down/Up
Jitter	Not set	<pre> Connecting to host iperf3.meji.fr, port 5200 [5] local 192.168.180.77 port 59961 connected to 45.147.210.189 port 5200 [ID] Interval Transfer Bitrate Total Datagrams [5] 0.00-1.01 sec 15.3 MBytes 127 Mbits/sec 11020 [5] 1.01-2.01 sec 13.1 MBytes 110 Mbits/sec 9435 [5] 2.01-3.00 sec 9.65 MBytes 76.7 Mbits/sec 6501 [5] 3.00-4.01 sec 12.6 MBytes 105 Mbits/sec 9035 [5] 4.01-5.01 sec 13.2 MBytes 110 Mbits/sec 9477 [5] 5.01-6.00 sec 12.1 MBytes 102 Mbits/sec 8682 [5] 6.00-7.01 sec 13.7 MBytes 114 Mbits/sec 9847 [5] 7.01-8.00 sec 12.1 MBytes 103 Mbits/sec 8710 [5] 8.00-9.01 sec 13.4 MBytes 112 Mbits/sec 9630 [5] 9.01-10.01 sec 14.6 MBytes 122 Mbits/sec 10518 ----- [ID] Interval Transfer Bitrate Jitter Lost/Total Datagrams [5] 0.00-10.01 sec 129 MBytes 108 Mbits/sec 0.000 ms 0/92855 (0%) sender [5] 0.00-10.08 sec 129 MBytes 108 Mbits/sec 0.256 ms 0/92854 (0%) receiver </pre> <p>0.256 ms</p>
Ping / Round Trip Time	50 ms 30 ms	<pre> Pinging 13.248.68.72 with 32 bytes of data: Reply from 13.248.68.72: bytes=32 time=28ms TTL=244 Reply from 13.248.68.72: bytes=32 time=20ms TTL=244 Reply from 13.248.68.72: bytes=32 time=24ms TTL=244 Reply from 13.248.68.72: bytes=32 time=21ms TTL=244 Ping statistics for 13.248.68.72: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 20ms, Maximum = 28ms, Average = 23ms </pre> <p>RTT avg: 23 ms</p>



Date: 3rd December 2025 @ 9:30 CEST

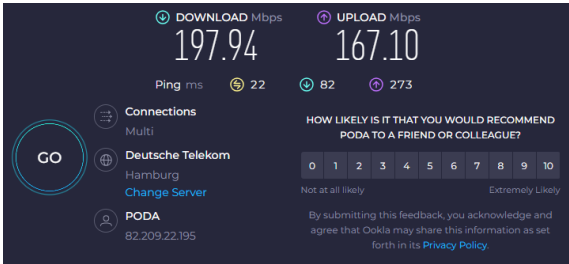
Note: Wi-fi connection under load

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	 <p>165.45 / 82.41 Mbit Down/Up</p>
Latency	50 ms 30 ms	29/81 ms Down/Up
Jitter	Not set	<pre> Connecting to host iperf3.moji.fr, port 5200 [5] Local 192.168.100.52 port 57270 connected to 45.147.210.189 port 5200 [ID] Interval Transfer Bitrate Total Datagrams [5] 0.00-1.00 sec 7.64 MBytes 63.9 Mbits/sec 5485 [5] 1.00-2.01 sec 7.60 MBytes 63.0 Mbits/sec 5455 [5] 2.01-3.01 sec 5.80 MBytes 48.9 Mbits/sec 4165 [5] 3.01-4.01 sec 5.06 MBytes 42.4 Mbits/sec 3634 [5] 4.01-5.00 sec 5.85 MBytes 49.4 Mbits/sec 4205 [5] 5.00-6.01 sec 7.86 MBytes 65.3 Mbits/sec 5642 [5] 6.01-7.00 sec 11.9 MBytes 101 Mbits/sec 8582 [5] 7.00-8.01 sec 11.7 MBytes 97.7 Mbits/sec 8435 [5] 8.01-9.02 sec 11.3 MBytes 94.2 Mbits/sec 8107 [5] 9.02-10.01 sec 9.03 MBytes 76.2 Mbits/sec 6483 ----- [ID] Interval Transfer Bitrate Jitter Lost/Total Datagrams [5] 0.00-10.01 sec 83.8 MBytes 70.2 Mbits/sec 0.000 ms 0/68193 (0%) sender [5] 0.00-10.06 sec 83.0 MBytes 69.9 Mbits/sec 0.499 ms 0/68192 (0%) receiver </pre> <p>0.499 ms</p>
Ping / Round Trip Time	50 ms 30 ms	<pre> Pinging 13.248.68.72 with 32 bytes of data: Reply from 13.248.68.72: bytes=32 time=25ms TTL=244 Reply from 13.248.68.72: bytes=32 time=25ms TTL=244 Reply from 13.248.68.72: bytes=32 time=33ms TTL=244 Reply from 13.248.68.72: bytes=32 time=22ms TTL=244 Ping statistics for 13.248.68.72: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 22ms, Maximum = 33ms, Average = 26ms </pre> <p>RTT avg: 26 ms</p>



Date: 4th December 2025 @ 10:20 CEST

Note: Wi-fi connection without load

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	 <p>197.94 / 167.10 Mbit Down/Up</p>
Latency	50 ms 30 ms	82/273 ms Down/Up
Jitter	Not set	<pre> Connecting to host iperf3.moji.fr, port 5200 [5] local 192.168.108.52 port 49315 connected to 45.147.210.189 port 5200 [ID] Interval Transfer Bitrate Total Datagrams [5] 0.00-1.00 sec 18.3 MBytes 153 Mbits/sec 13125 [5] 1.00-2.00 sec 17.6 MBytes 147 Mbits/sec 12688 [5] 2.00-3.01 sec 16.6 MBytes 139 Mbits/sec 11983 [5] 3.01-4.01 sec 18.1 MBytes 151 Mbits/sec 13066 [5] 4.01-5.01 sec 17.2 MBytes 144 Mbits/sec 12371 [5] 5.01-6.00 sec 18.1 MBytes 153 Mbits/sec 12971 [5] 6.00-7.01 sec 18.9 MBytes 158 Mbits/sec 13578 [5] 7.01-8.02 sec 18.0 MBytes 149 Mbits/sec 12898 [5] 8.02-9.00 sec 17.3 MBytes 147 Mbits/sec 12395 [5] 9.00-10.00 sec 18.7 MBytes 157 Mbits/sec 13465 ----- [ID] Interval Transfer Bitrate Jitter Lost/Total Datagrams [5] 0.00-10.00 sec 179 MBytes 150 Mbits/sec 0.000 ms 0/128320 (0%) sender [5] 0.00-10.06 sec 179 MBytes 149 Mbits/sec 0.133 ms 1/128319 (0.00078%) receiver </pre> <p>0.133 ms</p>
Ping / Round Trip Time	50 ms 30 ms	<pre> Pinging 13.248.68.72 with 32 bytes of data: Reply from 13.248.68.72: bytes=32 time=23ms TTL=244 Reply from 13.248.68.72: bytes=32 time=22ms TTL=244 Reply from 13.248.68.72: bytes=32 time=21ms TTL=244 Reply from 13.248.68.72: bytes=32 time=21ms TTL=244 Ping statistics for 13.248.68.72: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 21ms, Maximum = 23ms, Average = 21ms </pre> <p>RTT avg: 21 ms</p>



Date: 8th December 2025 @ 13:10 CEST

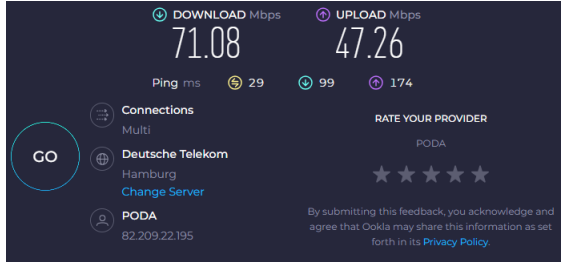
Note:

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	<p>154.67 / 127.44 Mbit Down/Up</p>
Latency	50 ms 30 ms	72/224 ms Down/Up
Jitter	Not set	<pre> Connecting to host iperf3.moj1.fr port 5200 [S] local 192.168.100.10 port 68552 connected to 45.147.219.189 port 5200 [ID] Interval Transfer Bitrate Total Datagrams [S] 0.00-1.02 sec 16.0 MBytes 132 Mbits/sec 11504 [S] 1.02-2.01 sec 14.3 MBytes 120 Mbits/sec 10271 [S] 2.01-3.01 sec 11.9 MBytes 101 Mbits/sec 8973 [S] 3.01-4.01 sec 7.38 MBytes 61.4 Mbits/sec 5298 [S] 4.01-5.00 sec 12.0 MBytes 102 Mbits/sec 8654 [S] 5.00-6.00 sec 17.9 MBytes 150 Mbits/sec 12884 [S] 6.00-7.01 sec 16.7 MBytes 140 Mbits/sec 12806 [S] 7.01-8.01 sec 16.7 MBytes 140 Mbits/sec 12827 [S] 8.01-9.01 sec 9.08 MBytes 76.8 Mbits/sec 6523 [S] 9.01-10.01 sec 8.51 MBytes 70.8 Mbits/sec 6113 ----- [ID] Interval Transfer Bitrate Jitter Lost/Totl Datagrams [S] 0.00-10.01 sec 131 MBytes 109 Mbits/sec 0.000 ms 0/93853 (0%) sender [S] 0.00-10.06 sec 131 MBytes 109 Mbits/sec 0.263 ms 1/93852 (0.0011%) receiver </pre> <p>0.263 ms</p>
Ping / Round Trip Time	50 ms 30 ms	<pre> Pinging 13.248.68.72 with 32 bytes of data: Reply from 13.248.68.72: bytes=32 time=20ms TTL=244 Reply from 13.248.68.72: bytes=32 time=23ms TTL=244 Reply from 13.248.68.72: bytes=32 time=20ms TTL=244 Reply from 13.248.68.72: bytes=32 time=19ms TTL=244 Ping statistics for 13.248.68.72: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 19ms, Maximum = 23ms, Average = 20ms </pre> <p>RTT avg: 20 ms</p>



Date: 10th December 2025 @ 12:20 CEST

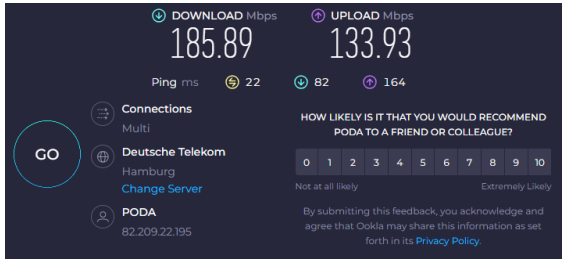
Note: Wi-fi connection under load

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	 <p>71.08 / 47.26 Mbit Down/Up</p>
Latency	50 ms 30 ms	29/99 ms Down/Up
Jitter	Not set	<pre> Connecting to host iperf3.moji.fr, port 5282 [S] Local 192.168.100.24 port 65378 connected to 45.147.218.189 port 5282 [ID] Interval Transfer Bitrate Total Datagrams [S] 0.00-1.02 sec 3.69 MBytes 38.5 Mbits/sec 2652 [S] 1.02-2.02 sec 4.55 MBytes 38.1 Mbits/sec 3267 [S] 2.02-3.01 sec 4.08 MBytes 34.4 Mbits/sec 2931 [S] 3.01-4.01 sec 4.78 MBytes 48.2 Mbits/sec 3433 [S] 4.01-5.00 sec 5.28 MBytes 44.5 Mbits/sec 3792 [S] 5.00-6.00 sec 3.57 MBytes 38.0 Mbits/sec 2563 [S] 6.00-7.01 sec 4.61 MBytes 38.2 Mbits/sec 3318 [S] 7.01-8.01 sec 4.77 MBytes 48.2 Mbits/sec 3428 [S] 8.01-9.01 sec 3.88 MBytes 32.6 Mbits/sec 2788 [S] 9.01-10.01 sec 5.15 MBytes 45.3 Mbits/sec 3701 ----- [ID] Interval Transfer Bitrate Jitter Lost/Total Datagrams [S] 0.00-10.01 sec 44.4 MBytes 37.2 Mbits/sec 0.000 ms 0/31865 (0%) sender [S] 0.00-10.06 sec 44.4 MBytes 37.0 Mbits/sec 0.539 ms 1/31857 (0.0031%) receiver </pre> <p>0.539 ms</p>
Ping / Round Trip Time	50 ms 30 ms	<pre> Pinging 13.248.68.72 with 32 bytes of data: Reply from 13.248.68.72: bytes=32 time=22ms TTL=244 Reply from 13.248.68.72: bytes=32 time=22ms TTL=244 Reply from 13.248.68.72: bytes=32 time=22ms TTL=244 Reply from 13.248.68.72: bytes=32 time=24ms TTL=244 Ping statistics for 13.248.68.72: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 22ms, Maximum = 24ms, Average = 22ms </pre> <p>RTT avg: 22 ms</p>



Date: 15th December 2025 @ 12:20 CEST

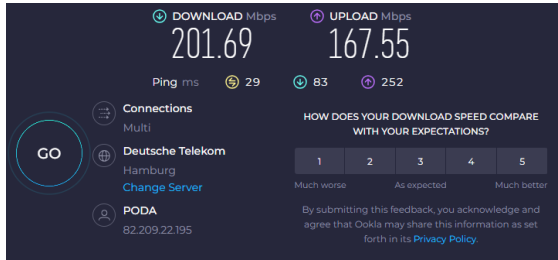
Note:

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	 <p>185.89 / 133.93 Mbit Down/Up</p>
Latency	50 ms 30 ms	82/164 ms Down/Up
Jitter	Not set	<pre> Connecting to host iperf3.moj1.fr, port 5202 [5] local 192.168.180.92 port 64889 connected to 45.147.210.189 port 5202 [ID] Interval Transfer Bitrate Total Datagrams [5] 0.00-1.01 sec 6.82 MBytes 56.6 Mbits/sec 4896 [5] 1.01-2.01 sec 6.67 MBytes 56.1 Mbits/sec 4791 [5] 2.01-3.00 sec 12.3 MBytes 104 Mbits/sec 8838 [5] 3.00-4.01 sec 6.82 MBytes 57.2 Mbits/sec 4980 [5] 4.01-5.02 sec 7.38 MBytes 61.2 Mbits/sec 5298 [5] 5.02-6.01 sec 7.41 MBytes 62.6 Mbits/sec 5321 [5] 6.01-7.00 sec 6.14 MBytes 51.7 Mbits/sec 4410 [5] 7.00-8.02 sec 9.77 MBytes 81.1 Mbits/sec 7017 [5] 8.02-9.01 sec 8.13 MBytes 68.6 Mbits/sec 5836 [5] 9.01-10.04 sec 6.29 MBytes 51.2 Mbits/sec 4518 ----- [ID] Interval Transfer Bitrate Jitter Lost/Total Datagrams [5] 0.00-10.04 sec 77.7 MBytes 64.9 Mbits/sec 0.000 ms 0/55825 (0%) sender [5] 0.00-10.11 sec 77.7 MBytes 64.5 Mbits/sec 0.329 ms 0/55824 (0%) receiver </pre> <p>0.329 ms</p>
Ping / Round Trip Time	50 ms 30 ms	<pre> Pinging 13.248.68.72 with 32 bytes of data: Reply from 13.248.68.72: bytes=32 time=22ms TTL=244 Reply from 13.248.68.72: bytes=32 time=20ms TTL=244 Reply from 13.248.68.72: bytes=32 time=21ms TTL=244 Reply from 13.248.68.72: bytes=32 time=21ms TTL=244 Ping statistics for 13.248.68.72: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 20ms, Maximum = 22ms, Average = 21ms </pre> <p>RTT avg: 21 ms</p>



Date: 13th January 2026 @ 8:40 CEST

Note:

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	 <p>201.69 / 167.55 Mbit Down/Up</p>
Latency	50 ms 30 ms	29/83 ms Down/Up
Jitter	Not set	<pre> Connecting to host iperf3.mej1.fr, port 5200 [5] local 192.168.100.45 port 50146 connected to 45.147.210.189 port 5200 [ID] Interval Transfer Bitrate Total Datagrams [5] 0.00-1.02 sec 17.3 Mbytes 143 Mbits/sec 12485 [5] 1.02-2.01 sec 17.6 Mbytes 149 Mbits/sec 12674 [5] 2.01-3.00 sec 18.6 Mbytes 157 Mbits/sec 13364 [5] 3.00-4.01 sec 19.6 Mbytes 163 Mbits/sec 14046 [5] 4.01-5.00 sec 15.9 Mbytes 134 Mbits/sec 11391 [5] 5.00-6.01 sec 18.0 Mbytes 150 Mbits/sec 12983 [5] 6.01-7.00 sec 19.2 Mbytes 162 Mbits/sec 13759 [5] 7.00-8.01 sec 18.5 Mbytes 153 Mbits/sec 13253 [5] 8.01-9.02 sec 19.0 Mbytes 158 Mbits/sec 13639 [5] 9.02-10.00 sec 18.4 Mbytes 156 Mbits/sec 13216 ----- [ID] Interval Transfer Bitrate Jitter Lost/Total Datagrams [5] 0.00-10.00 sec 182 Mbytes 153 Mbits/sec 0.000 ms 0/130650 (0% sender) [5] 0.00-10.06 sec 182 Mbytes 152 Mbits/sec 0.061 ms 12/130650 (0.0092% receiver) </pre> <p>0.061 ms</p>
Ping / Round Trip Time	50 ms 30 ms	<pre> Pinging 13.248.68.72 with 32 bytes of data: Reply from 13.248.68.72: bytes=32 time=20ms TTL=244 Reply from 13.248.68.72: bytes=32 time=18ms TTL=244 Reply from 13.248.68.72: bytes=32 time=18ms TTL=244 Reply from 13.248.68.72: bytes=32 time=19ms TTL=244 Ping statistics for 13.248.68.72: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 18ms, Maximum = 20ms, Average = 18ms </pre> <p>RTT avg: 18 ms</p>




VR lab at OTH

Date: 17.09.2025 | 11:10

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	<p>181.99 / 34,44 Mbit Down/Up</p>
Latency	50 ms 30 ms	<p>212.201.131.47 - Verein zur Foerderung eines Deutschen Forschungsnetzes e.V., Germany</p>
Jitter	Not set	<pre> Connecting to host iperf3.moji.fr, port 5202 [5] local 172.19.32.158 port 53565 connected to 45.147.210.189 port 5202 [ID] Interval Transfer Bitrate Total Datagrams [5] 0.00-1.01 sec 92.6 MBytes 770 Mbits/sec 77038 [5] 1.01-2.00 sec 0.00 Bytes 0.00 bits/sec 0 [5] 2.00-3.01 sec 0.00 Bytes 0.00 bits/sec 0 [5] 3.01-4.01 sec 0.00 Bytes 0.00 bits/sec 0 [5] 4.01-5.00 sec 0.00 Bytes 0.00 bits/sec 0 [5] 5.00-6.01 sec 0.00 Bytes 0.00 bits/sec 0 [5] 6.01-7.01 sec 0.00 Bytes 0.00 bits/sec 0 [5] 7.01-8.00 sec 0.00 Bytes 0.00 bits/sec 0 [5] 8.00-9.01 sec 0.00 Bytes 0.00 bits/sec 0 [5] 9.01-10.01 sec 0.00 Bytes 0.00 bits/sec 0 ----- [ID] Interval Transfer Bitrate Jitter Lost/Total Datagrams [5] 0.00-10.01 sec 92.6 MBytes 77.6 Mbits/sec 0.000 ms 0/77038 (0%) sender [5] 0.00-19.56 sec 92.6 MBytes 39.7 Mbits/sec 0.242 ms 0/77038 (0%) receiver </pre> <p>0.242ms</p>
Ping / Round Trip Time	50 ms 30 ms	RTT avg: 18 ms



Date: 29.09.2025 | 09:25


Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	 <p>810.90 / 744,18 Mbit Down/Up</p>
Latency	50 ms 30 ms	43/38 ms Down/Up
Jitter	Not set	<pre data-bbox="837 1108 1407 1332">(base) l@rcbe-mob-135 ~ % iperf3 -u -b 0 -c iperf3.moji.fr -p 5202 Connecting to host iperf3.moji.fr, port 5202 [7] local 10.121.1.47 port 59362 connected to 45.147.210.189 port 5202 [ID] Interval Transfer Bitrate Total Datagrams [7] 0.00-1.00 sec 118 MBytes 986 Mbits/sec 85118 [7] 1.00-2.00 sec 113 MBytes 945 Mbits/sec 81884 [7] 2.00-3.00 sec 113 MBytes 948 Mbits/sec 81542 [7] 3.00-4.00 sec 114 MBytes 954 Mbits/sec 82655 [7] 4.00-5.01 sec 113 MBytes 948 Mbits/sec 81904 [7] 5.01-6.00 sec 113 MBytes 952 Mbits/sec 81836 [7] 6.00-7.01 sec 114 MBytes 952 Mbits/sec 82578 [7] 7.01-8.00 sec 113 MBytes 951 Mbits/sec 82879 [7] 8.00-9.01 sec 114 MBytes 954 Mbits/sec 82428 [7] 9.01-10.01 sec 113 MBytes 952 Mbits/sec 82158 ----- [ID] Interval Transfer Bitrate Jitter Lost/Total Datagrams [7] 0.00-10.01 sec 1.11 GBytes 954 Mbits/sec 0.000 ms 0/824166 (0%) sender [7] 0.00-10.03 sec 1.10 GBytes 945 Mbits/sec 0.009 ms 3068/828928 (0.37%) receiver</pre> <p>0.009ms</p>
Ping / Round Trip Time	50 ms 30 ms	RTT avg: 12 ms



Date: 08.10.2025 | 12:00

Note: mobile lab setup

Remark: Results too low, therefore termination and use of existing network structure in the educational institution

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	
Latency	50 ms 30 ms	
Jitter	Not set	
Ping / Round Trip Time	50 ms 30 ms	



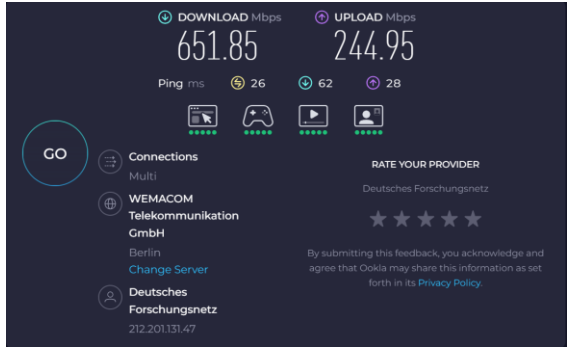
Date: 09.10.2025 | 10:00

Note: mobile lab setup

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	
Latency	50 ms 30 ms	109/79 ms Down/Up
Jitter	Not set	<pre> Connecting to host iperf3.moj1.fr port 5202 [S] Local 172.19.32.188 port 53505 connected to 45.107.210.189 port 5202 [ID] Interval Transfer Bitrate Total Datagrams [S] 0.00-1.01 sec 92.6 MBytes 77.0 Mbits/sec 77938 [S] 1.01-2.00 sec 0.00 Bytes 0.00 bits/sec 0 [S] 2.00-3.01 sec 0.00 Bytes 0.00 bits/sec 0 [S] 3.01-4.01 sec 0.00 Bytes 0.00 bits/sec 0 [S] 4.01-5.00 sec 0.00 Bytes 0.00 bits/sec 0 [S] 5.00-6.01 sec 0.00 Bytes 0.00 bits/sec 0 [S] 6.01-7.01 sec 0.00 Bytes 0.00 bits/sec 0 [S] 7.01-8.00 sec 0.00 Bytes 0.00 bits/sec 0 [S] 8.00-9.01 sec 0.00 Bytes 0.00 bits/sec 0 [S] 9.01-10.01 sec 0.00 Bytes 0.00 bits/sec 0 ----- [ID] Interval Transfer Bitrate Jitter Lost/Total Datagrams [S] 0.00-10.01 sec 92.6 MBytes 77.6 Mbits/sec 0.000 ms 0/77938 (0%) sender [S] 0.00-19.56 sec 92.6 MBytes 39.7 Mbits/sec 0.242 ms 0/77938 (0%) receiver iperf Done PS C:\Users\Uca40638\Downloads>iperf-3.19 1--min60v .\iperf3.exe -s -b 0 -c iperf3.moj1.fr -p 5202 Connecting to host iperf3.moj1.fr port 5202 </pre>
Ping / Round Trip Time	50 ms 30 ms	RTT avg: 14 ms



Date: 15.10.2025 | 14:00

Item	Minimum Recommended	Results measured
<p>Connection speed/bitrate</p>	<p>25/5 Mbit 200/50 Mbit</p>	
<p>Latency</p>	<p>50 ms 30 ms</p>	<p>62/28 ms Down/Up</p>
<p>Jitter</p>	<p>Not set</p>	<pre data-bbox="837 1084 1407 1323"> (base) lk@rbe-mob-135 ~ % iperf3 -u -b 0 -c iperf3.moji.fr -p 5203 Connecting to host iperf3.moji.fr, port 5203 [7] local 19.121.1.47 port 56493 connected to 45.147.210.189 port 5203 [ID] Interval Transfer Bitrate Total Datagrams [7] 0.00-1.00 sec 116 Mbytes 974 Mbits/sec 84899 [7] 1.00-2.01 sec 113 Mbytes 945 Mbits/sec 82893 [7] 2.01-3.00 sec 112 Mbytes 948 Mbits/sec 81456 [7] 3.00-4.00 sec 113 Mbytes 947 Mbits/sec 81828 [7] 4.00-5.00 sec 112 Mbytes 948 Mbits/sec 81854 [7] 5.00-6.01 sec 113 Mbytes 944 Mbits/sec 81974 [7] 6.01-7.00 sec 113 Mbytes 952 Mbits/sec 81865 [7] 7.00-8.00 sec 114 Mbytes 958 Mbits/sec 82689 [7] 8.00-9.00 sec 114 Mbytes 955 Mbits/sec 82450 [7] 9.00-10.00 sec 114 Mbytes 955 Mbits/sec 82361 ----- [ID] Interval Transfer Bitrate Jitter Lost/TOTAL Datagrams [7] 0.00-10.00 sec 1.11 Gbytes 952 Mbits/sec 0.000 ms 0/821679 (0%) sender [7] 0.00-10.02 sec 1.10 Gbytes 942 Mbits/sec 0.009 ms 3145/818286 (0.38%) receiver iperf3 Done. </pre>
<p>Ping / Round Trip Time</p>	<p>50 ms 30 ms</p>	<p>RTT avg: 15 ms</p>



Date: 17.10.2025 | 08:00

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	
Latency	50 ms 30 ms	
Jitter	Not set	<pre>(base) lk@rcbe-mob-135 ~ % iperf3 -u -b 0 -c iperf3.moji.fr -p 5203 Connecting to host iperf3.moji.fr, port 5203 [7] local 10.121.1.47 port 50493 connected to 45.147.210.189 port 5203 [ID] Interval Transfer Bitrate Total Datagrams [7] 0.00-1.00 sec 116 MBytes 974 Mbits/sec 84099 [7] 1.00-2.01 sec 113 MBytes 945 Mbits/sec 82803 [7] 2.02-3.00 sec 112 MBytes 948 Mbits/sec 81456 [7] 3.00-4.00 sec 113 MBytes 947 Mbits/sec 81928 [7] 4.00-5.00 sec 112 MBytes 940 Mbits/sec 81054 [7] 5.00-6.01 sec 113 MBytes 944 Mbits/sec 81874 [7] 6.02-7.00 sec 113 MBytes 952 Mbits/sec 81865 [7] 7.00-8.00 sec 114 MBytes 958 Mbits/sec 82589 [7] 8.00-9.00 sec 114 MBytes 955 Mbits/sec 82450 [7] 9.00-10.00 sec 114 MBytes 955 Mbits/sec 82361 ----- [ID] Interval Transfer Bitrate Jitter Lost/Total Datagrams [7] 0.00-10.00 sec 1.11 GBytes 952 Mbits/sec 0.000 ms 0/821679 (0%) sender [7] 0.00-10.02 sec 1.10 GBytes 942 Mbits/sec 0.009 ms 3145/818286 (0.38%) receiver iperf Done.</pre>
Ping / Round Trip Time	50 ms 30 ms	RTT avg: 18 ms



Date: 07.11.2025 | 17:00

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	<p>SPEEDTEST by Ookla 11/24/2025 10:34 AM GMT @Speedtest DOWNLOAD 725.97 Mbps UPLOAD 644.35 Mbps Ping ms 28 83 46 Deutsches Forschungs... Deutsche Telekom Speedtest.net Berlin</p>
Latency	50 ms 30 ms	<p>LibreSpeed Start Ping 27.0ms Jitter 8.96ms Download 97.7 Mbit/s Upload 101 Mbit/s 212.201.131.47 - Verein zur Foerderung eines Deutschen Forschungsnetzes e.V., Germany</p>
Jitter	Not set	<pre>(base) lk@rcbe-mob-135 ~ % iperf3 -u -b 0 -c iperf3.moji.fr -p 5284 Connecting to host iperf3.moji.fr, port 5284 [7] local 172.20.36.218 port 63814 connected to 45.147.210.189 port 5284 [ID] Interval Transfer Bitrate Total Datagrams [7] 0.00-1.00 sec 116 MBytes 971 Mbits/sec 83933 [7] 1.00-2.00 sec 116 MBytes 955 Mbits/sec 82667 [7] 2.00-3.01 sec 115 MBytes 968 Mbits/sec 83886 [7] 3.01-4.01 sec 114 MBytes 957 Mbits/sec 82592 [7] 4.01-5.00 sec 114 MBytes 962 Mbits/sec 82719 [7] 5.00-6.00 sec 115 MBytes 968 Mbits/sec 82987 [7] 6.00-7.00 sec 115 MBytes 959 Mbits/sec 83844 [7] 7.00-8.00 sec 114 MBytes 968 Mbits/sec 82547 [7] 8.00-9.01 sec 115 MBytes 962 Mbits/sec 83288 [7] 9.01-10.00 sec 114 MBytes 963 Mbits/sec 82798 ----- [ID] Interval Transfer Bitrate Jitter Lost/Total Datagrams [7] 0.00-10.00 sec 1.12 GBytes 961 Mbits/sec 0.800 ms 0/829560 (0%) sender [7] 0.00-10.02 sec 1.11 GBytes 952 Mbits/sec 0.812 ms 2532/826178 (0.31%) receiver iperf Done.</pre>
Ping / Round Trip Time	50 ms 30 ms	RTT avg: 18 ms




Date: 14.11.2025 | 15:00

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	
Latency	50 ms 30 ms	
Jitter	Not set	<pre>(base) lk@rcbe-mob-135 ~ % iperf3 -u -b 0 -c iperf3.moji.fr -p 5203 Connecting to host iperf3.moji.fr, port 5203 [7] local 19.121.1.47 port 56493 connected to 45.147.219.189 port 5203 [ID] Interval Transfer Bitrate Total Datagrams [7] 0.00-1.00 sec 116 MBytes 974 Mbits/sec 84099 [7] 1.00-2.01 sec 113 MBytes 945 Mbits/sec 82003 [7] 2.01-3.00 sec 112 MBytes 948 Mbits/sec 81456 [7] 3.00-4.00 sec 113 MBytes 947 Mbits/sec 81928 [7] 4.00-5.00 sec 112 MBytes 940 Mbits/sec 81954 [7] 5.00-6.01 sec 113 MBytes 944 Mbits/sec 81874 [7] 6.01-7.00 sec 113 MBytes 952 Mbits/sec 81865 [7] 7.00-8.00 sec 114 MBytes 958 Mbits/sec 82689 [7] 8.00-9.00 sec 114 MBytes 955 Mbits/sec 82450 [7] 9.00-10.00 sec 114 MBytes 955 Mbits/sec 82361 ----- [ID] Interval Transfer Bitrate Jitter Lost/Total Datagrams [7] 0.00-10.00 sec 1.11 GBytes 952 Mbits/sec 0.000 ms 0/821679 (0%) sender [7] 0.00-10.02 sec 1.10 GBytes 942 Mbits/sec 0.009 ms 3145/818286 (0.38%) receiver iperf Done.</pre>
Ping / Round Trip Time	50 ms 30 ms	



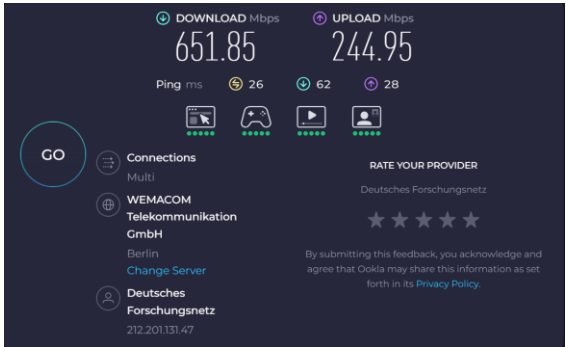
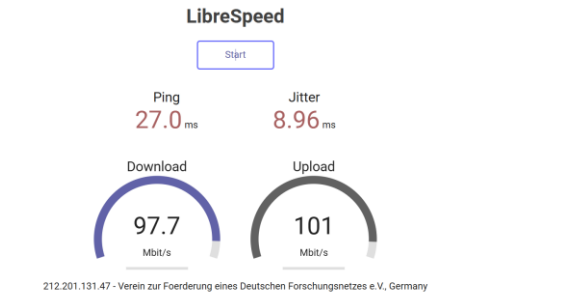
Date: 17.11.2025 | 11:00

Note: mobile lab setup

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	
Latency	50 ms 30 ms	
Jitter	Not set	
Ping / Round Trip Time	50 ms 30 ms	



Date: 24.11.2025 | 08:00

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	
Latency	50 ms 30 ms	
Jitter	Not set	<pre data-bbox="839 1391 1406 1429">[ID] Interval Transfer Bitrate Jitter Lost/Total Datagrams [5] 0.00-10.01 sec 423 MBytes 354 Mbits/sec 0.000 ms 0/354716 (0%) sender</pre>
Ping / Round Trip Time	50 ms 30 ms	



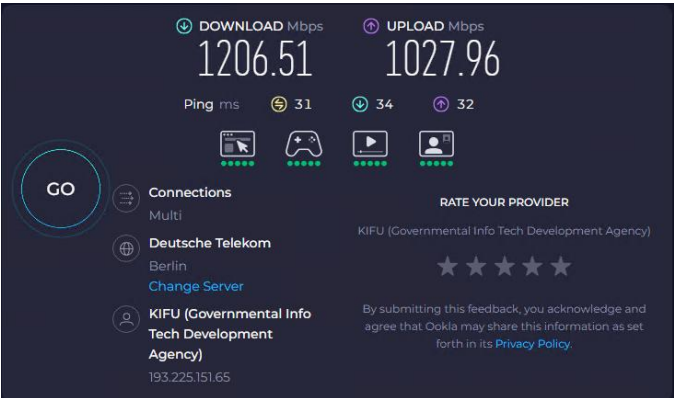
VR lab at SZE

Date: 23.09.2025, Time: 09:00 CET

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	<p>speedtest: down: 1152.45 Mbit/s, up: 948,05 Mbit/s</p> <p>librespeed: down: 1143 Mbit/s, up: 793 Mbit/s</p>
Latency	50 ms 30 ms	<p>speedtest: 32ms</p> <p>librespeed: 20.3ms</p>
Jitter	Not set	librespeed: 0.81ms
Ping / Round Trip Time	50 ms 30 ms	<pre>Pinging 13.248.68.72 with 32 bytes of data: Reply from 13.248.68.72: bytes=32 time=22ms TTL=244 Reply from 13.248.68.72: bytes=32 time=22ms TTL=244 Reply from 13.248.68.72: bytes=32 time=22ms TTL=244 Ping statistics for 13.248.68.72: Packets: Sent = 3, Received = 3, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 22ms, Maximum = 22ms, Average = 22ms</pre> <p>Round Trip time average: 22 ms</p>

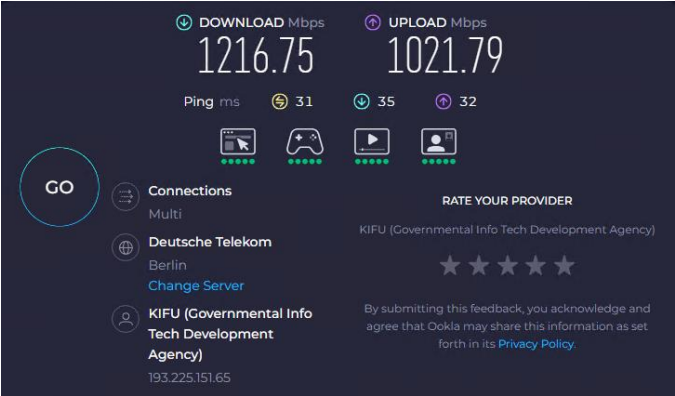


Date: 14.10.2025, Time: 09:00 CET

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	 <p>speedtest: down: 1206.51 Mbit/s, up: 1027,96 Mbit/s</p> <p>Server: <input type="text" value="Frankfurt, Germany (Clouvider)"/> Sponsor: Clouvider</p> <p>Ping 20.6 ms Jitter 0.90 ms</p> <p>Download 1189 Mbps Upload 539 Mbps</p> <p>193.225.151.65 - Unknown ISP</p> <p>librespeed: down: 1189 Mbit/s, up: 539 Mbit/s</p>
Latency	50 ms 30 ms	speedtest: 31ms librespeed: 20.6ms
Jitter	Not set	librespeed: 0.90ms
Ping / Round Trip Time	50 ms 30 ms	Round Trip time average: 20 ms

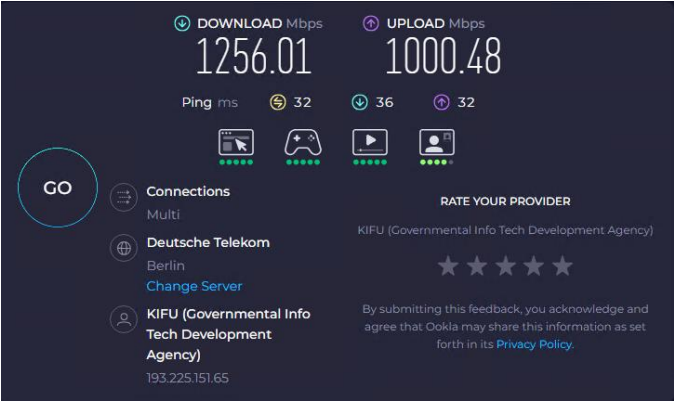


Date: 15.10.2025, Time: 09:00 CET

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	 <p>speedtest: down: 1216.75 Mbit/s, up: 1021,79 Mbit/s</p> <p>Server: <input type="text" value="Prague, Czech Republic (CESNET)"/> Sponsor: CESNET</p> <p>Ping 12.0 ms Jitter 0.25 ms</p> <p>Download 1190 Mbps Upload 1886 Mbps</p> <p>193.225.151.65</p> <p>librespeed: down: 1190 Mbit/s, up: 1886 Mbit/s</p>
Latency	50 ms 30 ms	speedtest: 31ms librespeed: 12.0ms
Jitter	Not set	librespeed: 0.25ms
Ping / Round Trip Time	50 ms 30 ms	Round Trip time average: 23 ms




Date: 21.10.2025, Time: 09:00 CET

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	 <p>speedtest: down: 1256.01 Mbit/s, up: 1000,48 Mbit/s</p> <p>Server: <input type="text" value="Frankfurt, Germany (Clouvider)"/> Sponsor: Clouvider</p> <p>Ping 20.0 ms Jitter 0.31 ms</p> <p>Download 995 Mbps Upload 611 Mbps</p> <p>193.225.151.65 - Unknown ISP</p> <p>librespeed: down: 995 Mbit/s, up: 611 Mbit/s</p>
Latency	50 ms 30 ms	speedtest: 32ms librespeed: 20.0ms
Jitter	Not set	librespeed: 0.31ms
Ping / Round Trip Time	50 ms 30 ms	Round Trip time average: 22 ms

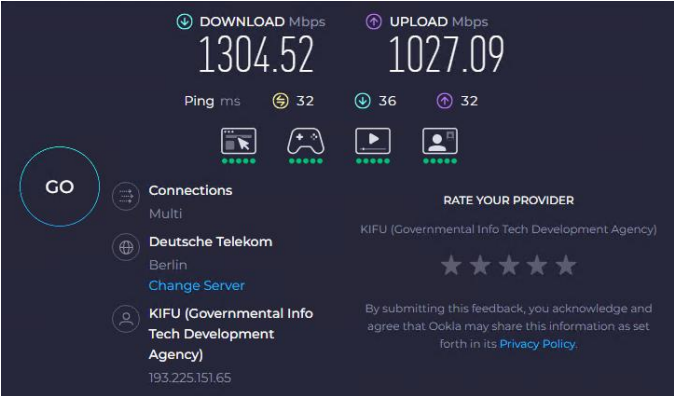


Date: 29.10.2025, Time: 09:00 CET

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	 <p>speedtest: down: 1281.14 Mbit/s, up: 1038,78 Mbit/s</p> <p>Server: Frankfurt, Germany (Clouvider) Sponsor: Clouvider</p> <p>Ping 18.4 ms Jitter 0.68 ms</p> <p>Download 1074 Mbps Upload 587 Mbps</p> <p>193.225.151.65 - Unknown ISP</p> <p>librespeed: down: 1074 Mbit/s, up: 587 Mbit/s</p>
Latency	50 ms 30 ms	speedtest: 31ms librespeed: 18.4ms
Jitter	Not set	librespeed: 0.68ms
Ping / Round Trip Time	50 ms 30 ms	Round Trip time average: 20 ms



Date: 11.11.2025, Time: 09:00 CET

Item	Minimum Recommended	Results measured
Connection speed/bitrate	25/5 Mbit 200/50 Mbit	 <p>speedtest: down: 1152.45 Mbit/s, up: 948,05 Mbit/s</p> <p>Server: Frankfurt, Germany (Clouvider) Sponsor: Clouvider</p> <p>Ping 20.3 ms Jitter 0.30 ms</p> <p>Download 1191 Mbps Upload 592 Mbps</p> <p>193.225.151.65 - Unknown ISP</p> <p>librespeed: down: 1191 Mbit/s, up: 592 Mbit/s</p>
Latency	50 ms 30 ms	speedtest: 32ms librespeed: 20.3ms
Jitter	Not set	librespeed: 0.30ms
Ping / Round Trip Time	50 ms 30 ms	Round Trip time average: 21 ms