# RAPID Remote Services
Connects, security, and use

RAPID (Remote Access Program for Interactive Diagnostics) is a service program that gives electron microscope users support from Thermo Fisher Scientific remotely. The program provides access to remote service engineers (RSE) and application specialists through a robust VPN connection. RAPID reduces the time to solve problems, increasing the availability of the microscope. With the consent of the user, a trained RSE can perform several actions using RAPID:

- Take over the Customer Instrument screen remotely to provide the required support

- Run service test software and diagnostics on Customer Instruments

- Optimize Customer Instruments performance

- Check and modify Customer Instruments settings

- Patch and upgrade software

- View Customer Instruments images

- You can invite a specialist from Thermo Fisher Scientific to a RAPID support session from anywhere in the world, reducing the time to troubleshoot problems.

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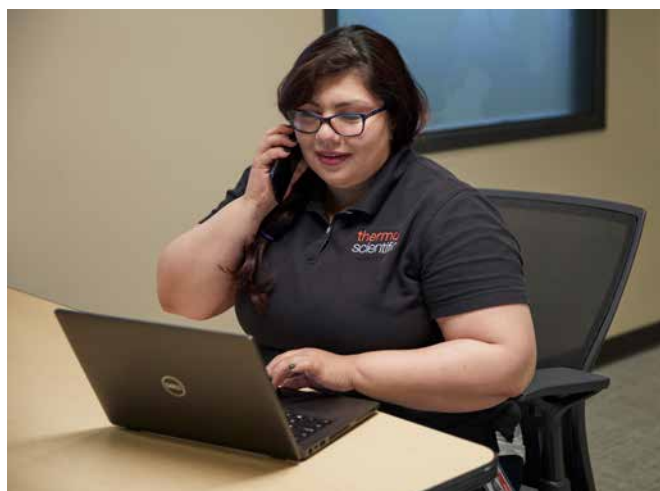
The RAPID infrastructure

Our network configuration makes it easy to connect with Thermo Fisher through the local corporate or institutional network (see **Figure 1**). RAPID is divided into two layers:

1. The connectivity layer (the red tube representing the VPN Connection)

2. The application layer (the blue tube representing the access control to the customer's instrument).

The Cloud-based RAPID Secure Server is the core of the RAPID infrastructure. The RAPID Secure Server manages all connections between the customer instruments and the remote service engineers. To enhance global performance and network availability, several RAPID Secure Servers have been deployed to different locations in the world: US East (Virginia), US West (Los Angeles), Japan (Tokyo) and Europe (Dublin).

The remote laptop or PC is the working environment of the RSE. The Microscope Controller (MPC, Microscope PC) is the working environment of the instrument user. It is not directly connected to the internet for security reasons.

For some instrument types, a Support PC (SPC) is mandatory (an SPC is recommended for all other instrument types). The SPC acts as a stepping stone between the instrument / MPC and the RSE. The SPC can be configured by the Customer IT organization, so that it is compliant with all mandatory security standards, such as running a specific operating system version or current antivirus software. Refer to the FAQ for more information on the SPC.
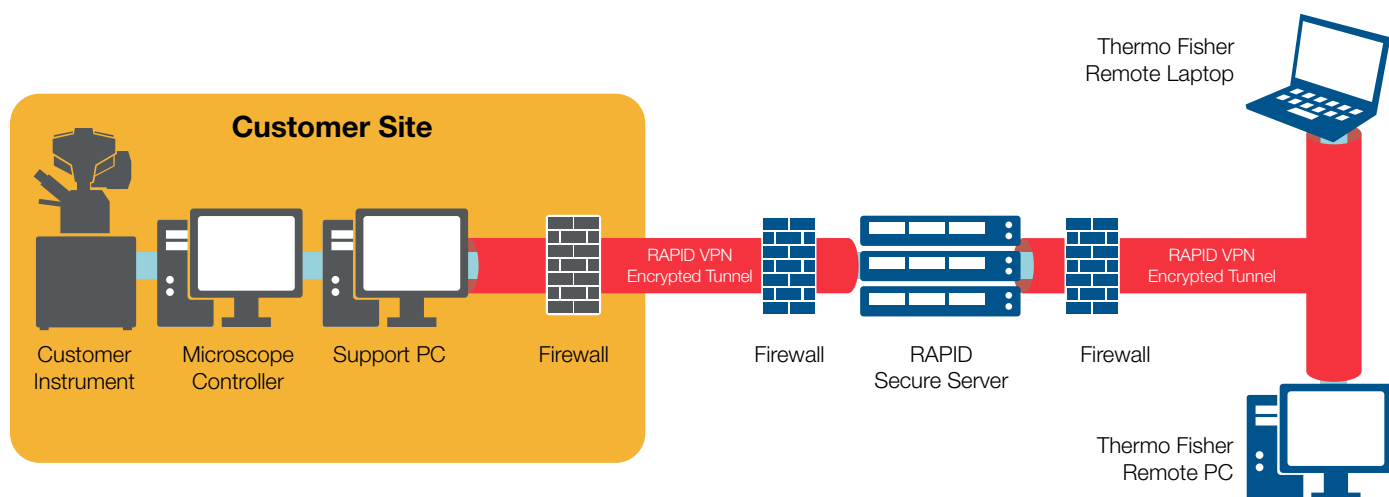
RAPID security

Security is implemented in both layers of the RAPID environment:

- The connectivity layer (red tube in **Figure 1**) for connection between instrument and engineer (by infrastructure-related security measures like demilitarized zones—DMZ and hardening). All RAPID support sessions are set up using OpenVPN, a secure communication protocol that uses TLS encryption to prevent unauthorized connections and provide confidentiality between the Customer Instrument and RAPID Secure Server.

- The application layer (blue tube in **Figure 1**) for taking over the instrument screen (by requesting user credentials to ensure access control to all RAPID support sessions). The RAPID Connection Wizard, with integrated TeamViewer screen sharing application, is part of the application layer.

Each RAPID Secure Server is secured by a firewall and has only minimum ports open to the outside world.

The TeamViewer screen sharing application comes with a set of preconfigured security settings that cannot be changed. The settings ensure that a TeamViewer connection is only possible via a RAPID connection. Operation and functioning of TeamViewer can be investigated via the local TeamViewer log file.

For each new RAPID release Thermo Fisher Scientific conducts security assessment with our Corporate Information Security group. These assessments allow us to identify possible vulnerabilities and apply improvements to ensure the security of RAPID.

Figure 1. RAPID infrastructure.

RAPID support session setup

Each RAPID support session is initiated by the instrument user, who is in control of who can participate in each session. This ensures that the instrument user is always in control of the start and end of a RAPID support session.

Establishing a RAPID support session begins with an agreed time slot, where the RSE is invited by the instrument user to use RAPID for troubleshooting. At the start of the timeslot, first the

VPN session is set up, then the RAPID support session itself is established. The main steps of this process are:

1. The instrument user connects to the RAPID Secure Server via the RAPID Connection Wizard on the SPC, using personal OpenVPN credentials.

2. The RSE connects to the RAPID Secure Server via the RAPID Connection Wizard on the remote laptop or PC, using personal OpenVPN credentials.

The VPN session setup is completed now.

3. The instrument user shares the OpenVPN IP address that was assigned to the SPC or to the MPC and the TeamViewer password with the RSE. Sharing is done "out of band" by telephone.

4. The RSE sets up the RAPID support session via TeamViewer on the remote laptop or PC using the shared IP address and password.

The RAPID support session is established, and remote support by the RSE via TeamViewer can start.

During the RAPID support session, the RSE has access to shared network resources on the instrument/ MPC and the SPC, since the RSE has the same access rights as the instrument user logged in at the time. Therefore, sensitive data such as images should be saved on a password-protected archive. Network sharing should also be turned off. This is a common practice among leading research institutions. It is also recommended that only reference samples are used during RAPID support sessions.

As part of the RAPID support session, all activities are captured in activity logs. The logs are stored on the RAPID Secure Server and can be checked via the RAPID User Portal. The instrument user can also do an OpenVPN password reset via the RAPID User Portal.

RAPID deployment
The RAPID deployment process consists of five simple steps: register, verify, enable, install and test (refer to **Figure 2**). Customer IT support is required in **Step 3**.

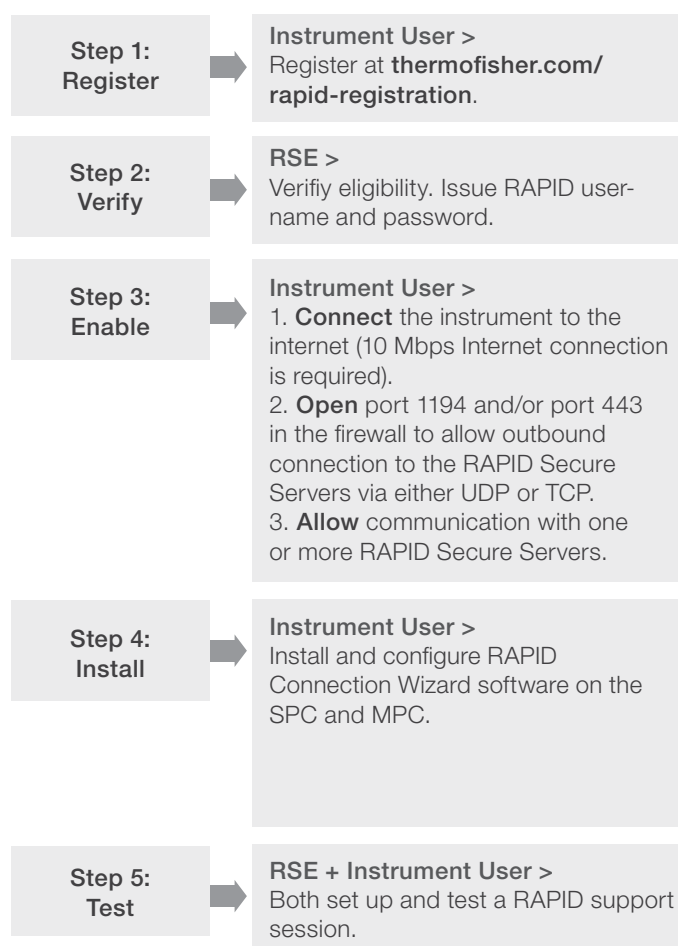| Step 1: Register | **Instrument User >** Register at **thermofisher.com/ rapid-registration**. |
Step 2: Verify	**RSE >** Verifiy eligibility. Issue RAPID user-name and password.
Step 3: Enable	**Instrument User >** 1. **Connect** the instrument to the internet (10 Mbps Internet connection is required). 2. **Open** port 1194 and/or port 443 in the firewall to allow outbound connection to the RAPID Secure Servers via either UDP or TCP. 3. **Allow** communication with one or more RAPID Secure Servers.
Step 4: Install	**Instrument User >** Install and configure RAPID Connection Wizard software on the SPC and MPC.
Step 5: Test	**RSE + Instrument User >** Both set up and test a RAPID support session.

Figure 2. RAPID deployment process.

Customer Site requirements for RAPID
The Customer Instrument, the SPC and MPC must have a broadband internet connection of at least 10 Mbps upload speed. To allow real-time remote imaging, 20 Mbps upload speed or higher is recommended.

If the local corporate or institutional network is protected by a firewall, port 1194 and/or 443 must be opened outbound for TCP and/or UDP to at least the RAPID Secure Server in your location, refer to **Table 1**. Opening ports 1194 and/or 443 to all RAPID Secure Servers is recommended for maximum flexibility and performance.

RAPID VPN Server (DNS name)	Connection ports	Location
vpn-use1.rapid.thermofisher.com	**TCP** 1194 or 443 / **UDP** 1194 or 443	US East 1 (Virginia)
vpn-usw1.rapid.thermofisher.com	**TCP** 1194 or 443 / **UDP** 1194 or 443	US West 1 (Los Angeles)
vpn-apne1.rapid.thermofisher.com	**TCP** 1194 or 443 / **UDP** 1194 or 443	APAC Northeast 1 (Tokyo)
vpn-euw1.rapid.thermofisher.com	**TCP** 1194 or 443 / **UDP** 1194 or 443	Europe West 1 (Dublin)
rapidvpn.thermofisher.cn	**TCP** 1194 or 443 / **UDP** 1194 or 443	China (Shanghai)

Table 1. RAPID Secure Server DNS Names, connection ports, and locations.

RAPID eligibility

Nearly all current instruments are designed to work with RAPID. In addition, many older Thermo Scientific™ instruments are able to utilize RAPID. Systems not produced by Thermo Fisher Scientific, however, will not be able to support RAPID.

More information?

For more information about support by RAPID and the RAPID program, visit **https://thermofisher.com/remote-service**. For technical questions regarding the setup and infrastructure of RAPID, send an email to **MSD.rapidsupport@thermofisher.com**. RAPID support personnel are available to discuss security issues and help with the necessary network configurations.

RAPID FAQ

What does RAPID cost?

RAPID is available at no additional cost to customers whose RAPID-enabled Customer Instruments are covered by an eligible service contract or new system warranty from Thermo Fisher Scientific.

How does the service engineer control the instrument?

Once you have initiated a RAPID support session, the RSE controls the Customer Instrument using the TeamViewer screen sharing application directly through the VPN connection. TeamViewer provides the optimal performance of the RAPID support session. The TeamViewer Host version as part of the RAPID Connection Wizard on the Customer Instrument / MPC does not require any additional licenses.

In case of older customer instruments, which cannot be upgraded to meet the requirements of the latest RAPID version, we offer a stand-alone UltraVNC screen sharing application as an alternative solution. To enhance performance on image resolution and refreshing, modifications have been made to the UltraVNC open source code. UltraVNC is distributed under the GNU General Public License Version 2. A copy of the source code can be obtained from one of Thermo Fisher Scientific's service centers.

Why not use an alternative tool for remote support?

Only RAPID supports the use of many auxiliary controls like the Transmission Electron Microscope (TEM) hand panels. The authentication of instrument user and RSE via RAPID ensures that only personnel authorized by Thermo Fisher Scientific can participate in a RAPID support session with the instrument user.

Why is the use of port 1194 and/or 443 required?

The Internet Assigned Numbers Authority (IANA) has registered ports 1194 and 443 for use by OpenVPN. Because RAPID relies on OpenVPN for the connection to the Thermo Scientific Secure Portal, it is a requirement that the IT network allows outbound connections (UDP or TCP) over ports 1194 and/or 443.

Do I need a support PC?

For security reasons, we do not recommend a direct internet connection on a MPC since it doesn't have an antivirus program or a firewall installed. An SPC is recommended for all instrument types to establish VPN connections through RAPID. The SPC has fewer restrictions than the MPC); it can run the latest antivirus program and firewall versions and can be used for Customer-specific IT protocols, such as automatic upgrades to operating systems or the installation of Windows Service Packs. An SPC can also provide additional data storage and offline reconstruction of data series.

You can purchase an SPC at minimal expense from Thermo Fisher Scientific or directly from your preferred local PC vendor. Refer to Table 2 for the SPC requirements.

Recommended SPC specifications	
Operating system	Windows 10 Pro
Processor	1 GHz or higher
RAM	4GB MB or more
Hard Drive	10 GB or larger
LAN Adapters	2
Recommended Security Settings	• Ensure Windows software patches are installed on a regular basis (automatic updates are preferred) • Use anti-malware/anti-virus software with automatic updates • Enable Windows defender or other host-firewall software

Table 2. Support PC requirements.

How will RAPID impact my current firewall?

Your network firewall needs to be opened to allow outbound UDP or TCP traffic on port 1194 and/or 443.

Can I use my existing corporate VPN instead of the Thermo Fisher Scientific VPN?

No, only the Thermo Fisher Scientific VPN is set up to run through the RAPID Secure Server and can offer the Thermo Fisher Scientific security features.

You always have the option to set up your own remote access to instruments for other purposes, but this will not be supported by Thermo Fisher Scientific. Thermo Fisher Scientific does not recommend (or in several cases allow) you to install your own software on the MPC.

How do I decide which RAPID Secure Server to use?

Connect to the RAPID Secure Server that is in the same geographic area as your instrument to minimize latency. However, any of the RAPID Secure Servers in other geographic areas can be used as well.

Learn more at **thermofisher.com/remote-service**

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