



Access via Teleport and VDI

Introduction to ECMWF computing services Training Week

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What is Teleport?

- **Teleport:** A modern SSH Jump Host solution.
 - Role-based access control with single sign-on.
 - Used to access key ECMWF services like Atos HPCF and ECGATE.
- **Features:**
 - Direct SSH to internal ECMWF servers (e.g., HPC).
 - Re-authenticate only once per 12 hours.
 - Compatible with OpenSSH tools: ssh, scp, and ssh-agent.
 - Supports X11 and Port forwarding.
- **Usage:**
 - Initial sign-on with "tsh" application.
 - Post sign-on: use standard ssh or scp for internal ECMWF connections.

What is Teleport?

- **Advantages :**

- Open source, very portable, and has minimal dependencies.

- **Installation:**

- Available for Linux, Mac and Windows
- As a static installation or a standalone client (if you don't have administrator privileges or are using Windows).
- **Must use a version of "tsh" equal to or lower than 13. We are working on removing this limitation in the very near future**

- **Authentication:**

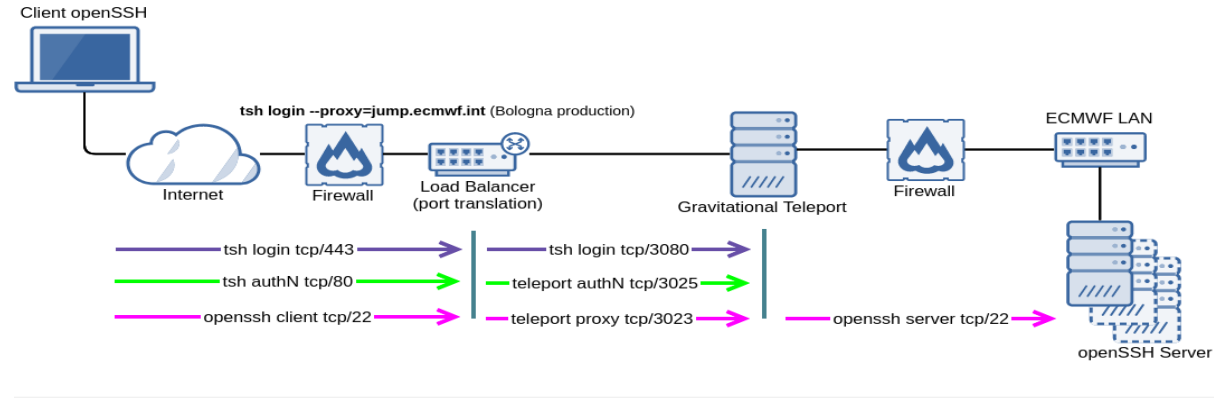
- Once every 12 hours, using ECMWF's Teleport gateway:
 - `tsh login --proxy=jump.ecmwf.int`
- Once you have logged in at least once, tsh will save your proxy settings and you only need to run 'tsh login'.

tsh login –proxy=jump.ecmwf.int

- The tsh login step utilizes ports 80 and 443 for service login and obtaining the client certificate.
- It first contacts jump.ecmwf.int on port 443.
- *Tip: View these steps using the tsh login --debug option.*
- Subsequently, it initializes a local HTTP client on a high port 64xxx, generating a localhost URL for user access (e.g., http://127.0.0.1:64068/...), awaiting a callback from jump.ecmwf.int.
- This localhost URL redirects users for OIDC authentication at https://accounts.ecmwf.int (port 443), integrating with Keycloak associated with ActiveDirectory user accounts and the TOTP (Time-based One Time Password) security token.

tsh login --proxy=jump.ecmwf.int

- After successful authentication, tsh gets a callback from jump.ecmwf.int, obtaining the client certificate and concluding the login process.
- With the 24-hour valid client certificate, users gain authorization to access hosts behind the Teleport proxy using either tsh ssh or OpenSSH processes.
- Standard port 22 is employed by your SSH client for server access.
- Teleport's web shell service operates on port 443 on the same host.



Accessing ECMWF's HPCF/ ECS

If authenticating is successful, you will see an output similar to this:

```
> Profile URL:      https://jump.ecmwf.int:443
  Logged in as:    user.address@somewhere.com
  Cluster:        jump.ecmwf.int
  Roles:
  Logins:         ecmwfusername
  Kubernetes:     disabled
  Valid until:    2022-12-13 20:54:18 +0000 GMT [valid for 4h37m0s]
  Extensions:    permit-X11-forwarding, permit-agent-forwarding, permit-port-forwarding, permit-pty
```

- **SSH config:**

- Strongly suggested to set up the options in it instead of passing them to the command line:

```
Host jump.ecmwf.int a?-* a??-* hpc-* hpc2020-* ecs-*
  User ecmwfusername
  IdentityFile ~/.tsh/keys/jump.ecmwf.int/user.address@somewhere.com
  CertificateFile ~/.tsh/keys/jump.ecmwf.int/user.address@somewhere.com-ssh/jump.ecmwf.int-cert.pub
  HostKeyAlgorithms +ssh-rsa*,rsa-sha2-512
  PubkeyAcceptedKeyTypes +ssh-rsa*
  ServerAliveInterval 60
  TCPKeepAlive yes

Host a?-* a??-* hpc-* hpc2020-* ecs-*
  ProxyJump jump.ecmwf.int
```

- Replace ecmwfusername by your registered ECMWF user and user.address@somewhere.com by your registered email address at ECMWF.

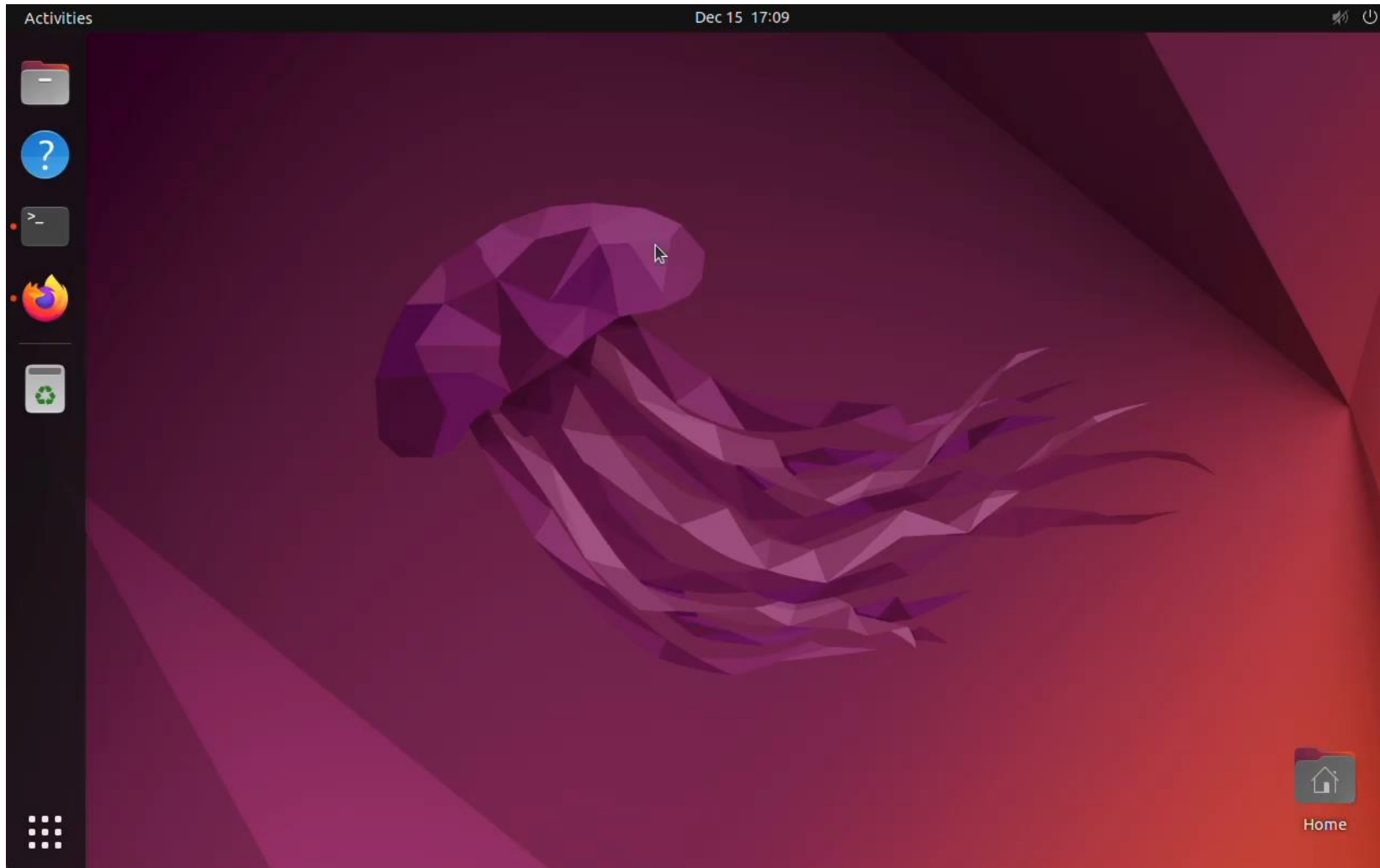
Accessing ECMWF's HPCF/ ECS

Once you have configured the appropriate settings, any SSH-based tools such as ssh, scp or rsync should work out of the box without any additional options.

- ssh hpc-login – for access to HPCF
- ssh ecs-login – for access to ECS
- If you didn't set up your config file you'll have to specify the jump host with the `-J` option

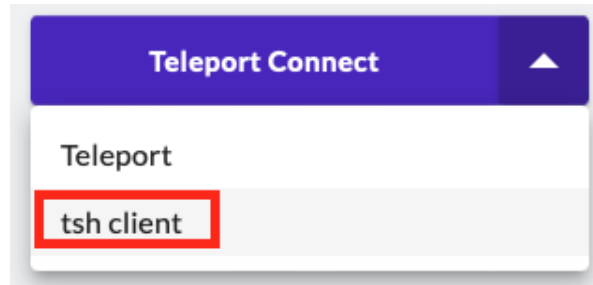
```
ssh -J user@jump.ecmwf.int user@hpc-login
```

Teleport demo – Installation and access from Linux



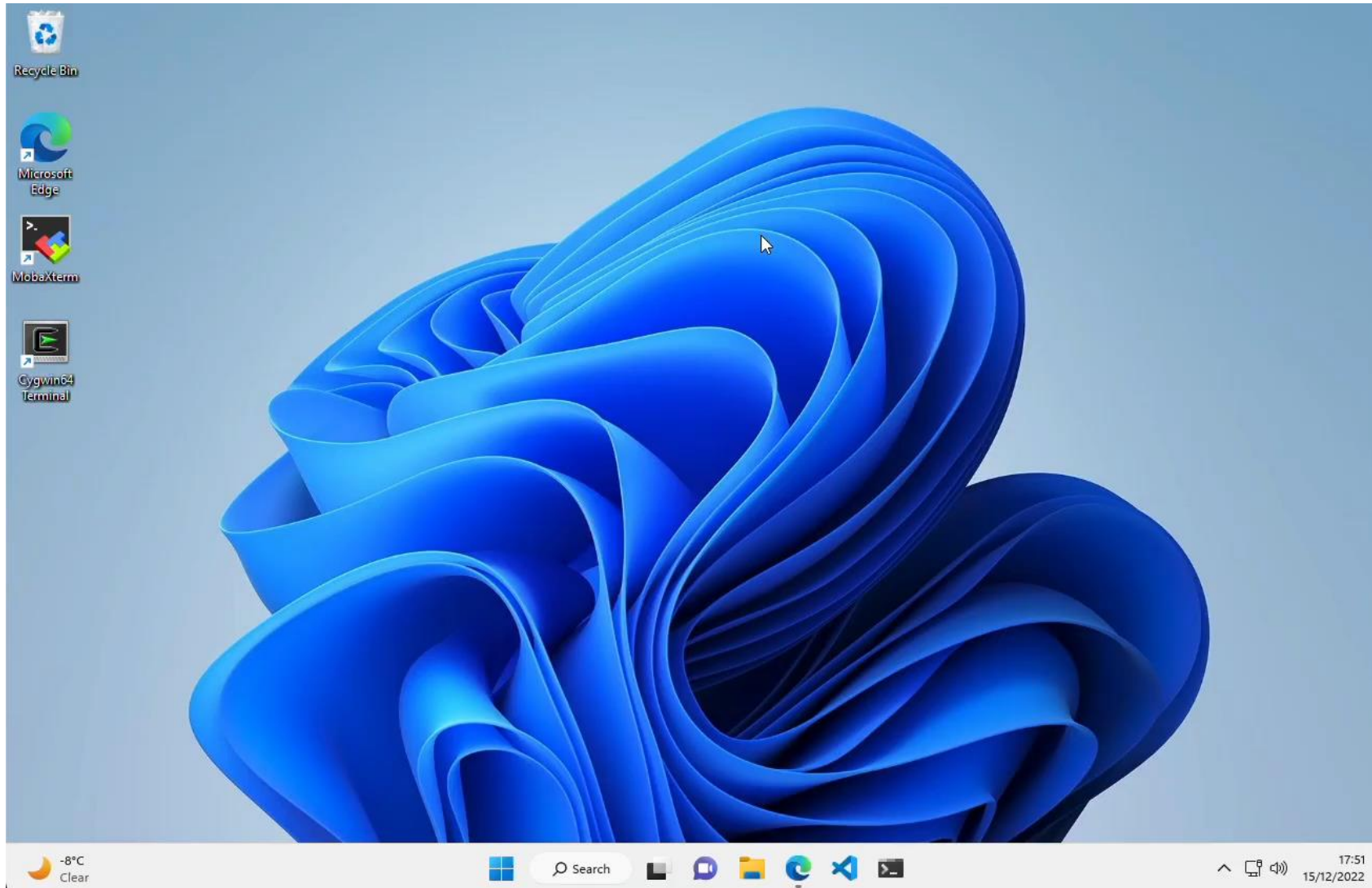
Teleport installation under Windows

Make sure you download the “tsh client” instead of “Teleport Connect” for Windows



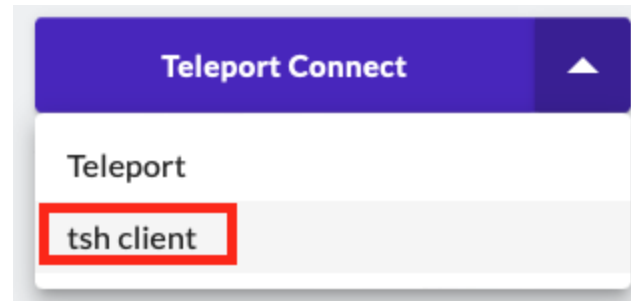
- Open the zip file in your file browser
- Drag the teleport folder inside the file and drop into the directory of your choice (the main directory for your user, for example)
- Open a Powershell and add to the PATH variable the location of the teleport directory. For example, if you dropped it on your main user directory (C:\Users\yourusername):
 - `setx PATH "%USERPROFILE%\teleport;%PATH%"`

Teleport demo – Installation and access from Windows



Teleport installation under Mac




- Either with brew or tsh client via Teleport website
- Teleport website recommended (brew doesn't have version 13.0)
 - With brew: brew install teleport
 - tsh client via Teleport website:



Teleport demo – Installation and access from Mac



Read more: User Documentation

Pages / User Documentation   

 Edit  Save for later  Watch  Share ...

Teleport SSH Access

Created by Oliver Gorwits, last modified by Daniel Varela Santoalla on Sep 27, 2023

Teleport is software which provides an SSH Jump Host (or Bastion host) service in a secure, modern way, with support for role-based access control and single sign-on. It is used to access a number of services at ECMWF, including our [Atos HPCF and ECGATE services](#). The service provides:

- Single SSH hop from client systems anywhere on the internet to servers inside ECMWF (HPC, etc)
- Re-authentication required only every 12 hours (usually once per working day)
- Integration with standard tools such as the OpenSSH ssh client, scp, and ssh-agent
- X11 and Port forwarding

The single sign-on step is performed using an application called "tsh". After that you use standard ssh or scp to connect to systems inside ECMWF.

Here are the instructions on how to set it up depending on your platform:

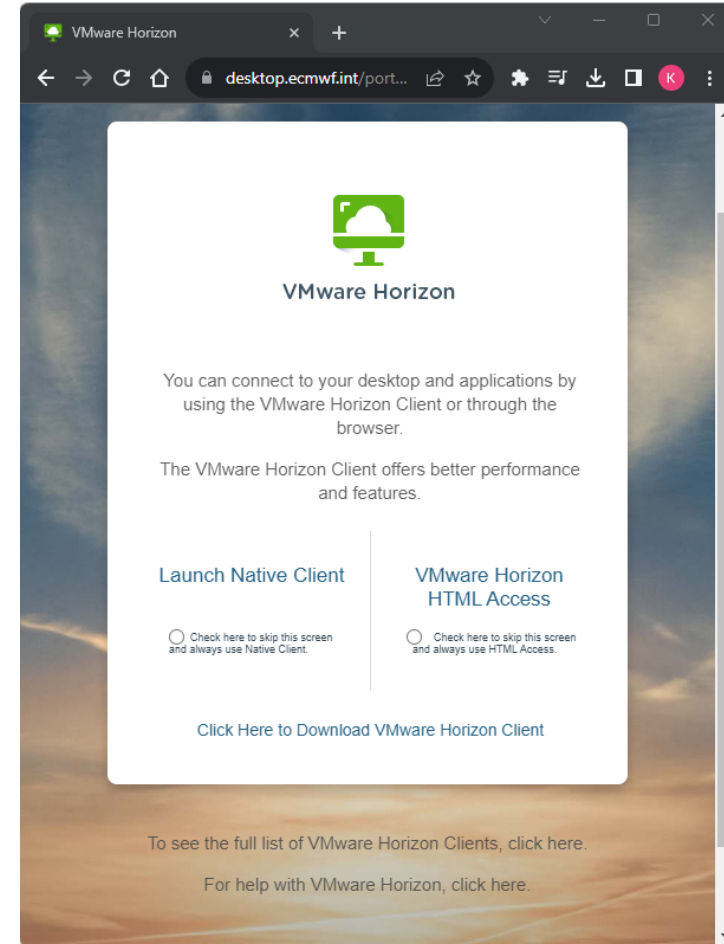
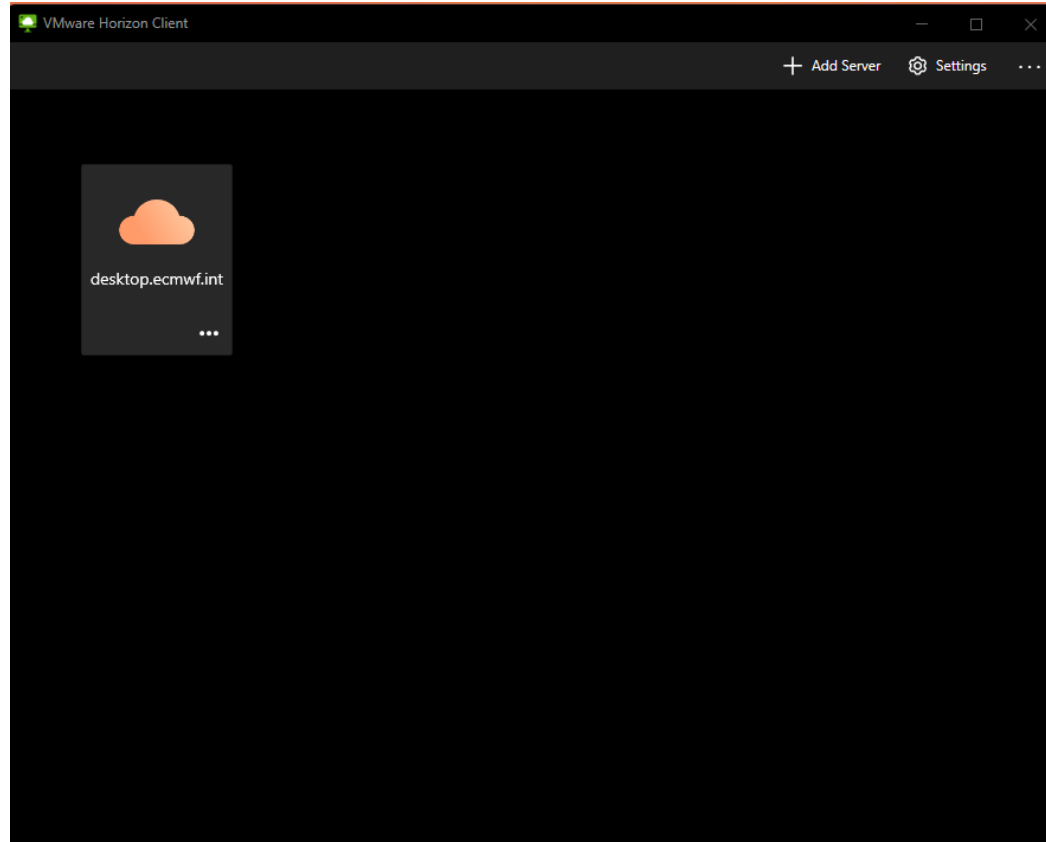
- [Teleport SSH Access - Mac configuration](#)
- [Teleport SSH Access - Linux configuration](#)
- [Teleport SSH Access - Windows Terminal and Powershell configuration](#)
- [Teleport SSH Access - Windows Subsystem for Linux \(WSL\)](#)
- [Teleport SSH Access - Windows MobaXterm configuration](#)
- [Teleport SSH Access - Windows Cygwin configuration](#)

System Administrators

If you are a system administrator setting up access to teleport from your organisation, have a look at the [Teleport SSH Access - Network requirements](#) for additional information on how this system works and its network requirements.

<https://confluence.ecmwf.int/display/UDOC/Teleport+SSH+Access>

VDI Service

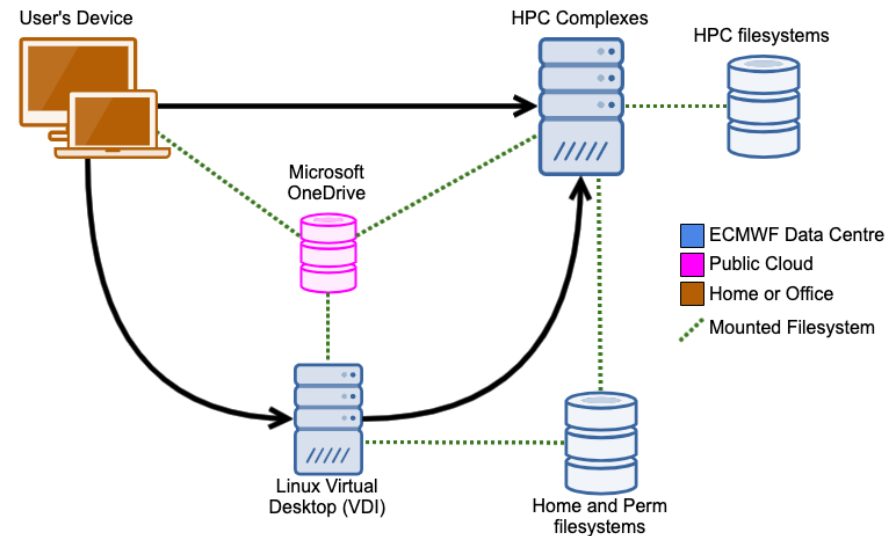


What is VDI?

- **VDI – Virtual Desktop Infrastructure**
- Provides users with a virtual desktop environment, allowing them to access applications, data, and resources without being tied to a physical workstation at the ECMWF location.
- **Remote Access:** Users can connect to their virtual desktops from anywhere with an internet connection.
- **Consistent Environment:** Regardless of the device or location from which users connect, they get a consistent desktop environment with the applications and settings they're accustomed to.

What is VDI?

- **Security:** VDI prioritizes security, ensuring that data remains within the data center and only screen updates, keyboard presses, and mouse movements are transmitted.
- **Collaboration:** Given that data is centrally located, collaboration becomes easier as users can access shared datasets (MARS, Data Stores, etc.) and applications without transferring large amounts of data.



Connecting to the VDI

- **Start the VMware Horizon Client**
 - Set desktop.ecmwf.int as the server.
- **Authentication**
 - Use your TOTP for verification.
- **Browser Prompt**
 - After authentication, the browser requests permission to run the "VMware Horizon Client". Click Allow.
- **Session Access**
 - The user gets redirected to an open VDI session or a login screen if there isn't an active VDI session.
 - If your userid isn't listed, select "Not Listed" and enter your ECMWF UNIX userid.

Connecting to the VDI

- **Unlocking the Session**

- Press any key on the "Lock" screen to access the "Unlock" screen.
- Enter your ECMWF UNIX password.
- Note: Be cautious with non-UK or US keyboards. Refer to FAQ for details.

- **Using the VDI**

- Access the Activities menu or search box to find apps.
- This VDI has limited software as per the Bologna model.
- Most apps are in the Atos HPC and run with ecinteractive.

VDI Demo – installation and connecting from Linux

The screenshot shows a Firefox browser window with the URL `https://confluence.ecmwf.int/display/UDOC/Linux+Virtual+Desktop+-+VDI:+Documentation`. The page title is "Linux Virtual Desktop - VDI: Documentation". The content includes:

- Page Tree:** A sidebar on the left with a "PAGE TREE" section containing links like "Support portal", "Teleport SSH Access", "Atos HPCF and ECGATE services", and "Linux Virtual Desktop - VDI: Do" (expanded to show sub-links like "Release Notes - Linux Virtual D", "How to connect - Linux Virtual", etc.).
- Main Content:**
 - Header: "Linux Virtual Desktop - VDI: Documentation" with metadata "Created by Daniel Varela Santoalla, last modified by Xavier Abellan on Jan 17, 2023".
 - Introduction: "The Linux Virtual Desktop is your dedicated Red Hat Enterprise Linux system running in ECMWF's data centre. It can be used as a graphical desktop to manage compute tasks on the HPC."
 - Overview: "Below you will find some basic information on the different parts of the system. Please click on the headers or links to get all the details for the given topic."
 - Section: "Release Notes - Linux Virtual Desktop VDI - [read more]"
 - Section: "2023/10/06 - 1.39 (under development)" with sub-point "vscode updated to v1.83.1".
 - Section: "How to connect - Linux Virtual Desktop VDI - [read more]" with text: "Using the VMware Horizon Client native application for Windows, Mac, Linux, Android or IOS. For this you will need to download the VMware Horizon Client from here. You can also access the documentation for the different clients here. After that, you will need to follow these steps."
 - Section: "Migrating from older ECMWF platforms - Linux Virtual Desktop VDI - [read more]" with text: "To understand the design of the new Linux Virtual Desktop system please check System overview - Linux Virtual Desktop VDI and Software stack - Linux Virtual Desktop VDI for a more detailed explanation of how to work with the Linux Virtual Desktop. Tasks that used to run in the desktop-class Linux machines or other Reading based platforms should typically be migrated to the Atos HPCF. In some cases, if not possible or practical, other options may be explored depending on the use cases, such as the using resources on the internal ECMWF managed cloud or the European Weather Cloud."

VDI - Available shells

- The Red Hat Linux VDI system utilizes Bash or Ksh as login shells.
- The choice depends on the configuration in your UNIX account.
- Csh is not supported in Linux VDI as per ECMWF policy.
- Software stack:

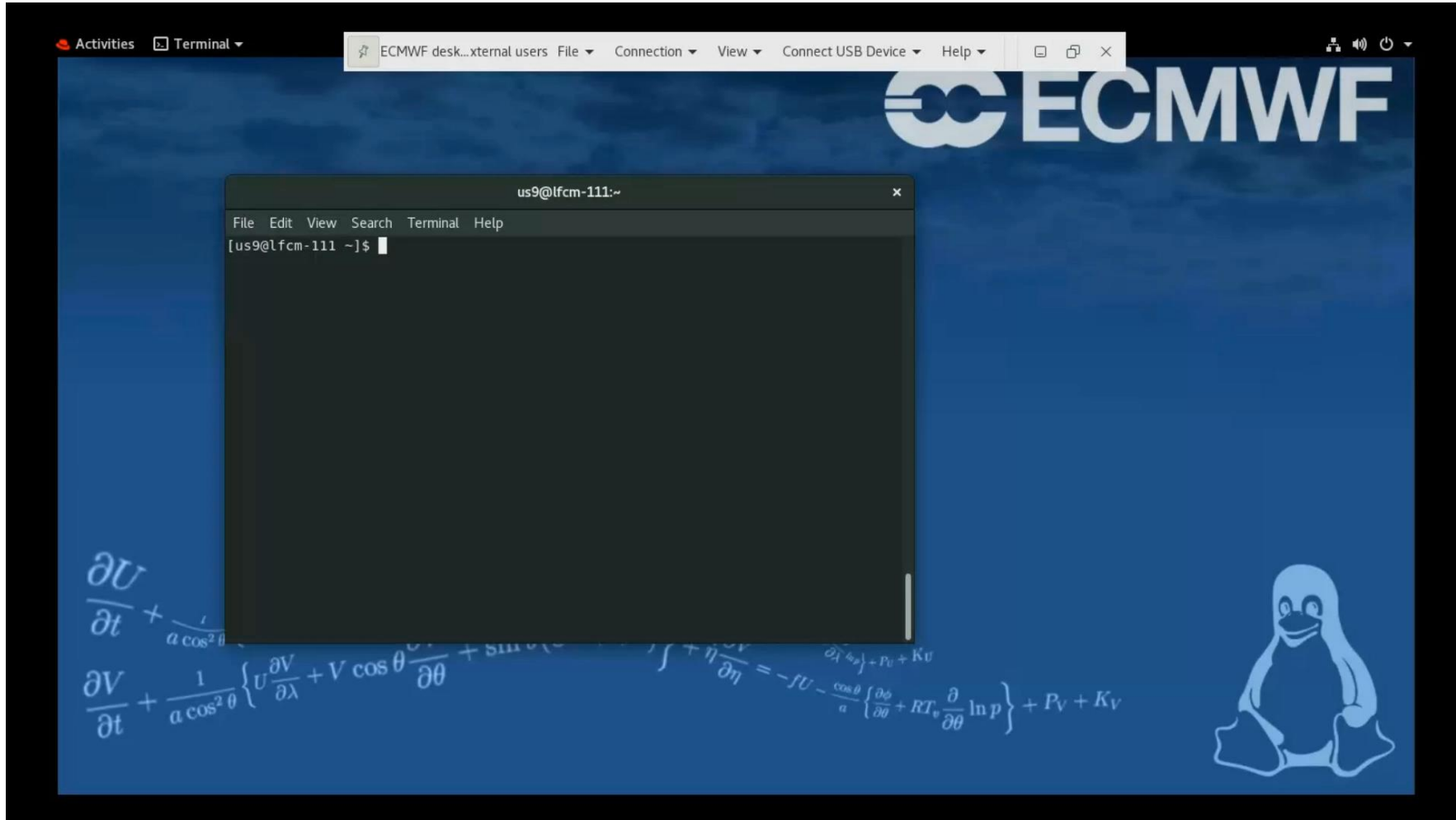
<https://confluence.ecmwf.int/display/UDOC/Software+stack+-+Linux+Virtual+Desktop+VDI>

VDI – Available filesystems

\$HOME and \$PERM are available both on the VDI and the HPC systems.

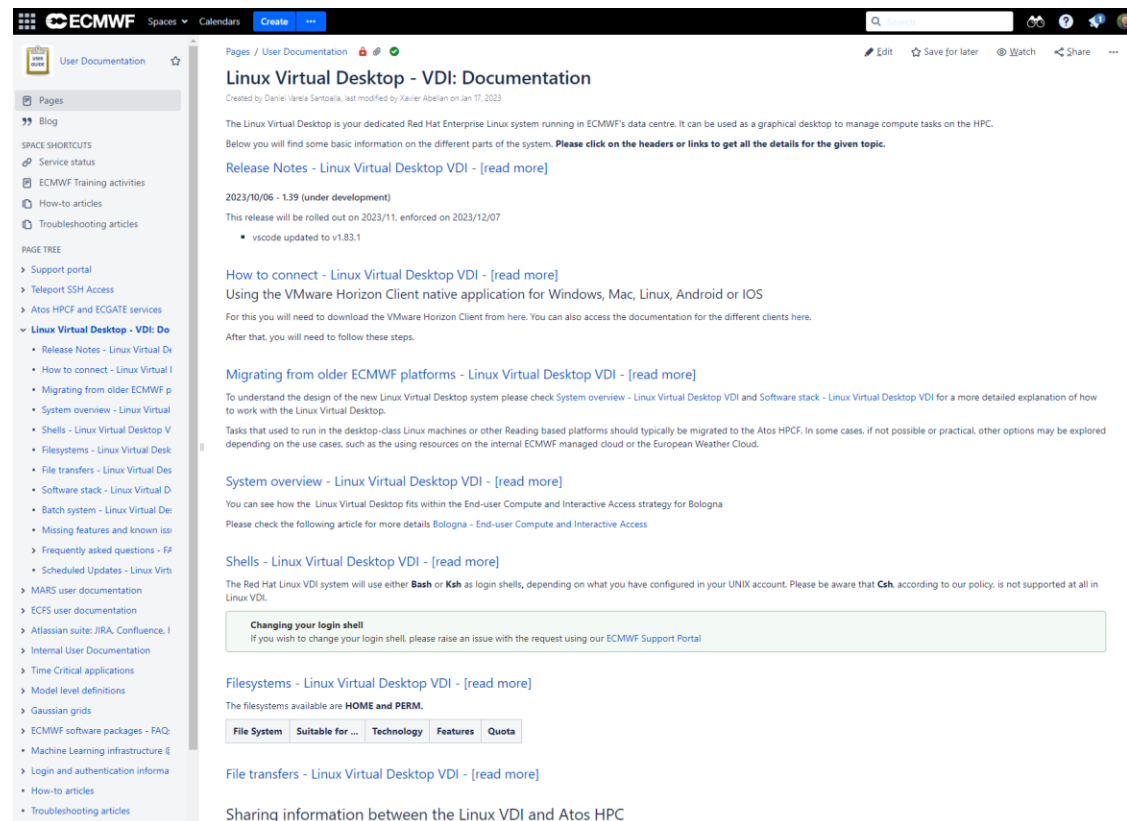
- **Sharing between Linux VDI and Atos HPC:**
 - Utilize the shared \$HOME or \$PERM filesystems.
- **Sharing between Linux VDI and End-User-Device (Windows/Mac):**
 - Use native file sharing with the VMware Horizon Client.
 - Default: local HOME on your device is shared.
 - Option to share additional folders.
 - Configure via VMware client settings > Drive Sharing.

VDI Demo – sharing files between HPCF and VDI



VDI – System documentation

- <https://confluence.ecmwf.int/display/UDOC/Linux+Virtual+Desktop+-+VDI%3A+Documentation>



The screenshot shows the ECMWF Confluence page titled "Linux Virtual Desktop - VDI: Documentation". The page is part of the "User Documentation" space. The main content area includes the following sections:

- Linux Virtual Desktop - VDI: Documentation**
 - Created by Daniele Vianea Santoballa, last modified by Xavier Abellan on Jan 17, 2023.
 - The Linux Virtual Desktop is your dedicated Red Hat Enterprise Linux system running in ECMWF's data centre. It can be used as a graphical desktop to manage compute tasks on the HPC.
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 - [Release Notes - Linux Virtual Desktop VDI - \[read more\]](#)
 - 2023/10/06 - 1.39 (under development)**
 - This release will be rolled out on 2023/11, enforced on 2023/12/07
 - vscode updated to v1.83.1
 - [How to connect - Linux Virtual Desktop VDI - \[read more\]](#)
 - Using the VMware Horizon Client native application for Windows, Mac, Linux, Android or iOS
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 - Tasks that used to run in the desktop-class Linux machines or other Reading based platforms should typically be migrated to the Atos HPCF. In some cases, if not possible or practical, other options may be explored depending on the use cases, such as the using resources on the internal ECMWF managed cloud or the European Weather Cloud.
 - [System overview - Linux Virtual Desktop VDI - \[read more\]](#)
 - You can see how the Linux Virtual Desktop fits within the End-user Compute and Interactive Access strategy for Bologna
 - Please check the following article for more details [Bologna - End-user Compute and Interactive Access](#)
 - [Shells - Linux Virtual Desktop VDI - \[read more\]](#)
 - The Red Hat Linux VDI system will use either **Bash** or **Ksh** as login shells, depending on what you have configured in your UNIX account. Please be aware that **Csh**, according to our policy, is not supported at all in Linux VDI.
 - Changing your login shell**
 - If you wish to change your login shell, please raise an issue with the request using our [ECMWF Support Portal](#)
 - [Filesystems - Linux Virtual Desktop VDI - \[read more\]](#)
 - The filesystems available are **HOME** and **PERM**.
 - File System Suitable for ... Technology Features Quota
 - [File transfers - Linux Virtual Desktop VDI - \[read more\]](#)
 - [Sharing information between the Linux VDI and Atos HPC](#)

Questions?