



Logging in to PDC

Using Kerberos and SSH for security

Communication in an insecure world

When you connect to PDC's systems from your local computer, you will be communicating over a non-secure network. PDC needs to protect the individual work and data of the researchers who use PDC's systems, as well as protecting PDC's own hardware resources from security threats and attacks.

Kerberos

PDC uses the Heimdal version of the open-source security software Kerberos to provide this kind of security. Kerberos is a computer network authentication protocol with mutual authentication - which means that both the researchers using PDC's resources and the PDC servers will verify each other's identities using Kerberos. Connecting in this way using Kerberos protects against eavesdropping and replay attacks, amongst other potential security breaches.

Kerberos tickets

Kerberos uses "tickets" to verify the identities of PDC's users and systems. When you log in to PDC, you will need a valid Kerberos ticket (which will contain encrypted information about you) to identify yourself. The PDC server you connect to will have a Kerberos ticket that identifies it too.

Your Kerberos tickets have to be created on your local computer and therefore you need to install the **Kerberos software** on your local computer. Note that each of your Kerberos tickets will only be valid for a limited amount of time (24 hours unless you specify a longer period). It is important to be aware of this because if you log in with a particular ticket and start a job running, that ticket needs to be valid for the length of time it will take till the job is finished if the job is using the AFS file system. The reason is that the ticket is needed while the job is running to allow your job to read or write data to the AFS file system. If your job does not use the AFS file system, then your ticket does not have to be valid until your job is finished. Also note that your Kerberos tickets need to be **forwardable** so they are valid on computers other than the one they were created on.

Using your Kerberos tickets you can access PDC's resources from any network, and you will only need to write your password once.

Logging in with SSH and Kerberos

To log in to the PDC systems over a network, you also need **SSH software supporting GSSAPI with KeyExchange** installed on your local computer. You then use this SSH software to forward your Kerberos tickets from your computer to PDC's so you can log in and access your files at PDC. Note that you will only type your password once and that will be on your local computer.



Preparing to log in to PDC

PDC supports a range of operating systems so that you can log in to our clusters using the operating system on your own computer.

Follow the instructions at <https://www.pdc.kth.se/support/documents/login/login.html> or the QR code to set things up so you can log in and use PDC's resources whenever you like.



Logging in to PDC from Linux and Unix-like systems

1. Open a terminal window on your computer.
2. Create a forwardable Kerberos ticket that is valid for the required amount of time and enter your password. If you are going to be submitting a job that will run and use AFS on one of PDC's systems after you log in, remember to create your ticket so that it is valid until after when your job should finish.

Examples

- To create a forwardable Kerberos ticket that will be valid in PDC's domain (which is known as NADA for historical reasons) for 24 hours, type the following "kinit" command after the prompt where "<username>" is your PDC username.

```
$ kinit --forwardable <username>@NADA.KTH.SE
```

- To create a forwardable Kerberos ticket that is valid in PDC's domain for 10 days, use this command (where "username" is your PDC username):

```
$ kinit -l 10d --forwardable <username>@NADA.KTH.SE
```

When you create a ticket, you will be prompted to enter your PDC password like this:

```
<username>@NADA.KTH.SE's Password:
```

Example

- If you want to check the details of your ticket after you have created it, you can list the information about the ticket like this:

```
$ klist -Tf
```

3. Log in with SSH and Kerberos.

Examples

- To log in to Beskow with X11 forwarding, enter this ssh command on your computer (where "<username>" is your PDC username):

```
$ ssh -Y <username>@beskow.pdc.kth.se
```

- To log in to Tegner with X11 forwarding, enter this command (where "<username>" is your PDC username):

```
$ ssh -Y <username>@tegnor.pdc.kth.se
```

Note that as long as your Kerberos ticket is still valid, you can just log in with SSH - you do not have to create a new ticket with "kinit".

Once you have logged in, you will be interacting with the PDC user interface which uses the shell BASH as the default command line interpreter and script host for accounts at PDC.

Examples of using the PDC BASH user interface

- If you want to see a list of the software that is available, you can use the module command.

```
$ module avail
```

- If you want to use a particular piece of software, such as GROMACS, use the module command to set your environment variables so you can then access the software.

```
$ module add gromacs
```

Access QR code or visit www.pdc.kth.se for more information.