Using the XtreemOS Testbed at Vrije Universiteit Amsterdam

The Testbed

Currently the testbed consists of 3 machines:

- node003.das2.cs.vu.nl (core node + resource)
- node002.das2.cs.vu.nl (resource + client node)
- node004.das2.cs.vu.nl (resource + client node)

The XtreemOS User Guide

Before starting to work with XtreemOS, it is recommended to read some sections from the user guide. The guide can be downloaded from here:

http://gforge.inria.fr/frs/?group_id=411

Take a look at chapter 7 ("Using XtreemOS"), especially at the sections 7.1.4 (that explains how the VO management works) 7.2 (that explains how to submit jobs) and 7.6 (that explains how to use XtreemFS).

You should also look at the sections 5.3.3 (which explains better how to get user certificates through VOLifeCycle) and 5.3.8 (which has some examples for using XtreemFS).

Creating a user account

In order to use XtreemOS you have to be registered in a virtual organization (VO). There is a web interface through which you can request to be included in a VO – here are the steps to do this:

1. Go to the VOLifeCycle portal and make yourself a new account:

http://node003.das2.cs.vu.nl:8080/volifecycle

2. Log in using this account and go to *Generate new keypair*. Press the *Generate* button and then press the *Download* button - this way you will get a private key (a *user.key* file).

3. Go to *Join a VO* and choose to join *VU-xtreemos* (this is the virtual organization that we are currently using for tests). Write an e-mail to cstratan@cs.vu.nl and I will add you to the VO and make accounts for you on the machines.

4. After you were added to the VO, log in again to the portal and go to *Get an XOS-Cert*. Download the new certificate and you will have a *user.crt* file. With this certificate you can prove that you are in the VU-Xtreemos virtual organization.

Setting up the certificates

In order to execute jobs in XtreemOS, you have to log into one of the client machines (node002, node004). Theoretically it should be enough to have an account set up on only one of these machines – but I'm not sure if this actually works. Please try it like this and let me know if it doesn't :-)

You will need to put your key and your certificate on that machine, in the *$HOME/.xos/truststore/private* and *$HOME/.xos/truststore/certs* directories (you have to create these directories first). Section 5.3.3 from the user guide explains how to do that.

Setting up XtreemFS automount

When you submit a job, you need to set up XtreemFS in order to be able to get the output files that the job generates; XtreemOS doesn't do any file stage-out and the output files will just remain on the machine where the job was executed if XtreemFS is not set up (and you probably will not be able to access them).

XtreemOS can mount a home volume for you (almost) automatically; then you can make your jobs write the output files in that home volume. In order to enable the auto-mounting, you have to write another e-mail to cstratan@cs.vu.nl, AFTER you have put your certificate in *$HOME/.xos/truststore/certs.* Unfortunately at this moment there are some manual steps that need to be done in order to enable the automount for a user and they can only be done from the root account.

Using ssh-xos

After XtreemFS automount was enabled for you, you will be able to access your home volume by using *ssh-xos*. Your home volume will be automatically mounted when you log in with *ssh-xos*, in the */home/<GUID>* directory, where GUID is your global user ID. You can see your global user ID by looking at your user certificate, with the following command:

```
view-xos-cert $HOME/.xos/truststore/certs/user.crt
```

(search for "GlobalUserID:"; or search for "Subject:" and remove the "CN=" prefix).

For example, for the user *owner1*, this ID is: *40c8a3d9-533a-409e-810d-d0ea3c06393c*. You can see a directory with this name in */home/*.

Your directory should already exist on the client node where you have the user account, after the root has configured the automount for you.

You need to create a configuration file for *ssh-xos*: *$HOME/.ssh/config-xos*. This file should look like this:

```
Host node00*
        XosProxyFile /home/<your_user_name>/.xos/truststore/certs/user.crt
        XosVoName    VU-xtreemos
```

You will be able to *ssh-xos* to all the nodes (node002, node003, node004).

Note #1: Currently there is a bug in *ssh-xos*, which reads *.ssh/config* instead of *.ssh/config-xos*. So you should write the lines above in *.ssh/config* as well. Be aware that the "regular" ssh will not work while *.ssh/config* contains these lines! (but fortunately you don't need the "regular" ssh in order to run jobs)

Note #2: Make sure that other users don't have write permissions on the *config* and *config-xos* files (otherwise *ssh-xos* will give an error message).

Now you are ready to use *ssh-xos* (prepare to be patient because it's quite slow):

```
ssh-xos <node_name>
```

You can connect to any node, including the one on which you are already logged in. You shouldn't be asked for a password. When you connect, the XtreemFS volume will be automatically mounted and you will be able to read/write files from it. When you disconnect (Ctrl-D), the volume will be unmounted.

Submitting jobs

For submitting jobs, use the *xconsole_dixi* command (there is an example of how to submit a job in chapter 4, step 13). A list with all the commands available in *xconsole_dixi* is in section 7.2.

In order to be able to retrieve the output of the jobs, you need to set the output files to be in your XtreemFS home volume. For example, a JSDL file of the user owner1 should contain:

```
<Output>/home/40c8a3d9-533a-409e-810d-d0ea3c06393c/out_cal.txt</Output>
<Error>/home/40c8a3d9-533a-409e-810d-d0ea3c06393c/err_cal.txt</Error>
```

This also applies to the input files, in case your job has input files.

You don't need to be logged in with *ssh-xos* when submitting jobs, but you have to log in at least afterwards, so that you can access the output files (or before, if you have input files and need to put them in the home volume).

For more information

You might want to join the XtreemOS users mailing list, if you haven't done that already: http://lists.gforge.inria.fr/cgi-bin/mailman/listinfo/xtreemos-users

If you have any problems, or if you want root access to the nodes, please contact me:

```
Corina Stratan
Room R-423
E-mail: cstratan@cs.vu.nl
Phone: (+31) 20 598 7874
```