

WASP Cloud Computing Module: Ericsson Research Data Center Practical Session

PRACTICAL PART ONE: MAKING A VIRTUAL MACHINE... AND LOGGING IN!

Goal: Getting you familiar with using the Ericsson Research Data Center (ERDC). Learn how to create a network of virtual machines, and practice by creating a Kubernetes cluster and deploying a container. **You can use this document after the course as a “cheat sheet” on how to create a cluster, if you use ER DC for your PhD research.**

Manually setting up a Cloud service

Step One – Log in to OpenStack

- Log into OpenStack at ERDC (in your browser): <https://xerces.ericsson.net>
- Enter the domain as “xerces”
- Use the username and password provided by this course
- Have a look at “Computer >> Overview” – this should show that you have NO virtual machines (Compute) and NO storage (Volume)

Step two – Generate an SSH key pair

- Select “Compute >> Key Pairs” and click “Create Key Pair”
- Give it any name you want
- Select the key type as “SSH Key”
- Select “Create Key Pair” in the bottom right
- You will now be prompted to download your private key (a .pem file)

If you’re using Windows, this gets a little tricky:

- Download PuTTY: <https://www.putty.org/> which links to <https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html>
- Run “PuttyGen” (type it at the Start Button if necessary)
- Click “Load” next to “Load an existing private key file”
- In the File Dialog, select “All Files (*.*)” in the bottom right
- Select the .pem file you just downloaded
- Next to “Save the generated key”, select “Save private key”. You don’t need a passphrase.
- This will create a file with the extension “.ppk” – this is the private key and you will use to connect to the ER DC nodes with PuTTY.

Step three – Create the networking infrastructure

- Back in the OpenStack interface, click “Network >> Network Topology”
- Click “Create Network” in the top right
- Give your network a name (call it whatever you like)
- Click “next” and you will be asked about the Subnet
- Call it whatever you want (like “subnet”)
- Enter “192.168.1.0/24” as the Network Address and click “Next”
- Leave subnet details unchanged, and click “Create” in the bottom right
- You should see a diagram of “internet” on the left with your network to the right

Step four – Add a router

- Click “Network >> Routers”
- Click “Create Router” in the top right
- Call your router whatever you like
- Under “External network”, select “internet”
- Click “Create router” in bottom right

Step five – Connect your router to the subnet

- Go back to “Network >> Network Topology”
- You’ll see your router linked to “internet”.
- Move the mouse over the router symbol, and select “+Add Interface”
- In the “Subnet” drop-down menu, select the Subnet you created in Step three
- Now click “Submit” in the bottom right
- Go back to “Network >> Network Topology”
- You should now see that your network is linked to the internet. Nice!

Step six – Configure security

- Click “Network >> Security Groups”
- At the moment, everything is disabled, so we need to open up some ports.
- Click “+Create Security Group” in the top right
- Call your group whatever you like (but maybe something descriptive)
- Click “+Add Rule”
- In the “Port” section, type “22”. Don’t touch anything else.
- Click “Add in the bottom right”.
- That will allow SSH access to your network.
- Click “+Add Rule” again, and this time do it for Port 8080

Step seven – Create a VM (finally!)

- Select “Compute >> Instances”
- Click “Launch Instance” in the top right
- Call your instance whatever you like - “maybe CloudTest1” or something
- Click “Next” in the bottom right

- *You are now in the “Source” tab*
- In “Select Boot Source” make sure that “image” is selected
- Set Volume Size to 20 GB – this will be your VM’s disk space
- Set “Delete Volume on Instance Delete” to “Yes”
- Look at the “Available” section at the bottom
- Click on the “up arrow” image, on the right of “Ubuntu 18.04”
- Click “Next” in the bottom right

- *You are now in the “Flavor” tab*
- Click on the “up arrow” image to the right of “c2m4” (i.e. 2 CPUs, 4GB RAM)
- Click “next” in the bottom right

- *You are now in the “Networks” tab*
- Click the “up arrow” image to the right of the network you created in Step three
- Click “next” in the bottom right

- *You are now in the “Network Ports” tab*
- We don’t need to change anything here
- Click “next” in the bottom right

- *You are now in the “Security Groups” tab*
- Scroll down under “Available”
- Click the “up arrow” image to the right of the security group you created in Step six
- Click “next” in the bottom right

- *You are now in the “Key Pair” tab*
- The key you created in Step two should already be allocated
- If it isn’t, then click the “up arrow” to the right of it in the “Available” section

- Phew! We can ignore the other tabs, so click “Launch instance” in the bottom right.

Now wait. You'll see your VM is being created.

After a while, you may want to click "Compute >> Instances" again if you don't see the image name.

We're not quite done yet, but we're close.

- Go to "Computer >> Instances" if you are not already there
 - In the drop down menu to the right of your VM instance (just to the right of "Create snapshot") select "Associate Floating IP"
 - Make sure your instance is selected in "Port to be associated"
 - Click the "+" button to the right of the "IP address" text box
 - Make sure that "internet" is selected in the "Pool" text box
 - Select "Allocate IP" in the bottom right
 - You will be back in the "Manage Floating IP Associations" box
 - Click "Associate" in the bottom right
 - Copy / remember the IP address you now see (should start 129.192.x.x or similar)
-

Now the moment of truth – let's SSH into our VM.

If you're in Linux, you can do something like from a terminal window:

```
ssh -i ./test-key -o UserKnownHostsFile=/dev/null ubuntu@external-address
```

where "./test-key" is the location of the .pem file you created in Step two and "external-address" is the IP address you just copied/remembered.

If you're in Windows, do this:

- Load "PuTTY"
- Enter the IP address you just copied/remembered in the "Host name" box
- In the "Connection" drop down on the left, click the "+" next to SSH
- Select "Auth"
- Click "Browse" in the "Private key for authentication" field
- Select the file you created earlier with PuttyGen
- Click "Open" in the bottom right
- Click "yes" if prompted by a dialogue box
- Enter your username as "ubuntu"

How simple and easy was that?! Only four pages of commands, and you have made your own VM, running in an actual data center!

Don't worry, we can make more VMs in seconds now (through several different methods). You'll find out more in the second part of this practical session.