Lab 4_SCP

CSCI 4306_60L – Computer Networks Lab
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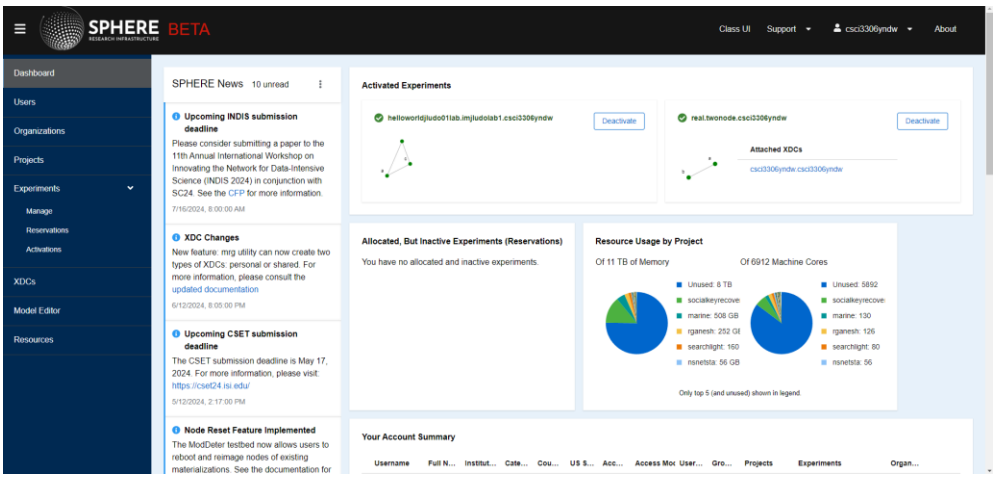
- **First, I used lab_1 experiment from deterlab to create and run this lab *twonode* in Juypter Lab notebook.**

```
csci3306yndw@csci3306yndw:~$ # su - csci3306yndw
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

csci3306yndw@csci3306yndw:~$ startexp twonode
Path /share/education lab twonode name twonode proj csci3306yndw
Logging csci3306yndw into Merge
Reading twonode model (revision b0a12a37b11d731c21b81b830edf40f6e4c21a03)
Model is already realized.
Checking materialization status...
Materialization status: Success
Checking XDC attachment...
XDC already attached to current materialization real.twonode.csci3306yndw
csci3306yndw@csci3306yndw:~$ runlab twonode
install

WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

install
csci3306yndw@csci3306yndw:~$
WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

Err:1 http://security.debian.org/debian-security bullseye-security InRelease
  Could not resolve 'security.debian.org'
Err:2 http://deb.debian.org/debian bullseye InRelease
  Could not resolve 'deb.debian.org'
Err:1 http://security.debian.org/debian-security bullseye-security InRelease
  Could not resolve 'security.debian.org'
Err:2 http://deb.debian.org/debian bullseye InRelease
  Could not resolve 'deb.debian.org'
Err:3 http://deb.debian.org/debian bullseye-updates InRelease
  Could not resolve 'deb.debian.org'
Reading package lists...Err:3 http://deb.debian.org/debian bullseye-updates InRelease
  Could not resolve 'deb.debian.org'
Reading package lists...
Building dependency tree...
Reading state information...
43 packages can be upgraded. Run 'apt list --upgradable' to see them.
W: Failed to fetch http://deb.debian.org/debian/dists/bullseye/InRelease  Could not resolve 'deb.debian.org'
W: Failed to fetch http://security.debian.org/debian-security/dists/bullseye-security/InRelease  Could not resolve 'security.debian.org'
W: Failed to fetch http://deb.debian.org/debian/dists/bullseye-updates/InRelease  Could not resolve 'deb.debian.org'
W: Some index files failed to download. They have been ignored, or old ones used instead.

WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

Reading package lists...
Building dependency tree...
Reading state information...
iperf is already the newest version (2.0.14a+dfsg1-1).
0 upgraded, 0 newly installed, 0 to remove and 43 not upgraded.

Building dependency tree...
Reading state information...
```



- **Next, I logged into node a to ping node b to confirm the creation of twonode lab was working (additionally checking to see if my XDC connected as well).**

```
csci3306yndw@csci3306yndw:~$ ssh a
Linux a.infra.real.twonode.csci3306yndw 5.10.0-29-amd64 #1 SMP Debian 5.10.216-1 (2024-05-03) x86_64

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the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

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permitted by applicable law.
Last login: Thu Sep 19 23:15:29 2024 from 192.168.254.2
csci3306yndw@a:~$ ping b
PING b.exp.real.twonode.csci3306yndw (10.1.1.3) 56(84) bytes of data.
64 bytes from 10.1.1.3 (10.1.1.3): icmp_seq=1 ttl=64 time=0.459 ms
64 bytes from 10.1.1.3 (10.1.1.3): icmp_seq=2 ttl=64 time=0.349 ms
64 bytes from 10.1.1.3 (10.1.1.3): icmp_seq=3 ttl=64 time=0.372 ms
64 bytes from 10.1.1.3 (10.1.1.3): icmp_seq=4 ttl=64 time=0.344 ms
64 bytes from 10.1.1.3 (10.1.1.3): icmp_seq=5 ttl=64 time=0.356 ms
^C64 bytes from 10.1.1.3: icmp_seq=6 ttl=64 time=0.304 ms

--- b.exp.real.twonode.csci3306yndw ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 10010ms
rtt min/avg/max/mdev = 0.304/0.364/0.459/0.047 ms
csci3306yndw@a:~$
```

- **Then, I checked the bandwidth between node a and node b.**

```
csci3306yndw@a:~$ iperf -s
------------------------------------------------------------
Server listening on TCP port 5001
TCP window size:  128 KByte (default)
------------------------------------------------------------
[  4] local 10.1.1.2 port 5001 connected with 10.1.1.3 port 43126
[ ID] Interval       Transfer     Bandwidth
[  4] 0.0000-10.0005 sec  26.3 GBytes  22.6 Gbits/sec
```

```
csci3306yndw@b:~$ iperf -c a
------------------------------------------------------------
Client connecting to a, TCP port 5001
TCP window size:  170 KByte (default)
------------------------------------------------------------
[  3] local 10.1.1.3 port 43126 connected with 10.1.1.2 port 5001
[ ID] Interval       Transfer     Bandwidth
[  3] 0.0000-10.0001 sec  26.3 GBytes  22.6 Gbits/sec
```

- **Redid previous step of node b bandwidth check but saved it to iperf.out.**

```
csci3306yndw@b:~$ iperf -c a > iperf.out
csci3306yndw@b:~$ ls
iperf.out
```

- **Following that I installed the merge command line interface onto my physical machine and ran this command.**

```
PS C:\Users\Jludo\Downloads\mrg_1.1.10_windows_386> .\mrg config set server grpc.sphere-testbed.net
PS C:\Users\Jludo\Downloads\mrg_1.1.10_windows_386>
```

- **I logged into the server.**

```
PS C:\Users\Jludo\Downloads\mrg_1.1.10_windows_386> .\mrg login csci3306yndw
Enter password for csci3306yndw:
PS C:\Users\Jludo\Downloads\mrg_1.1.10_windows_386>
```

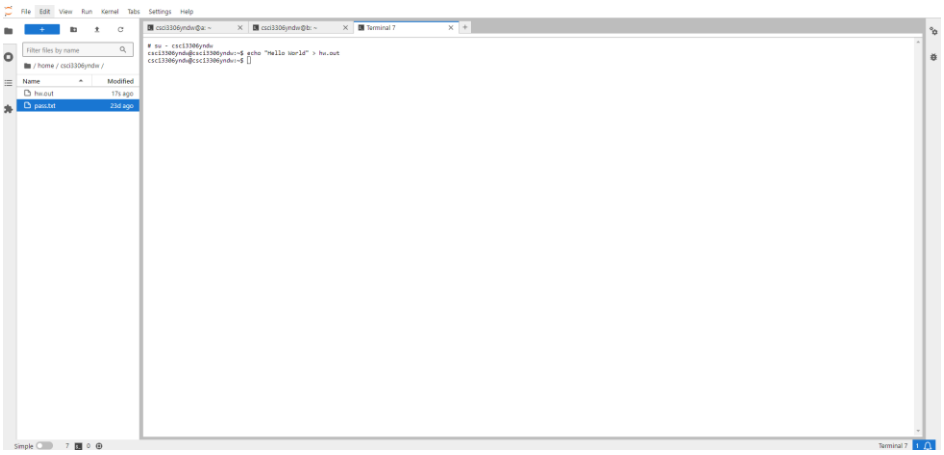
- **After logging into the server, I copied the file from node b onto my machine.**

```
PS C:\Users\Jludo\Downloads\mrg_1.1.10_windows_386> .\mrg xdc scp download -x csci3306yndw.csci3306yndw b:iperf.out .
level=info msg="downloading b:iperf.out to . via csci3306yndw.csci3306yndw ..."
PS C:\Users\Jludo\Downloads\mrg_1.1.10_windows_386> ls


    Directory: C:\Users\Jludo\Downloads\mrg_1.1.10_windows_386


Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
-a----         9/20/2024  12:57 PM            362 iperf.out
-a----         7/25/2023  12:18 PM       24884224 mrg.exe
-a----         7/25/2023  12:00 PM           1354 README.md
```

❖ **I went back to Juypter Labs and opened a new terminal to copy file from my physical machine to my XDC.**



```
PS C:\Users\Jludo\Downloads\mrg_1.1.10_windows_386> .\mrg xdc scp download csci3306yndw.csci3306yndw:hw.out .
level=info msg="downloading csci3306yndw.csci3306yndw:hw.out to . ..."
PS C:\Users\Jludo\Downloads\mrg_1.1.10_windows_386> ls


    Directory: C:\Users\Jludo\Downloads\mrg_1.1.10_windows_386


Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
-a----         9/20/2024   1:02 PM             12 hw.out
-a----         9/20/2024  12:57 PM            362 iperf.out
-a----         7/25/2023  12:18 PM       24884224 mrg.exe
-a----         7/25/2023  12:00 PM           1354 README.md
```

❖ **I copied file from my machine to node b that I created in terminal.**

```
PS C:\Users\Jludo\Downloads\mrg_1.1.10_windows_386> echo "Local file" > lf.out
PS C:\Users\Jludo\Downloads\mrg_1.1.10_windows_386> .\mrg xdc scp upload -x csci3306yndw.csci3306yndw lf.out b:.
level=info msg="uploading lf.out to b:. via csci3306yndw.csci3306yndw ..."
PS C:\Users\Jludo\Downloads\mrg_1.1.10_windows_386>
```

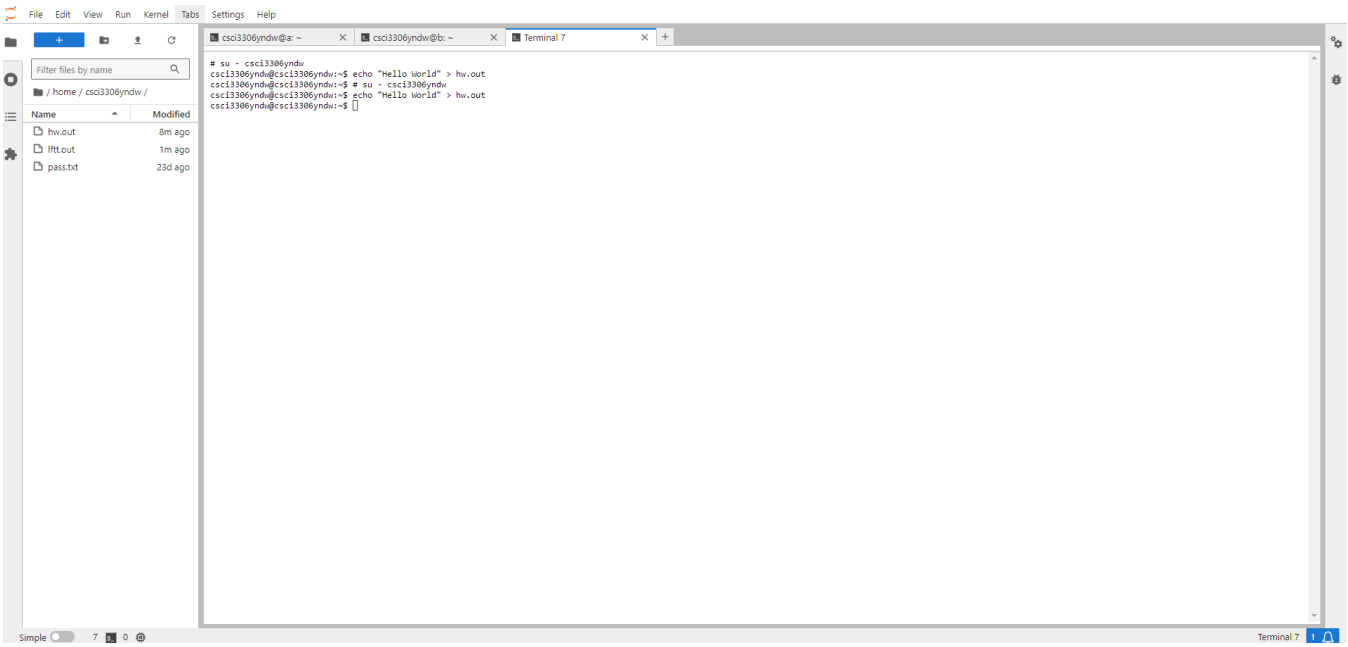
```
csci3306yndw@b:~$ ls
iperf.out  lf.out
```

❖ **Finally, I copied file from my physical machine to my XDC.**

```
PS C:\Users\Jludo\Downloads\mrg_1.1.10_windows_386> echo "Local file take two" > lftt.out
PS C:\Users\Jludo\Downloads\mrg_1.1.10_windows_386> .\mrg xdc scp upload  lftt.out csci3306yndw.csci3306yndw:.
level=info msg="uploading lftt.out to csci3306yndw.csci3306yndw:. ..."
PS C:\Users\Jludo\Downloads\mrg_1.1.10_windows_386> ls


    Directory: C:\Users\Jludo\Downloads\mrg_1.1.10_windows_386


Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
-a----         9/20/2024   1:02 PM             12 hw.out
-a----         9/20/2024  12:57 PM            362 iperf.out
-a----         9/20/2024   1:04 PM             26 lf.out
-a----         9/20/2024   1:06 PM             44 lftt.out
-a----         7/25/2023  12:18 PM       24884224 mrg.exe
-a----         7/25/2023  12:00 PM           1354 README.md
```



❖ *What I learned from this lab:*

From this lab, I learned how to utilize an existing experiment to create a new experiment through command-line terminal in SPHERE. Additionally, Nodes can hold files using the Transfer Control Protocol (TCP) and User Datagram Protocol (UDP) as they are connection points that allow data to be sent, received, or forwarded within a network. This allows for separation of data from one physical machine to another machine as it can stay in the network, specifically, in a single Node.