# Running JupyterLab on Nibi

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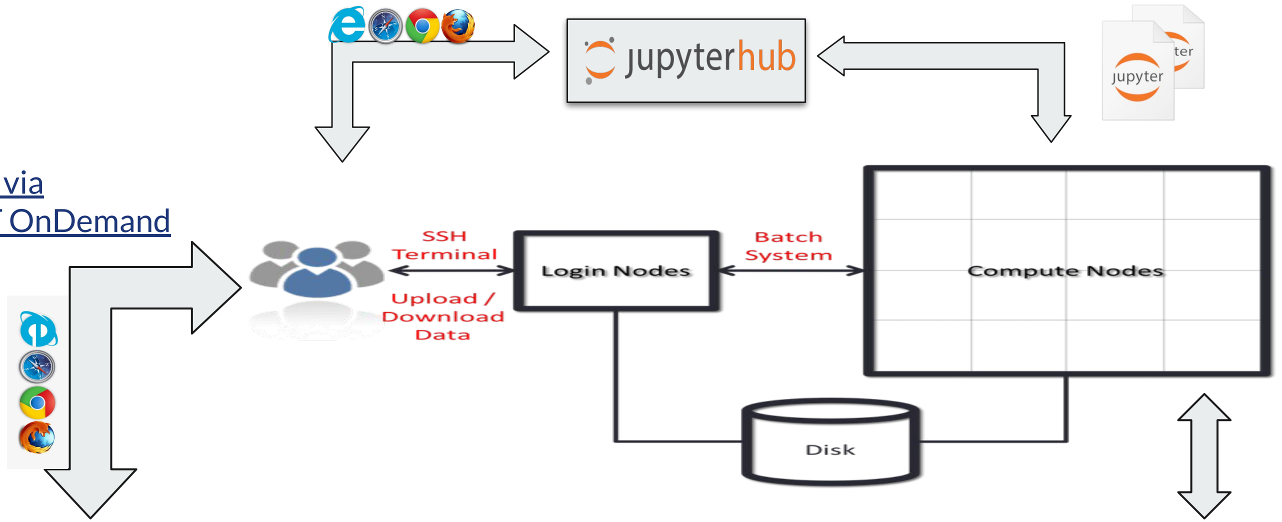
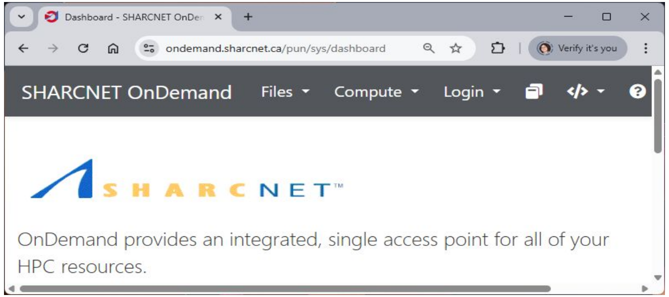
SHARCNET | Compute Ontario | Digital Research Alliance of Canada

help@sharcnet.ca

# Working on a cluster (e.g. nibi, rorqual, narval, fir and trillium)

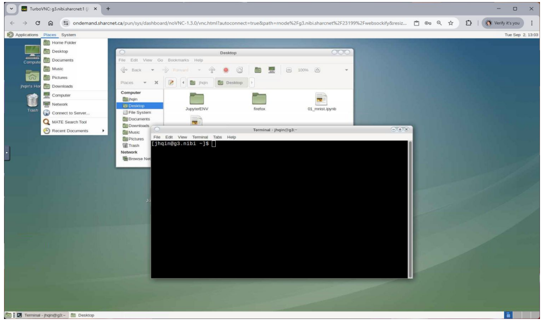
[Access Nibi via SHARCNET OnDemand]




Dashboard - SHARCNET OnDem
ondemand.sharcnet.ca/pun/sys/dashboard
Verify it's you
SHARCNET OnDemand
Files
Compute
Login
SHARCNET™

OnDemand provides an integrated, single access point for all of your HPC resources.

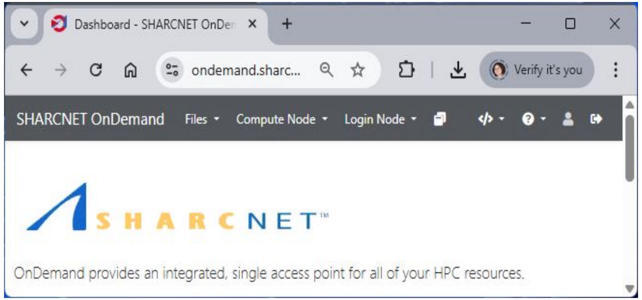
ondemand.sharcnet.ca



```
[jhqin@g3.nibi ~]$
```

# Access Nibi

SHARCNET OnDemand



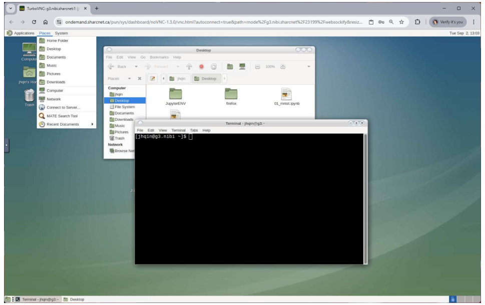
OnDemand provides an integrated, single access point for all of your HPC resources.

ondemand.sharcnet.ca

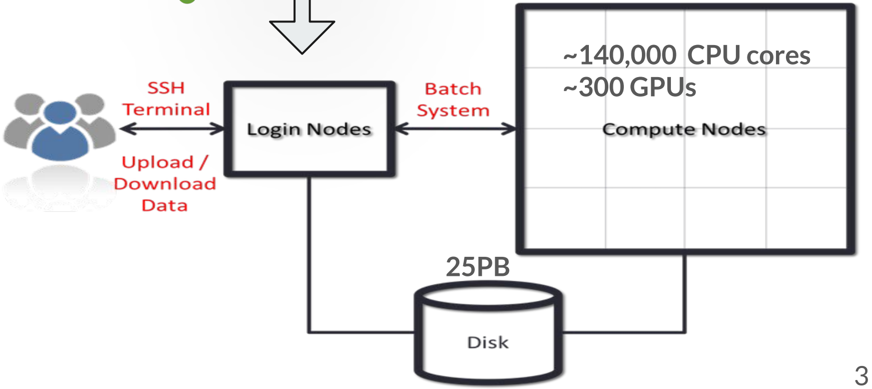
File Management

Login Terminal

Compute Desktop



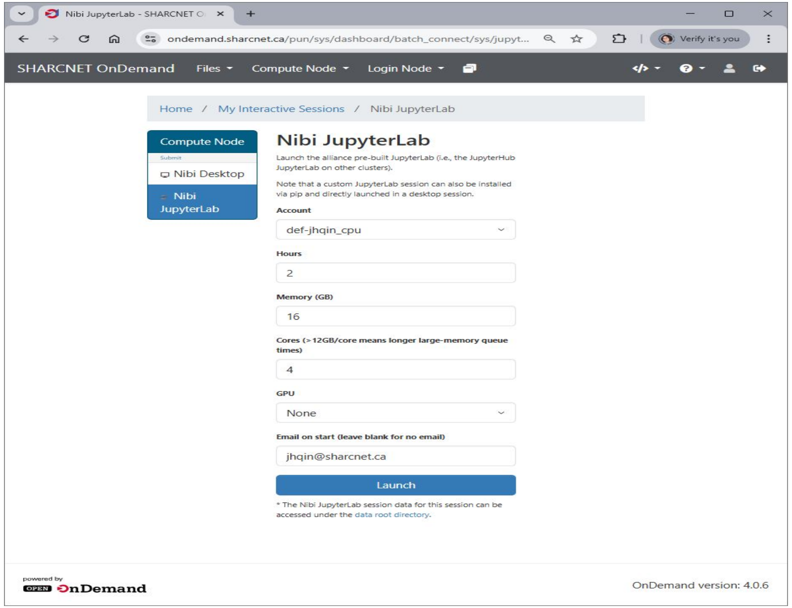
```
[jhqin@g3.nibi ~]$
```



~140,000 CPU cores
~300 GPUs

# Option 1: Request a Nibi JupyterLab instance

## — same pre-configured features as those from JupyterHub


Nibi JupyterLab - SHARCNET O
ondemand.sharcnet.ca/pun/sys/dashboard/batch_connect/sys/jupyt...
Verify it's you
SHARCNET OnDemand
Files
Compute Node
Login Node
Home / My Interactive Sessions / Nibi JupyterLab
Compute Node
Submit
Nibi Desktop
Nibi JupyterLab
Launch
powered by OPEN OnDemand

Nibi JupyterLab

Launch the alliance pre-built JupyterLab (i.e., the JupyterHub JupyterLab on other clusters).

Note that a custom JupyterLab session can also be installed via pip and directly launched in a desktop session.

**Account**: def-jhqin_cpu

**Hours**: 2

**Memory (GB)**: 16

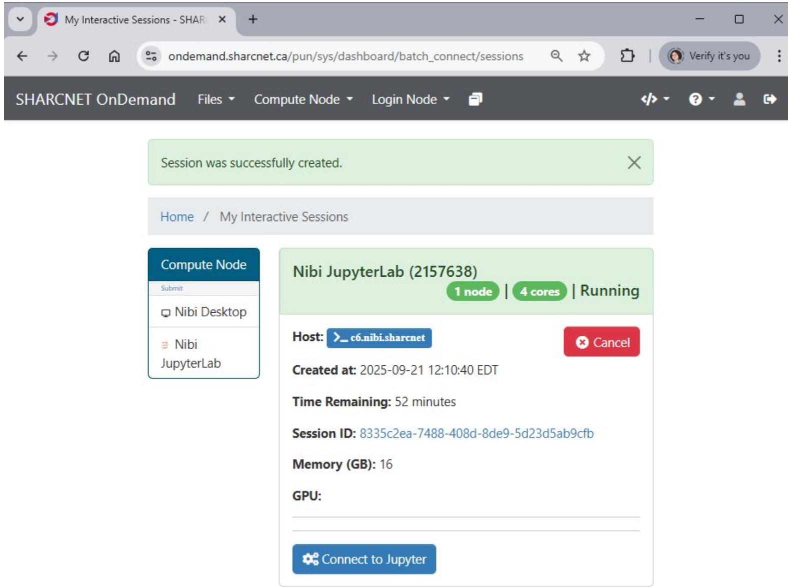
**Cores (>12GB/core means longer large-memory queue times)**: 4

**GPU**: None

**Email on start (leave blank for no email)**: jhqin@sharcnet.ca

* The Nibi JupyterLab session data for this session can be accessed under the data root directory.

OnDemand version: 4.0.6



Session was successfully created.

Nibi JupyterLab (2157638)

1 node | 4 cores | Running

**Host:** c6.nibi.sharcnet

**Created at:** 2025-09-21 12:10:40 EDT

**Time Remaining:** 52 minutes

**Session ID:** 8335c2ea-7488-408d-8de9-5d23d5ab9cfb

**Memory (GB):** 16

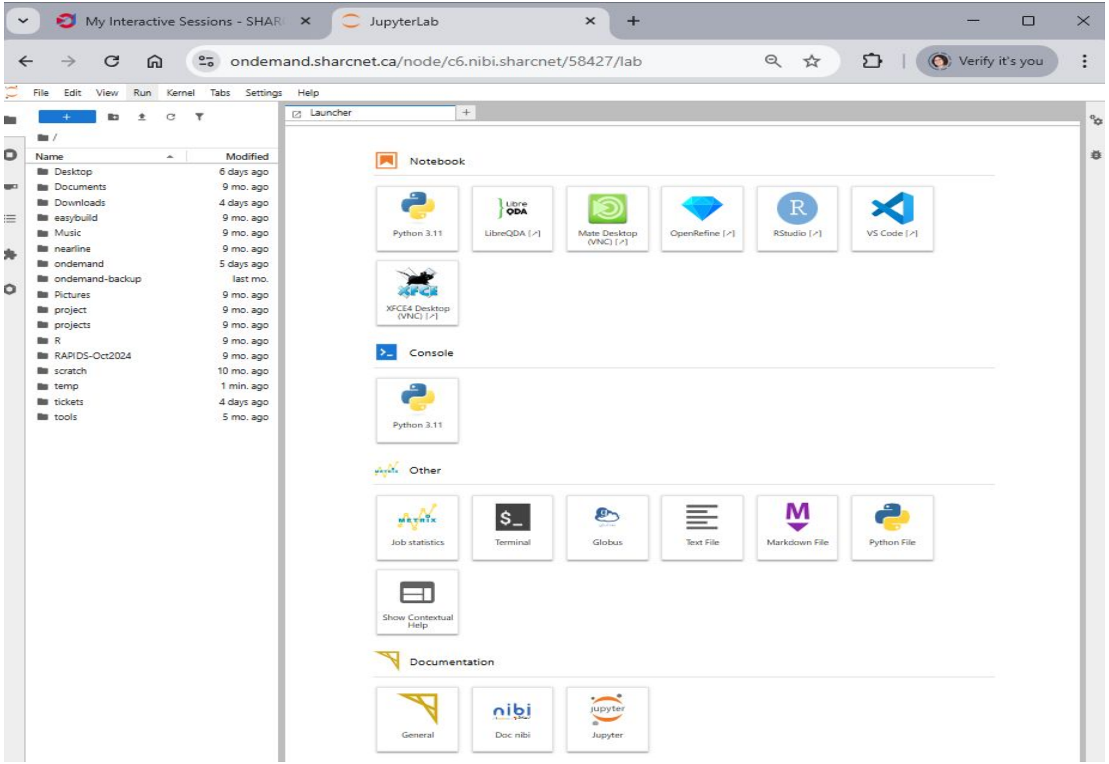
**GPU:**

# Option 1: Request a Nibi JupyterLab instance

## — same pre-configured features as those from JupyterHub

Note:

The pre-configured env is not persistent.

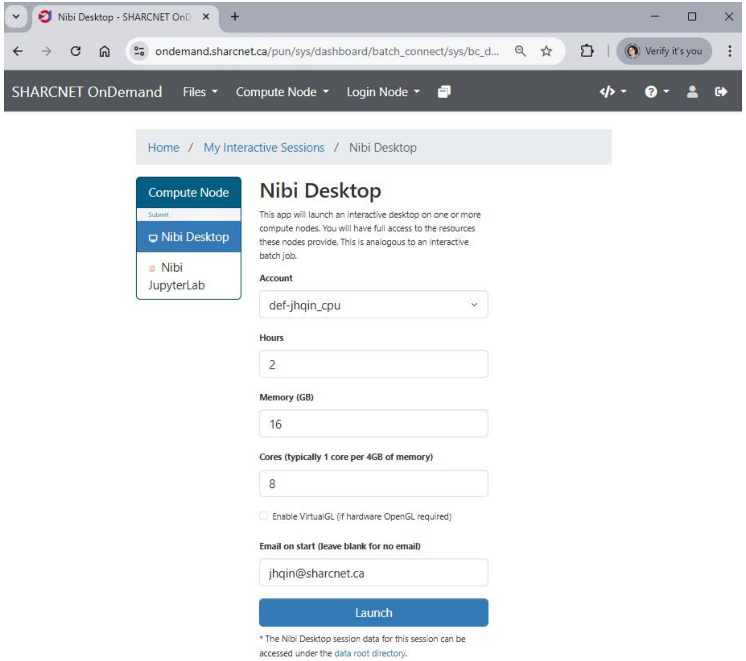


ondemand.sharcnet.ca/node/c6.nibi.sharcnet/58427/lab

| Name | Modified |
|---|---|
| Desktop | 6 days ago |
| Documents | 9 mo. ago |
| Downloads | 4 days ago |
| easybuild | 9 mo. ago |
| Music | 9 mo. ago |
| nearline | 9 mo. ago |
| ondemand | 5 days ago |
| ondemand-backup | last mo. |
| Pictures | 9 mo. ago |
| project | 9 mo. ago |
| projects | 9 mo. ago |
| R | 9 mo. ago |
| RAPIDS-Oct2024 | 9 mo. ago |
| scratch | 10 mo. ago |
| temp | 1 min. ago |
| tickets | 4 days ago |
| tools | 5 mo. ago |

# Option 2: Request a Nibi Desktop instance

## —to work with self-customized environment


Nibi Desktop - SHARCNET OnD
ondemand.sharcnet.ca/pun/sys/dashboard/batch_connect/sys/bc_d...
Verify it's you
SHARCNET OnDemand
Files
Compute Node
Login Node
Home / My Interactive Sessions / Nibi Desktop
Compute Node
Submit
Nibi Desktop
Nibi JupyterLab

### Nibi Desktop

This app will launch an interactive desktop on one or more compute nodes. You will have full access to the resources these nodes provide. This is analogous to an interactive batch job.

**Account**
def-jhqin_cpu

**Hours**
2

**Memory (GB)**
16

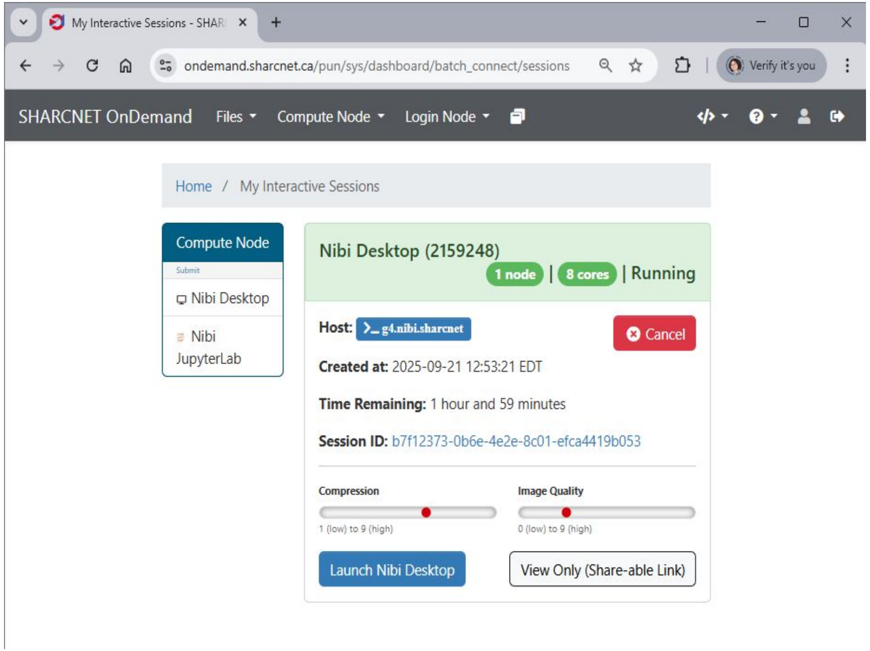
**Cores (typically 1 core per 4GB of memory)**
8

□ Enable VirtualGL (if hardware OpenGL required)

**Email on start (leave blank for no email)**
jhqin@sharcnet.ca

Launch

* The Nibi Desktop session data for this session can be accessed under the data root directory.


My Interactive Sessions - SHAR
ondemand.sharcnet.ca/pun/sys/dashboard/batch_connect/sessions
Verify it's you
SHARCNET OnDemand
Files
Compute Node
Login Node
Home / My Interactive Sessions
Compute Node
Submit
Nibi Desktop
Nibi JupyterLab

Nibi Desktop (2159248)
1 node | 8 cores | Running

**Host:** g4.nibi.sharcnet
Cancel

**Created at:** 2025-09-21 12:53:21 EDT

**Time Remaining:** 1 hour and 59 minutes

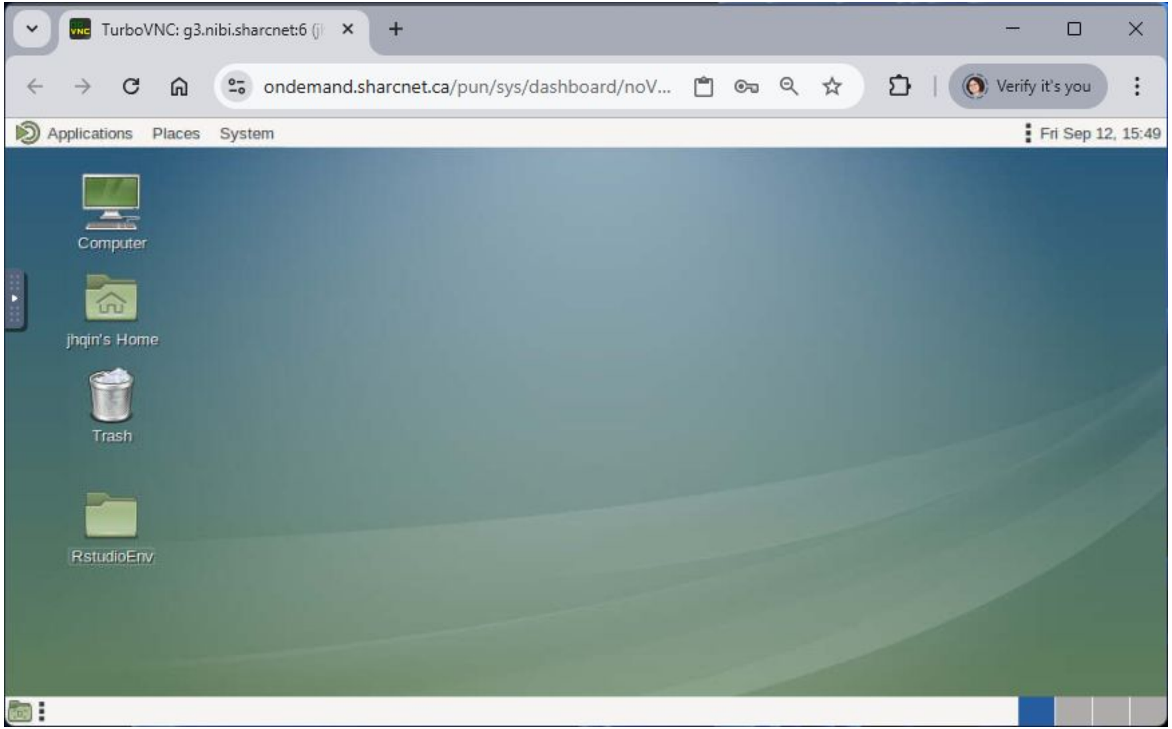
**Session ID:** b7f12373-0b6e-4e2e-8c01-efca4419b053

Compression
1 (low) to 9 (high)

Image Quality
0 (low) to 9 (high)

Launch Nibi Desktop
View Only (Share-able Link)

# Request a Nibi Desktop instance



# Launching JupyterLab on Nibi Desktop

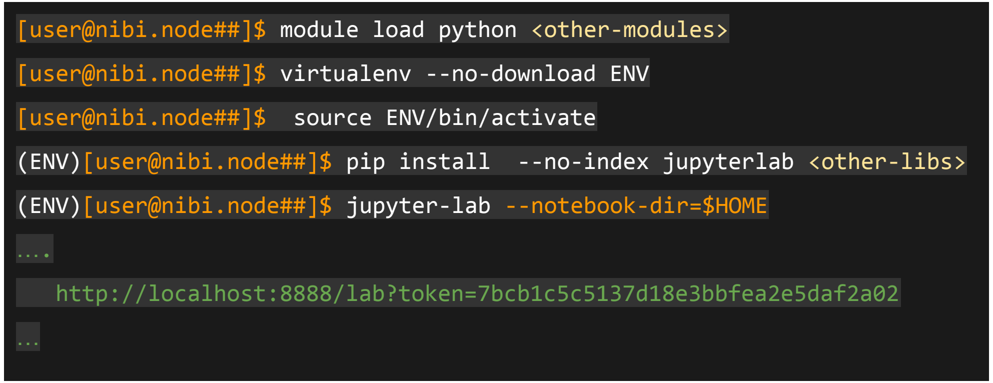
- Prepare a Python virtual environment

  - Install required python libs

  - Install jupyterlab

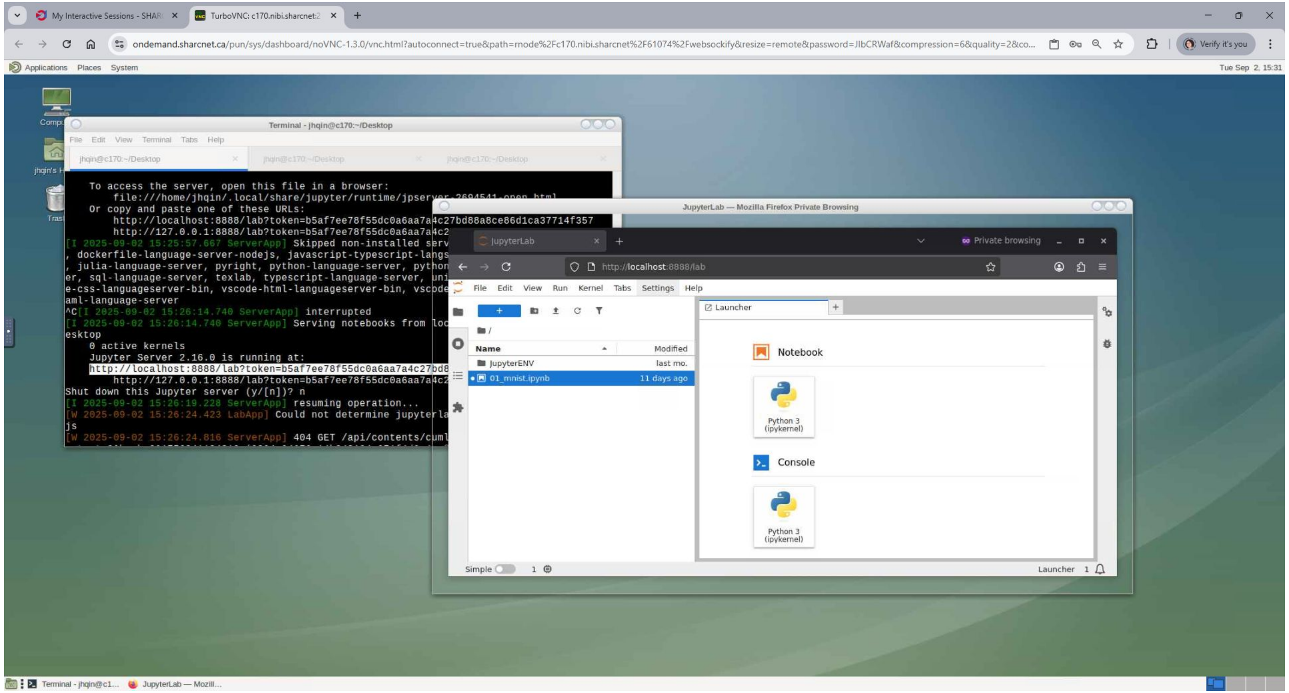
- Launch JupyterLab

  - set $HOME as the `root` dir



```
[user@nibi.node##]$ module load python <other-modules>
[user@nibi.node##]$ virtualenv --no-download ENV
[user@nibi.node##]$  source ENV/bin/activate
(ENV)[user@nibi.node##]$ pip install  --no-index jupyterlab <other-libs>
(ENV)[user@nibi.node##]$ jupyter-lab --notebook-dir=$HOME
....
   http://localhost:8888/lab?token=7bcb1c5c5137d18e3bbfea2e5daf2a02
...
```

# Running JupyterLab on Nibi Desktop



ondemand.sharcnet.ca/pun/sys/dashboard/noVNC-1.3.0/vnc.html?autoconnect=true&path=rnode%2Fc170.nibi.sharcnet%2F61074%2Fwebsockify&resize=remote&password=JlbCRWaf&compression=6&quality=2&co...

```
    To access the server, open this file in a browser:
        file:///home/jhqin/.local/share/jupyter/runtime/jpserver-2694541-open.html
    Or copy and paste one of these URLs:
        http://localhost:8888/lab?token=b5af7ee78f55dc0a6aa7a4c27bd88a8ce86d1ca37714f357
        http://127.0.0.1:8888/lab?token=b5af7ee78f55dc0a6aa7a4c2
[I 2025-09-02 15:25:57.667 ServerApp] Skipped non-installed serv
, dockerfile-language-server-nodejs, javascript-typescript-langs
, julia-language-server, pyright, python-language-server, python
er, sql-language-server, texlab, typescript-language-server, uni
e-css-languageserver-bin, vscode-html-languageserver-bin, vscode
aml-language-server
^C[I 2025-09-02 15:26:14.740 ServerApp] interrupted
[I 2025-09-02 15:26:14.740 ServerApp] Serving notebooks from loc
esktop
    0 active kernels
    Jupyter Server 2.16.0 is running at:
    http://localhost:8888/lab?token=b5af7ee78f55dc0a6aa7a4c27bd8
        http://127.0.0.1:8888/lab?token=b5af7ee78f55dc0a6aa7a4c2
Shut down this Jupyter server (y/[n])? n
[I 2025-09-02 15:26:19.228 ServerApp] resuming operation...
[W 2025-09-02 15:26:24.423 LabApp] Could not determine jupyterla
js
[W 2025-09-02 15:26:24.816 ServerApp] 404 GET /api/contents/cuml
```

http://localhost:8888/lab

| Name | Modified |
|---|---|
| JupyterENV | last mo. |
| 01_mnist.ipynb | 11 days ago |

# Demo on Nibi

# via SHARCNET OnDemand

# (ondemand.sharcnet.ca)

# Use Cases

## **Case 1**: Work with the pre-configured JupyterLab

- Request a Nibi JupyterLab instance
- Connect to JupyterLab
- Run a tutorial notebook for image classification
  - Install required python libraries, e.g. tensorflow, matplotlib, etc.

Features:

- Quick start with a pre-configured JupyterLab (same as from *JupyterHub*)
- The pre-configured environment is *not persistent.*

# Use Cases

## **Case 2**: Work with a self-built Python virtual environment

- Request a Nibi Desktop instance
- Launch and connect to Nibi Desktop session
- Run an example notebook with a commercial software Gurobi
    - Prepare *a* Python env with required python libs installed, including
        - pandas, numpy, matplotlib, scikit-learn, seaborn, *gurobipy and jupyterlab*
    - Launch JupyterLab from a terminal on the Nibi Desktop

Features

- Full flexibility to work with a customized environment
- The environment can be persistent in your account

# Use Cases

## **Case 3**: Run notebooks with a container

- Can’t be done with the pre-configured JupyterLab
- Can be done on a Nibi Desktop
- Run notebooks with Anaconda via a container
  - JupyterLab is included in Anaconda
  - Build an Apptainer container based on an Anaconda3 Docker container

```
[user@nibi]$ module load apptainer
[user@nibi]$ apptainer build anaconda3.sif docker://continuumio/anaconda3
```

# Use Cases

## **Case 3**: Run notebooks with a container

- Can't be done with the pre-configured JupyterLab
- Can be done on a Nibi Desktop
- Launch JupyterLab from the container shell

```
[user@nibi]$ module load apptainer
[user@nibi]$ apptainer shell anaconda3.sif
Apptainer> jupyter-lab --no-browser
... ...
    http://localhost:8888/lab?token=109c369980ab346bcd129eb…
```

# Use Cases

## **Case 3**: Run notebooks with a container

- Can’t be done with the pre-configured JupyterLab
- Can be done on a Nibi Desktop
- Launch JupyterLab from the container shell
- Connect to the JupyterLab URL using a web browser on Nibi Desktop

```
[user@nibi]$ firefox <JupyterLab URL>
```

# Summary for running JupyterLab on Nibi

- A web browser is all you need: https://ondemand.sharcnet.ca
- Request a *Nibi JupyterLab* to work with a pre-configured JL
  - Quick start
  - Additional apps on the JL launcher, e.g. RStudio, VS code, etc.
- Request a *Nibi Desktop* to work with a customized environment
  - Full flexibility to work with a self-built Python env, a container, etc.
  - A persistent environment in your project space
- Running JupyterLab or notebooks is meant for short interactive tasks
- Longer analysis in Python should be done in a non-interactive job
  - Docs wiki for Python: https://docs.alliancecan.ca/wiki/Python
- Demo examples are available at: https://staff.sharcnet.ca/jhqin/GIS-Jupyter-2025/