Intel® Developer Cloud (IDC)

Soner Steiner

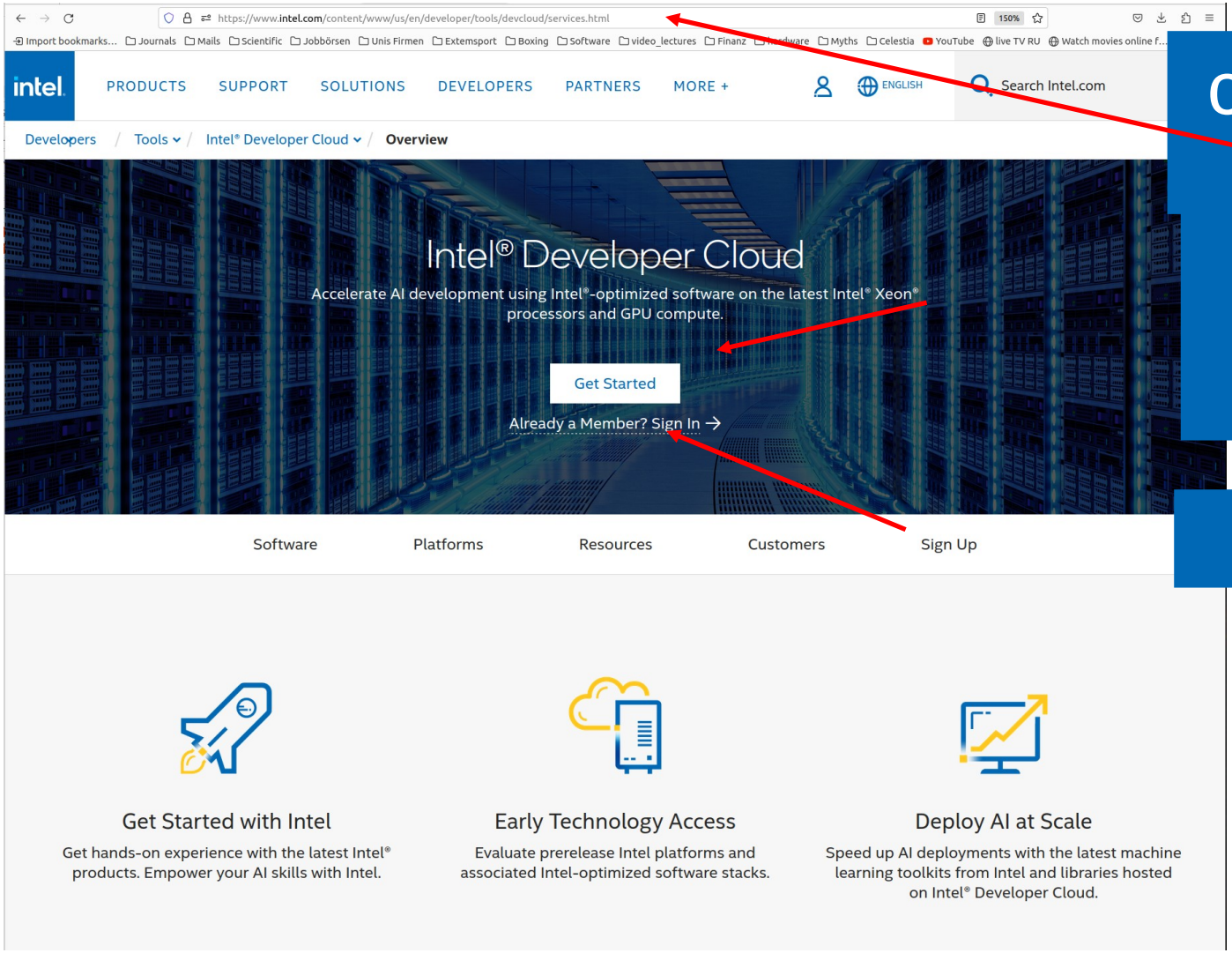
CSC WS Helsinki
Februar 2024

Agenda

- Public Intel Developer Cloud

Jupyter Nbs on Devcloud

- (IDC) slurm usage



cloud.intel.com

Create Developer account

Sign in

Console Home

Quick Start

- Hardware Catalog
- Software Catalog
- Training and Workshops
- Cloud Credits

Learning and Support

Getting started

Learn the fundamentals to get the Most out of the Intel developer cloud

Tutorials

Browse how to create better solutions using Intel develope cloud

What's new?

Learn the fundamentals to get the Most out of the Intel developer cloud

Jupyter NBs

Training and Workshops

Launch JupyterLab

AI

AI Kit XGBoost Predictive Modeling

Learn predictive modeling with decision trees using Intel® AI Analytics Toolkit

Launch

Heterogeneous Programming Using Data Parallel Extension for Numba® for AI and HPC

Data Parallel Extension for Numba accelerates Python® code on Intel® XPUs

Launch

Machine Learning Using oneAPI

Intel® AI Analytics Toolkit accelerates data science and analytics with Python®

Launch

C++ SYCL

Essentials of SYCL

Learn to write performant and portable code using oneAPI and SYCL C++

Launch

Performance, Portability and Productivity

Learn to write performant and portable HPC code for multiple platforms with oneAPI and SYCL C++

Launch

Introduction to GPU Optimization

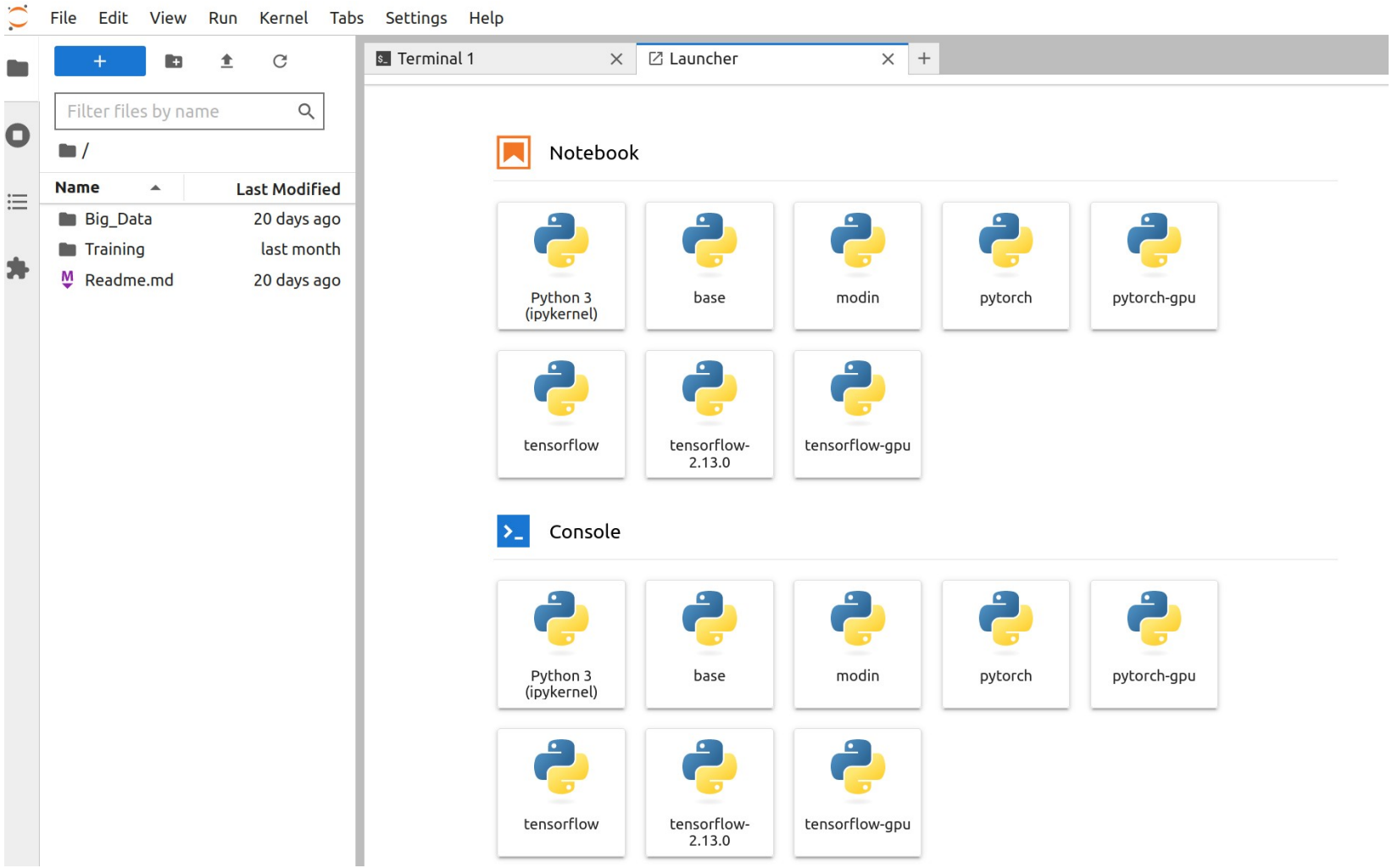
Learn GPU optimization techniques using SYCL.

Launch

Migrate from CUDA® to C++ with SYCL®

Optimize apps from traditional CUDA environments

Launch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Terminal 1
Launcher
Filter files by name
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Readme.md 20 days ago
Notebook
Python 3 (ipykernel)
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pytorch
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tensorflow
tensorflow-2.13.0
tensorflow-gpu
Console
Python 3 (ipykernel)
base
modin
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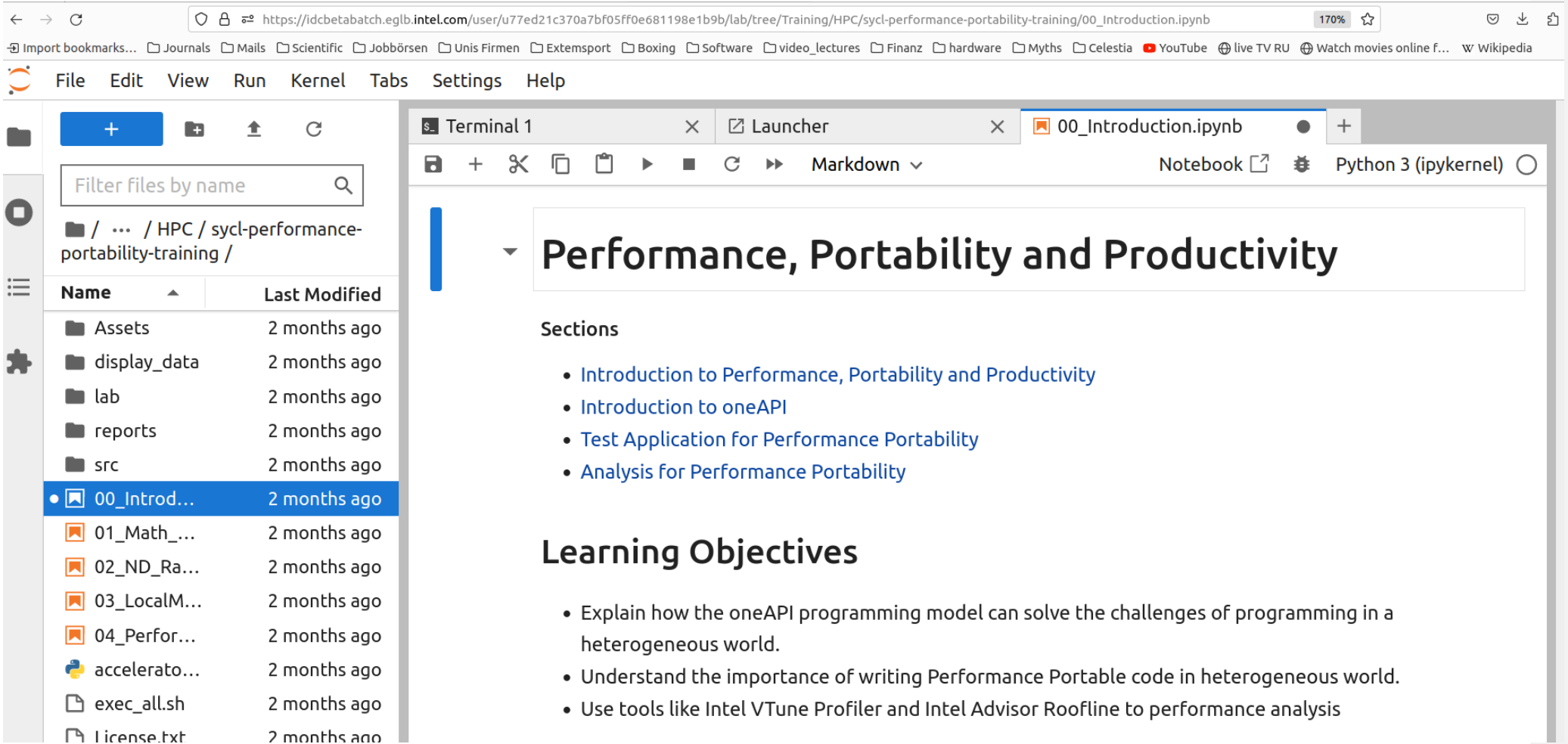
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Mails
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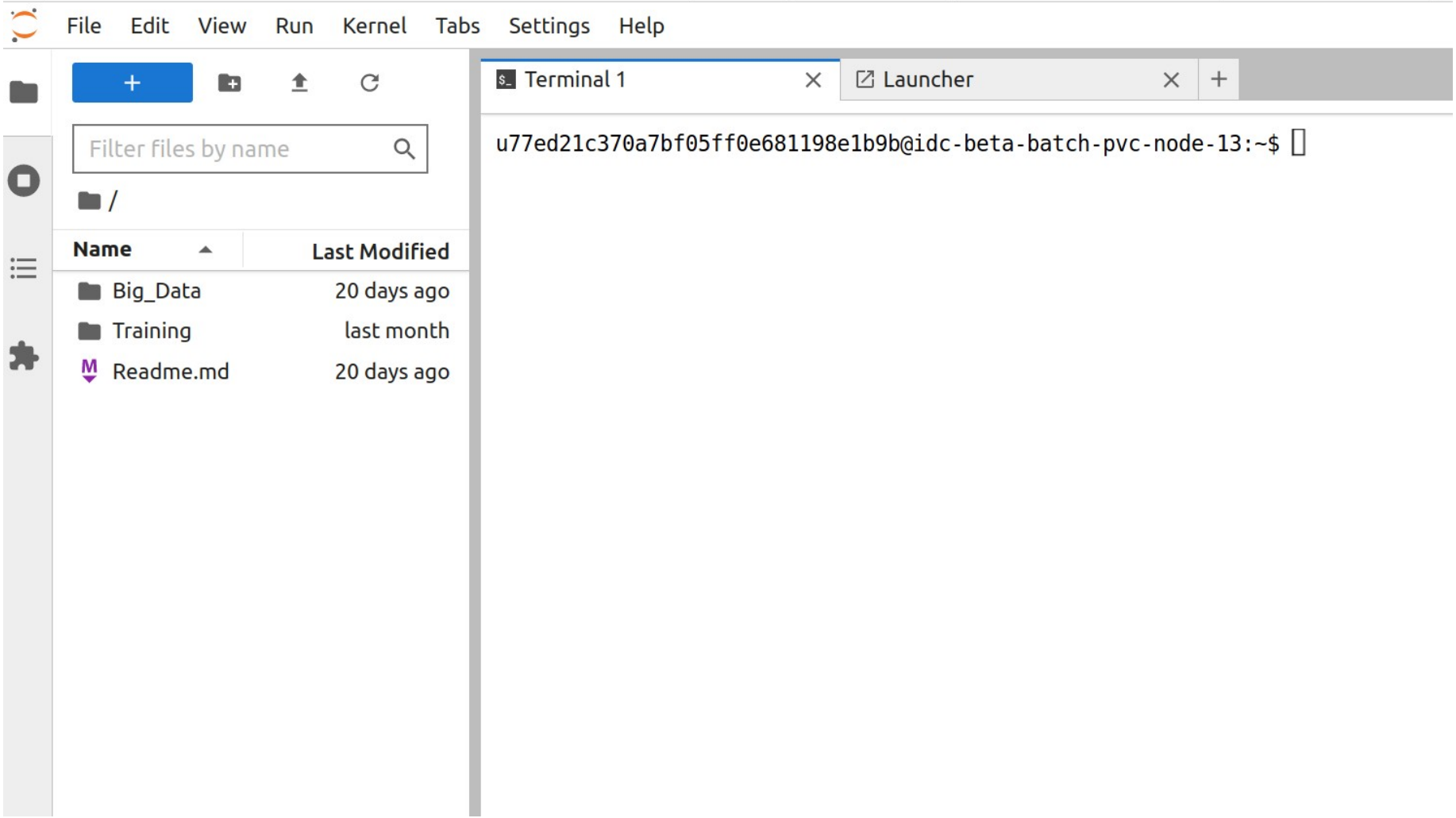
Extemsport
Boxing
Software
video_lectures
Finanz
hardware
Myths
Celestia
YouTube
live TV RU
Watch movies online f...
Wikipedia
File
Edit
View
Run
Kernel
Tabs
Settings
Help
Filter files by name
/ ... / HPC / sycl-performance-portability-training /
Name
Last Modified
Assets 2 months ago
display_data 2 months ago
lab 2 months ago
reports 2 months ago
src 2 months ago
00_Introd... 2 months ago
01_Math_... 2 months ago
02_ND_Ra... 2 months ago
03_LocalM... 2 months ago
04_Perfor... 2 months ago
accelerato... 2 months ago
exec_all.sh 2 months ago
License.txt 2 months ago
Terminal 1
Launcher
00_Introduction.ipynb
Markdown
Notebook
Python 3 (ipykernel)
Performance, Portability and Productivity
Sections
Introduction to Performance, Portability and Productivity
Introduction to oneAPI
Test Application for Performance Portability
Analysis for Performance Portability
Learning Objectives
Explain how the oneAPI programming model can solve the challenges of programming in a heterogeneous world.
Understand the importance of writing Performance Portable code in heterogeneous world.
Use tools like Intel VTune Profiler and Intel Advisor Roofline to performance analysis


File Edit View Run Kernel Tabs Settings Help
Filter files by name
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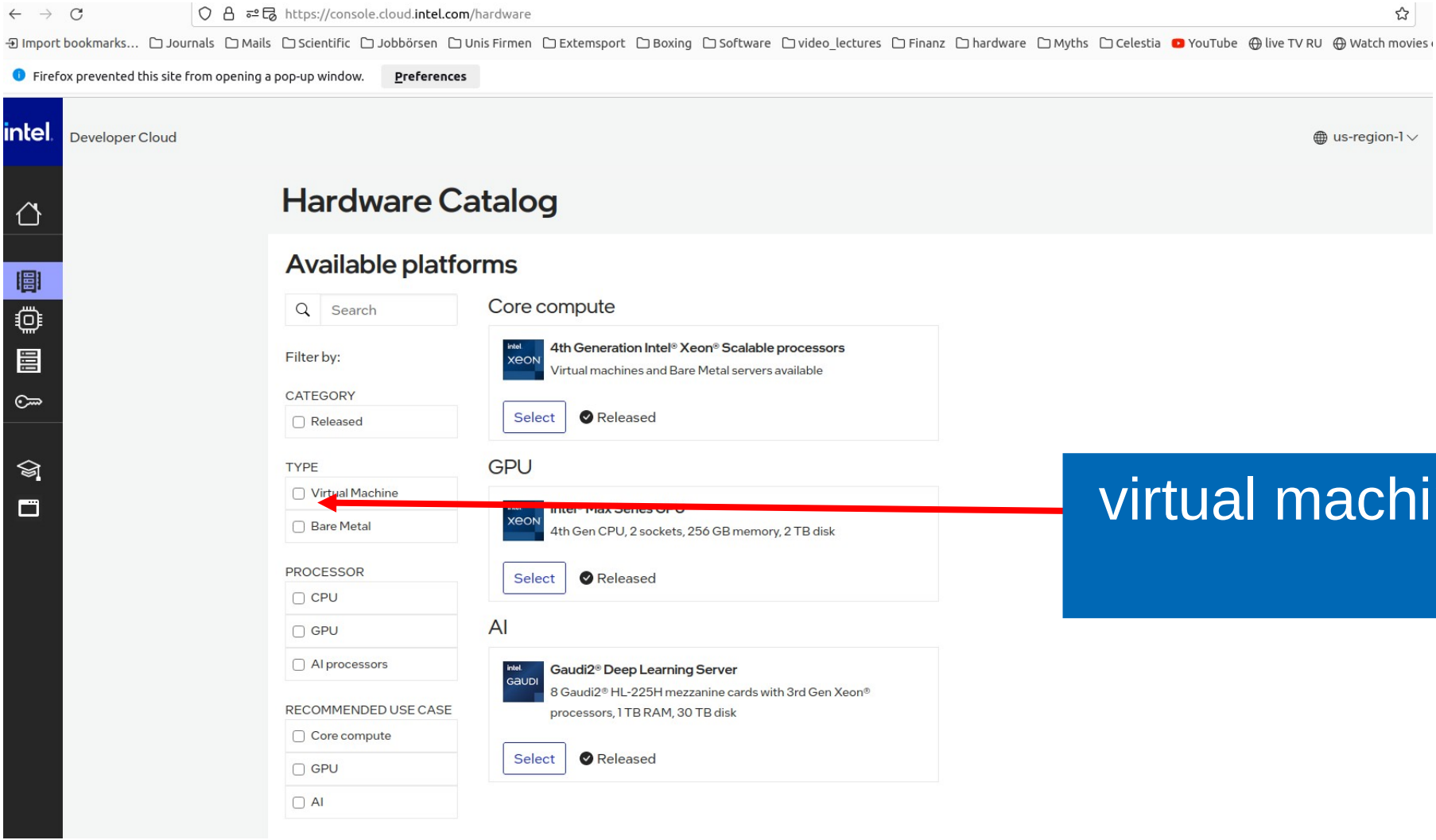
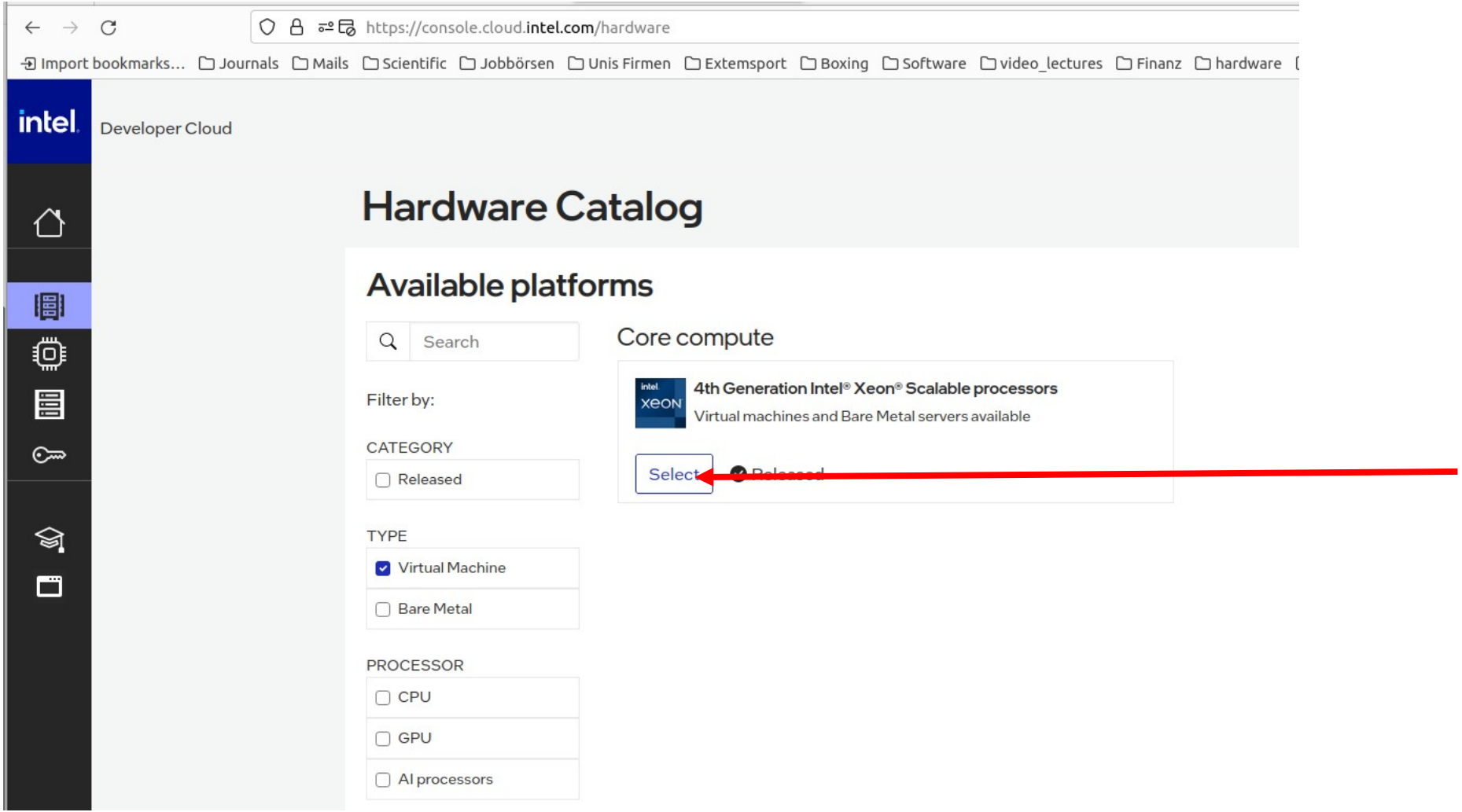
Name
Last Modified
Big_Data 20 days ago
Training last month
Readme.md 20 days ago
Terminal 1
Launcher
u77ed21c370a7bf05ff0e681198e1b9b@idc-beta-batch-pvc-node-13:~$

(IDC) slurm usage

- You need an instance on IDC
- The virtual machine is free of charge



virtual machine


https://console.cloud.intel.com/hardware
Import bookmarks...
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Mails
Scientific
Jobbörsen
Unis Firmen
Extemsport
Boxing
Software
video_lectures
Finanz
hardware
intel
Developer Cloud
Hardware Catalog
Available platforms
Search
Filter by:
CATEGORY
Released
TYPE
Virtual Machine
Bare Metal
PROCESSOR
CPU
GPU
AI processors
Core compute
4th Generation Intel® Xeon® Scalable processors
Virtual machines and Bare Metal servers available
Select
Released

Launch a compute instance

Instance configuration

Instance family: *

4th Generation Intel® Xeon® Scalable processors

For a Xeon® processor overview see the Technical Overview page. For detailed processor information see the Intel product documentation catalog, Intel Accelerator Engine page, and the Accelerator e-guide.

Instance type: * Compare instance types

Small VM - Intel® Xeon® 4th Gen Scalable processor $0.45 / hour
8 cores, 16 GB memory, 20 GB disk

Machine image: *

ubuntu-2204-jammy-v20230122
Architecture: X86_64 (VM only)

Image equipped with: Ubuntu 22.04 LTS (OS) ⓘ and OneAPI base kit (Software kit) ⓘ

Instance name: *

Instance name

Name must be 63 characters or less, and can include letters, numbers, and '-' only.
It should start and end with an alphanumeric character.

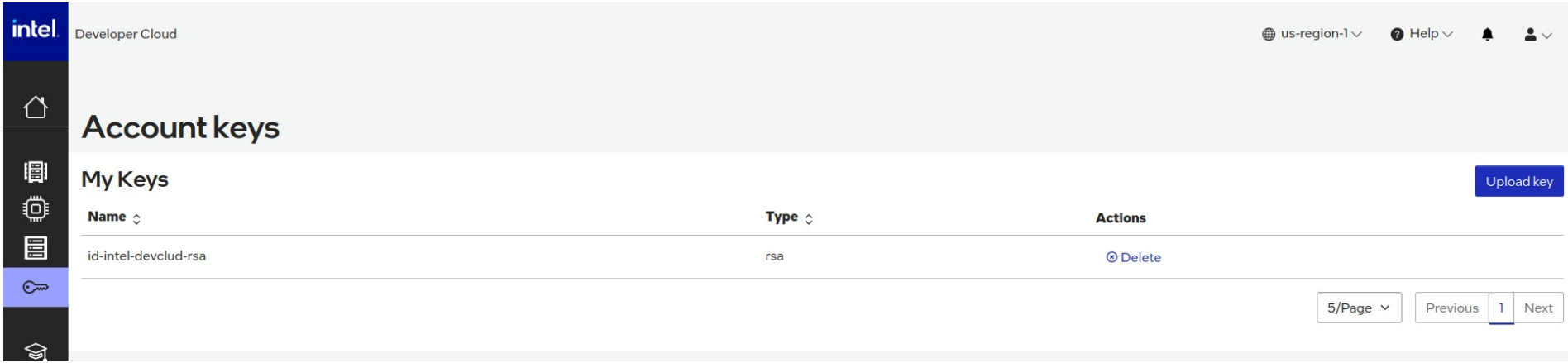
Public Keys

Select keys *

☐ id-intel-devclud-rsa

+ Upload Key | ↻ Refresh Keys

Launch Cancel

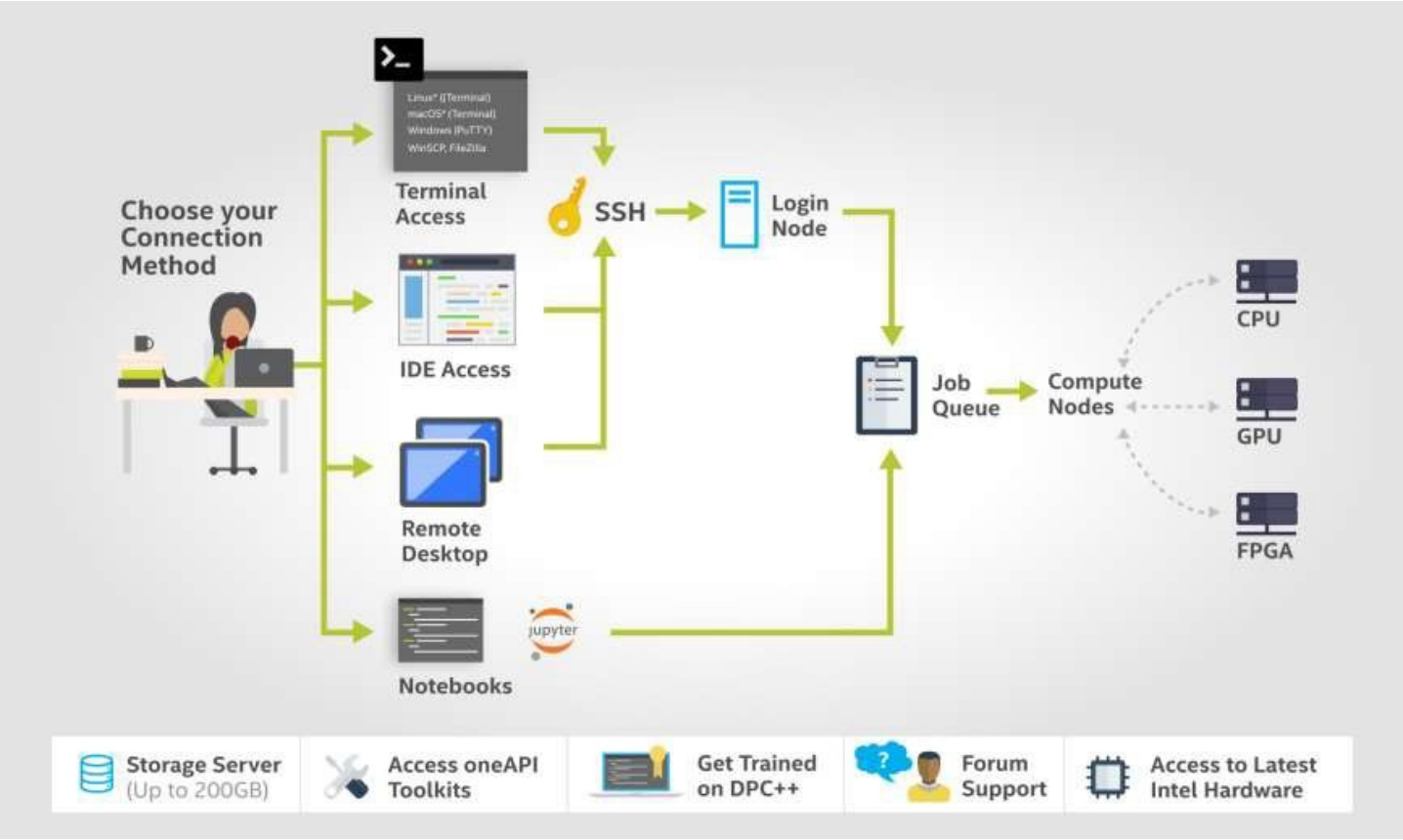

intel
Developer Cloud
us-region-1
Help
Account keys
My Keys
Upload key
Name
Type
Actions
id-intel-devclud-rsa
rsa
Delete
5/Page
Previous
1
Next

Voucher for the IDC, PREMIUM voucher

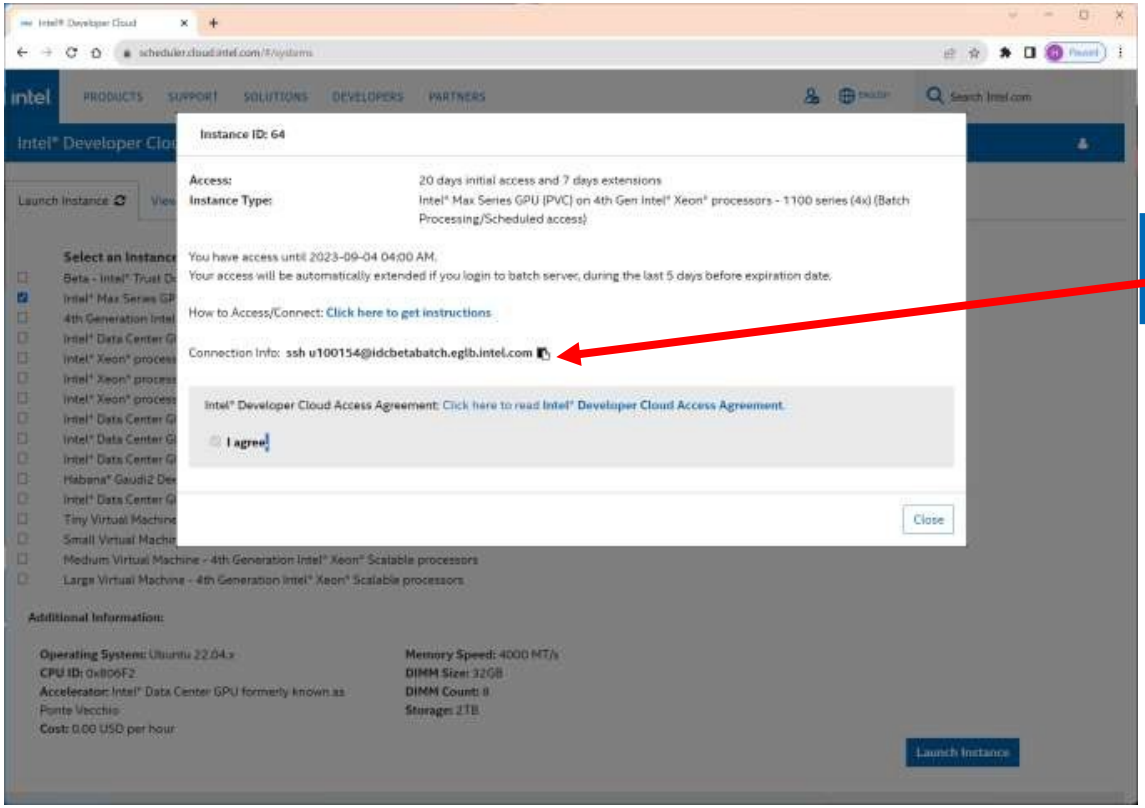
https://www.intel.com/content/www/us/en/developer/tools/devcloud/services.html

- You need to register and get an IDC ID
  - CODE: will come
- Be aware, that the IDC is very busy
- Close the instance when you are done

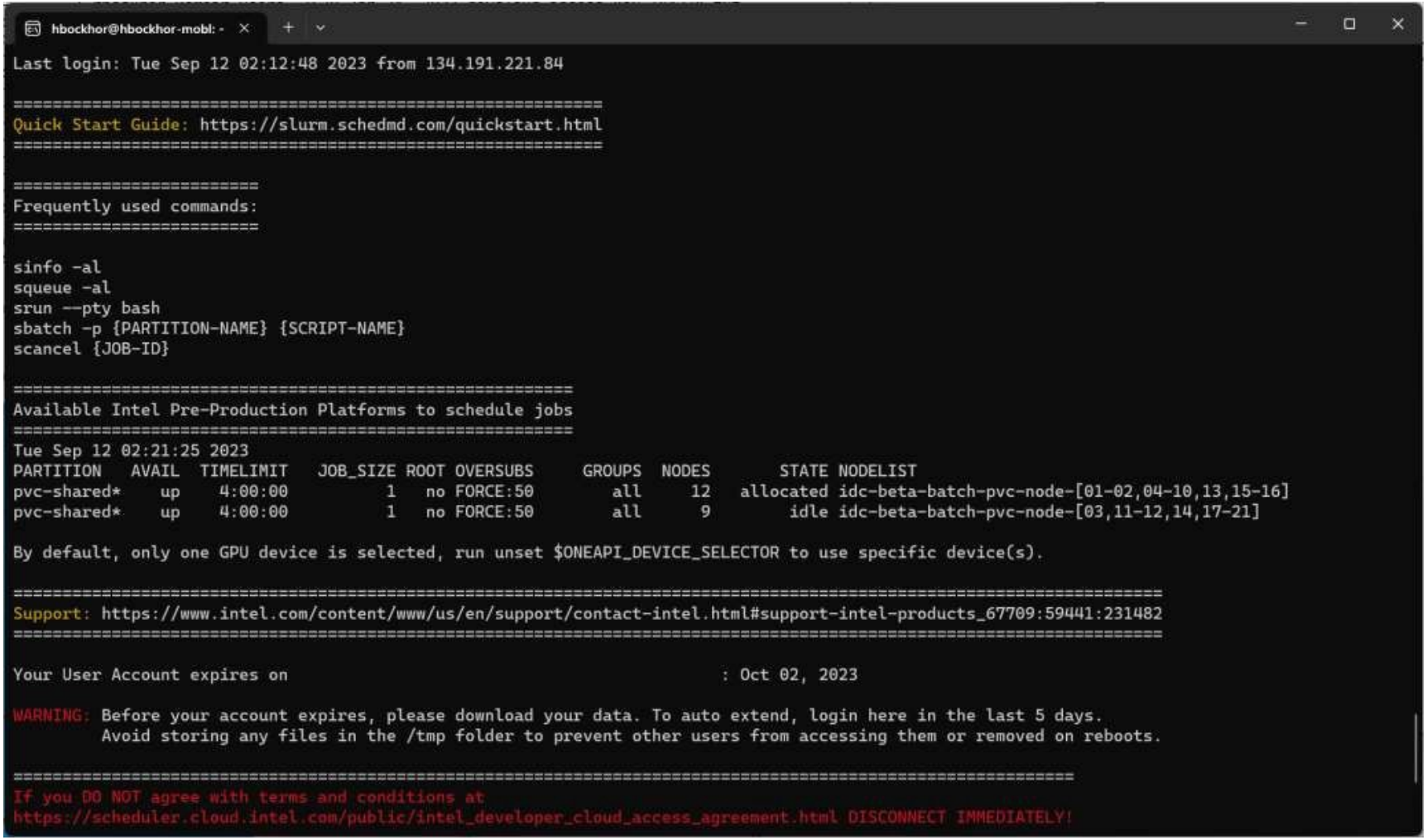
Connection Methods



Copy ssh line



Copy ssh line


hbockhor@hbockhor-mobl: ~
Last login: Tue Sep 12 02:12:48 2023 from 134.191.221.84
Quick Start Guide: https://slurm.schedmd.com/quickstart.html
Frequently used commands:
sinfo -al
squeue -al
srun --pty bash
sbatch -p {PARTITION-NAME} {SCRIPT-NAME}
scancel {JOB-ID}
Available Intel Pre-Production Platforms to schedule jobs
Tue Sep 12 02:21:25 2023
PARTITION AVAIL TIMELIMIT JOB_SIZE ROOT OVERSUBS GROUPS NODES STATE NODELIST
pvc-shared* up 4:00:00 1 no FORCE:50 all 12 allocated idc-beta-batch-pvc-node-[01-02,04-10,13,15-16]
pvc-shared* up 4:00:00 1 no FORCE:50 all 9 idle idc-beta-batch-pvc-node-[03,11-12,14,17-21]
By default, only one GPU device is selected, run unset $ONEAPI_DEVICE_SELECTOR to use specific device(s).
Support: https://www.intel.com/content/www/us/en/support/contact-intel.html#support-intel-products_67709:59441:231482
Your User Account expires on : Oct 02, 2023
WARNING: Before your account expires, please download your data. To auto extend, login here in the last 5 days.
Avoid storing any files in the /tmp folder to prevent other users from accessing them or removed on reboots.
If you DO NOT agree with terms and conditions at
https://scheduler.cloud.intel.com/public/intel_developer_cloud_access_agreement.html DISCONNECT IMMEDIATELY!

IDC oneapi commands

- Interactive usage:

```
$ srun --pty bash
```

- Show jobs

```
$ squeue –l
```

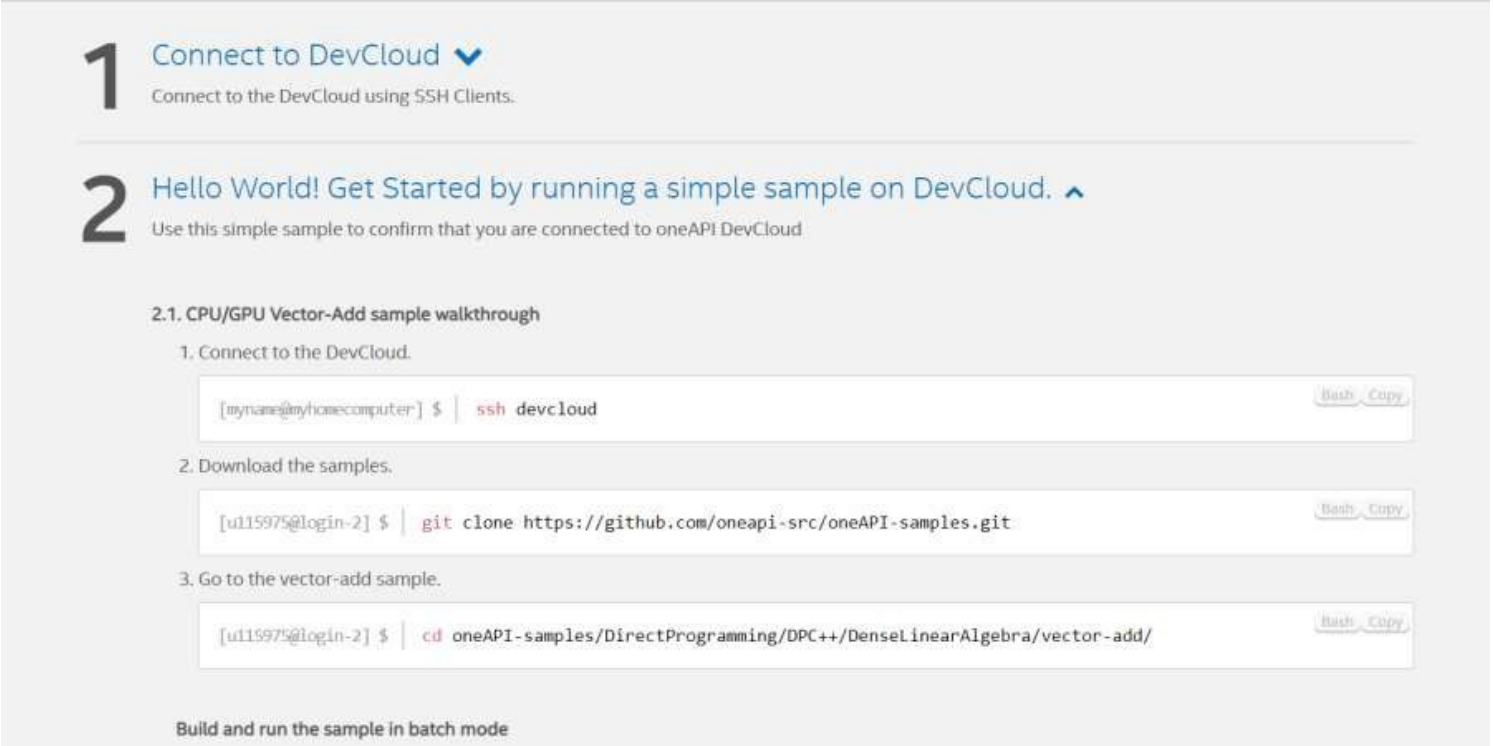
identify my job by looking at node name and timestamp

- Source oneAPI

```
$  source /opt/intel/oneapi/setvars.sh
```

Get Started (ssh)

https://devcloud.intel.com/oneapi/get_started/baseToolkitSamples



PBS Batch System

- DevCloud uses the PBS Batch System for node access
- Interactive jobs are possible (6 hours default)
- https://devcloud.intel.com/oneapi/documentation/job-submission

How to submit a batch job

```
[u115975@login-2] $ | qsub -l nodes=1:gpu:ppn=2 -d . job.sh
```

Note: `-l nodes=1:gpu:ppn=2` (lower case L) is used to assign one full GPU node to the job.
Note: The `-d .` is used to configure the current folder as the working directory for the task.
Note: `job.sh` is the script that gets executed on the compute node.

How to request interactive mode

```
[u115975@login-2] $ | qsub -I -l nodes=1:gpu:ppn=2 -d .
```

Note: `-I` (upper case i) is the argument used to request an interactive session.

IDC commands II

- Test SYCL:
  $ sycl-ls