Deploying Accelerated Computing Instances in AWS

YULMAN PEREZ

SUPRI-A

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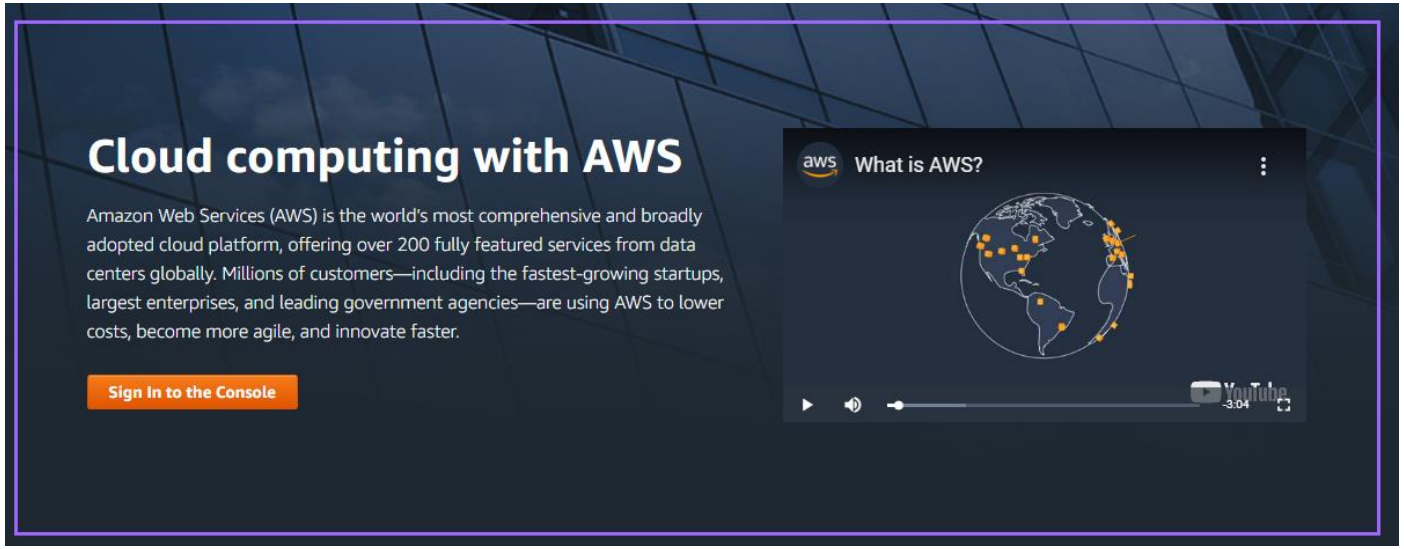
What is AWS?

- It is a private and public cloud platform.
- It is very useful to build, deploy and manage applications.



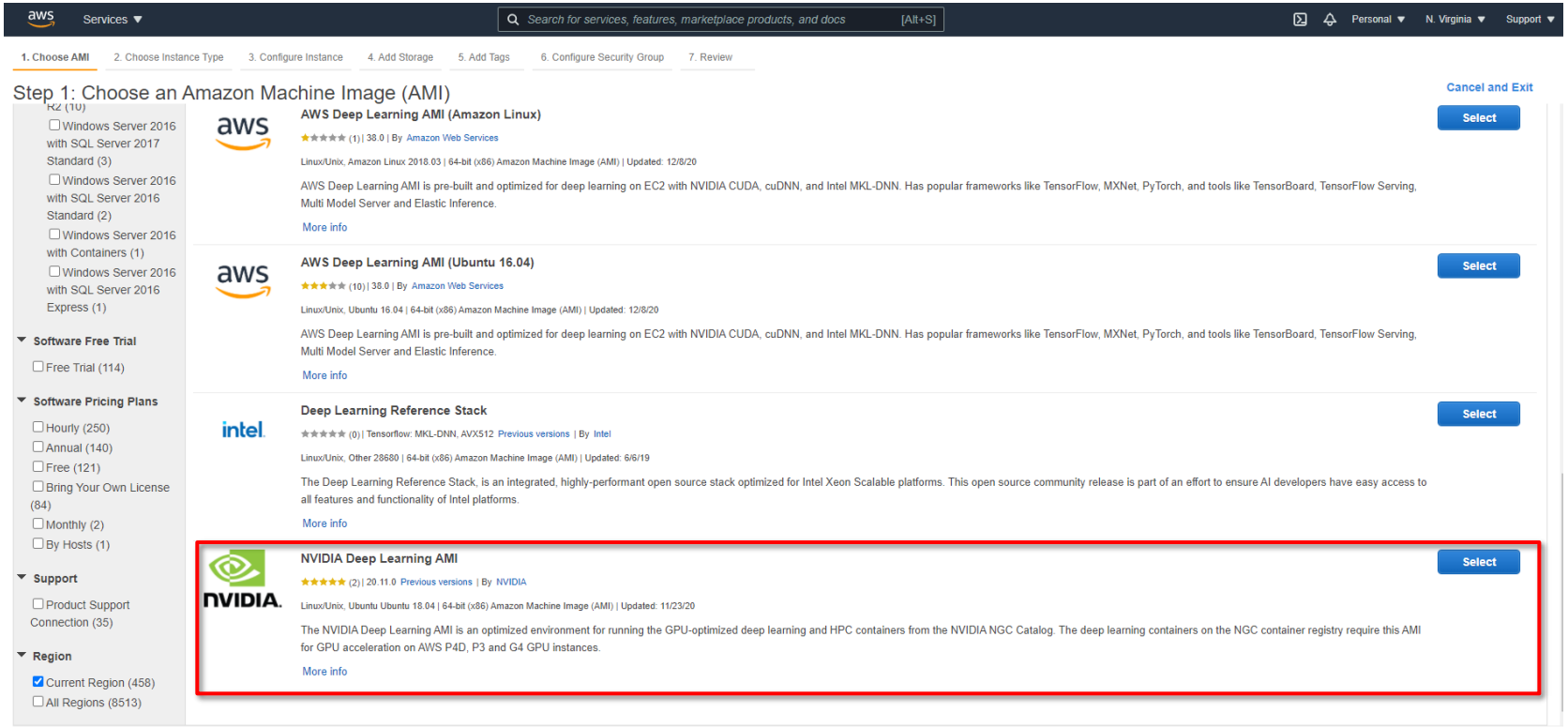
How does it work?

*Image from https://aws.amazon.com/what-is-aws/

Step by Step into AWS

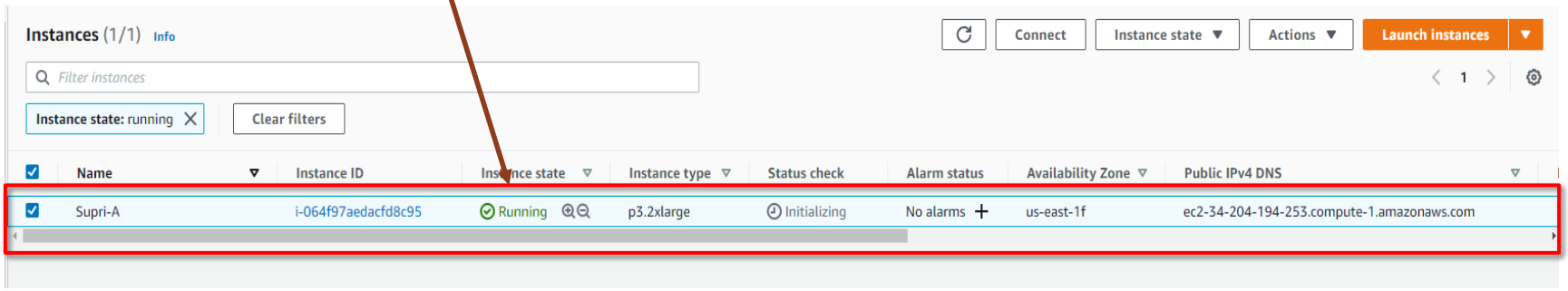
- 1. Create an AWS account
- 2. Sign in to the Console https://portal.azure.com.
- 3. Search for EC2 Instances
- 4. Launch Instance, search for the GPU that you are planning to deploy (NVIDIA) or your preferred GPU.
- 5. Define all the connection details.

Step by Step into AWS

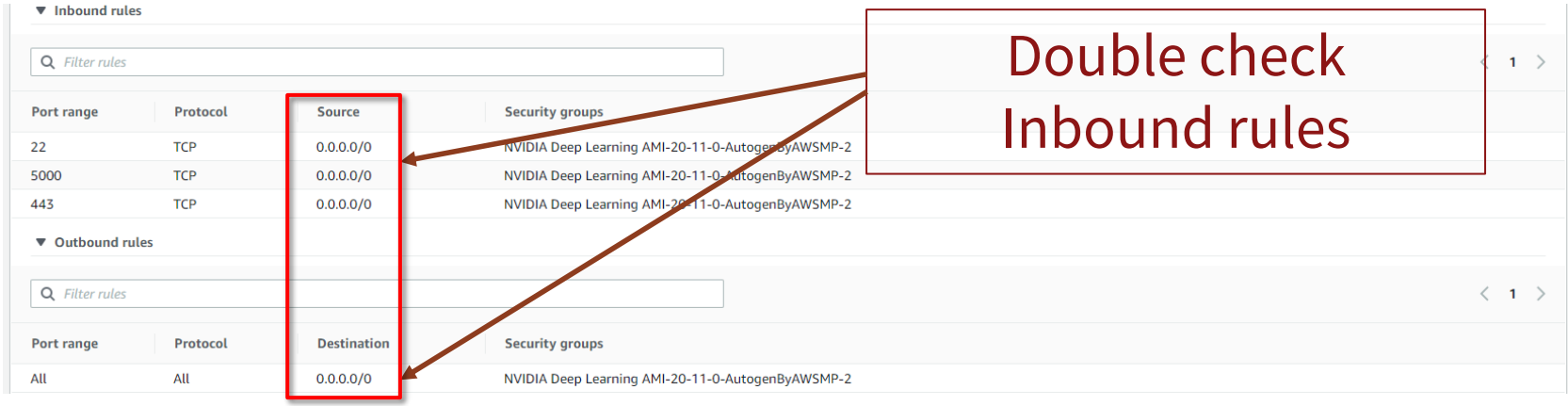


Step by Step into AWS

Make sure your instance is running.



Double check Inbound rules

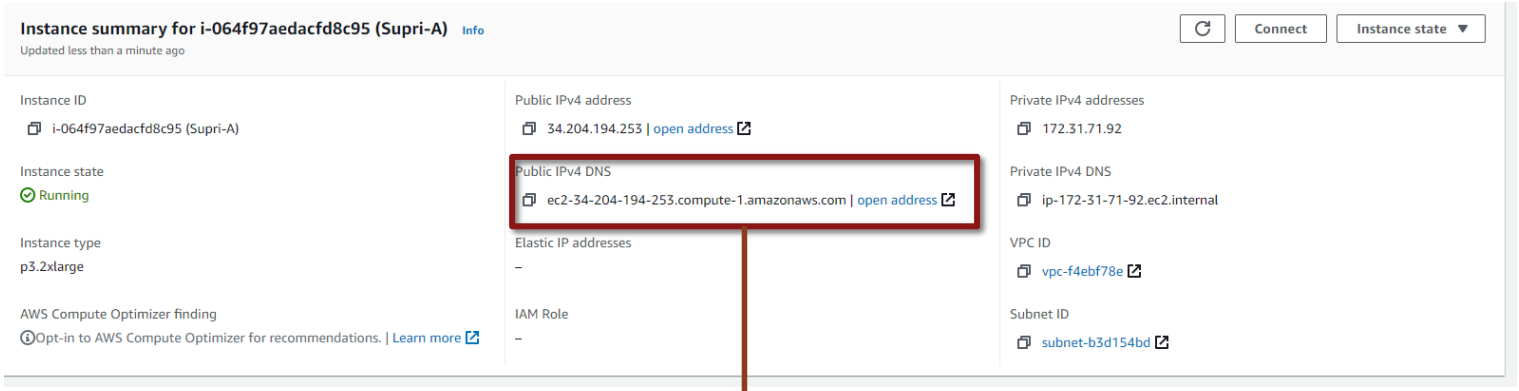


After this step the instance should be ready to use!

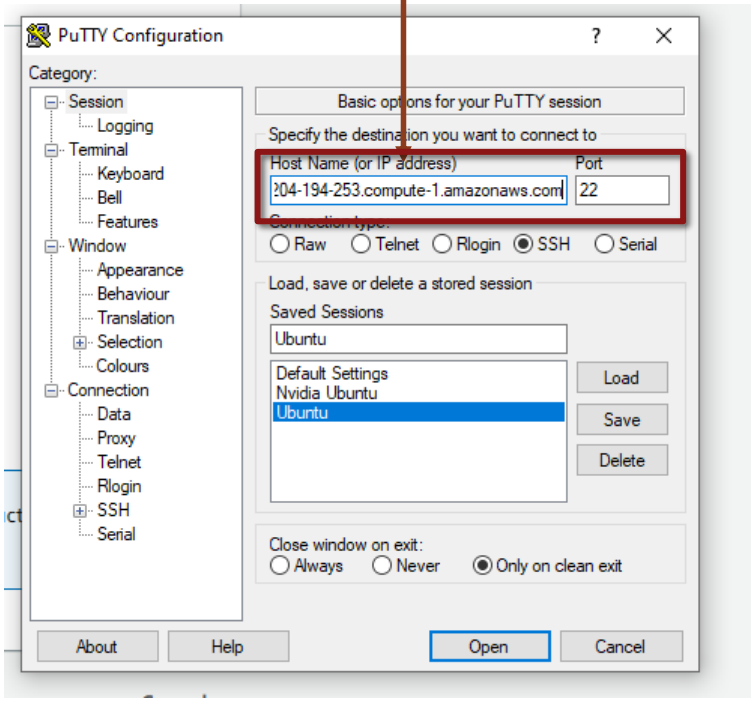
Steps to use AI with Matlab?

- 1. Matlab License.
- 2. Install PuTTY (Free SSH and Telnet for Windows).
- 3. Deploy the docker.
- 4. Pull the container using SSH.
- 5. Run the container for Matlab.
- 6. Tunnel SSH and it is ready to use.

Step by Step into AWS

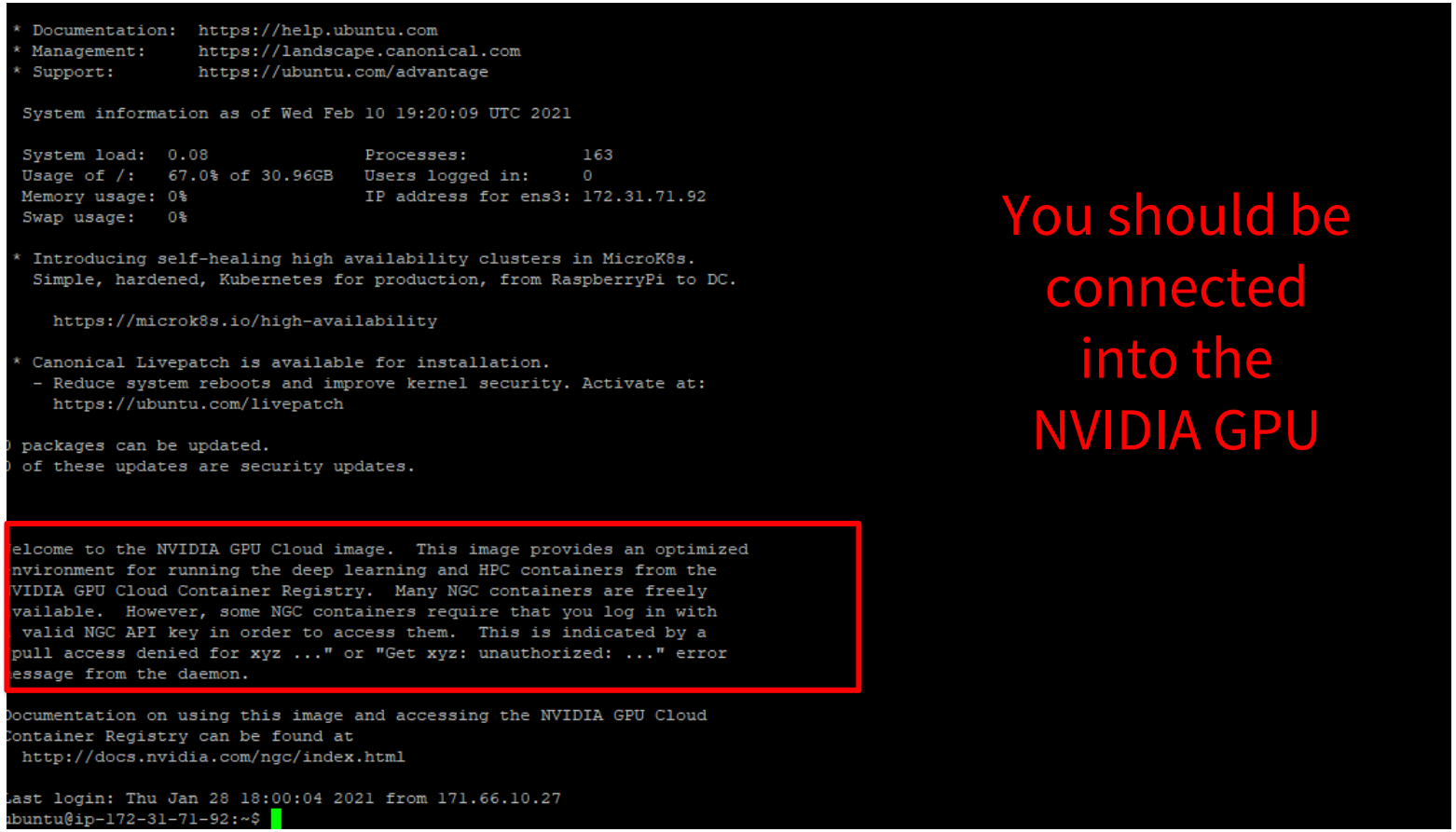


Start PuTTy



Step by Step into AWS

Run the Instance!



You should be connected into the NVIDIA GPU

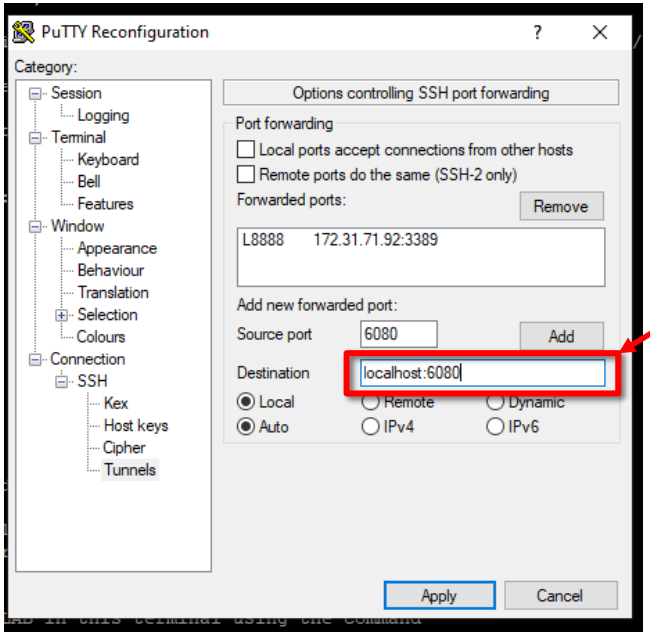
Step by Step into AWS

Run the Container for Matlab !

```
Welcome to the MATLAB Deep Learning Container on NVIDIA GPU Cloud

This container includes commercial software products of The MathWorks,
Inc. ("MathWorks Programs") and related materials. MathWorks Programs are
licensed under the MathWorks Software License Agreement, available in the
MATLAB installation in this container. Related materials in this
container are licensed under separate licenses which can be found in
their respective folders.

To run MATLAB desktop in this container, make sure you have exposed port
5901 and 6080 in the container.

For Docker 19.03 or later, use a docker run command of the form

    docker run --gpus all -it --rm -p 5901:5901 -p 6080:6080 --shm-size=512M nvcr.io/partners/matlab:r2020b

For Docker 19.02 or ealier, use a docker run command of the form

    nvidia-docker run -it --rm -p 5901:5901 -p 6080:6080 --shm-size=512M nvcr.io/partners/matlab:r2020b

To get started using the desktop in this container you can either

    1. Point a browser to port 6080 of the docker host machine running
       this container

        http://hostname:6080

    2. Use a VNC client to connect to display 1 of the docker host
       machine

        hostname:1

The default password to access the container desktop is

    matlab

Launch MATLAB using the MATLAB icon on the desktop.

To securely access the desktop from a browser or using VNC, you can use
```

Step by Step into AWS

Tunnel the connection via VNC.

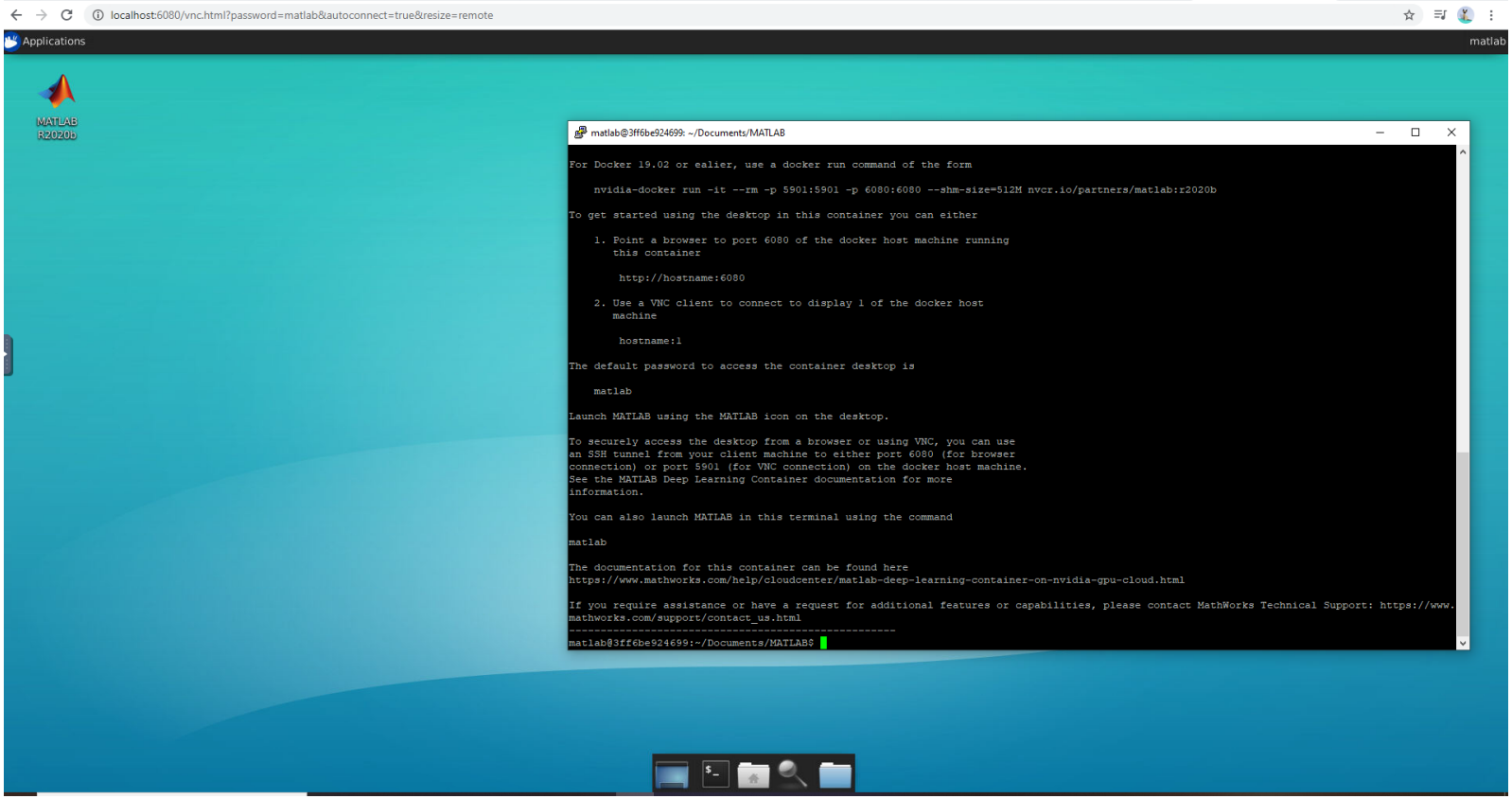


If the port does not work, try a different port (e.g., 6081, 6079)

You can connect with your web browser or VNC.

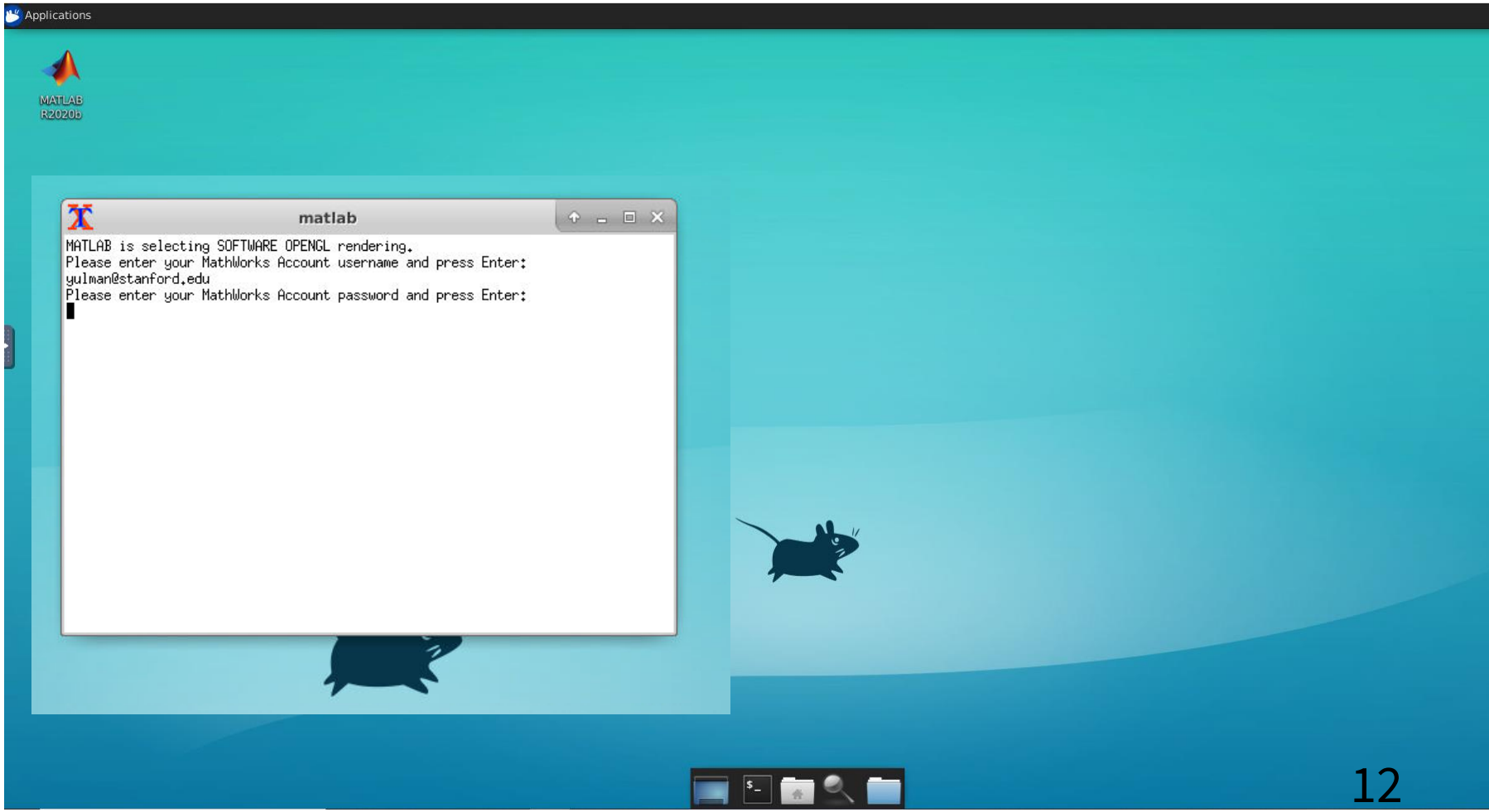
Step by Step into AWS

Open your browser and type: http://localhost:6080/

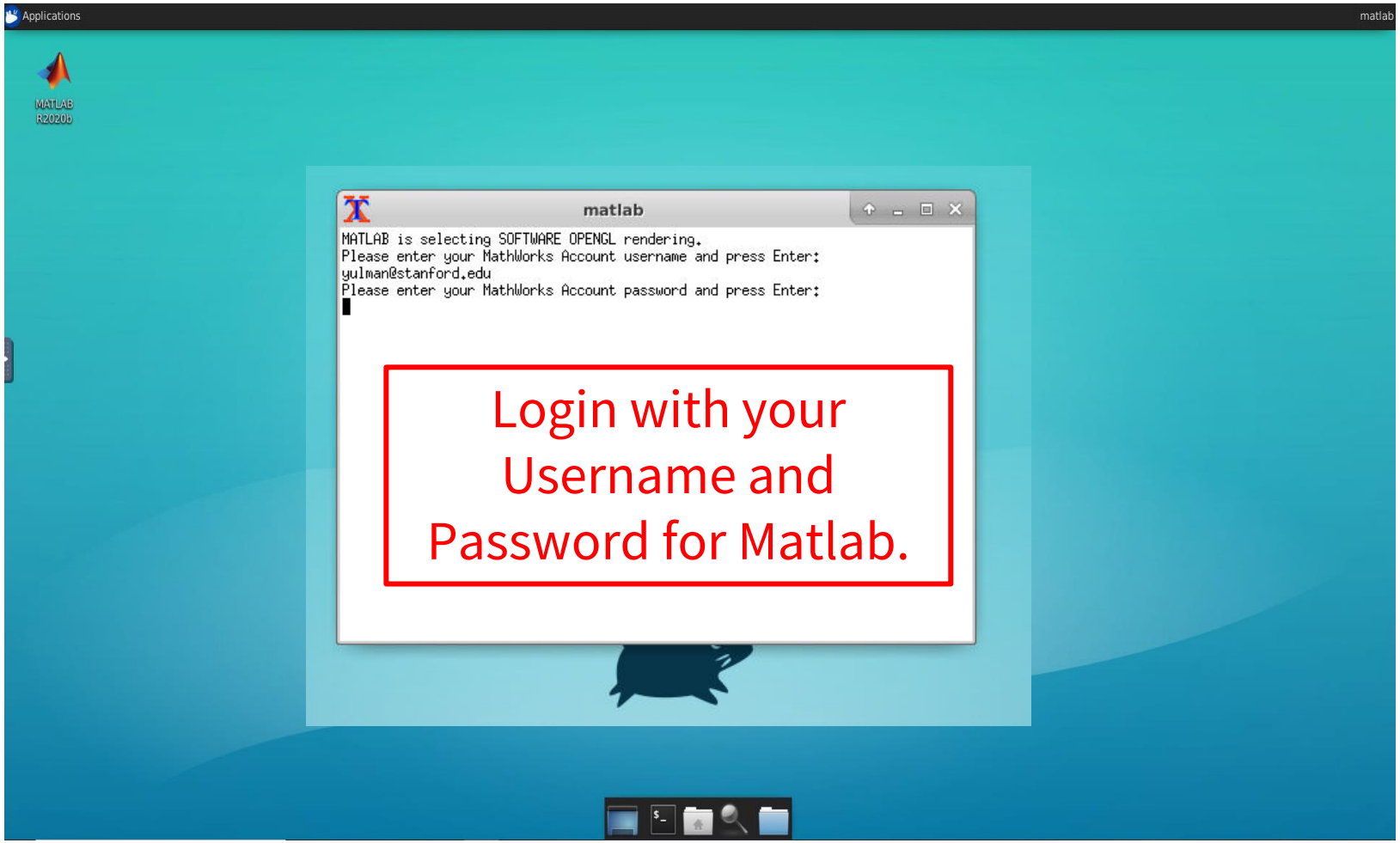


Matlab is ready!

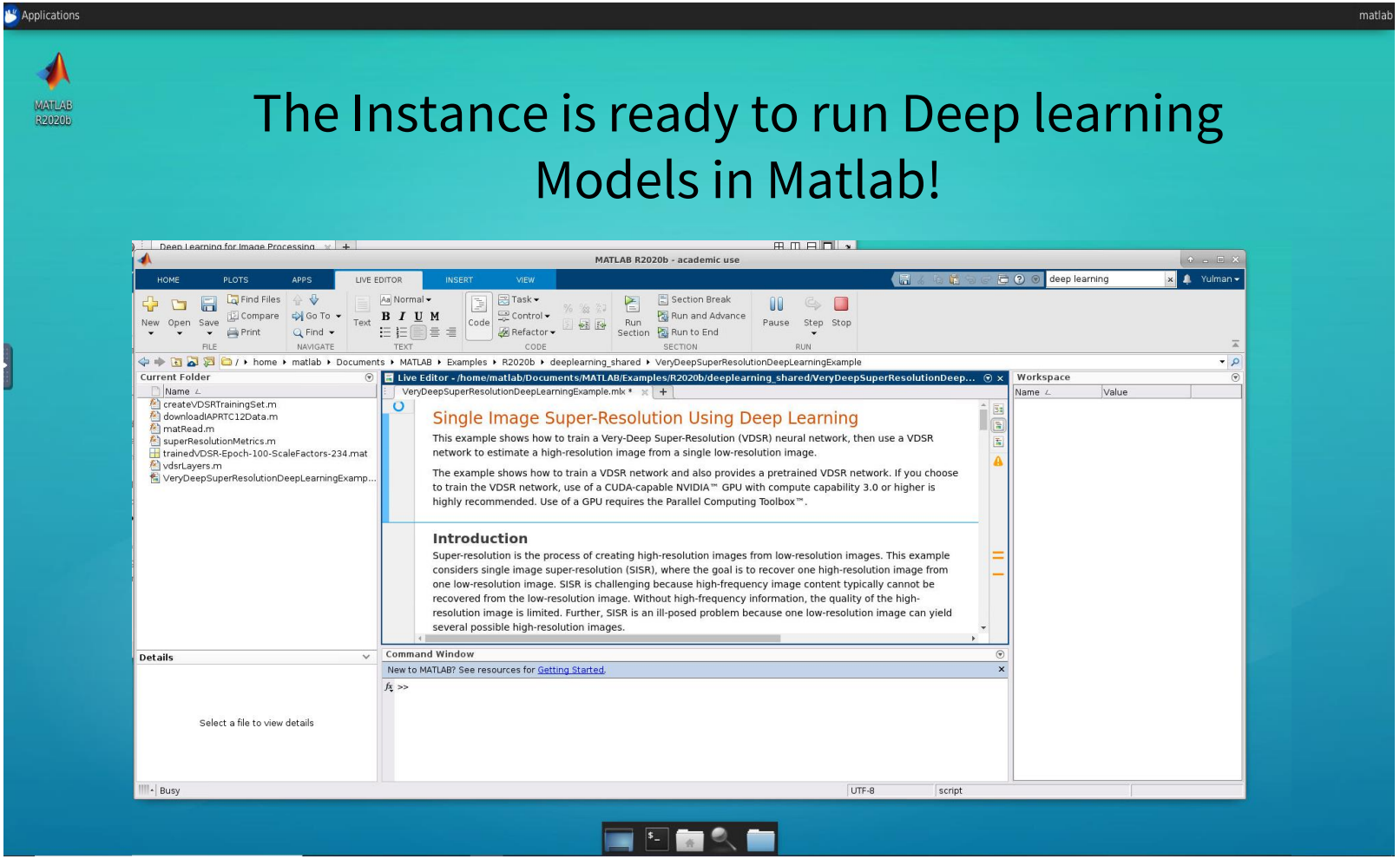
Step by Step into AWS



Step by Step into AWS

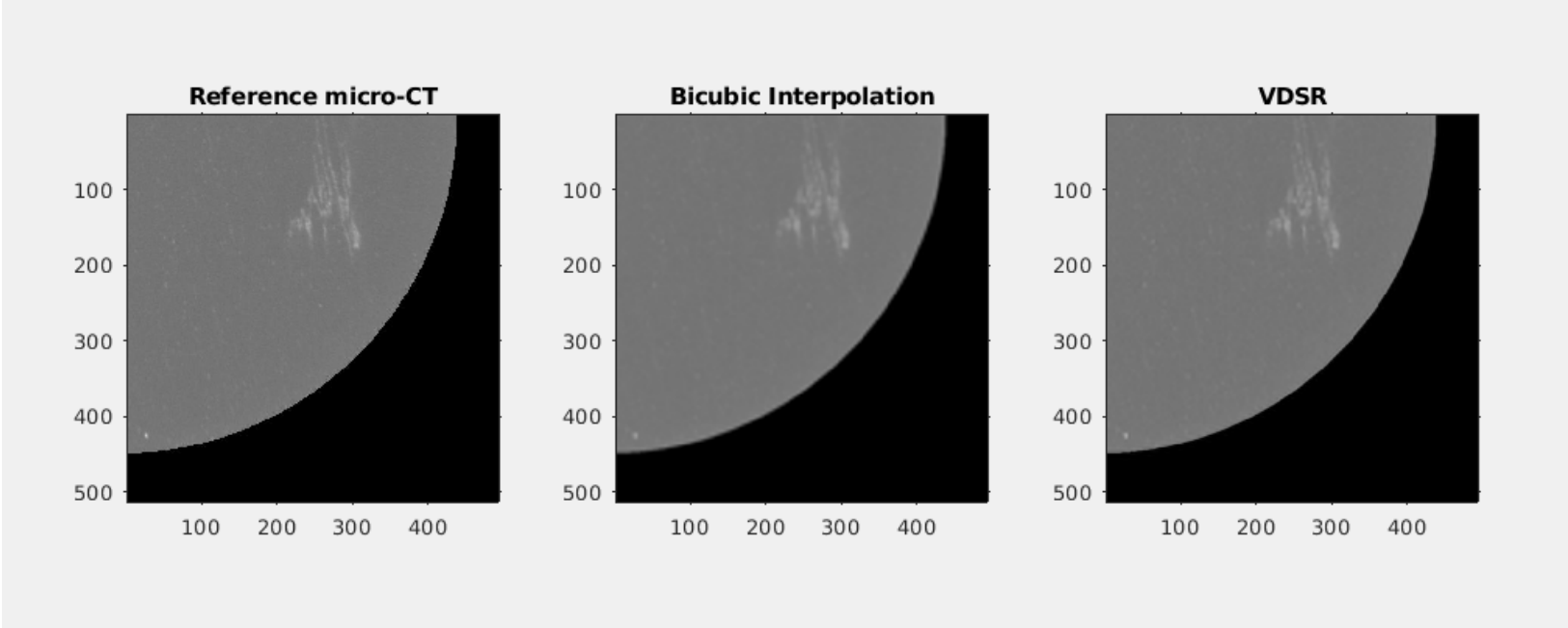


Step by Step into AWS



Example in Matlab (Shale Sample)

Numerical evaluations by using different metrics such as :
the Peak Signal-to-Noise Ration (PSNR)
Structure similarity index (SSIM)




```
Results for Scale factor 4

Average PSNR for Bicubic = 26.659808
Average PSNR for VDSR = 27.418227
Average SSIM for Bicubic = 0.858339
Average SSIM for VDSR = 0.873142
```

References for AWS

- **AWS Step by Step:**
- https://docs.aws.amazon.com/dlami/latest/devguide/gpu.html

- **Matlab AWS Deep Learning:**
- https://www.mathworks.com/help/cloudcenter/ug/matlab-deep-learning-container-on-aws.html#mw_05af73fd-10fe-42c1-bfee-c3539c22507e

- **Matlab 2020b:**
- https://github.com/mathworks-ref-arch/matlab-on-aws

Thank you!

Questions?