

# Forge Training for Debugging and Profiling - Introduction



Forge training for debugging and  
profiling  
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User Engagement Group

# Introduction

- Tutorial team
  - NERSC: Woo-Sun Yang
  - Linaro: Rudy Shand (lecturer), Beau Paisley, Marcin Krzysztofik
- Change Zoom name: 'GivenName LastName'
- Use the GDoc for Q&A: <https://tinyurl.com/4mux8646>
- Slides and video will be available at:  
<https://www.nersc.gov/users/training/events/2024/forging-training-for-debugging-and-profiling-march-13-2024/>
- Please participate in survey: <https://tinyurl.com/4tx4tfy4>

# X Window GUI over Internet Is Painfully Slow...

- NoMachine (formerly NX)
  - Improves X window performance - X window “accelerator”
  - Install & configure: <https://docs.nersc.gov/connection/nx>
- Linaro Forge remote client
  - Download: <https://www.linaroforge.com/downloadForge>
  - Configure:  
<https://docs.nersc.gov/tools/debug/ddt#reverse-connect-using-remote-client>

# Using NoMachine (NX)

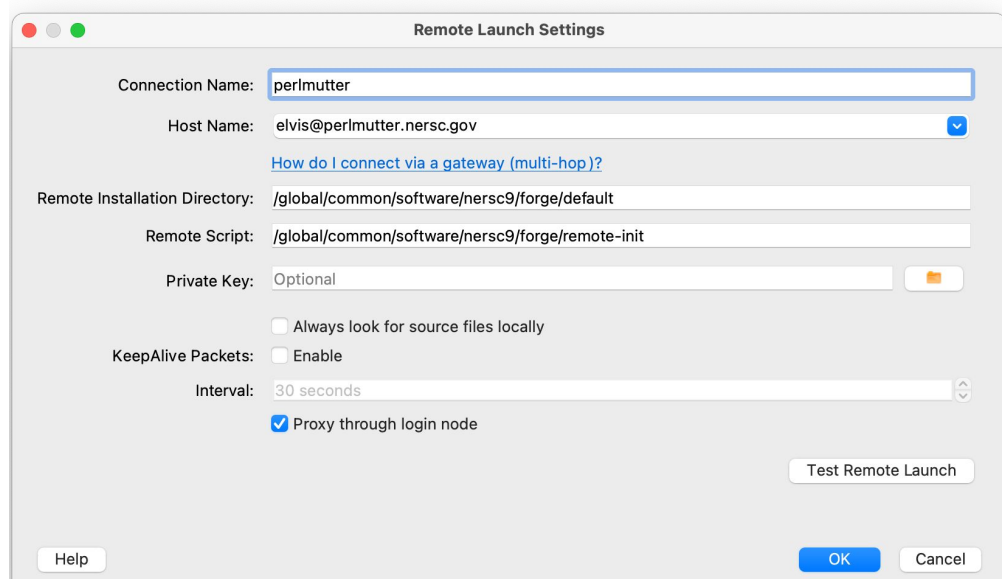
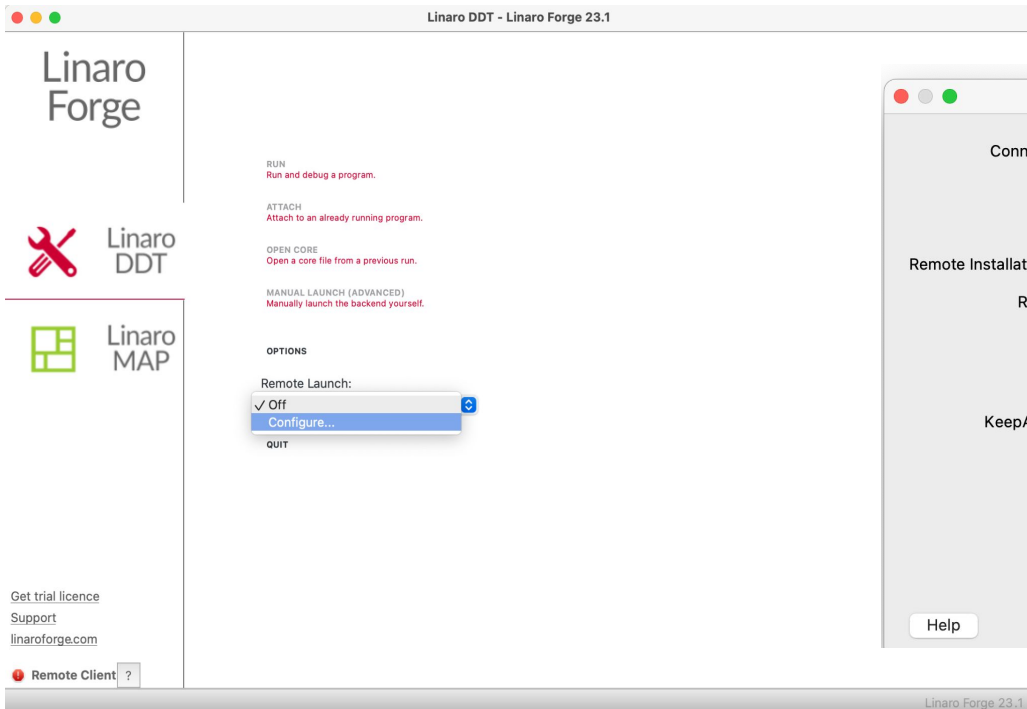
(1) Connect to Perlmutter

(2) Run on Perlmutter

The screenshot shows a NoMachine window titled "NoMachine - Connection to NERSC". On the left is a Linux desktop environment with a sidebar containing several icons, including two green gear icons. A red circle highlights the top gear icon, and a red arrow points to the second gear icon. The main window is a Linaro DDT IDE titled "Linaro DDT - Linaro Forge 23.1.1 (on nid200055)". The IDE has a menu bar (File, Edit, View, Control, Tools, Window, Help) and a toolbar. Below the toolbar is a "Current Group" section with a dropdown set to "All" and radio buttons for "Group", "Process", and "Thread". A "Create Group" dialog is open. The main editor shows Fortran code for "jacobi\_mpiomp.f90" with line numbers 14-27. The code includes MPI initialization and a loop. A "Locals" panel on the right shows variables: "mpi\_comm\_world" (1140850), "np" (224), and "ierr" (0). At the bottom, there are panels for "Input/O...", "Stacks (All)", "Processes", and "Evaluate". The "Processes" panel shows "jacobi\_mpiomp (jacobi\_mpiomp.f90:21)".

# Linaro Forge Remote Client

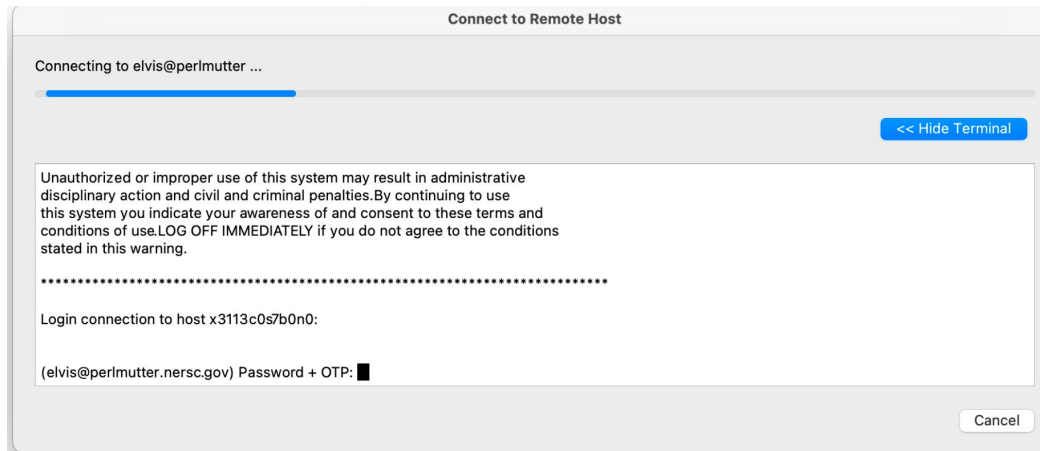
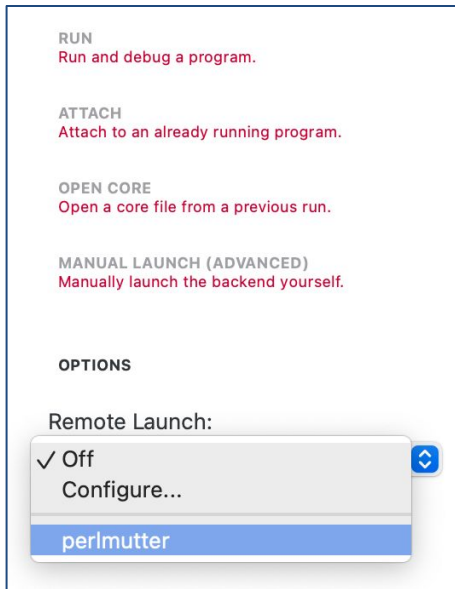
## (1) Create a configuration for Perlmutter



# Linaro Forge Remote Client (Cont'd)

## (2) Select the configuration to login

- **Authenticate with pw+OTP OR**
- **Passwordless ssh with sshproxy keys (see the MFA docs page)**

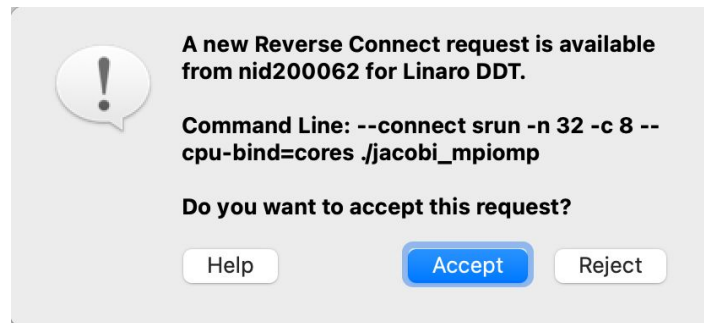


# Linaro Forge Remote Client (Cont'd)

**(3) Ssh to Perlmutter in a window;  
start an interactive job and start  
Forge there**

```
$ salloc -N 1 -C cpu -t 30:00 -q debug
...
$ module load forge
$ ddt --connect srun ... ./jacobi_mpiomp
```

**(4) Accept the connection on laptop**



# Exercises

- Example materials in /global/cfs/cdirs/training/2024/forge

```
$ cp -r /global/cfs/cdirs/training/2024/Forge_Mar2024 .
```

- Node reservation

- 10 CPU and 5 GPU nodes from 9 am-12:30 pm
- Name: **forge\_cpu** and **forge\_gpu**
- Project account: **ntrain7**

```
$ salloc -N 1 -C cpu -q interactive -t 30 \  
-A ntrain7 --reservation=forge_cpu
```

- If all the reserved nodes are taken, use your own project account or submit a non-interactive batch job



Thank You!

