

What is Rogues Gallery Hoteling?

Hoteling is a term used with compute infrastructure to indicate that a researcher has bought into a shared resource using their own funds. Hoteling is usually implemented for two reasons: 1) to help provide basic infrastructure required for all researchers (networking, storage, scheduling, etc.) and 2) to help manage scarce cycles especially on novel pieces of compute hardware. In the case of Rogues Gallery, we are focused on supporting **novel architectures**, which are in many cases both expensive and hard to access for most researchers.

In this vein, Rogues Gallery hoteling provides the following benefits:

1. A common, backed up */nethome* for users with a standard 50GB quota for users (15 GB for students).
2. Shared project storage on a research group basis
3. Access to a non-backed up */netscratch* that is 35TB.
4. Support for 10/40GE networked access to cluster resources
5. Slurm scheduling support with dedicated queue support to maximize your cycles for any contributed resources.
6. Access for systems-level modifications on your own servers (ie, sudo, IPMI) for advisors and senior graduate students.

How do I get involved?

To join the RG hoteling agreement, we ask that we get written confirmation via email from you to incorporate your servers/equipment as part of the combined cluster infrastructure. This will give you and your users access to the benefits listed above. We also ask for written confirmation to leave the CRNCH hoteling arrangement should you decide to separate out and set up your infrastructure as an independent resource.

Servers will need to run the following services to be part of RG hoteling:

- Autofs – to serve shared storage
- SSSD – for GT authentication and scheduling
- Slurmd – Slurm daemon
- Fail2ban or alternative denyhosts solution – to prevent unauthorized hacking attempts
- Standard TSO Simon infrastructure for monitoring and any GT security packages.

You also must agree to share relevant IPMI logs for servers with the relevant admins to allow for proper maintenance of included machines.

Equipment that is not a server must be attached to some kind of remotely accessible host to be part of the RG hoteling scheme. For a novel board like an FPGA or test chip, this can usually be set up using a desktop or Raspberry Pi host with USB-UART connection to the device under test. In this case, we ask the services above be loaded on the “host” device to allow for storage and scheduling support. Exceptions can be made in the case of non-schedulable resources or devices with limited host compute power.

What are some alternatives to CRNCH RG hosting?

The default model is that each lab installs and maintains their own equipment or asks TSO for some minimum level of service. CRNCH is advocating for a shared usage model because independent lab setups require one of your grad students to be the primary IT support, and it duplicates expensive resources like storage servers and tool licenses.

The Skynet cluster in the School of Interactive Computing (SIC) is built around the deployment of dense GPU servers with Slurm scheduling for machine learning training and inference. While there is no formal agreement for hoteling, this can be seen as an informal hoteling cluster.

The Partnership for Advanced Computing Environments (PACE) used to have a more formal hoteling agreement, and CRNCH's hoteling agreement is based in part on the success of this model. PACE currently has switched to an internal cloud model that gives researchers credits for use on PACE machines in a larger cluster environment, Phoenix, as well as hot and cold storage.

CRNCH aims to extend this model for novel architectures with the understanding that scheduling for some of the more novel architectures will involve engineering and research investment by the PIs. This investment will be funded in part by the NSF CCRI for the Rogues Gallery running from September 2020 to August 2023.