HPC Supercomputer Overview

This is an abbreviated version of information mostly found on other pages intended for existing users who wish to use the new cluster.

**Puma**

Puma is our latest supercomputer which came online in the middle of 2020. The key differences from Ocelote are; that it runs CentOS7 and not CentOS6; and it uses Slurm for a scheduler. Detailed information on using Slurm is here.

As is the case for our other supercomputers, we use the RFP process to get the best value for our financial resources, that meet our technical requirements. This time Penguin Computing one with AMD processors. This is tremendously valuable as each node comes with:

- AMD Zen2 96 core processors
- 512GB RAM
- 25Gb path to storage
- 25Gb path to other nodes for MPI
- 2TB internal NVME disk (largely available as /tmp)
- Qumulo all flash storage array for shared filesystems
- Two large memory nodes with 3TB memory and the same processors and memory as the other nodes
- Six nodes with four Nvidia V100S GPU's each

**Ocelote**

Ocelote arrived in 2016. Lenovo's Nextscale M5 technology was the winner of the RFP mainly on price, performance and meeting our specific requirements. This cluster is actually the next generation of the IBM cluster we call ElGato. Lenovo purchased IBM's Intel server line in 2015.

In 2021, Ocelote's operating system was upgraded from CentOS6 to CentOS7 and was configured to use SLURM, like Puma. It will continue until it is either too expensive to maintain or it is replaced by something else.

Features:

- Intel Haswell V3 28 core processors
- 192GB RAM per node
- FDR infiniband for fast MPI interconnect
- Qumulo all flash storage array (all HPC storage is integrated into one array)
- One large memory node with 2TB RAM, Intel Ivy Bridge V2 48 cores
- 46 nodes with Nvidia P100 GPU's

**ElGato**

ElGato is the cluster we obtained prior to Ocelote. It was rebuilt last year with CentOS 7 compared to CentOS 6 that is on Ocelote. Ocelote is being upgraded as its official life span of 5 years is up. This is policy to preserve a consistent compute environment. So if you need CentOS 7 or want another place to run jobs ElGato is available. Elgato will be upgraded to use Slurm when the Ocelote upgrade is complete.

Access

We use a bastion host as an entryway to the system that grants users access to all three clusters. To access the bastion host:

**Bastion Host Access**

```
$ ssh NetID@hpc.arizona.edu
Password:
Duo two-factor login for netid
Enter a passcode or select one of the following options:

1. Duo Push to XXX-XXX-3614
2. Phone call to XXX-XXX-3614
3. SMS passcodes to XXX-XXX-3614 (next code starts with: 1)

Passcode or option (1-3):
Success. Logging you in...
```

This is a bastion host used to access the rest of the RT/HPC environment.
Type "shell" to access the job submission hosts for all environments

```
[gatekeeper ~]$  
```

Schedulers

Our clusters use Slurm. More details are at Running Jobs with Slurm (Puma)