Installation of Flux

2022 HPC Academy Project

Christine Deng, Eric Sledge
August 2022
Table of Contents

❖ The Flux Project Interns
❖ What is Flux?
❖ Project Objectives
❖ Running Jobs in Flux Diagram
❖ Challenges
❖ Future Work and High End Goals
❖ Questions?
The Flux Project Interns

Eric Sledge  
Claflin University Orangeburg, SC  
Computer Engineering

Christine Deng  
CSU East Bay  
Computer Science
What is Flux?

- Resource management framework
  - Job scheduling algorithm
  - Allocation policy
- Designed for better throughput, job coordination/communication, portability
What is Flux?

Project Objective

- Install Flux on our cluster
  - flux-core, flux-security, flux-sched
- Run MPI jobs
Running jobs

```c
#include <mpi.h>
#include <stdio.h>

int main(int argc, char** argv) {
    // Initialize the MPI environment
    MPI_Init(NULL, NULL);

    // Get the number of processes
    int world_size;
    MPI_Comm_size(MPI_COMM_WORLD, &world_size);

    // Get the rank of the process
    int world_rank;
    MPI_Comm_rank(MPI_COMM_WORLD, &world_rank);

    // Get the name of the processor
    char processor_name[MPI_MAX_PROCESSOR_NAME];
    int name_len;
    MPI_Get_processor_name(processor_name, &name_len);

    // Print off a hello world message
    printf("Hello world from processor \%s, rank \%d\n\tout of \%d processors\n", processor_name, world_rank, world_size);

    // Finalize the MPI environment.
    MPI_Finalize();
}
```

```
[flux@siliconi ~]$ flux mini run -n4 -N4 hostname siliconi silicon4 silicon3 silicon2

[flux@siliconi ~]$ cat flux-run-hello.sh
#!/bin/bash
export OMPI_MCA_btl="tcp,self"
flux mini run -n 4 /var/flux/hello 2>/dev/null | grep -v Unable

[flux@siliconi ~]$ flux mini batch -n4 -N4 flux-run-hello.sh f3B23bEkdKM
[flux@siliconi ~]$ flux jobs

<table>
<thead>
<tr>
<th>JOBID</th>
<th>USER</th>
<th>NAME</th>
<th>ST NTASKS</th>
<th>NNODES</th>
<th>RUNTIME</th>
<th>NODELIST</th>
</tr>
</thead>
<tbody>
<tr>
<td>f3B23bEkdKM</td>
<td>flux</td>
<td>flux-run-h R</td>
<td>4</td>
<td>4</td>
<td>2.011s</td>
<td>silicon[2-5]</td>
</tr>
</tbody>
</table>

[flux@siliconi ~]$ cat flux-f3B23bEkdKM.out
Hello world from processor silicon2, rank 0 out of 4 processors
Hello world from processor silicon4, rank 2 out of 4 processors
Hello world from processor silicon3, rank 1 out of 4 processors
Hello world from processor silicon5, rank 3 out of 4 processors
```
Challenges

- Limited Web Resources and Documentation
  - Trial and error, and digging around a lot
- Precise Command Line Usage
  - Expert-Friendly, tough if you are used to GUI’s, once you know certain commands it gets easier
- Minor edits to configuration files
- Enabling Certain Repos
Future Work and High End Goals

❖ Explore using the flux API to manage jobs

❖ Setup the exclude for the mgmt node - normally we would not run real end-user work on the mgmt node

❖ Investigate the Prolog/epilog
Tools Used

- GitHub
- flux
- AlmaLinux
References

Questions?