

Upgrade and Update of Computer Systems
within Dr. Hohlmann's High Energy Physics
(HEP) Research Group Progress Evaluation:
Milestone 4

Josef Bostik
Eric Pereira
Ryan Wojtyla

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1 HEP Senior Design

- Josef Bostik - jbstik2015@my.fit.edu
- Eric Pereira - epereira2015@my.fit.edu
- Ryan Wojtyla - rwojtyla2015@my.fit.edu

2 Faculty Sponsor

Eraldo Ribeiro - eribeiro@fit.edu

3 Client

Marcus Hohlmann - hohlmann@fit.edu
Head of the Florida Tech HEP group

4 Meeting with Faculty Sponsor

5 Meeting with Client

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6 Progress of current Milestone

Task	% Completion	Eric	Josef	Ryan	To Do
Integrate cluster components.	0%	0%	0%	0%	find new solutions
Rewire the existing MTS.	90%	70%	20%	0%	miscellaneous touch ups
Resolve software issues with development MTS.	60%	0%	40%	20%	reinstall AMORE

7 Discussion - Current Milestone

7.1 Existing MTS Progress

Although the FEC firmware has been slow coming, we have been able to improve the MTS. Its cabling is quite messy, which makes rearranging components and diagnosing issues fairly cumbersome. We have exchanged some uncharacteristically long cables for more appropriate shorter ones, and generally cleaned up the other cables to be more presentable.

7.2 Development MTS Computer Progress

In an attempt to deal with the ROOT and AMORE issues plaguing the development machine, we have opted to reinstall both packages. We replaced the installed ROOT with a slightly newer version, which has solved the issues surrounding ROOT. After attempting to get AMORE to work with the new version of ROOT, we eventually decided to reinstall AMORE as well. Unfortunately, however, the repository on which AMORE is hosted is no longer available. The repository maintainers, though, have agreed to send us the packages we need.

We are working with the researchers working on the MTS to put together a document detailing the operation of the existing system. Once we have a through understanding of the MTS's system, we can begin work on the software wrapper for the development MTS.

7.3 Computing Cluster

The integration of the nodes into the cluster has been proving itself to be very challenging. The process as it is detailed in the ROCKS installation manual begins by booting the node with the ROCKS Kernel CD used to created the head node. A tool on the head node, `insert-ethers`, then listens for a DHCP request sent by the node when it starts up. This catalogs the node in the head node's database. The node is then supposed to request a kickstart file from the head node in order to be installed with all the appropriate software and configurations. Unfortunately, we are having a rather difficult time coaxing that request from the node. The ROCKS Kernel CD seems only interested in booting the node as a new head node without requesting a kickstart file.

A ray of hope had shone, however, when, while performing the unrelated task of installing CERN CentOS 7 onto a machine, we discovered that if a certain URL is provided in the “Installation Source” section of the Anaconda installer, shared by the ROCKS Kernel CD and the CERN CentOS CD, a long list of software packages is made available to customize what kind of system we would like to install, including a “Compute Node” package. Enlivened by this discovery, we immediately tried the URL in the ROCKS Kernel CD on the node, but no such list revealed itself. We then booted the node into the CERN CentOS 7 CD and tried the URL. The list appeared! We selected “Compute Node” and began the installation. The node, however, never requested a kickstart file from the head node.

7.4 GEM Machines

8 Parts Worked On

8.1 Josef Bostik

- reinstallation of ROOT on the MTS Development Machine
- reinstallation of AMORE on the MTS Development Machine

8.2 Eric Pereira

- recabling the existing MTS
-

8.3 Ryan Wojtyla

- integrating compute nodes into the cluster
- reinstallation of AMORE on the MTS Development Machine

9 Task Matrix - Next Milestone

Task	Eric	Josef	Ryan
Continue to Care for Existing MTS	60%	20%	20%
Compile Instructions for MTS Operation	20%	40%	40%
Prepare Development MTS Machine	20%	50%	30%
Integrate Nodes into Cluster	10%	10%	80%
Assist Researchers	70%	10%	20%

10 Discussion - Next Milestone

10.1 Existing MTS

While we wait for the FEC firmware to be made available to us, we can continue to clean up the physical detector. We will also be creating a manual in collaboration with the MTS's researchers detailing the operation of its software.

10.2 Development MTS Computer

Once the new AMORE package arrives, we will resume the process of completing the construction of the development MTS's software environment. We will also be able to begin construction of the wrapper once key parts of the manual have been completed.

10.3 Computing Cluster

Further efforts will be made to integrate the nodes into the cluster. Once the nodes are integrated, the storage element (SE) and storage units (NASs) must also be integrated.

10.4 GEM Machines

11 Sponsor Feedback

11.1 Existing MTS

11.2 Development MTS Machine

11.3 Computing Cluster

11.4 GEM Computers

11.5 Sponsor Signature

Sponsor Signature

Date

12 Sponsor Evaluation

Josef Bostik	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Eric Pereira	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Ryan Wojtyla	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10