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

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# Contents

# 1 HEP Senior Design


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# 2 Faculty Sponsor


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# 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 | Ryan | Eric | Josef | To Do |
|---|---|---|---|---|---|
| Repair Existing MTS | 70% | 20% | 40% | 10% | FEC firmware |
| Prepare Development MTS Machine | 70% | 20% | 10% | 40% | repair software |
| Boot Cluster into ROCKS | 80% | 60% | 10% | 10% | fix boot issues |
| GEM Machines | 80% | 10% | 60% | 10% | continue reorganization |

# 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
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### 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

### 11.5 Sponsor Signature

Sponsor Signature

Date

# 12 Sponsor Evaluation

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 |