FY10 Plan for **MINOS**
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Relevant Strategic Plans - Strategic Plan for Neutrino Program

MINOS Goal –

- Ensure the continued support of MINOS offline computing and data handling infrastructure.
- Ensure the continued support of the relevant parts of MINOS offline software

MINOS Strategy –

- Continue to support and streamline MINOS data-handling.
- Support MINOS analysis jobs running on GRID resources.
- Augment Computing resources to keep up with new data and analyses.
- Continue migration of MINOS simulation components to C++ framework.
- Maintain and develop packages in the offline software as required.
- Provide site-wide common code base and builds.

Minos Progress Indicators

1. Effective and secure operation of the Minos Control Room systems.
2. Timely generation and import of Monte Carlo data.
3. Timely reconstruction of data for detector monitoring and for analysis.
4. Stable operation of all analysis computing sysetems.
5. Timely presentation of analyses at conferences and in journals.

FY09 Accomplishments

1. Significantly expanded Fermigrid usage for MINOS Analysis usage, including opportunistic usage. Added simple front end to allow users to control jobs from any node, and to limit the rate of actions as necessary. Parrot continues in use.
2. Numerous code releases built; code corrected and improved.
3. Made preliminary connection of GENIE neutrino generator software to GMINOS simulation.
4. Deployed an additional 40TB BlueArc disk in /minos/data, and expanded monitoring.
5. Suggested, then moved to the use of /grid/fermiapp for our grid software.
6. Deployed the new minos-mysql2 database server, with DBA support.
7. Moved the production Minos CVS repository to cdcvs.
8. Made major progress toward the use of GENIE/GMINOS.

Not Accomplished in FY10

1. Production deployment of the C++ simulation framework.
2. Demonstrate integrated scaling of analysis grid computing at the desired level of about 5000 jobs.

Objectives for FY10

1. Support MINOS computing environment, including:
    a. Monitor data handling operations.
    b. Provide raw data archiving.
    c. Support MINOS instance and use of SAM.
    d. Support FNAL use of the MINOS offline framework including providing builds of releases and external packages.
    e. Support users running analysis processing on FermiGRID
    f. Support MINOS DocDB instance.
    g. Support MINOS CRL instance.
2. Support MINOS Control Room Computing.
3. Provide user consulting to MINOS collaborators in use of the data handling, computing systems and offline framework.
4. Complete the porting of fortran-based GMINOS simulation to C++ framework and integrate GENIE neutrino generator.
5. Continued code support for particular offline software components.
6. Replace servers and cluster nodes that will be coming out of warranty. Augment MINOS computing systems with additional disk and CPU.
7. Expand metrics and monitoring for operations.
8. Move the existing 30 TB of Satabeast/Nexsan from BlueArc to Dcache
9. Understand the scaling limitations of BlueArc on the grid, and continue to apply appropriate regulation to our usage.

Activities

Activity=Intensity_Frontier/MINOS/General Support and User Consultaton

- –Activity type: Service
- –Description: Support driven by infrastructure changes
- –Timescale: Continuous
- –Milestones: ------
- –Metrics Service request times < 1 business day

Activity=Intensity_Frontier/MINOS/Control Room Support

- –Activity type: Service
- –Description: Maintain Control Room computers
- –Timescale: Continuous
- –Milestones: -------
- –Metrics Service request times < 1 business day

Activity=Intensity_Frontier/MINOS/Simulation Upgrade

- –Activity type: Project
- –Description: Upgrade of MINOS simulation software
- –Timescale: Start: Oct' 08; Complete: Dec '09
- –Milestones: ------ Incorporation of GENIE in C++ framework, Jul 09
- –Metrics ------ Prodoction use in an active physics analysis

Activity=Intensity_Frontier/MINOS/Offline Framework Support

- –Activity type: Service
- –Description: Maintain/Improve code as necessary
- –Timescale: Continuous
- –Milestones: -------
- –Metrics ------

Activity=Intensity_Frontier/MINOS/Hardware Improvements

- –Activity type: Project
- –Description: Budget/Spec/Order new/replacement hardware
- –Timescale: 1st Q 2010
- –Milestones: -------
- –Metrics -------

Activity=Intensity_Frontier/MINOS/Operation Metrics

- –Activity type: Service
- –Description: Provide information on data handling operations
- –Timescale: Continuous
- –Milestones: -------
- –Metrics ------

Priorities: The highest priority is the continued running of MINOS analysis jobs on the GRID. As MINOS matures, efforts expand to more challenging analyses and more subtle effects; this has a marked affect on the desired computing capability. The most cost effective means of satisfying this is to make use of grid resources rather than buying dedicated compute hardware. We have modified our file handing and database access procedures to accommodate the large increase in computing. Further adjustments will be need in FY10.

Transitioning all components of the simulation from Fortran to C++ is also a high priority as the collaboration's needs change to requiring the improved modeling only found in the newer code.

Operational and User Support tasks are ongoing and their relative priorities change with collaboration needs.

Change control: Changes or delays in deployment of objectives need the approval of the REX/MINOS activity leader.

Risk Assessment:

1.Inadequate effort in supporting the MINOS computing environment would have the largest impact. In the worst case data loss could result. More realistically, the most likely consequence would be delays in access to the data and other resources which would delay collaboration reconstruction or analysis efforts, papers and result in disgruntled users and visits from spokespersons to FCC1.

2.Failure to support MINOS Control Room could lead to operational consequences for MINOS data taking. This has implications for DOE performance metrics.

3.Inadequate user consulting leads to users devising new and creative ways to abuse the systems (including but not limited to duplicating data or code, end runs around sensible limitations and generally overwhelming resources). This can have operational consequences for other parts of CD support, for example BlueArc, DCache and Fermigrid administration.

4.Further delays of the porting of fortran-based GMINOS simulation to C++ framework and integrating GENIE neutrino generator would mean MINOS is stuck maintaining the existing Fortran framework and developing kludged workarounds. It also prevents MINOS analyses from taking advantages of improvements to the neutrino event simulations that are only going into GENIE and not the older code base. This would mean MINOS results would be dependent on a less adequate modeling and weaken the physics impact.

5.Reducing the support for framework packages would allow bit rot to set in and cause others in the collaboration to acquire a more detailed understanding of those packages so they could maintain them.

6.Failure to provide adequate computing resources limits the ability of the experiment to publish the physics in a timely fashion. Failure to replace out of warranty equipment might mean that resources become unavailable at inopportune times or for extended periods.

7.Failure to provide operations metrics might mean that bottlenecks and inefficiencies get overlooked and problems aren't solved as quickly as they might otherwise be.

RESOURCES REQUEST

Staffing Issues: There does not seem to be any ramping down of support needs. The experiment is relatively mature, but new and challenging analysis techniques are being introduced. Grid computing continues to need ongoing support. The efforts are split with duties reflecting skill sets: 1.0 FTE of application physicist or equivalent for data handling and computing systems, and 1.0 FTE of a Computational Physics Developer on C++ framework and simulations.

1. Robert Hatcher (1.0FTE)
2. Arthur Kreymer (1.0FTE)
3. Jon Urish (0.2FTE) (Control Room Support)

Estimated costs of hardware:

60 TB of Blue-Arc, or equivalent technology, disk $90K
Replacement of remaining servers - $30K
Dedicated LT04 drives for Enstore - $8K