

Monitoring use case: Application Monitoring

- **Description:**
 - An application, such as Athena, uses some file transfer routines that have been instrumented to keep a history of file usage statistics, such as the amount of time between file accesses, that can be used with a system that prefetches files (such as the one developed by Arie) to determine how to match the prefetching of files with the file usage frequency so as to avoid the need for large buffer space. The time between file accesses can also be used to determine what alternatives are available for access to the files (e.g., can access a nearby file that is in a different format, but have enough time for transformation or access a remote file that is the right format). This use case entails instrumenting some of the core algorithms found with Athena such that applications that use Athena would have automatic monitoring of file accesses.
- **Contact:** Valerie Taylor, taylor@ece.northwestern.edu
- **Performance events required:**
 - File usage patterns (via application monitoring with tools such as Prophesy or NetLogger). In particular, the time between accesses to file. This information can be stored in a database for later use in designing good prefetch algorithms or generated dynamically by keeping a small amount of history with the application..
 - **How the performance information will be used:**
 - Prediction of when the next file will be needed.
 - **Access needed:**
 - Access to system timers
 - Access to a log file for which data is written at specified intervals
 - **Size of data to be gathered**
 - Only timing data is needed.
 - **Overhead constraints**
 - Small overhead; the major overhead would be the time to write to a log file for the case when it is desirable to store historical data in a database for later use
 - For the case of prediction during execution, very little data is gathered
- **Duration of the logging:**
 - Logs could be collected over some period of time as dictated by the frequency of use of the application.
- **Platforms:**
 - Prophesy currently has automatic instrumentation of C and Fortran program; manual insertion of instrumentation can be done with C++ programs