Significant Event System Requirements Document

1 Overview

The Significant Event System (SES) is a set of software applications that monitors and records the state of the D0 Run II data acquisition system and detector (DAQ). During the run the DAQ status is communicated to shifters through a graphical user interface that notifies users when a piece of the DAQ requires attention. During data analysis the stored status can be retrieved and reviewed to help determine if DAQ conditions inversely affected the physics data.

2 Framework

The D0 code development environment and hardware choices impact the SES.

- SES applications communicate using the Inter-Task Communication Package (ITC).
- Since ITC is based on a client-server model the SES will also follow a client-server model.
- Client platforms: OSF1, Linux, WinNT, VxWorks
- Server platforms: OSF1, Linux

3 Functionality

Sender clients send significant event (SE) messages to the server when a significant event occurs. A significant event occurrence corresponds to a state transition (good to bad or bad to good) or a one-time action. Each message contains several fields that uniquely identify the message source. Upon receipt of a SE message the server processes the message by modifying the state record kept internal to the server. Receiver clients register a filter with the server. Messages whose source specification matches the filter have the message forwarded to them from the server. The receiver clients can then process the message as needed.

4 Capabilities

Here are the highlights of SES capabilities.

- Events
    - Distribute filtered events to 100 clients
    - Guarantee delivery of distributed events
    - Handle 10,000 events simultaneously
    - Classify events by multiple qualifiers
- Provide a quick response path for “emergency” events
- Filters
    - Filter events by classification
    - Store filters in files
- Archiving
    - Record all events to an archive file

    - Timestamp archived events
    - Browse the events archive file
    - Store archived events in an Oracle database
    - Retrieve archived events from an Oracle database
- Hardware database
    - Retrieve information from the hardware database
    - Distribute information from the hardware database

5 Applications

Client applications must integrate an SE sender, SE receiver, or both a sender and receiver to utilize the SES functionality. This requires development of two classes:

- Sender client class
- Receiver client class

The stand-alone applications required are:

- Server – the heart of the system
- Display (receiver client) – transmits information to users
- Logger – write event messages to a file
- Log viewer – retrieve and view logged event messages