Event Transfer (ET) System

Carl Timmer
What is the ET system?

- Software to move events (data buffers) from process to process
  - One main ET process
    - Stores all events (buffers)
    - Distributes events to users
    - Monitors users
  - Library for users
    - Modify existing ET systems
    - Can even become an ET system
    - Get & put events from ET systems
  - Monitoring programs – text & graphical
ET System Design

- **FAST**
  - Shared memory
  - Fully multithreaded with POSIX pthreads
  - Written in C on Solaris, Linux, & Mac OS X

- **RELIABLE**
  - Complete error recovery for system & users
  - Data from crashed users are recoverable

- **FRIENDLY**
  - Threads transparent to users
  - Network transparent to users
  - Java version available
  - Reentrant – run as many copies on 1 computer as you like
Event Features

- Each event has integer array as metadata
- Events can be any size (within computer’s memory limits)
- Keeps track of endian changes
- Users can get and put events in arrays. This increases performance over 10X.
- Data in CODA format can be swapped
- 2 levels of priority
Station Features

- Users can define and add their own stations
- Multiple users can attach to the same station
- Each station can have a user-defined function to select events of interest
- Station order can be changed

NEW FEATURE

- Stations can be added in parallel with round-robin or load-balancing event distribution algorithms
Parallel Stations
What about performance?
ET graphical Monitor

File View Connections

Help /tmp/yourEtSystem (asisan)

Static Info
- Host: asisan.jlab.org, language: Java
- Ports: tcp = 11111, udp = 11111, mcast = 11112
- Events: total = 3000, size = 32 bytes, temps = 0
- Max #; stations = 20, attachments = 50
- Network interfaces: 129.57.14.45
- Multicast addresses: 239.200.0.0

Dynamic Info
- Event rate = 72274 Hz
- Events owned by: sys (2896), atts 1(0), 2(0), 3(0)
- Idle stations: Station3
- Stations = 3, attachments = 4, temp events = 0

Stations
- GRAND_CENTRAL
- Configuration
- Status
- Station1
- Station2
- Station3

Attachments
- 1
- 2
- 4
- 0

Jefferson Lab
Future Developments

- Rewrite roc, event builder, & event recorder to use ET as communication mechanism
- Run speed tests with and optimize for Gigabit ethernet and TCP Jumbo Frames
- Fix currently broken ET web manual at http://coda.jlab.org
- Bug fixes