On the Horizon - EPICS R3.16

Jeff Hill

On the Horizon – EPICS R3.16

- R3.14 is done
- R3.15 is in progress
- R3.16 - our horizon
  - Scheduled functionality
  - Bonus functionality

Scheduled Functionality

- Transition to one CA server code base

- Upgrade Portable Server API

- Portable Server thread safety audit

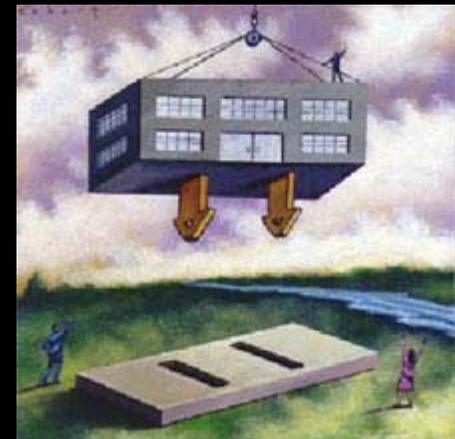- Portable Server thread scheduling

Transition to one CA server code base

- Currently we are maintaining two servers
  - Original server in iocCore
  - Portable CA server
- Moving to one server code base will drastically reduce the maintenance work load and increase upgrade efficiency
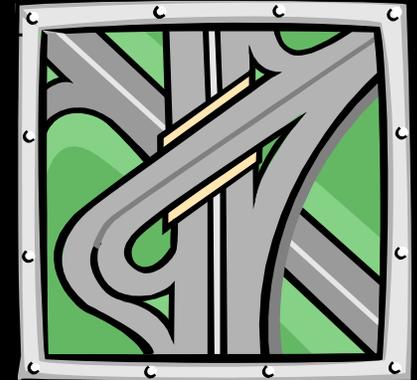
Upgrade Portable Server API

- Data Access HTML documentation

- Replace GDD with Data Access Interface

Portable Server Thread Safety Audit

- iocCore database must run in an independent thread
  - post events at a higher priority than the server

- Portable server integrates poorly with multi-threaded code unless we can certify it to be thread safe

Portable Server Thread Scheduling

- Portable server is currently select() scheduled
  - Support only thread scheduling in the future
  - Simplified design (my opinion)
  - Simplified debugging
  - Improved throughput and efficiency
  - Lower latency

Bonus Functionality

- We probably wont finish all of these but we'd like to
  - Client API Enhancements
  - Message Passing
  - Generalized array data
  - WAN Transparency
  - Enhanced Subscription Update Triggering
 - Virtual Circuit Enhancements
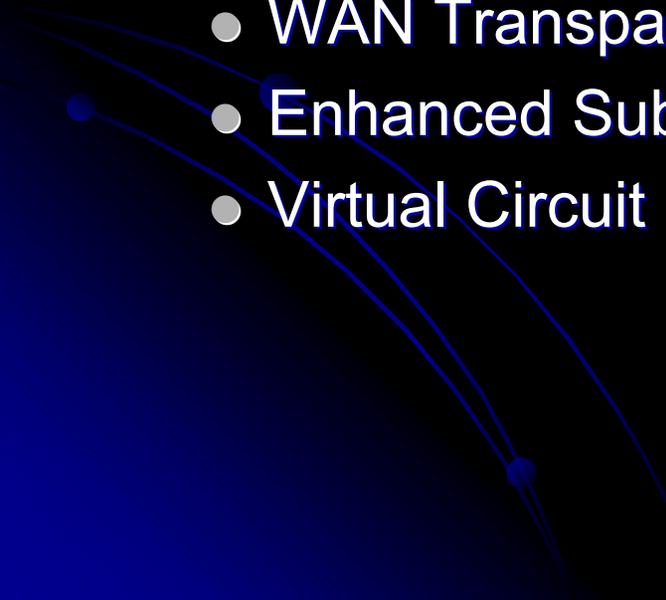
Client API Enhancements

- New next generation client API
  - Use of Data Access
- Server plug-ins can be accessed directly within client processes via procedure calls
- Simplified interface
- Original interface maintained for backward compatibility

Message Passing

- User defined types
  - Atomic updates of multiple parameters
  - Command completion notification
- Application expands set of named attributes
 - units, limits, process-passive, mesons per sec, etc
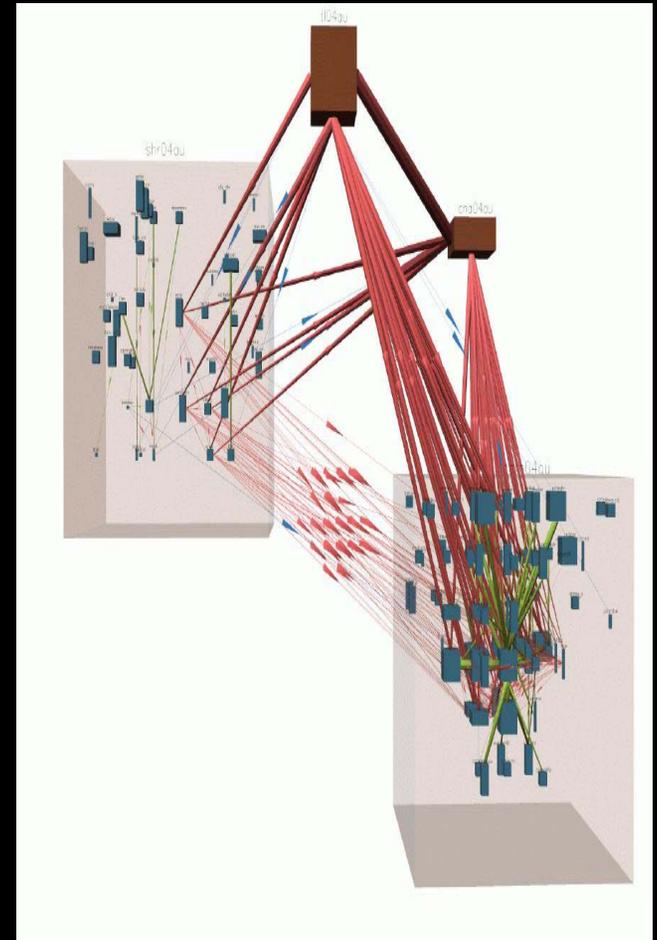
Generalized Array Data

- Client discovers N dimensional bounds of data

- Client addresses any hyper cube within bounds

- Eliminate string size limits

- Improved memory management for arrays
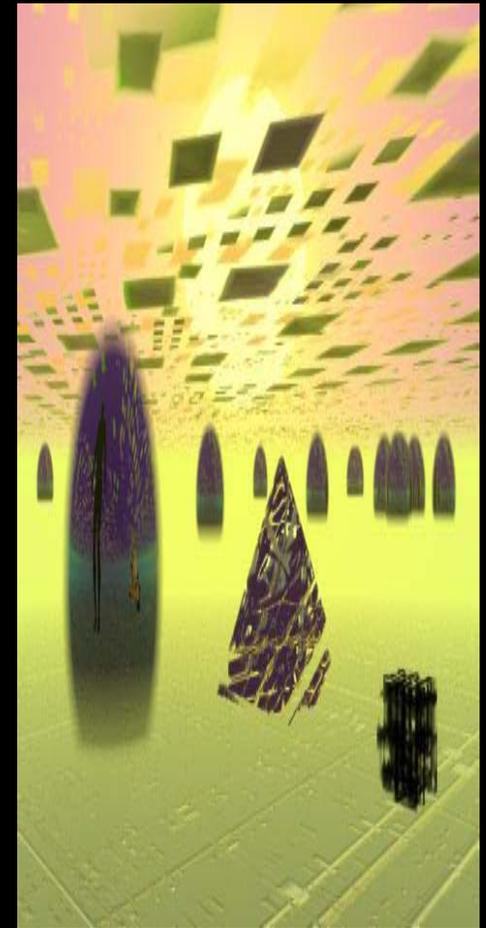
Enhanced Subscription Update Triggering

- New subscription dispatching mechanisms
  - Time based triggering
    - Maximum period
    - Minimum period
    - Fixed period
  - PV event triggered
    - Download simple trigger expression into the server
      - Possibly follow the example of the CALC record
  - Client specified event queue length
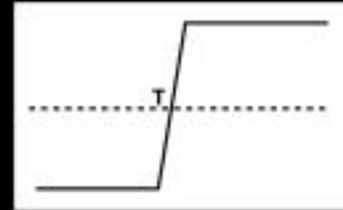
WAN Transparency

- Directory services
  - Wildcard queries
  - Resource location monitoring
  - Detection of name space collisions during resource installation
  - Simplified configuration
  - Is LDAP the solution?
- IP multicasting

LIC FEWAN Project
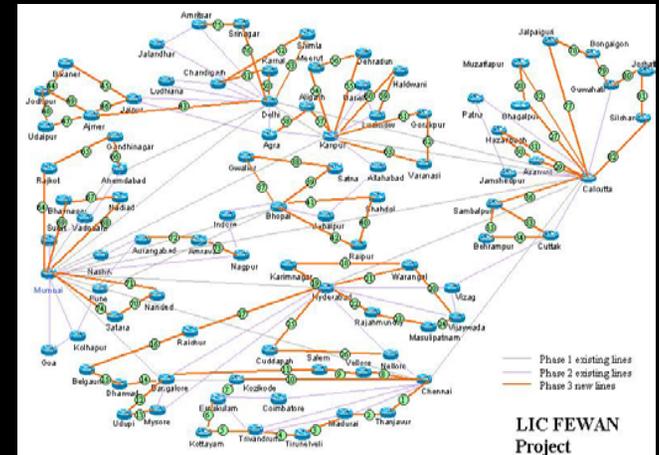
Virtual Circuit Enhancements

- Client specified priorities translated into IP circuit priorities
- Strengthened security (SSH, SSL, Kerberos etc)

Conclusions

- R3.14 is done

- R3.15 is nearly complete

- R3.16 – on our horizon