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LBT-AO Software Architecture

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System architecture

- CCD
- Slope Computer
- Reconstructor & mirror ctrl

Real time SW

Supervisor SW

Supervisor

To TCS (AOS)

Diagnostics & telemetry

Real time data stream
AdOpt data communication layout

LBT-AO Software Architecture
L. Fini, October 3rd 2006
Extremely modular
- Components (processes) are totally decoupled
- Components communicate via messages

Language independent
- Components can be coded in any language

Components may be added and removed at will
- E.g.-1: some of them will be needed in the lab only and will not be delivered at the telescope
- E.g.-2: “quick & dirty” components can be added/removed while the system is running
**MsgD-RTDB**

Message Dispatcher and (soft) Real-Time Database

- **Routes messages between components (MsgD)**
  - Uses Unix sockets
  - Custom protocol designed for efficiency
  - Centralized logging facilities
  - Simplified component architecture
  - Drop-in component scheme

- **Central repository for shared variables (RTDB)**
  - Unified access to information and data
  - Easy synchronization of tasks
  - Supports notification on data change

- **Shared memory buffer management**
  - Provides facilities to define and use O.S. provided shared buffers
  - Used for bulk data exchange (e.g.: diagnostics)
  - “Best-effort” and “off-line” data modes
Core Libraries

- **Msglib**
  - Message exchange between components and MSGD.
  - Ad Hoc protocol

  Built over msglib

- **RtdbLib**
  - Variable repository management
  - Create, read, write, delete, ownership
  - Goal: time efficiency

- **Buflib**
  - Shared buffer management
  - Creation, attach, detach
  - TBD: network access support
Thrdlib

- Threaded application support
  Threading necessary to manage complex message exchanges (e.g., unsolicited messages, variable change notification and the like) is hidden by the library.

- Message queues, handlers
  Easy implementation of applications which are both client and servers.

- Built over msglib, rtdblib, buflib
Supervisor Components

- BCUCtrl family
  - MirrorCtrl
  - SlopeCompCtrl
  - FrameGrabCtrl
  - TTCtrl

- Motor Controllers
  - SimpleMotorCtrl
  - StagesCtrl

- WFSCtrl

- Engineering UI's
  - Command based
  - Graphical

- IDL controller

- Mirror Diagnostics

- PyModules

- Scripts
A O S

• Interfaces AO-Sup to the TCS

• AOS functions: CAN 486f004, 486f006

• See next talk