EVLA Monitor & Control
EVLA M&C and e2e Software

Observing Tool

Proposal generation

SBs, including

Program block submission

Scheduling
Requirements

We now have requirements produced by the NRAO user community rather than Computer Division internally generated documents.

- EVLA e2e Science Software Requirements, April 15, 2003
- EVLA Data Post-Processing Software Requirements, July 3, 2003
- EVLA Array Operations Software Requirements, June 6, 2003
- EVLA Engineering Software Requirements, August 8, 2003
- EVLA Science Requirements for the Real-Time Software, to be started 9/2003
- Scientific Requirements for the EVLA Real-Time System, Sept, 2000
EVLA M&C Software

RTCAT output:
- goes to the M&C system
- is archived
- to the Quick Look Pipeline
- to the Astronomer's What's Up Screen

- Antenna gains
- Autophasing info
- pointing solutions
- focus determinations

Configuration and metadata:
- EVLA Antenna
- CMIBs
- CBE config & metadata

Real-Time Calibrator Analysis Tool (RTCAT)
- Shared Memory
- Formatter
- Archive Visibility Data

Monitor data, flagging, alarms:
- remote cmdns & monitor data

Archiver
- database (Oracle)

Proxy Server
- commands

Archival Visibility Data
- goes to the M&C system
- is archived
- to the Quick Look Pipeline
- to the Astronomer's What's Up Screen

EVLA Antenna
- Antenna
- LO
- Servo
- IF System
- DTS

Raw Antenna Data
- monitor data, flagging, alarms

Observing Layer
- real time observation queue
- activation event

Calculation (CALC)
- control scripts (jython)
- system parameters database (Oracle)

CMIBs
- TCP/IP ?

CBE config & metadata

Real-Time Data Store
- monitor data

Monitor data database (Oracle)
Antenna MIBs

- MIB – Module Interface Board
  - Refers to the TC11IB processor board that will be used to control antenna subsystems
  - 96 MHZ processor
  - 1.5 Mbytes on-chip RAM
  - 8 Mbytes Flash
  - SPI bus
  - GPIO (parallel I/O lines)
  - Ethernet Interface
Antenna MIB Software

• Quality of the MIB software is seen as crucial to the quality of the EVLA M&C software

• The MIB software consists of:
  – Systems software
  – MIB framework software
  – Module software
MIB Systems Software

- RTOS kernel
- Network stack
- Telnet server
  - Automatically activates the shell
- Shell
  - Shell provides memory display and memory modification
  - Shell is being extended to provide module specific commands & displays
- All of the systems software is up and running on MIB hardware
MIB Framework Software

- Common to all MIBs
- Device definition, instantiation, and initialization
- A data port, broadcasts monitor data
- A service port
  - Accepts time-tagged commands
  - Information services
- C++, ASCII text, XML, XPath (likely)
MIB Module Software

- HW module specific, chiefly written in C
- Responsible for
  - Device Control
  - Collection of monitor point values
  - Warnings, errors, alarms
- L301 (12-20 GHZ synthesizer) module software has been tested
- L302 (10.8-14.8 GHZ synthesizer) module software currently under development
Device Browser

- Generic, discovery-based, remote client application
  - Obtains a list of all devices connected to a MIB
  - Obtains a list and description of all monitor and control points associated with a device
- Can display any/all monitor point values for a device
- Can modify monitor point attributes
- Can be used to command devices
- Peek/Poke capabilities
- Multiplatform, written in Java
• At the low levels there is little commonality between the AMLA & EVLA M&C systems. The differences are driven by differences in the hardware.
• We hope sharing can occur at the higher levels of the two systems.
• Ralph Marson of ALMA and I have agreed to begin monthly meetings to explore the possibilities for sharing designs and code at the higher levels of the two systems.
Questions/Issues

- Are we headed in the right direction?
- Overall design?
  - Have we now positioned ourselves to produce a high quality overall design?