Correlator GUI

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Outline

• Top level WIDAR Correlator GUI
• Requirements for the testing of the board prototypes
• Concept of the observation configuration
• Station Board GUI – Demonstration
Correlator Top Level GUI

- MCCC 1: Active
- MCCC 2: Standby
- CPCC 1: Standby
- CPCC 2: Active
- Backend

- Log Server
- Boot Server

- Rack 001
- Rack 006
- Rack 100
- Rack 105
- Rack 110
- Rack 115

- Rack 002
- Rack 007
- Rack 101
- Rack 106
- Rack 111

- Rack 003
- Rack 008
- Rack 102
- Rack 107
- Rack 112

- Rack 004
- Rack 009
- Rack 103
- Rack 008
- Rack 113

- Rack 005
- Rack 010
- Rack 104
- Rack 109
- Rack 114

- Power Systems
- Heating and Cooling

- TGM 0
  - Board: 101-1-7
  - Status: Running
  - Time 0: 2007-123-09:45:34.000
  - Time 1: 2007-123-10:15:00.000
  - Time 2: 2007-123-09:30:00.000

- TGM 1
  - Board: 110-1-7
  - Status: Running
  - Time 0: 2007-123-09:45:34.010
  - Time 1: 2007-123-10:15:00.000
  - Time 2: 2007-123-09:30:00.000

- Observation
  - Start Time
  - Status: In progress
  - Accepted
  - Rejected

- Antenna
  - EVLA01
  - EVLA02
  - EVLA03
  - EVLA04
  - EVLA05
  - EVLA06
  - EVLA07

- Board
  - EVLA01: 01, 001-0-0, 001-0-1
  - EVLA02: 02, 001-0-4, 001-0-5
  - EVLA03: 03, 001-1-0, 001-1-1
  - EVLA04: 04, 001-1-4, 001-1-5
  - EVLA05: 05, 002-0-0, 002-0-1
  - EVLA06: 05, 002-0-2, 002-0-3
  - EVLA07: 06, 002-0-4, 002-0-5
Components

• Some subsystems, such as MCCC, CPCC, Backend, Log Server, should be always present in the system, and are always shown in the GUI.

• The number of racks that contain Station, Baseline, and Phasing Boards may vary.

• Racks that contain Station, Baseline and Phasing Boards may be added as they are detected.

• A new rack is added to the GUI screen when a newly detected board is located in a rack that does not already exist on the screen.

• A new rack can be added manually. For example, when user wants to configure in advance boards that are not currently not active, or not yet installed.
Functionality

• Color is used to indicate component status.

• Double click on the component opens a window with configuration parameters and status for the selected component.

• Time: When M&C GUI (and system) is fully implemented, time on the main screen should be read-only. For testing purposes, user may be allowed to change time via the main Correlator GUI.

• Observation builder will be used to configure observations.

• Antenna to Station Board connections: In the fully implemented system, antenna table in the Correlator GUI should be read-only.
IP address: x.y.rack.crate+slot+type

For this example:
STB_1 00 000 001
STB_2 00 001 001
STB_3 00 010 001
STB_4 00 011 001
BLB_1 00 100 010
TGM_1 00 111 100
Test Configuration

Antenna Monitor & Control

Model Server

Test GUI

Model Server configuration

Baseline Board

Station Board

Backend

Server
Single Rack Configuration

WIDAR Correlator - Top level system view (configuration for the on-the-sky prototype testing)

- Main

  - MCCC 0: Not present
  - MCCC 1: Not present
  - CPCC 0: Not present
  - CPCC 1: Not present
  - Backend

- Log Server

- Boot Server

- Rack 001

- Power Systems

- Heating and Cooling

- Time
  - TGM 0
  - TGM 1
  - Board: 001-0-7
  - Status: Running
  - Time 0: 2007-09-45:34:010
  - Time 1
  - Time 2

- Observation
  - Start Time: 2007-09-45:33:20
  - Status: Unknown

- Antenna
  - Quad: 01
  - #Boards: 1
  - Board 1: 001-0-0
  - Board 2: 001-0-1

Sonja Vrcic, April 3, 2006 WIDAR Correlator GUI
Boards

- GUIs for the Baseline Board and Station Board are in the final phase of development.
- Station Board and Baseline Board GUIs are not included in this document - the actual implementation will be demonstrated.
- Similar interface will be *(should be)* provided for the other correlator subsystems.
Prototype Testing: Configuration

• In fully implemented system, the correlator will receive configuration as a series of messages that define:
  – basebands / subbands, and
  – required products.

• Sophisticated software will be provided to translate high-level observation description to correlator configuration. Translation may be performed in two (or more) steps.

• For the testing of the prototype boards (including on-the-sky test) each Station and Baseline Board must configured individually.

• To expedite configuration process GUI interface allows user:
  – to copy configuration from one board to the other.
  – to copy configuration from one component (chip) to the other.
  – to save board configuration as an XML file.
  – to re-load configuration from the file and modify it.
Observation

- Observation may be defined as a list of parameters and files that contain configuration for the boards and other elements of the system.

- In addition to the Station Board and Baseline Board configuration, observation may contain the time setting, models, antenna to Station Board connections, etc.

- Observation can be saved as an XML file.

- Observation file is a repository that contains references to all the files that are needed to configure and run an observation.

- Observation file may include references to files that are not created and interpreted by the Correlator GUI.
Observation File

• For each file user must specify:
  – File name (path)
  – IP address (or name) of the target system and
  – Type.
• When “save observation” is selected, an XML element is created for each specified file, as follows:
  <File destination="123.23.1.009" type="StationBoard" fileName="stb3.xml" />
  <File destination="123.23.200.001" type="AntCfg" fileName="ant3.xml" />
• If GUI does not recognize file type, it does not read the content of the file. When “configure” command is selected, the file name is forwarded to the target system.
• This scheme does not require the GUI to be updated each time when a new file type is introduced by one of the correlator subsystems.
Test GUI: Observation Configuration

**Main Menu:**
- Save to file
- Read from file
- Configure
- Close this window

**Observation Configuration**

- **Observation ID:** MyFirstObservation
- **TGM Time:** 2007-123-10:10.00.000
- **Start Time:** 2007-123-10:10.00.000

**Comment**

This text is added to the output XML file as comment.

**File list**

<table>
<thead>
<tr>
<th>Type</th>
<th>Board ID</th>
<th>Dest. IP Address</th>
<th>File Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>StationBoard</td>
<td>1-0-0</td>
<td>192.139.1.1</td>
<td>myFirstObs/Stb2BB16Sb-0.xml</td>
</tr>
<tr>
<td>StationBoard</td>
<td>1-0-1</td>
<td>192.139.1.9</td>
<td>myFirstObs/Stb2BB16Sb-1.xml</td>
</tr>
<tr>
<td>StationBoard</td>
<td>1-0-2</td>
<td>192.139.1.17</td>
<td>myFirstObs/Stb2BB16Sb-2.xml</td>
</tr>
<tr>
<td>StationBoard</td>
<td>1-0-3</td>
<td>192.139.1.25</td>
<td>myFirstObs/Stb2BB16Sb-3.xml</td>
</tr>
<tr>
<td>BaselineBoard</td>
<td>1-0-4</td>
<td>192.139.1.34</td>
<td>myFirstObs/Btb2BB16Sb1prod64lags.xml</td>
</tr>
<tr>
<td>TIMECODE Gen</td>
<td>1-0-7</td>
<td>192.139.1.60</td>
<td>myFirstObs/Tgm-0.xml</td>
</tr>
<tr>
<td>AntennaCfg</td>
<td>n/a</td>
<td>192.139.200.4</td>
<td>corrProto/AntennaToStb-4Ant.xml</td>
</tr>
<tr>
<td>BackendCfg</td>
<td>n/a</td>
<td>192.139.200.4</td>
<td>myFirstObs/Cbe4Stb2Bb16Sb1prod.xml</td>
</tr>
<tr>
<td>StationBoard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BaselineBoard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PhasingBoard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TIMECODE Generator</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BackendCfg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AntennaCfg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CoefficientsFile-12</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Status

- Top level GUI and configuration of observation – design proposal
- Baseline Board - to be completed in April 2006
- Station Board - to be completed in April 2006
- TIMECODE Generator (test version) – Completed
- Phasing Board – board development postponed
- Graphical representation of the correlator output – design completed
- Monitor & Control functionality for the following subsystems has not been integrated:
  - Station Board Fiber Optic Receiver Module (FORM)
  - Backend
    - Model Server (not part of the correlator, will be needed for on-the-sky testing)

• FORM and Backend provide each own CLI.
  - To allow for automatic re-configuration, CLI commands could be specified in the text file and added to the observation file.
The End