NRC · CNRC

Corrélateur WIDAR Correlator

Software Status

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Expanded Very Large Array

Introduction

This presentation is focused on the status of software which is needed for the testing of the board prototypes and for preparation for On The Sky testing.

Other software issues are not addressed.

Software requirements for On The Sky testing are still to be defined. This task has been assigned to Bryan, Bill and Sonja.

CMIB

- Baseline Board Module Access Handlers are ready for testing.
- Station Board Module Access Handlers are ready for testing. Some updates are required for the Delay Module MAH. Timing chip MAH has been updated, needs to be tested.
- Baseline Board and Station Board s/w is running on CMIBs in NRAO and DRAO labs and is ready for the initial testing of the prototype boards (programming FPGAs, read/write FPGA registers, CRC error checking and reporting, FPGA configuration via GUI).
- Station Board output data format has been defined (XML schema).
- Functionality of the Baseline Board and Station Board software above Module Access Handlers needs to be defined in more detail and will be discussed at this meeting.

Test GUI

- Communications infrastructure is Web/REST-based using HTTP servers and clients.
- Software libraries provide:
  - XML processing
  - Number conversion and formatting
  - Synchronous / asynchronous client/server communications
  - Streaming data from the server
  - Reusable GUI components
- Programmers Guide has been published
- Extensive documentation in JavaDoc format is available
- Baseline Board GUI is ready for testing.
- Station Board GUI need to be updated to use the latest version of the Kevin's libraries and to implement changes in FPGA implementation. Will be ready for the testing.

Correlator Backend

- Correlator Backend software necessary for the initial testing of the prototype boards is available (with some exceptions that will be addressed later).
- Current version of the CBE software generates output products as ASCII text (as defined in the Baseline Board test plan).
- User manual that describes the current implementation is available, needs minor updates.

- ALMA/EVLA output binary format for the backend output products needs to be defined. The progress to be discussed later at this meeting.

Real-Time Data Display (RTDD)

- The document Requirements and Functional Specifications has been published and reviewed. New version will be released in a month.
- RTDD GUI infrastructure is in place.
- Uses the package JFreeChart which is in public domain.
- Station Board CRC Error histogram has been used to develop the core functionality.
- CRC Error display will be completed in two weeks.
- Station Board displays will to be completed by the end of November.
- Work on RTDD for the CBE output products will start after Dave's vacation. (Hopefully by that time format of the backend output products will be defined).

Other

- Miscellaneous software modules that produce coefficients for filters, delay module test vector, etc.
- Test Pattern Generator on FORM (Fiber Optic Received Module)

New “Operating” Mode

With the arrival of hardware the whole software team will have to divide the time between support and maintenance of the software used for testing and development of new features and systems.

Current & Future Development

- Station Board: real-time software beyond and above Module Access Handlers, including the user controlled state machine that enables user to start and stop tests using GUI or CLI.

  Will be needed for the testing of the Station Board prototype when the initial tests are completed.

- CMIB/board functionality beyond FPGA configuration and monitoring. Need to define board parameters and XML schema, at least for the “test” version of CMIB/GUI software.

  Current version of the Station Board GUI creates an “envelope” element stationBoard. Need to define board parameters (attributes). The same applies for the Baseline Board.

Current & Future Development

- Work on the WIDAR Correlator system-level GUI has started.
- The screens for the so called “Test Builder” and “Test Executor” have been defined.
- Need to define XML Schema for communication between the GUIs and CMIBs – *will be discussed at this meeting*.
- Need detail specification for the Intelligent Diff.
  - *Intelligent Diff will be needed soon, even before the system level GUI is completed.*
- To be addressed in future:
  - All WIDAR subsystems should be integrated in the WIDAR GUI (Backend).
  - Is FORM assumed to be part of the correlator or is it part of an antenna?
  - All utility (software) modules should be integrated in the WIDAR GUI.

Current & Future Development

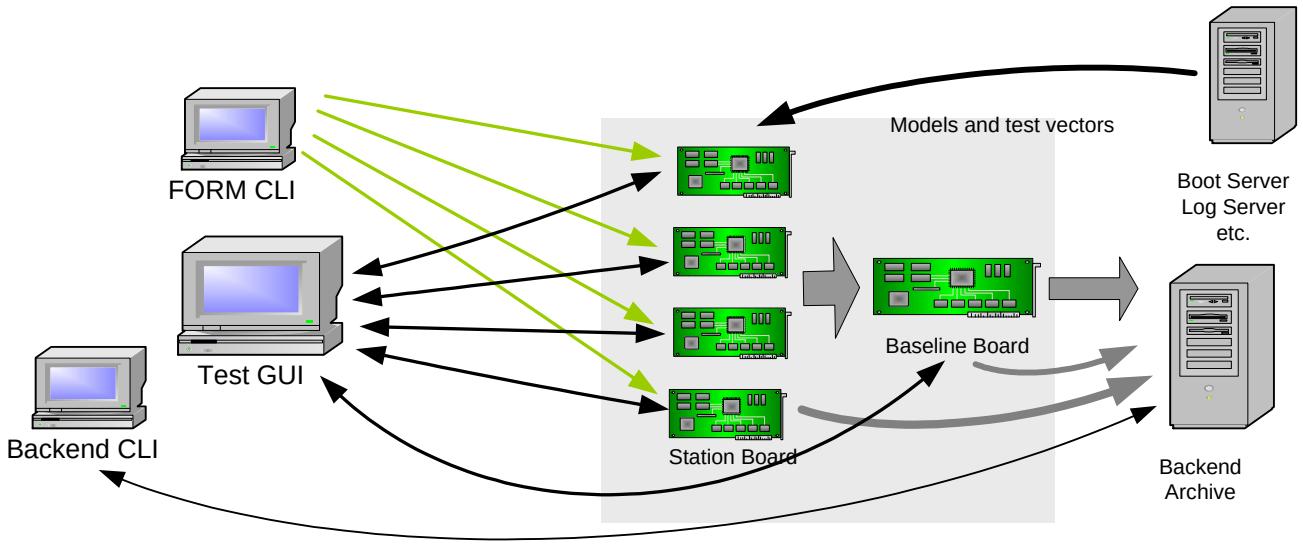
- Format for the Correlator Backend output products (binary data format) has to be defined.
- Need to define priorities for further development of the Correlator Backend software.

- CALC:
  - Need to define user interface: content, format.
  - Should we integrate CALC user interface into WIDAR Test GUI?
  - Content of delay models and tone extraction models is defined in the “VCI Protocol Specification”. Need to include XML schema.

On The Sky Testing

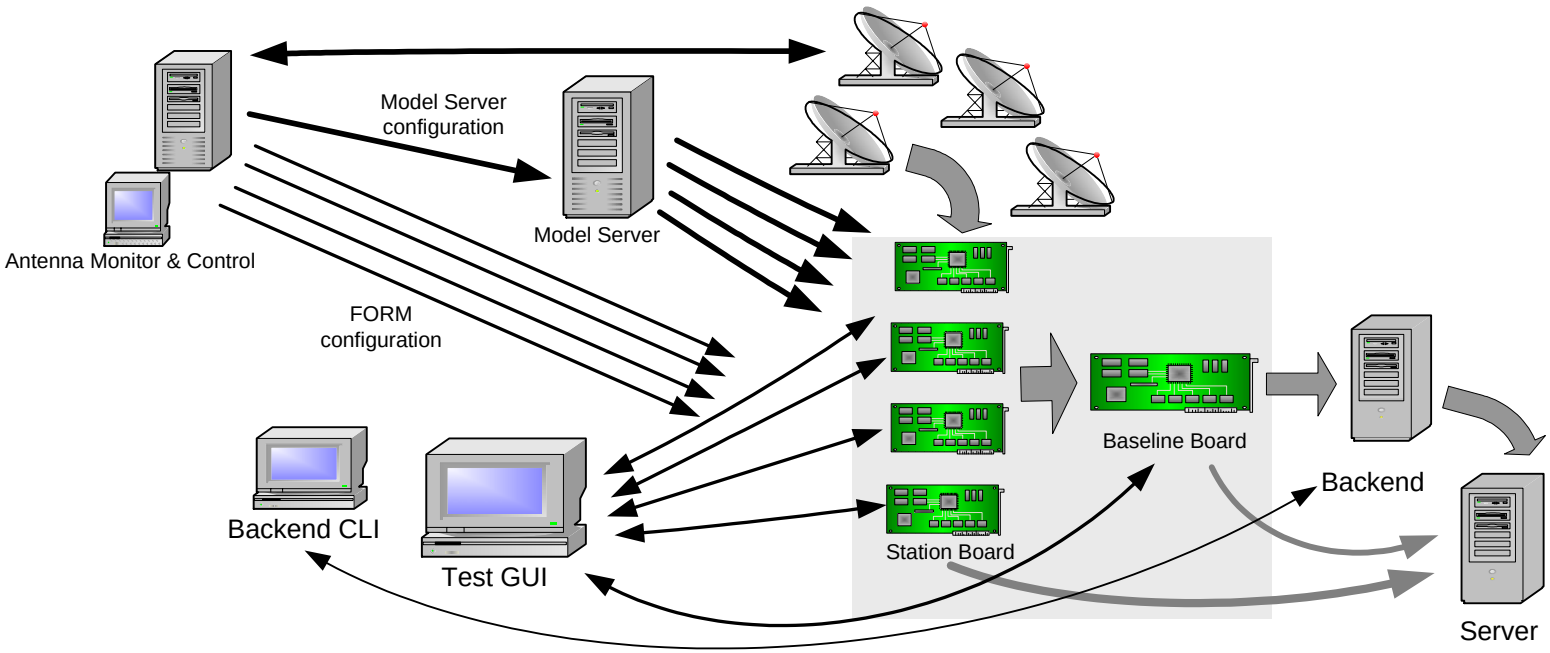
- Work on Configuration Mapper is under way.Will be interrupted to update Station Board GUI.
- Configuration Mapper will be available for the On-The-Sky testing.
- Need to define software requirements for On-The-Sky testing.

Prototype Correlator
Test Setup In Penticton

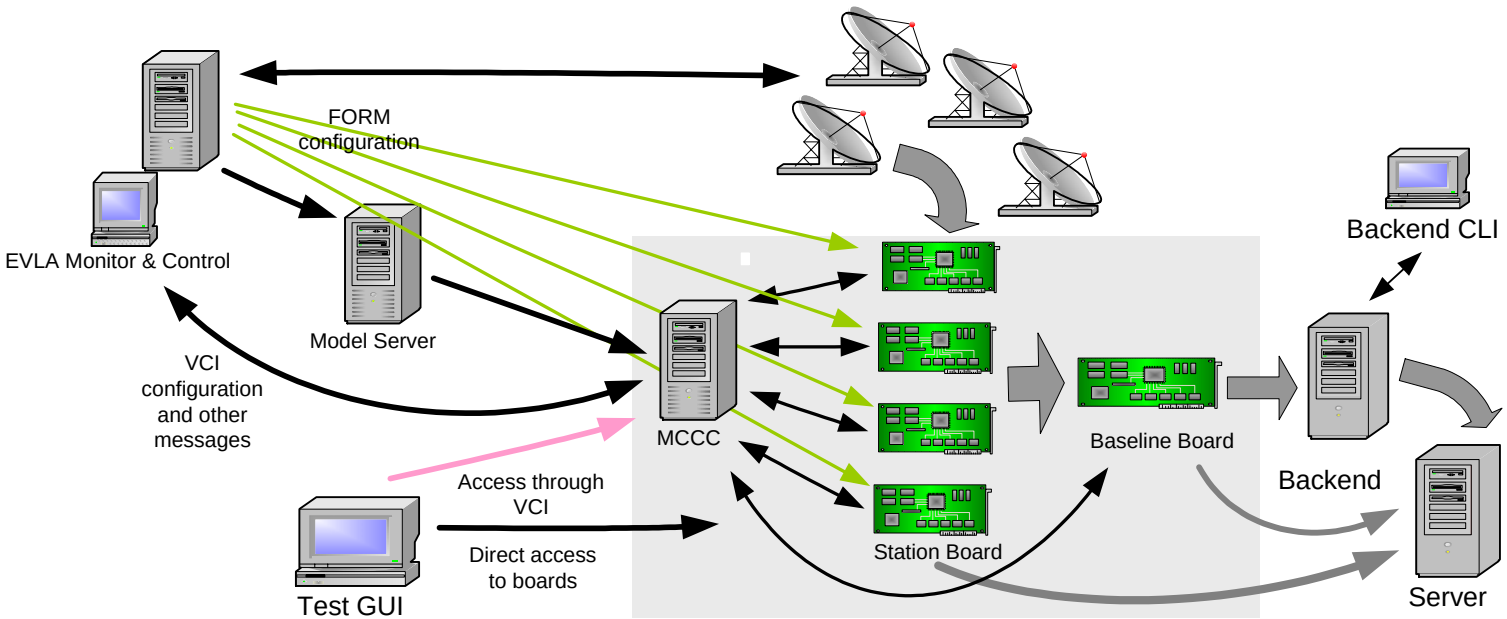


Prototype Correlator

Initial Setup for Hardware Testing



Prototype Correlator
On The Sky Testing – Full Configuration

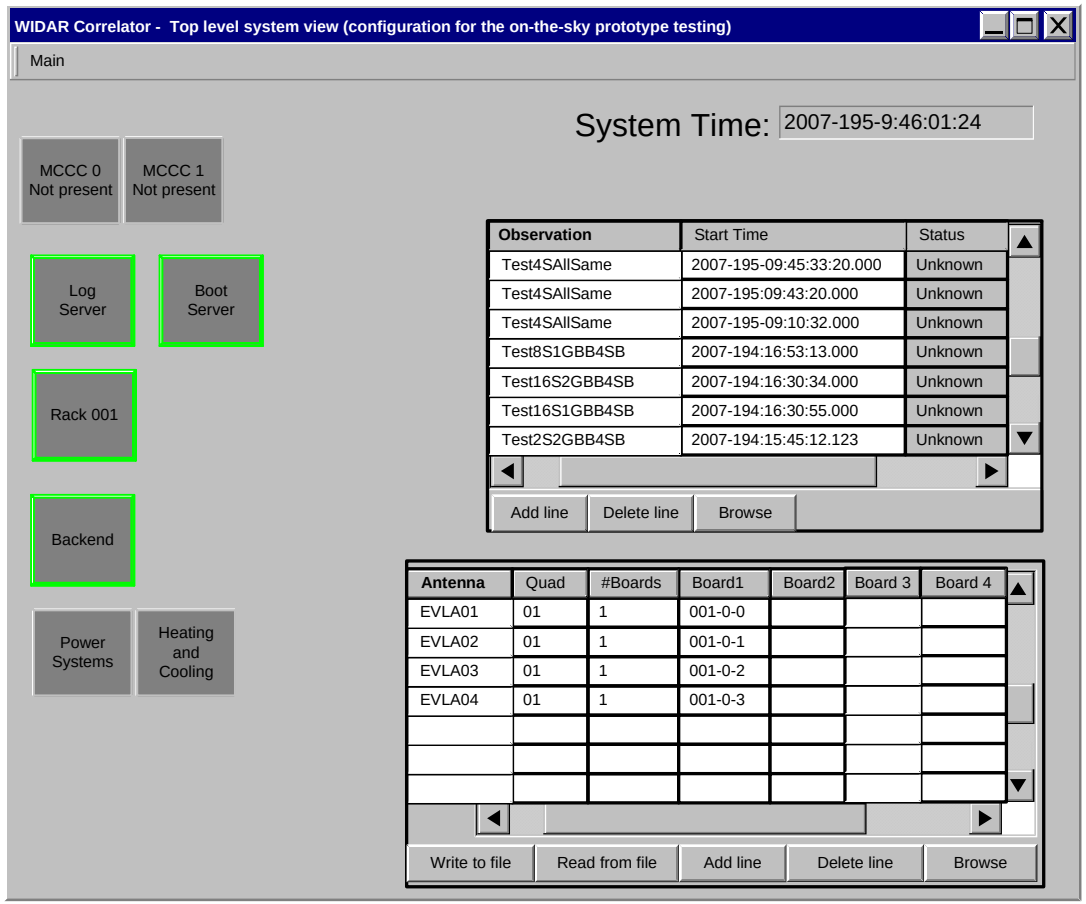


The End

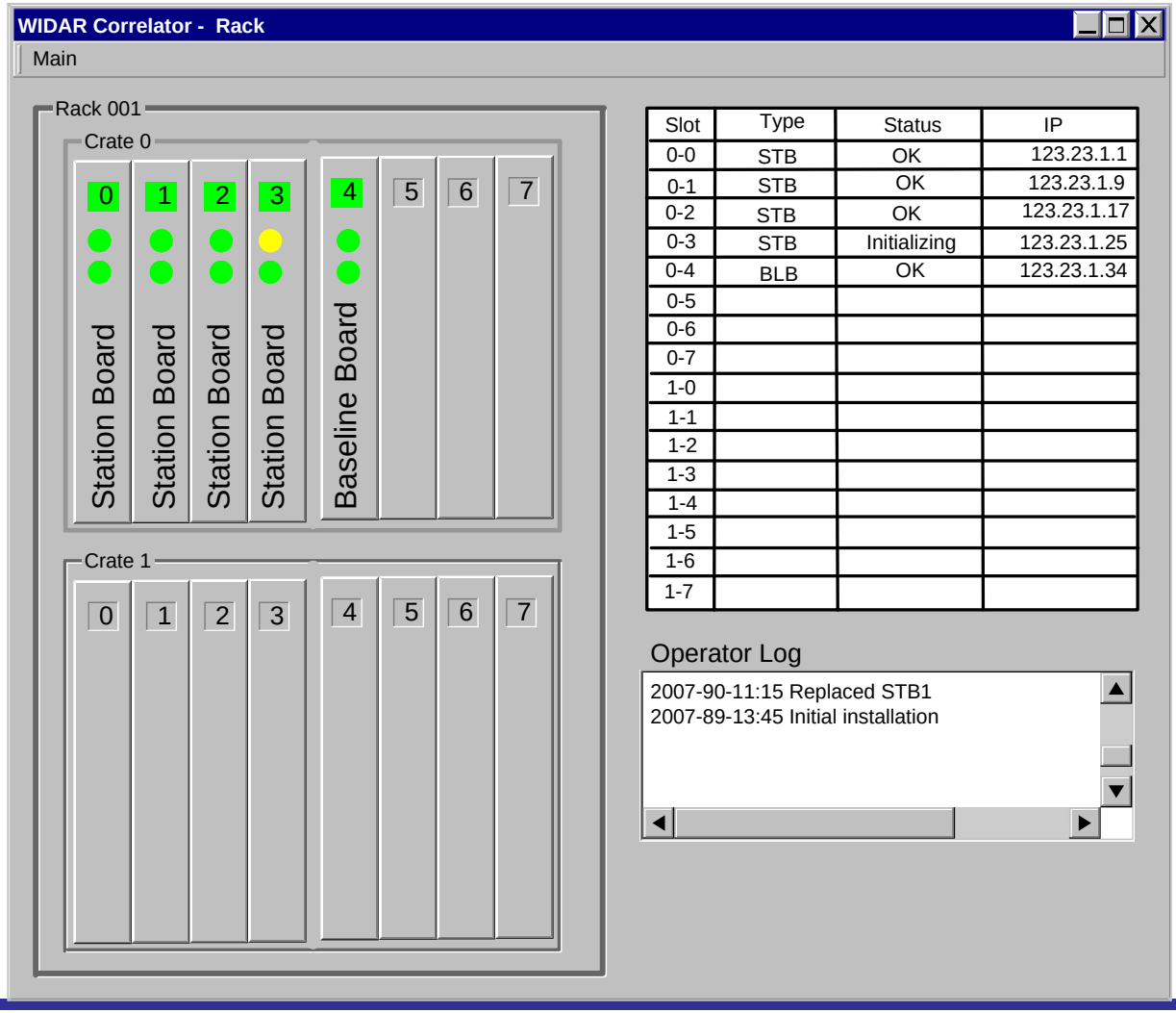
GUI

Top level GUI

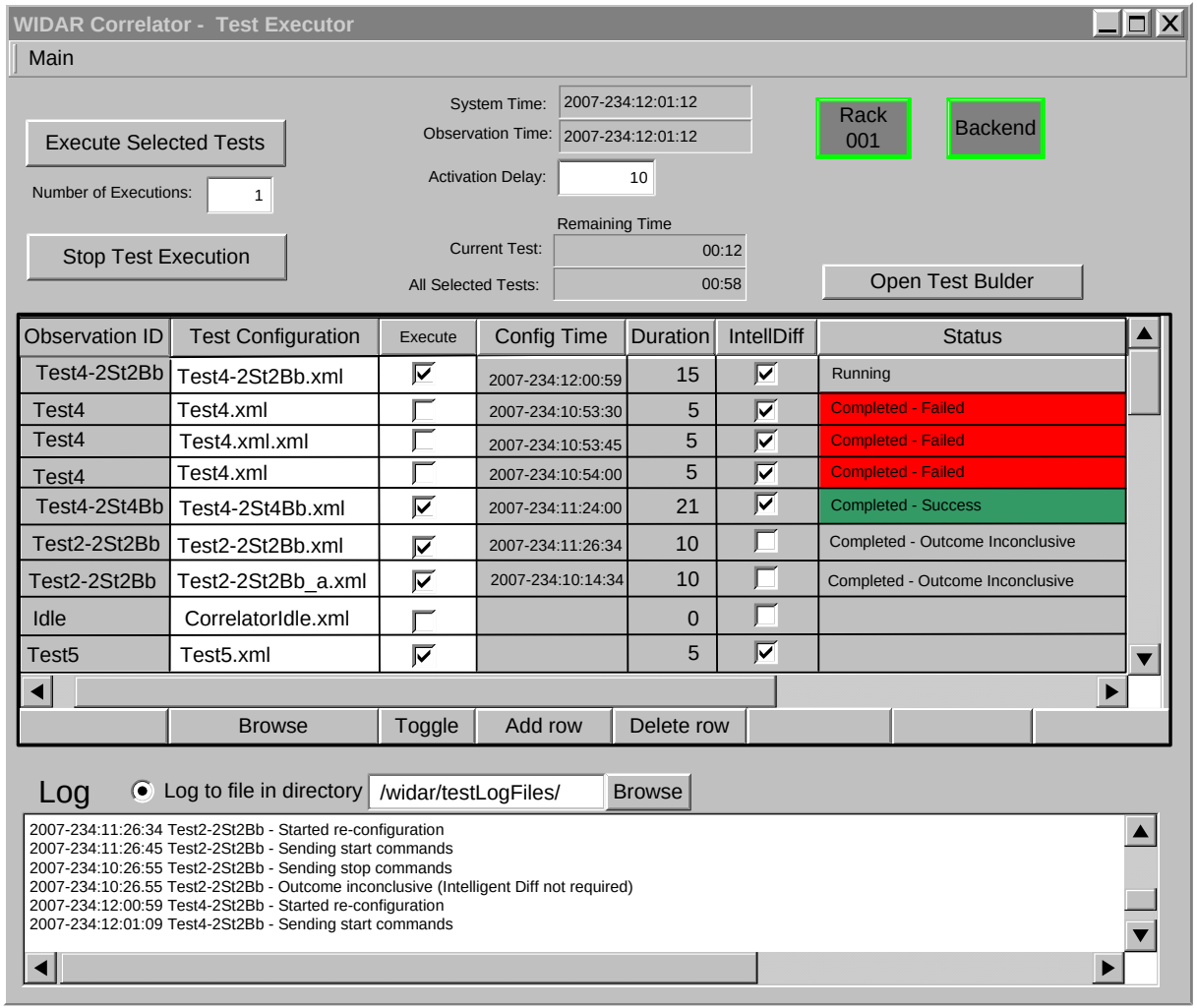
For Single Rack System (Prototype Correlator)



WIDAR Rack GUI



Test Executor



Observation Builder