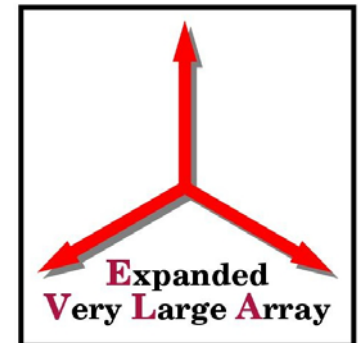




VCI Overview

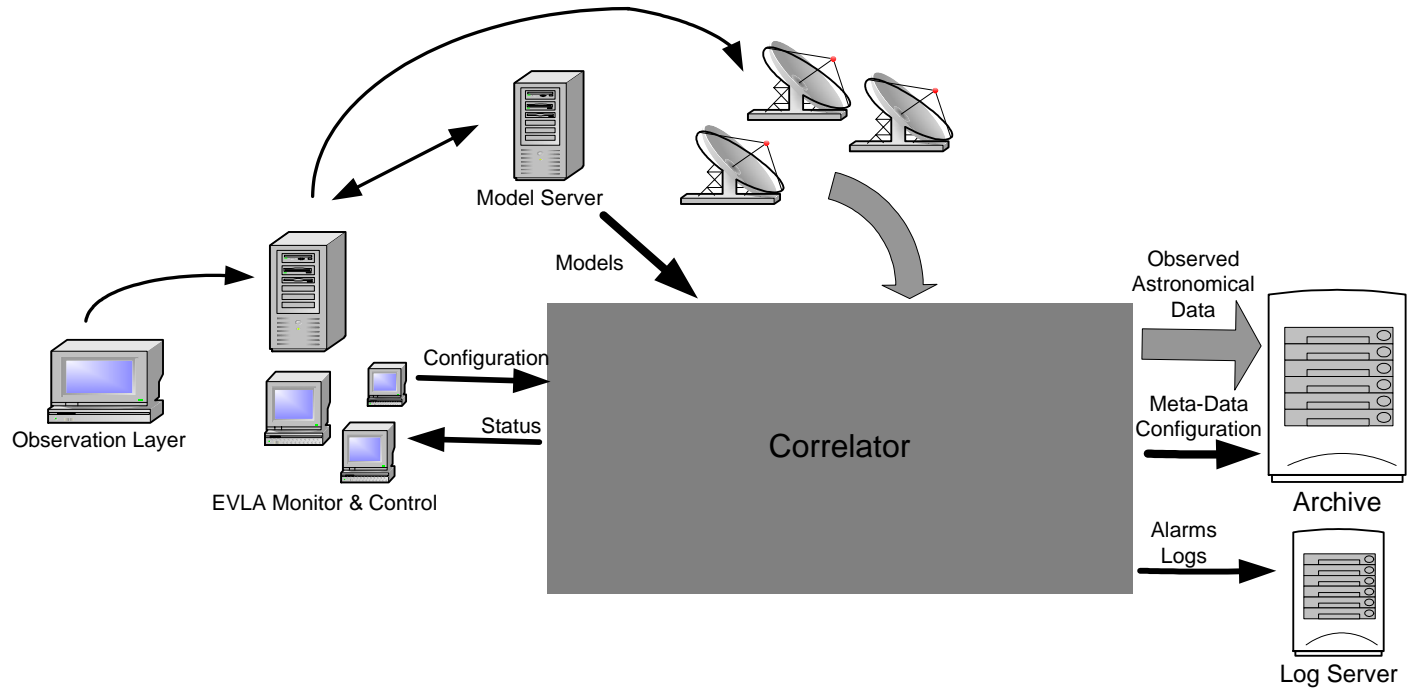
Sonja Vrcic



Introduction

- Virtual Correlator Interface (VCI) is machine-to-machine interface.
- Whenever possible, correlator output is XML encoded (human readable), however, it is assumed that between the user and correlator exists additional layer of software which presents information in more suitable form.

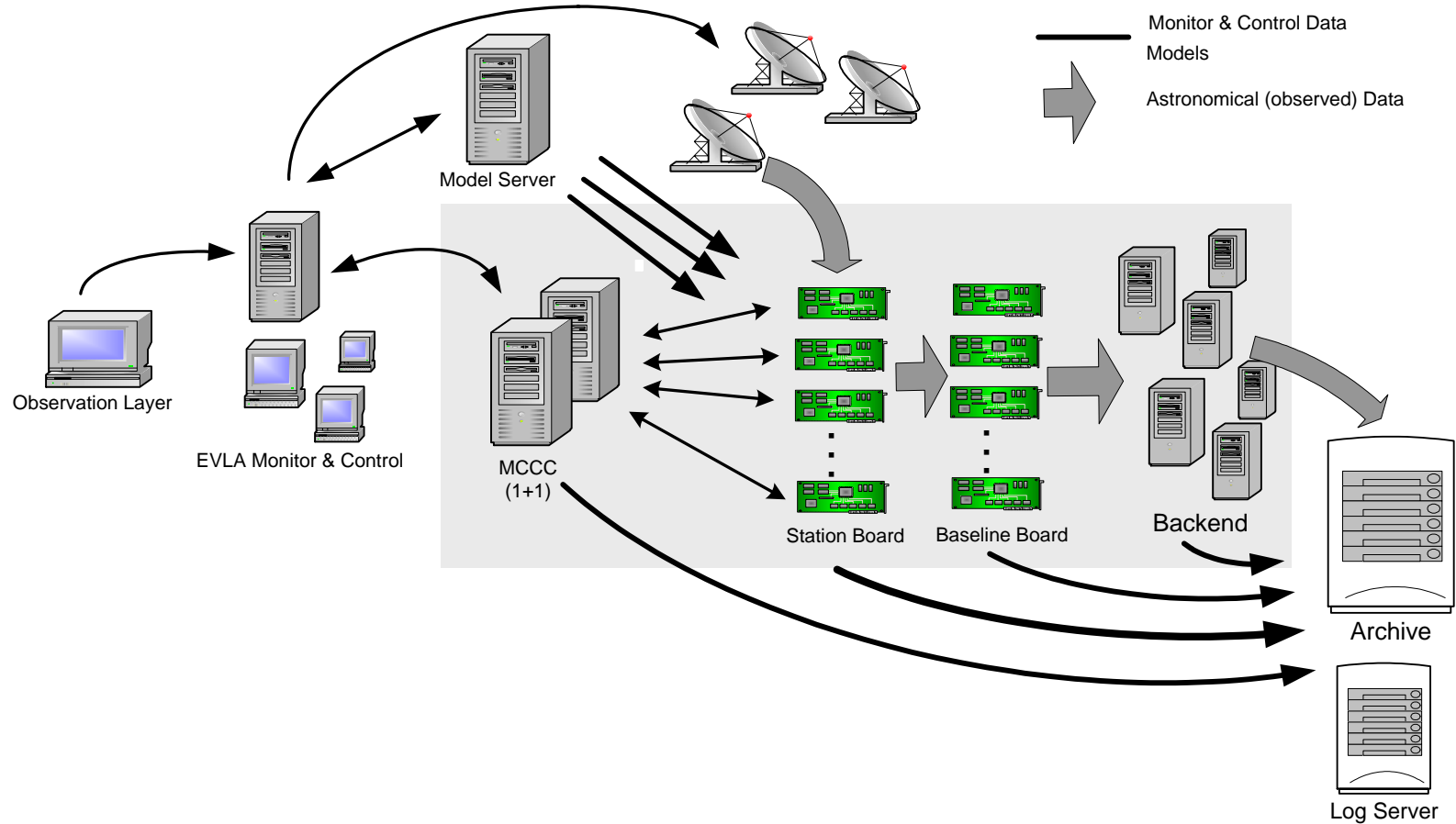
Gray Box



Input / Output

- Input :
 - From EVLA Monitor & Control (Executor):
 - Configuration (system parameters & observation)
 - From Model Server:
 - Delay and TEX Models (real-time input data)
- Output:
 - Backend Output Data
 - Wideband Correlator Products
 - Raw filter output (a.k.a. radar mode data)
 - Archived meta-data (configuration, auxiliary operational data)
 - Alarms / Logs
 - Status Reports

Data Flow



Input : Configuration

- Type:
 1. Observation configuration, describes input data and required products.
 2. System parameters, e.g. alarm reporting threshold, IP addresses, file name of the log file, etc.
- Message content defined in the document “VCI Protocol Specification”, DRAO A5201N0000
- Configuration of an observation (scan) is specified as a sequence of XML messages that describe Basebands, Subbands, and required products.
- The correlator has a single point of access (MCCC).
- Configuration requests and commands are acknowledged
- The document describes session oriented communication, however, if that is perceived as unnecessary overhead, the correlator (MCCC) could accept all requests, regardless of origin.

Input: Models

- Message content defined in the document “VCI Protocol Specification”, DRAO A5201N0000
- The correlator receives two types of models :
 - Delay models
 - Tone Extractor Phase Models
- XML encoded.
- Messages are not acknowledged. One way communication.
- If models are not received as expected, alarm is raised.
- Models are sent directly to Station Board CMIBs (bypassing MCCC).

Backend Output

- Current version of the Correlator Backend software generates binary files.
- Initial proposal defined in “EVLA Correlator Output Data Format”, DRAO A25205N0000, specifies human readable headers in binary files.
- Considered encoding techniques:
 - ASCII header,
 - XML header,
 - MIME (e-Mail) format,
 - XOP (XML Optimized Packaging) format
- ALMA Science Data Model (ASDM) uses MIME.
- To be discussed later today.

Wide Band Correlator (WBC) Products

- Each Station Board is equipped with a wide band correlator.
- Product integration is performed by Station Board CMIB software.
- WBC products are transmitted via the same interface as meta-data.
- For the testing purposes, WBC products are Hex encoded binary data.

Example:

```
<StbWbcTable observationId="MyFirstObservation" rack="15" crate="1" slot="7"
  wallTime="2006-8-17T09:30:57.500" integTime="1000" lags="1024" bw="2048000000"
  startTime="2006-8-17T09:30:47.000" endTime="2006-8-17T09:30:57.000" >
  <StbWbcProd pPath="0" pBand="0" lPath="0" lBand="0">
    A543218976A1C3FED56934BCE3452300NotFullContent0012345
  </StbWbcProd>
  <StbWbcProd pPath="0" pBand="0" lPath="1" lBand="0">
    ABC3453210765AAB474332544BCDEF00NotFullContent0012345
  </StbWbcProd>
  <StbWbcProd pPath="1" pBand="0" lPath="0" lBand="0">
    BCEFAA321076554A109348544BCDEF00NotFullContent0012345
  </StbWbcProd>
  <StbWbcProd pPath="1" pBand="0" lPath="1" lBand="0"/>
    123AABCAAB345FAEDF0765544BCDEF00NotFullContent0012345
  </StbWbcProd>
</StbWbcTable>
```

Radar Mode Output Data

- Output of a single Station Board Filter may be saved as binary data.
- Functionality is supported for all the Station Board filters, limitation is imposed due to high volume of output data.
- Unlike Backend output, Radar Mode output data shares the same network resources with archived data and logs.
- File and record headers in human readable format are provided, as for the Backend output.

Archived Meta-Data

- Integrated auxiliary data (e.g. stats counts) is periodically off-loaded and stored into XML encoded file.
- At the beginning of an observation (scan) and after a configuration change, Station Board and Baseline Board configuration are archived in the same output file where meta-data is stored.
- Document “EVLA Correlator Output Data Format”, DRAO A25205N0000, specifies content and provides examples.

Alarms and Logs

- Logs and Alarms are XML encoded.
- Proposed content and format is specified in DRAO Memo22.
- Will be discussed tomorrow.

Status Reporting

- Requirements have not been defined, however, it is assumed that the EVLA Monitor & Control System must have access to the correlator status.
- Document “VCI Protocol Specification”, DRAO A5201N0000, describes initial proposal which includes both periodical (subscription based) and on demand status reporting.
- The exact content of status reports will be defined as work on the correlator and M&C software progresses.
- Status reports are XML encoded.
- *Depending on the overall EVLA M&C system architecture, subscription may be replaced by multicasting.*

Status

- ✓ Content and format of the configuration of observations have been defined.
- ✓ Content of the output data is known.
- Format for the binary data (backend output and radar mode data) is still to be defined. Will be discussed later today.
- Due to work on the test GUIs work on the VCI has been postponed.

The End