



# Software – M&C

Bryan Butler  
(for Bill Sahr)



# Major Subsystems



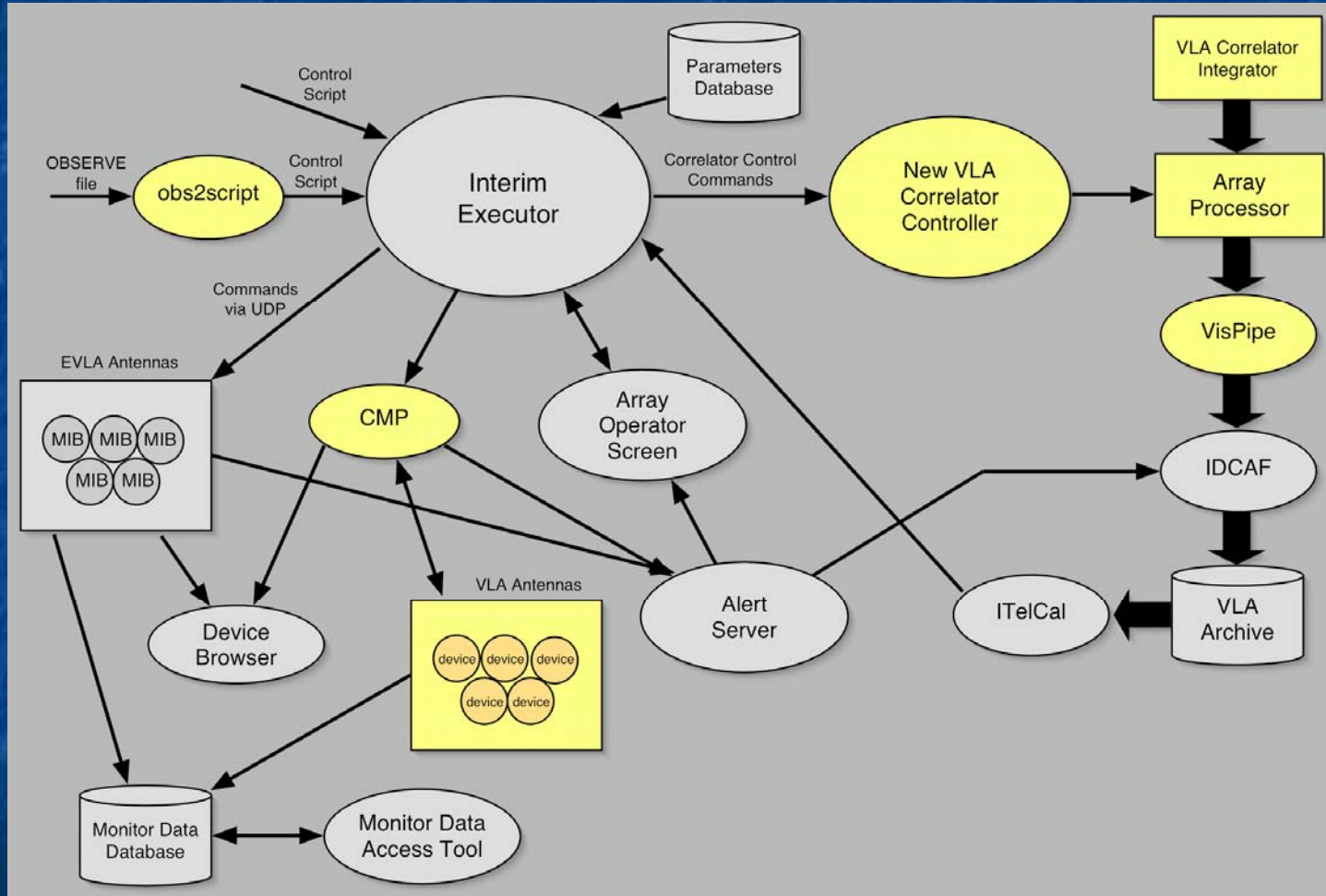
- Executor (with parameters database)
- Antenna M&C
- Correlator M&C (includes visibility data storage)
- Alerts and logging
- Monitor data storage and retrieval
- Metadata Capture and Format
- Telescope Calibration
- Monitoring GUIs



# Transition System

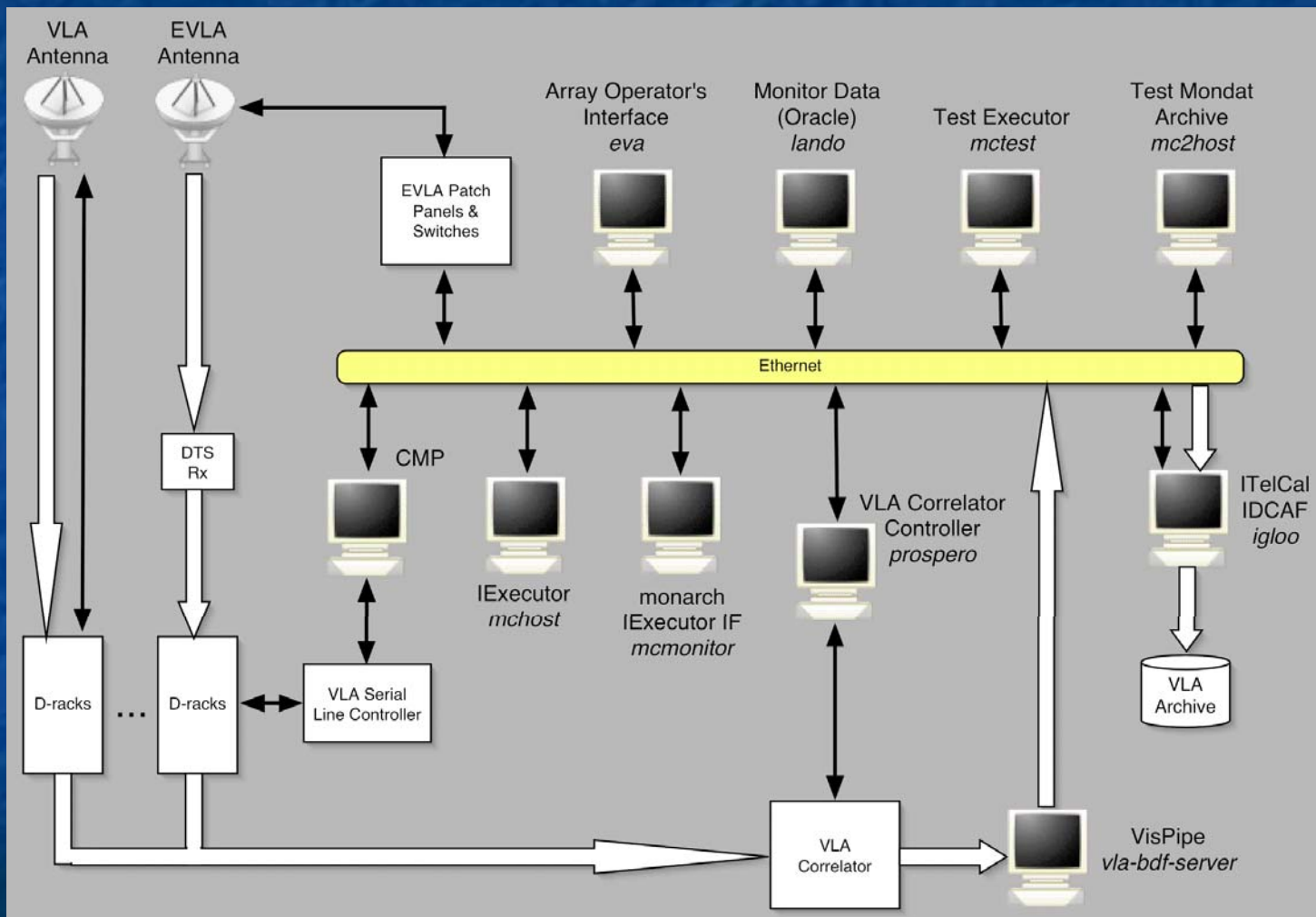
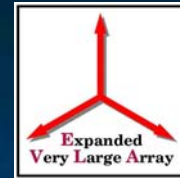


- In broad terms, there will be two major versions of the EVLA Monitor & Control System – a Transition System and a Final System
- The Transition System bridges the gap between the old Modcomp-based VLA Control System and the final version of the EVLA Monitor & Control System, while maintaining operational capabilities
- The Transition System will be responsible for controlling a wide array of old and new hardware – EVLA Antennas, VLA Antennas, the VLA Correlator, and the prototype WIDAR correlator
- The Transition System will incrementally shift its software architecture toward the desired architecture of the final system





# Deployment Diagram





# Transition System Milestones



- ✓ Support for EVLA antenna hardware development
- ✓ Use of EVLA antennas in scientific observations
  - Monitor and control of EVLA antennas
- ✓ Retirement of the Modcomp-based VLA control system
  - Monitor and control of VLA antennas
  - Monitor and control of VLA correlator
  - Distribution of VLA correlator output within EVLA M&C
  - Formation & writing of VLA format archive records
- Support WIDAR prototype correlator
- Implement architecture of final system



# Modcomp Retirement Milestones



- Monitor and control of VLA antennas – end of Q2 2006
- Monitor and control of VLA correlator – Q4 2006
- Distribution of VLA correlator output – Q4 2006
- Formation & writing of VLA format archive records – Q1 2007
- Parallel operation & testing – Q2 2007



# Transition System CDR



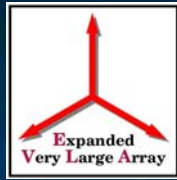
CDR of M&C transition system held Dec. 5-6 2006.

- **Passed with flying colors**
- General assessment
  - Requirements for the EVLA transition M&C system are complete
  - Architecture selected for the system design will satisfy those requirements
- Specific recommendations
  - Improve the design for network security (plan in place)
  - Improve the design for system alerts (implemented)
  - Update the design of the virtual correlator interface (done)
  - Make the use of the network protocol (UDP) for data transmission robust to packet loss (under advisement)





# Array Operators Screen



Array Operator Page [build date: 02.16.2006]

File View Screens

SCRIPTS

Active

Queued

History

- ✓ POLCAL\_000 558polc-000.evla
- ✓ 558evt.OBS 558evt-000.evla
- ✓ sysptc2h-part.evla sysptc2h-part.evla
- ✓ 557m858.OBS 557m858-000.e...
- ✓ AM857\_002 557m857d-000...
- ✓ robtest7 Xband

Job ID = 557m858.OBS  
 Submitted By evlaops@10.80.100.253  
 Script 557m858-000.evla  
 Status Normal Completion  
 Source 01:37+331  
 RA 01:37:41.299  
 Dec 33:09:35.133  
 Next Source  
 FrontierId 10GHz  
 Antennas ea13 ea14 ea16 ea18

ANTENNAS

ea13	260.870	92.812		✖
ea14	379.001	92.819		✖
ea16	319.867	88.844		✖
ea18	378.967	88.004		✖

VLA

TIME

Year.Day 2006.105  
 MJD 53840.037697  
 UTC 00:54:17  
 IAT 00:54:50  
 LST [60559] 07:16:00

WEATHER

Wind Speed 7.08  
 Wind Direction 253.80  
 Temperature 20.00  
 Barometer 784.40  
 Dew Point -1.26  
 RMS Phase 5.38

ALERTS

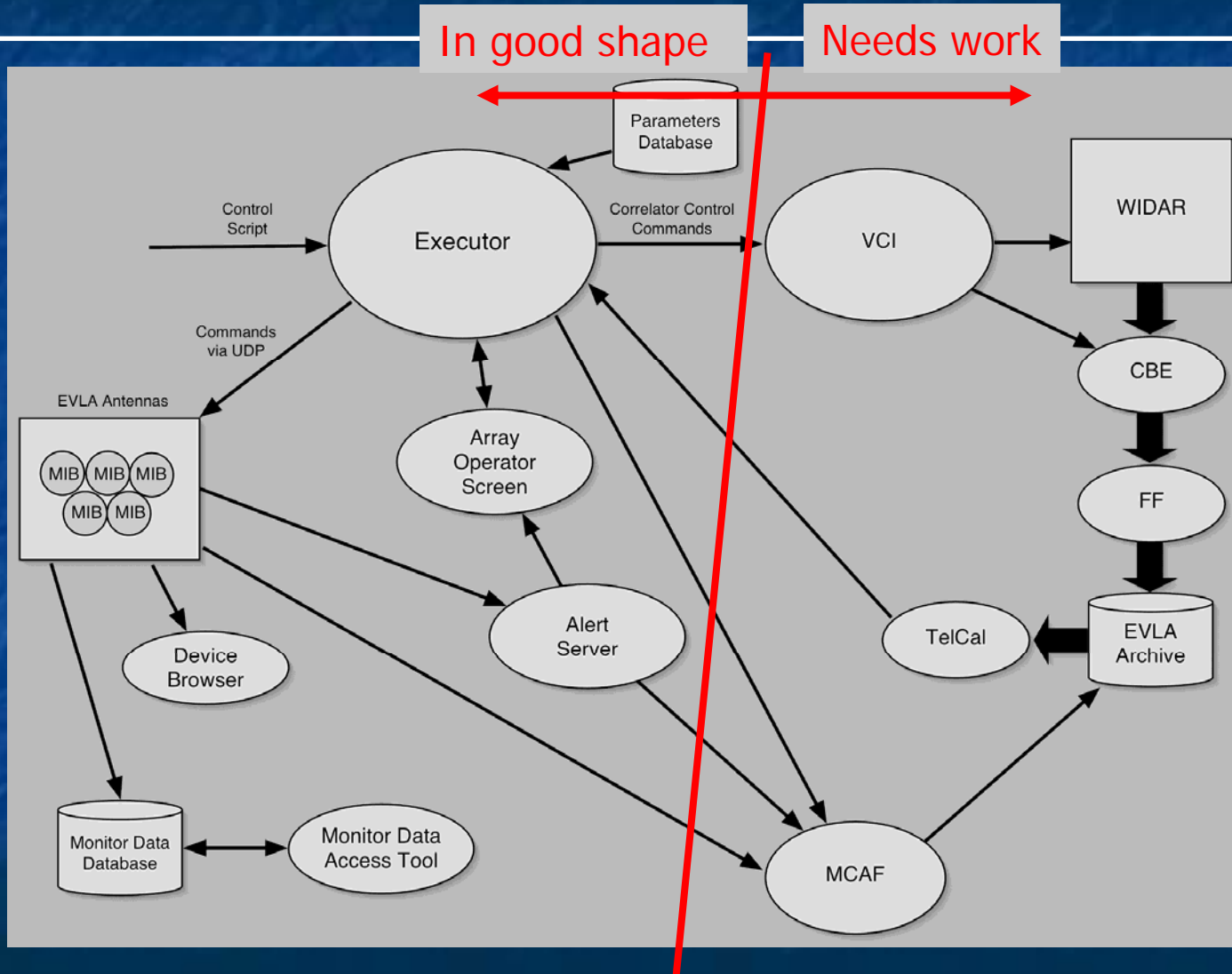
- 20:07:49 99 I301 refpwr
- 00:00:00 99 I301 m\_lock
- 00:00:00 99 I302 c\_lock
- 00:00:00 99 I302 m\_lock
- 15:42:59 99 I301 m\_lockh
- 20:34:45 99 I302 heartbeat
- 00:00:00 98 I302 refpwr
- 17:01:58 99 I302 refpwr
- 18:54:28 99 mib softwareresets
- 18:35:02 98 mib softwareresets
- 00:00:00 16 I302 heartbeat
- 23:23:20 98 I302 m\_lockh
- 23:54:16 99 I302 m\_lockh
- 20:19:52 99 I301 heartbeat
- 00:00:00 99 I301 c\_lock
- 20:34:47 99 I302 c\_lockh
- 00:00:00 14 I302 heartbeat

CONSOLE

```
18:13:13 Apr14: Executor->Job '558pevlb.OBS' completed.
558pevlb.OBS 53839 181312 Exit Array
558pevlb.OBS 53839 181312 Ending execution
558pevlb.OBS 53839 181312 Class edu.nrao.evla.observe.Array in File Array.java at 454
558pevlb.OBS 53839 181312 Class org.python.util.PythonInterpreter in File PythonInterpreter.java at -1
558pevlb.OBS 53839 181312 Class org.python.core.Py in File Py.java at -1
```



# Final System





# Subsystems Requiring Attention



- Correlator M&C System
  - The interaction between the VCI and the rest of the EVLA M&C system is a complex one (we have begun work on this)
  - The collection and writing of data by the CBE and FF needs development (we have also begun work on this)
- Metadata Capture and Format - we have IDCAF, but work on MCAF is in early stages
- Telescope Calibration - we have ITelCal, but work on the final TelCal is in early stages