

# EVLA Correlator Network Configuration

Rough Draft (February 21<sup>st</sup> 2008)

This document and the attached drawing represent a proposed network configuration for the EVLA Correlator after installation. There are varying level of details within the drawing. Those areas that must be completed prior to receipt of the Station and Baseline racks in June of 2008 are in greatest detail. Areas such as the Correlator Back-End (CBE) are in lesser detail.

The textual portion of this document is primarily a key into the drawing. It does not attempt to address scientific implications of limitations implied by the design though it does attempt to point out where those limitations exist.

The drawing *roughly* corresponds to the final physical layout and placement of racks but should not be considered 'to scale'. Labeling of rack components, particularly Station and Baseline racks does not conform to the DRAO standard for labeling. The drawing can be changed at a later today if such labeling is desired.

Notes are identified on the drawing as a red circle surrounding the notes number. The notes are as follows:

- (0) Drawing key. Solid lines represent single cables, dashed lines represent bundles of 16 or 32 cables. Color coding is for visual representation only and shouldn't be taken to represent the actual cables color. Except where otherwise noted cables are all Category 6 twisted pair operating at 100Mbit to 1Gbit.
- (1) 100 Mbit twisted pair connection from Station Board CMIB and FORM (aka deformatter) cards. Pig tail from Station rack connects to a *proposed* Panduit CP48BLY modular patch panel (Appendix A.1) housing Panduit RJ-45 Cat-6 couplers. 32 total cables from each Station rack (16 CMIB, 16 FORM). Cables run to network rack (5) and connect to Cisco 3560 network switch. One switch per rack.
- (2) 100 Mbit twisted pair connection from Baseline Board CMIB cards. Pig tail from Baseline rack connects to a *proposed* Panduit CP48BLY modular patch panel (Appendix A.1) housing Panduit RJ-45 Cat-6 couplers. 16 cables from each Baseline rack (16 CMIB). Cables run to network rack (5) and connect to same switch as corresponding Station Rack cables.
- (3) 1000 Mbit (Gbit) twisted pair connection from Baseline Board LAG (visibility data) interface. Connects to same patch panel as in (2). 16 cables from each Baseline rack (16 LAG). Cables run to network rack (6) and connect to Cisco 6509 network switch. Cables from all 8 racks are distributed evenly across six 1 Gbit 48 port line cards.
- (4) 1000Mbit (Gbit) twisted pair connection from Baseline Board VLBI interface. Cables connect to same patch panel as in (2). 16 cables from each Baseline rack (16 VLBI). Eventual destination for these cables is currently undefined.
- (5) CMIB/FORM board network rack houses 8 Cisco 3560T-LC 10/100 Mbit network switch with Gbit uplinks. Each switch houses CMIB and FORM board connections from one Station Rack and one Baseline Rack. Each switch is connected to Cisco 6509 network switch in network rack (6).

- (6) Correlator room and CBE distribution switch consists of a Cisco 6509 chassis with redundant Supervisor line cards and seven 1 Gbit 48 port line cards, two or more boot servers to support network booting of CMIBS and 2 CPCC/MCCC control computers. Each 1 Gbit line card has dual 20Gbit interconnects to 6509 backplane. Up to 22 (128 LAG / 6 line cards) LAG interfaces are connected per line card distributed such that no more than 11 are using one of the 20Gbit interconnects. Remaining Gbit interfaces on those 6 line cards connect to CBE nodes, again evenly distributed. Traffic is uni-directional (from Lag to CBE node). As configured the switch should be able to handle full 1Gbit traffic switching from all LAG interfaces to all CBE nodes. Remaining (7<sup>th</sup>) 1Gbit 48 port line cards provides connections for Cisco 3560 switches (5), boot servers and CPCC/MCCC computers. Each supervisor engine is connected via 1 Gbit fiber (8) to EVLA core switch outside of the correlator room.
- (7) Correlator Backend (CBE) racks. Drawing shows 3 racks of 32 nodes (96 total nodes) and one Cisco 3560G-48TS 10/100/1000 Mbit 48 port network switch per rack. Each node is connected to Cisco 6509 switch (6) for LAG data and to Cisco 3560G-48TS switch for monitor and control. Each Cisco 3560G-48TS switch is connected via 1 Gbit fiber (8) to EVLA core switch outside of the correlator room.
- (8) EVLA core switch to correlator room switch interconnects. 1 Gbit multi-mode fibers providing connectivity to EVLA core switch and ultimately VLA, AOC and other networks.

The proposed design should provide the necessary bandwidth to/from CMIBs, FORM boards, LAG interfaces