



Output Formats Part II

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General Approach



- Key: make sure it's readable ⇒ CASA
- Compare, define, reconcile
 1. Compare EVLA requirements with ALMA
 - Reviewed by CASA & ALMA
 - ALMA, EVLA formats should be as similar as sensible
 2. Define EVLA format
 - "Living document" maintained by developer
 - Changes reviewed by CASA & EVLA
 3. Reconcile with final ALMA format
 - Much later (years)
 - EVLA format is an earlier version of final ALMA one



Philosophy



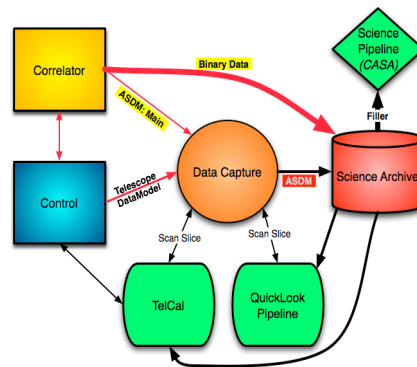
ALMA

- Minimize burden on direct correlator output
- Minimize data volume
- Minimal processing by Data Capture
- CORBA
- Multiple data streams per subarray

EVLA

- Maximum overlap with ALMA
- Ease of software trumps data volume issues
- Packets
- Single data stream
- Retain full flexibility: channelization, flagging, pulsar phase bins
 - Use WIDAR efficiently
 - Unknowns of processing (e.g., RFI)

ALMA Data Capture



- Only direct correlator outputs are **ASDM:Main** and **Binary Data** (visibilities)
- Rest of correlator information (e.g., correlator setup) is **passed via Control** and the **ATDM**



Some differences



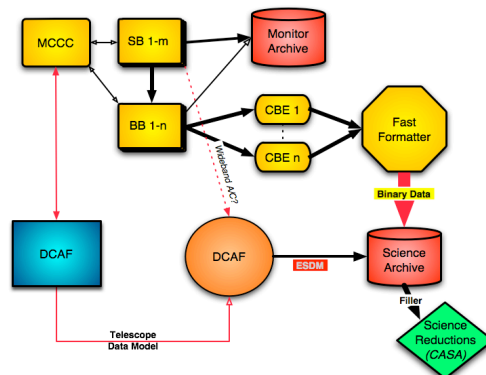
•WIDAR flexibility

- Sub-bands
- Channelization
- Integration times
- Pulsars
 - Phase bins
- Stitching in post-processing

•Finer flagging

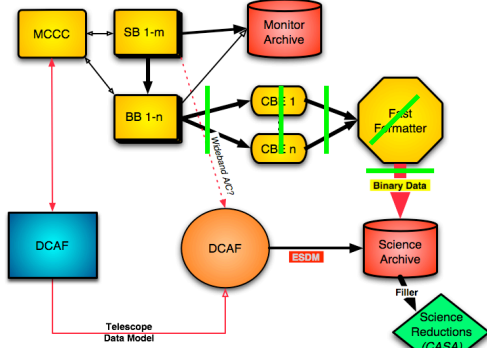
- Sub-bands, channels
- Weights (integration times)
- Time centroids

WIDAR Correlator Overview



- Fast formatter produces **Binary Data** (visibilities), *entirely from baseline boards*
- Who produces **ESDM:Main**?
- How much do we pass back through M&C?
 - Wideband A/C?
 - Correlator setup?
 - Times & durations?

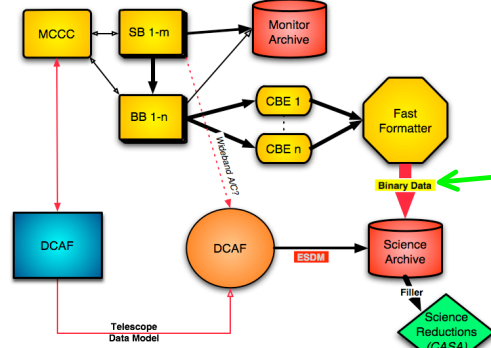
WIDAR Correlator Overview



M.P. Rupen Correlator Face-to-Face Meeting 31 Oct 2006

- What are the data rate throttles?
 - From BBs
 - Within CBEs
 - From CBEs to FF
 - Within FF
 - From FF to Science Archive
- Current spec is only the last of these

WIDAR Correlator Overview

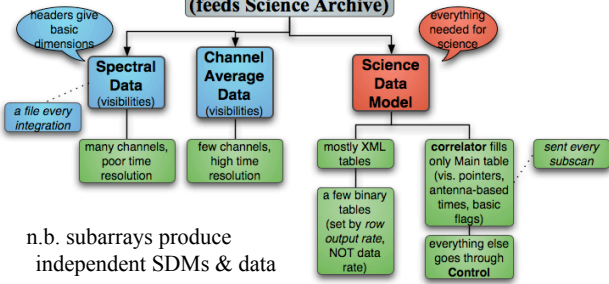


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- Scientific spec is for data rate of visibilities
- What about other data products?



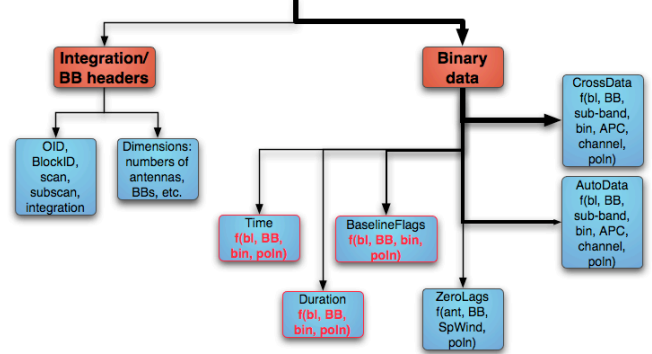
ALMA Output Data (feeds Science Archive)



n.b. subarrays produce independent SDMs & data streams

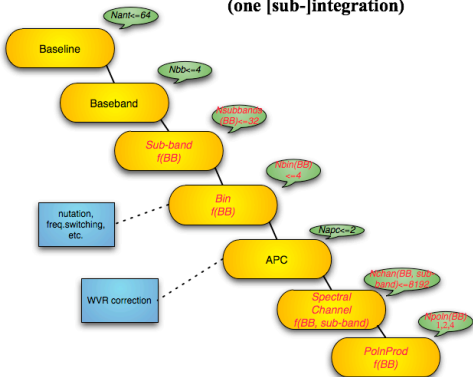
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ALMA Spectral Data

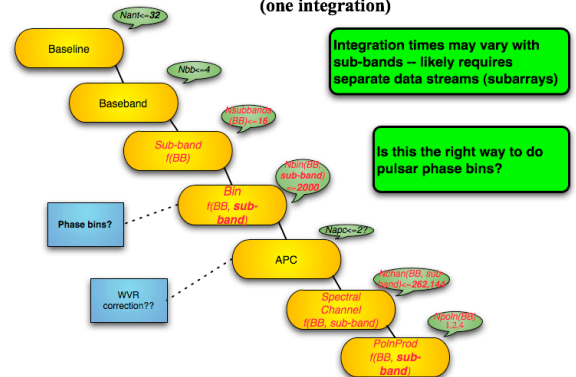


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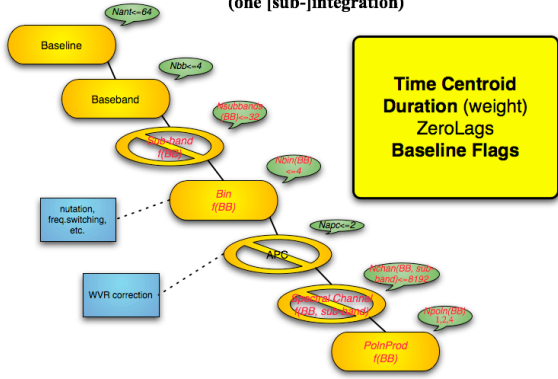
ALMA Output Binary Data (one [sub]-integration)



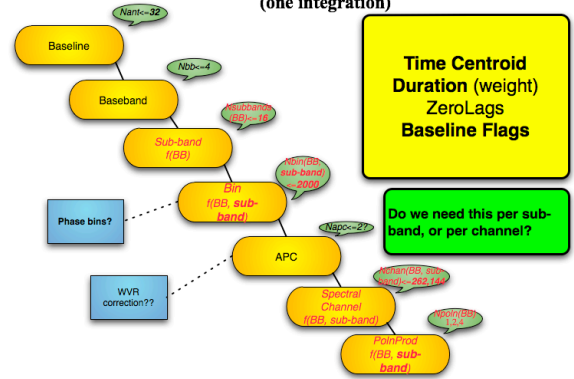
EVLA Output Binary Data (one integration)



ALMA Output Binary Data (one [sub-]integration)



EVLA Output Binary Data (one integration)



Status



- BDF comparison/revision (*Rupen*)
 - To ALMA/CASA by next Tuesday
 - Should converge easily, given much on-going discussion
- BDF definition (*Pokorny/Rupen + McMullin*)
 - Based on ALMA doc.
 - Revised to be understandable and definitive
 - First version in November?



Status



- SDM comparison/revision (*Rupen*)
 - Based on ALMA spreadsheet, with EVLA columns added (what we need, where it comes from)
 - Includes definition of “minimal SDM”
 - Target: to ALMA/CASA by end of November
 - Uncertainties include
 - Number of tables
 - XML vs. binary format (depends on frequency of dumps)
 - N.b. also defines Monitor vs. Science Archive
- ESDM definition (*Butler??/Rupen + McMullin*)
 - Should be a simple extension of comparison document
 - Target date is 1feb08, to allow decision on IDCAF-2



Questions



- Binary data format
 - Are subarrays ok for handling different int.times per sub-band?
 - Do we need flags/times from WIDAR per sub-band or per channel?
 - Are we happy with phase bins?
 - How do we handle lost lag frames?
 - Are we happy with one data stream?
 - Subscan headers: should this go through the correlator?
- SDM
 - EVLA extensions
 - “Minimal” ESDM
 - Science vs. monitor archive split
 - Is there a spot for everything we need?
 - Split between XML and binary tables
- Separate spigots ok?
 - Phased array outputs
 - VLBI data
 - “radar mode” data



More Questions



- SDM: Correlator vs. M&C
 - How much goes straight through the correlator?
 - How much gets sent back from the correlator to M&C?
- Post-processing
 - Can we use CASA to translate for AIPS? Stay tuned...
 - How do we get information from the Monitor Archive? (e.g., gain tables)
 - Must ensure multiple SDMs get filled to single MS, or at least allow easy cross-calibration etc.
- Data rates
 - Trade-off between visibilities and flags/times/weights
 - What are the bottlenecks?
- Uncertainties in high-level design lead to uncertainties in format specification
 - Put another way, adopting ALMA’s formats implies adopting some features of ALMA’s high-level design
- IDCAF-2: SDM or UV-FITS?



Science vs. Monitor Archive



-
- Science archive:
SDM+visibilities
 - SDM: everything
needed to do science
 - Tsys - state counts
 - Wideband A/C
 - Phase cal extraction
 - Monitor archive:
almost everything else
 - CMIB outputs
 - Alarms