Demo SP-838

Real-time signal displays & metrics for the PSI (QA displays)

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Assessment of MeerKAT and ASKAP real-time signal displays (YAN-286, YAN-289)

Input document: Review of proposed list of SDP plots related to signal integritydisplays for commissioning (TSK-1637) (PDF)

Collaboration with SPAZA on assessing MeerKAT Signal Display (katsdpdisp)

Use of MeerKAT's AWS image with MeerKAT SDP emulator to check functionality and usability

Use of ASKAP vis/spd operations tool (screenshots) and a previous assessment done by ASKAP Computing Team (comes from ATCA tool)

Code inspection for expandability, deployability and modifiability

Results

Feature	MeerKAT	ASKAP
Web-based Application	Yes	No
Input visibility data format	SPEAD, MeerKAT telstate	TCP sockets
Programming Language	Python (tornado server-side, JS clien—side)	C++ (ZeroMQ) server-side, Python/matplotlib client-side
Coupling (dependencies with telescope-specific)	katversion, spead2, katsdpservices, katsdptelstate; runtime requires katsdpingest (SPEAD packets)	Run-time requires ASKAP ingest running
Modifiability (updating existing data-stream/plots)	Easy to Medium	Medium
Extensibility	Medium to Hard	Hard
User documentation	Help text on webpage console	Limited (internal confluence pages)
Developer/API documentation	No	No

Easy = can be done in a 2 weeks Sprints
Medium = can be done between 1 to 5 Sprints (within a PI)
Hard = can be done in multiple PIs

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Results

Feature/View	MeerKAT	ASKAP
Data quality per antenna/(sub)station vs time (time scrolling)	Yes	Yes
Data quality vs baseline (matrix display)	Yes	Yes
Baseline spectrum with various integration options (time, baseline, etc.)	Yes	Yes
Visibilities (amplitude and/or phase) as a function of time & baseline or time & frequency	Yes	Yes
Delay plots	Yes	Yes
Support for sub-arrays	Yes	No
Support for sub-station	No	No
Support for multi-beam visibilities (SKA1_Low only)	No	Partial
UV coverage/weight distribution	No	No
Snapshot image	No	No
Calibration metrics (bandpass, gain, polarization)	Partial	No

Outcome

- (Recommended) Option 1: Design and prototype a new web-based tool using several of the design and usability concepts and technology choices from the MeerKAT solution such as Tornado and websocket API
  - Key Attributes: **Modifiability, Flexibility/Expandability**, Performance, Testability, Low Coupling
  - Review/co-design with Web developer/architect expert
- Option 2: Refactor MeerKAT software
  - De-couple from MeerKAT specific modules (can run standalone)
  - (Re)define and document the data layer, so different data stream can be added
  - SKA1_LOW requires support for multi-beam, substations axis to the data stream
- More details in the document attached to SP-838 or https://docs.google.com/document/d/1vGuQPGCzAKqX03sEqwtZ37kJrmm8JWofV0bsOUaEv4w/edit

Thank you

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