Virginia Tech Input*

Steve Ellingson

LWA Meeting @ UNM
Jan 13, 2009

* Responses to questions assigned in “January LWA Workshop Agenda Ver. 4”, Dec 22, 2008
(56) What work will remain on MCS beyond the scope of VT's efforts?
   - See MCS0004 (Dec 18, 2008)

(57) What is the plan for monitor/control (software) ICDs?
   - See MCS0005 (Dec 31, 2008)

(58) What is the schedule for MCS?
   - Not a reasonable question due to past history of funding halts plus possible additional funding halts in Mar 2009 (FY07 funds) and Sep 2009 (FY08 funds).
   - MCS is very low risk. If funding halts can be avoided, I guarantee that MCS will never be a pacing item.
(59) What will be the physical hardware required for MCS?
   - See (60) and (61)

(60) What is the estimated power consumption for MCS?
   - 3 PCs; est. 600W each
   - 2 1GbE managed switches; est. 100W each
   - Total power: 2 kW (110VAC)

(61) What is the parts cost estimate for MCS?
   - Pile-of-parts estimate from Memo 45 ($10K) is still valid. This includes:
     - 3 PCs averaging $2K each = $6K
     - 2 GbE managed switches averaging $1.5K each = $3K
     - $1K for TCD interface hardware, cables, power strips, cable mgmt, rackmount hardware (but NOT the rack(s) themselves)
(62) What are the observation timing requirements/definitions?

- Not exactly sure what this means
- System-level requirements should be resolved at the Project Office level
- Ref. extensive email discussion about this (primarily between Ellingson and D'Addario, Dec 7-10)
(63) What remains to be completed on MCS for PDR?

- Per “LWA1 PDR Documentation Requirements” (J. Craig, Jan 7, 2009):
  - Functional block diagram and MCS architecture.
    - Exists, needs to be documented
  - Message structure and interfaces defined.
    - Done (only minor revisions expected): MCS0005.
  - Cost estimate and schedule/timeline for fabricated parts and materials.
    - Cost estimate: Done: See (61)
    - Schedule/timeline: See (58)
  - Electromechanical interface and power requirements specified.
    - Comm interfaces: Essentially done (MCS0005)
    - Power interfaces/requirements: Essentially done; See (60)
    - Form factor / installation: Done to PDR level (see next).
(Not asked) How much physical rack space will be required for MCS?
- 3 sideways-mounted tower cases; allow 6U each (conservatively)
- Make it 4 to account for cable/power/heat mgmt, so not more than 24U
(64) How will data be recorded and played back?

- MCS0004 (Section 3)

(65) What is the cost estimate for data recorders?

- Essential: $12K (assumes data arrives from DP as GbE)
  - 5 PCs @ $2K each = $10K
  - 10 additional GbE NICs @ $30 each = $0.3K
  - 5 additional TB-class internal HDDs @ $140 each = $0.7K
  - $1K for cables, power strips, cable mgmt, rackmount hardware (but NOT the rack(s) themselves)

- Optional/Recommended: LTO4 tape drives (800GB per tape): $18K
  - 5 drives (1 per PC) @ $3K per drive = $15K
  - Initial supply of 100 tapes @ $30 each = $3K

- External USB HDDs would be provided by users or Project Office
(66) How much physical rack space will be required for data recorders?
   - 5 sideways-mounted tower cases; allow 6U each (conservatively)
   - Make it 6 to account for cable/power/heat mgmt, so not more than 36U.
   - Does not account for LTO drives and external USB drives; those need to go where users can easily reach them.

(67) What is the schedule and cost estimate for data recorders?
   - Cost estimate: See (65)
   - Schedule: See (58)

(68) What remains to be completed on data recorders for PDR?
   - See (63)
(Not asked) What is the estimated power consumption for MCS-DR?

- 5 PCs; est. 700W each = 3.5 kW
- 5 LTO tape drives (if used); est. 35W each = 175W
- Total power: 3.7 kW (110VAC)
(74) What additional backends are being planned
   - I am not aware of any.

(75) What interfaces will be provided for these backends?
   - MCS0005 is current/draft “MCS Common” ICD
   - Other interfaces (DP, TCD, PCD, etc.) are Project Office responsibility to identify/assign.

(76) What is the cost estimate for the backends?
   - See (74)

(77) What remains to be completed on additional backends for PDR?
   - See (74)
Station Level Calibration

- (78) What is the plan for station calibration?
  - SLC0010 demonstrates that reasonable beams can be formed with geometrical delays alone. Therefore, the primary goal of SLC has become sufficiently-accurate determination of instrumental delays. This can be determined crudely from installation, and refined/monitored by analysis of the sky data. Thus, it currently appears that beacons and other aids will not be necessary.

- (79) What is the plan for the outrigger interferometer (if required)?
  - Not required for SLC. (This should be a “Commissioning” question)

- (80) What remains to be completed on SLC for PDR?
  - Quoting from “LWA1 PDR Documentation Requirements” (J. Craig, Jan 7, 2009): “Design and Performance Analyses to show requirements can be met. Simulation, mathematical models and/or hardware testing results will be provided to demonstrate the subsystem’s performance as related to the system technical and science requirements.”
    - This is in progress