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ALMA SOFTWARE DOCUMENTATION REVIEW PROCEDURE
REVIEW REPORT

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Date : 2002-January-08

Document : Test Interferometer Networking Plan, ALMA08006Nx0001

Author(s): Mick Brooks

Reviewers submitting comments:

B. Glendenning	(bglendenning)
J. Mangum	(jmangum)
R. Marson	(rmarson)
B. Gustafsson	(bgustafs)

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FINAL DECISION

The document has been accepted, pending the changes agreed to below. The revised document will be posted before 2002-January-11. Comments received during the review period are included below. Further comments were received after the review period expired and these are included at the end of this document. The only major clarifications added after the review period are regarding the number of subnets, and the requirement to support simultaneous optical pointing. The issue of splitting the cost of the network was raised in this document but will be finalized at a later date. Purchase of networking equipment will proceed.

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COMMENTS RECEIVED DURING THE REVIEW PERIOD

(jmangum)

General

I have gotten only comments from you and Brian on the cabling plan. I suspect that I should just finalize it and distribute it, but I am unsure as to how it should be distributed. One idea is that it be an attachment to your network plan.

REPLY:

I don't think that the ALMA software team is the right review group to look at the cabling plan since the plan includes LO distribution fibers for example. I will bring this up with the Systems Group.

(rmarson)

General

Where's the data go?

I'm left wondering how the astronomical signals sampled at each antenna get back to the correlator. Is this on a separate path? If so that should be stated in the introduction. Similarly the data path for users looking at the correlated output on workstations in the SLOB should be mentioned (maybe thats what connection to the CCC is?)

REPLY:

The data path between the antennas and the correlator is outside the scope of this document since that data is carried on a dedicated fiber system being developed by Dick Sramek's group. I will mention this in the introduction.

Users may look at any data, including monitor data and correlator output, from any workstation on the network. I will mention this in Section 4.

(rmarson)

General

I printed this on a monochrome laser printer. The distinction between red and blue is entirely lost on me. Perhaps you can make some of the lines dashed.

REPLY:

The high priority stations now have dotted lines to clarify this.

(rmarson)

General

I am not an expert on acronyms. Perhaps you could spell them out either when first used or in an appendix or make a reference to the ALMA glossary. Many of them I can figure out but I'm still pondering some (like ARTM).

REPLY:

I will include a reference to the ALMA Software Glossary.

(jmangum)

p.4 The official name for the Test Interferometer has recently been changed to ALMA Test Facility (ATF). You might want to mention this in the introduction. I don't think that it is necessary to change all reference to the old TI name, though.

REPLY:

I will mention this in the introduction.

(jmangum)

p. 5 In figure 1, you show two trailers. In fact, there will be one trailer and two contractor containers. I think that we can hub the ethernet off of the trailer to feed ethernet to the contractor containers.

REPLY:

I have made this change to the diagrams.

(jmangum)

p.5 It would be better to call the subnet "atf.alma.nrao.edu" to reflect the recent name change.

REPLY:

OK.

(bglenden)

p.5 Are there only 2 meteorology towers now? At one time I thought there were more.

REPLY:

I believe that there are only two met towers. Since there was no correction from Jeff, I'll leave it at two.

(bglenden)

p.5 Currently there is no Gb path from a central computer to an antenna,

even for testing purposes. Can we hang one off the 3508? If so I would show a test computer just to show that it's possible. If it's not possible I think we should describe how it would be possible to do this. (I suppose we don't have any Gb computers at the antenna end either. I see that you list this as an issue on p.8. I think we should ultimately be able to go end-to-end to at least one Linux computer and one VxWorks computer if the costs aren't prohibitive. Not a priority for initial installation.)

REPLY:

I have added a note about this to the issues on p.8. For maximum benefit, the real time machines should be upgraded to use a GB link as well. In both cases hardware selection and device driver testing would need to be performed. Unless, a genuine bottleneck is found, this may not be particularly necessary.

(bglenden)

p.5 GB fiber or Gb fiber?

REPLY:

IEEE standard is "b" for bits. I have changed the document and the figures to reflect this.

(bglenden)

p.5 Do we now not use the "control" room at all?

REPLY:

I assume that machines such as the ACC and the DNS/DHCP server will be in the control room since they are not rack-mounted. However, people actually controlling the antenna will most likely be in the trailer rather than the control room.

(bglenden)

p.5 I have a (single) network printer budgeted. Should it show up in the diagram?

REPLY:

As the printer can be located anywhere, and the diagrams are already quite crowded, I will omit this from the diagrams.

(bglenden)

p.5 Are the 4 workstations and OTC doubled (one per trailer?). I only had this total for the TI. (And assumed Europe might pay for half of them.

REPLY:

There is only one trailer, so they are not doubled. Even when there are two antennas and two optical telescopes it is unlikely we will want to do simultaneous optical pointing, so your total seems correct.

(bglenden)

p.5 Perhaps it now has to be atf.alma.nrao.edu.

REPLY:

Yes, fixed.

(bustafs)

p.5 Figure 1: What are these Trailers? No explanation anywhere. Where in the diagram are the long haul fibers? I guess between the 3508 switch and the 3512 switches. Are you planning to test also with a very long fiber (20-30 km)?

REPLY:

The trailer is the main control location as planned by the Antenna Evaluation Group (AEG). I will add an explanation.

The long haul fibers are indeed between the 3508 and the 3512 switches at the antennas. We will initially test with 5 km GBICs and later test with long-haul 100 km GBICs. I have added explanation of this to the text.

(bustafs)

p.6 section 4 last sentence. Do you really want to give highest priority to VOIP?

I understand that it might not work otherwise, but it should not effect the M&C traffic!

REPLY:

I agree with you, but our network specialist, Gene Runion does not agree with us. I have added clarification of this sentence to suggest that thorough testing will be required to determine the best priority for VoIP traffic relative to M&C traffic.

(jmangum)

p.7 figure 2: I believe that the red-coloured computers located at each antenna are the ABMs. Might want to label them as such.

REPLY:

Yes, I have clarified this and the blue laptop at the antenna as well.

(jmangum)

p.8 Regarding the issue of an additional T1 for the VLA link, I think that we definitely need it. My experience with the webcam and the existing T1 indicates that the current link could not possibly handle the increased traffic that the ATF will require.

REPLY:

OK, this decision is definite.

(jmangum)

p.8 In section 5 you raise several issues. Let me just comment on them:

- Initial support for three antennas: Probably best to buy the equipment in phases. Outfit a single antenna in 2002.
- Your proposal for payment of the equipment by the partners sounds good to me.
- As you suggest, computer networking and telephony costs should be borne by Computing. The Systems group has been working under the assumption that meteorology, holography, trailers, etc. would be purchased from their own budgets.
- Delay the purchase of the CallManager until we can figure out how to interface to the VLA PBX, which is, as you point out, from a different vendor (NEC).

REPLY:

Accepted. Document reflects these decisions.

(bustafs)

p.9 What is the purpose of the media conveters?

REPLY:

Where 100 Mb Ethernet ports need to run over longer distances and outside the RFI shielded buildings (such as the links to the trailer and the SLOB), then fiber should be used for RFI reasons. The media converters take 100 Mb twisted pair and convert it onto fiber.

(jmangum)

p.10 Appendix A: You have 3 telephones allocated to the control room.
Now that the control room will be located in the trailer, perhaps it would be better to shift 2 of these control room phones to the trailer?

REPLY:

OK.

(bustafs)

p.12 From the table I understand that you alternatively use the WS-G5486 units or the WS-G5487.

How can it be that for the first one you need three for the antennas (one per each) and for the 5487 you need only one?
Did I misunderstand something here?

REPLY:

This is directly from a quote from Cisco, where I asked them for prices for outfitting one antenna with the 5487 and one with the 5486. Given this pricing we will outfit the Vertex antenna with a 5486. In short, the tables in Appendix should be viewed for pricing information only and not for final equipment parts numbers. The parts numbers are in Appendix A.

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COMMENTS RECEIVED AFTER THE REVIEW PERIOD

(jmangum)

Mick> (bgunden)

Mick> p.5 Are the 4 workstations and OTC doubled (one per trailer?). I only had
Mick> this total for the TI. (And assumed Europe might pay for half of them.

Mick> REPLY:

Mick> There is only one trailer, so they are not doubled. Even when there are two
Mick> antennas and two optical telescopes it is unlikely we will want to do
Mick> simultaneous optical pointing, so your total seems correct.

Actually, we will likely want to do simultaneous pointing, especially optical pointing, with the two (three?) prototype antennas.

REPLY:

I will amend the document to mention this point.

(graffi)

p.5 Fig.1 SLOB and trailer

I am concerned that when antennas get tested in parallel, all the

2 (or 3) teams can fit into the trailer. What is the role of SLOB then?
I assume you need 4 workstations for one team (or antenna sub-team).

This situation is confirmed by Jeff in his comment as well:
Actually, we will likely want to do simultaneous pointing, especially optical pointing, with the two (three?) prototype antennas.
But even if there was only other technical work to do, we need to be able to do technical tests, check optical telescopes etc in parallel.

Given the space problem in a standard trailer,
would it be possible to assume that only technical relatively low level work gets done in the trailer and higher level tests in SLOB.
Looking at your text, comments from Brian and Jeff, I still do not have a clear picture of how we will work. I suspect you give for granted something I do not know (remember) here.

REPLY: (from jmangum)

Let me try to explain the planned office/work space layout. There will be a 60 foot x 14 foot (18.3m x 4.3m) trailer located about 100 ft (30.5m) to the north of the east-west prototype antenna baseline. This trailer will serve as the main control room. The other office which will serve as a secondary control room is located on the second floor of the VLA control building, located about 100m to the south-west of the prototype antennas. This room is about 6m x 6m or so in size, but does not have a clear line-of-sight to the prototype antennas. The SLOB is a detached building located to the west of the VLA control building which used to serve as the offices for the VLA scientific staff before the AOC was built. A number of offices have been set aside for general ATF staff use in this building. These will likely just be offices where people can go to work, away from the activity of the ATF.

The following link also include useful information about the ATF site facilities:
<http://www.tuc.nrao.edu/~jmangum/alma/atf/>

(graffi)

p.5 3.1 Subnets ...48.0 to 51.0 This subnet should be named atf.
(from Erik) You have potentially 4*256 hosts and it looks a lot for putting them on 1 subnet, if this is what you mean. You could specify masking in such a way to have different subnets for different kind of traffic. Different subnets provide an easy way to group different kinds of traffic. This could be used for example to isolate VOIP rather than relaying on Quality of Service and Priorities.
Or one might decide to have a red subnetwork (m&c traffic) separate from the generic subnetwork.

REPLY:

I will amend the document to include the possibility of more than one subnet being used with the available IP address range.

(graffi)

p.8 5 Issues
Outfit a single antenna in 2002.
Yes and ESO will pay equipment for the other antenna early 2003 (right?).
In case we had to pay our 50% of shared equipment this year, I would like to have the approximate amount by Brian sometimes.

REPLY:

OK.

(bglenden)

> p.8 5 Issues
> Outfit a single antenna in 2002.
> Yes and ESO will pay equipment for the other antenna early 2003 (right?).
> In case we had to pay our 50% of shared equipment this year, I would like
> to have the approximate amount by Brian sometimes.

I think it's clear that each partner will pay for the equipment in their antenna. What's less clear to me is who pays for the common equipment. Does NRAO pay for all of it and Europe can pay for more of something else later (my preference - keeps things simpler), or do we split the costs up front? If we split the costs, what counts as common equipment? An ALMA specific printer? Increased network costs?

I suggest that we separate these "who pays for what" issues from the technical discussion in the paper. I've prodded my management to think about the issue. I'll separately send Gianni my current FY02 budget. The common "stuff" could range up to \$100k depending on what one wants to include.

REPLY:
OK.

(kmorita)

p.8
"Each ALMA partner should pay 1/3 of total networking costs."

I basically agree with this idea. ALMA-J is willing to pay reasonable cost for the test interferometer experiment. On the other hand, ALG (ALMA Liaison Group) are discussing about Japanese contribution to total costs of TI under current 2-way ALMA structure. I think, our contribution to total networking costs should be consistent with this discussion.

REPLY:
OK.

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