

Minutes from CHPS Meeting Thursday May 29, 2008

Attendees:

NCRFC - John Halquist
ABRFC - Billy Olsen
NWRFC – Harold Opitz, Don Laurine, Mark Pattee, Joe Intermill
CNRFC – Rob Hartman
Deltares - Karel Heynert, Arthur vanRooij
OHD - Pedro Restrepo, Jon Roe, Joe Gofus, Chris Dietz
OCWWS – Mary Mullusky, Randy Rieman

Pre-reading:

- Document "FEWS for CHPS Hardware & Infrastructure Design" submitted by Karel, distributed via this list on 5/18/08
- Email from Rob Shedd to Jon Roe subject: "RES-J and CHPS" distributed via the chps_migration list on 5/22/08

1. Draft hardware design.

General vision: this design looks to the future for CHPS, which will include ensembles. Each RFC is assumed to host a full set of hardware.

Terminology:

Online system is the one used for operations; high availability requirement

Online duty system: the primary operational system

Online standby system: a clone of the duty system, this is the warm spare which takes over when the duty system fails

Offline system is used to (e.g.) test new software releases. It is configured like the online duty system, except there's no high availability requirement so there's no standby. It is connected to live data feeds.

Standalone system is completely isolated from the online and offline systems. Used for (e.g.) model development, experiments, maybe calibration and verification (the latter can also be done on the offline system). It is NOT connected to live data feeds.

Author's note: suggest we try to avoid using the term "backup" for any of these components.

Error on p.2 – paragraph 2.3 should read "This standalone version will NOT be fed by live data feeds....."

The design document doesn't address all possible architecture flavors – need to discuss that further.

Can the 10-minute delay in switching from duty to standby be reduced? Some lag is inevitable because of data backlog, but it is configurable. Forecasters could log into the standby system directly but there's a risk it may not be up to date.

Operator Clients will run on AWIPS LXs. Need to confirm that they're up to the job. How many users can be on the system at one time? NW says up to 10 during flooding; NC says 9; AB says 7. Users typically work on different LXs. The LXs should be adequate; they're much more capable than the XTs which were used for the workshop.

p.10 – 8GB RAM for MC, FSS, and DB server – will o/s kernel need to be modified to read it all? No. AWIPS distributes Redhat Enterprise which should be able to address 64GB RAM. Delft hasn't tested a 64-bit version yet.

Can the FSS and OC be combined? Deltares doesn't recommend this – can reduce speed. Deltares is looking into parallel processing, which will greatly benefit ensembles and multiple what-if scenarios.

MC & FSS – 20GB storage was based on FEWS application needs; document should read >20GB. Aim to buy the best disk space available but don't need to go overboard.

OC used mainly for display; it does some local processing but none that is computationally intensive. Deltares recommends network attached storage rather than local.

Should we use same flavor of Linux as AWIPS, or go with another (e.g.) Fedora? Deltares doesn't recommend Fedora; it's not an enterprise-level system. Stick with RedHat.

Are all the OCs expected to be used inside the AWIPS firewall? Potential problem with limited set of IP addresses for any given RFC. Chris doesn't see acquiring extra IP addresses as a problem because we'll get Steve Schotz to support us. We need to get Steve on board with this proposed hardware when we're done.

Can the MC and FSS be combined? Yes, this is the reduced solution on p.11. Disadvantage is that the load can vary; FSS runs tasks sequentially so users will notice a slowdown as more and more users login.

CAT recommends we aim for the “Mercedes” solution for the fully operational system at all sites. If we start off short-changing CHPS we'll never catch up. What about the CAT sites in the interim? This is described in Section 5.

For simplicity let's make all machines (MC, FSS, DBS) the same configuration. It will be far too hard for AWIPS (NLS in Kansas City) to keep track of different configurations. The cost won't be too prohibitive.

Is CAT okay with dual DB servers? Yes, the RFCs have been asking for this for years, it's a very welcome aspect of the design.

Is the MC limited in the number of clients connected to it? Keep hearing "10" but that's just using the example of max # of users at NWRFC. No limit other than performance constraints. If we have 10 clients do we require 10 FSS? No. One FSS can handle 10 clients. We're running 2 FSS with more OCs in the pilot now.

This archiving approach essentially replaces the RAX. The OSIP project for the RAX upgrade will need this information; the RAX project isn't on a fast track so there's no rush. Gate 2 was held last week. CAT must discuss calibration, verification, archiving during June workshop, then we'll hook up with the other OSIP projects like the RAX (07-054), AWIPS at RFCs (07-059), and any others.

What about having a 2nd MC at another RFC for backup? Yes that's technically possible due to loose coupling in software. No firewall concerns between RFCs. Main concern would be bandwidth; AWIPS now uses MPLS and 4 x T1 pipes are shared between AWIPS and others, so bandwidth availability for extra off-site MC can't be guaranteed. Correction: what about having a 3rd MC at another RFC? FEWS software would require changes. Deltares to check into this and report back at the June workshop.

p.10 – Samba for Windows, or Linux? Samba can be used for either/both. It's on LDAD for that reason. It would be our choice whether to go with Samba or NFS, but NFS is preferred where possible because it's faster and more resilient.

Note that there's one archive for forecasting running on the offline system – is that OK? Deltares assumes the requirement is for low availability not high. CAT needs to explore further – some offices have had significant problems with archive servers. Also archived data is becoming more important in operations, not just for calibration any more, so a loss of days/weeks is not acceptable. Isn't 98% availability good enough (excluding planned outages)? Need to discuss at June workshop.

Can CAT confirm there will be central storage available? Yes, the NAS could be conscripted but would need to ask AWIPS for space on it; also would only want to use it for flat files not database.

CATs will need to do performance testing – in June we'll define what a good performance test is. Hardware purchase must be initiated SOON. Jon says Donna isn't sure if \$ will come from FY08 or FY09 Q1 funds. Suggest we purchase one online system for CATs without standby - one (duty) for each CAT site at first, then upgrade in FY09. Won't need to buy clients (using AWIPS LXs), so there'll be some money savings there. Is there any potential to upgrade the NAS as part of this exercise? NAS already undergoing hardware refresh now. CHPS will be I/O intensive so good throughput will be crucial; that shouldn't be a problem if you balance the network side of the NAS. AWIPS proposes bringing together 2 NAS units to a single unit with dual heads. Can we propose a new NAS for CHPS? In fact there are 2 AWIPS NAS components: one for the DXs; one for the REPs. We can use the

REP NAS however we want, but we don't want to interfere with AWIPS selection of hardware, that would be too crazy. CNRFC seems to run into space limitations all the time. There's probably more space available than they think – 100's of GBs. AWIPS configures the NAS with a tiny partition, but there's no reason we can't access more. Recall we had a new partition created for the Pilot. The NAS is a NetApp FAS250. Deltares will run some performance tests using one they have available at one of their facilities.

Summary: immediately purchase half preferred solution at all 4 CAT RFCs? 3 (identical) new machines each, use existing NAS, use existing LXs. Based on Pedro's ROM estimate, should be around \$24K per RFC. Jon had previously estimated \$80K when talking to Gary, so this isn't too far off. Rack-mounted? Can't use old AS racks – too shallow. Can use the REP rack. Still need extra rack(s). Why should racks be in 2 different rooms? To plug into different power sources for failover. Problem: only single power source at RFCs; use generators and UPS units for backup. What's the point having duty and standby system if there's still a single point of failure?? We must be careful not to overdesign the solution. Should talk more at the June workshop.

Final suggestion: for experimental purposes only (not operational solution) could we host a standby MC at NWS HQ linked to duty MC at 2 or 3 (or all 4) CAT RFCs? We will discuss all options at June workshop.

2. Rob Shedd's email

Need to send a response. We just don't have enough details yet to be able to go on the road and present anything comprehensive. We don't want to rush something just because people are anxious. We also don't want to convey lower quality than we know will be available at the end of the year. We know we've got the DOH and HIC meetings coming up. We talked about doing some sort of recorded GoTo/Webinar at the end of June/early July.

Quarterly demos/GoTo meetings would be too much.

Certainly don't want to have misinformation and bad rumors broadcast via the list. What about starting a "chps guru" email address so people could submit questions/concerns/rumors for the CAT to answer? Chris will set up a new account.

Problem is HICs are getting some information, but staff is not. Also July will be the first time DOHs will have seen/heard anything. Need a way to bring staff up to speed one step at a time otherwise the knowledge gap will have gotten huge before we know it (and probably already is).

Recommend we wait until the other side of the DOH conference before we try to put a package together.

We also don't know whether any presentations we come up with will be enough; much of the discussion occurs *in between* the slides. We should check with LMRFC and Tom Adams to see what they thought of the presentation in February. Was it useful? What would

they suggest for improvement? We might do a series of Webinars. Deltares can provide us with some assistance, such as presentations.

Jon has enough to reply to Rob Shedd; he will also reply to Reggina's email on a similar topic.

3. Other

Jon will get feedback from Mark Glaudemans on ABRFC's document (xnav). We know a fair amount of xnav capabilities will be in AWIPS II. After Mark's review, the ABRFC document can probably be sent as-is to AWIPS.

Old Action items from previous weeks (date format for action items is MMDDYY-n):

041708-1. OHD (?) will look into how to adapt HL-RDHM for CHPS BOC, and will put a placeholder in the project plan, with details to follow later. **Open; Chris considering adding Zhengtao Cui to the development team so he can adapt HL-RDHM.**

041708-2. Karel will set in motion discussions with Deltares hardware engineers concerning specs for CHPS, earlier than originally scheduled. **Discussed on 5/29/08. Closed.**

041708-3. Pedro agreed to discuss use of FY08 funds for CHPS hardware with Gary Carter. Update 5/8/08: Pedro has begun working this. Waiting for the CAT to discuss Deltares proposal (see action 041708-2) so Pedro can give Gary an estimate. **Open.**

042408-1. **Closed.**

042408-2. Karel to provide FEWS ensembles documentation to the CAT before the meeting in Portland next week; Karel also to provide a link to the UK Environment Agence offline/test system so the CAT can take a look at their use of ensembles. **Open.**

042408-3. Create a post-BOC document. [Who?] **Open.**

042408-4. **Closed**

042408-5. **Closed**

042408-6. **Closed**

042408-7. **Closed**

042408-8. OHD HSEB to make Res-Sngl available to CAT sites as soon as it's ready for release rather than have RFCs wait for the next Deltares release. **Open. Waiting for OHD software team to complete.**

042408-9. Deltares to provide OHD with feedback on TimeSeries ID change in FEWS. **Open. Deltares to present design w/c June 16 2008.**

050808-1. Chris to check "Migration Strategy Plan" timeline against Karel's timeline to see how well they match up. **Open.**

050808-2. Harold to update the "NWS CAT Migration Strategy Plan" to show December 2008 software installation and test activities; and to show January 2009 as a training workshop. **Open.**

050808-3. Karel to set up a CHPS project Wiki page. **Open.**

050808-4. Chris to schedule Seann to update the CAT on FldWav-to-HEC-RAS activities/progress at the June 14 workshop. **Open.**

052208-1. Chris to schedule discussion of CAT RFC products and services during June 14 workshop. **Open.**

- 052208-2. CAT to decide on XML schema for output from FEWS time series database. Deltares to assist with definition based on other FEWS users. **Open.**
- 052208-3. CAT members to let Jon know ASAP if they have any concerns with what his TIM notes say about XNAV. **Discussed on 5/29/08. Closed.**
- 052208-4. ABRFC to send results of XNAV analysis to CAT by Thurs 5/29/08. **Closed.**
- 052208-5. Deltares to provide recorded FEWS demo to CAT by [TBD]. **Open.**
- 052208-6. NWRFC to provide recorded CHPS demo of NWRFC configuration to CAT by [TBD]. **Open.**
- 052208-7. OHD to arrange GoTo-style presentation of recorded material (see actions 052208-5, 052208-6) for all RFC staff. **Open.**
- 052208-8. OHD to post recorded material from action 052208-7 on Web. **Open.**

New action items this week:

- 052908-1. Karel to correct various mistakes in hardware design document. **Open.**
- 052908-2. Karel to update hardware design document to reflect CAT's desire for identical configurations for MC, FSS, and DBS; also RedHat Enterprise as the o/s. **Open.**
- 052908-3. Chris to make sure we're synchronized with other relevant OSIP projects (after we've completed our CHPS hardware assessment) **Open.**
- 052908-4. Deltares to investigate changing FEWS to support > 2 MCs and report back at the June workshop. **Open.**
- 052908-5. Jon to initiate hardware purchase for CAT sites. **Open.**
- 052908-6. Deltares to run some performance tests on NetApp FAS250 and report back to CAT. **Open.**
- 052908-7. Chris to set up a new email account for people to submit their CHPS questions. **Open.**
- 052908-8. Someone [WHO?] to check with LMRFC and Tom Adams to see what they thought of the CHPS presentation in February. **Open.**
- 052908-9. Jon reply to Rob Shedd's and Reggina's emails. **Open.**

Evolving list of agenda items for June workshop

- Discuss and agree on approach for Calibration, Verification
- Discuss and agree on Archiving needs
- Define a "good" performance test
- Discuss hardware architecture options, taking into account failover, service backup, single points of failure, etc.
- Status of FldWav-to-HEC-RAS project (Seann)
- Define CAT RFC products and services requirements

Next meeting: Thursday 6/5/08.