

**AWIPS Configuration Control Board (AWCCB)  
Meeting Minutes**

**May 24, 2007**

**ATTENDEES:**

Chuck Piercy	Tim Hopkins	Jon Roe
Neal Dipasquale	Steve Pink	Jim Lane
Olga Brown Leigh	Susan Reiley	

**ACTION ITEMS:**

10,578 – Olga Brown-Leigh:

AWIPS WAN Migration is on going. SEC Analysis is working with CIO-14 on addressing outstanding action items, as part of the conditional approval to proceed. SEC Analysis Branch held the follow-up AWIPS MPLS Management Status Briefing on May 14, 2007. The purpose of the meeting was to conduct a follow-up status meeting with Executive Decision Team on SEC's NOAANet Corrective Action Schedule Plan, highlighting target dates for each outstanding condition.

**RCs REVIEWED AND THEIR NEW STATUS:**

10,655 – Approved

10,656 – Approved

10,688 – Approved

10,690 – Approved with updated criteria, see Attachment A

10,698 – On HOLD, all CCB Members agreed J.R. Gordon, CIO, must review this RC in more detail; ERH wants to move workstation from one network to another.

**OLD BUSINESS:**

10,590 – On HOLD, J, Lane has finished his updates; sent it to T. Tran for her updates

10,648 – Approved with conditions, see Attachment B

10,689 - Approved

**Attachment A**  
**New Criteria for AWIPS IP Addresses**

**NOTE: This RC is APPROVED with the following caveats:**

1. These devices are **NOT** approved for the preparation or issuance of official forecasts and warnings, etc.
2. The IP Address will be a “NA” host name.
3. OS version to be RHEL WS v4u2, security patched to current AWIPS level, going forward.
4. These devices are not supported by the NWSHQ/NCF.
5. The connection must be Ethernet (10/100 base-t).
6. The connection shall be made to the FDDI circuits.
7. These devices **CANNOT** be used for inter-site coordination.

**Attachment B**

**Conditions for Approval of AWIPS RC 10,648**

Recommendation is for approval, with the following conditions, as detailed in the report.

1. ATAN be conducted, per the report
2. Elevated monitoring of SBN be conducted during the ATAN.

The following is excerpted from the report:

*It is likely that the culminating data volume from the DHR and DSP radar products will not trigger bottlenecks within the AWIPS WAN. However, an AWIPS Testing Authorization Note (ATAN) is strongly suggested and be conducted at a limited number of AWIPS sites to support the analysis. Therefore, SEC Analysis recommends a Conditional Approval for AWIPS RC# 10,648.*

*From the perspective of the SBN, it is recommended that the RC be conditionally approved as well. Additional SBN monitoring is recommended during the ATAN period, after a small set of AWIPS sites have been enabled with the capability to disseminate the new DHR-DSP products. The SBN monitoring should be aimed at assessing the actual impact of these new product additions.*

The full report begins on the next page.

# **Analysis of AWIPS RC 10,648**

## **Central Collection/Distribution of WSR-88D Digital Hybrid Reflectivity and Digital Storm Precip**

OS&T/SEC Analysis Branch

May 2, 2007

### **General**

This RC calls for Central Collection/Distribution of WSR-88D Digital Hybrid Reflectivity (DHR/32) and Digital Storm Precipitation (DSP/138) products via the SBN. In order to provide these products, the EMPE will rely on receipt of Digital Hybrid Reflectivity (DHR) and Digital Storm Total Precipitation (DSP) NEXRAD products. The Flash Flood Monitoring and Prediction (FFMP) application and warning forecasters also rely on the DHR and DSP products. However, the DHR and DSP products can not be requested by AWIPS for more than 8 hours without manual intervention. An excerpt of the RC is at the end of this paper.

### **Approach to WAN Analysis**

The RC cites the requested products, their volumes, and their frequencies. An ATAN is tentatively scheduled to be conducted around June/July 2007. The following is noted potential WAN communications impact within the RC, and will serve as a basis for an approach to analysis:

This is an estimate of the increase in WAN traffic during higher traffic periods caused by the proposed solution. Product Content and Formats are defined in WSR-88D baseline specifications. The products are generated once per volume scan (about every 5 minutes during radar precipitation mode) and compressed before transmission using bzip2. The uncompressed product sizes are fixed at 85668 bytes (DHR) and 44628 bytes (DSP). Based on a sampling, of operational DHRs and DSPs, the mean product sizes after compression are 20360 bytes for DHR and 19000 bytes for DSP with most falling under 24000 bytes. National radar sites statistics during 2006 indicate a maximum of approximately 65 percent of sites are in precipitation mode during the peak summer months.

Considering 154 sites, this would equal 100 sites in precipitation mode with an average volume scan of 5 minutes or 12 products per hour:

Per site volume of DHR bziped files:  $12 \times 20360 = 244,320$  bytes/hour

Per site volume of DSP bziped files:  $12 \times 19000 = 228,000$  bytes/hour

Single site: .462 MB/hour. Total 100 sites precipitation mode: 46.2 MB/hour

54 sites in clear air mode with an average volume scan of 10 minutes or 6 products per hour:  
Per site volume of DHR bzipped files: 6 x 20360 = 122,160 bytes/hour  
Per site volume of DSP bzipped files: 6 x 19000 = 114,000 bytes/hour  
Single site: .125 MB/hour. Total 54 sites in clear air mode: 12.5 MB/hour

Grand total 58.7 MB/hour for the WSR-88D network

Previous studies indicate that product loading on the AWIPS WAN due to central product collection per radar is a maximum of 9 Megabytes per hour during precipitation mode operations. Therefore these two products will increase the single radar WAN loading from radar products by approximately 5.1 percent during precipitation mode. On a national scale, the WSR-88D network traffic reaches a maximum of 700 MB/hour usually during August. Therefore, these two products would increase the national WAN loading by approximately 8.4 percent during the peak radar products traffic periods.

Baseline WAN monitoring was conducted between Reno (REV), Sacramento (STO) and National Control Facility (NCF), for the period of April 17 – 24, 2007. The average bandwidth usage going out from STO to NCF was 10 Kbps over 512 Kbps committed information rate (CIR) frame-relay (FR) backbone. The average bandwidth usage from REV to STO was 11 Kbps over 128 Kbps CIR FR link. Please note, during the period the site was in clear air mode. Worst case scenario a single River Forecast Office (RFC) would carry the load of 24 radar sites, in precipitation mode, will be used in the analysis.

Given the product sizes of DHR and DSP, each site will be sending approximately 39 Kbytes (KB) to an RFC with an average volume scan of 5 minutes or 12 products per hour equating to 462 KB/hour, as noted above.

$462 \text{ KB/hr} \times 1/3600 \text{ hr/sec} \times 8 \text{ b/B} = 1.026 \text{ Kbps data volume for 1 radar site over 128 WAN link to an RFC}$   
Total 24 sites in precipitation mode: 24.6 Kbps data volume going out of an RFC to NCF over 512 WAN links

In the present AWIPS WAN architecture, each Weather Forecast Office (WFO) has a Frame Relay private virtual circuit (PVC), and each PVC has a CIR of 128 Kbps and a port rate of 256 Kbps to a RFC. The RFC has between one and four T-1 lines, a 512 Kbps CIR and 1280 Kbps port rate to the NCF.

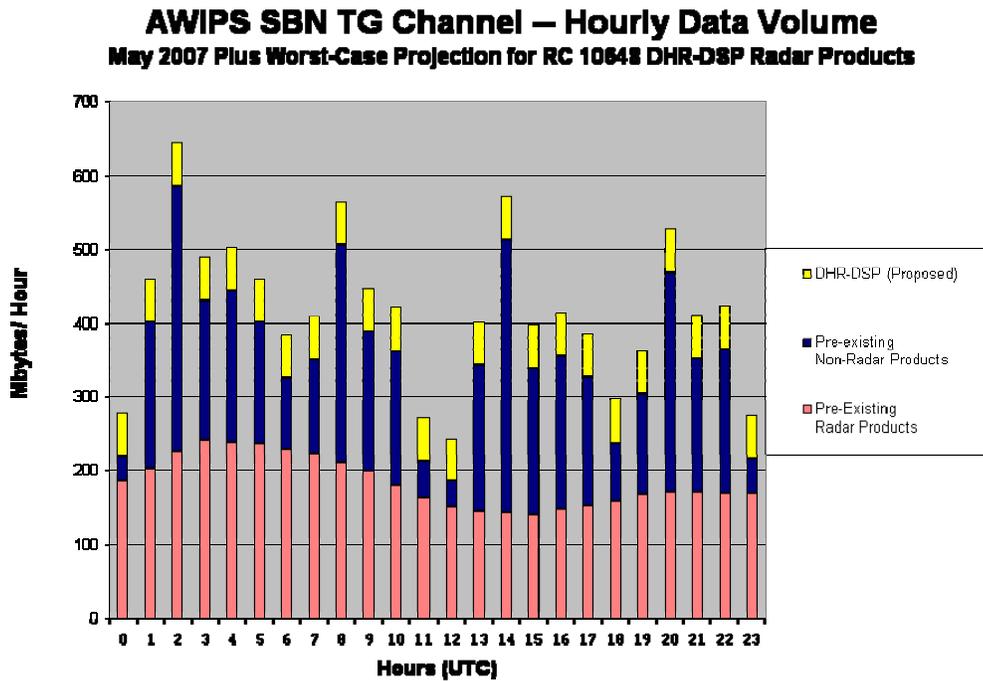
In reference to Sacramento (STO) and Reno (REV) in the analysis, 24 radar sites will see a minuscule delta/increase of .1306 Kbps from each site, and the average bandwidth usage between REV and STO is 11 Kbps over 128 Kbps WAN link. STO will see an additional 3.133 Kbps data volume, from its current 10 Kbps average over 512 WAN links to the NCF. These increases should not cause any product delay and are well within the normal operating bandwidth of a typical WFO and RFC.

## **Approach to SBN Analysis**

The SBN is commonly used to disseminate centrally-collected and –distributed radar products. The RC proposes that the Digital Hybrid Reflectivity (DHR) and Digital Storm

Precipitation (DSP) products be disseminated via the SBN. The SBN’s TG channel typically carries all radar products and, thus, that channel is assessed individually (in addition to the entire SBN impact).

The RC includes a data volume estimate of 58.7 Mbytes/hour. The basis for this estimate is described in the aforementioned section of this report. That estimate is depicted in conjunction with the pre-existing SBN TG1 channel hourly data volumes in Figure 1. The proposed addition represents a 12% increase to this channel’s hourly data volume. Because these products will arrive gradually over the course of the hour (from the collective population of 154 radars) and because this is a worst case scenario, this addition will likely be accommodated with no significant adverse consequence.



**Figure 1 – Effect of proposed DHR-DSP product addition on SBN’s TG1 Channel**

The RC estimate is next depicted in conjunction with the pre-existing total SBN (all channels or DVB PIDs). This is shown in Figure 2, below. The proposed addition represents approximately a 3% increase to this network’s hourly data volume. As noted above, the gradual dissemination of these products over the course of each hour (and not all products simultaneously) is expected to result in an added data load that can readily be accommodated.

## AWIPS SBN — Total Network Hourly Data Volume May 2007 Plus Worst-Case Projection for RC 10648 DHR-DSP Radar Products

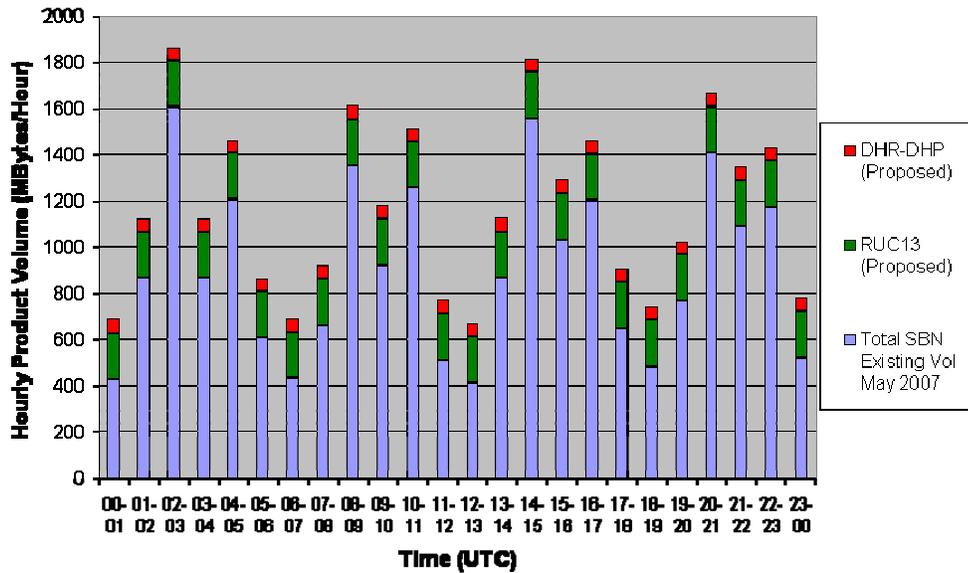


Figure 2 – Effect of proposed DHR-DSP product addition on SBN.

### Assessment and Recommendations

It is likely that the culminating data volume from the DHR and DSP radar products will not trigger bottlenecks within the AWIPS WAN. However, an AWIPS Testing Authorization Note (ATAN) is strongly suggested and be conducted at a limited number of AWIPS sites to support the analysis. Therefore, SEC Analysis recommends a Conditional Approval for AWIPS RC# 10,648.

From the perspective of the SBN, it is recommended that the RC be conditionally approved as well. Additional SBN monitoring is recommended during the ATAN period, after a small set of AWIPS sites have been enabled with the capability to disseminate the new DHR-DSP products. The SBN monitoring should be aimed at assessing the actual impact of these new product additions.

## RC 10,032 Excerpts

AWIPS CCB RC 10,648	Title: Central Collection/Distribution of WSR-88D Digital Hybrid Reflectivity (DHR/32) and Digital Storm Precipitation (DSP/138) products
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### 14. STATEMENT OF REQUIREMENT, PROBLEM, OR DEFICIENCY OF EXISTING SYSTEM

Flash Floods are the nation's number one weather-related cause of loss of life. To better help solve this threat, the Enhanced Multi-sensor Precipitation Estimator (EMPE), slated for operational use in AWIPS OB8.3, will automatically provide increased spatial and temporal resolution precipitation products to WFOs/RFCs and greatly augment Flash Flood warning guidance. In order to provide these products, the EMPE will rely on receipt of Digital Hybrid Reflectivity (DHR) and Digital Storm Total Precipitation (DSP) NEXRAD products. The Flash Flood Monitoring and Prediction (FFMP) application and warning forecasters also rely on the DHR and DSP products. However, the DHR and DSP products can not be requested by AWIPS for more than 8 hours without manual intervention.

### 15. KNOWN OR PROPOSED SOLUTION

Therefore, products DHR/32 and DSP/138 should be centrally collected, broadcast via Multicast and via SBN (NOAA port), and stored on the FTP server. This will require

- a) OCIO/TOC will need to change the WMO header for DHR (product 32) from SDUS6i to SDUS5i so that the DHR products will not be filtered at the NCF.
- b) OCIO/TOC will need to add DSP (product 138) to the SDUS5i WMO header.
- c) OCIO/TOC will add DHR and DSP to the radar FTP server directories. Update National RPS List and prodList.txt on all AWIPS systems. Update documentation.
- d) AWIPS changes to National Datasets will be required (1: National RPS list (rps-RPGOP-tcp.storm and rpg-RPGOP-tcp.clear), and 2: Centrally collected product list (prodList.txt). Prior to full nation-wide implementation, implementation is needed at a limited number of AWIPS sites to support testing.

7. NODE ID	8. AWIPS ID NNNXXX	9. WMO HEADER	DEL ADD REV	10.	Y/N 11. SEAS	12. CHAR PER MSG	13. FREQUENCY	14. NWSTG DISTR
NA	DHRXXX	SDUS50 KCCC	REV		N	20360	480/day	NCF/AWIPS
NA	DHRXXX	SDUS51 KCCC	REV		N	20360	4560/day	NCF/AWIPS
NA	DHRXXX	SDUS52 KCCC	REV		N	20360	4080/day	NCF/AWIPS
NA	DHRXXX	SDUS53 KCCC	REV		N	20360	8160/day	NCF/AWIPS
NA	DHRXXX	SDUS54 KCCC	REV		N	20360	7680/day	NCF/AWIPS
NA	DHRXXX	SDUS55 KCCC	REV		N	20360	5280/day	NCF/AWIPS
NA	DHRXXX	SDUS56 KCCC	REV		N	20360	3840/day	NCF/AWIPS
NA	DHRXXX	SDUS57 KCCC	REV		N	20360	240/day	NCF/AWIPS
NA	DHRXXX	SDUS58 KCCC	REV		N	20360	240/day	NCF/AWIPS
NA	DHRXXX	SDUS59 KCCC	REV		N	20360	240/day	NCF/AWIPS
NA	DSPXXX	SDUS50 KCCC	REV		N	19000	480/day	NCF/AWIPS
NA	DSPXXX	SDUS51 KCCC	REV		N	19000	4560/day	NCF/AWIPS
NA	DSPXXX	SDUS52 KCCC	REV		N	19000	4080/day	NCF/AWIPS
NA	DSPXXX	SDUS53 KCCC	REV		N	19000	8160/day	NCF/AWIPS
NA	DSPXXX	SDUS54 KCCC	REV		N	19000	7680/day	NCF/AWIPS
NA	DSPXXX	SDUS55 KCCC	REV		N	19000	5280/day	NCF/AWIPS
NA	DSPXXX	SDUS56 KCCC	REV		N	19000	3840/day	NCF/AWIPS
NA	DSPXXX	SDUS57 KCCC	REV		N	19000	240/day	NCF/AWIPS
NA	DSPXXX	SDUS58 KCCC	REV		N	19000	240/day	NCF/AWIPS
NA	DSPXXX	SDUS59 KCCC	REV		N	19000	240/day	NCF/AWIPS

**Notes:**

1. The values and frequency (columns 12 and 13) of these products are approximated based on the impact analysis in Part A Cover Sheet section 15 and the number of radar sites in each region which are distributed according to NWSTG geographic alignment.