

Configuring WarnGen to Include Decision Support Events in Warnings in AWIPS 2

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NOTE: THIS SOFTWARE WILL NOT RUN ON AN ADAM DEVELOPMENT WORKSTATION. IT REQUIRES UTILITIES AND DATABASE ACCESS PRESENT ONLY ON AN OPERATIONAL A2 SYSTEM

1. Introduction

Decision Support Services continue to take a larger role in day-to-day operations at the local WFO. Previous attempts at including Decision Support Events directly in the warnings were undertaken by the Central Region WarnGen Tiger Team (Kurimski et al. 2013) and included a selection to include a special heads-up for outdoor events. However, with an increased DSS role and growing numbers of large events, keeping track of these events to include in our warnings has become increasingly difficult and time consuming. Several previous efforts have made all DSS events and large event venues available to AWIPS for inclusion in a warning. Unfortunately, these solutions would mention events or venues, even when no event was ongoing and made no discretion of attendance. In an attempt to improve upon these efforts, this project expands upon previous groundbreaking work performed by Doug Speheger (2004; 2005) Evan Bookbinder (2011-2013) and Mike Dangelo (2013) to allow adaptable, dynamic displays within AWIPS. By introducing date/time based logic, and WarnGen flagging, we have developed a solution that allows the integration of DSS events into AWIPS on a dynamic approach, and one that is expandable toward more novel housekeeping efforts, such as Google Calendar.

2. Purpose

There are two main objectives accomplished with this software.

- 1.) Provide dynamic AWIPS D2D map displays of DSS activities across a CWA, allowing forecasters to enhance decision support via the direct integration of the DSS location with meteorological analysis.
- 2.) Allow for the automated integrated of selected, active DSS events into short-fuse warnings.

3. Getting setup

The AWIPS focal point, ITO and/or ESA will need to decide where to install this local app. A common NFS mounted point should be used, and the default location adhering to standard A2 practices is: /localapps/runtime/AppsAwips/. You are welcome to install the software components as desired by your office, with just a couple edits necessary to the underlying scripts.

- a. Create your directory as user 'awips', and untar the AWIPS_2_DSS.tar delivery file into it.
 - **mkdir /localapps/runtime/AppsAwips (this folder likely already exists on your system per the SCP guidelines)**
 - Move AWIPS_2_DSS.tar into the /localapps/runtime/AppsAwips folder
 - **tar -xvf AWIPS_2_DSS.tar** , which will create the WarnGenDSS folder and unpack all the files.

Once completed you should see the following directory listing:

```
./WarnGenDSS/bin
    decisionSupportToAWIPS.tcl
    decisionSupportToAWIPS
./WarnGenDSS/etc
    DSSToday.xml
    DSSTomorrow.xml
    DSSWeek.xml
./WarnGenDSS/data
    DSSEvents.txt
    warngen_dss.id
    dssevents_today.lpi
    dssevents_tomorrow.lpi
    dssevents_week.lpi

./WarnGenDSS/logs
    *log
```

**ENSURE ALL DIRECTORIES/FILES ARE OWNED BY awips:fxalpha.
ENSURE ALL FILES HAVE 775 PERMISSIONS EXCEPT THE bin FOLDER
WHICH SHOULD BE 777.**

- b. cd WarnGenDSS/bin
- c. Edit the **decisionSupportToAWIPS** file and edit the **A2DSS** path, if necessary.
- d. Edit the **decisionSupportToAWIPS.tcl** file.

Note the two variables **nulllat** and **nulllon** near the top of the document. These control a lat/lon location, somewhere in the middle of your CWA, where the D2D will display “NONE” and a timestamp if there are no active DSS Events present in the selected time frame. **Edit the values inside the quotes** to a location inside your CWA (preferably away from a county border).

Secondly, edit the **homedir** variable if necessary to reflect the base directory where you installed this software.

4. The DSS Master Events File

We have created a very simple format for the DSS Master Event that allows it to be created manually with ease, or even automatically via a script (such as a PHP script communicating with a DSS Google Calendar). There is no need to worry about the strict format of AWIPS’s WarnGen and D2D mapping files because the software creates them automatically from this master file.

Each “event” contains 7 comma delimited fields spanning two lines (for clarity): A name, a beginning date/time, an ending date/time, latitude, longitude, a WarnGen flag, and a progressive disclosure value. A few examples are provided in the included **DSSEvents.txt** file. Note, lines beginning with a # sign are considered comments and will be ignored.

The **DSSEvents.txt** file format is as follows:

**MM/DD/YYYY HH:NN,MM/DD/YYYY HH:NN,wgflag
xx.yyyyy,-xx.yyyyy,DDD,Event Name**

Where:

MM/DD/YYYY HH:NN is a date/time stamp in LOCAL TIME matching the FXA_LOCAL_TZ variable on your AWIPS system. For example, if this variable is CST6CDT then:

02/05/2013 00:30 would be 12:30 AM CST on Feb 5th 2013

07/04/2013 21:00 would be 9:00 PM CDT on July 4th 2013

The first date/time stamp marks the beginning of the event, the second stamp the ending.

wgflag = 0, 1, 2, or 3.

0 means do not include this event in WarnGen (it will still be shown on the CAVE map display)

1 means include it as a land based point in WarnGen

2 means include it as a marine based point in WarnGen

3 means include the event as both a land and marine based point in WarnGen.

xx.yyyy = a decimal latitude, followed by a decimal longitude to any number of decimal places.

DDD = A progressive disclosure value (any integer of 0 or greater). It determines how likely an object is to be plotted on a given zoom level on the CAVE map display. Making these all the same (such as 1000) is perfectly acceptable.

Event Name = A plain English name of the event. Keep in mind this will be used in the D2D plot and in WarnGen, and should reflect what people will understand. A landmark is always best (i.e. KAUFFMAN STADIUM vs. ROYALS HOME GAME) as the latter in this case wouldn't make much sense in a warning.

5. Including Events in WarnGen

The A2 Impact Based Warning Templates for TOR, SVR and SVS are ready to use this functionality out of the box, and will simply ignore it if not setup. For other WarnGen templates that you may wish to include DSS events, please reference the `dssEvents.xml` include line in the IBW TOR/SVR/SVS .xml files, and the `dssEvents.vm` parse line in the IBW TOR/SVR/SVS .vm files as examples. A cron (setup below) will run against your `DSSEvents.txt` file every 15 minutes to poll for active WarnGen events. The script will automatically generate a database table with active events, which is then used by the WarnGen templates dynamically and automatically without user intervention.

6. Setting up the cron

We now need to automate the creation of the CAVE map and WarnGen data files. Before we setup the cron, it's best to make sure that the software is working correctly since there were several variables/program paths you may have edited. From the working directory where you installed the software, run the main program script:

```
./decisionSupportToAWIPS
```

If successful, you should see the `.lpi` and `.id` files created in the `/data` sub-directory with no error messages. GREAT!

Now, you will need to setup a cron to run every 15 minutes to re-populate the active WarnGen database tables and your CAVE maps. It takes the script a fraction of a second to run with negligible CPU usage

It is assumed that the person setting up the A2 cron is familiar with the A2 crontab system environment, including editing the file, enacting the change, and then pushing the file to the backup server for failover purposes.

We are going to utilize the px2 site cron for this purpose:

On px2, edit `/etc/ha.d/cron.d/a2SITEpx2cron`

```
* /4 * * * * awips [path]/bin/decisionSupportToAWIPS > /dev/null 2>&1
```

Where the [path] above reflects where you installed this software, e.g.
/localapps/runtime/AppsAwips/WarnGenDSS

Now we need to copy this cron to the failover

```
scp -p /etc/ha.d/cron.d/a2SITEpx2cron px1:/etc/ha.d/cron.d/a2SITEpx2cron
```

Now we need to invoke this cron:

```
cp /etc/ha.d/cron.d/a2SITEpx2cron /etc/cron.d/
```

7. Displaying DSS Events on D2D

In addition to pulling DSS Events into your WarnGen products, sites may also wish to view these events on their D2D screen. From the master list of DSS Events discussed in section 4, the software will automatically create D2D displays of DSS Events for Today, Tomorrow and the upcoming week. The cron setup in section 6, generates three .lpi files for the three different time periods, and copies them to /awips2/edex/data/utility/cave_static/site/XXX/basemaps

Inside the installation /etc directory are three mapping bundles, which correspond to the .lpi files above

```
DSSToday.xml  
DSSTomorrow.xml  
DSSWeek.xml
```

You will need to copy these bundles into /awips2/edex/data/utility/cave_static/site/XXX/bundles/maps or some other location. Note there is a known “issue” with the maps menu sorting alphabetically, so you may want to utilize a subfolder, renaming or other option to group these bundles together.

8. Future Work

In addition to a Google -> AWIPS interface, much work is being done to investigate the dynamic sampling capabilities in AWIPS 2 to make better use of mouse-over-sampling with the DSS D2D plots (which are currently static overlays). The ability to use free-form sampling in this context would allow more fields to be displayed (contact, phone number, weather criteria, etc...) so it is possible (if not likely) that the format and application above will change at some point in the next year or two.

These instructions were written by Evan Bookbinder from the WFO Pittsburgh, PA. If you have any questions regarding implementation of DSS events in WarnGen or D2D please contact Evan at Evan.Bookbinder@noaa.gov

8. References

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