NWS Weather Event Simulator 7.2dlac
Installation Instructions

NOAA NWS Warning Decision Training Branch
Norman, OK

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1 WES 7.2dlac Release Notes

1.1 What's New in WES7.2dlac

1. WES7.2 updated with AvnFPS 3.2

- WES7.2dlac updates WES7.2 to include AvnFPS functionality and AvnFPS data processing during simulations. AvnFPS is driven on a minute-by-minute basis by the hourly METAR files in a standard AWIPS archive, and it also requires a set of TAFs to initialize correctly. For background information on how AvnFPS works with WES, see Section 8.

- WES7.2dlac updates the WES7.2 test case with AvnFPS data

2. Changes to point data processing in WES

- In the old WES point processing (e.g. METAR, lightning, etc), WES revealed the hourly point files at the top of the hour. This would at times reveal future point data. In the current WES, you will no longer see future point data at the wrong times. The current processing will make point data visible closer to the end of the hour, at the time of the last data in the file.

- The display and updating of point data in D2D does not work reliably in the current version. This enhancement is planned for future builds. METAR and Maritime point observations are processed on a five minute basis, but their displays is inconsistent.

- Point data updating in D2D (aka "notifying") is planned for future WES builds.

- There are a few files that can be manually modified to change the default delay of the METAR/Maritime data and the number of hours of AvnFPS METARs (See Section 7). Users do not need to modify these files. The default delay for individual METAR/Maritime observations is two minutes.

3. WES7.2dlac Overview Training is available in the LMS for NOAA users

- This training will be announced with the official WES7.2DLAC around June 1st, 2007.

1.2 WES7.2dlac Requirements / Post Install

1. WES7.2 must be installed before installing WES7.2dlac

- You do not need to create new localizations if you have already done so for WES7.2

- If you have any problems with the WES7.2dlac installation, please contact Timm Decker at WDTB (timothy.b.decker@noaa.gov). Other DLAC questions should be sent to dlacteam@mother.comet.ucar.edu.

2. Update existing cases for new point processing in simulations

- All existing cases in DRT format will need to be updated to support the new point processing in WES. If WES detects an old DRT format, it will offer to update the point data for you.

- For existing cases in original format, you do not need to do anything different to prepare your case for the new point processing and running AvnFPS.

- We recommend updating all DRT format cases in **`/data/awips`** overnight by using the new "Batch Mode Point Data Conversion" tool under the WES Tools button.

1.3 WES8.1 Development Timeline

The next WES release is planned to immediately precede the release of AWIPS OB8.1. Currently OB8.1 is planned for release in summer 2007. WES 8.1 will include the AvnFPS functionality included in WES7.2dlac.

2 Requirements and Overview

WES7.2dlac has the same hardware / software requirements as WES7.2. For general WES requirements, please see the WES7.2 installation and user guide: http://www.wdtb.noaa.gov/tools/wes/docs/INSTALL_WES72.pdf

The WES7.2dlac install DVD is an update to WES7.2 in support of the Distance Learning Aviation Course (DLAC). **WES7.2 must be installed prior to installing WES7.2dlac.** This update contains a slightly modified version of AvnFPS 3.2 from the official AWIPS OB7.1 release. This installation also updates several WES files in **`/awips/fxa/DRT`**.

Note: Future versions of WES will include AvnFPS functionality

The WES7.2dlac package contains both NWS AWIPS software and WES© software. The WES© software was written by CIMMS personnel at the University of Oklahoma in collaboration with the Warning Decision Training Branch and others. Limitations exist on the distribution of this package, however, NWS collaborators may obtain WES7.2dlac at no cost by requesting a copy from the WES distribution focal point and by agreeing to the conditions of the WES© software license agreement in the install script. To submit requests for WES7.2dlac please contact Timm Decker at the Warning Decision Training Branch (timothy.b.decker@noaa.gov) for details.

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3 WES7.2dlac Installation Procedure

1. Print out this document before starting if possible.

2. Log in as user **`fxa`**

Note: WES7.2 must be installed as user fxa prior to installing WES7.2dlac.

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3. Any previous AvnFPS installation (the **`/awips/adapt/avnfps`** and **`/data/adapt/avnfps`** directories) will be moved prior to the WES7.2dlac AvnFPS installation.

4. Load and mount the Weather Event Simulator 7.2dlac install DVD.

   e.g. **`mount /media/cdrecorder`** if the DVD doesn't automatically mount

5. cd to the WES directory and “script” your shell session to a log file:

   e.g. **`cd /awips`**

   e.g. **`script wes7.2dlac.log.070810-432pm`**

6. cd to your cdrom device.

   e.g. **`cd /media/cdrecorder`**

7. Run the WES7.2dlac install script.

   e.g. **`./install-wes72dlac.sh`**

Note: The script will install AvnFPS into the **/awips/adapt/avnfps** and **/data/adapt/avnfps** directories. The script will modify some WES files in /awips/fxa/DRT.

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8. End your scripting log by typing “**`Ctrl-D`**”. Now review the log file using “more” or your favorite text editor, and look for any problems that may have occurred during the install.

4 Installation Verification

4.1 Install Verification Test Case

In order to verify a successful installation, install the test case in **`/data/awips`** from the WES7.2dlac install DVD. This test case contains data used by AvnFPS. After successfully viewing the test case data, move to Section 4.2 to run a simulation. If you experience problems viewing the test case, contact WES installation support (timothy.b.decker@noaa.gov) before attempting to run a simulation.

1. As user **`fxa`**, load and mount the Weather Event Simulator 7.2dlac install DVD.

   e.g. **`mount /media/cdrecorder`** if the DVD doesn't automatically mount

2. To install the test case, cd to the DVD device and run the WES7.2_testcase_install program:

   e.g. **`cd /media/cdrecorder`**

   e.g. **`./wes7.2dlac-testcase-install`**

> **Note**: If you have previously installed a WES test case, you may see the message "A case already exists in **`/data/awips/2006Aug24test`**". Remove or move the previous case as directed.

4.2 Verify AvnFPS in Simulation Mode

Now that WES7.2dlac has been installed, we must run a simulation on the WES7.2dlac test case to ensure that AvnFPS is functioning properly.

> **Note**: As with GFE in WES, AvnFPS is available only during a simulation.

1. Run **`start_simulator`**

2. Convert the 2006Aug24test case to DRT format:

e.g. click the "**Tools**" button, click the "**Convert Case Data to DRT Format**" button, select "**2006Aug24test**" as the FXA_DATA case location, and click "**OK**" (this may take a while to complete).

3. Load the **WES72dlac_AvnFPS_test_case_ABR** macro to run a simulation.

   e.g. click the "**Run Simulation**" button and the "**OK**" button in the D2D warning popup

   e.g. click the "**Load Saved Settings**" button, and select "**WES72dlac_AvnFPS_test_case_ABR**", then click the "**OK**" button in the Load window followed by the "**OK**" button in the Simulation Entry window

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Note: Notice the new entry section labeled "TAFs Directory". This specifies a directory containing the TAFs used to initialize the simulation. AvnFPS processes will only run in simulation mode and only when the TAF directory is specified.

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4. Click the "**Run Simulation**" button when the Entry Verification window appears.

5. When the simulator prompts you to restart any D2D sessions, run **`start_awips`**. In the start_awips GUI select **"2006Aug24test"** as the case.

6. After the simulation begins processing data, start the AvnFPS menu. The AvnFPS GUI will launch after the AvnFPS decoders have been started and after TAF data is ingested into AvnFPS.

   e.g. run **`start_avnfps`** in a separate terminal window.

7. Once the AvnFPS menu has loaded select **"Default"** and click the **"TAFs"** button. This will load the AvnFPS monitor GUI.

Note: In this example there are 4 TAF sites being monitored: KABR, KATY, KPIR, KMBG.

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8. Load a TAF for KABR.

   e.g. click the "**KABR**" button (which should be orange in color) on the AvnFPS monitor

9. Edit the TAF.

e.g. click the “**Text Editor**” button

Make the following modifications to the TAF:

- On the first line, change the wind speed and direction from **16013KT** to **20020KT**
- Remove the entire second line
- On the third line, change the valid time from **FM2200** to **FM2300**
- On the fourth line, change the wind speed and direction from **18015KT** to **36030KT**

10. Send the TAF.

e.g. click the “**Syntax**” button on the top of the editor

e.g. click the “**Send**” button on the top of the editor

e.g. click “**OK**” in the transmit time GUI

e.g. close only the AvnFPS editor window (not the monitor window)

11. Verify the edited TAF was sent and ingested into AvnFPS.

In the AvnFPS monitor window, check the following:

- The KABR button should no longer be orange in color
- The TAF time next to the KABR button should not be 2141. It should be a time after 2200.
- Click on the “**KABR**” button and verify the TAF shows all the edits made in step 9

12. After verifying the install was successful, shut down D2D, all AvnFPS windows, and exit the simulator. You may consider putting icons on the desktop to run the **`start_avnfps`** script. If you launch from an icon, then select the run in terminal option, so you can see the status while it is starting.

13. Verify your edited TAF was saved.

- To simulate the process of sending TAFs, WES writes the TAF to a text file in the **`<your_case>/avnfps/previous_simulation`** directory
- After each simulation, this **`previous_simulation`** directory is copied to a **`<your_case>/saved_tafs/$date`** directory.

e.g. **`cd /data/awips/2006Aug24test/saved_tafs`**

e.g. **`ls`** (to look for the latest directory)

e.g. **`cd 200707042200`** (for example, if you ran the simulation July 4, 2007 at 2200)

e.g. **`ls`** (to look at all the saved TAFs)

e.g. **`more ABRTAFABR`** (for example)

Note: The latest TAF will always be stored as **CCCTAFXXX** (e.g. **ABRTAFABR**). The TAF used to start the simulation will always be stored as **CCCTAFXXX.init** (e.g. **ABRTAFABR.init**). The long filenames in the saved_tafs directory are the TAFs generated during the simulation (see Section 8.6).

Note: The TAF you just wrote will be used in the next section, so do not delete this file.

4.3 Verify AvnFPS in Simulation Mode using Previous TAFs

In the last section we started by using a TAF that we supplied. In this section, we will start a new simulation using the TAF you created in the previous simulation. This functionality can be useful when running multiple simulations.

1. Run **`start_simulator`**

2. Load the **WES72dlac_AvnFPS_test_case_ABR** macro and then change the TAF entry to use the TAF from the previous simulation.

   e.g. click the "**Run Simulation**" button and the "**OK**" button in the D2D warning popup

   e.g. click the "**Load Saved Settings**" button, and select "**WES72dlac_AvnFPS_test_case_ABR**", then click the "**OK**" button in the Load window

   e.g. click the **"Select"** button next to the "**Case Start Time**" entry section and change the minutes from **05** to **15** and then click **"OK"**

   e.g. click the **"Select"** button next to the "**TAFs_Directory**" entry section and select "**previous_simulation"** and then **"OK"**

e.g. click the "**OK**" button in the Simulation Entry window

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Note: Selecting **"previous_simulation"** in the TAFs directory entry window will initialize the simulation with the TAFs issued during the last simulation run on that WES box.

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3. Click the "**Run Simulation**" button when the Entry Verification window appears.

4. When the simulator prompts you to restart any D2D sessions, run **`start_awips`**. In the start_awips GUI select **"2006Aug24test"** as the case, and select the **"Start AWIPS Text Workstation Control"** checkbox.

5. After the simulation begins processing data, start the AvnFPS menu

   e.g. run **`start_avnfps`**

6. Once the AvnFPS menu had loaded, select **"Default"** and click the **"TAFs"** button

7. Load the TAF for KABR.

   e.g. click the "**KABR**" button on the AvnFPS monitor

8. Verify the initial TAF is the same as the latest TAF version in Section 4.2

   e.g. click the "**Text Editor**" button

   Verify the following

   - On the first line, the wind speed and direction is **20020KT**
   - On the second line, the valid time is **FM2300**
   - On the third line, the wind speed and direction is **36030KT**

9. After verifying the TAF is the same, shut down D2D, all AvnFPS windows, and exit the simulator.

5 Configuring AvnFPS for a Simulation

In Section 4.2 we started with pre-packaged AvnFPS data. In Section 5 you will learn how to configure AvnFPS and your case for a simulation.

For the following examples, we will step through configuring AvnFPS and the WES test case to work with downloaded OUN data. This example uses TAF data from 2000 to 2100 on 2007Mar21 for the Oklahoma City airport (KOKC). To become familiar with the process we recommend downloading the OUN data as outlined below. When you create AvnFPS data for your own archived case, you will need to apply these steps to your case.

5.1 Download TAFs

To begin a simulation with archived TAFs, this section will show you how to obtain historical TAFs from the National Climatic Data Center (NCDC) for ingest into AvnFPS during a simulation. You may use other sources for historical TAFs, provided the format is the version AvnFPS uses.

1. Go to the following website: http://has.ncdc.noaa.gov/

2. Click **"SRRS Text"** in the Surface & Marine category

3. Request your desired TAFs using the interface to select the time, type and location. Here is the OUN input for this example:

- Station: **KOKC – OKLAHOMA CITY(AWOS) , OK**
- Bulletin Id: **FTUS - Terminal Aerodrome Forecast**
- Start Date/Time: **2006082412**
- End Date/Time: **2006082420**
- Email Address: Enter your own e-mail address

Click the **"Continue with Selections"** button

4. You should receive a message in your web browser saying your selection has been submitted for processing. At some point you will receive an e-mail with **"Your SRRS Request....."** in the subject. This message will contain a link to a webpage with all available TAFs from the requested time frame. Open this webpage in a web browser.

The example request in step 3 above will return three identical TAFs, issued at 1739Z and valid between 18Z on August 24 to 18Z August 25. Copy **one** of the TAFs (not all three!) from the website into a text file with a name of the form **CCCTAFXXX** where CCC is the AFOS node site and XXX is the TAF site identifier. **The file name must have only nine characters with no extension!**

e.g. Make a file named **`OUNTAFOKC`** and copy / paste one TAF into this file

Note: The line before the TAF id (e.g. KOKC 241739…) must contain a valid WMO header or AWIPS PIL like "FTUS31…" or "TAFOKC". Otherwise the AvnFPS initialization will fail, and the AvnFPS GUI will fail to start.

5. Copy the TAF over to your WES machine.

   e.g. **`cp /media/cdrecorder/OUNTAFOKC /awips/fxa/WEScustomization`**

6. In the **`<data_case>/avnfps/archived_TAFs`** directory, create a new directory where the downloaded TAF is to be stored.

   e.g. **`mkdir <data_case>/avnfps/archived_TAFs/test`**

Note: This directory will eventually be selected from the run simulation entry window when running a simulation.

7. Copy the TAF created in step 4 into this directory

   e.g. **`cp /awips/fxa/WEScustomization/OUNTAFOKC <data_case>/avnfps/archived_TAFs/test`**

5.2 Configure /awips/adapt/avnfps/etc/ids.cfg

The file **`ids.cfg`** should contain the list of TAF sites for your current simulation. We suggest backing up the **`ids.cfg`** for each simulation that you run so that it can be used again.

1. If you are using your own case (not the OUN example), then copy the **`/awips/adapt/avnfps/etc/ids.cfg`** file from your real-time AWIPS into the **`/awips/fxa/WEScustomization`** directory for temporary storage.

   e.g. **`cp /media/cdrecorder/ids.config /awips/fxa/WEScustomization`**

2. Examine the current **`ids.cfg`** used by AvnFPS on the WES

   e.g. **`cd /awips/adapt/avnfps/etc/`**

   e.g. **`more ids.cfg`**

   Climate data for AvnFPS are only available for TAF sites specified in this file

3. Backup the current case **`ids.cfg`**

   e.g. **`cp ids.cfg idsABR-backup.cfg`**

4. Copy the new **`ids.cfg`** to be used for the simulation (from the WEScustomization directory in step 1 above if you are modifying your own case and are not testing the OUN example). We have provided **`idsOUN.cfg`** in the current directory for you to use in the OUN example.

   e.g. **`cp idsOUN.cfg ids.cfg`**

5. Identify the TAF sites for which we will copy in climate data (the climate files are listed in the ids.cfg file)

   e.g. **`cd /awips/adapt/avnfps/etc/`**

   e.g. **`more ids.cfg`**

5.3 Modify .cfg files in /awips/adapt/avnfps/etc/tafs

There are several files and subdirectories in the **`/awips/adapt/avnfps/etc/tafs`** directory that configure AvnFPS for your particular office. If you are working with your own case, you will need to download them from your local AWIPS (steps 1-3 below). If you are working through the OUN example, then we will provide the files for you.

1. If you are using your own case (not the OUN example), then copy the AvnFPS config file(s) in **`/awips/adapt/avnfps/etc/tafs`** from your real-time AWIPS into the **`/awips/fxa/WEScustomization`** directory for temporary storage. This file just lists the TAF sites (see **`/awips/adapt/avnfps/etc/tafs/Norman.cfg`** for an example).

   e.g. **`cp /media/cdrecorder/Norman.cfg /awips/fxa/WEScustomization`**

2. If you are using your own case (not the OUN example), then also copy the TAF site subdirectories in **`/awips/adapt/avnfps/etc/tafs`** from your real-time AWIPS

into the **/awips/fxa/WEScustomization** directory for temporary storage. These directories (e.g. KOKC for the KOKC site) have ***.template** files and an **info.cfg** file inside (see **/awips/adapt/avnfps/etc/tafs/KOKC** for an example).

e.g. **cp –R /media/cdrecorder/KOKC /awips/fxa/WEScustomization**

3. If you are using your own case (not the OUN example), then copy the AvnFPS config file from the **/awips/fxa/WEScustomization** directory (from step 1 above) to the **/awips/adapt/avnfps/etc/tafs** directory.

   e.g. **cp /awips/fxa/WEScustomization/Norman.cfg /awips/adapt/avnfps/etc/tafs**

4. If you are working through the OUN example, then view the AvnFPS config file in **/awips/adapt/avnfps/etc/tafs**/**Norman.cfg** that will be used by AvnFPS. The file should have a list of TAF sites.

   e.g. **more Norman.cfg**

5. Change the entry in the file, "**DEFAULT**", to contain the filename of the AvnFPS config file without the ".cfg" extension.

   e.g. Open the "**DEFAULT**" file in a text editor, and change the entry to be **Norman**

6. Make sure a subdirectory exists for each TAF site (e.g. KOKC) specified in the **/awips/adapt/avnfps/etc/ids.config** file (see step 5 of Section 5.2). Also make sure each subdirectory contains the following files:

- **00.template**
- **06.template**
- **12.template**
- **18.template**
- **info.cfg**

There should also be an "**XXXX**" subdirectory in addition to the sites listed in the **ids.config** file.

Note: Be selective and careful about copying over any other AvnFPS files from your local AWIPS. You should be able to copy any forecaster specific display customizations in the /**awips/adapt/avnfps/etc/app-resources**

directory with no problems. **Do not** overwrite or replace the WES versions of the **`server.cfg`** and **`localhostinit.cfg`** files.

5.4 Insert Climate Data Into AvnFPS

In this section we will copy the climate data for the case into AvnFPS. If you are following the OUN example, we provide these files for you. If you are running your local case, you can download the climate files from your local AWIPS. If you do not have access to the climate files you need, you may download the files from the MDL website as illustrated below.

1. If you are using your own case (not the OUN example), then copy the **`/awips/adapt/avnfps/data/climate`** directory from your real-time AWIPS to the WES as user **`fxa`**.

   e.g. as user fxa, **`cp /media/cdrecorder/climate/* /awips/adapt/avnfps/data/climate`**

2. If you are following the OUN example, then view the contents of the climate directory. There will be netcdf files for each TAF site.

   e.g. **`cd /awips/adapt/avnfps/data/climate`**

   e.g. **`ls`**

3. If you do not have access to climate files, obtain them from a WFO, or follow steps 4-7 below. Otherwise skip steps 4-7.

4. Download the HDF5 climate files for each TAF station name in **`ids.cfg`**

- Go to the following website: http://www.mdl.nws.noaa.gov/~avnfps/data/hdf5/

- Click on the TAF station name and save the **`KXXX.hd5`** file to **`/awips/adapt/avnfps/data/climate`**

- Repeat for every TAF station in **`ids.cfg`**

5. Download the netcdf climate files for each TAF station name in **`ids.cfg`**

- Go to the following website: http://www.mdl.nws.noaa.gov/~avnfps/data/

- Click on the TAF station name and save the **`KXXX.gz.tar`** file to **`/awips/adapt/avnfps/data/climate`**

- Repeat for every TAF station in **`ids.cfg`**

6. Before processing the climate files, make sure that the station id in each file name is in upper-case. For instance you want **`KOUN.hd5`** and **`KOUN.gz.tar`** not **`koun.hd5`** or **`koun.gz.tar.`** If any of your filenames are lower-case, rename them before continuing. Also be sure all extensions are lower-case.

   e.g. **`mv koun.hd5 KOUN.hdf`**

   e.g. **`mv koun.gz.tar KOUN.gz.tar`**

7. Use the **`avnfps_climo_prep`** script to process the netcdf files

   e.g. **`cd /awips/adapt/avnfps`**

   e.g. **`./avnfps_climo_prep`**

   This script breaks each **`KXXX.gz.tar`** file into monthly files.

5.5 Prepare the case to run a simulation

1. Once your AvnFPS configuration files are in place (Section 5.3) you need to **Convert case to DRT format** using the WES **Tools** button. If your case is already in DRT format, you need to restore to original format, then convert to DRT format. In the conversion to DRT format, all files with a ".cfg" extension in **`/awips/adapt/avnfps/etc/tafs`** will be used to generate METAR text files for the TAF sites from the hourly netcdf files.

   e.g. in **`start_simulator`** run **`"Convert to DRT Format"`** under the **`"Tools"`** button

2. After the case has been converted to DRT format, run a simulation to test the TAFS and the data. When configuring the simulation, you need to select the "**TAFs Directory**" to be the directory name containing the TAFs you created in Section 5.1. Make sure to set your start time after the time of the TAFs created in Section 5.1.

   e.g. for the OUN example, load the **WES72dlac_AvnFPS_test_case_ABR** macro

   e.g. select **`"test"`** for the **`"TAFs Directory"`**, and click **`"OK"`**

3. After the simulation has started, run "**start_avnfps**" to check the TAFs and METAR data in AvnFPS as in Section 4.2.

   e.g. **`"start_avnfps"`**

4. If your data looks good, you are free to set a new start time. Make sure the issuance time of your TAFs in the **`<data_case>/avnfps/archived_TAFs`**

directory is consistent with your simulation start time (i.e. don't make future TAFs visible by setting your start time before your TAF's valid times.

5. To set up a new simulation in another case from the same CWA (i.e. the same AvnFPS configuration), you only need to do Section 5.1 and Section 5.5.

6. If you switch between running already prepared simulations on cases with different AvnFPS customizations, you will need to modify the following appropriate files:

- **`/awips/adapt/avnfps/etc/ids.config`**

- **`/awips/adapt/avnfps/etc/tafs/DEFAULT`**

- **`/awips/adapt/avnfps/etc/tafs/*.cfg`**

7. If you switch between running already prepared simulations on cases with the same AvnFPS customization, you will not need to modify the files in step 6.

6 WES Main Files: enhanced_case_review, start_simulator, start_awips, start_GFE and start_avnfps

Background: There are three main programs used in running WES. The **`enhanced_case_review`** application was designed for static review of cases with D2D. The **`start_simulator`** application was designed to prepare cases and run simulations. The **`start_awips`** application was designed to start D2D in a simulation. If you are new to WES and want to gain more experience with these applications, we recommend reading the sections below and stepping through the 2006Aug24test WES test case installation verification (Section 4).

Two additional programs (**`start_GFE`** and **`start_avnfps`**) are used to start the graphical user interfaces of the Graphical Forecast Editor and the Aviation Forecast Preparation System, respectively. These two programs can only be used in simulation mode (e.g., only after running **`start_simulator`**).

6.1 enhanced_case_review

The enhanced_case_review application is the primary way to launch D2D to review case data when not running a simulation. The enhanced_case_review application allows for full functionality of FFMP and SCAN data along with text database queries outside of a simulation (i.e. in static case review). For example, you can step through FFMP data, and if you change the FFMP table "Thresh Type" from "precip" to "ratio" and select "Refresh D2D", the D2D will update. **WarnGen, however, will not work when using enhanced_case_review.** The enhanced_case_review works on both original and DRT format data. This script starts the AWIPS CommsRouter, notificationServer, TextDB_Server Write and Read, and the Postgres postmaster, along with the D2D.

1. To launch enhanced_case_review, run **`/awips/fxa/DRT/enhanced_case_review`**, or type **`enhanced_case_review`** as user **`fxa`** (it is in the path).

2. Next, select the case from the listing of **`/data/awips`**, and select the localization (if only one localization exists, it will fill in the value automatically).

3. Click the **OK** button, the AWIPS D2D launcher will be started. If more than one localization exists in this case, a pull-down menu may appear with the localization.

4. Click the **Start** button to launch D2D.

5. The **`enhanced_case_review`** application cannot be run during a simulation because the AWIPS decoders will conflict. There are popup warning messages if you try to do this. Please use **`start_awips`** to launch a D2D during a simulation.

6. If you would like to launch more D2D sessions, you can run another **`enhanced_case_review`** after the first **`enhanced_case_review`** has started loading D2D. The subsequent **`enhanced_case_review`** will only start D2D without starting more AWIPS decoders. A warning popup message will occur if you try to launch two versions before one has started the AWIPS decoders (to prevent AWIPS decoder conflicts).

7. When **`enhanced_case_review`** is shut down, the decoders are killed, to prevent impacting subsequent D2D sessions or simulations. In the event that **`enhanced_case_review`** was shut down uncleanly and there are leftover processes, the **`enhanced_case_review`** and **`start_simulator`** programs will notify the user of this bad condition, and recommend the processes be killed.

6.2 start_simulator

The **`start_simulator`** application was designed to prepare case data for simulations and run simulations. To launch the simulation as user fxa, just type "**`start_simulator`**" at a shell prompt and hit return. The main simulator interface contains these features:

- **Log window**: Processing information is provided in the center of the main window.
- **Help menu**: Pull-down menu with background on WES and simulation instructions.
- **Exit button**: Exits start_simulator.
- **Run Simulation button**: Select a case and run a simulation.
- **Simulation Entry window**:
    - **FXA_DATA**: case inside **`/data/awips`**,
    - **FXA_INGEST_SITE**: localization id,
    - **Case Start Time**: simulation start time,
    - **Case End Time**: simulation end time,
    - **WESSL Script (optional)**: wessl file inside **`<your_case>/wessl`**
    - **WESSL Case Flags (optional)**: any desired wessl case flags

- **FFMP File and Radars**: FFMP tar file created with WES
- **GFE Directory**: GFE dataset created with WES. Selecting this directory turns on GFE processing in a simulation.
- **TAFs Directory**: Directory containing TAFs to initial initialize a simulation. (stored in **`<your_case>/avnfps/archived_TAFs`**).Selecting this directory turns on AvnFPS processing in a simulation.
- **Save Current Settings button**: Saves the current Simulation Entry to a user specified filename
- **Load Saved Settings button**: loads a saved Simulation Entry to allow easy starting of different simulations
- **OK button**: Starts the AWIPS decoders and prepares data relative to the case start time. This can take a few minutes on a large case.
- **Cancel button**: Cancels the Simulation Entry window

- **Entry Verification and Simulation Control window**: Summarizes the simulation settings once it is done preparing the case.
    - **Run Simulation**: Sets the clock back, starts the remaining AWIPS decoders, starts the selected wessl file, and starts checking for data to process every 15 seconds. After the simulation is started the follow buttons are available:
    - **Stop Simulation button**: Stops the simulation, kills the AWIPS decoders, and saves the simulation's newly created text products in the **`<your_case>/saved_textWSwork`** directory.
    - **Pause Simulation button**: Pauses the simulation, temporarily kills the notificationServer, and colors a crimson border around D2D and the simulation control window.
        - **Resume Simulation button**: resets the clock based on the paused time, restarts the notificationServer, and restores the crimson color to gray. Note that when you resume a simulation, your D2D time will be waiting for the simulation time to catch up to the time the simulation was resumed. To reset this cosmetic issue, just double click on the D2D clock on the lower-right part of D2D, and select "**Use Current Real Time**".
    - **Cancel button**: Cancels the Simulation Entry window.

- **Tools button**: WES data manipulation functions.

- **Convert Case Data to DRT Format button**: Hides data through renaming files, and builds inventories for use in a simulation. This only needs to be done once before simulations can be run. This can take 30-60+ minutes to run depending on the machine and the case.

- **Restore Case Data to Original Format button**: Restores files to their original names, and removes inventories used in a simulation. This only needs to be done if you would like to add data to a simulation. This is relatively fast (a few minutes)

- **Create FFMP DataSet button**: Creates FFMP datasets that are tarred up and later selected in the simulation entry window. Typically this only takes a minute to create a full dataset.

- **Write Archived Text to Database**: Writes archived text data into a Postgres database. This is fairly quick (less than a minute).

- **Create GFE Dataset Button**: Creates a set of default GFE grids that are later to be selected in the "**GFE Directory**" part of the simulation entry window.

- **Batch Mode Point Data Conversion**: Converts all DRT format data cases located in **`/data/awips`** to support five minute point data processing

- **Cancel button**: Cancels the Tools window.

6.3 start_awips

The **`start_awips`** application was designed to start D2D after a simulation has been started.

1. To launch start_awips, run **`/awips/fxa/DRT/start_awips`**, or type **`start_awips`** as user **`fxa`**.

2. Next, select the case from the listing of **`/data/awips`**, and select the localization (if only one localization exists, WES will fill in the value automatically).

3. Click the **OK** button, the AWIPS D2D launcher will be started. If more than one localization exists in this case, a pull-down menu may appear with the localization.

4. Click the **Start** button to launch D2D.

6.4 start_GFE

The **`start_GFE`** program uses the WES simulation information from a live simulation **`(/awips/fxa/DRT/simustatus_history`** temporary file) to start GFE. GFE is started using the standard "runGFE" program installed in the case. The GFE needs the IFPServer running to be able to start. The IFPServer needs the clocks to be reset to the simulation date and the AWIPS "Grid" data to be in synchronization with the time. Therefore, you can only run **`start_GFE`** during a simulation.

The default configuration of **`start_GFE`** is to run "runGFE" with the practice mode flag, to allow the VTEC line to appear correctly coded. This turns the background color to the official orange practice mode background.

1. To launch **`start_GFE`**, run **`/awips/fxa/DRT/start_GFE`**, or just type **`start_GFE`** as user **`fxa`** while a simulation is running. This may take a minute or two while the IFPServer initializes.

2. When the GFE Startup popup appears, select "**fxa**" as the "**User**", "**gfeConfig**" as the "**Config**", and "**practice**" as the "**Mode**", then click the "Start" button.

6.5 start_avnfps

The **`start_avnfps`** program uses the WES simulation information from a live simulation **`(/awips/fxa/DRT/simustatus_history`** temporary file) to start AvnFPS on a particular case. Thus, AvnFPS can only be started during a simulation. The start_avnfps program uses an **`avnstart.sh`** script in **`/awips/adapt/avnfps/bin`** to launch AvnFPS.

1. To launch start_avnfps, run **`/awips/fxa/DRT/start_avnfps`**, or just type **`start_avnfps`** as user **`fxa`** while a simulation is running.

2. When the AvnFPS Menu appears, select your user then click the "**TAFs**" button.

7 User Adaptable Configuration Files

7.1 gridconfigfile

Located in the **`/awips/fxa/DRT`** directory, **gridconfigfile** allows the user to set a specific delay time that controls the visibility for each grid product (e.g. 0z NAM can be set to be visible at 0130z after setting the start time in DRT format). The delay time attempts to account for the processing and transmission time for a given model run.

gridconfigfile consists of the case-relative path of each grid product followed by a number. This number represents the time in minutes that you want the specific grid product to be delayed.

> **Note**: Changes to gridconfigfile **MUST BE MADE** while the case is in original format for the changes to take effect. If you make changes while in DRT format, you must then convert your case to original format and back to DRT for the changes to take place.

To see the current delay times for a particular case, you can type **`more <your_case>/drt/gridconfigfile`**

Example of Changing Grid Delay Time using gridconfigfile

Below is an example in which we change the delay time of LAPS and MSAS grid products to a delay time of 30 minutes from a default delay time of 20.

1. Convert your case to original format

2. Go to the DRT directory and open gridconfigfile for editing.

   e.g. **`cd /awips/fxa/DRT`**

   e.g. **`vi gridconfigfile`**

3. Change the delay times for the first two lines from 20's to 30's. Once completed, the first two lines should read as follows:

   Grid/FSL/netCDF/LAPS_Grid/LAPS 30

   Grid/FSL/netCDF/MSAS 30

4. Save the changes and then convert your case back to DRT format. In a simulation of this case, your LAPS and MSAS products will now process 30 minutes after valid time.

7.2 pointconfigfile

The **`/awips/fxa/DRT/pointconfigfile`** allows the user to set a specific delay time that controls the visibility for each point product in both D2D and AVNFPS (e.g. in the default file, METAR text products are assigned a two minute delay to simulate normal transmission delays). This file will likely not need to be modified, and **we recommend not doing so unless there is a strong need**. To modify the file requires understanding of the times stored in the data files. METAR and maritime obs are the only point products that are currently processed on sub-hourly time scales with WES.

pointconfigfile consists of the case-relative path of each point product followed by a number. This number represents the time in minutes that you want the specific point product to be delayed.

Note: Changes to pointconfigfile **MUST BE MADE** while the case is in original format for the changes to take effect. If you make changes while in DRT format, you must then convert your case to original format and back to DRT for the changes to take place.

Note: If you decide to change the point product delays, it is important to make the hourly netcdf file delay consistent with the individual files. For example, the original netcdf METAR files have data until 45 minutes past the hour. With a two minute delay for AvnFPS METAR files (current default setting), the delay for netcdf METAR files needs to be 47 minutes. If you make these inconsistent, you will likely have problems with data synchronization.

Example of Changing Point Delay Time using pointconfigfile

Below is an example in which we change the delay time of METAR fed to AvnFPS to a delay time of 4 minutes.

1. Convert your case to original format

2. Go to the DRT directory and open pointconfigfile for editing.

   e.g. **`cd /awips/fxa/DRT`**

   e.g. **`vi pointconfigfile`**

3. Change the delay times for the AvnFPS METAR lines to 4's and hourly METAR files to 49 (45 min + AvnFPS offset). Once completed, the lines should read as follows:

   ```
   avnfps/point/metar/text 4
   avnfps/point/metar/netcdf 4
   point/metar/netcdf 49
   ```

4. Save the changes and then convert your case back to DRT format. In a simulation of this case, METAR data will not be fed to AvnFPS until four minutes after valid time.

7.3 runPointFlag

The **`/awips/fxa/DRT/runPointFlag`** allows the user to turn on/off the five minute point METAR/maritime data processing. The default setting has the five minute point data processing turned on. You may wish to turn off the five minute point data processing if you notice slower performance on a non-baseline WES machine when starting a simulation or during a simulation near the end of the hour's observation (usually around 45 minutes after the hour).

The file **runPointFlag** contains the text "**YES**" or "**NO**".

- If the file contains "YES" the METAR/maritime point data will be processed on a five minute basis
    - Point data will be made visible at their respective valid times using the delay specified in the **pointconfigfile** (see section 7.2)
- If the file contains "NO" the METAR/maritime point data will be processed hourly. Don't select this option if you plan on running AvnFPS.
    - All point data will be made visible at the top of the hour regardless of valid time

Note: Changes to runPointFlag **MUST BE MADE** while the case is in original format for the changes to take effect. If you make changes while in DRT format, you must then convert your case to original format and back to DRT for the changes to take place.

7.4 avnfpsMetarHours.txt

The **`/awips/fxa/DRT/avnfpsMetarHours.txt`** file specifies the number of hours of METAR observations AvnFPS can access prior to the simulation start time. The default setting is 12, and you will probably not need to change this file.

For example if you set:

- Simulation Start Time: 1800Z
- avnfpsMetarHours.txt: 12

AvnFPS will have access to METAR data from 0600Z to 1800Z upon initialization.

To change, simply open **avnfpsMetarHours.txt** in a text editor, alter the number and save.

8 How AvnFPS Works With WES

8.1 AvnFPS Installation

AvnFPS is installed by the WES installation software in **`/awips/adapt/avnfps`** and **`/data/adapt/avnfps`**. The version of AvnFPS comes directly from the AWIPS release DVD, so it is intended to work with RHE4 and the AWIPS build in WES.

8.2 Simulation Background

For AvnFPS functionality to be useful, data must be fed into AvnFPS system on a minute by minute cycle. Yet, point data typically are archived in hourly chunks. Thus, WES utilizes new methods to access point data, when the runPointFlag is set to "YES" (see section 7.3). This allows AvnFPS input METAR text data to be fed on a minute-by-minute basis while the METAR /maritime data is fed on a five minute basis for display in D2D. In the current version, the D2D display of the point data is inconsistent, and this will be addressed in future WES builds. Higher temporal resolution for METAR /maritime observations in D2D isn't warranted, since AWIPS only allows notification updates in D2D every 15 minutes for hourly displays and 5 minutes for the 15 minute METAR displays.

8.3 Conversion to DRT Format

During the conversion process, the original netCDF files for METAR and maritime observations (located in the directory hierarchy at **`<case>/point…`**) are split into five-minute netCDF files. Additionally, individual one minute METAR observations are extracted in text format from the original netCDF files for each TAF forecast point listed in the configuration files in **`/awips/adapt/avnfps/etc/tafs.`** These files are stored in these locations:

- **`<your_case>/avnfps/point/metar/netcdf`** – 5 minute netcdf files
- **`<your_case>/avnfps/point/metar/text`** – individual 1 minute METAR obs (text)
- **`<your_case>/avnfps/point/maritime/netcdf`** – 5 minute netcdf files

Additionally, the data inventory system for WES creates "b-links" for each of these files so the simulator knows when to reveal data.

8.4 Simulation Initialization

When a simulation is prepared based on a given start time, the hourly point files are made visible, and the current hour's point data are built up to the start time of the simulation. The current hour's METAR and maritime point files are linked to a "current_file" located at:

- **`<your_case>/point/metar/netcdf/current_file`**
- **`<your_case>/point/maritime/current_file`**

AVNFPS requires a set of default TAFs to start with (see Section 5.1). The input directory containing the default TAFs for a simulation is specified in the run simulation entry window in the "TAFs directory" line. The input TAF directories are stored in **`<your_case>/avnfps/archived_TAFs`**.

After the simulation has been started, all the TAFs in the specified "TAFs directory" are ingested into AVNFPS.

The METAR and maritime text data are also fed to AVNFPS. The value listed in the **`avnfpsMetarHours.txt`** file is used to specify the number of hours of METAR observations AvnFPS is initialized with (default is 12).

8.5 Ongoing Simulation

During a simulation, the five-minute METAR/maritime netcdf data are appended to each **`current_file`** on a five minute basis to support D2D display. The current file is removed at the end of each hourly file's time span, and the link target is pointed to the original a-file. When the next hourly file's data is processed, a new **`current_file`** is created, and the process repeats. The display of point data is inconsistent in the current WES, and this will be improved in future builds.

At the appropriate times, the individual METAR text bulletins are fed into AvnFPS, and these update immediately when they are fed in.

When the forecaster decides to issue a TAF, the system feeds the TAF to AVNFPS and it copies the new TAF into the **`<your_case>/avnfps/previous_simulation`** directory for archiving. The "previous_simulation" directory can be used to start a new simulation based off the previous simulation's TAFs.

8.6 Stopping a Simulation

Once a simulation is stopped, the TAFs for the current simulation are copied to the **`<your_case>/saved_tafs directory`** with the current date as the directory name. The archived directory contains the TAFs written during a simulation as well as the TAFs

used to initialize the simulation (*.init). The TAFs written by AvnFPS have a long filename, including the user id, nine character TAF PIL, WMO id, and more.