

AWIPS-2 LAPS Training Overview

LAPS User Workshop 2012

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“Preliminary” AWIPS-2 Focal Point Training

Welcome to the AWIPS-2 Focal Point Course! **Preliminary** AWIPS-2 Transition: Local Analysis and Prediction System (LAPS)

Introduction

Want to know what LAPS is and how it is configured in AWIPS-2? Then this course is for you! This module provides a comprehensive overview of LAPS in AWIPS-2, including processing, configuration, and troubleshooting. The quiz for the module is embedded towards the end of the module. The follow-on (Part 2) to this course are the LAPS exercises, which step you through the details of configuring files for specific configuration tasks.

LAPS is still changing, so this course is currently considered **preliminary**. When LAPS development is complete, and the training is considered final, the preliminary tag will be removed, and a completion certificate will be attached to the course. If you take the preliminary course, you can consult the change logs on the [AWIPS-2 Transition Training Page](#) before taking the final quiz in the LMS once the final course has been posted.

Course Outline

1. LAPS Overview
2. LAPS Exercises

Take the LAPS Exercises after the LAPS Overview.

Posted to
NWS Learn
Center
12-6-2011

How to Complete This Course



1. **Hit "Next"** to go to the first and only section of this course.
2. **Click "Click here to launch the course"** A web module will open in a new window. The presentation can be paused and restarted at any point.
3. **Complete the exam:** The exam is embedded in the web module. You must score at least 70% to pass. You can retake the test if necessary by clicking "Retry Quiz" at the end of the test or relaunching the course from "My Training

Goals of LAPS Training

- Introduce LAPS to new focal points
 - Address spectrum of LAPS users in NWS
- Review LAPS fundamentals and significant changes in AWIPS-2
- Consolidate everything needed to configure and support LAPS in AWIPS-2
 - Address some LAPS documentation issues

Make it Easy!

Training: Two Parts

LAPS (00:39 / 18:25) | ATTACHMENTS



AWIPS-2 e-Training



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Outline | Thumbnails | Notes | Search

- 1. Introduction
- 2. Outline for AWIPS-2 LAPS Training
- 3. Learning Objectives
- 4. LAPS is a 3D Analysis System
- 5. LAPS Software Major Upgrade
- 6. LAPS Software Improvements
- 7. LAPS is a Rehosted Application
- 8. Know Basic LAPS Software/Data Structure
- 9. Default LAPS Inputs Basically the Same
- 10. LAPS Processing Overview - Cron Driven
- 11. 4 Crons for LAPS Ingest and Analysis
- 12. Cron #1: LAPS Radar Analysis
- 13. Cron #2: LAPS Satellite Analysis
- 14. Cron #3: Misc. LAPS Data Ingest
- 15. Cron #4: Full LAPS Analysis
- 16. Selecting the Analysis Software

Outline for AWIPS-2 LAPS Training

Part 1: Basic description of how LAPS is implemented in AWIPS-2

Part 2: Instructions on how to configure LAPS in AWIPS-2

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SLIDE 2 OF 26 | CLICK NEXT TO ADVANCE | 00:23 / 00:23

Declarative Knowledge

LAPS (01:06 / 18:25) | ATTACHMENTS



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- 15. Cron #4: Full LAPS Analysis
- 16. Special Ingest Analysis Routine

Learning Objectives

By the end of this lesson, you will be able to identify:

1. What function LAPS serves in AWIPS-2
2. The major improvements in LAPS from AWIPS-1 to AWIPS-2
3. Where the LAPS software resides
4. The data Inputs and outputs of LAPS in AWIPS-2
5. How LAPS data are processed in AWIPS-2
6. The 2 primary functions of the LAPS cron jobs
7. The general approach for configuring and troubleshooting LAPS

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SLIDE 3 OF 26 | CLICK NEXT TO ADVANCE | 00:27 / 00:27

Basics for Newbies

LAPS (01:39 / 18:25) ATTACHMENTS


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Outline Thumbnails Notes Search

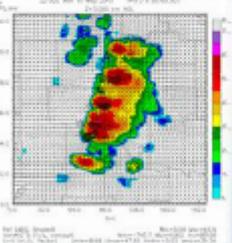
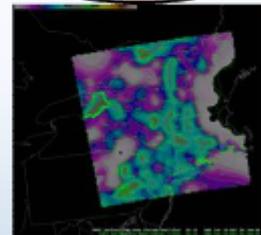
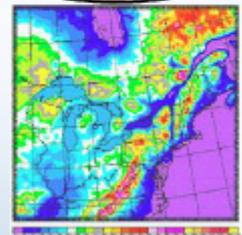
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- 15. Cron #4: Full LAPS Analysis
- 16. Backup and Restore Analysis Database

LAPS is a 3D Analysis System

Purpose: 3D grid of base and derived parameters

 Global +  National +  Local

Provides forecasters with software package capable of:

- DATA ASSIMILATION**

- NOWCASTING**

- MODEL INITIALIZATION**


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SLIDE 4 OF 26 CLICK NEXT TO ADVANCE 00:33 / 00:33

Include Improvements

LAPS (03:34 / 18:25) | ATTACHMENTS

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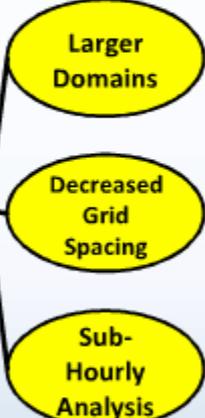
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16. School of Weather Analysis Software

LAPS Software Improvements

- Improved efficiency
 - Configuration freedom
- Misc. improvements
 - Quality Control/Terrain
 - Stuck sensor, MADIS QC
 - 3D volume ingest of radar
 - AWIPS-2: 3D 8-bit Z/V ingest
 - AWIPS-1: 4-bit Z, 0.5° elev.



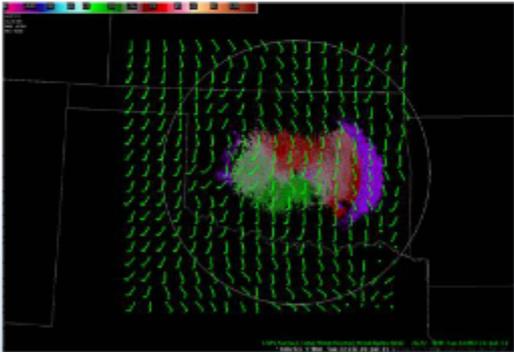
Larger Domains



Decreased Grid Spacing



Sub-Hourly Analysis



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SLIDE 6 OF 26 | CLICK NEXT TO ADVANCE | 01:20 / 01:20

Knowing Data Processing Important for Troubleshooting

LAPS (07:02 / 18:25) | ATTACHMENTS

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16. Detail of Winter Analysis System

LAPS Processing Overview = Cron Driven

EDEX SERVER ↔ **REHOSTED APPS**

Ingest Cron jobs (AWIPS-2 data retrieval)

AWIPS-2 MicroEngine

Output for AWIPS-1 netCDF generation

edex-ingestGrib

Grib2 output

LAPS HDF5 Folder

grib Table

Prep Files

Analysis cron jobs

LAPS Full Analysis

LAPS Time, Radar, Satellite

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SLIDE 10 OF 26 PLAYING 01:19 / 01:19

Fundamentals of the Cron Jobs

LAPS (10:32 / 18:25) ATTACHMENTS

 
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16. Sched.pl Initiates Analysis Routines

Cron #4: Full LAPS Analysis

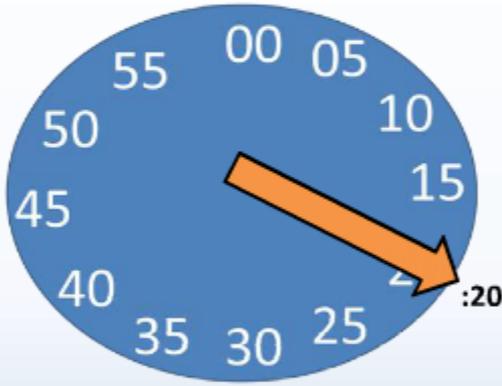
Script Run:

- sched.pl

Default Run Frequency
1x per hour

Goal:

- Runs 3D LAPS analysis using all inputs pulled from the previous ingest/analysis crons
- Generates grib2 output for AWIPS-2 to be displayable in CAVE



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SLIDE 15 OF 26 CLICK NEXT TO ADVANCE 00:40 / 00:40

Configuration Options

LAPS (13:19 / 18:25) | ATTACHMENTS

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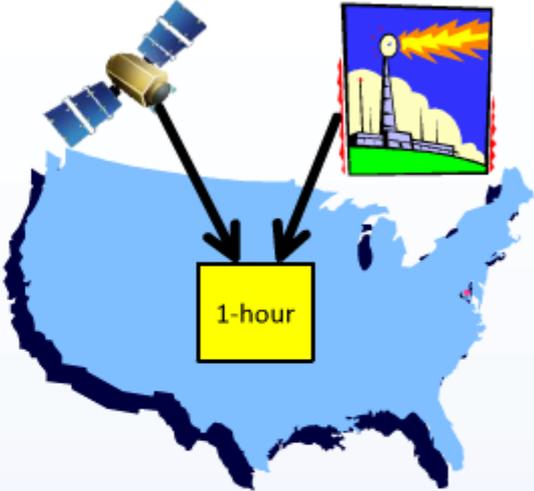
16. Sched.pl Initiates Analysis Routines

17. LAPS Output for CAVE - HDF5 + DB Entries

18. Considerations for Configuration

Considerations for Configuration

- Change dimension
 - Grid center
 - Larger grid
 - Higher spatial resolution
- Sub-hourly temporal resolution
- Blacklisting Surface Data
- Initialize Local Model
- Add new data
 - Can't change default model easily



The diagram shows a map of the United States. Two arrows point from the map to a satellite in the upper left and a power plant in the upper right. Below the map is a yellow box with the text '1-hour'.

Configuration Approach

LAPS (15:50 / 18:25) ATTACHMENTS

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Outline Thumbnails Notes Search

- 13. Cron #2: LAPS Satellite Analysis
- 14. Cron #3: Misc. LAPS Data Ingest
- 15. Cron #4: Full LAPS Analysis
- 16. Sched.pl Initiates Analysis Routines
- 17. LAPS Output for CAVE = HDF5 + DB Entries
- 18. Considerations for Configuration
- 19. Default Domain Size Is Larger & Higher-Res
- 20. Manual Configuration of LAPS Unchanged; No GUI
- 21. General Approach to Configuring LAPS
- 22. 3 Troubleshooting Areas In LAPS
- 23. AWIPS-2 LAPS Summary
- 24. AWIPS-2 LAPS Summary
- 25. Part 1 Quiz
- 26. The End

General Approach to Configuring LAPS

Action:
Edit the LAPS namelist files

Files:
nest7grid.parms,
background.nl,
etc.

Action:
Updating the LAPS XML files used by AWIPS-2

Script:
updateLAPSGrid.csh

Action:
Purge old LAPS data & copy new XML for EDEX

Script:
installLAPSdomain.csh

Action:
Restart EDEX to begin LAPS display with new configuration

Details in part 2 of this module

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Detailed Exercises

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Example: Big Picture/Background

Exercise 2: Blacklisting Suspicious Observations or Stations

Objectives: In this exercise, you will perform the following procedures:

- Identify the location of the LAPS `Blacklist.dat` file
- Modify this file with the correct syntax required
- Check the LAPS `obs_driver*` log to verify new blacklist file was implemented

Background: Similar to AWIPS-1 LAPS, the observation analysis component of the AWIPS-2 LAPS allows for the blacklisting of station variables. The blacklist file that the LAPS observational analysis reads from remains unchanged from AWIPS-1 and is located in 2 locations:

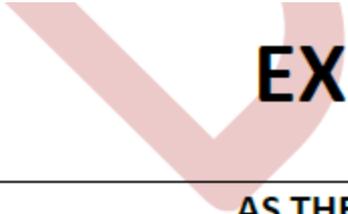
```
/data/fxa/laps_data/static/Blacklist.dat
```

```
/data/fxa/laps/static/Blacklist.dat
```

The following table provides an overview of the line syntax used inside this file.

Line Number	Background/Description
Line 1	The first line must contain the number of blacklist lines listed after this first line in the file. This value is a 5-digit number (e.g. 00004)

Step By Step Instructions



EXERCISE 2 START

AS THE fxa USER ON THE PX1 MACHINE

Concept #1 - Find and open the `Blacklist.dat` file.

1. Navigate to the `/data/fxa/laps_data/static` directory

```
$ cd /data/fxa/laps_data/static
```

2. Open the `Blacklist.dat` file with your favorite text editor (e.g `vi`).

```
$ vi Blacklist.dat
```

Verify Changes Take Effect

3. Save and exit the Blacklist.dat file.

Concept #3 - Copy the Blacklist.dat to its second AWIPS location in /data/fxa/laps/static.

1. In order for this blacklist file to be used immediately, it must be copied from /data/fxa/laps_data/static to /data/fxa/laps/static, as shown in the command below:

```
$ cp /data/fxa/laps_data/static/Blacklist.dat  
/data/fxa/laps/static
```

Concept #4 - Check the obs_driver.log.yydoyhmm log at the next analysis time to see what observations were blacklisted.

1. The next sched.pl LAPS analysis will read this new Blacklist.dat file and log its contents. Go to the LAPS logs directory and look for the current obs_driver.log* file.

```
$ cd /data/logs/fxa/<todays_date>/laps  
$ vi `ls obs_driver.log* | tail -1
```

Summary

- Comprehensive LAPS NWS focal point training now exists!
 - Few completions
 - Limited # of AWIPS-2 sites
 - No LAPS on AWIPS-2 development platform (ADAM)
 - “Preliminary” LAPS inertia?
- “Preliminary” version will need updates
 - WDTB needs heads up and continued coordination with GSD
- Final course will need marketing

Thoughts on Future LAPS User Training

- Tough budgets limiting all training
 - FY12 LAPS Best Practice Training Voted Low Priority
 - Try to fold into major upgrades (STMAS)?
- How to improve LAPS use across NWS?
 - Forum for sharing best practices approach...
 - Community efforts higher chance of success