SiteShadow

Operation and Maintenance Manual

(SiteShadow-OMM-004)

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Volume 1: Operation and Maintenance Manual AViD Version 3.5.5
Revision 4

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Contents

1. SiteShadow Overview

The JVN SiteShadow tool executes and manages applications that are needed to sniff live Interfacility and surveillance connections while forwarding messages to a “shadowing” system. The applications necessary for this functionality are ifshadow, relayd, and avid.

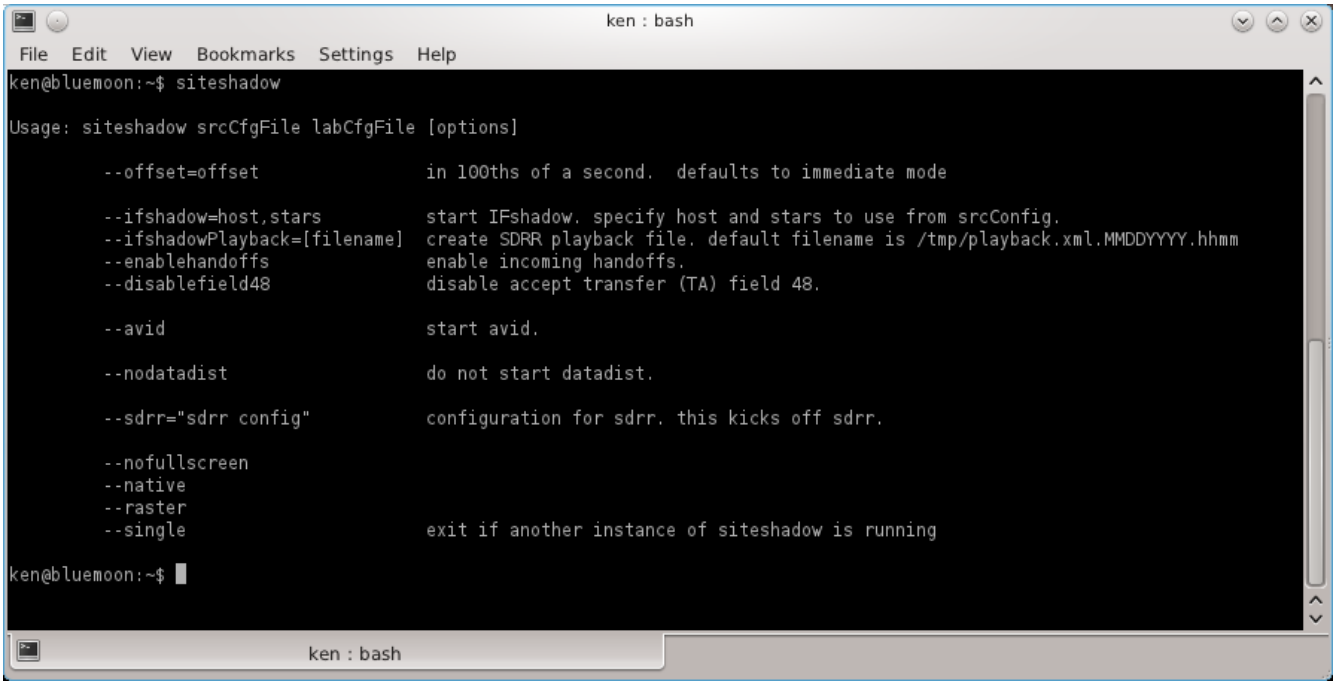
Ifshadow – interfacility messages

relayd – surveillance data

avid – graphical display of relayd message counts

2. Getting Started

SiteShadow is launched from the command line of a konsole window or through the SiteShadow wizard. Executing 'siteshadow' with no options will display usage information



SiteShadow command line options

srcCfgFile	The source configuration file that tells SiteShadow where to receive the data from.
labCfgFile	The lab configuration file that tells SiteShadow which devices to use.
--offset=offset	The amount of time to hold the data before sending it. The value is 100ths of a second and the default is to send the data immediately
--ifshadow=host,stars	Starts IFShadow. "host" is the 3 letter identifier of the HOST system in the config file. "stars" is the 3 letter identifier of the system that is being connected to.

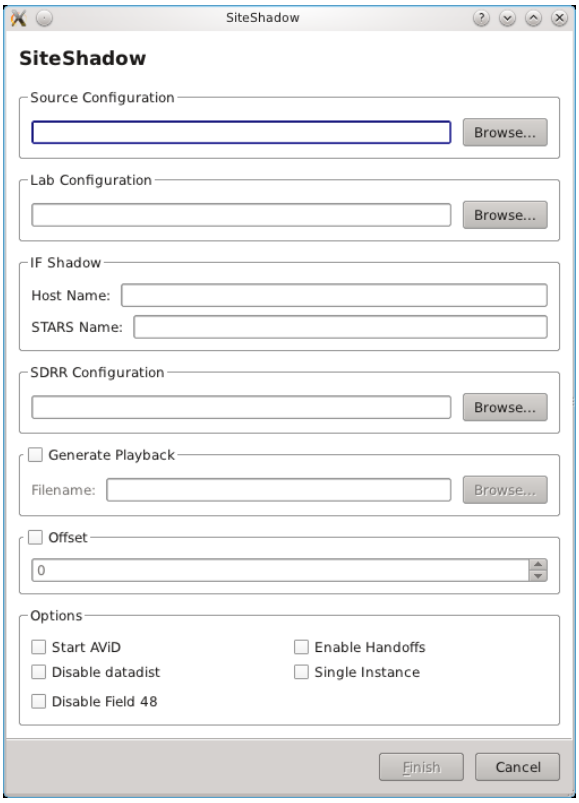
--ifshadowPlayback=[filename]	Creates an SDRR playback file. By default if no filename is specified /tmp/playback.xml.MMDDYYYY.hhmm will be created.
--enablehandoffs	Enables handoffs from HOST to STARS on start up. By default handoffs are disabled.
--disablefield48	Disables field 48 in the accept transfer (TA) message
--avid	Starts AViD to display a graphical count of surveillance statistics.
--nodatadist	Do not start datadist process
--sdrr="sdrr config"	Starts SDRR using the configuration file specified. Can be used for ETMS, static ADS-B message generation, etc..
--nofullscreen	Will not open SiteShadow to the full size of the screen
--native	Specify the graphics engine
--raster	Specify the graphics engine
--single	Will cause SiteShadow to exit if an instance of SiteShadow is already running

Sample command line execution

siteshadow /usr/local/cfg/src.xml /usr/local/cfg/lab.xml --ifshadow=zfw,dfa --avid --sdrr=/usr/local/cfg/sdrrCfg.xml

2.1. SiteShadow - Wizzard

To use the SiteShadow wizard execute “SiteShadow” in the konsole. The options that are listed above can be selected through a GUI. The required information is the “Source Configuration” and the “Lab Configuration” after those two items are filled in the “Finish” button is enabled. See below for what the SiteShadow wizard looks like.



SiteShadow Wizard

2.2. SiteShadow - Configuration Files

Below are examples of the srcCfgFile and labCfgFile configurations files.

srcCfgFile:

```
<root>
  <sources>
    <radar  name="atl" device="multi:eth1:239.1.1.1/1900" type="asr9-modes" magdev="-3.00"
scantime="4.75" elev="1028.00" pos="+33:37:43.50,-084:25:48.20"/>
    <arts name="aaa" device="multi:eth1:239.1.1.1/1909" facName="aaa" autoTR="0"/>
    <host name="ztl" facName="zct" facID="t" autoTR="0" autoTA="10" tangent="+34:21:24.98,-
084:02:28.97" org="-424.000,-365.625">
      <artsio name="aaa" device="multi:eth1:239.1.1.1/1910" facName="aaa" magdev="-3.00"
tangent="+33:37:44.00,-084:25:48.00"/>
    </host>
  </sources>
</root>
```

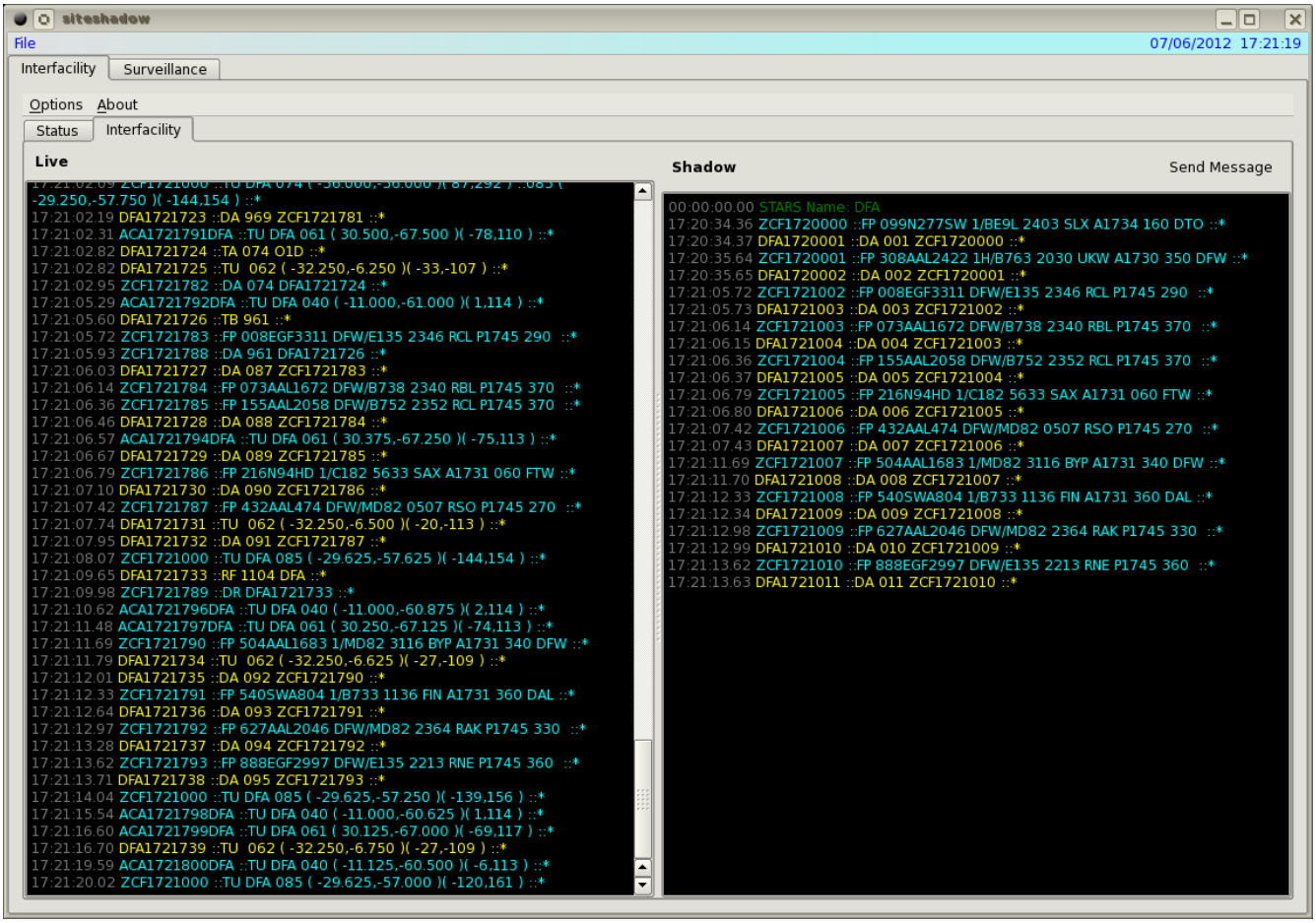
labCfgFile:

```
<root>
  <sources>
    <radar name="atl" device="/dev/srr0" type="asr9-modes" magdev="-3.00" scantime="4.75"
elev="1028.00" pos="+33:37:43.50,-084:25:48.20"/>
    <host name="ztl" facName="zct" facID="t" autoTR="0" autoTA="10" tangent="+34:21:24.98,-
084:02:28.97" org="-424.000,-365.625">
      <artsio name="aaa" device="/dev/if0" facName="aaa" magdev="-3.00" tangent="+33:37:44.00,-
084:25:48.00"/>
    </host>
  </sources>
</root>
```

In the above configuration files the shadow data comes in on the network device eth1 and is then sent out to a locally connected system by devices on the SiteShadow machine /dev/srr0 and /dev/if0. This is just a simple example showing radar and Interfacility messages being shadowed. More complex configurations can be made to shadow radar, Interfacility, ADS-B and DASI data to the system.

3. IFShadow

The JVN IFSHADOW application safely sniffs live IFDT connections with a receive port while passing the IFDT data along a separate bidirectional port to a terminal system/s, (STARS, CARTS, TAMR…). IFSHADOW acts as a translator between what it receives from the live IFDT and what it sends to the terminal system/s, converting ECID and TCIDs to match the connected terminal system/s. The terminal system/s actually receives what the real HOST sends and is able to respond back with DA, DR because IFSHADOW is in the middle acting like a smart switch. This allows controller/trainees to actually have real flight plans populate their tab list and auto acquire on tracks.

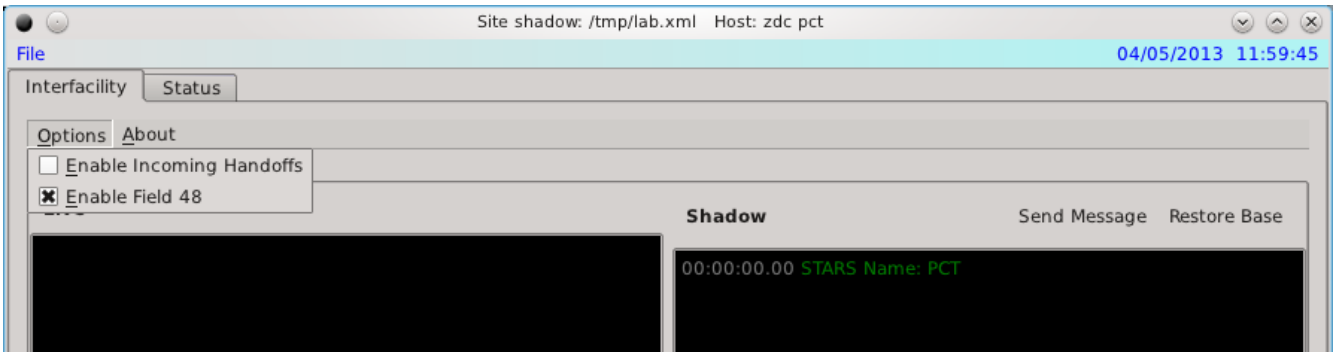


Interfacility Tab

3.1. IFShadow - Options

IFSHADOW includes the ability to pass handoff messages to and from the Host/Terminal. This allows controller/trainees to receive the actual arrival/over-flight handoffs from the center. To enable this functionality select “Enable Incoming Handoffs” from the options menu. They are also able to handoff departures tracks to the simulated center, or even to adjacent facilities that IFSHADOW is simulating. The controller will be able to see the response DA/DR messages as if the real HOST/Terminal responded. This is a big help while testing handoffs to adjacent sites.

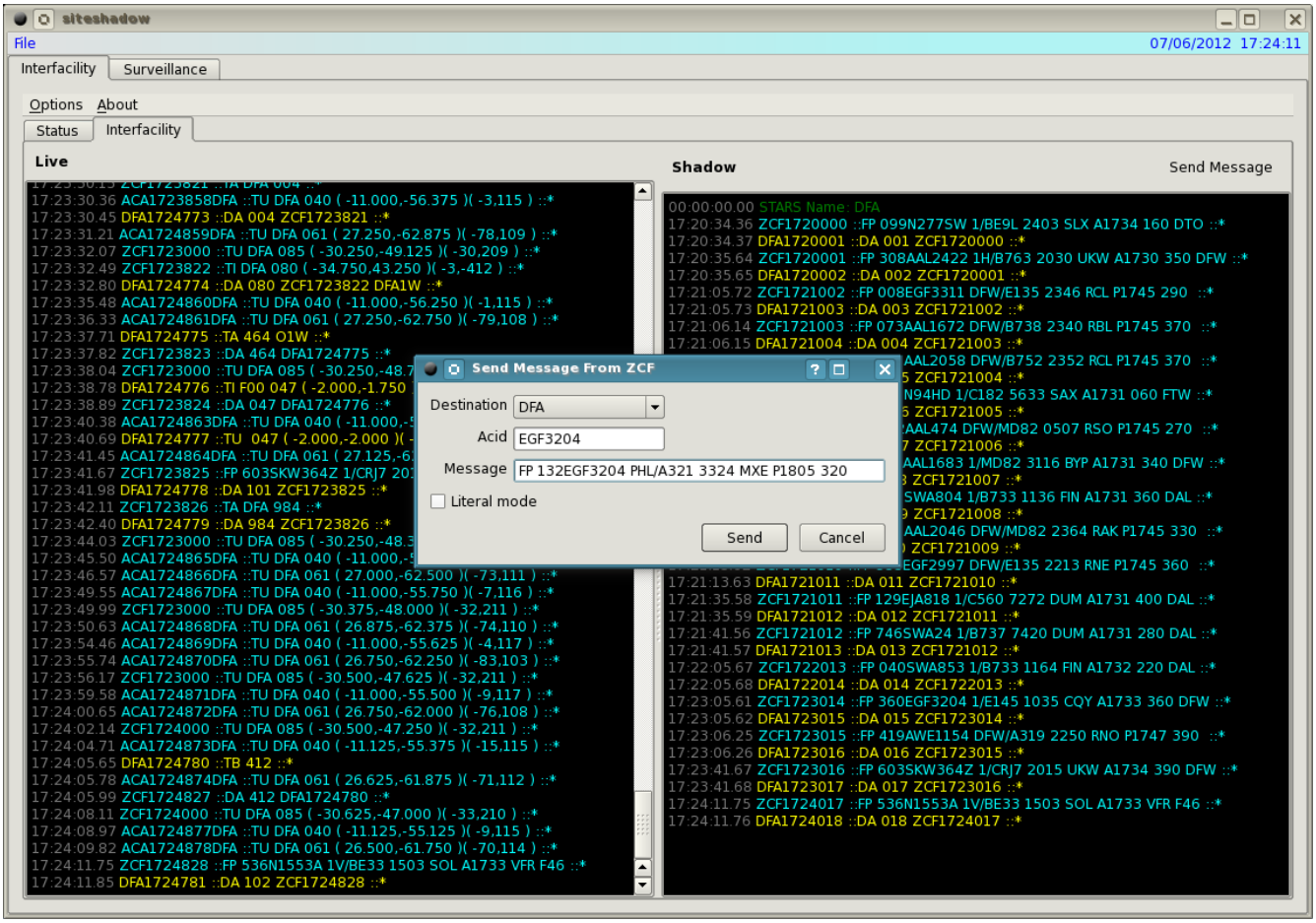
IFSHADOW includes the ability to enable field 48 in the TA message. By default this option is enabled to include filed 48. Some sites are configured to not receive filed 48 so disabling this will allow the site to mimic the TA message that they would receive. This option can be toggled while running by selecting “enable filed 48” from the options menu or disabled during application startup with the command line option “--disablefield48”. See the image below for the options menu.



IFShadow Options

3.2. IFShadow - Send Message

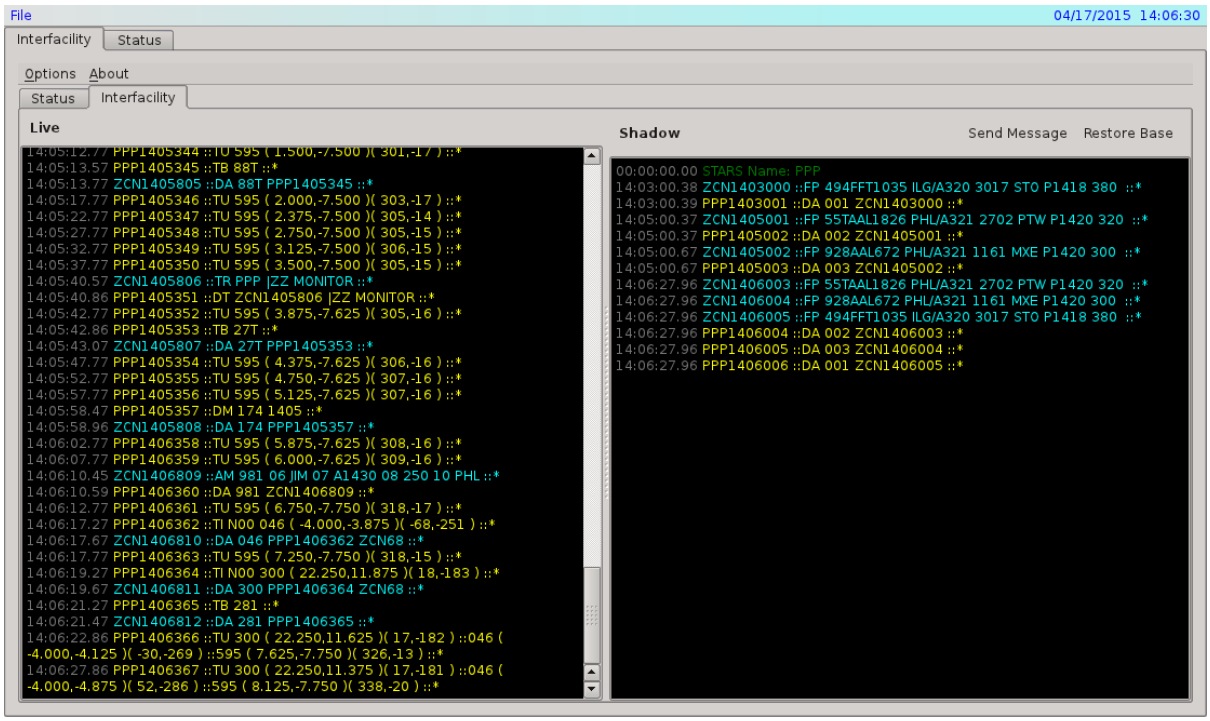
IFSHADOW includes a helpful send message button to allow messages to be input real-time such as flight plans, amendments, etc. to their terminal system. This functionality has proven to be a valuable test feature while debugging IFDT issues. It also allows users to manually send flight plans to tag with targets of opportunity on the glass.



IFShadow Send Message Dialogue

3.3. IFShadow – Restore Base

The Restore Base button under the interfacility tab is used to resend all of the active Flight Plans that are in the system. This is useful to use after doing a cold start or reset of the automation system.



IFShadow Restore Base Functionality

4. Relayd

This application is a process that relays JVN formatted messages. JVN formatted messages can be serial radar data, ADS-B data, Interfacilty messages or DASI. The devices used for input and output are defined in configuration files.

Usage : relayd inputCfg [outputCfg | -a dir] [-dtq]

-a dir Auto-create output files in specified dir. dir will be created if needed.
-d Turn debug messages on.
-q don't use QCoreApplication eventLoop (do select ourselves).
-t Don't fork into background.

4.1. Relayd – Configuration Files

Below are examples of the inputCfg and outputCfg configuration files.

input configuration:

```
<root>
  <sources>
    <radar name="atl" device="/dev/srr0" type="asr9-modes" magdev="-3.00" scantime="4.75"
elev="1028.00" pos="+33:37:43.50,-084:25:48.20"/>
    <arts name="aaa" device="/dev/if1" facName="aaa" autoTR="0"/>
    <host name="ztl" facName="zct" facID="t" autoTR="0" autoTA="10" tangent="+34:21:24.98,-
084:02:28.97" org="-424.000,-365.625">
      <artsio name="aaa" device="/dev/if2" facName="aaa" magdev="-3.00" tangent="+33:37:44.00,-
084:25:48.00"/>
    </host>
  </sources>
</root>
```

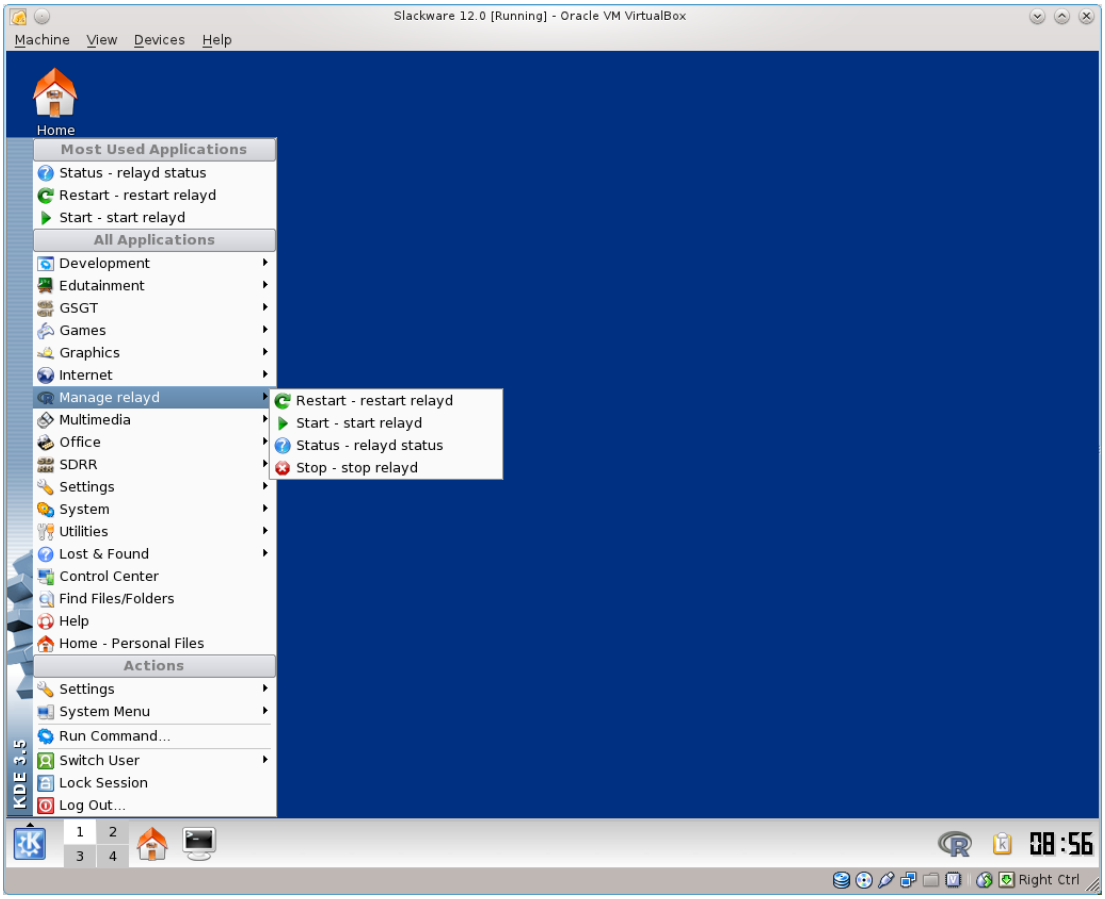
output configuration:

```
<root>
  <sources>
    <radar  name="atl" device="multi:eth1:239.1.1.1/1900" type="asr9-modes" magdev="-3.00"
scantime="4.75" elev="1028.00" pos="+33:37:43.50,-084:25:48.20"/>
    <arts name="aaa" device="multi:eth1:239.1.1.1/1909" facName="aaa" autoTR="0"/>
    <host name="ztl" facName="zct" facID="t" autoTR="0" autoTA="10" tangent="+34:21:24.98,-
084:02:28.97" org="-424.000,-365.625">
      <artsio name="aaa" device="multi:eth1:239.1.1.1/1910" facName="aaa" magdev="-3.00"
tangent="+33:37:44.00,-084:25:48.00"/>
    </host>
  </sources>
</root>
```

Using relayd with these configurations will cause any data from srr0/if1/if2 to be sent out of the network device eth1.

4.2. Manage relayd

Manage relayd is a convenient way to start, stop, restart or check the status of relayd. This is performed through the K-menu or the main panel. Left clicking on the K-menu you will find a section called "**Manage relayd**". Within the submenu there are four options **Restart/Start/Status/Stop** clicking on one of these will perform that action. If setup in the main panel left clicking on the icon will pop up a similar menu. After clicking on one of the options a window will be displayed with feedback from the action performed.



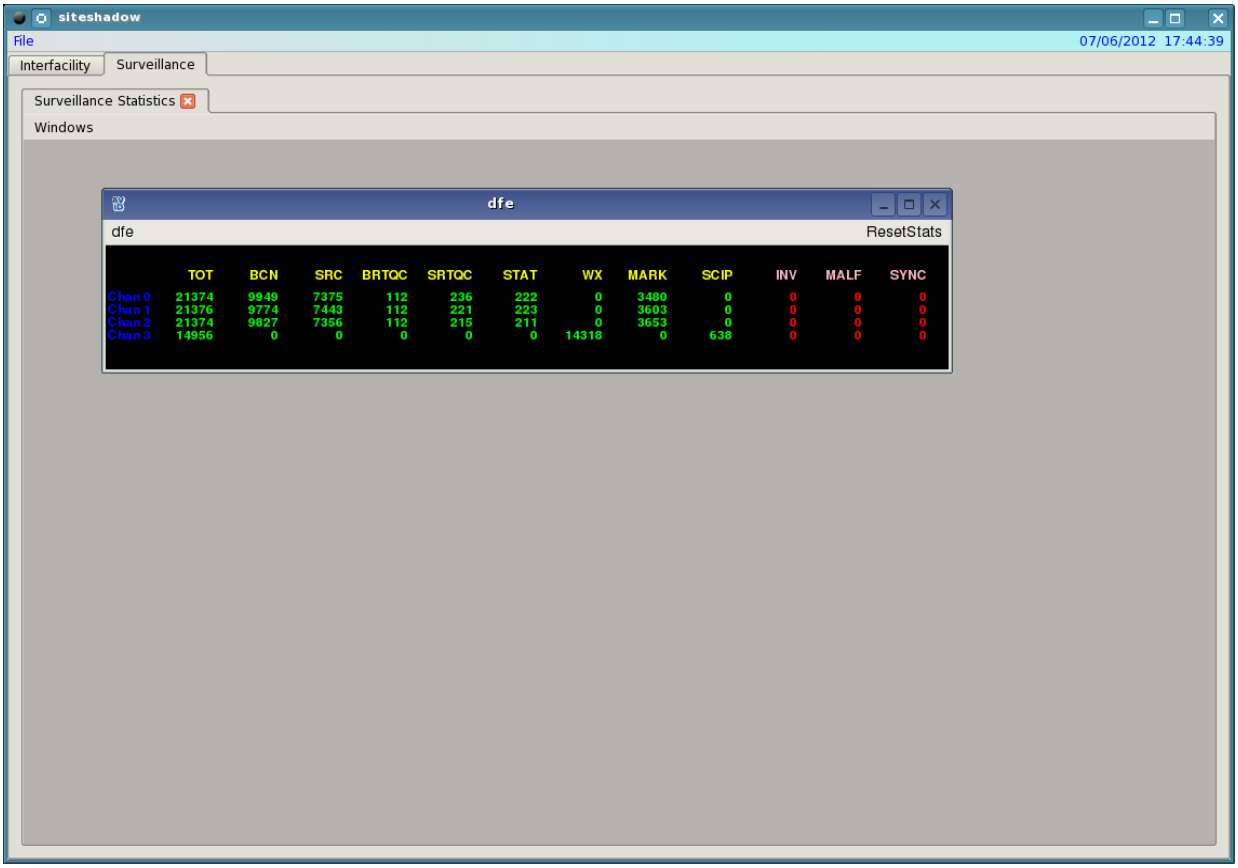
Manage relayd through the K-menu

Manage relayd through the main panel

Manage relayd status feedback

5. AViD

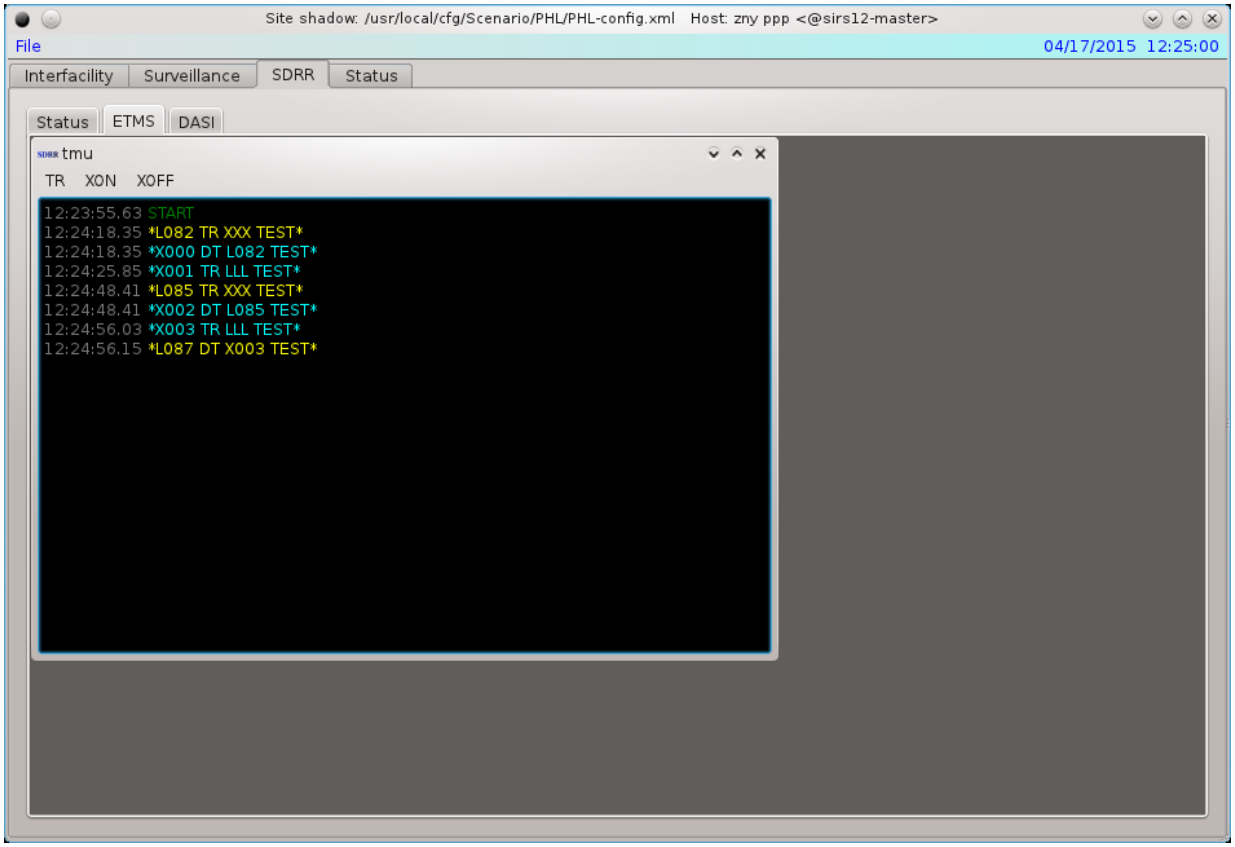
The Airspace Visualization Display (AViD) displays a graphical representation of messages counts from the relayd process.



AViD Surveillance Tab

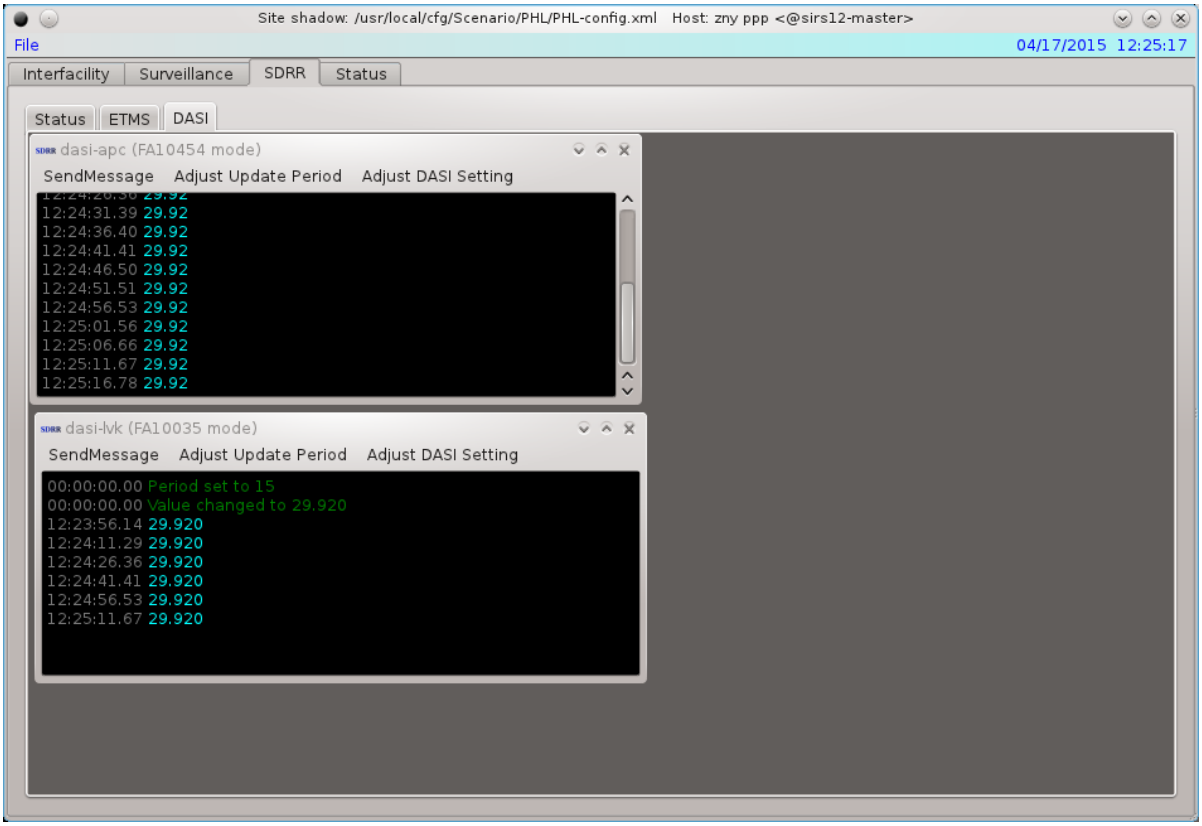
6. SDRR

SiteShadow can also include the use of SDRR to simulate ETMS or DASI data interfaces. When the --sdrr option is used an SDRR tab will appear in SiteShadow. Clicking the SDRR Tab will allow the user to display ETMS or DASI interaction with the system.



ETMS simulation Data under the SDRR Tab

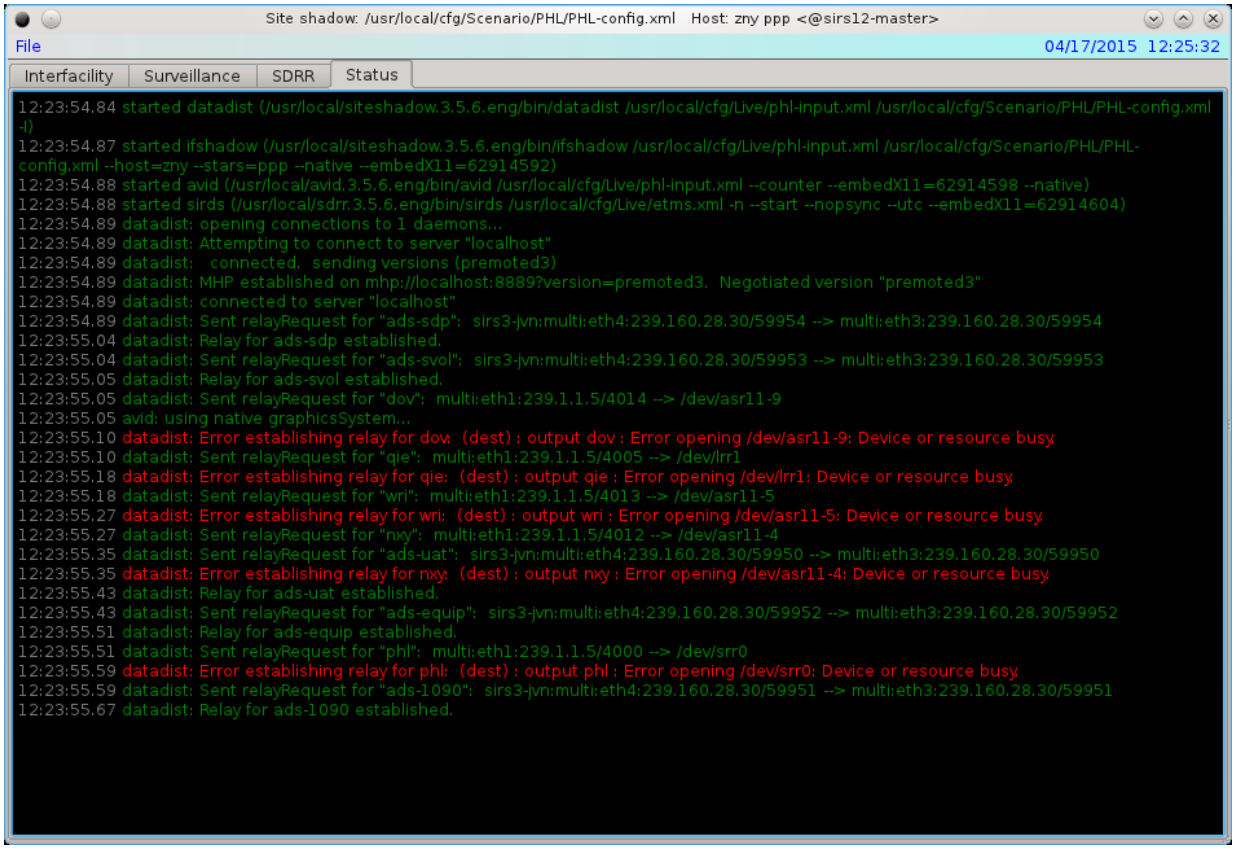
Under the DASI tab the user can adjust the Update Period or the DASI value that is sent to the system.



DASI simulation under the SDRR Tab

7. Status Tab

The Status Tab in SiteShadow displays useful information about the system status and device connections. Red errors may be displayed in the tab alerting the user to potential problems with the configuration. Some errors that the user may be alerted to are the the “Device or resource is busy” which means that the radar device is already transmitting data. The user should check that no other scenarios are running using the devices.



Appendix A. Revision History

July 5, 2012 (Version 1.1.4 Rev. 1)

- Initial Publication

April 3, 2013 (Version 3.2.2 Rev. 2)

- Editorial Changes

June 3, 2013 (Version 3.2.4 Rev. 3)

- Added Mange relayd

April 16, 2015 (Version 3.5.5 Rev. 4)

- Editorial Changes
- Added wizard subsection
- Added cfg subsections
- Added IFShadow Options/Send Message subsections
- Added SDRR Section
- Added Status Section