

M211315EN-G

Software Installation Guide

IRIS Radar
IRIS and RDA



VAISALA

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1. About This Document

1.1 Version Information

This document provides information for system managers about installing and upgrading IRIS and RDA software.

Familiarity with operating system concepts is required.

Table 1 Document Versions

Document Code	Date	Description
M211315EN-G	June 2017	This document. Sixth version.
M211315EN-F	March 2017	Fifth version.
M211315EN-E	February 2016	Fourth version.
M211315EN-D	November 2013	Third version.

1.2 Related Documents

Table 2 Weather Radar Documentation

Document Code	Name
M211315EN	<i>IRIS and RDA Software Installation Guide</i>
M211318EN	<i>IRIS Programming Guide</i>
M211316EN	<i>IRIS and RDA Utilities Guide</i>
M211319EN	<i>IRIS Product and Display Guide</i>
M211317EN	<i>IRIS Radar User Guide</i>
M211452EN	<i>IRIS and RDA Dual Polarization User Guide</i>
M211322EN	<i>RVP900 Digital Receiver and Signal Processor User Guide</i>
M211320EN	<i>Radar Control Processor RCP8 User Guide</i>

For information on changes made since your current release was installed, download the latest document versions and check the IRIS and RDA Release Notes from www.vaisala.com.

Vaisala encourages you to send your comments or corrections to helpdesk@vaisala.com

1.3 Documentation Conventions



WARNING! Warning alerts you to a serious hazard. If you do not read and follow instructions carefully at this point, there is a risk of injury or even death.



CAUTION! Caution warns you of a potential hazard. If you do not read and follow instructions carefully at this point, the product could be damaged or important data could be lost.



Note highlights important information on using the product.



Tip gives information for using the product more efficiently.



Lists tools needed to perform the task.



Indicates that you need to take some notes during the task.

1.4 Trademarks

IRIS™ is a trademark of Vaisala Oyj.

CentOS™ is a trademark of Red Hat, Inc.

Linux® is a registered trademark of Linus Torvalds.

All other product or company names that may be mentioned in this publication are trade names, trademarks, or registered trademarks of their respective owners.

2. Installing IRIS/RDA Software with SIGCONFIG

2.1 Overview to Installing IRIS/RDA Software with Sigconfig

The `sigconfig` script installs the IRIS / RDA software and the supporting RPMs.

The script simplifies the installation of extra RPMs by supporting `yum` group install. The following `yum` groups include the RPMs required by the IRIS / RDA software installation:

- Common Extras
Includes RPMs needed by IRIS and RDA.
- RDA extras
Includes RPMs needed by the RDA installation when using the `rvp900`, `rcp8`, or `rda` command line options.
- IRIS Extras
Includes RPMs needed by IRIS installation process.

In 8.13.6 release and newer, you can mount the IRIS/RDA software media with any mount point name, and the `sigconfig` script handles the `yum repo` to the correct location.

By default when you insert the IRIS/RDA software to a DVD drive, or USB flash drive, it mounts to `/run/media/username/irisrda_x.x.x`, where `username` is the login user, and `x.x.x` is the software release version. For example, for the root user and version 8.13.6: `/run/media/root/irisrda_8.13.6`.

During the installation, `sigconfig` backs up the `yum repo` files to the directory, `/etc/yum.repo.d/repo.bck`, and creates a `repo` file for IRIS/RDA extras RPMs in `/etc/yum.repo.d/`.

When `sigconfig` finishes the software installation, it restores the original `repo` files to `/etc/yum.repo.d`, and deletes the `IRIS/RDA Extras rpms repo` file.

2.2 Running Sigconfig Automatically



CAUTION! The `sigconfig` scripts overwrites the existing configuration. Do not run the script on systems with IRIS/RDA software already installed. Only run the script when installing IRIS/RDA software for the first time.

- ▶ 1. Install the CentOS operating system. See either:
 - [B.1 Overview to Installing CentOS 6.x \(page 95\)](#)
 - [A.1 Overview to Installing CentOS 7.x \(page 63\)](#)

2. Locate the IRIS / RDA installation media or create the media if no media is already available.
See [2.2.1 Creating the IRIS RDA Installation Media \(page 8\)](#).
3. If you are already logged in as a non-root user, log out.
4. Login as root.
See [2.2.2 Logging in as ROOT \(page 9\)](#).
5. Install the IRIS / RDA installation media and verify it mounts.
See [2.2.4 Installing Media and Verifying Mount Point \(page 10\)](#).
6. Run the **sigconfig** script at the mount point with the command line arguments for your application.
Vaisala recommends running **sigconfig** automatically. See [2.2.5 Running Sigconfig \(page 12\)](#).
If running **sigconfig** automatically is not possible, see [2.3 Running Sigconfig Manually \(page 18\)](#).
7. Verify expected services have started by logging in as **radarop** and running the **ps_iris** command.
See [2.4 Verifying Services Are Running \(page 30\)](#).
8. Configure your licenses.
See [2.5 Configuring IRIS License Setups \(page 32\)](#).
9. Check and update your firmware as needed. See:
 - [5. Installing RCP Firmware \(page 51\)](#)
 - [6. Installing RVP9 \(RDA\) Firmware \(page 53\)](#)

2.2.1 Creating the IRIS RDA Installation Media

Run the RDA IRIS installation process from a DVD drive or a USB stick.

2.2.1.1 Burning IRIS RDA ISO Image to DVD on Windows 7

- ▶ 1. Copy the IRIS/RDA ISO image to your desktop.
- 2. Right-click the file, and select **Open with > Windows Disc Image Burner**.
The **Windows Disc Image Burner** window opens.
- 3. Insert the DVD disk into the DVD burner drive.
- 4. Select **Burn**.

You can now continue with the IRIS/RDA software installation. See [2.2 Running Sigconfig Automatically \(page 7\)](#).

2.2.1.2 Copying IRIS RDA ISO Image to USB Flash Drive on Linux

- ▶ 1. Copy the IRIS/RDA iso image to your Linux workstation.
- 2. Login as root or switch to root user with the **su** command.
- 3. Run the **lsblk** command and take note of the output.
- 4. Insert USB flash drive in the USP port.

5. Re-run the **lsblk** command.
Make sure you see an additional device list on the output, that is, the USB device that you plugged-in earlier.
6. Transfer the IRIS/RDA iso image to USB flash drive with command, where X is the device number such as `/dev/sdc`:

```
# dd if=irisrda_image.iso of=/dev/sdx bs=512
```

You can now continue with the IRIS/RDA software installation. See [2.2 Running Sigconfig Automatically \(page 7\)](#).

2.2.2 Logging in as ROOT

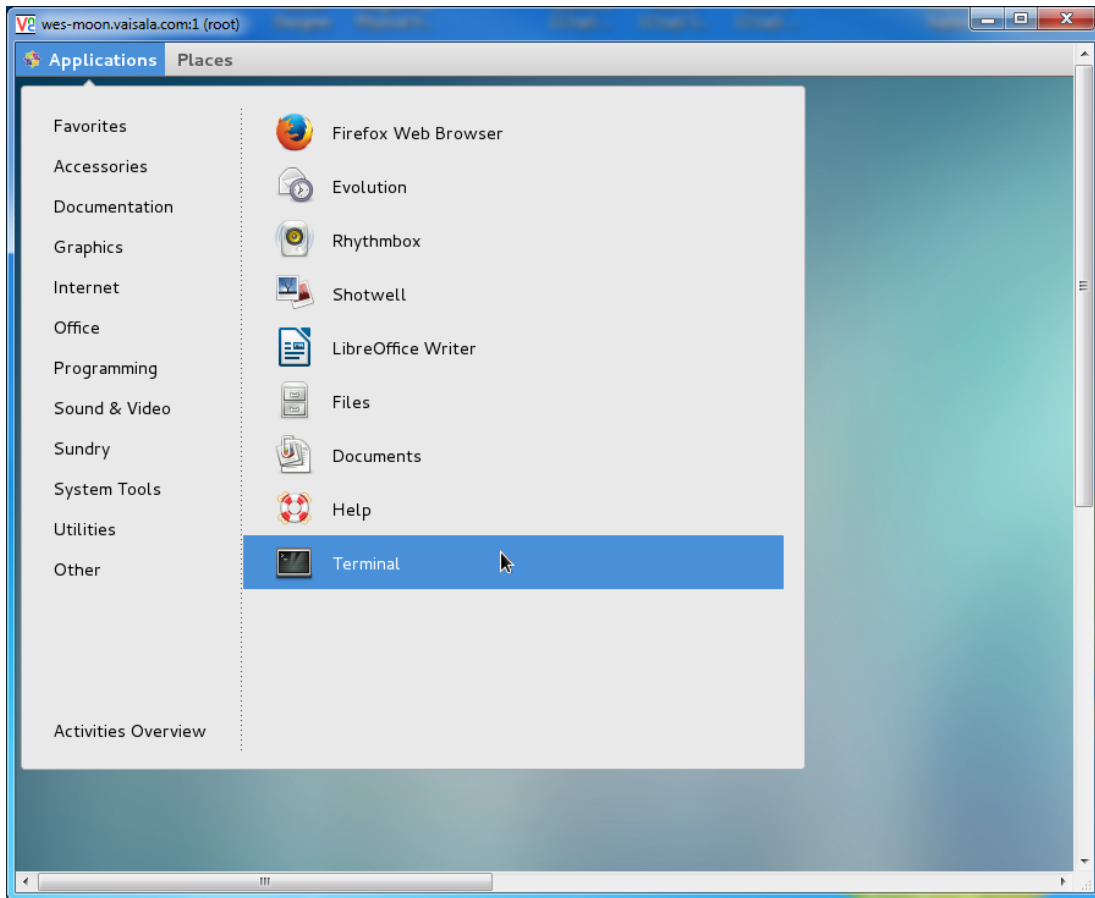
- ▶ 1. In the login screen displaying your user accounts, select **Not Listed?** below the user account login box.
- 2. Enter root as the user name and your root password.
The system displays a welcome message after the first time you log in and a blank screen after other logins.
If prompted, select your language and input settings.

You can now continue with the IRIS/RDA software installation. See [2.2 Running Sigconfig Automatically \(page 7\)](#).

2.2.3 Opening a Terminal Window

- ▶ 1. In the upper left corner, left-click **Applications**.

2. Move your cursor to highlight the terminal and select it.



A terminal window with a prompt opens.

3. Remove the user you created during the CentOS installation.
For example, if you created the user **service**, type:

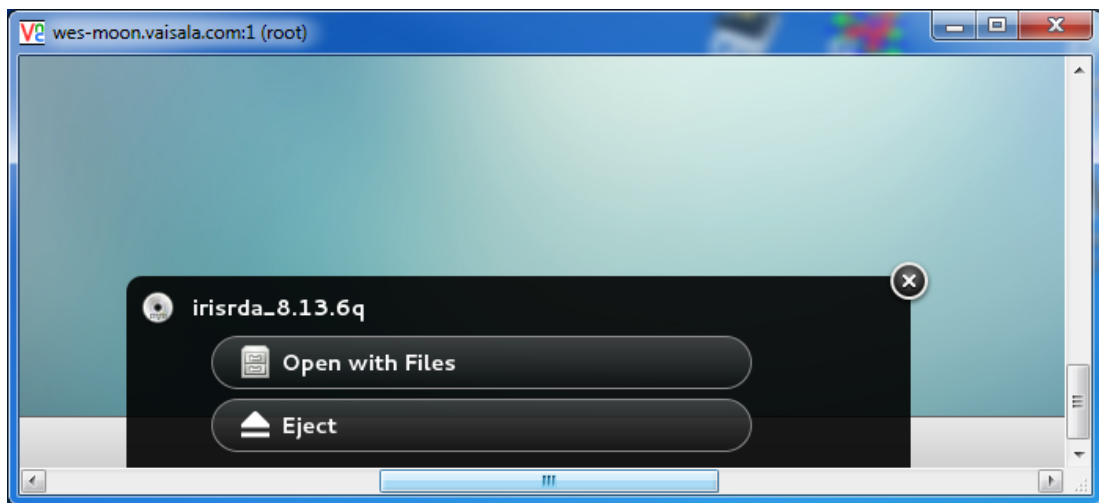
```
# userdel -r service
```

2.2.4 Installing Media and Verifying Mount Point

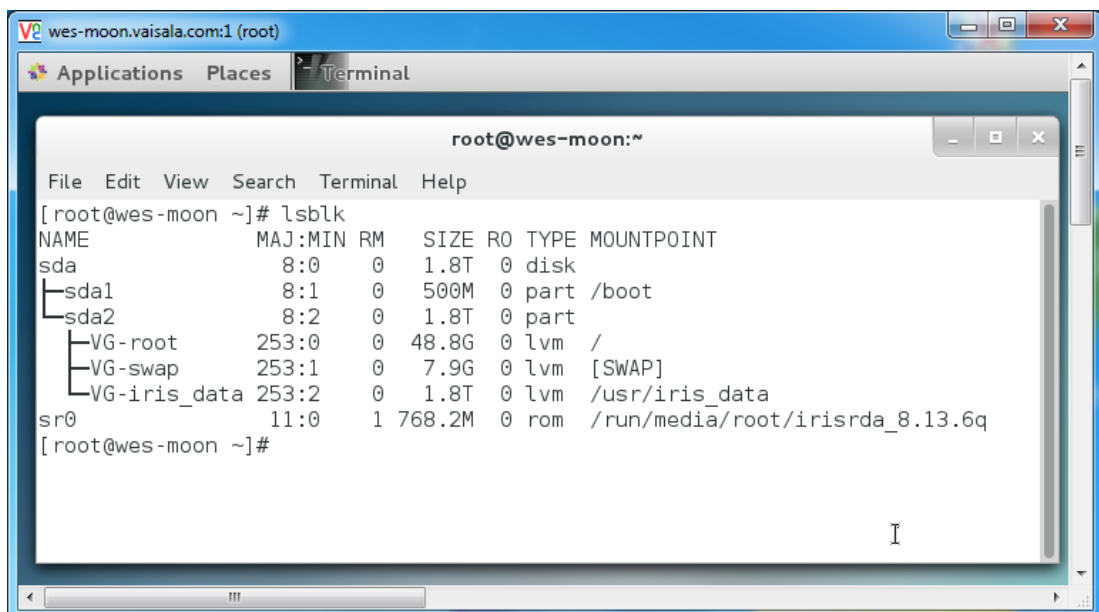
IRIS / RDA installation media can be either a USB device or a DVD disc.

1. Install the USB drive in the USB port or install the DVD disc in the DVD drive by pressing the eject button on the front to open the drive and gently pushing it shut to install the media.

- If you are using a DVD drive, a small black window indicates that the DVD disc has been recognized.
Select **X** in the upper right corner to close the window.



- Verify that the installation media is recognized by typing: **# lsblk**
- Check that your device is listed with the mount point:
CentOS 6
/media/irisrda_X.XX.X
CentOS /
/run/media/root/irisrda_X.XX.X
where X.XX.X is the version of software you are installing.



- If you do not see this mount point listed you must manually mount the device.
See [2.2.4.1 Mounting IRIS RDA Media Manually \(page 12\)](#).

You can now continue with the IRIS/RDA software installation. See [2.2 Running Sigconfig Automatically \(page 7\)](#).

2.2.4.1 Mounting IRIS RDA Media Manually

If the IRIS/RDA software does not mount automatically, you must mount it manually.

- ▶ 1. Create a mount point (directory).
 - If you are using a DVD, create a mount point at */media/dvd*:

```
# mkdir -p /media/dvd
# mount /dev/cdrom /media/dvd
```

- If you are using a USB drive, create a mount point at */media/usb* where X is the drive number and can be a, b, or c:

```
# mkdir /media/usb
# mount /dev/sdX /media/usb
```



If you do not know what the USB drive number is on your system, type **# lsblk** to list the block devices on your system. It is usually the last one on the list.

2. Verify the mount point is present by typing: **# lsblk**

2.2.5 Running Sigconfig



These instructions explain how to run **sigconfig** with CentOS7. If you are installing CentOS6 use the **-6** argument instead of the **-7** argument shown in the examples.

- ▶ 1. Change to the directory where IRIS/RDA media is mounted.
For example if you automatically mounted your disc the mount point would be */run/media/root/irisrda_X.XX.X*. In this example it is version 6.13.6q

```
# cd /run/media/root/irisrda_8.13.6
```

2. To list the files and verify **sigconfig** is present, type: **# ls**
Check that you see **sigconfig** on the top directory.

- Use the **sigconfig** command with the desired options to run the sigconfig script and install the IRIS / RDA software:

```
# ./sigconfig arg1 arg2 arg3 argn
```



To see a help menu of command line arguments, type **sigconfig** with no arguments: **# ./sigconfig**

Table 3 Sigconfig Installation Examples

Installation Setup	Command
IRIS on CentOS 7	# ./sigconfig -iris -7 Optionally, specify the install directory from the command line option using -instdir argument followed by the directory path.
RVP900 on CentOS 7 (auto start on system reboot)	# ./sigconfig -rvp900 -7
Dual system (IRIS, RVP900, RCP8) on CentOS 7 (auto start on system reboot) Use this option for Vaisala weather radar servers such as WRM or WRK.	# ./sigconfig -rvp900 -rcp8 -iris -7
RVP, and RCP on CentOS 7 (no auto start on system reboot)	# ./sigconfig -rda -7
	Since there is no auto start for the services for this install option, start the service manually.
	On CentOS 7, to start the service for rvp900 , or rcp8 , type: # systemctl start rvp900
	On CentOS 7, use the service command. For example, to start RVP9, type: # service rvp900 start

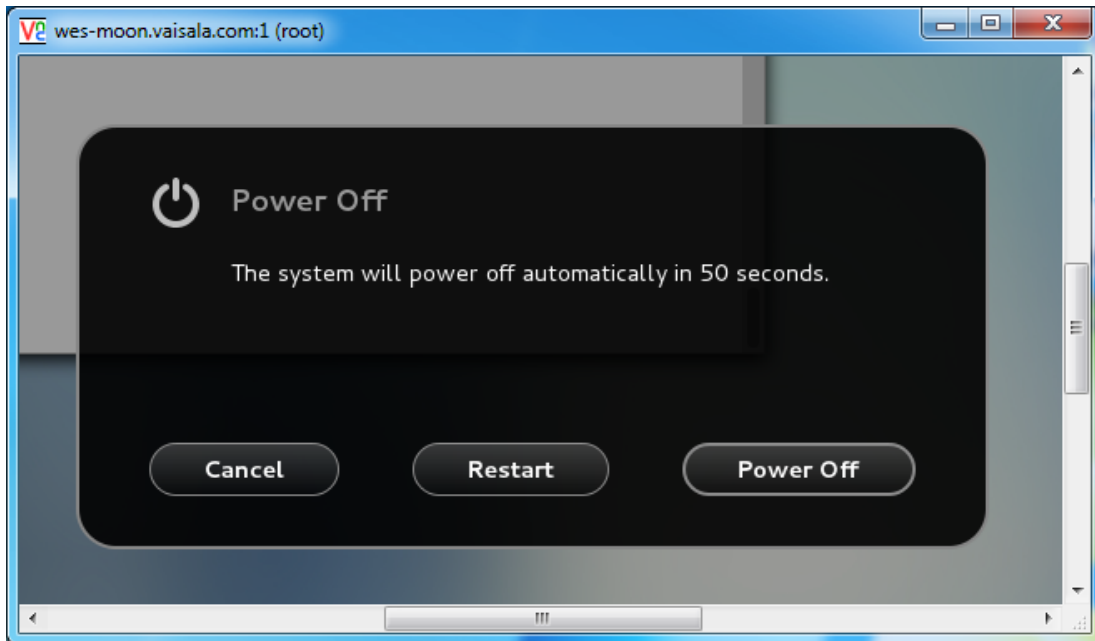
When the installation is complete, you are prompted to remove the installation media and reboot the server.

- Change directory to the root home directory and eject the media.

```
# cd ~
# eject
```

- Remove the media from either the USB port or the DVD drive

6. Reboot the computer:



- a. Select the root button in the top right corner of the window.
- b. Select **Power Off**.
- c. Select **Restart**.

2.2.6 Installing Additional RPMS



Here, X.XX.X is a placeholder for the version of IRIS/RDA software you are installing, for example 8.13.6.

► 1. Change to the RPM directory to verify that it is accessible.

- On CentOS6

```
# cd /run/media/root/irisrda_X.XX.X/CENTOS6/extras/RPMS/
```

- On CentOS7

```
# cd /run/media/root/irisrda_X.XX.X/CENTOS7/extras/RPMS/
```

In the rest of this section, this directory is referred to as *\$RPM_MOUNT_POINT*.

2. Backup your current yum repository:

```
# cd /etc/yum.repos.d
# install -m 644 -d repo.bck
# mv *.repo repo.bck
```

3. Check if the yum process is already running using the **ls** command.
4. If the *yum.pid* file exists, kill the process and delete the file.

```
# ls /var/run/yum.pid
# pkill yumBackend.py
# rm -fr /var/run/yum.pid
```

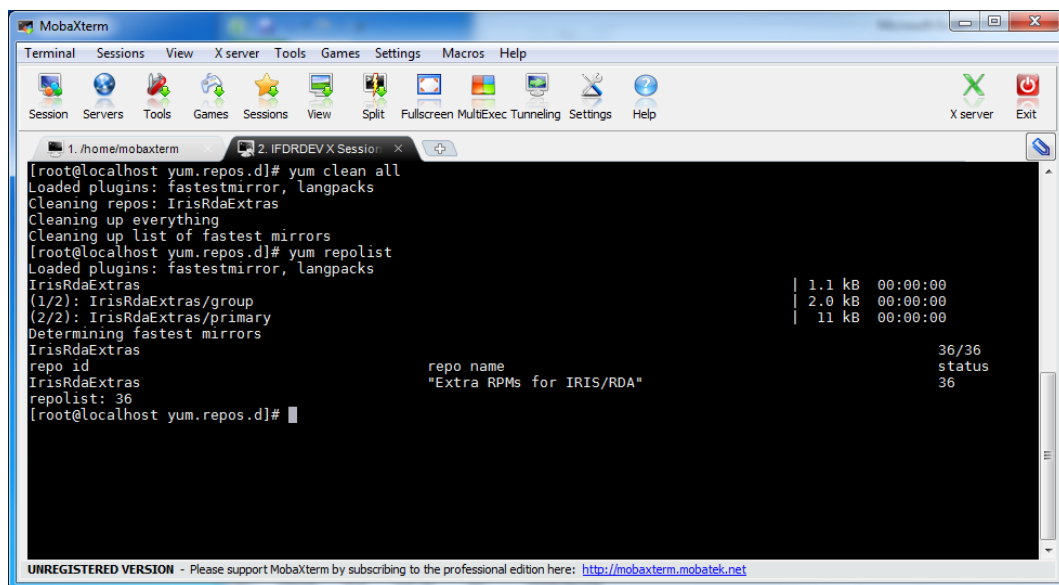
5. Using **emacs**, **vi**, or a Linux text editor, create a file named: *iris_rda.repo*
 - a. Enter the following text in the file,

```
[IrisRdaExtras]
name="Extra RPMs for IRIS/RDA"
baseurl=file://$RPM_MOUNT_POINT
enabled=1
gpgcheck=0
```

Be aware of white spaces in the formatting of the text. For the example above the baseurl line is:

```
baseurl=file:///run/media/root/irisrda_X.XX.X/CENTOS6/extras/RPMS/
```

- b. Save the file.
 - c. Clean yum repositories by typing: **# yum clean all**
 - d. Verify that the new yum repository is present by checking that the text entered in the *iris_rda.repo* is displayed in the repo name by typing: **# yum repolist**
- If you get warnings or errors, check for typos in the file.



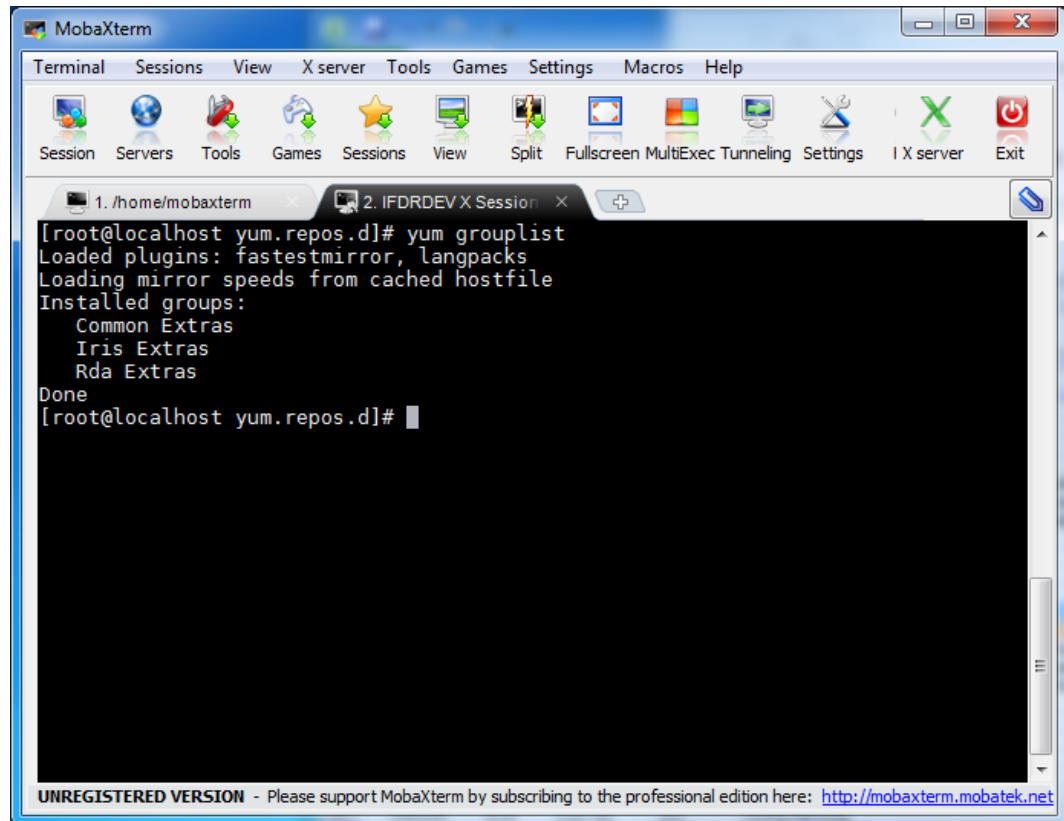
```
MobaXterm
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split Fullscreen MultiExec Tunneling Settings Help
1. /home/mobaxterm 2. IFORDEV X Session
[root@localhost yum.repos.d]# yum clean all
Loaded plugins: fastestmirror, langpacks
Cleaning repos: IrisRdaExtras
Cleaning up everything
Cleaning up list of fastest mirrors
[root@localhost yum.repos.d]# yum repolist
Loaded plugins: fastestmirror, langpacks
IrisRdaExtras
(1/2): IrisRdaExtras/group | 1.1 kB 00:00:00
(2/2): IrisRdaExtras/primary | 2.0 kB 00:00:00
Determining fastest mirrors
IrisRdaExtras
repo id repo name status
IrisRdaExtras "Extra RPMs for IRIS/RDA" 36/36
repolist: 36
[root@localhost yum.repos.d]#
```

- e. Install the new RDA software RPMS by typing:

```
# yum -y groupinstall "Rda Extras"
```

- f. Verify RPMS are installed by typing: **# yum grouplist**

Extras that are installed appear in the installed header area. Uninstalled Extras appear under the available header.



- g. Cleanup the yum directory

```
# rm -f /etc/yum.repos.d/*.repo*
# cp /etc/yum.repos.d/repo.bck/*.repo /etc/yum.repos.d/
```

- h. Save the yum settings to the cache `/etc/ld.so.cache` file for future use

```
# /sbin/ldconfig
```

2.2.7 Logging in as RADAROP

The IRIS / RDA software installation creates two additional default user accounts: radarop and observer.

- ▶ 1. Select the radarop login icon and enter the default password (xxxxxx) in the password.
2. Select **Next** in the series of welcome and initialization windows that appear the first time you log in.

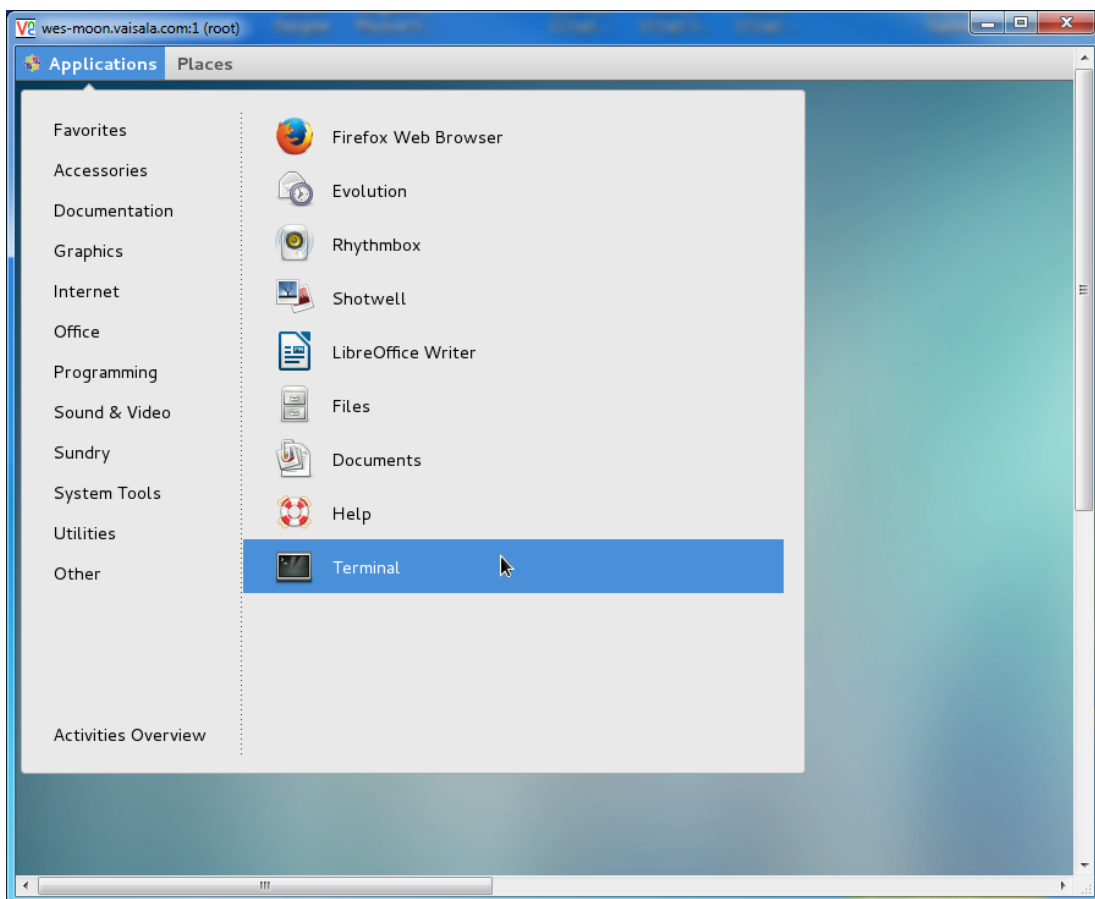
3. In the thank you window, select **Start using CentOS Linux**
4. In the **GNOME** Help window, select **X** in the right hand corner to continue.

2.3 Running Sigconfig Manually

If the automatic sigconfig procedure fails, you must install the RDA/ IRIS software manually.

Before beginning the manual installation:

- ▶ 1. In the login screen displaying your user accounts, select **Not Listed?** below the user account login box.
- 2. Enter root as the user name and your root password.
The system displays a welcome message after the first time you log in and a blank screen after other logins.
If prompted, select your language and input settings.
- 3. In the upper left corner, left-click **Applications**.
- 4. Move your cursor to highlight the terminal and select it.



A terminal window with a prompt opens.

5. Check that you have the necessary RPMS installation media.
There are several RPMS not installed by the standard CentOS installation processes needed for the RDA/ IRIS software to operate properly. These RPMS are provided by Vaisala on the RDA / IRIS release DVD.
If you do not have media and need to create it. See [2.2.1 Creating the IRIS RDA Installation Media \(page 8\)](#)
6. Install and mount IRIS / RDA Installation Disk. If the disk does not mount automatically, see [2.2.4 Installing Media and Verifying Mount Point \(page 10\)](#).

2.3.1 Installing Additional RPMS



Here, X.XX.X is a placeholder for the version of IRIS/RDA software you are installing, for example 8.13.6.

- ▶ 1. Change to the RPM directory to verify that it is accessible.
 - On CentOS6

```
# cd /run/media/root/irisrda_X.XX.X/CENTOS6/extras/RPMS/
```

- On CentOS7

```
# cd /run/media/root/irisrda_X.XX.X/CENTOS7/extras/RPMS/
```

In the rest of this section, this directory is referred to as *\$RPM_MOUNT_POINT*.

2. Backup your current yum repository:

```
# cd /etc/yum.repos.d
# install -m 644 -d repo.bck
# mv *.repo repo.bck
```

3. Check if the yum process is already running using the **ls** command.
4. If the *yum.pid* file exists, kill the process and delete the file.

```
# ls /var/run/yum.pid
# pkill yumBackend.py
# rm -fr /var/run/yum.pid
```

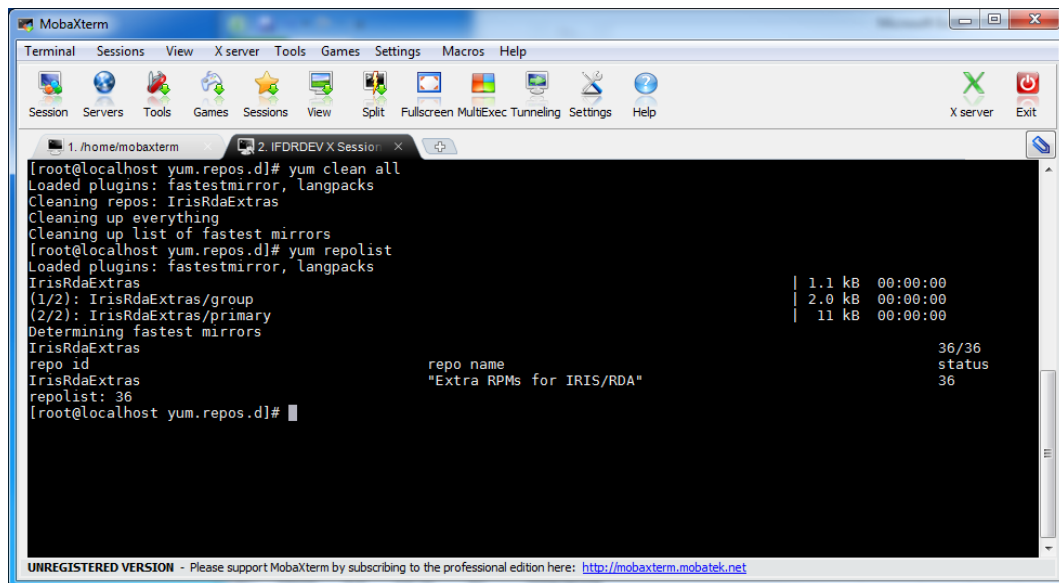
5. Using **emacs**, **vi**, or a Linux text editor, create a file named: *iris_rda.repo*
 - a. Enter the following text in the file,

```
[IrisRdaExtras]
name="Extra RPMs for IRIS/RDA"
baseurl=file://$RPM_MOUNT_POINT
enabled=1
gpgcheck=0
```

Be aware of white spaces in the formatting of the text. For the example above the baseurl line is:

```
baseurl=file:///run/media/root/irisrda_X.XX.X/CENTOS6/extras/RPMS/
```

- b. Save the file.
 - c. Clean yum repositories by typing: **# yum clean all**
 - d. Verify that the new yum repository is present by checking that the text entered in the *iris_rda.repo* is displayed in the repo name by typing: **# yum repolist**
- If you get warnings or errors, check for typos in the file.



```

MobaXterm
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split Fullscreen MultiExec Tunneling Settings Help
X server Exit

1. /home/mobaxterm 2. IFORDEV X Session
[root@localhost yum.repos.d]# yum clean all
Loaded plugins: fastestmirror, langpacks
Cleaning repos: IrisRdaExtras
Cleaning up everything
Cleaning up list of fastest mirrors
[root@localhost yum.repos.d]# yum repolist
Loaded plugins: fastestmirror, langpacks
IrisRdaExtras
(1/2): IrisRdaExtras/group | 1.1 kB 00:00:00
(2/2): IrisRdaExtras/primary | 2.0 kB 00:00:00
Determining fastest mirrors
IrisRdaExtras
repo id                               repo name                               status
IrisRdaExtras                         "Extra RPMs for IRIS/RDA"              36
repolist: 36
[root@localhost yum.repos.d]#
  
```

UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: <http://mobaxterm.mobatek.net>

- e. Install the new RPMS by typing:

```
# yum -y groupinstall "Common Extras"
```

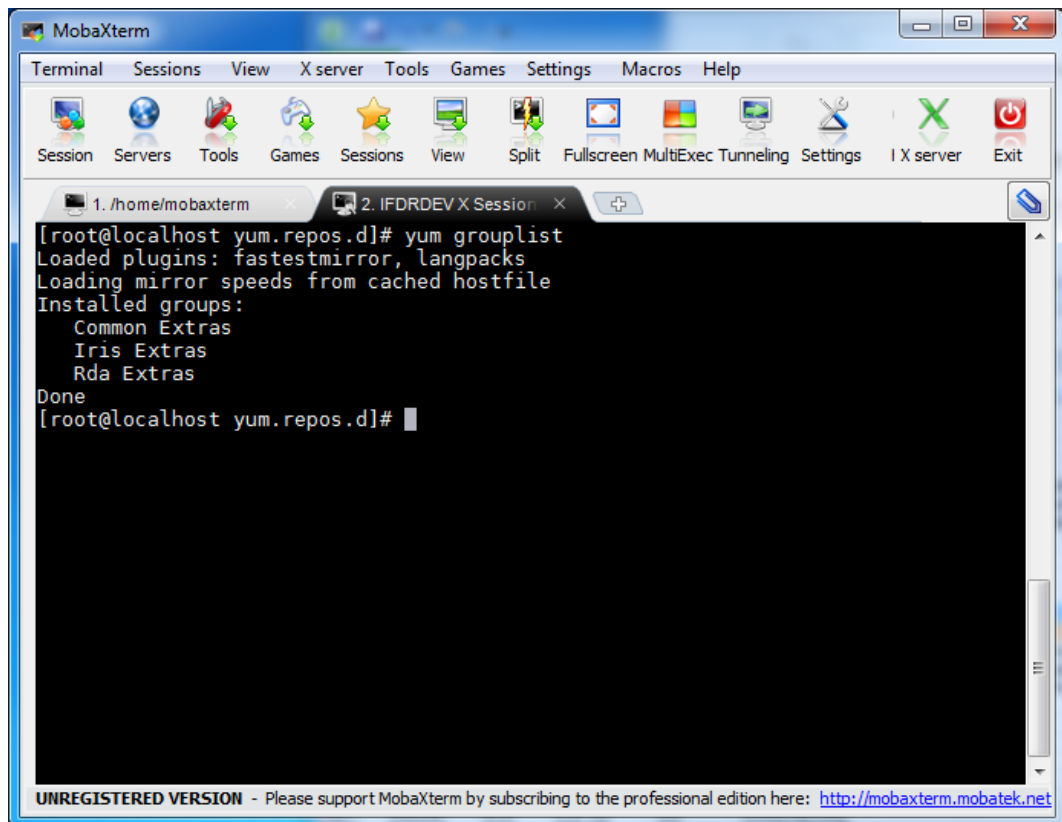
If you are installing RDA software:

```
# yum -y groupinstall "Rda Extras"
```

If you are installing IRIS software:

```
# yum -y groupinstall "Iris Extras"
```

- f. Verify RPMS are installed by typing: **# yum grouplist**
Extras that are installed appear in the installed header area. Uninstalled Extras appear under the available header.



- g. Cleanup the yum directory

```
# rm -f /etc/yum.repos.d/*.repo*
# cp /etc/yum.repos.d/repo.bck/*.repo /etc/yum.repos.d/
```

- h. Save the yum settings to the cache */etc/ld.so.cache* file for future use

```
# /sbin/ldconfig
```

2.3.2 Configuring User Accounts

You must create accounts for the radar operator and observer for IRIS, the RVP8, or RCP8.

- 1. Add radarop and observer user accounts:

```
# /usr/sbin/useradd -G users -m -u 1002 radarop
# /usr/sbin/useradd -G users -m -u 1001 observer
# echo 'xxxxxx' | passwd --stdin radarop
# echo 'xxxxxx' | passwd --stdin observer
```

2. By default, the Linux OS forces the use of strong passwords. If you want to use simpler passwords, edit the file */etc/pam.d/passwd* so that it consists of only a single line:

```
password required /lib/security/pam_unix.so
```

3. Save the file and exit.
Users can now change their password to be weak or strong.

4. Modify the `/etc/sudoers` file with user account information:

You can use `visudo` or a text editor after changing file privileges. Vaisala recommends `visudo` as it checks the syntax.

a. Define the services for `sudo` by adding the following line to the end of the file:

- On CentOS7

```
 Cmnd_Alias SERVICES = /sbin/service, /sbin/chkconfig, /usr/bin/
systemctl
```

- On CentOS6

```
 Cmnd_Alias SERVICES = /sbin/service, /sbin/chkconfig
```

b. Add the `radarop` account to `sudo` by adding the following line after services to `radarop`:

```
radarop=(ALL) NOPASSWD: SERVICES
```

c. Find the line that contains `Defaults requiretty` line and comment it out by adding a `#` to the first character in the line.d. If you use `visudo` and there is a syntax error when you save and quit, at the **What Now?** prompt, type **e** to re-edit the file.

2.3.3 Creating IRIS Root and Data Directories



Vaisala recommends using `/usr/sigmat` as the default root. If you choose another anchor point, note that the following sections use `/usr/sigmat`.

1. Login as **root**.
2. Create the `/usr/sigmat` directory by typing:

```
# mkdir /usr/sigmat
# chown operator:users /usr/sigmat
# chmod 6775 /usr/sigmat
```

3. Create the directories required to hold the data generated by the software. These directories may be anywhere within the file system. They have no connection with each other or with the */usr/sigmat* installation point. The following table shows the directories.

Directory	Description
<i>ascope</i>	Ascope data files
<i>input</i>	Generic pipe input
<i>ingest</i>	Acquired radar data in polar form
<i>log</i>	Error, status, and history messages
<i>product</i>	Normal product files from the product generator
<i>product_raw</i>	Raw product files from the product generator
<i>suncal</i>	Suncal results files are stored here
<i>tape_inv</i>	Tape inventories for quick retrieval
<i>temp</i>	Temporary storage used for network output
<i>zdrca1</i>	Zdrca1 results files

4. Create the directories at the operating system prompt. Make sure the owner and group are set to match operator's default.

For example:

- a. If */usr/iris_data* does not already exist, create the directory.

```
# mkdir /usr/iris_data
```

In CentOS 7, the directory should have been created as part of the automatic installation process.

- b. Change to the new directory and add the sub-directories:

```
# cd /usr/iris_data
# mkdir ascope input ingest log product product_raw
# mkdir suncal tape_inv temp zdrca1
# chown -R operator:users ./
# chmod -R 6775 ./
```

2.3.4 Installing IRIS and RDA Software

- ▶ 1. Install the IRIS / RDA Software DVD. It should auto mount.

2. Change directory to installation directory.

In the following commands, <8.13.6> is an example of the software installation version. If you are installing another version, replace 8.13.6 with your installation version.

- On CentOS 6:

```
# cd /run/media/root/irisrda_8.13.6/CENTOS6/
```

- CentOS 7:

```
# cd /run/media/root/irisrda_8.13.6/CENTOS7/
```

3. Install IRIS and RDA software:

- If installing IRIS only:

```
# cd iris
# ./instiris -files -root /usr/sigmet -new -manuals
```

- If installing RDA only:

```
# cd rda
# ./instiris -files -root /usr/sigmet -new -manuals
```

- If installing IRIS and RDA:

```
# cd iris
# ./instiris -files -root /usr/sigmet -new -manuals -rda
# cd /rda
# ./instiris -files -root /usr/sigmet -new -manuals -nodelete -rda
```

2.3.5 Configuring Home Environments

The software requires that some environment files are in the `/etc` tree so they can be executed when users log in.

The files are read during each login. Automatic startup programs only pick up changes after a reboot.

- ▶ 1. Change to the *sigmet* desktop directory:

```
cd /usr/sigmet/config_template/LINUX/desktop
```

2. Copy files to the home directory for each user:

- ```
INSTALL -O RADAROP -G USERS MWMRC /HOME/RADAROP/.MWMRC
INSTALL -O RADAROP -G USERS BASH_PROFILE /HOME/RADAROP/.BASH_PROFILE
INSTALL -O RADAROP -G USERS XDEFAULTS /HOME/RADAROP/.XDEFAULTS
INSTALL -O OBSERVER -G USERS MWMRC /HOME/OBSERVER/.MWMRC
INSTALL -O OBSERVER -G USERS BASH_PROFILE /HOME/OBSERVER/.BASH_PROFILE
INSTALL -O OBSERVER -G USERS XDEFAULTS /HOME/OBSERVER/.XDEFAULTS
```

- If installing IRIS only:

```
INSTALL -O RADAROP -G USERS XINITRC /HOME/OPERATOR/.XINITRC
INSTALL -O OPERATOR -G USERS XINITRC /HOME/OPERATOR/.XINITRC
```

- If installing RDA or RDA and IRIS:

```
INSTALL -O RADAROP -G USERS XINITRC_MWM /HOME/OPERATOR/.XINITRC
INSTALL -O OPERATOR -G USERS XINITRC_MWM /HOME/OPERATOR/.XINITRC
```

3. Log out and login as **radarop**.

### 2.3.6 Authenticating RPC (CentOs 6)

In CentOS6, the **rpc** calls used to communicate over the network between programs get the error message:

**Cannot register service: RPC: Authentication error;**

Fix this with the following command:

```
echo "RPCBIND_ARGS=-i" > /etc/sysconfig/rpcbind# service rpcbind restart
```

### 2.3.7 Configuring RDA



For RDA systems only.

- ▶ 1. Save the shared runtime library path by typing: **# ldconfig -v**
2. In a text editor, edit the `/etc/ld.so.conf` file to include the following lines at the end:

```
net.core.rmem_default = 1000000
net.core.rmem_max = 4000000
```

This is needed for tsarchive and RVP900. Without these lines in the file, you get the following error message when RVP900 starts:

```
could not set UDP receive buffer size to 1500000
```

3. Edit the `/usr/share/hwdata/pci.ids` file.  
Look for the line **Altera Corporation** and add the following lines so it appears as follows.  
Note that the indentations must be a tab, not spaces.

```
7805 SIGMET RVP8/Rx IF Receiver
7806 SIGMET RVP8/Tx IF Transmitter
7807 SIGMET RVP/RCP 62-pin I/O Board
```

4. On RVP900, it is assumed that the second Ethernet port has been configured.  
If the second Ethernet port has not been configured, see [A.4.4 Configuring the System and Network \(page 78\)](#).

### 2.3.8 Configuring Sound (CentOs 6)

Edit the `/etc/modprobe.d/dist-oss.conf` file to uncomment the lines starting with `install` by removing the `#` from the beginning of the line.

### 2.3.9 Configuring for Automatic Startup

RVP900, RVP8, RCP8, and IRIS application software can be configured to start automatically following a boot of the system.

In the automatic software installation, this happens by default.

In the manual software installation, this is an optional configuration. Depending on your operating system and configuration, type the following commands:

## CentOS6

RVP900:

```
chkconfig --add rdasys
chkconfig --add antennad
chkconfig --add rvp900
```

If not installing IRIS:

```
chkconfig --add dspexport
```

If not installing IRIS:

```
chkconfig --add dspexport
```

RCP8:

```
chkconfig --add rdasys
chkconfig --add antennad
chkconfig --add rcp8
```

IRIS:

```
chkconfig --add antennad
chkconfig --add iris
```

## CentOS7

RVP900:

```
systemctl enable antenna.service
systemctl enable rvp900.service
```

If not installing IRIS:

```
systemctl enable dspexport.service
```

If not installing IRIS:

```
systemctl enable dspexport.service
```

RCP8:

```
systemctl enable antenna.service
systemctl enable rcp8.service
```

IRIS:

```
systemctl enable antenna.service
systemctl enable iris.service
```

Turn off the automatic offline software update functionality:

```
systemctl stop packagekit-offline-update.service
systemctl mask packagekit-offline-update.service
```

Turn off the automatic offline software update functionality:

```
systemctl stop libvirtd.service
systemctl mask libvirtd.service
```

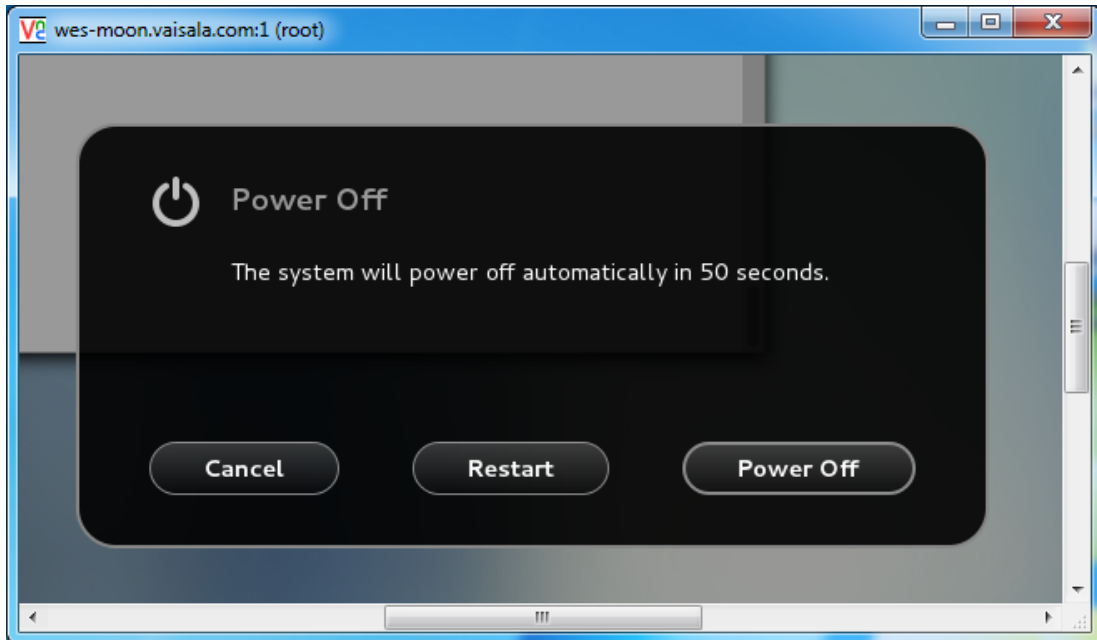
The network manager may try to start before the Ethernet hardware is ready, causing a delay in initializing the hardware and bringing up link. As a result processes that depend on the Ethernet hardware may fail to start such as the **rvp900** process. To prevent this from happening use the following command to allow the Network Manager to wait for hardware to be available:

```
systemctl enable NetworkManager-wait-online.service
```

### 2.3.10 Rebooting the Computer

When the manual installation and configuration is complete, reboot the computer for all changes to take effect.

1. Reboot the computer:



- a. Select the root button in the top right corner of the window.
- b. Select **Power Off**.
- c. Select **Restart**.

## 2.4 Verifying Services Are Running

1. If you have not done so already, log in as **radarop**.

2. In the terminal window user prompt use, list the services currently running by typing:  
**# ps\_iris**



If you are using CentOS 6, use the service command. For example to start **rvp900**, type: **# service rvp900 start**

The **COMMAND** column lists the running services.

| Option  | Running Services                                      |
|---------|-------------------------------------------------------|
| -rvp900 | rvp9<br>And its two related <b>rvp9proc</b> commands. |
| -rcp8   | rcp8                                                  |

You may also see the that antenna (**ant\_\***) and receive (**rtd\_\***) processes have started.



IRIS does not start until you have installed the IRIS license.

You can now continue with the IRIS/RDA software installation. See [2.2 Running Sigconfig Automatically \(page 7\)](#).

#### More Information

- [ps\\_iris Command \(page 109\)](#)

## 2.5 Configuring IRIS License Setups

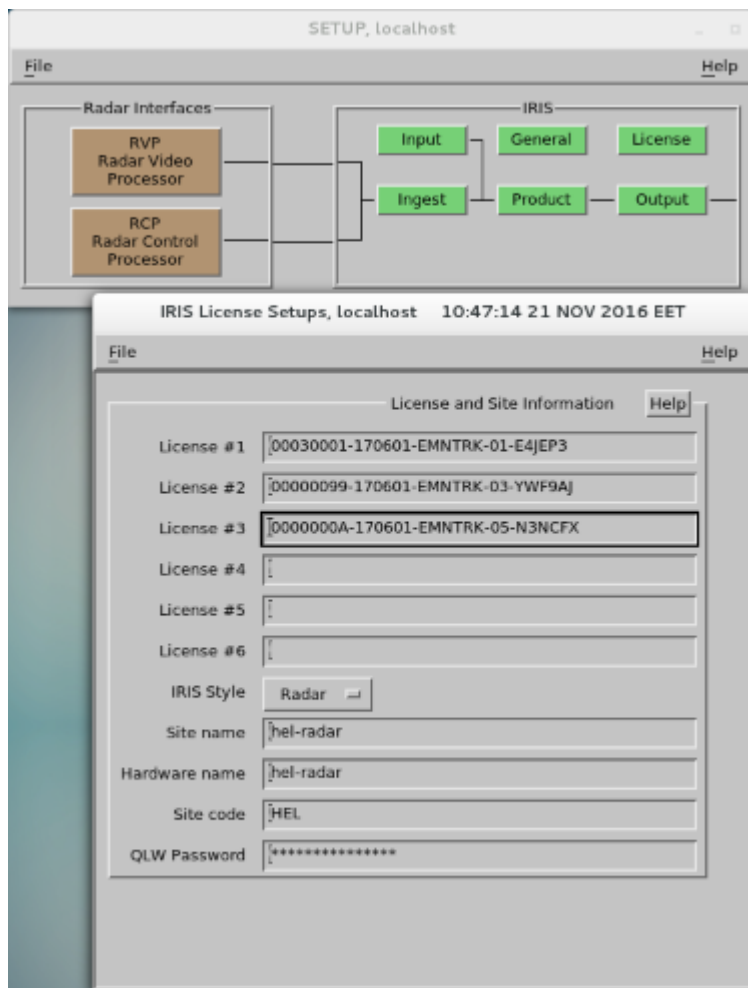


Figure 1 License Setup Example

Before you can use IRIS/RDA software, you must request and set up an license.

- ▶ 1. Open the **Setup** utility by typing: **setup&**

2. In the **Setup** utility, select **License**.
  - a. Delete the default texts in the **License** fields.
  - b. Depending on your setup, for **IRIS Style**, select either **Radar** or **Analysis**.
  - c. In **Site name**, type a name for the machine (typically the host name of the machine).  
For example: **hel-radar**
  - d. In **Site code**, type a code name for the radar site.  
For example: **HEL**
  - e. In the **IRIS License Setups** window, select **File > Close**
  - f. Select **File > Save** and **File > Exit**.
3. In the terminal window, type: **show\_machine\_code**  
The terminal prints the licensing information about this machine. For example:

```

Licensing Information for IRIS Version 8.13.6

```

```

Machine Code: EMNTRK
Site Name: hel-radar
Check Code: WPEFXE
OS Name: Linux
OS Release: 3.10.0-229.el7.x86_64
Host Name: localhost.localdomain
Locking To: host

```

4. Copy all the information under **Licensing Information for IRIS Version <version number>**
5. Contact your Vaisala representative and request an IRIS license.  
Provide the information you copied in the previous step.
6. When you receive the license from Vaisala, return to **Setup > License** and type the **License 1, License 2, ...** license codes *in the order listed in the license*.  
Depending on your configuration, you may have codes such as:
  - IRIS Features Code
  - IRIS Product Code
  - RDA Features Code
7. Select **File > Save** and **File > Exit**.
8. To confirm that your license is correctly setup, start IRIS by typing: **siris**  
Check that the IRIS **Quick Look Window** starts.  
If the IRIS **Quick Look Window** does not start, see [8.3 Making IRIS QLW Appear After IRIS Launch \(page 60\)](#).

You can now continue with the IRIS/RDA software installation. See [2.2 Running Sigconfig Automatically \(page 7\)](#).

## 2.6 Configuring SSH

You must set up ssh connection from one computer ( the **host**) to another (**target**) so users can login from **host** to **target** without a password and so that IRIS can send data from the **host** to the **target**.

- ▶ 1. Login to the host computer as **radarop**.
- 2. Open a new terminal window.
- 3. Generate **ssh** keys by typing:

```
ssh-keygen -t dsa
```

When prompted with questions, press ENTER without typing anything.

- 4. Become root user by typing: **su -**
- 5. Change directory by typing:

```
cd /root/.ssh
```

If there is no such directory, create it by typing:

```
cd /root/
mkdir -m 700 .ssh
```

- 6. Copy the **radarop** keys to **root** user by typing:

```
cp /home/radarop/.ssh/id_dsa* /root/.ssh/
```

- 7. Logout by typing: **exit**
- 8. Login as **radarop**
- 9. Copy the **id\_dsa.pub** file to the target computer by typing:

```
cd /home/radarop/.ssh
scp id_dsa.pub target:/home/radarop/.ssh/host_key
```

Where **<target>** is the host name of the target computer and **<host>** is the host name of the host computer.

- 10. Connect with ssh to the target computer by typing: **ssh <target>**  
Where **<target>** is the host name of the target computer.

11. Change directory by typing:

```
cd /home/radarop/.ssh
```

12. Type **ls** to see if there is a file called *authorized\_keys*:

- If there is an *authorized\_keys* file, add the key from the host computer to the end of the file with the command:

```
cat host_key >> authorized_keys
```

- If there is not an *authorized\_keys* file, rename the file *host\_key* with the command:

```
mv host_key authorized_keys
```

13. Logout from the target computer by typing: **exit**

14. On the host computer, test the SSH connection as **root**:

- a. Switch to **root** by typing: **su -**
- b. As **root**, test the login with the command:

```
ssh radarop@<target> date
```

Where **<target>** is the host name of the target computer.

- c. If prompted for a confirmation, answer **yes** and press ENTER.
- d. Try again until the date and time is shown without prompting for a password.

You can now send data from the **host** computer to the **target** through the IRIS product output menu.



## 3. Upgrading IRIS and RDA Software

### 3.1 IRIS and RDA Upgrade Overview

If your system is operational and you do not require the new features of a release, then often the best thing is to NOT upgrade.

Check the release notes at [ftp://ftp.sigmet.com/outgoing/manuals/release\\_notes/](ftp://ftp.sigmet.com/outgoing/manuals/release_notes/) to see what changes have been made since your current release was installed.



To check the release that you have currently installed, type:  
**\$ show\_machine\_code --version**

### 3.2 Preparing for an Upgrade

- ▶ 1. Login as **root**.  
The default password is **xxxxxxxx**.
2. Back-up and save important configuration files.  
As part of the upgrade, many files are erased and replaced. However, the upgrade procedure preserves everything in `${IRIS_CONFIG}`.
  - a. Back-up and save customized configuration files.
  - b. Even though it is not overwritten during the upgrade, create a backup of `/usr/sigmet/config`:

```
cd /usr/sigmet/
tar cfz <config_nodename_date.tgz> config/
```

- c. To backup the whole installation (for example, to support rollback), backup `/usr/sigmet`:

```
cd /usr/
cp -R sigmet/ sigmet_versionNumber/
```

3. Print the current setup.  
Run the **Setup** utility on the old system and generate an ASCII listing file with the **File/List** command.  
The format of these files can change between software versions, so you may need to re-enter some information.  
A date coded listing file is generated in the `${IRIS_LISTING}` directory, typically in `/usr/sigmet/config/listings`.
4. Make sure all applications are stopped by exiting any IRIS/RDA utilities that you are running and executing the following commands.

- For IRIS:

```
$ qiris
```

- For RDA:

```
$ su
service rvp900 stop (and/or service rcp8 stop)
service dspexport stop
qant
```

- For IRIS and RDA:

```
qiris
service rcp8 stop (or systemctl stop rcp8)
service rvp900 stop (or systemctl stop rvp900)
service dspexport stop (or systemctl...),

//if dspexport is running
qant
```

5. Verify that all processes have stopped by typing: **ps\_iris**
6. Stop any running processes as **root** with the **kill <process ID number>** command.  
The process ID number is the first column of numbers from the **ps\_iris** output.

## 3.3 Getting Upgrade Software

RVP and RCP (collectively RDA) and IRIS are active products. New features and updates are provided as software upgrades from the following sources:

- FTP download  
Go to <ftp.sigmet.vaisala.com> and follow the path to *ftp.sigmet.com/outgoing/releases/<release number>*  
See [3.5 Getting Network Upgrade Files \(page 39\)](#).  
These public releases are FREE of charge but do not include support services unless you are under warranty or have purchased a support contract from Vaisala. Contact Vaisala to arrange a support contract.
- DVD  
Provided as part of a support contract or upon request.

## 3.4 Upgrade Options

Use one of the following upgrade options:

- Upgrade using the **Install** utility  
This is the preferred technique because it leaves all configuration files intact.  
See [3.6 Performing an Upgrade Installation \(page 41\)](#).
- DVD or FTP download operating system upgrade and Vaisala software full re-install using the following process:
  - a. Backup your configuration files and network files.
  - b. Install from scratch. Start with the operating system update in [A.1 Overview to Installing CentOS 7.x \(page 63\)](#).
  - c. Restore your configuration files to the new installation.

This is recommended only when you must upgrade the operating system, if, for example, you have new hardware.

## 3.5 Getting Network Upgrade Files

There are two ways to get the network upgrade files. Both techniques use ftp to get the files from <ftp.sigmet.com>. The ftp client service allows you to run an ftp session and "get" files from another networked computer:

- [3.5.1 Downloading Upgrade Files to Workstation or Server Computer \(page 39\)](#)
- [3.5.2 Downloading Upgrade Files to Another Computer \(page 41\)](#)

### 3.5.1 Downloading Upgrade Files to Workstation or Server Computer

You must have Internet access to download the upgrade files directly to the workstation or server computer.



The examples in this procedure use release 8.11.0 as an example. In most cases, you install the most recent version, labelled below as **X.XX**.

- ▶ 1. On your IRIS Workstation, RVP, RCP8, or radar server computer, create a directory called `/tmp/iris-X.XX`.
2. If you are downloading RDA software, create a directory named `/tmp/rda-X.XX`. You should make a separate directory for each version and type (IRIS/RDA) of software that you download.
3. Login as **radarop**.

```
$ cd /
$ mkdir /tmp/rda-8.11.0
```

4. Change to the `/tmp` directory by typing:

```
$ cd /tmp/rda-8.11.0
```



On Windows machines, you can type the commands in the command prompt (remember to use the `"\"` backslash for DOS).

5. Start an FTP browser.
6. In the directory listing of available releases, find your release.
7. Download the `irisrda_image.iso`.  
If, for example, you have limited bandwidth, the minimum required files for an upgrade are:
  - `app.gz`
  - `install`
  - `install.gz`
  - `install.rf`
  - `instiris`
  - `source.gz`
  - `tplates.gz`
8. Make a list of the files that you want to download including at least the minimum files in the list above.
9. Select **Download**.
10. Become **root** using the **su** command and password.

11. Go to the RVP directory where the files were downloaded and change the mode on two of the files that require execute privilege:

```
cd /tmp/rda-8.11.0
chmod +x install
chmod +x instiris
```

### 3.5.2 Downloading Upgrade Files to Another Computer

If your workstation or server computer does not have an Internet connection, you must download the upgrade files to another computer and then transfer the files.

- ▶ 1. Download the upgrade files to the computer. See [3.5.1 Downloading Upgrade Files to Workstation or Server Computer \(page 39\)](#).
2. Do one of the following:
  - Use ftp to transfer the files from the other computer to RVP. See [3.5.1 Downloading Upgrade Files to Workstation or Server Computer \(page 39\)](#).
  - Put the files on a DVD, mount the DVD on RVP, and copy the files to the RVP.
3. Become **root** using the **su** command and password.
4. Go to the RVP directory where the files were downloaded and change the mode on two of the files that require execute privilege:

```
cd /tmp/rda-8.11.0
chmod +x install
chmod +x instiris
```

## 3.6 Performing an Upgrade Installation

Follow this procedure if you are upgrading a Vaisala system.



**CAUTION!** An upgrade installation overwrites any existing files in the \$  
{IRIS\_ROOT}/bin tree.  
Backup any important files before proceeding.



For network installations do not use **root**.

1. Login as **root**.  
The default password is xxxxxxxx.
2. In the command line, launch the Install utility. Change to the IRIS or RDA installation directory and run the install command shown below.
3. If you are updating IRIS and RDA, install IRIS first.

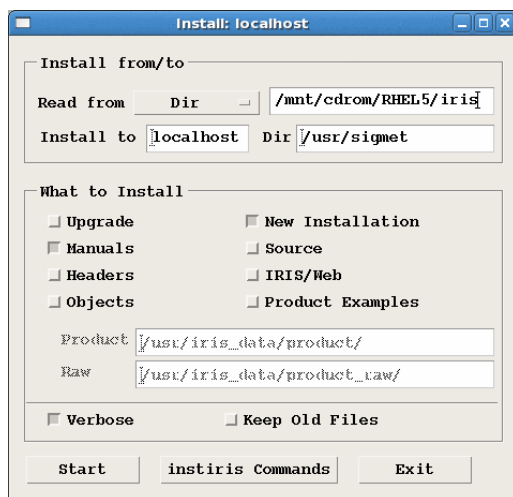
LINUX SYSTEMS (IRIS):

```
cd /mnt/cdrom/CENTOS7/iris
./install
```

LINUX SYSTEMS (RDA):

```
cd /mnt/cdrom/CENTOS7/rda
./install
```

The **Install** utility opens.



4. In the **Install** utility, check the paths in the **Install from/to** section.  
 The default installation is the directory from which you ran the installation (*/usr/sigmat*) on the local computer.  
 In the **Read From**, select files used in the installation to come from one of the following locations:
- The default location is the **DIR**, which means that the installation program automatically populates the **Read From** option with the path where the install command was run.  
 When selecting the **DIR** option, type a directory path.  
 The files are taken from a temporary directory on the local computer and copied to another destination and the field to the right of the **Read From** button is automatically populated with the directory from where *./install* was executed.
  - Select the **Local** option to access the files also from files already installed on your system.  
 Files are retrieved from the local installation of IRIS or RDA already in this computer and copied to another destination.  
 In the box to the right of **Read From**, type the location of the root directory of the IRIS software on your local system.  
 By default this is the translation of the **IRIS\_ROOT** environment variable.
5. In the **What to Install** section, select **Upgrade**.



If you are performing a RDA and IRIS upgrade installation, to prevent the installation process from erasing the IRIS files just installed:

- Install the IRIS software.
- Select **Keep Old Files**.
- Install the RDA software.

6. In the **What to Install** section, select any optional software packages.

Table 4 IRIS RDA Software Support Packages

| Package                 | Description                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Manuals</b>          | Installs the online manuals and the viewer program. It uses approximately 38 MB of disk space.                                                                                                                                                                                                                                                                                                                                           |
| <b>Product Examples</b> | <p>When using a IRIS/RDA release CDROM, you can choose to install example product and RAW product files.</p> <p>You can use the default installation directories for IRIS products and IRIS RAW products or your own directories.</p> <p>After installing the product examples, you can view these files in the directory or re-ingest them to make other products.</p> <p>The <b>Product Examples</b> option never erases old data.</p> |
| IRIS 3DView             | <p>You can install the optional IRIS 3DView on an IRIS Analysis machine, or on a machine without IRIS.</p> <p>See <a href="#">D.1 Installing IRIS 3DView (page 115)</a>.</p>                                                                                                                                                                                                                                                             |

7. Select **Start**.

The installation script takes a few minutes to complete and prints progress messages as it runs.



To see more information about the installation progress, select **Verbose > Start**.

8. When the progress status is **Install Complete**, select **Exit** to close the **Install** utility

9. When the installation is complete, unmount the CDROM:

```
cd /
eject /mnt/cdrom
```

10. If you are updating RDA software in a system with RVP901 IFDR, update the RVP901 Software.

See [6. Installing RVP9 \(RDA\) Firmware \(page 53\)](#).

11. When the installation is complete, restart the computer.

## 3.7 Running Setup After Upgrade

After upgrading, the **Setup** utility fills in default values for any new questions that were added. It is recommended that you read the release notes, then check the new questions to make sure they are right for your system.



1. Login as **radarop**.

2. Launch the **Setup** utility.

At startup for an upgrade, **Setup** checks the parameters to verify that they are within reasonable bounds and lists any problems.

The listing gives the name of the variable in question and prompts the user to consider the repair command. Errors are usually related to new features that have not been addressed or outdated features that do not conform to the current upgrade.

3. In the list dialog, select **Repair** to replace any mismatches with the appropriate default.

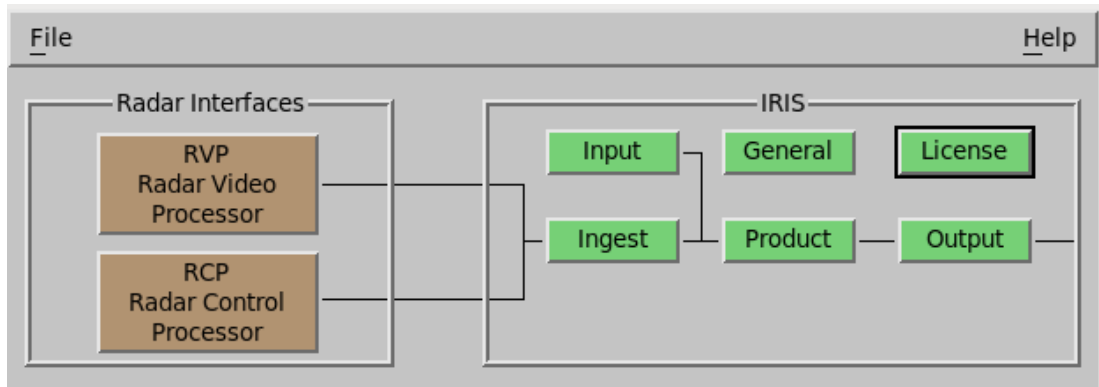
4. If you receive errors related to customized fields that are important to your operation, see [3.7.1 Invoking Setup and Built-In Error Checking \(page 44\)](#).

### 3.7.1 Invoking Setup and Built-In Error Checking

When IRIS starts, it performs configuration and bounds checks.

For new users, the **Setup** parameters are typically correctly set and do not cause any configuration errors. If an error does occur, follow these steps.

- ▶ 1. In the terminal window, type: **setup&**  
The **Setup** utility launches.



There are 2 variants of the **Setup** utility: one for IRIS and one for the RDA (RVP signal processor or an RCP8 antenna controller). The RDA variant does not show the IRIS setup features.

2. Select the part of the system setup you want to check or configure.
3. Make your changes and close the window for the selected part of the system.
4. Select **File > Save**.  
The configuration files are now updated.
5. To create a listing file of the **Setup** configuration:
  - a. Select **File > List**.  
A listing file called *YYYYMMDDHHMM.setup* is created in the `${IRIS_LISTINGS}` directory.

6. To take the configuration changes into effect, restart the application:
- For changes made to the **Setup > IRIS** section, restart the IRIS daemons by typing:

```
$ sudo /sbin/service qiris
$ sudo /sbin/service iris start
```

- For changes to the **Setup > RVP** section, stop any running utilities and restart RVP by typing:  
For CentOS 6:

```
$ sudo /sbin/service qiris
$ sudo /sbin/service rvp900 stop
$ sudo /sbin/service rvp900 start
$ sudo /sbin/service siris
```

For CentOS 7:

```
systemctl stop/start iris/rvp900/rcp8
```

- If you make changes in **Setup > RVP**, you must also restart IRIS and utilities. RVP has a configuration state accessible through **dspix**. Part of that state is local to the processor and part of it is also visible in **Setup > RVP**.
- For changes to the **Setup > RCP** section, in addition to the above, you must stop RCP8 (if you have one), and stop the antenna daemons, by typing:

```
$ sudo /sbin/service qiris
$ sudo /sbin/service rvp900 stop
$ sudo /sbin/service rcp8 stop
$ qant
$ sudo /sbin/service rcp8 start
$ sudo /sbin/service rvp900 start
$ sudo /sbin/service siris
```

RCP8 has a configuration state accessible through **Antx**. These changes take effect when you return to the top level prompt. You must save your changes.



License changes can affect RVP and IRIS.

7. If an error list is displayed,
  - a. Check the error list for parameters that you have customized and correct these customizations.
  - b. Select **Repair** to make corrections that are necessary for the software but do not need to be customized for your operation.
  - c. Select **File > Save**.

## 3.8 Restarting the Upgraded Kernel Module

After you upgrade you may get an error message saying that there is a kernel module mismatch.

To fix this, reboot the kernel or restart the kernel module with the following commands:

```
service rdasys stop
service rdasys start
```



## 4. Configuring RDA Software

After the receiving your unit from the factory, or after software re-installation, you must configure the software to customize your system for your environment and application.

Table 5 RDA Configuration Tools

| Configuration Tool                                                                                                 | RDA Device     | Description                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| setup/RVP utility<br><i>setup_dsp.conf</i><br>See <i>IRIS and RDA Utilities Guide</i> .                            | RVP900         | Configures the local environment required to run RVP support utilities such as <b>Ascope</b> and <b>dspx</b> .<br>Examples include radar equation parameters that are required for calibration, pulse width definitions and PRF request limits.               |
| setup/RCP utility<br><i>setup_ant.conf</i><br>See <i>RVP900 Digital Receiver and Signal Processor User Guide</i> . | RCP8           | Configures the local environment required to run the RCP8 support utilities that such as antenna or bitex.<br>Examples include, max allowed AZ/EL velocity request, MIN and MAX elevation angles that can be requested and LAT/LON of radar for sun tracking. |
| RVP900 NV setups<br><i>rvp9.conf</i><br>See <i>RVP900 Digital Receiver and Signal Processor User Guide</i> .       | RVP900         | Defines the details of the sampling and processing algorithms as well as the operational configuration of the system.<br>Examples include, IF filter design and selection, PRF limits, relative trigger timing, dual polarization features.                   |
| RCP8 NV setups<br><i>rcp8.conf</i><br>See <i>Radar Control Processor RCP8 User Guide</i> .                         | RCP8           | Configures which status and control bits are available and define the antenna servo control parameters.<br>Examples include, physical or virtual tachometer selection, shutdown safety criteria and internal antenna simulator on/off.                        |
| <i>softplane.conf</i>                                                                                              | RVP900<br>RCP8 | Defines the I/O signals on the I/O-62 connector panel, pin-by-pin.<br>For example, whether a line is an input or output, electrical spec such as RS422 or TTL, what local variable name is associated with each line.                                         |



During installation, you must configure the **Setup** utility and the TTY setups for your system.

The configuration results are stored as ASCII text *.conf* files, typically in the */usr/sigmat/* directory. Each file has a factory default configuration file that is stored in the template directory. The default is:

```
/usr/sigmet/config_template/init/
```



For a radar network with identical hardware, you can perform configuration maintenance by copying pre-tested files over the network.

## 5. Installing RCP Firmware

If you have installed or upgraded the RDA software, you must update the firmware running on RCP8 to be compatible with what was installed using **sigconfig**.

- ▶ 1. Login as **root**
2. Check for running processes by typing: **ps-iris**
3. Stop any running processes by typing:

```
qiris
quant
```

4. Login as **radarop** (with password xxxxxx)  
You enter X-Windows.
5. Right-click and start a terminal window.
6. For each Vaisala component type the appropriate command. For example:

| Vaisala Component        | Command         |
|--------------------------|-----------------|
| Standard I/O-62 Card     | <b>io62-0</b>   |
| Standard Connector Panel | <b>io62cp-0</b> |

7. Shut down the system by typing: **poweroff**
8. When **Power down** is displayed, turn power off with power switch on lower right of front panel.  
The FPGA software installation is complete.
9. Reboot the unit.  
Follow the progress of the reboot on the monitor. The front panel LED display shows the time of the reboot and display diagnostic messages.  
The reboot takes about 1 minute.
10. Stop the RCP process by typing:

```
$ killall rcp8
```

11. Run the following diagnostics and observe the results:

```
$ rdadiags io62-0
$ rdadiags io62cp-0
```

12. Restart the RCP8 process by typing:

```
rcp8 &
```

13. Verify that the restart messages show no faults.
14. Configure RCP.  
See *Radar Control Processor RCP8 User Guide*.

## 6. Installing RVP9 (RDA) Firmware

Before installing RVP9 (RDA) firmware, make sure that:

- The second Ethernet port has been configured. See [A.4.4 Configuring the System and Network \(page 78\)](#).
- RVP901 is physically connected to the port.

If you have installed or upgraded the RDA software, you must update the firmware running on RVP901 to be compatible with what was installed using **sigconfig**.

- ▶ 1. Reboot the computer.
2. Login as **radarop**.
3. If IRIS / RDA services are running, turn them off.
  - a. Check what is running.

```
ps_iris
```

- b. If any services are running, stop them.

- Centos6:

```
service iris stop
service rvp900 stop
service rcp8 stop
service dspexport stop
service antennad stop
```

- Centos7:

```
systemctl stop iris
systemctl stop rvp900
systemctl stop rcp8
systemctl stop dspexport
systemctl stop antennad
```

4. Verify that all services have stopped:

```
ps_iris
```

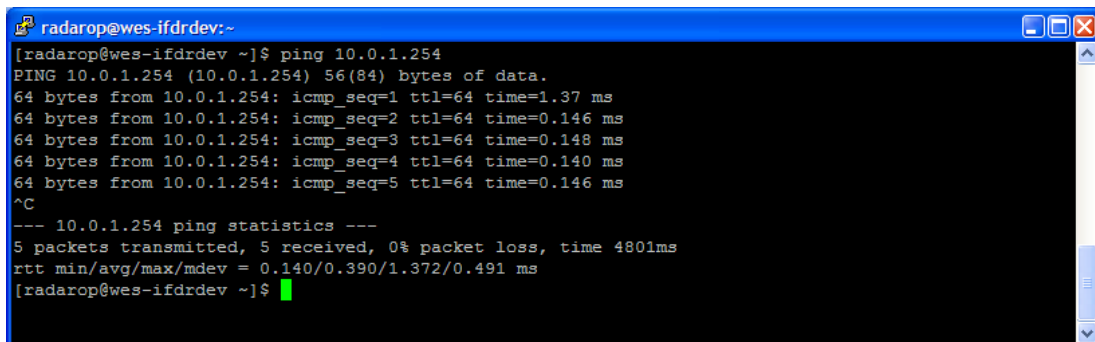
If there are services running, stop them using the **service** or **systemctl** commands or manually kill them.

You must be logged in as **root** to use the **kill** command:

```
su
kill <process ID number>
```

5. If not powered, power on RVP901 (RVP9 IFDR) and wait for it to boot. When booted D7 shows a flashing red light and a solid green light.
6. If the network cable is not attached, attach RVP901 (RVP9 IFDR) to the second Ethernet connection configured for the 10.0.1.x network.
7. Verify that RVP901 (RVP9 IFDR) is accessible over Ethernet.  
Run **ping** letting at least 4 packets transmit and CTRL-C to exit program. Verify that there is 0% packet loss.

```
ping 10.0.1.254
```



```
radarop@wes-ifdrdev:~$ ping 10.0.1.254
PING 10.0.1.254 (10.0.1.254) 56(84) bytes of data.
64 bytes from 10.0.1.254: icmp_seq=1 ttl=64 time=1.37 ms
64 bytes from 10.0.1.254: icmp_seq=2 ttl=64 time=0.146 ms
64 bytes from 10.0.1.254: icmp_seq=3 ttl=64 time=0.148 ms
64 bytes from 10.0.1.254: icmp_seq=4 ttl=64 time=0.140 ms
64 bytes from 10.0.1.254: icmp_seq=5 ttl=64 time=0.146 ms
^C
--- 10.0.1.254 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4801ms
rtt min/avg/max/mdev = 0.140/0.390/1.372/0.491 ms
[radarop@wes-ifdrdev ~]$
```

8. Use the `rdaflash` utility to update the RVP901 firmware by typing:

```
rdaflash -program rvp901-0
```

This takes several minutes. Do not interrupt programming.



**CAUTION!** When programming starts, do not power cycle or reboot RVP901 until `rdaflash` is successfully complete.

```
2. IFDRDEV X Session
$ rdaflash -program rvp901-0
No Busy PCI card(s)
RVP901 IP address: 10.0.1.254
Erasing 268328 bytes at 0x600000: Done!
Writing 268328 bytes at 0x600000: Done!
Erasing 6226877 bytes at 0: Done!
Writing 6226877 bytes at 0: Done!
Device programming was successful. BootID = 1
Factory Sof Version: 0x200077b1
Factory Elf Version: 0x200077b1
Default boot image is a Factory Application Image
Rebooting RVP901
$
```

When the programming is complete, RVP901 reboots. When the boot process is complete, the red light on **D7** is blinks and the green light on **D7** is solid.

9. Reboot the computer and login as **radarop**.
10. Verify that the expected process are running with the command:

```
ps_iris
```

11. Configure RVP.  
See *RVP900 Digital Receiver and Signal Processor User Guide*.
12. If the upgrade is interrupted or not completed successfully, the unit stays in diagnostic mode on the next reboot so you can recover from the failure.

13. For RVP upgrades, if the RDA software boots, but is unresponsive, you can force the RVP into diagnostic mode by sticking a paper clip in the inner most hole on the side of the enclosure.

After entering the diagnostic boot mode, you can re-flash the RVP901 software from the signal processor to recover from a corrupted image.

If the RVP901 firmware upgrade is part of a software upgrade process, see [3.7 Running Setup After Upgrade \(page 44\)](#).

# 7. Login, Logout, and Shutdown

## 7.1 Powering up

When you power-up the computer, the system goes through an automatic startup of the operating system at the end of which the software starts and performs power-up self tests. See *RVP900 Digital Receiver and Signal Processor User Guide* and *Radar Control Processor RCP8 User Guide*.

If you are not doing any diagnostic or software maintenance work on the system, there is no need to log-in after power-up. When you turn the unit on, your application software takes over.

## 7.2 Local and Remote Login

You can login either locally or remotely.

- Login locally using the local workstation or through a KVM.
- You can login remotely if `ssh` is enabled. Check with your network administrator.

Here, we assume local login is used.

## 7.3 Default Operator and Root Login Passwords

The standard software installation defines two standard users:

- **root** (password: `xxxxxxxx`)— for operating system maintenance functions.
- **radarop** (password: `xxxxxx`)— for application software maintenance functions.

The system administrator can change either of these passwords using the standard Linux password support.

For more information, see *IRIS and RDA Utilities Guide*.

## 7.4 Logging in

### 7.4.1 Local Login as Operator After Power-up

- ▶ 1. At the power-up login prompt, type **radarop** and press ENTER.  
When prompted, provide the appropriate password (factory default is `xxxxxx`).  
An X-Window screen appears.

2. Right-click and select **New Window** to get a terminal window.  
The top of the terminal window shows, your user name, the node name of the system, and the current directory path.

## 7.4.2 Switching from Operator to Root Login

- ▶ 1. Type the super user command: **su -**
- 2. Type the root password (factory default is **xxxxxxx**)  
The prompt changes from \$ to #, indicating that you are root.

## 7.4.3 Switching from "su" Root Login to Radar Operator

- ▶ 1. In the terminal where you are the "super user" (**su**), type: exit  
The prompt changes from # to \$.

## 7.4.4 Logging in as Root

You can login as root after a power-up or after exiting X-Windows,

- ▶ 1. Type: **root**
- 2. In the login prompt, press ENTER and type the appropriate password (factory default is **xxxxxxx**).

You are now in a full screen terminal. This is not as convenient as X-Windows since only one terminal can be displayed on the screen.



If you need a second full screen terminal type ALT+F2. You can return to your original terminal by typing ALT+F1. The other function keys can provide additional terminals.

## 7.5 Powering-off to Shutdown

- ▶ 1. Type **poweroff**  
The system goes through a shutdown sequence. When it is done **Power down** is displayed.

## 8. Troubleshooting

### 8.1 Correcting File Ownership and Protection

Sometimes, when starting or program or trying to access calibration files, users cannot access some files or receive an error message saying they do not have privileges to do an operation.

This is because the file ownership and protection settings are incorrect.



Do not change the file protection manually. Always use `instiris -setown` to fix the protection of your files.

- ▶ 1. To correct the file ownership and protection, type:

```
instiris -setown
```

The script goes through the `/usr/sigmet` directory tree, changing the ownership of the files to **operator** and setting the protection as follows:

- Directories—`rw-rw-r-x`
- All files, except executable files—`r-rw-r--`
- Executable files—`rwsrwsr-x`

### 8.2 Authorizing Remote X-Windows on Your Node

- ▶ 1. To allow IRIS systems running on other nodes to send output to your screen, enter the command:

```
$ xhost +<host>
```

Where `<host>` is the remote hostname, or IP address.

2. Check that this works as you intend.

3. Add the appropriate command at the end of one of the following files:
  - To authorize the windows as soon as anyone logs in: `/etc/profile.d/sigmat.sh`
  - To support just one user authorizing the windows: home directory `.bash_profile`

## 8.3 Making IRIS QLW Appear After IRIS Launch

Perform the following tasks if the IRIS Quick Look Window (QLW) does not appear after typing **siris** in a terminal window.

- ▶ 1. Log in as **root**.
2. In the first line of the `/etc/hosts` file, add the host name to the first line of the file:

```
127.0.0.1 <host-name> local host...
```

## 8.4 Replacing Failed CentOS RAID Disks

RAID1 is automatically configured on the server. However, in some cases, you may need to remove, recover, and add new devices to RAID.

In most cases, this requires removing the failing disk and installing a new one.



While you can do this while powered up, if the system allows you to power down, do so.

- ▶ 1. To check the status of the RAID1 disk, type:

```
cat /proc/mdstat
```

When RAID1 is working correctly, the terminal prints, for example:

```
Personalities : [raid1]

md126 : active raid1 sda[1] sdb[0]

 125032448 blocks super external:/md127/0 [2/2] [UU]

md127 : inactive sdb[1](S) sda[0](S)

 4520 blocks super external:imsm
```

- [UU] indicates that both disks are operational.
- If there is a problem with one of the disks, the [UU] string is [\_U] or [U\_].

2. Check if disk **sda** or **sdb** has failed.
3. To remove the disk from RAID configuration, type:



Take care when removing the failing disk.  
Remove only the disk identified as failing. In the following example, it is **sdb**.

```
mdadm --manage /dev/md/imsm0 --remove /dev/sdb
```

The terminal prints:

```
mdadm: hot removed /dev/sdb from /dev/md/imsm0
```

4. Power down computer, replace the failing disk, and reboot

5. To create the partition on the replacement disk, type:

```
sfdisk -d /dev/sda | sfdisk /dev/sdb
```

6. To verify the partition, type:

```
fdisk -l
```

7. To add a new disk to the raid array, type:

```
mdadm --manage /dev/md/ims0 --add /dev/sdb
```

8. To check the recovery process, type:

```
cat /proc/mdstat
```

The terminal prints:

```
[root@wes-install ~]# cat /proc/mdstat

Personalities : [raid1]

md126 : active raid1 sdb[2] sda[1]

 125032448 blocks super external:/md127/0 [2/2] [UU]

md127 : inactive sdb[1](S) sda[0](S)

 4520 blocks super external:ims0

unused devices: <none>
```

# Appendix A. Installing CentOS 7.X

## A.1 Overview to Installing CentOS 7.x

Vaisala provides a customized ISO image for CentOS 7.1 on the Vaisala FTP website at:

[ftp.vaisala.com/outgoing/releases/CentOS/7/CentOS-7-x86\\_64-vaiala-1503-01](ftp.vaisala.com/outgoing/releases/CentOS/7/CentOS-7-x86_64-vaiala-1503-01)

Vaisala supports two installation methods from the Vaisala spin version of the ISO image *CentOS-7-x86\_64-vaiala-1503-01*.

- Automatic - unattended installation
- Manual - interactive installation

For both installation methods you can use the local DVD or USB device as your installation media.

We recommend that you use the automatic process unless you have special system configuration needs or if your custom configuration fails the automatic installation process.

Installing Linux requires a Linux software installation tree and a boot device. You must transfer the CentOS7 distributions ISO images to the media that you are going to use in the installation.

You need the following to create installation media:

- PC running Windows 7, or CentOS (recommend the latest version)
- One of the following:
  - DVD writer and DVD disc media
  - USB port and USB Flash Drive 64 GB.

Vaisala recommends a USB 3.0 drive because data transfer is much faster than USB 2.0

## A.2 Creating Installation Media

After creating and initializing the installation media, you can run the installation process from either DVD or USB installation.

### A.2.1 Creating DVD Installation Media

- ▶ 1. To create DVD installation media on Windows 7 (recommended):
  - a. Insert DVD media in the DVD drive.
  - b. Right-click the ISO file.
  - c. Select **Open with->Windows Disc Image Burner** to burn the ISO image on the DVD.

2. To create DVD installation media on Linux (CentOS, Fedora), use **wodim** or **cdrecord** programs to burn the ISO image file on the DVD.
  - a. Run to scan burning device on your system:

```
$ wodim -devices
```

- b. Run:

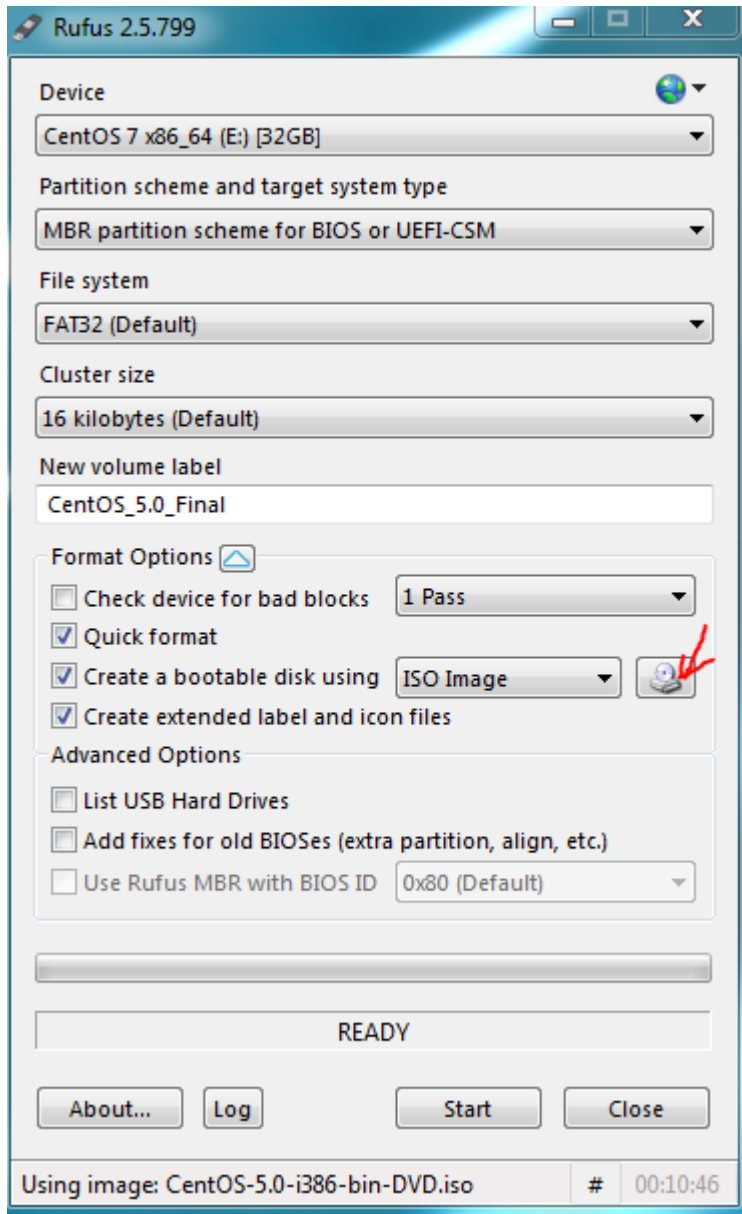
```
$ wodim -v dev=/dev/xxx speed=4 -eject path/toCentOS.iso
```

### A.2.2 Creating USB Installation Media on Windows 7

When creating USB installation media on Windows 7, use a standalone program such as **rufus** (available at <http://rufus.akeo.ie/>). Follow the on-screen instructions.

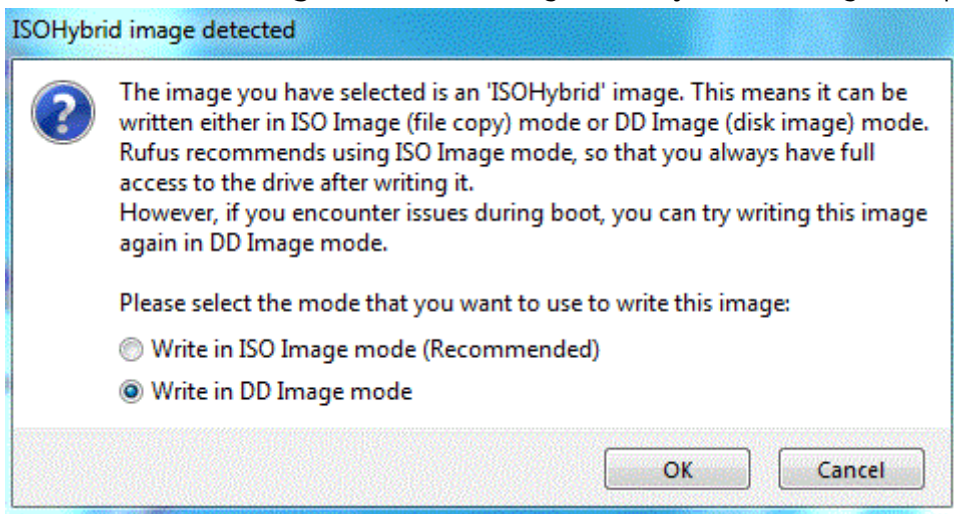
- ▶
  1. Launch **rufus** by double-clicking the program icon.
  2. Insert a USB drive in the USB port.

3. Select the drop-down list to the right of the **Create a bootable disk using**, and select **ISO Image**.



4. Select the **Disc** icon and then select the iso image.

5. Select **Write in DD Image mode** if a warning for the hybrid ISO image is displayed.



6. Select **Close**.

### A.2.3 Creating USB Installation Media on Linux (CentOS/Fedora)



**CAUTION!** This operation destroys data on the device you operate on.

- ▶ 1. Run **\$ lsblk** to list block device on your system. Take note of the output.
- 2. Insert a USB drive in the USB port.
- 3. Run **\$ lsblk**.  
Compare the output to previous step. The additional block device from this output is your USB device.
- 4. Run **\$ dd if=path/toCentOS.iso of=/dev/xxx**  
Where **/dev/xxx** is the path to the USB drive. Do not use the partition number for the USB device  
For example, **/dev/sdc**.

## A.3 Installing CentOS 7 Automatically

The automated installation uses KICKSTART to run an unattended installation.

You must configure the system to boot from the media device.

The instructions in this section are for the Vaisala-provided server. If you are using a different system, consult your systems manual for instructions.

- ▶ 1. Power-up the system by pressing the power button on the front of the server.

2. If you are using USB port for the first time, enable it by inserting the USB drive it into the USB port.
3. Enter the bios setup window by doing one of the following:
  - For SuperMicro computers, press **DELETE**.
  - For American Megatrend computers, press **ESC**.
4. Use the arrow keys to highlight the **Boot** option at the top of the window and press **ENTER**.
5. In the **Boot** window, use the arrow keys to choose the 1st boot device and highlight the installation media and press **ENTER**.
6. Have your installation media ready to insert into the computer.
7. Save and Exit the BIOS configuration window.
  - For SuperMicro computers, press **F10**.
  - For American Megatrend computers, press **F4**.The boot process restarts.
8. In the installation menu, use the arrow keys to select the media you have configured earlier.  
(either the USB or */dvd Kickstart* option)

9. In the CentOS7 window, select the install option you would like using the up/down arrow, and press **ENTER**.

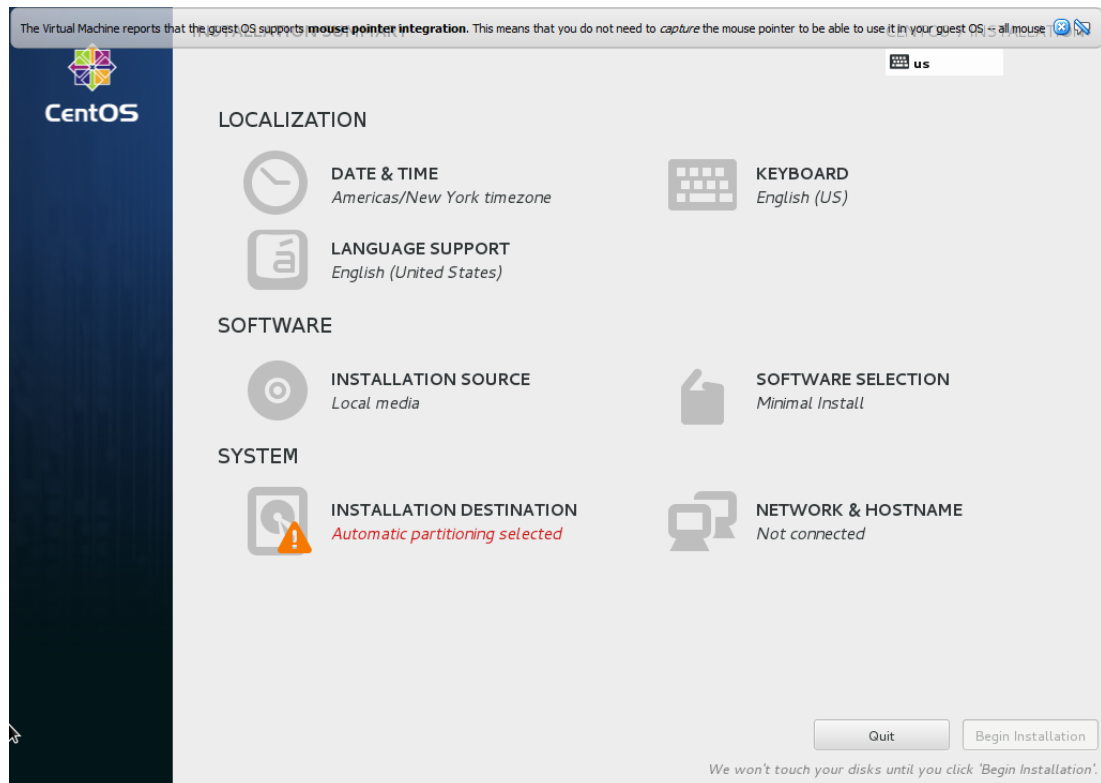


- If you have received the RVP902 / RVP902-IO Radar System server from the Vaisala factory (the **American Megatrend** banner shows on boot), select the **Managed RAID** option with the media you are using.  
Kickstart assumes your Managed RAID volume is named **Volume0\_0**, which is the factory default.
- If you have an older revision of computer (the **SuperMicro** banner shows on boot) that did not have RAID or had a HW RAID setup such as an Analysis System, use the **No RAID / HW RAID** option and your media type.

10. Press **ENTER**.

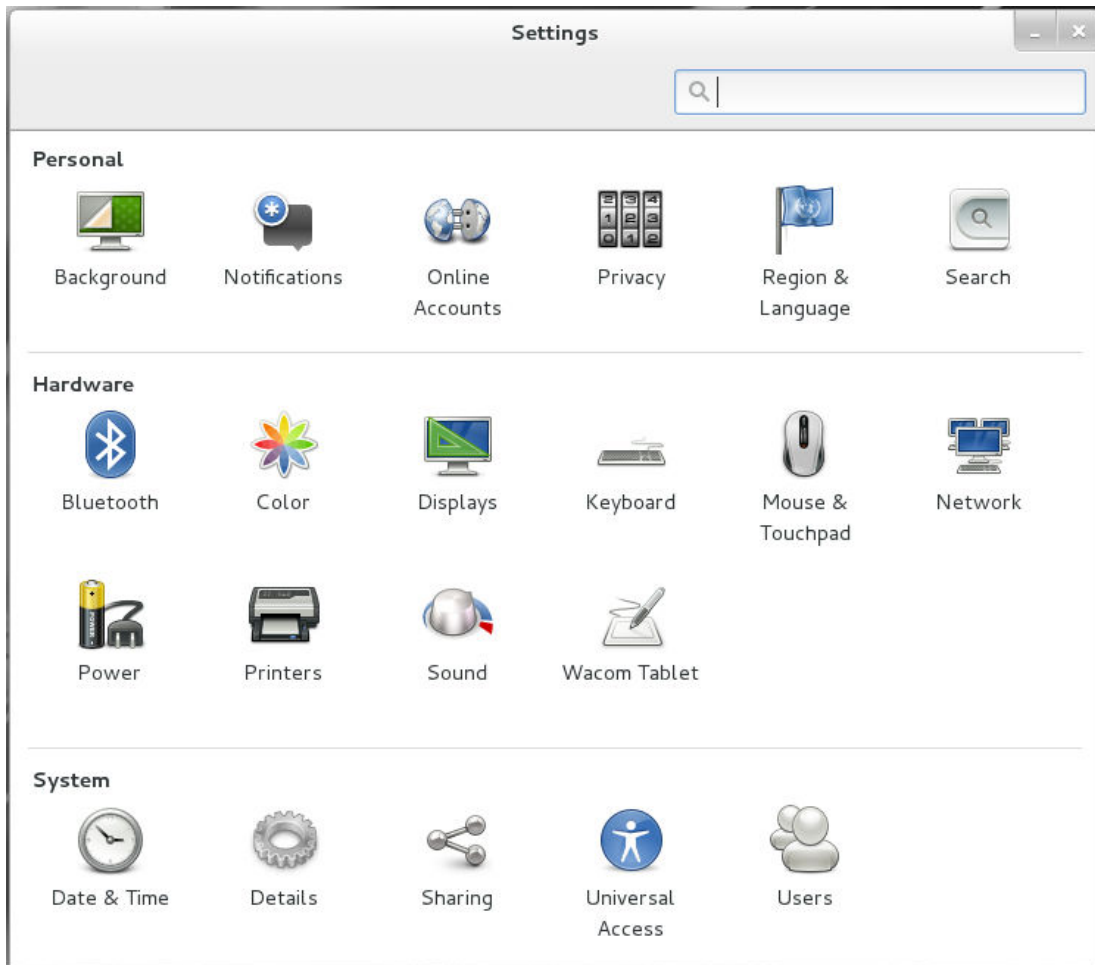
The installation starts automatically.

- If you are using the **No RAID / HW RAID** options, Kickstart runs and install without further intervention. Go to [step 11](#).
- If you are using the **Managed RAID** setup, Kickstart pauses to allow you to manually configure the disk partitions:



- In the **Installation Summary** window, select **Installation Destination**.
  - Create new partitions for the **/**, **/boot**, **swap**, and **/usr/iris\_data** partitions. For recommended partition settings, see [A.4.5.1 Vaisala-recommended Partition Settings \(page 82\)](#). For instructions, see [A.4.5 Partitioning the Destination Disk \(page 82\)](#) and [A.4.5.3 Creating New Partitions \(page 83\)](#).
  - In the **Installation Summary** window, select **Begin Installation**.
- When the installation is complete, remove the installation media and select **Reboot**.
  - Wait for the screen to go black and power cycle using the power button. On the next power up, you are shown the login prompt.
  - Login as **root**.  
The default password is xxxxxxxx.
  - The default **root** password is insecure. To change the password, in the terminal window, type **passwd**.

15. Select **Application > System Tools > Settings GUI** to complete the configuration.



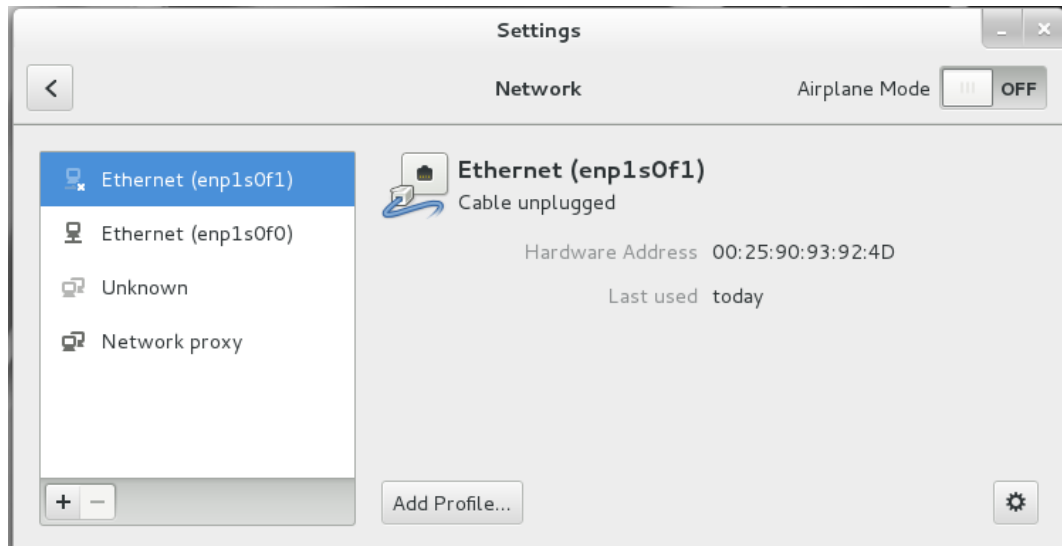
- a. In **Details**, configure your host name.
  - b. In **Region & Language**, configure your language settings.
  - c. In **Date & Time**, configure your localization settings.
  - d. In **Users**, manage user accounts.
  - e. In **Network**, set-up your host-specific network needs.
16. If you have selected the **Managed RAID** option, your **enp9s0** port is automatically setup to communicate with the RVP901 on a 10.0.1.x network.



**CAUTION!** Do not reconfigure the network port to RVP901.

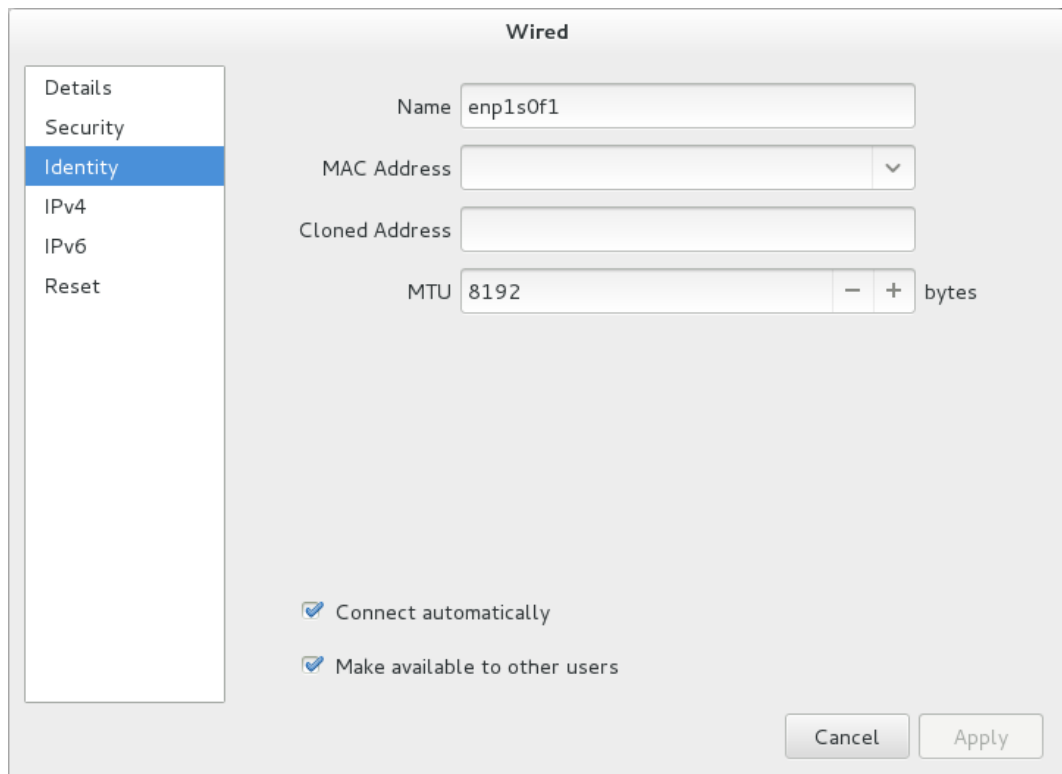
17. If you have selected the **No RAID / HW RAID** option, your network settings for an RVP901 are not pre-initialized. The RVP901 10.0.1.x network is usually configured on the **enp9s0**, **enp1s0f1**, or **eth1** ports but is not limited to these ports. This example use the **enp1s0f1** port.

- a. Select **System Tools > Settings > Network**.



- b. In the **Network** window, select the gear icon in the lower right corner.

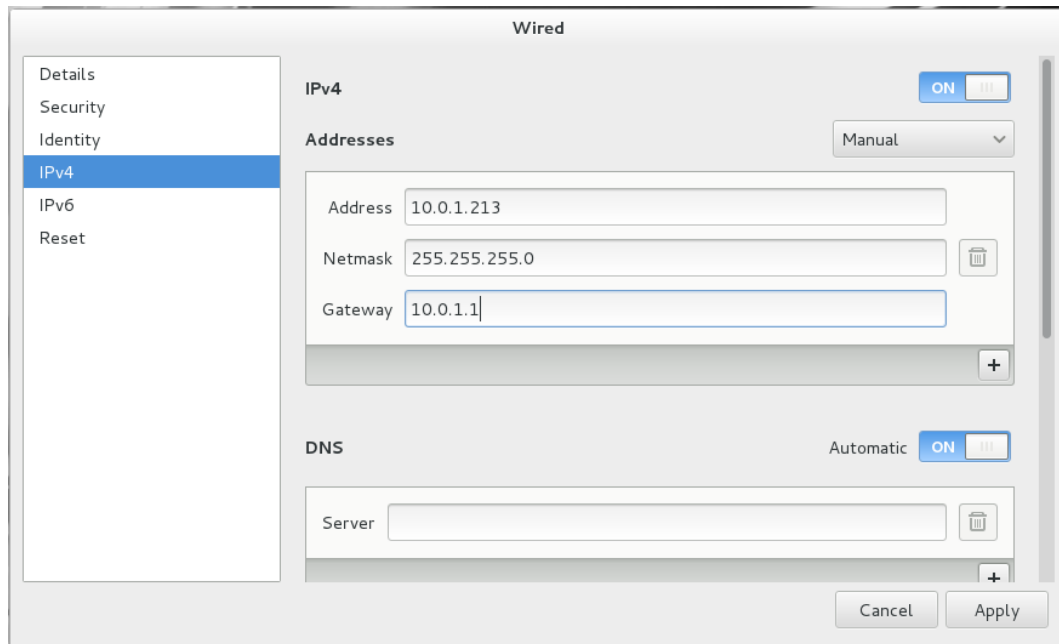
- c. In the right pane, select **Identity**.



In **MTU**, type **8192**,

Select **Connect automatically** and **Make available to other users**.

- d. In the right pane, select **IPv4**.



Change **Addressing** to **Manual**.

In the **Address**, **Netmask**, and **Gateway** fields, type enter the test shown in the figure.

Select **Apply**.

## A.4 Installing CentOS 7 Manually (Interactive)

### A.4.1 Booting the System for Manual Installation

You must configure the system to boot from the media device that you have created.

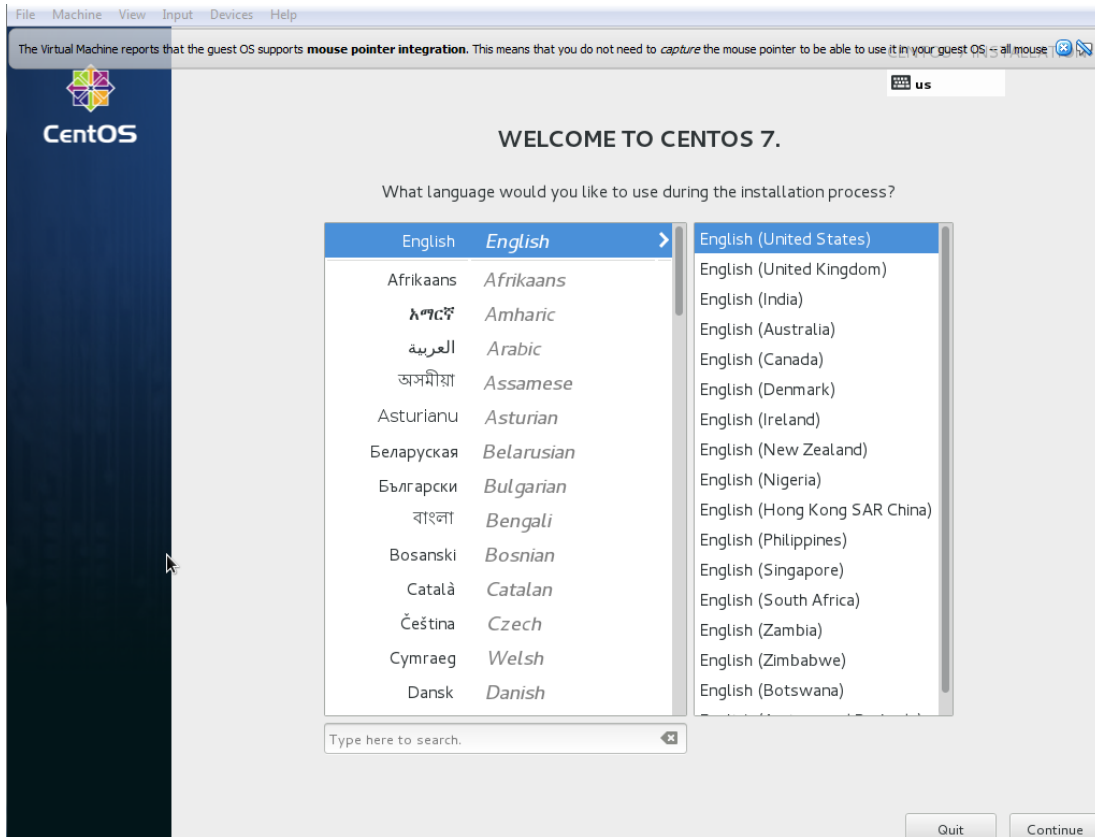
The instructions in this section are for the Vaisala-provided server. If you are using a different system, consult your systems manual for instructions.

- ▶ 1. Power-up the system by pressing the power button on the front of the server.
2. If you are using USB port for the first time, enable it by inserting the USB drive it into the USB port.
3. Enter the bios setup window by doing one of the following:
  - For SuperMicro computers, press **DELETE**.
  - For American Megatrend computers, press **ESC**.

4. Use the arrow keys to highlight the **Boot** option at the top of the window and press **ENTER**.
5. In the **Boot** window, use the arrow keys to select **Boot Device Priority** and press **ENTER**.
6. In the **Boot Device Priority** window, use the arrow keys to choose the 1st boot device and select the media that you are installing from.
7. Press **ENTER**.
8. Have your installation media ready to insert into the computer.
9. Save and Exit the BIOS configuration window.
  - For SuperMicro computers, press **F10**.
  - For American Megatrend computers, press **F4**.The boot process restarts.
10. On the installation welcome page, select **Manual Install/Upgrade** using the up arrow, and press **ENTER**.

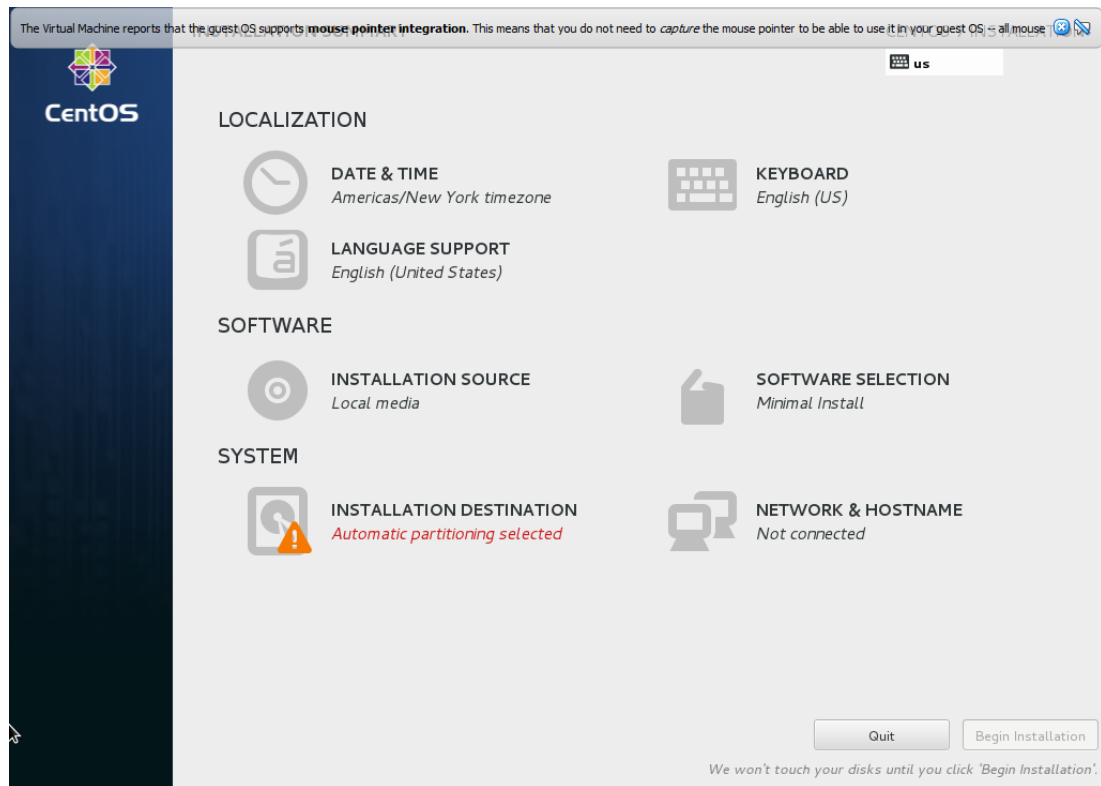


11. Select a language from the left hand panel and keyboard layout from the right hand panel.



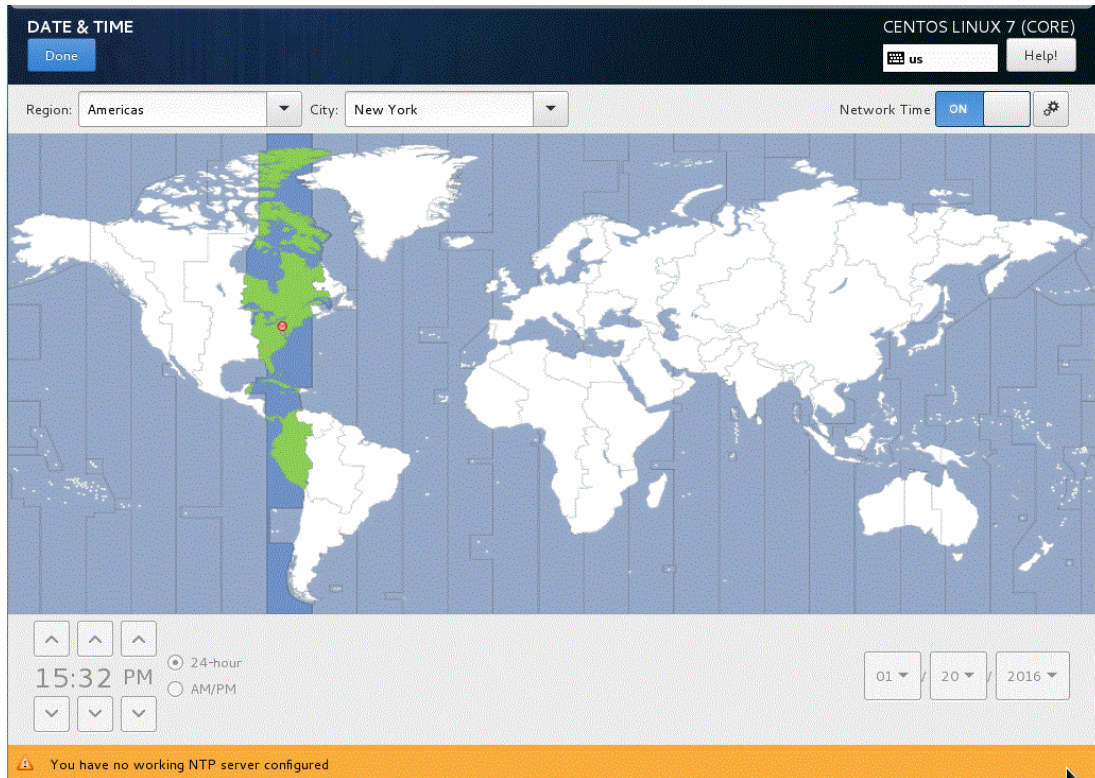
12. Select **Continue**.

13. After the first reboot, the initial settings window is shown. Continue the installation by setting up the local date and time, configuring the systems network and host name, setting the root password and creating a user account.



## A.4.2 Setting Localization Date and Time

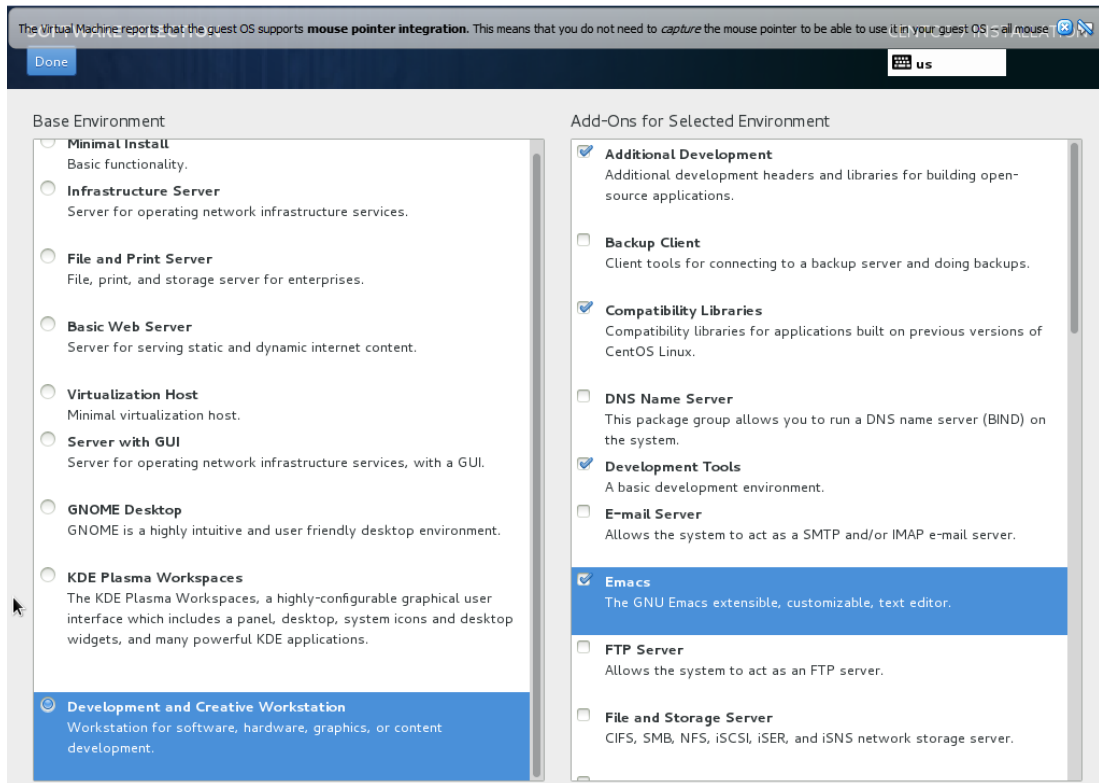
1. In the Localization section on the installation summary page, select **DATE & TIME** to set your local date and time preferences.



2. In the banner above the map select the region and city that represents your time zone from the drop down menus.
3. If you have an NTP server in your network:
  - a. Leave the **Network Time** setting in its default **ON** position.
  - b. Select the gears to the right of the **Network Time** switch to configure the server.
4. If you do not have an NTP server in your network, the date and time is set manually:
  - a. Switch the **Network Time** switch OFF by switching on the slider next to the word **ON**.  
Verify that **OFF** is displayed next to **Network Time**.
  - b. In the lower left hand corner enter the current time and select either 24 hour format or AM/PM format.
  - c. In the lower right hand corner enter the current date.
5. Review your settings to verify they are correct
6. Select **Done** in the upper left hand corner to save the configuration and return to the installation summary page.

### A.4.3 Selecting the Software

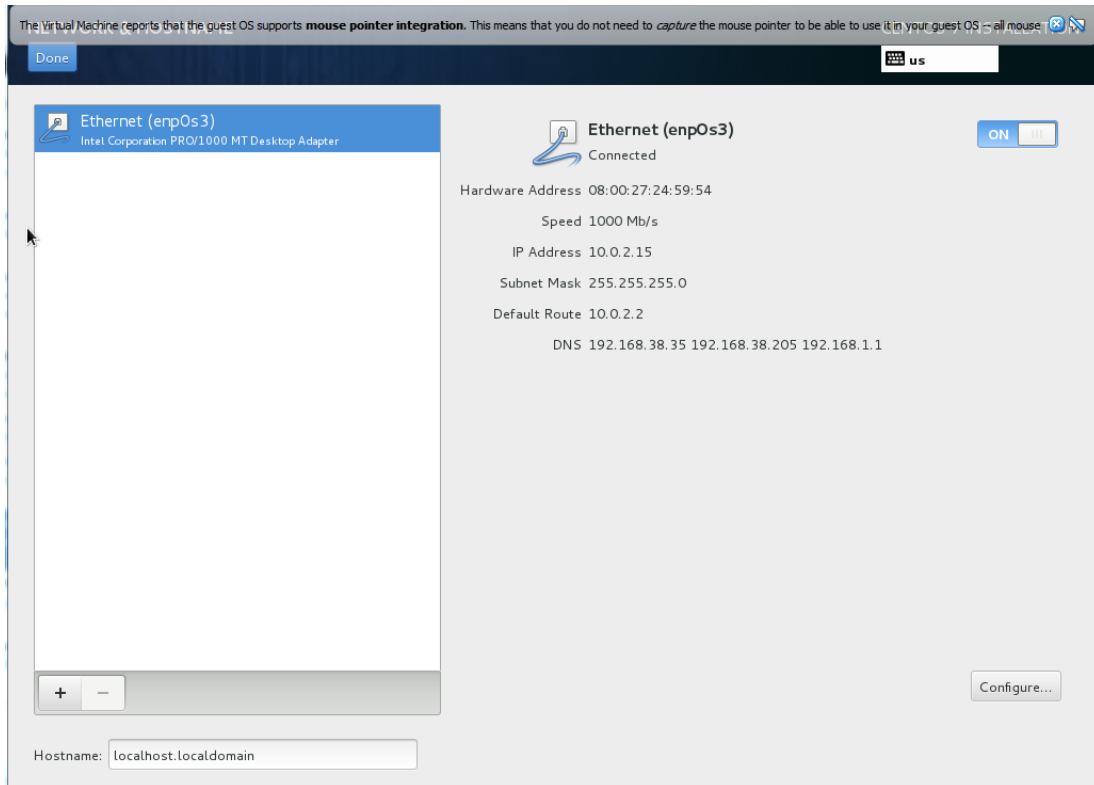
1. In the **Software** section of the installation summary page, leave the **INSTALLATION SOURCE** in its default state (**Local media**).
2. Select **SOFTWARE SELECTION** on the right side of the window. The **Software Selection** window appears.



3. In the left panel labeled **Base Environment**, select **Development and Creative Workstation**.
4. In the right panel labeled **Add-Ons for Selected Environment**, select the listed additional options from the right pane by checking the check box. Use the scroll bar to the right of the panel to view all of the options.
  - **Additional Development**
  - **Compatibility Libraries**
  - **Development Tools**
  - **FTP Server**
  - **Graphics Creation Tools**
  - **Legacy X Window System Compatibility**
  - **Network File System Client**
  - **Office Suite and Productivity**
  - **Platform Development**
  - **Legacy UNIX Compatibility**
5. Select **Done** in the top left corner to finish software selection and return to the installation summary page.

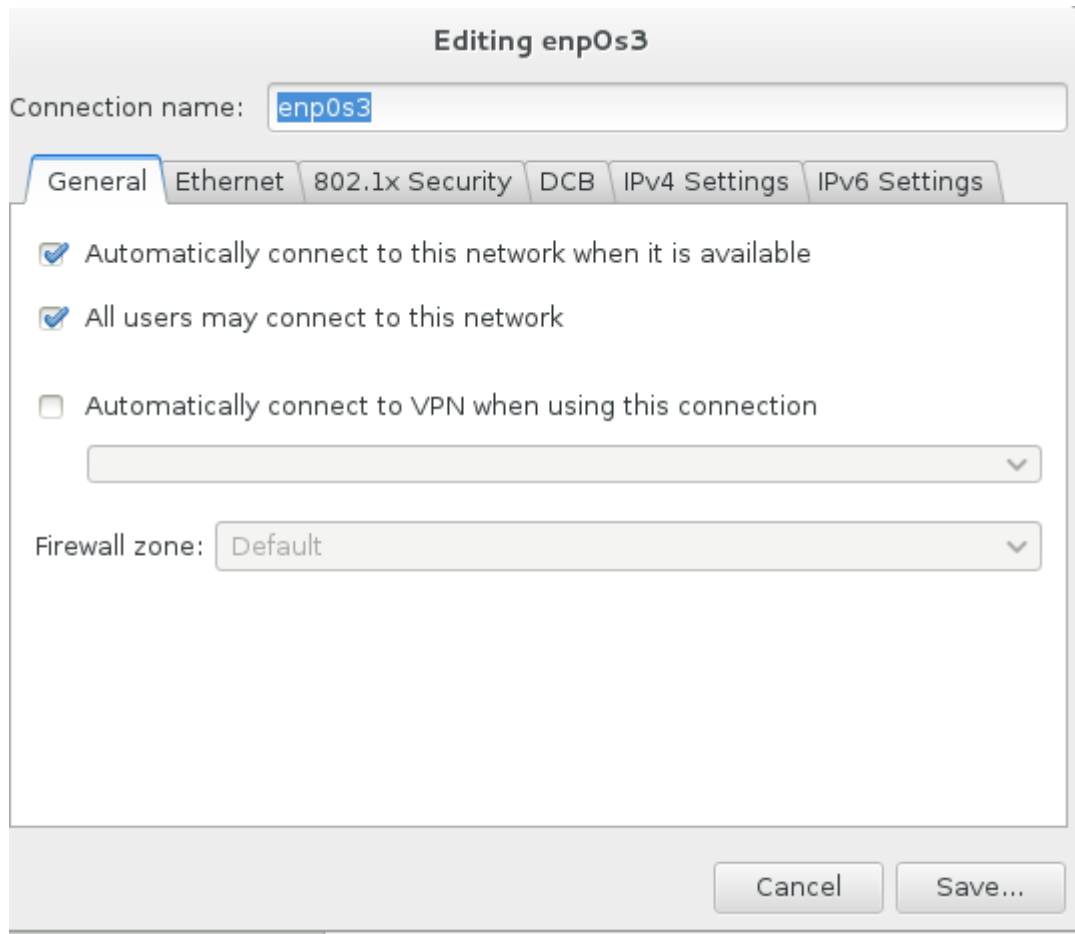
### A.4.4 Configuring the System and Network

- ▶ 1. In the installation summary page, select **NETWORK AND HOST NAME**.
2. In the **Network and Host Name** window, type the host name in the text box in the lower left window.



3. If you plan to run RDA software on this computer and connect to the RVP901 (IFDR), two Ethernet ports are required and should appear in the panel on the left hand side of the **Network and Host Name** window.  
The two ports probably have the same name one ending in 0 and one ending in 1. For example, **enp1sof0** and **enp1sof1**.  
The interface ending in **0 (eth0)** is typically connected to the internet and the interface ending in **1 (eth1)** is a dedicated local network directly connected to the RVP901 (IFDR).
  - If you do not plan to connect the computer to RVP901 (IFDR), you only need to configure **eth0** using this procedure.
  - If you plan to the computer to RVP901 (IFDR), you must use this procedure for **eth0** and **eth1**.

4. Enter the host name in the text box in the lower left window.
  - a. Select the network device you wish to configure listed in the panel on the left hand side. The selected device is highlighted as shown.
  - b. In some interfaces, to enable the network interface, select the blank button next to **OFF** in the upper right hand corner.  
If the button exists, slide the button **ON**.
  - c. Select **Configure** on the bottom right hand corner to display the **Editing** window.
5. In the **Editing** window, select the **General** tab to set the connectivity options.



- a. Select **Automatically connect to this network when it is available**.
- b. Select **All users may connect to this network**.

6. If you are configuring the RVP9IFDR port:

The screenshot shows a window titled "Editing enp0s3". At the top, there is a text field for "Connection name:" containing "enp0s3". Below this is a tabbed interface with six tabs: "General", "Ethernet", "802.1x Security", "DCB", "IPv4 Settings", and "IPv6 Settings". The "Ethernet" tab is currently selected. Inside the "Ethernet" tab, there are three fields: "Device MAC address:" with a dropdown menu, "Cloned MAC address:" with a text input field, and "MTU:" with a text input field containing "8192" and a spinner control with minus and plus buttons, followed by the text "bytes". At the bottom right of the window are two buttons: "Cancel" and "Save".

- a. In the **Editing** window, select the **Ethernet** tab.
- b. In the **MTU** field, type 8192.

7. In the **Editing** window, select the **IPv4 Settings** tab:

The screenshot shows the 'Editing enp0s3' window with the 'IPv4 Settings' tab active. The 'Method' is set to 'Manual'. The 'Addresses' section contains a table with headers 'Address', 'Netmask', and 'Gateway'. Below the table are input fields for 'DNS servers', 'Search domains', and 'DHCP client ID'. A checkbox labeled 'Require IPv4 addressing for this connection to complete' is present. At the bottom right, there is a 'Routes...' button. At the bottom center, there are 'Cancel' and 'Save...' buttons.

- In the **Method** drop down menu, select **Manual**.
- Select **Add**.
- Enter the IP address, netmask, and gateway in the text entry boxes under the headers.
  - If you are configuring your **eth0** interface connected to the internet or your corporate network.  
The settings in this window are specific to your network configuration, if you are unsure what to enter in these boxes contact your IT support staff.
  - If you are configuring your **eth1** interface for direct connection to the RVP91FDR use the following settings.

| Setting | Value                                                                                                                             |
|---------|-----------------------------------------------------------------------------------------------------------------------------------|
| Address | 10.0.1.X, where X is the last octet of your <b>eth0</b> address.<br>X cannot equal 254 as this is reserved for the RVP901 (IFDR). |
| Netmask | 24                                                                                                                                |

| Setting | Value    |
|---------|----------|
| Gateway | 10.0.1.1 |

- d. If configuring your **eth0** interface type your DNS server address in the **DNS server** field.  
If configuring your **eth1** interface leave this blank.
  - e. If configuring your **eth0** interface type your domain name in the **Search** domains field.  
If configuring your **eth1** interface leave this blank.
  - f. Check the **Require IPv4 addressing for this connection** box near the bottom of the page.
8. Select **Save** in the lower right corner to finish network configuration.
  9. Select **Done** in the upper left hand corner of the **Network and Host Name** window to return to the installation summary page.

## A.4.5 Partitioning the Destination Disk

1. On the installation summary page, select **Destination Installation**.
2. To select the destination disk for the CentOS installation, select the **Disk** icon.  
The factory default destination disk for **Managed RAID** is BIOS RAID Volume0\_0.  
Once selected, a check mark appears on the icon.
3. Select **I will configure partitioning > Done**.  
For recommended settings, see [A.4.5.1 Vaisala-recommended Partition Settings \(page 82\)](#).
4. If your drive is already partitioned and you want to change to the recommended settings:
  - a. See [A.4.5.2 Deleting Existing Partitions \(page 83\)](#).
  - b. See [A.4.5.3 Creating New Partitions \(page 83\)](#).
5. If your drive has never been partitioned, see [A.4.5.3 Creating New Partitions \(page 83\)](#).
6. If you wish to reuse your existing settings, see [A.4.5.4 Re-using Existing Partitions \(page 87\)](#).

### A.4.5.1 Vaisala-recommended Partition Settings

Table 6 Partition Settings

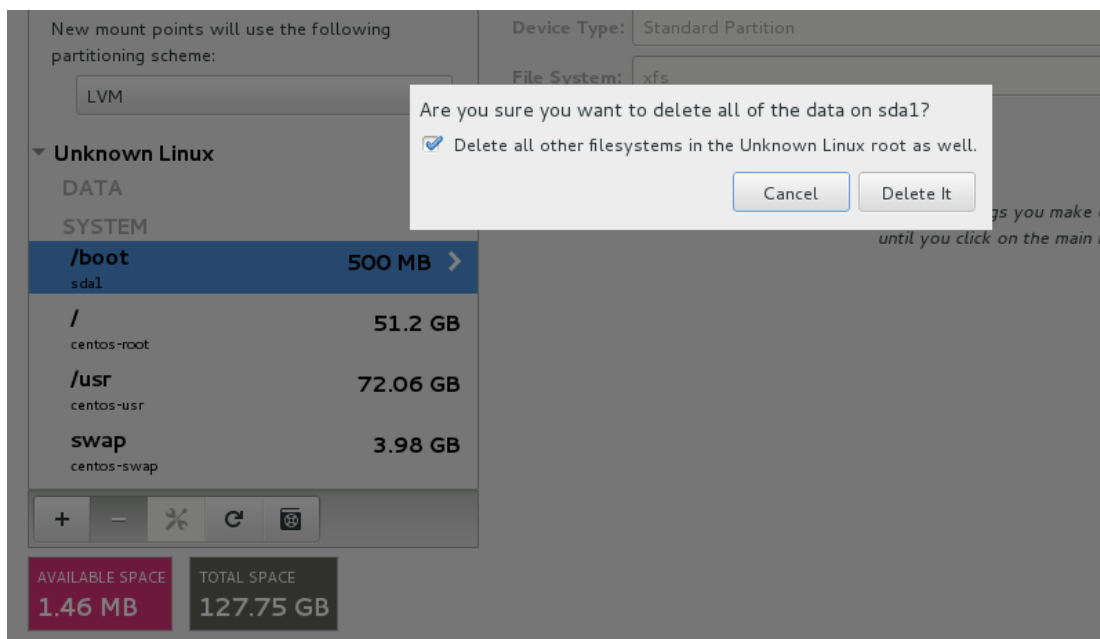
| Partition    | File System Type | Minimum Partition Size |
|--------------|------------------|------------------------|
| <i>/boot</i> | Ext4             | 500 MiB                |

| Partition      | File System Type | Minimum Partition Size |
|----------------|------------------|------------------------|
| Swap           | swap             | 8 GiB                  |
| /              | Ext4             | 50 GiB                 |
| /usr/iris_data | Ext4             | Remaining space        |

#### A.4.5.2 Deleting Existing Partitions

If you do not want to use the existing partitions, you must delete them to provide disk space for your installation.

1. Select the arrow to the left of the drive name you want to modify to expand the partitioning scheme.
2. Select a partition to delete.
3. Select a minus sign (-) icon to delete the partition.
4. On the pop-up window, check **Delete all other filesystems....** and select **Delete it.**

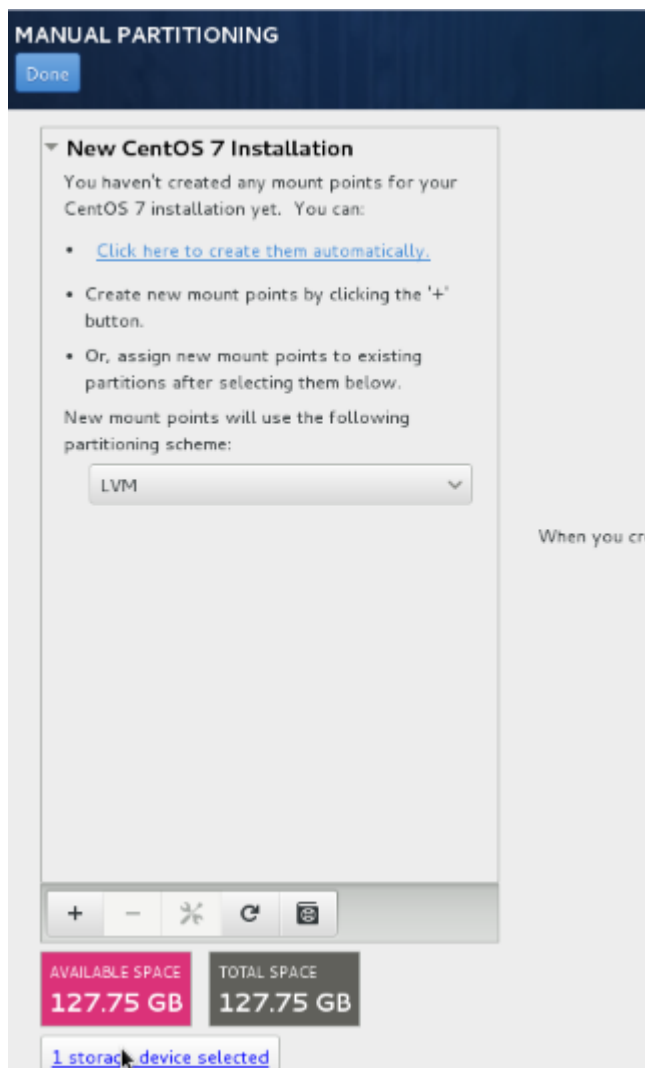


When you have completed partitioning, go to [A.4.6 Starting the Installation \(page 88\)](#).

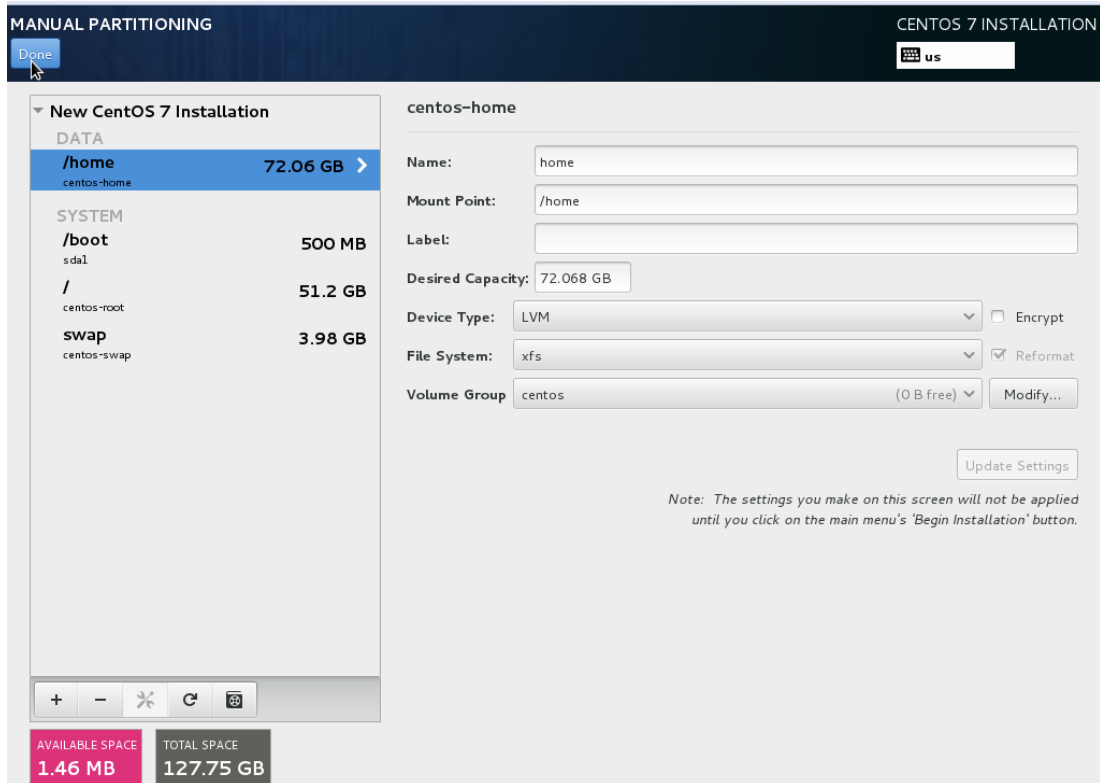
#### A.4.5.3 Creating New Partitions



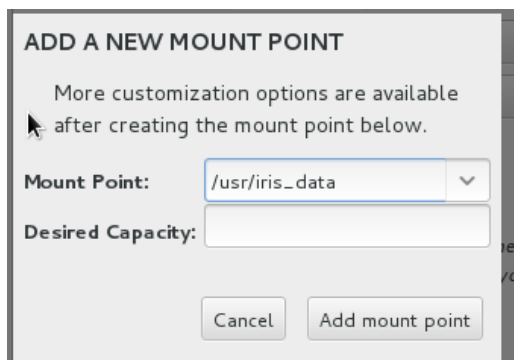
Vaisala recommends the LVM partition scheme.



1. If the `/home` partition exists, delete the `/home` partition by selecting the minus (-) icon



2. Select the plus (+) icon to add partitions. Do this 4 times, once for each partition.
3. For each directory `/`, `/boot`, and `swap`:



- a. From the **Mount Point** menu, select the directory.
- b. In **ADD A NEW MOUNT POINT > Desired Capacity**, type the value recommended in [A.4.5.1 Vaisala-recommended Partition Settings \(page 82\)](#).
- c. Select **Add mount point**.

4. Create the */usr/iris\_data* partition:
  - a. In the **Mount Point** field, type */usr/iris\_data*.  
Type a number larger than the remaining data size. For example: 9999999999.
  - b. Select **Add mount point**.
5. One at a time, select each partition and modify the value in the **Desired Capacity** box with values in [A.4.5.1 Vaisala-recommended Partition Settings \(page 82\)](#).
6. Select **Done > Accept changes** to finish partitioning
7. Select **Begin installation** to start installation.
8. While installation is in progress, follow the instructions in **User Settings**.

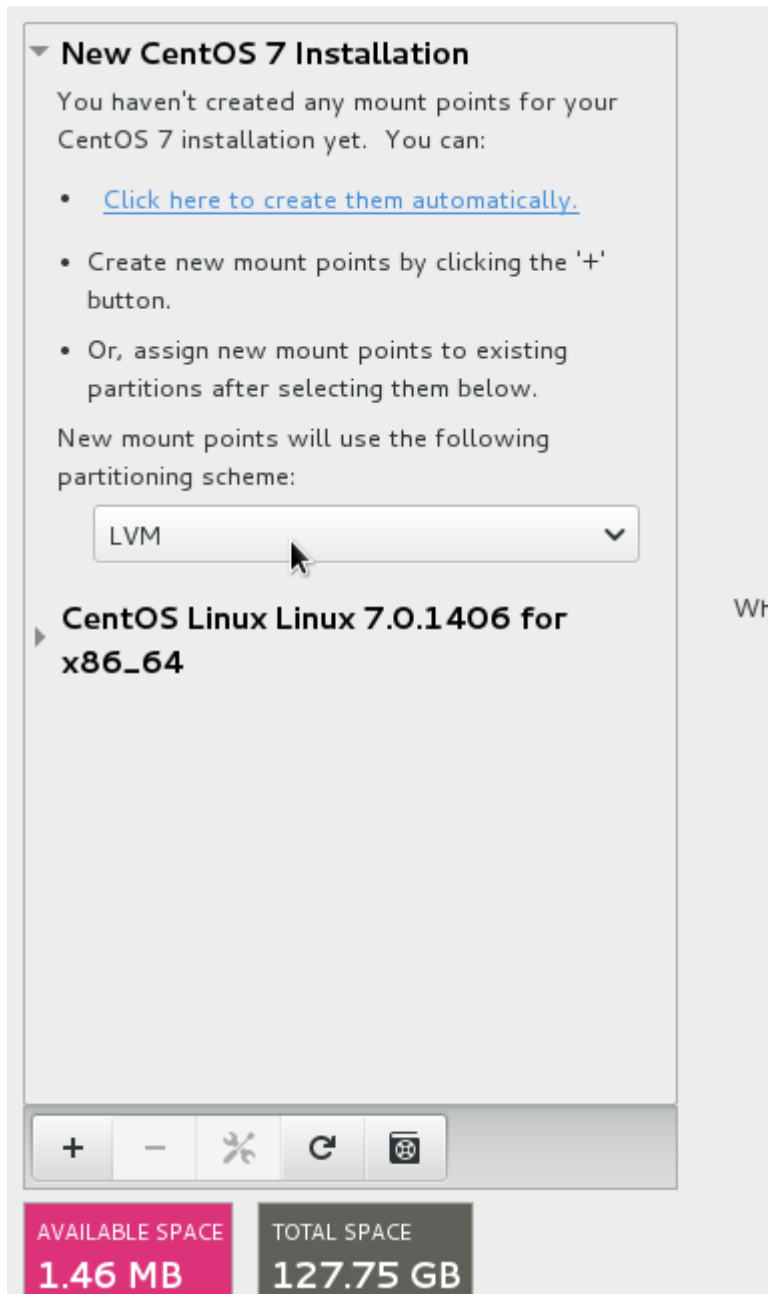
When you have completed partitioning do one of the following:

- If you are doing a manual installation, go to [A.4.6 Starting the Installation \(page 88\)](#).
- If you are doing an automatic installation, go back to [A.3 Installing CentOS 7 Automatically \(page 66\)](#).

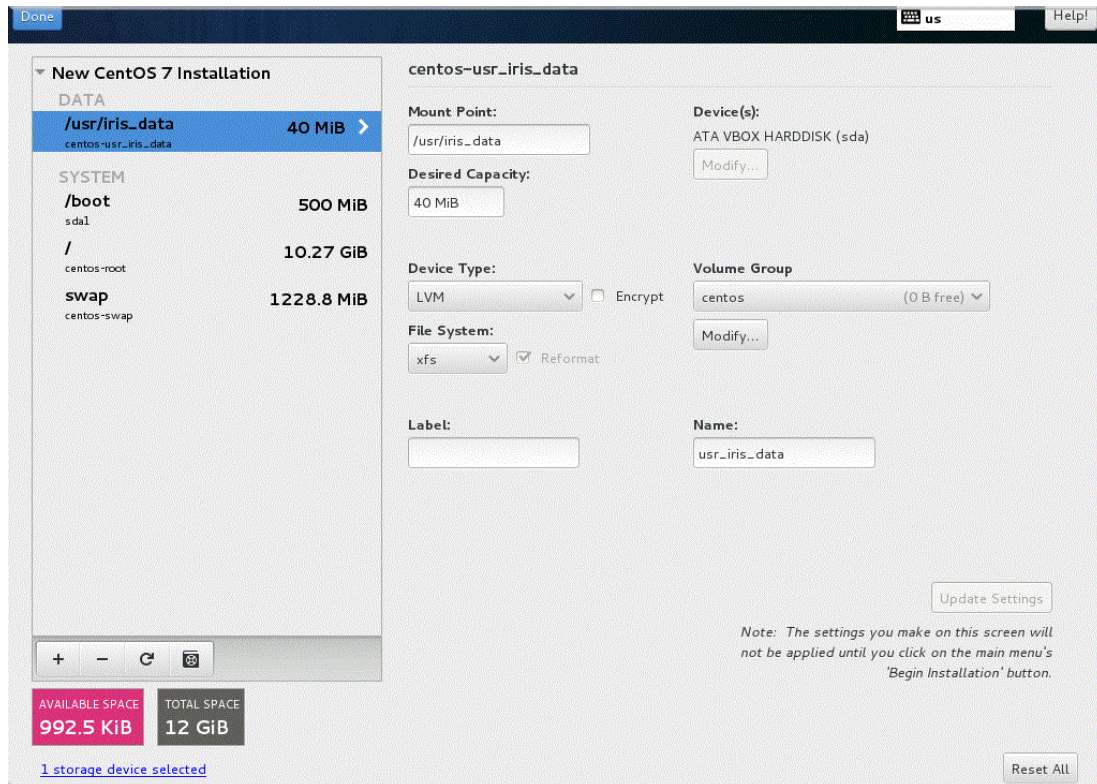
#### A.4.5.4 Re-using Existing Partitions

If your disk has an operating system installed, the partitioning scheme list is displayed.

1. Select the arrow head to the left of the drive name you want to re-use to expand the partitioning scheme.



2. In the partition window, for each partition shown in the left pane of the partition window, select the partition and enter the name shown in the **Mount Point** field.



3. Check the reformat box in the **File System** selection section so that a check appears in it.
4. Select **Update Setting**.  
For the swap partition, you do not need to enter the mount point name but you must check the reformat box and update the settings.
5. For each partition, update the settings and select **Done**.
6. Select **Accept Changes** to return to the installation summary page.

## A.4.6 Starting the Installation

Before starting the installation, make sure you have your root password and user account information.

1. In the lower right corner of the installation summary page, select **Begin installation**. The user settings configuration page appears.
2. While the installation process is in progress and before the end of the installation, configure the **root** password and at least one initial user account  
See [A.4.7 Setting the Root Password \(page 89\)](#) and [A.4.8 Creating Users \(page 89\)](#).
3. When installation status shows complete, remove the installation media and select **Reboot**.

4. When the screen goes blank, use the power button to power cycle the system.
5. If on first boot you are prompted to **Accept the License Information**, in the initial setup window:
  - a. Select **License Information**.
  - b. Check the **I accept the license agreement** box.
  - c. Select **Done**.

You are logged in to the user account that you created.
6. The first time you login to each new user account, follow the series of windows to verify your keyboard and localization settings.
  - a. Select **Next** until you get to the thank you screen.
  - b. Select **Start using CentOS Linux**.
7. Log out of the user account to continue with the next steps of the installation.

### A.4.7 Setting the Root Password

- ▶ 1. Select **ROOT PASSWORD**.  
The **Root Password** window opens.
- 2. Enter your root password.
- 3. Check the password strength meter.  
While Vaisala recommends a strong password, the software does not stop you from entering a weak one.
- 4. In the confirm text box, re-enter your root password.
- 5. In the upper left hand corner, select **Done** to return to the main configuration page.  
If your password is weak, you are prompted to select **Done** a second time.

In the **Installation Summary page / Initial Settings** page, the text under **Root Password** says **Root password is set**.

### A.4.8 Creating Users



Do not use the user name **radarop**, or **observer** when creating user accounts. These user names are reserved for use in the IRIS/RDA software installation.

- ▶ 1. Select **USER CREATION**.  
The **User creation** window opens.
- 2. In the user name text box, enter user account name or if you wish to have the user account name generated from the full name, enter the user's full name in the **Full name** text box.
- 3. In the password text box, enter your user account's password.

4. In the confirm text box, re-enter your user account's password.
5. Select **Done** to save the account and return to the main configuration page.  
If your password is weak, you are prompted to select **Done** a second time.

In the **Installation Summary page / Initial Settings** page, the text under **User Account** header says **User 'username' will be created where user name matches the name entered in the User name text box.**

### A.4.9 Disabling the Firewall

During a manual installation, you must disable the firewall.

- ▶ 1. Login as **root**.  
The default password is xxxxxxxx.
- 2. In the command line, type:

```
systemctl disable firewalld.service
```

### A.4.10 Disabling SELinux

During a manual installation, you must disable SELinux.

- ▶ 1. Login as **root**.  
The default password is xxxxxxxx.
- 2. In the `/etc/selinux/config` file, change the **SELINUX** line to **disabled**.

```
SELINUX=disabled
```

3. Reboot to take the setting into effect.
4. Check the status of SELinux by issuing the following command. The status should be **disabled**.

```
sestatus
```

### A.4.11 Disabling Monitor Negotiation

During manual CentOS installations, Vaisala recommends disabling monitor negotiation to ensure that the server recognizes the monitors.

- ▶ 1. Login as **root**.  
The default password is xxxxxxxx.

2. In the `/etc/default/grub` file, after the `quiet` in `GRUB_CMDLINE_LINUX` add:

```
nomodeset
```

3. Save your changes.
4. To update the configuration file, run the following script:

```
cd /boot/grub2/
grub2-mkconfig -o grub.cfg
```

## A.5 Configuring NTP Services

If you have configured the time sync server during the CentOS 7 installation, see [A.5.2 Configuring Time Sync With chronyd \(page 93\)](#).

If you have not yet configured the time sync server, see either [A.5.1 Configuring Time Sync With NTP \(page 91\)](#) or [A.5.2 Configuring Time Sync With chronyd \(page 93\)](#).

### A.5.1 Configuring Time Sync With NTP

You can configure your machine to time sync with another machine using NTP.

1. In the `/etc/ntp.conf` file, update the lines that start with the word `server` by removing the default server lines and adding your own. For example:

```
configure the servers for synchronization using ip address or name
server 198.102.75.10 iburst
server 0.centos.pool.ntp.org iburst
If you want to share your time with other machines on the local network.
Add the network range you want to allow to receive requests restrict
10.0.0.0 mask 255.255.255.0 nomodify notrap
if there are no out side server then use this address to use your local
machine no matter how accurate.
```



To make a server to act as a time server, use IP address `127.127.1.1`.

2. Create a file `/etc/ntp/step-tickers` and put in the server IP address, without the word **server**.

You must do this because NTP sets the time approximately 15 minutes after building a time syncing model. This means that after booting, the time may change in about 15 minutes, which can cause problems with IRIS automatic startup.

NTP sets the date at boot time, if possible. Do not put the step-tickers file on the time server.

3. To have NTP start automatically on restart:

- CentOS6

```
chkconfig --add ntpd
chkconfig ntpd on
```

This takes effect after the next reboot. To start without rebooting, type:

```
service ntpd start
```

- CentOS7

```
#systemctl enable ntpd.service
```

This takes effect after the next reboot. To start without rebooting, type:

```
#systemctl start ntpd
```

The system takes 15 minutes to sync the time. If the times are more than 10 minutes apart, NTP assumes there is an error and does not change the time.

4. To check on the status of **ntp**, type:

```
ntpq -p
```

The first character before the server host is **\*** when it is time synced.

5. To compare the time of your workstation with that of another (such as the NTP server), type:

```
ssh nodename date
```

The semicolon between the two commands allows both the local "date" command to run simultaneously with the remote date (**rdate**) command on the other workstation, making it easy to compare the times.

6. To manually set the time from another computer, type the following command:

```
ntpdate host
```

This does not work if **ntpd** is running on your machine.

## A.5.2 Configuring Time Sync With **chronyd**

You can configure your machine to time sync with another machine using **chronyd**.

- ▶ 1. In the **/etc/crony.conf** file, update the lines that start with the word **server** by removing the default server lines and adding your own. For example:

```
configure the servers for synchronization using ip address or name
server 198.102.75.10 iburst
server 0.centos.pool.ntp.org iburst
```

2. If **chronyd** is already running and you would like changes to take effect use the following command:

```
#systemctl restart chronyd.service
```

3. If you would like NTP to start automatically on restart, type:

```
#systemctl enable chronyd.service
```

This takes effect after the next reboot. To start without rebooting, type:

```
#systemctl start chronyd.service
```

The system takes 15 minutes to sync the time. If the times are more than 10 minutes apart, NTP assumes there is an error and does not change the time.

4. To check on the status of chrony, type:

```
chronyc sources -v
```

The first character before the server host is \* when it is time synced.

## A.6 Rebooting the System

- ▶ 1. When the installation is complete, select **Reboot** to reboot the system.
- 2. Depending on your system bios boot sequence setting, you may need to remove the installation media right after you see the system shutdown complete window flash by in order to boot using the hard drive.  
After rebooting, the system displays a login window allowing you to login with the user account created in the previous steps.

## A.7 Logging In With Your User Account

After rebooting, the login window shows the user account you created.

- ▶ 1. Select your user account and enter your password in the text box.
- 2. Select **Sign in**.  
The first time you log in to each new user account, you are asked to answer some initialization settings, these should be set properly and no setting changes should be required.
- 3. In the **Welcome** window, select your language and select **Next**.
- 4. In the **Input Sources** window, verify your source and select **Next**.
- 5. In the **On-line Accounts** window, select **Next**.
- 6. In the **Thank you** window, select **Start using CentOS Linux**.
- 7. Read the **GNOME Help** window and press **X** in the upper right corner to close the window.  
The installation and initialization process for CentOS 7 is complete.

# Appendix B. Installing CentOS 6

## B.1 Overview to Installing CentOS 6.x

This section provides instructions on installing and configuring CentOS6 for Vaisala WR (IRIS & RDA) application software.

For more information see *CentOS Linux Installation Guide*, on the Documentation disk of your CentOS Desktop DVDs.



During this process you must take notes so that you can properly reuse this information during the post installation modifications.

### Automatic Installation

The automatic installation uses bootable scripts on install CDs provided by Vaisala.

The install CDROM is specific to a particular OS version, see our ftp site (<ftp.sigmet.vaisala.com/outgoing/releases>) for the current list. If you wish to install a different version, use the manual method, or contact us.

After installing the OS, you separately install IRIS from the IRIS/RDA install media.

You should always use automatic installation for RVP8 and RCP8 systems.

### Manual Installation

Use the manual installation if there is a problem with the automatic installation, or if you wish to install a different version of the OS.

Manual installation is typically used to install Linux and IRIS on workstations that are not provided by Vaisala, that is, NOT RVP8 or RCP8 hardware.

The manual procedure described here can still use the automated sigconfig tool for system configuration.



During the installation, use the Tab key to move between different fields/options on the screen and the space bar to select check boxes.

### B.1.1 Installation Media

Installing Linux requires a Linux installation tree (Linux files) and a boot device.

The Linux installation tree can come either from the local DVD-ROM labeled *32 bit Installation*, or a file accessible over the network (via NFS or FTP).

Vaisala recommends a DVD-ROM based installation.

## B.1.2 Preparing to Install CentOS6

- ▶ 1. Verify that you can boot from a DVD:
  - a. Power off your computer.
  - b. Insert the Vaisala Install CD-ROM or the CentOS DVD (32-bit version) in the appropriate drive.
  - c. Power on your computer.
- 2. If a Linux screen is shown, see either:
  - [B.2 Installing CentOS6 Automatically \(page 96\)](#)
  - [B.3 Installing CentOS6 Manually \(page 96\)](#)
- 3. If a Linux screen is not shown, see [B.3 Installing CentOS6 Manually \(page 96\)](#).



In newer computer models, you may get a warning indicating that there is unsupported hardware. In many cases, you can ignore this warning and the CentOS 6 installation and the system will operate without additional errors.

## B.2 Installing CentOS6 Automatically

- ▶ 1. Place the Vaisala Install KICKSTART disk in the drive and reboot the computer. The installation process begins automatically.
- 2. When prompted, insert the DVD.  
When the installation is complete, the DVD is ejected and the system reboots.

If the automatic installation does not work, follow the manual installation instructions.

## B.3 Installing CentOS6 Manually

- ▶ 1. To start the installation, place the CentOS DVD (labeled *32 bit Installation*) in the drive:
  - a. Reboot the computer.
  - b. While the computer is booting, you are prompted to **Press DEL to enter SETUP** (or another key to enter setup).  
Press the specified key to enter the setup.
  - c. In the **BIOS Features Setup**, set the boot sequence to be **CD, C**.
  - d. Save your changes by pressing F10.  
The system reboots.

2. In the **Welcome to CentOS6!** screen, select **Install or upgrade an existing system**.
  - a. In the **Disc Found** dialog, select **OK** to test the install disk.  
This takes some time, but can be worth the effort.  
Select **Skip** if you are sure the disc is OK.
  - b. Select **Next**.
  - c. Select the installation language and select **Next**.
  - d. Select the keyboard type (for most systems, U.S. English) and select **Next**.
3. In **Type of Device for Installation**
  - a. Select **Basic Storage Devices**.
  - b. Type your host name, for example **wes-install.vaisala.com**.
  - c. Select **Config Network**.
4. In **Network Connections**, set the basic network configuration.  
You can do this later, but if you know the information, do it now. Consult with your network manager to get the information. For example:
  - a. In the **Wired** tab, select the device **System eth0**, and select **Edit**.  
The **Editing System eth0** window appears.
  - b. Select **Connect automatically**.
  - c. In the **Select the IPv4 Settings** tab, set **Method** to **Manual**.
  - d. Select **Add**.
  - e. Type your IP address, for example **192.168.45.208** and select **Enter**.
  - f. If you do not want to use the default **Netmask**, change it.
  - g. Type the Gateway IP address.
  - h. Optionally, type in the DNS server and domain name.
  - i. Select **Apply**.
  - j. Select **Close > Next**.
5. In **Time Zone**:
  - a. Select the nearest city in your time zone.
  - b. If you want your computer to use UTC for the system clock (good for shipboard systems, for example), scroll down to **Etc/UTC**.
  - c. Select **System clock uses UTC**.
  - d. Select **Next**.
6. In **Set Root Password**:
  - a. Enter the password for root (twice).  
The default Vaisala root password is **xxxxxxxx**.
  - b. Select **Next**.

7. In **What Type of Installation Would You Like?**

- a. Select option **5 Create Custom Layout**.
- b. Select **Next**.
- c. If you are going to record time series, we recommend that you create a separate partition for that purpose.

8. In **Please Select A Device:**

- a. Select your hard drive device from the list.
- b. Select **Create** 4 times and make 4 partitions similar to this table:

```
sda1 16384MB / ext4
sda2 8192MB swap
sda3 16384MB /usr ext4
sda4 Fit max size /usr/iris_data ext4
```

- c. Verify that it makes an extended partition for you.
  - d. Select **Next**.
9. In **Boot Loader Operating System List**, select **Next** to take the defaults.
10. In **Software Development Workstation**, leave default repositories.
11. Select **Customize now** and **Next**.

### B.3.1 Selecting CentOS 6 Package Groups

Select the packages to install (✓) or not to install (✗). In some cases you must look at the *Optional packages* to select or de-select specific packages. Text in **bold** indicates changes from the defaults.

#### Base System

- ✗ *Backup client*
- ✓ *Base*
- ✓ *Compatibility Libraries*
- ✗ *Console Internet Tools*
- ✓ *Debugging Tools*
- ✗ *Dial-up Networking Support*
- ✓ *Directory Client*
- ✗ *FCoE Storage Client*
- ✗ *Hardware Monitoring Utilities*

✗ *Infiniband Support*

✓ *Java Platform*

✗ *Large System Performance*

✓ *Legacy UNIX Compatibility*

- Optional Packages: Accept defaults, turn on *rsh*, *rsh-server*, *telnet*, and *telnet-server*

✗ *Mainframe Access*

✓ *Network File System Client*

✓ *Networking Tools*

✓ *Performance Tools*

✓ *Perl Support*

✓ *Printing Client*

✓ *Scientific Support*

- Optional Packages: Accept defaults, turn on *lapack*

✗ *Security Tools*

✗ *Smart Card Support*

✗ *Storage Availability Tools*

✗ *iSCSI Storage Client*

## **Servers**

✗ *Backup Server*

✓ *CIFS File Server*

✗ *Directory Server*

✗ *Email Server*

✓ *FTP Server*

✓ *NFS File Server*

✗ *Network Infrastructure Server*

✗ *Network Storage Server*

✓ *Print Server*

✓ *Server Platform*

✓ *System Administration Tools*

- Optional Packages: Accept defaults, turn on *tree*

## Web Services

✓ *PHP Support*

✗ *TurboGears Application Framework*

✓ *Web Server*

- Optional Packages: Accept defaults, turn on *mod\_auth\_pgsql*

✓ *Web Servlet Engine*

## Databases

✗ *MySQL Database Client*

✗ *MySQL Database Server*

✓ *PostgreSQL Database Client*

- Optional Packages: Accept defaults, turn on *postgresql-jdbc*

✓ *PostgreSQL Database Server*

## System Management

✗ *Messaging Client Support*

✗ *Messaging Server Support*

✗ *SNMP Support*

✗ *System Management*

✗ *Web-based Enterprise Management*

## Virtualization

✗ *Virtualization Client*

✗ *Virtualization Platform*

## Desktops

✓ *Desktop*

✓ *Desktop Debugging and Performance*

✓ *Desktop Platform*

- Optional Packages: Accept defaults, turn on *qt-postgresql*

✓ *Fonts*

✓ *General Purpose Desktop*

✓ *Graphical Administration Tools*

✓ *Input Methods*

✗ *KDE Desktop*

✓ *Legacy X Window System Compatibility*

- Optional packages: *xorg-x11-fonts-ISO8859-1-75dpi*
- Optional Packages: Accept defaults, turn on *openmotif-2.3*

✓ *Remote Desktop Clients*

✓ *X Window System*

## Applications

✓ *Emacs*

- Optional Packages: Accept defaults, turn on *emacs\_nox*

✓ *Internet Browser*

✓ *Graphics Creation Tools*

- Optional Packages: Accept defaults, turn on *ImageMagick*

✓ *TeX Support*

✓ *Technical Writing*

## Development

✓ *Additional Development*

- Optional Packages: Accept defaults, turn on *libXpm-devel*, *libtiff-devel*, *openmotif-devel-2.3*, *tcl-devel*, *tk-devel*

✓ *Desktop Platform Development*

✓ *Development Tools*

- Optional Packages: Accept defaults, turn on *ant*, *cmake*, *imake*, *rpmdevtools*

✓ *Eclipse*

- Optional Packages: Accept defaults, turn on *eclipse-mylyn-cdt*

✓ *Server Platform Development*

## Languages

Add languages that you want, the install language is implicit.

## B.3.2 Finalizing the Installation

1. Select **Next**.  
The install process takes 20 ... 40 minutes depending on the speed of your computer.
2. Select **Reboot**.  
Make sure the CentOS6 disk is removed from the drive.

### B.3.3 Customizing the CentOS6 Installation

After the first reboot you must enter some customization information.

- ▶ 1. In the license agreement dialog, select **Yes I agree** and **Forward**.
- 2. In **Set Up Software Updates**, register with CentOS.  
You can bypass this and do it later if needed.
- 3. Select **Forward**.
- 4. You will create the normal radar operator account later. For now, in **Create User**, create an account for **service**, with the password **xxxxxx**.
- 5. Select **Forward**.
- 6. Set the date and time.  
Use your local time (depending on the timezone set earlier).  
Alternatively set your NTP servers here.
- 7. Leave **Kdump Disabled** and select **Forward**.  
The machine reboots.
- 8. When the install procedure is complete, disable the firewall:
  - a. Make sure you are logged in as **root**.
  - b. Run the command: **# system-config-firewall**



If you are running the gnome desktop, launch `system-config-firewall` from the menu bar by selecting **System > Administration > Firewall**.

- c. Select **Disable** and **Apply**.
  - d. Exit the program.
- 9. Run the `sigconfig` post-install configuration script.  
See [2.1 Overview to Installing IRIS/RDA Software with Sigconfig](#) (page 7).

## B.4 Post-Install Steps

### B.4.1 Configuring Your Time Zone

If you used the automatic installation procedure or need to your time and date settings:

- ▶ 1. Login as root.
- 2. Type:

```
system-config-date
```

3. If you wish the system clock to display UTC, select the **Time Zone** tab, and select **Non-geographic timezones > UTC**.

## B.4.2 Performing Basic Network Configuration

1. Login as **root**.
2. If you did not use the automatic installation procedure or need to change your network settings for another reason, type:

```
system-config-network
```

3. Manually inspect and edit the network configuration files.  
The following table shows the required network configuration files for IRIS:

Table 7 Required Network Configuration Files

| File Name                                        | Function                                                                                                                                      | Test                                                                                                                                                                   |
|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>/etc/sysconfig/network</i>                    | Set official local host name and basic networking.                                                                                            | <b># hostname</b><br>Should show hostname exactly as as in the file.                                                                                                   |
| <i>/etc/sysconfig/network-scripts/ifcfg-eth0</i> | Define the local IP address and the other basic network information                                                                           | <b># ifconfig eth0</b><br>Displays network configuration and status summary for device eth0.                                                                           |
| <i>/etc/hosts</i>                                | Defines IP addresses, hostnames and aliases for all of the various IRIS or other network nodes.                                               | <b># ping &lt;hostname or alias&gt;</b><br>Shows that the hostname or alias corresponds to the proper IP address.                                                      |
| <i>/etc/hosts.equiv</i>                          | A list of other hosts and the corresponding users who are allowed remote access without password.                                             | <b># rsh hostname date</b><br>Also required for rcp and rlogin.                                                                                                        |
| <i>/etc/resolv.conf</i>                          | Specifies a network domain name server (DNS) as an alternative to a fixed <i>/etc/hosts</i> table. Many IRIS systems do not use this feature. | If after login, X-windows takes a long time to start, then there may be a problem with the DNS. In this case move <i>resolv.conf</i> to <i>/etc/resolv.conf.back</i> . |

4. Check that the files should look something like the following examples:  
Note that your specific node names and IP addresses, and so on, are different. Check with your network manager to get these assigned.  
*/etc/sysconfig/network* should look something like:

```
NETWORKING=yes HOSTNAME=typhoon.sigmet.com GATEWAY=192.168.76.10
```

*/etc/sysconfig/network-scripts/ifcfg-eth0* should look something like:

```
DEVICE=eth0
BOOTPROTO=static
BROADCAST=192.168.76.255
IPADDR=192.168.76.27
NETMASK=255.255.255.0
NETWORK=192.168.76.0
ONBOOT=yes
TYPE=Ethernet
```

*/ etc /hosts* should look something like:

```
127.0.0.1 localhost.localdomain localhost
192.168.76.27 typhoon.sigmet.com typhoon
192.168.76.28 otherhost.sigmet.com otherhost
```

*/ etc / hosts.equiv* should look something like:

```
cloud.sigmet.com operator
typhoon.sigmet.com operator
others.sigmet.com operator
```

5. Vaisala recommends using a static */ etc /hosts* file. To avoid possible confusion with the DNS server, move the *resolv.conf* file as follows:

```
mv /etc/resolv.conf /etc/resolv.conf.org
```

6. If you plan to use DNS, the *resolv.conf* should look something like (depending on your network):

```
search sigmet.com
nameserver 192.168.76.10
```

7. For most other changes, test by stopping and starting the network service as follows:

```
service network stop
service network start
```

8. After you have completed the networking, it is recommended that you reboot the system to test the changes.

```
reboot
```

If you change the host name for example, you must reboot for this to take effect.

### B.4.3 Enabling Routing

By default, a Linux system does not route network data.

- ▶ 1. Enable routing by typing:

```
echo 1 > /proc/sys/net/ipv4/ip_forward
```

2. Make sure this runs every time you boot by doing one the following:

- Edit the */etc/sysctl.conf* by adding a line such as:

```
net.ipv4.ip_forward = 1
```

- Put the echo command into your */etc/rc.d/rc.local* file

### B.4.4 Configuring NTP

- ▶ 1. To configure your machine to time sync with another machine, edit the */etc/ntp.conf* file to contain a single line similar to the following:

```
server 198.102.75.10
```

2. Substitute in the correct IP address of the machine to sync to. To make a computer the time server, use the special address as follows:

```
server 127.127.1.1
```

NTP sets the time approximately 15 minutes after building a time syncing model. After booting, the time may change in about 15 minutes. This can cause problems with automatic startup of IRIS. To fix this problem:

- a. Create a file `/etc/ntp/step-tickers`  
Do NOT put in the `/etc/ntp/step-tickers` file on the time server.
  - b. Put in just the server IP address (without the word `server`).  
NTP sets the date at boot time, if possible.
3. If `ntpd` was not added, type:

```
chkconfig --add ntpd
chkconfig ntpd on
```

This takes effect after the next reboot.

4. To start `ntp` without rebooting, type:

```
service ntpd start
```

It takes 15 minutes for `ntp` to sync the times. If the times are more than 10 minutes apart, `ntp` assumes there is an error and does not change the time.

5. To check on the status of `ntp`, type:

```
ntpq -p
```

The first character before the server host is `*` when it thinks it is time synced.

6. To compare your workstation time with another workstation time (such as the `ntp` server), type:

```
date ; rdate -p nodename
```

Note the semicolon between the two commands allows both the local “date” command to run simultaneously with the remote date (**rdate**) command on the other workstation. This allows the times to be easily compared.

7. To manually set the time from another computer, type:

```
ntpdate host
```

This does not work if **ntpd** is running on your machine.



# Appendix C. IRIS Diagnostic Utilities

## C.1 ps\_iris Command

Use the **ps\_iris** command to list currently active IRIS, antenna, and utility processes, including information about their owner UID, PID, time start time, and total CPU time. For example:

```
$ ps_iris
```

| UID      | PID      | PPID          | C | STIME    | TTY   |
|----------|----------|---------------|---|----------|-------|
| operator | 26705    | 1             | 0 | 15:34:56 | ttyp6 |
| 0:00     | ingfio   | IRIS_INGFIO   |   |          |       |
| operator | 26709    | 1             | 0 | 15:34:57 | ttyp6 |
| 0:00     | server   | IRIS_SERVER   |   |          |       |
| operator | 26713    | 1             | 0 | 15:34:59 | ttyp6 |
| 0:00     | output   | IRIS_OUTPUT13 |   |          |       |
| operator | 26718    | 26706         | 0 | 15:36:27 | ttyp6 |
| 0:00     | network  | IRIS_NETWORK  |   |          |       |
| operator | 26714    | 26711         | 0 | 15:34:59 | ttyp6 |
| 0:00     | window   | IRIS_WINDOW1  |   |          |       |
| operator | 26710    | 1             | 0 | 15:34:58 | ttyp6 |
| 0:00     | watchdog | IRIS_WATCHDOG |   |          |       |
| operator | 26708    | 1             | 0 | 15:34:57 | ttyp6 |
| 0:00     | reingest | IRIS_REINGEST |   |          |       |
| operator | 26706    | 1             | 0 | 15:34:56 | ttyp6 |
| 0:00     | network  | IRIS_NETWORK  |   |          |       |
| operator | 26712    | 1             | 0 | 15:34:59 | ttyp6 |
| 0:00     | output   | IRIS_OUTPUT02 |   |          |       |
| operator | 26711    | 1             | 0 | 15:34:58 | ttyp6 |
| 0:00     | output   | IRIS_OUTPUT01 |   |          |       |
| operator | 26704    | 1             | 0 | 15:34:55 | ttyp6 |
| 0:00     | ingest   | IRIS_INGEST   |   |          |       |

Antenna Processes:

| UID      | PID     | PPID         | C | STIME    | TTY   |
|----------|---------|--------------|---|----------|-------|
| operator | 26422   | 1            | 0 | 14:35:11 | ttyp6 |
| 0:00     | ant_xmt | IRIS_ANT_XMT |   |          |       |
| operator | 26418   | 1            | 0 | 14:35:10 | ttyp6 |
| 0:00     | ant_rcv | IRIS_ANT_RCV |   |          |       |

## Stand-alone Utilities:

| UID  | PID            | PPID      | C  | STIME    | TTY   |
|------|----------------|-----------|----|----------|-------|
| TIME | COMMAND        |           |    |          |       |
| ALAN | 26717          | 28786     | 15 | 15:35:50 | TTYQB |
| 0:02 | IRIS           |           |    |          |       |
| ALAN | 26894          | 26717     | 15 | 15:41:14 | TTYQB |
| 0:02 | IRIS_CLNT_RECV | 7 1097655 |    |          |       |



To stop a process, use the **PID** as an argument to the **kill** command.

## C.2 show\_iris Command

Use the **show\_iris** command to show information about the IRIS process: When it started, the present state of semaphores and event flags, and the current inventory of in-use products.

The **show\_iris** command also provides command line options for in-use bits. For more information, type **show\_iris -help**.

```
$ show_iris
IRIS Activity on 'hot' at: 09:52:52 17 SEP 1999
IRIS V7.11 was started at 16:19:38 16 SEP 1999 by 'joe'.
Manual startup from TTY:'/dev/tty' ; Restarts:1
Features License: 00004001-000101-WAHRMA-01-Y9ANHF
Products License: 000007FF-000101-WAHRMA-03-WFW4KR
```

### Present states of Semaphores...

```
PROCESS CONTROL: FREE (ID: 5833) PROCESS MODES: FREE (ID: 5826)
TASK SCHEDULE: FREE (ID: 5834) PRODUCT SCHEDULE: FREE (ID: 5831)
INGEST DIRECTORY: FREE (ID: 5831) PRODUCT DIRECTORY: FREE (ID: 5849)
DEVICE TABLE: FREE (ID: 5852) MODE SWITCH TABLE: FREE (ID: 5834)
ARCHIVE DIRECTORY: FREE (ID: 5834) ERROR LOG: FREE (ID: 5834)
```

### Present states of Event Flags...

```
RTDISP: CLEAR INGEST: CLEAR
INGFIO: CLEAR INGFIO MAPPING: SET
INGFIO WAITING: SET WATCHDOG: CLEAR
PRODUCT: CLEAR REINGEST: CLEAR
NETWORK: CLEAR NORDRAD: CLEAR
GLOBAL MAPPED: SET
```

```

Event Flags SET for Output Processes: 7 8
Event Flags SET for Network Child Processes: 1 2 3 4 5 6 7 8 9 10 11 12 13 14
15 16
Checking INGEST inventory for in-use files:
Total files checked: 92, total in use: 0.
Checking PRODUCT inventory for in-use files:
Total files checked: 260, total in use: 0.

```

```

===== Product Inventory Contents =====

```

| Prod Type        | Count | Size(Mb)  | Kept Count | Kept Size |
|------------------|-------|-----------|------------|-----------|
| PPI              | 0     | 0.00      | 0          | 0.00      |
| RHI              | 0     | 0.00      | 0          | 0.00      |
| CAPPI            | 159   | 92.06     | 21         | 60.92     |
| Cross Section    | 0     | 0.00      | 0          | 0.00      |
| Echo Tops        | 0     | 0.00      | 0          | 0.00      |
| Tracking         | 0     | 0.00      | 0          | 0.00      |
| Hourly Rainfall  | 0     | 0.00      | 0          | 0.00      |
| N Hours Rainfall | 0     | 0.00      | 0          | 0.00      |
| Vol. Vel. Proc.  | 0     | 0.00      | 0          | 0.00      |
| Vert.Int. Liquid | 0     | 0.00      | 0          | 0.00      |
| Wind Shear       | 0     | 0.00      | 0          | 0.00      |
| Warning          | 1     | 0.01      | 0          | 0.01      |
| Real Time PPI    | 0     | 0.00      | 0          | 0.00      |
| Real Time RHI    | 0     | 0.00      | 0          | 0.00      |
| Raw Data         | 73    | 52.35     | 73         | 52.35     |
| Max with panels  | 0     | 0.00      | 0          | 0.00      |
| User Map         | 0     | 0.00      | 0          | 0.00      |
| User Section     | 0     | 0.00      | 0          | 0.00      |
| User Other       | 0     | 0.00      | 0          | 0.00      |
| Status           | 25    | 0.06      | 0          | 0.00      |
| Shear Line       | 0     | 0.00      | 0          | 0.00      |
| Horizontal Wind  | 0     | 0.00      | 0          | 0.00      |
| Beam Pattern     | 0     | 0.00      | 0          | 0.00      |
| Text             | 0     | 0.00      | 0          | 0.00      |
| Forecast         | 0     | 0.00      | 0          | 0.00      |
| Multi-Doppler    | 2     | 15.36     | 2          | 15.36     |
| Image            | 0     | 0.00      | 0          | 0.00      |
| Composite        | 0     | 0.00      | 0          | 0.00      |
| LLWAS            | 0     | 0.00      | 0          | 0.00      |
|                  | 260   | 159.84 Mb | 97         | 128.65 Mb |

## C.3 sigmet\_env Command

Use **sigmet\_env** to test or troubleshoot items associated with an IRIS installation.

To sue the command, log in as a normal IRIS user, run **sigmet\_env**. The **sigmet\_env** command checks the following:

- That all the IRIS operators and observers are in the */etc/users* file.

- That all IRIS environment variables that point to directories are defined and the directory exists, and the directory can be read and written as required.
- For obvious bad file names in the saved menu directory.
- That IRIS executable files which require the **set-UID-on-execute** bit set are set with the correct UID.
- The RDA (RVP/RCP) environment.

The following example shows a case with a bad file name of `.TSC`.

```
$ sigmet_env
Checking IRIS_OPERATORS list...
Checking IRIS_OBSERVERS list...
Checking installation directories...
Checking configuration directories...
Checking data directories...
Checking file names in IRIS_MENU...
Bad menu filename: '/usr/sigmet/config/menu/.TSC'
Checking root file ownerships...
```

Errors Detected -- Please Check Printout

## C.4 structmap Command

Use the **structmap** command to display the format of IRIS structures. This is useful when writing applications that access IRIS data.



To make **structmap** available on your system, install IRIS with the **-headers** option .

### structmap Options

To show a list of **structmap** options, enter the command without options or parameters:

```
$ structmap
Command Line Options:
<struct name> : Display internal contents of IRIS structure(s)
-include <dir> : Override default 'include' directory name
-nopack : Force no packing of structure elements
-scan : Produce list of all defined structures
-scanlocal : Like 'scan', but do local directory only
-noflags : Suppress error flags in output
-recursive : Descend into substructures
-data : Show numeric data read from std.input
-dimension N : Use with '-data' for N-dimensional printout
```

For example **structmap 'structmap -scan'** displays everything.

### **structmap <structure name> Option**

Invoke **structmap** with the name of a structure to display the name of the include file where the structure is defined and a description of each element in the structure.

It offsets from the beginning of the structure, its size, the number of times it occurs, its data type, and name.

For example, to display information about the **tape\_header\_record** structure:

```
$ structmap tape_header_record

tape_header_record /usr/sigmet/iris/include/output.h
0 12 1 struct structure_header hdr
12 16 16 char stape_id[]
28 16 16 char sitename[]
44 12 1 struct ymds_time init_time
56 2 1 SINT2 idrive
58 2 2 char ipad58x2[]
60 8 8 char sversion[]
68 252 252 char ipad_end[]
320
```

The example shows that the structure is defined in */iris/include/output.h* and contains:

- **hdr**, a structure of type **structure\_header**, taking up the first 12 bytes.
- **stape\_id** and **sitename**, arrays of 16 characters each, at offsets 12 and 28.
- **init\_time** is a **ymds\_time**, structures taking up 12 bytes starting at offset 44.
- **idrive**, a long integer at offset 56.
- **ipad58x2**, **sversion**, and **ipad\_end**, arrays of 2, 8, and 252 characters, at offsets 58, 60, and 68, respectively.

The total size of the structure is 320 bytes.

### **-scan Option**

The **-scan** option lists the names of the structure defined by IRIS.

You can use the **-scan** option to recursively call **structmap** and display the format of all the structures in the system.

```
$ structmap -scan
ant_manual_setup
bitex_field_def
bitex_top_def
cappi_psi_struct
.
.
.
```

To redirect the output to a file, type:

```
$ structmap 'structmap -scan' > allstructs.out
```

# Appendix D. Alternative Configurations

## D.1 Installing IRIS 3DView

It is not necessary for IRIS software to be installed on the system to use 3DView.

If you chose to have the IRIS software on the same system, it is recommended that you install the IRIS software before installing the IRIS 3D View.

IRIS 3DView software is a separately licensed software package that renders 3D visualizations of IRIS format radar data.

You can install the IRIS 3DView either on an IRIS Analysis machine, or a machine without IRIS.



1. Obtain the following RPMs:

- *libogg-devel-1.1.4-2.1.el6.i686.rpm*
- *libtheora-devel-1.1.0-2.el6.i686.rpm*
- *qtwebkit-2.1.1-1.el6.i686.rpm*
- *qt-mobility-1.1.3-2.el6.i686.rpm*
- *gl2ps-1.3.5-1.el6.i686.rpm*
- *gl2ps-devel-1.3.5-1.el6.i686.rpm*
- *compat-expat1-1.95.8-8.el6.i686.rpm*
- *expat-2.0.1-9.1.el6.i686.rpm*
- *expat-devel-2.0.1-9.1.el6.i686.rpm*
- *xorg-x11-apps-7.4-10.el6.i686.rpm*
- *xorg-x11-server-common-1.7.7-29.el6.i686.rpm*
- *xorg-x11-server-Xvfb-1.7.7-29.el6.i686.rpm*
- *vtk-5.8.0-6.el6.i686.rpm*
- *vtk-devel-5.8.0-6.el6.i686.rpm*
- *vtk-java-5.8.0-6.el6.i686.rpm*
- *vtk-python-5.8.0-6.el6.i686.rpm*
- *vtk-qt-5.8.0-6.el6.i686.rpm*
- *vtk-tcl-5.8.0-6.el6.i686.rpm*
- *acoread-9.4.0-1.el6.i686.rpm*
- *acoread-plugin-9.4.0-1.el6.i686.rpm*

2. Install the RPMs in the following order:
  - a. `#rpm -Uvh libogg-devel-1.1.4-2.1.el6.i686.rpm`
  - b. `#rpm -Uvh libtheora-devel-1.1.0-2.el6.i686.rpm`
  - c. `#rpm -Uvh qtwebkit-2.1.1-1.el6.i686.rpm`
  - d. `#rpm -Uvh qt-mobility-1.1.3-2.el6.i686.rpm`
  - e. `#rpm -Uvh gl2ps-1.3*`
  - f. `#rpm -Uvh compat-expat1-1.95.8-8.el6.i686.rpm`
  - g. `#rpm -Uvh expat-2*`
  - h. `#rpm -Uvh xorg-x11*`
  - i. `#rpm -Uvh vtk*`
  - j. `#rpm -Uvh acroread-9*`
3. Log in as **root**.
4. The IRIS 3D View application is in the rpm package called *iris3dview-1.0.2-1.i686.rpm*. Install it using the rpm installation tool

```
rpm -Uvh iris3dview-1.0.2-1.i686.rpm
```



It is recommended that you do not run the IRIS 3D View application while logged in as a **root** user.

If you have IRIS software installed on your system, log in as **radarop** user.

If IRIS software is not installed, create a user on your system.

5. In the **GNOME** window, create a user by selecting **System > Administration > Users and Groups** and follow the online instructions.
6. Log in as normal user and check `.config/Vaisala` directory for the following files:
  - *IRIS3D.conf*
  - *IRIS3DColors.conf*
  - *IRIS3DLandmarks.conf*
  - *IRIS3DVisStyles.conf*

7. Do one of the following:
  - a. If you have the IRIS software installed, create the following directories:

```

/usr/iris_data/data/geo # for geo data
/usr/iris_data/data/2d # for 2d data
/usr/iris_data/data/3d # for 3d data
/usr/iris_data/data/background_output
for background images processing results

```

The permissions and ownership for these directories are:

```

drwxrwsr-x
2 operator users 4096 Dec 11 13:14 2d drwxrwsr-x
2 operator users 4096 Dec 11 13:15 3d drwxrwsrwx
2 operator users 4096 Dec 11 13:15 background_output drwxrwsr-x
2 operator users 4096 Dec 11 13:14 geo

```

- b. If you do not have the IRIS software installed, you can put your data directory anywhere you want, but you must set the directory permissions to read/write access.
8. Run **IRIS 3DView** visualization:

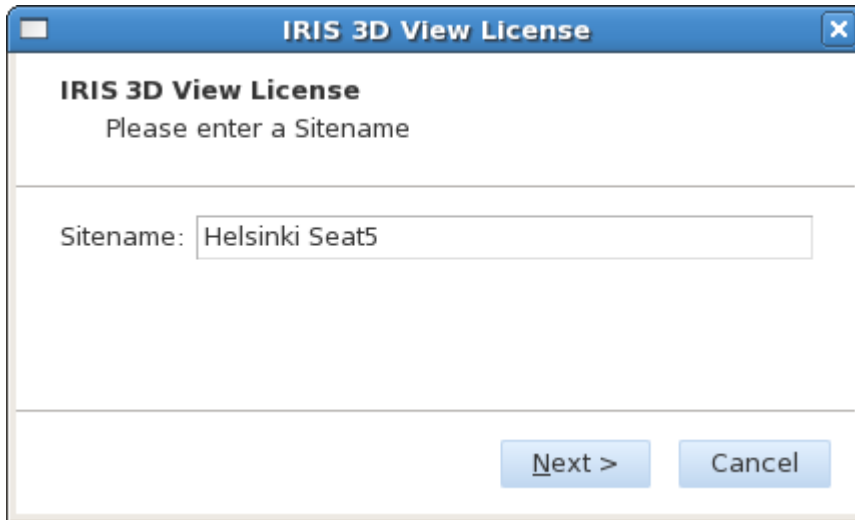
```

/usr/bin/iris3dview &

```

When you first start **IRIS 3DView**, it runs a license wizard. Follow the online instructions.

9. If your system has an IRIS or RDA system already installed, the **IRIS 3D View License** dialog box displays the **Sitename** for your system.  
In that case, leave it unchanged.  
If not, enter a unique **Sitename** (16 characters or less) and select **Next**.



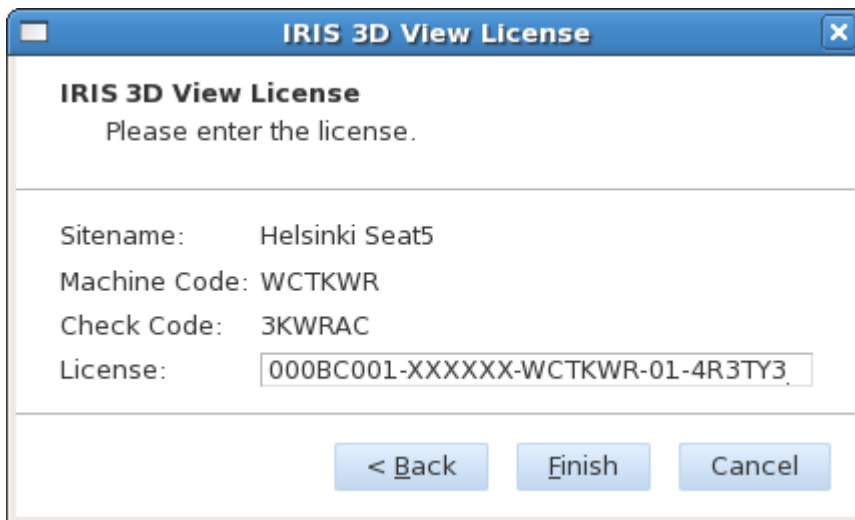
**IRIS 3D View License**

Please enter a Sitename

Sitename: Helsinki Seat5

Next > Cancel

The **IRIS 3D View License** dialog displays the site code and check code.



**IRIS 3D View License**

Please enter the license.

Sitename: Helsinki Seat5

Machine Code: WCTKWR

Check Code: 3KWRAC

License: 000BC001-XXXXXX-WCTKWR-01-4R3TY3

< Back Finish Cancel

10. Send the information shown in previous figure to Vaisala and request a license string.
11. Enter the license string in the **License** field and click **Finish**.

12. Once the **IRIS 3D View** window opens, click the setup icon in the upper right hand corner to open the **Settings Window** dialog box.

The screenshot shows a 'Settings window (on wes-ale.vaisala.com)' with the following options:

- Time:** Radio buttons for '12-hour clock' and '24-hour clock' (selected).
- Default units:** Radio buttons for 'English' and 'Metric' (selected).
- Lat/Lon unit:** A dropdown menu showing 'Decimal degrees (dd.dddd°)'.
- Vertical scale:** A text input field with '5.0' and a small up/down arrow.
- Data resolution:** Two dropdown menus: 'Horizontal: 1/4x' and 'Vertical: Full'.
- Data smoothing:** A horizontal slider bar with a blue knob, labeled '1.0 px' on the right.
- GEO data location:** A text input field containing '/usr/iris\_data/data/geo', followed by an ellipsis '...', a progress indicator with two green squares, and '25%'.
- 3D data location:** A text input field containing '/usr/iris\_data/data/3d', followed by an ellipsis '...', a progress indicator with two green squares, and '25%'.
- 2D data location:** A text input field containing '/usr/iris\_data/data/2d', followed by an ellipsis '...', a progress indicator with two green squares, and '25%'.

At the bottom of the window are three buttons: 'Reset to defaults', 'Clear GEO cache', and 'Apply'.

Configure the data directory to point to the directories created earlier, according to your data type.

## 13. Configure background processing.

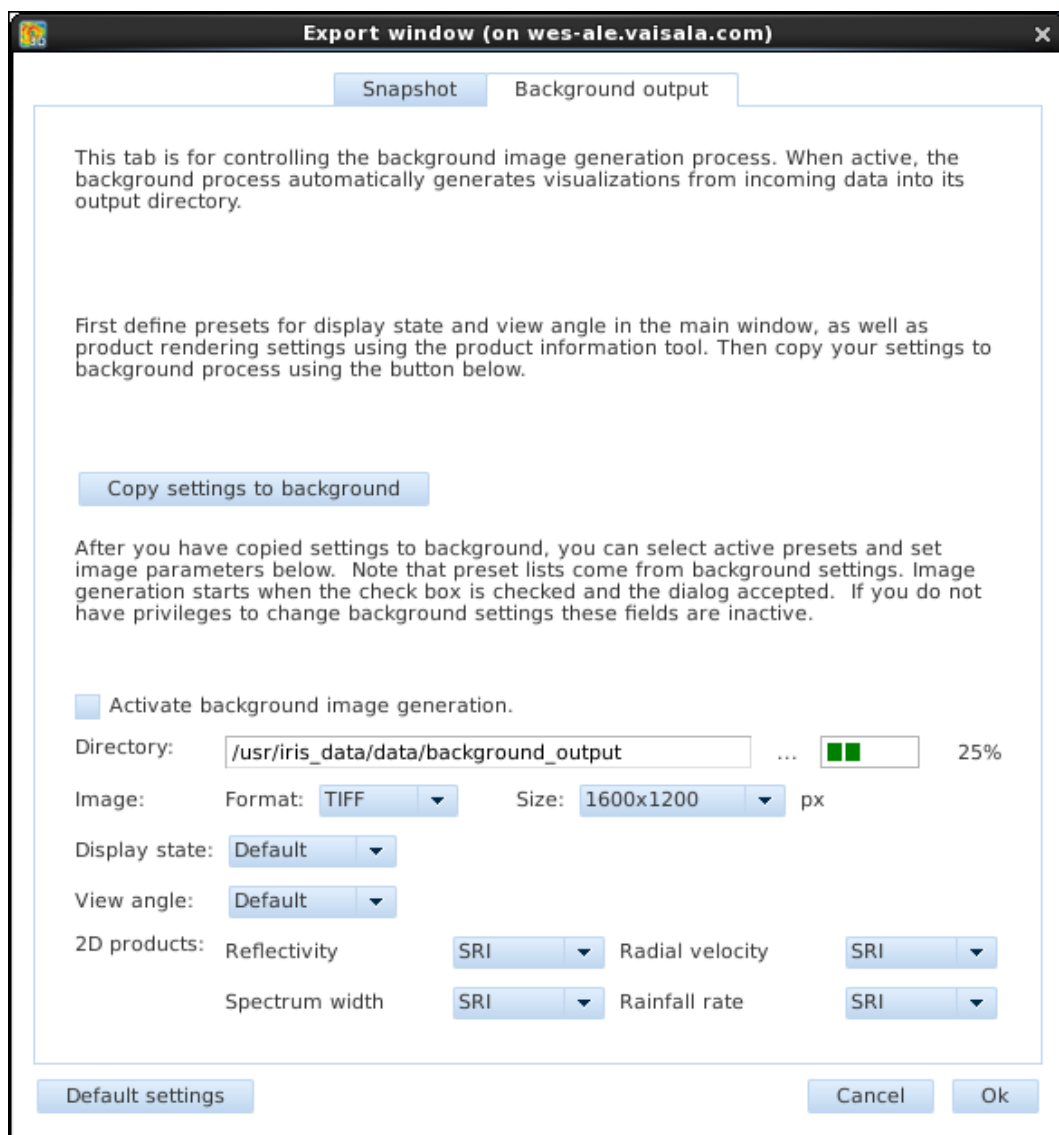
Background processing is run by the `iris3d` user; however, the user who runs the `iris3d` visualization must copy the configuration files to the `.config` directory of the `iris3d` user:

- a. Set permissions for everybody to be able to read and write by running:

```
#chmod -R 777 /home/iris3d/ as root user
```

- b. From the visualization window, select **File > Export tool**.

- c. From the export window, select the **Background** output tab and follow the online instructions to finish the setup.



After installing the IRIS 3D View, the background processing daemon starts automatically.

14. Check the daemon by running the `ps -ef` command:

```
ps -ef | grep iris
```

and you should get the printout similar to:

```
iris3d 3432 1 0 13:24 ? 00:00:00 dbus -launch -- autolaunch
841d3b9bca80c846219d29fc00000022 --binary-syntax --close- stderr
iris3d 3433 1 0 13:24 ? 00:00:00 /bin/ dbus - daemon --fork --
print- pid 5 --print-address 7 --session
iris3d 3435 1 0 13:24 ? 00:00:00 /usr/bin/ iris3dviewd --
loglevel =2 --daemon
```

If you need to restart the daemon, change to the root user by typing:

```
su root
```

You are prompted for the password.

Stop and start the daemon by typing the following:

```
#!/sbin/service iris3dviewd stop
#!/sbin/service iris3dviewd start
```

15. Test background processing:
  - a. Copy 3D data to the 3D directory that you configured.
  - b. Wait for a second and check the output file in output directory that you configured.
16. If needed, modify the logging level.
  - a. To check the logging, go to `/home/iris3d/` and open the `iris3dviewd.log` file.
  - b. To view real-time logging messages while you are running background processing, run `tail -f iris3dviewd.log`.
  - c. To set logging level to more details, like level 6, editing the `/etc/sysconfig/iris3dviewd` and change `loglevel=2` to `OPTIONS="-- loglevel=6 -- daemon"`.
  - d. Restart the processing daemon.

## D.2 Defining the Operator List in the Startup File

Most environments can function with **radarop** and **observer** users without any further definitions. If you wish to manage named users, follow the instructions below.

The `/etc/sigmet/profile.conf` file defines some of the base configuration, including the lists of users who can operate IRIS fully, and who can observe its operation but not make any changes.



Every IRIS user must share group access to files owned by the operator by being a member of the users group.

1. Edit the file and change these as needed.

```
operators='radarop operator john george mary root'
observers='observer'
```

2. Check your environment by typing:

```
$ env | grep IRIS
```

## D.3 Configuring Services for CentOS6

To operate of old versions of IRIS, you must enable services such as those in `/etc/xinetd.d`: *rlogin*, *rsh*, and *telnet*.

1. Type the commands:

```
chkconfig rsh on
chkconfig rlogin on
chkconfig telnet on
```

2. Configure other optional services as necessary:  
**gssftp** (sometimes called **vs-ftpd**)

3. Update the `xinetd` default configuration for receiving remote shell commands to at least 100:
  - a. Go to `/etc/xinetd.d/rsh`.
  - b. Add a line similar to the others in the "service shell" section, before the final `}`:

```
per_source = 100
```

The default configuration for `xinetd` in Linux allows the receipt of a limited number of remote shell commands per minute.

This limit is easily exceeded with a burst of network transfers between Vaisala systems. This can cause a network send request to be "aborted", and the network link to fail.

4. Enable your changes by rebooting the computer or by sending send the `hup` signal to `inetd` with the following command:

```
kill -s hup /var/run/xinetd.pid
```



# Warranty

For standard warranty terms and conditions, see [www.vaisala.com/warranty](http://www.vaisala.com/warranty).

Please observe that any such warranty may not be valid in case of damage due to normal wear and tear, exceptional operating conditions, negligent handling or installation, or unauthorized modifications. Please see the applicable supply contract or Conditions of Sale for details of the warranty for each product.

# Technical Support



Contact Vaisala technical support at [helpdesk@vaisala.com](mailto:helpdesk@vaisala.com). Provide at least the following supporting information:

- Product name, model, and serial number
- Name and location of the installation site
- Name and contact information of a technical person who can provide further information on the problem

For more information, see [www.vaisala.com/support](http://www.vaisala.com/support).

# Recycling



Recycle all applicable material.



Follow the statutory regulations for disposing of the product and packaging.





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