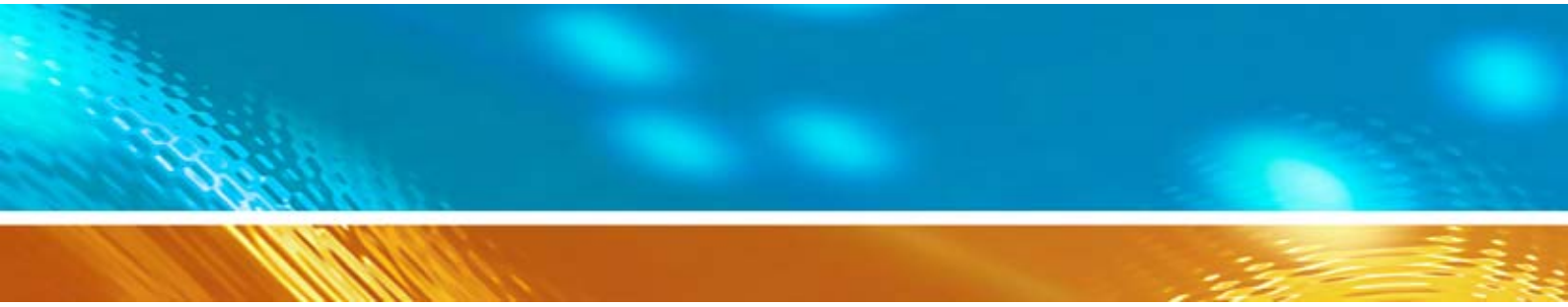
VAISALA

# INSTALLATION MANUAL



# IRIS™ and RDA SOFTWARE

M211315EN-D

PUBLISHED BY

Vaisala Oyj
P.O. Box 26
FI-00421 Helsinki
Finland

Phone (int.): +358 9 8949 1
Fax: +358 9 8949 2227

Visit our Internet pages at www.vaisala.com

# Table of Contents

CHAPTER 1
**GENERAL INFORMATION . . . . . 9**
**1.1 About This Manual . . . . . 9**
1.1.1 Intended Audience . . . . . 9
1.1.2 Contents of This Manual . . . . . 10
1.1.3 Version Information . . . . . 11
1.1.4 Related Manuals . . . . . 11
1.1.5 Document Conventions . . . . . 12
**1.2 Safety . . . . . 13**
**1.3 Trademarks . . . . . 13**

CHAPTER 2
**INSTALLATION . . . . . 15**
**2.1 Before You Start . . . . . 15**
**2.2 Mount the CD . . . . . 16**
**2.3 New Software Installation . . . . . 17**
2.3.1 Preparing for a New Software Installation . . . . . 17
2.3.2 Performing a New Software Installation . . . . . 18
2.3.3 Run Setup Utility . . . . . 20
2.3.4 Get Your License . . . . . 21
2.3.5 Run sigmet_env . . . . . 21
**2.4 Initial Configuration . . . . . 21**
2.4.1 Setting Up for SCP and Other SSH Commands . . . . . 21
2.4.2 Setting Up for RCP and Other R Commands . . . . . 23
2.4.3 Serial Line Setup . . . . . 24
2.4.4 Shared Memory Size . . . . . 25
2.4.5 Installation Security Issues . . . . . 25
**2.5 Upgrade Installation . . . . . 26**
2.5.1 When Should I Upgrade? . . . . . 26
2.5.2 What Should I Do Before I Upgrade? . . . . . 26
2.5.3 Where to Get Software Upgrades? . . . . . 27
2.5.4 How Should I Upgrade? . . . . . 27
2.5.5 Getting the Network Upgrade Files . . . . . 28
2.5.6 Performing an Upgrade Installation . . . . . 31
2.5.7 Post Upgrade Tasks . . . . . 33
**2.6 Install Utility Window Options . . . . . 33**
2.6.1 Read From Option . . . . . 34
2.6.2 Install To Option (Including Network Installs) . . . . . 35
2.6.3 Manuals Option . . . . . 36
2.6.4 Product Example File Option . . . . . 36
2.6.5 IRIS WebView Option . . . . . 36
2.6.6 IRIS 3DView Option . . . . . 36

2.6.7 Verbose Option . . . . . 36
2.6.8 Keep Old Files Option . . . . . 37
**2.7 Troubleshooting . . . . . 37**
2.7.1 File Ownership and Protection . . . . . 37
2.7.2 Authorizing Remote X–Windows on Your Node . . . . . 37
**2.8 Basics of Login, Logout, and Shutdown . . . . . 38**
2.8.1 Power-up Procedure . . . . . 38
2.8.2 Local and Remote Login . . . . . 38
2.8.3 Default Operator and Root Login Passwords . . . . . 38
2.8.4 Login Procedure . . . . . 39
2.8.5 Logout Procedure . . . . . 40
2.8.6 Power-off Shutdown Procedure . . . . . 40
**2.9 RVP8 & RCP8 (RDA) Software Installation . . . . . 41**
2.9.1 Install the Upgraded Kernal Module . . . . . 41
2.9.2 Installation Steps to Flash FPGA in Vaisala Devices . . . . . 41
2.9.3 Reboot Power-up Check and RDA Diagnostics . . . . . 42
**2.10 RDA Software Configuration . . . . . 43**
2.10.1 RCP8 Setup Configuration Summary . . . . . 45
2.10.2 RVP8 Setup Configuration Summary . . . . . 47
2.10.3 Configuring the softplane.conf File . . . . . 48
**2.11 Testing, Backup, and Calibration . . . . . 62**
2.11.1 Ascope Test (RVP8 Installations ONLY) . . . . . 62
2.11.2 Antenna Test (RCP Installations ONLY) . . . . . 63
2.11.3 IRIS Test (IRIS systems ONLY) . . . . . 63
2.11.4 Print Special Files . . . . . 63
2.11.5 Make a Full Backup . . . . . 63
2.11.6 DSP Calibration (RVP Installations ONLY) . . . . . 63

CHAPTER 3
**UNIX SURVIVAL SKILLS . . . . . 65**
**3.1 Running IRIS Utilities from a Remote Node . . . . . 65**
**3.2 Managing an IRIS System . . . . . 66**
3.2.1 Checking the IRIS Environment . . . . . 66
3.2.2 Reporting the Free Blocks on a Disk . . . . . 68
3.2.3 File Ownership and Protection . . . . . 68
**3.3 Command Summary . . . . . 69**
**3.4 Linux Issues . . . . . 70**
3.4.1 Backup Procedure . . . . . 70
3.4.2 Time & Date . . . . . 70
3.4.3 LINUX for Experienced Users of Other OS . . . . . 71
3.4.4 Red Hat Configuration Utilities . . . . . 72

CHAPTER 4
**IRIS DIAGNOSTIC UTILITIES . . . . . 73**
**4.1 sigmet_env Command . . . . . 73**
**4.2 ps_iris Command . . . . . 74**
**4.3 restart_iris Command . . . . . 75**
**4.4 show_iris Command . . . . . 76**

**4.5 structmap Command . . . . . 79**

APPENDIX A
**INSTALLING CENTOS5 . . . . . 83**
**A.1 Overview . . . . . 83**
A.1.1 Desktop Variants and Installation Number . . . . . 83
**A.2 Installation Overview . . . . . 84**
A.2.1 Using This Manual . . . . . 84
A.2.2 Types of Installation Media . . . . . 85
A.2.3 Installation Preparation . . . . . 85
**A.3 Sigconfig . . . . . 86**
**A.4 Manual Installation . . . . . 87**
A.4.1 Install CentOS5 . . . . . 87
A.4.2 CentOS5 . . . . . 87
A.4.3 Installation Language . . . . . 88
A.4.4 Keyboard Selection . . . . . 88
A.4.5 Upgrade/Install Choice . . . . . 88
A.4.6 Disk Partitioning Setup . . . . . 88
A.4.7 Network Devices . . . . . 88
A.4.8 Time Zone . . . . . 89
A.4.9 Set Root Password . . . . . 89
A.4.10 Software Selection . . . . . 89
A.4.11 Package Group Selection . . . . . 89
A.4.12 About to Install . . . . . 92
A.4.13 Congratulations . . . . . 92
A.4.14 Welcome . . . . . 92
A.4.15 License Agreement . . . . . 92
A.4.16 Firewall . . . . . 92
A.4.17 SELinux . . . . . 92
A.4.18 Kdump . . . . . 93
A.4.19 Date and Time . . . . . 93
A.4.20 Set Up Software Updates . . . . . 93
A.4.21 Create User . . . . . 93
A.4.22 Sound Card . . . . . 93
A.4.23 Additional CDs . . . . . 93
A.4.24 Finish Setup . . . . . 94
A.4.25 Install Additional rpms . . . . . 94
**A.5 Manual sigconfig Instructions . . . . . 94**
A.5.1 Install Additional rpms . . . . . 94
A.5.2 User Account Configuration . . . . . 97
A.5.3 Service Configuration . . . . . 98
A.5.4 Create the IRIS Root and Data Directories . . . . . 99
A.5.5 Install IRIS CDROM . . . . . 100
A.5.6 Configure Home Environment . . . . . 100
A.5.7 Raise Shared Memory . . . . . 101
A.5.8 RDA Configuration . . . . . 101
A.5.9 Configuration for Automatic Startup . . . . . 102
**A.6 Post-Install Steps . . . . . 103**
A.6.1 Configuring Your Time Zone . . . . . 103
A.6.2 Basic Network Configuration . . . . . 103
A.6.3 Routing . . . . . 106

A.6.4 Configuring NTP . . . . . 106
A.6.5 Configuring rcp . . . . . 107
**A.7 X-Windows Troubleshooting: Framebuffer Method . . . . . 109**
**A.8 Special Notes for Notebook Installations . . . . . 111**

APPENDIX B
**INSTALLING CENTOS6 . . . . . 113**
**B.1 Overview . . . . . 113**
**B.2 Installation Overview . . . . . 113**
B.2.1 Using this Manual . . . . . 114
B.2.2 Types of Installation Media . . . . . 114
B.2.3 Installation Preparation . . . . . 114
**B.3 Automatic Installation . . . . . 115**
B.3.1 Sigconfig . . . . . 116
**B.4 Manual Installation . . . . . 117**
B.4.1 Install CentOS6 . . . . . 117
B.4.2 Welcome to CentOS6! . . . . . 117
B.4.3 Disc Found . . . . . 118
B.4.4 CentOS6 . . . . . 118
B.4.5 Installation Language . . . . . 118
B.4.6 Keyboard Selection . . . . . 118
B.4.7 Type of Device for Installation . . . . . 118
B.4.8 Hostname . . . . . 118
B.4.9 Please Name This Computer . . . . . 119
B.4.10 Time Zone . . . . . 119
B.4.11 Set Root Password . . . . . 120
B.4.12 What Type of Installation Would You Like? . . . . . 120
B.4.13 Please Select A Device . . . . . 120
B.0.1 Boot Loader Operating System List . . . . . 120
B.0.2 Default Installation of CentOS . . . . . 120
B.0.3 Package Group Selection . . . . . 120
B.4.14 About to Install . . . . . 124
B.4.15 Congratulations . . . . . 124
B.4.16 Welcome . . . . . 125
B.4.17 License Agreement . . . . . 125
B.4.18 Set Up Software Updates . . . . . 125
B.0.4 Create User . . . . . 125
B.4.19 Date and Time . . . . . 125
B.4.20 Kdump . . . . . 125
B.0.5 Disable Firewall . . . . . 126
**B.5 Manual Sigconfig Instructions . . . . . 126**
B.5.1 Install Additional rpms . . . . . 126
B.5.2 User Account Configuration . . . . . 130
B.5.3 Service Configuration . . . . . 130
B.5.4 Create the IRIS Root and Data Directories . . . . . 131
B.5.5 Install IRIS CRDROM . . . . . 132
B.5.6 Configure Home Environments . . . . . 132
B.5.7 RPC Authentication . . . . . 133
B.5.8 Raise Maximum Shared Memory . . . . . 133
B.5.9 RDA Configuration . . . . . 133
B.5.10 Configuration for Automatic Startup . . . . . 135

**B.6 Post-Install Steps . . . . . 135**
B.6.1 Configuring Your Time Zone . . . . . 135
B.6.2 Basic Network Configuration . . . . . 136
B.6.3 Routing . . . . . 138
B.6.4 Configuring NTP . . . . . 138

APPENDIX C
**INSTALLING LINUX: RHEL 5 DESKTOP . . . . . 141**
**C.1 Overview . . . . . 141**
C.1.1 Desktop Variants and Installation Number . . . . . 141
**C.2 Installation Overview . . . . . 142**
C.2.1 Using This Manual . . . . . 142
C.2.2 Types of Installation Media . . . . . 143
C.2.3 Installation Preparation . . . . . 143
**C.3 Automatic Installation . . . . . 144**
**C.4 Sigconfig . . . . . 144**
**C.5 Manual Installation . . . . . 145**
C.5.1 Install Redhat Linux RHEL Desktop Version 5 . . . . . 146
C.5.2 Install Additional rpms . . . . . 152
**C.6 Manual sigconfig Instructions . . . . . 153**
C.6.1 Install Additional rpms . . . . . 153
C.6.2 User Account Configuration . . . . . 156
C.6.3 Service Configuration . . . . . 156
C.6.4 Create the IRIS Root and Data Directories . . . . . 157
C.6.5 Install IRIS CDROM . . . . . 158
C.6.6 Configure Home Environment . . . . . 159
C.6.7 Raise Shared Memory . . . . . 160
C.6.8 RDA Configuration . . . . . 160
C.6.9 Configuration for Automatic Startup . . . . . 161
**C.7 Post-Install Steps . . . . . 162**
C.7.1 Configuring Your Time Zone . . . . . 162
C.7.2 Basic Network Configuration . . . . . 162
C.7.3 Routing . . . . . 164
C.7.4 Configuring NTP . . . . . 165
C.7.5 Configuring rcp . . . . . 166
**C.8 X-Windows Troubleshooting: Framebuffer Method . . . . . 168**
**C.9 Special Notes for Notebook Installations . . . . . 169**

APPENDIX D
**INSTALLING LINUX: RHEL 6 FOR SERVERS . . . . . 171**
**D.1 Overview . . . . . 171**
**D.1 Installation Overview . . . . . 171**
D.1.1 Using this Manual . . . . . 172
D.1.2 Types of Installation Media . . . . . 172
D.1.3 Installation Preparation . . . . . 173
**D.2 Automatic Installation . . . . . 173**
D.2.1 Sigconfig . . . . . 174
**D.3 Manual Installation . . . . . 175**
D.3.1 Install Red Hat Enterprise Linux Version 6 For Servers . . . . . 175

D.3.2 Welcome to Red Hat Enterprise Linux 6.0! . . . . . 175
D.3.3 Disc Found . . . . . 176
D.3.4 RED HAT ENTERPRISE LINUX 6 . . . . . 176
D.3.5 Installation Language . . . . . 176
D.3.6 Keyboard Selection . . . . . 176
D.3.7 Type of Device for Installation . . . . . 176
D.3.8 Hostname . . . . . 176
D.3.9 Please Name This Computer . . . . . 177
D.3.10 Time Zone . . . . . 177
D.3.11 Set Root Password . . . . . 178
D.3.12 What Type of Installation Would You Like? . . . . . 178
D.3.13 Please Select A Device . . . . . 178
D.3.14 Boot Loader Operating System List . . . . . 178
D.3.15 The Default Installation of Red Hat Enterprise Linux... . . . . 178
D.3.16 Package Group Selection . . . . . 179
D.3.17 About to Install . . . . . 182
D.3.18 Congratulations . . . . . 183
D.3.19 Welcome . . . . . 183
D.3.20 License Information . . . . . 183
D.3.21 Set Up Software Updates . . . . . 183
D.3.22 Create User . . . . . 183
D.3.23 Date and Time . . . . . 183
D.3.24 Kdump . . . . . 184
D.3.25 Disable Firewall . . . . . 184

**D.4 Manual Sigconfig Instructions . . . . . 184**
D.4.1 Install Additional rpms . . . . . 184
D.4.2 User Account Configuration . . . . . 188
D.4.3 Service Configuration . . . . . 188
D.4.4 Create the IRIS Root and Data Directories . . . . . 189
D.4.5 Install IRIS CRDROM . . . . . 190
D.4.6 Configure Home Environments . . . . . 190
D.4.7 RPC Authentication . . . . . 191
D.4.8 Raise Maximum Shared Memory . . . . . 192
D.4.9 RDA Configuration . . . . . 192
D.4.10 Configuration for Automatic Startup . . . . . 193

**D.5 Post-Install Steps . . . . . 194**
D.5.1 Configuring Your Time Zone . . . . . 194
D.5.2 Basic Network Configuration . . . . . 194
D.5.3 Routing . . . . . 196
D.5.4 Configuring NTP . . . . . 197

APPENDIX E
**LINUX SYSTEM FILE LISTINGS . . . . . 199**

**E.1 /etc/sigmet/profile.conf . . . . . 199**

**E.2 /etc/profile.d/sigmet.sh . . . . . 199**

APPENDIX F
**PRINTER CONFIGURATION . . . . . 205**

**F.1 Configuring Printer Queues for IRIS use . . . . . 205**
F.1.1 Configuring a Local Printer Queue . . . . . 206
F.1.2 Configuring a Network Printer Queue . . . . . 206

F.1.3 Configuring a Remote Printer Queue . . . . . 208
**F.2 Displaying Print Queues . . . . . 208**
**F.3 Configuring Printer Options . . . . . 208**
F.3.1 Printer Setup Menu . . . . . 209

APPENDIX G
**SIGBRU UTILITY . . . . . 213**
**G.1 System Configuration for sigbru . . . . . 214**
G.1.1 Authorization to login as root on a remote system . . . . . 214
G.1.2 Authorization to use a remote tape drive or remote disk drive . . . . . 215
G.1.3 Archive Device and Media Configuration for sigbru . . . . . 216
**G.2 Starting sigbru . . . . . 218**
G.2.1 Command Line Options for Starting sigbru . . . . . 218
G.2.2 Running from a Local Terminal Window (IRIS is installed) . . . . . 219
G.2.3 Running from a Remote Workstation (IRIS Installed on Target System) . . . . 219
G.2.4 If IRIS is Not Installed- Start sigbru from the CDROM . . . . . 220
G.2.5 Copying the sigbru Files from a Local or Remote CDROM . . . . . 220
G.2.6 Copying the sigbru Files From Another IRIS System . . . . . 221
**G.3 The sigbru Menu . . . . . 222**
G.3.1 Title Bar . . . . . 223
G.3.2 File . . . . . 223
G.3.3 Options . . . . . 223
G.3.4 Backup/Restore <host name> . . . . . 224
G.3.5 Archive Host (Backup and Restore) . . . . . 224
G.3.6 Device or HDD (Hard Disk Drive) Path (Backup Case) . . . . . 224
G.3.7 Device or HDD (Hard Disk Drive) Path (Restore Case) . . . . . 225
G.3.8 gzip Compress (Backup only) . . . . . 225
G.3.9 Make Inventory (Restore only) . . . . . 226
G.3.10 Restore Path (Restore Only) . . . . . 226
G.3.11 Path and Contents (Backup and Restore) . . . . . 226
G.3.12 Include and Exclude from Backup (Backup Only) . . . . . 226
G.3.13 Include in Restore (Restore Only) . . . . . 227
G.3.14 Tape Archive Position Features (Restore Only) . . . . . 227
**G.4 Making System Backups for Linux Computers . . . . . 228**
G.4.1 When Should I Backup? . . . . . 229
G.4.2 What Should Go into a System Backup? . . . . . 229
G.4.3 What Should NOT Go into a System Backup? . . . . . 229
**G.5 Documenting Your Linux Disk Partitions . . . . . 232**
G.5.1 Running df . . . . . 233
G.5.2 Running fdisk . . . . . 234
**G.6 Documenting Your Basic Network Configuration . . . . . 235**
**G.1 Selected File Restore Functions . . . . . 236**
**G.7 Linux Disk Restore Functions . . . . . 238**
G.7.1 Disk Restore Overview . . . . . 238
G.7.2 Step 1: Basic Linux Installation into a Mini-Root Partition . . . . . 239
G.7.3 Step 2: Restore the sigbru backup to main partition . . . . . 242
G.7.4 Step 3: Configuring to boot from the main or mini partitions . . . . . 246
**G.8 Test IRIS and Backup Your Restored System . . . . . 252**
**G.9 Disk Crash After Mini-Root is Installed . . . . . 252**

**G.10 sigbru -auto: Auto Archive Features . . . . . 253**
G.10.1 Auto Archive Enable/Disable . . . . . 254
G.10.2 Archive Source: Quota and Current, sigbru Polling . . . . . 255
G.10.3 Archive Media Use: Total and Record # . . . . . 255
G.10.4 Delete Files After Archive . . . . . 255

APPENDIX H
**UPGRADING RED HAT LINUX . . . . . 257**
**H.1 Check Your Disk First . . . . . 257**
**H.2 Backing Up Important Files . . . . . 257**
**H.3 Do the OS install . . . . . 258**
**H.4 Do the IRIS or RDA install . . . . . 258**
**H.5 Restoring from backup . . . . . 258**
**H.6 Upgrade Release Notes . . . . . 258**
**H.7 Done . . . . . 259**

APPENDIX I
**INSTALLING LEGACY IRIS/WEB SERVER . . . . . 261**
**I.1 Overview . . . . . 261**
**I.2 Installing IRIS Web Server on a RHEL6 System/CentOS 6.X . . . . . 261**
I.2.1 Extracting RPMS . . . . . 262
I.2.2 Installing Java 1.6 . . . . . 262
I.2.3 Installing Apache Commons Packages . . . . . 262
I.2.4 Installing IRIS Web . . . . . 262
**I.3 Installing IRIS Web Server on a RHEL5.4 System/CentOS 5.X . . . . . 263**
I.3.1 Extracting RPMS . . . . . 263
I.3.2 Installing Java 1.6 . . . . . 263
I.3.3 Installing JPackage Utilities . . . . . 264
I.3.4 Installing the Rest of the Packages . . . . . 264
I.3.5 Installing IRIS Web . . . . . 264
**I.4 Configuring Service (RHEL5.4, RHEL6) . . . . . 265**
**I.5 Testing the IRIS/Web Server . . . . . 265**
**I.6 Configuring Login Authentication . . . . . 266**
I.6.1 Configuring Apache Basic Authentication . . . . . 266
I.6.2 Testing Authentication . . . . . 267
I.6.3 Configure IRIS for Web Server . . . . . 268

CHAPTER 1

# GENERAL INFORMATION

This chapter provides general notes for the manual and the IRIS and RDA software.

## 1.1 About This Manual

This manual provides detailed technical information about installing and upgrading the IRIS and RDA software.

### 1.1.1 Intended Audience

This manual is not intended for operators. It is intended for system managers who are responsible for installing the software and maintaining the system. Familiarity with the operating system and computer concepts is required.

## 1.1.2 Contents of This Manual

- Chapter 1, General Information provides general notes for the manual and the IRIS and RDA software.
- Chapter 2, Installation describes how to install this software on Linux systems.
- Chapter 3, UNIX Survival Skills describes the UNIX features that are useful for running the software, including networks and the login environment.
- Chapter 4, IRIS Diagnostic Utilities describes the diagnostic utility programs for debugging problems.
- Appendix A, Installing CentOS5 describes how to install CentOS5.
- Appendix B, describes how to install CentOS6.
- Appendix C, Installing Linux: RHEL 5 Desktop describes how to install Red Hat® Enterprise Linux® 5 (RHEL5) for desktops.
- Appendix D, describes how to install Red Hat® Enterprise Linux® 6 (RHEL6) for servers.
- Appendix E, describes the Linux system file listings.
- Appendix F, describes how to configure printers in UNIX®.
- Appendix G, sigbru Utility describes how to backup and restore using Vaisala's sigbru utility.
- Appendix H, Upgrading Red Hat Linux includes helpful hints on how to upgrade the Red Hat Linux operating system.
- Appendix I, describes how to install the IRIS/Web server.

## 1.1.3 Version Information

**Table 1 Manual Revisions**

| Manual Code | Description |
|---|---|
| M211315EN-D | This manual. Fourth version. September 2014 |
| M211315EN-C | Previous manual. Third version. November 2013 |
| M211315EN-B | Previous manual. Second version. March 2013 |
| M211315EN-A | Previous manual. First version. |

## 1.1.4 Related Manuals

**Table 2 Related Manuals**

| Manual Code | Manual Name |
|---|---|
| M211316EN | IRIS and RDA Utilities Manual |
| M211317EN | IRIS Radar Manual |
| M211318EN | IRIS Programmer’s Manual |
| M211319EN | IRIS Product and Display Manual |
| M211320EN | RCP8 User's Manual |
| M211321EN | RVP8 User's Manual |
| M211322EN | RVP900 User's Manual |
| M211452EN | IRIS and RDA Dual Polarization User’s Manual |

You can download the latest versions of the manuals from Vaisala product website, http://www.vaisala.com. They can be read online using by Adobe® Reader®, which is installed with IRIS.

Vaisala encourages you to send your comments and/or corrections to:

Vaisala Inc.
7A Lyberty Way
Westford, MA 01886
email: helpdesk@vaisala.com

## 1.1.5 Document Conventions

Different typefaces, type styles, and phraseology indicate specific user interactions with the system as illustrated in Table 3.

**Table 3 Document Conventions**

| | |
|---|---|
| `$`<br>`#` | The dollar sign is used to show the operating system prompt, though it may differ from one system to the next. On UNIX systems, the pound sign is also used to indicate the superuser's operating system prompt. Prompts specific to a utility are shown as they are displayed by the utility. |
| **`user input command parameter`** | User input and command syntax are printed in bold, monospaced type. User-supplied parameters are shown in italics. Enter the command as shown and supply the appropriate parameter or argument values. All commands are terminated by pressing the **Enter** button (not shown). In addition, UNIX filenames and keywords are printed in bold, monospaced type when referenced within the text. |
| `Command output` | Some commands generate output. The text of this output is displayed in monospaced type. |
| **Ctrl** + **X** | Some key sequences require you to press the Control key and another key at the same time. When you see this notation, hold down the **Ctrl** button and press the specified key. |

## 1.2 Safety

Throughout the manual, important safety considerations are highlighted as follows:

| | |
|---|---|
| **WARNING** | Warning alerts you to a serious hazard. If you do not read and follow instructions very 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** | Note highlights important information about using the product. |

## 1.3 Trademarks

IRIS™ is a trademark of Vaisala Oyj.

Linux® is a registered trademark of Linus Torvalds.

Red Hat® and Enterprise Linux® are registered trademarks of Red Hat, Inc in the United States and other countries.

UNIX® is a registered trademark of The Open Group.

All other company and product names may be trademarks of their respective companies.

CHAPTER 2

# INSTALLATION

## 2.1 Before You Start

The IRIS and RDA software is supplied on a DVD containing files that work on Red Hat® Enterprise Linux® 6 (RHEL6) for servers. Additionally, installation files may be downloaded at ftp.sigmet.vaisala.com. We provide an X-Windows based install utility for installing the software on local or remote systems.

Before you install the IRIS/RDA software, do the following:

1. Check the operating system version. Verify that the operating system level is at least CentOS5 or Red Hat Enterprise Linux 5 (RHEL5) for desktops. See Appendix A, Installing CentOS5 on page 83 or Appendix C Installing Linux: RHEL 5 Desktop on page 133 for installation details. Other Linux brands work as long as the kernel version is at least 2.6.9.

**NOTE** Vaisala does not provide support for operating system specific support questions on other Linux brands.

**NOTE** Vaisala provides an automated installation procedure for installing RHEL5. If you are starting with a new computer, go to Appendix C Installing Linux: RHEL 5 Desktop on page 133 to learn more.

2. Use the following sections to perform a new install or upgrade:
   - "Mount the CD" on page 16

- "New Software Installation" on page 17
- "Initial Configuration" on page 21
- "Upgrade Installation" on page 26
- "Install Utility Window Options" on page 33
- "Troubleshooting" on page 37
- "Basics of Login, Logout, and Shutdown" on page 38
- "RVP8 & RCP8 (RDA) Software Installation" on page 41
- "RDA Software Configuration" on page 43
- "Testing, Backup, and Calibration" on page 62


# 2.2 Mount the CD

1. Log into the system as 'root' and start the X-Windows environment (if it is not already running) with:

   **`startx`**

2. Insert the CD into the CD-ROM drive.

   The system must mount the CD. The installation scripts expect the CD to be mounted at:

   `/mnt/cdrom`

   If Linux automounts it, record the mount device using **`df`**, and **`unmount`** it with:

   ```
   # umount /dev/cdrom
   ```

3. Mount it with:

   ```
   # mount /dev/cdrom /mnt/cdrom
   ```

**NOTE** On a new system, you may need to first create the `/mnt/cdrom` directory with the following command:

```
# mkdir /mnt/cdrom
```

Type of installation:

- If this is a new installation, go to "Performing a New Software Installation" on page 18
- If this is an upgrade, go to "Performing a New Software Installation" on page 18

For a general description of the **install** utility and its options, "Install Utility Window Options" on page 33.

# 2.3 New Software Installation

## 2.3.1 Preparing for a New Software Installation

Follow the instructions in this section if you are installing a new IRIS/RDA system. If you are upgrading from a previous IRIS/RDA version, go to "Upgrade Installation" on page 26.

If you used the **sigconfig** script described in:

- Appendix A, Installing CentOS5 on page 83
- Appendix B Installing CentOS6 on page 107
- Appendix C Installing Linux: RHEL 5 Desktop on page 133
- Appendix D Installing Linux: RHEL 6 For Servers on page 161

go to "Run Setup Utility" on page 20.

If this is a new installation on a new computer or a new hard disk, please read Appendix A, Installing CentOS5 on page 83 or Appendix C Installing Linux: RHEL 5 Desktop on page 133 before proceeding. **Vaisala strongly recommends the use of its automatic installation procedure** for RHEL5 installations, see Appendix C Installing Linux: RHEL 5 Desktop on page 133.

1. Check that there is enough disk space.

   The IRIS/RDA software uses about 100 megabytes on the disk. The data stored on disk by IRIS typically uses at least 100 megabytes. Thus, you need at least 200 megabytes of free space on the disk before the installation is begun. The software and data can be on separate disks, if desired. If there is not enough space, unnecessary files should

be deleted before proceeding. You can see the amount of free disk space using the `df` command.

2. Check for conflicting user names.

   The IRIS software (including the installation procedure itself) requires the creation of two new login names: `operator` and `observer`. If either of these names are already in use, they will have to be changed. You may, however, use any convenient (new or old) group name for these two new login names. In this discussion, it is assumed that the group name is "users". Use the **redhat–config–users** or **linuxconf** utility on Linux to make the changes.

**NOTE** Do not proceed without making these login name modifications. The install utility will not run if the `operator` name is undefined. If this is a new system (OS installation) please read through Appendix A, Installing CentOS5 on page 83 or Appendix C Installing Linux: RHEL 5 Desktop on page 133 of this manual and run **sigconfig** from the CD.

3. Choose an anchor point for the IRIS directory tree.

## 2.3.2 Performing a New Software Installation

Log into the system as 'operator' and start the X-windows environment. Become the 'superuser' by using the `su` command and supplying the appropriate password. (**NOTE:** If you are performing a network-based install to option, it is not necessary to become the 'superuser' – see "Local and Remote Login" on page 38). You can run the **sigconfig** script, which modifies the OS, and also installs IRIS as an alternative.

**NOTE** A new installation completely overwrites any existing files in the `${IRIS_ROOT}/bin`, and `${IRIS_ROOT}/config trees`. **Make sure you do not have any irreplaceable data in these areas before proceeding.**

To install a new software installation:

- For Linux systems (IRIS):

```
# cd /mnt/cdrom/RHEL5/iris
```

- For Linux systems (RDA):

```
# cd /mnt/cdrom/RHEL5/rda
```

- For all systems:

```
# ./install
```

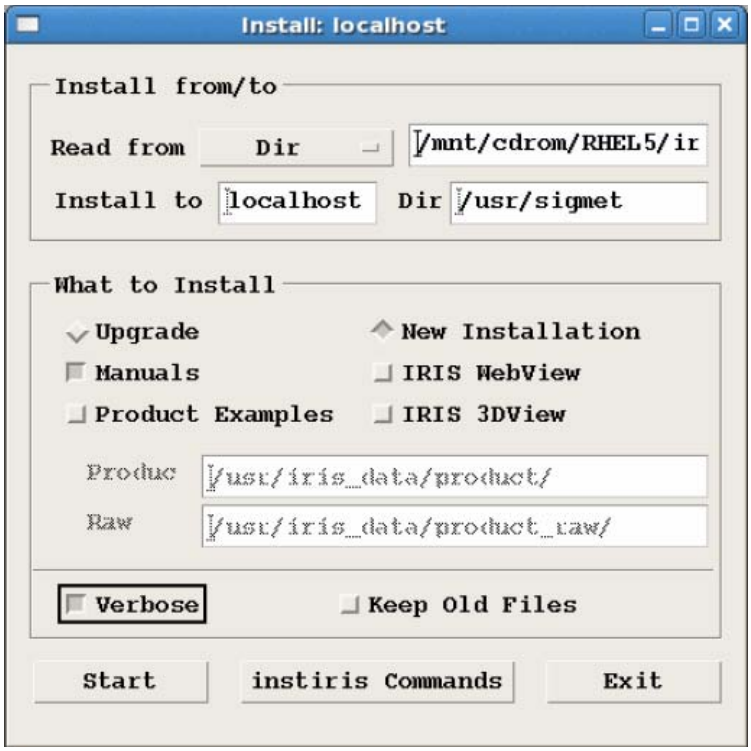



**Figure 1 New Install Dialog Box**

1. In the **What to Install** section of the install utility window, select the **New Installation** box (as shown in Figure 1 ).

| NOTE | If you are performing a RDA and IRIS install, first install the IRIS software, then install the RDA software with the **Keep Old Files** box selected. |
|---|---|

2. Optionally, you may select other support software packages to install by selecting the appropriate boxes (**IRIS WebView**, **IRIS 3DView**, etc.).
3. Click **Start**.

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

4. Once installation is complete, unmount the CD-ROM by:

```
# cd /

or

# eject /mnt/cdrom
```

5. Continue with the following sections to complete the installation process and required configuration.

**NOTE** For a detailed description of the full capabilities of the install utility, see "Install Utility Window Options" on page 33.

Now for a new OS installation, run the **sigconfig** steps manual as described in Appendix A, Installing CentOS5 on page 86 (CentOS5) or C.3 Sigconfig on page 136 (RHEL5).

## 2.3.3 Run Setup Utility

Use the **setup** utility to configure your software (this utility is described in detail in the *IRIS and RDA Utilities Manual*).

```
$ setup
```

Successful operation of **setup** does indicate that the utilities can modify the configuration files. All of the configurations in the **setup** utility should be checked for your system.

If your system is an **analysis or display system,** be sure to set that in the General setups, and in the RVP section specify that there is no processor, and the RCP should specify that there is no antenna.

If your system is a radar system (i.e. connected to an antenna/signal processor) the values in the RVP and RCP sections of setup are particularly important. These need considerable fine tuning before the RCP can be controlled accurately. For example, the maximum antenna speeds in both azimuth and elevation should be set at least six degrees per second slower than the maximum the antenna can go. To check how fast it can go, widen the limits, then run the **antenna** utility to see where it maxes out. The **antenna** utility is also discussed in the *IRIS and RDA Utilities Manual*.

Finally, in the license section of the utility, enter a desired site name. Make sure that this is unique and somehow relates to your radar site. Also, if you plan on sharing data with others, it is important that the site name is recognizable.

### 2.3.4 Get Your License

Run `show_machine_code`, which displays licensing information for your system — Machine code, Check code, Site ID, and OS Version number. For new installations, **you need to get a new license number from Vaisala.**

Contact Vaisala (helpdesk-support@vaisala.com) with the information supplied by `show_machine_code`, and we will provide you with the license numbers needed for IRIS to operate. If the machine code is the same as on your current license, no upgrade is required.

When the new license has arrived, run the **setup** utility and click the `License` button. Type the numbers at the `Features License` and `Products License` prompts.

For display systems, please use our free IRIS/Display license service on our web site (http://www.vaisala.com).

### 2.3.5 Run sigmet_env

Run the **sigmet_env** utility program. It checks for obvious mistakes like directories which do not exist. The **sigmet_env** defaults to IRIS only systems, to check the directories on an RDA system, run **sigmet_env –rda.**

## 2.4 Initial Configuration

### 2.4.1 Setting Up for SCP and Other SSH Commands

This is the preferred method for copying files between systems. First verify that the ssh daemon is running on both systems. This can be done with the command:

```
$ ps –aef | grep sshd
```

To turn on sshd run the following command as root:

```
# chkconfig --add sshd
```

This program is configured with the file */etc/ssh/sshd_config*. The default file should work for basic IRIS scp needs. In order to authorize opening X applications on your display afer ssh'ing to a remote machine, edit the file to add the following line (You can get the same effect by always typing "ssh –X"):

```
X11Forwarding yes
```

The security authorization is different for each user, so be sure to run all the applicable commands while logged in as operator. On the source machine generate your private key with the following command:

```
$ ssh–keygen –t dsa
```

You are prompted for a password, enter blank for no password. This will create the directory $HOME/.ssh. It will place in it the following files: **id_dsa** and **id_dsa.pub**. You then need to copy the contents of the **id_dsa.pub** file to all the target machines. Append it to the **$HOME/.ssh/authorized_keys** file. If there is no such file, then just rename it to match. Ssh is picky about directory protections, the.ssh directory must have protection 755. Now test by trying a simple command like:

```
$ ssh target date
```

The first time this is run, it will ask you to confirm the target host. Thereafter it will not. It should not ask for a password. If it does, there is a problem. Problems can be easily seen by examining the */var/log/secure* log file.

Because the IRIS daemons run as root, you also need to copy the radarop key files to the */root/.ssh* directory. This is a bit tricky because root does not have read access to the */home/radarop/.ssh* files. We suggest the following commands:

```
$ cd
$ cd .ssh
$ cp id_dsa* /tmp
$ su –

# mkdir –m 700 .ssh
# cd .ssh
# cp /tmp/id_dsa* ./
```

Log out and back in again so the new ssh files will take effect:

```
# exit
$ su –
```

Now test in a similar way by trying a simple command like:

```
# ssh radarop@target date
```

Again, the first time this is run, it will ask you to confirm the target host. After you get this working, delete the temporary file copies:

```
# exit
$ cd /tmp
$ rm id_dsa*
```

## 2.4.2 Setting Up for RCP and Other R Commands

Old IRIS systems use the **rcp** shell command internally to copy product files between computers over the network. For security reasons, this feature is by default blocked, and requires configuration to enable it.

For starters, please see the discussion on enabling the rsh services in "Service Configuration" on page 98.

There are two mechanisms to configure the remote commands: The *~/.rhosts* file and the */etc/hosts.equiv* file. These files are placed on the receiving computer to enable access from the outside world. The *.rhosts* file is placed in each user's login directory, and the hosts.*equiv* file is placed in the */etc* directory and applies system wide. We recommend using the *hosts.equiv* file and checking to make sure there is no *.rhosts* file for the applicable users. Note that root requires a private *.rhosts* file to do rcp. This file is basically a list of hostnames and user names. Though wildcarding is allowed, we recommend adding every host and user who needs it.

This can be little tricky to configure, so always test manually. The development cycle is very simple. Test with an rsh command like:

```
$ rsh target date
```

If it fails, then edit the hosts.equiv file and try again. Once the rsh commands are working, the rcp commands will almost certainly work also. A good starting point it to rsh to your own host to see if it works. If

that does not work then certainly you cannot expect it to work from other hosts.

**Table 1 Sample /etc/hosts.equiv File**

| # Comments allowed | |
|---|---|
| radar.company.com | operator |
| analysis.company.com | operator |

## 2.4.3 Serial Line Setup

**Set World Read/Write Permission**:

Each serial device must be set so that users can read and write to it. For a device called `/dev/ttyS0`, you can test this with the following command:

```
# chmod 666 /dev/ttyS0
```

The permissions will change back to the default values during the bootup process. To set this at boot on RHEL6 and RHEL5 create the file */etc/udev/rules.d/10-sigmet.rules*. Insert a line which reads:

```
KERNEL=="ttyS0", NAME="%k", GROUP="uucp", MODE="0666",
OPTIONS="last_rule"
```

Note that the "tty" is the group owner, which may vary on different systems. Check what yours should be by first typing:

```
$ ls –l /dev/ttyS*
```

**Disable Modem Manager:**

If your serial device supports modem control lines, then the modem manager daemon will try to figure out if there is a modem attached. This causes the device to be busy at boot time, and will cause the device lock up on open. This happens, for example with a USB-to-serial converter. Please disable this by adding a command like this to your */etc/udev/rules.d/10–sigmet.rules* file:

```
ATTRS{idVendor}==”067b”, ATTRS{idProduct}==”2303”,
ENV{ID_MM_DEVICE_IGNORE}=”1”
```

**Disable Logins on the Serial Lines:**

A problem that sometimes arises when assigning the computer’s serial lines to IRIS is that the system may already be running a `getty` process to log users onto that line. This process must be removed before IRIS can

use the serial line. On RHEL6, this is controlled by the */etc/sysconfig/init* file. On RHEL5 systems, there are command statements in the */etc/inittab* file that startup `getty`. These should be modified or commented out (using a '#' at the beginning of the line).

## 2.4.4 Shared Memory Size

On RHEL systems there is a system kernel parameter which determines the maximum shared memory allowed. The default size varies on different OS versions, but it often is 32 MB. Typically this causes a problem allocating the product inventory in IRIS, with an error such as:

```
EINVAL; Invalid argument <shmget iris_products (52975876
bytes)>
```

If you do not need it, you can lower the maximum products on disk to 60,000 in **setup/general**. Or you can raise the limit on your system by editing the */etc/sysctl.conf* file and adding a line which reads, for example:

```
kernel.shmmax = 100000000
```

Then reboot for this to take effect.

## 2.4.5 Installation Security Issues

During the course of an installation, the **install** utility needs to perform certain root level privileged operations. Such operations include the setting of the ownership and mode of certain IRIS executables. Because normally the **install** utility is run by the root user, these operations are allowed without question.

In the case of doing a network based installation using the "INSTALL TO" option, this installation method is not performed by root, but is instead performed by the operator. To grant the user operator the permission required to do these privileged operations, the iris **install** utility uses the Unix **sudo** facility.

By use of the **sudo** utility, the operator effectively is allowed to execute the **install** utility as the superuser. There are some minor security implications of this. Under most circumstances it is fine for the operator to perform these operations. If you wish to allow the operator to perform these actions (normal scenario), then no special action is required – just run install as documented in the following sections.

By disabling the root privileges for the **install** utility, when doing a network based "INSTALL TO" installation, after the install is finished, you will need to login to the remote system as root to complete the privileged part of the installation. The **install** utility will prompt you with the exact command to execute in this case.

# 2.5 Upgrade Installation

## 2.5.1 When Should I Upgrade?

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 available at www.vaisala.com/sigmet in the customer support section to see what changes have been made since your current release was installed. Be sure to check the release notes for all intervening releases.

To check the release that you have currently installed, you can type the command:

```
$ show_machine_code –version

IRIS Version 8.00 (indicates version 8.00)
```

## 2.5.2 What Should I Do Before I Upgrade?

1. Save customized files.

   As part of the upgrade, many of the files in the tree are erased and replaced. If you have placed anything important there, be sure to save it first. The upgrade procedure preserves everything in `${IRIS_CONFIG}`.

2. 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. Therefore, some of the information may have to be entered again.

3. Before you can upgrade, you must make certain that all sigmet applications are stopped. You can do this by exiting any **IRIS/RDA** utilities that you are running and executing the following commands.

For IRIS:

```
$ qiris
$ qant
```

For RDA:

```
$ su
# service rvp8 stop (or service rcp8 stop)
# service dspexport stop
```

Then type **ps_iris** to verify that all sigmet processes are stopped. If there are remaining processes, you can stop them as root with the "**kill** <*process ID number*>" command. The process ID number is the first column of numbers from the **ps_iris** output.

## 2.5.3 Where to Get Software Upgrades?

The RVP8 and RCP8 (collectively the RDA) and IRIS are active products. New features and bug repairs are provided in the form of software upgrades. Software upgrades from Vaisala can be obtained from two sources:

- **FTP (Internet) Upgrades**—These are available from ftp.sigmet.com. For example, to obtain the release RDA 8.00 you would go to:

  `ftp.sigmet.com/outgoing/releases/8.X.X`

  "Getting the Network Upgrade Files" on page 28 shows a typical ftp session. 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 sigmet-support@vaisala.com if you need to arrange a support contract.

- **CDROM Upgrades**— These are provided as part of a support contract or upon request.

## 2.5.4 How Should I Upgrade?

There are two basic upgrade techniques:

- **Upgrade using "install" utility**—This is the preferred technique since it leaves all configuration files intact. This is described in "Performing an Upgrade Installation" on page 31.

- **CD–ROM Operating System Upgrade & Vaisala software Full Re-Install**—Backup your configuration files and network files and then do

an install from scratch as described in Appendix A, Installing CentOS5 on page 83. Then restore your configuration files to the new installation. This is the preferred technique **only** when it is required that you upgrade the operating system which might be necessary in the event of hardware or new hardware.

Once you have decided on either a network or CDROM upgrade, then proceed with the upgrade installation as described in the sections below.

## 2.5.5 Getting the 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 is enabled on your computer allowing you to run an ftp session and "get" files from another networked computer:

- **Use your IRIS workstation/RVP8/RCP8/RCW to get the files**— a one-step procedure that requires that you have internet access.
- **Use another machine on the network**— a two-step procedure to first ftp the files to another computer, and then "get" them from this machine by running ftp on the IRIS workstation/RVP8/RCP8/RCW. Note that an alternative is to copy the files to a CDROM.

No matter what technique you use, you will need some basic familiarity with ftp. Here we will assume that our computer with the name **sigcomp** has direct internet access (the one-step procedure). The two-step procedure is analogous.

**One-step Approach: Direct Download:**

- On your IRIS Workstation/RVP8/RCP8/RCW create a directory called */tmp/iris-X.XX*. If you will be downloading RDA software also, use a separate directory named */tmp/rda-X.XX*. Here the X.XX is the version number of the RDA software that you want to install. This naming convention makes it easy to identify the version of the install files. You should make a directory for each version and type (IRIS/RDA) of software that you download. As **operator** type (assuming version 8.11.0 for all examples here):

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

- Position yourself in the */tmp* directory by typing:

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

Note that on a windows machine, all of the commands below can be typed in the MS–DOS prompt window (remember to use the "\" backslash for DOS).

- Start ftp and follow the sample session below (your responses are indicated by **bold**)

```
$ ftp ftp.sigmet.com
Connected to ftp.sigmet.com
220 Welcome to Vaisala Westford Operations FTP Serve
Name: anonymous
331 Guest login ok, send your complete e-mail address as
password.
Password: <Use your email address>
230 Guest login ok, access restrictions apply.
ftp> cd outgoing/releases/
ftp> dir
```

- You will see a directory listing of available releases. You are looking for an 8.11.0 release, then:

```
ftp> cd 8.11.0
ftp> dir
```

- You will then need to enter the appropriate directory for your OS version. Round the version down, so if you are running RHEL5.1, use RHEL5:

```
ftp> cd RHEL5
ftp> dir
```

- You will see a listing of the release type. You are looking for the "rda" release, then:

```
ftp> cd rda
ftp> dir
```

- Now you will see a list of files with file sizes. We recommend that you download all the files. The absolute minimum **required** files for an upgrade are:

```
app.gz
install
install.gz
install.rf
instiris
tplates.gz
```

- Make a list of the files that you want to download including at least the six files in the list above. Of the other files on the FTP site, man.tgz contains the manuals, and web.tgz contains the IRIS/Web feature which you might not need. Prepare to download by selecting BINARY file transfer:

```
ftp> bin
200 Type set to I.
```

**NOTE** Important: If you do not specify BINARY transfer, the download will not work.

- Now "get" the files, for example:

  ```
  ftp> get app.tgz
  200 PORT command successful.
  150 Opening BINARY mode data connection for app.gz
  (4897560 bytes)
  226 Transfer complete.
  ```

  You will get a confirmation that BINARY transfer is being used and the size of the file in bytes is displayed. Depending on the size of the file and the speed of your connection, the download could take many minutes. When the file transfer is completed, you will get a confirmation message.

  You can also use the multiple get command "**mget**" to get all of the files:

  ```
  ftp> mget *
  ```

  You will be prompted for each file download so you can still pick-and-choose by typing "y" or "n" to select (yes or no).

- After you have downloaded all of the files, then end your session by typing:

  ```
  ftp> quit
  221 Goodbye
  $ (back to UNIX prompt)
  ```

For the one-step approach, you have all of the files that you need in the directory */tmp/rda-8.11.0* on the RVP8.

**Completing the Two-step Approach Using Another Computer:**

The two step approach is to use another computer to get the upgrade files and then get these files on the RVP8. The first step of getting the files from Vaisala is done analogus to the one-step approach described above. The second step is to ftp the files from the other computer to the RVP8. This is also analogous to the procedure described above. An alternative is to put the files on a CDROM, mount the CDROM on the RVP8 and then copy the files to the RVP8.

The end result of all these various procedures is that the upgrade files are on the RVP8 in a directory called */tmp/rda-X.XX. N*

**Set the Modes on the Files:**

Become root using the **su** command and password. Go to the RVP8 directory where the files were downloaded and change the mode on two of the files that require execute privilege, i.e.,

```
# cd /tmp/rda-8.11.0

# chmod +x install

# chmod +x instiris
```

You are now ready to move on to the next section.

## 2.5.6 Performing an Upgrade Installation

Follow these instructions if you are upgrading from a previous Vaisala system.

Login to the system as 'operator' and start the X windows environment if it is not already running. Become the superuser by using the 'su' command and supplying the appropriate password (Note network installations do not use root–see "Install To Option (Including Network Installs)" on page 35).

| WARNING | Warning: An upgrade installation *overwrites* any existing files in the `${IRIS_ROOT}/bin` tree. Backup any important files before proceeding. |
|---|---|

LINUX SYSTEMS (IRIS):

```
# cd /mnt/cdrom/RHEL5/iris
```

LINUX SYSTEMS (RDA):

```
# cd /mnt/cdrom/RHEL5/rda

# ./install
```

In the **What to Install** section of the **install** utility window, you must select **Upgrade** by pressing its button in. This is shown below:

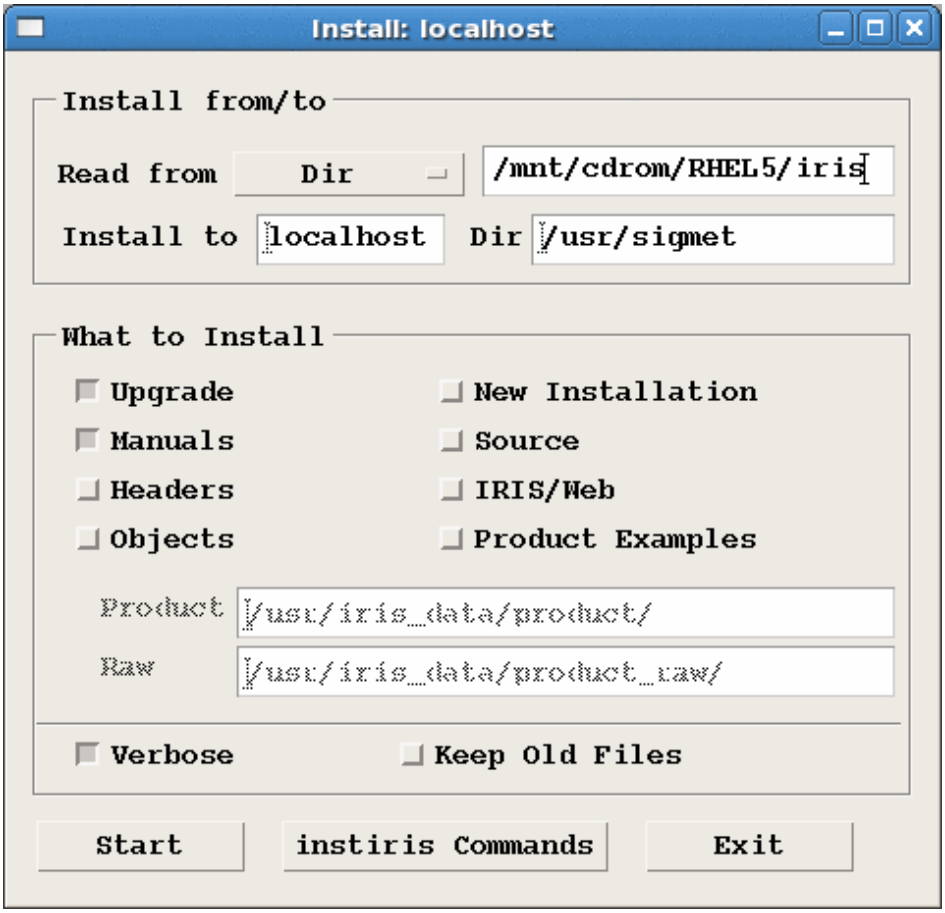



**Figure 2 Upgrade Install Dialog Box**

You may optionally also select other optional software packages to install by pressing their buttons in the **What to Install** section. When ready to do the install, just press **Start**.

| **NOTE** | If you are performing a RDA and IRIS install, first install the IRIS software. Then install the RDA software with the Keep Old Files button pressed. |
|---|---|

The installation script takes a few minutes to complete and prints progress messages as it runs. Don't forget to unmount the **CDROM** after the installation is complete.

```
# cd /

# eject /mnt/cdrom
```

### 2.5.7 Post Upgrade Tasks

Because some setup files may have changed formats, please run the following command:

```
$ makeAsciiSetups
```

## 2.6 Install Utility Window Options

This section describes in detail all the options available in the **install** utility. It is located on the distribution CDROM, as well as in the `${IRIS_ROOT}/install` directory after installation.

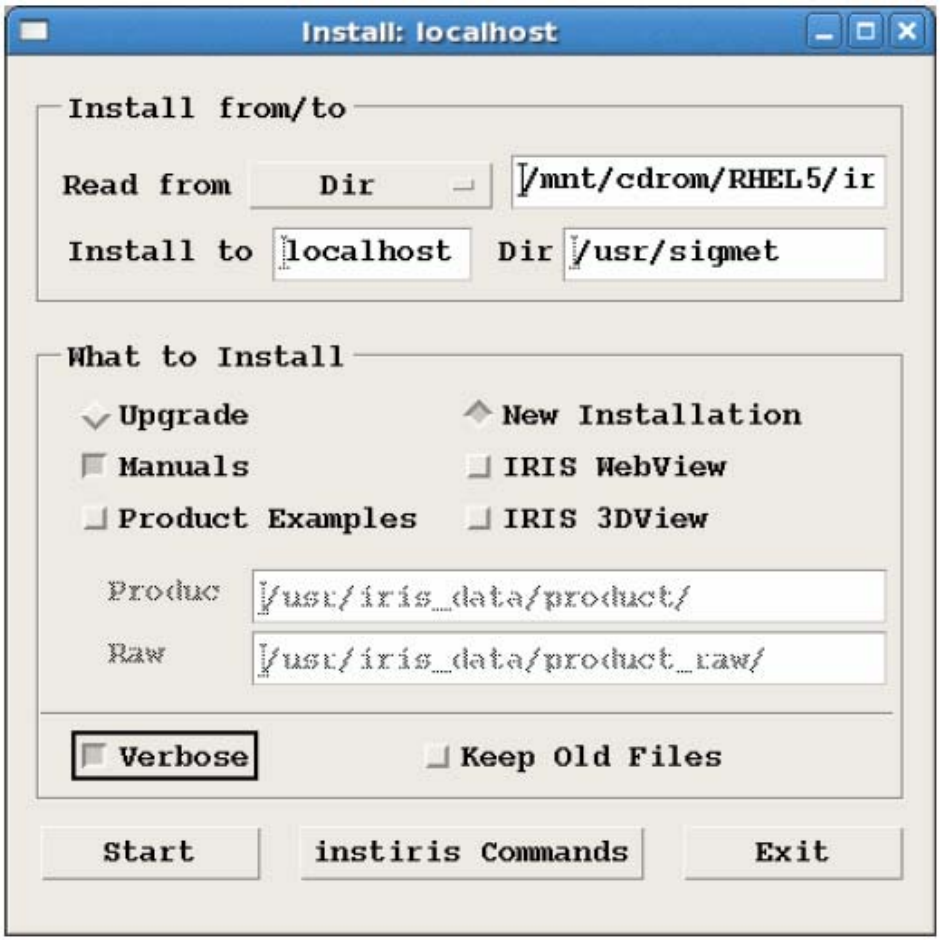



**Figure 3 Install Dialog Box**

The first section is labeled **Install from/to**. The default information in this section is shown above. This default information assumes that the

installation will be from the directory from which the installation was run, and will be installing to the default directory (*/usr/sigmet*) in the local computer. In "Install Utility Window Options" on page 33, other options for **Install from/to** are discussed.

The second section is labeled **What to Install**. In this section, you choose which of many different files to install. Depending on which button(s) are pressed, there are three basic different installation that can be performed:

- A **New Installation** of the software.
- An **Upgrade** installation on a system where an older version is already installed.
- Do not install the application software, but install one or more different optional support software packages such as **Manuals**, **IRIS Product Examples**, **IRIS WebView,** or I**RIS 3DView**. The meaning of each of the optional support software packages is described in "Install Utility Window Options" on page 33.

It should also be noted that when doing either a **New** or **Upgrade** installation, you can also install at the same time one or more of the optional support software packages discussed in item 3 above.

## 2.6.1 Read From Option

The **install** utility allows for the files used in the installation to come from one of three different locations. The default location is the **DIR** this means that the installation program will automatically populate the Read From option with the path where the install command was run (this implicitly works for **CDROMs**). However, by using the **Read From** button, you can choose to access the files also from either the files already installed on your system (**Local** option).

When selecting the **DIR** option, you can type a directory in manually.

When selecting the **Local** option, this implies that the files will be taken from the local installation of IRIS or RDA already in this computer and copied to some other destination. In this case in the box to the right of the **Read From** button, you must fill in 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, but you can override this if you wish.

When selection the **Dir** option, this implies that the files will be taken from some temporary directory on the local computer and copied to some

other destination. In this case in the box to the right of the **Read From** button which is automatically populated with the directory where ./install was executed from.

## 2.6.2 Install To Option (Including Network Installs)

The **Install To** fields must be entered in the **install** window. These fields choose where the IRIS software will be installed. By default, these fields will always be filled-in, in such a way that the IRIS software will be installed to the local system in the default */usr/sigmet d*irectory.

However, with the **Install To** fields, you can choose to install the software to any other computer on your network, or to any directory on your computer.

To install to a remote computer **(Network Install)**, one important step is that the **install** utility must be run from the as operator rather than from root:

```
$ cd /usr/sigmet/install

$ ./install
```

In the **install** utility window, enter the *nodename* of the remote computer that you are installing to in the **Install To** field. And if you wish to install to a directory that is different from */usr/sigmet*, enter this directory into the **Dir** box immediately to the right of the **Install To** box.

These network installations are very convenient, as if you update a single system on your network from a **CDROM** by choosing all of the default options in the **Install from/to** section of the **install** utility, you can then install from the Local directory of this first machine (Local option) to every other machine on your network by putting their hostnames, one at time, into the **Install To** field. This is a big time saving operation.

After the software has been installed on the remote machine, you must complete the procedure by setting the ownerships, modes, and application defaults on the remote machine itself. This can be done by way of a remote login (as root), as in:

```
# rlogin Remote_Machine –l root

# cd /usr/sigmet/install

# ./instiris –setown –v
```

## 2.6.3 Manuals Option

To install the Online Manuals, prior to starting the install, press the **Manuals** button in the **What to Install** section of the **install** utility.

This installs both the online manuals and the viewer program. It uses approximately 38 MB of disk space. Generally the online manuals are more up to date than the printed versions.

## 2.6.4 Product Example File Option

When using a IRIS/RDA release **CDROM**, it is possible to install example **Product and Raw Product** files. To do so, press the **Product Examples** button prior to clicking **Start**. Also, you must fill in the Product and the Raw fields next to the Product Example button. These fields are automatically filled in with default installation directories for IRIS Products and IRIS Raw Products. If you use different directories for these products, edit these fields prior to starting the install.

This will place a number of IRIS type product files in the above mentioned directories. These files can either be viewed directory, or may be re–ingested to make other products.

## 2.6.5 IRIS WebView Option

IRIS WebView can be installed on an IRIS analysis machine used for serving pictures over the internet. See Appendix G Installing Legacy IRIS/Web Server on page 181 for more details.

## 2.6.6 IRIS 3DView Option

IRIS 3DView can be installed either on an IRIS analysis machine, or a machine without IRIS at all. Refer to the *IRIS Product & Display Manual* for more details.

## 2.6.7 Verbose Option

Normally, **install** does its work silently, and prints only minimal progress messages as it runs. To see more details, press the **Verbose** button prior to clicking **Start**.

### 2.6.8 Keep Old Files Option

This option should only be used when upgrading or installing a computer system that has both RDA and IRIS software installed. When using this option, make sure that to install IRIS first and then install the RDA software with this button pressed. It will prevent **install** from erasing the IRIS files just installed. The **Product Examples** button never erases old data.

## 2.7 Troubleshooting

This section contains suggestions for fixing common problems.

### 2.7.1 File Ownership and Protection

Sometimes there are problems after an installation with access to some of the files. Typically, this is evidenced by an error message saying that the user does not have privilege to do an operation. This can happen when starting a program or when calibration files are accessed. If you should have this problem, run the `instiris` script, as shown below:

```
# instiris -setown
```

This procedure goes through the */usr/sigmet* directory tree, changing the owner of all files to `operator` and setting the protection, as follows:

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

Always use `instiris -setown` to fix the protection of your files. Do not try to change the protection of these files yourself.

### 2.7.2 Authorizing Remote X–Windows on Your Node

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

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

Where <*host*> is your remote hostname, or IP address. Once you have this working to your satisfaction, edit your */etc/profile.d/sigmet.sh* file and put the appropriate command at the end of the file. This will cause it authorize the windows as soon an anyone logs in. You can also put such a command in your home directory *.bash_profile* file if you want just one user to authorize.

# 2.8 Basics of Login, Logout, and Shutdown

## 2.8.1 Power-up Procedure

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. This is described in detail in of both the *RVP8 & RCP8 User's Manuals*.

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

## 2.8.2 Local and Remote Login

There are two ways to login to a SIGMET system:

- **Local login—**the local keyboard, mouse, and monitor can be used, or via a KVM.
- **Remote login—**if **telnet** is enabled you can use this for remote access. Check with your network administrator.

For the remainder of this discussion it is assumed that local login is used.

## 2.8.3 Default Operator and Root Login Passwords

There are two default users defined in the standard software installation:

- **Root** (with password: **xxxxxxxx**; 8 lower case x)—this is for operating system maintenance functions.

- **Operator** (with password: **xxxxxx**; 6 lower case x)—this is for SIGMET application software maintenance functions.

These are all described in detail in the *IRIS and RDA Utilities Manual*.

Your system administrator can change either of these passwords by using standard Linux password support.

## 2.8.4 Login Procedure

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

1. Connect keyboard, mouse, and monitor and then cycle power on the system to force a reboot. This causes Linux to recognize these devices on power-up.
2. At the power-up **login** prompt, type **operator** and press **Enter**.
3. When prompted, provide the appropriate password (factory default is **xxxxxx**, 6 lower case x).

   An X-Window screen appears.
4. Right-click the mouse and select **New Window**to get a terminal window.

   The top of the terminal window shows, for example:

   ```
   operator on rvp8-1 : /home/operator
   ```

   that is, your user name, the node name of the system, and the current directory path.

| NOTE | If you would like to have a terminal with a bigger font, you can type `sigterm`. |
|---|---|

### 2.8.4.2 Switching from Operator to Root Login Using "su"

The easiest way to switch to a root login for system administration work is to type the super user command `su` and then give the root password. The prompt will change from `$` to `#` indicating that you are root.

### 2.8.4.3 Exiting "su" Root Login to Return to Operator

In an X–terminal where you have become the "super user (su)", type `exit` to return to operator. The prompt will change from `#` to `$`.

### 2.8.4.4 Local Root Login after Power-up

To login as root after a power–up or after exiting X–Windows, type `root` and press **Enter** at the login prompt, then give the appropriate password (factory default is **xxxxxxxx**; 8 lower case x).

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

**NOTE** 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.

## 2.8.5 Logout Procedure

### 2.8.5.1 Logout from X-Windows

- Method 1: Right-click the mouse and select **Exit**.
- Method 2: Simultaneously press **Ctrl+Alt+Backspace** on the keyboard.

You are logged out and the screen shows the initial login prompt on the full screen terminal.

### 2.8.5.2 Root Logout from Full Screen Terminal

If you logged–in as root from the power-up full screen terminal.

## 2.8.6 Power-off Shutdown Procedure

**NOTE** If you need to swap PCI cards in the chassis, you must first do a power-off shutdown.

As either operator or root type `poweroff`. The system will go through a shutdown sequence. When it is done **"Power down"** is displayed. At this point you can press the power switch located on the right lower front of the chassis.

# 2.9 RVP8 & RCP8 (RDA) Software Installation

## 2.9.1 Install the Upgraded Kernal Module

After you upgrade you may get an error message saying that there is a kernel module mismatch. This is easily fixed by rebooting. As an alternative you can restart the kernel module with the following commands:

```
# service rdasys stop

# service rdasys start
```

## 2.9.2 Installation Steps to Flash FPGA in Vaisala Devices

In this section you will be installing FPGA software into each of the Vaisala components. You will need to make an inventory of what is in your system and then issue an `rdaflash` command to each one:

1. Login as **operator** (with password **xxxxxx** (6 x)

   You will enter X–Windows.

2. Right-click the mouse and start a terminal window.

3. For each Vaisala component type the appropriate command:

| **Vaisala Component** | **Unit ID** | **If RVP8, type:** | | |
|---|---|---|---|---|
| `Standard RVP8/Rx Card` | `-0` | `rdaflash` | `-program` | `rvp8rx–0` |
| `Standard I/O-62 Card` | `-0` | `rdaflash` | `-program` | `io62–0` |
| `Standard Connector Panel` | `-0` | `rdaflash` | `-program` | `io62cp–0` |
| `Standard RVP8/IFD` | `-0` | `rdaflash` | `-program` | `rvp8ifd–0` |
| `Optional RVP8/Tx Card` | `-0` | `rdaflash` | `-program` | `rvp8tx–0` |
| `Optional 2nd RVP8/Rx` | `-1` | `rdaflash` | `-program` | `rvp8rx–1` |
| | | **If RVP8, type:** | | |

| Vaisala Component | Unit ID | If RVP8, type: | | |
|---|---|---|---|---|
| Standard I/O-62 Card | -0 | rdaflash | -program | io62–0 |
| Standard Connector Panel | -0 | rdaflash | -program | io62cp–0 |

4. Perform a system shutdown by typing `poweroff`
5. When "**Power down**" is displayed, turn power off with power switch on lower right of front panel.

This completes the FPGA software installation.

## 2.9.3 Reboot Power-up Check and RDA Diagnostics

After you have completed the installation steps above, you should reboot the unit. You can observe the progress of the reboot on the monitor. In addition, the front panel LED display will show the time of the reboot and display diagnostic messages. Typically about 1 minute is required for the system to complete reboot.

After the reboot is completed:

1. Login as **operator.**
2. Right-click to start a terminal window, and then:
   a. Stop the rvp8 (or rcp8) process by typing:

      `$ killall rvp8` (or `rcp8`)

   b. Run the following diagnostics and observe the results:

      ```
      (for RVP8 and RCP8 systems)
      $ rdadiags io62–0  tests I/O–62
      $ rdadiags io62cp-0  tests connector panel.
                           Requires test cable
      (for RVP8 systems only)
      $ rdadiags rvp8rx-0
      ```

   c. Run these also for any optional RVP8 cards such as:

      ```
      $ rdadiags rvp8tx–0 tests RVP8/Tx
      $ rdadiags rvp8rx–1 tests 2nd RVP8/Rx
      ```

d. Restart the RVP8 or RCP8 process by typing (for the RVP8 example):

```
$ rvp8 & or rcp8 &
```

e. Verify that the restart messages show no faults.

# 2.10 RDA Software Configuration

After the receiving your unit from the factory, or after software re–installation, there are several configuration steps required to customize your system for your particular environment and application. The configuration tools available for this are summarized in the table below.

| Configuration Tool | RDA Device | Description of Configuration Features |
|---|---|---|
| setup/RVP utility<br>`setup_dsp.conf` | RVP8<br>RVP900 | Configures the local environment required to run RVP8 the support utilities such as **ascope** and **dspx.** Examples include radar equation parameters that are required for calibration, pulse width definitions and PRF request limits. |
| setup/RCP utility<br>`setup_ant.conf` | RCP8 | Configures the local environment required to run the RCP8 support **utilities that such as antenna or bitex**. 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. |
| RVP8 NV setups<br>RVP900 NV setups<br>`rvp8.conf`<br>`rvp9.conf` | RVP8<br>RVP900 | Defines the details of the sampling and processing algorithms as well as the operational configuration of the system. Examples include, IF filter design and selection, PRF limits, relative trigger timing, dual polarization features. |

| Configuration Tool | RDA Device | Description of Configuration Features |
|---|---|---|
| RCP8 NV setups<br>`rcp8.conf` | RCP8 | Used to configure which status and control bits are available and define the antenna servo control parameters. Examples include, physical or virtual tachometer selection, shutdown safety criteria and internal antenna simulator on/off. |
| `softplane.conf` | RVP8<br>RVP900 | File that is edited which defines the various I/O signals on the I/O-62 connector panel, pin-by-pin. 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. |
| | RCP8 | |

**NOTE** Important: Both the setup utility and the TTY setups must be configured to customize your system. This is part of the installation procedure.

All of the configuration results are stored as ASCII text *.conf* files, typically in a directory called */usr/sigmet/* (factory default). The file names are indicated in the table above. Each file has a factory default configuration file that is stored in the template directory (the default is*/usr/sigmet/config_template/init/)*. An advantage of this approach is that for a radar network with identical hardware, configuration maintenance can be performed by copying pre-tested files over the network.

The following serve as references and are not repeated here:

- setup utility—*IRIS Utilities Manual*
- RVP8 NV setups—*RVP8 User's Manual*
- RVP900 NV setups—*RVP900 User's Manual*
- RCP8 NV setups—*RCP8 User's Manual*

An overview of these setups for both the RVP8 and RCP8 is provided in the next two sections, followed by a description of the softplane.conf file and its configuration.

## 2.10.1 RCP8 Setup Configuration Summary

The table below summarizes the setups required for the RCP8 and its associated host computer (if any). The three cases are summarized in the *RCP8 User's Manual*.

| | **Case 1: Serial Interface** | **Case 2: Combined RCP8/RCW** | **Case 3: Socket Interface** |
|---|---|---|---|
| **RCP8 TTY Setups: Site Host section** | | | |
| Serial port | /dev/ttyS0 (e.g.) | .../fifo_hostio-x See note | .../fifo_hostio-x See note |
| Baud rate for host computer I/O | 9600 | *–Ignored–* | *–Ignored–* |
| **RCP8 Setup: RCP Section** | | | |
| System has an antenna | Yes | Yes | Yes |
| Interface Type | Native | Serial | Serial |
| Main channel device name | Not displayed for interface type Native | .../fifo_hostio-y See note | .../fifo_hostio-y See note |
| running at | | *–Ignored–* | *–Ignored–* |
| with parity | | *–Ignored–* | *–Ignored–* |
| Antenna angle insertion source | Native RCP8 | Normal serial | Normal serial |
| *AntExport Running on RCP8* | *No* | *No* | *Yes* |
| **Host RCW Setup Utility: RCP (e.g., running IRIS/Radar)** | | | |

| | **Case 1: Serial Interface** | **Case 2: Combined RCP8/RCW** | **Case 3: Socket Interface** |
|---|---|---|---|
| System has an antenna | Yes | NA | |
| Interface Type | Serial | | |
| Main channel device name | /dev/ttyS0/ (e.g.) | | |
| running at | 9600 | | |
| with parity | No | | |
| Antenna angle insertion source | Normal Serial | | |

**NOTE** The recommended full path for the fifo interface is */usr/sigmet/config/fifo_hostio-x*. The other one (it does not matter which) is at */usr/sigmet/config/fifo_hostio-y.*

| **For Case 3: AntExport Receiving Workstation** | |
|---|---|
| System has an antenna | Yes |
| Interface Type | Socket |
| AntExport hostname/IP-Address | *<for source node running AntExport>* |
| AntExport Port Number | 30745 |

## 2.10.2 RVP8 Setup Configuration Summary

The table below summarizes the setups required for the RVP8 and its connection to the associated host radar control workstation (RCW). Refer to the *RVP8 User's Manual*.

**Table 2 RVP8 Local Setups: TTY Setups and Setup Utility**

<table>
<tr><td colspan="4">RVP8 TTY Setups</td></tr>
<tr><td rowspan="3">"Mc" Live angle input Antenna angles from RVP8 Az/El S/D inputs Antenna angles from other source (e.g., serial input)</td><td>Antenna angles from RVP8 Az/El TTL inputs</td><td></td><td>2: Tags</td></tr>
<tr><td colspan="3">3: S/D</td></tr>
<tr><td colspan="3">1: None</td></tr>
<tr><td>"Mt N" Range Mask spacing</td><td colspan="3" rowspan="3">These are all forced by the corresponding settings in the RVP8 Setup Utility: RVP Section (See Below)</td></tr>
<tr><td>"Mt N" Maximum number of Pulses/Sec</td></tr>
<tr><td>"Mt N" Maximum instantaneous PRF</td></tr>
<tr><td colspan="4">RVP8 Setup Utility: RVP Section</td></tr>
<tr><td>System has a signal processor</td><td colspan="3">Yes</td></tr>
<tr><td>Interface Type</td><td colspan="3">Native</td></tr>
<tr><td>Range Mask spacing</td><td>Default is 125 m</td><td rowspan="3">Configuring these fields will also set the corresponding fields in the RVP8 TTY Setups (See above)</td><td></td></tr>
<tr><td>Minimum PRF</td><td>As required</td><td></td></tr>
<tr><td>Maximum PRF</td><td>As required for max duty cycle</td><td></td></tr>
<tr><td colspan="3">RVP8 Setup Utility: RCP Section</td><td></td></tr>
<tr><td>Response to Mc Live angle input (above)</td><td>TTL binary angles or S/D</td><td colspan="2">"None"</td></tr>
<tr><td>System has an antenna</td><td>Yes</td><td colspan="2">Yes</td></tr>
</table>

**Table 2 RVP8 Local Setups: TTY Setups and Setup Utility**

| | | |
|---|---|---|
| Interface Type | Not applicable when Antenna angle insertion source is set to RVP8 | Serial |
| Main channel device name | | Default: /dev/ttyS0 |
| running at | | Default: 9600 |
| with parity | | None |
| Antenna angle insertion source | Native RVP8 | Normal serial |
| *DspExport Running on RVP8* | Yes | Yes |

**Table 3 Setup Utility on RCW (Radar Control Workstation) running IRIS**

| **IRIS Host RCW Setup Utility: RVP Section** | | |
|---|---|---|
| System has a signal processor | Yes | |
| Interface Type | Socket | |
| DspExport hostname/IP–Address | *<hostname or IP address of RVP8>* | |
| DspExport Port Number | Default: 30740 | |
| **IRIS Host RCW Setup Utility: Ingest Section** | | |
| Response to Mc Live angle input (above) | TTL binary angles or S/D | "None" |
| Manner of angle acquisition | Binary TAGS | Serial Stream |

# 2.10.3 Configuring the softplane.conf File

## 2.10.3.1 What is the softplane.conf File?

The softplane.conf file is used to define pin–by–pin assignment of I/O functions to various connectors on the I/O-62 connector panel. It is a plain text ASCII file that is self-documented. Since the RVP8 and RCP8 have virtually no jumpers, or wirewrap, all I/O configuration on the I/O-62 connector panel is done by software approach according to this file.

### 2.10.3.2 Where is softplane.conf?

The file resides in the IRIS_CONFIG directory. Typically this is */usr/sigmet/config* (this is the default directory that is factory installed). The factory configurations are also available in the */usr/sigmet/template/init* directory so that you can always return to the factory defaults if you need to.

### 2.10.3.3 When do I Need to Change softplane.conf?

The softplane.conf file that is shipped with your system is configured for a standard connector panel with I/O as described in the *RCP8 User's Manual*. As long as you use the standard I/O pin assignments, then you do not need to change softplane.conf.

If you need to redefine some of the I/O pins on the connector panel, or add additional Vaisala cards such as a second I/O-62 then you must change softplane.conf.

#### 2.10.3.3.1 Editing he Softplane.conf File

You will need to use a text editor to modify the softplane.conf file. There are several editors included in the system:

- **vi** —the generic UNIX editor that is available on every UNIX system. It is really arcane to use, but many people know how to use it out of necessity or they are simply used to it now.
- **gedit**—this is more user friendly with keyboard commands and mouse support when you are in X–Windows so it a little easier to learn than **vi**.

If you are not familiar with either of these, then you will need to either find someone who is or learn how to use these tools.

To start an editing session you would do the following as **operator:**

```
$ cd /usr/sigmet/config

$ gedit softplane.conf
```

or

```
$ vi softplane.conf
```

#### 2.10.3.3.2 Softplane.conf File: RVP8 Example

An example from the beginning and some excerpts from the softplane.conf file are shown below (note that the command "**cat**" causes the file to be listed on a terminal):

```
cat /usr/sigmet/config/softplane.conf
```

```
Softplane Configuration File
```

```
The following general purpose control and status signals
can be routed to/from any available hardware pin. The '~'
prefix character may be used for signal inversion.
```

| Control Outputs | Status Inputs |
|---|---|
| cPedAZ[15:0] | sPedAZ[15:0] |
| cPedEL[15:0] | sPedEL[15:0] |
| cEarthAZ[15:0] | sServoPwr |
| cEarthEL[15:0] | sLocal |
| cServoPwr | sStandby |
| cCabinetRelay | sLowerEL |
| cTransmitPwr | sUpperEL |
| cPWidth[3:0] | sTransmitPwr |
| cTrigBlank | sTransmitLocal |
| cRadiateOn | sPWidth[3:0] |
| cRadiateOff | sTrigBlank |
| cReset | sRadiate |
| cIrisMode[2:0] | sAirflowFlt |
| cAux[63:0 | sWavegpFlt |
| true | sInterlockFlt |
| false | sMagCurrentFlt |
| | sReset |
| | sIrisMode[2:0] |
| | sAux[319:0] |

```
splConfig.sVersion = "7.32"
# ------------------- IO62 Slot #0 -------------------
#
splConfig.Io62[0].lInUse = 1
# The remote backpanel type should be one of the following:
# Direct : Direct I/O with IO62 connector itself
# IO62CP : Standard IO62-CP connector panel
# RVP88D : RVP8 portion of WSR88D panel
```

```
# RCP88D : RCP8 portion of WSR88D panel
#
splConfig.Io62[1].sExtPanel = "IO62CP"
# TTL/CMOS on J1
#
splConfig.Io62[0].Opt.Cp.J1.pin01 = "sPedAZ[0]"
splConfig.Io62[0].Opt.Cp.J1.pin02 = "sPedAZ[1]"
splConfig.Io62[0].Opt.Cp.J1.pin03 = "sPedAZ[2]"
...
# Relays and relay drivers on J6
#
splConfig.Io62[0].Opt.Cp.J6_IntRelay1 = ""
splConfig.Io62[0].Opt.Cp.J6_IntRelay2 = ""
splConfig.Io62[0].Opt.Cp.J6_IntRelay3 = ""
splConfig.Io62[0].Opt.Cp.J6_ExtRelay1 = ""
splConfig.Io62[0].Opt.Cp.J6_ExtRelay2 = ""
splConfig.Io62[0].Opt.Cp.J6_ExtRelay3 = ""
splConfig.Io62[0].Opt.Cp.J6_ExtRelay4 = ""
# BNC testpoint monitors
#
splConfig.Io62[0].Opt.Cp.J13_BNC = ""
splConfig.Io62[0].Opt.Cp.J16_BNC = ""
# BNC trigger drivers direct from IO62 PCI card.
# Special signals 'trigger[8:1]' may also be used here.
#
splConfig.Io62[0].Opt.Cp.J14_BNC = "trigger[1]"
splConfig.Io62[0].Opt.Cp.J15_BNC = "trigger[2]"
splConfig.Io62[0].Opt.Cp.J17_BNC = "trigger[3]"
splConfig.Io62[0].Opt.Cp.J18_BNC = "trigger[4]"
# RS232 TTY transmitters from IO62
#
splConfig.Io62[0].Opt.Cp.TTY0_Tx = ""
splConfig.Io62[0].Opt.Cp.TTY1_Tx = ""
# ------------------- IO62 Slot #1 -------------------
#
splConfig.Io62[1].lInUse = 0
# ------------------- IO62 Slot #2 -------------------
#
splConfig.Io62[2].lInUse = 0
....
# <End of softplane definitions>
```

### 2.10.3.3.3 Softplane.conf File: RVP900 Common Panel Example

An example showing RVP900 IFDR related excerpts from the softplane.conf file are shown below:

```
#
#
# Softplane Configuration File
#
# The following general purpose control and status signals:
#
...
# ––––––––––––––––––– RVP9IFD #0 ––––––––––––––––––––
#
# If you change the in–use flag, run 'softplane –resave' to
rev the choices.
#
splConfig.Rvp9[0].lInUse = 1
# The remote backpanel type must be one of the following:
#    Common : Direct connections using the 'Common I/O'
model
#    TDWR : MIT/LL TDWR custom breakout panel and protocols
# If you change this, run 'softplane –resave' to rev the
choices.
#
splConfig.Rvp9[0].sNetPanel = "Common"
# In addition to all of the standard logical signals, the
# following realtime 'live' signals may be assigned to any
# of the RVP9 interface pins under the Common I/O model.
#
# Control Outputs  Status Inputs
# ---------------  -------------
# tgBlanked        tgBlankReq
# trigger[10:1]    tgExtern
# txPolar[2:1]
# txPhase[7:0]
# DAFCser
spl#

splConfig.Rvp9[0].Opt.Comm.ttl[0].pin = ""
splConfig.Rvp9[0].Opt.Comm.ttl[1].pin = ""
splConfig.Rvp9[0].Opt.Comm.ttl[2].pin = ""
splConfig.Rvp9[0].Opt.Comm.ttl[3].pin = ""
splConfig.Rvp9[0].Opt.Comm.ttl[4].pin = ""
splConfig.Rvp9[0].Opt.Comm.ttl[5].pin = ""
splConfig.Rvp9[0].Opt.Comm.ttl[6].pin = ""
splConfig.Rvp9[0].Opt.Comm.ttl[7].pin = ""
splConfig.Rvp9[0].Opt.Comm.ttl[8].pin = ""
splConfig.Rvp9[0].Opt.Comm.ttl[9].pin = ""
splConfig.Rvp9[0].Opt.Comm.ttl[10].pin = ""
splConfig.Rvp9[0].Opt.Comm.ttl[11].pin = ""
splConfig.Rvp9[0].Opt.Comm.ttl[12].pin = ""
splConfig.Rvp9[0].Opt.Comm.ttl[13].pin = ""
splConfig.Rvp9[0].Opt.Comm.ttl[14].pin = ""
splConfig.Rvp9[0].Opt.Comm.ttl[15].pin = ""
splConfig.Rvp9[0].Opt.Comm.ttl[16].pin = ""
splConfig.Rvp9[0].Opt.Comm.ttl[17].pin = ""
splConfig.Rvp9[0].Opt.Comm.ttl[18].pin = ""
```

```
splConfig.Rvp9[0].Opt.Comm.ttl[19].pin = ""
splConfig.Rvp9[0].Opt.Comm.diff[0].pin = ""
splConfig.Rvp9[0].Opt.Comm.diff[1].pin = ""
splConfig.Rvp9[0].Opt.Comm.diff[2].pin = ""
splConfig.Rvp9[0].Opt.Comm.diff[3].pin = ""
splConfig.Rvp9[0].Opt.Comm.diff[4].pin = ""
splConfig.Rvp9[0].Opt.Comm.diff[5].pin = ""
splConfig.Rvp9[0].Opt.Comm.diff[6].pin = ""
splConfig.Rvp9[0].Opt.Comm.diff[7].pin = ""
splConfig.Rvp9[0].Opt.Comm.diff[8].pin = ""
splConfig.Rvp9[0].Opt.Comm.diff[9].pin = ""
splConfig.Rvp9[0].Opt.Comm.diff[10].pin = ""
splConfig.Rvp9[0].Opt.Comm.diff[11].pin = ""
splConfig.Rvp9[0].Opt.Comm.diff[12].pin = ""
splConfig.Rvp9[0].Opt.Comm.diff[13].pin = ""
splConfig.Rvp9[0].Opt.Comm.diff[14].pin = ""
splConfig.Rvp9[0].Opt.Comm.diff[15].pin = ""
splConfig.Rvp9[0].Opt.Comm.diff[16].pin = ""
splConfig.Rvp9[0].Opt.Comm.diff[17].pin = ""
splConfig.Rvp9[0].Opt.Comm.diff[18].pin = ""
splConfig.Rvp9[0].Opt.Comm.diff[19].pin = ""

splConfig.Rvp9[0].Opt.Comm.trig[0].pin = "trigger[1]"
splConfig.Rvp9[0].Opt.Comm.trig[1].pin = "trigger[2]"
# Voltage samples from the six low-speed A/D converters are
# requested here. These produce additional I/O overhead, so
# put a '1' here only if the samples are actually being
used.
#
splConfig.Rvp9[0].Opt.Comm.lInUseADC = 0
```

#### 2.10.3.3.4 Softplane.conf File: RVP900 TDWR Panel Example

An example showing RVP900 IFDR related excerpts from the softplane.conf file are shown below:

```
#
#
# Softplane Configuration File
#
# The following general purpose control and status signals:
#
...
# -------------------- RVP9IFD #0 --------------------
#
# If you change the in-use flag, run 'softplane -resave' to
rev the choices.
#
splConfig.Rvp9[0].lInUse = 1
# The remote backpanel type must be one of the following:
#    Common : Direct connections using the 'Common I/O'
model
```

```
#    TDWR : MIT/LL TDWR custom breakout panel and protocols
# If you change this, run 'softplane –resave' to rev the
choices.
#
splConfig.Rvp9[0].sNetPanel = "TDWR"
```

softplane.conf file: RCP8 example

An example from the beginning and some excerpts from the softplane.conf file are shown below (note that the command "**cat**" causes the file to be listed on a terminal):

```
Softplane
Configuration File
```

```
The following general purpose control and status signals
can be routed to/from any available hardware pin. The '~'
prefix character may be used for signal inversion.
```

| **Control Outputs** | **Status Inputs** |
|---|---|
| cPedAZ[15:0] | sPedAZ[15:0] |
| cPedEL[15:0] | sPedEL[15:0] |
| cEarthAZ[15:0] | sServoPwr |
| cEarthEL[15:0] | sLocal |
| cServoPwr | sStandby |
| cCabinetRelay | sLowerEL |
| cTransmitPwr | sUpperEL |
| cPWidth[3:0] | sTransmitPwr |
| cTrigBlank | sTransmitLocal |
| cRadiateOn | sPWidth[3:0] |
| cRadiateOff | sTrigBlank |
| cReset | sRadiate |
| cIrisMode[2:0] | sAirflowFlt |
| cAux[80:0] | sWavegpFlt |
| true | sInterlockFlt |
| false | sMagCurrentFlt |
| | sReset |
| | sIrisMode[2:0] |

```
sAux[319:0]splConfig.sVersion = "8.00"
# ------------------- IO62 Slot #0 -------------------
#
splConfig.Io62[0].lInUse = 1
```

```
# The remote backpanel type should be one of the following:
# Direct : Direct I/O with IO62 connector itself
# IO62CP : Standard IO62-CP connector panel
# RCP88D : RCP8 portion of WSR88D panel
# RVP88D : RVP8 portion of WSR88D panel
#
splConfig.Io62[0].sExtPanel = "IO62CP"# TTL/CMOS on J1
#
splConfig.Io62[0].Opt.Cp.J1.pin01 = "sPedAZ[0]"
splConfig.Io62[0].Opt.Cp.J1.pin02 = "sPedAZ[1]"
splConfig.Io62[0].Opt.Cp.J1.pin03 = "sPedAZ[2]"
splConfig.Io62[0].Opt.Cp.J1.pin04 = "sPedAZ[3]"
splConfig.Io62[0].Opt.Cp.J1.pin05 = "sPedAZ[4]"
splConfig.Io62[0].Opt.Cp.J1.pin06 = "sPedAZ[5]"
splConfig.Io62[0].Opt.Cp.J1.pin07 = "sPedAZ[6]"
splConfig.Io62[0].Opt.Cp.J1.pin08 = "sPedAZ[7]"
splConfig.Io62[0].Opt.Cp.J1.pin09 = "sPedAZ[8]"
splConfig.Io62[0].Opt.Cp.J1.pin10 = "sPedAZ[9]"
splConfig.Io62[0].Opt.Cp.J1.pin11 = "sPedAZ[10]"
splConfig.Io62[0].Opt.Cp.J1.pin12 = "sPedAZ[11]"
splConfig.Io62[0].Opt.Cp.J1.pin13 = "sPedAZ[12]"
splConfig.Io62[0].Opt.Cp.J1.pin14 = "sPedAZ[13]"
splConfig.Io62[0].Opt.Cp.J1.pin15 = "sPedAZ[14]"
splConfig.Io62[0].Opt.Cp.J1.pin16 = "sPedAZ[15]"
splConfig.Io62[0].Opt.Cp.J1.pin17 = ""
splConfig.Io62[0].Opt.Cp.J1.pin18 = ""
splConfig.Io62[0].Opt.Cp.J1.pin19 = ""
splConfig.Io62[0].Opt.Cp.J1.pin20 = ""# TTL/CMOS on J2
#
splConfig.Io62[0].Opt.Cp.J2.pin01 = "cEarthAZ[0]"
splConfig.Io62[0].Opt.Cp.J2.pin02 = "cEarthAZ[1]"
splConfig.Io62[0].Opt.Cp.J2.pin03 = "cEarthAZ[2]"
. . .
splConfig.Io62[0].Opt.Cp.J2.pin15 = "cEarthAZ[14]"
splConfig.Io62[0].Opt.Cp.J2.pin16 = "cEarthAZ[15]"
splConfig.Io62[0].Opt.Cp.J2.pin17 = ""
splConfig.Io62[0].Opt.Cp.J2.pin18 = ""
splConfig.Io62[0].Opt.Cp.J2.pin19 = ""
splConfig.Io62[0].Opt.Cp.J2.pin20 = ""# TTL/CMOS on J4
#
splConfig.Io62[0].Opt.Cp.J4.pin01 = "sPedEL[0]"
splConfig.Io62[0].Opt.Cp.J4.pin02 = "sPedEL[1]"
splConfig.Io62[0].Opt.Cp.J4.pin03 = "sPedEL[2]"
. . .
splConfig.Io62[0].Opt.Cp.J4.pin15 = "sPedEL[14]"
splConfig.Io62[0].Opt.Cp.J4.pin16 = "sPedEL[15]"
splConfig.Io62[0].Opt.Cp.J4.pin17 = ""
splConfig.Io62[0].Opt.Cp.J4.pin18 = ""
splConfig.Io62[0].Opt.Cp.J4.pin19 = ""
```

```
splConfig.Io62[0].Opt.Cp.J4.pin20 = ""# TTL/CMOS on J5
#
splConfig.Io62[0].Opt.Cp.J5.pin01 = "cEarthEL[0]"
splConfig.Io62[0].Opt.Cp.J5.pin02 = "cEarthEL[1]"
splConfig.Io62[0].Opt.Cp.J5.pin03 = "cEarthEL[2]"
. . .
splConfig.Io62[0].Opt.Cp.J5.pin15 = "cEarthEL[14]"
splConfig.Io62[0].Opt.Cp.J5.pin16 = "cEarthEL[15]"
splConfig.Io62[0].Opt.Cp.J5.pin17 = ""
splConfig.Io62[0].Opt.Cp.J5.pin18 = ""
splConfig.Io62[0].Opt.Cp.J5.pin19 = ""
splConfig.Io62[0].Opt.Cp.J5.pin20 = ""# TTL/CMOS on J7
#
splConfig.Io62[0].Opt.Cp.J7.pin01 = "sAux[0]"
splConfig.Io62[0].Opt.Cp.J7.pin02 = "sAux[1]"
splConfig.Io62[0].Opt.Cp.J7.pin03 = "sAux[2]"
splConfig.Io62[0].Opt.Cp.J7.pin04 = "sAux[3]"
splConfig.Io62[0].Opt.Cp.J7.pin05 = "sAux[4]"
splConfig.Io62[0].Opt.Cp.J7.pin06 = "sAux[5]"
splConfig.Io62[0].Opt.Cp.J7.pin07 = "sAux[6]"
splConfig.Io62[0].Opt.Cp.J7.pin08 = "sAux[7]"
splConfig.Io62[0].Opt.Cp.J7.pin09 = "sAux[8]"
splConfig.Io62[0].Opt.Cp.J7.pin10 = "sAux[9]"
splConfig.Io62[0].Opt.Cp.J7.pin11 = "sAux[10]"
splConfig.Io62[0].Opt.Cp.J7.pin12 = "sAux[11]"
splConfig.Io62[0].Opt.Cp.J7.pin13 = "sAux[12]"
splConfig.Io62[0].Opt.Cp.J7.pin14 = "sAux[13]"
splConfig.Io62[0].Opt.Cp.J7.pin15 = "sAux[14]"
splConfig.Io62[0].Opt.Cp.J7.pin16 = "sAux[15]"
splConfig.Io62[0].Opt.Cp.J7.pin17 = "sAux[16]"
splConfig.Io62[0].Opt.Cp.J7.pin18 = "sAux[17]"
splConfig.Io62[0].Opt.Cp.J7.pin19 = "sAux[18]"
splConfig.Io62[0].Opt.Cp.J7.pin20 = "sAux[19]"
#
# Eight IO62 line pairs on J3
#
splConfig.Io62[0].Opt.Cp.J3_01_14.lRS422 = 0
splConfig.Io62[0].Opt.Cp.J3_01_14.iTerm = 0
splConfig.Io62[0].Opt.Cp.J3_01_14.pinPos = "cPWidth[0]"
splConfig.Io62[0].Opt.Cp.J3_01_14.pinNeg = "cPWidth[1]"
splConfig.Io62[0].Opt.Cp.J3_02_15.lRS422 = 0
splConfig.Io62[0].Opt.Cp.J3_02_15.iTerm = 0
splConfig.Io62[0].Opt.Cp.J3_02_15.pinPos = "cRadiateOn"
splConfig.Io62[0].Opt.Cp.J3_02_15.pinNeg = "cRadiateOff"
splConfig.Io62[0].Opt.Cp.J3_03_16.lRS422 = 0
splConfig.Io62[0].Opt.Cp.J3_03_16.iTerm = 0
splConfig.Io62[0].Opt.Cp.J3_03_16.pinPos = "cServoPwr"
splConfig.Io62[0].Opt.Cp.J3_03_16.pinNeg = "cTransmitPwr"
splConfig.Io62[0].Opt.Cp.J3_04_17.lRS422 = 0
```

```
splConfig.Io62[0].Opt.Cp.J3_04_17.iTerm = 0
splConfig.Io62[0].Opt.Cp.J3_04_17.pinPos = "cReset"
splConfig.Io62[0].Opt.Cp.J3_04_17.pinNeg = ""
splConfig.Io62[0].Opt.Cp.J3_05_18.lRS422 = 0
splConfig.Io62[0].Opt.Cp.J3_05_18.iTerm = 1
splConfig.Io62[0].Opt.Cp.J3_05_18.pinPos = "sPWidth[0]"
splConfig.Io62[0].Opt.Cp.J3_05_18.pinNeg = "sPWidth[1]"
splConfig.Io62[0].Opt.Cp.J3_06_19.lRS422 = 0
splConfig.Io62[0].Opt.Cp.J3_06_19.iTerm = 1
splConfig.Io62[0].Opt.Cp.J3_06_19.pinPos = "sRadiate"
splConfig.Io62[0].Opt.Cp.J3_06_19.pinNeg = ""
splConfig.Io62[0].Opt.Cp.J3_07_20.lRS422 = 0
splConfig.Io62[0].Opt.Cp.J3_07_20.iTerm = 1
splConfig.Io62[0].Opt.Cp.J3_07_20.pinPos = "sServoPwr"
splConfig.Io62[0].Opt.Cp.J3_07_20.pinNeg = "sTransmitPwr"
splConfig.Io62[0].Opt.Cp.J3_08_21.lRS422 = 0
splConfig.Io62[0].Opt.Cp.J3_08_21.iTerm = 1
splConfig.Io62[0].Opt.Cp.J3_08_21.pinPos = "sReset"
splConfig.Io62[0].Opt.Cp.J3_08_21.pinNeg = ""
# Two RS-422 Tx/Rx chips on J3
#
splConfig.Io62[0].Opt.Cp.J3_09_22 = ""
splConfig.Io62[0].Opt.Cp.J3_10_23 = ""
# Seven IO62 line pairs on J9
#
splConfig.Io62[0].Opt.Cp.J9_01_14.lRS422 = 0
splConfig.Io62[0].Opt.Cp.J9_01_14.iTerm = 1
splConfig.Io62[0].Opt.Cp.J9_01_14.pinPos = "sWavegpFlt"
splConfig.Io62[0].Opt.Cp.J9_01_14.pinNeg = "sAirflowFlt"
splConfig.Io62[0].Opt.Cp.J9_02_15.lRS422 = 0
splConfig.Io62[0].Opt.Cp.J9_02_15.iTerm = 1
splConfig.Io62[0].Opt.Cp.J9_02_15.pinPos = "sInterlockFlt"
splConfig.Io62[0].Opt.Cp.J9_02_15.pinNeg = "sMagCurrentFlt"
splConfig.Io62[0].Opt.Cp.J9_03_16.lRS422 = 0
splConfig.Io62[0].Opt.Cp.J9_03_16.iTerm = 1
splConfig.Io62[0].Opt.Cp.J9_03_16.pinPos = "sLocal"
splConfig.Io62[0].Opt.Cp.J9_03_16.pinNeg = "sStandby"
splConfig.Io62[0].Opt.Cp.J9_04_17.lRS422 = 0
splConfig.Io62[0].Opt.Cp.J9_04_17.iTerm = 1
splConfig.Io62[0].Opt.Cp.J9_04_17.pinPos = "sLowerEL"
splConfig.Io62[0].Opt.Cp.J9_04_17.pinNeg = "sUpperEL"
splConfig.Io62[0].Opt.Cp.J9_05_18.lRS422 = 0
splConfig.Io62[0].Opt.Cp.J9_05_18.iTerm = 0
splConfig.Io62[0].Opt.Cp.J9_05_18.pinPos = ""
splConfig.Io62[0].Opt.Cp.J9_05_18.pinNeg = ""
splConfig.Io62[0].Opt.Cp.J9_06_19.lRS422 = 0
splConfig.Io62[0].Opt.Cp.J9_06_19.iTerm = 0
splConfig.Io62[0].Opt.Cp.J9_06_19.pinPos = ""
splConfig.Io62[0].Opt.Cp.J9_06_19.pinNeg = ""
```

```
splConfig.Io62[0].Opt.Cp.J9_07_20.lRS422 = 0
splConfig.Io62[0].Opt.Cp.J9_07_20.iTerm = 0
splConfig.Io62[0].Opt.Cp.J9_07_20.pinPos = ""
splConfig.Io62[0].Opt.Cp.J9_07_20.pinNeg = ""
# Relays and relay drivers on J6
#
splConfig.Io62[0].Opt.Cp.J6_IntRelay1 = "cPWidth[0]"
splConfig.Io62[0].Opt.Cp.J6_IntRelay2 = "cPWidth[1]"
splConfig.Io62[0].Opt.Cp.J6_IntRelay3 = ""
splConfig.Io62[0].Opt.Cp.J6_ExtRelay1 = ""
splConfig.Io62[0].Opt.Cp.J6_ExtRelay2 = ""
splConfig.Io62[0].Opt.Cp.J6_ExtRelay3 = ""
splConfig.Io62[0].Opt.Cp.J6_ExtRelay4 = ""
# BNC testpoint monitors
#
splConfig.Io62[0].Opt.Cp.J13_BNC = ""
splConfig.Io62[0].Opt.Cp.J16_BNC = ""
# BNC trigger drivers direct from IO62 PCI card.
# Special signals 'trigger[8:1]' may also be used here.
#
splConfig.Io62[0].Opt.Cp.J14_BNC = ""
splConfig.Io62[0].Opt.Cp.J15_BNC = ""
splConfig.Io62[0].Opt.Cp.J17_BNC = ""
splConfig.Io62[0].Opt.Cp.J18_BNC = ""
# RS232 TTY transmitters/Receivers from IO62
#
splConfig.Io62[0].Opt.Cp.TTY0_Tx = ""
splConfig.Io62[0].Opt.Cp.TTY1_Tx = ""
splConfig.Io62[0].Opt.Cp.TTY0_Rx = ""
splConfig.Io62[0].Opt.Cp.TTY1_Rx = ""
# ------------------- IO62 Slot #1 -------------------
#
splConfig.Io62[1].lInUse = 0
# ------------------- IO62 Slot #2 -------------------
#
splConfig.Io62[2].lInUse = 0
# ------------------ IO62 Slot #3 -------------------
#
splConfig.Io62[3].lInUse = 0
```

### 2.10.3.3.5 Softplane. conf Organization and Syntax

The softplane.conf file is used to define every I/O pin on every connector, on the PCI cards themselves and on the connector panel. There are two primary definitions that are made for each pin:

- **Physical Interface—** the electrical properties (RS422 output, analog input, TTL output, etc.).

- **Logical Interface**-—the internal variable name that is associated with each pin.

The syntax of the file is:

- "#" at the beginning of a line indicates a comment. These are used for internal documentation and if you make changes you should comment them, for example:

```
# TTL I/O on J7
#
# Modification by REP on 2 Apr 03
# Added new interlock input on connector panel J7 pin07
...
```

- The top part of the file provides a list of internal variables names that are used to define the logical interface to the softplane. These are divided into status inputs (also called indicators) and control outputs (also called requests). For example, sPedAZ0 corresponds to the LSB of a digital azimuth angle relative to the antenna pedestal. The tables on the next page provide a summary of the available status and control variable names.

| **NOTE** | Important: This table is subject to change |
|---|---|

- Each definition line in the file starts with the keyword text:

```
# splConfig...
```

- The first un-commented line of the file indicates the version of the IRIS support software that was last used to machine–generate the file. This is an information only field for traceability purposes and is thus not edited. In the example we have this shown as:

```
# splConfig.sVersion = "7.32"
```

In any event, on the TTL connectors (J1, J2, J4, J5, J7) each of these connectors must be exclusively used for INPUT (s vars) or OUTPUT (c vars). You can not mix these on an individual connector.

**Table 4 Summary of softplane.conf Status and Control Bits**

| Control Output | Meaning/Interpretation |
|---|---|
| `cPedAZ[15:0]` | 16 bits of antenna azimuth angle relative to the pedestal (fixed base system) |
| `cPedEL[15:0]` | 16 bits of antenna elevation angle relative to the pedestal (fixed base system) |
| `cEarthAZ[15:0]` | 16 bits of antenna azimuth angle relative to the earth (moving platform) |
| `cEarthEL[15:0]` | 16 bits of antenna elevation angle relative to the earth (moving platform) |
| `cServoPwr` | To control servo power on |
| `cCabinetRelay` | To control a relay signal |
| `cTransmitPwr` | Request transmit power on |
| `cPWidth[3:0]` | Request one of four pulse widths |
| `cTrigBlank` | Trigger blanking signal |
| `cRadiateOn` | Request radiate on |
| `cRadiateOff` | Request for radiate off |
| `cReset` | Request a reset of external equipment |
| `cIrisMode[2:0]` | Request the application software (e.g., IRIS) to switch to 1 of 8 operating modes. |
| `cAux[63:0]` | Arbitrarily assigned output requests |
| `true` | Internal logic variable |
| `false` | Internal logic variable |

| Status Input | Meaning/Interpretation |
|---|---|
| `sPedAZ[15:0]` | 16 bits of antenna azimuth angle relative to the pedestal (fixed base system) |
| `sPedEL[15:0]` | 16 bits of antenna elevation angle relative to the pedestal (fixed base system) |
| `sServoPwr` | Servo power on indicator |
| `sLocal` | Antenna local mode indicator, usually tied to an external local/remote switch. |
| `sStandby` | Radar ready to radiate indicator |
| `sLowerEL` | Lower limit switch indicator |
| `sUpperEL` | Upper limit switch indicator |

| Status Input | Meaning/Interpretation |
|---|---|
| sTransmitPwr | Transmitter cabinet power on indicator |
| sTransmitLocal | Transmitter local mode indicator, usually tied to an external local/remote switch. |
| sPWidth[3:0] | Indicator of the current pulse width |
| sTrigBlank | Indicator that trigger blanking is requested, usually from an external source. |
| sRadiate | Radiate on indicator |
| sAirflowFlt | Cooling airflow fault indicator |
| sWavegpFlt | Wave guide pressure fault indicator |
| sInterlockFlt | Master interlock fault indicator |
| sMagCurrentFlt | Transmitter overload fault indicator |
| sReset | Request for reset coming from external source |
| sIrisMode[2:0] | Information on which operating mode is active in the application software |
| sAux[319:0] | Arbitrary status indicators |

- Next, each piece of hardware is identified as being either in use or not in use.

  ```
  splConfig.Io62[0].InUse = 1 if in use
  splConfig.Io62[0].InUse = 0 if unused or not installed
  ```

  Currently, the I/O-62 is the only I/O device supported by the softplane.

- The method of connecting to the I/O-62 is specified next, for example:

  ```
  splConfig.Io62[0].sExtPanel = "DIRECT"
  ```

  Currently, the options are:

| Type of Connection | softplane Descriptor |
|---|---|
| Direct connect to I/O-62 via 62 pin connector | DIRECT |
| I/O-62 Connector Panel (used for RVP8 and RCP8) | IO62CP |
| WSR88D connector panel, RVP8 portion | RVP88D |
| WSR88D connector panel, RCP8 portion | RCP88D |

- The assignments for each connector and each pin are then made. For convenience, these are usually grouped together by connector. For

example let's say that, Pin 1 of connector J1 on the I/O-62 connector panel is assigned to be the LSB of the input azimuth angle, i.e.,

```
# TTL/CMOS on J1
#
splConfig.Io62[0].Opt.Cp.J1.pin01 = "sPedAZ[0]"
...
```

- The notation "" indicates that no assignment is made.

  ```
  # BNC testpoint monitors
  #
  splConfig.Io62[0].Opt.Cp.J13_BNC = ""
  ```

  In the example above the "pin name" is J13_BNC.

- Putting a ~ in front of a logic variable inverts the variable.

  ```
  splConfig.Io62[0].Opt.Cp.J1.pin03 = "~sPedAZ[2]"
  ```

Check in the */usr/sigmet/config_template/init* directory for other examples of softplane configurations.

# 2.11 Testing, Backup, and Calibration

After software installation and before calibration, it is possible to check performance and detect errors in the installation. If DSP calibrations are off, radar data may not be available.

## 2.11.1 Ascope Test (RVP8 Installations ONLY)

Run the ascope utility by typing `ascope`. This serves as an overall test of the signal processor. See the I*RIS and RDA Utilities Manual* for details. If the displayed PRF does not match what is requested, the processor type may be set incorrectly. Be careful with high PRFs because the pulse width control may not be working yet.

### 2.11.2 Antenna Test (RCP Installations ONLY)

Run the Antenna utility by typing `antenna`. It should be able to control the position and speed of the antenna as documented in the *Utilities Manual*.

### 2.11.3 IRIS Test (IRIS systems ONLY)

As a final test, run IRIS and schedule a simple task that moves the antenna, runs the signal processor, and generates a PPI product. Be sure to check for messages in the message menu. Normal startup should produce no messages.

### 2.11.4 Print Special Files

Because every system is customized on installation, it is desirable to save the work that was done at installation time, in case it needs to be repeated. Our recommendation is to print the Setup listing file generated by the `all` command.

### 2.11.5 Make a Full Backup

You should backup your system on a regular basis. This is the only way to restore your disk if data are lost. For HP systems follow the system backup procedures recommended by these manufacturers. In addition, the sigbru utility can be used for auxiliary backup. Linux customers can use the backup procedure recommended by Red Hat or can use the sigbru utility for complete backup and restore. Sigbru is described in Appendix E, sigbru Utility, on page 135.

### 2.11.6 DSP Calibration (RVP Installations ONLY)

Below is a list of the calibrations for the signal processor in the suggested order. Next to each is the name of the utility program that can help perform the calibration. How to perform each calibration is described in the *IRIS/RDA Utilities Manual*.

- Calibration of Reflectivity. (zauto)
- Calibration of the dual-pol LDR Offset. (suncal)
- Calibration of the dual-pol ZDR Offset. (zdrcal)

CHAPTER 3

# UNIX SURVIVAL SKILLS

This chapter describes how to configure your UNIX system for running IRIS.

## 3.1 Running IRIS Utilities from a Remote Node

IRIS systems running on one node can run utilities from another node if the systems are set up properly. This is useful, for example, if you are doing diagnostics and need to run an IRIS utility on a remote system. You can log onto the remote system across the network and display the product output on your local workstation, as follows:

1. Enter the following command on your workstation to allow other nodes to display windows on it:

   ```
   $ xhost +
   ```

   This command must be entered by someone logged on directly to the system (not by someone who has done a remote login), and the command cannot be run from a login file. If this is impractical, create a file called */etc/X0.hosts* on the system. In the file, list the names of each of the nodes on the network that should be given access to the display of the system. For example, in a network consisting of three nodes "host", "prod", an "ws1", *etc/X0.hosts* would contain the following three entries:

   ```
   host
   prod
   ws1
   ```

   When the *etc/X0.hosts* file is present on a workstation, all nodes in the list are authorized to display windows on that workstation at any time. There is a bug in HPUX 10.20 which causes it to miss it's own node name from this file.

Under CDE, you can also configure this with a file in the */etc/td/config/Xsession.d* directory. Place commands like "xhost +host" in a file called 090xhost in this directory, set protection to 555, owner and group to bin. For just one user, place the command in the file *~/.dt/config/sessions/sessionetc.*

2. From the local workstation, log on to the remote system and set the display to the local workstation. For example, to log onto the `host` system from `prod`, type the following commands from the `prod system:`

   ```
   $ rlogin host
   $ DISPLAY=prod:0.0
   $ export $DISPLAY
   ```

3. Run the IRIS utility from the remote system. All output from the utility is displayed on the local workstation

4. When you are done, exit from the utility, then log off of the remote system.

# 3.2 Managing an IRIS System

This section describes some commands provided by the UNIX operating system that you may find helpful in managing the IRIS system after it is installed. IRIS provides some commands for system management purposes, as well. These commands, described in Chapter 4, IRIS Diagnostic Utilities on page 73, are the same across all platforms.

## 3.2.1 Checking the IRIS Environment

If you have questions about the environment variables that are defined for your session, use the `env` and `grep` commands, as follows:

```
$ env | grep IRIS | sort
IRIS_ANTSIM=/dev/tty01
IRIS_APP_DEFAULTS=/usr/sigmet/bin/app-defaults/
IRIS_BIN=/usr/sigmet/bin/
IRIS_BIN_ACROBAT=/usr/sigmet/acrobat/bin/
IRIS_BITMAPS=/usr/sigmet/dt/icons/
IRIS_CONFIG=/usr/sigmet/config/
```

```
IRIS_DICTIONARY=/usr/sigmet/config/dict/

IRIS_INGEST=/usr/iris_data/ingest/

IRIS_INIT=/usr/sigmet/config/init/

IRIS_KEYS=/usr/sigmet/bin/keys/

IRIS_LOG=/usr/iris_data/log/

IRIS_MANUALS_INST=
/usr/sigjoe/manuals/IrisInstall.ilcab/instapdf/install/

IRIS_MANUALS_IRIS=
/usr/sigjoe/manuals/IrisUsers.ilcab/irisupdf/irisug/

IRIS_MANUALS_NOTE=
/usr/sigjoe/manuals/relnotes.ilcab/relnopdf/relnotes/

IRIS_MANUALS_PROG=
/usr/sigjoe/manuals/IrisProgram.ilcab/irisppdf/program/

IRIS_MANUALS_RCP02=
/usr/sigjoe/manuals/rcp02_ug.ilcab/rcp02pdf/rcp02/

IRIS_MANUALS_RVP6=
/usr/sigjoe/manuals/rvp6_ug.ilcab/rvp6updf/rvp6user/

IRIS_MANUALS_RVP7=
/usr/sigjoe/manuals/rvp7_ug.ilcab/rvp7updf/rvp7user/

IRIS_MANUALS_RXNET7=
/usr/sigjoe/manuals/rxnet7.ilcab/rxnetpdf/rxnet7/

IRIS_MANUALS_UTIL=
/usr/sigjoe/manuals/IrisUtils.ilcab/irisupdf/irisutl/

IRIS_MENU=/usr/sigmet/config/menu/

IRIS_NETRCV=TCPIP 30725

IRIS_NLS=/usr/sigmet/bin/nls/C/

IRIS_OBSERVERS=observer

IRIS_OPERATORS=joe alan doug operator rich

IRIS_OVERLAY=/usr/sigmet/config/overlay/

IRIS_PIPES=/usr/sigmet/config/pipes/

IRIS_PRODUCT=/usr/iris_data/product/

IRIS_PRODUCT_RAW=/usr/iris_data/product_raw/

IRIS_ROOT=/usr/sigmet
```

```
IRIS_SCRIPT=/usr/sigjoe/script/

IRIS_SOUNDS=/usr/sigjoe/dt/sounds/

IRIS_TAPE_INV=/usr/iris_data/tape_inv/

IRIS_TEMP=/usr/iris_data/temp/
```

Together, these commands return all the environment variables containing the string "IRIS." If you have some question whether your definitions are correct, compare the results of this command to the definitions in the file */config/profile*.

## 3.2.2 Reporting the Free Blocks on a Disk

IRIS is always gathering data, producing many ingest and product files. When there is not enough space for the new data coming in, the Watchdog process makes room for it, deleting the oldest files first. You need to make sure there is enough space allocated on the disk partition to hold at least three volume scans for the periodic configuration that IRIS is running.

The `df` command returns the number of free 512-byte blocks and free inodes available on each mounted disk, including disks mounted over the network. This command can tell you whether enough space is available for your data. For more information on these commands, type `man df`.

## 3.2.3 File Ownership and Protection

Sometimes there are problems after an installation with access to some of the SIGMET files. Typically, this is evidenced by an error message saying that the user does not have privilege to do an operation. This can happen when starting a program or when calibration files are accessed. If you should have this problem, log in as `root` and run the `install_iris` script as shown below:

```
# install_iris –setown
```

This procedure goes through the */usr/sigmet* directory tree, changing the owner of all files to `operator` and setting the protection, as follows:

- Directories: `rwxrwxr–x`
- All files, except executable files: `rw–rw–r––`
- Executable files: `rwsrwsr–x`

Always use `install_iris -setown` to fix the protection of your IRIS files. Do not try to change the protection of these files with the `chown` command.

# 3.3 Command Summary

Here is the location of the system log file:

HP-UXs: */var/adm/syslog/syslog.log*

Linux: */var/log/messages*

**Table 1 UNIX Commands**

| Command | HP-UX | Linux |
|---|---|---|
| Display status of interprocess communication. | `ipcs` | `ipcs` |
| Remove a message queue, semaphore set, or shared memory ID. | `ipcrm` | `ipcrm` |
| Scan the I/O system and report the hardware that is found. | `ioscan` | `-` |
| Display information about system swap space. | `swapinfo -t` | `top` |
| Report the number of free disk blocks. | `df` | `df` |
| Display on-line help for UNIX commands. | `man` | `man,...` |
| Backup/restore files from tape. | `tar` | `tar` |
| Configure network interface parameters. | `ifconfig` | `ifconfig` |
| Show network status. | `netstat` | `netstat` |
| List all clients with remotely mounted disks. | `showmount` | `showmount` |

**Table 1 UNIX Commands (Continued)**

| Command | HP-UX | Linux |
|---|---|---|
| List all exported directories, or update the list. | `exportfs`<br>`exportfs –a` | `exportfs`<br>`exportfs –a` |
| Mount an NFS directory | `mount` | `mount` |
| List all mounted directories. | `mount –p` | `mount –p` |
| Display NFS statistics. | `nfsstat` | – |
| Verify network connections. | `ping` | `ping` |

# 3.4 Linux Issues

## 3.4.1 Backup Procedure

SIGMET supplies a backup/restore utility called "sigbru" for Linux systems. This is described in Appendix E, sigbru Utility, on page 135.

## 3.4.2 Time & Date

Here is a basic summary of how some of the time related programs work:

- **date—**Just sets and displays the currently running date. The hardware clocke is not changed.
- **hwclock—**Just sets and displays the current hardware clock. The current system time is not changed.
- **redhat–config–time—**Interactive GUI to set both the time and timezone. Sets both the current date and the hardware clock. IRIS can always be configured to record using UTC. If you wish to set the local time on the computer to UTC, see Appendix A, Installing CentOS5 on page 103. You should never record using a timezone which switches to summer time.
- **timeconfig—**This program sets the time zone. Appears to be just a link to the text version of the **redhat–config–time** timezone submenu.

- **/etc/localtime—**This file is a symbolic link to a file containing the time zone information. The time zone definition files are usually kept in */usr/share/zoneinfo*. Do not be surprised if this is a copy, not a link to one of those files. If the TZ environment variable is defined, it will override the system default. This file is configured by **timeconfig**.
- **tzselect —**This program helps you select the name of the time zone you want. It does not change the computer's setting.
- **rdate—**Gets the date from a remote system. Can optionally set it also. SIGMET recommends that you use ntpdate for this purpose.

## 3.4.3 LINUX for Experienced Users of Other OS

In this chapter, you can learn to avoid some of the usual traps when you start to use Linux after another OS.

In Linux files, the byte order is swapped compared to HP Unix (but similar to VMS). That means you can't transfer binary files from Linux to Unix, and also you have to set the byte order in RVP7 if you change your radar computer from Linux to Unix. In the newest version, setup files are ASCII so you can copy them.

### 3.4.3.1 Unix to Linux

Linux is a unix, more or less. But now you are working with a PC so you have to mount and unmount disks (such as CD-ROM and floppy) more often than in the world of bigger machines. Remember to `umount /mnt/cdrom` before hitting the button in the drive.

### 3.4.3.2 DOS to Linux

It's rather different. Get a good book to learn the basics or follow the instructions in this manual very carefully. Remember that for Linux it matters if words are UPPERCASE or lowercase, and it doesn't really matter if filenames end with extension or not.

## 3.4.4 Red Hat Configuration Utilities

The following list provides a brief description about graphical user interface (GUI) configuration utilities that must be run from within a windowed Linux environment as root:

- **redhat–config–date—**A GUI for modifying system date and time
- **redhat–config–httpd—**Apache configuration tool
- **redhat–config–keyboard—**A GUI for modifying the keyboard
- **redhat–config–language—**A GUI for modifying the system language
- **redhat–config–mouse—**A GUI for configuring mice
- **redhat–config–network—**The Network Administration Tool for Red Hat Linux
- **redhat–config–nfs—**NFS server configuration tool
- **redhat–config–packages—**Package manager for RedHat
- **redhat–config–printer—**A printer configuration backend/frontend combination
- **redhat–config–printer–gui—**A GUI frontend for printconf
- **redhat–config–proc—**A configuration tool for operating system tunable parameters
- **redhat–config–rootpassword—**A GUI for modifying the root password
- **redhat–config–securitylevel—**A GUI for modifying the system security level
- **redhat–config–services—A**n initscript and xinetd utility
- **redhat–config–soundcard—**A GUI for detecting and configuring sound cards
- **redhat–config–users—**A GUI for administering users and groups
- **redhat–config–xfree86—**A GUI for configuring XFree86

CHAPTER 4

# IRIS DIAGNOSTIC UTILITIES

IRIS supplies a number of commands that can help with system management and troubleshooting.

## 4.1 sigmet_env Command

This program tests many things which could cause problems with an IRIS installation. If you suspect problems, please run this (logged in as the normal IRIS user), and check the results. The following are checked:

- Checks that all the IRIS operators and observers are in the /etc/users file.
- Checks that all IRIS environment variables which point to directories are defined and the directory exists, and the directory can be read and written as required.
- Checks for some obvious bad file names in the saved menu directory.
- Checks that IRIS executable files which require the "set–UID–on–execute" bit set are setup with the correct UID.
- Checks the RDA (RVP8/RCP8) environment as well.

Here is an example, 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
```

# 4.2 ps_iris Command

The `ps_iris` command lists all the currently active IRIS, antenna, and utility processes, including information about their owner UID, PID, time start time, and total CPU time.

Use this command to determine what IRIS processes are running on the system and when they were started. You can use the PID as an argument to the `kill` command if you need to stop a process.

```
$ ps_iris
```

IRIS Activity on `'humid.sigmet.com'` at: Wed Dec 4 16:38:50 EST 1996 Detached Processes:

```
UID       PID     PPID     C        STIME     TTY      TIME     COMMAND
operator  26705   1        0        15:34:56  ttyp6    0:00     ingfio
                                                                IRIS_IN
                                                                GFIO
operator  26709   1        0        15:34:57  ttyp6    0:00     server
                                                                IRIS_SE
                                                                RVER
operator  26713   1        0        15:34:59  ttyp6    0:00     output
                                                                IRIS_OU
                                                                TPUT13
operator  26718   26706    0        15:36:27  ttyp6    0:00     network
                                                                IRIS_NE
                                                                TWORK
operator  26714   26711    0        15:34:59  ttyp6    0:00     window
                                                                IRIS_WI
                                                                NDOW1
operator  26710   1        0        15:34:58  ttyp6    0:00     watchdo
                                                                g
                                                                IRIS_WA
                                                                TCHDOG
```

```
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      TIME     COMMAND
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
```

# 4.3 restart_iris Command

The `restart_iris` command runs through all the IRIS host processes and checks to see if they are still running. If any have stopped (usually due to a fatal error), it restarts them. Because of the automatic restarting feature, this utility is useful mainly for restarting processes after manually killing them for debugging purposes.

It takes the following command line options:

- `-colors`—Reload color setup information
- `-restart`—Restart all IRIS processes (default, if no other args)
- `-resurrect`—Only restart from fatal internal errors
- `-rescan`—Rescan file system for new PRODUCT files
- `-silent`—Do not print informational messages

Note that the IRIS automatic restarting feature runs "`restart_iris -resurrect -silent`".Use of the `-rescan` option is for diagnostic purposes only. Once you have a working configuration, please run **qiris** and **siris** to make sure everything is OK.

```
$ restart_iris

Restarting all IRIS processes...

 IRIS_INGEST         OK.
 IRIS_INGFIO         OK.
 IRIS_RTD_XMT        OK.
 IRIS_NETWORK        0K.
 IRIS_NORDRAD        OK.
 IRIS_PRODUCT        OK.
 IRIS_REINGEST       OK.
 IRIS_SERVER         OK.
 IRIS_WATCHDOG       OK.
 IRIS_OUTPUT01       Restarted.
 IRIS_OUTPUT02       OK.
 IRIS_OUTPUT03       OK.
 IRIS_OUTPUT04       OK.
 IRIS_ARCHIVE1       OK.
 IRIS_ARCHIVE2       OK.
 IRIS_OUTPUT07       OK.
 IRIS_OUTPUT08       OK.
```

# 4.4 show_iris Command

The `show_iris` command gives information about the IRIS process—when it was started, the present state of semaphores and event flags, plus the current inventory of in-use products.

The show_iris command also provides some usefule command line options for in–use bits. Type show_iris –help to learn more.

```
$ 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:    Process Modes:
 FREE (ID: 5833)     FREE (ID: 5826)
 Task Schedule:      Product Schedule:
 FREE (ID: 5834)     FREE (ID: 5831)
 Ingest Directory:   Product Directory:
 FREE (ID: 5831)     FREE (ID: 5849)
 Device Table: FREE  Mode Switch Table:
 (ID: 5852)          FREE (ID: 5834)
 Archive Directory:  Error Log: FREE
 FREE (ID: 5834)     (ID: 5834)


Present states of Event Flags...

 RTDISP: CLEAR    INGEST: CLEAR
 INGFIO: CLEAR    INGFIO Mapping:
                  SET
 INGFIO Waiting:  WATCHDOG: CLEAR
 SET
 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 | 1 | 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 |

# 4.5 structmap Command

The `structmap` command displays the format of IRIS structures. This is useful for programmers writing applications that access IRIS data. You must install IRIS with the `–headers` option to make `structmap` available on your system.

`structmap` can take several options, producing different results. To display the list of 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 |

```
E.G., "structmap 'structmap –scan'" displays everything
```

When you invoke `structmap` with the name of a structure, it displays the name of the include file where the structure is defined and a description of each element of the structure—its offset from the beginning of the

structure, its size, the number of times it occurs, its data type, and name. For example, `structmap` returns the following 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 | | | |

structmap shows that the structure is defined in */iris/include/output.h* and contains the following elements:

- `hdr` is a structure of type `structure_header`, taking up the first 12 bytes.
- `stape_id` and `sitename` are arrays of 16 characters each, at offsets 12 and 28.
- `init_time` is a `ymds_time` structure, taking up 12 bytes starting at offset 44.
- `idrive` is a long integer at offset 56.
- `ipad58x2`, `sversion`, and `ipad_end` are arrays of 2, 8 and 252 characters,at offsets 58, 60, and 68, respectively.

The total size of the structure is 320 bytes.

When you invoke `structmap` with the `-scan` option, it lists the names of all the structure defined by IRIS.

```
$ structmap -scan

ant_manual_setup
```

```
bitex_field_def

bitex_top_def

cappi_psi_struct

.

.

.
```

You can also use the `-scan` option to recursively call `structmap` and display the format of all the structures in the system. The following command takes this output and redirects it to a file:

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

APPENDIX A

# INSTALLING CENTOS5

## A.1 Overview

This installation manual provides instructions on how to properly install and configure CentOS5 for the Vaisala (IRIS & RDA) application software. We recommend that you completely read through this appendix if you are about to install the Linux OS and the Vaisala application software for the first time. If you wish to install on CentOS6, see Appendix B, Installing CentOS6 on page 113.

### A.1.1 Desktop Variants and Installation Number

Unfortunately, CentOS supplies multiple variants of their CentOS5. You should purchase the "CentOS Enterprise Desktop with Workstation option". There are 4 varients of features: Plain, "Multi-OS", "Workstation", and "Workstation and Multi-OS". There are also 2 variants of support, "Basic" and "Standard". We recommend the "Workstation with Basic Subscription". This comes with an installation number which is required as part of the installation process, and which will enable installing more required features from the media. Be sure to get your installation number, which is supplied separately from the media.

For more information and a more in-depth discussion of the installation process, please refer to the CentOS Installation Guide which can be found on the Documentation CD of your CentOS Desktop CDs.

| **NOTE** | During this process it is critical to take notes so that you can properly reuse this information during the post installation modifications. |
|---|---|

# A.2 Installation Overview

Vaisala supports two types of installation methods:

- Automatic
- Manual

The **automatic** installation method uses bootable scripts located on special Install CDs available from Vaisala. The install CDROM is specific to a particular OS version, see our ftp site (ftp.sigmet.vaisala.com:/outgoing/releases/install) for the current list. If you wish to install a different version, use the manual method, or contact us. After installing the OS, you can separately install IRIS from the IRIS/RDA install media. While some manual steps are still required after this automatic procedure, the time necessary to complete an IRIS/RDA installation on a new computer system is drastically reduced.

The **manual** installation method is documented here as an alternative in the event that there is a problem with the automatic installation, or if you wish to install a different version of the OS. It is written for an CentOS5 installation. There will be differences with other versions, so some operator flexibility will then be required.

## A.2.1 Using This Manual

The instructional sections of this manual use the following format:

- **Screen** "Title"
- **Action:** What to do

The Screen Title indicates what you will see on the installation wizard screen. In some cases we include a screen capture. The action explains what you should do.

| **NOTE** | Use the Tab key to move between different fields/options on the screen and the space bar to select check boxes. |
|---|---|

## A.2.2 Types of 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 CD-ROM (set of 4) or the single DVD-ROM labeled "32 bit Installation", or a file accessible over the network (via NFS or FTP). Vaisala recommends a CD-ROM or DVD-ROM based installation and this is the only type of installation that will be covered in this manual. For more information refer to the CentOS Installation Guide. Vaisala's IRIS/RDA release CD-ROM contains all of the necessary files for an NFS installation, which easily scales when the number of systems increases above two or three.

## A.2.3 Installation Preparation

You have a choice or using the CentOS5 CDROM set (5 disks) or single DVD depending on whether you have a CD drive or a DVD drive available on your system. Verify that you can boot from a CDROM or DVD by powering off your computer system, inserting the Vaisala IRIS/RDA CDROM, the CentOS CDROM labeled CD 1 or the CentOS DVD (32-bit version) into the appropriate drive and then powering on your computer.

- **If a Linux screen is displayed on your screen continue to** "Sigconfig" on page 86 **for the automatic installation procedure or** "Manual Installation" on page 87 **for the manual procedure.**
- If **a Linux screen was not displayed** on your computer then continue with this section. When the computer is booting, a message will be displayed to "Press **DEL** to enter SETUP" (or some other key to enter setup).

Here is what to check: In the BIOS Features Setup, set the boot sequence to be "CD, A, C". Finally, save your changes by pressing the **F10** key. The system will reboot.

# A.3 Sigconfig

**NOTE** From 8.13.3 release on, sigconfig installation script use yum instead of rpm command to install extras RPMs during initial IRIS installation. The command line is the same as before and there is no need from user interaction. Yum is the tool that makes it easy to handle rpm dependency issue when installing extras RPMs.

Once the operating system installation is complete, Vaisala provides a script that performs all of the necessary post OS installation steps and installs the Vaisala software called **sigconfig**. **Sigconfig** works for either CentOS5 or CentOS6.

1. Login as root with a password of "**xxxxxxxx**" (8 x).
2. Insert the IRIS/RDA release CD into the CD-ROM. It automounts to directory */media/irisrda_x.x.x*, where *x.x.x* is the IRIS release version number. **Sigconfig** is now using yum to install extras rpm packages.

   It may be necessary to correct the mount point in order for yum to work. If the system did not automount the DVD, you will need to mount it manually.

To mount IRIS DVD disc manually, you have to create directory:

```
#mkdir -p /media/irisrda_x.x.x
```

where `x.x.x` is the IRIS version. For example, if the IRIS version is 8.13.3, the directory would be */media/irisrda_8.13.3*.

```
# mount /dev/cdrom  /media/irisrda_8.13.3
```

or

```
# mount /dev/dvd /media/irisrda_8.13.3
```

To run the sigconfig script:

```
# cd  /media/irisrda_8.13.3
sigconfig [arg1 arg2 arg3 argn} <cr>
```

If you need to know command line arguments, type `sigconfig <cr>` and the help menu displays a list of the command line arguments.

For IRIS only on CentOS5:

```
# ./sigconfig -iris -6
```

For RCP8 on CentOS5:

```
# ./sigconfig -rcp8  -6
```

For dual system on CentOS5:

```
#./sigconfig  -rvp900 -rcp8 -iris -6
```

If you want to install individual rpm package from the *extras/RPMS* directory, type:

```
# yum install <rpm package>
```

Yum resolves any required dependencies. In the past we use rpm command and we have issues with dependencies when installing rpm packages.

# A.4 Manual Installation

Manual installation is typically used to install Linux and IRIS onto workstations that are not provided by Vaisala, that is, not RVP8 or RCP8 hardware. Note that the automatic procedure should always be used for RVP8 and RCP8 systems. The manual procedure described here can still take advantage of our automated post OS installation script (**sigconfig**) to perform system configuration functions.

## A.4.1 Install CentOS5

If you have not already done so, place the CentOS CDROM #1 or the DVD (labeled in small letters "32 bit Installation") into the appropriate drive and reboot your computer. At the first prompt screen, select the "graphical mode" installation by pressing the **Enter** key. Then follow the instructions below.

## A.4.2 CentOS5

**Purpose**: Splash Screen

**Action**: Click **Next**.

## A.4.3 Installation Language

**Purpose**: Select the installation language.

**Action**: Select your favorite language, then click **Next**.

## A.4.4 Keyboard Selection

**Purpose**: Select the keyboard type that you have purchased.

**Action**: For most systems choose **U.S. English** then click **Next**.

## A.4.5 Upgrade/Install Choice

**Purpose**: If an installation is detected, then you can choose whether to upgrade or do a "fresh installation". Here we assume that you will be doing a "fresh installation". This is often the safest thing to do.

**Important**: Before you proceed, be sure that you have backed up any critical files. The **sigbru** utility, if installed, can be used for this. See Appendix G sigbru Utility on page 371 of this manual.

**Action**: Select **Install CentOS Client** and click **Next**.

## A.4.6 Disk Partitioning Setup

**Action**: Select **Remove all partitions on selected drives and create default layout** and click **Next**. If you are going to record time series, we recommend that you create a separate partition for that purpose.

## A.4.7 Network Devices

**Purpose**: Set basic network configuration. You can do this later, but if you know the information you might as well do it now. You will need to consult with your network manager to get the information. An example is shown here:

**Actions**:

1. Select **Edit Network Devices**. In the **Edit Interface eth0** menu:

a. Clear **Configure using DHCP**.

b. Select **Enable IPv4 support**.

c. Select **Activate on boot**.

d. Clear **Enable IPv6 support**.

e. IPv4 Address: for example, *192.168.76.51*

f. Net Mask: for example, *255.255.255.0*

2. Hostname: Select **manually** and enter a host name provided by your network manager (for example, *iris-test.sigmet.com*).
3. Miscellaneous Settings: per requirements of network manager.

## A.4.8 Time Zone

**Actions**:

1. Select the nearest city in your time zone.
2. Select **System clock uses UTC**
3. Select: **Next**.

## A.4.9 Set Root Password

**Action**: Enter the password for root (twice) and then click **Next**. The default Vaisala root password is "xxxxxxxx" (8 x).

## A.4.10 Software Selection

**Action**: Check MultiMedia, Office, Software Development, no Virtualization. **Select Customize Now** and click **Next**.

## A.4.11 Package Group Selection

**Purpose**: Select the packages to install (☑) or not to install (☐). In some cases you will need to look at the “Optional packages” to select or clear specific packages. Text in **bold** indicates changes from the defaults.

**Desktop Environments**

☑ GNOME Desktop Environment

☑ KDE (K Desktop Environment)

**Applications**

☑ Authoring and Publishing

☐ Eclipse

☑ Editors

Optional Packages: Accept defaults, and also select emacs & emacs_nox

☑ Engineering and Scientific

Optional Packages: Accept defaults, and also select lapack

☑ Games and Entertainment

☑ Graphical Internet

☑ Graphics

☑ Office/Productivity

☑ Sound and Video

☐ Text–Based Internet

**Development**

☑ Development Libraries

☑ Development Tools

☑ GNOME Software Development

☑ Java Development

☐ KDE Software Development

☑ Legacy Software Development

☐ Ruby

☑ X Software Development

Optional Packages: Accept defaults, turn on openmotif–devel

**Servers**

☐ DNS Name Server

☑ FTP Server

☑ Legacy Network Server
Optional Packages: Accept defaults, turn on rsh–server and telnet–server

☐ Mail Server

☑ MySQL Database

☐ Network Servers

☐ News Servers

☑ PostgreSQL Database

☑ Printing Support

☑ Server Configuration Tools

☑ Web Server

☑ Window File Server

**Base System**

☑ Administration Tools

☑ Base

☑ Dial-up Networking Support

☑ Java

☑ Legacy Software Support

☑ System Tools
Optional Packages: Accept the defaults and also select festival

☑ Workstation

☑ X Window System

**Virtualization**

☐ Virtualization

**Languages**

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

## A.4.12 About to Install

**Action**: Select **Next**.

The install process will take about 20 to 40 minutes depending on the speed of your computer.

## A.4.13 Congratulations

**Action**: Click **Reboot**.

## A.4.14 Welcome

**Purpose**: After the first reboot you will need to enter some customization information. You only need to do this once.

**Action**: Click **Forward**.

## A.4.15 License Agreement

**Action**: Select **Yes I agree** and then click **Forward**.

## A.4.16 Firewall

**Action**: Select **Disabled** and then click **Forward**.

## A.4.17 SELinux

**Action**: Select **Disabled** and then click **Forward**.

## A.4.18 Kdump

**Action**: Leave **Disabled** and then click **Forward.**

## A.4.19 Date and Time

**Action**: Set the date and time. Use your local time. NTP, if used will be setup later.

## A.4.20 Set Up Software Updates

**Purpose**: To register with CentOS. You can bypass this and you can do it later if needed.

**Action**: Click **Forward**.

## A.4.21 Create User

**Purpose**: This will be done in a later step.

**Action**: Click **Forward** and then **Continue** in the pop-up.

## A.4.22 Sound Card

**Purpose**: Check sound function.

**Action**: **Play test sound** then click **Forward**.

## A.4.23 Additional CDs

**Purpose**: Install additional CDs.

**Action**: Insert the extras CDOM or DVD, and click **Install**.

In the system cdinstall–helper program, select **Multimedia**, then select acroread and the acroread plugin packages. If you do not have the extras CD or DVD, these same rpms are supplied on our IRIS CDROM, and you can manually install them from there.

### A.4.24 Finish Setup

**Purpose**: To congratulate you. Nice job!

**Action**: Click **Next**.

At this point you will need to run our `sigconfig` post-install configuration script. Follow the instructions in "Sigconfig" on page 86.

### A.4.25 Install Additional rpms

You need these additional rpms, get them by installing from the CentOS5 dvd:

```
# cd /mnt/cdrom/Client
# rpm -Uvh sharutils-4.6.*.i386.rpm
# rpm -Uvh mesa-libOSMesa-*.rpm

# cd /mnt/cdrom/Workstation
# rpm -Uvh tk-devel-*.i386.rpm tcl-devel-*.i386.rpm
# rpm -Uhv lapack-devel-*.i386.rpm

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

## A.5 Manual sigconfig Instructions

After installing Linux above, there are some steps to customize the Linux installation for IRIS and RDA use. Most of the steps here are performed automatically by running the **sigconfig** utility as described in "Sigconfig" on page 86. You should go to this section and run this utility. This section describes those steps in case you need to do them manually.

### A.5.1 Install Additional rpms

Now install the IRIS release CDROM. The remainder of the rpms are not standard CentOS, and are supplied by Vaisala. Type:

```
# cd /media/irisrda_x.x.x/CENTOS5/extras/RPMS
```

You can use `rpm -Uhv` or `yum install` to install the rpm packages.

Install the acroread and geotiff library rpms:

```
# rpm –Uhv acroread–7.0.*.el5.i386.rpm
# rpm –Uhv acroread–plugin–7.0.*.el5.i386.rpm
# rpm –Uhv proj–*4.*.vel5.i386.rpm
# rpm –Uhv libgeotiff–*.el5.i386.rpm
# rpm –Uhv openmotif–*.rpm
```

or

```
# yum install acroread–7.0.*.el5.i386.rpm
# yum install acroread–plugin–7.0.*.el5.i386.rpm
# yum install proj–*4.*.vel5.i386.rpm
# yum install libgeotiff–*.el5.i386.rpm
# yum install openmotif–*.rpm
```

If you are doing an **RDA** install, then install dkms, and these canbus library, gpib library, and power monitor rpms:

```
# rpm –Uhv dkms–2.*.noarch.rpm
# rpm –Uhv kvasercan–lib–*.el5.i686.rpm
# rpm –Uhv linux–gpib–lib–*–1.el5.i686.rpm
# rpm –Uhv nrpz–lib–*.vel5.i686.rpm
```

or

```
# yum install dkms–2.*.noarch.rpm
# yum install kvasercan–lib–*.el5.i686.rpm
# yum install linux–gpib–lib–*–1.el5.i686.rpm
# yum install nrpz–lib–*.vel5.i686.rpm
```

If you are installing an **rcp8** which is using the canbus (such as the Vaisala antenna pedestal), then you will need to install the Kvaser kernel module. This module will automatically recompile at boot time to match your kernel version.

```
# rpm –Uhv dkms–kvasercan–*.vel5.i386.rpm
```

or

```
# yum install dkms–kvasercan–*.vel5.i386.rpm
```

If you are installing an **rcp8** which is using the GPIB bus to control a signal generator, then you will need to install the GPIB kernel module. This module will automatically recompile at boot time to match your kernel version.

```
# rpm –Uhv dkms–linux–gpib–*.vel5.i386.rpm
```

or

```
# yum install dkms–linux–gpib–*.vel5.i386.rpm
```

If you are installing an **rcp8** which is using the power monitor, then you will need to install the power monitor kernel module.This module will automatically recompile at boot time to match your kernel version.

```
# rpm –Uhv dkms–nrpzmodule–*.vel5.i386.rpm
```

or

```
# yum install dkms–nrpzmodule–*.vel5.i386.rpm
```

If you are installing an rcp8 which is using the USB serial port device, then you will need to install this kernel module. This module will automatically recompile at boot time to match your kernel version.

```
# rpm –Uhv dkms–moxauport–*.vel5.i386.rpm
```

or

```
# yum install dkms–moxauport–*.vel5.i386.rpm
```

If you are installing an **IRIS** system and using our HDF4 pipes, then you will need to install the HDF4 library.

```
# rpm –Uhv hdf–*4.*.el5.i386.rpm
```

or

```
# yum install hdf–*4.*.el5.i386.rpm
```

If you are installing an **IRIS** system and using our HDF5 pipes, then you will need to install the HDF5 library.

```
# rpm -Uhv hdf5-*.el5.rf.i686.rpm
```

or

```
# yum install hdf5-*.el5.rf.i686.rpm
```

If you are installing an iris system and using our BUFR pipes, then you will need to install the BUFR library.

```
# rpm -Uhv bufr-*.i386.rpm
```

or

```
# yum install bufr-*.i386.rpmor
```

If you are installing an **IRIS** system and using our metar pipe, then you will need to install the mdsplib rpm.

```
# rpm –Uhv mdsplib–*.i386.rpm
```

or

```
# yum install mdsplib–*.i386.rpm
```

If you are installing an **IRIS** system and using our NetCDF pipe, then you will need to install the NetCDF rpm.

```
# rpm -Uhv netcdf-*.i386.rpm
```

or

```
# yum install netcdf-*.i386.rpm
```

If you are installing an **IRIS** system and using our GRIB2 pipes, then you will need to install the GRIB rpms.

```
# rpm –Uhv jasper*.el5.i386.rpm
# rpm –Uhv grib_api–*.el5.i386.rpm
```

or

```
# yum install jasper*.el5.i386.rpm
# yum install grib_api–*.el5.i386.rpm
```

If you are installing from the web, you can pick up these same rpms from our ftp site in the following directory:

ftp.sigmet.vaisala.com://outgoing/os_patches/CentOS5

If you are running sigconfig from a local directory, and not from the CDROM, then these rpms will not install, and you will need to do them manually.

## A.5.2 User Account Configuration

Type in the following commands to create accounts for the operator & observer users that are needed for IRIS, the RVP8 or RCP8:

```
# /usr/sbin/useradd –G users –m –u 1000 radarop
# /usr/sbin/useradd –G users –m –u 1001 observer
# echo 'xxxxxx' | passwd --stdin radarop
# echo 'xxxxxx' | passwd --stdin observer
```

By default, the Linux OS forces the use of "strong passwords". If you wish to be able to use simpler passwords, you should now edit the file

*/etc/pam.d/passwd*. The file should then be made to consist of only a single line reading:

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

Save the file and exit. Now each user can change their password to be anything.

## A.5.3 Service Configuration

For operation of IRIS, various services must be enabled including these in */etc/xinetd.d: rlogin, rsh, telnet*.

To enable these services, type the commands:

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

Other optional services are:

- `gssftp` (sometimes called vs-ftpd)
- `ntpd` (see also section "Configuring NTP" on page 106)
- `tomcat` (required for web server)

The default configuration for **xinetd** in Linux allows receipt of only a limited number of remote shell commands per minute. This limit can easily be exceeded with a burst of network transfers between Vaisala systems. This will cause a network send request to become "aborted", and the network link to fail thereafter. Vaisala recommends raising this number to at least 100 on all systems. This is easily done by editing the */etc/xinetd.d/rsh* file and adding a line similar to the others in the "service shell" section, that is, before the final "}", that reads as follows:

```
per_source = 100
```

Changes take effect when you reboot, or send the hup signal to inetd with:

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

The CentOS Linux has a problem with kerberos **rsh** and **rcp** as follows:

- **rsh** does not work at all to hp 10.20 systems
- **rcp** gets a warning message to all platforms

As it turns out, there are 2 sets of r* commands installed on those systems. The commands in /usr/bin work fine the old way. We recommend for Vaisala systems that you remove the kerbero code from your system:

```
# rpm -e krb5-workstation
```

## A.5.4 Create the IRIS Root and Data Directories

**NOTE** Vaisala recommends using */usr/sigmet* as the default root. You may choose another anchor point, but the remaining discussion assumes the */usr/sigmet* anchor point.

To create this directory, login as root and then type:

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

Vaisala software requires a number of directories to hold the data that it generates. These directories may be positioned anywhere within the file system. They have no connection with each other or with the */usr/sigmet* installation point. The directories are listed below along with their purpose.

| | |
|---|---|
| `ascope` | Ascope data files |
| `input` | Generic pipe input |
| `ingest` | Acquired radar data in polar form |
| `log` | Error, status, and history messages |
| `product` | Normal product files from the product generator |
| `product_raw` | Raw product files from the product generator |
| `suncal` | Suncal results files are stored here |
| `tape_inv` | Tape inventories for quick retrieval |
| `temp` | Temporary storage used for network output |
| `zdrcal` | Zdrcal results files are stored here |

Next, create the directories at the operating system prompt. Be sure the owner and group are set to match operator's default. For example:

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

## A.5.5 Install IRIS CDROM

Install the IRIS or RDA code from our media. See instructions in "Performing a New Software Installation" on page 18, or type commands similar to this:

```
# cd /mnt/cdrom/sigmet/CentOS5/iris

# ./instiris -files -root /usr/sigmet -new -manuals \> -
source -headers
```

## A.5.6 Configure Home Environment

Vaisala requires a number of special "environment" files to be included in the /etc tree so they can be executed whenever anyone logs in. Copy the following files:

```
# mkdir /etc/sigmet
# cd /usr/sigmet/config_template/LINUX/etc
# cp ./profile.d/* /etc/profile.d
# cp ./sigmet/* /etc/sigmet
```

Also copy files to the home directory for each user:

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

```
# install -o operator -g users mwmrc          /home/operator/.mwmrc
# install -o operator -g users bash_profile   /home/operator/.bash_profile
# install -o operator -g users Xdefaults      /home/operator/.Xdefaults
# install -o operator -g users xinitrc        /home/operator/.xinitrc
# 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
# install -o observer -g users xinitrc        /home/observer/.xinitrc
```

Logout of the computer and login as operator. These files are read each time you login. Automatic startup programs will only pick up changes after you reboot. Continue with the next step to complete the post installation configuration.

### A.5.6.1 Operator List Defined in the Startup File

The file */etc/sigmet/profile.conf* 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. Edit the file and change these as needed. Note that every IRIS user must share group access to files owned by `operator` by being a member of the users group.

```
operators='operator joe alan jason root'
observers='observer'
```

You can check your environment by typing:

```
$ env | grep IRIS
```

## A.5.7 Raise Shared Memory

Edit your */etc/sysctl.conf* file to include the following lines at the end:

```
# Increase shared memory
sys.kernel.shmmax = 500000000
```

While you are in there, do the RDA changes in "RDA Configuration" on page 101.

## A.5.8 RDA Configuration

For RDA systems only:

Edit your */etc/ld.so.conf* file to include the following line at the end:

```
/usr/sigmet/bin/dynamic
```

Then type the following command so that it will take effect:

```
# /sbin/ldconfig
```

If you do not do this, you will get the following error message when the RVP900 starts:

```
rvp9: error while loading shared libraries: libipps.so:
cannot open shared object file: no such file or directory.
```

Edit your */etc/sysctl.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 the RVP900. If you do not do this, you will get the following error message when the RVP900 starts:

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

Edit your */usr/share/hwdata/pci.ids* file. Look for the line which reads "Altera Corporation". Add lines following so that it reads as follows (Note that the indentations must be a tab, not spaces.):

```
1172 Altera Corporation
7805 SIGMET RVP8/Rx IF Receiver
7806 SIGMET RVP8/Tx IF Transmitter
7807 SIGMET RVP/RCP 62-pin I/O Board
```

If your system is an RVP900, then you need to raise the MTU on your network interface to the IFDR. This is done by editing your */etc/sysconfig/network-scripts/ifcfg-eth0* file. Add the following to the end of the file:

```
MTU=8192
```

Also, while you are in the ifcfg–eth1 file on the RVP900, edit it so it contains the following 3 lines after the “DEVICE” line:

```
BOOTPROTO=static
IPADDR=10.0.1.213
NETMASK=255.255.255.0
```

## A.5.9 Configuration for Automatic Startup

The RVP900/RVP8/RCP8/IRIS application software can be configured to startup automatically following a boot of the system. In the Automatic Software Installation, this happens by default. However, in the Manual Software Installation, this is an optional configuration that may be performed. Type the following commands, depending on your configuration:

RVP900:

```
# chkconfig --add rdasys
# chkconfig --add rvp901
# chkconfig --add dspexport
```

RVP8:

```
# chkconfig --add rdasys
# chkconfig --add rvp8
# chkconfig --add dspexport
```

RCP8:

```
# chkconfig --add rdasys
# chkconfig --add rcp8
```

IRIS:

```
# chkconfig --add iris
```

# A.6 Post-Install Steps

## A.6.1 Configuring Your Time Zone

If you used the automatic installation procedure or need to your time/date settings for another reason, as root, run:

```
# system-config-date
```

Unfortunately, this GUI does not support setting the timezone to UTC. Do this with the following command:

```
# ln -sf /usr/share/zoneinfo/GMT /etc/localtime
```

## A.6.2 Basic Network Configuration

If you did not use the automatic installation procedure or need to change your network settings for another reason, as root, run:

```
# system-config-network
```

After you have made your desired changes:

```
# reboot
```

You can manually inspect and edit the various network configuration files. The ones required for IRIS are as follows:

| File name | Function | Test |
|---|---|---|
| */etc/sysconfig/network* | Set official local host name and basic networking. | `# hostname`<br>Should show hostname exactly as as in the file. |
| */etc/sysconfig/network-scripts/ifcfg-eth0* | Define the local IP address and the other basic network information | `# ifconfig eth0`<br>Displays network configuration and status summary for device eth0. |
| */etc/hosts* | Defines IP addresses, hostnames and aliases for all of the various IRIS or other network nodes. | `# ping <hostname or alias>`<br>Shows that the hostname or alias corresponds to the proper IP address. |
| */etc/hosts.equiv* | A list of other hosts and the corresponding users who are allowed remote access without password. | `# rsh hostname date`<br>Also required for rcp and rlogin. |
| */etc/resolv.conf* | Specifies a network domain name server (DNS) as an alternative to a fixed */etc/hosts* 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 resolv.conf to /etc/resolv.conf.back. |

The various files should look something like the examples below. Note that your specific node names and IP addresses, etc., will be different so 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
```

Vaisala recommends the use of a static */etc/hosts* file. In this case, to avoid possible confusion with the DNS server, you should move the resolv.conf file as follows:

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

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

*/etc/resolv.conf* (should look something like the following)

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

After you have completed the networking, it is recommended that you reboot the system to test the changes. If you change the host name for example, you will need to reboot for this to take effect. For most other changes however you can test by simply stopping and starting the network service as follows:

```
Restart the network by typing;
service network stop
service network start
```

## A.6.3 Routing

By default, a Linux system will not route network data. To enable routing, type the following command:

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

Once you get this working, you need to make a change so this will run every time you boot. Do this by editing the */etc/sysctl.conf* and add a line like:

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

Or, you can put the echo command into your */etc/rc.d/rc.local* file.

## A.6.4 Configuring NTP

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
```

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 will set the time after approximately 15 minutes after building a time syncing model. This means that after booting, the time may change in about 15 minutes. This can cause problems with automatic startup of IRIS. To fix this problem, create a file */etc/ntp/step-tickers* and put in just the server IP address, without the word "server". Ntp will then set the date at boot time, if possible. Do not put in the step-tickers file on the time server.

If ntpd was not added under "Configuring rcp" on page 107 (Configuring for automatic startup), type the following:

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

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

```
# service ntpd start
```

It will take 15 minutes before it will sync the times. If the times are more than 10 minutes apart, ntp will assume there is an error and never change the time. To check on the status of ntp, type:

```
# ntpq -p
```

The first character before the server host will be "*" when it thinks it is time synced.

Another convenient check to compare the time of your workstation with that of another (such as the ntp server is):

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

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

You can also manually set the time from another computer with the following command. This will not work if ntpd is running on your machine.

```
# ntpdate host
```

## A.6.5 Configuring rcp

Only read this section if you are having problems getting rcp to work. Authorization to use **rcp** is controlled both by the file */etc/hosts.equiv* discussed in "Setting Up for RCP and Other R Commands" on page 23, and by the pam.d software. Take a look in the /etc/pam.d directory. There is a separate file controlling many different services. The "rsh" file controls rsh and rcp. Login as operator and then conduct a simple test to see if you are authorized to use "rsh" commands. Type "rsh host date", where "host" is your hostname. The hosts date should be displayed to the terminal of the "rsh" commands are authorized.

```
$ rsh iris-test date
Wed Jan 4 12:12:34 EST 2014
```

If the test does not work properly the rsh file should be modified. The rsh file should contain the following:

```
#%PAM-1.0
```

# For root login to succeed here with pam_securetty, "rsh" must be

```
# listed in /etc/securetty.


 auth      required  /lib/security/pam_nologin.so
 auth      required  /lib/security/pam_securetty.so
 auth      required  /lib/security/pam_env.so
 auth      required  /lib/security/pam_rhosts_auth.so
 account   required  /lib/security/pam_stack.so service=
                     system-auth
 session   required  /lib/security/pam_stack.so service=
                     system-auth
```

The documentation for this package is available online on your system. Point your browser to the file: */usr/share/doc/pam-0.74/html/pam.html*.

Here is a summary: The word "required" means that the operation must pass all 6 of these security tests before it is permitted. The "pam_nologin.so" command means that if the file /etc/nologin exists you are stopped. The "pam_securetty.so" means that if you are root, and the terminal is not listed in the /etc/securetty file then you are blocked. The "pam_rhosts_auth.so" means that ruserok function must pass, which basically means that the /etc/hosts.equiv file is checked, or the $HOME/.rhosts file is checked. I have not figured out what the other lines mean. When it fails, a single line is added to the /var/log/messages file mentioning the failure, but not the reason.

If you cannot get it to work, then try changing one of the lines from "required" to "sufficient". This should make it go without checking the rest. Changing this file takes effect right away, you do not need to reboot.

In addition to the /etc/pam.d/rsh file, there is also a /etc/xinetd.d/rsh file. This file frequently gets damaged on installation. If this happens to you, remove and reinstall the rsh-server rpm file. The /etc/pam.d/rsh file should contain:

```
# default: on
# description: The rshd server is the server for the rcmd(3)
routine and, \
# consequently, for the rsh(1) program. The server provides
\
# remote execution facilities with authentication based on
\
# privileged port numbers from trusted hosts.
service shell
```

```
{

disable             = no
socket_type         = stream
wait                = no
user                = root
log_on_success      += USERID
log_on_failure      += USERID
server              =
                    /usr/sbin/in.rshd


}
```

Then log out and in.

# A.7 X-Windows Troubleshooting: Framebuffer Method

Sometimes the standard X server for your video card just does not seem to work, or works very poorly. In cases like this, you can often achieve success by configuring the card as a frame buffer device, rather than using one of the specific X servers. We have used this method several times for video cards that were not fully supported by Linux, and it works quite well. Frame buffer support is directly built into the 2.2.x kernels, so the procedure is pretty easy.

Here are instructions that should get tough-dog video cards up and running:

- Don't worry too much about setting up X during the install. You're going to change the /etc/X11/xorg.conf file later anyway. Just fiddle through the X setup, choose VGA16 or some other generic server like SVGA, pick a monitor, etc. It will probably fail, which is no problem — just quit the X setup stuff when you get the chance, and complete the RedHat install.
- When you first boot, login as root and edit your */etc/lilo.conf* file, adding the line VGA=794 under the read-only line in the Linux section. This is the decimal code for 16bpp and 1024x768 resolution. To get a different resolution and color depth, see the valid decimal code table below (from the Vesafb Mini-HOWTO).

| Colors | 640x480 | 800x600 | 1024x768 | 1280x1024 | 1600x1200 |
|---|---|---|---|---|---|
| 256 | 769 | 771 | 773 | 775 | 796 |
| 32,768 | 784 | 787 | 790 | 793 | 797 |
| 65,536 | 785 | 788 | 791 | 794 | 798 |
| 16.8M | 786 | 789 | 792 | 795 | 799 |

- Exit the editor saving your changes, and type:

  ```
  lilo -v
  ```

  Then reboot. When you reboot, you should now have a cute penguin in the top left hand corner of your screen and your resolution should be 1280x1024.

- Login as root and do the following (assuming you still have your RedHat install CD in the drive):

  ```
  # mount /dev/cdrom /mnt/cdrom
  # cd /mnt/cdrom/RedHat/RPMS
  # rpm -Uvh XFree86-FBDev-3.3.6-35.i386.rpm
  # cd /etc/X11
  # rm X
  # ln -s /usr/X11R6/bin/XF86_FBDev /etc/X11/X
  ```

- Edit the */etc/X11/xorg.conf* file (for older systems you should modify the XF86Config–4 file as well) file so it will work with the FBDev server. First, delete all the mode lines. You don't need them. Next, add this to the area that has all the different screen and server information:

  ```
  Section "Screen"

  Driver              "FBDev"
  Device              "My Video Card"
  Monitor             "My Monitor"
  DefaultDepth        16
  SubSection          "Display"
  Depth               16
  Modes               "1280x1024"


  EndSubSection
  EndSection
  ```

- Run `xinit`.

That's it! Naturally, you will have to change the Depth and Modes lines to reflect the decimal code you chose for your depth and resolution in your *lilo.conf* file.

# A.8 Special Notes for Notebook Installations

Most notebook computers have only a single bay for the CDROM or floppy, and some have unusual interfaces to these devices. Often there is a magic code required to allow booting from the CDROM, or to enable the graphics. Fortunately each model laptop is well documented on the web page:

`http://Linux-on-laptops.com/`

APPENDIX B

# INSTALLING CENTOS6

## B.1 Overview

This appendix provides instructions on how to install and configure CentOS6 for the Vaisala WR (IRIS & RDA) application software. We recommend that you completely read through this manual if you are about to install the Linux OS and the Vaisala application software for the first time. If you wish to install on CentOS6, please follow the instructions in Appendix A, Installing CentOS5 on page 83.

For more information and a more in-depth discussion of the installation process, refer to the *CentOS Linux Installation Guide*, which can be found on the Documentation disk of your CentOS Desktop DVDs.

| **NOTE** | During this process it is critical to take notes so that you can properly reuse this information during the post installation modifications. |
|---|---|

## B.2 Installation Overview

Vaisala supports two types of installation methods:

- Automatic
- Manual

The **automatic** installation method uses bootable scripts located on special Install CDs available from 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 can separately install IRIS from the IRIS/RDA install media. While some manual steps are still required after this automatic procedure, the time necessary to complete an IRIS/RDA installation on a new computer system is drastically reduced.

The **manual** installation method is documented here as an alternative in the event that there is a problem with the automatic installation, or if you wish to install a different version of the OS. It is written for an CentOS6 installation. There will be differences with other versions, so some operator flexibility will then be required.

## B.2.1 Using this Manual

The instructional sections of this manual use the following format:

- **Screen** "Title"
- **Action:** What to do

The Screen Title indicates what you will see on the installation wizard screen. In some cases we include a screen capture. The action explains what you should do.

| NOTE | Use the Tab key to move between different fields/options on the screen and the space bar to select check boxes. |
|---|---|

## B.2.2 Types of 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 and this is the only type of installation that will be covered in this manual. For more information, refer to the *CentOS Linux Installation Guide*.

## B.2.3 Installation Preparation

Verify that you can boot from a DVD by powering off your computer system, inserting the Vaisala Install CD-ROM or the CentOS DVD (32–

bit version) into the appropriate drive and then powering on your computer.

**If a Linux screen is displayed on your screen continue to "Automatic Installation" on page 115 for the automatic installation procedure or "Manual Installation" on page 117 for the manual procedure.**

**If a Linux screen was not displayed** on your computer then continue with this section. When the computer is booting, a message will be displayed to “Press DEL to enter SETUP” (or some other key to enter setup). Press the specified key to enter setup.

Here is what to check: In the BIOS Features Setup, set the boot sequence to be “CD, C”. Finally, save your changes by pressing the **F10** key. The system will reboot.

# B.3 Automatic Installation

If you have not already done so, place the Vaisala Install disk for the desired OS version into the appropriate drive and reboot your computer. You should see a CentOS splash screen.

**Action**: For SATA disk drives hit return, for IDE drives type ide and return. We also include options for the SATA disk configured as sda, sdb, or sdc.

After this command has been entered, the installation process will continue automatically. The DVD should be inserted by an operator, when prompted. Once the installation is complete the last DVD will eject from the system. The system will reboot. If the automatic installation does not work for some reason, use the manual installation in "Manual Installation" on page 117.

## B.3.1 Sigconfig

**NOTE** From 8.13.3 release on, sigconfig installation script use yum instead of rpm command to install extras RPMs during initial IRIS installation. The command line is the same as before and there is no need from user interaction. Yum is the tool that makes it easy to handle rpm dependency issue when installing extras RPMs.

Once the operating system installation is complete, Vaisala provides a script that performs all of the necessary post OS installation steps and installs the Vaisala software called **sigconfig**. **Sigconfig** works for either CentOS5 or CentOS6.

1. Login as root with a password of "**xxxxxxxx**" (8x).
2. Insert the IRIS/RDA release CD into the CD-ROM. It automounts to directory */media/irisrda_x.x.x*, where *x.x.x* is the IRIS release version number. **Sigconfig** is now using yum to install extras rpm packages.

   It may be necessary to correct the mount point in order for yum to work. If the system did not automount the DVD, you will need to mount it manually.

To mount IRIS DVD disc manually, you have to create directory:

```
#mkdir -p /media/irisrda_x.x.x
```

where `x.x.x` is the IRIS version. For example, if the IRIS version is 8.13.3, the directory would be */media/irisrda_8.13.3*.

```
# mount /dev/cdrom  /media/irisrda_8.13.3
```

or

```
# mount /dev/dvd /media/irisrda_8.13.3
```

To run the sigconfig script:

```
# cd  /media/irisrda_8.13.3
sigconfig [arg1 arg2 arg3 argn} <cr>
```

If you need to know command line arguments, type `sigconfig <cr>` and the help menu displays a list of the command line arguments.

For IRIS only on CentOS6:

```
# ./sigconfig -iris -6
```

For RCP8 on CentOS6:

```
# ./sigconfig -rcp8  -6
```

For dual system on CentOS6:

```
#./sigconfig  -rvp900 -rcp8 -iris -6
```

If you want to install individual rpm package from the *extras/RPMS* directory, type:

```
# yum install <rpm package>
```

Yum resolves any required dependencies. In the past we use rpm command and we have issues with dependencies when installing rpm packages.

# B.4 Manual Installation

Manual installation is typically used to install Linux and IRIS onto workstations that are not provided by Vaisala, that is, not RVP8 or RCP8 hardware. Note that the automatic procedure should always be used for RVP8 and RCP8 systems. The manual procedure described here can still take advantage of our automated post OS installation script (**sigconfig**) to perform system configuration functions.

## B.4.1 Install CentOS6

If you have not already done so, place the CentOS DVD (labeled in small letters “32 bit Installation”) into the appropriate drive and reboot your computer.

## B.4.2 Welcome to CentOS6!

**Purpose:** Splash Screen

**Action:** Select **Install or upgrade an existing system**.

## B.4.3 Disc Found

**Purpose:** Allow you to test the installation disk.

**Action:** Select **OK** if you want to test the install disk. This takes a long time, but we have found many bad discs over the years. Or select **Skip** if you are sure the disc is OK.

## B.4.4 CentOS6

**Purpose:** Splash Screen

**Action:** Click **Next**.

## B.4.5 Installation Language

**Purpose:** Select the installation language.

**Action:** Select your favorite language, then click **Next**.

## B.4.6 Keyboard Selection

**Purpose:** Choose the keyboard type that you have purchased.

**Action:** For most systems choose **U.S. English**, then click **Next**.

## B.4.7 Type of Device for Installation

**Action:** Select **Basic Storage Devices**.

## B.4.8 Hostname

**Action:** Type in your host name, for example *wes–install.vaisala.com*, then click **Config Network**.

## B.4.9 Please Name This Computer

**Purpose:** Set basic network configuration. You can do this later, but if you know the information you might as well do it now. You will need to consult with your network manager to get the information. An example is shown here:

**Actions:**

1. From the **Network Connections** menu, in the **Wired** tab, select the device **System eth0**, and click **Edit**. The **Editing System eth0** window. appears. In this window do the following:
   a. Select the **Connect automatically** button.
   b. Select the **IPv4 Settings** tab. On this menu:
      i. Set **Method** to **Manual**.
      ii. Click **Add**.
      iii. Type in your IP address, for example *192.168.45.208* and click **Enter**. It will default the **Netmask**, (change if desired).
      iv. Type in the Gateway IP address.
      v. *Optionally*, type in the DNS server and domain name and click **Apply**.
6. Click **Close** on the parent **Network Connections** menu.
7. CLick **Next** to leave the **Please name this computer** page.

## B.4.10 Time Zone

**Actions**:

1. Select the nearest city in your time zone. If you want your computer to use UTC for the system clock (good for shipboard systems, for example), then scroll down the list to find the “Etc/UTC” choice..
2. Select **System clock uses UTC**.
3. Select: **Next**.

## B.4.11 Set Root Password

**Action:** Enter the password for root (twice) and then click **Next**. The default Vaisala root password is “xxxxxxxx” (8 x).

## B.4.12 What Type of Installation Would You Like?

**Action:** Select option 5 **Create Custom Layout** and click **Next**.

If you are going to record time series, we recommend that you create a separate partition for that purpose.

## B.4.13 Please Select A Device

**Action:** Select your hard drive device from the list. Click **Create** four times, and make four partitions similar to this table:

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

It will make an extended partition for you, this is OK. Now click **Next**.

## B.0.1 Boot Loader Operating System List

**Action:** Click **Next** to take the defaults.

## B.0.2 Default Installation of CentOS

**Action:** Check **Software Development Workstation**. Leave default repositories. Select **Customize now** and click **Next**.

## B.0.3 Package Group Selection

**Purpose:** Select the packages to install (☑) or not to install (☐). In some cases you will need to 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

☐ E-mail 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: 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.4.14 About to Install

**Action:** Click **Next**.

The install process will take about 20 to 40 minutes depending on the speed of your computer.

## B.4.15 Congratulations

**Action:** Click **Reboot**. Make sure the CentOS6 disk is removed from the drive.

## B.4.16 Welcome

**Purpose:** After the first reboot you will need to enter some customization information. You only need to do this once.

**Action:** Click **Forward**.

## B.4.17 License Agreement

**Action:** Select **Yes I agree** and then click **Forward**.

## B.4.18 Set Up Software Updates

**Purpose:** To register with CentOS. You can bypass this and you can do it later if needed.

**Action:** Click **Forward**.

## B.0.4 Create User

**Purpose:** Create a user for the system.

**Action:** We will be creating the normal radar operator account later. We suggest you create an account for “service” here, make the password “xxxxxx” if you have no other preference, then click **Forward**.

## B.4.19 Date and Time

**Action:** Set the date and time. Use your local time (depending on the timezone set earlier). Alternatively set your NTP servers here.

## B.4.20 Kdump

**Action:** Leave **Disabled** and then click **Forward.**

### B.0.5 Disable Firewall

After the install procedure has completed, you need to manually disable the firewall. You need to be logged in as root to do this. Run the following command:

```
# system-config-firewall
```

Click **Disable**, then **Apply**, then exit the program. If you are running the gnome desktop, you can launch system–config–firewall from the menu bar by selecting System/Administration/Firewall.

At this point you will need to run our “sigconfig” post-install configuration script. Either follow the instructions in "Sigconfig" on page 116, or do it manually as described in "Manual Sigconfig Instructions" on page 126

## B.5 Manual Sigconfig Instructions

After installing Linux above, there are some steps to customize the Linux installation for IRIS and RDA use. Most of the steps here are performed automatically by running the sigconfig utility as described in "Sigconfig" on page 116. You should go to this section and run this utility. This section describes those steps in case you need to do them manually.

### B.5.1 Install Additional rpms

Now install the IRIS release CDROM. The remainder of the rpms are not standard CentOS, and are supplied by Vaisala.

You need these additional CentOS rpms, which are not supplied on the CentOS media, get them by installing from the Vaisala dvd:

```
# cd /mnt/cdrom/CENTOS6/extras/RPMS
```

You can use `rpm -Uhv` or `yum install` to install the rpm packages.

Install the acroread rpms:

```
# rpm -Uvh acroread-9.4.*.el6.i686.rpm
# rpm -Uvh acroread-plugin-9.4.*.el6.i686.rpm
```

or

```
# yum install acroread-9.4.*.el6.i686.rpm
# yum install acroread-plugin-9.4.*.el6.i686.rpm
```

Install the blas–devel, mesa–libOSMesa, and lapack–devel rpms:

```
# rpm -Uvh blas-devel-3.*.el6.i686.rpm
# rpm -Uvh mesa-libOSMesa-*7.*.el6.i686.rpm
# rpm -Uvh lapack-devel-3.*.el6.i686.rpm
# rpm -Uhv xorg-x11-apps-7*.el6.i686.rpm
```

or

```
# yum install blas-devel-3.*.el6.i686.rpm
# yum install mesa-libOSMesa-*7.*.el6.i686.rpm
# yum install lapack-devel-3.*.el6.i686.rpm
# yum install xorg-x11-apps-7*.el6.i686.rpm
```

Install the geotiff library rpms:

```
# rpm -Uhv proj-*4.*.el6.i686.rpm
# rpm -Uhv libgeotiff-*.el6.i386.rpm
```

or

```
# yum install proj-*4.*.el6.i686.rpm
# yum install libgeotiff-*.el6.i386.rpm
```

If you are doing an RDA install, then install dkms, and these canbus library, gpib library, and power monitor library rpms:

```
# rpm -Uhv dkms-2.*.noarch.rpm
# rpm -Uvh kvasercan-lib-*.vel6.i686.rpm
# rpm -Uvh linux-gpib-lib-*.vel6.i686.rpm
# rpm -Uvh nrpz-lib-*.vel6.i686.rpm
```

or

```
# yum install dkms-2.*.noarch.rpm
# yum install kvasercan-lib-*.vel6.i686.rpm
# yum install linux-gpib-lib-*.vel6.i686.rpm
# yum install nrpz-lib-*.vel6.i686.rpm
```

If you are installing an **rcp8** which is using the canbus (such as the Vaisala antenna pedestal), then you will need to install the Kvaser kernel module. This package will automatically rebuild at boot time to match your kernel version.

```
# rpm -Uhv dkms-kvasercan-*.vel6.i686.rpm
```

or

```
# yum install dkms-kvasercan-*.vel6.i686.rpm
```

If you are installing an **rcp8** which is using the GPIB bus to control a signal generator, then you will need to install the GPIB kernel module. This package will automatically rebuild at boot time to match your kernel version.

```
# rpm -Uhv dkms-linux-gpib-*.vel6.i686.rpm
```

or

```
# yum install dkms-linux-gpib-*.vel6.i686.rpm
```

If you are installing an **rcp8** which is using the power monitor, then you will need to install the power monitor kernel module. This package will automatically rebuild at boot time to match your kernel version.

```
# rpm -Uhv dkms-nrpzmodule-*.vel6.i686.rpm
```

or

```
# yum install dkms-nrpzmodule-*.vel6.i686.rpm
```

If you are installing an **rcp8** which is using the USB serial port device, then you will need to install this kernel module. This package will automatically rebuild at boot time to match your kernel version.

```
# rpm -Uhv dkms-moxauport-*.vel6.i686.rpm
```

or

```
# yum install dkms-moxauport-*.vel6.i686.rpm
```

If you are installing an IRIS system and using our HDF5 pipes, then you will need to install the HDF5 library.

```
# rpm -Uhv hdf5-*.el6.i686.rpm
```

or

```
# yum install hdf5-*.el6.i686.rpm
```

If you are installing an IRIS system and using our HDF4 pipes, then you will need to install the HDF4 library.

```
# rpm -Uhv hdf-*.el6.i686.rpm
```

or

```
# yum install hdf-*.el6.i686.rpm
```

If you are installing an IRIS system and using our BUFR pipes, then you will need to install the BUFR library.

```
# rpm –Uhv bufr–*.vel6.i686.rpm
```

or

```
# yum install bufr–*.vel6.i686.rpm
```

If you are installing an IRIS system and using our metar pipe, then you will need to install the mdsplib rpm.

```
# rpm –Uhv mdsplib–*.i386.rpm
```

or

```
# yum install mdsplib–*.i386.rpm
```

If you are installing an IRIS system and using our NetCDF pipe, then you will need to install the NetCDF rpm.

```
# rpm –Uhv netcdf–*.el6.2.i686.rpm
```

or

```
# yum install netcdf–*.el6.2.i686.rpm
```

If you are installing an IRIS system and using our GRIB2 pipes, then you will need to install the GRIB rpms.

```
# rpm –Uhv ksh*.el6.i686.rpm
# rpm –Uhv jasper*.el6.i686.rpm
# rpm –Uhv grib_api–*.el6.i686.rpm
```

or

```
# yum install ksh*.el6.i686.rpm
# yum install jasper*.el6.i686.rpm
# yum install grib_api–*.el6.i686.rpm
```

If you are installing from the web, you can pick up these same rpms from our ftp site in the following directory:

```
ftp.sigmet.vaisala.com://outgoing/os_patches/CentOS6
```

If you are installing on an CentOS6 system, then you will find similar files in the */mnt/cdrom/CENTOS6/extras/RPMS* directory and on our ftp site. If you are running sigconfig from a local directory, and not from the cdrom, then these rpms will not install, and you will need to do them manually.

## B.5.2 User Account Configuration

Type in the following commands to create accounts for the operator and observer users that are needed for IRIS, the RVP8 or RCP8:

```
# /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
```

By default, the Linux OS forces the use of "strong passwords". If you wish to be able to use simpler passwords, you should now edit the file */etc/pam.d/passwd*. The file should then be made to consist of only a single line reading:

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

Save the file and exit. Now each user can change their password to be anything.

## B.5.3 Service Configuration

For operation of old versions of IRIS, various services must be enabled including these in */etc/xinetd.d: rlogin, rsh, telnet*.

To enable these services, type the commands:

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

Other optional services are:

- `gssftp` (sometimes called vs–ftpd)
- `ntpd` (ee also section "Configuring NTP" on page 106)
- `tomcat6` (required for web server)

The default configuration for **xinetd** in Linux allows receipt of only a limited number of remote shell commands per minute. This limit can easily be exceeded with a burst of network transfers between Vaisala systems. This will cause a network send request to become "aborted", and the network link to fail thereafter. Vaisala recommends raising this number to at least 100 on all systems. This is easily done by editing the */etc/xinetd.d/rsh* file and adding a line similar to the others in the "service shell" section, i.e., before the final "}", that reads as follows:

```
per_source = 100
```

Changes take effect when you reboot, or send the hup signal to inetd with:

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

## B.5.4 Create the IRIS Root and Data Directories

**NOTE** Vaisala recommends using */usr/sigmet* as the default root. You may choose another anchor point, but the remaining discussion assumes the */usr/sigmet* anchor point.

To create this directory, login as root and then type:

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

Vaisala software requires a number of directories to hold the data that it generates. These directories may be positioned anywhere within the file system. They have no connection with each other or with the */usr/sigmet* installation point. The directories are listed below along with their purpose.

| | |
|---|---|
| `ascope` | Ascope data files |
| `input` | Generic pipe input |
| `ingest` | Acquired radar data in polar form |
| `log` | Error, status, and history messages |
| `product` | Normal product files from the product generator |
| `product_raw` | Raw product files from the product generator |
| `suncal` | Suncal results files are stored here |
| `tape_inv` | Tape inventories for quick retrieval |
| `temp` | Temporary storage used for network output |
| `zdrcal` | Zdrcal results files are stored here |

Next, create the directories at the operating system prompt. Be sure the owner and group are set to match operator's default. For example:

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

## B.5.5 Install IRIS CRDROM

Install the IRIS or RDA code from our media. See instructions in "Performing a New Software Installation" on page 18, or type commands similar to this:

```
# cd /mnt/cdrom/sigmet/CENTOS6/iris
# ./instiris –files –root /usr/sigmet –new –manuals
```

## B.5.6 Configure Home Environments

Vaisala requires a number of special "environment" files to be included in the /etc tree so they can be executed whenever anyone logs in. Copy the following files as described below:

```
# mkdir /etc/sigmet
# cd /usr/sigmet/config_template/LINUX/etc
# cp ./profile.d/* /etc/profile.d
# cp ./sigmet/* /etc/sigmet
```

Also copy files to the home directory for each user:

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

```
# install -o operator -g users mwmrc          /home/operator/.mwmrc
# install -o operator -g users bash_profile   /home/operator/.bash_profile
# install -o operator -g users Xdefaults      /home/operator/.Xdefaults
# install -o operator -g users xinitrc        /home/operator/.xinitrc
# 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
# install -o observer -g users xinitrc        /home/observer/.xinitrc
```

Logout of the computer and login as operator. These files are read each time you login. Automatic startup programs will only pick up changes after you reboot. Continue with the next step to complete the post installation configuration.

### B.5.6.1 Operator List Defined in the Startup File

The file */etc/sigmet/profile.conf* 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. Edit the file and change these as needed. Note that every IRIS user must share group access to files owned by `operator` by being a member of the users group.

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

You can check your environment by typing:

```
$ env | grep IRIS
```

## B.5.7 RPC Authentication

Starting with CentOS6, the rpc calls used to communication over the network between programs are getting the error message "Cannot register service: RPC: Authentication error;". Fix this with the following comand:

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

## B.5.8 Raise Maximum Shared Memory

Edit your */etc/sysctl.conf* file to include the following lines at the end:

```
# Increase Shared Memory
sys.kernel.shmmax = 500000000
```

While you are in there, do the RDA changes in "RDA Configuration" on page 133.

## B.5.9 RDA Configuration

For RDA systems only:

Edit your */etc/ld.so.conf* file to include the following line at the end:

```
/usr/sigmet/bin/dynamic
```

Then type the following command so that it will take effect:

```
# /sbin/ldconfig
```

If you do not do this, you will get the following error message when the RVP900 starts:

```
rvp9: error while loading shared libraries: libipps.so:
cannot open shared object file: No such file or directory
```

Edit your */etc/sysctl.conf f*ile to include the following lines at the end:

```
net.core.rmem_default = 1000000

net.core.rmem_max = 4000000
```

This is needed for tsarchive, and the RVP900. If you do not do this, you will get the following error message when the RVP900 starts:

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

Edit your */usr/share/hwdata/pci.ids* file. Look for the line which reads "Altera Corporation". Add lines following so that it reads as follows. Note that the indentations must be a tab, not spaces.

```
1172 Altera Corporation
7805 SIGMET RVP8/Rx IF Receiver
7806 SIGMET RVP8/Tx IF Transmitter
7807 SIGMET RVP/RCP 62–pin I/O Board
```

If your system is an RVP900, then you need to raise the MTU on your network interface to the IFDR. This is done by editing your */etc/sysconfig/network–scripts/ifcfg–eth0 and ifcfg–eth1* files. Add the following to the end of the files:

```
MTU=8192
```

Also, while you are in the ifcfg–eth1 file on the RVP900, edit it so it contains the following 3 lines after the "DEVICE" line:

```
BOOTPROTO=static
IPADDR=10.0.1.213
NETMASK=255.255.255.0
```

### B.5.10 Configuration for Automatic Startup

The RVP900/RVP8/RCP8/IRIS application software can be configured to startup automatically following a boot of the system. In the Automatic Software Installation, this happens by default. However, in the Manual Software Installation, this is an optional configuration that may be performed. Type the following commands, depending on your configuration:

RVP900:

```
# chkconfig --add rdasys
# chkconfig --add rvp900
# chkconfig --add dspexport
```

RVP8:

```
# chkconfig --add rdasys
# chkconfig --add rvp8
# chkconfig --add dspexport
```

RCP8:

```
# chkconfig --add rdasys
# chkconfig --add rcp8
```

IRIS:

```
# chkconfig --add iris
```

## B.6 Post-Install Steps

### B.6.1 Configuring Your Time Zone

If you used the automatic installation procedure or need to your time/date settings for another reason, as root, run:

```
# system-config-date
```

If you wish the system clock to display UTC, then in the “Time Zone” tab, look in the “Non-geographic timezones” to find “UTC”.

## B.6.2 Basic Network Configuration

If you did not use the automatic installation procedure or need to change your network settings for another reason, as root, run:

```
# system-config-network
```

After you have made your desired changes:

```
# reboot
```

You can manually inspect and edit the various network configuration files. The ones required for IRIS are as follows:

| File name | Function | Test |
|---|---|---|
| */etc/sysconfig/network* | Set official local host name and basic networking. | `# hostname`<br>Should show hostname exactly as as in the file. |
| */etc/sysconfig/network-scripts/ifcfg-eth0* | Define the local IP address and the other basic network information | `# ifconfig eth0`<br>Displays network configuration and status summary for device eth0. |
| */etc/hosts* | Defines IP addresses, hostnames and aliases for all of the various IRIS or other network nodes. | `# ping <hostname or alias>`<br>Shows that the hostname or alias corresponds to the proper IP address. |
| */etc/hosts.equiv* | A list of other hosts and the corresponding users who are allowed remote access without password. | `# rsh hostname date`<br>Also required for rcp and rlogin. |
| */etc/resolv.conf* | Specifies a network domain name server (DNS) as an alternative to a fixed */etc/hosts* 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 resolv.conf to /etc/resolv.conf.back. |

The various files should look something like the examples below. Note that your specific node names and IP addresses, etc., will be different so 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
```

Vaisala recommends the use of a static */etc/hosts* file. In this case, to avoid possible confusion with the DNS server, you should move the resolv.conf file as follows:

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

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

*/etc/resolv.conf* (should look something like the following):

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

After you have completed the networking, it is recommended that you reboot the system to test the changes. If you change the host name for example, you will need to reboot for this to take effect. For most other

changes however you can test by simply stopping and starting the network service as follows:

```
Restart the network by typing;
service network stop
service network start
```

## B.6.3 Routing

By default, a Linux system will not route network data. To enable routing, type the following command:

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

Once you get this working, you need to make a change so this will run every time you boot. Do this by editing the */etc/sysctl.conf* and add a line like:

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

Or, you can put the echo command into your */etc/rc.d/rc.local* file.

## B.6.4 Configuring NTP

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
```

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 will set the time after approximately 15 minutes after building a time syncing model. This means that after booting, the time may change in about 15 minutes. This can cause problems with automatic startup of IRIS. To fix this problem, create a file */etc/ntp/step–tickers* and put in just the server IP address, without the word “server”. Ntp will then set the date at boot time, if possible. Do not put in the step–tickers file on the time server.

If ntpd was not added in "Configuration for Automatic Startup" on page 102, type the following:

```
# chkconfig ––add ntpd
# chkconfig ntpd on
```

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

```
# service ntpd start
```

It will take 15 minutes before it will sync the times. If the times are more than 10 minutes apart, ntp will assume there is an error and never change the time. To check on the status of ntp, type:

```
# ntpq –p
```

The first character before the server host will be "*" when it thinks it is time synced.

Another convenient check to compare the time of your workstation with that of another (such as the ntp server is):

```
# date ; rdate –p nodename
```

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

You can also manually set the time from another computer with the following command. This will not work if ntpd is running on your machine.

```
# ntpdate host
```

APPENDIX C

# INSTALLING LINUX: RHEL 5 DESKTOP

## C.1 Overview

This installation manual provides instructions on how to properly install and configure Red Hat Enterprise Linux Desktop Version 5 for the Vaisala (IRIS & RDA) application software. We recommend that you completely read through this appendix if you are about to install the Linux OS and the Vaisala application software for the first time. If you wish to install on RHEL6, see Appendix D, Installing Linux: RHEL 6 For Servers on page 171.

### C.1.1 Desktop Variants and Installation Number

Unfortunately, Red Hat supplies multiple variants of their Red Hat Enterprise Linux 5 Desktop. You should purchase the "Red Hat Enterprise Desktop with Workstation option". There are 4 varients of features: Plain, "Multi-OS", "Workstation", and "Workstation and Multi-OS". There are also 2 varients of support, "Basic" and "Standard". We recommend the "Workstation with Basic Subscription". This comes with an installation number which is is required as part of the installation process, and which will enable installing more required features from the media. Be sure to get your installation number, which is supplied separately from the media.

For more information and a more in-depth discussion of the installation process, please refer to the Red Hat Enterprise Linux Installation Guide which can be found on the Documentation CD of your RHEL Desktop CDs.

| NOTE | During this process it is critical to take notes so that you can properly reuse this information during the post installation modifications. |
|---|---|

# C.2 Installation Overview

Vaisala supports two types of installation methods:

- Automatic
- Manual

The **automatic** installation method uses bootable scripts located on special Install CD's available from Vaisala. The install cdrom is specific to a particular OS version, see our ftp site (ftp.sigmet.vaisala.com:/outgoing/releases/install) for the current list. If you wish to install a different version, use the manual method, or contact us. After installing the OS, you can separately install IRIS from the IRIS/RDA install media. While some manual steps are still required after this automatic procedure, the time necessary to complete an IRIS/RDA installation on a new computer system is drastically reduced.

The **manual** installation method is documented here as an alternative in the event that there is a problem with the automatic installation, or if you wish to install a different version of the OS. It is written for an RHEL5 installation. There will be differences with other versions, so some operator flexibility will then be required.

## C.2.1 Using This Manual

The instructional sections of this manual use the following format:

- **Screen** "Title"
- **Action:** What to do

The Screen Title indicates what you will see on the installation wizard screen. In some cases we include a screen capture. The action explains what you should do.

| NOTE | Use the Tab key to move between different fields/options on the screen and the space bar to select check boxes. |
|---|---|

## C.2.2 Types of 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 CD-ROM (set of 4) or the single DVD-ROM labeled "32 bit Installation", or a file accessible over the network (via NFS or FTP). Vaisala recommends a CD-ROM or DVD-ROM based installation and this is the only type of installation that will be covered in this manual. For more information refer to the Red Hat Enterprise Linux Installation Guide. Vaisala's IRIS/RDA release CD-ROM contains all of the necessary files for an NFS installation, which easily scales when the number of systems increases above two or three.

## C.2.3 Installation Preparation

You have a choice or using the RHEL5 CDROM set (5 disks) or single DVD depending on whether you have a CD drive or a DVD drive available on your system. Verify that you can boot from a CDROM or DVD by powering off your computer system, inserting the Vaisala IRIS/RDA cdrom, the RHEL CDROM labeled CD 1 or the RHEL DVD (32-bit version) into the appropriate drive and then powering on your computer.

**If a Linux screen is displayed on your screen continue to** "Automatic Installation" on page 144 **for the automatic installation procedure or** "Manual Installation" on page 145 **for the manual procedure.**

If **a Linux screen was not displayed** on your computer then continue with this section. When the computer is booting, a message will be displayed to "Press DEL to enter SETUP" (or some other key to enter setup).

Here is what to check: In the BIOS Features Setup, set the boot sequence to be "CD, A, C". Finally, save your changes by pressing the **F10** key. The system will reboot.

# C.3 Automatic Installation

If you have not already done so, place the Vaisala Install disk for the desired OS version into the appropriate drive and reboot your computer. You should see a RedHat splash screen.

**Action:** For SATA disk drives hit return, for IDE drives type ide and return.

After this command has been entered, the installation process will continue automatically. The CDs should be inserted by an operator (when prompted) in the following order: 1, 2, 3, 4, 1, or use the DVD. Once the installation is complete the last CD will eject from the system. The system will reboot. If the automatic installation does not work for some reason, use the manual installation in "Manual Installation" on page 145.

# C.4 Sigconfig

**NOTE** From 8.13.3 release on, sigconfig installation script use yum instead of rpm command to install extras RPMs during initial IRIS installation. The command line is the same as before and there is no need from user interaction. Yum is the tool that makes it easy to handle rpm dependency issue when installing extras RPMs.

Once the operating system installation is complete, Vaisala provides a script that performs all of the necessary post OS installation steps and installs the Vaisala software called **sigconfig**. **Sigconfig** works for either RHEL5 or RHEL6.

1. Login as root with a password of "**xxxxxxxx**" (8 x).
2. Insert the IRIS/RDA release CD into the CD-ROM. It automounts to directory */media/irisrda_x.x.x*, where *x.x.x* is the IRIS release version number. **Sigconfig** is now using yum to install extras rpm packages.

   It may be necessary to correct the mount point in order for yum to work. If the system did not automount the DVD, you will need to mount it manually.

To mount IRIS DVD disc manually, you have to create directory:

```
#mkdir -p /media/irisrda_x.x.x
```

where `x.x.x` is the IRIS version. For example, if the IRIS version is 8.13.3, the directory would be `/media/irisrda_8.13.3`.

```
# mount /dev/cdrom  /media/irisrda_8.13.3
```

or

```
# mount /dev/dvd /media/irisrda_8.13.3
```

To run the sigconfig script:

```
# cd  /media/irisrda_8.13.3
sigconfig [arg1 arg2 arg3 argn} <cr>
```

If you need to know command line arguments, type `sigconfig <cr>` and the help menu displays a list of the command line arguments.

For IRIS only on RHEL5:

```
# ./sigconfig -iris -6
```

For RCP8 on RHEL5:

```
# ./sigconfig -rcp8  -6
```

For dual system on RHEL5:

```
#./sigconfig  -rvp900 -rcp8 -iris -6
```

If you want to install individual rpm package from the *extras/RPMS* directory, type:

```
# yum install <rpm package>
```

Yum resolves any required dependencies. In the past we use rpm command and we have issues with dependencies when installing rpm packages.

# C.5 Manual Installation

Manual installation is typically used to install Linux and IRIS onto workstations that are not provided by Vaisala, i.e., not RVP8 or RCP8 hardware. Note that the automatic procedure should always be used for RVP8 and RCP8 systems. The manual procedure described here can still take advantage of our automated post OS installation script (**sigconfig**) to perform system configuration functions.

# C.5.1 Install Redhat Linux RHEL Desktop Version 5

If you have not already done so, place the RHEL CD-ROM #1 or the DVD (labeled in small letters "32 bit Installation") into the appropriate drive and reboot your computer. At the first prompt screen, Select the "graphical mode" installation by clicking **Enter**. Then follow the instructions below.

## C.5.1.1 Red Hat Enterprise Linux 5

**Purpose**: Splash Screen

**Action**: Click **Next**.

## C.5.1.2 Installation Language

**Purpose**: Select the installation language.

**Action**: Choose your favorite language, then click **Next**.

## C.5.1.3 Keyboard Selection

**Purpose**: Choose the keyboard type that you have purchased.

**Action**: For most systems choose **U.S. English** then click **Next**.

## C.5.1.4 Installation Number

**Purpose**: This number will control which software you can install.

**Action**: Enter your installation number which you got from Red Hat then click **Next**. If you do not have an installation number, the installation will miss important packages.

## C.5.1.5 Upgrade/Install Choice

**Purpose**: If an installation is detected, then you can choose whether to upgrade or do a "fresh installation". Here we assume that you will be doing a "fresh installation". This is often the safest thing to do.

**Important**: Before you proceed, be sure that you have backed up any critical files. The **sigbru** utility, if installed, can be used for this. See Appendix G, sigbru Utility on page 213 of this manual.

**Action**: Select **Install Red Hat Enterprise Linux Client** and click **Next**.

### C.5.1.6 Disk Partitioning Setup

**Action**: Select **Remove all partitions on selected drives and create default layout** and click **Next**. If you are going to record time series, we recommend that you create a separate partition for that purpose.

### C.5.1.7 Network Devices

**Purpose**: Set basic network configuration. You can do this later, but if you know the information you might as well do it now. You will need to consult with your network manager to get the information. An example is shown here:

**Actions**:

1. Click **Edit Network Devices**. In the **Edit Interface eth0** menu:
   a. Clear **Configure using DHCP**.
   b. Click **Enable IPv4 support**.
   c. Click **Activate on boot**.
   d. Clear **Enable IPv6 support**.
   e. IPv4 Address: e.g. *192.168.76.51*
   f. Net Mask: e.g., *255.255.255.0*
2. Hostname: Select "manually" and enter a host name provided by your network manager (for example, *iris-test.sigmet.com*).
3. Miscellaneous Settings: per requirements of network manager.

### C.5.1.8 Time Zone

**Actions**:

1. Select the nearest city in your time zone.
2. Select **System clock uses UTC**

3. Select: **Next**.

### C.5.1.9 Set Root Password

**Action**: Enter the password for root (twice) and then click **Next**. The default Vaisala root password is "xxxxxxxx" (8 x).

### C.5.1.10 Software Selection

**Action**: Check MultiMedia, Office, Software Development, no Virtualization. **Select Customize Now** and click **Next**.

### C.5.1.11 Package Group Selection

**Purpose**: Select the packages to install (☑) or not to install (☐). In some cases you will need to look at the “Optional packages” to select or de-select specific packages. Text in **bold** indicates changes from the defaults.

**Desktop Environments**

☑ GNOME Desktop Environment

☑ KDE (K Desktop Environment)

Applications

☑ Authoring and Publishing

☐ Eclipse

☑ Editors

Optional Packages: Accept defaults, and also select emacs & emacs_nox

☑ Engineering and Scientific

Optional Packages: Accept defaults, and also select lapack

☑ Games and Entertainment

☑ Graphical Internet

☑ Graphics

☑ Office/Productivity

☑ Sound and Video

☐ Text–Based Internet

**Development**

☑ Development Libraries

☑ Development Tools

☑ GNOME Software Development

☑ Java Development

☐ KDE Software Development

☑ Legacy Software Development

☐ Ruby

☑ X Software Development
Optional Packages: Accept defaults, turn on openmotif–devel

**Servers**

☐ DNS Name Server

☑ FTP Server

☑ Legacy Network Server
Optional Packages: Accept defaults, turn on rsh–server and telnet–server

☐ Mail Server

☑ MySQL Database

☐ Network Servers

☐ News Servers

☑ PostgreSQL Database

☑ Printing Support

☑ Server Configuration Tools

☑ Web Server

☑ Window File Server

**Base System**

☑ Administration Tools

☑ Base

☑ Dial-up Networking Support

☑ Java

☑ Legacy Software Support

☑ System Tools
Optional Packages: Accept the defaults and also select festival

☑ Workstation

☑ X Window System

**Virtualization**

☐ Virtualization

**Languages**

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

### C.5.1.12 About to Install

Action: Select **Next**.

The install process will take about 20 to 40 minutes depending on the speed of your computer.

### C.5.1.13 Congratulations

**Action**: Click **Reboot**.

### C.5.1.14 Welcome

**Purpose**: After the first reboot you will need to enter some customization information. You only need to do this once.

**Action**: Click **Forward**.

### C.5.1.15 License Agreement

**Action**: Select **Yes I agree** and then click **Forward**.

### C.5.1.16 Firewall

**Action**: Select **Disabled** and then click **Forward**.

### C.5.1.17 SELinux

**Action**: Select **Disabled** and then click **Forward**.

### C.5.1.18 Kdump

**Action**: Leave **Disabled** and then click **Forward.**

### C.5.1.19 Date and Time

**Action**: Set the date and time. Use your local time. NTP, if used will be setup later.

### C.5.1.20 Set Up Software Updates

**Purpose**: To register with Red Hat. You can bypass this and you can do it later if needed.

**Action**: Click **Forward**

### C.5.1.21 Create User

**Purpose**: This will be done in a later step.

**Action**: Click **Forward** and then **Continue** in the pop-up.

### C.5.1.22 Sound Card

**Purpose**: Check sound function.

**Action**: **Play test sound** then click **Forward**.

### C.5.1.23 Additional CDs

**Purpose**: Install additional CDs.

**Action**: Insert the extras CDROM or DVD, and click **Install**.

In the system cdinstall–helper program, select **Multimedia,** then select acroread and the acroread plugin packages. If you do not have the extras CD or DVD, these same rpms are supplied on our IRIS CDROM, and you can manually install them from there.

### C.5.1.24 Finish Setup

**Purpose**: To congratulate you. Nice job!

**Action**: Click **Next**.

At this point you will need to run our `sigconfig` post-install configuration script. Either follow the instructions in "Sigconfig" on page 144, or do it manually as described in the next "Manual sigconfig Instructions" on page 153.

## C.5.2 Install Additional rpms

You need these additional rpms, get them by installing from the RHEL5 dvd:

```
# cd /mnt/cdrom/Client
# rpm –Uvh sharutils–4.6.*.i386.rpm
# rpm –Uvh mesa–libOSMesa–*.rpm

# cd /mnt/cdrom/Workstation
# rpm –Uvh tk–devel–*.i386.rpm tcl–devel–*.i386.rpm
# rpm –Uhv lapack–devel–*.i386.rpm

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

# C.6 Manual sigconfig Instructions

After installing Linux above, there are some steps to customize the Linux installation for IRIS and RDA use. Most of the steps here are performed automatically by running the **sigconfig** utility as described in "Sigconfig" on page 144. You should go to this section and run this utility. This section describes those steps in case you need to do them manually.

## C.6.1 Install Additional rpms

Now install the IRIS release CDROM. The remainder of the rpms are not standard CentOS, and are supplied by Vaisala. Type:

```
# cd /media/irisrda_x.x.x/CENTOS5/extras/RPMS
```

You can use `rpm -Uhv` or `yum install` to install the rpm packages.

Install the acroread and geotiff library rpms:

```
# rpm -Uhv acroread-7.0.*.el5.i386.rpm
# rpm -Uhv acroread-plugin-7.0.*.el5.i386.rpm
# rpm -Uhv proj-*4.*.vel5.i386.rpm
# rpm -Uhv libgeotiff-*.el5.i386.rpm
# rpm -Uhv openmotif-*.rpm
```

or

```
# yum install acroread-7.0.*.el5.i386.rpm
# yum install acroread-plugin-7.0.*.el5.i386.rpm
# yum install proj-*4.*.vel5.i386.rpm
# yum install libgeotiff-*.el5.i386.rpm
# yum install openmotif-*.rpm
```

If you are doing an **RDA** install, then install dkms, and these canbus library, gpib library, and power monitor rpms:

```
# rpm -Uhv dkms-2.*.noarch.rpm
# rpm -Uhv kvasercan-lib-*.el5.i686.rpm
# rpm -Uhv linux-gpib-lib-*-1.el5.i686.rpm
# rpm -Uhv nrpz-lib-*.vel5.i686.rpm
```

or

```
# yum install dkms-2.*.noarch.rpm
# yum install kvasercan-lib-*.el5.i686.rpm
# yum install linux-gpib-lib-*-1.el5.i686.rpm
# yum install nrpz-lib-*.vel5.i686.rpm
```

If you are installing an **rcp8** which is using the canbus (such as the Vaisala antenna pedestal), then you will need to install the Kvaser kernel module. This module will automatically recompile at boot time to match your kernel version.

```
# rpm –Uhv dkms–kvasercan–*.vel5.i386.rpm
```

or

```
# yum install dkms–kvasercan–*.vel5.i386.rpm
```

If you are installing an **rcp8** which is using the GPIB bus to control a signal generator, then you will need to install the GPIB kernel module. This module will automatically recompile at boot time to match your kernel version.

```
# rpm –Uhv dkms–linux–gpib–*.vel5.i386.rpm
```

or

```
# yum install dkms–linux–gpib–*.vel5.i386.rpm
```

If you are installing an **rcp8** which is using the power monitor, then you will need to install the power monitor kernel module.This module will automatically recompile at boot time to match your kernel version.

```
# rpm –Uhv dkms–nrpzmodule–*.vel5.i386.rpm
```

or

```
# yum install dkms–nrpzmodule–*.vel5.i386.rpm
```

If you are installing an rcp8 which is using the USB serial port device, then you will need to install this kernel module. This module will automatically recompile at boot time to match your kernel version.

```
# rpm –Uhv dkms–moxauport–*.vel5.i386.rpm
```

or

```
# yum install dkms–moxauport–*.vel5.i386.rpm
```

If you are installing an **IRIS** system and using our HDF4 pipes, then you will need to install the HDF4 library.

```
# rpm –Uhv hdf–*4.*.el5.i386.rpm
```

or

```
# yum install hdf–*4.*.el5.i386.rpm
```

If you are installing an **IRIS** system and using our HDF5 pipes, then you will need to install the HDF5 library.

# rpm -Uhv hdf5-*.el5.rf.i686.rpm

or

# yum install hdf5-*.el5.rf.i686.rpm

If you are installing an iris system and using our BUFR pipes, then you will need to install the BUFR library.

# rpm -Uhv bufr-*.i386.rpm

or

```
# yum install bufr-*.i386.rpmor
```

If you are installing an **IRIS** system and using our metar pipe, then you will need to install the mdsplib rpm.

```
# rpm –Uhv mdsplib–*.i386.rpm
```

or

```
# yum install mdsplib–*.i386.rpm
```

If you are installing an **IRIS** system and using our NetCDF pipe, then you will need to install the NetCDF rpm.

# rpm -Uhv netcdf-*.i386.rpm

or

# yum install netcdf-*.i386.rpm

If you are installing an **IRIS** system and using our GRIB2 pipes, then you will need to install the GRIB rpms.

```
# rpm –Uhv jasper*.el5.i386.rpm
# rpm –Uhv grib_api–*.el5.i386.rpm
```

or

```
# yum install jasper*.el5.i386.rpm
# yum install grib_api–*.el5.i386.rpm
```

If you are installing from the web, you can pick up these same rpms from our ftp site in the following directory:

ftp.sigmet.vaisala.com://outgoing/os_patches/CentOS5

If you are running sigconfig from a local directory, and not from the cdrom, then these rpms will not install, and you will need to do them manually.

## C.6.2 User Account Configuration

Type in the following commands to create accounts for the operator & observer users that are needed for IRIS, the RVP8 or RCP8:

```
# /usr/sbin/useradd -G users -m -u 1000 radarop
# /usr/sbin/useradd -G users -m -u 1001 observer
# echo 'xxxxxx' | passwd --stdin radarop
# echo 'xxxxxx' | passwd --stdin observer
```

By default, the Linux OS forces the use of "strong passwords". If you wish to be able to use simpler passwords, you should now edit the file */etc/pam.d/passwd*. The file should then be made to consist of only a single line reading:

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

Save the file and exit. Now each user can change their password to be anything.

## C.6.3 Service Configuration

For operation of IRIS, various services must be enabled including these in */etc/xinetd.d: rlogin, rsh, telnet*.

To enable these services, type the commands:

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

Other optional services are:

- `gssftp` (sometimes called vs-ftpd)
- `ntpd` (see also section "Configuring NTP" on page 165)

- `tomcat` (required for web server)

The default configuration for **xinetd** in Linux allows receipt of only a limited number of remote shell commands per minute. This limit can easily be exceeded with a burst of network transfers between Vaisala systems. This will cause a network send request to become "aborted", and the network link to fail thereafter. Vaisala recommends raising this number to at least 100 on all systems. This is easily done by editing the */etc/xinetd.d/rsh* file and adding a line similar to the others in the "service shell" section, that is, before the final "}", that reads as follows:

```
per_source = 100
```

Changes take effect when you reboot, or send the hup signal to inetd with:

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

The RHEL Linux has a problem with kerberos **rsh** and **rcp** as follows:

- **rsh** does not work at all to hp 10.20 systems
- **rcp** gets a warning message to all platforms

As it turns out, there are 2 sets of r* commands installed on those systems. The commands in /usr/bin work fine the old way. We recommend for Vaisala systems that you remove the kerbero code from your system:

```
# rpm -e krb5-workstation
```

## C.6.4 Create the IRIS Root and Data Directories

| NOTE | Note: Vaisala recommends using /usr/sigmet as the default root. You may choose another anchor point, but the remaining discussion assumes the /usr/sigmet anchor point. |
|---|---|

To create this directory, login as root and then type:

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

Vaisala software requires a number of directories to hold the data that it generates. These directories may be positioned anywhere within the file system. They have no connection with each other or with the */usr/sigmet* installation point. The directories are listed below along with their purpose.

| | |
|---|---|
| `ascope` | Ascope data files |
| `input` | Generic pipe input |
| `ingest` | Acquired radar data in polar form |
| `log` | Error, status, and history messages |
| `product` | Normal product files from the product generator |
| `product_raw` | Raw product files from the product generator |
| `suncal` | Suncal results files are stored here |
| `tape_inv` | Tape inventories for quick retrieval |
| `temp` | Temporary storage used for network output |
| `zdrcal` | Zdrcal results files are stored here |

Next, create the directories at the operating system prompt. Be sure the owner and group are set to match operator's default. For example:

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

## C.6.5 Install IRIS CDROM

Install the IRIS or RDA code from our media. See instructions in "Performing a New Software Installation" on page 18, or type commands similar to this:

```
# cd /mnt/cdrom/sigmet/RHEL5/iris
# ./instiris -files -root /usr/sigmet -new -manuals \> -
source -headers
```

## C.6.6 Configure Home Environment

Vaisala requires a number of special "environment" files to be included in the /etc tree so they can be executed whenever anyone logs in. Copy the following files as described below:

```
# mkdir /etc/sigmet
# cd /usr/sigmet/config_template/LINUX/etc
# cp ./profile.d/* /etc/profile.d
# cp ./sigmet/* /etc/sigmet
```

Also copy files to the home directory for each user:

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

```
# install -o operator -g users mwmrc          /home/operator/.mwmrc
# install -o operator -g users bash_profile   /home/operator/.bash_profile
# install -o operator -g users Xdefaults      /home/operator/.Xdefaults
# install -o operator -g users xinitrc        /home/operator/.xinitrc
# 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
# install -o observer -g users xinitrc        /home/observer/.xinitrc
```

Logout of the computer and login as operator. These files are read each time you login. Automatic startup programs will only pick up changes after you reboot. Continue with the next step to complete the post installation configuration.

### C.6.6.1 Operator List Defined in the Startup File

The file */etc/sigmet/profile.conf* 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. Edit the file and change these as needed. Note that every IRIS user must share group access to files owned by `operator` by being a member of the users group.

```
operators='operator tom doug jason root'
observers='observer'
```

You can check your environment by typing:

```
$ env | grep IRIS
```

## C.6.7 Raise Shared Memory

Edit your */etc/sysctl.conf* file to include the following lines at the end:

```
# Increase shared memory
sys.kernel.shmmax = 500000000
```

While you are in there, do the RDA changes in "RDA Configuration" on page 160.

## C.6.8 RDA Configuration

For RDA systems only:

Edit your /etc/ld.so.conf file to include the following line at the end:

```
/usr/sigmet/bin/dynamic
```

Then type the following command so that it will take effect:

```
# /sbin/ldconfig
```

If you do not do this, you will get the following error message when the RVP900 starts:

```
rvp9: error while loading shared libraries: libipps.so:
cannot open shared object file: no such file or directory.
```

Edit your */etc/sysctl.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 the RVP900. If you do not do this, you will get the following error message when the RVP900 starts:

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

Edit your */usr/share/hwdata/pci.ids* file. Look for the line which reads "Altera Corporation". Add lines following so that it reads as follows. Note that the indentations must be a tab, not spaces.

```
1172 Altera Corporation
7805 SIGMET RVP8/Rx IF Receiver
7806 SIGMET RVP8/Tx IF Transmitter
7807 SIGMET RVP/RCP 62-pin I/O Board
```

If your system is an RVP900, then you need to raise the MTU on your network interface to the IFDR. This is done by editing your */etc/sysconfig/network-scripts/ifcfg-eth0* file. Add the following to the end of the file:

```
MTU=8192
```

Also, while you are in the ifcfg–eth1 file on the RVP900, edit it so it contains the following 3 lines after the "DEVICE" line:

```
BOOTPROTO=static
IPADDR=10.0.1.213
NETMASK=255.255.255.0
```

## C.6.9 Configuration for Automatic Startup

The RVP900/RVP8/RCP8/IRIS application software can be configured to startup automatically following a boot of the system. In the Automatic Software Installation, this happens by default. However, in the Manual Software Installation, this is an optional configuration that may be performed. Type the following commands, depending on your configuration:

RVP900:

```
# chkconfig --add rdasys
# chkconfig --add rvp901
# chkconfig --add dspexport
```

RVP8:

```
# chkconfig --add rdasys
# chkconfig --add rvp8
# chkconfig --add dspexport
```

RCP8:

```
# chkconfig --add rdasys
# chkconfig --add rcp8
```

IRIS:

```
# chkconfig --add iris
```

# C.7 Post-Install Steps

## C.7.1 Configuring Your Time Zone

If you used the automatic installation procedure or need to your time/date settings for another reason, as root, run:

```
# system-config-date
```

Unfortunately, this GUI does not support setting the timezone to UTC. Do this with the following command:

```
# ln -sf /usr/share/zoneinfo/GMT /etc/localtime
```

## C.7.2 Basic Network Configuration

If you did not use the automatic installation procedure or need to change your network settings for another reason, as root, run:

```
# system-config-network
```

After you have made your desired changes:

```
# reboot
```

You can manually inspect and edit the various network configuration files. The ones required for IRIS are as follows:

| File name | Function | Test |
|---|---|---|
| */etc/sysconfig/network* | Set official local host name and basic networking. | `# hostname`<br>Should show hostname exactly as as in the file. |
| */etc/sysconfig/network-scripts/ifcfg-eth0* | Define the local IP address and the other basic network information | `# ifconfig eth0`<br>Displays network configuration and status summary for device eth0. |
| */etc/hosts* | Defines IP addresses, hostnames and aliases for all of the various IRIS or other network nodes. | `# ping <hostname or alias>`<br>Shows that the hostname or alias corresponds to the proper IP address. |

| File name | Function | Test |
|---|---|---|
| */etc/hosts.equiv* | A list of other hosts and the corresponding users who are allowed remote access without password. | `# rsh hostname date` Also required for rcp and rlogin. |
| */etc/resolv.conf* | Specifies a network domain name server (DNS) as an alternative to a fixed */etc/hosts* 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 resolv.conf to /etc/resolv.conf.back. |

The various files should look something like the examples below. Note that your specific node names and IP addresses, etc., will be different so 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
```

Vaisala recommends the use of a static */etc/hosts* file. In this case, to avoid possible confusion with the DNS server, you should move the resolv.conf file as follows:

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

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

*/etc/resolv.conf* (should look something like the following)

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

After you have completed the networking, it is recommended that you reboot the system to test the changes. If you change the host name for example, you will need to reboot for this to take effect. For most other changes however you can test by simply stopping and starting the network service as follows:

```
Restart the network by typing;
service network stop
service network start
```

## C.7.3 Routing

By default, a Linux system will not route network data. To enable routing, type the following command:

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

Once you get this working, you need to make a change so this will run every time you boot. Do this by editing the */etc/sysctl.conf* and add a line like:

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

Or, you can put the echo command into your */etc/rc.d/rc.local* file.

## C.7.4 Configuring NTP

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
```

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 will set the time after approximately 15 minutes after building a time syncing model. This means that after booting, the time may change in about 15 minutes. This can cause problems with automatic startup of IRIS. To fix this problem, create a file */etc/ntp/step-tickers* and put in just the server IP address, without the word "server". Ntp will then set the date at boot time, if possible. Do not put in the step-tickers file on the time server.

If ntpd was not added under "Configuring rcp" on page 166 (Configuring for automatic startup), type the following:

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

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

```
# service ntpd start
```

It will take 15 minutes before it will sync the times. If the times are more than 10 minutes apart, ntp will assume there is an error and never change the time. To check on the status of ntp, type:

```
# ntpq -p
```

The first character before the server host will be "*" when it thinks it is time synced.

Another convenient check to compare the time of your workstation with that of another (such as the ntp server is):

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

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

You can also manually set the time from another computer with the following command. This will not work if ntpd is running on your machine.

```
# ntpdate host
```

## C.7.5 Configuring rcp

Only read this section if you are having problems getting rcp to work. Authorization to use **rcp** is controlled both by the file /etc/hosts.equiv discussed in "Setting Up for RCP and Other R Commands" on page 23, and by the pam.d software. Take a look in the /etc/pam.d directory. There is a separate file controlling many different services. The "rsh" file controls rsh and rcp. Login as operator and then conduct a simple test to see if you are authorized to use "rsh" commands. Type "rsh host date", where "host" is your hostname. The hosts date should be displayed to the terminal of the "rsh" commands are authorized.

```
$ rsh iris-test date
Wed Jan 4 12:12:34 EST 2014
```

If the test does not work properly the rsh file should be modified. The rsh file should contain the following:

```
#%PAM-1.0
```

# For root login to succeed here with pam_securetty, "rsh" must be

```
# listed in /etc/securetty.
```

```
auth       required     /lib/security/pam_nologin.so
auth       required     /lib/security/pam_securetty.so
auth       required     /lib/security/pam_env.so
auth       required     /lib/security/pam_rhosts_auth.so
account    required     /lib/security/pam_stack.so service=
                        system-auth
session    required     /lib/security/pam_stack.so service=
                        system-auth
```

The documentation for this package is available online on your system. Point your browser to the file: */usr/share/doc/pam-0.74/html/pam.html*.

Here is a summary: The word "required" means that the operation must pass all 6 of these security tests before it is permitted. The

"pam_nologin.so" command means that if the file /etc/nologin exists you are stopped. The "pam_securetty.so" means that if you are root, and the terminal is not listed in the /etc/securetty file then you are blocked. The "pam_rhosts_auth.so" means that ruserok function must pass, which basically means that the /etc/hosts.equiv file is checked, or the $HOME/.rhosts file is checked. I have not figured out what the other lines mean. When it fails, a single line is added to the /var/log/messages file mentioning the failure, but not the reason.

If you cannot get it to work, then try changing one of the lines from "required" to "sufficient". This should make it go without checking the rest. Changing this file takes effect right away, you do not need to reboot.

In addition to the /etc/pam.d/rsh file, there is also a /etc/xinetd.d/rsh file. This file frequently gets damaged on installation. If this happens to you, remove and reinstall the rsh-server rpm file. The /etc/pam.d/rsh file should contain:

```
# default: on
# description: The rshd server is the server for the rcmd(3)
routine and, \
# consequently, for the rsh(1) program. The server provides
\
# remote execution facilities with authentication based on
\
# privileged port numbers from trusted hosts.
service shell

{

disable             = no
socket_type         = stream
wait                = no
user                = root
log_on_success      += USERID
log_on_failure      += USERID
server              =
                    /usr/sbin/in.rshd


}
```

Then log out and in.

# C.8 X-Windows Troubleshooting: Framebuffer Method

Sometimes the standard X server for your video card just does not seem to work, or works very poorly. In cases like this, you can often achieve success by configuring the card as a frame buffer device, rather than using one of the specific X servers. We have used this method several times for video cards that were not fully supported by Linux, and it works quite well. Frame buffer support is directly built into the 2.2.x kernels, so the procedure is pretty easy.

Here are instructions that should get tough-dog video cards up and running:

- Don't worry too much about setting up X during the install. You're going to change the /etc/X11/xorg.conf file later anyway. Just fiddle through the X setup, choose VGA16 or some other generic server like SVGA, pick a monitor, etc. It will probably fail, which is no problem — just quit the X setup stuff when you get the chance, and complete the RedHat install.
- When you first boot, login as root and edit your /etc/lilo.conf file, adding the line VGA=794 under the read-only line in the Linux section. This is the decimal code for 16bpp and 1024x768 resolution. To get a different resolution and color depth, see the valid decimal code table below (from the Vesafb Mini-HOWTO).

| Colors | 640x480 | 800x600 | 1024x768 | 1280x1024 | 1600x1200 |
|---|---|---|---|---|---|
| 256 | 769 | 771 | 773 | 775 | 796 |
| 32,768 | 784 | 787 | 790 | 793 | 797 |
| 65,536 | 785 | 788 | 791 | 794 | 798 |
| 16.8M | 786 | 789 | 792 | 795 | 799 |

- Exit the editor saving your changes, and type:

  ```
  lilo -v
  ```

  Then reboot. When you reboot, you should now have a cute penguin in the top left hand corner of your screen and your resolution should be 1280x1024.

- Login as root and do the following (assuming you still have your RedHat install CD in the drive):

```
# mount /dev/cdrom /mnt/cdrom
# cd /mnt/cdrom/RedHat/RPMS
# rpm -Uvh XFree86-FBDev-3.3.6-35.i386.rpm
# cd /etc/X11
# rm X
# ln -s /usr/X11R6/bin/XF86_FBDev /etc/X11/X
```

- Edit the */etc/X11/xorg.conf* file (for older systems you should modify the XF86Config–4 file as well) file so it will work with the FBDev server. First, delete all the mode lines. You don't need them. Next, add this to the area that has all the different screen and server information:

```
Section "Screen"

Driver              "FBDev"
Device              "My Video Card"
Monitor             "My Monitor"
DefaultDepth        16
SubSection          "Display"
Depth               16
Modes               "1280x1024"


EndSubSection
EndSection
```

- Run `xinit`.

  That's it! Naturally, you will have to change the Depth and Modes lines to reflect the decimal code you chose for your depth and resolution in your *lilo.conf* file.

# C.9 Special Notes for Notebook Installations

Most notebook computers have only a single bay for the CDROM or floppy, and some have unusual interfaces to these devices. Often there is a magic code required to allow booting from the CDROM, or to enable the graphics. Fortunately each model laptop is well documented on the web page:

`http://Linux-on-laptops.com/`

APPENDIX D

# INSTALLING LINUX: RHEL 6 FOR SERVERS

## D.1 Overview

This appendix provides instructions on how to install and configure Red Hat Enterprise Linux Server Version 6 for the Vaisala WR (IRIS & RDA) application software. We recommend that you completely read through this manual if you are about to install the Linux OS and the Vaisala application software for the first time. If you wish to install on RHEL5, please follow the instructions in Appendix C, Installing Linux: RHEL 5 Desktop on page 141.

For more information and a more in-depth discussion of the installation process, refer to the *Red Hat Enterprise Linux Installation Guide*, which can be found on the Documentation disk of your RHEL Desktop DVDs.

| **NOTE** | During this process it is critical to take notes so that you can properly reuse this information during the post installation modifications. |
|---|---|

## D.1 Installation Overview

Vaisala supports two types of installation methods:

- Automatic
- Manual

The **automatic** installation method uses bootable scripts located on special Install CDs available from Vaisala. The install CD-ROM is specific to a particular OS version, see our ftp site (ftp://ftp.sigmet.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 can separately install IRIS from the IRIS/RDA install media. While some manual steps are still required after this automatic procedure, the time necessary to complete an IRIS/RDA installation on a new computer system is drastically reduced.

The **manual** installation method is documented here as an alternative in the event that there is a problem with the automatic installation, or if you wish to install a different version of the OS. It is written for an RHEL6 installation. There will be differences with other versions, so some operator flexibility will then be required.

## D.1.1 Using this Manual

The instructional sections of this manual use the following format:

- **Screen** "Title"
- **Action**: What to do

The Screen Title indicates what you will see on the installation wizard screen. In some cases we include a screen capture. The action explains what you should do.

| **NOTE** | Use the Tab key to move between different fields/options on the screen and the space bar to select check boxes. |
|---|---|

## D.1.2 Types of 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 and this is the only type of installation that will be covered in this manual. For more information, refer to the *Red Hat Enterprise Linux Installation Guide*.

### D.1.3 Installation Preparation

Verify that you can boot from a DVD by powering off your computer system, inserting the Vaisala Install CD-ROM or the RHEL DVD (32–bit version) into the appropriate drive and then powering on your computer. **If a Linux screen is displayed on your screen continue to "Automatic Installation" on page 173 for the automatic installation procedure or "Manual Installation" on page 175 for the manual procedure.**

**If a Linux screen was not displayed** on your computer then continue with this section. When the computer is booting, a message will be displayed to “Press DEL to enter SETUP” (or some other key to enter setup). Press the specified key to enter setup.

Here is what to check: In the BIOS Features Setup, set the boot sequence to be “CD, C”. Finally, save your changes by pressing the F10 key. The system will reboot.

## D.2 Automatic Installation

If you have not already done so, place the Vaisala Install disk for the desired OS version into the appropriate drive and reboot your computer. You should see a RedHat splash screen.

**Action**: For SATA disk drives hit return, for IDE drives type ide and return. We also include options for the SATA disk configured as sda, sdb, or sdc.

After this command has been entered, the installation process will continue automatically. The DVD should be inserted by an operator, when prompted. Once the installation is complete the last DVD will eject from the system. The system will reboot. If the automatic installation does not work for some reason, use the manual installation in "Manual Installation" on page 175.

## D.2.1 Sigconfig

**NOTE** From 8.13.3 release on, sigconfig installation script use yum instead of rpm command to install extras RPMs during initial IRIS installation. The command line is the same as before and there is no need from user interaction. Yum is the tool that makes it easy to handle rpm dependency issue when installing extras RPMs.

Once the operating system installation is complete, Vaisala provides a script that performs all of the necessary post OS installation steps and installs the Vaisala software called **sigconfig**. **Sigconfig** works for either RHEL6 or RHEL5.

1. Login as root with a password of "**xxxxxxxx**" (8 x).
2. Insert the IRIS/RDA release CD into the CD-ROM. It automounts to directory */media/irisrda_x.x.x*, where *x.x.x* is the IRIS release version number. **Sigconfig** is now using yum to install extras rpm packages.

   It may be necessary to correct the mount point in order for yum to work. If the system did not automount the DVD, you will need to mount it manually.

To mount IRIS DVD disc manually, you have to create directory:

```
#mkdir -p /media/irisrda_x.x.x
```

where `x.x.x` is the IRIS version. For example, if the IRIS version is 8.13.3, the directory would be `/media/irisrda_8.13.3`.

```
# mount /dev/cdrom  /media/irisrda_8.13.3
```

or

```
# mount /dev/dvd /media/irisrda_8.13.3
```

To run the sigconfig script:

```
# cd  /media/irisrda_8.13.3
sigconfig [arg1 arg2 arg3 argn} <cr>
```

If you need to know command line arguments, type `sigconfig <cr>` and the help menu displays a list of the command line arguments.

For IRIS only on RHEL6:

```
# ./sigconfig -iris -6
```

For RCP8 on RHEL6:

```
# ./sigconfig -rcp8  -6
```

For dual system on RHEL6:

```
#./sigconfig  -rvp900 -rcp8 -iris -6
```

If you want to install individual rpm package from the *extras/RPMS* directory, type:

```
# yum install <rpm package>
```

Yum resolves any required dependencies. In the past we use rpm command and we have issues with dependencies when installing rpm packages.

# D.3 Manual Installation

Manual installation is typically used to install Linux and IRIS onto workstations that are not provided by Vaisala, i.e., not RVP8 or RCP8 hardware. Note that the automatic procedure should always be used for RVP8 and RCP8 systems. The manual procedure described here can still take advantage of our automated post OS installation script (**sigconfig**) to perform system configuration functions.

## D.3.1 Install Red Hat Enterprise Linux Version 6 For Servers

If you have not already done so, place the RHEL DVD (labeled in small letters “32 bit Installation”) into the appropriate drive and reboot your computer.

## D.3.2 Welcome to Red Hat Enterprise Linux 6.0!

**Purpose:** Splash Screen

**Action:** Select **Install or upgrade an existing system**.

## D.3.3 Disc Found

**Purpose:** Allow you to test the installation disk.

**Action:** Select **OK** if you want to test the install disk. This takes a long time, but we have found many bad discs over the years. Or select **Skip** if you are sure the disc is OK.

## D.3.4 RED HAT ENTERPRISE LINUX 6

**Purpose:** Splash Screen

**Action:** Click **Next**.

## D.3.5 Installation Language

**Purpose:** Select the installation language.

**Action:** Select your favorite language, then click **Next**.

## D.3.6 Keyboard Selection

**Purpose:** Choose the keyboard type that you have purchased.

**Action:** For most systems choose **U.S. English**, then click **Next**.

## D.3.7 Type of Device for Installation

**Action:** Select **Basic Storage Devices**.

## D.3.8 Hostname

**Action:** Type in your host name, for example *wes–install.vaisala.com*, then click **Config Network**.

## D.3.9 Please Name This Computer

**Purpose:** Set basic network configuration. You can do this later, but if you know the information you might as well do it now. You will need to consult with your network manager to get the information. An example is shown here:

**Actions:**

1. From the **Network Connections** menu, in the **Wired** tab, select the device **System eth0**, and click **Edit**. The **Editing System eth0** window. appears. In this window do the following:
   a. Select the **Connect automatically** button.
   b. Select the **IPv4 Settings** tab. On this menu:
      i. Set **Method** to **Manual**.
      ii. Click **Add**.
      iii. Type in your IP address, for example *192.168.45.208* and click **Enter**. It will default the **Netmask**, (change if desired).
      iv. Type in the Gateway IP address.
      v. *Optionally*, type in the DNS server and domain name and click **Apply**.
6. Click **Close** on the parent **Network Connections** menu.
7. CLick **Next** to leave the **Please name this computer** page.

## D.3.10 Time Zone

**Actions**:

1. Select the nearest city in your time zone. If you want your computer to use UTC for the system clock (good for shipboard systems, for example), then scroll down the list to find the “Etc/UTC” choice..
2. Select **System clock uses UTC**.
3. Select: **Next**.

## D.3.11 Set Root Password

**Action:** Enter the password for root (twice) and then click **Next**. The default Vaisala root password is “xxxxxxxx” (8 x).

## D.3.12 What Type of Installation Would You Like?

**Action:** Select option 5 **Create Custom Layout** and click **Next**.

If you are going to record time series, we recommend that you create a separate partition for that purpose.

## D.3.13 Please Select A Device

**Action:** Select your hard drive device from the list. Click **Create** four times, and make four partitions similar to this table:

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

It will make an extended partition for you, this is OK. Now click **Next**.

## D.3.14 Boot Loader Operating System List

**Action:** Click **Next** to take the default.

## D.3.15 The Default Installation of Red Hat Enterprise Linux...

**Action:** Check **Software Development Workstation**. Leave default repositories. Select **Customize now** and click **Next**.

## D.3.16 Package Group Selection

**Purpose:** Select the packages to install (☑) or not to install (☐). In some cases you will need to 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

☐ E-mail 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: 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.

## D.3.17 About to Install

**Action:** Click **Next**.

The install process will take about 20 to 40 minutes depending on the speed of your computer.

## D.3.18 Congratulations

**Action:** Click **Reboot**. Make sure the CentOS6 disk is removed from the drive.

## D.3.19 Welcome

**Purpose:** After the first reboot you will need to enter some customization information. You only need to do this once.

**Action:** Click **Forward**.

## D.3.20 License Information

**Action:** Select **Yes I agree** and then click **Forward**.

## D.3.21 Set Up Software Updates

**Purpose:** To register with Red Hat. You can bypass this and you can do it later if needed.

**Action:** Click **Forward**.

## D.3.22 Create User

**Purpose:** Create a user for the system.

**Action:** We will be creating the normal radar operator account later. We suggest you create an account for “service” here, make the password “xxxxxx” if you have no other preference, then click **Forward**.

## D.3.23 Date and Time

**Action:** Set the date and time. Use your local time (depending on the timezone set earlier). Alternatively set your NTP servers here.

### D.3.24 Kdump

**Action:** Leave **Disabled** and then click **Forward**.

### D.3.25 Disable Firewall

After the install procedure has completed, you need to manually disable the firewall. You need to be logged in as root to do this. Run the following command:

```
# system-config-firewall
```

Click **Disable**, then **Apply**, then exit the program. If you are running the gnome desktop, you can launch system–config–firewall from the menu bar by selecting System/Administration/Firewall.

At this point you will need to run our “sigconfig” post-install configuration script. Either follow the instructions in "Sigconfig" on page 174, or do it manually as described in "Manual Sigconfig Instructions" on page 184.

## D.4 Manual Sigconfig Instructions

After installing Linux above, there are some steps to customize the Linux installation for IRIS and RDA use. Most of the steps here are performed automatically by running the sigconfig utility as described in "Sigconfig" on page 174. You should go to this section and run this utility. This section describes those steps in case you need to do them manually.

### D.4.1 Install Additional rpms

Now install the IRIS release CDROM. The remainder of the rpms are not standard CentOS, and are supplied by Vaisala.

You need these additional CentOS rpms, which are not supplied on the CentOS media, get them by installing from the Vaisala dvd:

```
# cd /mnt/cdrom/CENTOS6/extras/RPMS
```

You can use `rpm -Uhv` or `yum install` to install the rpm packages.

Install the acroread rpms:

```
# rpm –Uvh acroread–9.4.*.el6.i686.rpm
# rpm –Uvh acroread–plugin–9.4.*.el6.i686.rpm
```

or

```
# yum install acroread–9.4.*.el6.i686.rpm
# yum install acroread–plugin–9.4.*.el6.i686.rpm
```

Install the blas–devel, mesa–libOSMesa, and lapack–devel rpms:

```
# rpm –Uvh blas–devel–3.*.el6.i686.rpm
# rpm –Uvh mesa–libOSMesa–*7.*.el6.i686.rpm
# rpm –Uvh lapack–devel–3.*.el6.i686.rpm
# rpm –Uhv xorg–x11–apps–7*.el6.i686.rpm
```

or

```
# yum install blas–devel–3.*.el6.i686.rpm
# yum install mesa–libOSMesa–*7.*.el6.i686.rpm
# yum install lapack–devel–3.*.el6.i686.rpm
# yum install xorg–x11–apps–7*.el6.i686.rpm
```

Install the geotiff library rpms:

```
# rpm –Uhv proj–*4.*.el6.i686.rpm
# rpm –Uhv libgeotiff–*.el6.i386.rpm
```

or

```
# yum install proj–*4.*.el6.i686.rpm
# yum install libgeotiff–*.el6.i386.rpm
```

If you are doing an RDA install, then install dkms, and these canbus library, gpib library, and power monitor library rpms:

```
# rpm –Uhv dkms–2.*.noarch.rpm
# rpm –Uvh kvasercan–lib–*.vel6.i686.rpm
# rpm –Uvh linux–gpib–lib–*.vel6.i686.rpm
# rpm –Uvh nrpz–lib–*.vel6.i686.rpm
```

or

```
# yum install dkms–2.*.noarch.rpm
# yum install kvasercan–lib–*.vel6.i686.rpm
# yum install linux–gpib–lib–*.vel6.i686.rpm
# yum install nrpz–lib–*.vel6.i686.rpm
```

If you are installing an **rcp8** which is using the canbus (such as the Vaisala antenna pedestal), then you will need to install the Kvaser kernel module. This package will automatically rebuild at boot time to match your kernel version.

```
# rpm –Uhv dkms–kvasercan–*.vel6.i686.rpm
```

or

```
# yum install dkms–kvasercan–*.vel6.i686.rpm
```

If you are installing an **rcp8** which is using the GPIB bus to control a signal generator, then you will need to install the GPIB kernel module. This package will automatically rebuild at boot time to match your kernel version.

```
# rpm –Uhv dkms–linux–gpib–*.vel6.i686.rpm
```

or

```
# yum install dkms–linux–gpib–*.vel6.i686.rpm
```

If you are installing an **rcp8** which is using the power monitor, then you will need to install the power monitor kernel module. This package will automatically rebuild at boot time to match your kernel version.

```
# rpm –Uhv dkms–nrpzmodule–*.vel6.i686.rpm
```

or

```
# yum install dkms–nrpzmodule–*.vel6.i686.rpm
```

If you are installing an **rcp8** which is using the USB serial port device, then you will need to install this kernel module. This package will automatically rebuild at boot time to match your kernel version.

```
# rpm –Uhv dkms–moxauport–*.vel6.i686.rpm
```

or

```
# yum install dkms–moxauport–*.vel6.i686.rpm
```

If you are installing an IRIS system and using our HDF5 pipes, then you will need to install the HDF5 library.

```
# rpm –Uhv hdf5–*.el6.i686.rpm
```

or

```
# yum install hdf5–*.el6.i686.rpm
```

If you are installing an IRIS system and using our HDF4 pipes, then you will need to install the HDF4 library.

```
# rpm –Uhv hdf–*.el6.i686.rpm
```

or

```
# yum install hdf-*.el6.i686.rpm
```

If you are installing an IRIS system and using our BUFR pipes, then you will need to install the BUFR library.

```
# rpm -Uhv bufr-*.vel6.i686.rpm
```

or

```
# yum install bufr-*.vel6.i686.rpm
```

If you are installing an IRIS system and using our metar pipe, then you will need to install the mdsplib rpm.

```
# rpm -Uhv mdsplib-*.i386.rpm
```

or

```
# yum install mdsplib-*.i386.rpm
```

If you are installing an IRIS system and using our NetCDF pipe, then you will need to install the NetCDF rpm.

```
# rpm -Uhv netcdf-*.el6.2.i686.rpm
```

or

```
# yum install netcdf-*.el6.2.i686.rpm
```

If you are installing an IRIS system and using our GRIB2 pipes, then you will need to install the GRIB rpms.

```
# rpm -Uhv ksh*.el6.i686.rpm
# rpm -Uhv jasper*.el6.i686.rpm
# rpm -Uhv grib_api-*.el6.i686.rpm
```

or

```
# yum install ksh*.el6.i686.rpm
# yum install jasper*.el6.i686.rpm
# yum install grib_api-*.el6.i686.rpm
```

If you are installing from the web, you can pick up these same rpms from our ftp site in the following directory:

```
ftp.sigmet.vaisala.com://outgoing/os_patches/CentOS6
```

If you are installing on an CentOS6 system, then you will find similar files in the */mnt/cdrom/CENTOS6/extras/RPMS* directory and on our ftp site. If you are running sigconfig from a local directory, and not from the cdrom, then these rpms will not install, and you will need to do them manually.

## D.4.2 User Account Configuration

Type in the following commands to create accounts for the operator & observer users that are needed for IRIS, the RVP8 or RCP8:

```
# /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
```

By default, the Linux OS forces the use of "strong passwords". If you wish to be able to use simpler passwords, you should now edit the file */etc/pam.d/passwd*. The file should then be made to consist of only a single line reading:

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

Save the file and exit. Now each user can change their password to be anything.

## D.4.3 Service Configuration

For operation of old versions of IRIS, various services must be enabled including these in */etc/xinetd.d: rlogin, rsh, telnet*.

To enable these services, type the commands:

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

Other optional services are:

- `gssftp` (sometimes called vs–ftpd)
- `ntpd` (see also TBD)
- `tomcat6` (required for web server)

The default configuration for **xinetd** in Linux allows receipt of only a limited number of remote shell commands per minute. This limit can easily be exceeded with a burst of network transfers between Vaisala systems. This will cause a network send request to become "aborted", and the network link to fail thereafter. Vaisala recommends raising this number to at least 100 on all systems. This is easily done by editing the */etc/xinetd.d/rsh* file and adding a line similar to the others in the "service shell" section, i.e., before the final "}", that reads as follows:

```
per_source = 100
```

Changes take effect when you reboot, or send the hup signal to inetd with:

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

## D.4.4 Create the IRIS Root and Data Directories

**NOTE** Vaisala recommends using */usr/sigmet* as the default root. You may choose another anchor point, but the remaining discussion assumes the /*usr/sigmet* anchor point.

To create this directory, login as root and then type:

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

Vaisala software requires a number of directories to hold the data that it generates. These directories may be positioned anywhere within the file system. They have no connection with each other or with the */usr/sigmet* installation point. The directories are listed below along with their purpose.

| | |
|---|---|
| `ascope` | Ascope data files |
| `input` | Generic pipe input |
| `ingest` | Acquired radar data in polar form |
| `log` | Error, status, and history messages |

| | |
|---|---|
| `product` | Normal product files from the product generator |
| `product_raw` | Raw product files from the product generator |
| `suncal` | Suncal results files are stored here |
| `tape_inv` | Tape inventories for quick retrieval |
| `temp` | Temporary storage used for network output |
| `zdrcal` | Zdrcal results files are stored here |

Next, create the directories at the operating system prompt. Be sure the owner and group are set to match operator's default. For example:

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

## D.4.5 Install IRIS CRDROM

Install the IRIS or RDA code from our media. See instructions in "Performing a New Software Installation" on page 18, or type commands similar to this:

```
# cd /mnt/cdrom/sigmet/RHEL6/iris
# ./instiris –files –root /usr/sigmet –new –manuals
```

## D.4.6 Configure Home Environments

Vaisala requires a number of special "environment" files to be included in the /etc tree so they can be executed whenever anyone logs in. Copy the following files as described below:

```
# mkdir /etc/sigmet
# cd /usr/sigmet/config_template/LINUX/etc
# cp ./profile.d/* /etc/profile.d
# cp ./sigmet/* /etc/sigmet
```

Also copy files to the home directory for each user:

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

```
# install -o operator -g users mwmrc          /home/operator/.mwmrc
# install -o operator -g users bash_profile   /home/operator/.bash_profile
# install -o operator -g users Xdefaults      /home/operator/.Xdefaults
# install -o operator -g users xinitrc        /home/operator/.xinitrc
# 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
# install -o observer -g users xinitrc        /home/observer/.xinitrc
```

Logout of the computer and login as operator. These files are read each time you login. Automatic startup programs will only pick up changes after you reboot. Continue with the next step to complete the post installation configuration.

### D.4.6.1 Operator List Defined in the Startup File

The file */etc/sigmet/profile.conf* 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. Edit the file and change these as needed. Note that every IRIS user must share group access to files owned by operator by being a member of the users group.

```
operators='radarop operator joe alan jason root'
observers='observer'
```

You can check your environment by typing:

```
$ env | grep IRIS
```

## D.4.7 RPC Authentication

Starting with RHEL6, the rpc calls used to communication over the network between programs are getting the error message "Cannot register service: RPC: Authentication error;". Fix this with the following comand:

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

## D.4.8 Raise Maximum Shared Memory

Edit your `/etc/sysctl.conf` file to include the following lines at the end:

```
# Increase Shared Memory
sys.kernel.shmmax = 500000000
```

While you are in there, do the RDA changes in "RDA Configuration" on page 192.

## D.4.9 RDA Configuration

For RDA systems only:

Edit your */etc/ld.so.conf* file to include the following line at the end:

```
/usr/sigmet/bin/dynamic
```

Then type the following command so that it will take effect:

```
# /sbin/ldconfig
```

If you do not do this, you will get the following error message when the RVP900 starts:

```
rvp9: error while loading shared libraries: libipps.so:
cannot open shared object file: No such file or directory
```

Edit your */etc/sysctl.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 the RVP900. If you do not do this, you will get the following error message when the RVP900 starts:

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

Edit your */usr/share/hwdata/pci.ids* file. Look for the line which reads “Altera Corporation”. Add lines following so that it reads as follows. Note that the indentations must be a tab, not spaces.

```
1172 Altera Corporation
7805 SIGMET RVP8/Rx IF Receiver
7806 SIGMET RVP8/Tx IF Transmitter
7807 SIGMET RVP/RCP 62-pin I/O Board
```

If your system is an RVP900, then you need to raise the MTU on your network interface to the IFDR. This is done by editing your */etc/sysconfig/network–scripts/ifcfg–eth0 and ifcfg–eth1* files. Add the following to the end of the files:

```
MTU=8192
```

Also, while you are in the ifcfg–eth1 file on the RVP900, edit it so it contains the following 3 lines after the "DEVICE" line:

```
BOOTPROTO=static
IPADDR=10.0.1.213
NETMASK=255.255.255.0
```

## D.4.10 Configuration for Automatic Startup

The RVP900/RVP8/RCP8/IRIS application software can be configured to startup automatically following a boot of the system. In the Automatic Software Installation, this happens by default. However, in the Manual Software Installation, this is an optional configuration that may be performed. Type the following commands, depending on your configuration:

RVP900:

```
# chkconfig --add rdasys
# chkconfig --add rvp900
# chkconfig --add dspexport
```

RVP8:

```
# chkconfig --add rdasys
# chkconfig --add rvp8
# chkconfig --add dspexport
```

RCP8:

```
# chkconfig --add rdasys
# chkconfig --add rcp8
```

IRIS:

```
# chkconfig --add iris
```

# D.5 Post-Install Steps

## D.5.1 Configuring Your Time Zone

If you used the automatic installation procedure or need to your time/date settings for another reason, as root, run:

```
# system-config-date
```

If you wish the system clock to display UTC, then in the “Time Zone” tab, look in the “Non-geographic timezones” to find “UTC”.

## D.5.2 Basic Network Configuration

If you did not use the automatic installation procedure or need to change your network settings for another reason, as root, run:

```
# system-config-network
```

After you have made your desired changes:

```
# reboot
```

You can manually inspect and edit the various network configuration files. The ones required for IRIS are as follows:

| File name | Function | Test |
|---|---|---|
| */etc/sysconfig/network* | Set official local host name and basic networking. | `# hostname`<br>Should show hostname exactly as as in the file. |
| */etc/sysconfig/network-scripts/ifcfg-eth0* | Define the local IP address and the other basic network information | `# ifconfig eth0`<br>Displays network configuration and status summary for device eth0. |
| */etc/hosts* | Defines IP addresses, hostnames and aliases for all of the various IRIS or other network nodes. | `# ping <hostname or alias>`<br>Shows that the hostname or alias corresponds to the proper IP address. |

| File name | Function | Test |
|---|---|---|
| */etc/hosts.equiv* | A list of other hosts and the corresponding users who are allowed remote access without password. | `# rsh hostname date` Also required for rcp and rlogin. |
| */etc/resolv.conf* | Specifies a network domain name server (DNS) as an alternative to a fixed */etc/hosts* 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 resolv.conf to /etc/resolv.conf.back. |

The various files should look something like the examples below. Note that your specific node names and IP addresses, etc., will be different so 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
```

Vaisala recommends the use of a static */etc/hosts* file. In this case, to avoid possible confusion with the DNS server, you should move the resolv.conf file as follows:

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

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

*/etc/resolv.conf* (should look something like the following):

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

After you have completed the networking, it is recommended that you reboot the system to test the changes. If you change the host name for example, you will need to reboot for this to take effect. For most other changes however you can test by simply stopping and starting the network service as follows:

```
Restart the network by typing;
service network stop
service network start
```

## D.5.3 Routing

By default, a Linux system will not route network data. To enable routing, type the following command:

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

Once you get this working, you need to make a change so this will run every time you boot. Do this by editing the */etc/sysctl.conf* and add a line like:

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

Or, you can put the echo command into your /etc/rc.d/rc.local file.

## D.5.4 Configuring NTP

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
```

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 will set the time after approximately 15 minutes after building a time syncing model. This means that after booting, the time may change in about 15 minutes. This can cause problems with automatic startup of IRIS. To fix this problem, create a file */etc/ntp/step–tickers* and put in just the server IP address, without the word "server". Ntp will then set the date at boot time, if possible. Do not put in the step–tickers file on the time server.

If ntpd was not added in "Configuration for Automatic Startup" on page 193, type the following:

```
# chkconfig –-add ntpd
# chkconfig ntpd on
```

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

```
# service ntpd start
```

It will take 15 minutes before it will sync the times. If the times are more than 10 minutes apart, ntp will assume there is an error and never change the time. To check on the status of ntp, type:

```
# ntpq –p
```

The first character before the server host will be "*" when it thinks it is time synced.

Another convenient check to compare the time of your workstation with that of another (such as the ntp server is):

```
# date ; rdate –p nodename
```

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

You can also manually set the time from another computer with the following command. This will not work if ntpd is running on your machine.

```
# ntpdate host
```

APPENDIX E

# LINUX SYSTEM FILE LISTINGS

## E.1 /etc/sigmet/profile.conf

```
install_root=/usr/sigmet
data_root=/usr/iris_data/current
network_port="TCP 30725"
operator=operator
operators="operator tester"
observers=observer
```

## E.2 /etc/profile.d/sigmet.sh

```
# COPYRIGHT (c) 2007 BY
# Vaisala INC., WESTFORD MASSACHUSETTS, U.S.A.
#
PROFILE_CONF=/etc/sigmet/profile.conf
export IRIS_ROOT='grep -v "#" ${PROFILE_CONF} | \
grep -E "^[ ]*install_root[= ]" | \
sed -e "s/^[ ]*install_root[= ]*//"'
export IRIS_DATA='grep -v "#" ${PROFILE_CONF} | \
grep -E "^[ ]*data_root[= ]" | \
sed -e "s/^[ ]*data_root[= ]*//"'
export IRIS_OPERATOR='grep -v "#" ${PROFILE_CONF} | \
```

```
grep -E "^[ ]*operator[= ]" | \
sed -e "s/^[ ]*operator[= ]*//"'
export IRIS_NETRCV='grep -v "#" ${PROFILE_CONF} | \
grep -E "^[ ]*network_port[= ]" | \
sed -e "s/^[ ]*network_port[= ]*//"'
if [ -z "${IRIS_NETRCV}" ]; then
export IRIS_NETRCV="TCPIP 30725"
fi
if [ -z "${IRIS_ROOT}" ]; then
export IRIS_ROOT=/usr/sigmet
fi
if [ -z "${IRIS_DATA}" ]; then
export IRIS_DATA=/usr/iris_data
fi
if [ -z "${IRIS_OPERATOR}" ]; then
export IRIS_OPERATOR=operator
fi
export IRIS_OPERATORS="${IRIS_OPERATOR} \
'grep -v "#" ${PROFILE_CONF} | \
grep -E "^[ ]*operators[= ]" | \
sed -e "s/^[ ]*operators[= ]*//" \
-e "s/$IRIS_OPERATOR//" \
-e "s/\\"//g"'"
export IRIS_OBSERVERS="'grep -v "#" ${PROFILE_CONF} | \
grep -E "^[ ]*observers[= ]" | \
sed -e "s/^[ ]*observers[= ]*//" \
-e "s/\\"//g"'"
# The following variables reference the
source/release/configuration
```

```
# tree. These should all be rooted at the location where
IRIS has

# been installed.

#

export IRIS_APP_DEFAULTS="${IRIS_ROOT}/bin/app-defaults/"

export IRIS_BIN="${IRIS_ROOT}/bin/"

export IRIS_BIN_ACROBAT="/usr/bin/"

export IRIS_BITMAPS="${IRIS_ROOT}/dt/icons/"

export IRIS_CONFIG="${IRIS_ROOT}/config/"

export IRIS_IMAGES="${IRIS_ROOT}/config/images/"

export IRIS_INIT="${IRIS_ROOT}/config/init/"

export IRIS_KEYS="${IRIS_ROOT}/bin/keys/"

export IRIS_LISTINGS="${IRIS_ROOT}/config/listings/"

export IRIS_MANUALS_INST=
"${IRIS_ROOT}/manuals/IrisInstall.ilcab/instapdf/install/"

export IRIS_MANUALS_IRIS=
"${IRIS_ROOT}/manuals/IrisUsers.ilcab/irisupdf/irisug/"

export IRIS_MANUALS_IRISRAD=
"${IRIS_ROOT}/manuals/IrisRadar.ilcab/irisrpdf/irisrad/"

export IRIS_MANUALS_NOTE=
"${IRIS_ROOT}/manuals/relnotes.ilcab/relnopdf/relnotes/"

export IRIS_MANUALS_PROG=
"${IRIS_ROOT}/manuals/IrisProgram.ilcab/irisppdf/program/"

export IRIS_MANUALS_RCP02=
"${IRIS_ROOT}/manuals/rcp02_ug.ilcab/rcp02pdf/rcp02/"

export IRIS_MANUALS_RVP8=
"${IRIS_ROOT}/manuals/install_ug.ilcab/rvp8updf/rvp8user/"

export IRIS_MANUALS_RCP8=
"${IRIS_ROOT}/manuals/rcp8_ug.ilcab/rcp8updf/rcp8/"

export IRIS_MANUALS_RVP7=
"${IRIS_ROOT}/manuals/rvp7_ug.ilcab/rvp7updf/rvp7user/"

export IRIS_MANUALS_UTIL=
"${IRIS_ROOT}/manuals/IrisUtils.ilcab/irisupdf/irisutl/"

export IRIS_MANUALS_EXTRA="${IRIS_ROOT}/config/extraspdf/"
```

```
export IRIS_MENU="${IRIS_ROOT}/config/menu/"

export IRIS_NLS="${IRIS_ROOT}/bin/nls/C/"

export IRIS_OVERLAY="${IRIS_ROOT}/config/overlay/"

export IRIS_PIPES="${IRIS_ROOT}/config/pipes/"

export IRIS_SOUNDS="${IRIS_ROOT}/dt/sounds/"

# The following variables define where IRIS data are
placed. These

# must be separate directories, but need have no relation
among each

# other.

#

export IRIS_INGEST="${IRIS_DATA}/ingest/"

export IRIS_LOG="${IRIS_DATA}/log/"

export IRIS_PRODUCT="${IRIS_DATA}/product/"

export IRIS_PRODUCT_RAW="${IRIS_DATA}/product_raw/"

export IRIS_TAPE_INV="${IRIS_DATA}/tape_inv/"

export IRIS_TEMP="${IRIS_DATA}/temp/"

# Modify existing PATH variable to include IRIS_BIN, and
other useful

# directories. First add the platform-independent paths.

#

if [ -r ${IRIS_BIN}/hardware ] ; then

PATH="${IRIS_BIN}hardware:$PATH"

fi

if [ -r ${IRIS_BIN}/rda ] ; then

PATH="${IRIS_BIN}rda:$PATH"

fi

export PATH=".:/usr/local/bin:${IRIS_BIN}:$PATH"

LD_LIBRARY_PATH="${LD_LIBRARY_PATH}:${IRIS_BIN}/dynamic"

export LD_LIBRARY_PATH="${LD_LIBRARY_PATH#:}"
```

```
# Default umask kills group write, leaves all else
unchanged.

#

umask 002

# Allow local windows to display. If you want remote
displays,

# add them here also. The [ -z ] prevents from executing on

# non-graphical login. The /dev/null prevents text on
terminals.

[ -z "$DISPLAY" ] || xhost +localhost > /dev/null
```

APPENDIX F

# PRINTER CONFIGURATION

IRIS lets you print menus, displays, and on-line documentation, as follows:

- Print the contents of a menu or a window by choosing **File->Print** from the IRIS menu or utility menu bar.
- Print products from the Product Output Menu by choosing **Device->** from the menu bar and selecting a printer from the pull-down list of devices.
- Print online documentation by choosing **File->Print** from the Acroread window.

This appendix gives you some hints on configuring printers to work with IRIS menus and utilities and the online document viewer.

## F.1 Configuring Printer Queues for IRIS use

The IRIS software always generates printer output in Postscript format, thus the most important matter in printing is to make sure that you have a postscript compatible printer.

The next note on printers is that IRIS always prints using UNIX type print queues. This implies that the computer that you are running IRIS on has at least one print queue setup on it. To setup a print queue, you should use the system administration tool on your computer. In HP-UX systems, this is the **sam** utility. In Linux PC systems, this is the **printtool**. After making any changes in **printtool**, you must click "Restart LPD" prior to using the printer you just configured.

Print queues can be for one of three types of printer configurations. The first is a **local printer**. In this case the printer is connected directly to the computer with via a parallel port connection. Printing information goes

directory from the computer to the printer via the parallel port connection. The second queue configuration is for a **network printer**. In this case the printer is attached directly to the computer network. With a network printer, the printing information goes from the computer directly to the printer via the network. The third queue configuration is a **remote printer**. In this case the printer is connected up to another UNIX based computer either with a local or a network connection as described above. In this case, when a print job is executed, the printing information is first transferred over the network from the local computer to the remote computer. The remote computer then transfers the information to printer using the queue configuration configured (either local or network) on that remote computer.

## F.1.1 Configuring a Local Printer Queue

Configuration for a local printer is the easiest — but perhaps not always practical. The reason why it is not always practical is that generally each computer does not have its own printer, but instead shares printers with other computers. None the less, sometimes you may have a local printer with a direct parallel port connection. In this case, merely configure the printer to be a local printer of type postscript using the system administration tool described above. During the configuration, you must specify a name for the queue and the parallel port to be used. At this point, when IRIS is restarted, it will recognize this printer and be able to print images to it.

It should be noted that once a printer is configured locally on one computer, other computers can still use that printer by using a remote printer queue pointing back to this first computer. See the section on configuring remote printers for more information on this.

## F.1.2 Configuring a Network Printer Queue

Network printers come in two different architectures. The first is referred to as "internal" and the second as "external". An internal architecture network printer has a network port (10/100 Base T) directly on the printer. An external architecture network printer is a printer with a parallel cable, and that parallel cable connects back to a hardware box called a "print server". The print server has the parallel port that connects to the printer and a network port (10/100 Base T) that connects to the network. The HP Jet Direct is a well known example of a print server product.

To configure your network printer (either internal or external), SIGMET recommends that you follow the instructions from the manufacturer. But generally these instructions have you either enter the printer configuration into the printer control panel, or to configure the printer through a network scheme such as BOOTP or TFTP. The main goal of this configuration step is so your printer can learn its Internet (IP) address. Again, refer to notes from your manufacturer to accomplish this step. Once this setup step is complete, you can use the **ping** command to test if the printer is recognized on the network.

Once the above is accomplished and your printer is recognized on the network, you must configure a print queue on your computer(s) to access it.

As is implied by a network printer, it is a shared device meaning more that one computer is capable of accessing it (via a queue). Configuration of a queue of a network printer depends on the type of platform you are configuring.

**HP-UX**: For HP-UX, you must install the optional Operating System software known as "**Jet Admin**" from HP. If the network printer you are installing is an HP, it is likely that this software was provided with the printer. If not, then the Jet Admin software can be downloaded from www.hp.com in the drivers section. This software can be installed with the HP-UX **sam** utility. Once the Jet Admin software is installed, you can use the **sam** utility to make a new printer queue of type "Network". During this process, you will need to specify the hostname or IP address of the printer and perhaps some other information depending on the installation circumstances.

**Linux PC**: For a Linux PC, it is not necessary to install any additional operating system software. To make a queue on a Linux system for a network printer, use the print manager that comes with the Linux **printtool**. Enter in a queue name. Specify the printer as a **Jet Direct** printer. Specify the **hostname or IP address** of the printer. Specify **postscript** as the filter type. Remember in **printtool** to save the information, then click "Restart LPD" prior to attempting to print.

Because Linux systems need no special operating system files to do network based printing, Linux requires the network printer to handle **LPD** type printing. Most network printers do handle this type printing, but if you are not sure, then check with your printer or print server manufacturer. HP Jet Direct printer and Lexmark network printers have been tested and do support LPD type printing.

It should be noted that once a printer is configured as a network printer on one computer, other computers can still use that printer by using a remote printer queue pointing back to this first computer. See the section on configuring remote printers for more information on this.

For Red Hat Enterprise Linux, standard DeskJet/Inkjet Printers can also be used. It is recommended that drivers be downloaded from:

http://hpinkjet.sourceforge.net

### F.1.3 Configuring a Remote Printer Queue

Configuration of a remote printer queue relies on a local or network printer queue already being configured on another computer, and that other computer will server as a relay point for print jobs from your computer. To setup a remote print queue use the system administration utility on your system. On HP this is **sam**, and on Linux this is the **printtool**. In the setup, you must specify a local queue name. Choose a name of your choice, but often this is the same as the remote queue name. Enter in the hostname or IP address of the remote computer that will serve as the relay point. Enter in the remote queue name which refers to the queue names as it is known on that remote computer.

## F.2 Displaying Print Queues

On UNIX systems, you can display a list of printer queues by issuing the `sig_lpstat -listall` command. This command displays the queues that are available on the system. To get more detailed information about the status of the queues, the **lpstat -a** command can be used.

## F.3 Configuring Printer Options

After you have worked with a menu, you may want to save the results to a postscript file or print the results for an archive of your IRIS system. Printed copies of IRIS configurations, product configurations, or schedules can be stored in a notebook to document how the system is used.

Printers are set up on a per-user basis. That way, users can send their results to the printers that are most convenient to them.

## F.3.1 Printer Setup Menu

From any IRIS menu, choose **File**->**Print**->**Setup** to activate the Printer Setup menu.

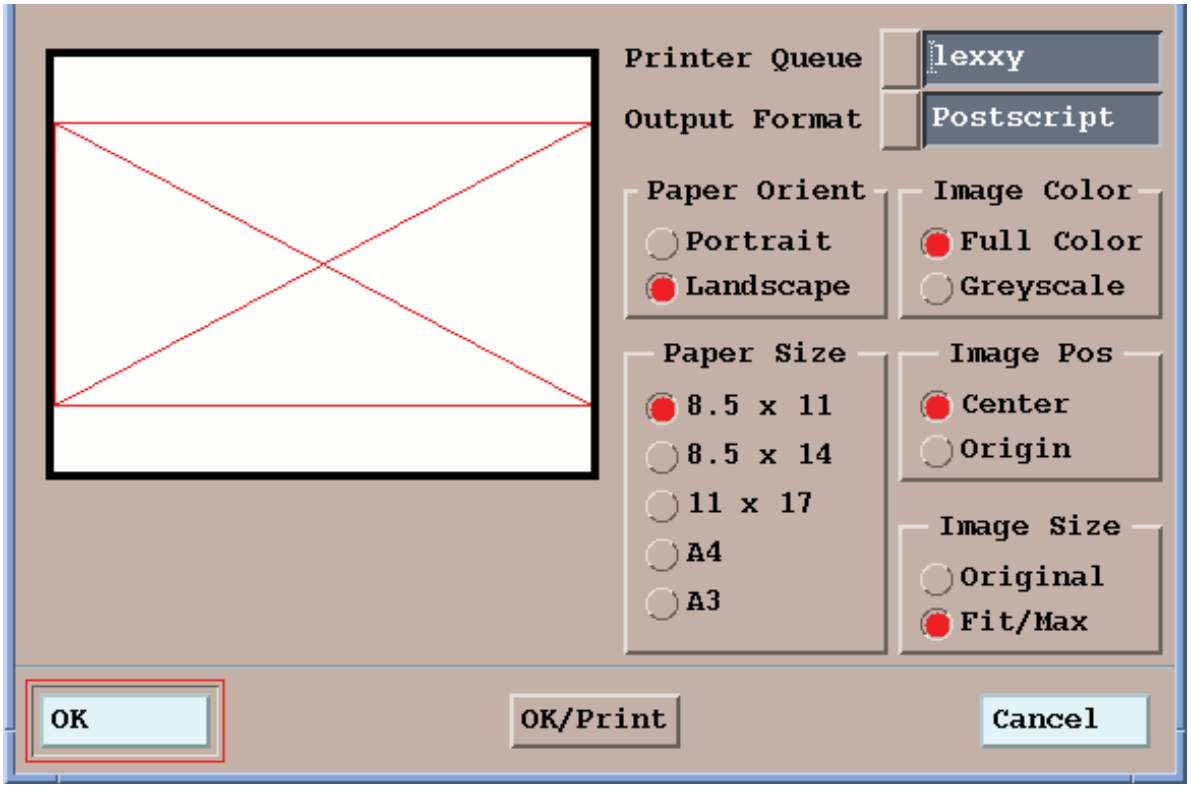



**Figure 1 Printer Setup Menu**

### F.3.1.1 Printer Queue

Enter the printer queue directly in the Printer Queue test field or click the push button to choose from the pull–down menu. The pull menu can contain up to 4 queue names that are configured on your system. Queues must be created at Operating System level before they will be displayed in the Setup Menu.

### F.3.1.2 Output Format

The output format can be Postscript, GIF, of JPEG. If you have a postscript capable printer, then the postscript option will allow you to have control over more output options. The GIF and JPEG options are just graphic files and are best use with no postscript printers such as InkJets,

etc. The options for the output when using GIF or JPEG cannot be set in the IRIS Print Setup tool, but rather must be configured using the operating system printer configuration tools.

### F.3.1.3 Paper Orientation

- **Portrait** – Click on the toggle button to print the screen image vertically (↕) on the page.
- **Landscape** – Click on the toggle button to print the screen image horizontally (↔) on the page.

### F.3.1.4 Image Color

- **Full Color** – Click on the toggle button for a full-color printout of your screen image. This option should be chosen for all full-color printers.
- **Greyscale** – Click on the toggle button for a grayscale printout of your screen image. This option should be chosen for all black-and-white printers. **Note**: You may choose this option if you are using a color printer and desire a grayscale printout of your screen image.

### F.3.1.5 Paper Size

The Paper Size option is designed to print the screen image on the size of the paper that is loaded in your printer—sizes 8.5 x 11, 8.5 x 14, and 11 x 17 are US standards (inches) and sizes A3 and A4 are International standards (metric).

### F.3.1.6 Image Position

- **Center** – Click on the toggle button to print the screen image in the center of the page.
- **Origin** – Click on the toggle button to print the screen image in the upper left-hand corner of the page.

### F.3.1.7 Image Size

- **Center** – Click on the toggle button to print the screen image in the center of the page.
- **Origin** – Click on the toggle button to print the screen image in the upper left-hand corner of the page.

### F.3.1.8 Printing Options

- **OK** – Click on the button to save the current settings.
- **OK/Print** – Click on the button to save the current settings and print a hardcopy of the the screen image (i.e. QLW, Setup, etc). If the OK/Print button is desensitized, a printer queue was not selected.
- **Cancel** – Click on the button to cancel any changes and ext the printer setup menu.

# APPENDIX G
# SIGBRU UTILITY

"**sigbru**" is Vaisala's manual/automatic backup and restore utility. This utility provides system administrators with an easy-to-use tool for creating and restoring backups from supported archive media. The supported media are:

- **DAT Tape**- HP SureStore DAT's are the most common and have proven to be very reliable.
- **HDD**- hard disk drive.
- **DVD**- DVD+RW is supported for writing backups. Use only media from well-known manufacturers such as SONY, Fuji or Memorex.

Note that **sigbru** is only one component of an effective backup strategy. Proper system documentation and advance preparation are essential in assuring that when (not if) your hard disk fails, you can easily resume operation. This chapter also includes recommended procedures for a comprehensive backup strategy.

**sigbru** is a graphical user interface which works in conjunction with Sigmet's **sigbrush** script file to allow easy archiving without having to know any of the sigbrush command line options. **sigbrush** interfaces with gnu's tar version 1.13.11 to give the tar utility even greater flexibility and control. The output is a "tar" file that is stored either on tape or disk. The tar file can optionally be gzip compressed.

One of the important features of **sigbru** is that it allows backups of a system to be made and placed on a tape or disk drive on another computer. The advantage of this is that the archive can be centrally located and the administrator can then backup systems to this one drive (typically a tape where he/she is sitting). Note that this requires a high-speed network connection, i.e., at least a T1 connection is recommended (1 megabit per second).

| NOTE | DVD backup and restore is supported only on a local DVD drive. |
|---|---|

A very powerful feature of **sigbru** is the automatic archiving feature. This allows a directory on disk to be monitored so that when a specified quota of disk space is reached, **sigbru** automatically archives the contents to the archive medium. One application is for use to archive non-IRIS products that are created by format conversion through an output pipe (the normal IRIS menu archive approach does not work for these).

# G.1 System Configuration for sigbru

## G.1.1 Authorization to login as root on a remote system

You can run **sigbru** either as root or operator. However, as operator you will have reduced privileges such as not being allowed to restore at all, or not being able to do a full system backup which requires root access to various directories.

If you want to run **sigbru** on a remote computer using an xterm (or sigterm), the operating system protection may block your login as root. You would notice that even if you provide the proper root password, you are not allowed to login.

You can circumvent this problem by going to the remote system and then moving the security file to another name, i.e., on the computer that you wish to access:

```
# cd /etc
# mv securetty securetty.orig
```

Test that you can now do a remote login as root from a another system. You only need to do this once.

## G.1.2 Authorization to use a remote tape drive or remote disk drive

| NOTE | sigbru does not support backup and restore on a remote DVD. Only a local DVD can be used. sigbru does support use of both a remote tape drive and a remote hard disk. |
|---|---|

If the computer that you are backing-up does not have a tape drive, you can back-up to a remote computer that does have a drive. You need to set-up special authorization file for this (*/etc/pam.d/rsh*). First, on the remote computer (with the tape drive) backup the old file and then use your favorite editor or "vi" to edit the file:

```
# cd /etc/pam.d
# cp rsh rsh.bak
# vi rsh
```

The file will look something like below. The exact lines vary by installation:

```
#%PAM-1.0
auth          required      /lib/security/pam_rhosts_auth
                            .so
auth          required      /lib/security/pam_nologin.so
account       required      /lib/security/pam_pwdb.so
session       required      /lib/security/pam_pwdb.so
```

Under the first line (which is commented with #) add the line:

```
auth          sufficient    /lib/security/pam_rootok.so
```

The edited file will look something like:

```
#%PAM-1.0
auth          sufficient    /lib/security/pam_rootok.so
auth          required      /lib/security/pam_rhosts_auth
                            .so
auth          required      /lib/security/pam_nologin.so
account       required      /lib/security/pam_pwdb.so
```

```
session       required      /lib/security/pam_pwdb.so
```

Save the modified file.

## G.1.3 Archive Device and Media Configuration for sigbru

Sigbru supports three different archive devices:

- DAT Tape
- HDD Hard disk drive
- DVD+RW

The configuration of both the drive and the media for each of these is described below:

### G.1.3.1 DAT for sigbru

The most common type of DAT used on IRIS systems is the HP SureStore. This comes in several versions (for example, version DAT 72). Make sure that you purchase tapes that are compatible with your hardware version.

In sigbru, the typical device names for DAT tapes are selected right in the menu. If this is not the correct selection for your system, you may type-in the correct device name. Check with your system manager if you are uncertain. Note that IRIS systems with tapes will also input the device name in the setup/output/archive device menu so you can check there as well.

The privileges for the device should be set as follows (in the typical Linux case of the DAT device name */dev/nst0*)

```
chmod 666 /dev/nst0
```

DAT tapes for sigbru do not need to be initialized.

### G.1.3.2 HDD for sigbru

You only need create a disk directory on the archive host you will be using. Note that you can make this the local computer. Having and HDD

backup on your local computer makes it very convenient to restore files, but is not a good idea for a full disk backup since you want to protect against failure of the disk itself.

To make the directory and set its privileges, become root and then, for the example of a directory named /iris_data/backups, type the following:

```
# mkdir /iris_data/backups
# chmod 666 /iris_data/backups
```

HDD directories for sigbru do not need to be initialized. Note that you can have several different backup files in this directory so it is not necessary to create a new directory every time you run sigbru.

### G.1.3.3 DVD for sigbru

Only DVD+RW drives are supported so make sure that you have one of these (SONY makes a nice one that we use at SIGMET). First you need to determine the device name that has been assigned to the DVD by the Linux OS. To do this, as root type:

```
# cdrecord -scanbus
```

The operating system will respond with many lines that look like:

```
...

scsibus3:

3,0,0 300) 'SAMSUNG ' 'CD-ROM SC-148C ' 'B100' Removable
CD-ROM

3,1,0 301) 'SONY ' 'DVD RW DRU-500A ' '2.0c' Removable CD-
ROM

3,2,0 302) *

...
```

Here we see the SONY DVD we are looking for. It's device name is */dev/scd1* which is taken from the middle of the three leading numbers, i.e., the "1" from 3,1,0.

Next set the protections as follows (continuing to use /dev/scd1 as the example):

```
# chmod 666 /dev/scd1
```

Now create symbolic link

```
# ln -s /dev/scd1 /dev/dvd
```

Then create a mount point for the DVD

```
# mkdir /mnt/dvd
```

Finally, initialize the DVD (essentially formatting the DVD):

```
# init_sigbru_dvd
```

# G.2 Starting sigbru

| NOTE | Important: sigbru is run on the machine that you want to backup / restore. |
|---|---|

| NOTE | Important: You must be root to do full sigbru backup and restore operations. |
|---|---|

## G.2.1 Command Line Options for Starting sigbru

**sigbru** has several command line options summarized below:

```
-help               Print this list.
-auto               Start Sigbru with
                    auto archive
                    options.
-enabled            Enable auto
                    archive function.
-include <dir>      Directory included
                    in archive.
-exclude <dir>      Directory excluded
                    from archive.
-compress           Enable gzip
                    compression.
```

| | |
|---|---|
| -delete | Delete files after archive. |
| -archivehost <hostname> | Hostname where archive device is located. |
| -quota <XXX.X> | Number of GB per each archive event |
| -device <device> | Name of archive device. |
| -display | Display name. |

The meaning of each of these options is described in the subsequent descriptions of the **sigbru** menu fields.

## G.2.2 Running from a Local Terminal Window (IRIS is installed)

On a local terminal window simply open a terminal as root on the system that you want to backup and then type:

```
# sigbru
```

If the system cannot find **sigbru** because the UNIX search path is not defined, then you can start **sigbru** by typing:

```
# cd /usr/sigmet/bin
```

```
# ./sigbru
```

If this does not find **sigbru**, then perhaps IRIS is not properly installed and you should use the cdrom method described below.

## G.2.3 Running from a Remote Workstation (IRIS Installed on Target System)

From a remote machine, you can use the sigterm <hostname> command to open a terminal over the network. Then become super user and follow the "Local Terminal" procedure described above.

Alternatively you can rlogin or telnet to the machine that you want to backup, become root and then type:

```
# export DISPLAY=hostname:0.0
```

Here you substitute the hostname of the computer where you are sitting. You may also have to type the command "xhost +" on a terminal on your local display to allow the remote machine to display the **sigbru** menu on your screen.

## G.2.4 If IRIS is Not Installed- Start sigbru from the CDROM

If you haven't installed IRIS, then **sigbru** will not be installed. This might happen if you are doing a restore operation, i.e., you need to restore IRIS and **sigbru**. In this case you can start **sigbru** directly from the SIGMET IRIS Release CDROM.

Insert the IRIS Release CDROM on the system where you want to run **sigbru**. Depending on your system you may need to mount the CDROM. See the instructions in the *IRIS Installation Manual*.

You can check that the CDROM is properly mounted by issuing the "df" command. This will also tell you what the mount point is (assumed here to be "/cdrom" for the linux example. Be careful to use upper or lower case as indicated by df). Once the CDROM is mounted type the following to select the correct version of **sigbru** for you workstation:

```
# cd /mnt/cdrom/linux/sigbru
```

Then start **sigbru** by typing:

```
# ./sigbru
```

Now that **sigbru** is running, refer to the next section which describes the various features of the **sigbru** menu.

## G.2.5 Copying the sigbru Files from a Local or Remote CDROM

You can copy the **sigbru** files to your system from either a local or remote CDROM. First create a directory on your local computer to hold the **sigbru** files. SIGMET recommends the following location:

```
# mkdir /root/sigbru
```

The CDROM must be mounted and the mount point (assumed here to be "/mnt/cdrom") must be properly specified. You can check both by issuing the "df" command. Now copy the files that you need from the CDROM with the IRIS Installation disk, to this directory:

- For a CDROM drive on your local system:

```
# cp /mnt/cdrom/linux/sigbru/* /root/sigbru
```

- For a CDROM drive on a remote system,

```
# rcp nodename:/mnt/cdrom/linux/sigbru/* /root/sigbru
```

To start **sigbru** type:

```
# cd /root/sigbru
# ./sigbru
```

## G.2.6 Copying the sigbru Files From Another IRIS System

You can copy the **sigbru** files to your system from another system on the network. The example here uses "rcp" (remote copy), but you could use ftp or NFS (via "cp") as well to do this. First create a directory to hold the **sigbru** files. SIGMET recommends the following location:

```
# mkdir /root/sigbru
```

Now copy the files that you need from the remote system that has IRIS (nodename) to your local system (careful with the rename of the first file from **sigbru** to sigbru.rf):

```
# rcp nodename:/usr/sigmet/bin/app-defaults/sigbru
/root/sigbru/sigbru.rf
# rcp nodename:/usr/sigmet/bin/sigbru /root/sigbru
# rcp nodename:/usr/sigmet/bin/sigbrush /root/sigbru
# rcp nodename:/usr/sigmet/bin/gnufind /root/sigbru
# rcp nodename:/usr/sigmet/bin/gnutar /root/sigbru
# rcp nodename:/usr/sigmet/dt/icons/hour32.bm /root/sigbru
# rcp nodename:/usr/sigmet/dt/icons/hour32m.bm /root/sigbru
```

To start **sigbru** type:

```
# cd /root/sigbru
# ./sigbru
```

# G.3 The sigbru Menu

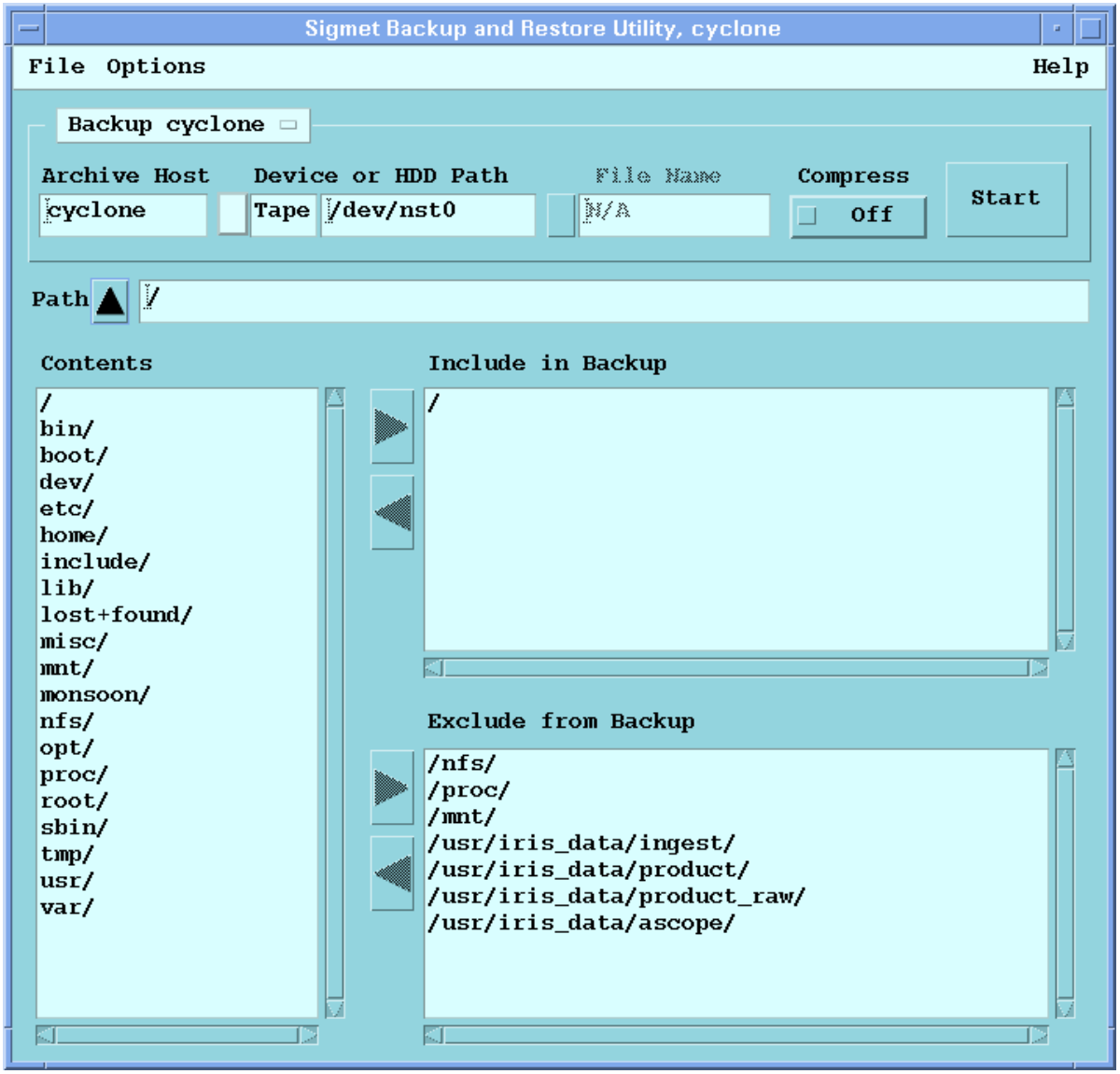



**Figure 1 sigbru Menu**

The **sigbru** user interface, shown in Figure 5 on page 254, allows you to define what files are moved to/from the archive media. *Remember, sigbru is run on the system where you want to backup/restore and you must be root to run sigbru*. A tape drive or HDD can be located on another system, however a DVD must be on the same system.

| NOTE | To get the automatic archiving features of sigbru, use "sigbru -auto" |
|---|---|

Figure 2 on page 223 shows the appearance of the top part of the sigbru menu for the case of restore operation.

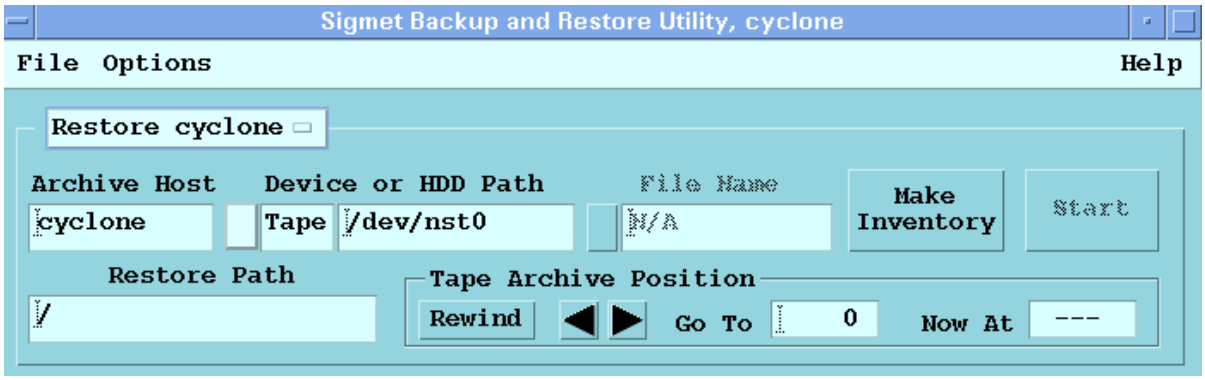



**Figure 2 sigbru Menu (Top of Dialog Box)**

The various menu fields are described below:

## G.3.1 Title Bar

This identifies the network node name on which **sigbru** is being run. In the example, the node name is "cyclone". This is the hostname of the system that will be backed-up or restored.

## G.3.2 File

The only option is "Exit". This is how **sigbru** is normally exited.

## G.3.3 Options

This is used to manually start or view the status log window. The status log contains useful messages about the backup and reports any errors or problems.

## G.3.4 Backup/Restore <host name>

Use this to select whether you are doing a backup or restore. The hostname of the computer is indicated as a reminder of what system is being used. The choice of Backup/Restore changes some of the other menu options. In the description of the various fields, both the backup and restore functions will be clearly indicated.

## G.3.5 Archive Host (Backup and Restore)

Specify the network hostname where the archive tape or disk file is located. The tape or disk drive can be on another machine on the network. Note that the slower your network, the longer it will take to make the remote backup to another machine. SIGMET recommends a 1 MBit/sec line (T1) as a minimum.

Note that in the case of a DVD, the archive host is fixed to be your local workstation.

## G.3.6 Device or HDD (Hard Disk Drive) Path (Backup Case)

First use the button to select the kind of media (DVD, HDD or Tape). For the case of "Tape" you will be prompted to specify the type of UNIX that you are running HP-UX, IRIX, Linux). **sigbru** then automatically fills-in a device file name which would be typical for your system and in most cases will work fine as is. However, depending on the specific configuration of your system, you may have to type in a different device file name. Check with your system administrator.

The example shown at the beginning of this section is the Linux device file name for a tape drive (the n specifies a non-rewind on close). If you select HDD or DVD, then you would type-in the filename that you want to use for the archive.

| NOTE | Note on Tape Drive Device Name: SIGMET recommends using the device name corresponding to "no rewind on opening". For Linux systems, for example /dev/nst0. Use of a non-rewind tape device driver permits multiple archive or backup files to be placed on the same tape for both archive and restore functions. |
|---|---|

If you store your archive in a DVD or HDD file, then you should use the following naming convention:

- *.gz for compressed files
- *.tar for uncompressed files

where the you would substitute a file name of your choosing for the *. For example, if you want to store a compressed backup in a directory called /tmp and you want to name it "back01" then you would type-in:

```
/tmp/back01.gz
```

For more information on backup devices and media please see "Archive Device and Media Configuration for sigbru" on page 216.

## G.3.7 Device or HDD (Hard Disk Drive) Path (Restore Case)

In the case of doing a restore from an HDD or DVD, the button next to filename is activated. Click this to select among the archive tar files files in the specified directory. Then click the "Inventory" button to get a full listing of what is stored in the backup file.

## G.3.8 gzip Compress (Backup only)

Click the button in for compression. Compression uses less space on the disk or tape archive, or, if you are using a remote networked tape or disk, compression will allow faster network transmission. The disadvantage of compression is that it does slow the archive process. For this reason, compression is recommended only for the following two applications:

When the backup would not otherwise fit on the tape or disk archive. In this case, your only choice is to use compression.

When you are using a remote tape or disk and network speed is the limiting factor. In this case it does not matter that the compression slows the archive process since the network transmission step is the limiting factor.

## G.3.9 Make Inventory (Restore only)

Push the "Update" button to get an inventory of the files on the tape. In the case of multiple archive files on the same tape, the tape positioning features of the restore menu can be used to select the archive file.

When you perform an inventory, the Status display will show all of the files that are in the the archive record. At the top of the list, is the date and time at which the archive record was written. This is generally useful, but especially useful for tapes on which there are multiple archive records.

## G.3.10 Restore Path (Restore Only)

This specifies the starting path for the restore. In most cases this should always be set to "/" (the default). However, if you want to place files in a temporary directory (for example) so that you do not overwrite existing files, then you can type-in the directory name. For example, if you wanted to restore all files in the /usr/sigmet directory to /tmp/usr/sigmet, then you would enter /tmp in the Restore Path.

## G.3.11 Path and Contents (Backup and Restore)

This field shows the current UNIX file path. Note that "/" is at the top of the UNIX file tree. Click the up arrow to go up a level. The files and sub-directories (indicated by trailing "/") in the path are shown in the left hand column labeled "Contents". You can double click on a sub-directory to go down a level. This will be reflected in the "Path".

## G.3.12 Include and Exclude from Backup (Backup Only)

You can select files to include in your backup by highlighting one or more files or directories in the "Contents" list and then clicking the right arrow

to put them in the "Include" list. You can highlight multiple files by click-dragging the mouse over consecutive files, or by holding the "Shift" key and clicking. If you select a directory to include, all files in that directory and in any subdirectories will be included in the backup. The directory structure will be preserved.

If you change your mind, you can highlight files and directories in the "Include" column and then click the left arrow to remove them from the list.

Similarly you can select files or directories to exclude from the backup, e.g., nfs directories exported from other machines.

## G.3.13 Include in Restore (Restore Only)

In the Restore mode, first select the tape or disk file that has the backup archive and then click in "Contents" to highlight the files or directories that you want to restore. Use the right arrow to move them in to the "Include in Restore" list.

## G.3.14 Tape Archive Position Features (Restore Only)

In some cases a single tape may contain multiple archive records from **sigbru** backups or archives written sequentially. This can result from either manual or automatic archive operations that were performed with a "non-rewind" tape device.

In restore mode, there is a tape positioning section to allow the user to control the archive record at which the tape is positioned. This is shown in Figure 3 on page 227:


**Figure 3 Tape Archive Position (Restore Mode)**

**Rewind** This is the first button you should click to select an archive file. The **Go To** and **Now At** fields will both show "1" when the rewind is complete.

<- (back) and -> (forward) arrow buttons decrement/increment the 1 the **Go To** archive record request field.

**Go To** Shows the current archive record request. Type-in a value or use the arrow keys to change this. You can change this "on-the-fly" even while a search is being made. If you did not first do a rewind, then the field shows only the relative position from where you started and the **Now At** field shows —.

**Now At** Shows at what archive record the drive is positioned at. When it matches the **Go To** field then the search is complete. Before a rewind, it always shows — since it is uncertain where the tape is positioned after startup.

When you reach the archive record number that you want, click the **Make Inventory** button to see what the archive contains. Check the archive record date and time at the beginning of the Status display after you do the **Make Inventory**.

**NOTE** Note on tape drive Device Name: SIGMET recommends always using the device name corresponding to "no rewind on opening". This is required for proper operation of the tape ositioning features (e.g., for *Linux /dev/nst0*).

# G.4 Making System Backups for Linux Computers

**NOTE** The device file permissions for the tape drive must be properly set. As root type the following:

```
# chmod 666 /dev/st0 or nst0
```

While **sigbru** is useful in backing-up individual files and directories, it is best used for making full system backups in case you have a disk failure. Note that these system backups can also be used to restore individual files and directories so we will use the system backup as an example.

What are the Steps in Making a System ping Backup

There are two steps in backing up your system:

- Make a **sigbru** backup from "/", i.e., all of the files on your system.
- Document the disk partition information using fdisk and df commands (described in G.5 Documenting Your Linux Disk Partitions on page 101)

You need both of these to recover from the worst case- a disk crash.

## G.4.1 When Should I Backup?

Certainly after you have completed and tested an IRIS upgrade or installed an IRIS patch you should make a backup. Also, if you have made configuration changes you may want to backup the system, or at least the /usr/sigmet/config directory. Routine backups should be made at least every other month (6 times per year), depending on the changes that are made on your system. Development systems may require daily backups.

## G.4.2 What Should Go into a System Backup?

The idea behind a system backup is that all of the program files for your computer should be restored. Therefore the system backup should be made of the entire UNIX tree starting with "/".

## G.4.3 What Should NOT Go into a System Backup?

Large data files should not be included. These simply take-up space and don't add anything. Also, NFS (Network File Sharing) directories should not be backed up since these are on other computers. The "df" command can be used to display NFS directories. The large data files that are part of IRIS that should be excluded are:

- `/usr/iris_data/ingest`
- `/usr/iris_data/product`
- `/usr/iris_data/product_raw`
- `/usr/iris_data/ascope (if used)`

Note that if you have clutter maps or special product or ingest files that are tagged with a "keep" bit, then you should archive these using the standard IRIS archive features. Ingest files will first have to be converted to RAW products. Alternatively you use the IRIS menus to delete all of the ingest and product files except for the ones that you want to save on the archive.

There are two other directories that should not be included in the backup, since they might cause your system to hang when they are restored. These are:

- `/proc`
- `/mnt`

On some system, excluding `/mnt` will automatically exclude a CDROM mounted at `/mnt/cdrom`. However, for some systems the CDROM may have be mounted at a point such as:

`/cdrom`

Check the df command to see if there is a CDROM on your system and make sure it is either unmounted or excluded from the backup. The example menu in "The sigbru Menu" on page 222 shows the exclusion of these directories.

**NOTE** Note: Even though you exclude directories, when you do a restore, the directory entries will be restored but, the contents will be empty. This means that you do not have to recreate excluded directories when you do a restore. However, you will have to recreate any subdirectories beneath them.

The step-by-step backup procedure is provided below.

1. Archive any special IRIS data files or delete the other data files

   Here you can convert ingest clutter maps to RAW products and then save them on tape or disk using the standard IRIS archive features. Also any other special products such as a RAIN1 clutter map or "kept" products can be archived as well. In this case you would exclude the four IRIS data directories from the archive.

The alternative is to use the IRIS menus to delete all of the ingest and product files that you do not need and then not exclude these directories, i.e., the special files would be included on the archive.

2. Stop IRIS before making the backup

   Do a qiris and a qant on the machine to be backed-up. Check that no IRIS processes are running by doing a ps_iris and "kill <process ID> any remaining processes. Note that you might have do a "kill -9 <process ID>"

3. Ready the Archive

   Put in fresh archive media. Make sure it is labelled with at least the text "Backup" and the hostname and date, and that a tape is not write-protected or, if you are archiving to a HDD, make sure that the directory exists and that there is enough space for the archive. You can estimate the size of the "/" backup by doing a "df -h" command for Linux or SGI systems or a "df -k" command for HP systems. Exclude any NFS directories or CDROM's from your size estimate.

4. Run sigbru on the machine that is to be backed-up

   - Start **sigbru** on the machine where the backup is to be made (of course you can do this over the network as described in G.2 Starting sigbru on page 88). *REMEMBER, YOU MUST BE ROOT TO RUN SIGBRU*.
   - Select the Backup <hostname> option.
   - Select your archive host and device name- typically a tape drive either on the local host or on the network. For best speed, use the local tape drive if one exists.
   - Select compression off unless the you are doing a networked backup or the backup would exceed your backup medium size..
   - Click the Up Arrow on "Path" to select "/". Highlight "/" in the contents and click the right arrow to "Include in Backup".
   - Exclude NFS directories:
   - Scroll down the contents list and find any "nfs" directories (check the "df" list). Note that NFS directories may not always be preceded by the text "nfs". SIGMET does not generally use NFS in its applications. Highlight them and click the right arrow to "Exclude from Backup". It is not recommended to exclude anything in /usr/sigmet.

- Optional: Exclude the large data directories in /usr/iris_data/, i.e., the subdirectories ingest, product, product_raw and ascope. Refer to discussion in Step 1.
- Exclude /proc, /mnt
- Exclude the CDROM (if necessary):
- Use df to identify any CDROM and its associated mount point (e.g., /cdrom). Note that if the CDROM is mounted at /mnt/cdrom. then excluding /mnt is sufficient.
- Click "Start" to start the backup.

The cursor will change to an hour glass shape and the only button that can be accessed is the "Cancel" button (in case you change your mind). Note that if you cancel, you do not have a valid backup and will need to start over. You can re-use the same tape and it will rewind automatically when you restart the backup again.

The status log will pop-up automatically and show the files that are being saved. At the end of backup, the log will say "Backup Complete" and the cursor will change back to a pointer shape.

5. Write Protect, Label and Store your Backups

   When you remove the tape, slide the write protection tab on the tape to be in the protect position to avoid accidental over-writing. You should save several previous version (e.g., the last 6 months) of backups. This provides some assurance that if a backup fails for some reason and you need to restore, you will have more than one. Old tapes can then be re-labelled and used for new backups.

   It is a very good idea to store the backups in a location different than the computer. Then if the entire building is destroyed, hopefully the backup will be safe. At SIGMET, our backups are stored in a safety deposit box in a bank vault as well as on site.

# G.5 Documenting Your Linux Disk Partitions

| **NOTE** | Important: It is critical that you make a hardcopy print-out of your disk partition information using the fdisk and df commands. Without this, recovery of your disk in the event of failure will be more difficult. |
|---|---|

An important part of your backup documentation is to document your disk partitions. This does not have to be done every time that you do a system backup, but it should be done when your system is installed or when you change the disk partitions. The results must be recorded *on hardcopy.*

## G.5.1 Running df

First run the "df -h" command (as root). This will show the disks that are mounted and any CDROM or NFS directories. The -h option displays the disk usage in bytes ( (G for giga and M for mega):

```
# df -h
```

```
[root@cyclone operator]# df -h
Filesystem   Size      Used      Avail     Use%      Mounted on
/dev/hda2    3.1G      1.8G      1.1G      61%       /
/dev/hda3    577M      490M      57M       89%       /usr/iris_data
/dev/hdb1    13G       9.6G      3.3G      75%       /usr/images
/dev/hdb2    4.4G      889M      3.5G      20%       /mnt/hdb2
haze-        2.4G      1.7G      492M      78%       /nfs/haze/usr/sigmet
gw:/usr/si
gmet
```

In the example above there are two hard disks, /dev/hda and /dev/hdb. There is also an NFS directory mounted at /nfs/haze/usr/sigmet which points to the /usr/sigmet directory on a different computer called "haze-gw". The "used" column tells you how many bytes (G for giga and M for mega) are actually used. This information is useful in determining if your backup will fit on a tape. For example, if our backup is to be of "/" (/dev/hda2), then this will require us to store 1.8 GB on tape which is easily done for most tape backups.

You can store the results of df to a file by using a standard editor such as vi and pasting the output into the file. Alternatively you can automatically put the results in a file by typing:

```
# df -h > /root/filename.lis
```

The resulting file will be stored in the root's home directory. The file can viewed by typing the command

```
# cat /root/filename.lis
```

The file can be printed using the command:

```
# lpr /root/filename.lis
```

If there is no printer on your system, the file can be sent to another computer (using rcp) for printing. As a last resort, record the results by hand. Store your hardcopy in a safe place.

## G.5.2 Running fdisk

The fdisk command displays the partition table information that will be used during the restore. Sizes are shown in 512-byte blocks. Convert to MBytes by dividing the block count by 2000. An example is shown below for a system that has two disks (hda and hdb). The example command is issued for /dev/hda. Your system will probably not look like the example.

```
# fdisk -l /dev/hda

[root@cyclone operator]# fdisk -l /dev/hda

Disk /dev/hda: 255 heads, 63 sectors, 524 cylinders
Units = cylinders of 16065 * 512 bytes

 Device     Boot       Start      End        Blocks     Id         System
 /dev/hda1  *          1          6          48163+     6          FAT16
 /dev/hda2             7          424        3357585    83         Linux
 /dev/hda3             425        500        610470     83         Linux
 /dev/hda4             501        524        192780     82         Linux
                                                                   swap
```

To store the results in a file named /root/fdisk.lis, use the command

```
# fdisk -l > /root/fdisk.lis
```

Use "cat" to view the file and "lpr" to print it as described in the previous section for the df command.

An example of a df listing is shown below. This is useful in showing you how much disk space is used to assist in sizing the required backup medium (i.e., will your backup fit on the tape). The -h option displays disk usage in gigabytes and megabytes which is a more convenient.

You should make a hardcopy of the fdisk and df information The easiest way to do this is to grab the text into a file and then print the file. If you do not have a printer you could send it by email to somebody who does or, as a last resort, copy it by hand.

# G.6 Documenting Your Basic Network Configuration

| NOTE | You may need basic networking support to restore your system. For example, you may need to use a tape drive on another system to restore files over the network. It is critical that you make a hardcopy of your basic network configuration information so that you can get your network back up after a disk failure. Without this, recovery of your disk will be more difficult. |
|---|---|

This is done on Linux systems by running the netconf utility. As root type the command:

```
# netconf
```

When the netconf utility screen appears (in either text or X-Window mode), select "Basic Host Information" for your network adapter (usually adapter 1). Record ALL of the information by hand (including the button positions) or use "xv" to make a print-out of the menu. An example is shown in Figure 4 on page 236. The information for your system will be different. After you have copied the information, exit netconf without activating any changes.

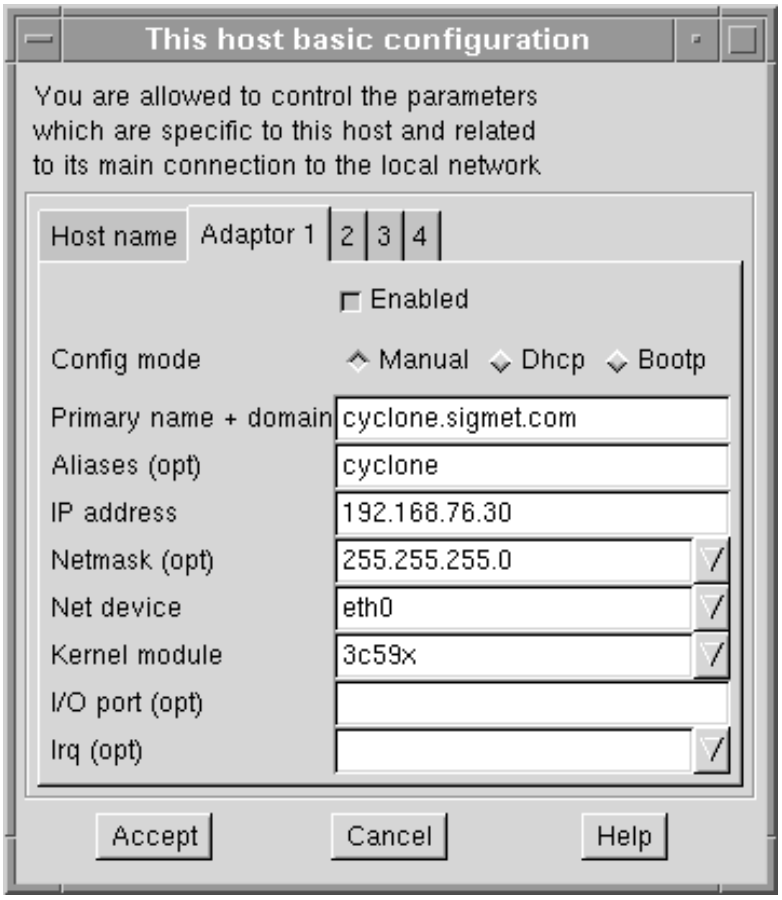



**Figure 4 Basic Host Information Dialog Box**

| **NOTE** | The kernel module for RxNet7 customers is smc9194. |
|---|---|

# G.1 Selected File Restore Functions

Disk files can become corrupted accidently by users or by malfunction of the disk. The worst case is when the entire disk fails and a new disk must be installed. In all these cases, having a backup archive makes it much easier to resume operation since the software does not have to be installed from scratch and then completely reconfigured.

There are two basic restore scenarios:

- Restoration of selected files and/or directories.
- Full disk recovery

This section discusses the recovery of selected files or directories. It is assumed that your computer is basically working and that the disk does not have to be repartitioned and the operating system re-installed. G.8 Linux Disk Restore Functions on page 106 discusses the Linux recovery procedures in the event that the disk fails and you have to reinstall the operating system.

In this example, we shall assume that the */usr/sigmet/config* directory is to be restored. Perhaps some of the IRIS configuration files (for example, TASK Configuration, overlays, etc.) have been inadvertently changed by an inexperienced operator. Restoring the entire directory can sometimes be easier than trying to figure out what the operator has done.

1. **Locate backup**

   Identify the backup (tape or disk file) that you want to use. Here is where proper labelling and storage are important. It is also useful to keep a log of the backups identifying any system changes that are in the backup.

   If you are using a tape, make sure that the tape is write-protected and insert the tape into the drive. Note that the drive can be on another system.

2. **Stop all IRIS processes**

   Since you will be restoring the */usr/sigmet/config* directory which has IRIS configuration files, you need to stop ALL IRIS processes. Do a qiris and qant to do this. Check by doing a ps_iris and manually do a "kill <process ID>". You may have to be root to kill some processes or do a "kill -9 <process ID>". Recheck with ps_iris that all processes have indeed been stopped (nothing reported back).

3. **Start sigbru as described in**"Starting sigbru" on page 218

   Start **sigbru** from a terminal by typing "sigbru" as root, or start it from the CDROM is described in "Starting sigbru" on page 218. Note that if you do a ps_iris now, you will see sigbru, but this is OK. *REMEMBER, YOU MUST BE ROOT TO RUN SIGBRU*.

4. **Select Restore in the sigbru menu**

5. **Select Archive Host, Archive Device Name and Make Inventory**

   During the "Make Inventory" process, the status window will show a growing list of files that are on the archive. After the inventory is completed, you will see the top level directory appear in the "Contents". The message "Retrieving Dirs and Files Complete" will be displayed in the status log.

6. **Select the Retrieve Path (default is / )**

   Here you almost always want to use "/". One reason not to would be if you wanted to restore some files and then selectively copy them to another directory. For example you might want to restore an old version of */usr/sigmet/config* to another directory (e.g., */tmp/usr/sigmet/config*) so that you could later select some config files to copy into the /usr/sigmet/config directory.

7. **Select the files or directory to restore**

   In this example (restoring */usr/sigmet/config*) you would select directories until "*/usr/sigmet*" appears in the Path and then highlight "*config/*". Click the right arrow to "Include in Restore".

8. **Click the "Start" button**

   The cursor will change to an hour glass shape and the status log will pop-up.. You can monitor the progress of the restore in the status log which will show the files that have been restored. Any errors during the restore will pop-up in a separate error window. When completed the status log will show "Restore Complete".

   The Cancel button can be used to stop the restore before completion.

# G.7 Linux Disk Restore Functions

## G.7.1 Disk Restore Overview

Eventually it will happen- your hard disk will fail. Repairing the hardware failure is as easy as putting in a new disk, but now you must format the disk and reload and configure all of the software. Installing and configuring the operating system and IRIS can be very time consuming unless you have prepared in advance with a proper backup strategy.

Here are the things that you need in order to restore the system using sigbru:

- Your Red Hat distribution CDROM. The version must match the version that was backed-up by sigbru.
- A hardcopy of the disk partition information that you collected (see "Documenting Your Linux Disk Partitions" on page 232)
- The IRIS release cdrom (this has **sigbru** on it).

- Your **sigbru** system backup (from "/") of the failed disk.

Here we will assume the worst case- that your disk has crashed and you need a new one. You will need to get a disk that is the same size or larger than the one that failed.

The basic steps are as follows:

- **Step 1:** Use the Red Hat Linux CDROM to get a basic version of the operating system installed on a "mini-root" partition, i.e., a small disk partition to hold a temporary version of the operating system.
- **Step 2:** Create a large "main" partition and restore the files from your **sigbru** backup of "/" to the main partition.
- **Step 3:** Swap the system to boot from the main partition. The mini-root partition will be kept for possible future use.

Step 1 gets your system up and running on the mini-root partition. Step 2 restores to the main partition all of the files on the backup. This recovers any customization that you performed for IRIS and Linux. Step 3 gets the system booting off the large partition.

**NOTE**

**Important**: The mini-root partition may already be installed on your disk. You can check this by typing "miniroot" (the standard SIGMET name) at the LILO boot prompt and see if your system boots. If you do not get a LILO boot prompt or the system does not boot then you must install the mini-root. If the system boots the miniroot, then skip to Step 2 in "Step 2: Restore the sigbru backup to main partition" on page 242.

## G.7.2 Step 1: Basic Linux Installation into a Mini-Root Partition

### G.7.2.1 What You Need

You will need to have your Red Hat LINUX CD and the the hardcopy listing that you made of the basic system configuration, i.e.,

- The file system information from df: see "Running df" on page 233
- The disk partition information from fdisk: see "Running fdisk" on page 234

- The basic network configuration information from netconf: see "Documenting Your Basic Network Configuration" on page 235
- Basic knowledge of the use of the vi editor.

For this procedure, you will need to be able to use the "vi" editor. If you need some help with this, you can refer to the *UNIX for Dummies* book that SIGMET provides with its systems, you can type "man vi" and read the on-line documentation or, better yet, find someone who knows how to use vi and ask that person to help you.

### G.7.2.2 Installing Linux

The restore procedure described here assumes that your computer can boot from CDROM. Turn on the computer and immediately insert the Linux release CDROM into the drive so that the computer boots off the CD. At this point, we shall install the basic Linux operation system.

**NOTE** See the IRIS Installation Manual, Appendix A, Installing Linux: RHEL 5 Desktop, on page 71 for detailed instructions on installing Linux from CDROM. The installation procedure described there contains important information.

Follow the usual steps, selecting "Text" style installation menus and a "Custom" installation. The exceptions to the installation procedure for installing the mini-root partition are:

- For the disk partitioning step, delete all partitions and then create a 200 MB Linux partition with the mount point "/". This will be the "mini-root" partition. Also, create a 128 MB Linux swap partition (or use the size of the swap partition that is documented in your fdisk hardcopy, see "Running fdisk" on page 234).
- When you are prompted for what packages to install, select only "Networked Workstation". This allows you to set up networking on your system in case you need to use the network for the restore operation. When prompted for the network node name, use the node name that is documented in your hardcopy of the basic network information (see "Documenting Your Basic Network Configuration" on page 235).

The installation will not take very long since there is not much to install. When it is done, the computer will reboot automatically. Be sure to remove the CDROM before the reboot so that the system will boot from the mini-root partition.

After reboot from the mini-root partition, the only post-installation step that you need do is install the "k-shell" which is used by the **sigbru** restore utility. Follow the *IRIS Installation Manual* steps for installing "pdksh..." using the the RPM post installation step.

If you are on an RxNet7 and plan to use a local tape drive for the restore, you can do a shutdown (# shutdown -h now) and connect the SCSI tape drive by daisy-chaining it on the CDROM. Be sure that the tape and CDROM both have unique SCSI addresses set via switches on the back. Also be sure that the last SCSI device on the chain has a terminator or else the system will not work reliably (or perhaps at all).

### G.7.2.3 Setting-Up Basic Networking (Optional)

Note that if you have a local CDROM and a local tape for the restore, then you do not need to do this step. If you need to do this, run netconf as root and provide the basic host information from your hardcopy documentation (see "Documenting Your Basic Network Configuration" on page 235). Reboot the system. You will need to edit two files to allow you to access the other machines on the network that you might have to use (e.g., the one with the tape drive or the copy of sigbru).

```
/etc/hosts
```

This file has the list of node names and IP addresses. Be sure to check that your "alias" is specified- the short version of your node name without the domain name. After you have done this, test with the "ping" command, i.e. type:

```
# ping nodename
```

where *nodename* is the name of the computer(s) that you configured in /etc/hosts.

The next step is to configure the file:

```
/etc/hosts.equiv
```

This file is a list of computers who are authorized to use your system.

You can look on other systems on the network to see examples of these. Remember, you probably only need to have entries for one or two other systems.

You must also make sure that the corresponding /etc/hosts and /etc/hosts.equiv files on the remote computer that you will access include the computer that you will need to restore. For example, if you are going to use a tape drive, cdrom or copy files from a node called "cyclone", make sure that the /etc/hosts and /etc/hosts.equiv files on cyclone contain entries for the target local computer that will be restored. Since you are restoring to a computer that was originally on the network, there is a good chance that these files are already configured on the other network computers.

## G.7.3 Step 2: Restore the sigbru backup to main partition

Creating and mounting the main partition

First we need to create the main partition. This only need be done once. In the mini-root run fdisk as root:

```
# fdisk /dev/hda
```

In fdisk issue the "p" command to view the partitions. You should see three partitions as shown in the example below:

Disk /dev/hda: 66 heads, 63 sectors, 1018 cylinders

```
Units = cylinders of 4158 * 512 bytes

 Device     Boot  Start    End      Blocks   Id   System
 /dev/hda1  *     1        99       205789+  83   Linux
 /dev/hda2        100      1018     1910601  5    Extended
 /dev/hda5        100      163      133024+  82   Linux
                                                  swap
```

In the example, /dev/hda1 is the "mini" partition. /dev/hda2 is an extended partition. This is available to add logical partitions, or can be removed and this space repartitioned. At this point, you should use the features of fdisk to repartition the disk according to the hardcopy documentation that you obtained during your backup procedure (see "Running fdisk" on page 234). **However, you must not remove or change the mini-root partition or your system will not be bootable**.

**NOTE** If your main partition had already been created (e.g., you are restoring a system that was already configured with main and mini-root partitions) then you can skip the next creation step and start the procedure with the "mkfs" (make file system) step below.

A simple thing to do that will serve most systems is to simply create a logical partition within the extended partition. Do this with the "n" command. Make the partition start after the swap area and use the entire disk, e.g., start at 164 and end at 1018. Do not specify a mount point. When you are done, use the "w" command to write the partition information. The "p" command will then show (for example):

| Device | Boot | Start | End | Blocks | Id | System |
|---|---|---|---|---|---|---|
| /dev/hda1 | * | 1 | 99 | 205789+ | 83 | Linux |
| /dev/hda2 | | 100 | 1018 | 1910601 | 5 | Extended |
| /dev/hda5 | | 100 | 163 | 133024+ | 82 | Linux swap |
| /dev/hda6 | | 164 | 1018 | 1777513+ | 83 | Linux |

The "main" partition is /dev/hda6.

.At this point you must reboot the system by issuing the command:

```
# reboot
```

After the reboot you must make the file system on the main partition (/dev/hdaN would be /dev/hda6 in the example):

```
# mkfs /dev/hdaN
```

Finally create the mount point and mount the file system:

```
# mkdir /mnt/hdaN
# mount /dev/hdaN /mnt/hdaN
```

### G.7.3.1 Restoring the sigbru Backup to the Main Partition

For this step you will need two things:

- A copy of **sigbru** programs. These can be found on the IRIS release CDROM. For Linux systems, these are in /mnt/cdrom/linux/sigbru. The CDROM can be local or, if you do not have a CDROM on the local system, you can copy the files from another IRIS computer on the network.
- Your **sigbru** system backup tape which will be placed on either a local or remote tape drive.

There are several restore scenarios corresponding to the different combinations of the above (i.e., local/networked IRIS release CDROM or local/networked **sigbru** backup tape). The easiest and fastest case is that of restoring from a local CDROM and a local tape drive.

In the case of using either a networked CDROM or tape drive, you will have to set up some minimal networking on the target machine that is being restored. Networking needs to be installed as part of Step 1 (the Linux installation).

All of the procedures below assume that the **sigbru** backup is the full disk image (from "/" with /proc and /mnt excluded). We will restore the backup to the main partition mounted at /mnt/hdaN where N is the number of the partition (viewed via df).

If the main partition is not mounted then mount it with (see previous step):

```
# mount /dev/hdaN /mnt/hdaN
```

### G.7.3.2 Local Tape and Local CDROM

Insert the system backup tape (write-protected) into the local tape drive and the SIGMET IRIS release CDROM into the local CDROM drive (this has the **sigbru** command utility on it). Next perform the following steps as root:

```
# cd /mnt/hdaN (hdaN is the number of the main partition
from df)
# /mnt/cdrom/linux/sigbru/sigbrush -extract -device
/dev/st0
```

Here the mount point of the CDROM is assumed to be /mnt/cdrom.

### G.7.3.3 Remote Tape and Local CDROM

Insert the system backup tape (write-protected) into the remote tape drive and the SIGMET IRIS release CDROM into the local CDROM drive (this

has the **sigbru** command utility on it). The command is similar except that the network nodename of the workstation with the tape drive is specified.

```
# cd /mnt/hdaN (hdaN is the number of the main partition
from df)
# /mnt/cdrom/linux/sigbru/sigbrush -extract -device
/dev/st0 -node nodename
```

### G.7.3.4 Local or Remote Tape and Remote CDROM

*Getting the* **sigbru** *Program Over the Network*

If you have a remote CDROM, then you will need to copy the **sigbru** files over the network to a directory on your local machine. The example procedure assumes that the "rcp" command is working (remote copy). ftp could also be used. The procedure for doing this as follows.

First create a special **sigbru** directory (/root/sigbru) on the local machine to hold the **sigbru** files. On the local computer that is to be restored type (as root):

```
# cd /root
# mkdir sigbru
```

The next step is to copy the **sigbru** files to the directory /root/sigbru. The minimal required files are called sigbrush and gnutar and are stored on the CDROM under the directory for your platform (e.g., /*cdrom/linux/sigbru*). They can also be found in the /*usr/sigmet/bin* directory of an IRIS system on the network. You can obtain them from either place.

*Getting* **sigbru** *from a remote CDROM*

Insert the IRIS CDROM into the remote machine and mount it (see the *IRIS Installation Manual*). On Linux systems this is usually accomplished by typing (as root on the remote computer with CDROM):

```
# mount /dev/cdrom
```

Next, copy the two files from the remote CDROM to the local computer's */root/sigbru* directory. On the local computer (where you want to store the files in /root/sigbru) type:

```
# rcp nodename:/cdrom/linux/sigbru/sigbrush /root/sigbru
# rcp nodename:/cdrom/linux/sigbru/gnutar /root/sigbru
```

*Nodename* is the name of the computer with the CDROM. The local computer now has the **sigbru** files stored in a directory called /root/sigbru.

*Getting* **sigbru** *from a remote computer with IRIS installed*

Identify the remote computer with the installed IRIS system. The two **sigbru** files that you need to copy are stored in the /usr/sigmet/bin directory. Copy them to the /root/**sigbru** directory on the local computer by typing (on the local computer):

```
# rcp nodename:/usr/sigmet/bin/sigbrush /root/sigbru
# rcp nodename:/usr/sigmet/bin/gnutar /root/sigbru
```

*Nodename* is the name of the remote computer with IRIS installed. The local computer now has the **sigbru** files stored in a directory called /root/sigbru.

Now follow the steps below to do the restore from tape to the main partition.

- For a local tape drive type:

  ```
  # cd /mnt/hdaN
  # /root/sigbru/sigbrush -extract -device /dev/st0
  ```

- For a remote tape drive type:

  ```
  # cd /mnt/hdaN
  # /root/sigbru/sigbrush -extract -device /dev/st0 -node
  nodename
  ```

*Nodename* is the name of the remote network computer with the tape drive. /dev/hda*N* is the device name of the main partition from df.

We are now ready to configure Linux to boot from either the main partition or the mini-root partition.

## G.7.4 Step 3: Configuring to boot from the main or mini partitions

We have restored the backup to the main partition. Now we must configure the system to boot from the main partition. For possible future use, we will keep the mini-root partition since we might need it in the future restore operations.

First, if it is not already booted, boot your computer. At this point it will be booted in the mini-root partition since we have not activated the main partition. Also, if it is not mounted, mount the main partition with:

```
# mount /dev/hdaN /mnt/hdaN
```

### G.7.4.1 Modify /mnt/hda*N*/etc/fstab on the Main Partition

For this step, you need to know what your disk partitions are. These were just configured, but to refresh your memory you can use fdisk, i.e. type,

```
# fdisk -l /dev/hda
```

The disk partition information should look something like:

```
Device     Boot       Start      End        Blocks     Id         System
/dev/hda1  *          1          99         205789+    83         Linux
/dev/hda2             100        1018       1910601    5          Extended
/dev/hda5             100        163        133024+    82         Linux
                                                                  swap
/dev/hda6             164        1018       1777513+   83         Linux
```

In this example, hda1 is the mini-root partition, hda2 is an extended partition that contains two logical partitions, i.e., the swap space in hda5 and the main partition in hda6. This is the information that we need to edit fstab in the main partition.

For this step you will need to be able to use the "vi" editor. Start the editor on the fstab file by typing:

```
# vi /mnt/hda6/etc/fstab
```

The file should look something like ("/" is incorrectly pointing to the min-root):

```
/dev/hda1      /              ext2           defaults       1 1
/dev/cdrom     /mnt/cdrom     iso9660        noauto,owner,  0 0
                                             ro
/dev/hda5      swap           swap           defaults       0 0
/dev/fd0       /mnt/floppy    ext2           noauto,owner   0 0
none           /proc          proc           defaults       0 0
none           /dev/pts       devpts         gid=5,mode=    0 0
                                             620
```

"/" is currently pointing to /dev/hda1. Change this to /dev/hdaN where N corresponds to your main partition. Also check that the swap partition is pointing to the correct disk partition. In the example, the swap partition from fdisk is /dev/hda5 so the fstab entry for swap is OK. However for this example, the entry for /dev/hda1 pointing to "/" needs to be changed to /dev/hda6. After you have finished editing, save your results and proceed to the next step.

### G.7.4.2 Modify /etc/lilo.conf File on the Mini-root Partition and Run lilo

The file /etc/lilo.conf on the mini-root partition will be used to configure the LILO boot loader. We use the mini-root version since we do not yet fully trust our restore and the mini-root is fully tested.

First, we need to document the lilo.conf file on the main partition. Do this by typing the command:

```
# cat /mnt/hda6/etc/lilo.conf
```

This will show the lilo.conf that was used on your old disk. You want to record by hand the lines corresponding to the "image" that has the "label= linux". The lines that you want to record will look something like:

```
image=/boot/vmlinuz-2.2.12-20
label=linux
initrd=/boot/initrd-2.2.12-20.img
read-only
root=/dev/hda1
vga=773
append="mem=128M"
```

No changes will be made to this file. Now we use this information to edit */etc/lilo.conf* in the mini-root. As in the previous step, you will need to be able to use the vi editor to do this.

```
# vi /etc/lilo.conf
```

The mini-root lilo.conf file will look something like:

```
boot=/dev/hda
map=/boot/map
install=/boot/boot.b
prompt
timeout=50
default=linux
image=/boot/vmlinuz-2.2.12-20
label=linux
```

```
initrd=/boot/initrd-2.2.12-20.img
read-only
root=/dev/hda1
```

You only need to make one change to these lines, that is:

- Change the "label=linux" to "label=miniroot"

Now after these lines, type-in the lines that you recorded and make the following changes to them (hdaN refers to the main partition):

- Change "image=/boot..." to "image=/mnt/hdaN/boot..."
- Change (if necessary) "label=linux"
- Change "initrd=/boot..." to "initrd=/mnt/hdaN/boot..."
- Change "root=/dev/hda1" to "root=/dev/hdaN"

All other lines should stay the same since. When you are done, the */etc/lilo.conf* file (mini-root) should look something like:

```
boot=/dev/hda
map=/boot/map
install=/boot/boot.b
prompt
timeout=50
default=linux
image=/boot/vmlinuz-2.2.12-20
label=miniroot
initrd=/boot/initrd-2.2.12-20.img
read-only
root=/dev/hda1
image=/mnt/hda6/boot/vmlinuz-2.2.12-20
label=linux
initrd=/mnt/hda6/boot/initrd-2.2.12-20.img
read-only
root=/dev/hda6
vga=773
append="mem=128M"
```

Carefully check your entries and save the file. Now run lilo by typing:

```
# lilo -v
```

Carefully check that lilo runs without errors. Errors are most likely due to typo's and should be repaired by re-editing the /etc/lilo.conf file. Re-run lilo until it is error free.

At this point we have two bootable partitions that can be selected at boot time at the "LILO:" prompt. The main partition can be booted by:

- Typing "linux".
- Simply hitting the ENTER key.
- Waiting for the timeout (50 seconds in the example).

The mini-root partition can be booted by typing "miniroot" at the LILO prompt. Perform the following tests to verify that you can boot either partition:

- Issue the "reboot" command and type "miniroot <Enter>" at the LILO prompt to verify the mini-root boots OK.
- Issue the "reboot" command and type "linux <enter>" at the LILO prompt to verify that the main partition boots OK.

Proceed to the next step.

### G.7.4.3 Modify the /etc/lilo.conf File on the Main Partition and Rerun lilo

**NOTE** Note: If you restored a backup of the main partition for a system that was already configured for the min-root, then your /mnt/hda6/etc/lilo.conf file may not require any modification. Check it by going through the procedure below.

We need to configure the /etc/lilo.conf file on the main partition so that if lilo is run here, it will properly install the boot record for both the main and the mini-root partitions. To do this, first reboot the system in the main partition and at the LILO prompt type linux, that is:,

```
LILO boot: linux
```

After reboot, manually mount the mini-root partition, i.e. (with N corresponding to the mini-root partition),

```
# mount /dev/hdaN /mnt/hdaN
```

If this does not work, you may have to first create the mount point, i.e.,

```
# mkdir /mnt/hdaN
```

Now look at the lilo.conf file in the mini-root by typing:

```
# cat /mnt/hdaN/etc/lilo.conf
```

This will look something like the example on the previous page. Copy by hand all the lines corresponding to the mini-root label, i.e., following the example:

```
image=/boot/vmlinuz-2.2.12-20
label=miniroot
initrd=/boot/initrd-2.2.12-20.img
read-only
root=/dev/hda1
```

Use vi to edit the */etc/lilo.conf* file (main partition). Add the lines that you copied for the miniroot, with the following changes (here N refers to the mini-root, 1 in the example):

- Change "image=/boot..." to "image=/mnt/hda*N*/boot..."
- Change "initrd=/boot..." to "initrd=/mnt/hda*N*/boot..."
- The miniroot "root" line should already point to the proper partition for the mini-root.
- Change (if necessary) the linux "root" line to point to the main partition.

When you are done the /etc/lilo.conf file (main partition) should look something like:

```
boot=/dev/hda

map=/boot/map

install=/boot/boot.b

prompt

timeout=50

default=linux

image=/boot/vmlinuz-2.2.12-20

label=linux

initrd=/boot/initrd-2.2.12-20.img

read-only

root=/dev/hda6

vga=773
```

```
append="mem=128M"

image=/mnt/hda1/boot/vmlinuz-2.2.12-20

label=miniroot

initrd=/mnt/hda1/boot/initrd-2.2.12-20.img

read-only

root=/dev/hda1
```

In this example, hda1 is the miniroot partition and hda6 is the main "linux" partition. Save your results and then run lilo:

```
# lilo -v
```

Carefully check that lilo runs without errors. Errors are most likely due to typo's and should be repaired by re-editing the /etc/lilo.conf file. Re-run lilo until it is error free.

Reboot both the "miniroot" and main "linux" partitions to test them, then proceed to the next (final) step.

# G.8 Test IRIS and Backup Your Restored System

At this point you should test IRIS in its full operational mode. All should be as it was before. Note that if you separately archived ingest clutter maps (as RAW products), RAIN1 clutter maps or special "kept" data files, you should restore them now.

After IRIS has been tested, you should then do a backup of your system. Only the main partition need be backed–up. Follow the procedure in "Making System Backups for Linux Computers" on page 228 and subsequent sections to record the df, fdisk and netconf information as part of your backup. You should of course maintain this backup over the years.

# G.9 Disk Crash After Mini-Root is Installed

When your next disk failure occurs (hopefully 10 years from now), if the disk hardware is OK and the miniroot is still intact, you will be able to restore your disk more easily- just boot the mini-root and start your restore procedure at Step 2 ("Step 2: Restore the sigbru backup to main partition" on page 242). Since you faithfully carried-out the backup

prescribed in preceding section, your backup will be exactly the main partition that you want to restore.

| NOTE | If you use an existing miniroot to restore your main partition from a backup tape, be sure to go through all of the steps of running lilo in both the mini-root and then the main partition. Failure to do so might cause your system to become un-bootable, in which case you would have to re-install the mini-root. Do not skip steps in the procedure, although you will have less work to do since all the files in the main partition should be configured properly already. |
|---|---|

# G.10 sigbru -auto: Auto Archive Features

A powerful feature of **sigbru** is the auto archive feature. This allows **sigbru** to monitor a disk directory so that when a specified "quota" of files is placed there, **sigbru** automatically:

- Archives the files to tape (or perhaps disk).
- Optionally deletes the files in the directory that is being monitored.

Note that if the optional delete is enabled, then **sigbru** will continue to monitor the directory and write sequential archives to the tape. Otherwise, the auto archive is to disabled, i.e., it is "write-once".

An ideal application of this is as follows:

- Use the product output menu to send files in .gif format to a directory.
- Use **sigbru** -auto to monitor the directory, and when a selected size is reached, archive the files to tape.
- **sigbru** can then delete the disk files so that the disk does not fill-up.

To be on the safe side it is always best for IRIS to send disk files to a directory that is on a separate disk partition, i.e., not / or /usr, since filling the disk space in these will cause the system to fail. The /usr/iris_data directory is also not a good choice since filling this will cause IRIS to fail. We recommend that if you do this, you create a separate disk partition for the directory.

| NOTE | Only tape drives support multiple automatic archive files. The tape must use a non-rewind driver (e.g., /dev/nst0 for linux). |
|---|---|

| WARNING | If you inadvertently specify a tape device driver that performs rewind on opening, then attempt to do multiple automatic archives to tape, then the you will always overwrite the last archive, i.e., when you are done only the most recent archive will be on the tape. |
|---|---|

To invoke the auto archive features of sigbru, start by typing as root:

```
# sigbru -auto
```

At the bottom of the **sigbru** menu (in "Backup" mode), you will see the following:


**Figure 5 sigbru Menu (Bottom of Dialog Box)**

The menu features are described below:

## G.10.1 Auto Archive Enable/Disable

This defaults to disabled when you start **sigbru** unless you specify **-enable** at startup. This enables the automatic polling of the "Included" directories that are to be archived.

## G.10.2 Archive Source: Quota and Current, sigbru Polling

Type-in the quota in GB. When Auto Archive is enabled, **sigbru** polls the included directories and calculates the total size of all files that are more than one minute old. This is updated every 5 minutes and the result is displayed in the field called **Current**. When the **Current** size exceeds the **Quota** that you specified, **sigbru** performs an archive operation for all included files that are more than one minute old.

Note that the max size of a DVD archive quota is 4 GB — the size of a typical DVD.

## G.10.3 Archive Media Use: Total and Record #

These are display-only text fields are valid only during automatic archive operation. They are not valid during manual archive operation when the operator clicks the **Start** button.

- **Total** shows the total size of all files that have been written to the archive medium. The total is uncompressed. If you use compression, then the actual amount written will be less.
- **Record** # shows the number of archive records that have been written to the tape, i.e., whenever the **Quota** is exceeded.

## G.10.4 Delete Files After Archive

**WARNING** This is a potentially dangerous command, since you might end up deleting key system files if you are not careful to specify the Included files correctly.

The **Delete Files after Archive** feature is designed for automatic maintenance of a disk directory. See the example at the beginning of "sigbru -auto: Auto Archive Features" on page 253

This defaults to **No** when **sigbru** is started unless -delete is specified at startup. It can only be set to **Yes** when auto archiving is enabled. The option is not available in the manual archive mode, i.e., when the user manually clicks the **Start** button.

**NOTE** When you specify "Enable" sigbru waits for 10 seconds before polling the directory to give you a chance to set the Delete Files field.

APPENDIX H

# UPGRADING RED HAT LINUX

This appendix gives advise about how to upgrade the Linux on your IRIS and RDA systems. Some of the comments may be applicable to other platforms. The recommended procedure is to back up important files, install the OS, install the Sigmet software, then restore the backup of the config directory. It is assumed that you will be upgrading the version of IRIS and RDA at the same time, but it is not necessary.

## H.1 Check Your Disk First

Type "fdisk –1". The output will show all the disk partitions on your system. You should jot down the partition table, and your IP address for reference later. If your disk is smaller than 20 GB, now is a convenient time to replace it with a larger disk considering that disks are such low cost.

## H.2 Backing Up Important Files

Before upgrading, examine you home directory, and your IRIS data directories and delete anything which is not needed. You could backup your whole system in case there is a problem, but it is convenient to backup the following directories onto separate media because you may want to restore them: */usr/sigmet/config*, /*usr/iris_data*, */home*, etc. We recommend using **sigbru** to do this. Alternatively you can use the UNIX **tar** command. It is fastest to backup to a disk file on a partition which will be preserved, or to a neighboring computer.

## H.3 Do the OS install

Do a full Linux install, following Appendix C, Installing Linux: RHEL 5 Desktop on page 141. If you are keeping the same partitions, then you can preserve partitions such as */usr/iris_data*. If possible, use our boot-and-go cdrom feature which will also install Sigmet code. In this case you can skip the next step.

## H.4 Do the IRIS or RDA install

Do a full IRIS and/or RDA install, following "Mount the CD" on page 16. Immediately after "Configure Home Environment" on page 159, perform step E.5 below, then continue with the post installation configuration from "Mount the CD" on page 16.

## H.5 Restoring from backup

Delete the just installed config directory with:

```
$ rm -rf /usr/sigmet/config
```

Replace it using **sigbru** to restore your previous setup configuration. You might also consider restoring: /home and /usr/iris_data, /usr/local if you have important files there. Do not restore /etc. You can run **sigbru** from the IRIS cdrom as discussed in Appendix G, sigbru Utility on page 213. Next run:

```
$ makeAsciiSetups
```

This will upgrade you older configuration files, if appropriate.

## H.6 Upgrade Release Notes

Even though you did a new IRIS install in "Do the IRIS or RDA install" on page 258, in effect you have done an upgrade. Please read all the release notes covering the upgrade span. You may need to do some of the *Important Upgrade Notes* mentioned.

# H.7 Done

You are now done. If you discover any obscure OS problems after the upgrade, you should consider the following special files. Some of these you may want to edit or restore as appropriate:

```
/etc/hosts
/etc/hosts.equiv
/etc/group
/etc/cron.*/*
/etc/fstab
/etc/rc.d/rc.local
/etc/resolv.conf
/etc/vsftp.ftpusers
/etc/vsftp.user_list
/etc/X0.hosts
```

APPENDIX I

# INSTALLING LEGACY IRIS/WEB SERVER

## I.1 Overview

This appendix provides instructions how to install and configure the Vaisala legacy IRIS/Web Server software on a Red Hat Enterprise Linux system. It must be installed on the same system where the IRIS server is installed. These installation procedures apply to a new installation.

For a RHEL6 system, see "Installing IRIS Web Server on a RHEL6 System/CentOS 6.X" on page 261.

For a RHEL5.4 system, see "Installing IRIS Web Server on a RHEL5.4 System/CentOS 5.X" on page 263.

## I.2 Installing IRIS Web Server on a RHEL6 System/CentOS 6.X

To install the IRIS Web Server on a RHEL6 system:

1. You can use either Vaisala's Kickstart or manually install RHEL6. If you are manually installing, follow the instructions in Appendix D, Installing Linux: RHEL 6 For Servers on page 171.
2. After RHEL6 is installed, start IRIS and log in as a "root" user.
3. Insert the IRIS & RDA DVD disc into DVD drive.
4. The system should mount the drive automatically; for example, */media/irisrda_8.13.3*. If not, you can mount the DVD using:

   ```
   # mount /dev/cdrom /mnt
   ```

## I.2.1 Extracting RPMS

To extract RPMS, enter:

```
# cd /

# tar zxvf /<your
path>/RHEL6/extras/iris_webview/iris_web_rhel6_rpms.tgz

# cd /iris_web_rpms
```

## I.2.2 Installing Java 1.6

To install Java 1.6, enter:

```
# rpm -Uvh java-1.6.0-sun-1.6* java-1.6.0-sun-plugin-1.6*
flash-plugin-*"
```

## I.2.3 Installing Apache Commons Packages

To install the Apache commons packages:

1. Enter:

   ```
   # rpm -Uhv apache-commons*.rpm
   ```

2. Add softlink to `commons-pool` from `tomcat6` tree:

   ```
   # cd /usr/share/tomcat6/lib/
   # ln -s /usr/share/java/commons-pool.jar ./
   ```

## I.2.4 Installing IRIS Web

To install the IRIS Web software:

1. Enter:

   ```
   # cd /
   # tar xzf /<your path>/iris_web/iris_web.tgz
   ```

   If `proxy_ajp.conf` doesn't exist, create the file and add the following line:

```
ProxyPass /irisservlets/
ajp://localhost:8009/irisservlets/
```

to

```
/etc/httpd/conf.d/proxy_ajp.conf
```

2. Go to "Configuring Service (RHEL5.4, RHEL6)" on page 265 to finish the installation.

# I.3 Installing IRIS Web Server on a RHEL5.4 System/CentOS 5.X

To install the IRIS Web Server on a RHEL5.4 system:

1. You can use either Vaisala's Kickstart or manually install RHEL5.4. If you are manually installing, follow the instructions in Appendix C, Installing Linux: RHEL 5 Desktop on page 141.
2. After RHEL5.4 is installed, start IRIS and log in as a "root" user.
3. Insert the IRIS & RDA DVD disc into DVD drive.

   The system should mount the drive automatically; for example, */media/irisrda_8.13.3*. If not, you can mount DVD using:

   ```
   # mount /dev/cdrom /mnt
   ```

## I.3.1 Extracting RPMS

To extract RPMS, enter:

```
# cd /

# tar zxvf /<your
path>/RHEL6/extras/iris_webview/iris_web_rhel6_rpms.tgz

# cd /iris_web_rpms
```

## I.3.2 Installing Java 1.6

To install Java 1.6, enter:

```
# rpm -Uvh java-1.6.0-sun-1.6* java-1.6.0-sun-plugin-1.6*
flash-plugin-*"
```

## I.3.3 Installing JPackage Utilities

To install the jpackage utilities, enter:

```
# rpm -Uvh jpackage-utils-5.0.0-2.jpp5.noarch.rpm
```

If you are getting this error: `/usr/bin/rebuild-security-providers is needed by..`, then enter:

```
# rpm -Uvh --nodeps jpackage-utils-5.0.0-2.jpp5.noarch.rpm
```

## I.3.4 Installing the Rest of the Packages

To install the rest of the packages:

1. Enter:

   ```
   # rm jpackage-utils-5.0.0-2.jpp5.noarch.rpm
   ```

   ```
   # rm java-1.6.0-sun-1.6* java-1.6.0-sun-plugin-1.6*
   flash-plugin-*
   ```

   ```
   # rpm -Uhv *.rpm
   ```

2. Add softlink to `commons-pool` from `tomcat6` tree:

   ```
   # cd /usr/share/tomcat6/lib/
   ```

   ```
   # ln -s /usr/share/java/commons-pool.jar ./
   ```

## I.3.5 Installing IRIS Web

To install the IRIS Web software:

1. Enter:

   ```
   # cd /
   ```

   ```
   # tar xzf /<your path>/iris_web/iris_web.tgz
   ```

   If `proxy_ajp.conf` doesn't exist, create the file and add the following line:

   ```
   ProxyPass /irisservlets/
   ajp://localhost:8009/irisservlets/
   ```

   to

   ```
   /etc/httpd/conf.d/proxy_ajp.conf
   ```

2. Go to "Configuring Service (RHEL5.4, RHEL6)" on page 265 to finish the installation.

# I.4 Configuring Service (RHEL5.4, RHEL6)

The RPM installation usually takes care of auto starting the service. If it does not, you can automatically start Apache Web Server and Tomcat 6 Server during system boot-up by entering:

```
# /sbin/chkconfig --level 345 httpd on

# /sbin/chkconfig --level 345 tomcat6 on

# /sbin/service httpd start

# /sbin/service tomcat6 start
```

# I.5 Testing the IRIS/Web Server

To test the newly installed IRIS/Web Server:

1. From your system, open the Firefox web browser.
2. In the address bar, enter the web server address, for example `http://localhost`. The Welcome to IRIS/Web page appears.

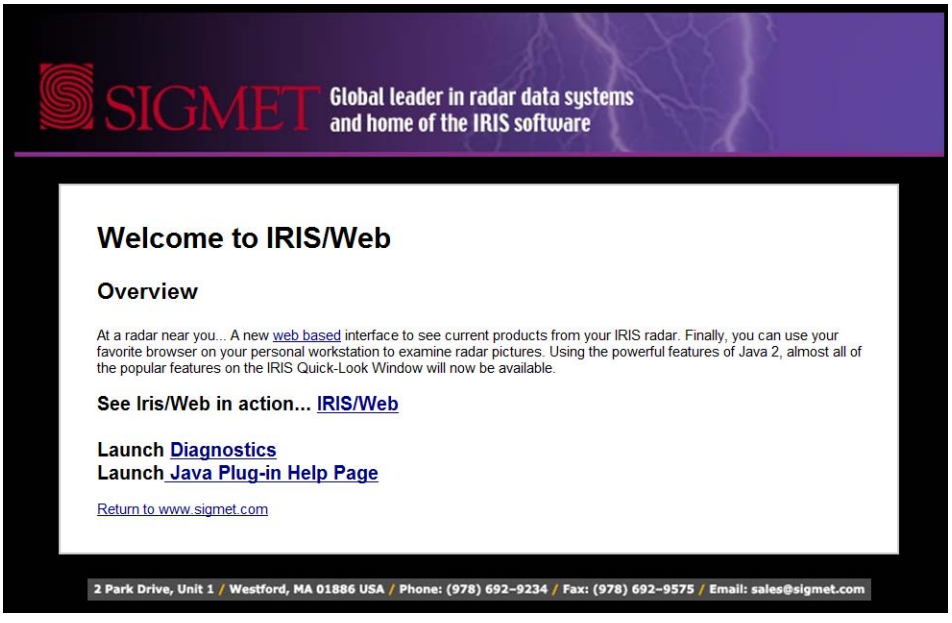



**Figure 1 IRIS/Web Page**

3. Click the **IRIS/Web** link. The Quick Look Window (without authentication) appears.

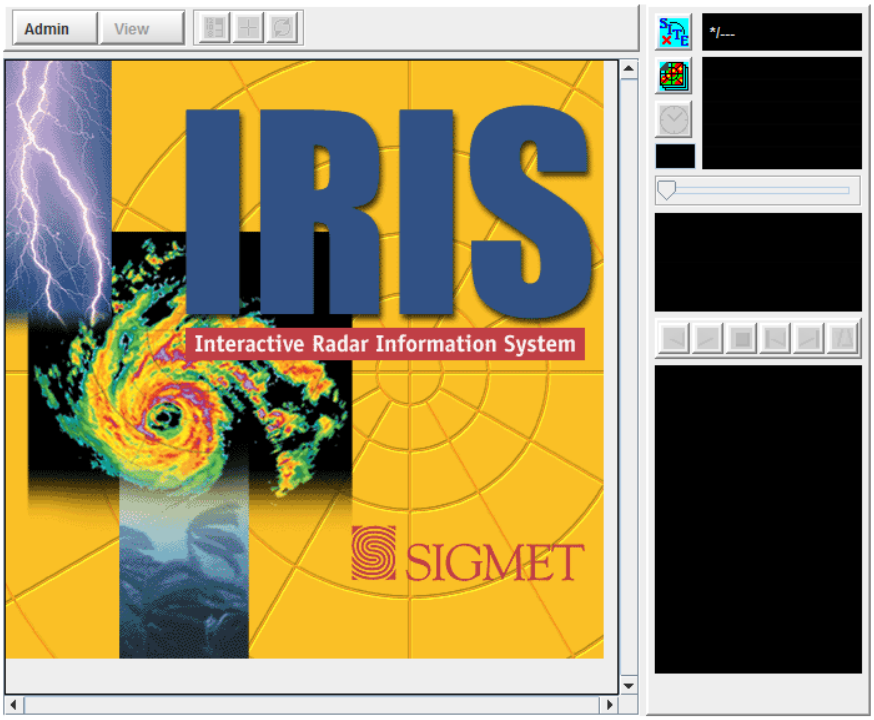



**Figure 2 IRIS Quick Look Window**

# I.6 Configuring Login Authentication

## I.6.1 Configuring Apache Basic Authentication

To protect unauthorized users from accessing IRIS/Web Server, configure Apache basic authentication:

1. Create a password file that contains a list of IRIS/Web Server users. Store this password file in a secure location; however, the apache user must be able to read this file and its directory. For example, create a password file called `.htpasswd` in directory `/etc/htpasswd`, and assign ownership to `apache.apache`:

   ```
   # mkdir /etc/htpasswd
   # chown apache.apache /etc/htpasswd
   ```

2. Create a user, for example, `radarop`:

```
# /usr/bin/htpasswd -c /etc/htpasswd/.htpasswd radarop
```

Enter password when prompted.

3. Add more users:

```
# /usr/bin/htpasswd /etc/htpasswd/.htpasswd <username>
```

Notice this time there is no `-c`.

4. Edit */etc/httpd/conf.d/proxy_ajp.conf*, and add these lines at the end:

```
<location>  "/weblook/irisapplets">
     AuthType Basic
     AuthName "IRIS Web View"
     AuthUserFile /etc/htpasswd/.htpasswd
     Require valid-user
</location>
```

5. Restart your web server:

```
/sbin/service httpd restart
```

## I.6.2 Testing Authentication

To test authentication:

1. Using a system in your network, start a web browser.
2. In the address bar, enter the web server address, for example wes-porter.vaisala.com. The Welcome to IRIS/Web page appears.

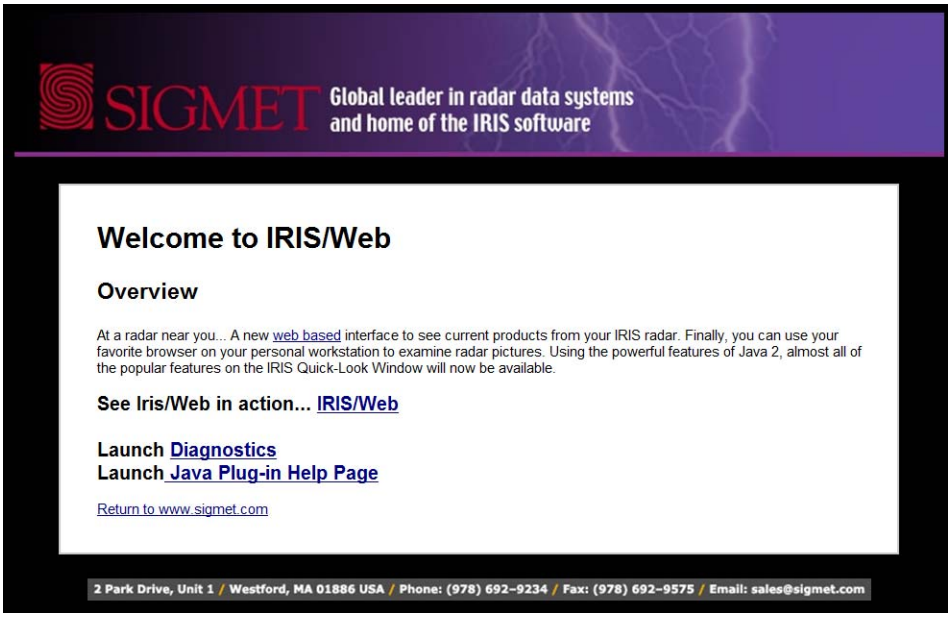


**Figure 3 IRIS/Web Page**

3. Click the **IRIS/Web** link, the login dialog box appears. Enter the user name and password created in "Configuring Apache Basic Authentication" on page 266.

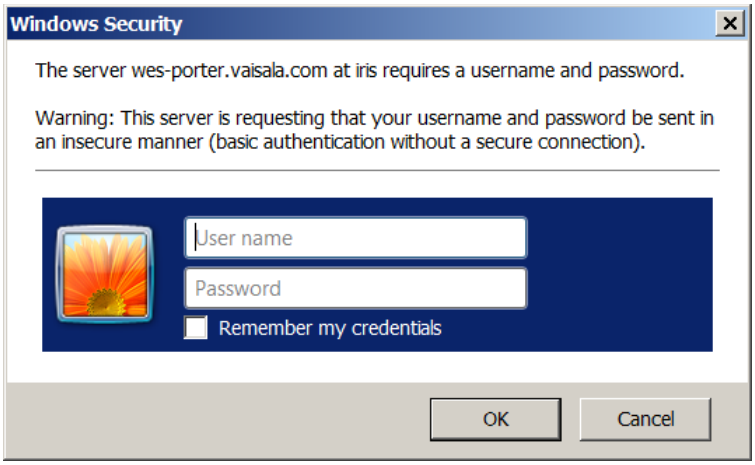



**Figure 4 IRIS/Web Login Window**

4. After successful authenticate, the Quick Look Window (QLW) appears. From here you can use the QLW as a normal IRIS QLW with limited features.

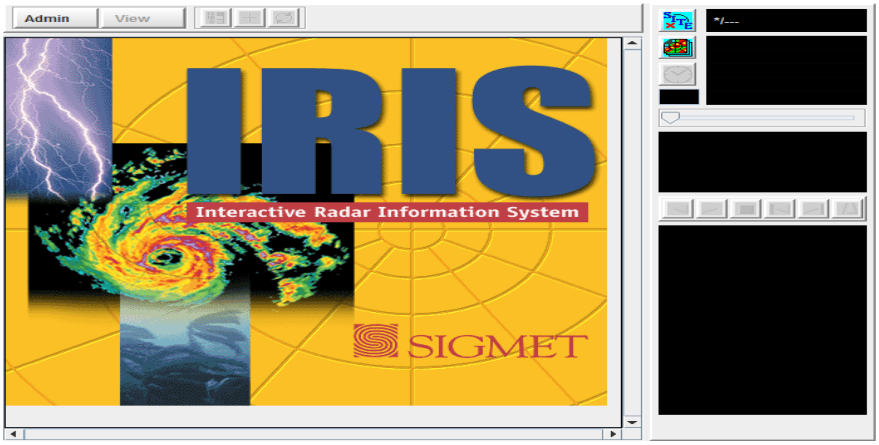



**Figure 5 IRIS Quick Look Window**

## I.6.3 Configure IRIS for Web Server

Turning on the display options menu for Web display allows you to configure IRIS product with overlay that can be displayed on the Web server on the Web browser.

1. From the terminal, run the IRIS setup menu:

```
$setup
```

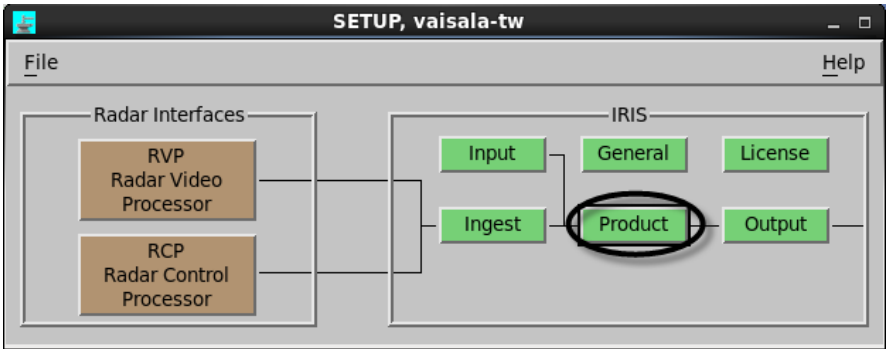



**Figure 6 IRIS SETUP Menu**

2. From the **IRIS** pane on the right, select **Product**. The **IRIS PRODUCTS Setups** menu appears.

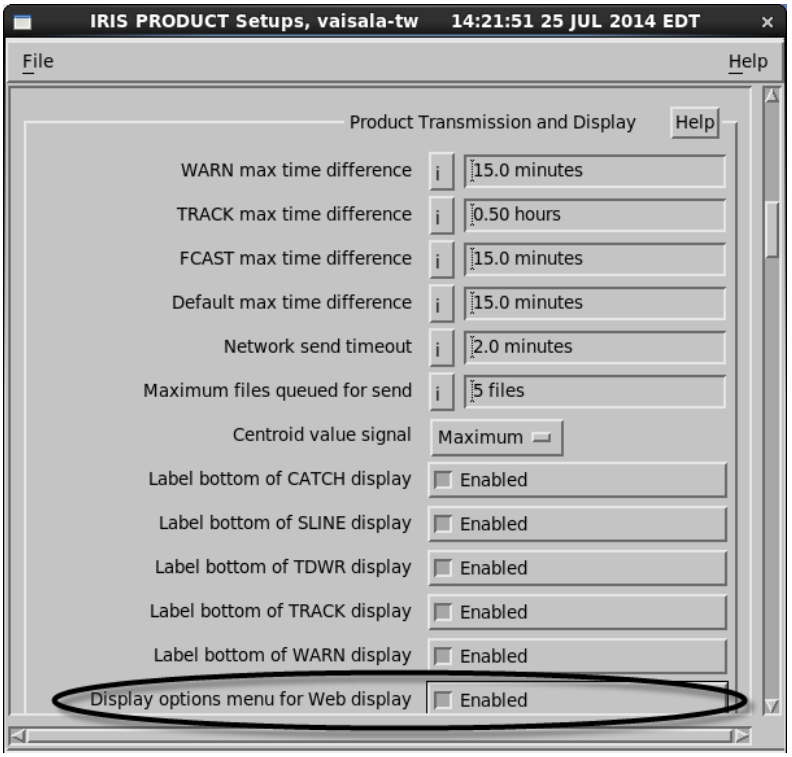



**Figure 7 IRIS PRODUCT Setups Menu**

3. Scroll down and select the **Enabled** check box for **Display options menu for Web display**.

4. Close the **IRIS PRODUCT Setups** menu. **Save** and **Close** the **IRIS Setup** menu.
5. From the terminal, run IRIS menu:

```
$iris&
```

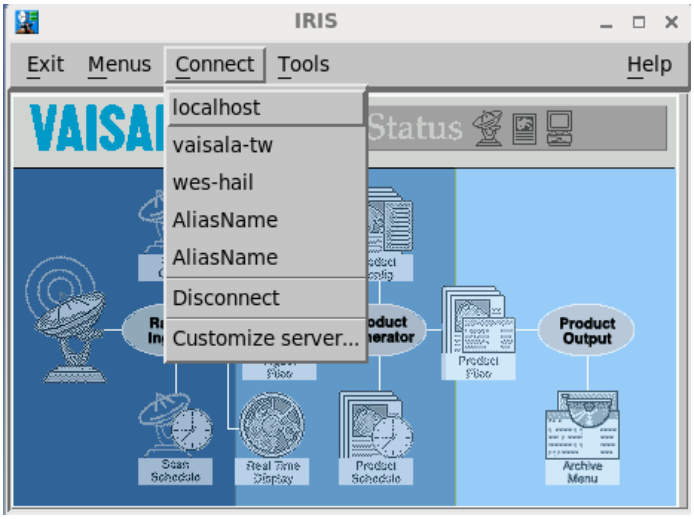



**Figure 8 IRIS Main Menu**

6. To connect to the IRIS server, click **Connect** and then select the server from the drop-down menu or select the **localhost**.
7. Click **Menus** and then click **Radar Status**. The **Radar Status** menu appears.

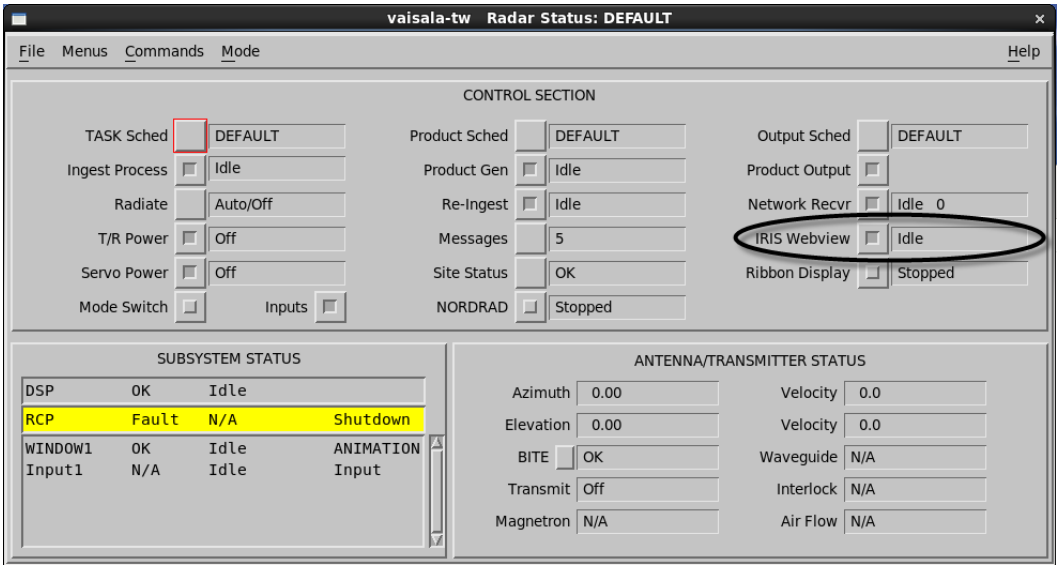


**Figure 9 IRIS Radar Status Menu**

8. To enable the **IRIS Webview**, select the check box next to it.
9. **Save** and **Close** the **Radar Status** menu.
10. From the **IRIS** main menu (see Figure 8 on page 270), click **Menus** and then click **Product Output**. The **Product Output** menu appears.

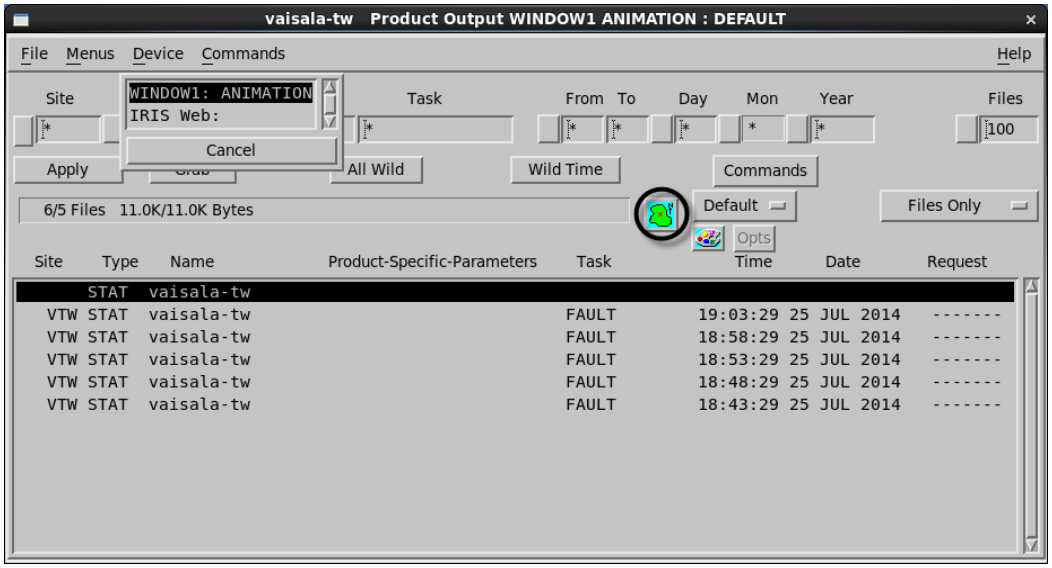



**Figure 10 IRIS Product Output Menu**

11. From the **Device** menu, select **IRIS Web:**.
12. Select any product and then click the display option icon to select any underlay and other options available for the product.

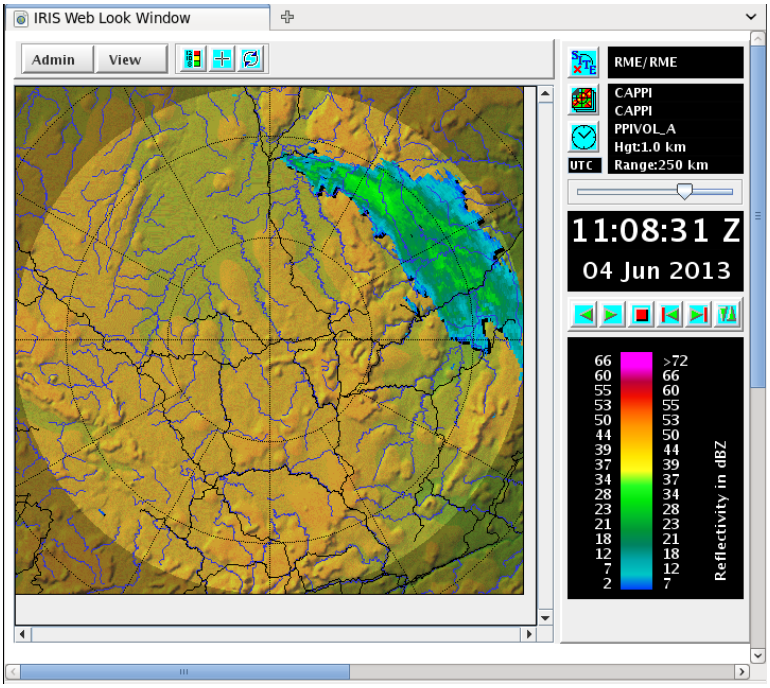



**Figure 11 Webview with Underlay and Range Ring Sample**

# INDEX


**B**

Backup procedure 54

**D**

Directory structure, anchor point 11
Disk, space requirements 11
DSP, calibration procedure 54

**F**

File, ownership and mode 30
Framebuffer Method 97, 150

**H**

hosts.equiv file 16

**I**

Install utility, options, 26
installation, reboot test, 34
in-use bits 67

**L**

Library, installation option 28
Login
- logout 33
- operator 31
- poweroff 33
- procedure 31
- root 32

login 32

**N**

Network configuration 91, 144
Ntp 94, 147

**O**

Operating system, minimum version requirements 9
Operator, user account 11

**P**

Passwords 31
Postscript Setup menu 188
- image color 190
- image position 190
- image size 190
- paper orientation 190
- paper size 190
- printer queue 189
- printing options 190

Power off 33
Printer Options, configuring 188
Printers
- configuring for IRIS 186
- listing with lpstat 188
- local print queues 186
- network print queues 187
- remote print queues 188

Printing Options, Postscript Setup menu 190
Ps_iris command 64

**R**

Rcp configuration 95, 148
RCP8 setup summary 37
RDA 33
- FPGA flash 34
- Kernel module 33

Remote node, installation option 28
Restart_iris command 65
RVP8 setup summary 39

**S**

Serial line setup 17
Shared memory size 18
Show_iris command 67
Show_machine_code command 14
Sigbru utility
- DAT. See Sigbru 194
- devices. See Sigbru 194
- DVD. See Sigbru 196
- HDD. See Sigbru 195

Sigconfig script 75, 101, 128, 155
sigmet_env 14

sigmet_env Command 63
Software configuration 36
introduction 36
Softplane, softplane.conf 40
utilities 36
Ssh, configuration 15
Structmap command 69
su 32

**T**

Testing IRIS installation 54

**U**

upgrade, download files 21
User accounts 11

**V**

version 11

**X**

xhost command 30

www.vaisala.com

*M211315EN*