Intel® IoT Gateways: Wind River IDP XT 3.0

Getting Started Guide

September 2015

Revision History

Date	Revision	Description
September 2015	003	• Added `feature/target-toolchain` to `config` command in Build a Gateway OS • Added directory path to Copy Gateway OS to USB Flash Drive to account for possible directory differences when configuration was done via command line versus Workbench. • Corrected links to reference documents.
August 2015	002	Added Intel® Core™ processor content.
August 2015	001	Initial public release

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1.0 Introduction

Note: For an online version of this document, see https://software.intel.com/en-us/Setup-IDP-DevelopmentTools .

This guide helps you install Linux 7, Intelligent Device Platform XT 3.0, and Workbench 4 on a Linux computer and then use the software to build and install a Gateway OS.

Before using this guide, your Gateway hardware must be installed and accessible through a Development Computer. If you have not yet installed your Gateway, see https://software.intel.com/en-us/SetupGateway-hardware.

Note: Your Gateway came with a pre-installed evaluation operating system that is intended for exploring basic Gateway capabilities. If you do not need a customized OS for your initial evaluation, then you need only follow the Wind River® Intelligent Device Platform XT 3 steps in this guide. This allows you to focus on exploring Gateway functions without building a Gateway operating system.

The examples in this guide use a Development Computer that has an Intel® Core™ i5 second generation processor and uses Ubuntu* Desktop 14.04 distribution software. If you are using a different operating system, use commands that are appropriate for your operating system.

Required Experience

- Installing computer hardware.
- Executing Linux commands, creating and executing scripts.
- Installing and configuring Linux software.
- Using a terminal emulation program like PuTTY* with serial connections between computers.

Document Terminology and Conventions

- **Terminology**
  - Gateway: Hardware included in your Gateway kit.
  - Development Computer: Linux computer that you provide to develop applications for your Gateway.
  - Intelligent Device Platform: Bundled software from Wind River Systems, Inc.
  - Workbench: Wind River development tool included with Intelligent Device Platform.

- **Conventions**
  - `This font is used for commands, API names, parameters, filenames, directory paths, and executables.`
  - **Bold text** is used for graphical user interface entries, buttons, and keyboard keys.

```
This font in a gray box is used for commands you must type or include in a script.
```

```
This font in a green box displays responses to your commands or scripts that you
have run.
```

Items and Software You Need to Provide

You will need to provide the following items to complete your installation:

What you need	Notes
Development Computer with minimum hardware requirements: • Intel® Pentium® 2 processor • 80 GB free disk space • 768 MB RAM • One USB 2.0 port See the notes at the right for the recommended hardware.	Recommended hardware: • 3rd Generation Intel® Core™ i5 processor or better • CPU with four or more cores and with Intel® Hyper-Threading Technology • 150 GB or more of free disk space • 4 GB or more RAM
Development Computer operating system	These instructions have been validated on an Ubuntu 14 64-bit Development Computer. Others may be used. For information, see Development Computer Operating Systems. Ubuntu 14 is available at http://old-releases.ubuntu.com/releases/trusty/ as ubuntu-14.04-desktop-amd64.iso
USB flash drive with at least 4 GB capacity	The contents of this flash drive will be overwritten.
Communications • PuTTY utility or equivalent • Serial to USB cable	The steps in this guide use PuTTY. You can use an equivalent terminal emulation program.
USB keyboard	
Video: HDMI or VGA display with appropriate cable	
Communications • Ethernet connection to wired LAN • Internet connection • Optional: Ethernet router with integrated DHCP server • Optional: Wireless or cellular access	Cellular access requires the installation of a SIM card (not provided) and activation with a cellular service provider.
Optional connectivity components • Micro USB-B to standard USB-A adapter • Serial cable	Micro USB adapter is to connect additional devices A serial cable is for serial connectivity or debug purposes

Task Checklist and Completion Times

Below are the key tasks you will complete in this guide with estimated completion times. Complete each task in order.

The full installation process will take several hours. The time required will vary, depending on your skills and experience, the processor speed of your Development Computer, and your Internet connection speed. The estimated completion times are based on Ubuntu* Desktop 14.04 running on an Intel® Core™ i5 second generation processor and with an Internet connection running at approximately 3 MB per second.

Task	Estimated Completion Time
Activate Wind River License	Less than 1 hour
Installing Ubuntu Linux Updates	Less than 1 hour
Creating Directories and Confirm Disk Space	10 minutes
Install Wind River Software	2 - 4 hours
Build a Gateway OS	3 - 5 hours
Install the OS on the Gateway	45 minutes

Development Computer Operating Systems

Wind River Systems, Inc. tested the following development operating systems for running Wind River Linux. Intel recommends the Ubuntu Desktop 14.04.0 (base version) 64-bit operating system for your Development Computer.

Note: You must use a 64-bit operating system.

Table 1.   **Recommended Operating Systems for Development Computer**

Distribution	Architecture
Ubuntu* Desktop 14.04.0 (base version), (Intel recommended) or 12.04	x86 64-bit
Red Hat Enterprise Linux Workstation 6.5	x86 64-bit
Red Hat Enterprise Linux Workstation 7	x86 64-bit
OpenSUSE* 12.2	x86 64-bit
Novell* SUSE Linux Enterprise Desktop 11 SP2	x86 64-bit
Fedora* 18	x86 64-bit

For detailed information on supported Linux development operating systems, and for additional Linux operating system requirements, see the *Wind River® Intelligent Device Platform XT 3 Release Notes* at http://www.intel.com/content/www/us/en/embedded/design-tools/evaluation-platforms/gateway-solutions/wind-river-idp-release-notes.html.
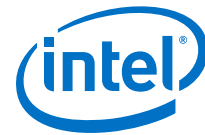
2.0 Activate Wind River License

Wind River® Linux 7 and Intelligent Device Platform XT 3 enable you to build a Gateway operating system and IoT applications. Before using the development tools you must activate your product license(s).

- If you already have a Wind River support account, proceed to Log in to Support.WindRiver.com.

- If you do not have a Wind River support account, go to Create a Wind River Support Account.

Create a Wind River Support Account

1. Go to Wind River Support: http://support.windriver.com

2. Click **Register for an Account** to create a support account and provide your information.

3. See the product notification email message from Wind River to find your license information including License Number, License Authorization Code (LAC) and License Administration Token (LAT)

4. Enter the License number, LAC and LAT numbers, and then click **Submit**.

5. Watch for a Welcome email message from Wind River. In this message, click **activateLink** to confirm your email address and activate your account.

6. Proceed to Log in to Support.WindRiver.com

Log in to Support.WindRiver.com

1. Decide which computer will function as your Development Computer. This is the computer you will use to develop operating systems and applications for this Gateway.

2. Write down the computer name and HWaddr results from:

```
uname -n
ifconfig | grep eth0
```

   Note: The 12-digit HWaddr is the 12-digit MAC address specific to the Development Computer. Wind River refers to this as "Host ID" in the registration process.

3. See the product notification email message from Wind River to find your License Number and License Administration Token.

4. Log in to the Wind River Product Activation portal at http://www.windriver.com/licensing.

   Tip: Use the video instructions for help: https://vimeo.com/61674063.

5. Select **Manage Licenses**, and then click **Add New License**.

6. Type in your **License Number** and **License Administrator Token (LAT)**. Click **Submit**.

7. Click **Manage Licenses** to view the newly added license number.

8. Locate the new license number and then use the **Actions** dropdown to select **Activate Products**.

License #▲	License Label	Role	Actions
0123456	Team XYZ	Administrator	Select... ▼
			Select...
			Activate Products
			License Files By Host
			Rehost
Add New License			Installation Keys

9. On the **Select Product** screen, check the box next to Wind River® Intelligent Device Platform XT 3. Click **Next**.

10. On the **Select Host** screen, determine the Development Computer that will be associated with your license.

    Choose one:

    - Select an existing host (Development Computer) under the **Host Label** menu. Click **Next** and then **skip to step 13**.

    - Create a new host computer (Development Computer) using the **Create New Host** button. Click **Next** and then continue with step 12.

11. If you selected **Create New Host**, enter the following information about the Development Computer, and then click **Create**:

    - Enter a label describing your Development Computer.

    - Exact host name (Development Computer name).

    - Host ID: The network MAC address that you obtained from `ifconfig | grep eth0`. This is a 12-character address. Use characters only. Do not include spaces or punctuation.

    - Leave the defaults for the TCP port and the Borrow Period (days).

    - Other information as indicated.

12. On the **Create Host Confirmation** screen, click **Continue with Activation Process**, and then click **Next**.

13. On the **Select Host** screen, click **Next**.

14. On the **Verify/Generate** screen, review Product allocation to **Host label**. Click **Next**.

15. On the **Download/Email License** screen use the **Download** button to immediately download the license or use the **Send** button to email it.

16. Save `WRSLicense.lic` to `$HOME` on your Development Computer.

17. Continue to Prepare Development Computer.
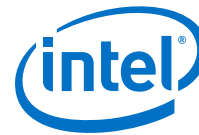
3.0   Prepare Development Computer

Installing Ubuntu Linux Updates

The Linux software on your Development Computer must be current before you install the Wind River Host Tools software. This section provides instructions to perform this update.

From your Development Computer command line interface, use the following commands to apply the Ubuntu updates and install new software packages.

Caution: To maintain Wind River® Intelligent Device Platform XT 3 compatibility, do not perform `sudo apt-get` **upgrade**

```
sudo apt-get update
```

Tip: Select and **COPY** the entire command, **PASTE** it into the terminal window, and then click **Enter**.

```
sudo apt-get install libstdc++6:i386 libgtk2.0-0:i386 libxtst6:i386 texi2html
chrpath diffstat subversion libgl1-mesa-dev libglu1-mesa-dev libsdl1.2-dev texinfo
gawk gcc help2man g++ git-core python-gtk2 bash diffutils xz-utils make file
screen gcc-4.7 gcc-4.7-multilib g++-4.7 g++-4.7-multilib gtk2-engines-murrine:i386
libcanberra-gtk-module:i386 unity-gtk2-module:i386 unity-gtk2-module
```

Type your password if prompted for it, and then answer `Yes` to continue.

Creating Directories and Confirm Disk Space

You will need about 100 GB of free disk space to install the Wind River Host Tools and build your Gateway OS. Create the following directories on your Development Computer:

- `$HOME/WindRiver` - Wind River Host Tools directory.

- `$HOME/Installer` - A temporary directory that you can delete after completing your installation.

- `$HOME/Project` - You will use this directory both now and later when you develop future applications.

- `$HOME/Project/build-cache` - Using a build cache will reduce the time required to build your Gateway OS.

Use these commands to create the directories:

```
cd $HOME
mkdir WindRiver
mkdir Installer
mkdir Project
mkdir Project/build-cache
```

4.0 Install Wind River Software

1. On your Development Computer, use your Wind River account credentials to log in to Wind River Windshare (https://windshare.windriver.com)

2. Under the **Products** menu, select Wind River® Intelligent Device Platform XT 3, and then click **Installer for Linux**.

    The installer begins downloading.

3. When the download completes, move the Installer file into the `$HOME/Installer` directory on your Development Computer.

4. Change to the `Installer` directory and unzip the file:

```
cd $HOME/Installer
unzip idp*.zip
```

5. Start the Wind River Host Tools Installer:

```
./setup_linux
```

6. In the **Extract Installer** window, browse to the `$HOME/WindRiver` directory. Click **OK**.

7. Click **Next** in the **Installer Welcome** screen.

8. On the **Online Update Settings** screen, keep the box at the top checked to look for and apply Installer updates.
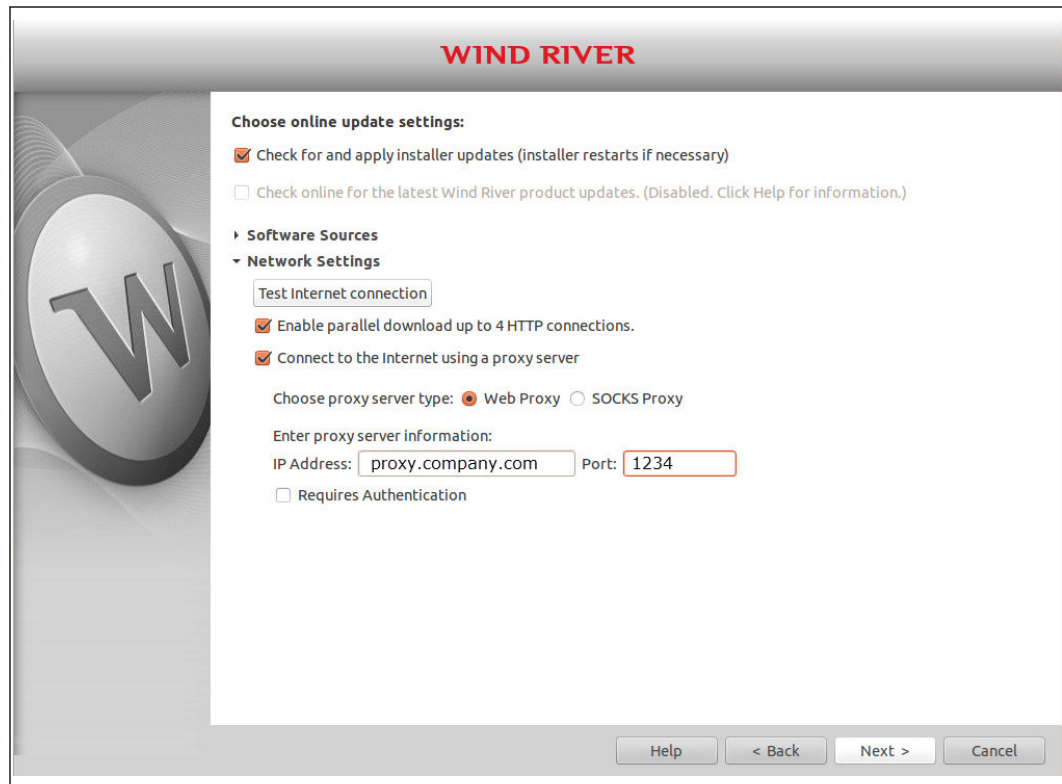
9. Click the triangle to expand **Network Settings**.

10. If your company uses a proxy server:

    a. Check the option **Connect to the Internet using a proxy server**.

    b. Select the radio button for your proxy server type.

    c. Enter your proxy server information and port number.

       Note: You can use either an IP address or a proxy server name in the **IP Address** field, as shown in the example above.

11. Click **Test Internet connection** to verify Internet connectivity. If the test fails, verify your proxy configuration and try again.

12. Click **Next** and then provide your Wind River account login information.

    The Installer takes about two minutes to check for updates.

13. Select **Typical** as the installation type.

14. If you agree to the terms of the End User License Agreement, click **I Accept**.

    The installer continues to download software for a few minutes. If prompted for it, supply your Wind River account login information.

15. When the **Installer - Select Product** page displays, click **Install**.

    The installation beings. It downloads approximately 27 GB of information. This might take several hours and can run unattended. The Intelligent Device Platform XT 3 is complete when you see **Installation Successful**. Click **Finish**.

16. Install the Wind River license by moving the file `WRSLicense.lic`, obtained in Activate Wind River License, from your `$HOME` directory into the `$HOMEWindRiver/license` directory.

Verify All Required Linux Packages Are Installed

1. Change to the `$HOME/WindRiver/wrlinux-7/scripts` directory and verify all packages have been installed:

```
cd $HOME/WindRiver/wrlinux-7/scripts
./host_package_install.sh
```

2. If you receive stating `All required host packages are installed`, proceed to Build a Gateway OS. If you receive a message that packages must be installed, install them, replacing `[package #1] [package #2] [etc]`:

```
sudo apt-get install [package #1] [package #2] [etc]
```

If prompted, provide your Linux password.

The Wind River® Intelligent Device Platform XT 3 is complete. You are ready to build a Gateway operating system and develop applications for your Gateway.

5.0　Build a Gateway OS

Note:　Your Gateway came with a pre-installed operating system that is adequate for many tasks you will perform. If you do not plan to perform custom development tasks at this time, you have completed your development environment configuration.

You are ready to build the operating system that will run on your Gateway. You have two choices to build your OS. Each will take several hours:

- Command line: See Using a Command Line.
- Wind River Workbench: See Using Wind River Workbench.

Using a Command Line

These steps use an example Wind River Linux `configure` command with options that vary slightly by Gateway model. To see additional options, see the Wind River® Intelligent Device Platform XT Programmer's Guide, Part II (Key Related Tasks).

1. Go to the `$HOME/Project` directory on your Development Computer:

```
cd $HOME/Project
```

2. Define your Gateway options by **copying and pasting** the `configure` command to the Development Computer.

Important: The parameters are vary by Gateway processor. Select the configure command for your Gateway processor:

Configure for Intel® Atom™ processor

```
../WindRiver/wrlinux-7/wrlinux/configure --enable-board=intel-baytrail-64 --
enable-kernel=idp --enable-bootimage=ext3,hdd --enable-patchresolve=noop --enable-
rootfs=idp --enable-addons=wr-idp --with-layer=wr-prosyst-mbs-smarthome-sdk-ia,wr-
digi-idigiconnector,wr-wks-oneagent-oma-dm-ia,wr-wks-oneagent-tr069,sys-
version,wr-iot --with-template=feature/vlan,feature/opc,feature/recovery,feature/
opc_demo,feature/ipsec_vpn,feature/l2tp,feature/realtek,feature/ems-test,feature/
remote-session,feature/openjdk-bin,feature/online_updates,feature/
bluetooth,feature/pptp_vpn,feature/target-toolchain --with-
package=make,git,iasl,libtool,perl,ruby,subversion,autoconf,automake,curl,conntrac
k-tools,fuse,igmpproxy,iperf,ipset,libcli,mipv6-daemon-
umip,ntfs-3g,ntfsprogs,sshfs-fuse,tftp-hpa,tftp-hpa-server,tcpdump,vim
```

Configure for Intel® Core™ processor

```
../WindRiver/wrlinux-7/wrlinux/configure --enable-board=intel-haswell-64 --enable-
kernel=idp --enable-bootimage=ext3,hdd --enable-patchresolve=noop --enable-
rootfs=idp --enable-addons=wr-idp --with-layer=wr-prosyst-mbs-smarthome-sdk-ia,wr-
digi-idigiconnector,wr-wks-oneagent-oma-dm-ia,wr-wks-oneagent-tr069,sys-
version,wr-iot --with-template=feature/vlan,feature/opc,feature/recovery,feature/
opc_demo,feature/ipsec_vpn,feature/l2tp,feature/realtek,feature/ems-test,feature/
remote-session,feature/openjdk-bin,feature/online_updates,feature/
bluetooth,feature/pptp_vpn,feature/target-toolchain --with-
package=make,git,iasl,libtool,perl,ruby,subversion,autoconf,automake,curl,conntrac
```

```
k-tools,fuse,igmpproxy,iperf,ipset,libcli,mipv6-daemon-
umip,ntfs-3g,ntfsprogs,sshfs-fuse,tftp-hpa,tftp-hpa-server,tcpdump,vim,feature/
target-toolchain --with-
package=make,git,iasl,libtool,perl,ruby,subversion,autoconf,automake,curl,conntrac
k-tools,fuse,igmpproxy,iperf,ipset,libcli,mipv6-daemon-
umip,ntfs-3g,ntfsprogs,sshfs-fuse,tftp-hpa,tftp-hpa-server,tcpdump,vim
```

The `configure` command will take several minutes to complete. Upon completion, your terminal prompt will return.

3. Remove grsecurity to experiment with application development: Build Gateway OS Without Grsecurity

Note: Grsecurity is included in the Linux kernel by default. This feature can inhibit exploration by preventing your apps from working. Disable grsecurity while you experiement with your Gateway. When you are ready to build a production-ready Gateway, consider re-enabling grsecurity.

4. Build the Gateway operating system:

```
make fs
```

The Gateway OS takes 3 - 5 hours and creates files with `*.bz` extensions in `$HOME/Project/export`.

5. The `config.log` created in `$HOME/Project` is an exact copy of the `configure` options used to build the Gateway OS. Save this as `config.sh` for future development projects:

```
cp config.log config.sh
```

6. Continue to Copy Gateway OS to USB Flash Drive.

Using Wind River Workbench

1. Launch Wind River Workbench:

```
cd $HOME/WindRiver/workbench-4
./startWorkbench.sh
```

2. In the **Workspace Launcher** window select a workspace folder and then click OK. For example: `home/<username>/WindRiver/workbench-4/workspace` where `<username>` is your Linux login ID.

3. From the main menu, click **File** > **New** > **Wind River Workbench Project**.

4. Select **Platform** as the build type. Click **Next**.

5. Type a name for your project. Click **Finish**.

6. Click **Add Option**.

7. Locate and highlight **--enable-addons=[ ]**. With the line highlighted, replace the text in the **Option:** field with `--enable-addons=wr-idp`. Click **OK**.
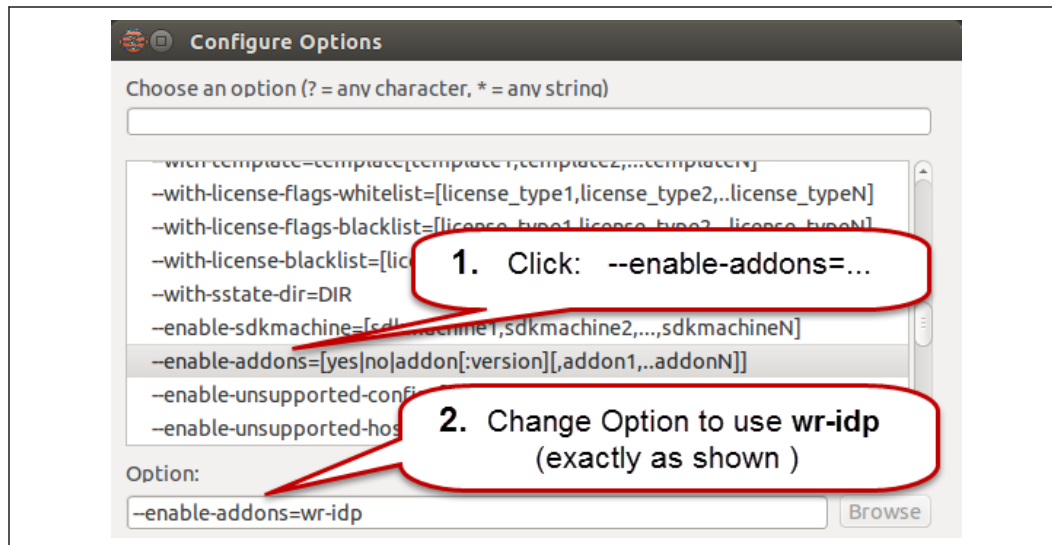
8. Click **Add Option** again.

9. Locate and highlight **--with-package=....** With the line selected, replace the entire **Option** field with

```
--enable-
package=make,vim,git,iasl,libtool,perl,ruby,subversion,autocon
f,automake,curl,conntrack-
tools,fuse,igmpproxy,iperf,ipset,libcli,mipv6-daemon-
umip,ntfs-3g,ntfsprogs,sshfs-fuse,tftp-hpa,tftp-hpa-
server,tcpdump
```

Click **OK**

10. **IMPORTANT**: Click **Rescan Layers**.

Refer to the following figure to complete the next steps:
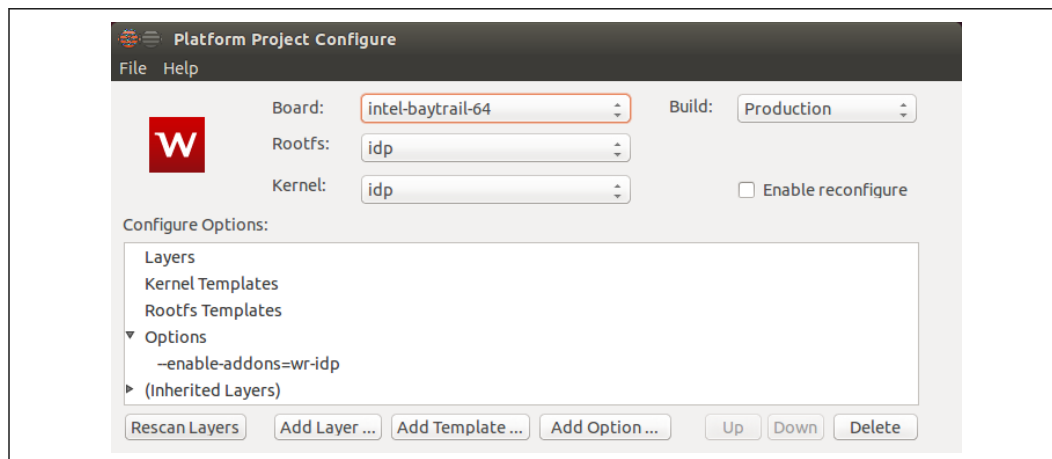
11. The **Board** option refers to the processor type installed in the Gateway. Select the correct **Board** for your Gateway:

• Intel® Atom™ processor: select **intel-baytrail-64**

- Intel® Core™ processor: select **intel-haswell-64**

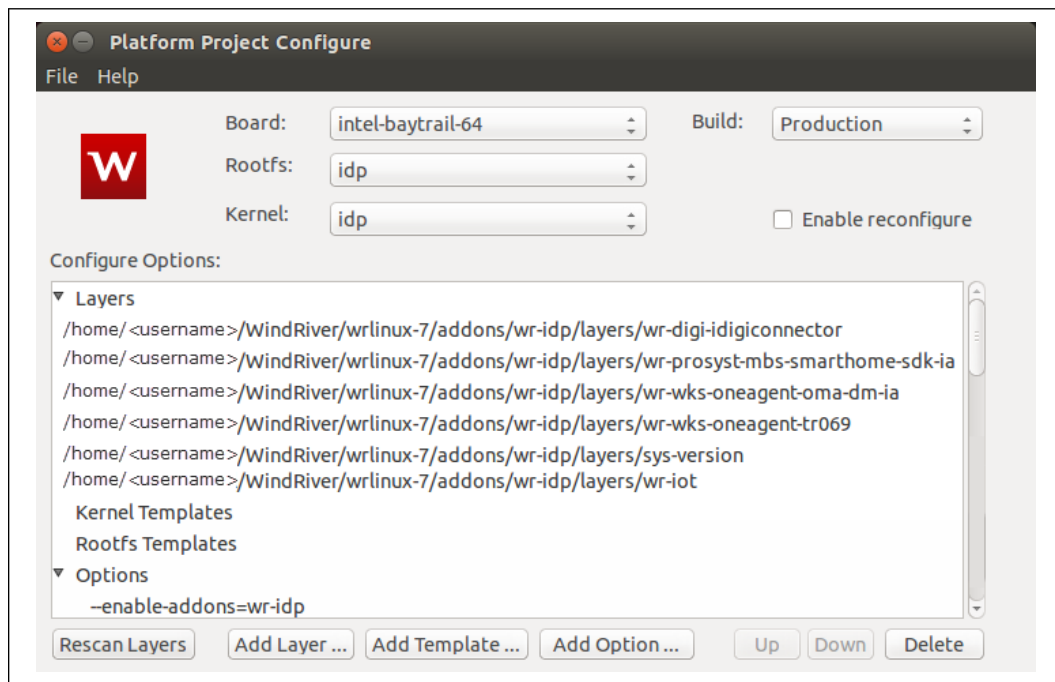, select one of the following: **intel-baytrail-64**

12. Select **idp** for both **RootFS** and **Kernel**.

> *Important:* If **idp** is not listed as a choice, repeat steps 6 - 9, making sure you correctly define `--enable-addons=wr-idp` in step 7 and **Rescan Layers** in step 8.

Continue referring to the figure above for steps 11 - 14.

13. Click **Add Layer**.

14. Click **Browse**.

15. In the **Places** window select your user name (your home directory), and then the folder `WindRiver/wrlinux-7/addons/wr-idp/layers/wr-digi-idigiconnector`. Click **OK**, and then click **Add**.

16. Repeat step 11 - 13 to add these layers:

- sys-version
- wr-iot
- wr-prosyst-mbs-smarthome-sdk-ia
- wr-wks-oneagent-oma-dm-ia
- wr-wks-oneagent-tr069

17. Click **Add Template**.

18. Locate and select the following features. Select them by clicking the box at the left of each. Refer to the figure below.

- feature/bluetooth
- feature/ems-test

- feature/l2tp

- feature/ipsec_vpn

- feature/online_updates

- feature/opc

- feature/opc_demo

- feature/openjdk-bin

- feature/pptp_vpn

- feature/realtek

- feature/recovery

- feature/remote-session

- feature/target-toolchain

- feature/vlan
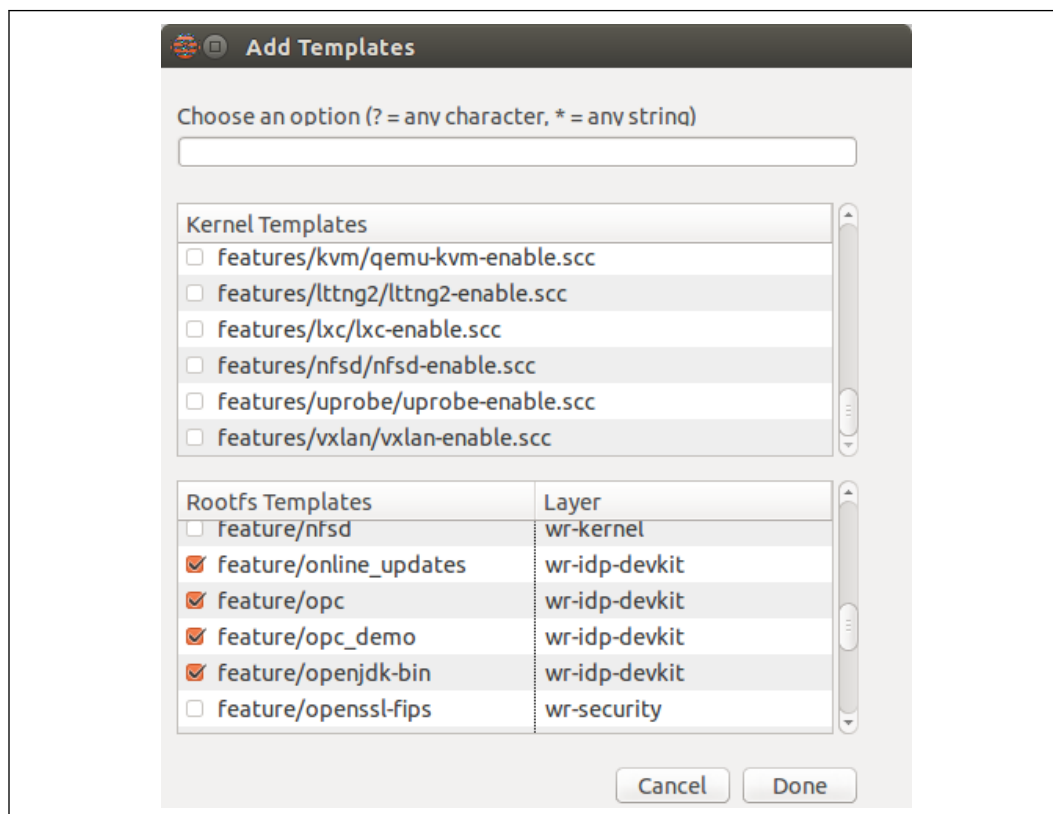
19. Click **Done**.

20. Click **Run Configure**.

    The configuration runs for a few minutes, and then displays results.

21. Click **Finish**.

22. Remove grsecurity to experiment with application development: Build Gateway OS Without Grsecurity

> *Note:* Grsecurity is included in the Linux kernel by default. This feature can inhibit exploration by preventing your apps from working. Disable grsecurity while you experiement with your Gateway. When you are ready to build a production-ready Gateway, consider re-enabling grsecurity.

23. From the Workbench menu, select **Project** > **Build Project**.

24. Click **OK** in response to the message about parallel builds.

    The operating system build begins. It will take 3 - 5 hours to complete. A file with a .bz2 extension and a config.log file are created in $HOME/Project/ export.

25. Save config.log as config.sh for future development tasks:

```
cp config.log config.sh
```

26. Continue to Copy Gateway OS to USB Flash Drive.

6.0 Copy Gateway OS to USB Flash Drive

In this section you will copy your Gateway OS onto a bootable USB flash drive. The USB flash drive must be at least 4 GB and **any content on it will be erased**.

1. From your Development Computer, display the storage devices:

```
ls /dev/sd?
```

2. Insert the USB flash drive into your Development Computer.

3. Run `ls` again and compare the results to determine the newly connected storage device (USB flash drive):

```
ls /dev/sd?
```


You will need the USB flash drive name in the next step. In this example, the USB flash drive is `/dev/sdb`

4. Change to the appropriate directory:

    *   If you built the OS using Workbench, change to the workspace directory, replacing `<YourProjectDirectory_prj>` with the directory name.:

```
cd $HOME/workspace/<YourProjectDirectory_prj>
```

> *Note:* There will be two similarly named project directories, one of which has **_prj** appended to it. Change to the ***_prj** directory.

    *   If you built the OS from the command line:

```
cd $HOME/Project
```

5. Deploy the Gateway OS to the USB flash drive. The compiled OS file is named to match the processor type in the Gateway. Select the appropriate command for your Gateway and replace ??? with the storage device:

    Deploy for Intel® Atom™ processor:

```
sudo ./deploy.sh -u -f export/intel-baytrail-64-idp-idp-dist.tar.bz2 -d /dev/??? -y; sync
```

    Deploy for Intel® Core™ processor:

```
sudo ./deploy.sh -u -f export/intel-haswell-64-idp-idp-dist.tar.bz2 -d /dev/??? -y; sync
```

The deploy process takes about 15 minutes.

6. Type your Linux password if prompted and click **OK**.

   The bootable USB drive is created when you see `DONE!`

7. **Remove** and **reinsert** into your Development Computer. The flash drive mounts with two partitions, one of which is `/media/<username>/wr_usb_boot`.

8. Copy the Gateway OS file to the flash drive. Select the appropriate command for your Gateway and replace <username> with your Linux login name:

   Copy OS for Intel® Atom™ processor:

   ```
   sudo cp export/intel-baytrail-64-idp-idp-dist.tar.bz2 /media/<username>/
   wr_usb_boot/opt/; sync
   ```

   Copy OS for Intel® Core™ processor:

   ```
   sudo cp export/intel-haswell-64-idp-idp-dist.tar.bz2 /media/<username>/
   wr_usb_boot/opt/; sync
   ```

9. Remove the USB flash drive from your Development Computer.

7.0 Install the OS on the Gateway

Important: Before using these steps, you must complete the steps in the Getting Started Guide, **paying special attention to the steps in "Appendix: Setup BIOS Boot from USB". Your Gateway will not boot to the USB flash drive if these BIOS settings are not correct**. See https://software.intel.com/en-us/SetupGateway-Atom-hardware.

1. Power down the Gateway, insert the USB flash drive, and then re-apply power. Login using `root` for the login ID and password.

2. Install the OS:

```
tgt=/dev/sda /sbin/reset_media
```

   When prompted to `Restore the boot media to its factory defaults`, answer `yes`. This installation can take up to 20 minutes.

   Important: If you receive the message `ERROR: Unmount /dev/sda1 failed!` your Gateway might not have booted from the USB flash drive. Check the boot priority and UEFI settings to ensure the first boot priority is UEFI, using the internal storage device. See "Appendix: Setup BIOS Boot from USB" in https://software.intel.com/en-us/SetupGateway-Atom-hardware.

3. Installation is complete when you see the message `DONE!` Shut down the Gateway:

```
poweroff
```

4. Remove the USB flash drive and then power up your Gateway.

   Note: If you see a boot error message, such as `Reboot and Select proper boot device` or similar, ensure the Gateway BIOS has Boot Priority 1 set for: UEFI via internal storage. See See "Appendix: Setup BIOS Boot from USB" in https://software.intel.com/en-us/SetupGateway-Atom-hardware

5. Login using `root` for both the login ID and password.

The OS installation is complete.
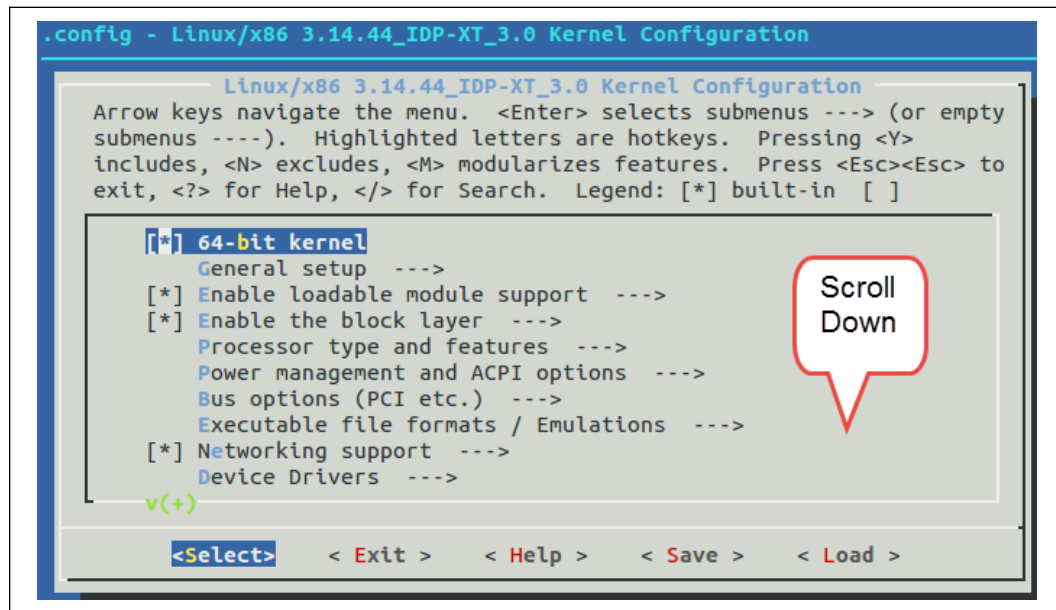
Appendix A Build Gateway OS Without Grsecurity

By default, grsecurity is included in the Wind River® Intelligent Device Platform XT 3 configuration process but the Intelligent Device Platform XT 3 does not include an option to remove it. Complete these steps on your Development Computer to remove grsecurity at the kernel level.

1. Configure the kernel:
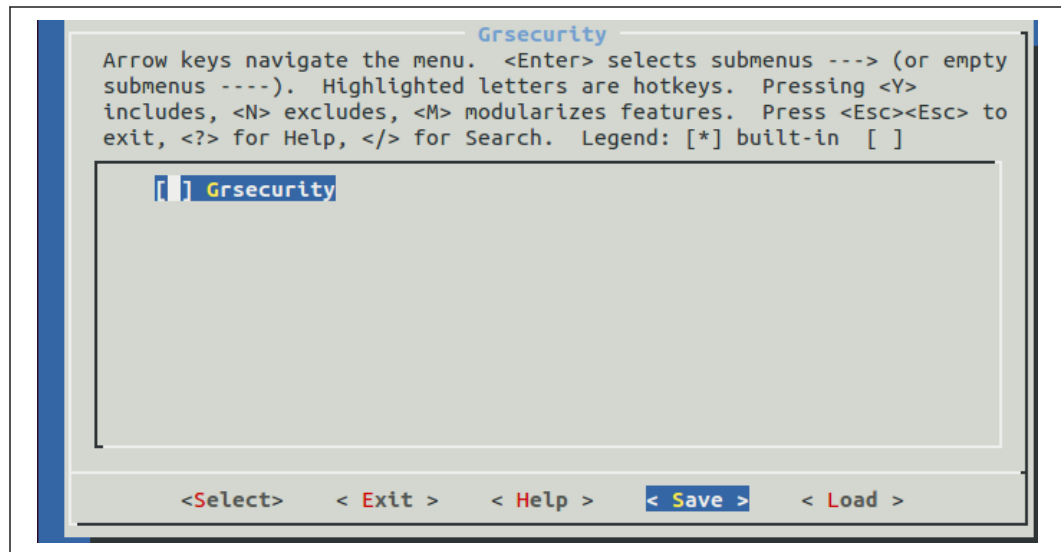
```
make linux-windriver.menuconfig
```

The Kernel Configuration screen is displayed after a few minutes.

2. In the Kernel Configuration, use down arrow key to highlight **Security options**. Press **Enter**.

```
.config - Linux/x86 3.14.44_IDP-XT_3.0 Kernel Configuration

        Linux/x86 3.14.44_IDP-XT_3.0 Kernel Configuration
   Arrow keys navigate the menu.  <Enter> selects submenus ---> (or empty
   submenus ----).  Highlighted letters are hotkeys.  Pressing <Y>
   includes, <N> excludes, <M> modularizes features.  Press <Esc><Esc> to
   exit, <?> for Help, </> for Search.  Legend: [*] built-in  [ ]

      [*] 64-bit kernel
          General setup  --->
      [*] Enable loadable module support  --->
      [*] Enable the block layer  --->               Scroll
          Processor type and features  --->           Down
          Power management and ACPI options  --->
          Bus options (PCI etc.)  --->
          Executable file formats / Emulations  --->
      [*] Networking support  --->
          Device Drivers  --->
      v(+)

          <Select>    < Exit >    < Help >    < Save >    < Load >
```

3. In the **Security Options** screen, use the arrow keys to select **Grsecurity**. Press **Enter**.

4. On the **Grsecurity** screen, an asterisk (*) indicates grsecurity is included in the kernel. Press the **space bar** to remove the asterisk, disabling grsecurity.

```
                            Grsecurity
   Arrow keys navigate the menu.  <Enter> selects submenus ---> (or empty
   submenus ----).  Highlighted letters are hotkeys.  Pressing <Y>
   includes, <N> excludes, <M> modularizes features.  Press <Esc><Esc> to
   exit, <?> for Help, </> for Search.  Legend: [*] built-in  [ ]

       [ ] Grsecurity




        <Select>    < Exit >    < Help >   < Save >   < Load >
```

5. Use the right arrow key to select **Save**. Press **Enter**.

6. When prompted to enter a filename, leave the default `.config`. Press **Enter**.

7. A window confirms the configuration file was written. Press **Enter**.

8. On the **Grsecurity** menu, select **Exit**. Press **Enter**.

9. On the **Security** menu select **Exit**. Press **Enter**.

10. On the Kernel Configuration menu select **Exit**. Press **Enter**.

The kernel is now configured without grsecurity. Continue the Gateway OS build process.

Appendix B Login IDs and Passwords

You are prompted for several login IDs and passwords throughout your installation procedures. The following is a quick reference to the default IDs and passwords.

Table 2.   **Default Login IDs and Passwords**

Logging into...	Default ID and Password
Gateway	ID: root Password: root
Gateway local wireless network	Password: windriveridp

Appendix C Technical Support Options

Intel® Premier Support

For users with a registered product, Intel provides technical support for your Gateway through Intel® Premier Support. You created an Intel® Premier Support when you registered your Gateway. To access support, go to https://premier.intel.com.

To submit a support request using Intel Premier Support, go to https://businessportal.intel.com. Click the **Product Support Tab** -> **Intel Premier Support Home**. Submit your issue using the product name that is appropriate for your Gateway:

In addition to Intel® Premier Support, registered users can use the Intel® IoT Gateway - Knowledge Forum to ask "how-to" questions. Follow the instructions in the remainder of this Appendix to register, login, and submit questions in the Knowledge Forum.

Intel® IoT Gateway Knowledge Forum

In addition to the technical support through Intel® Premier Support, an online community knowledge forum is available for your Gateway. The forum is located at https://ask.intel.windriver.com. On this forum, you can ask how-to questions and search for answers related to Wind River® Linux and the Wind River development tools.

Intel will continue to offer hardware and software technical support through Intel® Premier Support. The Knowledge Forum is an additional support option. The difference is that questions on the Knowledge Forum are typically related to the installation and usage of Wind River Linux, the Intelligent Device Platform XT, and compilers and development tools, such as the Wind River Workbench.

In using the forum, be aware that this is an open support model and the following bullets apply:

- Wind River hosted knowledge forums, including the Wind River Knowledge Forum and the Intel® IoT Gateway Knowledge Forum, are open support repositories that are accessible to Intel, Wind River employees, and customers who have active Support Maintenance Agreements.

- Questions posted on the forums are visible to all users. All users can contribute answers. Both questions and answers can be viewed by any user on the Knowledge Forums.

- Refrain from posting proprietary, confidential, or controlled information on the Knowledge Forums. Intel Corporation and Wind River Systems are not responsible for ensuring the privacy of data on the Knowledge Forums.

This section guides you through accessing and using the Intel® IoT Gateway Knowledge Forum.

Note: If your issue is urgent or related to BSP development on a specific project, create an issue ticket through Intel® Premier Support instead of relying on this forum for answers.

Accessing the Forum

Use the following steps to create a Wind River account and log in to the forum.

Note: You might already have a Wind River support account. If you have an account, disregard Step 1.

1. To create a Wind River support account you must fill out a short form at https://support.windriver.com/selfservicewebapp/register.action. This form requires you to enter your license and LAC keys. You received this information after you registered your Gateway.

2. Login at https://ask.intel.windriver.com. Use your Wind River Online Support account user name and password.

3. If you have not yet done so, then when prompted, set up a screen name. This is the identity you will use in the online community. Other users will see you by this identity. Do not use your email address for your screen name.

Submitting Questions

Use the following steps to ask a question on the forum.

1. Click **ASK YOUR QUESTION**. See the red box in the following figure.

2. Title your question in the field provided.

3. Provide details. To help the support staff to provide accurate and timely guidance, include details about your test / development environment, including:

   • Detailed information about your question.

   • Software, such as Intelligent Device Platform XT release, Wind River Linux version, BIOS, FW, etc.

   • Hardware, such as board, processor SKU, memory, I/O etc.

4. Categorize your question. Add **IOT-Gateway** as a tag in addition to specific product tags. This will allow the support team to track issues related to your Gateway.

   Your selected tags display in a list. Add and remove tags as necessary.

5. Click **Ask Your Question** to submit the question. See the red box in the following figure.

Subscribing to Tags

You can choose to subscribe to specific tags to receive email alerts for issues and updates to questions related to that tag/category. Use the following steps.

1. Select your preferred email setting. See the red box in the following figure.

2. Click **Change frequency of emails** to set up how often you receive email messages.

Appendix D Using the Triage Tool

The Triage Tool is a set of shell scripts designed to collect customer's hardware and software information for efficient issue debugging. One set of scripts is for the Development Computer and second set of scripts is for the Gateway. The scripts know the location of information like log files, and they know the commands to run to gather the details. The output is a compressed tar file that can be provided to Intel's support team for quick issue resolution. Attach your Triage Tool outputs to Intel® Premier Support issues for faster resolution.

Development Computer Location and Usage

On your Development Computer, the script is located in the project directory. The example below shows the usage. In the example:

- `-i <install dir>` is the path to Wind River Intelligent Device Platform installation directory

- `-b <Project>` is the path to where you build your project, such as `$HOME/Project`

```
$HOME/Project$ sudo sh ./triage_tool_host.sh -i <install dir> -b <Project>
```

The output is a tar file in your current working directory.

Gateway Location and Usage

After deploying the runtime image to your Gateway, the script is located in the `/root/examples` directory. The example below shows the usage:

```
root@WR-IntelligentDevice:~/examples# ./triage_tool_target.sh
```

The output is a tar file in your current working directory.

Appendix E References

The following documents might help you complete your installation procedures.

Note: You will be required to login to the Wind River Knowledge Library to access these documents. Use your account information from Activate Wind River License.

Content	Key Contents	Link
Wind River® Linux 7	Look here multiple Wind River Linux documents to help you set up and use Wind River Linux.	https://knowledge.windriver.com/?cid=lx7
Wind River® Intelligent Device Platform XT 3 Programmer's Guide	• Product overview • Architecture • Security, connectivity & management • Validation • System owner, device & application development vendor tasks	https://knowledge.windriver.com/Content_Lookup?id=045671
Wind River® Intelligent Device Platform XT 3 - Release Notes	• Changes in this release • Requirements • Issues & customer service	https://knowledge.windriver.com/Content_Lookup?id=045672
Wind River® Intelligent Device Platform XT 3 Security Guide	• Platform security overview • Security planning • Risks, threats & security mechanisms • BKMs, keys & certificates • Secure repository • Encrypted data storage	https://knowledge.windriver.com/Content_Lookup?id=045673