



Rugged Operating system on Linux v2.1.0 Release Notes

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Overview

ROX™ v2.1.0 represents the next “Generally Available” (GA) release of RuggedCom’s “second-generation” ROX™ II operating system software. This “second-generation” operating system software is required by all models within the RuggedBackbone™ product series (RX5000/MX5000/RX1500/RX1501/RX1510/RX1511/RX1512). It is also available as an upgrade to the RuggedRouter product series (RX1000/RX1100).

- RX5000/RX15xx Build date: December 3, 2010 – 16:36
- RX1000/RX1100 Build date: December 3, 2010 – 17:38

User Guides

All user Guides are available from the RuggedCom Web site at www.ruggedcom.com. Refer to the **Rugged Operating system on Linux v2.1.0** User Guide with this release.

Overview of ROX™ II features

ROX v2.x is not just an update to RuggedCom's current **ROX v1.x** operating-system (originally released to support the RuggedRouter RX1000/RX1100 product models), but instead represents the "second-generation" of the ROX software series (hence the **ROX™ II** moniker). Here some important **ROX™ II v2.x** highlights:

- runs on both (legacy) RX1000/1100 and (new) RX5000/RX15xx product models
- combining IP routing (L3) and Ethernet managed switch (L2) functionality
- provides a 'telecom-standard command-line-interface (CLI)
- support for modular designs with 'hot-swappable' hardware circuitry
- very high Ethernet port-densities
- incorporates explicit 'real-time' performance mechanisms
- support for modular IPv4/Layer 3 hardware switching capabilities
- source code reuse of RuggedCom 'in-house' developed software library originally designed for Ethernet managed-switching (ROS™)
- introduces NETCONF for powerful and secure advanced management of system data-model
- USB port access (new) RX5000/RX15xx models
- Removable 1GB Compact Flash card for program & configuration storage
- Enhanced reliability through Data ('forwarding') and Control plane separation
- Single configuration file for easy maintenance and upgrades
- Dual-redundant file systems for greatly improved software-upgrade reliability
- New WEB GUI design facilitates dynamic screen updating

Summary of changes in ROX™ II – v2.1.0 (2010-12-03 16:36)

L2/Ethernet switching feature-set

- 100 Mbps and 1Gbps Ethernet interfaces
- VLAN (802.1Q) including GVRP
- Port rate and Broadcast storm limiting
- Port configuration, status, statistics and mirroring
- Port security including 802.1x including RADIUS authentication
- MSTP 802.1Q-2005 (formerly 802.1s)
- RSTP (802.1w) and Enhanced Rapid Spanning Tree (eRSTP™) network fault recovery (<5ms/hop)
- CoS (802.1P)
- VLAN Trunking (802.1Q)

- Multicast Filtering including GMRP, IGMP-Snooping, and Static MAC Table
- DHCP Relay Agent
- LLDP (802.1ab)

L3/IP routing feature-set

- Support for Layer 3 IPv4 Switching (MX/RX5000 requires Layer 3 hardware configuration)
- T1/E1 WAN interfaces using PPP and Frame Relay (RX1000, RX15xx)
- T3/E3 WAN interfaces using PPP and Frame Relay (RX1000)
- DDS WAN interfaces using PPP and Frame Relay (RX1000)
- GSM/HSPA Cellular interfaces (RX1000)
- CDMA/EvDO Cellular interfaces (RX1000)
- Asynchronous serial interfaces (RX1000)
- IPv4 Static Routing (Zebra)
- IPv4 Dynamic Routing support using OSPF/RIPv2/BGP4 (Quagga)
- Static IP Multicast Routing
- Stateful Firewall engine

IP/Gateway Services

- NTP Server (ms precision)
- VRRP
- Multiple Address (IPv4 and IPv6) assignment per interface
- GRE Tunneling
- Enhanced Link-backup/failover

Device Control/Status

- Power Supply Management
- Fan Controller Management (RuggedEnclosure™)
- Alarm Management
- Upgradeable Software License Support

- SNMPv1/v2c/v3
- Full NETCONF standard compatibility with device operational/status data-model
- Support including IF-MIB and BRIDGE-MIB support
- Device Access control configurable with RADIUS authentication

SNMP MIB support

RuggedCom (private) MIB Revisions:

- RUGGEDCOM-MIB revision: 2010-05-27
- RUGGEDCOM-RX5000-MIB revision: 2010-09-16
- RUGGEDCOM-SYS-INFO-MIB revision: 2010-09-16
- RUGGEDCOM-TRAPS-MIB revision: 2010-09-16

ROX 2.1 Developed/Integrated SNMP MIB Support for:

- IF-MIB revision: 2000-06-14
- RSTP-MIB revision: 2005-12-07
- BRIDGE-MIB revision: 2005-09-19
- IANA-ADDRESS-FAMILY-NUMBERS-MIB revision: 2002-03-14
- IANAifType-MIB revision: 2007-03-08
- INET-ADDRESS-MIB revision: 2005-02-04
- IP-MIB revision: 2006-02-02
- LLDP-MIB revision: 2005-05-06
- P-BRIDGE-MIB revision: 2006-01-09
- Q-BRIDGE-MIB revision: 2006-01-09
- TCP-MIB revision: 2005-02-18
- UDP-MIB revision: 2005-05-20



Known Limitations

The following list describes limitations of functionality which are ‘known’ to exist within this software release.

Only Power Supply Modules are Hot-swappable

Products: RX1500, RX1501, RX1510, RX1511, RX1512

ID: 3611

The full hot-swap functionality for interface ‘Line Modules’ (LM) does not exist within the ROX 2.1.0 release. For this release only the ‘Power-supply Modules’ (PM) are hot-swappable.

Layer 3 Multicast Routing is not supported with L3 Hardware Acceleration

Products: RX5000, RX1500, RX1501, RX1510, RX1511, RX1512

ID: 3616

The RX5000 and RX15xx family supports Layer 3 hardware acceleration for IP routed traffic with the optional Layer 3 Switch option however hardware acceleration for IP multicast routing is not supported in this release. IP Multicast routing is supported in software but without an optimized level of performance.



ROX™II Upgrade instructions

Upgrading ROX™ II using the RuggedCLI Wizard

ROX II supports a ‘dual-partition’ file- system offering storage redundancy and rollback features. Software upgrades are always performed to the ‘alternate’ partition in order not to disturb your current running system context while will remain operational and intact during the upgrade progress. It should be noted that the upgrade process may also be launched through the WWW and NETCONF interfaces. Details on upgrading using these interfaces are available in the ROX 2.1.0 User Guide.

Follow the steps below to perform an upgrade:

1. From the RuggedCLI prompt enter configuration mode:

```
ruggedcom# config
```

2. Launch the upgrade wizard with the following command:

```
ruggedcom(config)# wizard rox_upgrade
```

3. You will then be prompted to enter the URL of your upgrade server as well as the target release version:

```
The upgrade repository url is set to: http://10.200.17.235/rox/releases
```

```
Press <ENTER> to accept this or type a new address to change it:
```

```
http://10.200.17.235/roxii/releases
```

```
changing repository
```

```
The software release you are upgrading to is: 2.1.0
```

```
Press <ENTER> to accept this or type a different version:
```

```
Warning:
```

```
You are about to commit changes to upgrade settings. If any other modifications to the candidate database are pending, they will be committed too.
```

```
Continue?
```

```
(y/n): y
```

4. The upgrade process will then proceed through three distinct phases: transferring the file-system to the alternate partition, downloading all updated and new packages and installing the packages to the ‘alternate’ partition:

```
Checking for a more recent version of the upgrade system
```

```
Already running the most recent version of the upgrade system
```

```
*****
```

```
Launching ROXII Upgrade.....
```

```
Upgrading system to Partition 2
```



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Estimating size of upgrade. This may take a few minutes....

21 packages to install, 13220468 bytes to download

6353 files, 301611585 bytes will be copied to Partition 2

Starting upgrade...

Preparing to transfer files to alternate partition. This may take a few minutes....

---- File Transfer Phase: 301611585 bytes, 6353 files ----

progress: 100%

File transfer phase complete.

Starting download of packages...

---- Package Download Phase ----

progress: 100%

Download phase complete.

Installing packages...

---- Package Install phase ----

progress: 100%

Package installation complete.

Upgrade to partition 2 completed successfully.

A reboot is required to run the upgraded partition.

ruggedcom(config)#

5. Reboot the system to boot the upgraded partition

ruggedcom(config)# admin reboot



ROX™ Firmware/User Guide Version Numbering System

The ROX™ software is labeled with a three digit version numbering system of the form X.Y.Z where each digit is a number starting from zero. The 'X.Y' digits together describe the functional version of ROX™ whereas the 'Z' digit represents firmware updates made within a specific functional version series.

In this release, the 'X' digit identifies the ROX™ series as being series '2' and therefore referring to RuggedCom's next-generation ROX™ II operating system support for the RuggedBackbone™ and future products to be released. The 'Y' digit identifies the major version number and is incremented for a 'major' functional updates of the software. The 'Z' digit represents the minor version number and is incremented for 'minor' software updates including bug fixes, cosmetic enhancements and other minor issues.

ROX™ user-guide documentation will follow the same format. In general, a user guide will have the same 'X.Y' digits as the firmware to which it corresponds.

Type of Changes

Each change to the software is categorized according to the table below which provides guidance as to whether the change justifies upgrading. As well, each change lists an internal RuggedCom change number.

Change Type	Description
Critical	Critical changes fix problems that prevent the basic operation of the device and have no workaround. Any critical changes merit a device upgrade under all circumstances.
Major	Major changes fix problems that prevent the basic operation of the device but do have a workaround. Any major changes merit a device upgrade if the workaround is not acceptable.
New Feature	New features add significant new capability to the device. Such changes may change the basic operation of the device, the user interface, and how the device is configured. New features only merit a device upgrade if the feature is required.
Enhancement	Enhancements improve existing device capability and do not significantly change the basic operation of the device, the user interface, or how the device is configured. Enhancements only merit a device upgrade if the feature is required.
Minor	Minor changes fix non-vital problems that may or may not have a workaround. Minor changes do not necessarily merit a device upgrade unless the specific problem applies.
Cosmetic	Cosmetic changes have negligible impact on device operation and include such updates as spelling mistakes, user interface adjustments, and help text improvements. Cosmetic changes rarely merit a device upgrade.
Security	Security changes usually do not have a discernable impact on normal device operation other than to improve the unit's defensive response to known exploits and vulnerabilities. This might include such updates as enhanced protection against newly discovered denial-of-service (DOS) attacks. It is left entirely to the customer's discretion to decide whether or not a security change is appropriate to merit a device upgrade.



Contacting RuggedCom

For further information on this release or technical support of any nature, please contact RuggedCom at the locations below:

Corporate headquarters

RuggedCom Inc,
300 AppleWood Cres., Unit #1
Concord, Ontario, Canada
L4K 5C7

Toll-free: 1(888) 264-0006
Tel: (905) 856-5288
Fax: (905) 760-1995

Web: <http://www.ruggedcom.com>
Email: support@ruggedcom.com

US Corporate Headquarters

RuggedCom
1930 Harrison St., Suite-307
Hollywood, Florida
USA, 33020

Tel: (954) 922-7975

Technical Support

Toll Free: 1(866) 922-7975