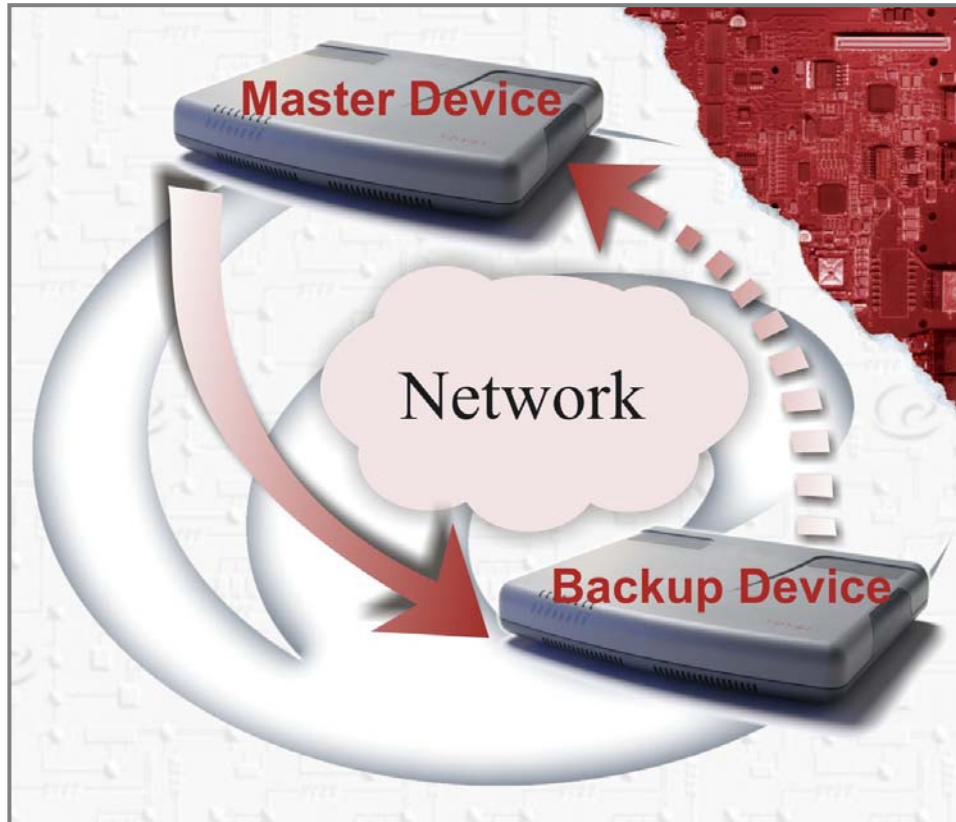

QuadroM32x Redundancy Feature



Revision: 1.0

Abstract: This document describes the redundancy feature functionality on QuadroM32x and explains how to configure and use it.

Table of Contents:

- 1 Introduction 4
- 2 Functional Description 4
- 3 Redundancy Configuration..... 5
 - 3.1 Configuring first Quadro..... 5
 - 3.2 Configuring second Quadro..... 6
- 4 Deployment Procedure..... 7
- 5 Failover to Backup Quadro 8
- 6 Accessing GUI and Checking the Status of the Backup Quadro..... 8
- 7 Backup Device Modes 9
- 8 Swapping the Master and Backup..... 10
- 9 Firmware and Language Pack upgrade 10
- 10 Restoring Configuration 11
- 11 References..... 12

Document Revision History

Revision	Date	Description	Valid for SW	Valid for models
1.0	04-Jun-2010	Initial release	5.1.x	QuadroM32x

1 Introduction

The Redundancy feature of QuadroM32x is intended to increase Quadro device availability using a second Quadro unit as the Backup unit.

Feature assumes that two units are running the same version of Quadro firmware and connected as depicted on the Figure 1 below.

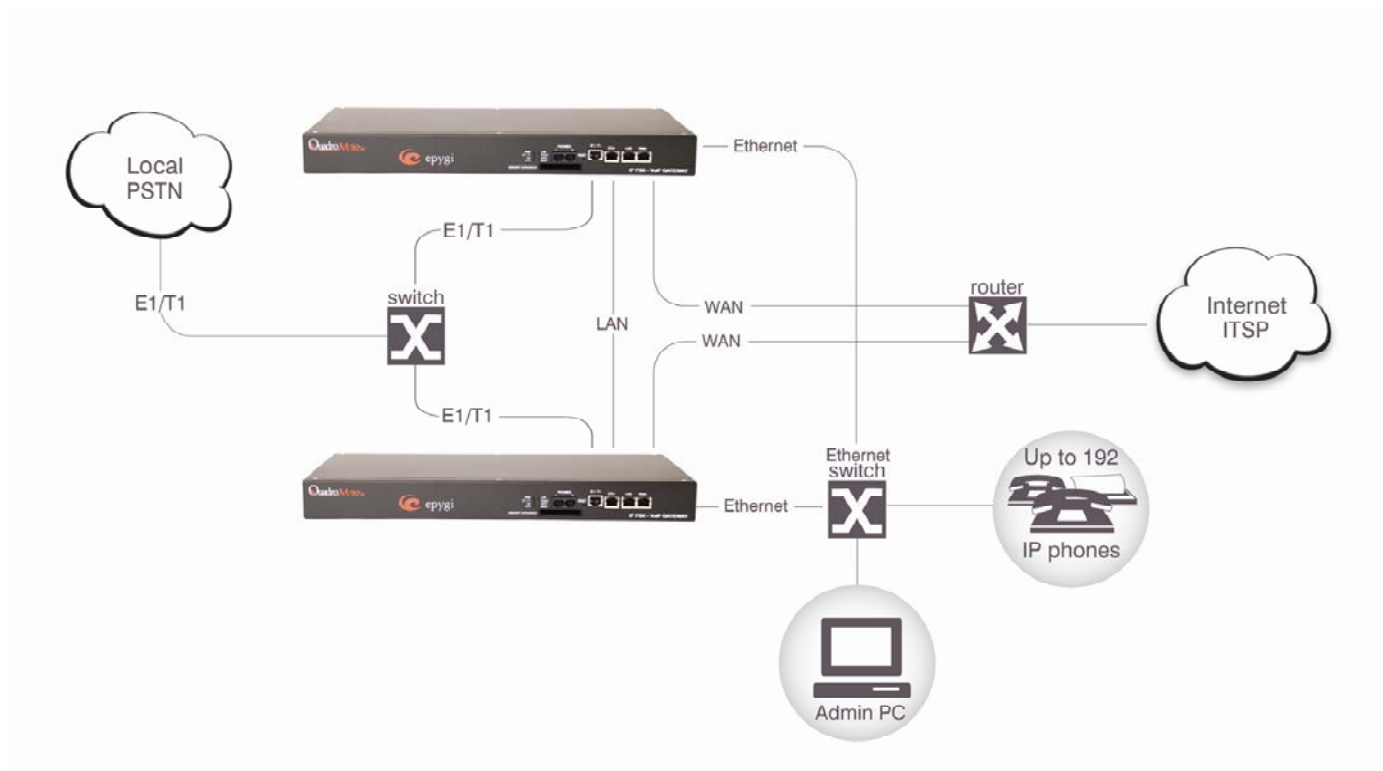


Figure 1

2 Functional Description

Feature implementation is based on using “keepalived” Linux daemon running on both Master and Backup devices. The daemon uses VRRP (Virtual Routing Redundancy Protocol, RFC-3768) to periodically determine the state of machines in redundant group. VRRP assumes that more than 2 machines can be included into redundant group however, by practical reasons two QuadroM32x in one redundancy group is considered to be sufficient.

VRRP protocol uses the same unique ID (called Router ID) for both Master and Backup device. This ID is configurable from Quadro GUI and must be set to the same value for two Quadros to make them members of the same redundancy group.

After configuring the Router ID, the Quadro that boots up first becomes the Master device. The second Quadro, booting up with some delay after the first one, after checking and founding the Master in its redundancy group, becomes the Backup.

Master QuadroM32x runs all applications usually running on standalone QuadroM32x. Additionally it is running the synchronization server ("rsyncd") for configuration and voice data synchronization with the Backup QuadroM32x.

The Backup QuadroM32x doesn't run any application except for "keepalived" daemon (for checking the status of Master QuadroM32x), debugging tools (telnet, ftp, etc.), httpd (configuration part) and synchronization client ("syncd"), which periodically (period is configurable and is set to 60 seconds by default) synchronizes the configuration and voice data changes with the Master Quadro.

When the Backup Quadro cannot find the Master in its network failing to get the keep-alive messages on ETH port (see Figure 1), it starts the failover to Master procedure launching all applications, which were running on Master Quadro before failure, using the latest configuration and voice data retrieved from the Master.

If the old Master Quadro becomes available again, it finds that there is already the Master in its redundancy network and automatically starts in Backup mode.

3 Redundancy Configuration

Before connecting the Quadros working in redundant scenario to the network, some minimum configuration needs to be done on both Quadros.

3.1 Configuring first Quadro

Open the **Redundancy Settings** from the **System** menu on the first QuadroM32x (see Figure 2 below).

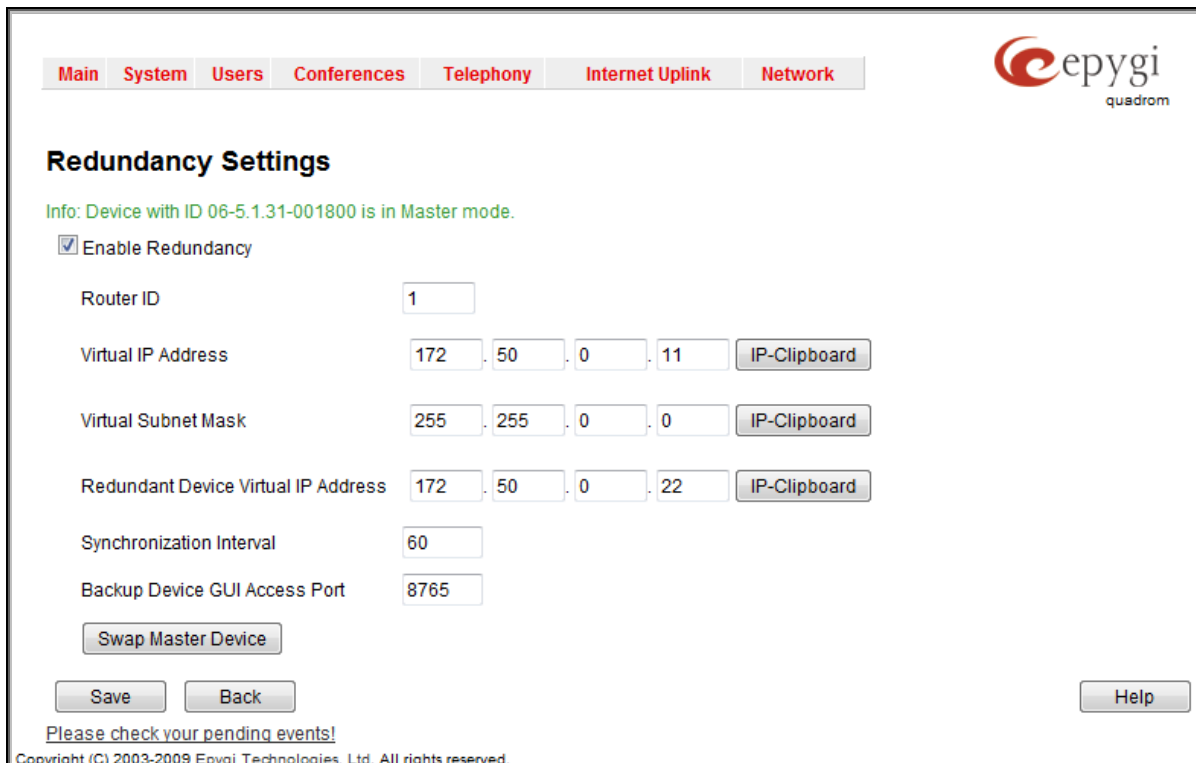


Figure 2

- **Enable Redundancy** – enables/Disables the membership of Quadro in the redundancy group identified by “Router ID”. Tick that checkbox to make Quadro the member of redundancy group
- **Router ID** – the unique ID identifying the redundancy group. The same value must be set on both Quadros to be included into redundant group (that value is 1 in the example above).
- **Virtual IP Address / Virtual Subnet Mask** – an alternate IP network of the LAN interface which stays unchanged when the device switches its mode (from Master to Backup or vice versa). The configuration and voice data synchronization daemon uses this IP address to communicate with the second Quadro.
- **Redundant Device Virtual IP Address** – the alternate IP address of the LAN interface of the second Quadro.
- **Synchronization Interval** – period of time in seconds between two consecutive configuration and voice data synchronizations from Master to Backup device.
- **Backup Device GUI Access Port** – this port will be used for accessing the GUI of the Backup device through Master. For example, to open the GUI of Backup device you have to enter <http://192.168.24.28:8765>, where 192.168.24.28 is the IP address of the Master device and 8765 is the port number configured on master device (“Backup Device GUI Access Port” field).

The IP address of regular LAN port on Quadro doesn’t need to be changed – leave it in the default value: 172.30.0.1.

3.2 Configuring second Quadro

Now open **Redundancy Settings** on the second QuadroM32x and configure the redundancy settings as depicted on Figure 3 below. Don’t be misled by the following message on the screen: “Info: Current mode: Device is in Master mode” – at this point, since we are configuring the devices separately and they are not connected to the redundant network yet - each Quadro assumes that it is in Master mode.

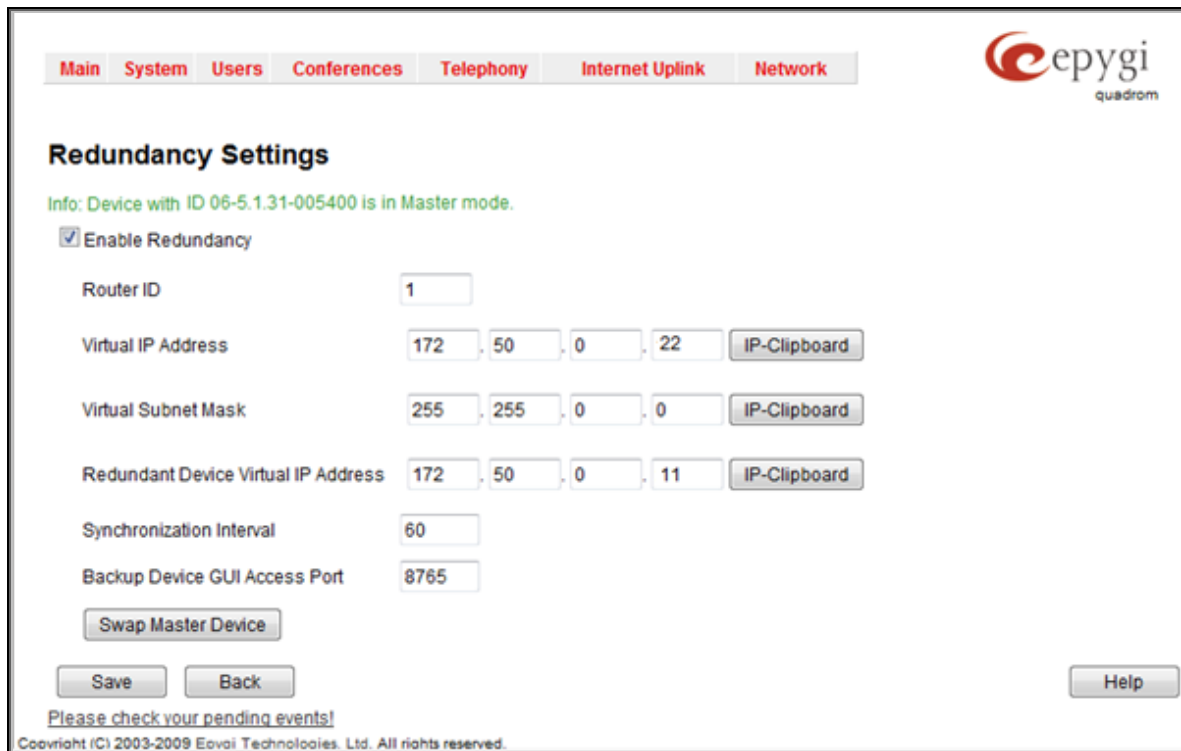


Figure 3

4 Deployment Procedure

1. Configure the redundancy settings separately on both Quadros as described above connecting PC to the LAN port of each Quadro. Default IP address of the LAN port is 172.30.0.1. Install all needed license keys on both Quadros.
2. Configure the other settings as needed on the unit that is assumed to be the Master. There is no need to configure those settings on the second Quadro assumed to be the Backup because it will synchronize its settings automatically with Maser as soon as you connect it to the redundant network.
3. Connect the devices as depicted on Figure 1. Connect ETH ports of Quadros using Ethernet **cable**.
4. Power up all devices except for the Quadro assumed to be Backup. The powered up Quadro will start running in Master mode.
5. Configure all remaining settings on the first (powered) Quadro including IP phones and E1/T1 settings.
6. Test the system to be sure that all parts do work as needed. At this point the system should be fully functional – the only missing part in the system should be the Backup functionality
7. Power up the Quadro supposed to be Backup. Upon detecting that there is already Master in its redundancy group, it will start in Backup mode.

5 Failover to Backup Quadro

If the Master Quadro fails by some reason and doesn't send the keep-alive messages, the Backup Quadro starts the failover procedure: it launches all applications running so far on failed Master Quadro and restarts all IP phones.

During failover procedure all active calls will be disconnected and the system will be out of service for 2-5 minutes (depending on the number of IP phones connected to the system), which is needed for running the applications and rebooting the phones. The IP phones are being rebooted by Quadro at a certain intervals with the default of 1 second. Thus, if there are many phones connected to the network it may take quite a long until Quadro reboots the last phone.

Please Note: If there are IP phones in the network that are not auto configured by Quadro (IP phones not supported by Epygi), they will not reboot automatically - you have to manually reboot them. The same will happen to IP phones with the changed login name and password – they will not reboot automatically even though they are auto configured by Quadro. These phones need to be rebooted manually.

The failover is automatic process not requiring user intervention unless there are phones that need to be rebooted manually.

After replacing the failed Quadro and powering it up, it will start running in Backup mode.

Please Note: After failover the license keys are not being transferred from the Master to Backup Quadro therefore, the same license keys shall be installed on both Quadros included into redundancy group. The same with firmware and Language Pack - be sure to install the same firmware and Language Pack on both Quadros.

6 Accessing GUI and Checking the Status of the Backup Quadro

To access the GUI of Master device enter the IP address of Master device (LAN or WAN) in browser's address field.

To access the GUI of Backup device enter the IP address of Master device (LAN or WAN) followed by **Backup Device GUI Access Port** (see Figure 2) in browser's address field.

To check the status of Backup Quadro, on Master Quadro select the **Status -> Hardware Status**. On the opened page you will see the status of the backup device along with its unique ID (see the example on Figure 4).

The screenshot shows the Epygi QuadroM32x web interface. At the top, there is a navigation menu with tabs: Main, System, Users, Conferences, Telephony, Internet Uplink, and Network. The 'Network' tab is selected. In the top right corner, the Epygi logo is displayed with the text 'quadrom' and 'Refresh in 324 seconds!'. The main heading is 'Quadro Status - Hardware Status'. On the left, there is a sidebar with links: General Information, Network Status, Lines Status, Memory Status, Hardware Status (highlighted in red), SIP Registration Status, IP Lines Registration Status, and License Status. Below these links is a 'Back' button. The main content area contains a table with the following data:

LAN Ethernet	10/100 Mbps	Link is up (100 Mbps, full duplex)
ETH Ethernet	10/100 Mbps	Link is down
WAN Ethernet	10/100 Mbps	Link is up (100 Mbps, full duplex)
Backup device	N/A	Backup device with ID 06-5.1.30-005400 is UP (Active mode)
Compact Flash	No device connected	N/A
FXS	2 Ports	Available
DSP	1 DSP unit	Available

Below the table, there is a 'Help' button and a message: 'Please check your pending events!'. At the bottom, the copyright notice reads: 'Copyright (C) 2003-2009 Epygi Technologies, Ltd. All rights reserved.'

Figure 4

7 Backup Device Modes

The regular mode of Backup device is **Active** mode. In that mode the Backup listens to keep-alive messages from Master, synchronizes its configuration with Master and is ready to take over the control (become the Master) if the Master fails.

For reasons discussed below in more details, the user may wish to change manually the mode of the Backup device to **Passive**. In this mode the Backup stops listening to keep-alive messages and synchronizing its configuration with the Master. In this mode the Backup device cannot take over the control in case if Master fails unless the **Swap Master Device** button is pressed on Master Quadro.

To change the Backup device mode, open the **Redundancy Settings** page as described above and switch the mode from drop-down list of **Backup Device Mode** configuration field pressing the **Save** button after that (see example on Figure 5).

quadrom

[Home](#)

Redundancy Settings

Info: Device with ID 06-5.1.31-005400 is in Backup mode.

Enable Redundancy

Backup Device Mode Passive ▾

Router ID Active
Passive

Virtual IP Address 172 . 50 . 0 . 22 [IP-Clipboard](#)

Virtual Subnet Mask 255 . 255 . 0 . 0 [IP-Clipboard](#)

Redundant Device Virtual IP Address 172 . 50 . 0 . 11 [IP-Clipboard](#)

Synchronization Interval 60

[Firmware update](#)

[Upload language pack](#)

[Download system logs](#)

[Logout](#)

[Save](#) [Help](#)

Figure 5

8 Swapping the Master and Backup

Sometimes (for maintenance purposes and the like) there is a need for a manual swapping of functionality of Master and Backup devices in redundant system. To swap the functionality, open the **Redundancy Settings** page on Master device and press the **Swap Master Device** button. This action will result in switching the current Backup to Master and rebooting the current Master. After rebooting the current Master will start running in Backup mode. Switching the Backup to Master starts all applications on Quadro and causes all IP phones to reboot. The transition of Backup to Master takes around 1 minute however another 1-3 minutes are required in order to reboot all the IP phones connected to redundant system.

If Backup device before swapping was in passive mode then after swapping the Master will start running as Backup in passive otherwise, if it was in active mode then Master will start running as Backup in active mode.

9 Firmware and Language Pack upgrade

The firmware upgrade procedure stops the telephony services therefore, the upgrade process shall be carefully planned for avoiding the unnecessary failovers disabling the overall functionality of the redundant system and disrupting the services. Choose proper time for the firmware upgrade taking into account that the process will take approximately 2-5 minutes during which the system will not be functional. Before starting the upgrade, don't forget to save the latest

configuration of the Master Quadro in case if something goes wrong and you will need to restore the configuration.

There are several ways to upgrade the firmware and Language Pack on Quadros in redundant system, however the procedure described below supposed to be the best from all perspectives.

The recommended upgrade procedure is as follows.

1. Open the **Redundancy Settings** page of Backup device and change its mode to **Passive**. This page for the Backup device in **Passive** mode displays the **Firmware Update** and **Upload Language Pack** links.
2. To upgrade the firmware or Language Pack, click on one of those links and start upgrading the way similar to that of on stand-alone Quadro. At the end of the upgrade process the device will reboot and start running in **Passive** mode again with the updated firmware or Language Pack.
3. Open the **Redundancy Settings** of Master device and press the **Swap to Master Device** button. Pressing this button will initiate the reboot of Master Quadro and switching the Backup device to Master mode. The transition of Backup to Master will take around one minute, after that the new Master will start rebooting the phones. After reboot the Master device will start running in Backup passive mode.
4. To upgrade the firmware or Language Pack of the new Backup device (old Master), open its **Redundancy Settings** page and click on the firmware or Language Pack upgrade link. At the end of the upgrade process the device will reboot and start running in **Passive** mode again with updated firmware or Language Pack.
5. After reboot, open the **Redundancy Settings** of the new Backup Quadro and switch its mode to **Active**.

10 Restoring Configuration

The configuration restoring process stops the telephony services and eventually reboots the Quadro. The same takes place when changing some configuration settings on Quadro from GUI (in the latter case you will get appropriate warning message on Quadro GUI).

Therefore, this process shall be carefully planned for avoiding the unnecessary failovers disabling the overall functionality of the redundant system and disrupting the services. Choose proper time for restoring configuration or making configuration changes requiring reboot, taking into account that the process will take approximately 2-5 minutes during which the system will not be functional.

The suggested configuration restore procedure is as follows.

1. Open the **Redundancy Settings** page of Backup device and change its mode to **Passive**. To access the GUI of Backup device enter the IP address of Master device and backup device access port in browser's address field.
2. To restore configuration or make configuration changes requiring reboot, go to Master device and do it the way similar to that of on stand-alone device. At the end of configuration restore process, the device will reboot and start running again as a Master with restored configuration.
3. Go back to **Redundancy Settings** of Backup device and change its mode to **Active**.

11 References

Following documents for the corresponding software release:

- ManualII-AdministratorsGuide.