



Lx0 RAID on Profile XP and Open SAN Installation Instructions

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World Wide Web: <http://www.thomsongrassvalley.com/support/>

Technical Support E-mail Address: vgtechsupport@thomson.net.

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International Support Centers

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Support Center	Toll free	In country
France	+800 80 80 20 20	+33 1 48 25 20 20
United States	+1 800 547 8949	+1 530 478 4148

Authorized Local Support Representative

A local support representative may be available in your country. To locate a support center during normal local business hours, refer to the following list. This list is regularly updated on the website for Thomson Grass Valley Product Support (<http://www.thomsongrassvalley.com/support/contact/phone/>).

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	Japan	+81 3 5484 6868
	Southeast Asia - Malaysia	+603 7805 3884
	Southeast Asia - Singapore	+65 6379 1313
	Indian Subcontinent	+91 11 515 282 502 +91 11 515 282 504
Pacific	Australia, New Zealand	+61 1300 721 495
Central America, South America	All	+55 11 5509 3440
North America	North America, Mexico, Caribbean	+1 800 547 8949 +1 530 478 4148

Region	Country	Telephone
Europe	UK, Ireland, Israel	+44 118 923 0499
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	Benelux – Belgium	+32 (0) 2 334 90 30
	France	+800 80 80 20 20 +33 1 48 25 20 20
	Germany, Austria, Eastern Europe	+49 6150 104 444
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	Nordics (Norway, Sweden, Finland, Denmark, Iceland)	+45 40 47 22 37
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	Southern Europe – Spain	+34 91 512 03 50
	Middle East, Near East, Africa	Middle East
Near East and Africa		+800 80 80 20 20 +33 1 48 25 20 20

About Lx0 RAID on the Open SAN

You can add Lx0 RAID storage devices to an existing Profile XP Open SAN for the following purposes:

- Bandwidth expansion — To increase your maximum bandwidth, you add RAID storage devices and configure them as an expansion of an existing stripe group or groups. The size of an added LUN must be equal to or larger than the size of an existing LUN. You can do this and retain existing media.
- Replacement — To fix a faulty RAID chassis, you remove the faulty chassis and replace it with a new chassis. When you do this, you lose existing media.

NOTE: Adding RAID storage devices changes your system design and must be specified for your Open SAN by Grass Valley. Do not attempt to add RAID storage devices without support from Grass Valley.

Adding Lx0 RAID to a Profile XP Open SAN is supported as follows:

- Profile System Software must be at version 5.4.9.1308, at the time of this writing. Contact Grass Valley Support for information on compatible versions and to obtain software.
- All Profile XP systems on the Open SAN must have the RTP-II board.
- The Fibre Channel fabric must be 2 Gb/s.
- If the Open SAN has one or more PFR 700 primary RAID chassis, you may add one or more Lx0 RAID as additional primary RAID chassis, according to supported expansion procedures.
- The size of an added LUN must be equal to or larger than the size of an existing LUN. If larger, that portion that exceeds the size of the existing LUN is unused.
- If the Open SAN has a PFR 700 primary RAID chassis, you may replace it with a Lx0 RAID chassis.
- If the Open SAN has PFC 500, PFR 500, or PFR 600 RAID and you want to replace or expand, you must remove all RAID devices and replace them with Lx0 RAID devices. You may not mix Lx0 RAID with PFC 500, PFR 500, or PFR 600 RAID.

Take the following into consideration as you add Lx0 RAID to an Open SAN:

- Refer to the *Open San Instruction Manual* for detailed procedures and related information as necessary. This document assumes you understand the Open SAN system and that you are familiar with configuration procedures.
- You must bind Lx0 RAID disks as RAID 5, with 5 disks per LUN.
- A Lx0 RAID chassis has slots for 12 disks (slots 0 – 11), yet only 10 disks are needed to fill out the two RAID 5 LUNs.
- Slots 0 – 4 must be used for one RAID 5 LUN. Slot 5 can be used for a Hot Spare disk or you can put a blank in the slot. Slots 6 – 10 must be used for the other RAID 5 LUN. Slot 11 can be used for a Hot Spare disk or you can put a blank in the slot.
- A PFR 700 RAID has a single LAN card for Ethernet connection, while a Lx0

RAID chassis has one or two controllers, each of which have their own Ethernet connection. This results in the following:

- PFR 700 RAID is one device on the control network, regardless of if it has one or two controllers.
- Lx0 RAID with one controller is one device on the control network.
- Lx0 RAID with two controllers is two devices on the control network.

About Lx0 RAID on a stand-alone Profile XP

You can add Lx0 RAID storage devices to stand-alone Profile XP only as a replacement. To fix a faulty RAID chassis, you remove the faulty chassis and replace it with a new chassis. When you do this, you lose existing media.

Adding Lx0 RAID to a stand-alone Profile XP is supported as follows:

- Profile System Software must be at version 5.4.9 or higher.
- The Profile XP system must have the RTP-II board.
- The Fibre Channel connections must be 2 Gb/s.
- You must remove all RAID devices from the stand-alone Profile XP and replace them with Lx0 RAID devices.

Take the following into consideration as you add Lx0 RAID to a stand-alone Profile XP:

- Refer to the *Installation Guide* for your Profile XP model for detailed procedures and related information as necessary. This document assumes you understand the Profile XP system and that you are familiar with configuration procedures.
- You must bind Lx0 RAID disks as RAID 5, with 5 disks per LUN.
- A Lx0 RAID chassis has slots for 12 disks (slots 0 – 11), yet only 10 disks are needed to fill out the two RAID 5 LUNs.
- Slots 0 – 4 must be used for one RAID 5 LUN. Slot 5 can be used for a Hot Spare disk or you can put a blank in the slot. Slots 6 – 10 must be used for the other RAID 5 LUN. Slot 11 can be used for a Hot Spare disk or you can put a blank in the slot.
- A PFR 700 RAID has a single LAN card for Ethernet connection, while a Lx0 RAID chassis has one or two controllers, each of which have their own Ethernet connection. This results in the following:
 - PFR 700 RAID is configured as one device on the control network, regardless of if it has one or two controllers.
 - Lx0 RAID with one controller is configured as one device on the control network.
 - Lx0 RAID with two controllers is configured as two devices on the control network.

Cable Lx0 RAID

Any Lx0 chassis that you add to your Open SAN or stand-alone Profile XP must have all disks unbound. If it currently has disks bound as part of another system, connecting it to your system can cause errors.

Lx0 RAID controllers must be configured for 2 Gb/s. Contact Grass Valley Support for information about this configuration.

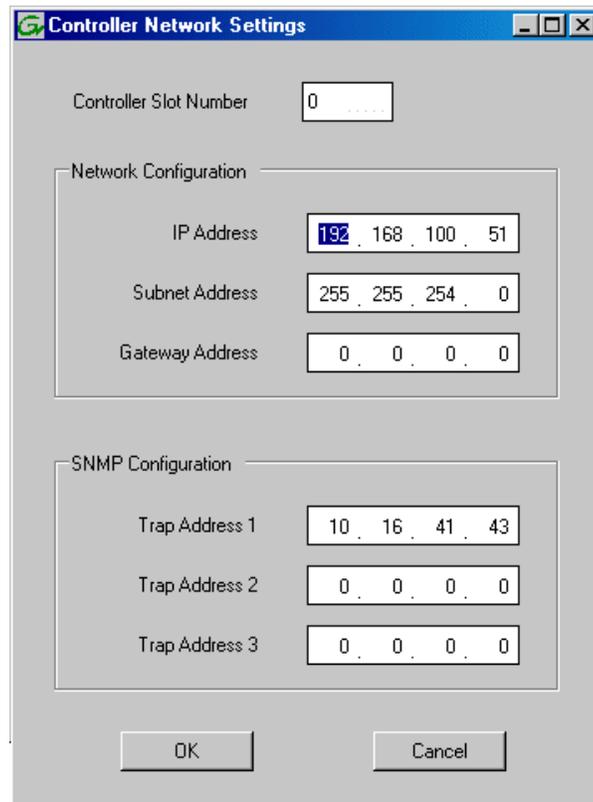
1. Power down the Open SAN or stand-alone Profile XP, including all RAID devices.
2. Connect Lx0 RAID as follows:
 - For an Open SAN, refer to the *K2 Storage System Instruction Manual* for procedures. Use the instructions for installing a Level 10 system (one controller) or Level 10R system (two controllers). When you make the Fibre Channel connection, connect between the Lx0 RAID controller and the Open SAN Fibre Channel switch.
 - For a stand-alone Profile XP, refer to the *K2 Media Client System Guide* for procedures. Use the instructions for installing Direct Connect Storage.
3. Power up RAID devices. Refer to the *K2 Storage System Instruction Manual* for Lx0 RAID procedures. Wait until the RAID devices stabilize, with no errors indicated, before proceeding.
4. Continue with the next procedure “[Configure RAID network properties](#)”.

Configure RAID network properties

1. Use Disk Utility as follows:
 - For an Open SAN, power up the primary FSM and open Disk Utility. Refer to the *Open SAN Instruction Manual* for procedures. Use the instructions for PFR 700 RAID.
 - For a stand-alone Profile XP, power up the Profile XP and open Disk Utility. Refer to the *Installation Guide* for your Profile XP model. Use the instructions for PFR 700 RAID.
2. In Disk Utility, right-click the icon for a Lx0 controller and select **Set Network Properties**.

The Controller Network Settings dialog box opens.

Disk Utility features are different than those in the *Open SAN Instruction Manual* or the *Installation Guide* for your Profile XP model. For a chassis with two controllers, you can make settings on both controllers using this dialog box.



3. In the Controller Slot Number field enter **0** and then press **Enter**. The settings from controller 0 are loaded into the Controller Network Settings dialog box and are available for you to modify.
4. Enter the control network IP address and other network settings.
5. You want SNMP trap messages go to the NetCentral server PC, so for SNMP Configuration enter the IP address of the NetCentral server PC. You can also enter IP addresses for other SNMP managers to which you want to send SNMP trap messages.
6. For the RAID chassis with two controllers, in the Controller Slot Number field enter **1** and then press **Enter**. The settings from controller 1 are loaded into the Controller Network Settings dialog box and are available for you to modify. Repeat the previous steps to configure controller 1.
7. Click **OK** to save settings and close.
8. Continue with the next procedure “[Bind disks](#)”.

Bind disks

1. If you have not already done so, open Disk Utility as instructed in the earlier procedure.
2. In Disk Utility, click **View | Refresh**.

3. If you have disks in the extra chassis slots (slots 10 and 11) in the primary or (if present) expansion chassis, bind all these disks as Hot Spares. You must bind all Hot Spares before binding the RAID 5 LUNs.
4. For each Lx0 chassis (both primary chassis and expansion chassis), bind disks as follows:
 - a. Bind 5 consecutive disks in slots 0 – 4 as a RAID 5 LUN
 - b. Bind the remaining 5 consecutive disks in slots 5 – 9 as a RAID 5 LUN.
5. When binding is complete, do one of following:
 - If you are replacing RAID devices on a stand-alone Profile XP, create the video file system as instructed in the *Installation Guide* for your Profile XP model. When the media file system is created and devices are restarted, the replacement procedure is complete.
 - If you are replacing all RAID devices on an Open SAN, label disks and create the media file system configuration file as instructed in the *Open SAN Instruction Manual*. When the media file system is created and devices are restarted, the replacement procedure is complete.
 - If you are adding Lx0 RAID devices to an Open SAN for bandwidth expansion, do not create the media file system. Doing so destroys all existing media. Instead, just restart devices as instructed in the next step in this procedure.
6. Restart Open SAN devices as follows:
 - a. Power down the primary FSM.
 - b. Restart RAID devices. Wait until the RAID devices stabilize, with no errors indicated, before proceeding.
 - c. Power up the primary FSM.
 - d. On the primary FSM, open Disk Utility and confirm that the added disks are available and properly bound.
7. To add adding Lx0 RAID devices to an Open SAN, continue with the next procedure “[Label disks](#)”.

Label disks

NOTE: Do not label the Windows NT system disk. The disk drive labeling process makes a drive unusable by Windows NT.

From the primary File System Manager only, label your disks as follows:

1. On the File System Manager, click **Programs | Media Area Network | Disk Device Labeler**. The Disk Labeler application opens.
2. Select the new drives. The new drives are the LUNs that you bound using the procedures earlier. They should appear as unused drives or drives that do not have a recognized volume type. To identify the physical location of the disks, use the **Probe Disk(s)** button to make the disk lights flash.

Your Windows NT system disk is usually listed as *PhysicalDrive0*. Do not select

this disk.

3. Click **Label**. To confirm the operation, click **OK**. For each drive selected, the Make a Label dialog box appears.
4. Enter a label name for the drive. Extend the current naming convention as appropriate.

NOTE: MetaData is a reserved word. Do not use it for custom names.

5. In the **New Sectors** field, enter exactly the same number of sectors as the existing LUNs. This is required even if the new LUNs are a different size (larger) than the existing LUNs.
6. Click **Create Label** to save the label name for the disk.
7. Repeat steps four to six for the remaining drives.
8. When the disk labeling process is complete, exit the application.
9. To add adding Lx0 RAID devices to an Open SAN, continue with the next procedure "[Modify file system configuration](#)".

Modify file system configuration

In this procedure you add the new LUNs to an existing stripe group or groups.

Pre-requisites for this procedure are as follows:

- The new RAID storage to be added to the file system is correctly scaled and load balanced, as specified by Grass Valley for the specific Open SAN.
- The new RAID storage devices are correctly set up, LUNS bound, and configured, as specified by the appropriate checklist from earlier in this section.

Use the Configuration Administrator application to modify the file system configuration file. This file is named *default.cfg*. In an Open SAN with redundant FSMs, this file is the same on both FSMs.

To add new LUNs to stripe groups, do the following:

1. On the FSM, stop the file system as follows:
 - a. Click **Programs | Media Area Network | File System Administrator**. The File System Administrator application opens.
 - b. Click **File | Stop File System** and confirm on message boxes that appear.
 - c. Exit the File System Administrator application.

NOTE: Do not stop the CVFS file system services.

2. Open the Configuration Administrator application as follows:
 - a. Click **Programs | Media Area Network | Configuration Administrator**. The opening screen of the Configuration Administrator appears.
 - b. Click **Modify Existing** and open *default.cfg*. The Configuration dialog box opens.
3. On the **Disk Definitions** tab, configure as follows:

- a. Add a disk name for each of the new disks by clicking the **New** button that is below the Disks Available box. This opens the Enter New Disk Name dialog box.
 - b. Define a disk name by entering one of the disk label names you used to label your new disks. These disk label names are displayed in the Disk Device Labeler application. The disk names you define in the Enter New Disk Name dialog box must exactly match the disk labels from the Disk Device Labeler application, Disk names are case sensitive.
 - c. Repeat steps a and b until all of your new Open SAN disks are displayed in the Disks Available box. The existing Open SAN disks should still be displayed as well.
 - d. For your new disks, select each disk name and in the **Disk Type** drop-down list, select the same disk type as that of the existing disks. This is required even if the new LUNs are a different (RAID 5 vs. RAID 3) than the existing LUNs.
4. On the **Stripe Groups** tab, add the new drives to your existing video stripe group or groups, as follows:
- a. In the Stripes Available box select your video stripe group.
 - a. Next to the Primary box, click the **Modify** button. The Add/Remove Primary Disks dialog box opens.

Click the arrow buttons to move the appropriate new disks for this stripe group to the Primary Disks box. Click **OK** to close the Add/Remove Primary Disks dialog box.
 - b. With your video stripe group still selected in the Stripes Available box, verify or modify configuration according to the specifications from Grass Valley for expanding bandwidth on your Open SAN, as follows:
 - Status:Up: Checked
 - Exclusive: Not checked
 - Metadata: Not checked
 - Journal: Not checked
 - Stripe Breadth: 144
 - Mirror Read Method: Rotate
 - Primary | Read: Checked
 - Primary | Write: Checked
 - RTIOS Quality of Service value for your system, click the **Stripe Groups** tab and enter the value in the **Rtios** box. Enter only the value provided to you by a qualified Grass Valley representative that has been calculated specifically for your expanded Media Area Network. There is no default value for this setting that applies to more than one system. Do not “guess” at what the value might be for your system. If you do not have a calculated RTIOS value, enter 0.
5. When you are satisfied with all your settings in the Configuration Administrator application, click **OK**. The Save A File dialog box opens. Save the configuration file, overwriting the current *default.cfg* file, and exit the Configuration

Administrator application.

NOTE: DO NOT reinitialize the file system.

6. To add adding Lx0 RAID devices to an Open SAN, continue with the next procedure [“Update the file system”](#).

Update the file system

Since the configuration of stripe groups has changed, you must update the file system. The update incorporates the new disks without completely reinitializing the file system. To do the update you use the `cvupdateefs` utility. This utility detects changes in a stripe group's configuration file and updates the file system metadata to reflect these changes.

To update the file system for the stripe group change, do the following:

1. As in the previous procedure, the file system should still be stopped but the file system services should be running.
2. On the FSM, from the MS-DOS command prompt, navigate to the following location:

```
C:\MediaAreaNetwork\bin
```

3. At the command prompt, type the following and press **Enter**:

```
cvupdateefs default
```

The utility displays any expanded stripe groups it detects and prompts for verification.

4. Type **Y** and press **Enter** to verify. The utility updates the metadata and expands the stripe groups. It can take several hours, depending on the size of your file system, for the utility to complete its processes.
5. When the utility reports processes complete, restart the FSM.
6. If a redundant FSM system, update the backup FSM as follows:
 - a. Copy *default.cfg* to backup FSM.
 - b. Place backup FSM into service.
7. Restart Profile XP systems twice.
8. Test as follows:
 - a. Record a short clip and make sure disk lights flash across the entire stripe group, on both new and original disks.
 - b. Delete test clips. Do not use new codecs or save newly recorded clips until you have expanded existing clips, as in the next procedure.
9. To add adding Lx0 RAID devices to an Open SAN, continue with the next procedure [“Expand \(restripe\) existing media”](#).

Expand (restripe) existing media

Use this procedure to expand by bandwidth on an Open SAN.

With an expanded stripe group, newly recorded clips are striped across both new and old disks and so take advantage of the increased bandwidth. However, existing clips remain striped across the old disks only. While these clips still play out, they do so without accessing the increased bandwidth. To allow the existing clips to use the increased bandwidth, they must be expanded (copied) across all the disks in the stripe group. To do this you use the Dynamic Disk Expansion tool, as explained in the following procedure. The tool automatically makes a copy of each media file, deletes the original file, then renames the copy the same as the original. You can run the Dynamic Disk Expansion tool to expand your media in the background while your normal media operations are underway.

To expand existing media across the entire stripe group, do the following:

1. Choose a Profile XP on the Open SAN on which to run the Dynamic Disk Expansion tool.
2. Restart the Profile XP.
3. From the Profile XP, open the following:

C:\profile\DBE.exe

The Dynamic Bandwidth Expansion tool opens.

4. Click **Config | View**. The Configuration dialog box opens.
5. For Reference time, enter the time and date that you reconfigured your Open SAN for expanded bandwidth. The tool expands all media files created before this time. Media files created after this time are not expanded.

Leave all other settings at their default values, as they have no bearing on the tasks necessary for media expansion.
6. Click **OK** to save settings and close.
7. Click the start button to begin expanding media. The tool displays a list of media expansion tasks and begins processing them.

NOTE: Depending on the size of your Open SAN and the number of clips you have recorded, it may take up to 20 minutes to scan the drives and build the task list. Do not shut down the Dynamic Bandwidth Expansion tool if no tasks appear in the window in the first few minutes.

View drive lights flashing across all disks in the stripe group to verify the re-stripping process. In the “%” column you can monitor the progress of each task. As each task completes, it is purged from the list.

8. When all tasks complete, close the Dynamic Bandwidth Expansion tool.
9. To verify that Dynamic Bandwidth Expansion tool processed all your clips, open Media Manager and check modified times. There should be no clip with a modified time that is prior to the time that you reconfigured your Open SAN for expanded bandwidth. To verify that a clip is correctly re-stripped, play a clip and verify that disk lights flash across both original and new disks.
10. Update other system elements as appropriate, as follows:
 - Configure NetCentral to monitor added RAID devices.

- Update recovery disk images.
- Record system information. Make sure you keep diagrams and other on-site documentation up to date.

The Dynamic Bandwidth Expansion process is now complete.

