Coraid® EtherDrive® SR/SRX CorOS Update Addendum

This addendum describes how to install a CorOS update file on EtherDrive SR/SRX storage appliances from an ESM 1500 or from host with an HBA card or software initiator (Linux).

The following terminology conventions are used throughout this document:

- SR/SRX refers to both SR and SRX Coraid storage appliances.
- ESM refers to the EtherDrive SAN Manager.
- The term `SR-x.x.x-Rx.tarc` refers to the CorOS update file.
- The fictitious IP address 10.10.10.117 is used as a sample ESM IP address.

Before you begin

Keep in mind the following before you update the CorOS on an SR/SRX:

- **Expect the appliance to reboot** — The SR/SRX reboots automatically during the update process.

- **Updating the CorOS in an ESX(i) environment** — Because the update LUN is temporary and is deleted automatically when the SR/SRX reboots, the ESX(i) server may behave unpredictably when it sees the update LUN initially but no longer sees it following the reboot. To prevent the ESX(i) server from seeing the update LUN in the first place, use the `mask` command to mask the update LUN before placing it online so that it is visible only to the host computer from which you are copying the `tarc` update file. Because the deleted update LUN may continue to appear on the network after you update the SR/SRX from an ESX(i) initiator, use one of the following methods to remove it after the update:
  - ESX(i) driver version **5.2.x** or later, issue the `flush` command:

    From ESX(i) 4.1: `echo flush > /proc/ethdrv/ctl`

    From ESXi 5.0: `esxcli ethdrv flush`
  - ESX(i) driver version earlier than **5.2.0**: reboot the host.
- **Legacy SR appliances** — Do not install CorOS version SR-5.1.1 or later on legacy EtherDrive series SR420, SR421, and SR1520 appliances. Doing so will cause those appliances to become inoperable. (You are prevented from installing CorOS version SR-6.0.0 or later on these legacy appliances.) EtherDrive series SR420, SR421, and SR1520 should run CorOS version 20090929.

- **Updating the SR/SRX CorOS when the SAN includes a VSX that is *not* managing mirrored PV pairs** — Because the SR/SRX reboots automatically during the update process, VSX appliances unavoidably interpret the auto-reboot as an I/O connection failure, but only temporarily.

(continued below)

- **Updating the SR/SRX CorOS when the SAN includes a VSX that *is* managing mirrored PV pairs** — In this case, there are three options:

  Option 1: Set `maintenancemode` on the active VSX. Placing the active VSX in `maintenancemode` in this case increases the VSX timeout interval to help it tolerate the auto-reboot that occurs during the SR/SRX CorOS update process. In most cases this strategy keeps the mirror intact during the SR/SRX update but it can, in a minority of cases, create an I/O pause on the initiator. Certain applications accessing storage may have I/O response requirements that are not compatible with this method.

  Option 2: Break any mirrored pairs that are on the SR/SRX appliances that require a CorOS update, and update each SR/SRX and re-establish the mirrors in turn. Because the SR/SRX LUNs that comprise the mirrored pair (the primary PV and the mirror target) are typically in separate SR/SRX appliances, this strategy allows you to separately remove each SR/SRX from active I/O and update it without disrupting initiator access to storage.

  1. **Issue the VSX `unmirror` command to break the mirror between the primary PV and the mirror target.**

     Breaking the mirror allows you to remove one SR/SRX at a time from active I/O in order to update it. In the following example, SR/SRX shelf 20 is removed and updated first. SR/SRX shelf 7 contains the LUN that backs the VSX primary PV (SR/SRX LUN 7.5); SR/SRX shelf 20 contains the LUN that acts as the mirror target (SR/SRX LUN 20.5).

     ```
     VSX shelf> unmirror 7.5
     ```

  2. **Update the CorOS on SR/SRX shelf 20 (see the update instructions on the following pages).**
  3. **Issue the VSX `mirror` command to rebuild the mirrored pair.**

     ```
     VSX shelf> mirror 7.5 20.5
     ```

  4. **Issue the VSX `promote` command to exchange the primary PV and mirror target roles (make 20.5 the primary and make 7.5 the target).**

     The mirror must be fully rebuilt before you perform this action.

     ```
     VSX shelf> promote 20.5
     ```

  5. **Break the mirror again to remove SR/SRX shelf 7 from active I/O.**

     ```
     VSX shelf> unmirror 20.5
     ```

  6. **Update the CorOS on the SR/SRX shelf 7 (see the update instructions on the following pages).**
  7. **After the CorOS on both SR/SRX shelves has been updated, issue the VSX `mirror` command to rebuild the mirrored pair again.**

     ```
     VSX shelf> mirror 20.5 7.5
     ```

  8. **Issue the VSX `promote` command to return the LUNs in their original primary PV and mirror target roles (make 7.5 the primary and make 20.5 the target).**

     The mirror must be fully rebuilt before you perform this action.

     ```
     VSX shelf> promote 7.5
     ```

  Option 3: Schedule the SR/SRX CorOS update during a time when you can safely power off VSX appliances and the host (such as during a full maintenance window).

  For more information, see the *VSX Administration Guide*.

More Topics:

Updating SR/SRX appliances from an ESM 1500

If your SAN includes an ESM 1500 appliance, you can update the CorOS on SR/SRX appliances through the ESM command line interface (CLI). This method offers the following advantages over the HBA / initiator installation method (described beginning on page 6):

- A single update method that works with any supported host operating system.
- Ability to update multiple SR/SRX appliances at once.
- Eliminates the need to create RAM-based update LUNs on SR/SRX appliances.

To update the CorOS on SR/SRX appliances from an ESM 1500 appliance, you need to:

- Copy the CorOS update file to the ESM.
- Install the CorOS update file through the ESM CLI.

To copy the CorOS update file to the ESM appliance

1. **Obtain the SR/SRX CorOS update file from the Coraid Technical Assistance Center (TAC).**
2. **Upload the CorOS update file to the ESM using `FTP`, `scp` or `pscp`.**

   Note: 10.10.10.117 is used as a sample ESM IP address in the following examples.

Upload using `FTP`

For example, from a Linux host (make sure to use binary mode):

```
[ host prompt ]# ftp 10.10.10.117
```

Type the user ID and password when prompted.

```
Connected to 10.10.10.117.
Name (10.10.10.117:root): admin
331 Please specify the password.
Password: ********
230 Login successful.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> put SR-x.x.x-Rx.tarc
local: SR-x.x.x-Rx.tarc remote: SR-x.x.x-Rx.tarc
227 Entering Passive Mode (10,10,10,117,113,140).
150 Ok to send data.
226 Transfer complete.
```

Upload statistics are shown.

Upload using `SCP`

Type the SR/SRX administrator password when prompted.

```
[ host prompt ] # scp SR-x.x.x-Rx.tarc  admin@10.10.10.117:
admin@10.10.10.117 password:********
```

Upload statistics are shown.

Upload using `PSCP` (Windows PuTTY)

```
C:\>pscp -scp SR-x.x.x-Rx.tarc admin@10.10.10.117:
admin@10.10.10.117 password:********
```

Note: Make sure to use the `-scp` argument as shown in the example above.

Follow the onscreen prompts. Upload statistics are shown.

3. **Proceed to the procedure To install the CorOS update file from the ESM CLI.**

To install the CorOS update file from the ESM CLI

IMPORTANT: Review the topic Before you begin before performing this procedure. If your SAN includes one or more VSX appliances, see the important information on page 2.

1. **Log into the ESM CLI through a direct console connection or SSH. Type the admin password when prompted.**

```
Admin Password: *****
ESM IP 10.10.10.117>
```

2. **Type `applupdate` and press Enter to see the SR/SRX CorOS update file you uploaded to the ESM in the previous procedure (see page 3).**

```
ESM IP 10.10.10.117> applupdate
Uploaded update files are:

SR-x.x.x-Rx.tarc

Select file to update and run: applupdate name.tarc
```

3. **Type `applupdate SR-x.x.x-Rx.tarc` where `SR-x.x.x-Rx.tarc` is the name of the CorOS update file you want to install, and press Enter.**

   For example:

```
ESM IP 10.10.10.117> applupdate SR-x.x.x-Rx.tarc

SHELF STATE              MODEL     RELEASE UPDATED
7         up         SRX4200-G6 SR-6.1.0-R6      no
8         up         SRX4200-S4 SR-6.1.0-R6      no
20        up         SRX2800-C4 SR-6.1.0-R6      no
24        up         SRX3500-S2 SR-6.1.0-R6      no
```

   All SR/SRX appliances that are visible to the ESM are listed. The `UPDATED` column indicates whether an appliance has been updated with the CorOS update file in the holding area.

4. **When prompted, select one or more shelves (SR/SRX appliances).**
   - To update a single appliance, type the shelf number.
   - To update several appliances (but not all), type shelf numbers separated by spaces.
   - To update all appliances listed, type `all`.
   - To re-display the list of appliances, type `ls`.

5. **When prompted, type `yes` to begin the update process.**

WARNING: Do not interrupt the automatic reboot or cycle power during the update.

Warning and progress messages display:

```
Do not reboot or powercycle. Update in progress...
updated. Rebooting...
Admin password:
```

6. **Type the admin password when prompted.**
7. **To verify that the update file was installed successfully on the SR/SRX, do either of the following:**
   - From the ESM GUI, display a particular SR/SRX appliance in the Details pane and view **Chassis > General > CorOS Version**

     -or-
   - From the SR/SRX command line prompt, type **release**. For example:

```
SR/SRX shelf> release
SR-x.x.x-Rx - [date time year]
```

Updating SR/SRX appliances from a host computer

To update the CorOS on SR/SRX appliances from a host computer, you need to:

- Copy the CorOS update file to the host computer.
- Create a RAM-based update LUN on the SR/SRX using the **make** command.
- Copy the CorOS update file from the host computer to the SR/SR/SRX update LUN.
- Issue the **update** command on the SR/SRX to install the CorOS update file.

To install the CorOS update file from a host computer

IMPORTANT: Review the topic Before you begin before performing this procedure. If your SAN includes one or more VSX appliances, see the important information on page 2.

1. **Obtain the CorOS update file and upload it to the host computer.**

   The CorOS update file is available from the Coraid Technical Assistance Center.
2. **At the SR/SRX command prompt, create a RAM-based update LUN on the SR/SRX and place it online.**

```
SR/SRX shelf 7> make 15 update
SR/SRX shelf 7> online 15
SR/SRX shelf 7> update -l
15
SR/SRX shelf 7> list -l
15    0.041GB online
  15.0      0.041GB raw normal
   15.0.0  normal        0.041GB update
SR/SRX shelf 7>
```

3. From the host computer, copy the CorOS update file to the update LUN you created in step 2. Perform the procedure below appropriate for your host computer.

Host	CorOS update file copying procedure
Windows	**(a) On the Windows host, launch HBA HostView.** **(b) Click the Action menu and choose SRX CorOS Update.** **(c) In the Update LUN column, click the box next to the update LUN(s) on which you want to install the CorOS update file.** **(d) Click Browse.** **(e) Navigate to the CorOS update file, select the file, and then click Open.** **(f) Click Copy.** **(g) Proceed to step 4.**

ESX 4, ESXi 4, and ESX 5	For more information, see *Appendix C* in the *Coraid® EtherDrive® HBA for VMware® vSphere™ Administration Guide*.
	 
	For important information about masking and later flushing the update LUN, see the bullet Updating the CorOS in an ESX(i) environment on page 1.
	(a) Claim the update LUN (ESXi 5 only):
	`esxcli ethdrv claim -t 7.15`
	There is no formal claiming action in ESX(i) 4.
	(b) Find the SCSI device that corresponds to the update LUN:
	• On **ESX** and **ESXi 4**, run:
	`cat /proc/ethdrv/devices`
	• On **ESXi 5**, run:
	`esxcli ethdrv devices list`
	The SCSI device-to-AoE target correspondence is shown. For example,
	`vmhba2:C0:T9:L0 7.15 0.04GB`
	shows that LUN `7.15` maps to SCSI device `vmhba2:C0:T9:L0`.
	(c) Find the NAA device that corresponds to the SCSI device:
	`esxcfg-mpath -l`
	In the output, `Runtime Name` is the SCSI device identified in step b and `Device` is the NAA device that corresponds to the SCSI device.
	(d) Use `dd` to copy the update file to the update LUN (where *xxx* is the NAA device identified in step c):
	`dd if=/tmp/SR-x.x.x-Rx.tarc of=/vmfs/devices/disks/naa.xxx conv=notrunc`
	(e) Proceed to step 4.

Host	CorOS update file copying procedure
Linux	**(a) Find the local device that corresponds to the update LUN and copy the file to the update LUN.**

From a Linux server with an HBA (assumes version 5.2 or later):
Find the local device:

```
# modprobe ethdrv
# ethdrv-stat
e7.15  sdb  0.040GB  2,3
# md5sum SR-x.x.x-Rx.tarc
b1936c99efe79a41204eb0f4a58192db  (example only)
```

Copy the file using `coraid-update` or `dd`:(*)

```
# coraid-update SR-x.x.x-Rx.tarc /dev/ethdrv/e7.15
```

-or-

```
# dd if=SR-x.x.x-Rx.tarc of=/dev/ethdrv/e7.15
5260+0 records in
5260+0 records out
#
```

From a Linux server running the software initiator:
Find the local device:

```
# modprobe aoe
# aoe-stat
e7.15  sdb  0.040GB  eth4, eth5 8704 up
# md5sum SR-x.x.x-Rx.tarc
b1936c99efe79a41204eb0f4a58192db  (example only)
```

Copy the file using `coraid-update` or `dd`:(*)

```
# coraid-update SR-x.x.x-Rx.tarc /dev/etherd/e7.15
```

-or-

```
# dd if=SR-x.x.x-Rx.tarc of=/dev/etherd/e7.15
5260+0 records in
5260+0 records out
#
```

Note: If your host is running a driver version earlier than 5.2, type the device name instead of the symbolic link (e.g., `dev/sdb` in the above examples).

(*) `aoetools` on Linux (bundled with the software initiator available on the Coraid website) includes the `coraid-update` utility. The utility validates the destination target and the CorOS update file. Coraid recommends that you use the utility to avoid simple mistakes when using `dd` to copy the CorOS update file to the update LUN. To update from a client system that lacks the `coraid-update` utility, use `dd`; simply write the CorOS update file to the raw block device represented by the update LUN.

(b) Proceed to step 4.

Host	CorOS update file copying procedure

Solaris	**(a) Find the SCSI device that corresponds to the update LUN.**
	`# format -e < /dev/null  # Use -e to get all disks`
	
	`Searching for disks...done`
	
	`AVAILABLE DISK SELECTIONS:`
	`0. c1d0 <DEFAULT cyl 10008 alt 2 hd 255 sec 63>`
	`/pci@0,0/pci-ide@1f,2/ide@0/cmdk@0,0`
	`1. c2t7d15 <DEFAULT cyl 37 alt 2 hd 64 sec 32>`
	`/ethdrv/disk@7,f`
	`Specify disk (enter its number):`
	`#`
	
	In this example note that `c2t7d15` corresponds to the update LUN `7.15`.
	
	(b) Copy the CorOS update file to the update LUN using `dd`:
	`# dd if=SR-x.x.x-Rx.tarc of=/dev/rdsk/c2t7d15`
	`5260+0 records in`
	`5260+0 records out`
	`#`
	
	(c) Proceed to step 4.

4. **At the SR/SRX command prompt, issue `update` to install the CorOS update file.**

```
SR/SRX shelf 7> update
Updating CorOS will reboot unit.
Continue? (y/n) y
Updating kernel ... done.
Updating root fs ... done.
Update successful.
Hard rebooting system. Please stand by ...
```

5. **Issue `release` to verify that the update succeeded.**