

Rapid Recovery for Prinergy 2.x Systems

Field, RC, and Production Document

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Revision History

Revision	Date	Author	Comments
1.0	Dec 10, 2000	Robyn Lundstrom	Initial Rev.
1.1	Jan 11, 2001	Robyn Lundstrom	Added p/n for SCSI switch Added standard drive mappings
1.2	Jan 12, 2001	Robyn Lundstrom	Updated to include NT4 and Prinergy 1.1 systems on W2K or NT4
1.3	Mar 1, 2001	Robyn Lundstrom	Updated product name to “Rapid Recovery”
1.4	Jun 21, 2001	Robyn Lundstrom	Corrected error in Restoring Mirror Disks section
1.5	Jul 20, 2001	Robyn Lundstrom	Made adjustment to PE6400 section re: booting from the mirror disk. These were made due to an unsuccessful beta test.
1.6	Sept 7, 2001	Robyn Lundstrom	Removed the option of buying a second server to do RR with after buying the first server. It’s just too painful to try to get them to match. Removed 2400 support due to lack of interest. Removed NT 4.0 and Prinergy 1.1 support. Removed SCSI switch requirement, as we no longer sell SCSI RAID’s with Prinergy.
1.7	Oct 15, 2001	Robyn Lundstrom	Minor text and spelling corrections
1.8	Dec 10, 2001	Robyn Lundstrom	Added support for Dell PE2500 Rewrote this doc from scratch; it was waaaay too tweaked to death.
1.9	Aug 19, 2002	Robyn Lundstrom	Added support for PE4600 server.
2.0	September 4, 2003	Robyn Lundstrom	Removed 4600 server, replaced with 2600 server.

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1. OVERVIEW

This document describes how a Prinergy Rapid Recovery Server would be configured and used with Dell 6400, 2600, 2500 and DG 3700 servers. It applies to Prinergy 2.0 running on Windows 2000 Server.

In Rapid Recovery (RR), a Prinergy Secondary server is the recipient of the master disks and RAID from the Primary server in the event that the Primary server's hardware fails. Below is a listing of exactly what Rapid Recovery can and cannot do.

1.1 Supported Servers

Rapid Recovery is supported on the following platforms. This may change in the future as new servers are added and older units are discontinued. Please make sure you have the latest revision of this document. It can be found on TechPlanet.

- Dell PE2500
- Dell PE2600
- Dell PE6400
- Dell PE6450 (same as 6400, only rack-mounted)
- DG AV3700

Note: Rapid Recovery is only supported as a Factory installed option. The two servers must be purchased at the same time as the Rapid Recovery option and integrated in Production. If a customer already owns one server, they cannot purchase just one more and integrate them in the field. We tried this. It was horrible. Don't go there.

1.2 Capabilities and Limitations

1.2.1 Capabilities

- Protects against hardware failure (that is, SCSI/FC card failure, network card failure, CPU or RAM failure).
- Allows users to continue to work at a slightly reduced capacity in the event of a hardware failure on the Primary server.
- No downtime for maintenance, and only very minimal periodic dry-run testing.
- Primary and Secondary are protected from hard disk failures by a mirrored system disk (unless otherwise noted).

1.2.2 Limitations

- Does NOT protect against corrupted software (that is, corrupted OS, corrupted database, etc). If the OS won't boot because of a bad driver or registry corruption, this procedure will have no effect.
- Not automatic. Time required is approximately 20 minutes. There is a slight risk if the procedure is not followed exactly.

- Requires and external Fibre Channel RAID. Rapid Recovery cannot work with internal Dell RAID 5 sets. This is due to a rare but real possibility of data loss when failing over. External FC RAIDs do not have this problem.
- It cannot fail over between 2 different types of systems (that is, failing an AV3700 primary to a PE6400 will not work and will cause massive damage to data).
- It cannot fail over between two systems of the same model that have different internal components (that is, different SCSI cards or different network cards). Both machines must be identical, and must have been purchased at the same time with Rapid Recovery in mind to assure proper functionality.
- **AV3700 only:** This solution (along with every other solution currently available) does not provide any redundancy for the Datalog (E:) drive. A failure of this drive will result in the system being down while it is restored from tape. This does not apply to the PE6400, Pe2600 or PE2500.
- Archiving and Backup will **not** function when the Primary system is in its failed-over state.

1.3 Theory Behind the Procedure

This procedure is designed to be a relatively inexpensive and relatively easy to configure failover solution for Prinergy 2.0. It requires no additional software to be installed; no periodic maintenance; and only very minimal dry run testing (every 6 months or so).

The basic procedure is this:

1. A piece of hardware fails on the Primary, requiring a switch to the secondary machine.
2. Both machines are shut down, including any RAID's.
3. The hard disks of the Primary are moved over to the bays of the Secondary. The RAID cable is moved to the Secondary. The Secondary server's disks are set aside until needed. The Prinergy Dongle is also moved.
4. The Secondary is booted; it is now the Primary in every respect, and will now perform the Primary's duties until the Primary is repaired. The Secondary is no longer available.
5. The Primary is repaired; its hard disks are removed from the Secondary, and reinstalled in the Primary. The Secondary's hard disks are returned to their original place. The Prinergy Dongle is placed back on the Primary.
6. The Primary and Secondary are booted. They now resume their previous roles.

The entire procedure takes approximately 10 minutes for each swap, for a total of less than half an hour of downtime (assuming no other trouble-shooting is done).

Since the fail-over server is used as a Secondary until it is needed, the investment in redundant hardware is minimal; no component is sitting around doing nothing until it's used.

The Secondary server used as a Rapid Recovery server should not be used as a Renderstation. This configuration may not function properly and is not supported.

The major drawback is that the machines need to be **exactly** the same. This product **cannot** be implemented with two machines that were purchased at different times. They must be purchased as a unit to ensure reliability and supportability.

These (very stringent) configuration requirements are outlined in the next section.

It is also important to note that this solution protects against a **hardware** failure. If the OS becomes corrupted, or a similar software problem causes the machine to go down, swapping the disks will accomplish nothing.

A second Prinergy dongle is not required, and in the case of Prinergy 2.0 is a bad idea, as 2.0 and above is keyed to a specific dongle.

1.4 Configuration Requirements

A Prinergy Secondary server must be configured with **exactly the same** hardware as the Primary. A second dongle is not required.

WARNING: It is extremely important that the hardware be IDENTICAL, down to the last hard disk. The two systems must have been purchased at the same time and integrated in Production. If they were not, this procedure is not supported and likely will not work, resulting in excessive downtime for the customer and a great deal of wasted expense to Creo. The only exception to this is that there can be only one external FC RAID between the two servers, attached to the Primary.

1.4.1 Job Storage Options

1. External RAID: A Clariion Fibre-Channel RAID may be used. It must be attached to the Primary, but local to both servers (that is, not so far apart that the cables don't reach).

   Note: There cannot be a RAID attached to the Secondary server that is used for Rapid Recovery purposes. This is not supported, and will render those jobs inaccessible in the event of having to perform the disk swap.

2. Tertiary servers: Jobs may be stored on a volume on a Tertiary server. This will work with a minimum of effort, because the network connections to the Tertiary will be restored when the Secondary is brought up as the Primary.

Note: Internal RAID 5 sets are not supported on the Primary or Secondary. This applies to all machines covered in this procedure. This is due to a rare but real risk of data loss while performing this procedure. External FC RAIDs do not have this limitation.

1.4.2 Internal Disk Configurations

The disk configurations on the Primary and Secondary servers must match exactly. There is some room for custom disk configuration, as long as it does not use a RAID 5 set (RAID 1 (mirror) sets are OK).

2. CONFIGURING RAPID RECOVERY

This section is intended for Production personnel only.

This section is the same for both Dell and Data General servers.

1. Unzip the appropriate script for your OS into the **D:\RapidRecovery** directory on the Primary and Secondary Servers. Create the directory if it does not exist. This file is available on TechPlanet in the Download pages for Dell and DG servers:
   - Win2k: **rapid_recovery_win2k.zip**
2. Ensure that the Fibre Channel RAID is not plugged into both the Primary and Secondary at the same time. This will prevent both machines accessing the RAID at the same time and causing horrific data loss.
3. Label the disk cages and disks on each machine as follows (Which bays are which and what they are called must match exactly between the Primary and Secondary servers).

DG AV3700:

Disk Slot	Primary Disk	Primary Bay	Secondary Disk	Secondary Bay
Slot 1	Primary Master	Master	Secondary Master	Master
Slot 2	Primary Slave	Slave	Secondary Slave	Slave
Slot 3	Primary Temp	Temp	Secondary Temp	Temp
Slot 4 (if applicable)	Primary Data 1	Data 1	Secondary Data 1	Data 1
Slot 5 (if applicable)	Primary Data 2	Data 2	Secondary Data 2	Data 2
Continue if needed	Etc	Etc	Etc	Etc

Dell PE2600

Disk Slot	Primary Disk	Primary Bay	Secondary Disk	Secondary Bay
Top of top bay	Primary Master	Master	Secondary Master	Master
Bottom of top bay	Primary Slave	Slave	Secondary Slave	Slave
Bottom Slot 1 (if applicable)	Primary Data 1	Data 1	Secondary Data 1	Data 1
Bottom Slot 2 (if applicable)	Primary Data 2	Data 2	Secondary Data 2	Data 2
Continue if needed	Etc	Etc	Etc	Etc

Dell PE2500

Disk Slot	Primary Disk	Primary Bay	Secondary Disk	Secondary Bay
Slot 1	Primary Master	Master	Secondary Master	Master
Slot 2	Primary Slave	Slave	Secondary Slave	Slave
Slot 3 (if applicable)	Primary Data 1	Data 1	Secondary Data 1	Data 1
Slot 4 (if applicable)	Primary Data 2	Data 2	Secondary Data 2	Data 2
Continue if needed	Etc	Etc	Etc	Etc

Dell PE6400

Disk Slot	Primary Disk	Primary Bay	Secondary Disk	Secondary Bay
Top of top bay	Primary Master	Master	Secondary Master	Master
Bottom of top bay	Primary Slave	Slave	Secondary Slave	Slave
Bottom Slot 1 (if applicable)	Primary Data 1	Data 1	Secondary Data 1	Data 1
Bottom Slot 2 (if applicable)	Primary Data 2	Data 2	Secondary Data 2	Data 2
Continue if needed	Etc	Etc	Etc	Etc

3. RECOVERING FROM FAILURE (DATA GENERAL AV3700)

This section is to be done by the customer under the guidance of the Creo Response Center. The actual failover procedure is outlined here and in Tech Bulletin 78-0134A, which the customer should have.

Follow the below steps if you cannot boot into Win2k. These steps should be done in the following order until Win2k and Prinergy is up.

- Booting Last Known Good
- Booting from the Mirror drive
- Follow the Rapid Recovery procedure appropriate for your platform.

Once Prinergy is running the Creo Response Center will schedule a site visit to repair the Primary and bring you back to a normal state.

3.1 Booting Last Known Good

In the event you cannot boot the Primary server follow these steps to try booting from the Last Known Good configuration before continuing.

1. Re-boot the problem Server.
2. When the Server gets to the OS Selection Menu screen, press the F8 for the Advanced Startup Options menu.
3. Select Last Known Good from the list.

If there is still a problem, continue to the next section.

3.2 Booting from the Mirror Drive

You should only do this if step 4.1 was ineffective. The system disk mirroring differs between the Dell and DG platforms. The Dell machines accomplish system disk mirroring in hardware, which make this step irrelevant. You should already be in contact with the Creo Response Center at this time.

1. Power down the entire server, including the RAID and any tape devices.
2. Remove the Primary Master disk from the Primary
3. Move the Primary Slave disk to the Primary Master slot
4. Power up the tape devices and RAID. Wait approximately 5 minutes for everything to initialize.
5. Power up the server. If it boots and you can log into Prinergy, arrange a replacement hard disk for the server. If it still does not boot, continue to the next section.

3.3 Failing Over from Primary to Secondary

This procedure is outlined here and in Tech Bulletin 78-0134A, which the customer should have.

1. Power down the Primary and Secondary servers, along with any attached RAID or Tape devices.
2. Remove all disks from the Secondary server and put them in a safe place
3. Move all disks on the Primary server to the matching slots on the Secondary server (it is *critical* that the disks are moved to the matching bays. Be very careful that the placement is correct).
4. Move the Prinergy dongle from the parallel port on the Primary to the parallel port on the Secondary.
5. Move the Fibre Channel RAID cable from the Primary to the matching port on the Secondary.
6. Power up all peripherals and wait 5 full minutes for them to finish initialization.
7. Power up the server.
8. If you are still unable to boot it may be an OS issue. Call the Response Center back (you should already be in contact with them), and they will continue to troubleshoot the problem.
9. If it does boot properly, start Prinergy and run as normal. Ignore any error messages about not being able to find the Secondary. You may have to delete some JTP's that normally reside on the Secondary. These can be added back later after the Primary is restored to its original configuration.
10. The Creo Response Center will coordinate a site visit by a Creo Service Engineer to bring the Primary back to normal operation. A Creo Service Engineer must do this. Do not attempt to return to a normal configuration until the Primary is repaired!

4. RECOVERING FROM FAILURE (DELL PE2600/6400/6450)

This section is to be done by the customer under the guidance of the Creo Response Center. The actual failover procedure is outlined here and in Tech Bulletins 78-0132A, and 78-0xxxA, which the customer should have.

Follow the below steps if you cannot boot into Win2k. These steps should be done in the following order until Win2k and Prinergy is up.

- Booting Last Known Good
- Follow the Rapid Recovery procedure appropriate for your platform.

Once Prinergy is running the Creo Response Center will schedule a site visit to repair the Primary and bring you back to a normal state.

4.1 Booting Last Known Good

In the event you cannot boot the Primary server follow these steps to try booting from the Last Known Good configuration before continuing.

1. Re-boot the problem Server.
2. When the Server gets to the OS Selection Menu screen, press the F8 for the Advanced Startup Options menu.
3. Select Last Known Good from the list.

If there is still a problem, continue to the next section.

4.2 Failing Over from Primary to Secondary

This procedure is outlined here and in Tech Bulletin 78-0134A, which the customer should have.

1. Power down the Primary and Secondary servers, along with any attached RAID or Tape devices.
2. Remove all disks from the Secondary server and put them in a safe place
3. Move all disks on the Primary server to the matching slots on the Secondary server (it is *critical* that the disks are moved to the matching bays. Be very careful that the placement is correct).
4. Move the Prinergy dongle from the parallel port on the Primary to the parallel port on the Secondary.
5. Move the Fibre Channel RAID cable from the Primary to the matching port on the Secondary.
6. Power up all peripherals and wait 5 full minutes for them to finish initialization.
7. Power up the server.

8. The PERC controller may complain that the disk configuration has changed. This is normal and not a concern. Follow the prompts on the screen to continue the boot process. DG machines do not exhibit this behavior.

9. If you are still unable to boot it may be an OS issue. Call the Response Center back (you should already be in contact with them), and they will continue to troubleshoot the problem.

10. If it does boot properly, start Prinergy and run as normal. Ignore any error messages about not being able to find the Secondary. You may have to delete some JTP's that normally reside on the Secondary. These can be added back later after the Primary is restored to its original configuration.

5. RECOVERING FROM FAILURE (DELL PE2500)

This section is to be done by the customer under the guidance of the Creo Response Center. The actual failover procedure is outlined here and in Tech Bulletin 78-0136A, which the customer should have.

Follow the below steps if you cannot boot into Win2k. These steps should be done in the following order until Win2k and Prinergy is up.

- Booting Last Known Good
- Follow the Rapid Recovery procedure appropriate for your platform.

Once Prinergy is running the Creo Response Center will schedule a site visit to repair the Primary and bring you back to a normal state.

5.1 Booting Last Known Good

In the event you cannot boot the Primary server follow these steps to try booting from the Last Known Good configuration before continuing.

1. Re-boot the problem Server.

2. When the Server gets to the OS Selection Menu screen, press the F8 for the Advanced Startup Options menu.

3. Select Last Known Good from the list.

If there is still a problem, continue to the next section.

5.2 Failing Over from Primary to Secondary

This procedure is outlined here and in Tech Bulletin 78-0134A, which the customer should have.

1. Power down the Primary and Secondary servers, along with any attached RAID or Tape devices.

2. Remove all disks from the Secondary server and put them in a safe place

3. Move all disks on the Primary server to the matching slots on the Secondary server (it is *critical* that the disks are moved to the matching bays. Be very careful that the placement is correct).
4. Move the Prinergy dongle from the parallel port on the Primary to the parallel port on the Secondary.
5. Move the Fibre Channel RAID cable from the Primary to the matching port on the Secondary.
6. Power up all peripherals and wait 5 full minutes for them to finish initialization.
7. Power up the server.
8. The PERC controller may complain that the disk configuration has changed. This is normal and not a concern. Follow the prompts on the screen to continue the boot process. DG machines do not exhibit this behavior.
9. If you are still unable to boot it may be an OS issue. Call the Response Center back (you should already be in contact with them), and they will continue to troubleshoot the problem.
10. If it does boot properly, start Prinergy and run as normal. Ignore any error messages about not being able to find the Secondary. You may have to delete some JTPs that normally reside on the Secondary. These can be added back later after the Primary is restored to its original configuration.

6. TROUBLESHOOTING THE HARDWARE AFTER FAILED OVER

This section is for Creo personnel only. The Secondary Server will most likely be operating in a Rapid Recovery state. The crash will be hardware related since the OS and Apps are working fine on the Secondary Server. Order and replace parts appropriately.

Ensure the RAID is not connected directly to the server you're working on. Only the server acting as the Primary should have direct access to the RAID.

Use the Secondary's disks to bring the Primary up. All you need to do is verify that the replaced hardware is functioning, and then swap the Primary disks back to the Primary server. Do not leave the system in its failed-over state, as this will cause grief to later service personnel due to mismatched serial numbers.

7. RESTORING CONFIGURATION BACK TO NORMAL

This section should be done only by a Creo qualified Service Engineer.

This section is identical for both Dell and DG platforms.

1. Both servers and all RAID and Tape devices must be shut down.
2. Remove any internal disks present in the Primary.
3. Move the Prinergy Dongle from the Secondary server back to the Primary.

4. Move the Fibre Channel RAID cable from the Secondary server back to the Primary.
5. Move the Primaries disks (Master, Slave, etc) from the Secondary server back to the matching bays on the Primary.
6. Replace the Secondary's internal disks in their appropriate slots in the Secondary.
7. Power up all RAID and Tape devices. Wait 5 full minutes to let them complete initialization.
8. Power up the Primary server.
9. Power up the Secondary server.
10. When both servers are up, start Prinergy normally.
11. Replace the JTPs (if any) that were deactivated during the time the systems were in their failed-over state.

8. END