



Disaster Recovery Planning for BlackBerry Enterprise Server for Microsoft Exchange

An Overview of Best Practices

Contents

Audience.....	1
Purpose	1
BlackBerry Architecture.....	2
Overview of BlackBerry Enterprise Server Components	2
BlackBerry Enterprise Server	2
SQL Database	3
BlackBerry Enterprise Server administrator mailbox	3
User Mailboxes.....	4
Disaster Recovery Planning: What to Backup.....	5
Windows OS Backup	5
SQL Database Backup.....	6
Mailbox Backup	6
BlackBerry Backup Utility	6
Disaster Scenarios and How To Recover.....	7
Hardware Failure.....	7
SQL Database Data Loss.....	7
Accidental User Mailbox Deletion	7
Accidental BlackBerry Enterprise Server admin mailbox Deletion.....	8
Extending Availability	8
Failover/Redundancy: Some Best Practices.....	8
Deployment Best Practices	11
A Final Word.....	11
For More Information	11

Audience

This document is designed for IT administrators and assumes a working knowledge of:

- BlackBerry Enterprise Server installation, configuration, administration, and architecture
- Corporate Messaging
- Collaboration Server installation and administration
- Disaster recovery procedures

Purpose

This document provides an overview of BlackBerry Enterprise Server components and is intended to help administrators prepare for the design and delivery of disaster recovery procedures for a BlackBerry environment.

Many organizations consider BlackBerry to be an integral part of the enterprise's IT infrastructure—therefore having a disaster recovery plan in place for the BlackBerry Enterprise Server is just as essential as having a plan for other critical corporate applications and servers. This document is designed to show how disaster recovery planning for BlackBerry can work for your organization and provide IT with a framework to begin preparing a plan.

Also included is information on the key BlackBerry architecture components, how to back them up, and how to restore them.

Helpful links at the end of this document provide more in-depth information on specific technical issues.

BlackBerry Architecture

Figure 1 illustrates a typical BlackBerry architecture with a single BlackBerry Enterprise Server providing email and mobile data services. For disaster recovery purposes, the most important elements are the BlackBerry Enterprise Server, the corporate messaging server, and the SQL databases.

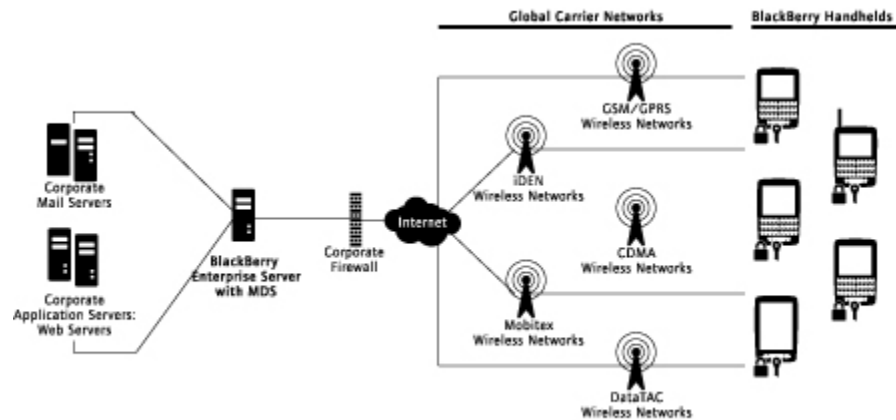


Figure 1 – BlackBerry Architecture

Overview of BlackBerry Enterprise Server Components

BlackBerry Enterprise Server components include:

- BlackBerry Enterprise Service(s)
- Mobile Data Service(s) (MDS) NT Service/Registry
- Attachment Service(s)
- SQL database
- BlackBerry Enterprise Server administrative mailbox
- User mailboxes
- Registry

The BlackBerry Enterprise Service, MDS and Attachment Service act as standalone components to the BlackBerry Enterprise Server and can be recreated relatively easily. However, the SQL database, BlackBerry Enterprise Server admin mailbox, and user mailboxes are critical components and must be included in the disaster recovery planning process.

BlackBerry Enterprise Server

The BlackBerry Enterprise Server requires access to:

- SQL database (for BlackBerry Enterprise Server management)
- BlackBerry Enterprise Server admin mailbox
- User mailboxes
- SRP connection to BlackBerry Enterprise Server (srp.xx.blackberry.net)

SQL Database

Wireless IT Policy Recovery

In BlackBerry Enterprise Server v3.6, the supporting SQL database contains the wireless IT policies. When a new IT wireless policy is created, the BlackBerry Enterprise Server management console is used to send the policy to users. The console is also used to periodically review policies to make sure they are up-to-date.

When a new policy is created using BlackBerry Enterprise Server v3.6, it is immediately sent to all users. In this version, there is no reconciliation to see if the new policy overlaps or is in conflict with an existing policy. Therefore, if the SQL database goes down, the current BlackBerry Enterprise Server version will still enforce all existing policy rules. If the BlackBerry Enterprise Server loses connectivity to the SQL database, the BlackBerry Management Software (often referred to as the MMC Snap-in or MMC) will continue to run.

Administrators are alerted to problems when they try to open the MMC in order to administer users. The MMC needs to read the SQL database and also connects to the BlackBerry Enterprise Server admin mailbox, which contains folders for each BlackBerry Enterprise Server name. Inside the folders is information on all users, including the data the BlackBerry Enterprise Server needs to contact those users. Administrators will not be able to access licensing information and the list of available BlackBerry Enterprise Servers.

The loss of the SQL database does not prevent any services from running. However, since the SQL database contains IT policies, it is a good idea to manually document these policies in case there is a problem with the database restore—the policies can then be recreated from the manual documentation.

If the policy list is small, the easiest way to recreate it is by simply typing the policies back in. However, if there are a large number of policies, it is important to ensure that the SQL database is backed up.

BlackBerry Mobile Data Service (MDS)

BlackBerry MDS connects with the SQL database for the purposes of retrieving:

- Statistics
- Push data

It also requires access to

- SRP connection to BlackBerry Enterprise Server (srp.xx.blackberry.net)

For push data, MDS looks up user email addresses, which are contained in maps stored in the SQL database. If the BlackBerry Enterprise Server fails, this information can be recreated when the server is reinstalled.

If the SQL database is stopped, MDS will continue to function, but the push capability is no longer available. This means that mobile users will still be able to pull information they require, but until the SQL database is restarted, important information will no longer be automatically pushed out to their handheld.

If MDS was running when the database is lost and MDS is not restarted, it can run off the cached information (MDS caches this information on startup). MDS usually reads from the PIN to email mapping table every 15-30 minutes, but if the tables are not accessible it will use the information it has cached. It will not see updated information (such as an updated PIN), only cached information.

If MDS is restarted after or during the database failure it will not start as the MDS configuration information is not available. By MDS configuration information, we mean the ports MDS uses and the BlackBerry Enterprise Server it connects to, not just the PIN to email mapping table. The database is not populated with PIN to email mapping information until dbconsistency is run.

BlackBerry Enterprise Server administrator mailbox

The contents of the BlackBerry Enterprise Server admin mailbox include:

- ServerConfig Folder
 - GlobalFilter
 - MsgsPending
 - MsgsSent

- MsgsSent
- MsgsFiltered
- MsgsExpired
- MsgsForwarded
- ServerPagerData
 - ServerDN
 - MailboxDN
 - UserName
 - PINCache
 - RedirectionState
 - CreationTime

ServerConfig Folder

The ServerConfig Folder contains the aggregate statistics. The MMC provides a list of users in a spreadsheet view, showing all the statistics that it has read from the BlackBerry Enterprise Server admin mailbox. Every 10 minutes, the MMC reads the current statistics in all user mailboxes and moves the statistics into the BlackBerry Enterprise Server admin mailbox. Administrators should refresh the data every time they access this data in order to ensure they have up-to-date information. Right click on a specific user to retrieve the latest statistical data for that user. Information in the ServerConfig Folder is not considered critical in terms of disaster recovery.

ServerPagerData

ServerPagerData is important for the BlackBerry Enterprise Server functionality, but can be easily recreated after a system crash. When the BlackBerry Enterprise Server starts, it accesses this data to determine:

- ServerDN
- MailboxDN
- UserName
- PINCache
- RedirectionState
- CreationTime

User Mailboxes

User mailboxes contain:

- All Mail Folders
 - PagerConfigData
 - PagerStatsData
 - User Mailbox
 - Inbox
 - Sent Items
 - Drafts
 - Deleted Items

Hidden Folders

The PagerConfigData and PagerStatsData are hidden folders that reside in every mailbox. They contain configuration and statistical data. Since they are located above the user mailbox, users cannot access them.

PagerStatsData folder contains:

- MsgsExpired
- MsgsFailed

- MsgsFiltered
- MsgsPending
- MsgsReceived
- MsgsSent
- LastMsgReceived
- LastMsgSent
- Status

The BlackBerry Enterprise Server copies this information into the BlackBerry Enterprise Server admin mailbox. PagerConfigData folder contains:

- ActivationTime
- RoutingInfo
- ServiceName
- DeviceID
- AutoSignature
- Filter
- InCradle
- RedirectionState
- Status
- Encryption Key

Encryption keys are most important information in the PagerConfigData folder.

Disaster Recovery Planning: What to Backup

Usually BlackBerry Enterprise Server is another NT box in the IT environment and, once installed, the Operations department takes over its maintenance and backup. Therefore it is important for the purposes of disaster recovery that the Operations staff understands the BlackBerry Enterprise Server as well as what needs to be backed up. The following components are recommended for backup:

1. Windows OS
2. SQL Database
3. BlackBerry Enterprise Server admin mailbox
4. User Mailbox
5. BlackBerry Enterprise Server configuration
 - SRP ID, Authentication Key
 - Service Account, BESAdmin Mailbox
 - License keys
 - Database name, location
 - IT Policy configuration

Windows OS Backup

When designing a backup plan for the BlackBerry Enterprise Server backup on the server:

- BlackBerry Enterprise Server Install directory and subdirectories

- Windows Registry
- HKLM\Software\Research In Motion
- HKCU\Software\Research In Motion
- ICSSync directory (3.5 and earlier)
- SQL/MSDE Database

A ghost of the BlackBerry Enterprise Server can also be created. This ensures that the backed up data is current -- the ghost reads the latest information in the mailboxes and SQL database and stores it on a continuing basis. If the primary BlackBerry Enterprise Server fails, the ghost machine immediately takes over. Using NT backups also works. However, when in recovery mode, there can be a number of extra steps involved, including reinstalling NT. Another option would be to integrate the BlackBerry Enterprise Server backup with existing operations procedures, providing that automated backup is available.

SQL Database Backup

Backing up the SQL database is important for BlackBerry Enterprise Server v3.6, as a large amount of wireless policy information is stored in this database. The SQL database tends to be routinely backed up by the Operations department, but this should be confirmed as part of the disaster recovery planning process. Backing up using MSDE (Microsoft Data Engine) is more difficult because there is no administrative interface. However there are scripts available that will make the process easier. Please refer to additional RIM and Microsoft documentation regarding facilitating MSDE backup.

Mailbox Backup

Both the BlackBerry Enterprise Server admin mailbox and user mailboxes are backed when the Microsoft Exchange server is backed up. However this approach does not allow a single user to be backed-up and restored. Therefore, if a single user mailbox is deleted by accident, a new mailbox will need to be created for that user.

BlackBerry Backup Utility

The BlackBerry Backup Utility allows the BlackBerry Enterprise Server data to be easily backed-up and restored, including configuration and user information, into a password-protected file. There is also an included utility to back up the contents of the BlackBerry Enterprise Server admin mailbox.

Usage: BlackBerryBackup -flags

Note: [] indicates mandatory flags and <> indicates optional flags

-b [-o/-i] [<n/-r/-f>]: to backup/restore the entire BlackBerry Enterprise Server (and all its users)

-u [-o/-i] [<d/-n>]: to backup/restore a single user

-r [-o/-i]: to backup/restore the BlackBerry Enterprise Server configuration information.

Can also be used in conjunction with -b

-p [-i] [-o]: prints out user information to file from specified input file

Examples of the BlackBerry Backup Utility

1. To backup the entire BlackBerry Enterprise Server to backup.txt

```
C:\>BlackBerrybackup.exe -b -o backup.txt
```

2. To load the BlackBerry Enterprise Server config info from BlackBerry Enterprise Server.txt into Test BlackBerry Enterprise Server

```
C:\>BlackBerrybackup.exe -r -i BlackBerry Enterprise Server.txt -n "Test BLACKBERRY ENTERPRISE SERVER"
```

3. To create a printable version of the data in BlackBerry Enterprise Server.txt and output it to print_BlackBerry Enterprise Server.txt

```
C:\>BlackBerrybackup.exe -p -i BlackBerry Enterprise Server.txt -o print_BlackBerry Enterprise Server.txt
```

An offline server can be brought online immediately if it has the same BlackBerry Enterprise Server name, BESAdmin service account, BESAdmin mailbox, and SRP. This provides a new hardware platform without affecting service. The principles are the same as a hot spare knife-edge cutover.

Existing hardware can be used for recovery by configuring second BlackBerry Enterprise Server instances on BlackBerry Enterprise Server A and B as hot spare options for BlackBerry Enterprise Server B and A respectively.

Disaster Scenarios and How To Recover

Hardware Failure

When the hardware fails an outage will occur. However, critical data will not be lost, and the data that is lost is recoverable.

The steps to take include:

1. Restore the ghost image
2. Reinstall OS and restore from backup
3. Rebuild
 - Install a new BlackBerry Enterprise Server using the same BlackBerry Enterprise Server name, BlackBerry Enterprise Server admin mailbox, SRP ID and Authentication Key
 - SQL database including restore SQL backups
 - BlackBerry Enterprise Server admin mailbox MAPI profile
 - Start the MMC (not strictly necessary)

Once the ghost image loads, the BlackBerry Enterprise Server comes back online and picks up where it left off. The BlackBerry Enterprise Server has many tasks to do in a restore -- it connects to the BlackBerry Enterprise Server admin mailbox and retrieves the list of user names, then logs on to every server where mailboxes exist and then scans the mailbox. Consequently, it will take a few minutes before mail arrives on the users' devices.

SQL Database Data Loss

To recover from a SQL database outage:

1. Restore from SQL backup
2. Create a new database and use the BlackBerry Enterprise Server to install and repair (or create db.sql script)
3. Start MMC to re-add the server and policies.

If there are only a few wireless IT policies in the SQL database, the simplest procedure is to recreate those policies. However, when users return to the restored policy, they will see a notification that tells them that the policy settings have been updated even though nothing has changed. This unexpected message may cause some users concern. To avoid this issue simply restore the SQL backup. If a backup does not exist, the database can be created through the add/remove/repair function in the BlackBerry Enterprise Server.

To make the MMC function properly, add the BlackBerry Enterprise Server as if it were the first installation. Right click on the root level, choose *add server* and enter the server's correct name. MMC will connect to the BlackBerry Enterprise Server admin mailbox and access the data that is already there.

Accidental User Mailbox Deletion

The user mailbox contains critical information, and deletion will cause an outage to occur for that user.

If the user mailbox is accidentally deleted there are two recovery options:

- An individual mailbox can be recovered from the Microsoft Exchange backups. However, if these backups are not available and it is not possible to restore an individual mailbox, the entire BlackBerry Enterprise Server will need to be restored.
- Restore from Blueberry Exchange Server backup. Any new users will have to be added to the BlackBerry Enterprise Server again. By restoring from backup, in BlackBerry Enterprise Server v.3.0 and later users will not have to cradle.

Another option is to remove the user from the server, recreate the mailbox, add the new mailbox to the server, and then cradle. Note: cradling will not be required in BlackBerry Enterprise Server v4.0 because of this version's wireless provisioning feature.

Accidental BlackBerry Enterprise Server admin mailbox Deletion

The BlackBerry Enterprise Server admin mailbox is required to perform administration activities and deletion of it will cause an outage to occur for all users.

The BlackBerry Enterprise Server admin mailbox is completely recoverable either by restoring it from the Microsoft Exchange backups or recreating it. User devices will not need to be re-cradled. The statistics table will be available, but will contain no data. However, up-to-date individual user data can be obtained by right clicking on the user. The BlackBerry Backup utility can also be used to restore information without having to use the MMC console.

To recreate the BlackBerry Enterprise Server admin mailbox:

- Recreate the mailbox and give it the same name.
- Start the MMC. The BlackBerry Enterprise Server will be listed there without users. The BlackBerry Enterprise Server name is read from the SQL database.
- Add the users. When adding a user to the BlackBerry Enterprise Server, the BlackBerry Enterprise Server checks for hidden folders. If none exist, it will create and populate, then set user to initializing. If they do exist, but the BlackBerry Enterprise Server name is different, it will prompt to switch to the current BlackBerry Enterprise Server name and then initialize the user. If they do exist with same name, it will add and NOT set to initializing and will load and continue operation as normal.

Extending Availability

Failover/Redundancy: Some Best Practices

1. Investment in a standby server or hot spare is mandatory. This will help to speed up recovery time. It is also essential to document settings such as the SRP ID, authentication key, and the name of the BlackBerry Enterprise Server. To rebuild:
 - BlackBerry Enterprise Server install using same configuration
 - SQL database (optional)
 - BESAdmin MAPI profile
 - Start MMC and add users

The server can be rebuilt on new hardware provided that the user and administrator mailboxes are intact and:

- The same SRP ID and key are used
- The same BlackBerry Enterprise Server name is used
- The same BESAdmin mailbox is used

Using this configuration brings users on-line with no downtime and no cradling. Please refer to the RIM documents on the knife-edge cutover process—this is the same procedure used to move to a standby server in a failover situation.

2. Create and communicate disaster policies within IT and to users so they will know what to expect when an outage occurs. These policies will vary depending on the IT architecture. For example, if a desktop machine is functioning as a backup server, it may be advisable to turn off all Attachment Services.

3. Test to ensure that email and calendaring services will work if the BlackBerry Enterprise Server is down for a two or three hour period. This is accomplished by sending a test message to a test user in-house in order to verify that the email flow is working.
4. Use monitoring tools to alert Operations to outages.

Monitoring Tools

Monitoring tools are essential. This will help to ensure that IT is immediately notified of issues and allow the administrator to get users back online quickly. There are a number of monitoring tools available that can provide outage alerts.

- NetIQ (a third party application) contains a module that connects directly to the BlackBerry Enterprise Server.
- SNMP (Simple Network Management Protocol) is built into the BlackBerry Enterprise Server and all statistics, status and other network data is exposed in SNMP.
- There are also a number of inexpensive or free SNMP monitoring tools available on the Internet that monitor the status of the BlackBerry Enterprise Server.

Manual Failover

Without automated tools in place, the failover will have to be accomplished manually. When notified that the BlackBerry Enterprise Server is down, cancel services on both the primary BlackBerry Enterprise Server and the failover server. Then start the failover server.

Note: Do not start services on both machines at the same time. The reason is that each BlackBerry Enterprise Server has its own SRP ID and authentication key (provided by the carrier). If two servers make connection with the BlackBerry Infrastructure using the same SRP ID and authentication key, there is no way for it to determine if the servers are in the administrator's segment or at some other location. Therefore for security reasons, both machines would be shut off. Service can be restored by contacting BlackBerry Technical Support; in general though, this is a process to avoid whenever possible.

Running the Standby Server

The standby server can be running on the network with all services stopped. In a Microsoft Exchange environment, it is important for the BlackBerry Enterprise Server name, BlackBerry Enterprise Server admin mailbox, SRP ID and the authentication keys all are the same. The NetBIOS name and the IP address are not important here, except when needed for firewall rules.

Running Services During Failover

Only one BlackBerry Enterprise Server service can be running at the same time. If BlackBerry Enterprise Server 1 is stopped, BlackBerry Enterprise Server 2 can be started to take over where BlackBerry Enterprise Server 1 left off. This failover process can be handled manually or it can be scripted to occur automatically. The use of monitoring tools is important to make sure not to disconnect or attempt to connect using two different machines that have the same ID and authentication information for the reasons described above. There are three possible states for the SRP -- it is either connected, disconnected, or idle. Generally, if the statistics show that there have been zero messages in the last ten minutes, it is time to investigate to see if there is an issue. If there has been no traffic in an hour, then the failover server should be turned on. .

Sample Redundancy/ Failover Configurations

Figure 2 shows a typical configuration with a production and a failover BlackBerry Enterprise Server v3.6.

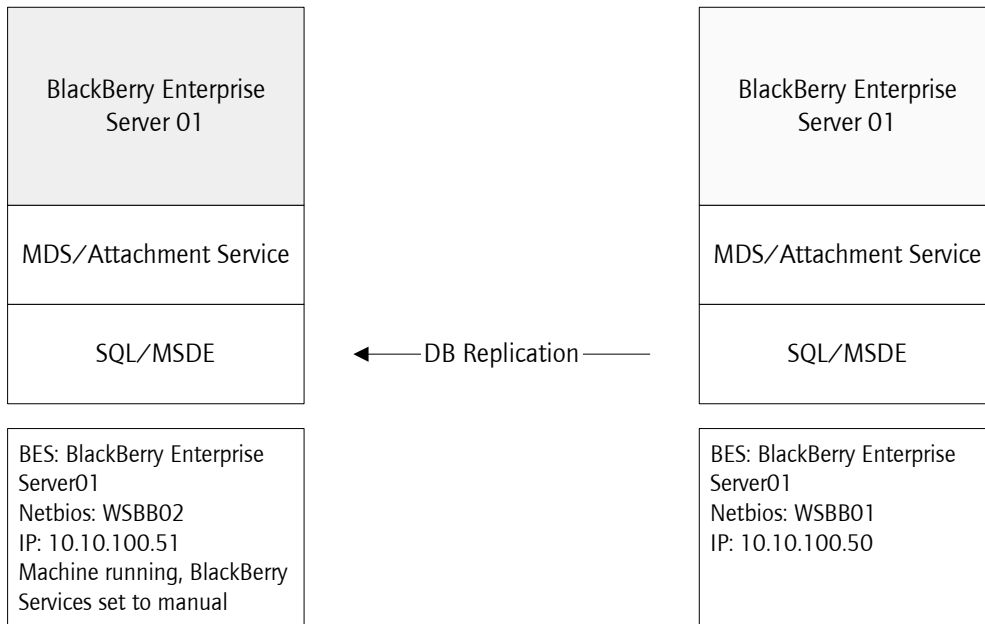


Figure 2 – Redundancy/Failover configuration with one BlackBerry Enterprise Server running

There is no one solution for configuring the BlackBerry Enterprise Server architecture -- it really depends on the organization's particular situation, such as number of users on each server, degree of desired automatic backup, etc. Figure 3 shows another configuration with two BlackBerry Enterprise Servers running simultaneously.

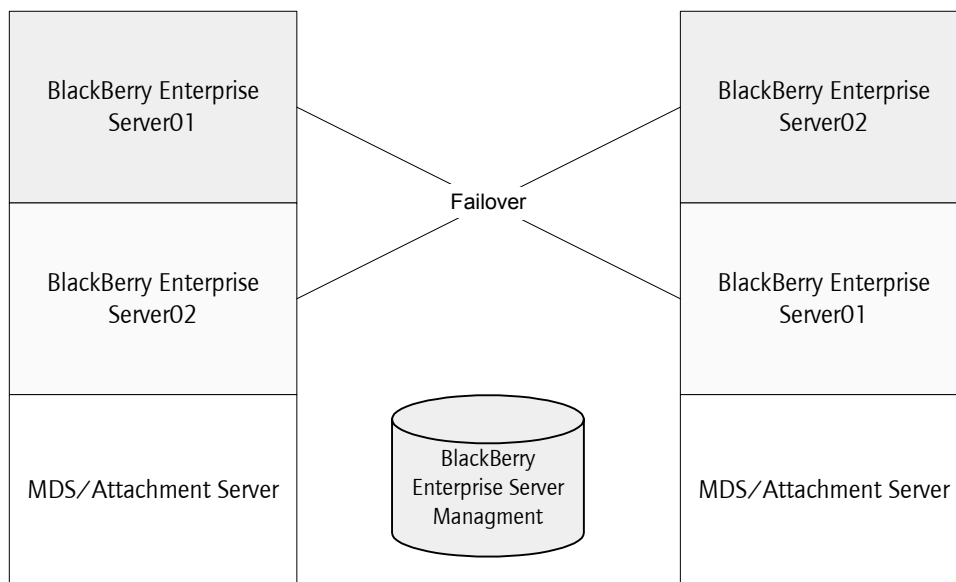


Figure 3 – Redundancy/failover configuration with two BlackBerry Enterprise Server running simultaneously

Deployment Best Practices

- Do not install the BlackBerry Enterprise Server on a Windows Domain Controller or Microsoft Exchange production email server. Recovery after an outage is generally more complicated on these servers than on the BlackBerry Enterprise Server.
- Use a central database so the BlackBerry Enterprise Server can share mailboxes and calendars for push data. Also, to manage multiple BlackBerry Enterprise Servers from a single console, a central database is required.
- Invest in standby hardware.
- Develop a detailed disaster recovery plan and review it once a month.
- Test the disaster recovery plan on a regular basis to make sure that it still applies to the current BlackBerry Enterprise Server environment.

A Final Word

To make sure administrators and other members of the IT organization are ready when an outage occurs, they need to become very familiar with BlackBerry Solution components and how they affect the operation of the BlackBerry Enterprise Server. Use the BlackBerry utility on a regular basis and fully document the BlackBerry Enterprise Server configuration, including the SRP identification key and all BlackBerry Enterprise Server names. And finally, always have a fully configured standby BlackBerry Enterprise Server ready to start up whenever it is needed.

For More Information

- BlackBerry Technical Knowledge Center <http://www.blackberry.com/knowledgecenterpublic>
- BlackBerry Enterprise Server for Microsoft Exchange <http://www.blackberry.com/products/software/server/exchange/index.shtml>

Part number: WPE-000105-001

*Check with service provider for availability, roaming arrangements and service plans. Certain features outlined in this document require a minimum version of BlackBerry Enterprise Server software, BlackBerry Desktop Software, and/or BlackBerry handheld software. May require additional application development. Prior to subscribing to or implementing any third party products or services, it is your responsibility to ensure that the airtime service provider you are working with has agreed to support all of the features of the third party products and services. Installation and use of third party products and services with RIM's products and services may require one or more patent, trademark or copyright licenses in order to avoid infringement of the intellectual property rights of others. You are solely responsible for determining whether such third party licenses are required and are responsible for acquiring any such licenses. To the extent that such intellectual property licenses may be required, RIM expressly recommends that you do not install or use these products and services until all such applicable licenses have been acquired by you or on your behalf. Your use of third party software shall be governed by and subject to you agreeing to the terms of separate software licenses, if any, for those products or services. Any third party products or services that are provided with RIM's products and services are provided "as is". RIM makes no representation, warranty or guarantee whatsoever in relation to the third party products and services and RIM assumes no liability whatsoever in relation to the third party products and services even if RIM has been advised of the possibility of such damages or can anticipate such damages.

© 2004 Research In Motion Limited. All rights reserved. The BlackBerry and RIM families of related marks, images and symbols are the exclusive properties of Research In Motion Limited. RIM, Research In Motion, 'Always On, Always Connected' and BlackBerry are registered with the U.S. Patent and Trademark Office and may be pending or registered in other countries. All other brands, product names, company names, trademarks and service marks are the properties of their respective owners. The handheld and/or associated software are protected by copyright, international treaties and various patents, including one or more of the following U.S. patents: 6,278,442; 6,271,605; 6,219,694; 6,075,470; 6,073,318; D,445,428; D,433,460; D,416,256. Other patents are registered or pending in various countries around the world. Please visit www.rim.net/patents.shtml for a current listing of applicable patents.

RESEARCH IN MOTION LIMITED (RIM) ON BEHALF OF ITSELF AND ITS AFFILIATES MAKES NO REPRESENTATIONS ABOUT THE SUITABILITY OF THE INFORMATION OR GRAPHICS CONTAINED IN THIS ADVISORY FOR ANY PURPOSE. THE CONTENT CONTAINED IN THIS DOCUMENT, INCLUDING RELATED GRAPHICS, ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND. RIM HEREBY DISCLAIMS ALL WARRANTIES AND CONDITIONS WITH REGARD TO THIS INFORMATION, INCLUDING ALL IMPLIED WARRANTIES AND CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE AND NON-INFRINGEMENT. IN NO EVENT SHALL RIM BE LIABLE FOR ANY SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF INFORMATION CONTAINED HEREIN. THIS DOCUMENT, INCLUDING ANY GRAPHICS CONTAINED WITHIN THE DOCUMENT, MAY CONTAIN TECHNICAL INACCURACIES OR TYPOGRAPHICAL ERRORS. UPDATES ARE PERIODICALLY MADE TO THE INFORMATION HEREIN AND RIM MAY MAKE IMPROVEMENTS AND/OR CHANGES IN THE PRODUCT(S) AND/OR THE PROGRAM(S) DESCRIBED HEREIN AT ANY TIME WITHOUT NOTICE.