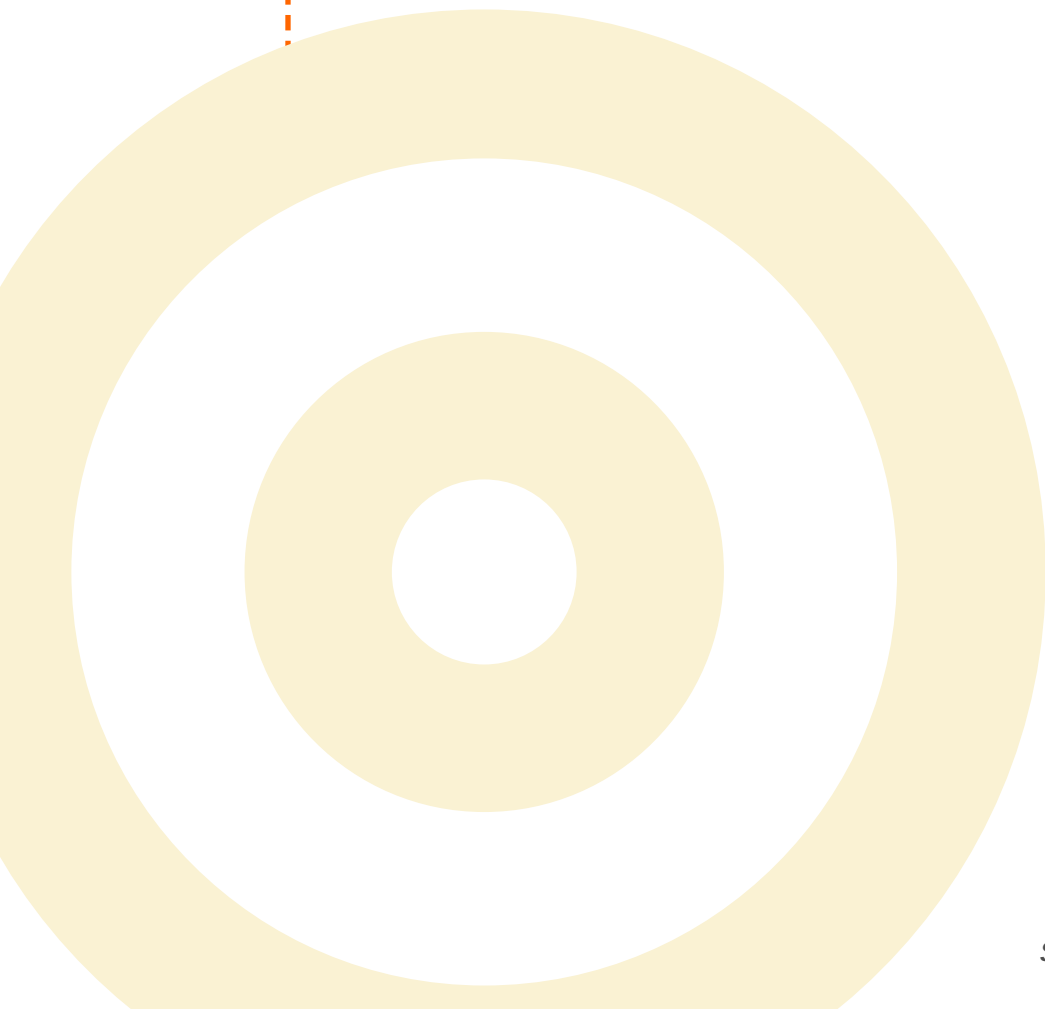# Best Practices of Deploying and Maintaining BlackBerry for Microsoft Exchange

Best Practices of Deploying and Maintaining BlackBerry for Microsoft Exchange

This reference document is based on a Research In Motion/TechTarget webcast, "Best Practices of Deploying and Maintaining BlackBerry for Microsoft Exchange." To view the webcast online, please click the link.

This TechTarget *IT Briefing* covers the following topics:

Best Practices of Deploying and Maintaining BlackBerry for Microsoft Exchange

This reference document highlights proven best practices for deployment and maintenance of the BlackBerry solution. It is intended for companies that have already deployed BlackBerry® in their own environment.

Standard server tasks

BlackBerry is an important enterprise application and it must be treated as such. To begin with, you should create a maintenance plan containing tasks that run on a daily, weekly and monthly basis. From a day-to-day perspective, in many organizations the task of caring for the BlackBerry solution is often folded into the responsibilities of administrators who are already busy caring for Microsoft® Exchange and Active Directory, as well as other components of their infrastructure. Checking the event viewer logs on the BlackBerry Enterprise Server™ for OS and hardware-related errors should be a standard part of any administrator's job. As a practical reality, this often doesn't happen. Many companies automate this function through management software such as Microsoft MOM or NetIQ App Manager.

Adding BlackBerry Enterprise Server to other managed servers within your infrastructure is fundamental. Another good practice is for the administrator to examine the BlackBerry Enterprise Server Management console for any user or server issues. The administrator should check for red light indicators, yellow light indicators or gray icons. These are icon indicators that show status of the BlackBerry service. Generally, this is a manual process, though some automation can be achieved. For more information about the BlackBerry Enterprise Server Management Console please refer to the Administration Guide: http://www.blackberry.com/knowledgecenterpublic/livelink.exe/fetch/2000/8067/645045/7963/7965/335877/BlackBerry_Enterprise_Server_3.6_for_Microsoft_Exchange_Administration_Guide?nodeid=335878&vernum=0.

Many organizations have built-in processes for IT help desks. For example, if a user leaves the company, the IT help desk would disable or delete a user's account, and an automated process will launch to automatically delete the user's mailbox. If such processes are not tied to the activities of the

BlackBerry administrator, then there's no way for the BlackBerry Enterprise Server to know that the user's mailbox has been deleted. So as the BlackBerry Enterprise Server tries to connect to that particular mailbox—with the Exchange administrator having deleted that mailbox—the BlackBerry Enterprise Server will fail to find the mailbox. This process can decrease the performance of the BlackBerry Enterprise Server as it tries to access a mailbox that no longer exists. Removing that user's mailbox can help increase system performance, giving a good indication that a user's handheld is available and can be deployed to other users.

Automating administration tasks such as these does not take a lot of work. Many companies opt to have their web administrator or developer—someone proficient at writing ASP code—create web pages to automate these tasks. Research In Motion® has long offered the BlackBerry user administration client tool, which a help desk technician can utilize using a command prompt for BlackBerry Enterprise Server account creation and deletion. Rather than worrying about setting this command up for every help desk technician, it tends to be more practical if you run the command using a server-side script where these technicians can log in and add or delete users. (For more detailed information on this tool, please consult the BlackBerry Administrator Guide.)

As for best practices for account troubleshooting, the BlackBerry Enterprise Server administrator can elect to offload that work to the help desk technician. But to do so, the help desk support personnel must have tools to isolate the potential problems in BlackBerry handhelds. A good option is to develop a web page or two that allows your technicians to view pertinent details on BlackBerry Enterprise Server accounts. Such details could include the last time the user received mail or his PIN number.

Help desk personnel should also have the ability to see the current status of the BlackBerry Enterprise Server with data such as whether the server is running, the SRP is down, or the attachment service is running. This information is essential for first-level support to be able to isolate a handheld before escalating the problem to the BlackBerry Enterprise

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Server administrator. The BlackBerry Enterprise Server Administration Guide has extensive information on what type of information you can get out of the SNMP Management Information Base (MIB). Please refer to the BlackBerry Enterprise Server Administration Guide for more details: http://www.blackberry.com/knowledgecenterpublic/livelink.exe/fetch/2000/8067/645045/7963/7965/335877/BlackBerry_Enterprise_Server_3.6_for_Microsoft_Exchange_Administration_Guide?nodeid=335878&vernum=0.

As part of weekly administrative routines, it is important to review the debug log file and then view any critical errors in it. Using third party software can help you automate this task and alert you if a specific type of error has occurred. Make sure there's enough disk space available for the new logs to be written. If the BlackBerry Enterprise Server is low on disk space, you should consider archiving or backing up the older logs and then removing them from the BlackBerry Enterprise Server.

The handheld cleanup utility is a useful tool for BlackBerry Enterprise Server administrators. This utility performs handheld mailbox check and update. It checks for any mailboxes that have been moved from one Exchange server to another. If any handhelds within the server have been changed, you can print them using this tool. (Refer to the BlackBerry Enterprise Server Administrator Guide for more information.)

From a monthly perspective, you must consider backup of the management console databases if that is not already part of your daily or weekly backup plans. (See below for more discussion of backup and disaster recovery.) In addition, performance testing and base-lining of the server are key—before you start a project, as you pilot it, and as you go into production. The comparison of server statistics from the previous period allows you to scale a particular server and thus improve its performance.

From a bi-annual or annual standpoint, you should evaluate server hardware for possible replacement. You may not plan to replace a server for two or three years, but you should still evaluate the server hardware regularly, depending on the features and functionalities you're adding to the environment.

Performance and scalability

Performance and scalability become important chiefly at three junctures (see Figure 1). First, when introducing this technology into your environment, you need to find out and understand what kind of impact it will have on your messaging environment. Second, as RIM adds new components and features, you'll want to understand the impact on the BlackBerry Enterprise Server itself. Third, you should evaluate the throughput impact, understanding what kind of network utilization and performance this solution will have on your environment.

To optimize the performance of the BlackBerry solution, you must consider three things during the planning stages: the physical proximity, type of Internet connectivity and the push rate. RIM recommends that the BlackBerry Enterprise Server be placed where it can access mail servers via a local high-speed switch network connection. If the mail servers are centralized, this may indeed be a viable option. For a more decentralized server topology, you should evaluate the physical link speeds between the sides as well as the location of the end users. As a rule of thumb, the BlackBerry Enterprise Server needs to be situated as close to the mail servers as possible. Depending on your WAN infrastructure, it may be advisable to deploy a BlackBerry Enterprise Server in more than one site for optimal performance.

The BlackBerry Enterprise Server requires outbound-initiated Internet connectivity on Port 3101. Any firewall placed between the BlackBerry Enterprise Server and the Internet must be configured to permit this traffic. It is also important to ensure the Internet bandwidth is sufficient to manage the additional traffic placed on the connection by the BlackBerry Enterprise Server. Typically, each message going out to the BlackBerry Enterprise Server is about 2KB; however, due to compression, this can go down to approximately 1.5KB. But as users create longer messages and include attachments, they will pull more data via that Internet connection. When deploying the BlackBerry Enterprise Server with Mobile Data Service, the administrator must take Mobile Data Service traffic into account when pushing data to handhelds.

Administrators must analyze the performance impact of each feature, taking into account internal user habits and culture. One recommendation is to stage the feature in your production environment. For example, you might start with email, calendaring and address look-up as a baseline. Then you can add features such as attachment viewing and Mobile Data Service as well as wireless email reconciliation incrementally.

Internally at RIM, we have done a lot of work on performance tuning and capacity planning. For more information on how individual features impact

Performance & Scalability

- **Impact on Exchange**
- **Impact on BlackBerry Enterprise Server**
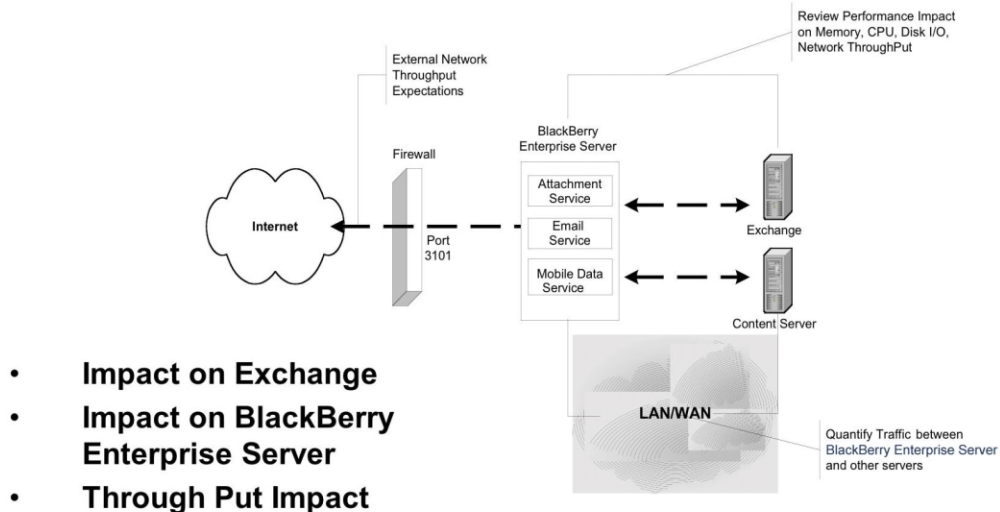- **Through Put Impact**

Figure 1

performance at RIM, check our web site (www.blackberry.com/knowledgecenterpublic). As a general rule, when you're running 500 users on the BlackBerry Enterprise Server, we recommend that you have about half a gigabyte to a gigabyte of RAM, increasing this as you add more instances of BlackBerry Enterprise Server. These recommendations relate to the new attachment service feature depending on how users are using it. After extensively testing the attachment service with about 2,000 users and four instances of the BlackBerry Enterprise Server running on one particular box (with each BlackBerry Enterprise Server of 500 users and with attachment handling testing), we've come to the conclusion that you should upscale the RAM on the BlackBerry Enterprise Server to accommodate the amount of attachments that your users might use. These are just guidelines aimed at ensuring your RAM is not consumed by your attachment servers, which would affect other areas of the system.

Large shops can scale up for more users and scale out for more features. The resource requirements for new features are dependent on environmental factors such as the usage pattern. If you have the attachment service but nobody uses it, it won't consume a significant amount of resources within your environment.

But if you roll it out and then suddenly every email has a large attachment in it, that will negatively impact your performance.

To address the issue of many users using attachments, we have introduced BlackBerry Enterprise Server version 3.6 Service Pack 1 (and sequentially after that Service Pack 1a). For those that have not yet deployed BlackBerry Enterprise Server version 3.6, Service Pack 1, the attachment service comes as part of this installation. When you install it, you can go in through the Install Wizard, select 'Attachment Service' and install it. By default, it gets installed as a service on that same physical box. That attachment service can service up to four BlackBerry Enterprise Server instances within that particular box.

Having learned of the potential performance impact of the attachment service, some companies asked for the ability to push it out on another box in case they needed to dramatically scale the number of users and therefore wanted to offload performance onto another box. When we rolled out the attachment service, we did not expose the user interface. The administrator never had the ability to configure the attachment service (for example, the cache size, the types of attachments and what distillers are being used). In

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3.6 SP1 and SP1a we added the ability to configure the installation of the attachment service on a stand-alone server—without requiring an extra SRP key.

In addition, we introduced the attachment service configuration tool, which enables the configuration and testing of the attachment service and the attachment service connector. For example, we now have the ability to pull a variety of attachment types (such as Word documents, Adobe PDF files and Power-point presentations) and test them when you install the attachment service connector. This will give you a good idea of how the user will view the attachment and in what format.

As for best practices for server and desktop upgrades, you should have an implementation plan for full version upgrades—and you should test this plan before implementation. This plan should include the option to back out of the upgrade if necessary. It should be done in a test environment that closely mirrors the production environment. It is a good idea to keep the upgraded test environment available for Service Pack and half-fix testing.

As part of the process of redeploying a handheld, it makes sense to remove the user from the BlackBerry Enterprise Server. First, delete those user accounts and then reload the handhelds and run the handheld cleanup utility on the BlackBerry Enterprise Server itself.

We normally do not recommend using the backup-and-restore function that comes with desktop manager to wipe out the contents of the handheld. If your users are using the BlackBerry Web Client and they turn the handheld in to you, you must make sure you disable the BlackBerry Web Client for that particular user. You can have the user log in to the BlackBerry Web Client account and delete the PIN or you can reassign that particular web client account to another user, provided that the company has ownership of that user's personal web client account. In most cases however, the web client account is a personal one, and the Administrator can implement an IT policy, preventing the functionality of the BlackBerry Web Client. Another option is to go through the carrier and have that particular account disabled.

Backup and disaster recovery best practices

BlackBerry is one of the easiest solutions to back up and restore in your own environment. One option is to have a standby server configure backup and have

it on standby or ghost the server image where you could restore it at a later time if needed. You can also have backup software back up the entire server and then use the restore function whenever you need to restore the components of the BlackBerry Enterprise Server.

From an Exchange perspective, all the information within the Exchange server comes in two main areas: the BlackBerry Enterprise Server administrator mailbox and the user mailbox. Typically you must do Exchange backups; otherwise, you're setting yourself up for much bigger trouble. If you're already doing that, then you're all set. If a corruption occurred, you could simply do a restore and then the mailbox will be restored. Thus, the user does not have to re-cradle and then regenerate the Triple-DES encryption key, etc.

To make it easier for administrators we have introduced the BlackBerry Backup Utility. It allows you to back up the entire BlackBerry-related configuration on your BlackBerry Enterprise Server, as well as within the mailbox of the BlackBerry Enterprise Server administrator and the user mailbox. So if you re-created the user mailbox and restored files using the BlackBerry Backup Utility, then you should have all the user configuration settings including the Triple-DES encryption key within that particular mailbox.

Since we use the SQL database to manage the BlackBerry environment, it is critical that you back up the SQL database. It is straightforward to schedule a backup job within SQL Server to do just that. If you're using the MSDE database, you don't have to deploy backup software to do it. You can simply write a batch file and do "net stop MS SQL server", copy the data into another directory and then "net start MS SQL Server" again, and then you could schedule that using the schedule service within the BlackBerry Enterprise Server machine.

In the worst case scenario, if you lose the SQL database, the BlackBerry Enterprise Server will continue to work because it's a service running MAPI and communicating with Exchange. The only thing you won't be able to do is manage your BlackBerry Enterprise Server environment, so you won't be able to open your MMC or push IT policies down to your users.

As for disaster recovery BlackBerry Enterprise Server best practices, if you have an accidental user BlackBerry Enterprise Server administrator mailbox deletion corruption, you can restore from your Exchange backups or you can remove and re-add users to the BlackBerry Enterprise Server. If your BlackBerry Enterprise Server administrator mailbox

is gone, you can recreate the BlackBerry Enterprise Server administrator mailbox, start the MMC and add all the users in. It does not require your users to re-cradle their handhelds. If you have to change the service account that is using the BlackBerry Enterprise Server administrator mailbox, you can do that by contacting BlackBerry Technical Support. We do not recommend that customers attempt this on their own.

In the case of SQL database crash corruption, restore the database from backup or in the worst case recreate from the SQL database from scratch. The only thing missing will be the IT policies that you've enabled. If you have two or three policies, you would have to reconfigure them manually if you do not have that particular database backed up. And then finally in the case of a BlackBerry Enterprise Server hardware crash, you could bring it up, restore it from a ghost image or use that standby server.

Debug log maintenance

Debug log file support depends on the debug log files for issue resolution. You will want to ensure that the logs are not set with a size limit, otherwise the logs will overwrite themselves. The BlackBerry Enterprise Server can be configured to delete these logs or delete logs that are older than a certain number of days. Generally we recommend you keep seven days' worth of logs. With disk space being cheap, you should be able to keep more than seven days in most cases. As the administrator, you have the ability to modify these parameters on the BlackBerry Enterprise Server.

The BlackBerry Enterprise Server management has its own logging console. Here, you can put in the length of time to keep the log file, the location of the log and the log message levels as well as the maximum log file size. This is important because if you want to find out what went on (such as adding or deleting a user), this log file keeps track of what you're doing.

In terms of what a debug log format looks like, the event ID number indicates the severity of the entry. The 10,000 is the error condition; 20,000 is a warning; 30,000 is informational; and 40,000 is a debug level. Typically you should have the 40,000 level enabled so you can capture detailed debug information about what's occurring within your environment.

The thread ID refers to the particular thread (ie., what it is doing). It is opening a mailbox, scanning a mailbox, etc. The description gives you insight into

what that thread is doing at any unit of time. Figure 2 gives an example of reading the debug log file. Number 1 shows that new mail has arrived for the user and the BlackBerry Enterprise Server has received the MAPI notification. In numbers 2 and 3 for this john@company.com, the BlackBerry Enterprise Server goes back and retrieves the information on the message including the filtering criteria. In number 3, the reference ID and the entry ID for the message are marked and the message is queued and each message that gets retrieved will get a unique reference ID. Number 4 shows the messages being submitted to the BlackBerry Infrastructure. This is based on a tag ID and it's stored in a queue in memory on the BlackBerry Enterprise Server. That allows the BlackBerry Enterprise Server to communicate with the BlackBerry Infrastructure and to identify acknowledgements of messages that have been sent and received.

Number 6 (above) shows the data transfer to the wireless network. Number 7 shows the handheld has received the message and sends an acknowledgement back to the wireless network. Finally, in number 8, the BlackBerry server receives an acknowledgement back from the network verifying that the message made it to the handheld and the BlackBerry server decrements this message from the queue. This is critical for an administrator to learn because this is how you would begin to troubleshoot a problem and discover what's going on in your environment.

Common BlackBerry Enterprise Server for Microsoft Exchange support issues

One of the most common BlackBerry Enterprise Server for Microsoft Exchange support issues is where you get an "unable to open the database" message. This is an MMC console error. Typically, the cause of this situation is the BlackBerry Enterprise Server Management Console is attempting to connect to a BlackBerry Enterprise Server management database that does not currently exist, or the ODBC connection from the BlackBerry Enterprise Server to the back-end SQL server (where the BlackBerry Enterprise Server management database resides) is not configured properly or may have been deleted. If that ODBC connection is not occurring, you'll get an error message and you won't be able to open that particular database. Typically, the resolution is to recreate the database. You can go through the installation guides to do that or you can make sure that your ODBC connections are properly configured to your SQL server in the back-end.

Reading the Debug Log File

Message flow

1. [40423] (04/15 11:20:04):{0xEC0} {john@company.com} Queuing new mail through notification (external). EntryId=527

   [40724] (04/15 11:20:04):{0xFB8} {john@company.com} Get record key for this MAPI object, EntryId=527

2. [40435] (04/15 11:20:04):{0xFB8} {john@company.com} Queuing new mail through notification. EntryId=527. Msgs Pending 0

   [30085] (04/15 11:20:04):{0xFB8} {john@company.com} New mail has arrived, EntryId=527

3. [40287] (04/15 11:20:04):{0xFB8} {john@company.com} Queuing message, RefId=-1462745970, FolderId=-3, EntryId=527

   [30066] (04/15 11:20:04):{0xFB8} Total Msgs Pending 1

   [40140] (04/15 11:20:04):{0xFA8} Encrypting using key ID 04D72D2E7+G+2

4. [30081] (04/15 11:20:04):{0xFA8} {john@company.com} Sending message to device, size=230, EntryId=527, RefId=-1462745970, TransactionId=-1097138327, Tag=62

5. [40279] (04/15 11:20:04):{0xFA8} {john@company.com} SubmitToRelaySendQ, Tag=62

6. [40000] (04/15 11:20:04):{0xF0C} [SRP] Send data, Tag=62

7. [40000] (04/15 11:20:07):{0xF08} [SRP] Received status DELIVERED, Tag=62

   [30096] (04/15 11:20:07):{0xFA8} Total Msgs forwarded to Handhelds 26

8. [30097] (04/15 11:20:07):{0xFA8} {john@company.com} Message has been delivered to device, Tag=62, EntryId=527

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Figure 2

Another common issue is handhelds that cannot browse Internet pages after recently deploying Mobile Data Service. That problem can be related to few things. The particular port that the BlackBerry Enterprise Server with Mobile Data Service has to bind to may be not binding properly. The Mobile Data Service may not be enabled and thus the IPPP service book cannot be pushed to the handheld. It is important to remember that when you enable Mobile Data Service, you enable it on the server "for the server" and then you enable it "per user". When you enable it per user, the user has to cradle the handheld so that that IPPP service book gets pushed down to the handheld. Once it gets to the handheld, the user will get an icon (the BlackBerry Browser) and then they have the ability to browse using Mobile Data Service.

Another common error is where the user attempts to access unsupported content on the handheld. For example, BlackBerry does not currently support JavaScript on the handheld itself. So if you attempt to access an Internet or intranet page that executes Java code on the handheld, you will get an error message. One other common error is when you browse through a proxy server, whether in your intranet or Internet, and Mobile Data Service has not been configured properly with your proxy server.

Another issue is a user who does not appear after re-adding the BlackBerry server or the user has to re-cradle the handheld. The cause of that is you have re-added the server with the incorrect server name or you have removed the server prior to mailbox migration. This issue crops up often when you are adding or creating a new BlackBerry Enterprise Server administrator mailbox. As you are entering the BlackBerry Enterprise Server name itself, it is common to enter the wrong server name, which will cause this particular issue. Typically, you'll need to export the list of users and the server configuration prior to this migration and then you'll want to point the MAPI profile to the new mailbox. You do not want to remove the old mailbox name from the server itself. You typically want to move it out of the BlackBerry Enterprise Server management database by editing the appropriate SQL table, and then you can re-add the BlackBerry server into the Exchange extensions or the MMC and then import the text file of the users.

With remote BlackBerry Enterprise Server administration, common issues include: unable to initialize MAPI profile, unable to open database and unable to display routing group. Typically, this situation indicates insufficient Exchange permissions on the

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BlackBerry Enterprise Server administrator mailbox, insufficient SQL permissions to the BlackBerry Enterprise Server management database, or insufficient permissions to the Exchange routing group itself. This is self-explanatory and you should be able to resolve that by resolving the permissions.

There are some common issues related to CDO. These include sporadic wireless calendar synchronization or unable to accept meeting request. Typically there are two main causes: either incorrect Exchange permissions or an incorrect CDO.dll version, depending on the version of CDO.dll that you have running in your environment.

Finally there are the MAPI-related issues. For example, a common scenario is that MMC statistics do not get updated. The BlackBerry Enterprise Server crashes on the MAPI subsystem, receiving specific service errors like 5302 or 5303. This typically occurs when there's only one MAPI profile that is being used for the BlackBerry Enterprise Server service and the MMC or the MAPI subsystem on the BlackBerry Enterprise Server is corrupt. Reinstalling MAPI on that particular BlackBerry Enterprise Server, should solve the problem.

The final scenario is an MMC-restricted permission mode. Many people have asked about this. Administrators want to provide limited BlackBerry Enterprise Server access to their help desk without having to use the administration client. You can get a tool called a "setadminkey" from our support personnel, who will show you how to install and configure it within your environment. That will give your help desk user the ability to add users, delete users, import information, and the like. This is very limited, and it would not disable BlackBerry server properties or Mobile Data Service properties.

About BlackBerry

The BlackBerry enterprise solution is a leading wireless connectivity solution that provides corporations with a secure[1], open platform for extending wireless communications and corporate data applications to mobile users. BlackBerry Enterprise Server software tightly integrates with existing enterprise systems, allowing integrated wireless access to a range of business information.

The BlackBerry enterprise solution includes the following features:

- Secure wireless extension of the corporate messaging environment

- Secure wireless access to corporate data (through push or pull technology)

- 'Always On Always Connected®' push technology, providing immediate access to corporate data, email, calendar, and global address list

- Over the Air (OTA) synchronization of email and calendar items

- Integration with existing enterprise systems

- Simplified management and centralized control of the wireless environment

- Multi-network and multi-device support

- Global deployment capabilities[2]

- Automated desktop software deployment (using an existing software distribution process or the silent installation process)

- Powerful development environment and open architecture for third-party and in-house solution development[3]

- Advanced wireless handhelds include phone, email, corporate data, browser, SMS, and organizer applications

For more information

RIM offers a number of different resources to learn more about wireless solutions in general and BlackBerry in particular.

The web site www.BlackBerry.com is a good first place to start. The site features a developer's forum www.blackberry.com/developers/forum/index.jsp and is used by application developers around the world. RIM also offers BlackBerry reference documents on a variety of topics. The Technical Knowledge Center www.blackberry.com/support/index.shtml on the site can help you get answers to particular questions.

The network provider web sites are another good resource for information on what the carriers offer for BlackBerry and what their coverage is. It is a good idea to speak to a carrier sales representative.

[1] End-to-end Triple DES encryption from enterprise mailbox to handheld when operating BlackBerry Enterprise Server software.

[2] Check with service provider for availability, roaming arrangements and service plans. International roaming may be subject to network and export control restrictions.

[3] Additional application development or third party software may be required. Some restrictions may apply to third party software, such as service provider support and license conditions. RIM shall in no way be liable for any third party software or your use of such software.

All carrier sales teams have access to additional RIM resources. They can come to your site and help you answer any of your questions about BlackBerry.

There is also an archive of BlackBerry web seminars on the web site at www.blackberry.com/news/ events/web_seminars_archive.shtml.

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