

The background of the slide features a blurred, blue-tinted image of several people in business attire, suggesting a professional or corporate environment. The figures are out of focus, with the one on the right being slightly more prominent.

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BlackBerry Technical Series



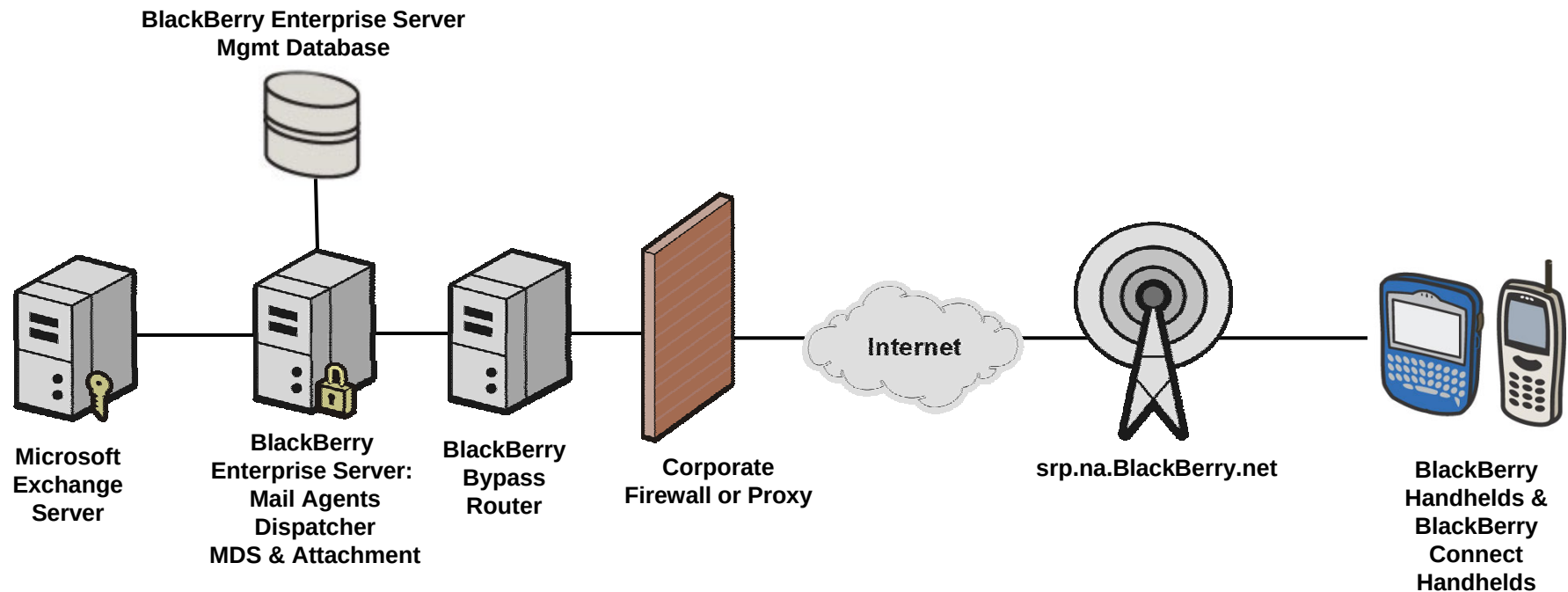
Objectives

- Provide an understanding of how the BlackBerry® solution operates with specific emphasis on those components that present as critical points of failure
- Provide an overview how component failure manifests itself in terms of lost functionality
- Provide planning suggestions on how to mitigate the risk of specific component failure scenarios
- Provide an overview of Best Practices for deploying BlackBerry Enterprise Server™ with the goal of extending availability

Agenda

- Architecture review
- BlackBerry solution components
- Backup best practices
- Extending availability
- Future BlackBerry Enterprise Server v4.0 considerations

Architecture Review



Solution Components

- BlackBerry Enterprise Server (Server and Service)
- BlackBerry Bypass Router
- BlackBerry Service Account and Service Account Mailbox
- BlackBerry Enabled User Mailbox
- BlackBerry Wireless Gateway (SRP Connectivity)
- BlackBerry Management Console
- BlackBerry Enterprise Server Mgmt Database

Solution Components: BlackBerry Enterprise Server

- Hosts the BlackBerry Enterprise Server, Mail Agents, Dispatcher, BlackBerry Router*, BlackBerry Mobile Data Service (MDS)* and BlackBerry Attachment* Services
- Contains critical registry information required to start these services
 - MAPI Profile Information (Server Startup, Access to Service Account Mailbox)
 - Server Name (Server Startup i.e. BES01)
 - Network Access Node (srp.xx.blackberry.net / Proxy address)
 - Port number (firewall access)
 - BlackBerry Service Account User Profile (user context within Microsoft® Exchange and Windows® AD)
- MAPI/CDO Subsystem for Exchange connectivity

Solution Components: BlackBerry Enterprise Server

- Failure Considerations
 - Server failure will result in a loss of all communication and data redirection to the BlackBerry enabled user community associated with that BlackBerry Enterprise Server
- Risk Mitigation Considerations
 - Backing up and restoring from tape is an option but could take longer than reinstalling
 - Documentation is key! Document installation parameters and incremental changes thoroughly and have them stored in more than one location
 - Cold Standby or redundant instance on separate server is also an option (more detail later in this presentation)

Solution Components: BlackBerry Service Account and Service Account Mailbox

- Service Account
 - Provides the user context under which the BlackBerry Service runs
 - Required during installation/reinstallation
- Service Account Mailbox
 - Contains information critical to the startup and operation of the BlackBerry solution
 - Initial MAPI connectivity for BlackBerry Enterprise Server
 - Address lookups performed through this mailbox connection
 - Name/Address resolution for std BlackBerry Enterprise Server operations completed through this mailbox connection

Solution Components: BlackBerry Service Account and Service Account Mailbox

- Failure Considerations
 - Loss of service account results in loss of user context, resulting in service login/startup failure
 - Loss or changes to service account permissions (Windows/Exchange) can have an equally negative affect on service
 - Loss or corruption of service account mailbox results in loss of Address resolution (non Ldap configs) and may have a performance impact.
- Risk Mitigation Consideration
 - Backing up and restoring the Service Account Mailbox is largely irrelevant with the movement of information to the SQL database
 - Documentation of permissions for the service account and procedures for applying are critical to a full system restoration
 - Recovery from a mailbox loss can be quickly done by recreating a new mailbox and associating the MAPI profile with it

Solution Components: BlackBerry Enabled User Account Mailbox

- Accepts inbound MAPI/CDO connections from BlackBerry Enterprise Server Mail Agents for:
 - Sending/receiving new email to/from user's BlackBerry handheld
 - Email reconciliation (read, deleted, moved messages)
 - Sending/receiving/updating calendar appointments
- Contains information critical to the startup and operation of a BlackBerry enabled user
 - Encryption keys
 - Filter information
 - Redirection State
 - Service UID / Routing UID (Service Book information)
 - Calendar/Folder/Email Sync State information
 - Statistics and Status information

Solution Components: BlackBerry Enabled User Account Mailbox

- Failure / Impact Consideration
 - Loss or corruption of a users mailbox will result in a loss of BlackBerry redirection for that specific user
 - Could temporarily impact BlackBerry Enterprise Server performance for some BlackBerry Enterprise Server users
 - Exchange backup and restore procedures often happen on an information store basis, as such recreation of the users mailbox often precedes restoration of legacy data from tape.
 - Restoration of BlackBerry hidden folder information is required in order to restore BlackBerry services for the user

Solution Components: BlackBerry Enabled User Account Mailbox

- Risk Mitigation Considerations
 - Backup of the user's mailbox at an information store level backs up all information including any hidden folder information associated with BlackBerry. Recovery of a mailbox from an information store backup can be time consuming, prolonging the loss of service to the end user.
 - Backup of a users mailbox at a brick level (i.e. individual selection of the mailbox) can speed the recovery time, but does require attention to detail so as to include the hidden folder information associated with BlackBerry
 - In the absence of a timely Exchange mailbox recovery strategy
 - Recreate the users mailbox
 - Re-add the user to the BlackBerry Enterprise Server
 - Re-cradle the user and regenerate the users encryption key
 - BlackBerry Backup Utility should provide a facility to backup and restore the information from hidden folders containing BlackBerry information

BlackBerry Bypass Router

- Provides pass through routing gateway for the BlackBerry dispatch service to route traffic to srp.xx.BlackBerry.net
- Provides the gateway for least cost routing connectivity from user desktops
- Can be placed in a DMZ as part of a more “security” sensitive configuration.
- Failure / Impact Considerations
 - Loss of this component terminates the SRP connection to relay, suspending all message flow to or from the BlackBerry handhelds
 - Loss of this component terminates the user communities ability to utilize least cost routing.
 - Loss of this component would impact future WIFI enabled BlackBerry components that will rely heavily on this component.

BlackBerry Bypass Router

- Risk Mitigation Considerations

- Restoration of this service can be done manually very quickly through a reinstallation
- For configurations that utilize the BlackBerry Router in a DMZ, documentation on firewall rules should be kept close by in the event that a new server with different IP/MAC address is required for restoration
- Creating more than one BlackBerry Router in larger environments provides additional exit points for the dispatcher
- Develop procedure for switching dispatcher to a different BlackBerry Router in the event of a failure
 - HKLM\Software\Research In Motion\BlackBerry Enterprise Server\dispatcher\NetworkAccessNode and TCPPort
 - Change is picked up by the IT policy server (~2 minutes max) and generates updated service books to be sent to the handheld
- Dispatcher connect directly to relay without the BlackBerry Router, as such connecting direct may also be an option but does impact LCR and DMZ configurations

Solution Components:

BlackBerry Wireless Gateway (SRP Connectivity)

- Wireless gateway through which all BlackBerry Enterprise Server SRP traffic must flow
- Configuration information
 - SRP ID/Authentication key stored in the BlackBerry Enterprise Server Mgmt Database
 - Network Access Node (srp.xx.blackberry.net / proxy address) stored in the BlackBerry server registry (Dispatcher and BlackBerry Router(s))
 - Port number (default 3101) stored in the BlackBerry Enterprise Server registry (Dispatcher and BlackBerry Router(s))
 - Internet connectivity required
 - DNS required
 - Firewall / Proxy configuration typically required to enable outbound connectivity to network access node on port 3101.
 - BlackBerry Router in a DMZ could more complex configurations for the Firewall

Solution Components: BlackBerry Wireless Gateway (SRP Connectivity)

- Failure Considerations
 - Loss or corruption of either the BlackBerry Enterprise Server registry or BlackBerry Enterprise Server Mgmt database has the effect of impacting the ability to establish SRP connectivity
 - SRP ID and Authentication key is unique to the BlackBerry Enterprise Server and the associated users. Duplication of an SRP ID / Authorization key from a second server in the event of loss is not possible and will result in the second key becoming disabled. (5 in 5 Rule)
 - Loss of firewall or proxy configuration can result in a loss of all data redirection for all BlackBerry Enterprise Servers
 - Loss of Internet connectivity will result in a loss of all data redirection for all BlackBerry Enterprise Servers
 - Inability to resolve the IP addresses for `srp.xx.blackberry.net` will result in the servers inability to establish an SRP connection, resulting in a loss of data flow for all BlackBerry Enterprise Servers

Solution Components: BlackBerry Wireless Gateway (SRP Connectivity)

- Risk Mitigation Considerations
 - See all considerations regarding the backup and restoration of the BlackBerry Enterprise Server as well as the BlackBerry Enterprise Server Mgmt database
 - Document firewall / proxy configurations and procedures with respect to BlackBerry connectivity
 - Use FQDN for srp.xx.blackberry.net vs. an IP address when possible as it provides a degree of redundancy in terms of multiple IP addresses
 - Periodically check the IP addresses for SRP.XX. blackberry.net and have them available, creating a temporary host file can provide a quick recovery from DNS failure

Solution Components: BlackBerry Management Console and BlackBerry Enterprise Server Mgmt Database

- BlackBerry Management Console is the primary interface through which all BlackBerry administration is performed.
- The BlackBerry Enterprise Server Mgmt database is used to store information related to:
 - BlackBerry Enterprise Server Configuration and Statistics
 - BlackBerry Mobile Data Service configuration information critical to the operation of this service
 - BlackBerry IT Policy configuration information critical to the operation of this functionality

Solution Components: BlackBerry Management Console and BlackBerry Enterprise Server Mgmt Database

- Failure Considerations
 - Loss, corruption, or general unavailability of the BlackBerry Enterprise Server Mgmt database will cause the following
 - Loss of the ability to restart the BlackBerry Enterprise Server, restarting during a failure would result of a suspension of all data flow until the database was restored
 - Inability to perform BlackBerry Enterprise Server administration
 - Inability to start the Mobile Data Service
 - Inability to perform push data functionality using the Mobile Data Service (loss of email to PIN mappings)
 - Inability to perform IT Admin command or submit IT Policy changes/updates

Solution Components: BlackBerry Management Console and BlackBerry Enterprise Server Mgmt Database

- Risk Mitigation Considerations
 - Perform a regular Backup of the MSDE/SQL server database using the SQL Administration tools
 - RIM is going to provide backup tools specifically to backup the MSDE/SQL database
 - Although not supported as an active active fail over mechanism, having the database replicated one way to another database server provides a quick way to recover in the event of a database failure
 - Use the BlackBerry Enterprise Server configuration tool to point the BlackBerry Enterprise Server at a different (backup) database
 - Documented procedures for recovery of the database should be created and stored in multiple locations
 - <http://www.microsoft.com/sql/msde/partners/default.asp>

Best Practices for Backups:

- Backups
 - Windows® Operating System and BlackBerry Services
 - Ghost, NT Backup
 - Integrate with your existing operations procedures
 - BlackBerry Enterprise Server Mgmt MSDE/SQL Data
 - SQL Enterprise Manager
 - Consider one way SQL Replication
 - BlackBerry Service Account Mailbox
 - Captured as part of Exchange backup
 - Regular backup using the BlackBerryBackUp.exe utility
 - BlackBerry Enabled User Mailboxes
 - Captured as part of Exchange IS backups
 - Brick level back ups if your utility supports hidden folder capture
 - BlackBerrybackup.exe

Best Practices for Backups: BlackBerryBackup.exe command usage details

- Provides administrators the ability to backup critical BlackBerry configuration information from the BlackBerry service account mailbox into a password protected file
- BlackBerryBackup.exe
 - 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
 - p [-i] [-o]: prints out user information to file from specified input file

Best Practices for Backups : BlackBerryBackup.exe command usage details

- C:>\Blackberrybackup.exe -b -o backup.txt
 - This will backup an entire BlackBerry Enterprise Server to backup.txt
- C:>\Blackberrybackup.exe -p -i bes.txt -o print_bes.txt
 - this will create a printable version of the data in bes.txt and output it to print_bes.txt
- C:>\BlackBerryBackup.exe -u -o jsmith.txt -d jsmith
 - This will back up the associated information for user jsmith into a file with the name jsmith.txt
- C:>\BlackBerryBackup.exe -u -l jsmith.txt

Subject to some change with the addition of BlackBerry Enterprise Server v4.0 functionality.

Extending Availability: BlackBerry Enterprise Server v4.0

- Two Scenarios
 - Cold Standby configured exactly the same as the current BlackBerry Enterprise Server, pointing to the same BlackBerry Enterprise Server Mgmt database or a replicated copy of the database*
 - Users distributed across multiple BlackBerry Enterprise Server with excess capacity enough to service the users of one or more BlackBerry Enterprise Server in the event one or more servers fail.
 - Requires users to be manually moved from one BlackBerry Enterprise Server to another
 - Requires BlackBerry Enterprise Server be on the same database and the database be available
 - Requires an update to the service books on the handheld in order to work (which requires BlackBerry handheld software v4.0)
 - Native BlackBerry Enterprise Server v4.0 only mode
 - Previous multi-instance scenarios must be cleaned up before moving to one of the above strategies

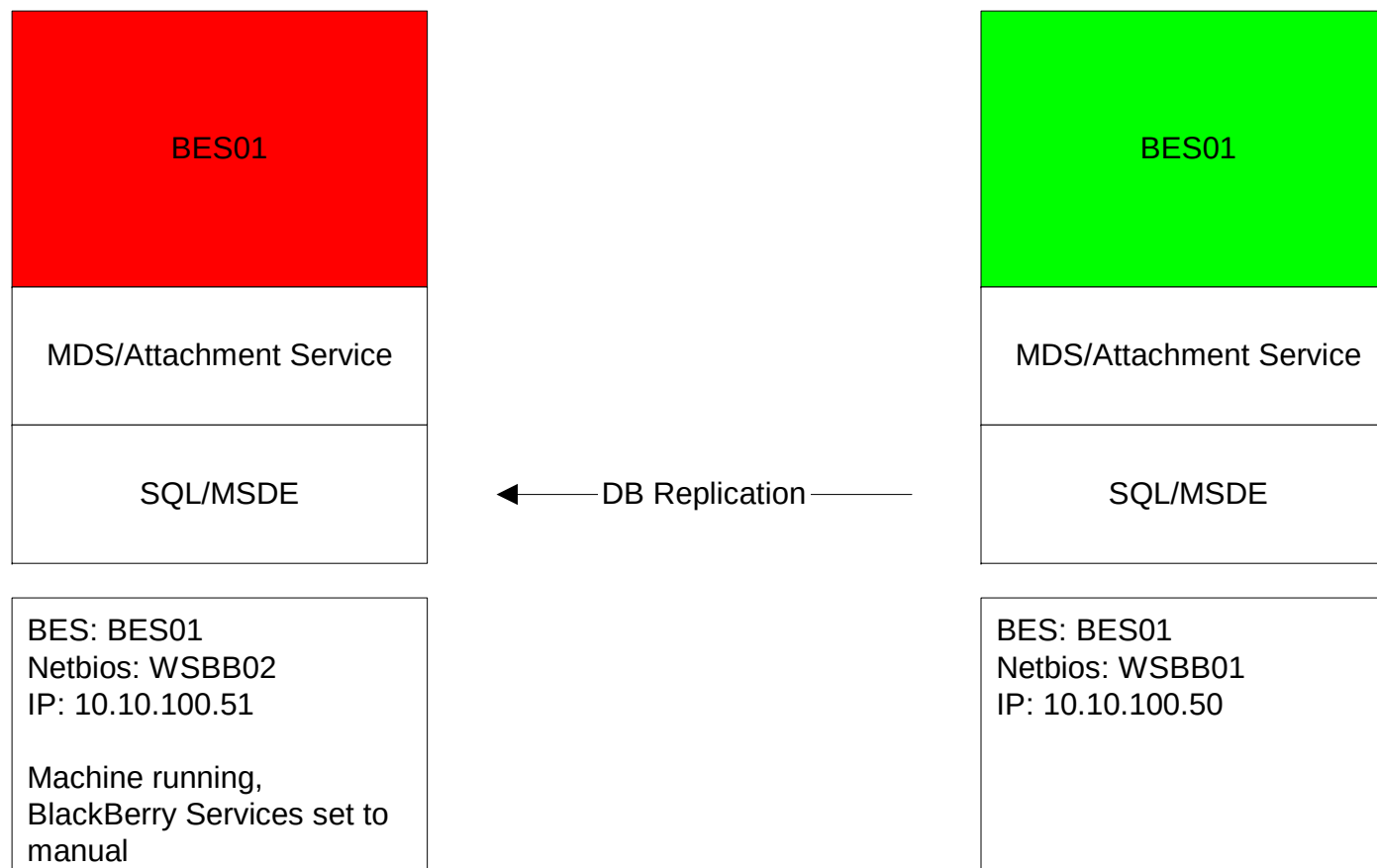
Extending Availability Scenario One : BlackBerry Enterprise Server v4.0 Failover Configuration

- Provision a standby server
- Document your settings for all critical components as per previous sections
- Use monitoring tools to alert to outages
 - NetIQ, SNMP, others
 - Manual or Automatic failover
 - Be careful services on both machines are never started at the same time
- Create and communicate disaster policies
 - Reduced functionality due to circumstance
 - No Attachment Service, No MDS...

Extending Availability Scenario One: BlackBerry Enterprise Server v4.0 Failover Configuration

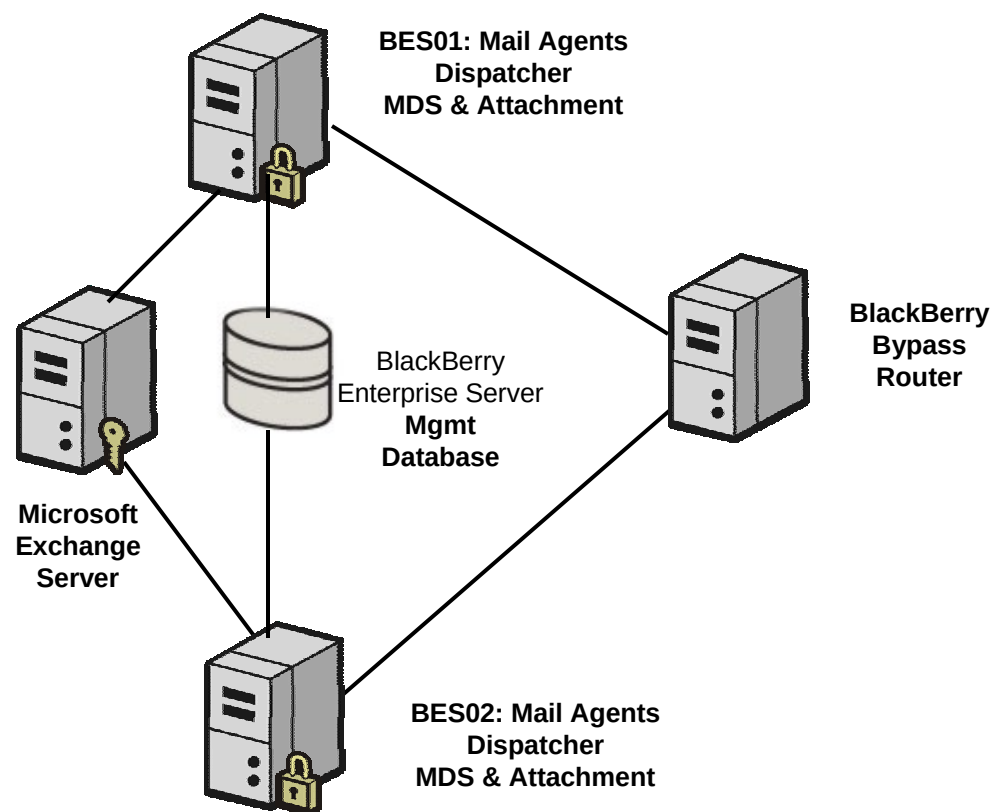
- Standby server can be fully operational and actually running on the network with BlackBerry services stopped
- Netbios name of the standby server is not important
- IP Address of BlackBerry Enterprise Server and Standby are important insofar as they both must be permitted to initiate SRP connections via the firewall
- MAPI Profile is not required to be the same
- The following information is critical to be exactly the same on both the primary and standby BlackBerry Enterprise Servers
 - BlackBerry Enterprise Server name (i.e. “BES01”)
 - BlackBerry Service Account Mailbox (i.e. “BESAdmin”)
 - SRP ID and Auth key

Extending Availability Scenario One: BlackBerry Enterprise Server v 4.0 Failover Configuration

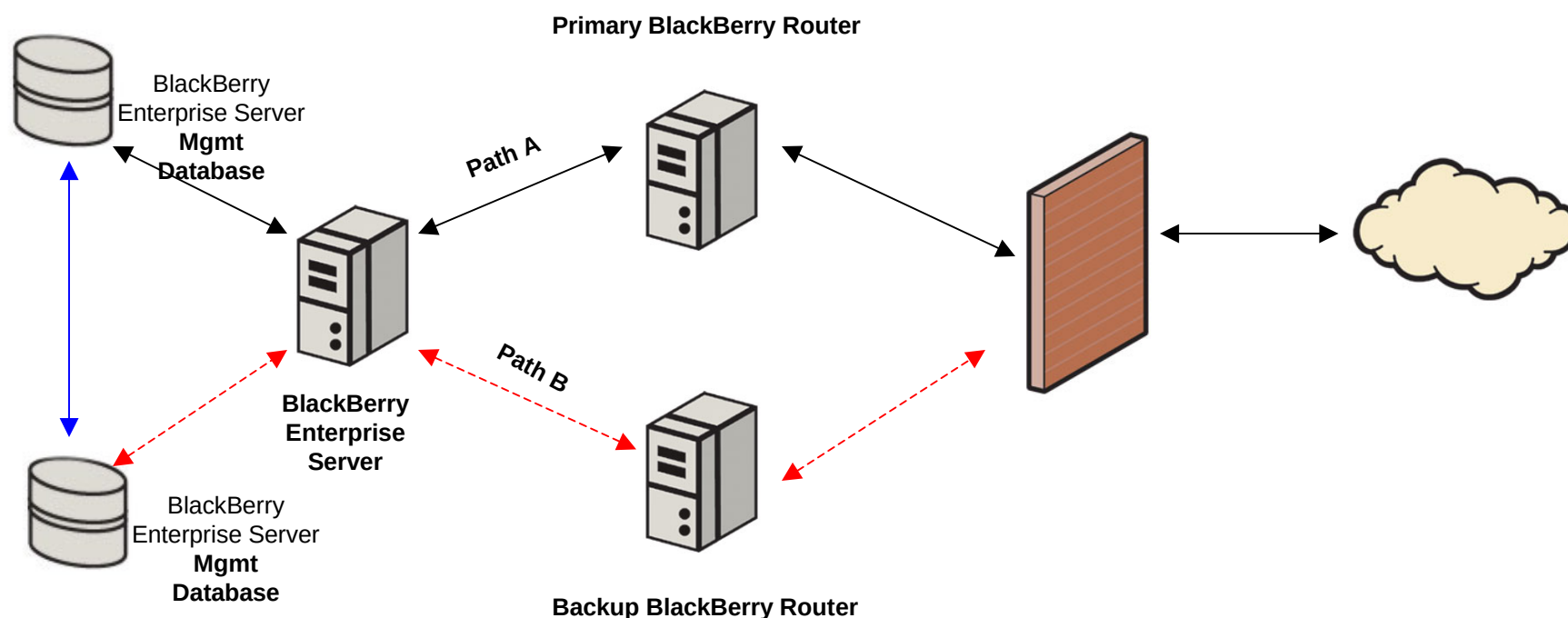


Extending Availability Scenario Two: BlackBerry Enterprise Server v4.0 Failover Configuration

- User density limited by strategy of failing over users
- Users from BES01 could be moved upon failure to BES02
 - BES02 would have to have sufficient capacity to accommodate the extra load
- Requires manual move* and update of the service books by the IT Policy service



Extending Availability: BlackBerry Bypass Router / BlackBerry Enterprise Server Mgmt Database



Extending Availability: BlackBerry Bypass Router / BlackBerry Enterprise Server Mgmt Database

- **BlackBerry Router**
 - Update registry entries to reflect new BlackBerry Router
 - Will generate update to BlackBerry Enterprise Server Mgmt database as well as update to service books on the devices associated with that BlackBerry Enterprise Server
- **BlackBerry Enterprise Server Mgmt Database**
 - Replication must be one way
 - Update BlackBerry Enterprise Server to reflect new database location using BlackBerry Enterprise Server Configuration Tool

Extending Availability

Detecting Failure conditions

- BlackBerry Enterprise Server includes a new application called the BlackBerry Controller
 - Ability to detect an inactive BlackBerry Enterprise Server service and restart the service
 - Ability to detect non responsive thread conditions and take action based on a pre-configured set of parameters
 - Number of health checks to wait before a restart is triggered in the event of a non responsive thread
 - Time intervals when a restart should not be triggered as a result of a non responsive thread
 - Restart in the event of a crash

Extending Availability

Detecting Failure conditions

- Third party monitoring tools such as NetIQ offer the ability to monitor the status of the BlackBerryServer.exe service
 - Based on the status of the process alerts can be configured and actions taken
 - Actions might include
 - Restart the service if it is stopped
 - Stopping the service on the primary server and starting the corresponding service on a secondary server

BlackBerry Enterprise Server v.4.0 Server planning / Architecture Considerations

- Significant changes to SQL server role and criticality
 - BlackBerry Service Account Mailbox information will be stored in the SQL server database
 - BlackBerry Service must communicate with BlackBerry Enterprise Server Mgmt database in order to start up and operate
 - SQL server becomes a critical component for the delivery of all data to the BlackBerry enabled user community
- Size of BlackBerry Enterprise Server Mgmt SQL server database to increase
 - ~100MB + 1MB per user
 - 500 user configuration = 600MB
 - 5000 user configuration = 5.1 GB
 - Replication, backup and restore times are a consideration
- Larger configurations may require SQL server vs. MSDE

BlackBerry Enterprise Server v4.0 Considerations

- Wireless Provisioning (requires BlackBerry Enterprise Server v4.0 and BlackBerry handheld software v4.0)
 - Move users between servers without having to physically re-cradle
 - Re-provision users on recovered servers without having to re-cradle
- Existing cross over failover strategy previously described will not be supported in BlackBerry Enterprise Server v4.0 (multiple instances)

Review

What constitutes a disaster for BlackBerry?

- The loss of a system component that if not recovered restricts the flow of data to/from the BlackBerry handhelds
 - BlackBerry Enterprise Server Services (dispatcher, mail agents, BlackBerry Router)
 - BlackBerry Service Account
 - BlackBerry Service Account Mailbox
 - Internet Connectivity (routing, firewall/proxy, carrier)
 - DNS Name Resolution
 - Exchange / Windows components

Review

- Most important things to consider when planning disaster recovery
 - Hidden folder information for the end user (BlackBerry Backup or Exchange backup).
 - Recovery from a server hardware failure (i.e. provision standby server, reprovision/move users)
 - Detection and action on a failed service (NetIQ Integration, BlackBerry Controller installation)
 - Recovery of the BlackBerry Enterprise Server Mgmt database (SQL Server Backup, one way Replication)

Review

- Questions