

BlackBerry Mobile Voice System

Version: 5.0 | Service Pack: 2

Planning Guide



Contents

1	Overview.....	2
2	Requirements.....	3
	System requirements: BlackBerry MVS.....	3
	System requirements: Telephony environment.....	5
	System requirements: PBX.....	6
3	Planning your organization's Wi-Fi infrastructure.....	8
	Best practice: Planning your organization's Wi-Fi infrastructure.....	8
4	Planning a BlackBerry MVS installation.....	10
	Best Practices: Installing and configuring the BlackBerry MVS.....	10
5	Configuring call direction.....	12
	PBX-initiated calling.....	12
	BlackBerry device-initiated calling.....	12
6	BlackBerry MVS high availability.....	13
	Support for BlackBerry Enterprise Server failover.....	14
	Support for PBX failover.....	14
	How the BlackBerry MVS determines the health of MVS Session Manager instances.....	14
	Conditions for failover to a standby MVS Session Manager.....	14
	Scenario: What happens after the active MVS Session Manager stops responding.....	15
7	Glossary.....	16
8	Provide feedback.....	18
9	Legal notice.....	19

Overview

1

The BlackBerry® Mobile Voice System integrates your organization's PBX phone system with the BlackBerry® Enterprise Server to extend desk phone features to BlackBerry devices. The BlackBerry MVS is designed to do the following:

- Integrate with the phone application on BlackBerry devices so that users can make calls from and receive calls to your organization's work numbers
- Extend commonly used PBX features that are available from users' desk phones to their BlackBerry devices
- Provide simplified access to your organization's voice mail system
- Provide Voice over Wi-Fi® access to desk phone features for users of Wi-Fi enabled BlackBerry devices
- Extend the security features of the BlackBerry Enterprise Server to authenticate BlackBerry device users to the BlackBerry MVS and your organization's PBX phone system
- Permit you to manage the BlackBerry MVS from a single web administration console
- Incorporate the use of templates and classes of service to manage users' access to their work numbers and phone features
- Permit you to configure the BlackBerry MVS to support high availability to help enhance the consistency and reliability of your organization's BlackBerry MVS implementation

Requirements

2

System requirements: BlackBerry MVS

Item	Requirement
hardware	<ul style="list-style-type: none"> two Intel® Xeon® 2.0 GHz processors 4 GB RAM two drives that are configured as RAID 1 or better <p>For a computer that is running only the MVS Console, you require only one 2.0 GHz processor, and 2GB RAM.</p>
operating system	<p>Any of the following operating systems:</p> <ul style="list-style-type: none"> Windows Server® 2003 R2 SP2 Standard (32 bit or 64 bit) Windows Server 2003 R2 SP2 Enterprise (32 bit or 64 bit) Windows Server 2008 R2
BlackBerry® Enterprise Server	<p>Any of the following BlackBerry® Enterprise Server software:</p> <ul style="list-style-type: none"> BlackBerry® Enterprise Server 4.1 SP7 or later for Microsoft® Exchange BlackBerry Enterprise Server 5.0 or later for Microsoft Exchange BlackBerry® Enterprise Server 4.1 SP7 or later for IBM® Lotus® Domino® BlackBerry Enterprise Server 5.0 or later for IBM Lotus Domino BlackBerry® Enterprise Server 4.1 SP7 or later for Novell® GroupWise® BlackBerry Enterprise Server 5.0 or later for Novell GroupWise
data management system	<p>Any of the following data management systems:</p> <ul style="list-style-type: none"> Microsoft® SQL Server® 2000 with named pipes and TCP/IP network protocols turned on Microsoft SQL Server 2005 SP2 with named pipes and TCP/IP network protocols turned on Microsoft SQL Server 2008 with named pipes and TCP/IP network protocols turned on
browser	<p>Any of the following browsers:</p> <ul style="list-style-type: none"> Windows® Internet Explorer® 7 Windows Internet Explorer 8 with JavaScript® turned on Mozilla® Firefox® 3.5 or later
your organization's telephony environment	PBX vendor that is BlackBerry MVS platform-compliant
BlackBerry device	<p>Any of the following devices:</p> <ul style="list-style-type: none"> BlackBerry® Pearl™ 8100 Series

Item	Requirement
	<ul style="list-style-type: none"> • BlackBerry® Pearl™ 8220 smartphone • BlackBerry® Curve™ 8300 smartphone • BlackBerry® Curve™ 8310 smartphone • BlackBerry® Curve™ 8320 smartphone • BlackBerry® Curve™ 8330 smartphone • BlackBerry® Curve™ 8520 smartphone • BlackBerry® Curve™ 8530 smartphone • BlackBerry® 8700 Series • BlackBerry® 8800 smartphone • BlackBerry® 8820 smartphone • BlackBerry® Curve™ 8900 smartphone • BlackBerry® Curve™ 8910 smartphone • BlackBerry® Curve™ 8980 smartphone • BlackBerry® Bold™ 9000 smartphone • BlackBerry® Pearl™ 9100 smartphone • BlackBerry® Curve™ 9300 smartphone • BlackBerry® Curve™ 9330 smartphone • BlackBerry® Storm™ 9500 smartphone • BlackBerry® Storm™ 9530 smartphone • BlackBerry® Storm2™ Series • BlackBerry® Tour™ 9630 smartphone • BlackBerry® Bold™ 9650 smartphone • BlackBerry® Style™ 9670 smartphone • BlackBerry® Bold™ 9700 smartphone • BlackBerry® Bold™ 9780 • BlackBerry® Torch™ 9800 smartphone
BlackBerry® Device Software	<p>Any of the following BlackBerry Device Software versions:</p> <ul style="list-style-type: none"> • BlackBerry Device Software 4.5 or later for devices that operate on GSM® networks (Voice over Mobile support only) • BlackBerry Device Software 4.7.1 or later for devices that operate on CDMA networks (Voice over Mobile support only) • BlackBerry Device Software 5.0 or later for Voice over Wi-Fi® support and Voice over Mobile support • BlackBerry 6 for the BlackBerry Torch 9800
wireless service plan	<p>Any of the following features:</p> <ul style="list-style-type: none"> • data • voice (not required if you use only Wi-Fi to make and take BlackBerry MVS calls)

Item	Requirement
	<ul style="list-style-type: none"> caller ID
virtual environment (if applicable)	Any of the following virtual environment software: <ul style="list-style-type: none"> VMware® ESX® Server 3.5.0 VMware ESX Server 4.x
PDF file viewer	Adobe® Reader® 5.0 or later

System requirements: Telephony environment

Item	Requirement
DTMF	<p>Your organization's telephony environment must be able to perform the following actions:</p> <ul style="list-style-type: none"> detect and intercept DTMF tones from the cellular call leg between the PBX and BlackBerry® devices notify the BlackBerry MVS Server of the DTMF tones using KPML notification emit DTMF tones into the audio path when the BlackBerry® Mobile Voice System requests them send DTMF tones that are at least 100 milliseconds in duration to devices <p>If your organization's telephony environment includes components, such as a voice mail server, that receive DTMF tones from the BlackBerry MVS, the telephony environment must be able to present the DTMF tones in the correct format (for example, RFC 2833, in-band media, H.323).</p>
ANI number (Calling party)	<ul style="list-style-type: none"> The Calling Line ID of a received call identifies the BlackBerry MVS call that is presented to the device. The Calling Line ID must be configured in the MVS Console to match the ANI that your organization's telephony environment plans to use for all BlackBerry MVS calls. Any BlackBerry MVS calls that a device makes must use the ANI that you configured in your organization's telephony environment so that the called party can see the caller ID that is configured for the BlackBerry MVS user. If your organization has a hunt group that is configured in the PBX with multiple outgoing trunks, and each trunk has its own ANI number, you must type each ANI number in the MVS Console.
DID/DDI number (Called party)	<ul style="list-style-type: none"> If you configure your organization's BlackBerry MVS for BlackBerry device–initiated calling, you must configure a DID/DDI number in your organization's telephony environment. You configure the DID/DDI number in the MVS Console for each MVS Session Manager. The DID/DDI number is used to provision the user accounts that you configured for the device.

Item	Requirement
	<ul style="list-style-type: none"> In the class of service, make sure that you choose BlackBerry Smartphone > PBX for users that you want to use BlackBerry device–initiated calling. You must verify that a call that arrives at the DID/DDI number prompts the telephony environment to send a SIP invitation to the BlackBerry MVS over the telephony connector that has been configured between the telephony environment and the BlackBerry MVS.
voice mail server (if necessary)	If your organization uses solicited voice mail, the BlackBerry MVS requires a SIP line to your organization's voice mail server, which must be compliant with RFC 3842, so that a MWI displays on users' devices.

System requirements: PBX

Item	Requirement
KPML	The PBX must support KPML for the exchange of DTMF tones between the PBX and the BlackBerry® Mobile Voice System.
support for BlackBerry devices	<p>The device must be an endpoint for the PBX.</p> <p>G.729 is supported by BlackBerry MVS 5.0 and later. It is supported on all devices except for the BlackBerry® Bold™ 9000 device and devices that operate on CDMA networks.</p>
SIP line	<p>The BlackBerry MVS requires a SIP line be connected to the PBX so that the PBX can establish calls to devices.</p> <p>If you configure the BlackBerry MVS for high availability, you must configure a SIP line on each MVS Session Manager.</p>
SIP trunk	<p>The BlackBerry MVS requires that a SIP trunk be connected to the PBX so that the PBX can send calls to the mobile numbers on devices. When you configure the SIP trunk, you must provide the IP address and port number of the MVS Session Manager.</p> <p>If you configure the BlackBerry MVS for high availability, you must configure a SIP trunk on each MVS Session Manager.</p>
call routing patterns for internal numbers and external numbers	<p>The phone numbers that the BlackBerry MVS sends to the PBX are E.164 formatted numbers and might not contain leading digits to indicate how the PBX should route the call. You might need to configure the PBX so that the call routing patterns add or remove leading digits for routing to internal numbers or external numbers. For example, you should consider creating the following call routing patterns:</p> <ul style="list-style-type: none"> one that permits BlackBerry MVS users to make calls from the call log or contact list on their devices without adding 9 before a phone number

Item	Requirement
	<ul style="list-style-type: none"> • one that removes an NDD number from phone numbers that are dialed from devices if the BlackBerry MVS user is in the same geographic location as the PBX. The PBX should be configured to manage calls from devices if the user types (519) 555-0100 or (1) (519) 555-0100. • one for regions or countries that your organization's users frequently travel to <p>Ensure the Class of Service setting of "User may change the mobile phone number" is checked. When your organization's users are roaming internationally, it might be necessary for the users to manually change the mobile number on their devices to reflect what the PBX must dial to contact the user. For example, if the user is from the United Kingdom the mobile number on the user's device should be changed to include the IDD (00), the home country code (44), and the user's area code and local phone number. For more information on changing the mobile phone number on the device, visit www.blackberry.com/support to read article KB17940.</p>
DID/DDI number	<p>To configure device-initiated calling, you must configure your organization's call routing patterns so that the PBX can route the device-initiated calls that use a DID/DDI number to the MVS Session Manager that is associated with the DID/DDI number. For example, if the DID/DDI number that you configure in the MVS Console for the MVS Session Manager is +15195550100, for any device-initiated calls that arrive at the PBX using a DID/DDI number of +15195550100, the PBX must route the calls to the MVS Session Manager that is associated with the DID/DDI number of +15195550100.</p> <p>You require one DID/DDI number for each MVS Session Manager in your organization's environment.</p>

Planning your organization's Wi-Fi infrastructure

3

If your organization plans to use Wi-Fi® enabled BlackBerry® devices for making and taking BlackBerry® Mobile Voice System calls, you must make sure that your Wi-Fi infrastructure can support Voice over Wi-Fi calls. During the planning process, you should collaborate with your organization's Wi-Fi infrastructure vendor to make sure that the Wi-Fi infrastructure is designed and configured to support Voice over Wi-Fi calls.

To make sure that your organization's Wi-Fi infrastructure can support Voice over Wi-Fi calls, you should use BlackBerry devices to perform an in-depth site survey. For more information, visit www.blackberry.com/support to read article KB13299. The results of the survey should permit you to perform the following tasks:

- design and configure a Wi-Fi controller-based architecture
- identify the type of authentication and level of encryption that your organization requires
- configure a QoS implementation
- determine the expected Wi-Fi coverage and capacity boundaries of the access points
- determine the capacity of your organization's Wi-Fi infrastructure. Make sure that you account for the expected usage for both BlackBerry MVS users and individuals who use Wi-Fi technology on their laptop computers.
- create documentation for your organization's users to help them configure their devices to connect to Wi-Fi networks and make Voice over Wi-Fi calls

Best practice: Planning your organization's Wi-Fi infrastructure

The following guidelines are intended to help you design a Wi-Fi infrastructure that permits BlackBerry devices to connect to an access point that has a medium-to-high data rate. When the data rate of the access point is too low or the signal strength of the access point is too weak, the device should roam to an access point with a higher data rate or a stronger signal strength. When designing your organization's Wi-Fi infrastructure, you should consider the following guidelines:

- Establish a minimum signal strength level of -65 dBm in the planned coverage area.
- Establish a minimum SNR of 25 dB in the planned coverage area.
- When roaming in the planned coverage area, make sure that it takes no longer than 50 milliseconds to perform an access point to access point handoff.
- Eliminate any 802.11b-only devices and the associated data rates. By eliminating the 802.11b-only devices, 802.11g devices do not need to enter protection mode, which reduces the maximum data throughput of the devices.

Using Wi-Fi enabled BlackBerry devices for making and taking BlackBerry MVS calls from a home office or a hotspot is unpredictable because of the instability of those types of networks and cannot be expected to be as reliable as when the user is in a controlled environment. If your organization's users make Voice over Wi-Fi calls from a home office or hotspot, you must make sure that the integrated VPN client on their BlackBerry devices is configured for a highly secure connection to your organization's network through the Internet.

For more information about planning your organization's Wi-Fi infrastructure, visit <http://na.blackberry.com/eng/ataglace/networks> to see the *Considerations for Planning and Deploying a Wireless LAN* document.

Planning a BlackBerry MVS installation

4

You can install the MVS Console and MVS Session Manager on the computer that hosts the BlackBerry® Enterprise Server or on a separate computer. During the first BlackBerry® Mobile Voice System installation process, you must install both BlackBerry MVS components and provide the IP address, name and port number for your organization's BlackBerry Configuration Database.

If your organization's environment requires high availability, you must have three computers available to host two MVS Session Manager instances and a MVS Console. You can use high availability to provide minimum downtime for BlackBerry MVS users if one of your organization's MVS Session Manager instances stops responding or requires maintenance. The failover process is automatic, but you can perform a manual failover to perform scheduled maintenance.

If your organization's environment includes multiple BlackBerry Enterprise Server instances, you can configure one MVS Session Manager for each BlackBerry Enterprise Server, or you can associate all BlackBerry Enterprise Server instances with one MVS Session Manager. You can install only one MVS Session Manager on a computer. If your organization's users are associated with different PBXs, you must configure multiple telephony connectors, which provide connectivity to each PBX. You require only one MVS Console to manage the BlackBerry MVS in each BlackBerry Domain.

If your organization's environment already includes one MVS Console, during the BlackBerry MVS installation process, you must install the MVS Session Manager only. You must also provide the host name or IP address, and the port number for your organization's MVS Console.

To add another MVS Session Manager to your organization's environment, you must load security key stores that the BlackBerry MVS generates during the installation process.

During the BlackBerry MVS installation process, you might be required to involve the administrators of your organization's PBX, voice mail system, LAN, security network, or BlackBerry Enterprise Server.

Best Practices: Installing and configuring the BlackBerry MVS

Best practices for installing BlackBerry MVS components

- The first time that you install the BlackBerry® Mobile Voice System software and associate it with a BlackBerry Configuration Database, you must install both the MVS Session Manager and MVS Console. You can install the components on the same computer or on separate computers.
- You can install the MVS Session Manager and MVS Console on dedicated physical hardware, or on a dedicated virtual computer, or on the computer that hosts the BlackBerry® Enterprise Server. If you plan to install the BlackBerry MVS components on the computer that hosts the BlackBerry Enterprise Server, your organization can have no more than 500 users, and the BlackBerry MVS installation cannot be configured for high availability.
- You can install only one MVS Session Manager (which is a Windows® service) for each Windows Server® instance.
- You can install only one MVS Console for each BlackBerry Configuration Database in your organization's environment.

- You can install multiple MVS Session Manager instances with a BlackBerry Configuration Database if you configure the MVS Session Manager instances to use a single MVS Console.

Best practices for testing network ping time

- During times of high network use, the maximum time that a network ping can take to travel from the BlackBerry MVS Server to the BlackBerry Enterprise Server or BlackBerry Configuration Database and back to the BlackBerry MVS Server must be 240 milliseconds.
- During times of high network use, the maximum time that a network ping can take to travel from the BlackBerry MVS Server to the PBX and back to the BlackBerry MVS Server must be 240 milliseconds.

Best practices for installing the BlackBerry MVS on a virtual computer

- If you install the BlackBerry MVS in a virtual environment, the virtual instance should perform as well as a computer with two Intel® Xeon® 2.0 GHz processors with 4 GB of RAM and two drives that are configured as RAID 1 or better.

Best practices for configuring the MVS Session Manager

- A MVS Session Manager can support multiple BlackBerry Enterprise Server instances when all BlackBerry Enterprise Server instances use the same BlackBerry Configuration Database.
- You can associate each BlackBerry Enterprise Server with only one MVS Session Manager.
- A MVS Session Manager can support up to 10,000 BlackBerry MVS users.
- To add more BlackBerry MVS users, you can install additional MVS Session Manager instances. You must associate each additional MVS Session Manager with at least one BlackBerry Enterprise Server that is not already associated with another MVS Session Manager.
- If you configure BlackBerry device–initiated calling, you must configure a unique DID/DDI number for each MVS Session Manager in your organization’s environment. You must also configure your organization’s call routing patterns so that the PBX can route the device-initiated calls to the MVS Session Manager that is associated with the DID/DDI number.

Best practices for configuring the BlackBerry MVS for high availability

- When you configure the BlackBerry MVS for high availability, you install the MVS Console, the active MVS Session Manager, and the standby MVS Session Manager on different computers in the same BlackBerry Domain. Both MVS Session Manager instances use the same MVS Console and BlackBerry Configuration Database.

Best practices for configuring a telephony connector

- In a MVS Session Manager, you can configure one or more telephony connectors that provide connectivity to the PBX. All telephony connectors in a MVS Session Manager can support up to 10,000 BlackBerry MVS users.
- You can use multiple telephony connectors to divide your organization’s users between distinct nodes of the PBX. You can configure telephony connectors for nodes of the PBX that exist in the same cluster or in separate clusters in your organization’s phone system.
- In a telephony connector, the value that you configure for the caller ID number must match the last six digits of the outgoing ANI that you specify in your organization’s phone system. If the value that you configure for the caller ID number has fewer than six digits, that value must be an exact match for the outgoing ANI. If a complete ANI does not arrive at the device (which might happen during international roaming, for example), the BlackBerry MVS user might not be able to make or receive BlackBerry MVS calls.

Configuring call direction

5

You can configure the BlackBerry® Mobile Voice System to use PBX-initiated calling or BlackBerry device–initiated calling for incoming calls and outgoing calls.

PBX-initiated calling

You can configure the BlackBerry® Mobile Voice System to use PBX-initiated calling. When a BlackBerry device receives or sends a call request, the BlackBerry MVS sends a call request to the PBX so that the PBX can make a call to the device. The device verifies that the call is from the BlackBerry MVS, and it either connects the caller to the BlackBerry MVS user or initiates an outgoing call to the dialed number.

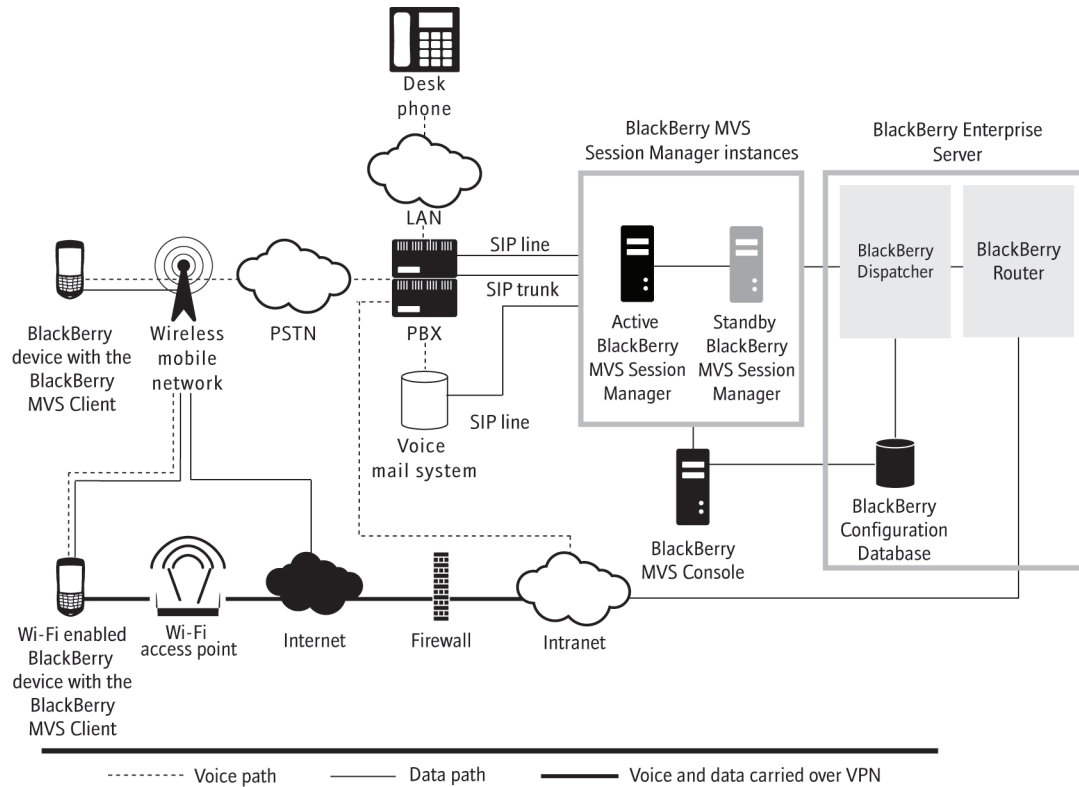
If your organization uses devices that operate on GSM® networks, PBX-initiated calling offers optimal performance and reliability for BlackBerry MVS calls.

BlackBerry device–initiated calling

You can configure the BlackBerry® Mobile Voice System to use BlackBerry device–initiated calling. When a device receives or sends a call request, the BlackBerry MVS sends a call request, which includes the DID/DDI number, to the PBX. The PBX routes the call to the BlackBerry MVS. The BlackBerry MVS answers the call, verifies that the call is from the device, and either connects the caller to the BlackBerry MVS user or initiates an outgoing call to the dialed number.

If your organization uses devices that operate on CDMA networks, device-initiated calling offers optimal performance and reliability for BlackBerry MVS calls.

BlackBerry MVS high availability



BlackBerry® Mobile Voice System high availability consists of an active MVS Session Manager and a standby MVS Session Manager. You can use high availability to help provide minimum downtime for BlackBerry MVS users if one of your organization's MVS Session Manager instances stops responding or requires maintenance. The failover process is designed to be automatic, but you can perform a manual failover before you perform scheduled maintenance.

When you configure the BlackBerry MVS for high availability, you install the MVS Console, active MVS Session Manager, and standby MVS Session Manager on different computers in the same BlackBerry Domain. Both MVS Session Manager instances use the same MVS Console and BlackBerry Configuration Database.

Both MVS Session Manager instances connect to the MVS Console. The MVS Console periodically checks that the active MVS Session Manager is healthy. If the health of the active MVS Session Manager falls below the failover threshold or if the active MVS Session Manager stops responding, the MVS Console promotes the standby MVS Session Manager.

If any of your organization's users are on BlackBerry MVS calls when the active MVS Session Manager stops responding, the calls remain active but the users cannot use the features that are typically available to them during a call. While the active MVS Session Manager fails over, the users cannot send or receive any BlackBerry MVS calls until the failover process completes.

You cannot configure high availability for the MVS Console because you can install only one MVS Console in a BlackBerry Domain.

To manage your organization's users, if the computer that you installed the MVS Console on stops responding, you should determine why the MVS Console stopped responding. Alternatively, you can install another MVS Console instance and connect it to the active and standby MVS Session Manager instances.

Support for BlackBerry Enterprise Server failover

The BlackBerry® Mobile Voice System supports BlackBerry® Enterprise Server failover. If any of your organization's users are on BlackBerry MVS calls when the active BlackBerry Enterprise Server stops responding, the calls remain active, but the users cannot use the features that are typically available to them during a call. The users also cannot send or receive a second call. While the active BlackBerry Enterprise Server fails over, the users cannot send or receive any BlackBerry MVS calls until the failover process completes.

Support for PBX failover

The BlackBerry® Mobile Voice System does not support PBX failover. If any of your organization's users are on BlackBerry MVS calls when the active PBX stops responding, the calls remain active until the BlackBerry device stops receiving registration messages from the PBX. The users cannot send or receive any new BlackBerry MVS calls until the PBX is active again or until you associate the affected telephony connector with the standby PBX.

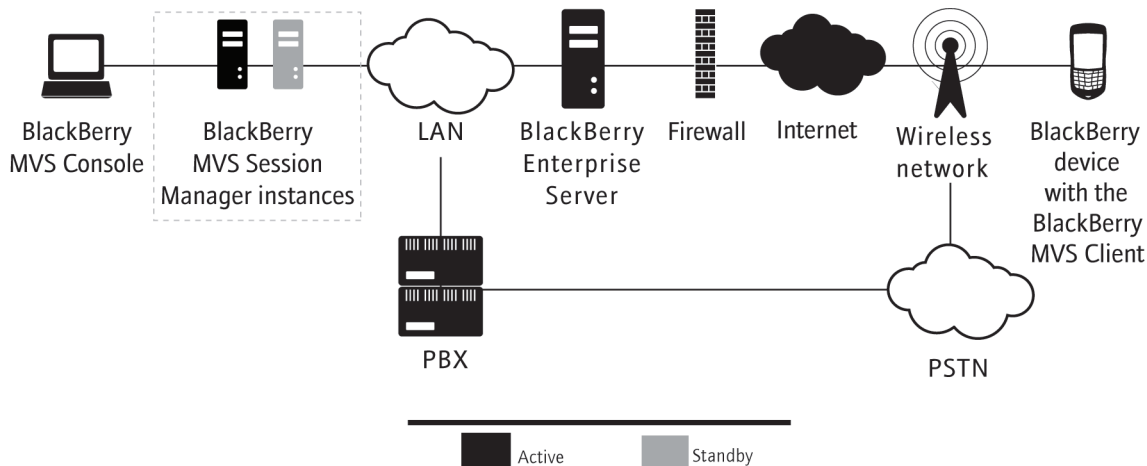
How the BlackBerry MVS determines the health of MVS Session Manager instances

The MVS Console determines the health of the MVS Session Manager instances by monitoring its connection to the MVS Session Manager instances. If the active MVS Session Manager sends a network ping to the MVS Console at regular intervals, the MVS Console keeps the MVS Session Manager active. If the active MVS Session Manager does not send a network ping to the MVS Console every 60 seconds, the MVS Console promotes the standby MVS Session Manager to be the active MVS Session Manager.

Conditions for failover to a standby MVS Session Manager

Failover from the active MVS Session Manager to the standby MVS Session Manager occurs when the MVS Console stops receiving network pings from the active MVS Session Manager for 1 minute. If the MVS Console continues to receive network pings from the standby MVS Session Manager, the MVS Console starts the failover process.

Scenario: What happens after the active MVS Session Manager stops responding



If the active MVS Session Manager stops responding, the response of the MVS Console depends on the health of the standby MVS Session Manager. If the standby MVS Session Manager is healthy, the MVS Console promotes it to be the active MVS Session Manager.

The following scenario assumes that the MVS Console is available.

1. The MVS Console determines that the active MVS Session Manager stopped responding, demotes the active MVS Session Manager, and promotes the standby MVS Session Manager to be the active instance.
2. The active MVS Session Manager connects to the active BlackBerry® Enterprise Server.
3. The active MVS Session Manager registers the BlackBerry devices with the PBX.
4. An error message appears on the MVS Console to indicate that a MVS Session Manager is unhealthy.

You must resolve any issues with the unhealthy MVS Session Manager before the MVS Console can promote it to be the active instance again.

Glossary

7

ANI

Automatic Number Identification

BlackBerry Domain

A BlackBerry Domain consists of the BlackBerry Configuration Database with its users and any BlackBerry® Enterprise Server instances that connect to it.

BlackBerry MVS

BlackBerry® Mobile Voice System

CDMA

Code Division Multiple Access

DDI

Direct Dial In

DID

Direct Inward Dial

DTMF

Dual Tone Multiple-frequency

GSM

Global System for Mobile Communications®

IP

Internet Protocol

KPML

Key Press Markup Language

LAN

local area network

MWI

message waiting indicator

NDD

national direct dialing

PBX

Private Branch Exchange

PSTN

Public Switched Telephone Network

RAID

redundant array of independent (or inexpensive) disks

RFC

Request for Comments

SIP

Session Initiation Protocol

TCP/IP

Transmission Control Protocol/Internet Protocol (TCP/IP) is a set of communication protocols that is used to transmit data over networks, such as the Internet.

VPN

virtual private network

Provide feedback

8

To provide feedback on this deliverable, visit www.blackberry.com/docsfeedback.

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Legal notice

9

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Research In Motion Limited
295 Phillip Street
Waterloo, ON N2L 3W8
Canada

Research In Motion UK Limited
Centrum House
36 Station Road
Egham, Surrey TW20 9LF
United Kingdom

Published in Canada