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Chapter 4
Introduction to push technology

Objectives

- Define push technology and describe the benefits of push technology
- Describe how a server-side push application works
- Provide an example of how a server-side push works on a BlackBerry® smartphone

This chapter introduces push technology and describes the advantages of using push technology for BlackBerry smartphones. The chapter describes server-side push and provides an example of how a server-side push works on a BlackBerry smartphone.
Push technology

Push applications send web content or other data to specific BlackBerry smartphones. Users do not need to request or download the data because the push application delivers the information as soon as it becomes available. The BlackBerry smartphone listens for new information and notifies the user when it arrives by vibrating, changing an icon on the screen, or turning on a light. The BlackBerry smartphone does not poll the server to look for updates. It simply waits for the update to arrive and notifies the user when it does.

Benefits of push technology

Push technology offers the following key benefits for users and organizations.

Immediacy

Pushing data to a BlackBerry smartphone is the most efficient way to get information to BlackBerry smartphone users. Data is delivered to applications on the BlackBerry smartphone as soon as it becomes available.

Efficiency

Applications do not need to repeatedly poll servers for new data. Although these polling requests and responses are small individually, the cost of these can add up quickly with frequent polling intervals across multiple applications.

Reduced latency

Applications that use push can reduce the impact on network latency. Data is delivered to BlackBerry smartphones in the background without user involvement. The most recent data is synchronized and available on the BlackBerry smartphone the moment the user opens the application.

Longer battery life

Push applications can extend battery life. Instead of actively checking for new data, the application listens in the background for data to arrive. When it arrives, the application can process it as needed.
Shorter learning curve

BlackBerry smartphone users already know all that is needed to access push content. For developers, much of the complexity of a push data delivery service is hidden because the BlackBerry® Infrastructure handles the process of managing and delivering push requests.
Push applications for the BlackBerry Enterprise Server

You can use the BlackBerry MDS Connection Service component of the BlackBerry® Enterprise Server to deliver data or web content directly to any BlackBerry smartphone that is activated on an organization's BlackBerry Enterprise Server. Users do not need to request or download data; the push application, in conjunction with the BlackBerry MDS Connection Service, delivers it as soon as it is available.

Two applications are required to push data to a BlackBerry smartphone: a server-side push application that submits the push request, and a client-side listener application that listens for incoming push messages.

The server-side push application is designed to send HTTP POST requests to the BlackBerry MDS Connection Service on the web server listen port. The HTTP POST requests contain delivery parameters and the data to be pushed. The BlackBerry MDS Connection Service then delivers the data to a specified port number on the BlackBerry smartphones within a specified time frame. You must create the server-side application. The Push requests that this application generates must conform to either the WAP PAP version 2.0 specification or to the RIM® push format.

A client-side listener application listens for data to be delivered to its specific port number. You can create a custom BlackBerry MDS Java Application that is designed to listen for and handle pushed data, or you can push web content to the BlackBerry® Browser. The BlackBerry Browser has an integrated listener thread, which allows you to push web content to the BlackBerry smartphone without the need to create a custom client-side application.

The BlackBerry MDS Connection Service manages the flow of pushed data from various push applications, and sends the data to the BlackBerry smartphone using the same encrypted channel that is used for data communication between the smartphone and the BlackBerry Enterprise Server. The BlackBerry MDS Connection Service can push data to individual users or to user groups.

The BlackBerry Enterprise Server push process includes the following steps:

1. The server-side push application submits a push request to the BlackBerry MDS Connection Service.
2. The BlackBerry MDS Connection Service sends a response to the push application, acknowledging that the push request has been received.
3. The BlackBerry MDS Connection Service pushes the data to the specified BlackBerry smartphones.
4. Each BlackBerry smartphone that successfully receives the pushed data returns a result notification to the BlackBerry MDS Connection Service.
5. The BlackBerry MDS Connection Service sends the result notification to the Notification URL, if one was specified in the push request.
Client/server push applications

Client/server push applications consist of a custom client BlackBerry smartphone application and a server-side application that pushes content to the client BlackBerry smartphone. This approach provides more control than browser push applications. It also provides more flexibility regarding the type of data that you can send and how the BlackBerry smartphone processes and displays the data.

Client/server push applications have many advantages: you can store data on the smartphone, you can make network connections based on the information that comes in, and you can integrate the data with BlackBerry applications such as a calendar. The BlackBerry smartphone listens for new information and notifies the user when it arrives by vibrating or with a ring tone.

Server-side push applications

Server-side push applications make requests to the BlackBerry MDS Connection Service to push data to specified BlackBerry smartphone users. These requests include push delivery parameters that uniquely identify the push request, inform the BlackBerry MDS Connection Service which smartphones to send the data to, and provide additional delivery information, such as the priority and the reliability level of the push request.

You can create a server-side push application using any development language. However, the application must generate and send HTTP POST requests to the BlackBerry MDS Connection Service and use either the PAP push format or RIM push format to specify the delivery parameters.

You can push data to individual users based on either their email addresses or their smartphone PINs, or to groups of users created and maintained on the BlackBerry Enterprise Server.

Supported push formats

The push format you use for push requests not only affects the format in which the delivery parameters are specified, but also affects how the data is packaged within the HTTP POST request. The BlackBerry MDS Connection Service supports two push formats.

PAP push format

The PAP push format sends an HTTP POST request to the BlackBerry MDS Connection Service. The request contains a MIME multipart message that includes two components: an XML-based PAP control entity that defines the delivery parameters, and the data to be pushed.

The PAP push format is an open standard developed by the Open Mobile Alliance. The BlackBerry MDS Connection Service supports the WAP PAP version 2.0 standard.
RIM push format

The RIM push format sends an HTTP POST request to the BlackBerry MDS Connection Service. However, in this case, the pushed content is sent as a byte stream. The destination port is specified within the URL of the pushed content, and the destination users and other delivery parameters are specified in HTTP headers included with the request.

The RIM push format is a proprietary push format supported exclusively by the BlackBerry MDS Connection Service and BlackBerry smartphone.

Client-side listener applications

Client-side listener applications on the BlackBerry smartphone listen for incoming data. You can create a custom listener application using Java®, or you can use the BlackBerry Browser as your listener application.

Custom listener application

You can create a custom BlackBerry MDS Java Application that contains a listening thread that listens for incoming data on a specified port.

To create a Java-based push application architecture, you must create both the custom client-side application that receives the pushed data and the server-side application that makes the push request.

This approach requires that you have some knowledge of Java® ME, as well as an understanding of BlackBerry application design and development. However, creating a custom BlackBerry MDS Java Application can provide you with control over both the type of data that you can deliver and the manner in which this data is processed and displayed on the BlackBerry smartphone.

Configure the push listener to start up automatically

You can configure the background push listener application to start up automatically when the BlackBerry smartphone starts. The application automatically starts when you perform a hard reset on the BlackBerry smartphone or when the application is first installed.

BlackBerry smartphone applications can also have multiple entry points. Different entry points enable the application to start up in different ways. In the following example, an entry point is created so the application automatically starts up when the BlackBerry smartphone starts up. When the application starts from this entry point, a thread is created that listens for incoming push data. This entry point does not have an icon on the BlackBerry smartphone Home screen. The second entry provides an icon on the BlackBerry smartphone Home screen, where the user can launch the application. This entry point displays the applications UI.
The following steps illustrate how to create an auto-start application with multiple entry points using the BlackBerry® JDE Plug-in for Eclipse® or the BlackBerry® Java® Development Environment.

1. Create a background listener application, which starts a listener thread.

2. In the application properties, select the System module. This option does not display an icon on the BlackBerry smartphone Home screen.

3. Select the Auto-run on startup option. This option starts the application automatically when the BlackBerry smartphone starts.

4. Code the main method to start the listener thread.

5. Create a project that has just an application icon, and then choose the Alternate CLDC Application Entry Point project type.

6. Set the Alternate entry point to the main application.

7. In the Argument Passed to field, enter descriptive text (for example, UI). The argument for the Alternate entry point passes into the main method of the application when the BlackBerry smartphone user clicks the application icon.

8. Modify the source code and combine the two startup sections, UI startup and thread startup. The application runs the background listener on startup and the UI when the BlackBerry smartphone user selects the application icon.

For example

```java
public static void main(String[] args) {
    if (args != null && args.length > 0 && args[0].equals("UI") ) {
        // code to launch the UI.
    } else {
        // code to launch the background thread
    }
}
```

BlackBerry Browser

The BlackBerry Browser on the BlackBerry smartphone contains a built-in listening thread, which listens on port 7874. You can push web content or other browser-supported data to the BlackBerry Browser, which stores it in a cache dedicated to pushed content. When the BlackBerry smartphone user
views the URL associated with the pushed content, the browser retrieves the content from the cache and displays it, rather than making an HTTP request for the content.

You can add an icon to the BlackBerry smartphone Home screen that is associated with your push request. To the user, the icon looks like an application, but it simply opens an instance of the BlackBerry Browser to the URL associated with the pushed content.
Web Signals and BlackBerry Push API

Web Signals and the BlackBerry Push API are two push options for non-Enterprise or BIS-connected smartphone users.

Web Signals are near-real time content updates which push data directly to a user’s BlackBerry smartphone, allowing third-party content providers to add timely and relevant updates to their application portfolio.

BlackBerry push API lets you build push capability into Java®-based consumer applications. The pushed data is directed to the BlackBerry smartphone PIN number rather than the phone number. You can send push messages and alerts to a single BlackBerry smartphone or broadcast to BlackBerry smartphones that use a specific application.

Both of these push options provide the ability to push data to any network connected BlackBerry smartphone—even if the BlackBerry smartphone is not managed by an organization’s BES. Both Web Signals and the BlackBerry Push API require that you follow certain procedures, and the BlackBerry user must confirm them before any data is pushed to a BlackBerry smartphone.
Push application design considerations

When you develop push applications, consider the type of information that users in your organization need pushed to them and how often you must push that information. For example, some users require only event-based information that is a response to a business event, such as an assignment of a field service ticket or a notification when inventory levels drop below a specified level. Other users require recurring reports pushed to them. The user drives the type of push mechanism that you choose.

Consider having users subscribe to the push information that they require. The users can manage their own subscriptions, or an administrator can manage the subscriptions centrally. Subscriptions are not specific to an application.
Components of a push request

Whether you are using the PAP push format or the RIM push format, a push request is made up of the data to be pushed, and a set of delivery parameters, which define how, when, and to whom the data is pushed. The principle difference between the two formats is the way in which the delivery parameters are specified.

Both the PAP push and RIM push formats support the following features:

- **Reliable push requests**—Lets you request that the BlackBerry MDS Connection Service send a result notification to indicate the success or failure of the push request for each recipient address.
- **Deliver-Before time stamp**—Lets you provide a time stamp before which the BlackBerry MDS Connection Service must deliver the pushed data. If the BlackBerry MDS Connection Service is unable to deliver the data by the specified time, the push request is considered to have failed.
- **Deliver-After time stamp**—Lets you provide a time stamp before which the push must not be delivered. If a push is not successfully delivered after the specified time, the push is considered to have failed.

In addition, the PAP push service implementation supports the following features:

- **Push cancellation**—Push applications can cancel a push submission that has already been sent.
- **Push status query**—Push applications can check the status of a push submission.

Push request reliability

In your push request, you can specify that you want the BlackBerry smartphone to return a result notification when the pushed data is successfully delivered. The BlackBerry MDS Connection Service receives notifications from each destination BlackBerry smartphone that successfully receives the pushed data and forwards those notifications to the push originator. Similarly, the BlackBerry MDS Connection Service sends a notification to the push originator if a push request is not successfully delivered to one or more destination BlackBerry smartphones within the allotted time.

If you do not specify a reliability level for your push method, the BlackBerry MDS Connection Service does not provide the push originator with any notification regarding the outcome of the push request.

You must also specify a notification URL to which the BlackBerry MDS Connection Service sends result notifications, with every push request that specifies a reliability option. A push request that requests some level of reliability but does not provide a notification URL is considered invalid and is rejected by the BlackBerry MDS Connection Service. You must register the port number on which the client-side application listens with the BlackBerry MDS Connection Service if you are creating a custom BlackBerry Java Application to receive and process pushed data and intend to use application-reliable push requests. Contact your organization's BlackBerry Enterprise Server Administrator with the unique port numbers that you defined for any BlackBerry Java Application you develop.
If you created a BlackBerry Java Application as a push listener and you intend to use application-reliable push requests, you might need to design your application to make a request to the BlackBerry MDS Connection Service the first time the user opens it.

Before you can submit an application-reliable push request, the BlackBerry MDS Connection Service must know the BlackBerry Device Software version information for each recipient BlackBerry smartphone, since application-reliable push requests are only supported by BlackBerry smartphones running BlackBerry® Device Software version 3.8 or later. The BlackBerry MDS Connection Service acquires the BlackBerry smartphone information from the device profile, which is identified in the UAProf header that is included when a user makes a request for content using the BlackBerry Browser.

If the user must register to use your push application, or if they must download your BlackBerry Java Application using the BlackBerry Browser to install it onto their BlackBerry smartphone, then the BlackBerry MDS Connection Service already has registered the BlackBerry smartphone information for each recipient. However, if users acquire your BlackBerry Java Application without using the BlackBerry Browser, the BlackBerry MDS Connection Service will not have the user profile information it needs before permitting application-reliable requests. By developing your application so that it sends an HTTP request, you can make sure that the BlackBerry MDS Connection Service registers profile information for each BlackBerry smartphone that receives pushed data.

To specify a reliable push request
- Using the PAP push format—Include the `<quality-of-service>` element in the `<push-message>` element of the control entity.
- Using the RIM push format—Include the `X-Rim-Push-Reliability` header in the request.

**Levels of reliability**

You can choose one of the following reliability levels that is appropriate for your push request:
- Transport
- Application
- Application-preferred

**Transport**

The BlackBerry smartphone sends an acknowledgment notification when the pushed data reaches the BlackBerry smartphone. It does not attempt to verify that the data was received by the client-side application. Transport-reliable push requests are supported by any BlackBerry smartphone running BlackBerry Device Software version 3.6 or later.

**Application**

The BlackBerry smartphone sends an acknowledgment notification when the pushed data reaches the client-side application. The BlackBerry smartphone sends the acknowledgment to the BlackBerry MDS Connection Service, which forwards it on to the notification URL provided in the push request.
You must register the listen port number on the BlackBerry smartphone with the BlackBerry MDS Connection Service before you can make application-reliable push requests. If you are pushing data to the BlackBerry Browser, the port is preregistered. Application-reliable push requests are only supported by BlackBerry smartphones running BlackBerry Device Software version 4.0 or later.

**Application preferred**

Only the RIM push format supports the application preferred reliability level. If the BlackBerry smartphone supports application-level reliability (that is, if it is running BlackBerry Device Software version 4.0 or later), it sends an acknowledgment notification when the pushed data reaches the client-side application. If the BlackBerry smartphone does not support application-level reliability, it sends an acknowledgment notification when the pushed data reaches the BlackBerry smartphone.

You must register the listen port number on the BlackBerry smartphone with the BlackBerry MDS Connection Service before you can make application-reliable push requests. If you are pushing data to the BlackBerry Browser, the port is preregistered.

Application-preferred push requests are not available with the PAP push format. Application-reliable push requests are only supported by BlackBerry smartphones running BlackBerry Device Software version 4.0 or later.

**Time restrictions for push delivery**

You can define an expiry time during which pushed data must be delivered to the recipient BlackBerry smartphones.

You can set two time stamps to specify time restrictions.

- The Deliver-Before time stamp specifies the date and time by which the push request must be delivered to the BlackBerry smartphone. If the BlackBerry MDS Connection Service is unable to deliver a push request to a recipient before the time specified in the Deliver-Before time stamp, the push request is considered unsuccessful for the affected BlackBerry smartphones.

- The Deliver-After time stamp specifies the data and time before which the push request cannot be delivered.

If the BlackBerry MDS Connection Service is unable to deliver a push request to a recipient before or after the times specified by using these time stamps, the push request is considered unsuccessful for the affected smartphones.

To specify time restrictions for push delivery using the PAP push format:

Define one or both of the `deliver-after-timestamp` and the `deliver-after-timestamp` attribute for the `<push-message>` element of the control entity.

To specify time restrictions for push delivery using the RIM push format: `X-Rim-Push-Deliver-Before` and `X-Rim-Push-Deliver-After` header in the request.
PAP push format

Your server-side application can use the PAP push format to send the following three types of requests to the BlackBerry MDS Connection Service:

- **Push request**—This request allows you to push data to the specified recipients. A PAP push request is a MIME multipart message, which contains a PAP control entity that defines the delivery parameters, and the data to be pushed.

- **Status-query request**—This request allows you to query the status of a push request for one or more specified recipients. A PAP status-query request includes only an XML-based PAP control entity, which identifies the associated push request, and lists the recipient addresses for which the push request status should be queried.

- **Cancellation request**—This request allows you to cancel a push request for one or more specified recipients. A PAP cancellation request includes only an XML-based PAP control entity, which identifies the associated push request, and lists the recipient addresses for which the push request should be cancelled.

In each case, you send the request as an HTTP POST request to the BlackBerry MDS Connection Service. If the BlackBerry MDS Connection Service is configured to support secure connections, you can use the **HTTPS** protocol. The HTTP POST request must use the following format:

```
POST http://<MDS_CS>:<MDS_CS_port>/pap

<message>
```

where

- `<MDS_CS>` is the URL address of the BlackBerry MDS Connection Service web server. If you are unsure of the URL address of the BlackBerry MDS Connection Service, contact your BlackBerry Enterprise Server Administrator.

- `<MDS_CS_port>` is the port number on which the BlackBerry MDS Connection Service web server listens. By default, the BlackBerry MDS Connection Service listens on port number is 8080. If you are unsure of the port number, contact your BlackBerry Enterprise Server Administrator.

- `<message>` is either a multipart message with the PAP control entity and the data (in the case of push requests), or a PAP control entity on its own (in the case of status-query and cancellation requests)

Create a PAP push request

You can use a PAP push request to push content to one or multiple BlackBerry smartphone users using PAP.

1. Send an HTTP POST request using the following format:
http://mdsServer:web server listen port/pap - The URL to send the PAP push to.

The request is a MIME multipart message, which consists of the following items:
- XML document specifying the control entity
- push content

The following example shows a PAP push request:

Content-Type: multipart/related; type="application/xml";
boundary=asdlfkjiurwghasf
X-Wap-Application-Id: /
--asdlfkjiurwghasf
Content-Type: application/xml
<?xml version="1.0"?>
<!DOCTYPE pap PUBLIC "-//WAPFORUM//DTD PAP 2.0//EN" "http://www.wapforum.org/DTD/pap_2.0.dtd">
pap

The following are the optional push ID and notification URL parameters:

<push-message push-id="a_push_id" ppg-notify-requested-to="http://foo.rim.net/ReceiveNotify">
<address address-value="WAP-PUSH=aisha.wahl%40blackberry.com%3A7874/TYPE=USER@rim.net"/>
<quality-of-service delivery-method="unconfirmed"/>
</push-message>
pap

The following is the pushed content:

--asdlfkjiurwghasf
Content-Type: text/html
<html><body>Hello, PAP world!</body></html>--asdlfkjiurwghasf--

2. To push content to multiple recipients using PAP, add multiple address tags to the post request. For example

<address address-value="WAPPUSH=user1%40rim%2ecom%5B%3A7874/TYPE=USER@rim.net"></address>

<address address-value="WAPPUSH=user2%40rim%2ecom%5D%3A7874/TYPE=USER@rim.net"></address>
3. To push content to a group using PAP, in the recipient addresses part of the push submission, prefix the group name with the $character. In the following example, the $character is URL encoded.

The following example shows an address element used to push to a group named IT using PAP:

```xml
<address address-value="WAPPUSH=%24IT/TYPE=USER@rim.net"/>
```

**Code sample: Submitting a PAP push request**

The following code sample shows an example of the push request that is sent to the BlackBerry MDS Connection Service. This request is a multipart message that includes a PAP push message control entity and the pushed data.

The PAP push message control entity requests the BlackBerry MDS Connection Service to push accompanying data to two individual BlackBerry smartphone users (user1@rim.com and user2@rim.com). The `<quality-of-service>` element defines this request as application-reliable.

Special characters specified in the email address portion of the address-value attribute are URL encoded, as specified in the WAP PAP version 2.0 specification.

The content portion of the multipart message includes a number of browser push headers, which specify a browser channel and the icons that represent the browser channel on the Home screen.

```xml
Content-Type: multipart/related; type="application/xml"
boundary=asdlfkjiurwghasf

--asdlfkjiurwghasf

Content-Type: application/xml
<?xml version="1.0"?>
<!DOCTYPE pap PUBLIC "-//WAPFORUM//DTD PAP 2.0//EN"
"http://www.openmobilealliance.org/tech/DTD/pap_2.0.dtd"
[<?wap-pap-ver supported-versions="2.0"?>]>
<pap>
  <push-message push-id="123@foo.rim.com"
    deliver-before-timestamp="2009-12-31T13:30:00Z"
    ppg-notify-requested-to="http://rim.com/ReceiveNotify">
    <address address-value="WAPPUSH=user1%40rim.com%3A7874/TYPE=USER@rim.com"/>
    <address address-value="WAPPUSH=user2%40rim.com%3A7874/TYPE=USER@rim.com"/>
    <quality-of-service delivery-method="confirmed"/>
  </push-message>
</pap>
```

RIM push format

Your server-side application can use the RIM push format to send both the data and the delivery parameters to the BlackBerry MDS Connection Service in a single byte stream.

You send the request as an HTTP POST request to the BlackBerry MDS Connection Service. If the BlackBerry MDS Connection Service is configured to support secure connections, you can use the HTTPS protocol. The HTTP POST request must use the following format:

```
POST http://<MDS_CS>:<MDS_CS_port>/push?
DESTINATION=<destination>&PORT=<client_port>&REQUESTURI=<uri>
=headers
<data>
```

where

- **MDS_CS** is the URL address of the BlackBerry MDS Connection Service web server. If you are unsure of the URL address of the BlackBerry MDS Connection Service, contact your BlackBerry Enterprise Server Administrator.

- **MDS_CS_port** is the port number on which the BlackBerry MDS Connection Service web server listens. By default, the BlackBerry MDS Connection Service listens on port number is 8080. If you are unsure of the port number, contact your BlackBerry Enterprise Server Administrator.

- **destination** is the recipient email address, BlackBerry smartphone PIN, or BlackBerry user group name, to whom the BlackBerry MDS Connection Service should push the data. To specify multiple recipient addresses, include a separate DESTINATION parameter for each intended recipient email address or BlackBerry smartphone PIN.

- **client_port** is the port number on which your client-side listening application listens. If you are pushing to the BlackBerry Browser, the port number is 7847. Custom BlackBerry Java Applications should each listen on a unique port number.

- **uri** is the URL sent to the BlackBerry smartphone.

- **headers** are the HTTP headers that specify the delivery parameters such as reliability level or delivery time stamp. If you are pushing data to the BlackBerry Browser, you must also include the browser-specific HTTP headers.

- **data** is a byte stream containing the data or content that the BlackBerry MDS Connection Service must deliver to the recipient BlackBerry smartphones.

Create a RIM push request

You can push data to BlackBerry smartphone users in several ways.
To push content to one or multiple BlackBerry smartphone users using a RIM push request, send an HTTP POST request using the following URL format:

http://mdsServer:web server listen port/push?DESTINATION=destination&PORT=port&REQUESTURI=uri headers content

where

- destination is the destination PIN, email address or BES group
- port is the destination port number
- uri is the URI sent to the BlackBerry smartphone
- headers are HTTP headers
- content is a byte stream

To push content to multiple recipients using a RIM push, include multiple DESTINATION parameters in the query string.

http://md_server:8080/push?DESTINATION=user1@rim.com&DESTINATION=user2@rim.com&PORT=7874&REQUESTURI=/

To push content to a group using RIM push, in the recipient addresses portion of the push submission, prefix the group name with the $character. In the following example, the $character is URL encoded.

The following example shows a URL used to push to a group named IT using RIM push:


1. Specify a unique message ID to cancel or check the status of a message. Use the X-RIM-Push-ID header. Typically, specify a URL in combination with a value, such as 123@blackberry.com. If this header is omitted, the BlackBerry® Mobile Data System generates a unique message ID.

2. You can optionally specify a URL to which the BES sends a result notification. Use the X-RIM-Push-NotifyURL header.

   The result notification contains the X-RIM-Push-ID header, which specifies the message ID, and the X-RIM-Push-Status header, which specifies an HTTP response code. The notification also contains an X-RIM-Push-Destination header that specifies the recipient address to which the result pertains.

3. You can optionally specify the delivery reliability mode of the content. Use the X-RIM-Push-Reliability-Mode header with one of the following modes:
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- application-level (APPLICATION)
- application-preferred (APPLICATION-PREFERRED)
- transport-level (TRANSPORT)
Push applications send web content or other data to specific BlackBerry smartphones. Users do not need to request or download the data because the push application delivers the information as soon as it becomes available. The BlackBerry smartphone listens for new information and notifies the user when it arrives by vibrating, changing an icon on the screen, or turning on a light. The BlackBerry smartphone does not poll the server to look for updates. It simply waits for the update to arrive and notifies the user when it does.

You can use the BlackBerry MDS Connection Service component of the BlackBerry Enterprise Server to deliver data or web content directly to any BlackBerry smartphone that is activated on an organization’s BlackBerry Enterprise Server. Users do not need to request or download data; the push application, in conjunction with the BlackBerry MDS Connection Service, delivers it as soon as it is available.

Server-side push applications make requests to the BlackBerry MDS Connection Service to push data to specified BlackBerry smartphone users.

The push format you use for push requests not only affects the format in which the delivery parameters are specified, but also affects how the data is packaged within the POST request. The BlackBerry MDS Connection Service supports two push formats: PAP and RIM.

Client-side listener applications on the BlackBerry smartphone listen for incoming data. You can create a custom listener application using Java, or you can use the BlackBerry Browser as your listener application.

Whether you are using the PAP push format or the RIM push format, a push request is made up of the data to be pushed, and a set of delivery parameters, which define how, when, and to whom the data is pushed. The principle difference between the two formats is the way in which the delivery parameters are specified.

Your server-side application can use the PAP push format to send three types of requests to the BlackBerry MDS Connection Service: push request; status-query request; cancellation request.

Your server-side application can use the RIM push format to send both the data and the delivery parameters to the BlackBerry MDS Connection Service in a single byte stream.
1. Which one of the following is not a benefit of push technology?
   A. Ease of use
   B. Immediacy
   C. Efficiency
   D. Reduced latency

2. Which one of the following is the contrasting technology to pull technology?
   A. Poll
   B. Push
   C. Place
   D. Ping

3. The server-side push application sends __________ requests to the BlackBerry MDS Connection Service?
   A. Poll
   B. HTTP GET
   C. HTTP POST
   D. SMTP

4. Which of the following items are not reliability levels? Choose two.
   A. Application
   B. Accreditation
   C. Fire
   D. Transport
5. The BlackBerry Push API and Web Signals allow you to do which one of the following?
   A. Push data to a BlackBerry smartphone that is not connected to the BlackBerry Enterprise Server.
   B. Push data to BlackBerry smartphones that are connected to the BlackBerry Enterprise Server.
   C. Push data to non-BlackBerry smartphones
   D. Push data from the BlackBerry smartphone to the server

6. Which of the following is provided by the base version PAP 2.2 standard? Choose three.
   A. Encryption
   B. Optional result notification
   C. Query for device capabilities
   D. The ability to process XML documents

7. What one of the following is a characteristic of push request reliability?
   A. Fire and Forget
   B. Encryption
   C. HTTPS
   D. Notifications

8. Which of the following can be used to specify time restrictions on a push request? Choose two.
   A. Delivery Date
   B. Deliver-Before
   C. Deliver-After
   D. Delivery Range
Chapter 4

Answers

1. A
2. B
3. C
4. B and C
5. A and B
6. A, C, and D
7. D
8. B and C
1. Describe the advantages of using push technology as opposed to pull technology.

2. Name the server-side and client-side components of a push application service and describe what they do.

3. Describe an event-based push application, its benefits and how subscriptions could be used with it.