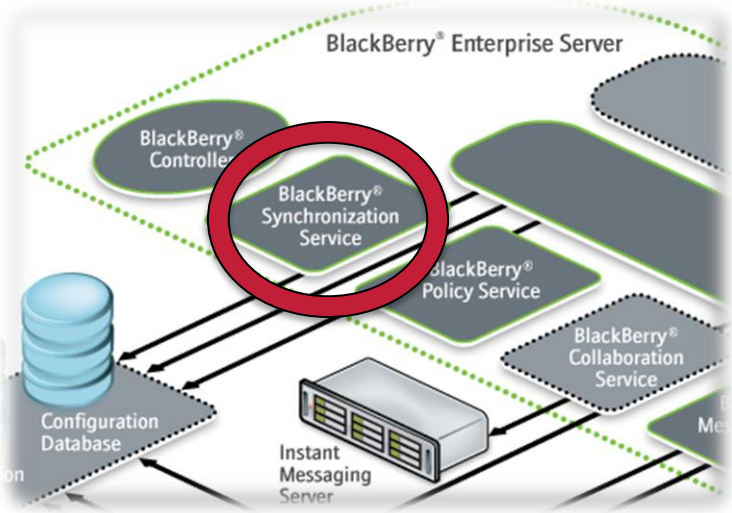
Understanding the BlackBerry Synchronization Service

Understanding the BlackBerry Synchronization Service

Topics

- Functions and features of the BlackBerry® Synchronization Service
- Analyzing BlackBerry Synchronization Service log files



Functions and features of the BlackBerry Synchronization Service

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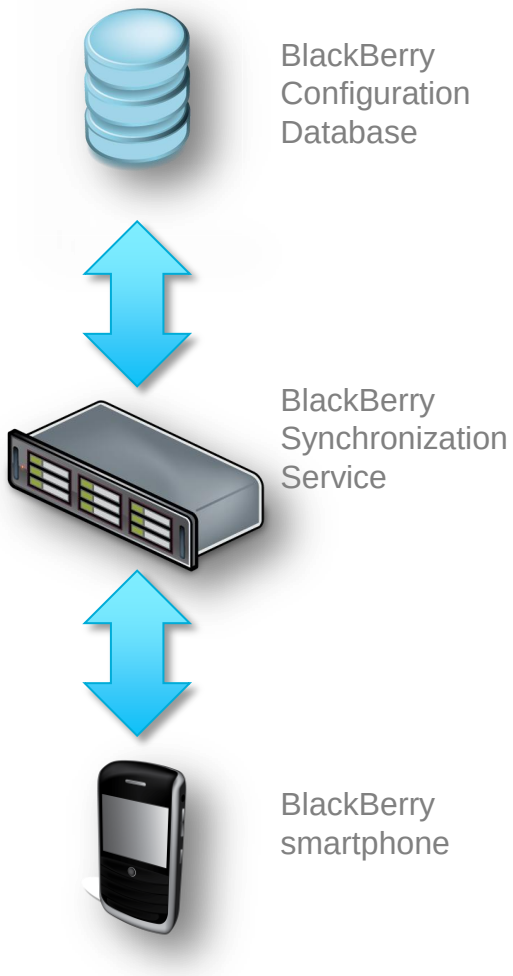
Features and functions of the BlackBerry Synchronization Service

Synchronizes organizer data over the wireless network

- Tasks
- Memos
- Contacts

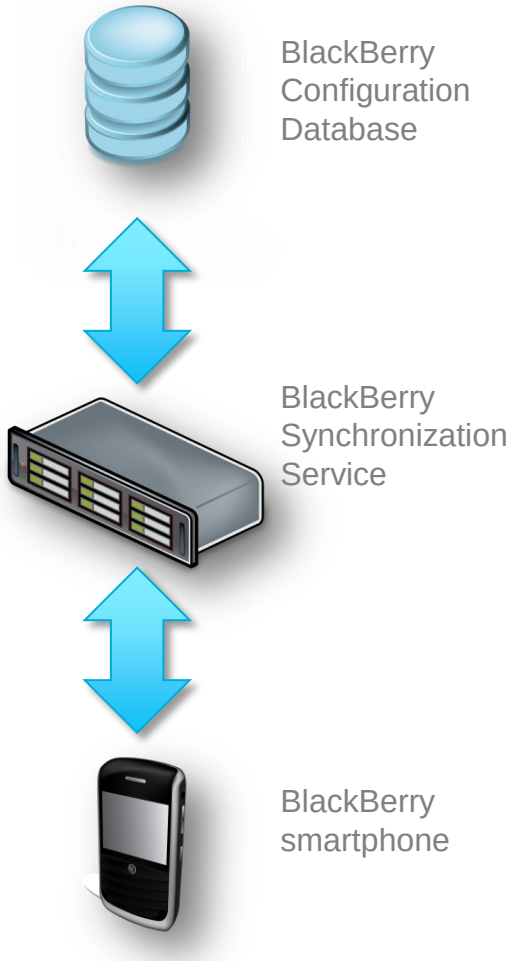
The BlackBerry Synchronization Service does not reconcile email messages or synchronize calendar entries.



Features and functions of the BlackBerry Synchronization Service

Backs up BlackBerry smartphone settings and data to the BlackBerry Configuration Database over the wireless network

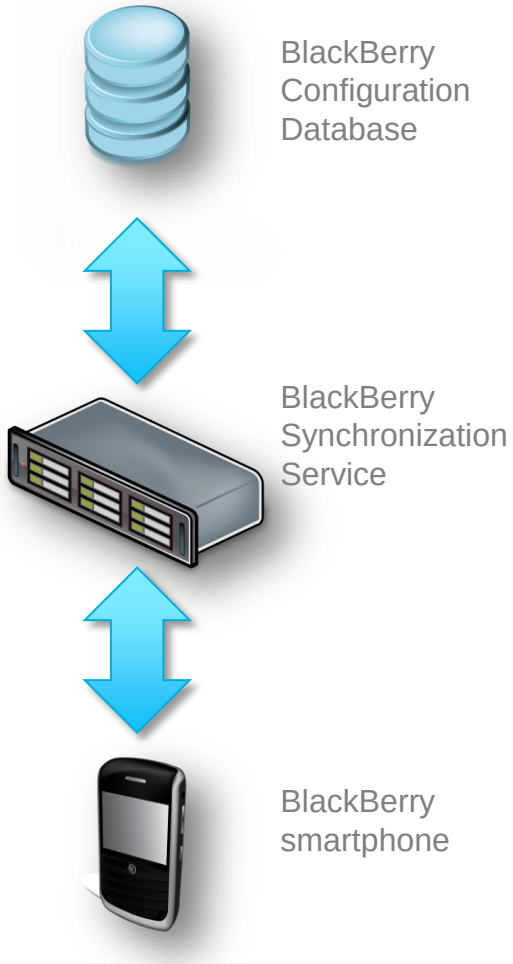
- Some examples of BlackBerry smartphone settings and data include the following:
  - Icon locations
  - BlackBerry® Browser bookmarks
  - Call logs
  - Password keeper entries



Features and functions of the BlackBerry Synchronization Service

Backs up BlackBerry smartphone settings and data to the BlackBerry Configuration Database over the wireless network

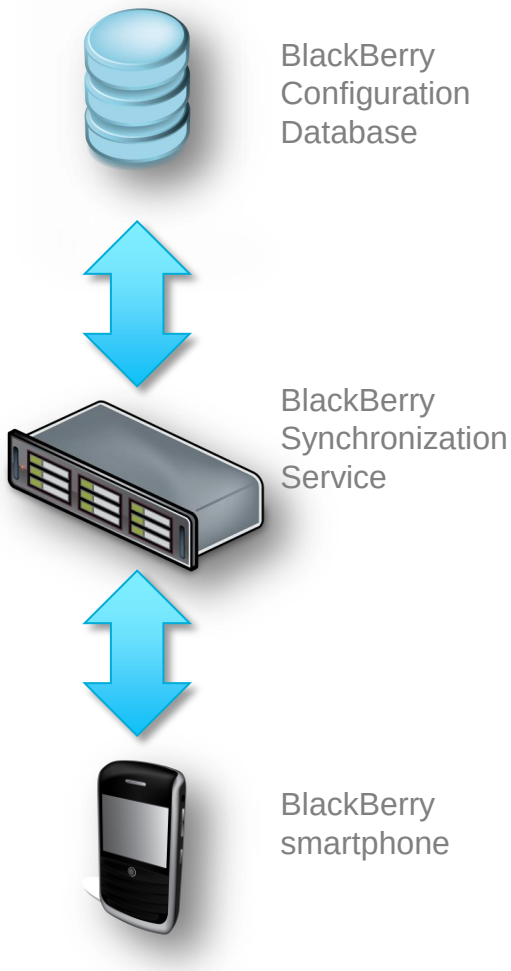
- By default, automatic backup is turned on.
- BlackBerry smartphone settings and data can be sent to a new BlackBerry smartphone during wireless activation.
- Removing a BlackBerry smartphone user from the BlackBerry® Enterprise Server removes user settings and data.



Features and functions of the BlackBerry Synchronization Service

Played a role in the distribution of the DST 2007 patch

- An `invokesync` command was placed in the SyncRequest table of the BlackBerry Configuration Database.
- Restarting the BlackBerry Synchronization Service forces the BlackBerry Enterprise Server to find the `invokesync` command immediately, instead of at the regularly scheduled time.

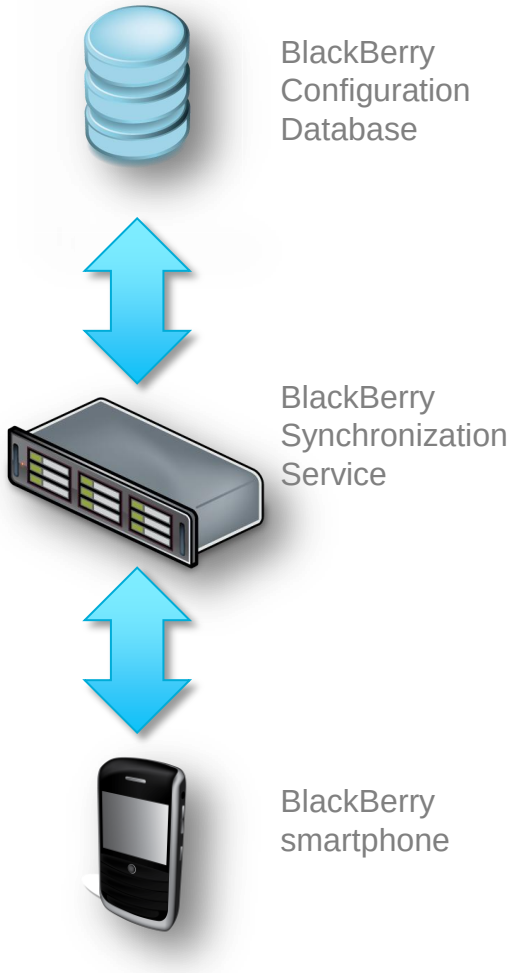


DST Daylight Saving Time

Features and functions of the BlackBerry Synchronization Service

Initial synchronization

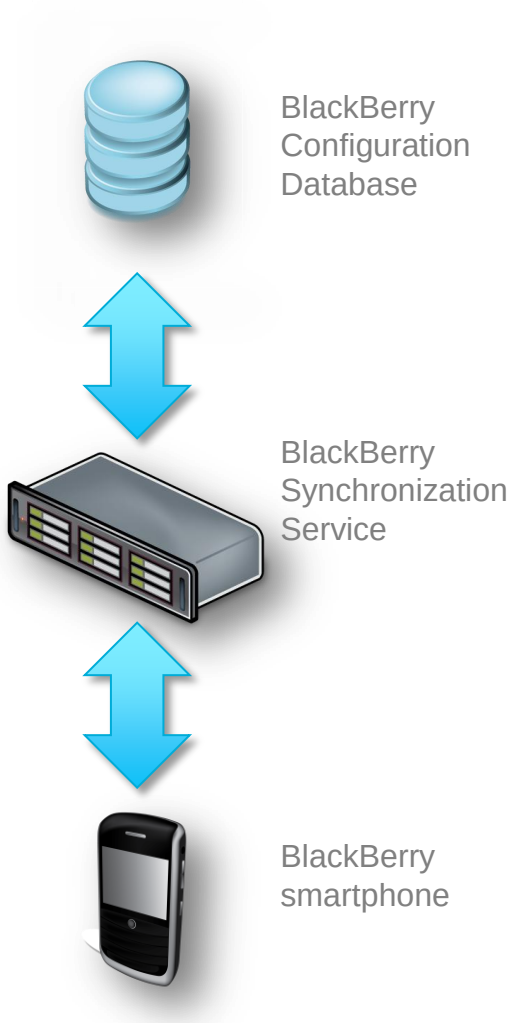
- During initial synchronization, the BlackBerry Synchronization Service performs email message prepopulation and organizer data synchronization.
- Initial synchronization also includes resolution of conflicting or duplicate organizer data.
- By default, calendar entries that occur up to 31 days in the past or 28 years in the future are synchronized.



Features and functions of the BlackBerry Synchronization Service

Synchronization settings

- Synchronization settings can apply to individual BlackBerry smartphone user accounts.
- IT policies can apply synchronization settings to groups.
- Settings can include information on:
  - Which data to synchronize
  - How conflicts are resolved
  - Which direction to synchronize



IT information technology

Features and functions of the BlackBerry Synchronization Service

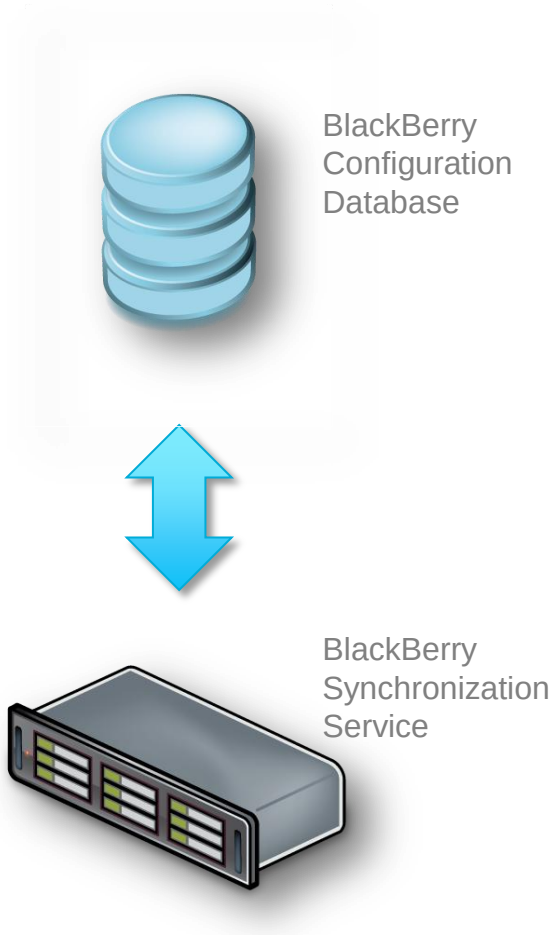
Support for different types of BlackBerry smartphone user access

- The BlackBerry Synchronization Service can be configured to support different types of BlackBerry smartphone user profiles, such as the roaming profiles available in IBM® Lotus® Domino®.

Features and functions of the BlackBerry Synchronization Service

XML-based records

- The BlackBerry Synchronization Service requires Microsoft® XML Parser 4.0 or later, which is included with the BlackBerry Enterprise Server.

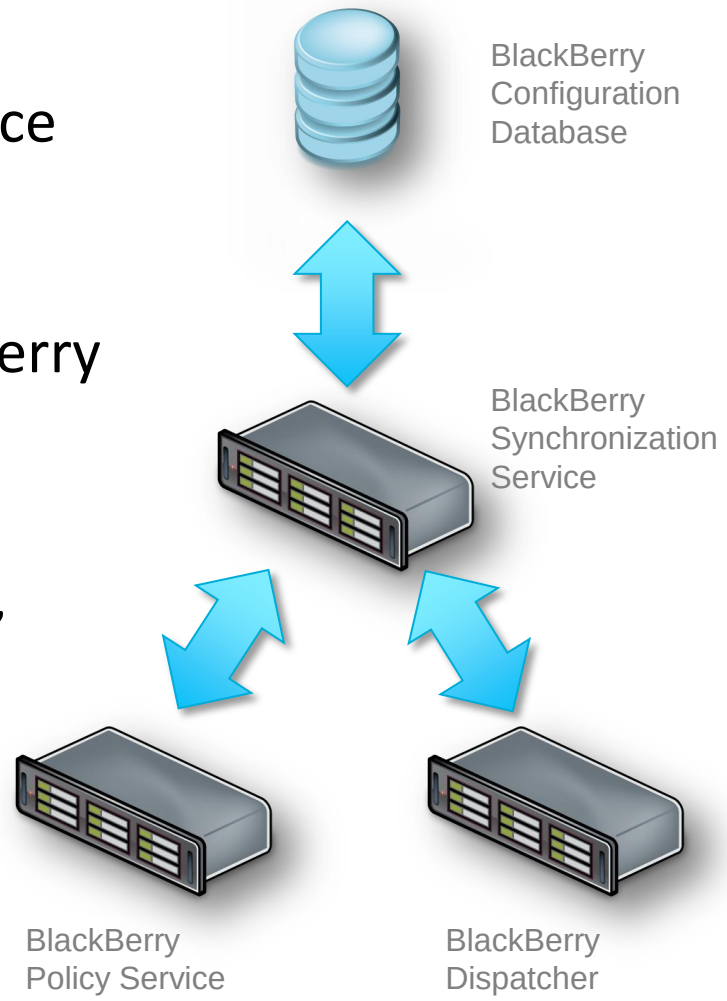


XML Extensible Markup Language

Features and functions of the BlackBerry Synchronization Service

Additional information

- The BlackBerry Synchronization Service must be able to connect with the BlackBerry Configuration Database, BlackBerry Policy Service, and BlackBerry Dispatcher.
- If any of these BlackBerry Enterprise Server components are not available, the BlackBerry Synchronization Service is not able to function.



Analyzing BlackBerry Synchronization Service log files

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Analyzing BlackBerry Synchronization Service log files

BlackBerry Synchronization Service log files

- The location can be modified, but, by default, log files for the BlackBerry® Synchronization Service and its subcomponents are located in

```
C:\Program Files\Research In Motion\BlackBerry
Enterprise Server\Logs
```

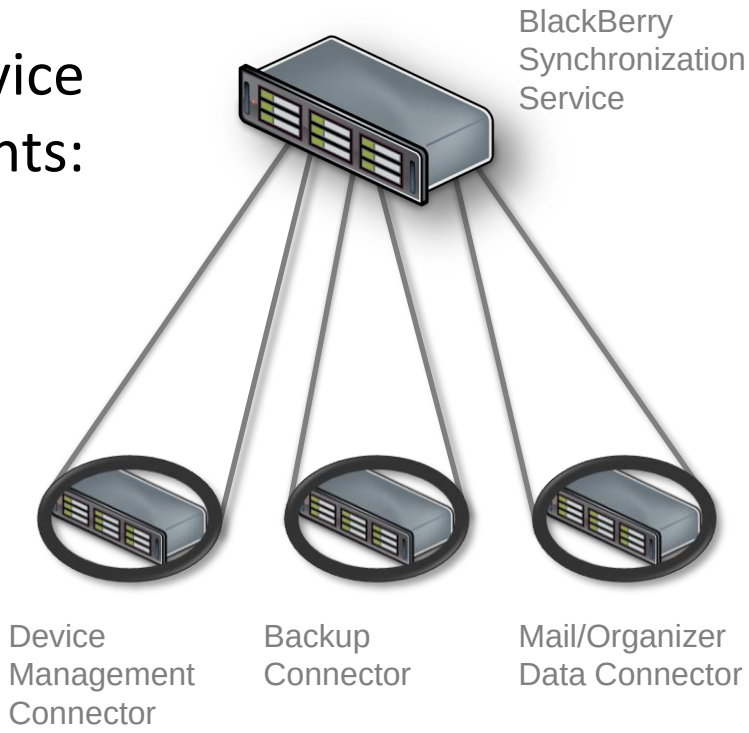
- BlackBerry Synchronization Service log files are identified by SYNC in the file name.

```
NYCBES19_SYNC_01_20100211_0001.txt
```

Analyzing BlackBerry Synchronization Service log files

BlackBerry Synchronization Service connectors

- The BlackBerry Synchronization Service includes the following subcomponents:
  - Device Management Connector
  - Backup Connector
  - Mail/Organizer Data Connector



Analyzing BlackBerry Synchronization Service log files

Device Management Connector

- The Device Management Connector connects to BlackBerry smartphones to collect configuration information, such as applications that were pushed to the BlackBerry smartphone.
- The collected information is stored in the BlackBerry Configuration Database.

```
[46031] (01/11 06:36:56.359):{0x1750} [SYNC-DSession]
Submit XML request to DevMgmt connector. [Da Silva,
Sherisse:66]
```

Analyzing BlackBerry Synchronization Service log files

Device Management Connector

- The Device Management Connector generates a daily debug log file.

```
NYCBES19_CMNG_01_20100211_0001.txt
```

Analyzing BlackBerry Synchronization Service log files

Backup Connector

- The Backup Connector archives BlackBerry smartphone information, such as call logs and password keeper entries.
- The collected information is stored in the BlackBerry Configuration Database.

```
[46031] (01/11 06:36:56.343):{0x1750} [SYNC-DSession]
Submit XML request to Backup connector. [deBoer,
Jeanette:66]
```

Analyzing BlackBerry Synchronization Service log files

Backup Connector

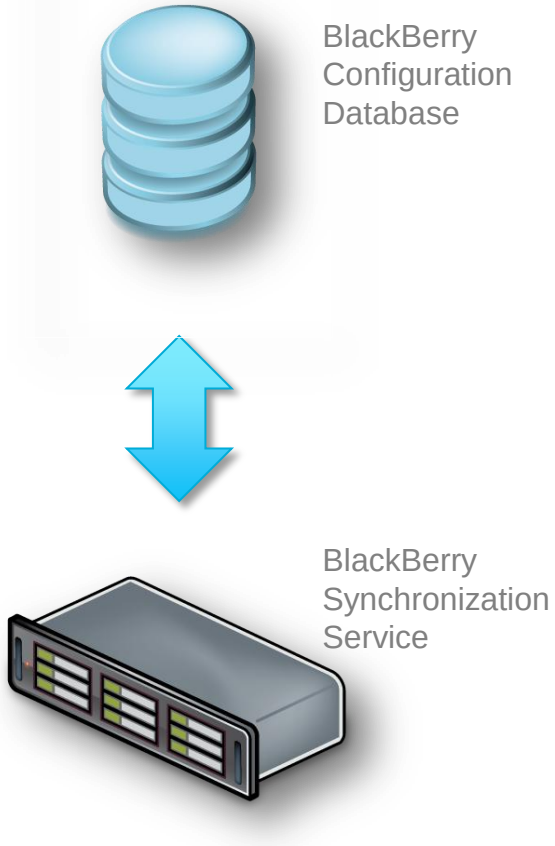
- The Backup Connector generates a daily debug log file.

```
NYCBES19_CBCK_01_20100211_0001.txt
```

Analyzing BlackBerry Synchronization Service log files

Connection to the BlackBerry Configuration Database

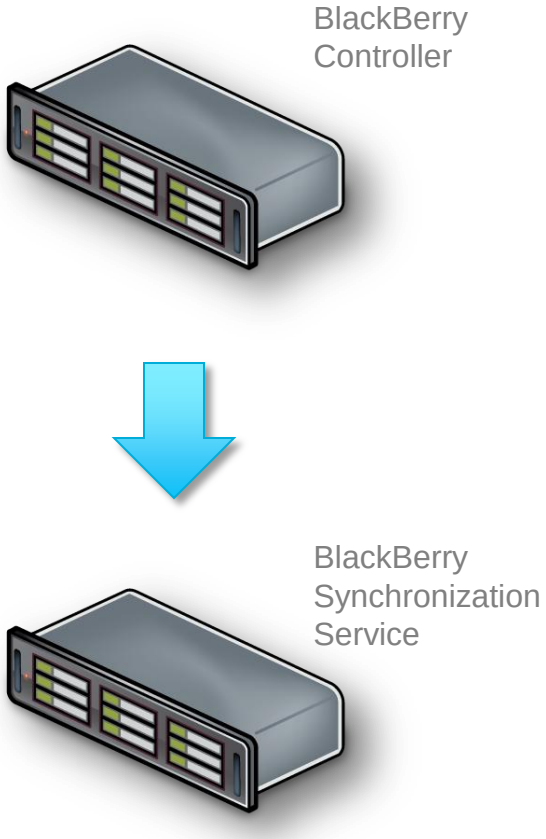
- The BlackBerry Synchronization Service connects with the following BlackBerry Configuration Database tables:
  - SyncRequest
  - SyncDeviceMgmt
  - SyncDeviceMgmtSummary



Analyzing BlackBerry Synchronization Service log files

BlackBerry Synchronization Service startup

- The BlackBerry Controller monitors the BlackBerry Synchronization Service
- If the BlackBerry Synchronization Service stops running, the BlackBerry Controller restarts it up to 10 times in a 24-hour period.



Analyzing BlackBerry Synchronization Service log files

BlackBerry Synchronization Service startup

- When the BlackBerry Synchronization Service starts, or when it creates a new daily log file, it records several items in the log file.
  - The current PID of the BlackBerry Synchronization Service
  - The current Windows® account name and total uptime
  - The version of the BlackBerry Synchronization Service
  - The processes that are running on the computer that hosts the BlackBerry® Enterprise Server

PID process identifier

Analyzing BlackBerry Synchronization Service log files

BlackBerry Synchronization Service startup

- When the BlackBerry Synchronization Service starts, or when it creates a new daily log file, it records the current PID in the log file.

```
[30000] (01/11 00:00:00.362):{0xE64} [ENV] Current Process id: 3652
```

- When the BlackBerry Synchronization Service starts, or when it creates a new daily log file, it records the current Windows account name and total uptime in the log file.

```
[30000] (01/11 00:00:00.362):{0xE64} [ENV] Current Process logged on as:
INSIDELIVE\BESAdmin, Start Time: Dec 21 2009 11:40:48, Uptime (seconds): 1772352
```

Analyzing BlackBerry Synchronization Service log files

BlackBerry Synchronization Service startup

- When the BlackBerry Synchronization Service starts, or when it creates a new daily log file, it records the processes that are running on the computer that hosts the BlackBerry Enterprise Server in the log file.

```
[30000] (01/11 00:00:00.487):{0xE64} [ENV] Running Process: System
[30000] (01/11 00:00:00.487):{0xE64} [ENV] Running Process: smss.exe
[30000] (01/11 00:00:00.487):{0xE64} [ENV] Running Process: csrss.exe
[30000] (01/11 00:00:00.487):{0xE64} [ENV] Running Process: winlogon.exe
[30000] (01/11 00:00:00.487):{0xE64} [ENV] Running Process: services.exe
[30000] (01/11 00:00:00.487):{0xE64} [ENV] Running Process: lsass.exe
[30000] (01/11 00:00:00.487):{0xE64} [ENV] Running Process: svchost.exe
[30000] (01/11 00:00:00.487):{0xE64} [ENV] Running Process: svchost.exe
[30000] (01/11 00:00:00.487):{0xE64} [ENV] Running Process: svchost.exe
[30000] (01/11 00:00:00.487):{0xE64} [ENV] Running Process: svchost.exe
[30000] (01/11 00:00:00.487):{0xE64} [ENV] Running Process: svchost.exe
[30000] (01/11 00:00:00.487):{0xE64} [ENV] Running Process: spoolsv.exe
```

Analyzing BlackBerry Synchronization Service log files

BlackBerry Synchronization Service startup

- When the BlackBerry Synchronization Service starts, or when it creates a new daily log file, it records the version of the BlackBerry Synchronization Service in the log file.

```
[30000] (01/11 00:00:00.581):{0x176C} [ENV] BlackBerrySyncServer Version
4.1.6.12
[30000] (01/11 00:00:00.581):{0x176C} [ENV] BES Service Name: BlackBerry
Synchronization Service
```

Analyzing BlackBerry Synchronization Service log files

BlackBerry Synchronization Service health checks

- The BlackBerry Synchronization Service performs regular health checks on itself to make sure that it is running correctly.

```
[36021] (01/11 00:20:26.854):{0x1770} [SYNC-Gate] Performing system health check
(BlackBerrySyncServer Version 4.1.6.12 (built at 13:37:15 on Sep 15 2008))
```

Analyzing BlackBerry Synchronization Service log files

BlackBerry Synchronization Service BlackBerry smartphone user configuration checks

- The BlackBerry Synchronization Service checks periodically for changes in BlackBerry smartphone user configurations.

```
[36009] (01/11 00:00:15.018):{0x1858} [SYNC-Gate] Performing user config change
check.
```

- If there are no changes, the log file shows the following:

```
[46077] (01/11 00:00:15.018):{0x1858} [SYNC-Gate] Finished user config change
check. No change detected.
```

Analyzing BlackBerry Synchronization Service log files

BlackBerry Synchronization Service BlackBerry smartphone user configuration checks

- If there are changes, the Backup Connector log file shows the following:

```
[40000] (01/11 01:06:19.555):{0x185C} [BIPP] Received datagram, Tag=17149447
[46042] (01/11 01:06:19.555):{0x172C} [SYNC-DSession] Received 110 bytes from device. [Cacciacarro, Marco:31, SID=469632748, SEQ=1/1]
[46052] (01/11 01:06:19.555):{0x172C} [SYNC-DSession] Contain 1 record(s) and 3 command(s) from Backup.Phone Call Logs/DevMgmt.Handheld Agent [Cacciacarro, Marco:31]
[46031] (01/11 01:06:19.555):{0x172C} [SYNC-DSession] Submit XML request to Backup connector. [Cacciacarro, Marco:31]
[46031] (01/11 01:06:19.571):{0x172C} [SYNC-DSession] Submit XML request to DevMgmt connector. [Cacciacarro, Marco:31]
[46037] (01/11 01:06:19.587):{0x1728} [SYNC-DSession] UID Logging: U83886080. [Cacciacarro, Marco:31, DS=DevMgmt, DB=Handheld Agent]
[46008] (01/11 01:06:19.587):{0x1728} [SYNC-DSession] Send 1 packet(s) with 8 bytes to the device. [Cacciacarro, Marco:31, SID=469632748, CLID=10538, ECLID=538, TAG=1100303, ST=20]
```

Analyzing BlackBerry Synchronization Service log files

BlackBerry Synchronization Service BlackBerry smartphone user configuration checks

- When the BlackBerry Synchronization Service finishes a DSession, the log file shows the following:

```
[46019] (01/11 01:06:19.587):{0x1728} [SYNC-DSession] DSession is finished.
[Cacciacarro, Marco:31, SID=469632748, CLID=10538, ECLID=538]
```

- A DSession, or device session, represents an individual synchronization transaction.

Analyzing BlackBerry Synchronization Service log files

BlackBerry Synchronization Service BlackBerry smartphone user configuration checks

- When a BlackBerry smartphone user's configuration changes, the BlackBerry Synchronization Service log file records the type of change and the database location.

```
[46033] (01/11 02:10:20.656):{0x1740} [SYNC-UserControl] Received ADD, ADD
exists in SyncRequest. [Patel, Aarti:176, DS=Exchange, DB=Tasks]
```

DS	Datastore
DB	Database

Analyzing BlackBerry Synchronization Service log files

BlackBerry Synchronization Service BlackBerry smartphone user configuration checks

- When the BlackBerry Synchronization is asked to back up a call log on a BlackBerry smartphone, the BlackBerry Synchronization Service log file shows the following:

```
[46042] (01/11 03:42:09.167):{0x171C} [SYNC-DSession] Received 52 bytes from
device. [Wagler, Meredith:224, SID=478860576, SEQ=1/1]
[46052] (01/11 03:42:09.167):{0x171C} [SYNC-DSession] Contain 0 record(s) and 2
command(s) from Backup.Phone Call Logs [Wagler, Meredith:224]
[46031] (01/11 03:42:09.167):{0x171C} [SYNC-DSession] Submit XML request to
Backup connector. [Wagler, Meredith:224]
[46008] (01/11 03:42:09.183):{0x1724} [SYNC-DSession] Send 1 packet(s) with 8
bytes to the device. [Wagler, Meredith:224, SID=478860576, CLID=16674, ECLID=80,
TAG=1100306, ST=20]
```

Analyzing BlackBerry Synchronization Service log files

BlackBerry Synchronization Service and the SYNC service book

- When the SYNC service book on a BlackBerry smartphone is deleted and then undeleted, the BlackBerry Synchronization Service starts the slow synchronization process.
- When the BlackBerry Synchronization Service finishes the slow synchronization process, the log file shows the following:

```
[36023] (01/11 05:37:07.498):{0x1750} [SYNC-DSession] *** SLOWSYNC COMPLETE ***
[Symonds, Sarah:10]
```

Analyzing BlackBerry Synchronization Service log files

BlackBerry Synchronization Service and the SYNC service book

- If the BlackBerry Synchronization Service cannot complete the slow synchronization process, the Device Management connector log file shows the following:

```
[46055] (12/08 12:07:22):{0x1300} [SYNC-DSession] DevMgmt connector responded
FAILED_TO_BACKUP_DATA for Add on Handheld Agent, return ERROR_RETRY_OPERATION to
the device. [Koen, Trudy:23, SID=190258296, CLID=6, ECLID=3, TB=1]
```

Analyzing BlackBerry Synchronization Service log files

BlackBerry Synchronization Service

- ECLID versus CLID
  - The BlackBerry smartphone and the BlackBerry Configuration Database both maintain a change list that tracks data that should be synchronized
  - A hash comparison between the change list on the BlackBerry smartphone and the change list on the BlackBerry Configuration Database

CLID change list identifier
ECLID expected change list identifier

Analyzing BlackBerry Synchronization Service log files

BlackBerry Synchronization Service

- When a request to initialize records occurs, records that are marked as deleted are ignored and only the following types of records are processed:
  - Add
  - Update
  - No Change

Analyzing BlackBerry Synchronization Service log files

BlackBerry Synchronization Service

- A GUID is generated that is unique to all BlackBerry Enterprise Server instances using the BlackBerry Configuration Database

GUID globally unique identifier

Analyzing BlackBerry Synchronization Service log files

BlackBerry Synchronization Service

- If the BlackBerry Enterprise Server cannot connect to the BlackBerry Configuration Database, it will log the unsuccessful attempt, along with a possible error.
- On the next attempt to connect to the BlackBerry Configuration Database, an attempt is made to look for outstanding Add requests.

Analyzing BlackBerry Synchronization Service log files

Extended logging for the BlackBerry Synchronization Service

- The BlackBerry Synchronization Service can track data packets that are sent between the BlackBerry Synchronization Service and specific BlackBerry smartphones.
- Extended logging generates two additional log files
  - A text file containing record information

    `ExtLog<UserId>_<Date>.txt`

  - A binary file containing data packet information

    `PacketLog<UserId>_<Date>.bin`

Analyzing BlackBerry Synchronization Service log files

Extended logging for the BlackBerry Synchronization Service

- To enable extended logging for the BlackBerry Synchronization Service, complete the following steps:
  1. Make sure that event logging on the BlackBerry smartphone is set to **Debug Info**.
  2. In the Windows registry, under **Logging Info > Synchronization Service**, add a string type registry value named **DebugUserIdList**.
  3. In the DebugUserIdList value, type the comma-separated UserIds of all BlackBerry smartphone user accounts that should be included for extended logging.

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