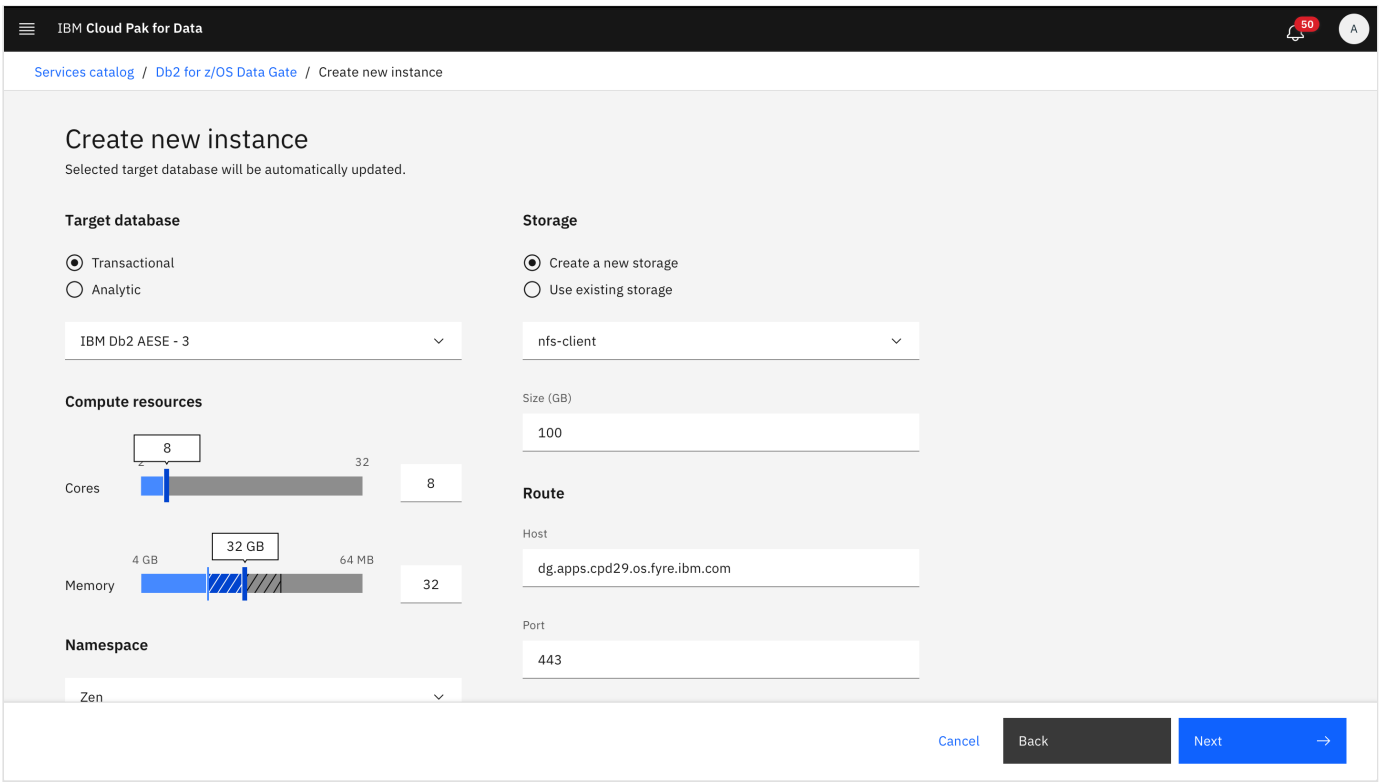
Db2 Data Gate on Cloud Pak for Data

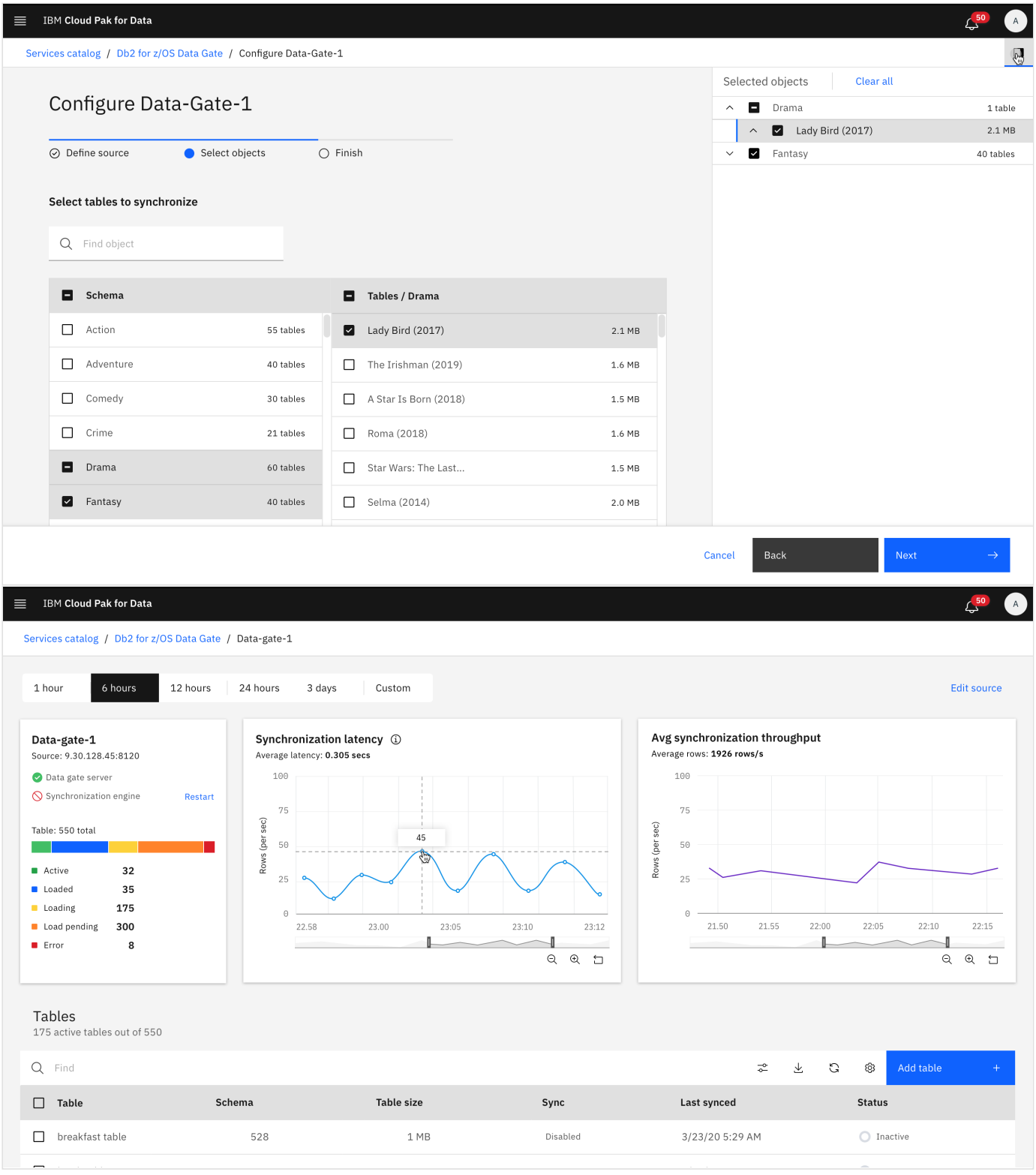
Last Updated: 2022-10-26

Versions 1.1.1, 1.1.2, 1.1.3

Included

IBM





Description

The IBM Db2 for z/OS Data Gate service extracts, loads, and synchronizes your mission-critical data from Db2 for z/OS to Cloud Pak for Data for quick access by your new, high volume, read-only transactional and analytic applications.

The service propagates your data from a Db2 for z/OS source on IBM Z to a target database on Cloud Pak for Data. You can choose your target database based on your business need. For example, you might set up Db2 as your target database for your new high-intensity transactional workloads, such as mobile banking applications. Or, you might set up Db2 Warehouse as your target database for your analytic or AI workloads.

The Db2 Data Gate service uses an integrated data synchronization protocol to ensure that your data is current, consistent, and secure. The fully zIIP-enabled synchronization protocol is lightweight, high throughput, and low latency. It enables near real-time access to your data without degrading the performance of your core transaction engine.

Compared to any custom-built solution, the Db2 Data Gate service reduces the cost and complexity of your application development. By using this service to synchronize and access your enterprise data on Cloud Pak for Data, a cloud-native solution, you can reduce your operational cost while accelerating your journey to the cloud and AI.

Quick links

Install	Administer	Use	What's new	Known issues	Troubleshoot
Install the service	Configure and maintain the service	Work with the service	See a list of top new features	View limitations	Find solutions to problems
→	→	→	→	→	→

Integrated services

Prerequisite services ⓘ

Db2	Work with a relational database that delivers advanced data management and analytics capabilities for transactional workloads.
Db2 Warehouse	Get in-memory processing and integrated database analytics with this high-performing analytics engine.

Installing Db2 Data Gate

Last Updated: 2021-04-28

Installing Db2 Data Gate requires a number of installation and configuration steps be performed on IBM Z and on IBM® Cloud Pak for Data. Additional steps are required to connect these systems.

Certain installation and configuration tasks might be best performed by people in different roles.

The tasks and steps in the following table should be preformed in the order listed in the table for ease of installing and configuring Db2 Data Gate. However, depending on your environment, some steps might be optional if they are already complete (for example, if the Db2 for z/OS® subsystem is already running with all current maintenance, or if inbound network access to the Db2 for z/OS subsystem is already configured).

Because of the different user roles required and potentially different system environments, consider creating a high-level plan to manage, coordinate, and track all major planning, installation, and configuration activities, using this roadmap as a guide.

Table 1. Db2 Data Gate planning, installation, and configuration roadmap

Type	Task	Subtask	User role(s)
Plan	Review the Db2 Data Gate system requirements		z/OS system administrator or programmer, Cloud Pak for Data cluster administrator, Cloud Pak for Data project administrator, Data Gate administrator

Type	Task	Subtask	User role(s)
Prepare	Configure inbound access to Db2 for z/OS	1. Define a secure network port 2. Configure AT-TLS	z/OS system administrator or network administrator
Prepare	Encrypt outbound network access from Db2 for z/OS to the Db2 Data Gate service	1. Create a key ring that includes the CA certificate 2. Generate and export a key pair and a certificate for Db2 Data Gate 3. Configure the Policy Agent on your z/OS client LPARs **Important:** Steps 2 and 3 require the OpenShift® route hostname, port, and IP address of the Db2 Data Gate instance and might best be done after you create a Db2 Data Gate instance. However, you can preform the tasks with proper planning of the hostname, port, and IP address.	z/OS system administrator or network administrator
Install	Install the Db2 Data Gate PTF on IBM Z		z/OS system administrator or programmer
Install	Installing Db2 maintenance to enable Db2 Data Gate		z/OS system administrator or Db2 installation system

Type	Task	Subtask	User role(s)
			operator (Install SYSOPR authority)
Configure	Configure Db2 for z/OS to support Db2 Data Gate	1. Set Db2 for z/OS subsystem parameters 2. Create Db2 for z/OS databases and tables for Db2 Data Gate 3. Verify the setup of Db2-supplied stored procedures	z/OS system administrator or Db2 installation system operator (Install SYSOPR authority)
Configure	Create and setup Db2 Data Gate stored procedure	1. Create a dedicated WLM environment for Db2 Data Gate stored procedures 2. Define WLM performance goals for Db2 Data Gate stored procedures 3. Create the Db2 Data Gate stored procedures	z/OS system administrator or programmer
Configure	Create Db2 Data Gate users and grant privileges on Z		z/OS system administrator or programmer with Unix service system skills, security administrator
Install and Configure	Install, provision, and configure a Db2 instance for Db2 Data		Cloud Pak for Data project administrator, Db2 administrator

Type	Task	Subtask	User role(s)
	Gate on Cloud Pak for Data		
Configure	Set up the Cloud Pak for Data cluster for Db2 Data Gate		Cloud Pak for Data cluster administrator, Cloud Pak for Data project administrator
Install	Install Db2 Data Gate service on Cloud Pak for Data		Cloud Pak for Data project administrator
Install and configure	Create a Db2 Data Gate instance		Cloud Pak for Data project administrator, Data Gate administrator

Configuring network access between Db2 Data Gate and IBM Z®

Last Updated: 2021-04-28

Synchronizing data requires a secure TCP/IP network connection between the Db2 for z/OS® source system and the Db2 Data Gate instance on IBM® Cloud Pak for Data. Network bandwidth and speed impacts overall performance.

For optimal performance, at least a 10 Gigabit Ethernet connection is suggested between the Z System and the IBM Cloud Pak for Data system.

Db2 Data Gate requires a secure port be enabled on the z/OS LPAR and be accessible through the firewall. Port 448 is the default secure DRDA port for Db2 for z/OS client connections. Db2 Data Gate uses this port:

- To update information in Db2 configuration tables
- As the listening port for Db2 Data Gate to read the Db2 Data Gate log

A remote connection must be permitted on every Db2 member that Db2 Data Gate connects to on a z/OS LPAR.

Db2 Data Gate reads Db2 for z/OS log records through a REST interface. The connection used for data transfer must be encrypted using SSL. Db2 for z/OS supports encrypted connections through the SECPORT parameter and AT-TLS to support encryption on the SECPORT.

The following z/OS and TCP/IP components and configuration are required:

- TCP/IP must specify a TTLS policy
- Policy agent (PAGENT)
- ICSF (IBM Encryption Facility for z/OS)
- RACF® - to generate a server certificate and install to the key ring store

Related information

Db2 for z/OS DISPLAY DDF command

Configuring the Db2 server for SSL

Db2 for z/OS AT-TLS configuration

Application Transparent Transport Layer Security data protection

Defining a secure network port for connections to Db2 Data Gate

Last Updated: 2021-04-28

Db2 Data Gate uses the distributed data facility (DDF) to connect to Db2 for z/OS®. Connections between Db2 Data Gate and Db2 for z/OS must be encrypted.

About this task

Encrypted connections are required because the log records and data transferred by Db2 Data Gate might contain sensitive information. Unencrypted connections will be refused. Check if a secure port (SECPORT) exists, and if not define one.

Procedure

1. To check if a secure port exists, run the Db2 for z/OS **-DISPLAY DDF** command from TSO. For example, the following command output shows that the secure port (**SECPORT**) is set to **15111**:

   ```
   RESPONSE=XYZ1
   DSNL080I -DB12 DSNLTDDF DISPLAY DDF REPORT FOLLOWS:
   DSNL081I STATUS=STARTD
   DSNL082I LOCATION           LUNAME            GENERICLU
   DSNL083I LOCDB12            NATIVE.IPWADB12   -NONE
   DSNL084I TCPPORT=12511 SECPORT=15111 RESPORT=15011 IPNAME=-NONE
   ```

   If the value of SECPORT is 0, you must define a secure port.
2. To define a secure port, use one of the following methods:
   - Set the Db2 for z/OS SECURE PORT subsystem parameter on the DSNTIPR panel.
   - Specify the secure port in the boot strap data set (BSDS) by using the DSNJU003 change log inventory utility.

   > **Important:** This method requires a restart of Db2 for z/OS because the BSDS can only be updated while Db2 is not running.

3. To work with data sharing groups, Db2 Data Gate requires a stable connection to the log reader task of the member that the session was started from.
   That is, for incremental update processing, the connection must always go to the same member. To achieve this, use one of the following options:

   - **Option 1:**
     This is a full data sharing setup that uses DDVIPA with the TIMEDAFFINITY option. With this type of setup, a dedicated SECPORT is assigned to the Db2 members and an exclusive location alias for Db2 Data Gate is defined on each member. This means that all members have the same SECPORT.

     a. Define a dedicated location alias and a secure port (SECPORT) for Db2 Data Gate on all data sharing members. If you already use a SECPORT for other workloads, choose a different SECPORT for Db2 Data Gate.
     b. Set up high availability for Db2 Data Gate as described in Suggestion for a high-availability setup and start the location alias on all data sharing members that participate in the high-availability setup.

   - **Option 2:**
     In a setup like this, the data sharing setup uses a DDVIPA network, but the TIMEDAFFINITY option is not set. A dedicated SECPORT is assigned to the Db2 members and an exclusive location alias for Db2 Data Gate is defined on each member. This means that all members have the same SECPORT.

     However, the location alias is started on a single member only. To shift the workload from a member A to a member B, you must stop the location alias on member A and then start the alias on member B.

     a. Define a dedicated location alias and a secure port (SECPORT) for Db2 Data Gate on all data sharing members. If you already use a SECPORT for other workloads, choose a different SECPORT for Db2 Data Gate.
     b. Start the location alias on the member that provides the Db2 log data for Db2 Data Gate. Make sure that the location alias is started on this member only. If this member or the network fails, or if you have to shut down the member for maintenance purposes, the location alias can be started on another member so that Db2 Data Gate can continue to work.

   With a configuration like this, all members used for connections can share the same DDVIPA IP address. This makes the handling and the setup of SSL certificates easier because a single, shared certificate can be used.

The following example shows how to use the **-MODIFY DDF** command to define and start a location alias for a single member DB1CMBR1 that listens on secure port 15011:

```
-DB1C MODIFY DDF ALIAS(DB1CMBR1) ADD
-DSNL300I  -DB1C DSNLTMDF MODIFY DDF REPORT FOLLOWS:
-DSNL302I ALIAS DB1CMBR1 IS SET TO ADD
-DSNL301I DSNLTMDF MODIFY DDF REPORT COMPLETE

-DB1C MODIFY DDF ALIAS(DB1CMBR1) SECPORT(15011)
-DSNL300I  -DB1C DSNLTMDF MODIFY DDF REPORT FOLLOWS:
-DSNL302I ALIAS DB1CMBR1 IS SET TO SECPORT 15011
-DSNL301I DSNLTMDF MODIFY DDF REPORT COMPLETE

-DB1C MODIFY DDF ALIAS(DB1CMBR1) START
-DSNL300I  -DB1C DSNLTMDF MODIFY DDF REPORT FOLLOWS:
-DSNL302I ALIAS DB1CMBR1 IS SET TO START
-DSNL301I DSNLTMDF MODIFY DDF REPORT COMPLETE
-DSNL314I  -DB1C DSNLILNR THE ALIAS DB1CMBR1 IS STARTED
```

Running **-DISPLAY DDF** generates the following screen output:

```
-DIS DDF
-DSNL080I  -DB1C DSNLTDDF DISPLAY DDF REPORT FOLLOWS:
-DSNL081I STATUS=STARTD
-DSNL082I LOCATION           LUNAME            GENERICLU
-DSNL083I LOCDB2             NATIVE.APP2DB2A   -NONE
-DSNL084I TCPPORT=446   SECPORT=12000   RESPORT=5001  IPNAME=-NONE
...
-DSNL087I ALIAS              PORT  SECPORT STATUS
-DSNL088I DB1CMBR1           0     15011   STARTD
...
-DSNL099I DSNLTDDF DISPLAY DDF REPORT COMPLETE
```

Parent topic:

→ Configuring inbound access to Db2 for z/OS for Db2 Data Gate

Related information

- Db2 for z/OS DISPLAY DDF command
- Configuring the Db2 server for SSL