

Centers for Medicare & Medicaid Services

EDGE Server Annual Archive Job Aid

June 2017

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I. Background

The External Data Gathering Environment (EDGE) server data submission for 2016 ended on May 1, 2017. The Centers for Medicare & Medicaid Services (CMS) issued a blackout period after the submission deadline in order for annual Reinsurance (RI) and Risk Adjustment (RA) payments and charges to be performed. Once CMS has finished the benefit year payments and/or charges, a command will be sent to issuers' EDGE servers to archive the data on the server for future audit purposes, and to clear the production tables for submission of the new benefit year data once the blackout is lifted.

It is important to note that only the PROD and COMMON tables will be archived. The TEST zone and VALIDATION zone tables will not be archived. Issuers who want to sync their PROD and TEST zone after the archive occurs will need to truncate the TEST zone to clear the tables. Issuers who have received a TEST zone truncation script before, may utilize the same script. For initial TEST zone truncation requests, please email CMS_FEPS@cms.hhs.gov.

II. Purpose

The purpose of the EDGE Server Annual Archive Job Aid is to provide issuers with instructions on the pre-archive steps necessary to successfully prepare their servers to execute the EDGE server remote command that will create the archive schemas to back up benefit year data that was used for RA and RI calculations. This job aid also provides instructions on the post-archive confirmations that are recommended to confirm a successful archive has occurred. Issuers should refer to CMS-published communications about the deadlines for executing these steps, to ensure a successful archive process.

III. Conventions

The following documentation conventions will be used:

Table 1: Conventions Table

Convention	Description
Black highlighted in gray: • Text	Black characters highlighted in gray indicate a command that should be run at the Linux or MySQL command line.
Red highlighted in gray: • <Text>	Red characters highlighted in gray indicate text that needs to be replaced with a value custom to the issuer.

Note: Please do not copy commands to the command line directly from this document. You can either type the commands in the command line or you can copy commands from this document to NotePad or TextPad, and then copy it to the command line.

IV. Pre-Archive Steps

Step 1: Identify 'DB User' from edge.properties along with 'DB password'

1. Log on to the server and access the properties file by entering:
   - cd /opt/edge/config

- view edge.properties

```
[ec2-user@edgeserver-2906515 config]$ pwd
/opt/edge/config
You have mail in /var/spool/mail/ec2-user
[ec2-user@edgeserver-2906515 config]$ view edge.properties
```

Figure 1: Edge.properties – DB User (1 of 2)

2. Identify the value associated with the property, **db_user and db_password,** from edge.properties, using the EDGE application that connects to MySQL DB.

```
db_host=localhost
db_port=3306
db_user=edgedbuser
```

Figure 2: Edge.properties – DB User (2 of 2)

Step 2: Identify Custom Schemas, If Applicable

3. Identify the custom schemas by checking the values associated with the following properties:
   a. db_common_schema
   b. db_prod_schema

```
db_common_schema=EDGE_SRVR_COMMON_CUSTOM
db_test_schema=EDGE_SRVR_TEST_CUSTOM
db_prod_schema=EDGE_SRVR_PROD_CUSTOM
```

Figure 3: Schemas Check

Step 3: Check Current Storage Space Usage by Database Schemas

The following steps can be used to check the DB storage space currently used by DB schemas on the MySQL server. If there is insufficient space, issuers may encounter problems executing the archive remote command. To address this, issuers will need to add additional storage to the MySQL DB mount point.

4. Log in to the MySQL shell using the **db-user**, as shown below.

- mysql --host localhost -u edgedbuser -p

```
[ec2-user@edgeServer-29089 config]$ mysql --host localhost -u edgedbuser -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 3213
Server version: 5.7.18 MySQL Community Server (GPL)

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Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>
```

Figure 4: MySQL – DB User Login

Steps to check current storage space, taken by DB schemas:

5. Run the following **SQL** from MySQL shell to check storage space.

```
SELECT table_schema "Data Base Name",
sum( data_length + index_length ) / 1024 /
1024 "Data Base Size in MB"
FROM information_schema.TABLES
GROUP BY table_schema;
```

```
mysql> SELECT table_schema "Data Base Name",
    -> sum( data_length + index_length ) / 1024 /
    -> 1024 "Data Base Size in MB"
    ->  FROM information_schema.TABLES
    ->  GROUP BY table_schema;
+--------------------+----------------------+
| Data Base Name     | Data Base Size in MB |
+--------------------+----------------------+
| EDGE_SRVR_COMMON   |          67.01562500 |
| EDGE_SRVR_COMMON_V |          66.84375000 |
| EDGE_SRVR_PROD     |           3.73437500 |
| EDGE_SRVR_TEST     |           2.95312500 |
| EDGE_SRVR_VALIDATION |         2.95312500 |
| information_schema |           0.15625000 |
+--------------------+----------------------+
6 rows in set (0.03 sec)
```

Figure 5: Schema Storage Space

6. Based on DB size, issuers can increase the space available on the DB Mount points for the back-up schemas and also for upcoming file ingests. To check the available space, enter the following command:

```
df -h /var/lib/mysql
```

Note: Depending on the MySQL installation, the mount point for MySQL may vary.

```
[ec2-user@edgeServer-29089 config]$ df -h /var/lib/mysql
Filesystem      Size  Used Avail Use% Mounted on
/dev/xvdk       246G  1.2G  233G   1% /var/lib/mysql
[ec2-user@edgeServer-29089 config]$
```

Figure 6: DB Mount Points

7. During backup process, the DB backup files will be written to **/opt/edge/ingest/backup**. It is recommended to allocate more space for the mount point for /opt/edge. Use the below command to check the available space:

   - df -h /opt/edge

```
[ec2-user@edgeServer-29089 config]$ df -h /opt/edge
Filesystem      Size  Used Avail Use% Mounted on
/dev/xvdk       246G  1.2G  233G   1% /opt/edge
You have new mail in /var/spool/mail/ec2-user
[ec2-user@edgeServer-29089 config]$
```

Figure 7: DB Backup – Space Check

If issuers encounter server storage space issues, the following error message will display in the error log files:

- java.io.IOException: No space left on device

To resolve this error, issuers need to contact their internal infrastructure team to increase space.

Step 4: Grant Permissions for 'DB User'

The following three (3) steps are prerequisites for executing the remote command. Please ensure the database user who will be executing the remote command has the appropriate permissions, as outlined below before executing.

8. Log in into MySQL with **root** access:

   - mysql –u root –p

   Note: If you do not have the root password, execute the following steps to obtain the root password:

   - cd /opt/edge/config
   - ls –lart
   - more .edge.root

```
[ec2-user@edgeServer-43328 ~]$ mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 2758148
Server version: 5.7.17 MySQL Community Server (GPL)

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>
```

Figure 8: MySQL Login for Remote Command Execution

9. Next, grant the required permissions to the database user in order to execute the archive process.

   - GRANT ALL PRIVILEGES ON EDGE_SRVR_COMMON_YYYY.* TO 'edgedbuser'@'localhost';
   - GRANT ALL PRIVILEGES ON EDGE_SRVR_PROD_YYYY.* TO 'edgedbuser'@'localhost';
   - FLUSH PRIVILEGES;

   Note: YYYY = the benefit year that is being archived. In July of 2017, CMS will archive 2016 Benefit Year data.

```
mysql> GRANT ALL PRIVILEGES ON EDGE_SRVR_COMMON_2016.* TO 'edgedbuser'@'localhost';
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT ALL PRIVILEGES ON EDGE_SRVR_PROD_2016.* TO 'edgedbuser'@'localhost';
Query OK, 0 rows affected (0.00 sec)

mysql> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.00 sec)
```

Figure 9: Grant Privileges

10. Next, verify that all the correct permissions were granted. **All of the permissions MUST be granted.**

    - SHOW GRANTS FOR 'edgedbuser'@'localhost';

```
mysql> SHOW GRANTS FOR 'edgedbuser'@'localhost';
+-----------------------------------------------------------------------------------------------------------+
| Grants for edgedbuser@localhost                                                                           |
+-----------------------------------------------------------------------------------------------------------+
| GRANT USAGE ON *.* TO 'edgedbuser'@'localhost'                                                            |
| GRANT ALL PRIVILEGES ON `EDGE_SRVR_COMMON`.* TO 'edgedbuser'@'localhost' WITH GRANT OPTION                |
| GRANT ALL PRIVILEGES ON `EDGE_SRVR_COMMON_V`.* TO 'edgedbuser'@'localhost' WITH GRANT OPTION              |
| GRANT ALL PRIVILEGES ON `EDGE_SRVR_TEST`.* TO 'edgedbuser'@'localhost' WITH GRANT OPTION                  |
| GRANT ALL PRIVILEGES ON `EDGE_SRVR_PROD`.* TO 'edgedbuser'@'localhost' WITH GRANT OPTION                  |
| GRANT ALL PRIVILEGES ON `EDGE_SRVR_VALIDATION`.* TO 'edgedbuser'@'localhost' WITH GRANT OPTION            |
| GRANT ALL PRIVILEGES ON `EDGE_SRVR_COMMON_2016`.* TO 'edgedbuser'@'localhost'                             |
| GRANT ALL PRIVILEGES ON `EDGE_SRVR_PROD_2016`.* TO 'edgedbuser'@'localhost'                               |
+-----------------------------------------------------------------------------------------------------------+
8 rows in set (0.00 sec)
```

Figure 10: Show Grants

11. (Optional) Grant the required permissions to the database user for CUSTOM SCHEMAS to be ARCHIVED in order to execute the archive process.

    - GRANT ALL PRIVILEGES ON EDGE_SRVR_COMMON_CUSTOM_YYYY.* TO 'edgedbuser'@'localhost';
    - GRANT ALL PRIVILEGES ON EDGE_SRVR_PROD_CUSTOM_YYYY.* TO 'edgedbuser'@'localhost' ;
    - FLUSH PRIVILEGES;

    Note: YYYY = the benefit year that is being archived. In July of 2017, CMS will archive 2016 Benefit Year data.

V. Archive Steps

CMS will release the archival remote command below once all servers pass the steps mentioned above.

YEAR_END_BACKUP_DB

Step 5: Start Database Archive Process

The following steps outline how to execute the database archive remote command once it has been released by CMS.

To complete the database archive process, run a local edge command to execute the remote command released by CMS:

1. Enter one (1) of the two (2) commands in the command window:

    - `edge queue execute`
    - `edge version`

    Note: DO NOT enter ‘edge update’ command, as this is only for application updates. The ‘edge version’ or ‘edge queue execute’ command is needed to trigger the remote command. If there is a cron job running, the command will automatically be picked up.

```
[ec2-user@edgeserver-606103 ~]$ edge queue execute
```

OR

```
[ec2-user@edgeserver-606103 ~]$ edge version
```

Step 6: Validate Remote Command Status is Executed

2. After the remote command is finished executing, log in to MySQL and navigate to the remote command queue table below to confirm the status is executed and the date/time stamp.

1. mysql --host localhost -u edgedbuser -p
2. USE EDGE_SRVR_COMMON
3. SELECT * FROM REMOTE_CMD_QUEUE WHERE REMOTE_CMD_TYPE= 'YEAR_END_BACKUP_DB' and REMOTE_CMD_CREATED_DT > '2017-06-01'\G;

```
mysql> SELECT * FROM REMOTE_CMD_QUEUE WHERE REMOTE_CMD_TYPE= 'YEAR_END_BACKUP_DB' and REMOTE_CMD_CREATED_DT > '2017-06-01'\G;
*************************** 1. row ***************************
   REMOTE_CMD_QUEUE_ID: 34
     REMOTE_CMD_STATUS: EXECUTED
       EXTERNAL_CMD_ID: 84121
      REMOTE_CMD_TYPE: YEAR_END_BACKUP_DB
  REMOTE_CMD_CREATED_DT: 2017-06-14 14:14:16
REMOTE_CMD_SCHEDULED_AT: 2017-06-14 00:00:00
  REMOTE_CMD_EXPIRES_ON: NULL
             PARAMETERS: {"JOB_ID":"86044","YEAR":"2016","BATCH_ID":"S02-2016-00020","BATCH_TYPE":"YEAR_END_BACKUP_DB","ZONE_TYPE":"P"}
                RESULTS: NULL
             CREATED_DT: 2017-06-14 14:15:13
             UPDATED_DT: 2017-06-14 00:00:00
1 row in set (0.00 sec)
```

Figure 11: Command Execution Confirmation

Step 7: Validate New Schemas Created

The following steps outline how to confirm the database archive process successfully created the new schemas. The new schemas will preserve the data used for the benefit year EDGE server calculations.

1. In order to validate that the database archive process completed successfully, check to confirm the following schemas created in MySQL:

- show schemas;

a. Confirm the following schemas exist:

   i. **EDGE_SRVR_COMMON_YYYY**
   ii. **EDGE_SRVR_PROD_YYYY**

NOTE: YYYY = the benefit year that is being archived. In July of 2017, CMS will archive 2016 Benefit Year data.

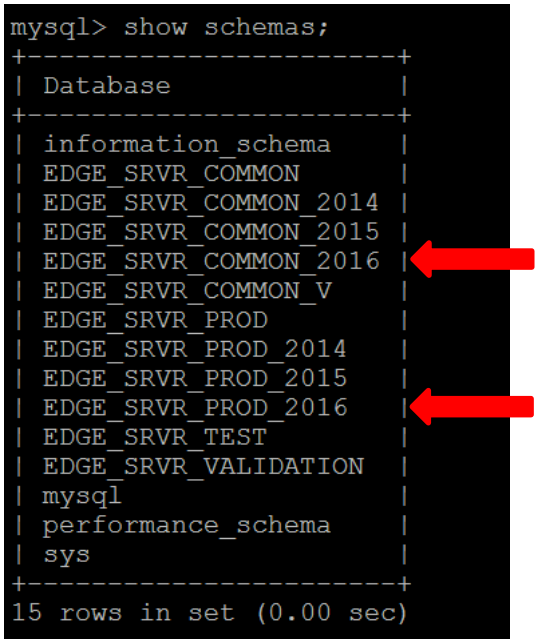


Figure 12: Command Execution Confirmation

Step 8: Validate New Tables within Schemas Created

The following steps outline how to confirm that the correct tables were created in the new 2016 archive schemas.

2. After validating the new schemas created, issuers need to validate that new tables within those schemas also created:

   - USE EDGE_SRVR_COMMON_YYYY
   - show tables;

   Expected table count: 75

   - USE EDGE_SRVR_PROD_YYYY
   - show tables;

   Expected table count: 44

   Note: YYYY = the benefit year that is being archived. In July of 2017, CMS will archive 2016 Benefit Year data.

Step 9: Validate Remote Command is Successful

3. The below step outlines how to confirm the archive remote command completed successfully in the EDGE log files. Open the edge.log files by executing the following commands:

   - cd /opt/edge/log
   - ls -l
   - view edge.log

4. If the archive process is completed successfully, please verify the following:
    a. Archive status will show as COMPLETED and code as 200 in log file.

```
DB BACKUP Process is completed successfully!!!. Exiting with success code of 200
Printing FINAL BackupVO element details:
```

Figure 13: Backup Completion Confirmation

    b. Issuers will see empty PROD schemas, recreated with 44 tables with NO data in all PROD schemas.

Step 10: Report Execution of Archive Command and Ingest Files for the New Benefit Year

Once the archive is successful, please log in to the Archive web form and report execution of the archive command. CMS will confirm when the blackout has been lifted so that issuers may start submitting data for the new benefit year.

VI. Technical Assistance

Financial Management Coordination Center (FMCC) representatives are available to answer any questions or assist issuers with this process. To reach an FMCC representative, send an email to EDGE_Server_Data@cms.hhs.gov.