



Centers for Medicare & Medicaid Services
Center for Consumer Information and
Insurance Oversight (CCIIO)

EDGE Server Operations and Maintenance Manual (O&MM) – Reference Data

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Section 1 - Introduction

As part of the Patient Protection and Affordable Care Act (PPACA), the Risk Adjustment (RA) program mitigates the impact of adverse selection of plans and provides stability for issuers. Included in the RA program is the High Cost Risk Pool (HCRP), which was implemented starting BY2018 to mitigate incentives for risk selection to avoid high-cost enrollees. States have the option to operate the RA program (including HCRP) themselves or have the Department of Health and Human Services (HHS) operate the programs on their behalf.

- Section 1343 of the PPACA created the RA program to better spread the financial risk borne by health insurance issuers, to stabilize premiums and enable issuers to offer a variety of plans to meet the needs of a diverse population. Under the RA program, payments are transferred from issuers with relatively lower-risk populations to issuers with relatively higher-risk populations. Non-grandfathered Individual and Small Group Market plans, irrespective of whether they are a part of the Exchange, submit RA data (claims and enrollment data) that is used to determine individual-level risk scores and plan average actuarial risk and associated payments and charges.
- Beginning BY2018, the HCRP partially reimburses issuers for enrollees' aggregated issuer plan paid claim amounts that are above a certain threshold attachment point (AP), at a certain coinsurance rate. HCRP applies to all issuers who offer PPACA health insurance coverage in the small group and/or individual market (including catastrophic and merged), both on and off the Exchange. HCRP payments are funded by a national percent of premium charge on all issuers by market, and all payments and charges are in addition to any RA transfers. [Note: HCRP information can be found in the [2018 Payment Notice](#) (FR 81 94080-94082)].
- Section 1341 of the PPACA established the Reinsurance (RI) program as a temporary three (3)-year program which was applicable for BY2014 through 2016 with External Data Gathering Environment (EDGE) operations ceasing in 2017. RI provided funds to issuers that incur high costs for claims in the Individual Market. In accordance with [45 CFR § 153.230](#), RI payments are based on a coinsurance rate or proportion of an issuer's claims costs that are above an AP and below a RI cap for the applicable benefit year. The AP is the threshold dollar amount after which the issuer is eligible for RI payments. The RI cap is the dollar limit at which point an issuer is no longer eligible for RI payments. The AP, coinsurance rate and RI cap are applied to an issuer's total costs for an individual enrollee in a given calendar year. Individual Market plans, irrespective of whether they are part of the Exchange, submitted RI data (claims and enrollment data) that was used to determine if an Individual Market plan issuer was eligible for RI.

Under regulation with the authority of the HHS, the Centers for Medicare & Medicaid Services (CMS) was delegated the authority to collect data from issuers when CMS is operating RA and/or HCRP on behalf of a State. In response to community feedback, CMS developed the distributed data collection (DDC) methodology based on the fact that 1) issuers needed a dedicated data environment that protects personally identifiable information (PII) and issuer proprietary data and 2) CMS needed access to install and update a common software in the

distributed data environment to check data integrity and perform calculations for program implementation.

The EDGE application is a component of Financial Management (FM) within the Federally-facilitated Marketplace (FFM). Issuers in states where HHS is operating an RA program are required to submit enrollment, pharmaceutical claims and medical claim information on enrollees from issuers' proprietary systems to an issuer's EDGE server. In addition, issuers may submit supplemental diagnosis codes identified in medical records and associated with claim services that were otherwise not included on the claim. All processing of enrollment claims and supplemental diagnosis data, as well as calculation of individual risk scores and RI amounts, occurs on the issuer owned EDGE server.

The purpose of the EDGE Server Operations and Maintenance Manual (O&MM) is to provide the information necessary to operate and maintain the EDGE application. CMS has also published two (2) Interface Control Documents (ICD), which provide the technical specifications to create inbound eXtensible Markup Language (XML) files and receive outbound XML files. In addition, the EDGE Server Business Rules (ESBR) explain the EDGE application processing logic and requirements from a business operations perspective.

1.1 Conventions

The following documentation conventions will be used:

Table 1-1: 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 that is specific to the issuer.
Blue and underlined: Text	Blue characters underlined indicate text that are hyperlinked to external documents or websites.
	You must contact the indicated party, or perform the indicated steps, before proceeding.
	Indicates a critical step or warning. If this guidance is not followed, it will have an impact to current or future functionality.
	Indicates information an issuer should note. Although the information may not impact a command, EDGE application update, and/or EDGE reference data update.



Please do not copy commands to the command line directly from this document to avoid execution errors caused by Windows End of Line (EOL) Conversion. Issuers can either type the commands in the command line or copy commands from this document to NotePad or TextPad, then copy it to the command line.

- Copy the entire installApplication.sh command into a text editor (Ex. NotePad++).
- Ensure EOL is Unix and then copy it back to the Linux terminal.

Technical Assistance

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

1.2 Additional Resources

There are several resources published in the [Registration for Technical Assistance Portal](#) (REGTAP). REGTAP is the primary source for policy communications and documentation regarding the EDGE server. This site provides information on common questions CMS has received from issuers, as well as additional information and announcements from CMS related to the EDGE server implementation. To access the REGTAP web site, log into <http://www.regtap.info/> and click “Register as a New User” using an email address.



Figure 1-1: REGTAP

Issuers can sign up for training events, such as the EDGE Server Webinar Series, to receive updates about the EDGE server and ask questions to CMS representatives.

In addition, issuers can access the Program Area page and review the DDC for RA, Including High Cost Risk Pool (HCRP), and EDGE server documents including, but not limited to, the following key documents:

Table 1-2: Key Documents

Document	Summary
EDGE Server Updates and Data Submission	Provides new information for EDGE functionality, operations and background information regarding deadlines. Note: this document has been retired and previous versions are located in the REGTAP Library, as well as the DDC Retired Resources Page located here, (https://www.regtap.info/ddcrr.php).

Document	Summary
EDGE Server Maintenance Release Notes	Provides EDGE server version numbers, date and time of releases and updates to the functionality of the new EDGE server versions.
EDGE Server Timeline	Provides important deadlines for maintenance releases, command deployments, submission, etc.
Interface Control Document (ICD)	Tracks the necessary information required to effectively define the CMS-EDGE server system interface, as well as any rules for communicating with the EDGE servers, which provides guidance on the architecture of the system to be developed. Specifically, the ICD includes the detailed XML file layouts and XSDs for the four (4) input XML files (medical, pharmacy, enrollment and supplemental) and the related summary and detail output files generated during file processing. Also, the ICD helps ensure compatibility between system segments and components.
Risk Adjustment and Reinsurance (RARI) Interface Control Document (ICD) Addendum	An addendum to the ICD that provides file layouts and data element definitions/formats for the RA, RADV, HCRP, and analytic XML reports generated by the EDGE server. The RARI ICD Addendum includes five (5) documents: RA Addendum, RADV Addendum, RI Addendum, HCRP Addendum, and Issuer Frequency Report Addendum.
EDGE Server Business Rules (ESBR)	Supplements the EDGE Server ICD by providing the EDGE server file processing business rules issuers are required to follow when submitting enrollment, pharmacy claims, medical claims and supplemental diagnosis code files.
High Cost Risk Pool (HCRP) Reference Guide	Provides issuers with an overview of the HCRP calculations and associated EDGE reporting. Beginning in BY2018, the RA Program will include the HCRP program, which helps to stabilize premiums by partially reimbursing issuers for enrollees with high claims costs above a certain threshold AP, at a certain coinsurance rate.

Document	Summary
EDGE Server Operations and Maintenance Manual (O&MM) – HIOS, ESM, & Provisioning	Provides issuers with an overview of the EDGE server options and the EDGE Server Management (ESM) console used to create server requests, provision a server, and view reports, among other basic EDGE actions. In addition, it provides steps on how to set up an AWS or OP server, as well as how to migrate servers after provisioning.
EDGE Server Operations and Maintenance Manual (O&MM) – File Processing & Commands	Provides instruction for issuers to execute the EDGE operational activities including file processing, local and remote command execution, configuration management, and application errors.
EDGE Server Operations and Maintenance Manual (O&MM) – Configuration, Validation and Application Errors	Provides issuers with the requirements for proper EDGE application configuration in order to maximize functionality.
EDGE Server Operations and Maintenance Manual (O&MM) – Backup & Maintenance Procedures	Provides issuers with an overview of the operational support and backup procedures for both AWS and OP EDGE servers which is part of the disaster recovery process.

In addition, the REGTAP portal allows issuers to access a list of Frequently Asked Questions (FAQs) and review upcoming deadlines.

1.3 Technical Assistance

FMCC representatives are available to answer any questions or assist issuers with questions related to the technical operation of the EDGE server or software functionality including the file ingest and program calculations. To contact an FMCC representative, send an email to EDGE_Server_Data@cms.hhs.gov. For other inquiries, please see [additional CMS contacts below](#):

Table 1-3: Technical Assistance Table

Reason	Email Address or Website
Technical assistance for EDGE server data submission/processing, EDGE reports, EDGE calculations	EDGE_Server_Data@cms.hhs.gov

Reason	Email Address or Website
Financial Management (FM) Community* for webforms and notifications including: Truncation, Baseline, Quantity/Quality Outliers, EDGE Server Status Update, Attestation and Discrepancy, RA Reconsiderations, Archive, and EDGE Server Contacts update, including Chief Executive Officer (CEO) Designation.	ccrms-rari.force.com/financialmanagement
Policy, baseline, EDGE data quantity notifications, payments/charges, exempt filing, general information	RARIPaymentOperations@cms.hhs.gov
EDGE data quality notifications	EDGEdatareply@cms.hhs.gov
EDGE Server Data Truncation	RARIPaymentOperations@cms.hhs.gov
RA Do-It-Yourself (DIY), SAS software model questions	hhshccraops@cms.hhs.gov
Risk Adjustment Data Validation (RADV)	CCIIOACARADatavalidation@cms.hhs.gov

*In September 2019, CMS introduced the FM Community to streamline issuer reporting to support EDGE server data submission for the RA program. Accessing the FM Community requires the use of a multi-factor authentication (MFA) application. Up to four (4) contacts from each participating company will have access to the FM Community, with the CEO Designate as the primary user. The CEO Designate's responsibilities include maintaining contact information for EDGE contacts; completing or overseeing the completion of all webforms; and receiving EDGE related notifications.

The FM Community is only available to authorized contacts approved by the company.

Section 2 - System Overview

This section provides an overview of the EDGE application, the types of files submitted and output files generated, as well as the two (2) server options available for issuers. Each section is then further detailed later in the O&MM. In addition, this section details the system software specifications, types of users, directories and binary files used.

2.1 Functional System Overview

This section provides an overview of the EDGE application and functionality addressed in the O&MM. The EDGE application supports two (2) technical solutions, the first of which is the automated provisioning of the issuer EDGE server in Amazon Web Services (AWS). The second solution is an On-Premise (OP) issuer EDGE server that is set up and provisioned by the issuer in accordance with CMS requirements. The EDGE application includes the following functionality:

File Ingest Jobs

The file ingest job processes four (4) different types of files provided by the issuer. The files are:

- Enrollment File
- Medical Claims File
- Pharmacy Claims File
- Supplemental Diagnosis Code File

Each file is validated according to the field level technical validation rules outlined in the file ingest ICD (See [Interface Control Document \(ICD\)](#)) and the business validation rules outlined in the ESBR document (See [EDGE Server Business Rules \(ESBR\)](#)). Only successfully validated and accepted records are loaded to the EDGE database during processing.

Commands and Output Reports

CMS will deploy commands to issuer servers that produce RA, HCRP and analytic XML reports. Issuers will receive detail and summary reports; CMS will receive only summary reports. The summary reports generated from successful file processing are used to evaluate and perform RA and HCRP calculations for issuers and other stakeholders. Issuers may also execute commands locally. For additional details and a complete list of EDGE server input files, output files and their formats refer to the Appendices in the [EDGE Server Operations and Maintenance Manual \(O&MM\) – File Processing and Commands Document](#).

Application Version Maintenance

CMS will periodically need to perform maintenance activities on issuer servers and will communicate the functionality being modified and a deployment schedule. Once a maintenance release occurs, issuer EDGE servers must be updated and be running on the most recent version of the EDGE application.

In order for any ingest file to be processed or any local or remote command to be executed on the EDGE server, the server must be on the latest application version released by CMS. Each time an EDGE job, which could be a command, EDGE application update and/or EDGE reference data update, is executed by an issuer, the server will first confirm if any EDGE

application updates are available and apply them as needed. If the server fails to update to the latest version, the server will stop processing until the error is addressed. The following updates may be applied by CMS in future EDGE maintenance release versions:

- EDGE server application updates including ingest functionality, outbound file structure or RA, HCRP, and/or RI calculation updates
- Reference table updates
- Operating system (OS) updates
- SQL database updates

The EDGE application and reference data updates must be on the latest version in order to have accurate claims processing. Operating system and database updates will be configured to require the database administrator to manually run the update command as new updates are made available. If desired, these updates can be configured to be applied automatically by enabling a CRON job, which is detailed in Section 3.1.4: Automated Job Scheduling in the [EDGE Server Operations and Maintenance Manual \(O&MM\) – Configuration, Validation and Application Errors](#). For each update processed, the update type (OS, DB, application, reference data), date, completion status (successful/error), and issuer for which the update was made will be logged on the EDGE Server Management console database, which is further explained in Section 3.2: EDGE Server Management Console in the [EDGE Server Operations and Maintenance Manual \(O&MM\) – HIOS, ESM & Provisioning](#). The next section provides information related to individual components of the functional system.

2.1.1 Issuer Responsibilities and Infrastructure Overview

This section provides an overview of issuer responsibilities and the infrastructure of the AWS and OP EDGE Server application.

As mentioned earlier, the issuer EDGE Server solution supports two (2) scenarios. The first scenario is the issuer EDGE server hosted in an AWS environment which may be hosted by the issuer or a Third Party Administrator (TPA).

The second scenario is the OP EDGE server. This server can be physical or virtual and may be managed and provisioned by an issuer or by a TPA on the issuer's behalf. More details about the differences between the two (2) options will be described in Section 3.1: EDGE Server Options in the [EDGE Server Operations and Maintenance Manual \(O&MM\) – HIOS, ESM & Provisioning](#).

Issuer Roles and Responsibilities

Issuers are responsible for the following:

- Procuring dedicated server and Red Hat enterprise evaluation license
- Providing physical security and installation and maintenance of anti-virus and anti-intrusion software
- Developing the extract, transform and load (ETL) to extract data from issuer processing system and submit to the EDGE server
- Loading claim, enrollment and supplemental diagnosis code information to the dedicated server
- Masking enrollee identities on claims and enrollment files
- Reviewing and resolving processing errors identified on outbound files
- Evaluating accuracy of program calculations as provided on outbound reports

- Contacting CMS to report problems



Note: Issuers who chose to use a TPA to manage the EDGE server remain fully responsible for complete and accurate data submission, meeting all data and baseline submission deadlines, reviewing program reports for accuracy, and responding to CMS inquiries related to quantity and quality outliers.

File Processing Zones

Each EDGE server application supports the following three (3) separate file processing zones. When loading an ingest file for processing, issuers must indicate the intended file processing zone in the file name.

- **Production Zone**
 - Used by issuers to load production files for processing.
 - Enrollment, medical claims, pharmacy claims, and supplemental diagnosis data will be submitted, verified and stored for RA, HCRP, and RI processes.
 - A minimum number of data elements associated with rejected records will be stored for issuer reference and use.
 - Only data submitted to the production zone is used by CMS for RA and HCRP payments and charges and RI payments.
- **Test Zone**
 - Uses the same application version and file processing validation rules as the production zone.
 - Uses the same reference data as the production zone.
 - Issuers use the test zone to ingest files prior to loading into production. CMS encourages issuers to submit their files to the test zone and evaluate the results of the detail reports to limit the amount of rework necessary once data is submitted to production.
 - Issuers may submit enrollment for prior years, cross-year claims where the statement coverage end date is in the new benefit year and supplemental records are associated with claims for the new benefit year.
 - Available for issuers to test files any time with one (1) exception:
 - Once the production blackout is in effect, issuers cannot submit claim data to the test zone for a benefit year that has closed or is in the process of being finalized.
- **Validation Zone**
 - Uses a different application version and file processing validation rules as the production zone.
 - Uses a different set of reference data as the production and test zones.
 - The validation zone is intended for issuers to utilize, upon the direction of CMS, to test upcoming releases prior to deployment to the test and production zone which only house the current software version and table structures.

- Issuers and CMS use the validation zone as a pre-prod environment to test EDGE application releases with pre-selected issuers or “beta” testers, using their existing EDGE servers, prior to releasing the application to production. Once the beta testers have confirmed the accuracy of the release, all issuers will be permitted to utilize the validation zone for testing.

Server Schemas

In order to support the three (3) different file processing zones, the EDGE server is comprised of the following five (5) database schemas identified in the table below.

Table 2-1: EDGE Server Schemas

Schema Name	Description	EDGE Schema Name
EDGE Server Common Schema	Contains reference data used in both the production and test zones.	EDGE_SRVR_COMMON
EDGE Server Production Schema	Contains claim, enrollment and supplemental diagnosis code transactional data loaded in the production zone.	EDGE_SRVR_PROD
EDGE Server Test Schema	Contains claim, enrollment and supplemental diagnosis code transactional data loaded in the test zone.	EDGE_SRVR_TEST
EDGE Server Validation Schema	Contains claim, enrollment and supplemental diagnosis code transactional data loaded in the validation zone.	EDGE_SRVR_VALIDATION
EDGE Server Common Validation Schema	Contains reference data used in the validation zone.	EDGE_SRVR_COMMON_V

2.1.2 Architecture

Although the EDGE server solution supports an AWS and an OP scenario, the code base used in both solutions are the same. The configurations are slightly different to accommodate the implementation of the EDGE server in AWS or OP.

The figure below displays the logical flow of the EDGE server components in AWS after the issuer EDGE server has been deployed. The file ingestion flow starts when the issuer securely uploads their XML data files to the EDGE server. The following actions will occur:

- Validation and processing of the input data file

- Creation of summarized and detailed XML reports for review by the issuers
- Summarized XML reports are securely sent to the AWS Data Simple Storage Service (S3) bucket, where they are retrieved by the CMS EDGE File Sweep batch for CMS use.

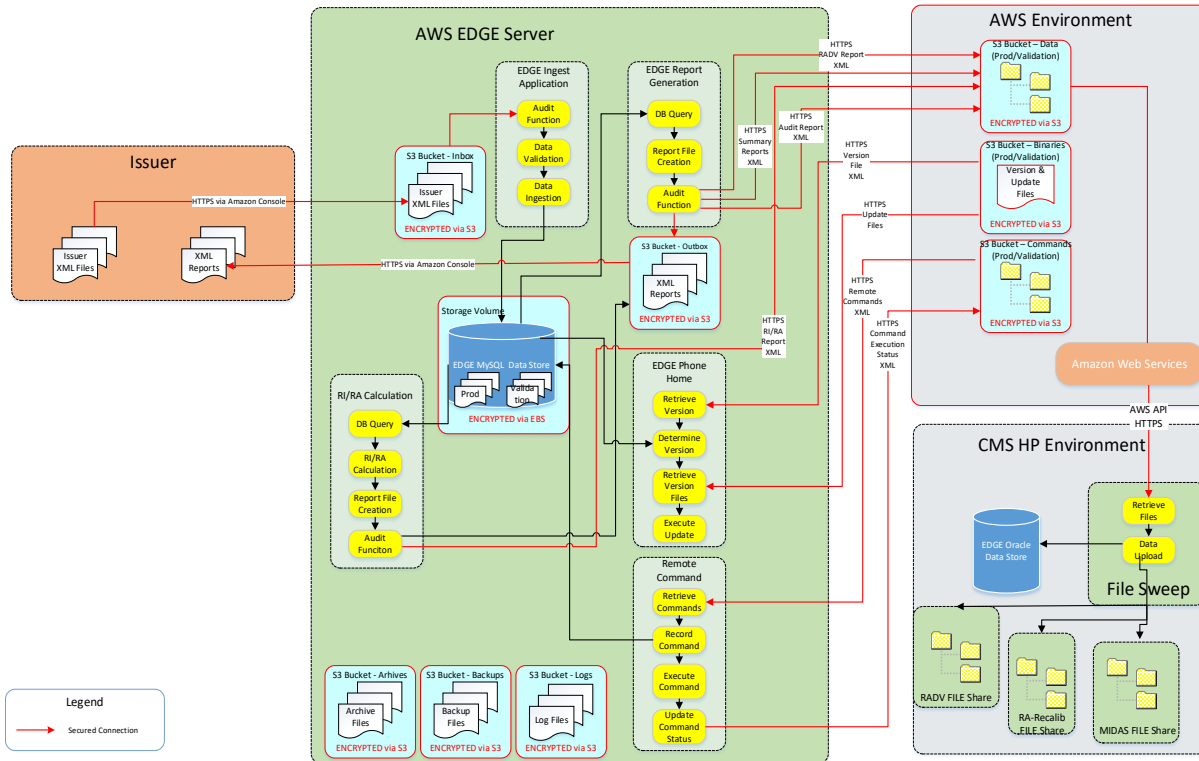


Figure 2-1: AWS EDGE Server Data Flow

The figure below displays the logical flow of the EDGE server components in the OP scenario after the issuer's EDGE server has been deployed. It is nearly identical to the EDGE solution in AWS except the EDGE server is in an issuer controlled environment and that the OP Server directories are located locally.

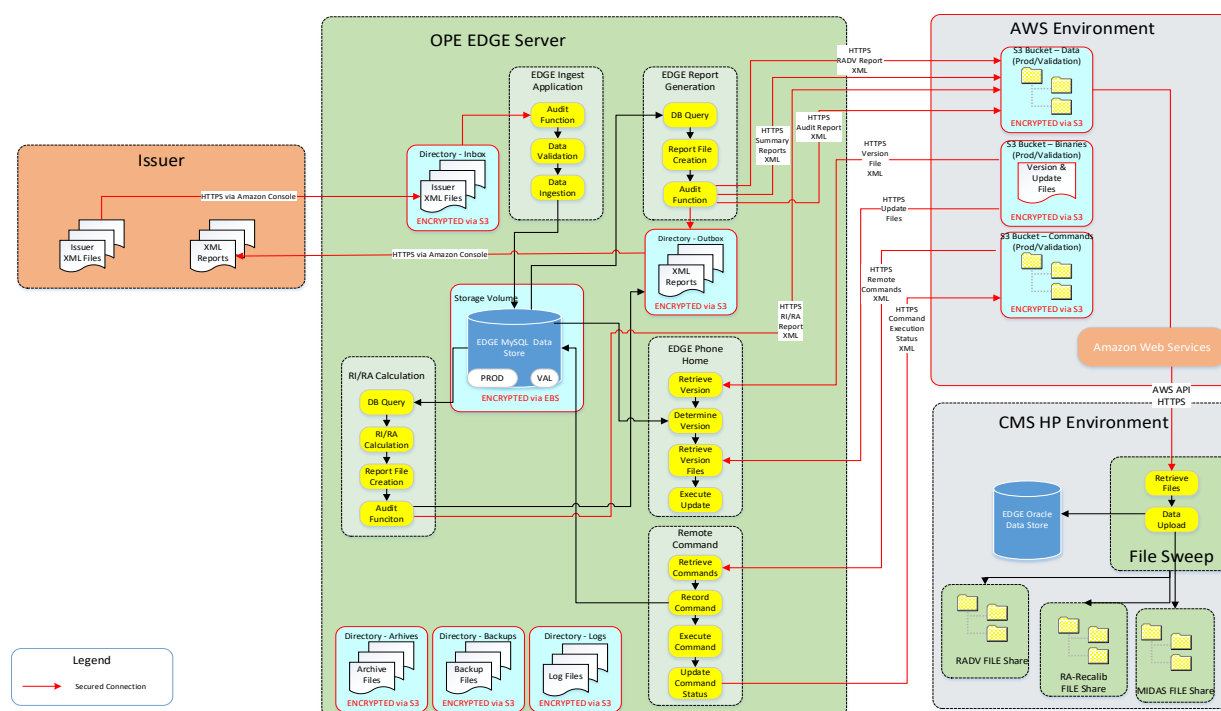


Figure 2-2: On-Premise EDGE Data Flow

2.1.3 System Software Specifications

The EDGE server application is deployed to either an AWS or OP server. The EDGE solution is a custom-built application that combines open-source software with custom objects. Table 2-2 below provides an overview of the EDGE server software components:

Table 2-2: Software Stack Components

Area	Vendor	Product
Common Services (afpj-common is used for exception handling)	CAN	afpj-common.jar
Batch	SpringSource	Spring Batch
Dependency Injection	SpringSource	Spring Framework
Security	SpringSource	Spring Security
Java	Oracle	JRE/JDK
Persistence	SpringSource	Spring JDBC
Database	MySQL	MySQL (EDGE)
Web Server	Apache	Tomcat

Area	Vendor	Product
MVC	SpringSource	MVC
Amazon Cloud API	Amazon	AWS Java API
EDGE Operating System	Red Hat	Red Hat Enterprise

2.1.4 Application Users

The table below describes the user the EDGE server application utilizes.

Table 2-3: EDGE Server Application Users

Application ID	Scenario	Description
edgedbuser	AWS & OP	EDGE Server MySQL DB user
Ec2-user	AWS	EDGE Server Application ID User

2.1.5 Application Directories

The following directories are used by the EDGE server application.

Table 2-4: Application Directories

Directory	Description
/opt/edge	Parent EDGE server application directory
/opt/edge/bin	Contains the EDGE server binaries
/opt/edge/config	Contains the EDGE server application configuration files
/opt/edge/ingest	Parent directory for the ingest application
/opt/edge/ingest/appdata	Contains EDGE server application data
/opt/edge/ingest/archives	Contains EDGE server archival files
/opt/edge/ingest/archives/accepted	Contains the issuer data files that have been processed
/opt/edge/ingest/archives/rejected	Contains the issuer data files that have been rejected due to data issues
/opt/edge/ingest/inbox	Directory that issuers post their Enrollment, Medical, Pharmacy, and Supplemental data files
/opt/edge/ingest/logs	Contains the EDGE server application log files
/opt/edge/ingest/outbox/cms	Contains summary report files that will be sent to CMS
/opt/edge/ingest/outbox/issuer	Contains the detailed and summary report files for the issuers

Directory	Description
/opt/edge/update	Parent directory for EDGE server application update files
/opt/edge/update/app	Contains the EDGE server application update files
/opt/edge/update/config	Contains the EDGE server configuration files
/opt/edge/update/db	Contains the EDGE server database update files
/opt/edge/update/db/common	Contains the EDGE server database common SQL statements for performing the DB updates
/opt/edge/update/db/issuer	Contains the EDGE server issuer specific database SQL statements
/opt/edge/update/lib	Contains updated library files used by the EDGE server application
/opt/edge/update/scripts	Contains EDGE server scripts
/opt/edge/update/sql	Contains EDGE server SQL scripts
/opt/edge/lib	Contains library files used by the EDGE server application

2.1.6 Application Binary Files

The table below lists and describes the binary files used by the EDGE server. The list also includes the location of the binary files. These files are installed during the deployment of an AWS EDGE server or are manually installed for an OP EDGE server during provisioning.



Note: The location information in the table below is for the AWS EDGE server. The location of the OP EDGE server scenario will be different. Issuers should consult with their local Information Technology (IT) team who performed the OP EDGE server installation for the binary file location.

Table 2-5: Binary Files

Binary Name	Description
afpj-common-6.5.0.jar	Accenture federal framework
annox-0.5.0.jar	Java extension contains annotations from XML
aopalliance-1.0.jar	Aspect orient programing (AOP) open sources library
aws-java-sdk-1.7.11.jar	Amazon java library to access amazon web service resources
bsh-2.0b4.jar	BeanShell library for dynamic execution of java syntax
cglib-nodep-2.2.2.jar	AOP Support library
classmate-1.0.0.jar	Generic type declarations

Binary Name	Description
commons-beanutils-1.9.1.jar	Java common bean utils
commons-codec-1.3.jar	Java based encode and decode library
commons-collections-3.2.1.jar	Java collection library contains iterators, maps, list and array collections
commons-configuration-1.7.jar	Java common configuration handling components
commons-dbcp-1.4.jar	Java common database components
commons-digester-1.8.1.jar	Java common XML digester classes
commons-io-2.4.jar	Java common file IO classes
commons-lang-2.3.jar	Java common objects classes
commons-logging-1.1.1.jar	Java common logging framework
commons-pool-1.5.4.jar	Java common connection pool classes
edge-server-application.jar	Edge application binaries, contains edge batch processes
gson-2.2.4.jar	Google library to parse JSON objects
guava-17.0.jar	Guava library contain google collection, caching and concurrency. Used by gson library.
hamcrest-core-1.3.jar	Library of match objects used by other frameworks
hibernate-validator-5.1.0.Final.jar	Hibernate validator library
hibernate-validator-cdi-5.1.0.Final.jar	Hibernate validator library
hsqldb-1.8.0.7.jar	Hyper SQL library, used for execute queries against relational database
httpclient-4.2.jar	Java HTTP client library
httpcore-4.2.jar	Java HTTP core library
jackson-annotations-2.1.1.jar	Jackson library for XML parsing
jackson-core-2.1.1.jar	Jackson library for XML parsing
jackson-databind-2.1.1.jar	Jackson XML library, to build XML to java objects
javassist-3.18.1-GA.jar	Java assist provides basic java class objects
javax.el-2.2.4.jar	Java extension for Expression Language, supports for JSP and JSF
javax.el-api-2.2.4.jar	Java extension for Expression Language, supports for JSP and JSF
jaxb2-basics-0.6.3.jar	XML Schema compiler

Binary Name	Description
jaxb2-basics-annotate-0.6.3.jar	XML Schema compiler using annotations
jaxb2-basics-runtime-0.6.3.jar	XML Schema compiler runtime
jaxb2-basics-tools-0.6.3.jar	XML Schema compiler tools
jboss-logging-3.1.3.GA.jar	Jboss logging framework
jcommander-1.27.jar	Command line parameter parser framework
jettison-1.1.jar	Java API for DOM and STaX parsing
joda-time-2.4.jar	Joda time a replacement for native java date time object
junit-4.11.jar	Junit framework for unit testing
liquibase-core-3.2.2.jar	Liquibase used for database change log and database schema maintenance
log4j-1.2.12.jar	Log4j library for logging
log4j-over-slf4j-1.7.7.jar	Log4j library for logging
logback-classic-1.1.2.jar	Logback logging framework
logback-core-1.1.2.jar	Logback logging framework
mysql-connector-java-5.1.30.jar	MySQL connection/driver classes
objenesis-1.3.jar	Objenesis framework to invoke methods using reflection
slf4j-api-1.7.6.jar	Simple logging façade used for logging
slf4j-simple-1.7.6.jar	Simple logging façade used for logging
snakeyaml-1.13.jar	YAML parser
spring-aop-4.0.3.RELEASE.jar	Spring aspect-oriented programming framework components
spring-batch-core-2.2.5.RELEASE.jar	Spring batch framework components
spring-batch-infrastructure-2.2.5.RELEASE.jar	Spring batch framework components
spring-beans-4.0.3.RELEASE.jar	Spring framework for bean definition
spring-context-4.0.3.RELEASE.jar	Spring framework context management objects
spring-context-support-4.0.3.RELEASE.jar	Spring framework context management objects
spring-core-4.0.3.RELEASE.jar	Spring framework core components

Binary Name	Description
spring-expression-4.0.3.RELEASE.jar	Spring framework expression components
spring-jdbc-4.0.3.RELEASE.jar	Spring framework JDBC objects for database operations
spring-oxm-4.0.3.RELEASE.jar	Spring framework XML to object mapping classes
spring-retry-1.0.2.RELEASE.jar	Spring framework batch component
spring-test-4.0.3.RELEASE.jar	Spring testing framework
spring-tx-4.0.3.RELEASE.jar	Spring framework transaction management classes
testng-6.8.7.jar	Testing framework for unit testing
tomcat-jdbc-7.0.53.jar	Tomcat framework for jdbc operations
tomcat-juli-7.0.53.jar	Tomcat framework objects
validation-api-1.1.0.Final.jar	Validation framework for XML
xpp3_min-1.1.4c.jar	XML publish library
xstream-1.3.jar	XML streaming library

2.2 Data Model & Dictionary

The EDGE server data submission process is identical in both the AWS and OP EDGE server scenarios. Issuers' data will be submitted to the EDGE servers by placing one (1) or more of the following file types in the Inbox S3 bucket or directory depending on the EDGE server scenario:

- Enrollment File
- Medical Claims File
- Pharmacy Claims File
- Supplemental Diagnosis Code File

CMS owns the data schemas, tables and software that exist on the EDGE server. The EDGE Server Data Models and EDGE Server Data Dictionaries detail and describe individual elements in the issuer's server environments and allows issuers to troubleshoot data issues. The EDGE Server Data Model illustrates all the data tables in the EDGE server and how they relate to each other. The EDGE Server Data Dictionary specifies what is collected in the table outlined in the corresponding data model.

Table 2-6: Data Model & Dictionary

Schema Name	Description	Data Model Link	Data Dictionary Link
EDGE Server Common Schema	The common schema contains reference data required by the EDGE application and is applicable to both the test and production zones.	EDGE Server Common Schema Data Model	EDGE Server Common Schema Data Dictionary
EDGE Server Production Schema	The production schema is used by the issuer to process production files.	EDGE Server Production Schema Data Model	EDGE Server Production Schema Data Dictionary
EDGE Server Test Schema	The test schema can be used to test and validate inbound XML files.	EDGE Server Test Schema Data Model	EDGE Server Test Schema Data Dictionary
EDGE Server Validation Schema	The validation zone serves as a pre-production environment for CMS to test EDGE application releases with issuers, using their existing EDGE servers, prior to releasing the application to production. The validation schema can be used to test and validate inbound XML files.	EDGE Server Validation Schema Data Model	EDGE Server Validation Schema Data Dictionary
EDGE Server Common Validation Schema	The common validation schema contains the reference data required by the validation zone to test EDGE application releases with issuers.	EDGE Server Common Validation Schema Data Model	EDGE Server Common Validation Schema Data Dictionary

EDGE Server File Reports

The EDGE server generates several outbound reports to inform both CMS and the issuer on various aspects of data submissions. With the exception of ad hoc query reports, which are in TXT format, all EDGE server outbound reports are generated in XML format and deposited in either the Outbox directory (OP server) or AWS S3 bucket (AWS server). There are two (2) categories of outbound reports:

- Summary and detail reports are generated each time an ingest file is processed.
- RA, HCRP, RI and analytic reports are generated by remote commands sent out by CMS and run by issuers.
 - Issuers can generate select RA, HCRP, RI and analytic reports through local commands. Please see Appendix G: EDGE Server Reports and Local Commands in the [EDGE Server Operations and Maintenance Manual \(O&MM\) – File Processing & Commands](#) for a complete list.

XSD and Example XML Files

The input and output files will be transmitted using XML with predefined XSDs as described in the ICD. There are two (2) kinds of primary transactions across the EDGE server interface - inbound data submission files and outbound data files that contain both detail and summary reporting data. The [EDGE Server XML XSD Zip File Contents Job Aid](#) provides the breakdown of the list of XML/XSD for inbound and outbound reports. The following zip files contain example files for [XML/XSD Outbound Files](#) and [XML/XSD Inbound Files](#) that provide the structure and layout of the files.

Section 3 - Reference Data

Reference data are categorized as Global Reference data and Plan Reference Data. Neither Global Reference Data nor Plan Reference Data require a scheduled maintenance release.

- Global Reference Data updates are deployed to all issuer servers.
 - Updates will typically be scheduled on a monthly basis.
- Plan Reference Data updates are deployed to issuer specific servers only.
 - Updates vary throughout the year based on a variety of factors including data submission deadlines, verification of changes (where applicable) and timing of requests.

The timing of the scheduled reference data updates is published in the EDGE Server Timeline available in the REGTAP Library.

3.1 Global Reference Data

Global reference data are not issuer specific and are the same across all issuer EDGE servers. These data include many industry standard codes such as Diagnosis Codes, Service Codes (Current Procedural Terminology [CPT] and Healthcare Common Procedure Coding System [HCPCS] codes only), Bill Types, etc. A complete list of reference data tables and a description of each column be found in [Section 2.2: Data Model & Dictionary](#).

CMS provides tentative monthly updates to these tables to ensure that issuer has the latest reference data. Reference data updates occur independently of maintenance releases. This allows reference data updates to occur more frequently, which allows for more up-to-date codes, dates, and RA inclusion flags. Within five (5) business days of each monthly update, CMS will publish monthly Global Reference Data Files that provide summary and detailed information for each update. The files will be posted to REGTAP on the DDC Program Page.

Deployment will be similar to plan data updates. EDGE servers will automatically complete a version check of global reference data. If an update is available, the EDGE server will be updated with the most recent version upon the initiation of any local or remote EDGE command, including running the following command:

- `edge update`

CMS may choose to retire or delete codes as necessary from the EDGE Server Common Schema.

Issuers may verify the modified codes by running a query on the last modified date.

3.2 Plan Data Source & Integration

The plan reference tables store issuer-specific plan data elements to verify the Plan IDs and rating areas submitted on the inbound files and to perform program calculations. Plan data are collected by CMS from various plan data sources, as indicated below, and are then integrated for deployment to issuers' EDGE servers.

When reusing a Plan ID from one (1) benefit year to the next, the metal level, market type and product type must match the latest record of that same Plan ID to ensure the integrity of the RA

program and adherence to uniform modification requirements established in 45 CFR 147.106 and in 45 CFR 144.103 (definition of “plan”). If the plan’s actuarial value changes, resulting in a metal level change, you must establish a new Plan ID for the following year.

Plan data are collected for use on issuer EDGE servers from the following four (4) sources:

- The Federally-facilitated Exchange (FFE) including State Partnership Exchange and State Based Exchange-Federal Platform
- State Based Exchange (SBE)
- Rates and Benefits Information System (RBIS) for Off-Exchange
- CMS and Issuer submitted EDGE templates

Please refer to Section 9 of the ESR for information on Plan Reference Data sources and Plan Data Integration.

3.3 Plan Data Public Sources

Detailed information about the sources of the plan data and how the data are combined from multiple sources is explained in the ESR, Chapter 9.

Information on how to query the plan data tables is found in Section 6.3. CMS expects issuers to accurately maintain data in each of the main source systems outlined above (FFE, SBE and RBIS). Alteration of plan reference tables is not expected if the plan data is submitted to the main source systems in an accurate and timely manner. Issuers can also check submitted plans in public sources published by CMS.



Note: Issuers must validate or attest to RBIS plan filings for their respective organization. Please contact the appropriate department within your organization frequently to ensure they meet the plan data submission deadlines. Failure to submit plan data timely will result in enrollment and claim records being rejected.

Submitted plan data information may be found in the public documents below:

Table 3-1: Public Documents Containing Plan Data

Public Document	Data Source	Plan Data Type	Description of Document
Uniform Rate Review Template (URRT)	URRT	All plan data types	Document summarizes the data used to determine rate increases for the entire single risk pool.
SBM Public Use Files (SBM PUF)	SERFF	State exchange	Document that lists plans that are available for the certified QHP plan year 2016 and 2017. The SBE PUF include plan and issuer level information for certified QHPs and stand-alone dental plans (SADPs) offered to individuals and small businesses through the SBEs.

Public Document	Data Source	Plan Data Type	Description of Document
QHP Landscape Files	QHP	Federal exchange	Document presents basic information about certified Qualified Health Plans and Stand-alone Dental Plans. The files contain plan information by county, including plan type, category, rating area, and premiums for various rating scenarios.

3.4 Plan Data Records on Server

CMS routinely deploys reference data to the MySQL reference tables on issuers' EDGE servers. Each reference table contains data used to verify data values submitted on the enrollment, pharmacy, medical and supplemental diagnosis files. The INSRNC_PLAN reference table stores the issuer's on and off-Exchange plan offerings to verify the Plan IDs submitted on the inbound files. As per the ESB, this section provides additional details for identifying missing plan data.

For a plan to be active and usable, the plan must contain the following:

- Issuers must have the required "Market Year(s)" for the plans associated with their claims and enrollments for the records to be accepted regardless of the plan start and/or end date. The Market Year field indicates the year in which the plan is effective. A plan ID used in a claim or an enrollment period should be active in the market year corresponding to the start date of the claim or the enrollment period.
- A unique occurrence of a given INSRNC_PLAN_ID must be present for each required Market Year in an active state (ACTIVE_FL should be 'Y') for a plan to be considered active, regardless of the EFCTV_STRT_DT and EFCTV_END_DT of the plan.



Note: During file processing, the EFCTV_STRT_DT and EFCTV_END_DT is not used to determine if a plan is effective during a benefit year. The EFCTV_END_DT is only used during file processing validation to identify when an Enrollment End Date is beyond the plan EFCTV_END_DT, in which case a warning will be displayed. The plan EFCTV_STRT_DT or EFCTV_END_DT cannot cause a rejection and CMS has started to default them to 1/1/2014-12/31/9999 to eliminate these warnings.

The following queries can be used at any time to identify the HIOS ID for the server and what is actively loaded on a server's plan reference table:

1. To identify the HIOS ID configured on the EDGE server. This query must return only one (1) row.
 - `select * FROM ISSR_ORG`
2. A row must exist in the "INSRNC_PLAN" table of the "EDGE_SRVR_COMMON" schema for each 16-digit plan ID for each market year that you have enrollment. Execute the following query to determine whether the plan and variant exists:
 - `select * from EDGE_SRVR_COMMON.INSRNC_PLAN where INSRNC_PLAN_ID = <Insert 16-Digit Plan ID> and MARKETYEAR = <Insert Market Year> and ACTIVE_FL='Y';`

3. A row must exist in your "ISSR_PLCY_RATG_AREA" table of the "EDGE_SRVR_COMMON" schema for each 16-digit plan ID, market year and rating area combination that you have enrollments for. Execute the following query to determine whether the rating area exists:

- `select * from EDGE_SRVR_COMMON.ISSR_PLCY_RATG_AREA where PLAN_ID = <Insert 16-Digit Plan ID> and MARKETYEAR = <Insert Market Year> and ACTIVE_FL='Y';`

3.5 Plan Data Small Group Rollover

Beginning with the BY2018, CMS will rollover certified small group plans offered in the previous benefit year that are no longer offered for new enrollment in the current benefit year. Because small group plans do not follow the typical calendar year, CMS implemented this rollover process to streamline the plan data submission process for issuers. Please note, this process will **NOT** roll over plans that were rolled over in the previous year and will not rollover any inactive plans. If a plan has already been rolled over from the previous benefit year and it is offered for new enrollment, issuers must follow the normal off-Exchange RBIS submission process and schedule.

3.6 Updating Plan Data

Issuers must submit their plan data to the applicable data sources that were previously mentioned so an issuer's plan data can be comprehensive and complete. In the event that plans are missing from the plan reference table, inaccurate plan data fields need to be updated, or plan data is causing rejections on claims, please follow the below steps:

1. Perform a plan data refresh on ESM (if CMS database is correct, but issuer tables are not synched).
 - a. To perform the refresh, log into ESM as mentioned in Section 3.6: Accessing the ESM Website in the [EDGE Server Operations and Maintenance Manual \(O&MM\) – HIOS, ESM, & Provisioning](#), search your HIOS, and view your server. Scroll down to the bottom of the page and click the **Refresh Plan Data** button.

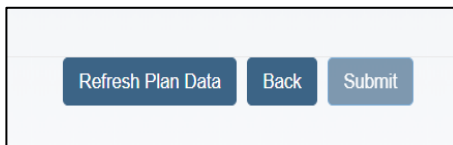


Figure 3-1: Refresh Plan Data button on ESM

- b. Wait a few seconds to allow the refresh to occur. If successful, the below message will appear.



Figure 3-2: Refresh Plan Data Success Message

- c. Log into your server and then run the below command:

- `edge update`

If this step does not resolve your issue, then issuers should continue to Step 2:

2. Consult with your plan data team to ensure that these plans were appropriately filed to the appropriate plan data sources during the correct market year.
3. Check the public documents containing plan data sources, as described in [Table 3-1](#). If plans do not match these public documents, please consult with your plan data team to ensure public filings need update.
 - a. For all missing plans, check URRT
 - b. For missing state on-Exchange plans, check SBM PUF
 - c. For missing federal on-Exchange plans, check QHP Landscape
4. Submit missing plans to the FMCC Service Representative Team at Edge_Server_Data@cms.hhs.gov so they may start the validation process.
 - For off-Exchange plans - Starting with the BY2018 off-Exchange plan data, issuers should closely monitor RBIS quarterly data submissions and correct any errors and/or missing plans during the next RBIS submission window. Issuers should not rely on EDGE templates to correct their plan data as it is only to be used when other means of plan data updates are unavailable.



Note: Please submit only missing/update-required plans to avoid any unintentional changes to your plan reference tables. If you are missing off-Exchange and on-Exchange plans, then please submit two (2) separate inquiries to the FMCC team at EDGE_Server_Data@cms.hhs.gov.

Validation Process

CMS expects all applicable plans, except Medicaid expansion private plans, to be submitted to the data source. When the FMCC team receives an Issuer Plan Data Template (IPDT), the plans and associated data elements will be validated with all of the data sources mentioned in [Sections 3.2: Plan Data Source & Integration](#) and [3.3: Plan Data Public Sources](#) to ensure these plans are available for the submitted market year. CMS encourages issuers to send missing plans or plans that need corrections as soon as these plans are identified to allow sufficient validations to occur. The FMCC team will individually work with each issuer's unique scenario and will inform the issuer if these plans successfully pass validations.

When plans have been loaded, run the below command and check your EDGE tables, as described in [Section 3.4: Plan Data Records on Server](#).

- edge update