Installing and Running a Data Quality Loqate Standard Address Application

This topic describes how to install and run a Data Quality (DQ) Loqate Standard Address application. It includes the following topics:

Prerequisites

This section summarizes the prerequisites that are required before using the DQ Loqate Standard Address application. A basic knowledge of building and running DQ plans is assumed.

The DQ Loqate Standard Address application requires:

- iWay Data Quality Server (DQS) GUI or iWay Integration Tools (iIT) with DQ plugins.
- A Loqate license.
- A sample DQ plan, which you can download from:

  http://techsupport.ibi.com/iway_patch/Loqate/LOQATE_SCORING_2016.zip

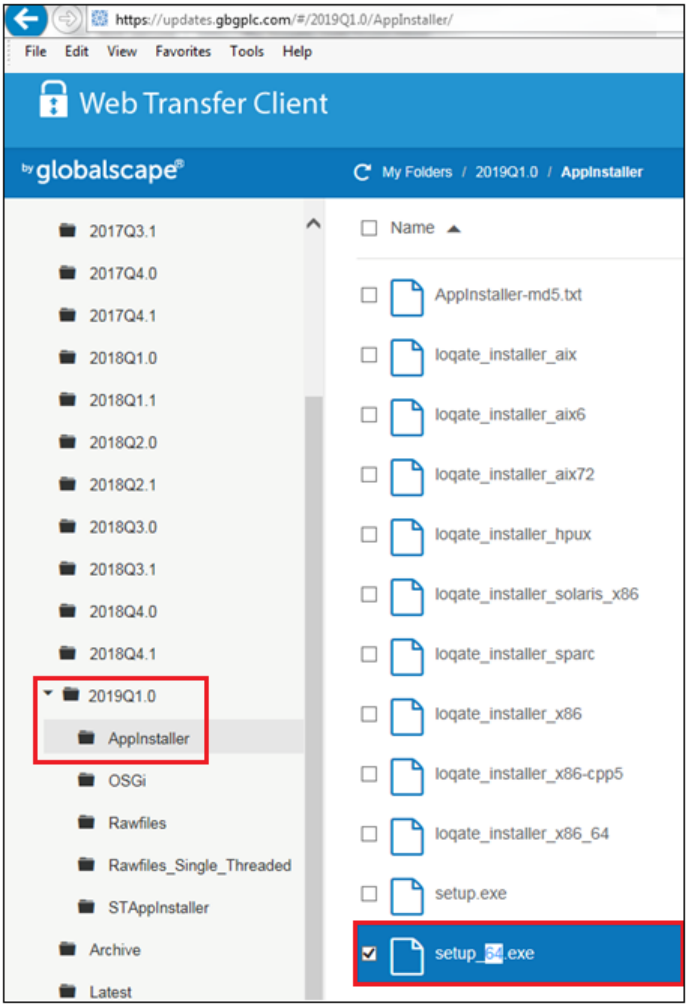
- The latest Loqate installation, which can be downloaded from the following HTTP or FTP download sites:
  - **HTTP Download Access:** https://updates.gbgplc.com
  - **SFTP Download Access:** sftp://updates.gbgplc.com

To obtain the login credentials (user name and password) for the Loqate download site, contact *Information Builders Customer Support*.

Once you have logged in to this FTP site, you must navigate to the following folder to download the executable files:

/2019Q1.0/AppInstaller

Note: Updates to the Loqate installation are made every quarter. It is recommended to download the latest available version.



Notes:

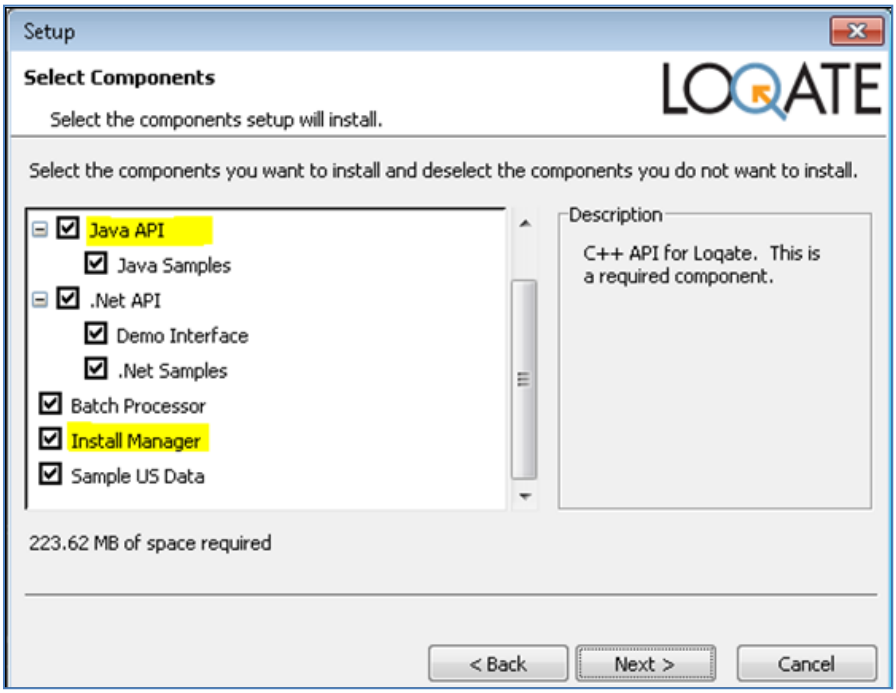
- The standard installer for Windows platforms is *setup_64.exe*.
- The standard installer for Linux platforms is *loqate_installer_x86_64*.

Installing Loqate

The installation of Loqate consists of two parts (installing the Loqate application and then installing your address data).

1. Run *setup_64.exe.*

2. Ensure *Java API* and *Install Manager* are selected in the Setup dialog, as shown in the following image.



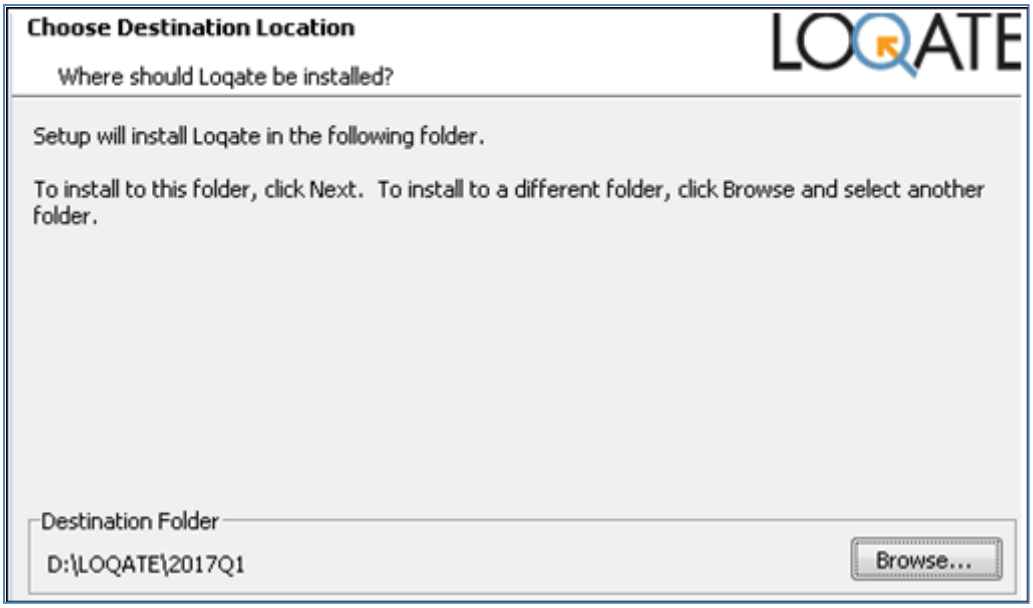
Notes:

- The *Java API* option installs the required .jar and .dll files for Loqate, which are 64-bit.

- The *Install Manager* option provides the *InstallManager.bat* file, which is used to download your address databases, also known as Global Knowledge Repositories (GKRs).

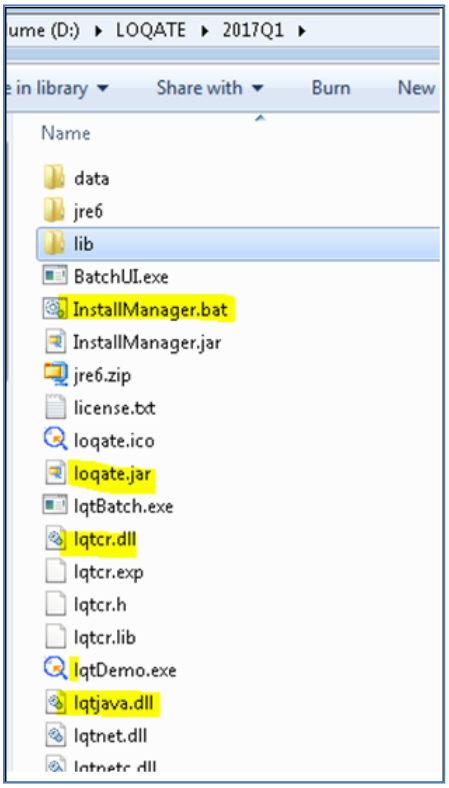
3. Click *Next* to continue.

   The Choose Destination Location pane is displayed, as shown in the following image.

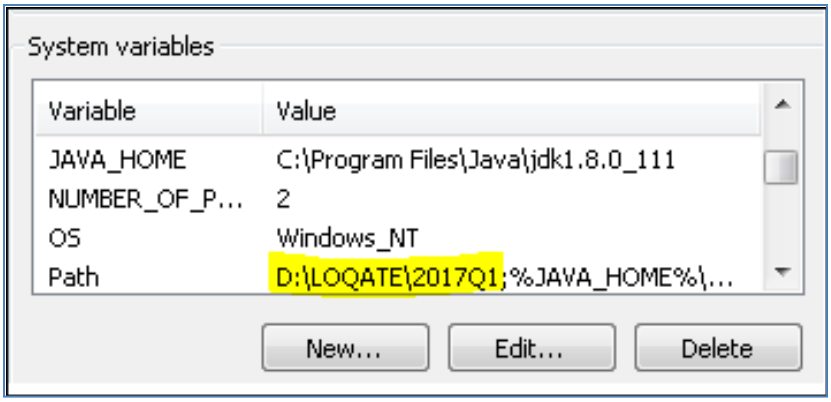


4. Select an appropriate root installation directory for Loqate on your file system.

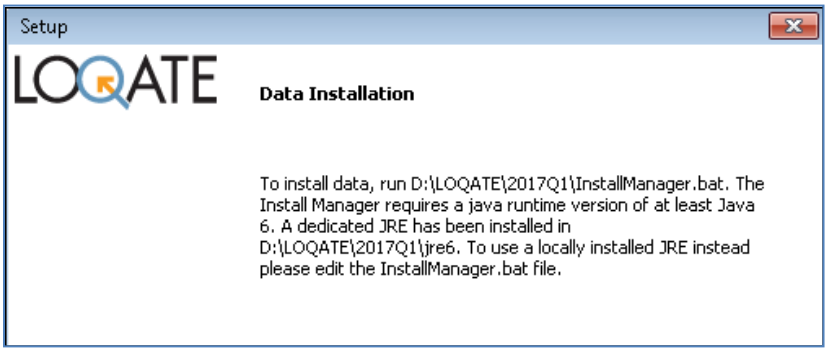
   The following key files (highlighted) are installed in the specified Loqate installation directory, as shown in the following image.



   Note: Your Windows system *Path* environment variable is updated automatically to include your Loqate installation directory, as shown in the following image.



This is required so an application (for example, iWay Data Quality Server) can find the Loqate .dll files.

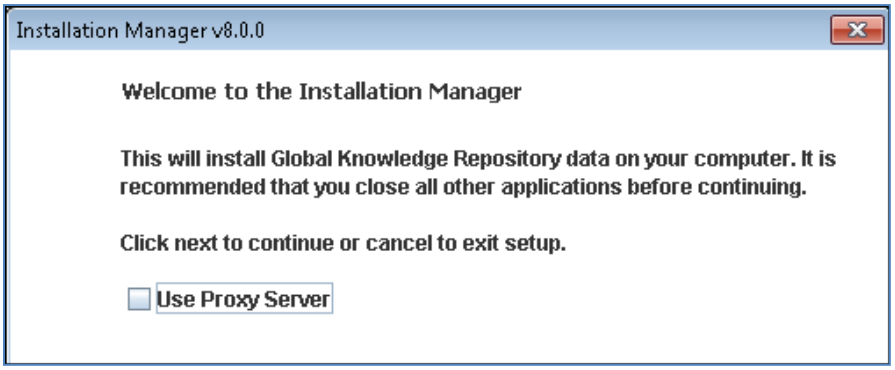


Installing the Address Data

This section describes how to install the address data (Global Knowledge Repository data).

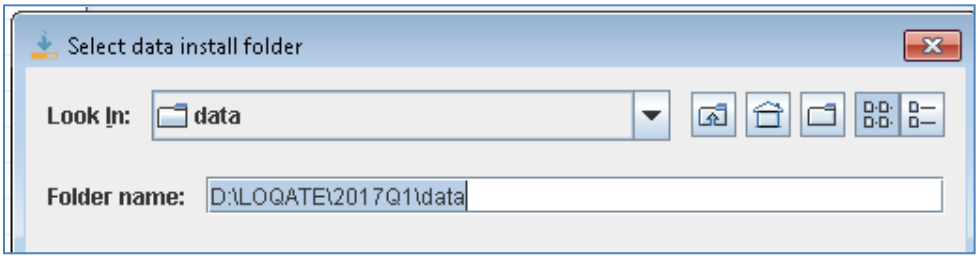
1. Navigate to the location on your file system where the Loqate application is installed and run the *InstallManager.bat* file (using the *Run as administrator* option).

   A Welcome message/dialog is displayed, as shown in the following image.



2. Click *Next*.

The Select data install folder dialog is displayed, as shown in the following image.

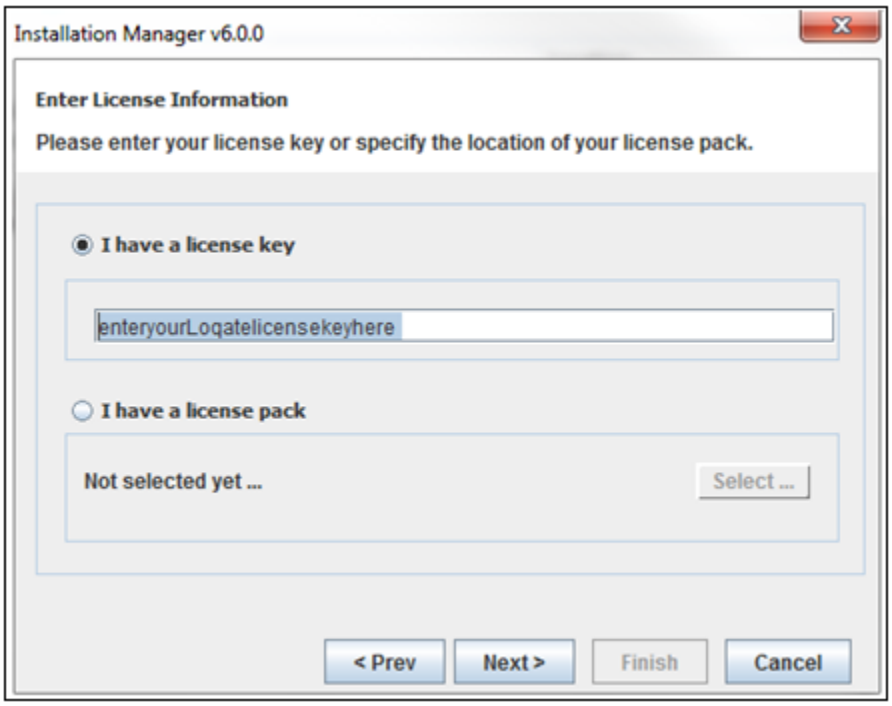


3. Select a directory on your file system where the address data files will be installed.

   Note: This is the same directory path that your Data Quality (DQ) Plan Loqate steps must point to.

4. Click *Next*.

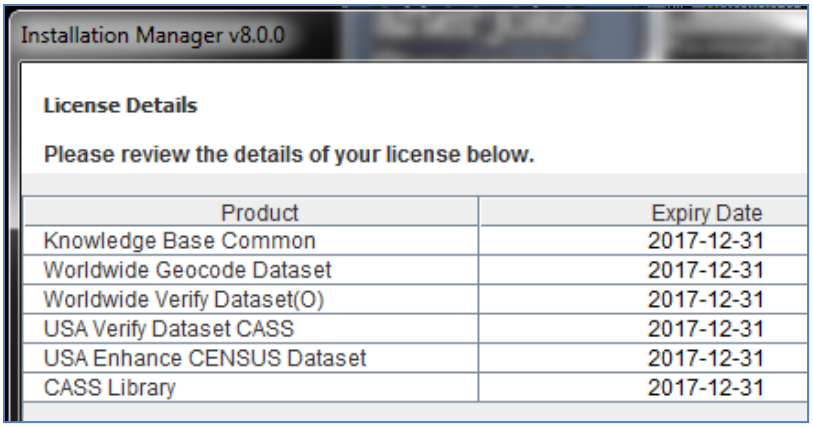
   The Enter License Information dialog is displayed, as shown in the following image.



5. Enter your Loqate license key in the corresponding field.

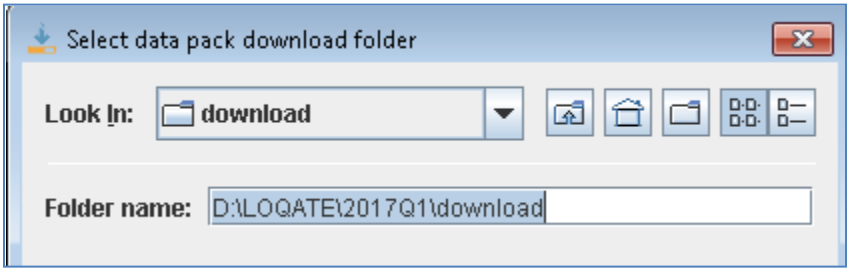
   Note: Customers are provided with a Loqate License key by iWay licensing/support, after a *Loqate License Request* form is submitted and processed.

   After the Loqate license server is contacted (which requires internet access), a list of your specific entitlements will be displayed, as shown in the following image.



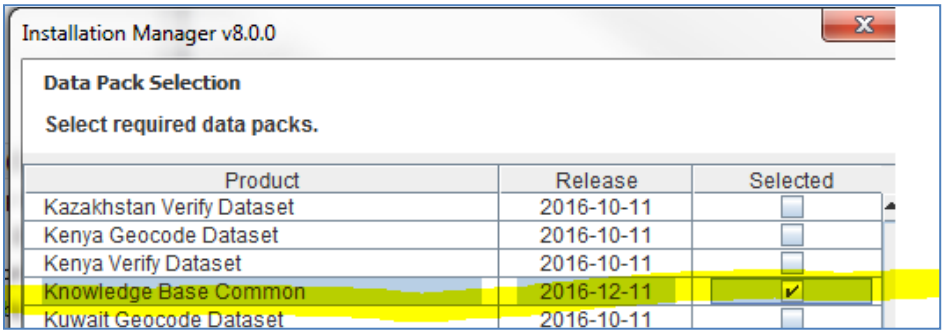
Note: If you receive an error stating the license is invalid, this may be due to a network, system environment, or security issue. On Windows 10, ensure that you run the *InstallManager.bat* file (using the *Run as administrator* option).

6. Select a directory on your file system where you want to download the data packs, as shown in the following image.

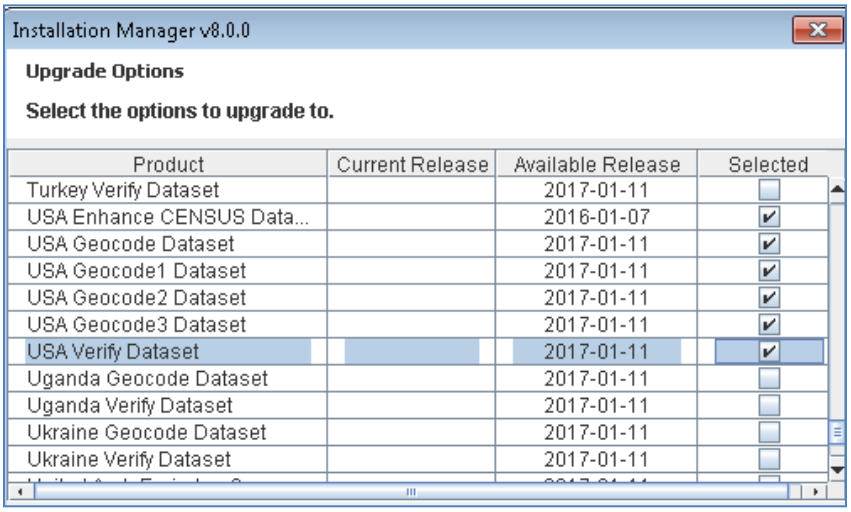


The data packs are packaged as .zip archive files and can be downloaded to any location. The data packs are then uncompressed into the *data* subfolder of your Loqate installation.

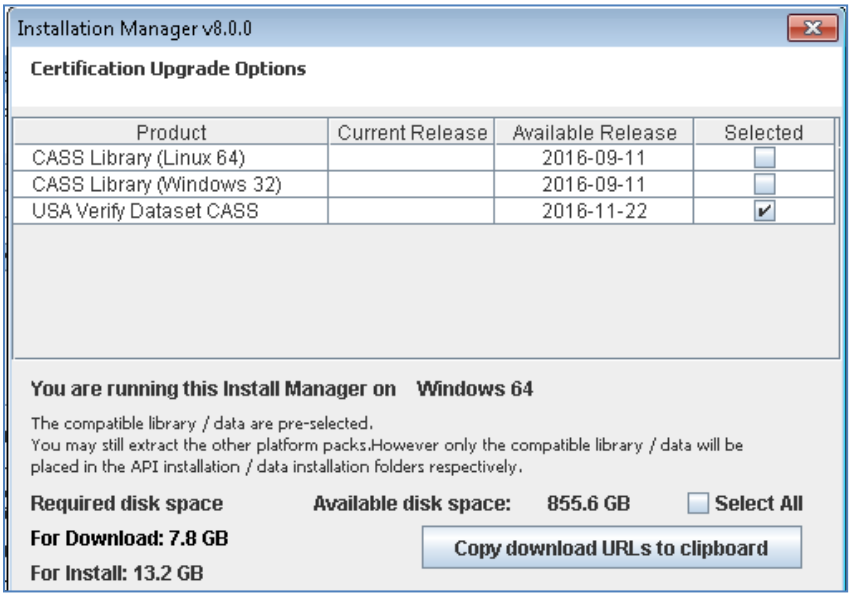
7. You must select and download the *Knowledge Base Common* data pack, as shown in the following image.



A list of all your licensed countries appears, as shown in the following image.



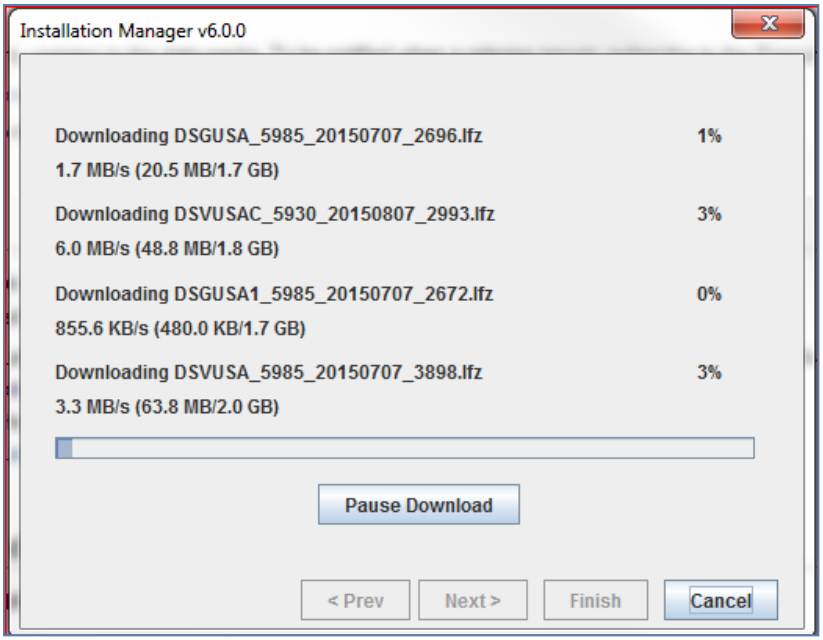
8. Select the individual products that you want to download at this time (or click the *Select All* check box).



Note: If you already have data packs in your download directory, you may not be presented with an option to download them again (if they are already up to date). If you want to override this behavior, then delete the existing data packs (.lfz files) in the download directory.

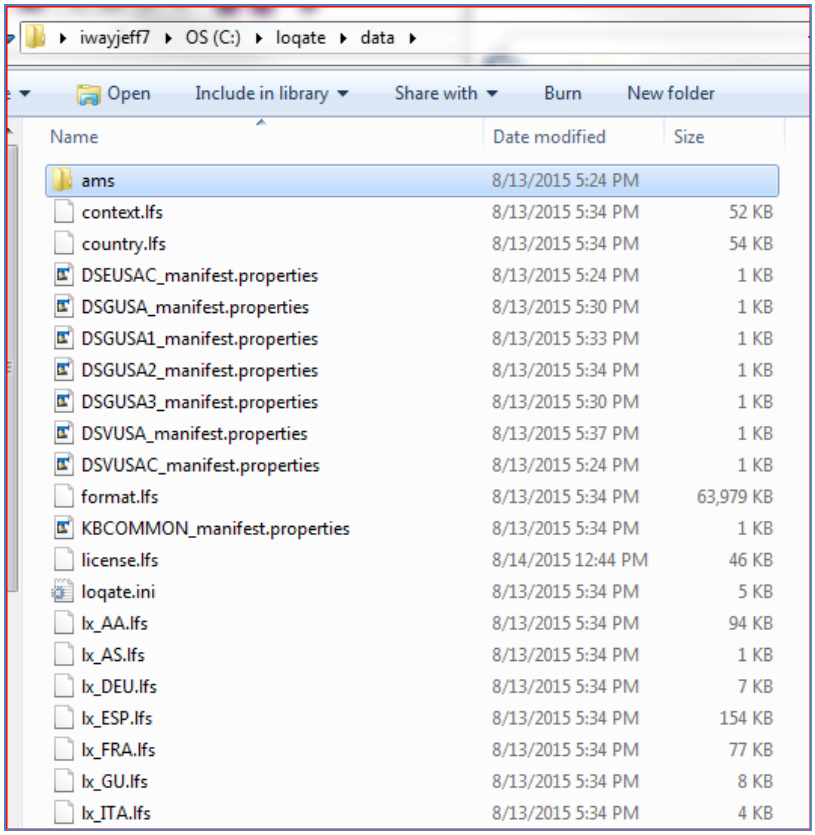
9. Click *Next*.

The selected data packs are downloaded, as shown in the following image.

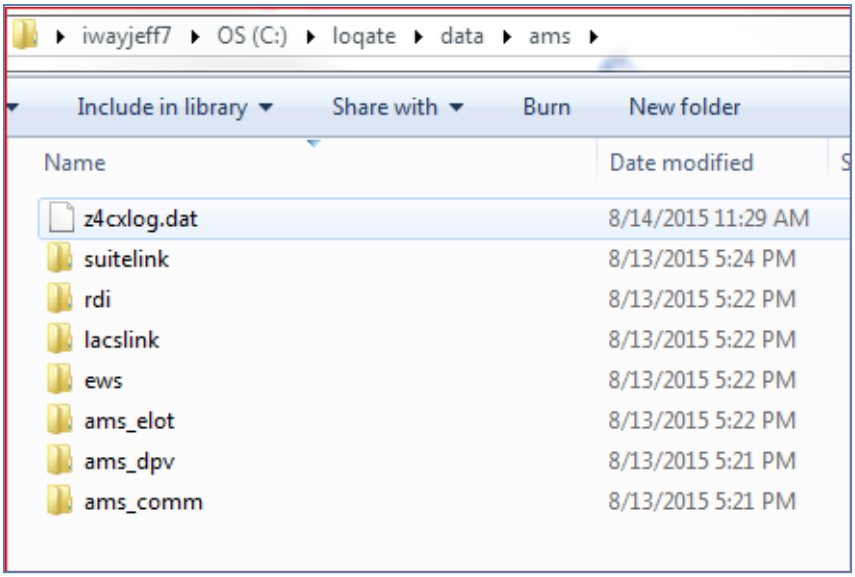


Note: This process may take some time to complete depending on the number of data packs that have been selected for download.

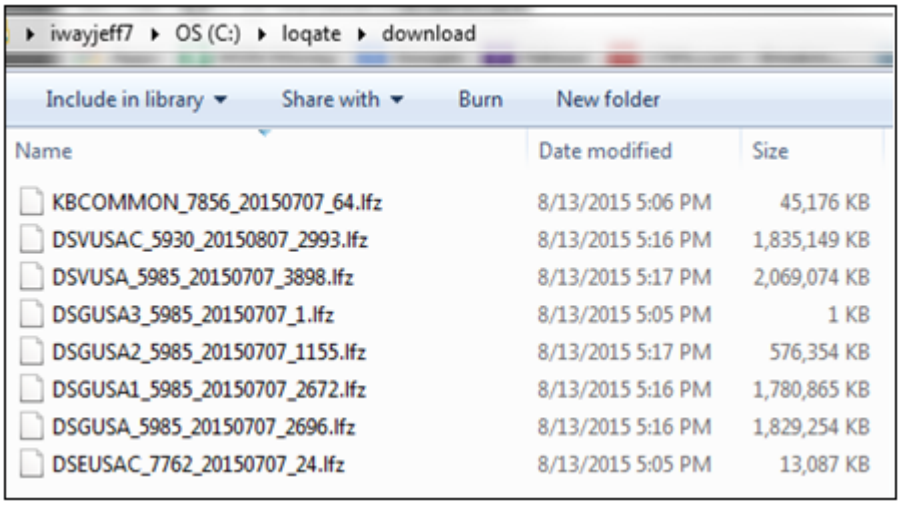
When the download process has finished, the *data* subfolder of your Loqate installation contains a number of .lfs files, which correspond to each downloaded data pack, as shown in the following image.



If you have licensed and installed US/CASS, it will be installed in the *ams* subfolder of your Loqate installation (not required for this how-to).

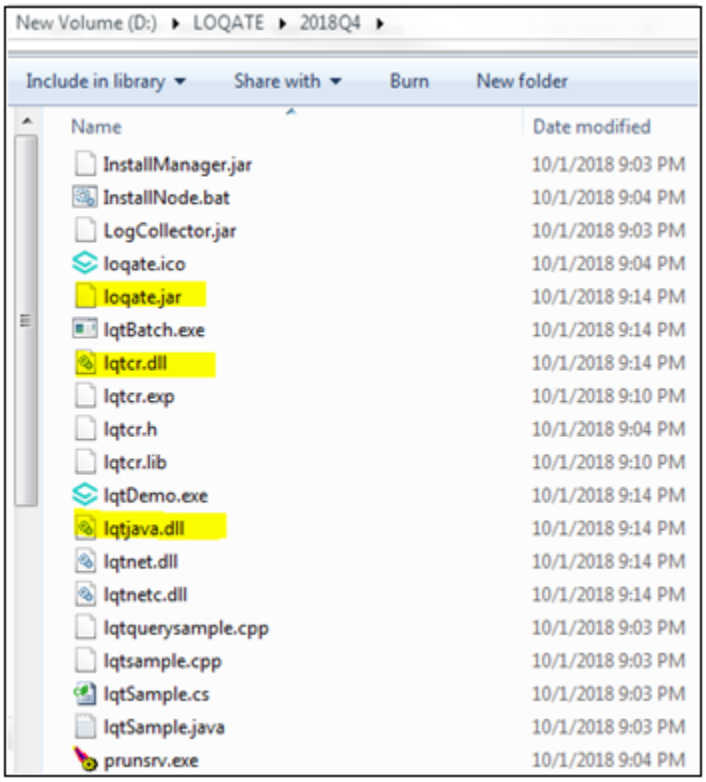


Note: To save space, you can delete the data pack.lfz files in your download directory. A complete US data pack download with geocode and CASS is 8GB.



Configuring Data Quality Runtime

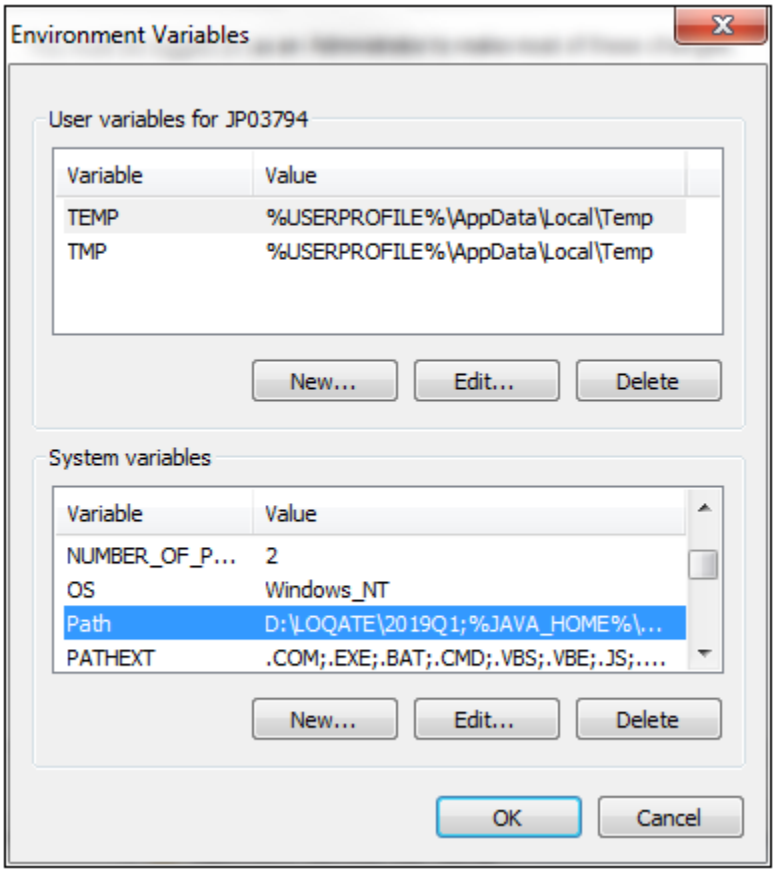
After Loqate is installed, the latest API files are available under the *LOQATE* installation directory, as shown in the following image.



Note: These API files replace any previously installed API files that were originally bundled with iWay Data Quality Server (DQS), DQS components installed into iWay Integration Tools (iIT), iWay Service Manager (iSM), or Omni-Gen.

To update API files in your environment:

1. Ensure your Windows system *Path* environment variable has been updated by the Loqate install, with the *LOQATE* installation directory included first, as shown in the following image.



If your Windows system *Path* environment variable has not been updated, then set it now. This step ensures that all DQ-related applications will always find the latest Loqate .dll files.

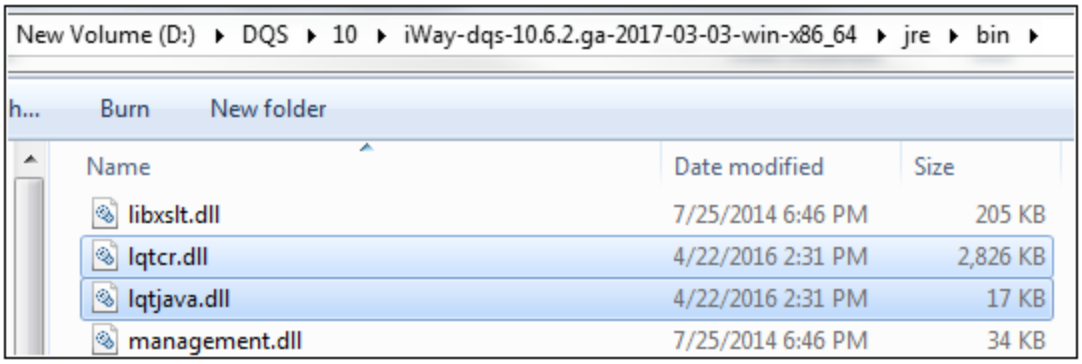
iWay DQS includes its own Java Runtime Environment (JRE).

2. Check the *bin* subfolder to ensure it does not contain any old (outdated) copies of the Loqate .dll files.

   It is recommended that you navigate to your *<DQS_Home>**jre**bin* directory and remove any older versions of the following .dll files:

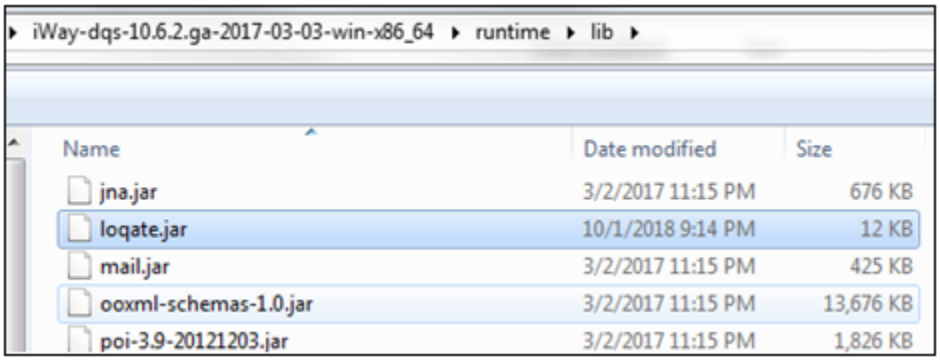
   - lqtcr.dll
   - lqtjava.dll

   For example:



Note: It is not recommended to copy the new versions of the .dll files to this location. If your Windows system *Path* environment variable has been updated by the Loqate install, this ensures that iWay DQS (and any other DQ-related applications) will always find the latest version of these .dll files.

3. Copy the new *loqate.jar* file from the Loqate root installation directory to your *<DQS_Home>\jre\lib* directory, as shown in the following image.

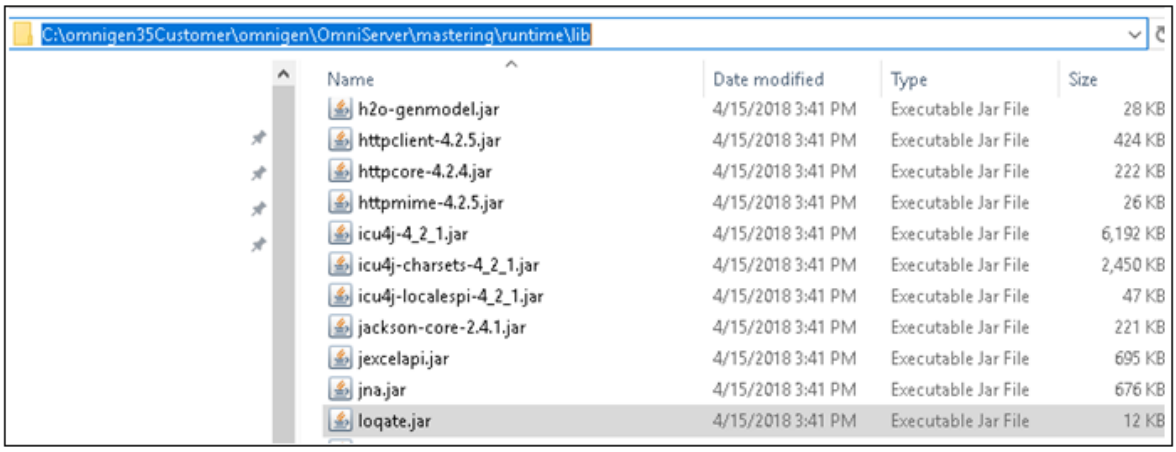


Note: .jar files are not found through the system *Path* environment variable. However, any .jar file in this *\lib* directory will be automatically loaded, so it should be copied here, replacing any previous (older) version.

In an Omni-Gen configuration, the *loqate.jar* file is located in the following directory path:

`<Omni_Gen_Home>\omnigen\OmniServer\mastering\runtime\lib`

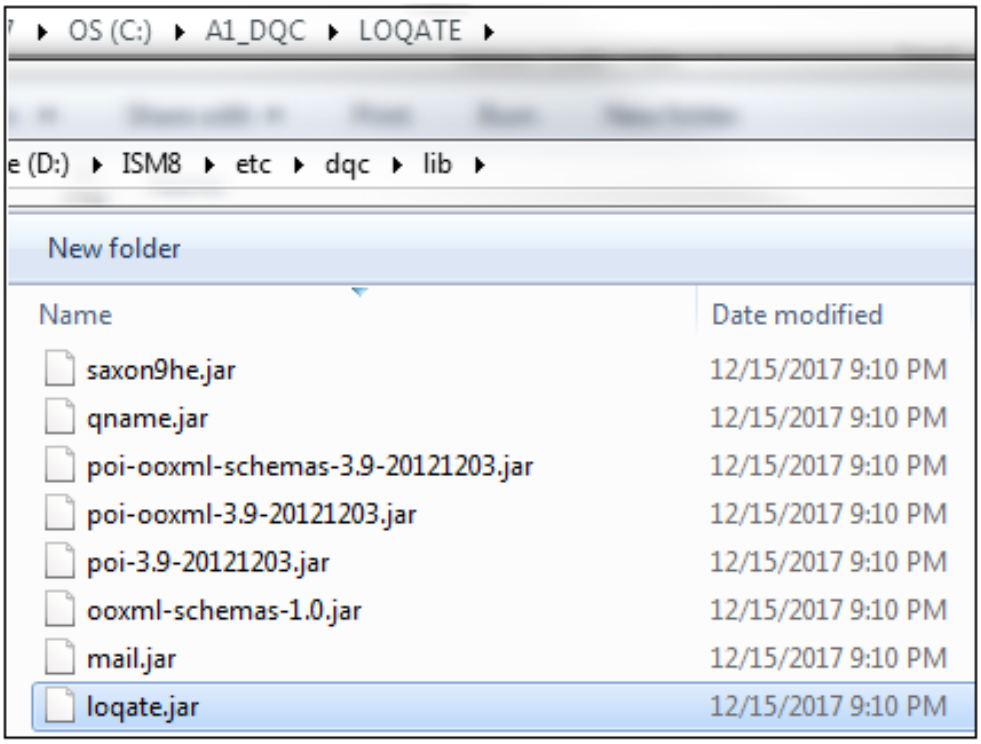
For example:



In an iSM configuration, the *loqate.jar* file is located in the following directory path:

`<iSM_Home>\etc\dqc\lib`

For example:

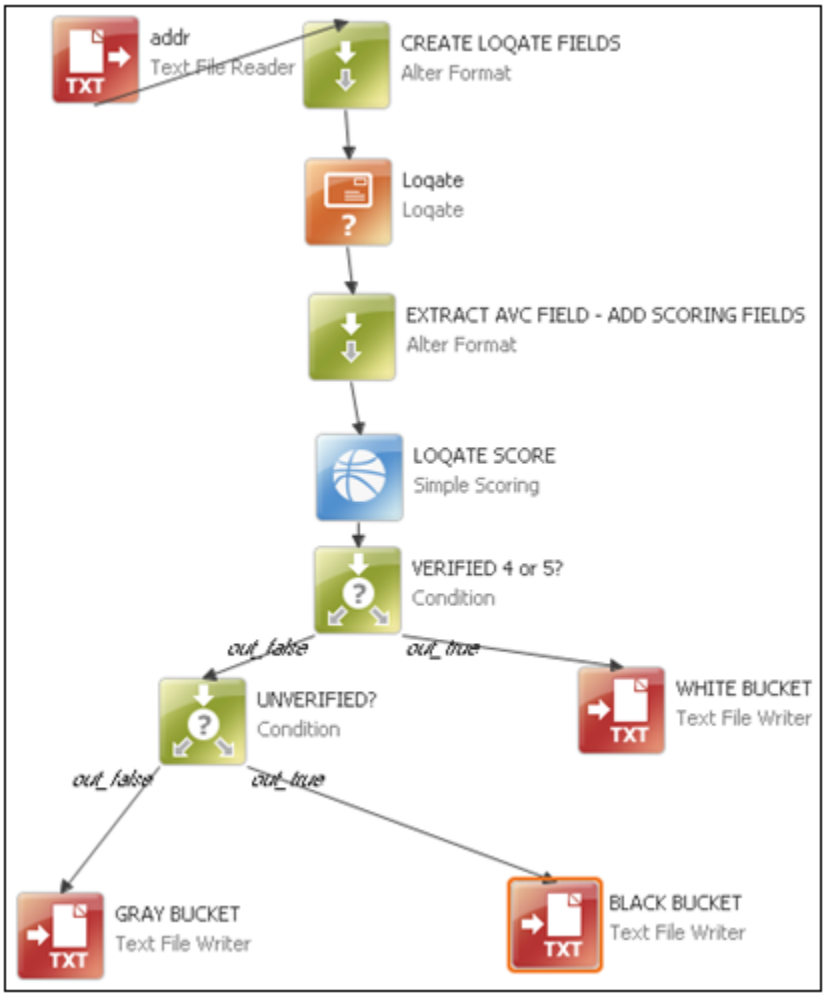


Configuring the Data Quality Scoring Plan

Download and unzip the *SCORING_PLAN_2016.zip* archive file to any directory on your file system.

Open iWay Data Quality Server (DQS), navigate to the directory where you unzipped the *SCORING_PLAN_2016.zip* archive file, and open *SCORING_PLAN.plan*.

The Data Quality Scoring plan opens in your iWay DQS workspace, as shown in the following image.



This plan demonstrates how to configure a basic Loqate address checking plan. You only need to adjust the Loqate data folder setting before running this plan.

Address records are provided as input in CSV format. Input and output fields are mapped by the Loqate step. The results are received in the form of an Address Verification Code (AVC) field. This field is then parsed into separate columns for readability, and a score is assigned based on the quality of the address.

Each application you build will need to determine the appropriate level of what will constitute a *good* address. A verified address *V5* is the highest possible score, while unverified *U0* indicates a bad address and should never be used. Scores between *V5* and *U0* constitute a gray area. You will need to become familiar with the AVC codes in order to ascertain what is acceptable for your application.

To configure the plan, specify the location of the */data* subfolder for your Loqate installation, as shown in the following image.

The input file includes 76 records. A sample is shown in the following image.

	Local_Address_1	Local_Address_2	Local_Address_3	Local_City	Local_County	Local_State	Local_Zip
1	NULL	P.O. Box 4229	NULL	Sacramento	SACRAMENTO	CA	95815
2	NULL	4790 Irvine Blvd.,...	NULL	Irvine	ORANGE	CA	92614
3	112 S 4th St. (98901)	or	Po Box 1789	Yakima	YAKIMA	WA	98907
4	NULL	PO BOX 11589	NULL	Spokane	SPOKANE	WA	99211
5	20 South Balph Ave.	NULL	NULL	Pittsburgh	ALLEGHENY	PA	15202
6	1036 WASHINGTON...	WILLIAMSPORT, ...	NULL	Williamsport	NULL	PA	17701
7	9320 PRIORITY WY ...	PO BOX 80883	INDIANAPOLIS IN	Indianapolis	NULL	IN	46240

The following set of images show how the input and output columns map to the Loqate element names.

Input Elements

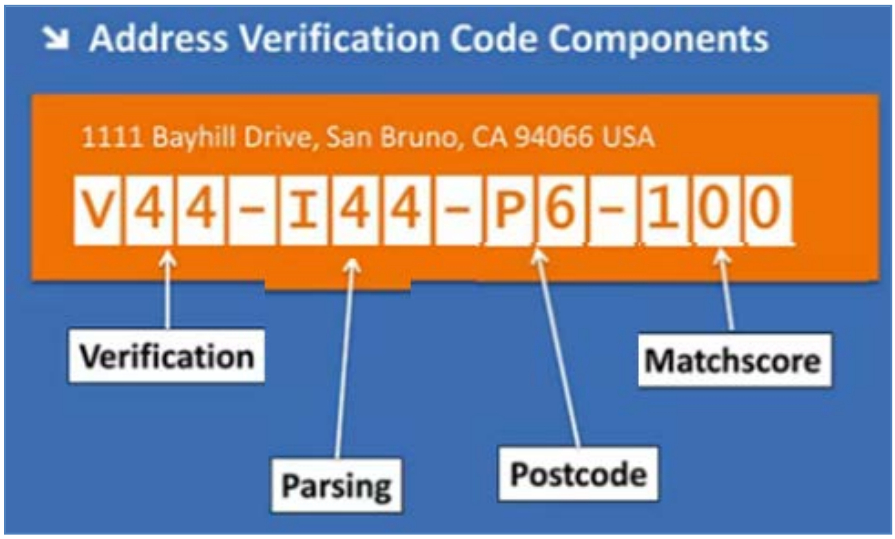
	Column	Element Name
1	Local_Address_1	Address1
2	Local_Address_2	Address2
3	Local_Address_3	Address3
4	Local_City	Locality
5	Local_State	AdministrativeArea
6	Local_Zip	PostalCode
7	'US'	Country
8	Local_County	SubAdministrativeArea
*		

Output Elements

	Column	Element Name
1	out_Address	Address
2	out_Address1	Address1
3	out_Address2	Address2
4	out_Address3	Address3
5	AVC	AVC
6	out_CITY	Locality
7	out_STATE	AdministrativeArea
8	out_ZIP	PostalCode
9	out_LAT	Latitude
10	out_LON	Longitude
11	out_COUNTY	SubAdministrativeArea
12	out_UNMATCHED	Unmatched
13	out_Premise	Premise
14	out_Thoroughfare	Thoroughfare

When Loqate analyzes an address, it returns a 16-character string known as the Address Verification Code (AVC). The Data Quality Scoring plan shows you how to parse out the AVC and sort the results.

The following diagram illustrates how the AVC is formatted.



Verification

The Verification section contains three characters:

- The first character indicates the *Verification Status* . In this case *V* indicates *Verified*.
- The first digit represents the post-processing *Verification Level*. The first character and the first digit are the two most important factors.
- The second digit represents the pre-processing level.

The following table provides a reference for the *Verification Status* values.

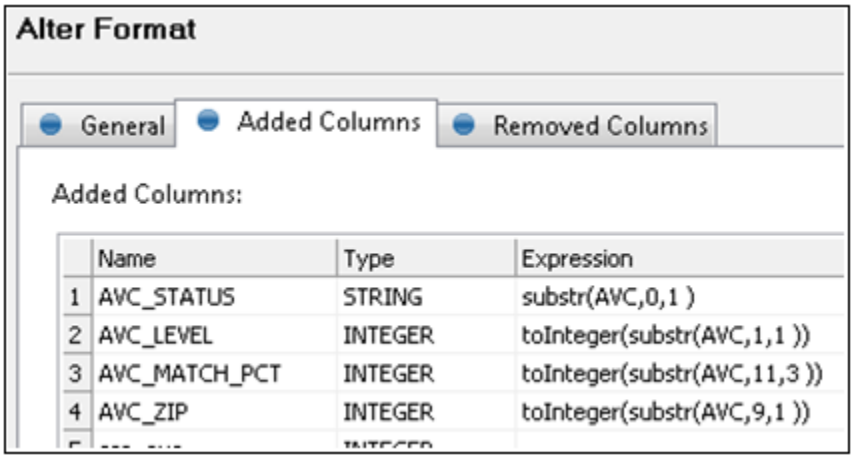
Value	Status	Description
V	*Verified*	A complete match was made between the input data and a single GKR record. Values are 1 to 5.
P	*Partially Verified*	A partial match was made to a single GKR record.
U	*Unverified*	Unable to verify. The output fields will contain the input data.
A	*Ambiguous*	More than one close reference data match was made.
C	*Conflict*	More than one close reference data match was made with conflicting values.
R	*Reverted*	Record could not be matched to the specified minimum acceptable level (through *Server Option: MinimumMatchscore*). The output fields will contain the input data.

The following table provides a reference for the *Verification Levels*.

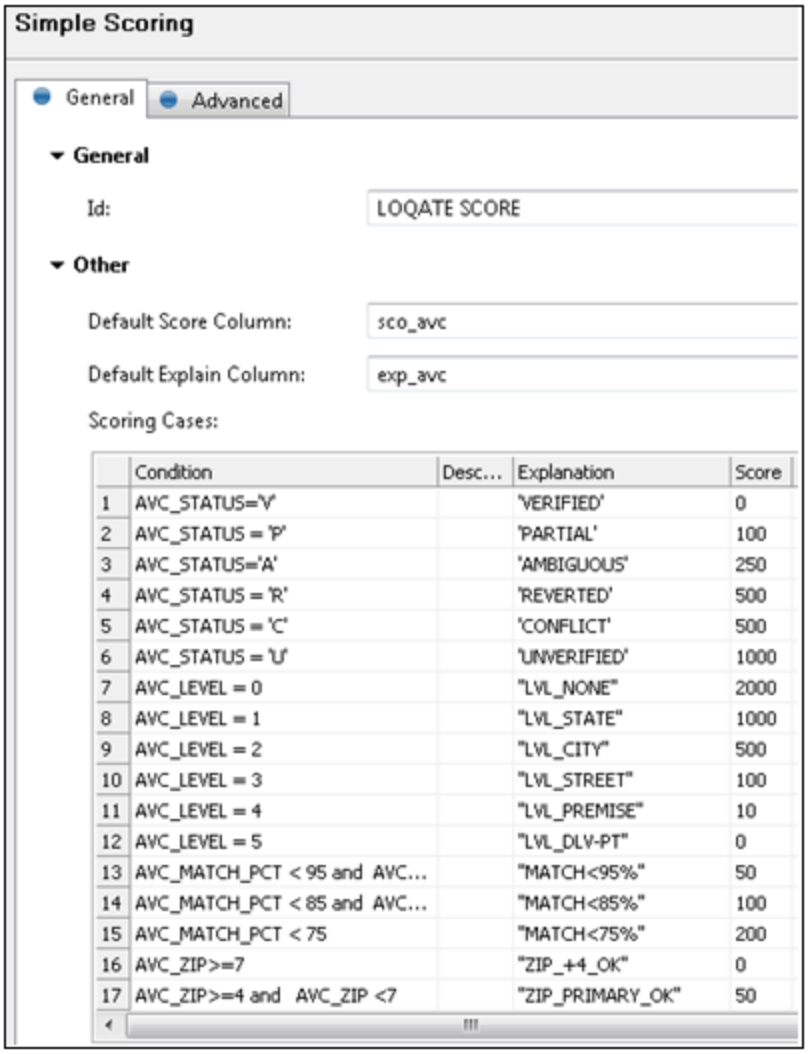
Value	Level	US
5	Delivery Point	Postbox or Suite
4	Premise	Premise or Building
3	Thoroughfare	Street
2	Locality	City
1	AdministrativeArea	State
0	None	

For simplicity, this use case will adopt a policy where *V4* and *V5* addresses are considered *good*. Unverified (*U*) addresses are considered *bad*, and everything else falls in a gray area.

To make the results more understandable, this plan parses the AVC into separate fields. This is done with several string functions, as shown in the following image.

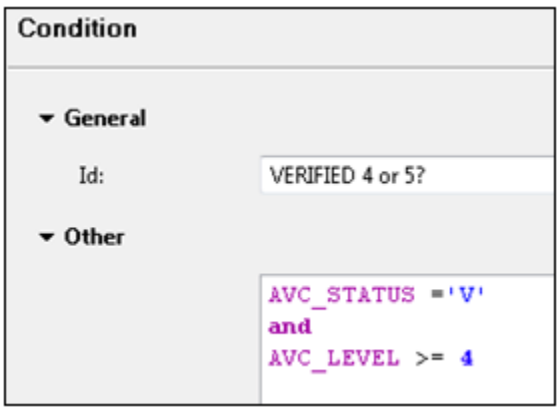


You can also apply optional scoring and explanations based on the AVC. This part is optional. However, *scoring* is used in most other parts of iWay DQS. In general, a higher score in iWay DQS indicates a more serious defect. A score of 0 is considered perfect.



	Condition	Desc...	Explanation	Score
1	AVC_STATUS='V'		'VERIFIED'	0
2	AVC_STATUS = 'P'		'PARTIAL'	100
3	AVC_STATUS='A'		'AMBIGUOUS'	250
4	AVC_STATUS = 'R'		'REVERTED'	500
5	AVC_STATUS = 'C'		'CONFLICT'	500
6	AVC_STATUS = 'U'		'UNVERIFIED'	1000
7	AVC_LEVEL = 0		"LVL_NONE"	2000
8	AVC_LEVEL = 1		"LVL_STATE"	1000
9	AVC_LEVEL = 2		"LVL_CITY"	500
10	AVC_LEVEL = 3		"LVL_STREET"	100
11	AVC_LEVEL = 4		"LVL_PREMISE"	10
12	AVC_LEVEL = 5		"LVL_DLV-PT"	0
13	AVC_MATCH_PCT < 95 and AVC...		"MATCH<95%"	50
14	AVC_MATCH_PCT < 85 and AVC...		"MATCH<85%"	100
15	AVC_MATCH_PCT < 75		"MATCH<75%"	200
16	AVC_ZIP>=7		"ZIP_+4_OK"	0
17	AVC_ZIP>=4 and AVC_ZIP <7		"ZIP_PRIMARY_OK"	50

To separate the good addresses from those that are not, a filter can be used. There are many ways you could accomplish this. You have the option of using either the SCORE, or the parsed out AVC values.



For example, *V4* and *V5* are considered good, which indicates that the address contains a verified building/premise.

You can also add a check to ensure that the address is a close match. For example, if a minor typo has been corrected, then its match percentage might be slightly less than 100. However, if too much has changed for the address, then its match percentage is much lower. In this case, it may no longer represent the original value and you would not want to consider it as a *good* address.

To prevent this situation, update the Condition to the following:

```
AVC_   STATUS = ‘V’
and    AVC_LEVEL   >=    4
and    AVC_MATCH_PCT >= 85
```

As you become more familiar with the AVC codes, you can adjust any of these parameters. This will be based on how stringent your application needs to be. For example, are you delivering valuables or just sending flyers?

The records are split into three files. Good address records are represented, as shown in the following image.

out_Address1	out_Address2	out_Address3	out_CITY	out_ST…	out_ZIP	AVC	AVC_STATUS	AVC_LEVEL	AVC_MATCH_PCT
112 S 4th St 989…	PO Box 1789	Yakima WA 98…	Yakima	WA	98907-1789	V55-I55-P7-100	V	5	100
Null	PO Box 11589	Spokane WA 9…	Spokane	WA	99211-1589	V55-I55-P7-100	V	5	100
20 S Balph Ave	Pittsburgh PA…		Pittsburgh	PA	15202-3504	V44-I44-P7-100	V	4	100
2680 Grand Isla…	PO Box 308	Grand Island …	Grand I…	NY	14072	V44-I55-P6-100	V	4	100
523 W 2nd St	Defiance OH …		Defiance	OH	43512-2143	V44-I44-P7-100	V	4	100

Unverified (U) addresses are considered *bad*, and are written to a separate file, as shown in the following image.

out_Address	out_Address1	…	…	out…	..	…	AVC	AVC…	AVC_LEVEL	AVC_…	AVC_ZIP	sco_avc
Null	Null			Null			U00-I02-P0-100	U	0	100	0	3100
Null	Null			Null			U00-I02-P0-100	U	0	100	0	3100
Null	Null			Null			U00-I02-P0-100	U	0	100	0	3100
Null	Null			Null			U00-I02-P0-100	U	0	100	0	3100
Null	Null			Null			U00-I02-P0-100	U	0	100	0	3100
Null	Null			Null			U00-I02-P0-100	U	0	100	0	3100
Null	Null			Null			U00-I02-P0-100	U	0	100	0	3100
Null	Null			Null			U00-I02-P0-100	U	0	100	0	3100

These addresses would not be usable.

The remaining addresses are placed into a third file, as shown in the following image.

out_Address1	out_CITY	out_...	out_ZIP	AVC	AVC_...	AVC_LE...	AVC_MATCH...	AVC_ZIP	sco_avc	exp_avc
New York NY 10048	New York	NY	10048	R44-I55-P4-...	R	4	92	4	610	REVERTED LVL_PREMISE M...
Johnson & Higgins Of	Salt Lak...	UT	84111	P22-I55-P6-...	P	2	100	6	650	PARTIAL LVL_CITY ZIP_PR...
18201 Von Karman A...	Des Moines	IA	50392	P22-I55-P6-...	P	2	100	6	650	PARTIAL LVL_CITY ZIP_PR...
Deerwood Office Park	San Ramon	CA	94583	P22-I55-P6-...	P	2	100	6	650	PARTIAL LVL_CITY ZIP_PR...
90 Bryant Woods S	Getzville	NY	14068	P22-I44-P6-...	P	2	100	6	650	PARTIAL LVL_CITY ZIP_PR...
35 Braintree Hill Park	Spokane	WA	99204	P22-I44-P6-...	P	2	100	6	650	PARTIAL LVL_CITY ZIP_PR...
1500 Market St	Philadelp...	PA	19102	P44-I44-P6-...	P	4	100	6	160	PARTIAL LVL_PREMISE ZIP...
Atlanta GA 30326	Atlanta	GA	30326	R55-I55-P4-...	R	5	90	4	600	REVERTED LVL_DLV-PT MA...
Saint Joseph MO 64502	Saint Jo...	MO	64502	R22-I25-P5-...	R	2	93	5	1100	REVERTED LVL_CITY MATC...
Austin TX 78731	Austin	TX	78731	R55-I55-P4-...	R	5	94	4	600	REVERTED LVL_DLV-PT MA...

This represents a *gray* area and may require some additional analysis, including being sent to a remediation process. The idea being that there may be a partial match that requires human intervention to make the final determination.

Debugging

Set the following option in DQ Run → configuration → runtimes → VM arguments:

```
-Dloqate.debugLog=myloqatelog.xml
```

Understanding Loqate License Expiration

Loqate licenses work on a subscription basis and expire after one year. The actual date will vary, based on when the license was issued to a customer. Loqate will send an email reminder about 30 days before license expiration.

To keep the current installation active, the Loqate subscription must first be renewed. Once the Loqate subscription is renewed, the installation program (*InstallManger.bat*) must be run again. When doing this, you use the same key originally delivered, and the Loqate back-end server will verify the subscription renewal. This will create a new runtime *license.lfs* file to be downloaded onto the local Loqate installation. At this point, you should also refresh your data packs to get the latest knowledgebase.

Engine Code Updates

Whenever an update is made to the Loqate engine, there will be some changes to the Loqate *.dll* files (*.so* files), and *loqate.jar* file. These files were installed when you originally ran the installation. Updating data packs does not automatically update these code files. To stay up to date, it is recommended to periodically download and run the latest installation (*setup_64.exe*). This will install the latest version of the Loqate engine.

Checking Your License Expiration Date

If the Loqate license does expire, the Loqate engine will return all zeros (0) in the AVC code, and an error may not be obvious.

To check the expiration date, run the following command and capture the results to a file:

On Windows:

```
C:\loqate> lqtbatch –d [loqate installation directory]\data  >X.txt
```

On Unix:

```
lqtbatch –d [loqate installation directory]/data)
```

Scan the file for *ExpiryDate*, and you should see entries similar to the following:

```
DSEUSAC.ExpiryDate : 2018-12-31
DSGTPWW.ExpiryDate : 2018-12-31
DSVTPWWO.ExpiryDate : 2018-12-31
DSVUSAC.ExpiryDate : 2018-12-31
KBCOMMON.ExpiryDate : 2018-12-31
LIBCUSA.ExpiryDate : 2018-12-31
```

Note: For Information Builders demo licenses, the expiration date is 12/31 of each year.

If this is a CASS installation, then the end of the file should also contain the following entries:

```
Number of days until API expires : 567
Number of days until data expires : 49
```

CASS data expires quarterly (as required by the USPS to remain certified). It must be updated/downloaded accordingly, independently of the license renewal.

Troubleshooting Install Manager Downloads

This section provides troubleshooting information when downloading Install Manager.

Older Version of Install Manager

If you are using an older version of Install Manager, then you must download the latest version from the following Loqate download sites:

- **HTTP Download Access:** https://updates.gbgplc.com
- **SFTP Download Access:** sftp://updates.gbgplc.com

To obtain the login credentials (user name and password) for the Loqate download site, contact *Information Builders Customer Support*.

Note: Downloading the latest version of Install Manager to a Virtual Machine may cause issues. If Install Manager still fails after trying the suggestions described in the following sections, then download Install Manager directly to the native operating system of your machine and then copy it to the required image.

Proxy/Firewall Access

Install Manager requires internet access, which connects to Loqate licensing servers to validate the license key, and then obtains the information about the latest compatible reference data for download. If proxy/firewall settings are enabled in your environment, then these settings may block access to the Loqate servers.

Verify that the following URLs are not blocked by your environment settings:

https://licensing.loqate.com (port 443)

https://download.loqate.com (port 443)

If these URLs are blocked, then update your proxy/firewall settings or use the proxy authentication that is specified during the Install Manager process (on the first screen). These URLs are required by Install Manager to connect to the Loqate servers, verify the license key, and retrieve the reference datapacks.

Testing the Connections Using Curl Commands

You can test the connections using the following *curl* commands:

```
$ curl https://licensing.loqate.com:443
```

```
$ curl https://download.loqate.com:443
```

No Internet Connection

If you do not have an internet connection available from your server or are unable to open the firewall on the server, then it is recommended to follow the online and offline instructions that are available on the Loqate website.

Basically, you must download the data packs on a machine that can connect to the Loqate licensing servers. Once the data packs are downloaded, copy them over to your server and install those data packs.

Insufficient Permissions

Install Manager requires read and write permissions to update the license pack. Ensure that you have permission to create/overwrite the *license.lfs* file, otherwise the license pack will not update.

Windows:

If you are installing data anywhere inside the *Program Files* directory, *Program Files (x86)* directory, or Windows file system (for example, *C:\Program Files\Loqate\data*), then you must provide administrator permissions. To do so, run Install Manager as an administrator using the Command Prompt or install data outside of the *Program Files/Program Files (x86)* directory and copy the installed data into the desired location.

Linux:

Since the installation of the *license.lfs* file on Linux platforms has a default permission of 644, only the owner of the *license.lfs* file has write permissions. If you are accessing the *license.lfs* file from a shared folder or someone else's folder, then you must first change the permission to 664 or 666.

Additional Resources

All users can create a support account with Loqate to gain access to the latest documentation by visiting the following Loqate website:

http://www.Loqate.com