Installing and Running a Data Quality Loqate CASS Address Application on Windows

This use case describes how to install and run a Data Quality (DQ) Loqate address application that supports the Coding Accuracy Support System (CASS).

For address verification in the United States, the United States Postal Service (USPS) provides CASS as an enhanced level of certification. CASS is supported in iWay Data Quality Server (DQS) and Loqate through its CASS step (when licensed accordingly).

This use case includes the following topics:

- **CASS Considerations**
- **Prerequisites**
- **Installation**
- **Downloading the Address Data**
- **Configuring the Data Quality Runtime**
- **Configuring and Analyzing the Data Quality CASS Test Plan**
- **Checking the Expiration Status for Loqate Data**
- **Appendix A: CASS Fields**
- **Appendix B: Configuring a 32-bit JRE**
- **Appendix C: Troubleshooting Install Manager Downloads**

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CASS Considerations

This section provides a summary of key considerations when integrating with CASS:

- The CASS API expires on July 31st every odd year (for example, every two years).
- CASS data files expire after 105 days from the release date (for example, every quarter).
- CASS requires a 32-bit configuration. For more information, see Appendix B: Configuring a 32-bit JRE.

Prerequisites

This section summarizes the prerequisites that are required before using the DQ Loqate CASS address application. A basic knowledge of building and running DQ plans and Loqate AVC codes are assumed, as discussed in the standard version of this use case (_Installing and Running a Data Quality Loqate Standard Address Application_).

The DQ Loqate CASS address application requires:

- iWay Data Quality Server (DQS) GUI or iWay Integration Tools (iIT) with DQ plugins, both configured to run with a 32-bit JRE.

- A Loqate/CASS license.

- A sample DQ plan, which you can download from:

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

- The latest Loqate installation, which can be downloaded from:

  ftp.loqate.com

  To obtain the login credentials (user name and password) for this FTP site, contact Customer Support.

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

  /2017Q1.0/AppInstaller

  If you want to use the CASS version, then you must download the setup.exe (32-bit version) executable file.

Installation

This section describes how to install DQ Loqate, which has two parts (installing the product and downloading the data libraries).

1. Run *setup.exe.*

   This installs most of the components, but ensure the following check boxes for these components are selected:

   - *Java API* (Loqate .jar and .dlls) which will be the 32-bit version for the CASS version.

   - *Install Manager*, which you will use to download your address databases, also known as Global Knowledge Repositories (GKRs).
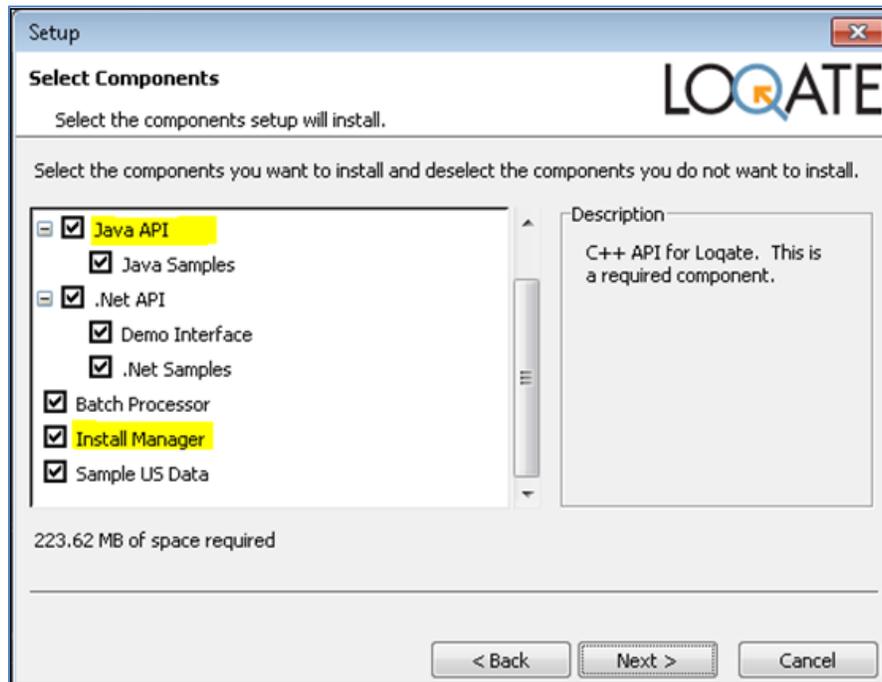
2. Click *Next*.

3. Select the directory where you wish to install DQ Loqate, for example, D:\LOQATE\2017Q1, as shown in the following image.
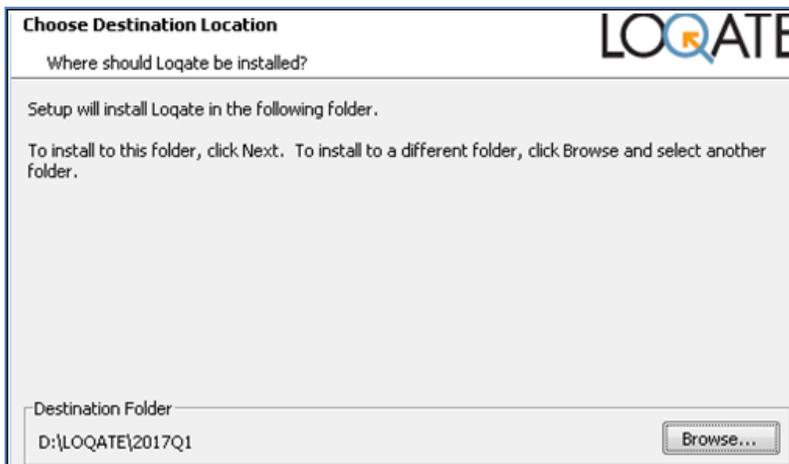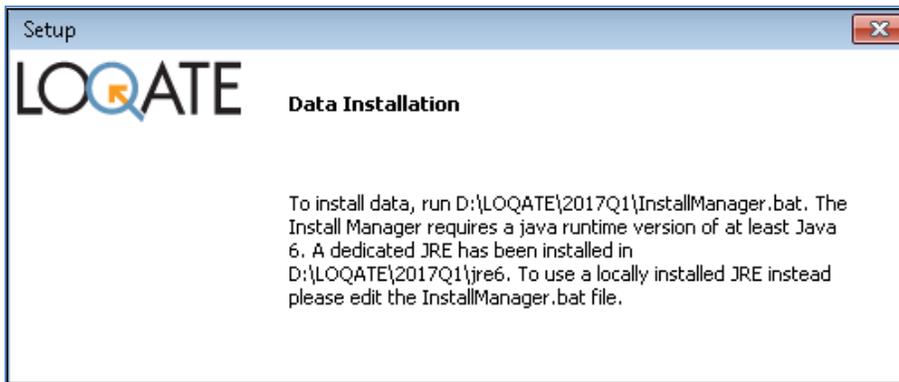

Once you have completed this step, the following key files should appear in the list, as shown in the following image.
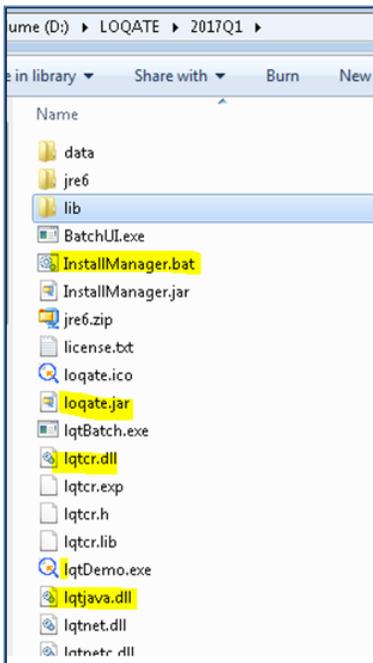
Note: Your Windows System Variables Path has automatically been updated to include your Loqate directory, as shown in the following image.
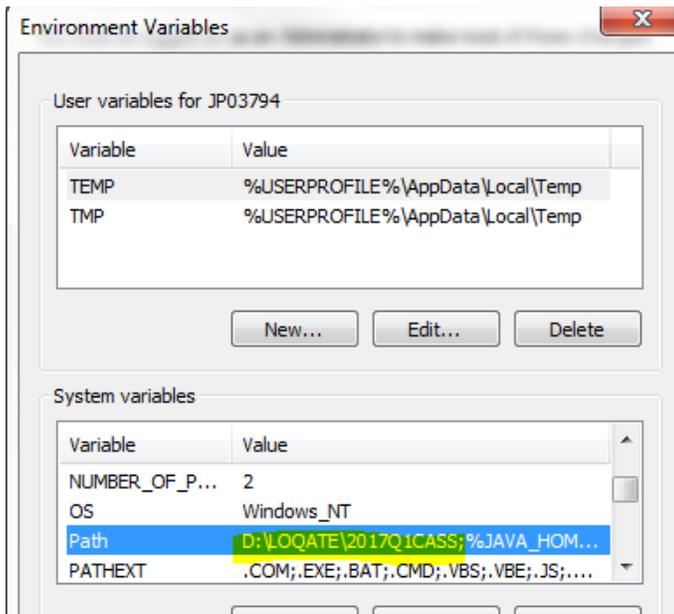
This is required so that any application (for example, iWay Data Quality Server) can find the Loqate .dll files.
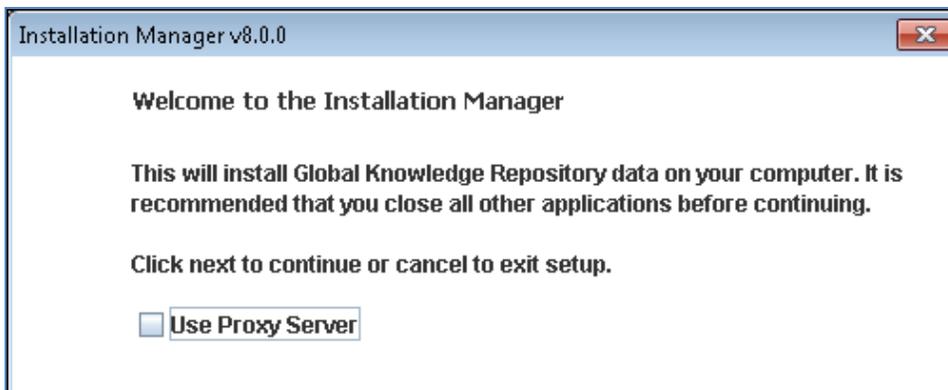
Downloading the Address Data

This section describes how to download the address databases, specifically Global Knowledge Repositories (GKRs), as mentioned in the installation process.

1. Run *InstallManager.bat*.

   The following Welcome message appears.

2. Click *Next*.

3. Select the location where the data files will be installed, as shown in the following image.
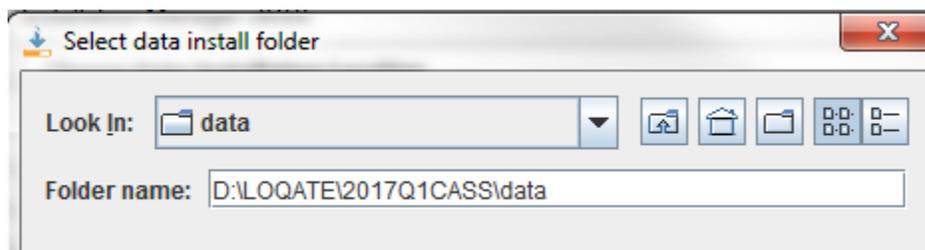
   Note: This is the directory that your CASS Loqate steps in your DQ plan must point to.

4. Enter your Loqate License key, as shown in the following image.

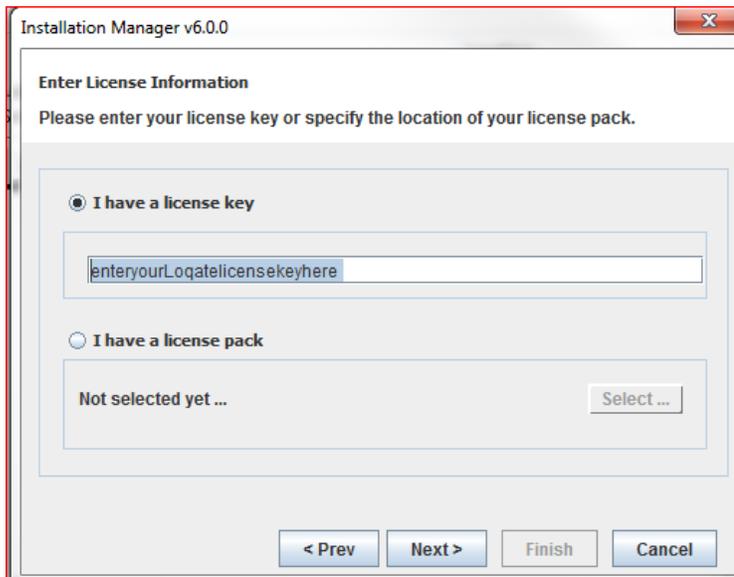- Customers are provided a Loqate License key by iWay licensing/support, after a Loqate License Request form is submitted and processed.

- Information Builders employees (internal) can go to the following internal network site to obtain a Loqate License key:

  http://eimwiki.ibi.com/mediawiki/index.php/Category:Loqate

  After the license server is contacted (which requires an Internet connection), a list of your entitlements will be displayed, as shown in the following image.

  If you receive an error message stating that the license is invalid, it may be due to a network, environmental, or security issue. If you are using Windows 10, you can try running the *InstallManager.bat* file as an Administrator.

5. Select the directory where you wish to download the data packs, which are archive files (.zip) of the address database.

You can download the data packs to any directory (for example, D:\LOQATE\2017Q1CASS\download), as shown in the following image.
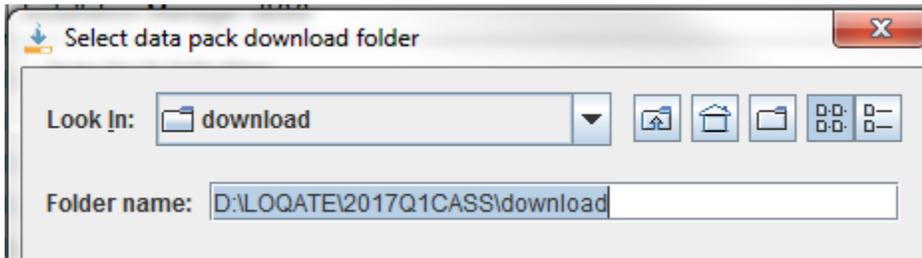
The data packs will be uncompressed and installed into the \data folder.

6. Select the *Knowledge Base Common* data pack, which is a requirement, as shown in the following image.

A list of all your licensed countries appears, as shown in the following image.
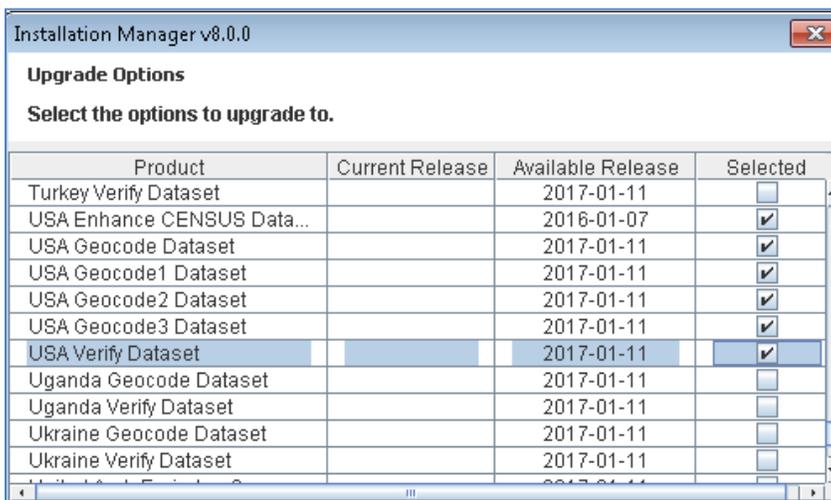
7. Click on the *Select All* check box or specific check boxes corresponding to products that you wish to download at this time.

For CASS, ensure that the *CASS Library (Windows 32)* and *USA Verify Dataset CASS* are selected, as shown in the following image.
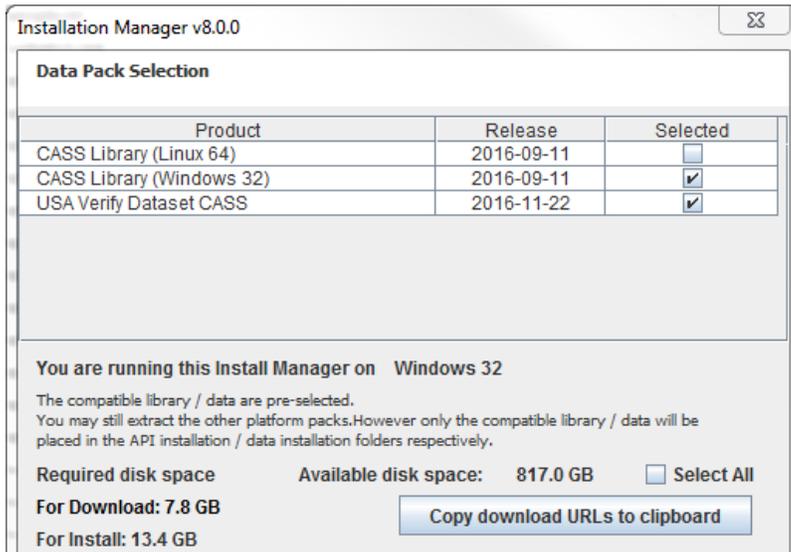
Note: If you already have data packs in your download directory, you may not be presented with an option to download them again (if they are already up to date). If you want to override this behavior, delete the existing data packs (.lfz files).

8. Click *Next*.

   The downloads begin, as shown in the following image.
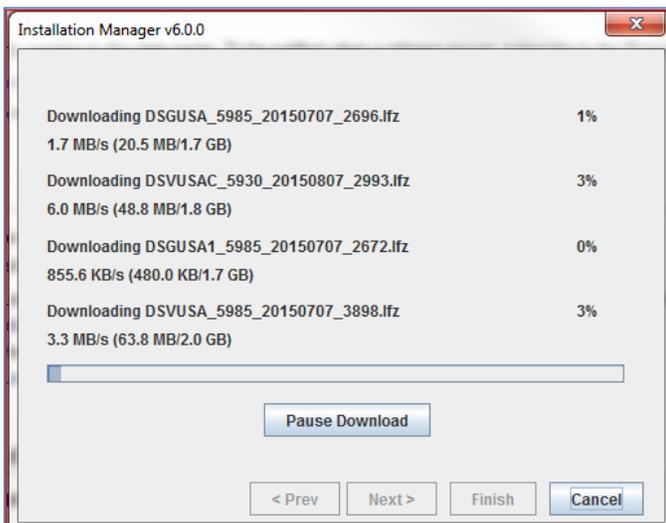
When the downloads are finished, your \data directory should contain numerous .lfs files, as shown in the following image.
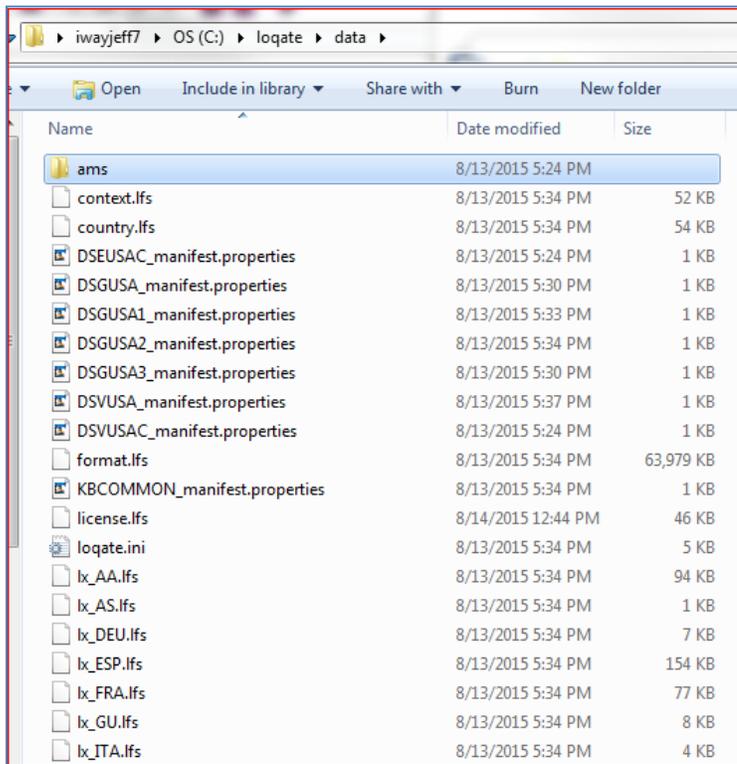
If you have licensed and installed US/CASS, it will be in the \ams subdirectory, as shown in the following image.
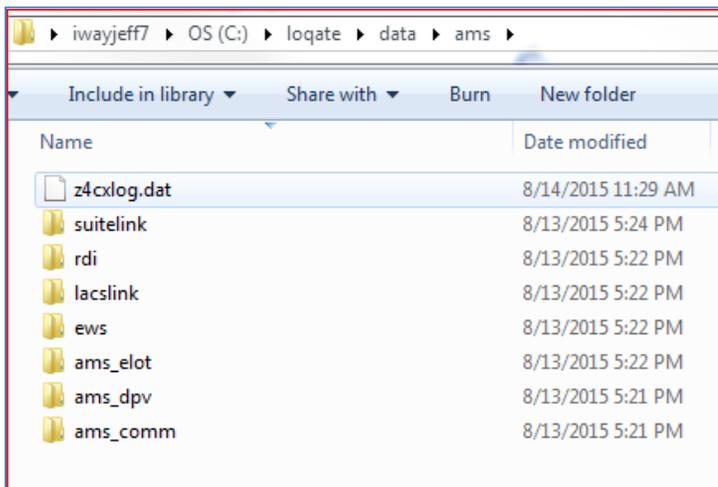
If you require, you can remove the downloaded datapack.lfz files to save space (a complete uninstallation with geocode and CASS is about 8GB).

CASS requires additional API files that have been installed, as shown in the following image.
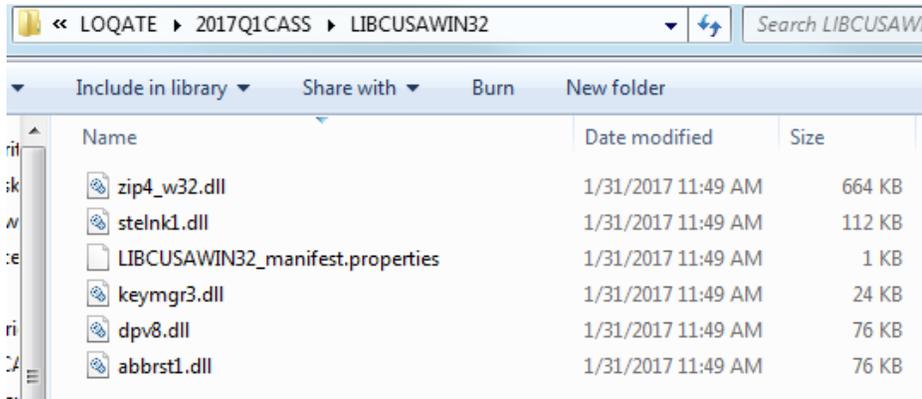
9. Copy these five .dll files to the *<DQ_HOME>*\jre\bin directory.

DQ 32-bit Environment

In order for the CASS API to work, it must be installed into a 32-bit Java Runtime Environment (JRE). The DQ eclipse GUI is packaged with its own JRE, so this must be set accordingly. For more information, see [Appendix B: Configuring a 32-bit JRE](#).

Configuring the Data Quality Runtime

When Loqate is installed, it includes the latest Loqate API files in your \loqate home directory.

The API files overwrite any previously installed API and must be copied into the DQ\runtime environment. This also applies to a DQ installed into iWay Integration Tools and iWay Service Manager.

To configure the DQ runtime, copy the new *loqate.jar* file to the DQ runtime\lib folder, as shown in the following image.
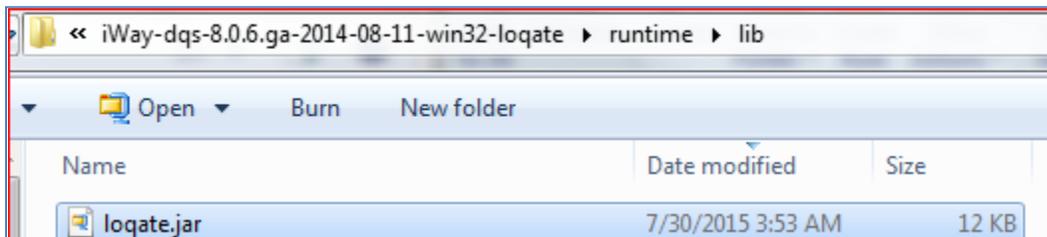
As noted in the installation section, *lqtcr.dll, lqtjava.dll,* and the *CASS* .dll files are already available in the Loqate home directory, which has been automatically included in the system Path variable.

**Note:** You do not need to copy the *lqtcr.dll, lqtjava.dll, or CASS* .dll files into the jre\bin folder, as long as this path remains accurate. Keep this in mind if you perform any updates, but note that this may not be applicable for Omni Installations. .

Configuring and Analyzing the Data Quality CASS Test Plan

The following image shows a Data Quality (DQ) test plan in iWay Data Quality Server (DQS) that supports CASS.
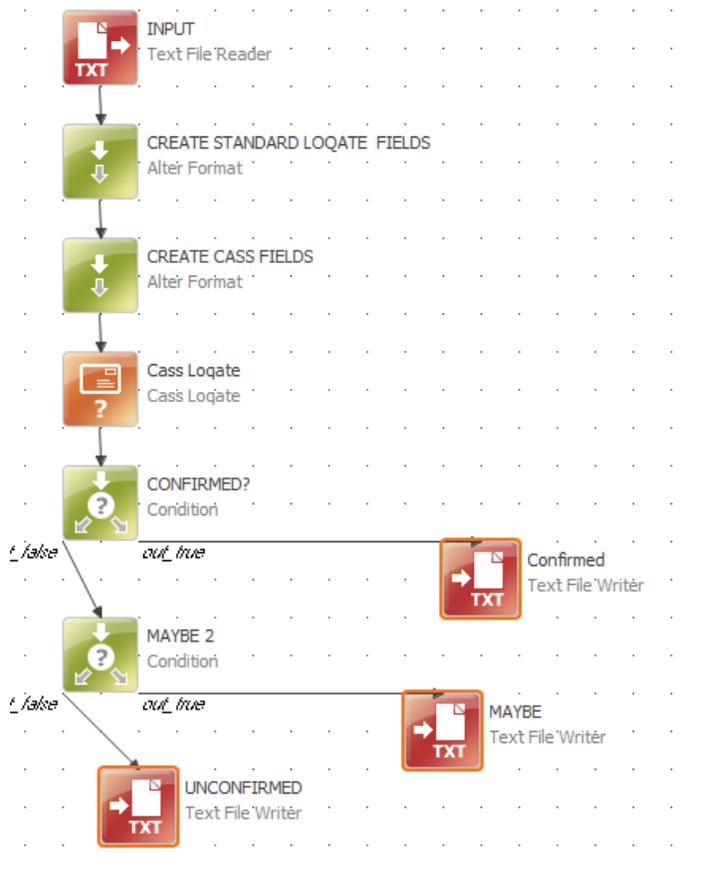
When this plan is run, the input addresses are passed to the CASS engine. The values returned will be examined and written to one of three possible files.

Open the provided test plan in iWay DQS. To run it, set the CASS Loqate step to point to the \data folder where Loqate was installed (for example, D:/LOQATE/2017Q1CASS/data), as shown in the following image.

The following images show how the CASS Loqate step is preconfigured to map all input and output columns to the CASS elements.

Output Elements

	Column	Element Name
11	LQ_Premise	Premise
12	LQ_Thoroughfare	Thoroughfare
13	LQ_COUNTY	SuperAdministrativeArea
14	LQ_UNMATCHED	Unmatched
15	DPVConfirmedIndicator	DPVConfirmedIndicator
16	DPVFootnotes	DPVFootnotes
17	ReturnCode	ReturnCode
18	AutoZoneIndicator	AutoZoneIndicator
19	CarrierRoute	CarrierRoute
20	AutoZoneIndicator	AutoZoneIndicator
21	CMRAIndicator	CMRAIndicator
22	CongressionalDistrict	CongressionalDistrict
23	DefaultFlag	DefaultFlag
24	DeliveryPointBarCode	DeliveryPointBarCode
25	eLOTCode	eLOTCode
26	eLOTNumber	eLOTNumber
27	EWSFlag	EWSFlag
28	FalsePositiveIndicator	FalsePositiveIndicator
29	FIPSCountyCode	FIPSCountyCode
30	LACSLinkCode	LACSLinkCode
31	LACSLinkIndicator	LACSLinkIndicator
32	LACSStatus	LACSStatus
33	NoStatIndicator	NoStatIndicator
34	PMBNumber	PMBNumber
35	PMBType	PMBType
36	PrimaryAddressLine	PrimaryAddressLine
37	RecordType	RecordType
38	ResidentialDelivery	ResidentialDelivery
39	SecondaryAddressLine	SecondaryAddressLine
40	SUITELinkFootnote	SUITELinkFootnote
41	VacantIndicator	VacantIndicator

Input Elements

	Column	Element Name
1	DAL1	Address1
2	DAL2	Address2
3	DAL3	Address3
4	CITY	Locality
5	STATE	AdministrativeArea
6	ZIP	PostalCode
7	COUNTRY	Country
*		

Run the plan. The results and the addresses will be written out to one of three files, based on the CASS analysis. AVC values are also shown for comparison, but there is no need to use them.

CASS supplies an enhanced set of US postal data parameters. These parameters are much more granular and supersede AVC codes. Some of the output parameters are informational in nature rather than quality level. For example, a congressional district, carrier route, or intended for residences and businesses.

For DQ analysis, there are three fields that are relevant. The first is the primary indicator of deliverability, while the others provide additional detail to help understand validity and deliverability.

- DPVConfirmedIndicator
- DPVFootnotes
- Return Code

The following image is an example of CASS analysis on 5 different addresses.

LQ_Address	LQ_AVC	.	DPVConfirm...	DPVFootn...	ReturnC...
3001 TAMIAMI TRL N STE 207 NAPLES FL 34103-4172	V55-I55-P7-100	.	Y	AABB	31
COMMERCE BLDG 300 N 2ND ST FL 10 HARRISBURG...	V44-I55-P7-100	.	S	AACC	32
3001 TAMIAMI TRL N STE 204-302 NAPLES FL 34103	A33-I45-P6-075	.		A1	22
3001 TAMIAMI TRL N STE 207 NAPLES FL 34103-4172	A33-I45-P7-075	.		A1	31
322 E 5TH ST NEW YORK NY 10019	P33-I44-P6-083	.		A1	22

For more information or a complete description of all the CASS fields and values, see Appendix A: CASS Fields.

The following table shows that the first address is *confirmed* and *deliverable*. This corresponds to an AVC of *V5*, which is the highest level of verification. In our application, address records that have a *DPVConfirmedIndicator=Y* will be written to the *CONFIRMED* output file.

Field	Value	Description
DPVConfirmedIndicator	Y	Confirmed
DPVFootnotes	AA	Street, city, state and ZIP +4 are valid
	BB	All components confirmed. Address is deliverable.
Return Code	31	A single matching address was found.

The following table shows that the last address is not as good, as indicated by the blank DPVindicator and the DPVFootnotes : *Address is invalid.* This corresponds to an AVC of only *P3*, which means a partial match was found, to the level of a street (but not a premise #). In our application, records such as these will be written to the *UNCONFIRMED* output file.

Field	Value	Description
DPVConfirmedIndicator		blank – Address was not presented to the table
DPVFootnotes	A1	not found in the ZIP+4 file. Address is invalid
Return Code	22	Multiple responses found more specific information is required to select a single or default response

The following table shows that the second address is in between – there is a match, but there was something wrong with the Subbuilding. The corresponding AVC is *V4*, which is normally considered good (a valid premise#). But based on the stringency of your application, you may not want to accept this. It can be a candidate for remediation (checking by a data steward) to see if there is a sub-building number that may be determined. In our application, address records that have a *DPVConfirmedIndicator=S* will be written to the *MAYBE* output file.

Field	Value	Description
DPVConfirmedIndicator	S	Confirmed after dropping the subbuilding number
DPVFootnotes	AA	Street, city, state and ZIP +4 are valid
	CC	Address is a deliverable after dropping subbuilding number
Return Code	22	Multiple responses found more specific information is required to select a single or default response

CASS provides a wealth of information. A full set of explanation codes is provided in *Appendix A: CASS Fields*.

Checking the Expiration Status for Loqate Data

Note that Loqate data expires every year, and that CASS data expires quarterly.

To check, run the following command:

On Windows:

```
lqtbatch –d [locate installation directory]\data
```

On Unix/Linux:

```
lqtbatch –d [locate installation directory]/data
```

Capture the results and find the *ExpiryDate.*

For example:

```
DSEUSAC.ExpiryDate      : 2017-12-31
```

Each must be refreshed by downloading an update.

Appendix A: CASS Fields

This section provides a reference for CASS fields.

AutoZoneIndicator	Automated Zone Indicator. A – Carrier route sort rates apply. Merge allowed. B – Carrier route sort rates apply. Merge not allowed. C – Carrier route sort rates do not apply. Merge allowed. D – Carrier route sort rates do not apply. Merge not allowed.
CarrierRoute	Carrier route code assigned to a mail delivery or collection route within a 5-digit ZIP Code. This is also referred to as CRID. There are 5 types: B – PO Box. H – Highway contract. R – Rural route. C – City delivery. G – General delivery.
CMRAIndicator	Indicates whether the address is associated with a Commercial Mail Receiving Agency(CMRA). Y – Address was found in the table. N – Address was not found in the table. blank – Address was not presented to the table.
CongressionalDistrict	The congressional district to which the address belongs.
DefaultFlag	A value of *Y* indicates that the record matched to a high rise default, rural route default, or street default record in the ZIP+4 file.

DeliveryPointBarCode	3-digit code which consists of the 2-digit delivery point code and 1-digit check digit. This is used to create the 12-digit POSTNET barcode which consists of the 5-digit ZIP Code, 4-digit ZIP+4 addon code, and this 3-digit code.
DPVConfirmedIndicator	Indicates the deliverability of the address. Y – Confirmed. N – Not confirmed. S – Confirmed after dropping the subbuilding number. D – Premise number confirmed but subbuilding number is missing. blank – The address was not submitted for DPV confirmation.
DPVFootnotes	Delivery Point Validation footnotes. This field is used together with the DPVConfirmedIndicator field to understand the input address' validity and deliverability. AA – Street, city, state and ZIP are valid. Address matched a record in the ZIP+4 file. A1 – Address not found in the ZIP+4 file. Address is invalid. BB – All address components are confirmed. Address is a deliverable address. CC – Address is a deliverable address after dropping the subbuilding number from the input address. F1 – Address matched to a military address. G1 – Address matched to a general delivery address. N1 – Found a DPV match to the premise number but the subbuilding number is missing from the input record. M1 – Premise number is missing. M3 – Premise number is invalid. P1 – PO, RR, HC Box number missing. P3 – PO, RR, HC Box number is invalid. RR – Address matched to CMRA and PMB designator is present. R1 – Address matched to CMRA but PMB designator is not present. U1 – Address matched to a unique ZIP Code.
eLOTCode	eLOT directional indicator. See the eLOTNumber field for additional information. A – ascending D – descending
eLOTNumber	4-digit sequence number for eLOT (Enhanced Line of Travel). This number combined with the eLOTCode field is used in mail sorting. eLOT processing may be used by mailers to qualify for enhanced carrier route presort discounts.
EWSFlag	A value of *Y* indicates that the address matched a record in the EWS (Earl Warning System) file, thus resulting in a ZIP+4 no match.
FalsePositiveIndicator	The False Positive table flags the False Positive addresses. This is a flag to determine whether a mailing list is being generated or created during validation. Creating a mailing list through DPV certification is not allowed by the USPS. Y – Address was found in the table. N – Address was not found in the table. blank – Address was not presented to the table.
FIPSCountyCode	5-digit FIPS (Federal Information Processing Standard) code which uniquely identifies counties.

Footnotes	Footnote string A – ZIP corrected B – City/State corrected C – Invalid City/State/ZIP D – No ZIP assigned E – ZIP assigned for multiple response F – No ZIP available G – Part of firm moved to address H – Subbuilding number missing I – Insufficient/incorrect data J – Dual input K – Multiple results caused by cardinal rule L – Delivery address component added/deleted/changed M – Street name spelling changed N – Delivery address was standardized O – Low +4 tie-breaker (multi-response) P – Better delivery address exists Q – Unique zipcode R – No match due to EWS (Early Warning System) S – Invalid secondary number T – Multiple results caused by magnet rule U – Unofficial PO name V – Unverifiable city/state W – Small town default X – Unique ZIP code generated Y – Military match Z – ZIP move match
LACSLinkCode	Code returned by LACS$^{Link®}$ after querying the LACS$^{Link®}$ database. A – The input address matched to a record in the LACS$^{Link®}$ database. A new address could be furnished. 00 – The input address could not be matched to a record in the LACS$^{Link®}$ database. A new address could not be furnished. 14 – The input record matched to a record in the LACS$^{Link®}$ database. The new address could not be converted to a deliverable address. 92 – The input address matched to a LACS$^{Link®}$ record but the input address had a subbuilding number and the LACS$^{Link®}$ record did not.
LACSLinkIndicator	Indicator returned by LACSLink® after querying the LACSLink® database. Y – The input address matched to a record in the LACSLink® database. S – The input address matched to a LACSLink® record but the input address had a subbuilding number and the LACSLink® record did not. N – The input address could not be matched to a record in the LACSLink® database. A new address could not be furnished. F – A false positive record was detected
LACSStatus	A value of *L* indicates that the input address matched an entry in the Locatable Address Conversion Service database and the input address has been converted from a rural-style address to a city-style address.
NoStatIndicator	Indicates the address is not receiving delivery, and the address is not counted as a possible delivery. These addresses are not receiving delivery because A) delivery has not been established; B) customer receives mail as a part of a drop; or C) the

	address is no longer a possible delivery because the carrier destroys or returns all of the mail. Y – Address was found in the table. N – Address was not found in the table. blank – Address was not presented to the table.
PMBNumber	Parsed PMB number following the PMB designator.
PMBType	Parsed Private Mailbox (PMB) designator.
PrimaryAddressLine	Primary delivery address line. This can include any of the following: Premise Number Thoroughfare Name Thoroughfare Predirection Thoroughfare Postdirection Thoroughfare Trailing Type Subbuilding Number PO BOX
RecordType	Record type of address that is confirmed as a valid delivery address S – Street P – PO Box R – Rural route H – Highrise F – Firm G – General delivery
ReturnCode	10 – Invalid input address 11 – Invalid 5-digit ZIP Code 12 – Invalid state abbreviation code 13 – Invalid city name 21 – No match found 22 – Multiple responses were found and more specific information is required to select a single or default response. 31 – A single matching address was found. 32 – An address was found, but a more specific address could be found with more information.
ResidentialDelivery	This field indicates whether the input address is a residential address or a business address Y – residential N – business blank – invalid address This field is only available if RDI data pack is installed together with CASS.
SecondaryAddressLine	Secondary delivery address line if present.
SUITELinkFootnote	Code returned by SuiteLink® after querying the SuiteLink® database. A – The input address matched to a record in the SuiteLink® database. An improved business address could be furnished. 00 – The input address could not be matched to a record in the SuiteLink® database.
VacantIndicator	Indicates that the delivery point was active in the past, but is currently vacant (in

|	most cases, unoccupied over 90 days) and is not receiving deliveries. Y – Address was found in the table. N – Address was not found in the table. blank – Address was not presented to the table.

Appendix B: Configuring a 32-bit JRE

Currently, CASS is only supported as 32-bit on Windows and will not run with the default 64-bit JVM.

The following procedure describes how to configure and set DQS/MDS to use the 32-bit JRE in the GUI.

If you are running DQS64.exe or MDS64.exe, the default JRE will be 64-bit.

1. From DQS/MDS, click *Window,* select *Preferences*, click *Java*, and then select *Installed JREs*, as shown in the following image.
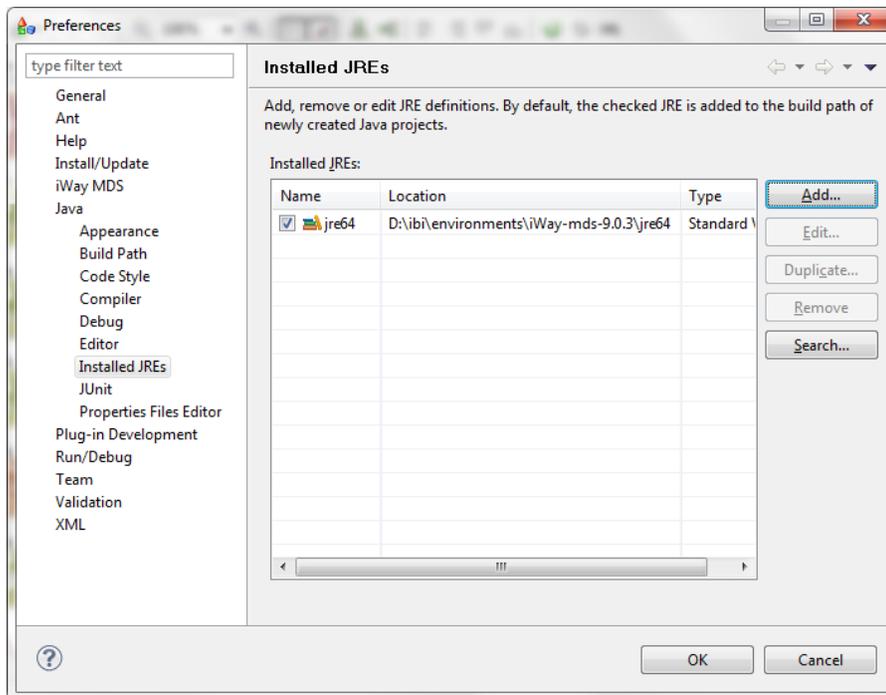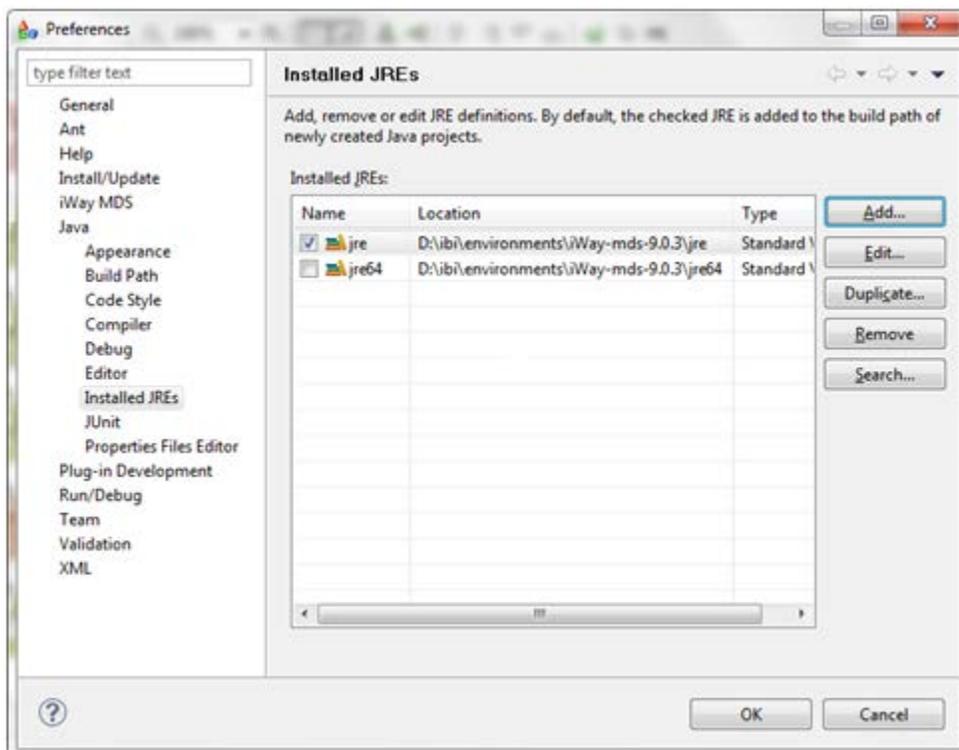

2. Click *Add.*

3. Select *Standard VM*.

4. Click *Next*.

5. Click *Directory*, and drill down to the jre directory under your MDS/DQS install directory, and then click *OK*.

6. In the JRE Name field, enter *jre*.

Your configuration should look similar to the following image.
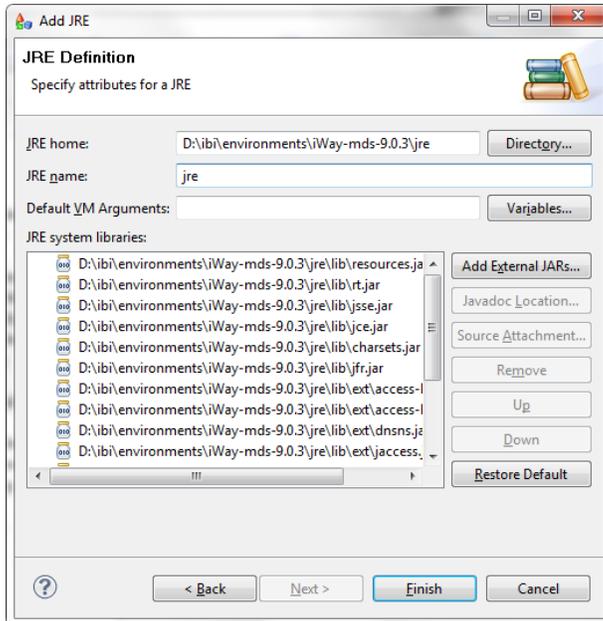
7. Click *Finish*.

8. Ensure that the 32-bit JRE is selected, which will be your default JRE.

9. Click *OK* to complete adding the 32-bit JRE.

Specifying a 32-bit JRE When Running a Plan

As you test the configuration in the DQS GUI, the runtime configuration for the plan must point to *jre*, not *jre64*. You do not have to be concerned about this if you only ran the 32-bit version. However, if you ran the 64-bit version, its configuration will likely be set to the 64-bit runtime.

The following procedure shows how to change the JRE for an individual plan execution in the GUI.

1. Click the drop-down arrow next to the Run button and select *Run Configuration* from the context menu, as shown in the following image.
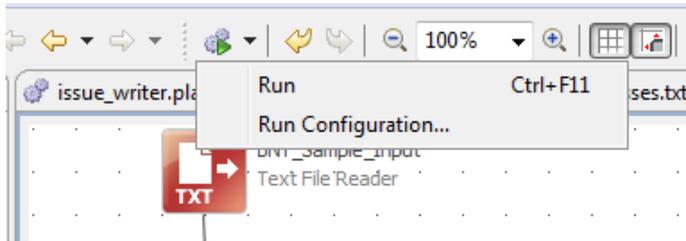
2. Select *jre* from the JRE drop-down list, as shown in the following image.
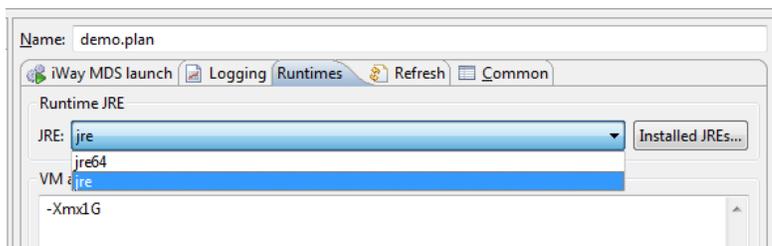
3. Click *Apply*.

4. Click *Run* to execute your plan.

Appendix C: 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 FTP site:

ftp.loqate.com

To obtain the login credentials (user name and password) for this FTP 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, 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:

http://www.loqate.com/support/local-apis/installers/example-of-installation-scenarios/

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

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.