Spectrum™ Technology Platform
Version 2019.1.0
Release Notes

This document contains information about Spectrum™ Technology Platform. You have access only to the modules you have licensed. To evaluate any other modules, contact your Pitney Bowes account executive for a trial license key.

Complete documentation can be found at **support.pb.com/spectrum**.

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System Requirements

Server

Operating Systems

Supported Operating System	Notes
AIX 7.1	
AIX 7.2	
CentOS 6.x	

CentOS 7.x	Requires the following:
	`libstdc++.so.5`
	installed as follows:
	`yum install compat-libstdc++-33`
	MrSID raster images require `libpng12.so` on this operating system.

HP-UX 11.31 (Itanium)	
Oracle Linux 6.x	
Oracle Linux 7.x	
Red Hat Enterprise Linux 6.x	
Red Hat Enterprise Linux 7.x	
Solaris 11 (SPARC only)	

Supported Operating System	Notes

SUSE Enterprise Linux Server 11.x	Requires the following:
	`glibc-2.9 or glibc-2.11`
	installed as follows:
	`zypper install libstdc++33-32bit zlib-32bit`

SUSE Enterprise Linux Server 12.x	Requires the following:
	`glibc-2.9 or glibc-2.11`
	installed as follows:
	`zypper install libstdc++33-32bit zlib-32bit`

Ubuntu 16.04 LTS	Requires these runtime libraries installed as follows: `apt-get install libstdc++5:i386 zlib1g:i386` MrSID raster images require `libpng12.deb` and `libjpeg62` on this operating system.
Ubuntu 18.04 LTS	Requires these runtime libraries installed as follows: `apt-get install libstdc++5:i386 zlib1g:i386` MrSID raster images require `libpng12.deb` and `libjpeg62` on this operating system.
Windows Server 2012	
Windows Server 2012 R2	
Windows Server 2016	
Windows Server 2019	

Unsupported Operating Systems by Module

All modules support the Windows operating systems listed in the previous section.

The following table shows the UNIX/Linux operating systems that are not supported for specific modules.

Module	Not Supported
Analytics Scoring Module	AIX 7.1, 7.2 HP-UX 11.31 (Itanium) Solaris 11 (SPARC only)
Data Hub Module	Data Hub is not supported on HP.
Enterprise Geocoding Module (U.S.)	SUSE Enterprise Linux Server 12.x Ubuntu 14.04 LTS
Enterprise Tax Module	Solaris 11 (SPARC only) SUSE Enterprise Linux Server 12.x Ubuntu 14.04 LTS
GeoConfidence Module	HP-UX 11.31 (Itanium)
GeoEnrichment Module	SUSE Enterprise Linux Server 12.x Ubuntu 14.04 LTS
Global Geocoding Module	SUSE Enterprise Linux Server 12.x (not supported for U.S. geocoder) Ubuntu 14.04 LTS
Machine Learning Module	AIX 7.1, 7.2 HP-UX 11.31 (Itanium) Solaris 11 (SPARC only)
Microsoft Dynamics CRM Module	Ubuntu 14.04 LTS, 16.04 LTS
SAP Module	Ubuntu 14.04 LTS, 16.04 LTS
SugarCRM Module	Ubuntu 14.04 LTS, 16.04 LTS
Universal Addressing Module	Ubuntu 14.04 LTS

Module	Not Supported
Universal Addressing Module - Validate Address Global	Ubuntu 16.04 LTS HP-UX 11.31 (Itanium)

Disk Space

New Installation	Upgrade
• The disk where you are installing Spectrum™ Technology Platform must have 4 GB of free space to install all modules, less if installing fewer modules. • The disk where the temp folder is located must have at least 10 GB of free space for the installation to extract the files it needs. You may need more depending on the options you are installing. If necessary, modify your TEMP environment variable (Windows) or IATEMPDIR environment variable (Unix and Linux) to point to a location with enough space.	• **Upgrade memory requirement -** You must have a minimum of 8GB of RAM to run the upgrade to release 2019.1. • The disk where you are installing Spectrum™ Technology Platform must have free disk space equal to three times the size of your current installation. To determine the size of your current installation, look at the size of the folder where you installed Spectrum™ Technology Platform. • If you are adding modules as part of your upgrade, you will need 3 GB to install all modules, less if installing fewer modules. • The disk where the temp folder is located must have 10 GB of free space plus four times the size of your current installation. For example, if your current installation is 5 GB, you would need 30 GB of temp space: (4 x 5 GB) + 10 GB = 30 GB. If necessary, modify your TEMP environment variable (Windows) or IATEMPDIR environment variable (Unix and Linux) to point to a location with enough space.

Note: If you are installing a module that uses a reference database, such as a postal database, geocoding database, or data normalization tables, you will need space for this data. The total disk space varies, depending on which modules and databases you are installing.

Memory

- **Upgrade memory requirement -** You must have a minimum of 8GB of RAM to run the upgrade to release 2019.1.
- Basic memory requirement: 16 GB
- The Data Normalization Module and Universal Name Module require additional memory if you use these name databases:
  - Arabic Plus Pack: 5.5 GB
  - Asian Plus Pack - Chinese: 32 MB

  - Asian Plus Pack - Japanese: 1.6 GB
  - Asian Plus Pack - Korean: 8 MB
  - Core Names: 1.1 GB
- The memory allocation for the Machine Learning Module should be three to four times the size of the input file used in jobs where models are created. We recommend that the minimum memory setting should be at least 1 GB. After installation of this release, configure minimum and maximum memory settings for the Machine Learning Module on the **Configuration Settings** tab of the Machine Learning Model Management application.

Additional Requirements

- For all Unix and Linux systems, a minimum value for file descriptors is required. Review the current *Installation Guide* for recommended settings. This can be set by running the `ulimit` command: `ulimit -n limitsetting`

  Note: Do not set `ulimit` to `unlimited`. Doing so may cause issues with system resources and security alerts that will cause the installation to fail.

- Set the file size limit to 2 GB. To set the file size limit, use the `ulimit` command: `ulimit -f 4194304`
- For CentOS and Ubuntu, you must increase the maximum number of memory map areas. To do this, open the `/etc/sysctl.conf` file and set `vm.max_map_count` to `262144`. Then, reboot the system. and run `sysctl vm.max_map_count` to verify that the setting has been updated.
- For IBM AIX only, you must download and install the AdoptOpenJDK, both the 32-bit version and the 64-bit version, before installing Spectrum™ Technology Platform. If you do not have this JDK, download and install it from **AdoptOpenJDK**
- For IBM AIX only, with IBM JDK/JRE, you must apply the properties in **spectrum.https.encryption.excludeCipherSuites**. See **Configure HTTP or HTTPS** in the *Spectrum Administration Guide* for details.
- Windows administrator rights are required to install .
- In order to use the enhanced system tray notification application the server must have .NET Framework 3.5 SP1 (also known as 3.5.1) or higher. Current versions of Windows Server come with the required version of .NET Framework.

System Requirements for Enterprise Geocoding and Global Geocoding modules

- The Enterprise Geocoding Module and Global Geocoding Module system requirements:
  - minimum: 16 GB RAM, 4 CPU, 100 GB storage
  - recommended 32 GB RAM, 8 CPU, 200 GB storage, sufficient for all datasets.

The amount of RAM will depend on how many users are on the system and how many datasets are loaded.

Requirements for the Big Data Integration Module

For the stages using Hadoop, which are **Read from Hive File**, **Read from Hadoop Sequence**, **Write to Hadoop Sequence**, and **Write to Hive File**, and for the activities **Run Hadoop MapReduce Job** and **Run Hadoop Pig**:

- Hadoop version 2.6 and above

For the activities using Spark, which are **Submit Spark Job** and **Spark Sorter**:

- Spark 2.0.1 and above.

Non-supported operating systems

In early 2019, we announced that we were dropping support for the following platforms in release 2019.1.

- Windows 7
- Ubuntu 14.04

Install the JDK and Set the JAVA_Home Environment Variable

You must have the Java 8 JDK (64-bit) installed to run Spectrum™ Technology Platform, regardless of your operating system. Below are our *supported* Java distributions.

Install the JDK

If you do not have the JDK installed:

- For AIX, download from **this site**. Follow the links to download and install the Java 8 JDK (64-bit).
- Use this table as a guideline for installing the JDK for operating systems:

Operating System	Vendor-supplied	Azul	Oracle
AIX	Yes		
CentOS		Yes	Yes
HP-UX	Yes		
Oracle Linux		Yes	Yes
Red Had Enterprise Linux		Yes	Yes
Solaris		Yes	Yes
SUSE Enterprise Linux Server		Yes	Yes

Operating System	Vendor-supplied	Azul	Oracle
Ubuntu		Yes	Yes
Windows Server		Yes	Yes

- Set the JAVA_HOME environment variable.

  Set JAVA_Home Environment Variable on Unix and Linux

  Setting the JAVA_Home Environment Variable on Windows

Network Ports

The Spectrum™ Technology Platform server uses several network ports for communication. Network port conflicts can result in module components failing to start. One indication that a component has failed to start is if it does not appear in Management Console. To troubleshoot the problem, look in the Spectrum™ Technology Platform `spectrum-server.log file`. This log shows which port is causing the problem. You can find the Spectrum™ Technology Platform server log in:

`server\spectrum-server.log`

Server port settings defined in the spectrum-container.properties file

You can modify network ports by modifying the properties in this file and restarting the server:

`server\conf\spectrum-container.properties`

> **Note:** In a clustered environment you must modify the `spectrum-container.properties` file on *each node* in the cluster.

Port	Description
5001	This port is used by the Spectrum™ Technology Platform configuration database. To use a different port in a non-clustered environment, configure the repository/neo4j.template. To use a different port in a clustered environment: • Specify the port you want instead of 5001 in `spectrum.repository.server.coordinator.port`. • Specify the seed nodes for the configuration database in **spectrum.repository.server.seeds**.

Port	Description
5701	This port is used by Hazelcast for managing distributed processing between Spectrum™ Technology Platform servers in a cluster. To use a different port in a non-clustered environment, modify this property: `spectrum.cluster.port` To use a different port in a clustered environment: • Specify the port you want to use instead of 5701 in `spectrum.cluster.port`. • Include the Hazelcast port number after each IP address specified in `spectrum.cluster.seeds`. For example, if `spectrum.cluster.port` is set to 5702 and the IP address of a seed node is 1.2.3.4.5, you would specify `1.2.3.4.5:5702` in `spectrum.cluster.seeds`.
6362	This port is used if you enable backups of the Spectrum™ Technology Platform configuration database. To use a different port, modify this property: `spectrum.repository.backup.port`
7474	This port is used by the Spectrum™ Technology Platform configuration database. To use a different port, configure the neo4j.template.
7687	This port is used by the Spectrum™ Technology Platform configuration database. To use a different port, configure the **spectrum.repository.port property**.
8080	The port used for communication between the server and Enterprise Designer and Management Console. This port is also used by web services. To use a different port, modify this property: `spectrum.http.port`
9200	This port is used by the index server. To use a different port, modify this property: `spectrum.index.http.port`
9300	This port is used by the search index engine used by the Advanced Matching Module, configured using `spectrum.index.tcp.port`.
10119	This port is used for API calls made to services. To use a different port, modify this property: `spectrum.socketgateway.port`
32751	This port is used for ODBC connections model stores which are created in Metadata Insights. To use a different port, modify this property: `spectrum.metadata.odbc.port`

Data Hub port settings defined in the neo4j.properties file

You can modify Data Hub ports by modifying the properties in this file and restarting the server:

`/server/modules/hub/db/neo4j.properties`

Port	Description
6044-6299	These ports are used by the Data Hub module. This is specified by the following property: `ha.host.data.port`
6372-6627	These ports are used by the Data Hub module. This is specified by the following property: `dbms.backup.address`
7001	This port is used by the Data Hub module. This is specified by the following property: `ha.host.coordination.base_port`

Machine Learning Module

Ports documented in this section are required for the Machine Learning module.

Port	Description
15431	Port 15431 is required for the Machine Learning module.

Change to property spectrum.security.enable.successful.login.audit

Log in and log out events are not no longer captured in the Audit Log by default.

The excessive logging of these events would increase the size of the Audit Log, taking unnecessary overhead. The default for property **spectrum.security.enable.successful.login.audit** is now "false" to resolve this issue.

Web Browsers

We recommend that you disable browser popup blocking when using Spectrum Web-based applications.

- Microsoft Internet Explorer 11
- Google Chrome 77.0 or later
- Mozilla Firefox 69.0 or later

- To use the Data Hub Relationship Analysis Client, use Microsoft Internet Explorer 11. See **Get Microsoft Silverlight (www.microsoft.com/getsilverlight)**.

  There is no longer support for Microsoft Silverlight on Chrome, Firefox, or any browser using the Mac operating system. For more information, see **Silverlight End of Support**.

  > **Note:** Metadata Insights now provides functionality previously found in Relationship Analysis Client for creating and editing Data Hub models.

Enterprise Designer

Enterprise Designer can connect to a Spectrum™ Technology Platform server on any currently supported platform.

System requirements:

- 86 MB of disk space to install Enterprise Designer without any modules. Each module you install requires additional disk space.
- Microsoft .NET Framework 4.6 (available from the Spectrum™ Technology Platform Welcome Page, `http://SpectrumServerName:8080`)
- A monitor with at least 1024 x 768 resolution
- Maximum DPI setting: 150%
- Adobe Reader 7 or later (for viewing and saving reports)

Command Line Tools

Job Executor and Process Flow Executor

The Job Executor and Process Flow Executor command line tools require Java 8.

Client SDK

The Client SDK provides API access to Spectrum™ Technology Platform services. To use the Client SDK your computer must meet the following requirements:

- 1.25 GB disk space
- JDK 8 is required to install the Client SDK. Be sure that JDK 8 is in the PATH environment variable.

Supported Compilers

The Spectrum™ Technology Platform Client SDK is supported with the following compiler and runtime minimum versions.

Java

Client SDK Package Directory: `clientSDK/platforms/java`

Client SDK requires the Java version 8. This is not installed with the Client SDK.

Windows 64-bit

- JDK: version 8
- C Compiler: MSVC 2005, MSVC 2008
- C++ Compiler: MSVC 2005, MSVC 2008

HP-UX RISC

- JDK: version 8
- C Compiler: cc: HP92453-01 A.11.01.21 HP C (Bundled) Compiler
- C++ Compiler: aCC: HP aC++ B3910B A.03.30 HP aC++ B3910B A.03.27

The clientSDK 64-bit lib is linked to these libraries:

- libpthread.1
- libnsl.1
- librt.2
- libdl.1
- libc.2
- libxti.2
- libdl.1

HP-UX Itanium

- JDK: version 8
- C Compiler: cc: HP aC++/ANSI C B3910B A.06.05
- C++ Compiler: aCC: HP aC++/ANSI C B3910B A.06.05

The clientSDK 64-bit lib is linked to the following libraries:

- libpthread.so.1
- libnsl.so.1
- librt.so.1
- libxti.so.1
- libdl.so.1

Red Hat (64-bit)

- Operating System: Red Hat Linux version 2.6.9-34.0.2.ELsmp
- C Compiler: gcc version 3.4.5
- C++ Compiler: g++ version 3.4.5

The clientSDK lib is linked to the following libraries:

- libstdc++.so.6
- libm.so.6
- libgcc_s.so.1
- libpthread.so.0

- libc.so.6
- ld-linux-x86-64.so.2

SuSE

- Operating System: SuSE SLES 11 and 12 (powered by UnitedLinux 1.0) (i586)\nKernel 2.4.21-295-smp (0).
- C Compiler: gcc version 3.2.2
- C++ Compiler: g++ version 3.2.2

Solaris

- Operating System: Solaris 5.11
- C Compiler: cc: Forte Developer 7 C 5.4 2002/03/09
- C++ Compiler: CC: Forte Developer 7 C++ 5.4 Patch 111715-16 2005/04/28

The clientSDK 64-bit lib is linked to the following libraries:

- libpthread.so.1
- libsocket.so.1
- libnsl.so.1
- librt.so.1
- libc.so.1
- libmp.so.2
- libmd5.so.1
- libscf.so.1
- libaio.so.1
- libdoor.so.1
- libuutil.so.1
- libm.so.2
- libc_psr.so.1
- libmd5_psr.so.1

AIX

- Operating System: AIX version 7.x
- C Compiler: xlc 6.0 Visual Age C 6.0
- C++ Compiler: xlC 6.0 Visual Age C++ 6.0

The clientSDK 64-bit lib are linked to the following libraries:

- libC.a
- libc_r.a
- libpthread.a
- librtl.a

Spatial Module Support

Databases

The Spatial Module, which includes routing, supports the following spatial databases for use with the spatial services, data, and resources:

- Oracle 11GR2 and Oracle 12CR2
- SQL Server 2016 and SQL Server 2017
- PostgreSQL 11.5 (with PostGIS 2.5) and PostgreSQL 12.0 (with PostGIS 3.0)

  Note: Spectrum Spatial requires the PostGIS extension for PostGreSQL data source provider even if spatial capability will be not needed or used.

- GeoPackage (Windows and CentOS)

Data Formats

The Spatial Module supports the following data formats for use with the spatial services:

- Generic JDBC (with XY)
- TAB (native, native extended, raster, grid, seamless, DBF)
- ESRI shapefile

JDK

Users with Azul JDK on Linux require Lucida fonts for Spatial map rendering. To obtain this font family, download and install the Zulu Commercial Compatibility Kit (ZCCK). Download and install instructions can be found at **https://www.azul.com/products/zulu-and-zulu-enterprise/cck-downloads**.

Raster Formats

In order to use rasters and grids as a map layer, there must be an associated .TAB file containing georeference information about the image, including the bounds, coordinate system, and registration points.

The Spatial Module supports the following raster and grid formats (64-bit only):

Raster Formats

Format	File Extension
ADRG	.gen
ASRP	.gen
BMP	.bmp, .wbmp
CADRG	.gen

CIB	various
ECW (SDK v5)	.ecw
GeoTiff	.geotif
GIF	.gif
JPEG	.jpg/.jpeg
MrSID (SDK v9) **Note:** Supports MG4 (MrSID Generation 4). See OS specific notes below.	.sid
NITF	.ntf
PNG	.png
TIFF **Note:** TIFF files used by the Feature Service and Mapping Service cannot exceed 2GB.	.tif

Note: Solaris or AIX machines, whether installed with 32- or 64- bit JVM, do not support ECW and MrSID raster formats.

Note: The following Linux operating systems require library files installed to read MrSID raster files.

OS	MrSID Prerequisites
CentOS 7.x	`libpng12.so` is required for reading MrSID raster files.

Ubuntu 16.x LTS
Ubuntu 18.x LTS
	`libpng12.deb` and `libjpeg62` are required for reading MrSID raster files. Otherwise, you will see an "E file" message when installing runtime libraries using the command:
	`apt-get install libstdc++5:i386 zlib1g:i386.`
	To install the lib files, as System Administrator:
	1. Download `libpng12.deb` and place it in the `/tmp` folder using the command:
	`wget -q -O /tmp/libpng12.deb http://mirrors.kernel.org/ubuntu/pool/main/libp/libpng/libpng12-0_1.2.54-1ubu`
	2. Install the debian package (located in the `/tmp` folder) by running the command:
	`dpkg -i /tmp/libpng12.deb`
	3. Install `libjpeg62` by running the command:
	`apt-get install libjpeg62`

Grid Formats

Format	File Extension
Defense Digital Terrain Elevation Data (DTED)	.dt0, .dt1, .dt2, .dt3
MapInfo Grid	.mig
MRR (Multi-Resolution Raster) **Note:** This support is provided on Windows. **Note:** This support is provided on the following Linux environments: • Oracle Linux 6.5 and 7.1 • CentOS 6.4 and 7.1 • Ubuntu 16.04 and 18.04	.mrr
Vertical Mapper Classified Grid	.grc
Vertical Mapper Continuous Grid	.grd

Utilities

The Spatial Module utilities (Tile Generator, WMTS Tile Generator, and the Geometry Validator) require, at a minimum, Java 8.

.NET Samples

The .NET samples require at a minimum Visual Studio 2013 and Microsoft .NET Framework 4.5.

MapInfo Professional Compatibility

The Map Uploader provided by the Spatial Module is compatible with MapInfo Professional 16.x or higher. For more information about the interoperability of the two products, see the section titled *MapInfo Pro* under *Getting Started* and *Tools* in the *Spectrum Spatial Guide*.

Internet Explorer

To use Internet Explorer 11, uncheck **Display intranet sites in Compatibility View** in the Compatibility View settings.

WebDAV

When communicating to the server over HTTPS to map a drive to the repository, a WebDAV client is required to use the TLS v1.2 protocol.

Deprecating

Centrus Support

To work with Centrus, you must install a 32-bit JDK.

Centrus users have an additional step after installing or upgrading the Spectrum™ Technology Platform and the Spatial Module. To work with Centrus, you must update the Spectrum properties file `jdks.properties` to work with your 32-bit JDK installation.

1. In a text editor, open the `jdks.properties` file.
   - On Windows, this file is located under `\Spectrum\server\conf` where the Spectrum™ Technology Platform is installed (the default install path is `C:\Program Files\Pitney Bowes\`).
   - On Linux or Unix, this file is located under `/Spectrum/server/conf` where the Spectrum™ Technology Platform is installed (the default install path is `/Program Files/Pitney Bowes/`).
2. Add a second property to the file, named `jdk.java.exe.32` that points to the 32-bit JDK (Java) installation. Your file will have two entries, one set to the 64-bit JDK and a second set to the 32-bit JDK. As an example:

   ```
   jdk.java.exe.64=C:/Java/Zulu/zulu-8-202/64/bin/java
   jdk.java.exe.32=C:/Java/Zulu/zulu-8-202/32/bin/java
   ```

   Paths must include forward slashes (/) not backslashes.
3. Restart the Spectrum™ Technology Platform server.
   - To start the server on Windows, right-click the Spectrum™ Technology Platform icon in the Windows system tray and select **Start Spectrum™**. Alternatively, you can use the Windows Services control panel to start the Pitney Bowes Spectrum™ Technology Platform service.
   - To start the server on Unix or Linux, run the *SpectrumDirectory*`/server/bin/server.start` script.

Microsoft Dynamics, SAP, and SugarCRM compatibility

This release of Spectrum™ Technology Platform is compatible with these versions of Microsoft Dynamics and SAP:

Compatible Versions of Microsoft Dynamics

Microsoft Dynamics CRM 2013
Microsoft Dynamics CRM 2013 SP1
Microsoft Dynamics 2015

Compatible Versions of SAP

SAP CRM 7.0 EHP 1 through 4

SAP ECC 6.0 EHP 1 through 7
SAP S/4 HANA 1610
SAP S/4 HANA 1709

Compatible Versions of SugarCRM

SugarCRM 7.7.1

What's New

This section describes new and changed features for this release.

Advanced Matching Module

Sonnex algorithm to process French words

With the addition of Sonnex algorithm, AMM is now capable of processing French words. It determines the similarity between two French-language strings based on a phonetic representation of their characters.

Deprecated features

These features will be deprecated in the next release (2020).

1. Lucene Search Index
2. Private Match stage

Analytics Scoring Module

PMML Library Upgrade

The Predictive Model Markup Language (PMML) library has been upgraded from version 1.2.12 to 1.4.11. This is primarily a security upgrade.

Business Steward Module

New CLI command to delete exceptions

We now provide the ability to purge Business Steward Module (BSM) exceptions through the command line interface (CLI) using the `bsm delete exceptions` command. The command follows this syntax:

```
bsm delete exceptions --n DATAFLOWNAME --i JobID --r true/false
```

where:

- `n` = Dataflow Name, required
- `i` = Job ID (optional). If not specified, all job runs for the named dataflow are removed.
- `r` = Remove data quality report data; Default is true.
  - If true, this function deletes data quality report data when deleting the exceptions.
  - If false, this function keeps data quality report data when deleting the exceptions.

Section 508 accessibility compliance features

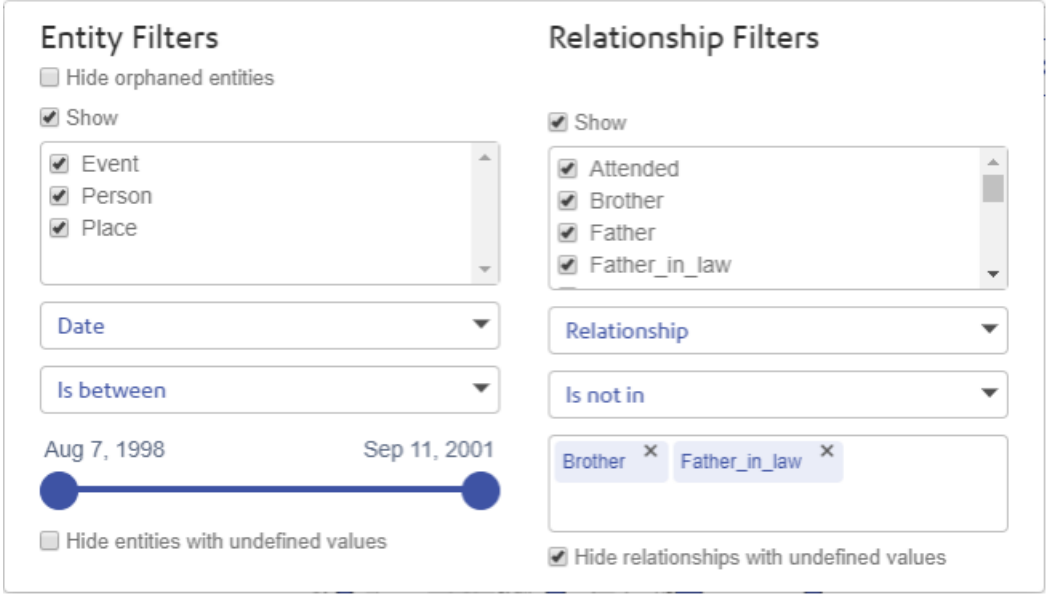
This release provides two Section 508 accessibility compliance features:

- Widget controls in Dashboard and Manage pages display in a larger font size to accommodate color contrasts greater than 3:1.
- Time series data provided in Performance page charts are also displayed in a detail row for each selected Domain and Metrics row in the table.

Data Hub Module

Filter options on the Data Hub Visualization Canvas

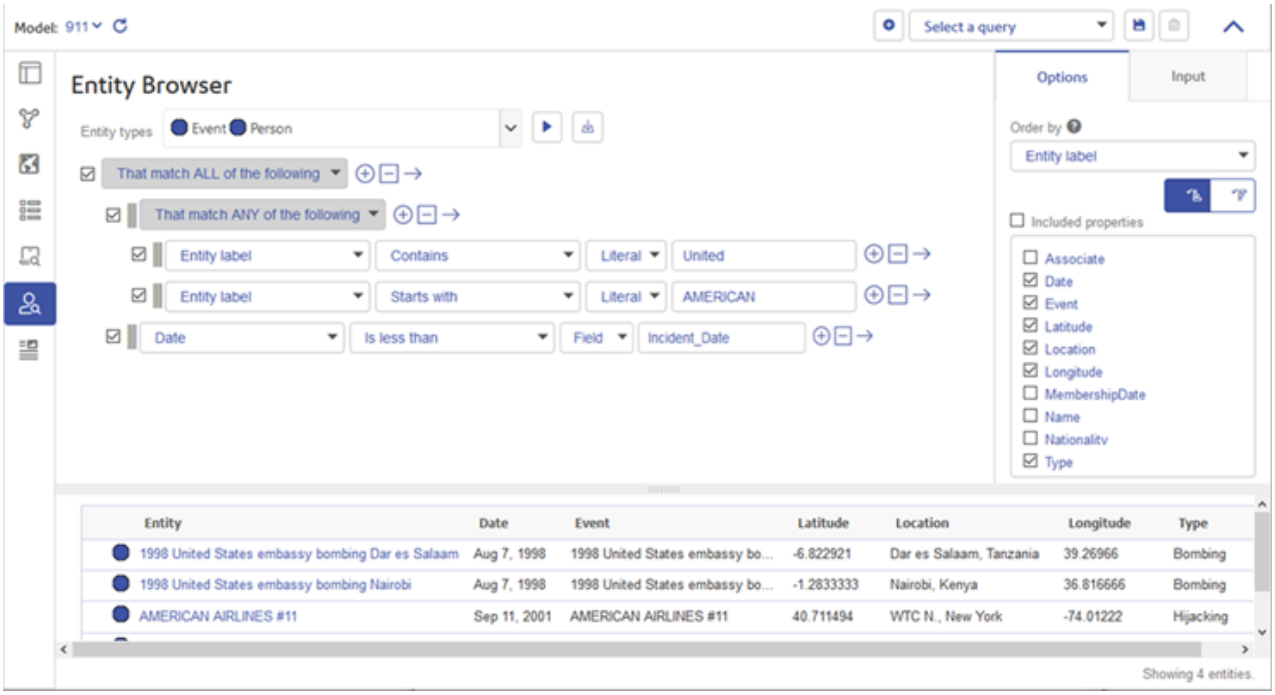
A Filters button on the Canvas toolbar applies entity and relationship filters. For entities, users can hide orphaned entities (entities without connecting relationships), specify types, filter by property values, and hide undefined values. For relationships, users can specify labels, filter by property values, and hide undefined values. Clicking the Filters button displays the Entity and Relationship Filters dialog box.



Selections for filter operators appear only after you select a property and depend on the type of property selected. The slider control is displayed for numeric and temporal properties and selects ranges or atomic values, depending on the property. When you choose a string property, you can select from string operators to apply filter criteria based on the string. True or false criteria may be applied for Boolean properties. Filter selections are reflected immediately on the canvas as you configure options in the Entity and Relationship Filters dialog box.

New Entity Browser added to Data Hub Visualization

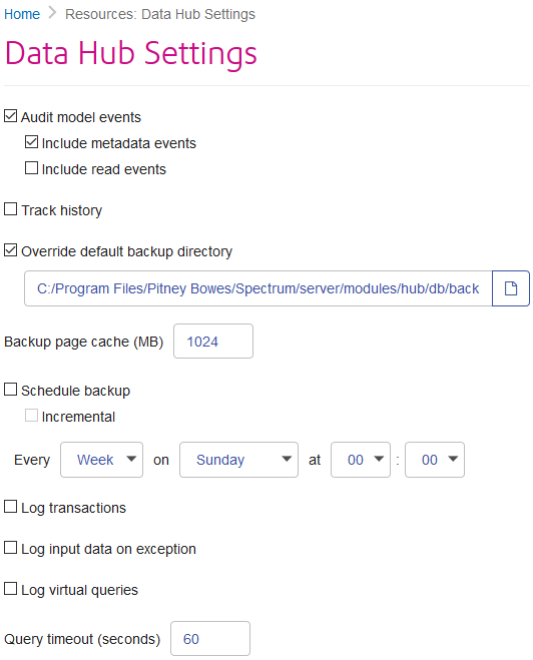
A new Entity Browser in the Data Hub Visualization application provides a visual interface to create entity queries. The queries select entities by type, and may include expressions that filter entities based on property values. Query results are displayed by the Entity Browser in table format and may be exported to a comma-separated values (CSV) file. Options allow users to order results by label property values in ascending or descending order. Input fields allow users to set expression values before running a query.



You begin by selecting entities that you want to view. You can then create entity property expressions to display entities that match any or all grouped expressions. Additional options allow you to initially order the results by values of a property and to include or exclude properties in the results. On the **Input** tab you can set values for query fields. Click the Run query button to execute a query to display the results of the query in the table at the bottom of the page. For each entity, its property values are displayed by columns in the table. You can sort the results by values in any column in the table and finish by saving the query. Queries saved in the Entity Browser may be used in the Canvas, Map, and Table applications.

Specify Target Folder for Backups

The new **Override default backup directory** option in Management Console **Resource** > **Data Hub Settings** now optionally specifies the backup directory for Data Hub backup folder. Model backup folders are added to this location during all backups. This setting when checked overrides the default location for Data Hub model backup folders.



This option initially shows the default location for Data Hub Model backups:

SpectrumFolder\server\modules\hub\db\backups

After you check the check box, you can enter a new path or click the browse button to locate the folder that you want to use for model backups.

New Data Hub REST API

The new Data Hub Module REST API in the Spectrum Web Services includes entity and relationship requests. You can now use HTTP or HTTPS to read, create, update, or delete an entity or relationship in a Data Hub model.

New CLI algorithm commands

Centrality algorithm commands added to the Administrative Utility Command Line Interface (CLI) measure the importance and significance of individual entities and relationships in a Data Hub model. The following commands run the named algorithm and save the results to a model property:

- `hub algorithm betweenness`
- `hub algorithm closeness`
- `hub algorithm degree`
- `hub algorithm influence`

Data Hub Connector added to Metadata Insights Connections

You can now create a connection to a Data Hub model either in the Management Console or in Metadata Insights.

Create and Edit Data Hub Models in Metadata Insights

You can now create and edit Data Hub models, including virtual entities and relationships, on the **Model** page of Metadata Insights. This replaces functionality previously found in Relationship Analysis Client. For more information, see **Data Hub Model added to Model page** on page 48 in the *What's New* topics for Metadata Insights.

Data Integration

DI Connectors

- SuccessFactors connector is deprecated with this release.
- MS Dynamics 365 On-Premise connector is tested with Spectrum 12.2.
- Marketo connector is tested with Spectrum version 2018.2.

Enterprise Tax Module

New CLI command - geotaxdb memory set

geotaxdb memory set - The new `geotaxdb memory set` command defines the memory size for the Enterprise Tax Module databases. The fields for defining minimum and maximum memory values can be empty. If a value is empty, that value will not be specified on the command line when starting the component, as if no value were explicitly defined. If no value is specified, or if a value is 0, the property will not be passed to the Command Line Interface.

```
geotaxdb memory set --name database_name --mn minimum_memory_size --mx
 maximum_memory_size
```

Improvements in Singleline Address Matching

Singleline Matching Enhancements

The following improvements were made to singleline matching:

Improved singleline matching for PO Boxes when entered as POST OFFICE BOX, or when the number is preceded by #.

Improvements have been made in handling of street names that could also be city names in singleline address processing.

For example:

Input address: BOX 58 ASHAWAY RI 02804

Previous match: 58 ASHAWAY RD, 02804

New match: BOX 58, ASHAWAY RI 02804

Input address: BARCLAY PLZ APT 68G NEW WINDSOR NY 12553

Previous match: 68G NEW ST, NEW WINDSOR, NY 12553

New match: 68G BARCLAY PLZ, NEW WINDSOR, NY 12553

Enhancements have been made in singleline POI matching to recognize one or more embedded POIs.

For example:

Input address: FIRST SHORE FEDERAL SAVINGS & LOAN W GREEN ST & PEARL ST SNOW HILL

Result: FIRST SHORE FEDERAL SAVINGS & LOAN, SNOW HILL MD 21863

Improved standard singleline addr2 handling.

For example:

Input address: MARVIN R BECK PT 1108 E PATTERSON/ POB 160 KIRKSVILLE MO 63501

Previous match: PO BOX 160

New match: 1108 E PATTERSON ST

Improved handling of singleline input addresses with missing or out of range house numbers. Matches and non-matches are now returned more accurately.

Improved handling and reporting of singleline matching of addresses containing multiple intersections when using Master Location Data.

For example: 8th & laurel & 9th 21851.

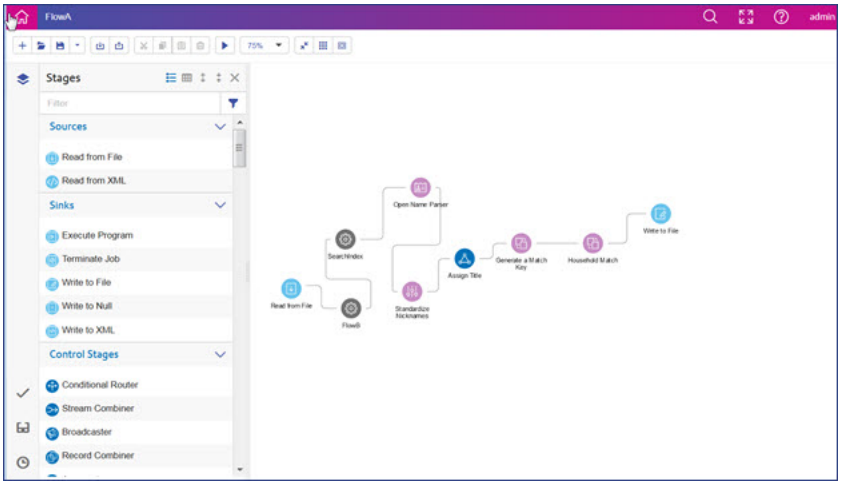
Enhancements have been made in POI matching for the following cases:

- Singleline input address containing a POI that ends with a city name that matches a given ZIP Code. For example: CHARTER HOSP OF DENVER 80228
- Singleline input address containing a POI that ends with a state name that matches a given ZIP Code. For example: BANK OF COLORADO 80720
- Two-line or singleline input address containing a POI that ends with a number. For example: KBIQ 102 7 80920

Flow Designer - Technical Preview Version

Try the technical preview

The Spectrum™ Technology Platform Team is pleased to provide a preview of its Flow Designer web-based job, service, and sub-flow design and deployment tool. You can launch Flow Designer from the Spectrum Welcome Page after you have installed Release 2019.1.



This preview version allows you to test-drive the fundamental capabilities that we believe you will use most often. We are providing this preview version now so that you can help us make sure that future releases will have the features that you find most useful.

As you explore this preview version, keep these things in mind:

- If you find yourself thinking, "It would be great if I could…," let us know what you want to do. You can submit an enhancement request to **Technical Support**, or you can join our **Spectrum Knowledge Community** and submit your ideas there.
- This version does not include all stages currently supported in Enterprise Designer. You will see a descriptive message if you try to open an unsupported stage in Flow Designer.
- If you encounter a roadblock, or if something isn't working as you'd expect, we ask that you let us know through our Technical Support team.
- Although we encourage you to use this preview version of Flow Designer in your production environment, know that we cannot provide standard service level agreement (SLA) for preview versions of our software. Additionally, we cannot guarantee that the work you do with the preview version will migrate to future releases.
- Custom Transforms are configurable through Enterprise Designer for this release. You can save those transforms and use them in Flow Designer jobs. Note that multiple Custom Transforms are not supported in this preview version.
- We will listen to your feedback! Your comments and suggestions can have a significant role in shaping future releases of Flow Designer.

If you are new to Spectrum and have not had experience with Enterprise Designer, our previous workflow solution, you may need some explanation of the terms used in the product.

- **Flows** ("workflows," in previous releases) are pre-built or custom processes that contain stages. Flows don't need to stand alone: you can integrate them into other jobs and services to perform specialized processing.
- **Stages** represent units of functionality such as data input, data output, aggregation, filtering, sampling, reporting, and geocoding. Though flows can become quite large in size, you can think of them as a series of connected stages, operations, or tasks.

This preview version of Flow Designer includes these features:

- Drag-and-drop stages from the palette to the canvas, with some stages configurable in this version
- Create new flows from templates
- Import and export existing Enterprise Designer `*.df` files
- Perform basic flow validation
- Inspect flows and stages
- Create custom data transformation scenarios - Additonal transformation scenarios will be available in a future release
- View flow history
- Read from or write to files on servers

As we continue to add features to Flow Designer, future releases will provide local file support, additional control stages, and additional module-specific stages.

Geocoding

Enterprise Geocoding Module

Added support for SPD file format

EGM USA now supports data in the Spectrum Platform Data (SPD) format. This makes it easier to manage datasets through the Management Console. SPD is the recommended file format because Spectrum will automatically expand the data to the configured location and the metadata is used by the platform and modules.

> **Note:** The methodology for deleting datasets has changed with this release. Do not delete the data where the SPD was extracted to. Instead, remove data using the Administration Utility command `productdata delete`. For more detail, see **Deleting geocoding SPD data requires CLI command** on page 27 .

MLD Extended Attributes including APN and Elevation

This new feature provides access to extended attributes associated with an addressable location that has a pbKey. When matching addresses with Master Location Data (MLD), Spectrum now

returns additional property information associated with the address, such as Assessor's Parcel Number (APN), Elevation, Address Type, Lot Size, etc. APN can be used to identify the parcel so the parcel ID can be linked to additional information for the insurance industry, such as property and insurance risk attributes.

Requirements

The following are required to return MLD Extended Attributes within the Enterprise Geocoding Module (EGM-US):

- Master Location Data dataset.
- Streets dataset.
- MLD Extended Attributes dataset.
- Recommendation: the vintages of the MLD and MLD Extended Attributes datasets be within 4 months of each other.
- Within EGM-US, on the **Output** tab, select the **MLD Extended Attributes** option. Output fields will display on the Preview tab or via Enterprise Designer.

MLD Extended Attributes Output Fields (optional)

For a full list of MLD Extended Attributes, refer to **MLD Extended Attributes Output Fields** in the Global Geocoding section of these Release Notes.

Deleting geocoding SPD data requires CLI command

The methodology for deleting SPD files has changed. Deletion is now done via the CLI command `productdata delete`. Do not manually delete the data where the SPD was extracted to.

- Before deleting any data, run the `productdata list` command to view details such as product component, qualifier, and vintage.
- Run `productdata delete` to remove the SPD from Spectrum Technology Platform.

Example

productdata delete --p productName --c productComponent --q qualifier --v dataVintage

```
spectrum> productdata delete --c geocoding-all --p geocoding-all --q
USA-HERE --v 201907
```

These items are listed in the metadata.json file within the extracted SPD folder.

For more about Product Data commands, see **productdata list** in the Administration Guide.

New and updated CLI commands

New commands

egmglobaldb memory set - The `egmglobaldb memory set` command defines the memory size for the Enterprise Geocoding Module for Global databases. The fields for defining minimum and maximum memory values can be empty. If a value is empty, that value will not be specified on the

command line when starting the component, as if no value were explicitly defined. If no value is specified, or if a value is 0, the property will not be passed to the Command Line Interface.

```
egmglobaldb memory set --name database_name --mn minimum_memory_size
--mx maximum_memory_size
```

egmusadb memory set - The `egmusadb memory set` command defines the memory size for the Enterprise Geocoding Module for U.S. databases. The fields for defining minimum and maximum memory values can be empty. If a value is empty, that value will not be specified on the command line when starting the component, as if no value were explicitly defined. If no value is specified, or if a value is 0, the property will not be passed to the Command Line Interface.

```
egmusadb memory set --name database_name --mn minimum_memory_size --mx
 maximum_memory_size
```

egmworlddb memory set - The `egmworlddb memory set` command defines the memory size for the Enterprise Geocoding Module for World databases. The fields for defining minimum and maximum memory values can be empty. If a value is empty, that value will not be specified on the command line when starting the component, as if no value were explicitly defined. If no value is specified, or if a value is 0, the property will not be passed to the Command Line Interface.

```
egmworlddb memory set --name database_name --mn minimum_memory_size --mx
 maximum_memory_size
```

Updated command

egmusadb add - The `egmusadb add` command creates a new US Enterprise Geocoding Module database resource on the server. This command now allows you to set minimum and maximum memory sizes.

```
egmusadb add --f file --mn minimum_memory_size --mx maximum_memory_size
```

"Version" now identifies PB Release Vintage

Applies to all geocoding modules: In Management Console, when you navigate to **System > Version**, the Version field now displays the PB Release vintage instead of the vendor's vintage. This makes it easier to keep dataset vintages aligned.

Global Geocoding Module

Performance and scalability improvements

With the proper configuration, the Global Geocoding Module (GGM) now performs faster than the Enterprise Geocoding Module.

Enhance GGM performance by setting database resource values **poolsize** and **POOL_MAX_ACTIVE** equal to or double the number of CPUs.

```
poolsize (maxActive - for CLI users) =  CPU  or 2 * CPU
POOL_MAX_ACTIVE = poolsize
```

GGM Performance Configuration

Before proceeding, see these topics about tuning Spectrum performance:

- **Designing high performance flows**
- **Optimizing Geocoding Stages**

GGM dataflow performance depends on multiple factors, including the following:

- **Machine configuration** (number of CPU, available RAM): Higher CPU and memory helps in executing multiple threads of geocoders inside GGM, leading to higher performance.
- **Databases configured**: Only configure those databases that need to be geocoded. Otherwise, the larger the configured databases are, the more memory GGM needs. This can eventually limit the number of threads that can be spawned on a given machine and limit performance.
- **Input addresses**: Refer to **Optimizing Geocoding Stages**.
- **Dataflow runtime settings:** Refer to **Database Pool Size and Runtime Instances**.
- **GGM database configuration** : GGM has certain configuration parameters which control internal threads and associated pools. To determine optimal value for your environment, review and adjust these parameters as explained in the Spectrum Dataflow Designer Guide. Key parameters are highlighted below.

GGM Database configuration parameters

An administrator can configure a GGM database by importing SPD files via the Administration Utility commands. Once it has been imported, users can go to the Management Console and configure a GGM database using imported SPDs.

While configuring databases in the **Add Database** screen, an administrator can set the following properties to enhance GGM performance:

- **Pool size** Database poolsize defines number of concurrent requests GGM can handle. Set it equal or double of current CPU to achieve better performance. (CLI users please refer to maxActive property.)
- Select the **Override advanced settings** option.
- **MAXIMIZE_BATCH_SIZE** The default is 100; this controls the maximum batch size for REST API.
- **POOL_MAX_ACTIVE** The default is 16, this controls the Internal API pool size.

Create and use multiple geocoding databases

GGM now allows users to create multiple database resources. Each database resource can be configured with a different vintage, which allows for flexibility within dataflows. Users can test a new release by comparing it with an older release before promoting it.

Backwards compatibility: when older flows are imported, they will default to the latest database created on 2019.1.

Notes:

- Before configuring and utilizing multiple database resources, confirm if there are any applications using the REST API from GGM. REST API calls will need to be modified to include the database name so it does not conflict with any new database resources.
- If you want to use this new capability and you have existing data flows, review and update any data flow database resources. Otherwise, no changes to data flow database resources are necessary.

MLD Extended Attributes including APN and Elevation

(USA) This new feature provides access to extended attributes associated with an addressable location that has a pbKey. When matching addresses with Master Location Data (MLD), Spectrum now returns additional property information associated with the address, such as Assessor's Parcel Number (APN), Elevation, Address Type, and Lot Size. APN can be used to identify the parcel so the parcel ID can be linked to additional information for the insurance industry, such as property and insurance risk attributes. For more detail, see the full list below.

Requirements

The following are required to return MLD Extended Attributes in the Global Geocoding Module (GGM):

- Master Location Data dataset.
- Streets dataset.
- MLD Extended Attributes dataset.
- Recommendation: the vintages of the MLD and MLD Extended Attributes datasets be within 4 months of each other.
- Within GGM, on the **Return Values** tab, select the **Return all available information** setting. Return values in Enterprise Designer, using Custom Fields.

MLD Extended Attributes Output Fields (optional)

Field	Description
AddressType	Address Type regarding number of units: S – Single unit M – Multiple units P – Post Office box X – Unknown

Field	Description
Apn	Assessor's parcel number.
IncorpPlaceInd	Incorporated Place Indicator. I – Incorporated place N – Not an incorporated place X – Unknown
LotSize	Lot size of the parcel expressed in square feet; 0 if none.
LotSizeMeters	Lot size of the parcel expressed in square meters; 0 if none.
MECLatitude	Latitude of Minimum Enclosing Circle expressed with an implied 6 digits of decimal precision; 0 if none.
MECLongitude	Longitude of Minimum Enclosing Circle expressed with an implied 6 digits of decimal precision; 0 if none.
MECRadius	Radius of Minimum Enclosing Circle (in square feet) expressed as a whole number. For example: 1234 means 1,234 feet.
MECRadiusMeters	Radius of Minimum Enclosing Circle (in meters) expressed with 1 digit of decimal precision.
Elevation	Elevation above sea level (in feet) expressed with 1 digit of decimal precision. For example: 12.5 feet.
ResidentialBusiness	Usage Indicator: R – Residential use B – Business use M – Mixed use – residential and business X – Unknown use
TigerFaceID	TIGER Face Identifier. This field can be used to match to all Census geocodes using external data; 0 if none.
TigerPlace	TIGER Place code; 0 if none.

Field	Description
UrbanAreaID	TIGER Urban Area Identifier. Defines the urban area if any; 0 if none.
UrbanAreaPop	Census population of the urban area; 0 if none.
Urbanicity	Urbanicity Indicator. An indicator that defines, according to the Census, the Urbanicity of the Address using TIGER UACE codes for categorization.

Added support for RDI™

The Residential Delivery Indicator (RDI™) is a United States Postal Service (USPS®) data product that identifies whether a delivery type is classified as residential or business. If you are shipping to residences, you may lower costs by shipping with the Postal Service™ and avoid residential delivery surcharges typically charged by other shipping companies.

Note: To use RDI, Delivery Point Validation (DPV) must also be enabled and a US Streets dataset loaded.

Output Field	Description
RDIRetCode	USPS Residential Delivery Indicator (RDI) return codes: • Y = Residence • N = Business • Blank = Not processed through RDI.

See also: **Improved dataset management for USPS® products (USA)** on page 37

Reverse Geocoding: supports fallback to World geocoder

Reverse geocoding can now fallback to the World Geocoder for those countries that are included in the GGM database. The advantage of this feature is for points that do not return a point or street-level candidate, it can now return a geographic or postal-level centroid match.

> **Note:** To enable this feature, configure the **GEOCODING GEOCODING WORLD PLACES INT WORLD GLOBAL ALL GLB** dataset in the database and select the **Fallback to world geocoder** option on the Reverse Geocoding tab within the Global Reverse Geocode stage.

New Input field: Addressline2

On the Global Geocode Stage: added the (optional) input field **AddressLine2** which is supported for USA, AUS, CAN, and GBR. It is also a new field on the REST Service.

New Output field: MatchScore

This new custom field displays a score (0-100) of how well the input compares to the candidate values for certain fields. It is used to better indicate what parts of input address were changed to make the match. Fields checked include street name, house number, directional, street type, unit number, place name, postal code, and area names 1, 3, and 4. A lower match score indicates many input fields were changed.

New Output field: Confidence (USA Only)

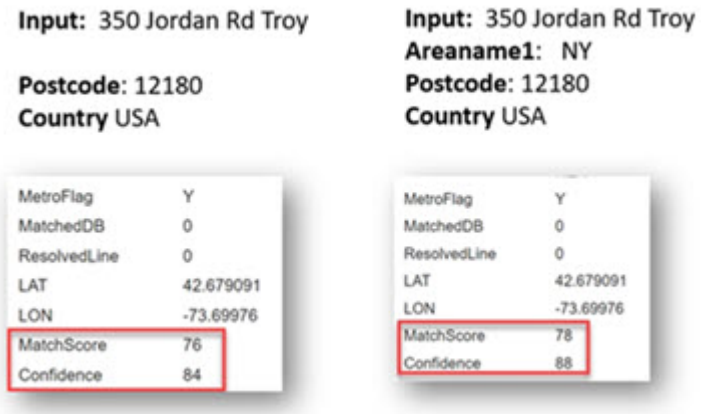
This new field indicates the confidence in the output provided, from 0 to 100. The higher the score, the higher the probability that the match is correct. If the match is exact, the confidence score is 100. For all other matches, the confidence score is calculated based on which portions of the input address had to be changed to obtain a match.

If you have enabled the option to return centroids, the **confidencevalue** indicates the type of centroid returned:

- 60: street centroid
- 50: postal code centroid
- 35: city centroid
- 30: county centroid
- 25: state centroid

Example

An address was initially entered without the Areaname. As shown below, when the Areaname is specified, the Confidence level increased. Adding additional address information, such as city, house number, street name, trailing or leading directional, street suffix, and postal code, will increase **Confidence**.



New Output field: CPC record type (CAN Only)

Added a field for Canadian postal code record type CPC_RECORD_TYPE which contains a 2-character code.

> **Note:** This field is returned only when the candidate contains a full postcode of FSA (Forward Sortation Area) + LDU (Local Delivery Unit).

Code	Description
<blank>	no address match was found
*	Unknown
A1	High rise
B1	LVR (Large Volume Receiver) street
C1	Government Street Address
D2	LVR (Large Volume Receiver) Served by Lock Box
E2	Government Served by Lock Box
F2	LVR (Large Volume Receiver) Served by General Delivery
11	Street
21	Street served by route
32	PO Box
42	Route service
52	General Delivery

Return Values: Parsed Address available for all countries

Parsed Address Output Fields

Previously available for both EGM USA and EGM Non USA, the Parsed Address output fields display the components of a matched address which has been parsed and standardized by the geocoder. In this release, additional output fields were added to support international addresses for all countries. (No changes to US fields.)

To enable, go to the **Return Values** tab and select the **Parsed Address** option.

Field Name	Parsed Input Description
AddressNumberInput	House or building number

Field Name	Parsed Input Description
AreaName1Input	State, province or region
AreaName2Input	County or district
AreaName3Input	City, town or suburb
AreaName4Input	Locality
CountryInput	Country
FormattedInputStreetInput	The formatted main address line
GenericField2Input	Reserved for custom use by country level geocoders
GenericField3Input	Reserved for custom use by country level geocoders
GenericField4Input	Reserved for custom use by country level geocoders
IntersectingStreetInput	If your data contains references by intersection, for example, main address “Central Avenue” intersecting street “Pine Lane”, you can enter the intersecting street on this line.
LeadingDirectionalInput	Directional information for delivery (i.e., N, S, E, W, NE, NW, SE, SW) before the address
PlaceNameInput	Point of interest or a business name
PostCode1Input	Series of numbers, letters, and spaces used to sort the mail
PostCode2Input	If an address contains a primary postcode and a postal coded add-on, the add-on postcode is entered here
StreetNameInput	Name of the street
StreetPrefixInput	Word before the street such as N., S., E., or W.
StreetSuffixInput	Word that follows the StreetName such as "Street" or "Avenue"

Field Name	Parsed Input Description
TrailingDirectionalInput	Directional information for delivery (i.e., N, S, E, W, NE, NW, SE, SW) after the address.
UnitTypeInput	Indicates the type of unit such as apartment or suite (APT, STE, etc.).
UnitValueInput	The number of the unit
UnparsedInput	The full address as entered

New CLI commands

Defining memory size for GGM

ggmglobalgeocodedb memory set The `ggmglobalgeocodedb memory set` command defines the memory size for the Global Geocoding Module databases. The fields for defining minimum and maximum memory values can be empty. If a value is empty, that value will not be specified on the command line when starting the component, as if no value were explicitly defined. If no value is specified, or if a value is 0, the property will not be passed to the Command Line Interface.

```
ggmglobalgeocodedb memory set --name database_name --mn
minimum_memory_size --mx maximum_memory_size
```

Important changes regarding data bundles and databases

In previous releases, archiving data bundles (SPD) was optional and turned off by default. In this release, the bundles(SPDs) will be archived on the machine where they are installed.

Default paths:

- **Archive folder:** <SpectrumInstallFolder>\server\archive
- **Extracted data:** <SpectrumInstallFolder>\server\ref-data

This release of Spectrum also requires users to use CLI to perform all operations related to installing and deleting data bundles. Here are a few example commands:

Changing default data extraction and archive folders:

```
productdata extract register --p platform --d
c:\\<desiredpath>\<SpectrumDataFolder>
```

```
productdata archive register --p platform --d
c:\\<desiredpath>\<SpectrumArchiveFolder>
```

Installing and deleting data bundles:

```
productdata install --f c:\<pathtToSPD>\KNT082019.spd –w
```

```
productdata install --f c:\< pathtToSPD>\CAN-EGM-PITNEYBOWES-CA8.spd
--w
```

```
productdata delete --c geocoding-all --p geocoding-all --q USA-HERE --v
 201907
```

where c=component, p=product, q=qualifier, v=vintage; these properties are in the metadata.json file

Importing Databases:

Similar to previous Spectrum versions, you can import databases using the import command.

```
globalgeocodedb import --f c:\<pathToFile>\GlobalGeocodeDbResource.txt
```

Improved dataset management for USPS® products (USA)

Overview

Datasets can now be added using the Spectrum Product Data (SPD) format. This applies to USPS products: Delivery Point Validation (DPV™), LACSLink®, SuiteLink®, and Residential Delivery Indicator (RDI™).

> **Note:** These steps assume the Administration Utility has already been installed as part of installing the **Client Tools**.

Regardless of the USPS product, the overall process is the same:

1. Download your licensed SPD files from the Software Data Marketplace (SDM), using the link provided in the release announcement or welcome email.
2. Install it using the Administration Utility command `productdata install`. For more detail, see **Installing a Spectrum Database**.
3. In Management Console, add the data as a Spectrum Database Resource (and any other required datasets).
4. Go to the Global Geocode stage. On the **Return Values** tab, select the **Return all available information** setting.
5. On the **Preview** tab, enter an address as **Input Record 1** and click **Run Preview**. Output fields are returned.

Obtaining Data

Data requirements are outlined in the product-specific sections below. On the Software Data Marketplace (SDM), the datasets are listed as:

USPS	SDM Name
DPV	GEOCODING GEOCODING DPV SPLIT AMER UNITED STATES ALL USA
LACSLink	GEOCODING GEOCODING LACSLINK DATABASE AMER UNITED STATES ALL USA
RDI	GEOCODING GEOCODING RESIDENTIAL INDICATOR AMER UNITED STATES ALL USA
SuiteLink	GEOCODING GEOCODING SUITELINK DATABASE AMER UNITED STATES ALL USA

DPV

Used for: Confirming if a ZIP + 4 address is a USPS delivery point; helpful for identifying potential addressing issues.

Requirements:DPV and Street datasets of the same vintage.

Example

Enter these values...

Input Field	Value
placeName	DRAKE BEAM
mainAddressLine	2502 N ROCKY POINT DR
areaName3	Tampa
areaName1	FL
postCode1	33607

...to return the output shown below.

Output Field	Value
DPVConfirm	D

Output Field	Value
DPVCMRA	N
DPVFootNote1	AA
DPVFootNote2	N1
DPVNoSTAT	Y
DPVShutdown	N
DPVVacant	N

LACSLink

Used for: Obtaining new addresses after a 911 emergency system has been implemented.

Requirements: LACS and Street datasets of the same vintage.

Example

Enter these values...

Input Field	Value
mainAddressLine	277 CLELAND LN
areaName3	BAXLEY
areaName1	GA
postCode1	31513
country	USA

...to return the output shown below.

Output Field	Value
LACSLinkIND	Y

Output Field	Value
LACSLinkRetCode	A
LACSLinkShutdown	N

RDI

Used for: Determining if an address is classified as a residence or business; helpful for avoiding delivery surcharges some shipping companies charge for residential delivery.

Requirements: DPV, RDI and Street datasets of the same vintage.

Example

Enter these values...

Input Field	Value
mainAddressLine	1627 S Jasmine St
areaName3	Denver
areaName1	CO
postCode1	80224

...to return the output shown below.

Output Field	Value
RDIReturnCode	Y

SuiteLink

Used for: Adding known secondary (suite) information to business addresses; helpful for delivery sequencing.

Requirements: SuiteLink and Street datasets of the same vintage.

Example

Enter these values...

Input Field	Value
placeName	DRAKE BEAM
mainAddressLine	2502 N ROCKY POINT DR
areaName3	Tampa
areaName1	FL
postCode1	33607

...to return the output shown below.

Output Field	Value
SuiteLink_Ret_Code	A

Custom Dataset Builder changes

Custom Dataset Builder (CDB) is a utility to create new datasets for use in the Global Geocoding Module and web service API.

Support for French-administered territories and Monaco

CDB now supports data creation for the French-administered territories of Guadeloupe (GLP), French Guiana (GUF), Martinique (MTQ), Mayotte (MYT), Réunion (REU), and the country of Monaco (MCO) using the similar command as used for other countries.

When geocoding any address from the territories, provide all the relevant settings as you would for France (including the country code FRA, not the territory code). Matching candidates are returned from those territories along with the country code of its parent (i.e., FRA).

Notes:

- Custom Dataset Builder is a command line driven tool. Configuration is done through JSON.
- Data must be in TAB format (native or nativeX).
- Data created with Custom Dataset Builder does not support interactive geocoding at this time.
- The result code for street geocoding contains a "U" for user datasets to distinguish it from "A" when candidates are from the standard address datasets. For example: S5HPNTSCZ**U** instead of S5HPNTSCZ**A**.

New parameter `-usePackagedLib`

Added optional parameter [required for USA] that uses the libraries bundled with the Custom Dataset Builder tool instead of using the library from the SPD. It will only work with Spectrum version 2019.1 or higher and SPD bundles OCT2019 or higher.

For more information, the Custom Dataset Builder Guide is included in the .zip file with the tool. Instructions are also provided in the **Global Geocoding User Guide**.

Spectrum Databases: new filter for data bundles

In **Resources** > **Spectrum Databases** > **database name**, you can now filter the list of data bundles to Show All, Show Enabled, or Show Disabled.

- **Show All** displays all available datasets
- **Show Enabled** displays datasets that are selected or configured in the database
- **Show Disabled** displays all available datasets that are not selected or configured in the database

New Reset Settings button

From any Global Geocoding stage, you can now click **Reset Settings** to return all options, across all tabs, to their default values.

Dataset expiration

Added the ability to view when your database resources expire. In Management Console, go to **System** > **Licensing and Expiration** > **Data tab** to review the new **Expires On** column.

"Version" now identifies PB Release Vintage

Applies to all geocoding modules: In Management Console, when you navigate to **System > Version**, the Version field now displays the PB Release vintage instead of the vendor's vintage. This makes it easier to keep dataset vintages aligned.

Global Addressing Module

New and updated CLI commands

New command

gamdb memory set - The `gamdb memory set` command defines the memory size for the Global Addressing Module databases. The fields for defining minimum and maximum memory values can be empty. If a value is empty, that value will not be specified on the command line when starting the component, as if no value were explicitly defined. If no value is specified, or if a value is 0, the property will not be passed to the Command Line Interface.

```
gamdb memory set --name database_name --mn minimum_memory_size --mx
maximum_memory_size
```

Updated command

gamdb create - The `gamdb create` command creates a new database resource on the server. This command now allows you to set minimum and maximum memory sizes.

```
gamdb create --f file --mn minimum_memory_size --mx maximum_memory_size
```

Global Address Parser

The **Global Address Parser** stage parses postal address strings into individual address elements, such as organization name, street, city, and postal code. The parser uses machine learning techniques and does not require a reference address database.

The **Global Address Parser** stage supports these new countries for this release:

- Australia (AUS)
- France (FRA)
- Spain (ESP)
- United States (USA)

For more information, see the Global Address Parser section in the *Spectrum™ Technology Platform Addressing Guide*.

Global Address Validation

Result Codes

The **Global Address Validation** stage includes new result codes that provide information about how Global Address Validation processed United States addresses.

VeriMove Data

The **Global Address Validation** stage includes a new US Addressing option. The VeriMove data block option determines whether to return 250-bytes of additional information codes to the output file. This additional information is used as input to the Pitney Bowes VeriMove move update product.

Multiple Candidates

The **Global Address Validation** stage has added the ability to return multiple candidates for US addresses. When the Maximum Records to Return option is set to a value other than 1 and multiple candidates are available, Global Address Validation processing now returns the specified number of candidate suggestions.

For more information, see the Global Address Validation section in the *Spectrum™ Technology Platform Addressing Guide*.

Global Sentry Module

Sunset of Global Sentry module

This is the last release of the **Global Sentry** module. Next release onwards, you are advised to use the Spectrum™ Technology Platform Screener module for all the services currently offered by the Global Sentry module.

Machine Learning Module

H2O Library Upgrade

An internal build 3.20.0.5.2 of the H2O Library is included with this release. This build fixes security vulnerabilities.

New Configuration Settings Page

A new **Configuration Settings** tab has been added to the Machine Learning Model Management application.

Machine Learning Module settings are now configured on the **Configuration Settings** page. The page provides configuration for pool size, maximum and minimum memory settings, Java property settings, environment variables, and process arguments.

XGBoost Technology Preview (Linux Platform)

This release of the Machine Learning Module on the Linux platform includes the XGBOOST Classification and XGBOOST Regression stages as a technology preview.

The XGBOOST Classification and XGBOOST Regression stages are an early implementation containing fundamental capabilities and are likely to change in future releases. Using these stages in a production environment is not currently recommended. These stages are only supported on the Linux platform.

Management Console

New CLI commands

Memory set commands

These new commands define `java.properties`, `java.vmargs`, `system.properties`, and `env.propertities`. Use the CLI or the Management Console UI to define these commands. These commands are described in detail in the Spectrum™ Technology Platform *Administration Guide*.

`egmglobaldb memory set`	Defines the memory size for the Enterprise Geocoding Module for Global databases.
`egmusadb memory set`	Defines the memory size for the Enterprise Geocoding Module for USA databases.
`egmworlddb memory set`	Defines the memory size for the Enterprise Geocoding Module for World databases.
`ermdb memory set`	Defines the memory size for the Enterprise Routing Module databases.
`geotaxdb memory set`	Defines the memory size for the Geographic Coding Tax Module databases.
`gamdb memory set`	Defines the memory size for the Global Addressing Module databases.
`ggmglobalgeocodedb memory set`	Defines the memory size for the Global Geocoding Module databases.
`uamdb memory set`	Defines the memory size for the Universal Addressing Module databases.

Commands to export audit log events

(CDQE-62338) This enhancement allows security administrators to export JSON files that track activities from Spectrum log file entries during specific time frames. This tracking is easily integrated into existing logging framework using two new commands.

`auditlog export`	This command adds a JSON activity log to all audit log files. Times are in `yyyyMMddHHmmss` format. If no specific timeframe is specified, the default is the current day's start date and the time the command is issued.
`auditlog info`	This command adds a JSON count info file to the audit log files. Times are in `yyyyMMddHHmmss` format. If no specific timeframe is specified, the default is the current day's start date and the time the command is issued.

Commands to maintain Spectrum Product Data (SPD)

We provide CLI commands that help you install, maintain, and archive SPD files. These commands are described in the Spectrum™ Technology Platform *Administration Guide*.

- Use the `productdata archive register` command to configure separate archive directories for your SPD files.
- Use the `productdata extract register` command to specify an alternate (non-default) extract location for a set of product data on the server.
- Use the `productdata install` command to install your data files.

Remote component call timeout

This release includes a new Timeout configuration setting on the Add Remote Server page. Use the **Timeout** entry field to specify the amount of time, in seconds, it takes to issue a timeout warning after a call to an external resource fails.

Metadata Insights

CLI for Business Glossary

These commands help you import business glossary entities to the Spectrum server and export those from the server to local directory in CSV format. These commands are described in detail in the Spectrum™ Technology Platform *Administration Guide*.

`glossaryentity export`	Exports glossary entities from Spectrum™ Technology Platform server to a CSV file in a specified directory.
`glossaryentity import`	Imports glossary entities (CSV file) from your specified directory to the Spectrum™ Technology Platform server.
`glossaryentity list`	Returns a list of all the existing glossary entities.

CLI for managing connections

These commands help you list all the configured connections, import connections to the Spectrum server and export connections from the server to a JSON file. These commands are described in detail in the Spectrum™ Technology Platform *Administration Guide*.

`resourceconnection export`	Exports a resource connection from Spectrum™ Technology Platform server to a JSON file.
`resourceconnection import`	Imports a database connection to the Spectrum™ Technology Platform server.
`resourceconnection list`	returns a list of all the resource connections defined on Spectrum™ Technology Platform server.

CLI for Profiling Tasks

These commands run a profile, cancel profile running, delete a profile, export a profile, update a profile, give status a profile run, and list all the defined profiles. These commands are described in detail in the Spectrum™ Technology Platform *Administration Guide*.

`profile run`	Runs the specified profile.
`profile cancel`	Cancels the specified profile run.
`profile delete`	Deletes the specified profile.
`profile export`	Exports reports of the specified profile to a directory.
`profile update`	Updates an existing profile. **Note:** Only profiles created by files on your machine or on server can be updated through this command.
`profile status`	Provides you the status of the profile.
`profile list`	Returns a list of all the profiles created.

Collaboration and Governance model in Business Glossary

You can now define the processes, policies, entities, and rules governing your organization centrally using the **Define Glossary** module. The definitions are workflow-based and require multilevel approval, which makes the process streamlined, collaborative, and error-proof, ensuring that a list of terms that are consistent, contextual, and transparent. For more information on defining business glossary entities, see the *Defining Glossary* section of *Metadata Insights*.

Connection to SFTP server

You can now connect Spectrum™ Technology Platform to an SFTP server using Management Console. For details on configuring the connection, see *Connecting to Data* section of *Metadata Insights User Guide*.

Custom semantic type for profile analysis

Semantic types can now be customized such that these double up as a profiling tool. While defining a semantic type, you can add rule types, based on which you can perform semantic analysis during profiling.

Join suggestions

You can now use automated join suggestions to map the columns of multiple tables. This feature becomes available only when you are using the **Discovery** module. The join suggestions are based on the primary and foreign key linkages in the tables you discovered.

Scorecards to assess data quality

Use the **Scorecard** feature for swift and easy data quality assessment. Define the key matrices and use those to monitor the health of your data with a graphics-based assessment tool.

View data trends

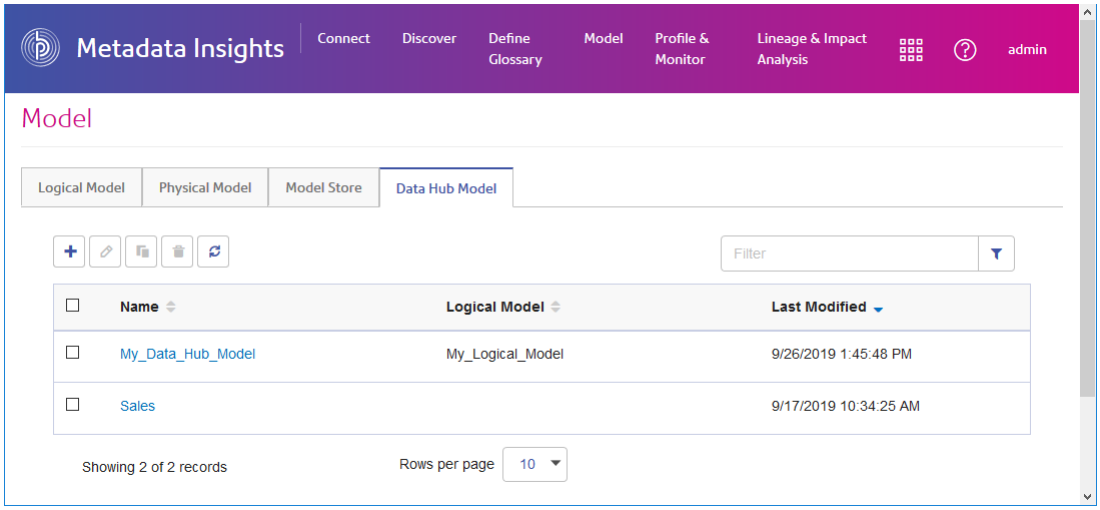
Use **Trends** to measure the improvement of data quality over a period of time. Plot a chart, based on your recent scorecard runs, or for a specified date range, to give you a clearer picture on the data improvement index.

Data Hub Connector added to Metadata Insights Connections

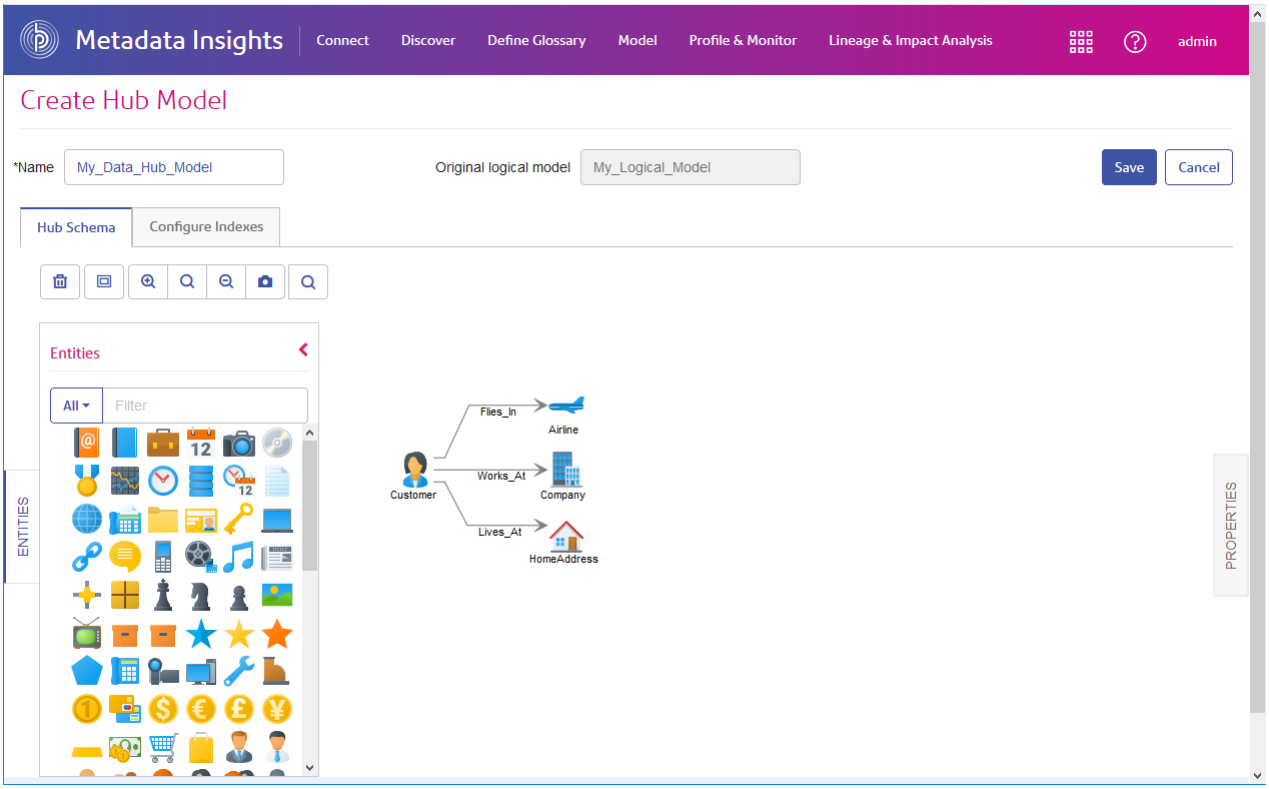
You can now create a connection to a Data Hub model either in the Management Console or in Metadata Insights.

Data Hub Model added to Model page

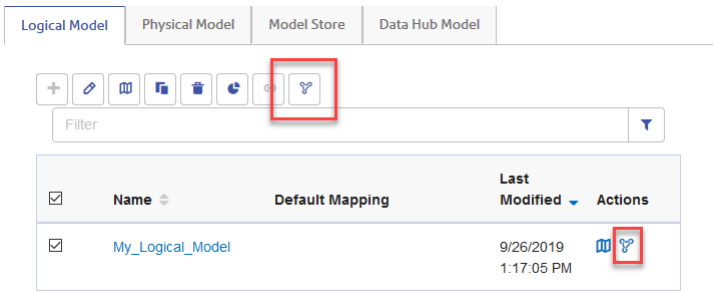
You can now create and edit Data Hub models on the **Model** page of Metadata Insights. The new **Data Hub Model** tab on the **Model** page lists Data Hub models and provides options to add, edit, copy, and delete models. These Metadata Insights options replace functionality that was previously in Relationship Analysis Client.



The Hub Model editor supports editing model metadata and adding and editing virtual entities and relationships. You can click **PROPERTIES** to expand the sidebar to edit the properties for a selected entity or relationship.



You can now also use a logical model to create a Data Hub Model for your data flows. The Create Data Hub button on the toolbar creates a new Data Hub model based on the currently selected logical model. You can also use Create Data Hub Model in the Actions column.



SAP Module

Simultaneous on-premise and on-demand support

The SAP hybrid functionality gives you the flexibility of using an on-premise and on-cloud (SPOD) Spectrum server simultaneously. For more information, see the SAP Module Guide.

Spectrum Screener

Approvals and versioning

Every modification or update made to a list, list entries, or list metadata can be easily tracked through versions. All modifications need to go through an approval cycle to become effective and every approved modification creates a new version. This helps you to know the exact state of a list, list metadata, and list entry for any look-back period.

Stringent approval process

The *n-level* approval process for the User Defined Attributes (UDAs), list metadata, list entries (for internal list), and screener groups ensures that the process is transparent and error-proof.

- The administrative user defines the value of *n*.
- Approvers cannot approve at multiple levels.
- Approval and disapproval reasons are required.

Search for duplicates with one click

For any list entry, one click on the **Duplicates** option gives you the desired result. This makes it easy to determine whether to save your current list entry or to take additional measures to remove duplicity.

User Defined Attributes for all Secured Entities

Screener comes with several pre-defined UDAs that are configurable by the administrative user. UDAs can also be defined through the user interface or during file reads.

Toggle view of cleansed and uncleansed entries

You can toggle between the cleansed and uncleansed views of list entries for easy comparison.

Security, ease, and flexibility in list management

Take advantage of these list management features:

- Ingest lists using schedule batch jobs or through the user interface.
- Enter, edit, deactivate, and soft-delete entries for internal lists.
- Provide different set of accesses for list entries of different lists.
- Download internal list entry data for offline viewing.
- Attach backup documents to list entries - such as news stories or other collateral information - to support changes.

Processing notifications

Relevant users receive notifications for list ingestion, entity approvals, and entity rejections for List, List Entries, UDAs, and Screener Groups.

Additionally, audit logs are generated for all activities you perform using Screener. Screener reports record events that occur when you create and modify objects on your system, and for events that occur when you run jobs.

Server

Supported languages for 2019.1

Release 2019.1 supports these languages:

- French
- German
- Japanese
- Spanish

Translated software is available at release time. We will notify customers when translated documentation is available.

Java support changes

As of release 2019.1, Pitney Bowes will no longer bundle Java with Spectrum™ Technology Platform and Spectrum Spatial Analyst.

> **Note: There are no changes required for AIX customers.** This change effects all other supported platforms for Spectrum™ Technology Platform and Spectrum Spatial Analyst.

Oracle Corporation has announced an end to free public updates for corporate clients of Java 8, starting February 1, 2019. You can review the Oracle Corporation policy and Java support roadmap **online**.

In previous releases, Pitney Bowes redistributed Java 8 with Spectrum and Spectrum Spatial Analyst. Because of the change in policy from Oracle, Pitney Bowes will no longer bundle Java with Spectrum and its modules. We will remain on Java 8 for this release.

As a result of Oracle's support changes:

- Customers must provide the Java JDK for all future releases.
- For now, Pitney Bowes will continue to develop and test with Java 8 for upcoming releases.
- The installation process has changed. You must verify that you have installed a Java JDK (64-bit) to proceed with product installation. You can review the **Install the JDK and Set the JAVA_Home Environment Variable** on page 7 requirements.

Supported Java distributions

The following table shows current (tested and verified) Pitney Bowes Java distributions.

Operating System	Vendor-supplied	Azul	Oracle
AIX	Yes		
CentOS		Yes	Yes
HP-UX	Yes		
Oracle Linux		Yes	Yes
Red Had Enterprise Linux		Yes	Yes
Solaris		Yes	Yes
SUSE Enterprise Linux Server		Yes	Yes
Ubuntu		Yes	Yes
Windows Server		Yes	Yes

Path structure and log name changes

As of release 2019.1, we have flattened the folder structure at the platform level. We have also changed the path to and names of some log files.

Path structure

We have removed the `server/app` and `server/app/repository` folders. Ensure that you make the necessary changes to configure the Spectrum™ Technology Platform server. The new folder hierarchy is:

```
..|index                    ** index location
   |-- logs                 ** log files for technical support
..|repository               ** repository location
   |-- logs                 ** log files for technical support
..|server                   ** primary server folder
   |-- archive              ** archive files: resource bundles, reports

       |-- audit            ** archive files: audit log data
       |-- bundles          ** storage: resource bundles
       |-- dataflows        ** archive: imported dataflows
```

```
       |-- reports          ** default location for reports on disk/by
name
   |-- bin                  ** startup scripts, wrapper
   |-- conf                 ** configuration files
   |-- deploy               ** car and war files; consoles
   |-- doc                  ** read me file(s)
   |-- drivers              ** jdbc drivers
   |-- exports              ** exported: Enterprise Designer, others
   |-- import               ** imported: license keys, flows, reports,
SPDs
       |-- error            ** import item error storage
          |-- dataflows     ** dataflow import errors
          |-- license-keys  ** backup of imported license keys
   |-- lib                  ** platform jar files
   |-- logs                 ** log files
   |-- modules              ** product modules
   |-- ref-data             ** reference data file archive
   |-- tmp                  ** temporary folder
   |-- types                ** types jar files
```

Log file location

Spectrum™ Technology Platform now directs all log files to *SpectrumDirectory*`/server/logs`.

wrapper.log file name change

The wrapper.log file is now the spectrum-server.log file.

Changed property file name

As of release 2019.1, we have consolidated our properties groupings. As a result, the **spectrum-advanced.properties** file is deprecated, and the properties that were in that file are now in the **spectrum.properties** file.

Security enhancements

Multiple domain support

We have added the ability to specify multiple domains in the **spectrum.ldap.dn.format** property of the ***SpectrumDirectory*/server/conf/spring/security/spectrum-config-ldap.properties** file. To set multiple domains in spectrum.ldap.dn.format, use commas to separate each full domain name and provide the domain value in single quotes.

```
spectrum.ldap.dn.format='CN=%s,CN=Users,dc=spectest,dc=pvt',
'CN=%s,ou=Services,dc=spectest,dc=pvt','CN=%s,ou=managers,dc=spectest,dc=pvt'
```

Record logout events in the Audit Log

You will now see the date and time when a user logs out of the Spectrum™ Technology Platform in the system Audit Log.

Export security setting overrides through Administration Utility

You can now export security overrides associated with a role or user, to JSON format, using the Administration Utility Command Line Interface (CLI). To export overrides for a user named "Sally," use this syntax:

```
entity override export --e User --p Sally
```

To export overrides for "Sally," who has the role "designer," use this syntax:

```
entity override export --e Designer --p Sally
```

In the above examples:

- `--e` is the value (userName/RoleName) of the role or user for which the overrides are exported. This attribute is required.
- `--p` *`Role/User Constant Value`* specifies the literal name of the "Role" or "User". This attribute is required.

Encrypt passwords or mask encryption strings

This enhancement, delivered as part of the 2018.2.S15 product update, directs Spectrum™ Technology Platform to encrypt all resource passwords and to either remove or mask passwords in log files. This is an optional feature: use it only if you wish to encrypt your passwords.

Update the following property files, replacing *p*********s* with your encryption string.

```
SpectrumDirectory\Program Files\Pitney
Bowes\Spectrum\server\conf\spectrum-container.properties
spectrum.cluster.password=p*********s
spectrum.encryption.node.keystorePassword=p*********s
spectrum.encryption.node.truststorePassword=p*********s
spectrum.encryption.client.keystorePassword=p*********s
spectrum.encryption.client.truststorePassword=p*********s
#spectrum.https.encryption.keystorePassword=p*********s
#spectrum.https.encryption.truststorePassword=p*********s
#spectrum.cache.encryption.keystorePassword=p*********s
#spectrum.cache.encryption.truststorePassword=p*********s
spectrum.index.password=p*********s
#spectrum.index.encryption.node.keystorePassword=p*********s
#spectrum.index.encryption.node.truststorePassword=p*********s
#spectrum.index.encryption.client.keystorePassword=p*********s
#spectrum.index.encryption.client.truststorePassword=p*********s

SpectrumDirectory\Program Files\Pitney
Bowes\Spectrum\server\bin\enableadmin.properties
```

```
spectrum.encryption.keystorePassword=p*********s
spectrum.encryption.truststorePassword=p*********s

/jobexecutor.properties (available on client side where CLI utilities
are downloaded)
spectrum.encryption.keystorePassword=p*********s
spectrum.encryption.truststorePassword=p*********s

/pflowexecutor.properties (available on client side where CLI utilities
 are downloaded)
spectrum.encryption.keystorePassword=p*********s
spectrum.encryption.truststorePassword=p*********s

/cli.properties (available on client side where CLI utilities are
downloaded)
spectrum.encryption.keystorePassword=p*********s
spectrum.encryption.truststorePassword=p*********s
```

Generating encryption strings

There are two methods for generating encryption strings.

Method one: use the *.jar file utility to generate the encryption string for the Spectrum default password.

Generate an encrypted string for the default password, p****s.

Specify the command:

`java -jar password-utility.jar -p` *`password`* `-a` *`algorithm`*

...where:

- *password* is your site's password
- *algorithm* is the encryption method: `AES` or `PBEWithMD5ANdDeS`

Sample output:

```
############################################################
############ Encrypted String for the password ############
############################################################
            9yOYoZ9W2aAF2Baapa5wIxCMNQ/9TZFP
```

Method two: You can also generate encryption strings from the JMX console through the `encryptString` property. This request takes the format `MBean operation: invoke method encryptString on MBean` *`servername`*`:manager=EncryptTextManager`.

Lightweight HTTP endpoint for server status

Use the URL-based server status check to quickly view overall status, such as memory use and CPU availability.

This URL-based check provides a low-overhead and non-password protected way to check that your server is running and accessible. In a web browser, specify one of these URLs: `https//server:port/dcg/status` or `http//server:port/dcg/status`.

Learn more about URL-based status checking in the Spectrum™ Technology Platform *Administration Guide*, under **Viewing server status**.

Remote server support is deprecated

Our research shows very few clients use remote server functionality. So, we are removing remote server support and functionality and are adding external REST Web services. We sent out a communication to our customers in June 2019 to announce this change.

When is this functional software change happening?

This change takes place in the fourth quarter, 2019, as part of release 2019.1.

Do you use remote server functionality?

You can determine by checking to see if any remote servers are defined:

1. Start Management Console
2. Select **Resources > Remote Servers** to display the remote servers page

We suggest that you work closely with your administrator to ensure that you have located all remote server resources. **If you currently do not use this feature, this change does not affect your current jobs, services, or workflows.**

If you do currently use this functionality, follow these steps:

- You must replace the remote dataflow stages by configuring an external REST Web service that points to the other Spectrum instance.
- This external Web service will then appear in the Enterprise Designer palette to select and use in your dataflows.
- You must update your dataflows which use remote dataflow stages and replace all remote dataflow stages with external Web service stages. You can adjust the runtime instances for that stage to optimize performance for your requirements.

If you need help

Review our product *Administration Guide* for more information on setting up and configuring external REST web services.

Starting a Cluster

These instructions assume that the server is stopped.

If all the nodes in a cluster are stopped, you must follow this procedure to start the cluster safely and avoid data loss.

On the last node that was stopped last, start the server. Do this for each node in the cluster.

Warning: The first node that you start must be the last node that was stopped to preserve the most recent data. Starting another node first may result in loss of data such as job history and configuration settings. If you do not know which node was stopped last, look in each node's log for the time stamp of the shutdown message. You can find the log in: *SpectrumDirectory*\server\logs\spectrum-server.log.

a) Start the server.
b) Start all nodes consecutively, after upgrading. Make sure that you start node 2 within only a few seconds after starting node 1, and repeat this for each remaining node.

   You can tell when the Spectrum™ Technology Platform server has completely started by looking in the log file: *SpectrumDirectory*\server\logs\spectrum-server.log. This message is displayed when the server is completely started:

```
Pitney Bowes Spectrum(TM) Technology Platform (Version Version
Number) Started.
```

Smart Data Quality

Automated group generation

We have automated record grouping and group strength to create the optimal training set for your machine learning model. Training sets are based on unsupervised machine learning algorithms.

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Training set smart selection

We have automated the selection of training set records and have removed the cap of 20K records. You can now conveniently point the system to your complete data set. The solution will pick the relevant training set based on the matching definition of the business provided to it.

Match rule updates with changing data set

Smart Data Quality (DQ) integration with the Business Steward Module (BSM) ensures current updated match rules. Exceptions raised and approved during the entity resolution flow in BSM are now linked back to Smart DQ to train the Machine Learning Module, keeping match rules up-to-date.

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Spatial and Routing Module

What's New

This section lists what's new in this release of the Spatial Module, which includes routing. All 2018.2 updates for the Location Intelligence Module and Enterprise Routing Module, listed under **Spectrum Update Summary 2018.2.0**, are included in this 2019.1 release of the Spatial Module.

Spectrum Spatial Analyst users will receive a release announcement containing product download information and Spectrum Spatial Analyst Release Notes.

Name change to Spatial Module

As of version 2019.1, the Location Intelligence Module (LIM) and Enterprise Routing Module (ERM) are now sold together as the Spatial Module. Applications, such as the Management Console, refer to “Spatial” instead of “Location Intelligence” and “Routing” instead of “Enterprise Routing”. The Spectrum™ Technology Platform installer lists this module as the “Spatial and Routing Module”.

The Spatial Module is part of a single sales product called Spectrum Spatial that includes Spectrum Spatial Analyst, which is a web mapping client. Spectrum Spatial Analyst installs separately from the Spectrum™ Technology Platform, is managed by Spectrum Spatial Manager, and uses Spectrum Spatial Services.

Documentation

Introduction to Security is a new section that contains revised and updated topics that used to be under the *Administration* section.

Managing Spatial is a new section that includes the Spatial Manager documentation that used to be under the *Utilities* section and new information about managing Spectrum Spatial Analyst.

Security

Database row security: You can now apply row security for a database. Use the PreSQL feature to pass user information to the session context in the database. Row filtering is then applied in the database with the user information in the session context.

User roles: spatial-sub-admin: There is a new predefined role called spatial-sub-admin that enhances the way administrators delegate spatial management capabilities to users. A user who is a spatial-sub-admin must have write permission on the folder containing the resources they are managing. They can log into Spatial Manager, the Map Uploader, and can manage projects in Spectrum Spatial Analyst. They also have access to the ACL REST service and the internal REST Named Resource service.

Users with folder write permissions who are not a member of the new spatial-sub-admin role, cannot use management applications. These users now have a different status: they can save map projects

via Spectrum Spatial Analyst to any folders they can write to. A new page in Spatial Manager lets an admin, spatial-admin, and spatial-sub-admin manage which users have folders (see below).

Managing spatial-sub-admin, user folders, and saving projects: Spatial Manager has a new page for assigning the spatial-sub-admin role to users, and for creating a folder for users in which they can save Spectrum Spatial Analyst map projects (select **Permissions** and then **Manage User Folders**). The folder creation functionality provides a quicker and more convenient way to manage folders for individual users than manually creating the folder and then using the existing folder permissions page to assign permissions. A folder is created for any user in the repository as a sub-folder inside `UserFolders` with the same name as the user account. The user is also granted read and write access to their folder, allowing them to save Spectrum Spatial Analyst map projects.

Spatial Manager

Parameterized Views: Administrators can now create parameterized views (view tables that contain bind parameters) when creating a named view table. On the **Advanced** tab of the Create View Table page, they can set bind parameters as part of the SQL definition. Parameters are defined using an at @ symbol. When validating the view, the parameters has the option to add a default value and description for each parameter. Clients, such as Spectrum Spatial Analyst, can describe the view and present the parameters for end-user input. The REST feature and REST mapping service are updated to accept parameter values in requests. When listing tables using the REST feature service it is possible to filter the list to return only named views that contain parameters.

Row-level security: Support has been added to facilitate row-level security. Two approaches are available.

- In MISQL two new functions have been provided `MI_User` and `MI_Roles` that return the currently logged in Spectrum user name and roles. These can be used in a MISQL statement to filter records in any table or view, as long as the data has a user or role column to lookup.
- A Named Connection definition enhancement allows for entering database-specific pre and post SQL. The pre and post SQL run when borrowing and releasing the connection. Administrators can utilize database-specific row-level security implementations by setting the database session context. There are sample SQL statements for Oracle, SQL Server, and PostGIS in the *Spectrum Spatial Guide*.

spatial-sub-admin role: A new pre-defined role called spatial-sub-admin enhances the way administrators can delegate spatial management capability to users. Users who are members of spatial-sub-admin require folder read or write permissions, either directly or via the other roles they belong. They can see and manage only resources within these folders. Such users can log into Spatial Manager, the Map Uploader, and can manage projects in Spectrum Spatial Analyst. They also have access to the ACL REST service and the internal REST Named Resource Service.

Folder permissions: Users with folder write permissions who are not a member of the new spatial-sub-admin role, cannot use management applications. These users now have a different status: they can save map projects via Spectrum Spatial Analyst to any folders they can write to. A new page in Spatial Manager lets an admin, spatial-admin, and spatial-sub-admin manage which users have folders.

Modify Named Maps: You can now modify Named Maps in Spatial Manager. Users who are an admin, spatial-admin, or spatial-sub-admin can add, remove, or rearrange named layers and save the map. Previously named maps could only be created but not modified.

Thematic maps: When creating or modifying a named layer in Spatial Manager, you can now define a thematic style for a layer. When defining individual or ranged themes, all of the standard options are available, including the choice of a color palette. You can also specify the labels to use for the legend.

MRR style overrides: When creating or modifying layers for Multi-Resolution Raster (MRR), grid, and raster type formats in Spatial Manager, you can now override their layer styles. You can specify a style for a specific field and band, including brightness, contrast, hill shade, color palettes, and various other options. For continuous raster tables, you can specify a custom color table. Settings display in an in-line map as a preview before saving them.

Performance with long lists of resources: There is improved performance displaying a folder with thousands of named resources. Previously, Spatial Manager could take over a minute or time out listing resources.

See also, **Security** on page 58, *Managing spatial-sub-admin, user folders, and saving projects*.

Routing

Spectrum Product Data (SPD): You can now use the Management Console to add Spectrum Product Data (SPD) resources. SPD files install via the Command Line Interface tool (CLI) and the datasets display in the Management Console under Spectrum Databases. You can select one or more datasets to add SPD files to.

Route calculation: A new **localRoadsLoadFactor** parameter lets you control the loading of local roads while calculating a route or matrix. The allowable values are either 2 or 3, which doubles or triples the area where roads are loaded. A larger number increases the chances that the best possible route is used but impedes performance.

See also, **Spatial and Routing Stages** on page 61 and **Spatial and Routing Services** on page 61.

New and Updated Routing CLI Commands

ermdb memory set - The new `ermdb memory set` command defines the memory size for routing databases. The fields for defining the minimum and maximum memory values can be empty. If a value is empty, that value is not specified on the command line when starting the component, as if no value were explicitly defined. If no value is specified, or if a value is 0, the property does not pass to the Command Line Interface.

```
ermdb memory set --name database_name --mn minimum_memory_size --mx
maximum_memory_size
```

ermdb add - The `ermdb add` command creates a new routing database resource on the server. We have added minimum and maximum memory allocations for databases.

```
ermdb add --f file --mn minimum_memory_size --mx maximum_memory_size
```

Spatial and Routing Services

REST ACL: The ACL service has four new operations to control the authorization of users and roles: Add User, Add Role, Add User to Role, and Remove User from Role. Spatial Manager and the Spectrum Spatial Analyst installer use these operations.

Travel Boundary: The propagation factor feature is now available in the Travel Boundary service. This impacts isodistance requests and it determines the off road travel distance while calculating the travel boundary.

Spatial and Routing Stages

Find Nearest: The Find Nearest stage previously only used straight line distance for its calculations. In this release, the stage can also calculate distance using a routing network where you can choose to find the nearest point locations by time or distance. To use the network option, you must already have an installed routing database. For more details, see *Setting Input Parameters for the Find Nearest Stage* in the *Spectrum Spatial Guide*.

Matrix: The new routing Matrix stage provides flexible input of either: a single start or end location as a point geometry or as two X and Y values; or multiple start or end locations as either a multi-point geometry or as a Spectrum list of X and Y values.

Map Uploader

The Map Uploader in older versions of Spectrum Spatial will not work with the 2019.1 release. If you are already using the Map Uploader, download the latest version from the Spectrum 2019.1 landing page (by selecting **Spectrum Spatial** and then the **Utilities** tab).

Path for tables: When uploading a Named Map, you can now choose a separate repository folder in which to save the new Named Tables. Previously named tables were added to the same repository folder chosen for the map.

Layer display names: You can now set the TAB file name as the display name (called a friendly name) for a layer. Previously a layer's display name had to be changed in MapInfo professional before uploading. Otherwise, a short (truncated) name was applied. You can modify layer names in Spatial Manager after uploading files.

Volatile and read-only flags: When uploading new tables, you can set the table volatile and read-only properties. These settings are check boxes in the table list.

Running Map Uploader: To run the Map Uploader, you must be an admin, spatial-admin, or a spatial-sub-admin with write permission on at least one folder.

Management Console

Heap size and process arguments: You can no longer set heap size and process arguments in the `java.vmargs` property file as they were in previous releases. Now they are set in Management Console by selecting **Resources** and then **Spatial**.

Connection pool: Properties for managing the database connection pool, tab file handle, and shape file handle previously set under the `modules/spatial` folder are now set in the Management Console by selecting **Resources** and then **Spatial**. Both tab and shape file handle pool are now set using the pool.file property. Details are under *Spatial Java Properties* in the *Spectrum Spatial Guide*.

Java Properties: The repository cache previously set in the `java.properties` file are now set in the Management Console by selecting **Resources** and then **Spatial**. Details are under *Spatial Java Properties* in the *Spectrum Spatial Guide*.

HTTP cache control header: HTTP cache control header properties in the `spectrum-advanced.properties` file have moved to the `spectrum-container.properties` file in the same folder location under *`SpectrumFolder`*`\server\conf\`. For details, search for *Disabling Default HTTP Cache Control Headers* in the *Spectrum Spatial Guide*.

Coordinate Reference Systems

This release adds the following coordinate reference systems.

- EPSG:2100 HGRS87
- EPSG:3003 Italian National System (Monte Mario), Zone 1 (West)
- EPSG:3004 Italian National System (Monte Mario), Zone 2 (East)
- EPSG:3346 LKS-94 Lithuania TM
- EPSG:5105 Norwegian NTM Zone 5 (EUREF89/ETRS89)
- EPSG:5106 Norwegian NTM Zone 6 (EUREF89/ETRS89)
- EPSG:5107 Norwegian NTM Zone 7 (EUREF89/ETRS89)
- EPSG:5108 Norwegian NTM Zone 8 (EUREF89/ETRS89)
- EPSG:5109 Norwegian NTM Zone 9 (EUREF89/ETRS89)
- EPSG:5110 Norwegian NTM Zone 10 (EUREF89/ETRS89)
- EPSG:5111 Norwegian NTM Zone 11 (EUREF89/ETRS89)
- EPSG:5112 Norwegian NTM Zone 12 (EUREF89/ETRS89)
- EPSG:5113 Norwegian NTM Zone 13 (EUREF89/ETRS89)
- EPSG:5114 Norwegian NTM Zone 14 (EUREF89/ETRS89)
- EPSG:5115 Norwegian NTM Zone 15 (EUREF89/ETRS89)
- EPSG:5116 Norwegian NTM Zone 16 (EUREF89/ETRS89)
- EPSG:5117 Norwegian NTM Zone 17 (EUREF89/ETRS89)
- EPSG:5118 Norwegian NTM Zone 18 (EUREF89/ETRS89)
- EPSG:5119 Norwegian NTM Zone 19 (EUREF89/ETRS89)
- EPSG:5120 Norwegian NTM Zone 20 (EUREF89/ETRS89)

- EPSG:5121 Norwegian NTM Zone 21 (EUREF89/ETRS89)
- EPSG:5122 Norwegian NTM Zone 22 (EUREF89/ETRS89)
- EPSG:5123 Norwegian NTM Zone 23 (EUREF89/ETRS89)
- EPSG:5124 Norwegian NTM Zone 24 (EUREF89/ETRS89)
- EPSG:5125 Norwegian NTM Zone 25 (EUREF89/ETRS89)
- EPSG:5126 Norwegian NTM Zone 26 (EUREF89/ETRS89)
- EPSG:5127 Norwegian NTM Zone 27 (EUREF89/ETRS89)
- EPSG:5128 Norwegian NTM Zone 28 (EUREF89/ETRS89)
- EPSG:5129 Norwegian NTM Zone 29 (EUREF89/ETRS89)
- EPSG:5130 Norwegian NTM Zone 30 (EUREF89/ETRS89)

For details about these or any other EPSG coordinate systems, see **http://epsg.io**.

Other Spatial Changes

MISQL functions for MRR: There are new MISQL functions: `MI_GridMinValue` finds the minimum value for specified field and band in MRR, and `MI_GridMaxValue` finds the maximum value for specified field and band in MRR.

Deprecating Features and Products

Centrus: The ability to configure a database resource for Centrus in the Spectrum Management Console is deprecated and unavailable after 2019.1. Centrus users have an additional step after installing or upgrading the Spectrum™ Technology Platform and the Spatial Module. The Spectrum™ Technology Platform does not install with a 32-bit JDK. To work with Centrus, you must update a Spectrum properties file to work with your JDK installation. See the instructions under *System Requirements* for *Spatial Module Support* in the *Spectrum™ Technology Platform Installation Guide*.

Closest Site stage: The Enterprise Designer will no longer include the Closest Site stage after 2019.1, which has been replaced by the Find Nearest stage.

Configuring request timeouts: Spectrum Spatial no longer includes configuring request timeouts for SOAP and REST operations as part of a request to the Mapping and Feature services, which were previously set in the `java.properties` file as `timeout.mapping.value` and `timeout.feature.value properties`.

Legacy Point in Polygon stage: The Enterprise Designer will no longer include the Legacy Point in Polygon stage after 2019.1, which is replaced by the Point in Polygon stage.

Spectrum Spatial for Business Intelligence (SSBI): The Spectrum™ Technology Platform, and Spatial Module, no longer provides the Integeo Data Provider. If you are working with Spectrum Spatial for Business Intelligence (SSBI), then you must purchase the Integeo Data Provider from Integeo. For contact information, see **https://www.integeo.com**.

Universal Addressing Module

New and updated CLI commands

New command

uamdb memory set - The `uamdb memory set` command defines the memory size for the Universal Addressing Module databases. The fields for defining minimum and maximum memory values can be empty. If a value is empty, that value will not be specified on the command line when starting the component, as if no value were explicitly defined. If no value is specified, or if a value is 0, the property will not be passed to the Command Line Interface.

```
uamdb memory set --name database_name --mn minimum_memory_size --mx
maximum_memory_size
```

Updated command

uamdb create - The `uamdb create` command creates a new database resource on the server. This command now allows you to set minimum and maximum memory sizes.

```
uamdb create --f file --mn minimum_memory_size --mx maximum_memory_size
```

Loqate Transaction Tracker

Loqate now charges on the basis of the number of valid records processed. A new transaction tracker has been added to help in tracking the number of valid records processed by Loqate. This new feature is valid for the Get Candidate Addresses Loqate, Get City State Province Loqate, Get Postal Codes Loqate, and Validate Address Loqate stages. This feature is not valid for the Auto Complete Loqate stage.

Validate Global Address

The Validate Global Address library has been upgraded from 5.13 to 5.15.

New Loqate Data Format

You can now download and install Loqate databases in the Spectrum Product Database (SPD) format. The SPD data format provides for an easier data installation process and allows the same datasets to be used in many different modules. Data bundles are now packaged in a file with the extension .spd.

New Validate Address Global Data Format

You can now download and install the UAM – Enhanced International (UAM-EI) databases for use with the Validate Address Global stage in the Spectrum Product Database (SPD) format. The SPD data format provides for an easier data installation process and allows the same datasets to be used in many different modules. Data bundles are now packaged in a file with the extension .spd.

Deprecated Validate Address AUS Stage

The Validate Address AUS stage has been deprecated and removed from the product. In place of using the Validate Address AUS stage, you can use the Validate Address Loqate stage to use AMAS rules when standardizing addresses. Select the Validate Address Loqate "Format data using AMAS conventions" option to format output address data using Address Matching Approval System (AMAS) conventions.

Installation Notes

For complete instructions on installing Spectrum™ Technology Platform, including system requirements, see the *Spectrum™ Technology Platform Installation Guide* available at **http://support.pb.com**.

Installer changes

Starting with this release, we no longer distribute Java.

As a result of this change:

- You must have Java version 8 installed before you begin installation of the Spectrum™ Technology Platform server.
- You will not be able to proceed with installation until you have installed Java. We recommend Azul or Oracle Java, as these are our tested vendor versions.
- See this topic for more information on Java support changes and Java installation requirements: **Java support changes** on page 51.

We have updated the Windows installer process so that the server auto-restart option is no longer enabled by default.

- **For standard installations**, where the server and repository are on the same physical or virtual machine, check the check box to start the Spectrum™ Technology Platform after installation.
- **For clustered installations**, where the server and repository are on different physical or virtual machines, **do not check the option to auto-start the server**, or the server will fail to join the cluster. For more information, see the Spectrum™ Technology Platform *Installation Guide*.

Upgrade paths

You can upgrade directly to Spectrum™ Technology Platform 2019.1 from some versions. For some versions, you must upgrade to one or more intermediate versions before upgrading to 2019.1.

Your current version	Upgrade path
2018.2.0	Upgrade directly to 2019.1
12.0 SP2.1	Upgrade directly to 2019.1
12.0 SP2	Upgrade to 12.0 SP2.1, then upgrade to 2019.1
12.0 SP1	Upgrade to 12.0 SP2.1, then upgrade to 2019.1
12.0	Upgrade to 12.0 SP2.1, then upgrade to 2019.1
11.0 SP1	Upgrade directly to 2019.1
11.0	Upgrade to 11.0 SP1, then upgrade to 2019.1

Before you install on Unix or Linux

Running as root user

You cannot run Spectrum™ Technology Platform as a root user. This type of installation is no longer supported.

You will see a prompt to designate the owner as part of the installation process.

```
================================================
Change Directory and File Ownership
------------------------------------------------
Do you wish to change file ownership at this time?
     → 1 - Yes
     → 2 - No
ENTER THE NUMBER OF THE DESIRED CHOICE OR PRESS ENTER TO
 ACCEPT THE DEFAULT:
```

- **For new installations**, do not install with the root user as the owner of the Spectrum™ Technology Platform installation.
- **For upgrade installations**, if root is the owner of the **Spectrum** directory, you will have to change the owner at installation time. If you do not change the installation ownership, the server will not start.

Before you install on Windows

Open JDK version

You must have the OpenJDK Java 8 JDK (64-bit) installed to run Spectrum™ Technology Platform. If you do not have the OpenJDK version installed, you can download it from **this site**. Follow the links to download and install the Java 8 OpenJDK (64-bit).

Upgrade requirements for Linux

This release requires that you change some settings for Linux systems.

Important: You must change these settings. If you do not, Spectrum™ Technology Platform will fail to start.

CentOS and Red Hat

For CentOS 5, CentOS 6, Red Hat Enterprise Linux 5, and Red Hat Enterprise Linux 6, you must modify a Spectrum™ Technology Platform server property in order for the server to start successfully. Perform these steps after upgrading and before starting the server.

1. Open the file `SpectrumDirectory/server/conf/spectrum-container.properties` in a text editor.
2. Change the property `spectrum.index.bootstrap.system_call_filter` to `false`.
3. Save and close the file.

Upgrading Enterprise Designer

Upgrading from releases prior to 2019.1

We have updated some of the underlying display framework for Enterprise Designer. As a result, you must install and use the latest version of Enterprise Designer, 2109.1, as provided with your installation package.

To upgrade Enterprise Designer:

1. Uninstall the existing client tools by going to **Start** > **All Programs** > **Pitney Bowes** > **Client Tools** > **Setup**.
2. Make sure that you have .NET 4.6 installed on the client machine. This is a newer version of .NET than was required in previous releases. Note that Windows 10 comes with this version of .NET installed by default.
3. Download the client tools installer from the Spectrum™ Technology Platform welcome page, http://*SpectrumServer*:*Port*. The default port is 8080.
4. Run the installer.

Upgrading external web services

If you are upgrading from a version prior to 11.0, you should test your external web services to ensure they were upgraded successfully. In most cases external web services will be upgraded without issue, but some external web services may not be successfully updated, including:

- REST web services that return XML
- SOAP web services that use WS-Security

If you find that an external web service is not working after upgrading, delete the external web service then recreate it in Management Console by going to **Resources** > **External Web Services**.

For SOAP web services, the upgrade process may need to access the WSDL document defined in the external web service. To ensure a successful upgrade, verify that the WSDL is accessible before upgrading.

Upgrading a cluster

We have changed the steps for upgrading a cluster in cases where the Spectrum™ Technology Platform server and configuration database are installed on each node of the cluster.

The upgrade process for a clustered environment in the Spatial Module is documented in the "Cluster" section of the *Installation Guide* located on **support.pb.com**. See the topic entitled, *Upgrading a Cluster*.

Moving transactional data - upgrades only

As of release 2019.1, we are moving transactional audit log and flow history data from Neo4j to Elasticsearch to improve the maintenance of and access to this data.

Note: New installations are not affected by this change.

If you are performing an upgrade from a previous version of Spectrum, the upgrade process will export **all** of this data into two *.zip files:

- Archive_Upgrade_18.2_history.zip
- Archive_Upgrade_18.2_audit.zip

The more data you have, the larger the *.zip files.

Important: To avoid building large export files, we suggest that you purge or archive the data before you begin the upgrade process.

If you have a **standard installation** (server and database installed together on a machine), the upgrade process exports files into a directory (*SpectrumDirectory*/server/import). From this directory, Spectrum imports the files automatically on the first startup of Spectrum. Standard installations require no manual steps to accomplish this task.

If you have a **separate installation**, where the database was installed separately from the server, following the upgrade process, you must manually move the files from the database machine ((*SpectrumDirectory*/server/import) to the server machine (*SpectrumDirectory*/server/import). Once you move the files to the server machine, Spectrum imports those files automatically on the first startup of the server.

Depending on how much data you are moving, you can expect the first startup to be considerably slower than usual while this data is imported back into the system and into the Elasticsearch repository. Once Spectrum imports all the data successfully, it deletes the *.zip files from the server machine automatically.

Migrating your search indexes

If you are upgrading to release 2019.1 from release 2018.2, your Elasticsearch search indexes will migrate to release 2019.1 during the upgrade process.

Important: Your server must be up and running to migrate your search indexes.

If you are upgrading to release 2019.1 from version 12.2.1 or earlier, you have to perform a separate, manual process as part of the upgrade to migrate your Elasticsearch indexes to release 2019.1. This process will maintain your compatibility with the latest version of Elasticsearch. We provide scripts to do this:

- export
- delete-all-indexes
- import

> **Note:** You do not need to perform these steps if you are from upgrading from release 2018.2 to 2019.1. Indexes from 2018.2 will convey to 2019.1 as part of the upgrade.

Using the command parameters outlined below, perform these steps.

Table 1: Index command parameters

Command parameter	Description	Default value
`-b value`	Optional - Number of records in one batch	import = 1_000 export = 25_000
`-e path`	Full path to where the Spectrum indexes will be exported to or imported from	
`-f value`	Optional - Number of records in each file	100_000
`-h value`	Optional - Number of concurrent threads	4
`-o operation`	Operation: exp, imp, or del	
`-p filename`	Optional – Override properties file containing default override index connection properties	
`-r value`	Optional – Batch size for profiling index report	500
`-s path`	Full path to the Spectrum installation location: Directory that includes the `/server`, `/index`, and `/repository` directories	
`-t value`	Optional – Timeout for export connection, in minutes	5

You can perform the import/export from a script (*.bat or *.sh) or by using the `upgrade-index.jar` file.

- If you use the script method to import/export, the `-o` parameter is implied and does not have to be specified.
- If you are not importing/exporting from the script, specify: *`javaLocation`* `-jar upgrade-index.jar`

1. Export your indexes before upgrading to 2019.1.

   ```
   export.bat -e backuplocation -s spectruminstalllocation
   export.sh -e backuplocation -s spectruminstalllocation
   ```

2. Delete your indexes.

   ```
   delete-all-indexes.bat -e backuplocation -s spectruminstalllocation
   delete-all-indexes.sh -e backuplocation -s spectruminstalllocation
   ```

3. Upgrade to release 2019.1 of Spectrum™ Technology Platform.
4. Import your indexes to 2019.1 after the upgrade.

```
import.bat –e backuplocation –s spectruminstalllocation
import.sh -e backuplocation –s spectruminstalllocation
```

If you have changed default Elasticsearch certificate connection properties

Most Spectrum users will run with the default set of connection properties. However, if you did change any connection properties, you will have to pass into Spectrum the properties file with your unique settings using the –p command, described in the previous section.

> **Note:** This section applies only to sites that have changed the default configuration for Elasticsearch.
>
> Review the valid properties, below. You can ignore/omit properties that do not apply.
>
> **Index properties for 2019.1**
>
> ```
> spectrum.index.connect.timeout=
> spectrum.index.encryption.keystore=
> spectrum.index.encryption.keystoreAlias=
> spectrum.index.encryption.keystorePassword=
> spectrum.index.encryption.keystoreType=
> spectrum.index.encryption.selfSignedCerts=
> spectrum.index.encryption.trustAllHosts=
> spectrum.index.encryption.truststore=
> spectrum.index.encryption.truststorePassword=
> spectrum.index.encryption.truststoreType=
> ```
>
> **Index properties for versions before 2019.1**
>
> ```
> spectrum.index.upgrade.certType=
> spectrum.index.upgrade.keystore.password=
> spectrum.index.upgrade.keystore.path=
> spectrum.index.upgrade.truststore.password=
> spectrum.index.upgrade.truststore.path=
> ```

Advanced Matching Module

Upgrading modules

When you upgrade the Universal Name, Data Normalization, and Advanced Matching Modules from Spectrum™ Technology Platform, you must first back up the contents of the following folders so that you can restore the data, such as indexes, matching tables, and configured properties later if anything goes wrong during the upgrade.

- cdqdb
- lucene
- matcher
- parser
- searchindex
- tables

Note: Backup and restore the *elasticsearch.template* file if you are using the snapshot and restore functionality in search index. The properties file is placed at: `<Spectrum Installation Folder>\index\elasticsearch.template`.

1. Stop the Spectrum™ Technology Platform server.
2. Navigate to the following directory:

   `<SpectrumDirectory>/server/modules`

3. Back up contents of all the folders mentioned above to a different location.
4. Perform the upgrade.
5. Start the Spectrum™ Technology Platform server.

Data Hub Module

Upgrading the Data Hub Module

As part of the upgrade process Spectrum™ Technology Platform backs up these two files from the previous version:

- *SpectrumFolder*`\server\modules\hub\hub.properties`
- *SpectrumFolder*`\server\modules\hub\db\neo4j.properties`

You can use these backups to restore any changes you made to these files. To restore changes that you made to these files, open the new files and edit the property settings that you want to retain from the previous version. It is imperative that you *do not* simply copy the old file over the new file to restore the previous settings, as some properties may have been added or removed in the new release.

If you are upgrading Spectrum™ Technology Platform from a version earlier than 12.0, the `neo4j.properties` file has changed significantly due to the neo4j update from 2.x to 3.x. Review`Spectrum\server\modules\hub\DataHubUpgrade_From_PreV12_README.txt` for full details.

Upgrading Data Hub Indexes

Spectrum™ Technology Platform 2019.1 implements an improved indexing method for better performance. As part of the upgrade to 2019.1, existing indexes will automatically be converted to the new format.

Indexed properties are now restricted to a maximum length of 4036 bytes. If a model has an indexed property that exceeds this limitation, you will not be able to open that model until you complete the following steps.

> **Note:** If you are using the Data Hub Module in a cluster and have hit the maximum index property constraint of 4036 bytes, see *Upgrading a Cluster with the Data Hub Module* in the Spectrum™ Technology Platform Installation Guide.

1. Stop the Spectrum™ Technology Platform server.
2. Copy the *SpectrumFolder*`\server\modules\hub\db\neo4j.properties` file to the *SpectrumFolder*`\server\modules\hub\db\model.`*ModelName* folder for each model that exceeds the property constraint of 4036 characters.
3. Open the neo4j.properties files that you copied in Step 1. In a text editor, uncomment and set `dbms.index.default_schema_provider` to `lucene+native-1.0`. Make sure the neo4j store upgrade is uncommented and that the following property is set to `true`:

```
dbms.allow_upgrade=true
```

4. Start the Spectrum™ Technology Platform server.
5. Open all affected Data Hub models.
6. Remove the *SpectrumFolder*`\server\modules\hub\db\model.`*ModelName*`\neo4j.properties` files. By removing this file from the model folders, native-btree-1.0 indexing will now be used by default.

   > **Note:** We recommend that you fix all models that failed upgrade due to the 4036 indexed property constraint and re-index those models from lucene+native-1.0 indexes to the latest native-btree-1.0 indexes. See the `hub model reindex command` in the Administration Utility section of the Administration Guide.

7. Stop and restart the Spectrum™ Technology Platform.

Geocoding

Enterprise Geocoding Module

Database memory usage

When using the Enterprise Geocoding Module it is important to allocate the memory appropriately when configuring a larger number of country data sets. The solution is to adjust the -Xmx Java max heap space argument to a larger value.

Global Geocoding Module

Added support for Ubuntu 18

We have added support for the Ubuntu 18 operating system.

Java heap size recommendation

If you are loading all countries, set the maximum Java heap size for the GlobalGeocode Module to `-Xmx10500m` for basic usage, `-Xmx16g` for normal usage, and `-Xmx32g` to `-Xmx64g` for high performance usage.

To set this, use one of the following options:

- Use the **Min memory** and **Max memory** fields on the database configuration page
- As part of a database import via the **Administration Utility** (CLI tool)
- Run a separate command from the **Administration Utility**

```
ggmglobalgeocodedb memory set --name database_name --mn
minimum_memory_size
--mx maximum_memory_size
```

Global Addressing Module

Upgrading the Global Addressing Module

You must upgrade from the 2018.2 or earlier versions of the Global Addressing Module to the 2019.1 version to continue processing with the Global Addressing Module.

To upgrade directly to the 2019.1 version of the Global Addressing Module from the Spectrum 2018.2 version, you must have applied the 2018.2 S18 product update and be using Q1 2019 or newer data.

To upgrade from any version prior to the 2018.2 S18 version of the Global Addressing Module (2018.2 **without** the S18 product update, 12.2.1, 12.2, or 11.1), follow these steps to ensure your existing jobs continue to process correctly:

1. Delete the old Global Addressing Module databases (databases prior to the Q1 2019 data refresh).
2. Upgrade to Spectrum™ Technology Platform 2019.1.
3. Follow the instructions in the *Spectrum™ Technology Platform Installation Guide* to install new SPD data files (Q1 2019 or newer).
4. Follow the instructions in the *Spectrum™ Technology Platform Installation Guide* to use the Management Console or the new 2019.1 CLI commands to create a database resource from the newly installed SPD data files.

   Note: Create the new database resources using the database names that were used for the previous database resources to ensure existing jobs process correctly.

The Spectrum™ Technology Platform 2019.1 release requires Q1 2019 or newer data.

Global Sentry Module

Upgrading the Global Sentry Module

Before upgrading the Global Sentry Module, you should first back up the contents of these folders so you can restore the data later if necessary:

- `ServerLocation\Program Files\Pitney Bowes\Spectrum\GlobalSentryDatabase\data`
- `ServerLocation\Program Files\Pitney Bowes\Spectrum\server\modules\ois\db\data`

Machine Learning Module

Configuration settings

In Release 2019.1 of the Spectrum™ Technology Platform, configure settings for the Machine Learning Module on the **Configuration Settings** tab of the Machine Learning Model Management application.

Memory requirements	The memory allocation for the Machine Learning Module should be three to four times the size of the input file used in jobs where models are created. We recommend that the minimum memory setting be at least 1 GB. After installation of this release, configure minimum and maximum memory

	settings for the Machine Learning Module on the **Configuration Settings** tab of the Machine Learning Model Management application.
Configuration changes are not retained after upgrade	Changes to Machine Learning Module settings are not saved during an upgrade to this release from a previous version of the Spectrum™ Technology Platform. After you upgrade to this release of the Spectrum™ Technology Platform, you can restore any changes made in the earlier version on the **Configuration Settings** tab of the Machine Learning Model Management application.

Upgrading from 12.0

You cannot upgrade from version 12.0 of the Machine Learning Module to version 12.1 of the Machine Learning Module because version 12.0 was a technology preview.

Spatial and Routing Module

Backup Spatial Module named resources and data

Although part of the Spectrum upgrade installation process for the Spatial Module is to automatically back up the data from a previous release before the upgrade continues, it is important to back up custom data sources and resources prior to upgrading using the `limrepo export` command in the Administration Utility (see the Administration section of the *Spectrum Spatial Guide* for instructions).

Any data that was installed with the module will be deleted after upgrade. If custom data is located in the same directories, back it up and copy to the same location in the Spectrum™ Technology Platform directories once upgraded. Pay special attention to any data or resources that have been added to default locations within the `%install_home%\Spectrum\server\modules\spatial\` directory, as these will be deleted after upgrade. For example, if you have used the default TileCache directory for generating your map tiles, back it up, and copy to the same location once upgraded.

It is also very important to perform a backup of the repository after the Spectrum™ Technology Platform upgrade is successful, to serve as a baseline in case your repository becomes corrupt later on.

Backup Spatial Module configuration files

Although the upgrade process from Spectrum™ Technology Platform will automatically back up configuration files (which are stored in the repository) and properties files for the Spatial Module, as well as merge custom settings, it is still important to back up the files before proceeding with an upgrade.

Follow these instructions if you:

- Run Spectrum™ Technology Platform server on a port other than 8080.

- Have made changes to any of these Spatial Module configuration files:
  - Mapping
  - Feature
  - Map Tiling
  - WFS
  - WMS
  - WMTS

Before an upgrade, you should also back up the `java.properties` and `java.vmargs` files that reside in `%install_home%\server\modules\spatial` to preserve any customizations you have made.

To back up user-modified configuration files and properties files:

1. Use the limrepo export command in the Administration Utility to export the configuration files: `limrepo export --s` *`SourceRepositoryPath`* `--o` *`OutputFilePath`* `--a --c --f`.

   For example, `limrepo export --s /Configuration --o C:\myrepository\configuration --a --c --f`

   > **Note:** For instructions on using the Administration Utility, see the Administration section of the Spectrum Spatial Guide. It is strongly recommended that you use the Administration Utility to export and import configuration files instead of WebDAV to ensure the files will comply with the new version of the Spatial Module.

2. Make a backup copy of `\modules\spatial\java.properties and java.vmargs` to save any non-default settings.
3. Perform the Spectrum™ Technology Platform upgrade.

If you have a successful upgrade, back up the new set of configuration files under `%install_home%\server\modules`. This backup will assist Tech Support should you encounter an issue with your installation. If you did not have a successful upgrade, follow the instructions described in **Spatial upgrade backup failure procedure** on page 77.

> **Note:** If you forgot to back up the configuration, `java.properties`, or `java.vmargs` files, you can check the backup zip file that is created by the upgrade process (as long as no failures occurred). This zip file (`upgrade_backup_yyyyMMddHHmmss.zip`) is located under `%install_home%\server\modules`.

Spatial upgrade backup failure procedure

Part of the Spectrum upgrade installation process for the Spatial Module is to automatically back up the data from a previous release before the upgrade continues. If the installer encounters an error during the backup, the installer displays a message and stops.

To re-attempt an upgrade after the error, complete these steps:

1. Go to the `<Spectrum installdir>\server\modules` and make a backup of the `lim_backupx.x` folder at some other location (where `x.x` is the backup version).
2. Delete the `lim_backupx.x` folder from the \modules directory.
3. Re-launch the Spectrum installer and follow the installation steps.

To ensure a successful upgrade process, manually back up your data beforehand. See **Backup Spatial Module named resources and data** on page 76.

Upgrading a clustered environment for the Spatial Module

The upgrade process for a clustered environment in the Spatial Module is documented in the "Cluster" section of the *Installation Guide* located on **support.pb.com**. See the topic entitled, "Upgrading a Cluster with the Spatial Module."

Heap memory and pool size

For new installations, the default heap memory is 2048 MB (2GB). An upgrade maintains the existing heap size value. For more information, see the performance tuning topics in the *Administration* section of the *Spectrum Spatial Guide*.

A new installation sets the default pool size to 4. An upgrade does not affect pool size expect when it is less than 4. In this case, upgrading resets the value to 4. To change the **Remote Component Pool Size** value after installing or upgrading the Spatial Module, open the Management Console, and select **Resources** and then **Spatial**. Change the pool size value and click **Save**. For details, see *Modifying the Pool Size* in the *Spectrum Spatial Guide*.

Upgrading with ACL

When upgrading to 12.0 SP2 or later, the Access Control List (ACL) model is upgraded to a new security model. The migration script will run as a part of installation but it also can be run independently of the installation procedure.

> **Note:** If you export the command line interface (CLI), it does not alter the permissions. These permission will need to be migrated. For example, the resources from 12.0 SP1 and earlier come with a VIEW permission, but when you upgrade to 12.0 SP2 or later, the migration script changes VIEW to EXECUTE.

The migration script will run the first time Spectrum™ Technology Platform is started after upgrading to 12.0 SP2 or later versions. It will only run once. The migration script will perform the following:

- All the permissions on folders will be removed.
- All the permissions on resources will be removed.
- The new EXECUTE permission will be applied if the VIEW permission existed on any resources.
- Any existing Deny permissions will be removed.
- Dataset VIEW permission is removed. Other permissions on Dataset such as CREATE, MODIFY, and DELETE will be preserved if they existed before the upgrade.
- NamedResourceMetadata resources will have no ACL for now.

Note: Having added the new EXECUTE permission, the Spectrum™ Technology Platform will start over with the new permissions.

Spatial installation directory names and special characters

For Spectrum™ Technology Platform installations that include the Spatial Module, the installation directory names must not contain any of the following characters.

- & - Ampersand
- > - Greater Than
- < - Less Than
- ' - Apostrophe
- " - Quote

Routing database memory usage

When loading a large Enterprise Routing database, you might have to increase the memory of the routing remote component. This setting is made in the Management Console after upgrading.

To increase the memory of the routing remote component in the Management Console, select **Spectrum Databases** from the **Resources** menu. On the **Spectrum Databases** page, click on the routing database you want to increase the memory for. On the **Edit Database** page, increase the **Max memory (MB)** value.

Universal Addressing Module

Canadian Database Update

If you are upgrading to version **2019.1** from any previous version and use the *Universal Addressing Module Canadian database*, you must re-install the database as version **2019.1** uses an updated coding engine which is not compatible with previous database versions.

Visual Insights Module

Visual Insights not supported on clusters

The Visual Insights Module is not supported on a clustered environment. To run the Visual Insights Module on a non-clustered environment, the property `spectrum.security.session.clusterable` must be set to `false`. For more information, see the *Visual Insights Guide*.

Fixed Issues

Data Hub Module

- (CDQE-70865) Error on initial load of a job that caused server to stop responding or ended the job with an error `GC overhead limit exceeded - Write to Hub`.
- (CDQE-71436) Visual Queries took longer than expected and timed out when search was based on virtual entities.
- (CDQE-72802) Data Hub returned a `TransientTransactionFailureException` when running multiple query/write stages, in parallel, in a clustered environment.
- (CDQE-73617) Write to Hub initial load failed for a large model.
- (CDQE-73624) After an upgrade backups would fail and return a `ConstraintViolationException` error.
- (CDQE-74281) Data Hub returned a `ConstraintViolationException` when running multiple query/write stages, in parallel, in a clustered environment.
- (CDQE-74590) Virtual entities could be selected and mapped in the Write to Hub stage. This has been fixed so that the server now throws an error when virtual entities are selected in the Write to Hub stage.
- (CDQE-75185) Data Hub Visualization hung while load connected when display labels are overridden with non-string properties.
- (CDQE-76368) Load Connected sometimes fails generating the following `spectrum-server.log` entries:

```
Java.sql.SQLRecoverableException: IO Error: Got minus one from a read
call
     Warn [VirtualEntityTransversalBehavior] Exception occurred while
executing query
```

- (CDQE-76391) Query in Data Hub Visualization is repeatedly executed on a database after a virtual entity is configured.
- (CDQE-72802) Data Hub returned a `TransientTransactionFailureException` while performing a Data Hub model backup and `The transaction has been terminated` when running multiple query/write stages, in parallel, in a clustered environment.

Data Integration Module

- (CDQE-66447) The query cache for the big decimal data type does not work as expected.

- (CDQE-72504) Spectrum™ Technology Platform returns a pipe exception error from the database loader.

Data Quality Module

-

Candidate Finder

(CDQE-65286) Candidate finder could not find the search index key.

Loqate Database

(CDQE-61056) There was an issue validating an address in Wales while running a Spectrum flow using Loqate. Spectrum processing returned the English version of the address. Manual address validation returned the Welsh spelling, which prevented an address match.

Enterprise Designer

- (CDQE-71773) Login Dialog: Username and password fields allow only 32-character maximum length.

  Note: To apply this change, you must uninstall then reinstall Enterprise Designer. The change will not take effect otherwise.

- (CDQE-71620) Display help in French, instead of English, as locale setting indicates.
- (CDQE-71749) Some subflows are missing for users with non-admin rights.

Server

- (CDQE-66137) Resolved two dataflow issues:
  - If any custom complex data types flow into the Execute Program stage, it will crash on the data type conversion.
  - None of the complex object sub-values show up in the list of fields available to pass to external programs for additional processing.
- (CDQE-66447) Query cache for bigdecimal data type does not work as expected.
- (CDQE-70072) Some users observed unexpected behaviors resulting from dataflows with embedded flows.
- (CDQE-71440) Cannot run search index jobs when Spectrum global encryption is enabled.

- (CDQE-72374) When running a flow in Distributed mode for the Duplicate Synchronization stage, Spectrum™ Technology Platform would issue error "java.lang.NumberFormatException: null." When running the same flow in Local mode, there were no errors.
- (CDQE-72502) Pipe exception error on database loader.
- (CDQE-73128) Process flow activities are out of sync on cluster nodes.
- (CDQE-73471) Read from DB stage causes timeout.
- (CDQE-73543) Management Console - Security Override - Application becomes unresponsive when many secured entities exist.
- (CDQE-73546) Entity override export file format is incorrect.
- (CDQE-73936) The jobexecutor -w option does not work as expected.
- (CDQE-74182) Unable to log in to Management Console when a repository node goes down in a distributed/clustered environment.
- (CDQE-74443) We have added default support for external requests to the Spectrum™ Technology Platform via proxy.
- (CDQE-75141) CLI - Export role JSON does not list multiple user names for "admin" role.
- (CDQE-75298) An error occurs when backing up the repository.
- (CDQE-76263) Cannot connect to CLI/Job Executor with passwords having certain special characters.
- (CDQE-76294) Change persistence layer to always check indexes and recreate indexes not found.
- (CDQE-76349) Fixed the process that Spectrum uses to stop Neo4j.
- (CDQE-76759) Provide a utility to encrypt strings.
- (CDQE-76948) DistributedObjectDestroyed exception occurs in some microflows.
- (CDQE-77684) Clarify documentation for Purge History process.
- Japanese language support fixes:
  - (CDQE-61957) Improved the Japanese language string provided for option "Data from the right port is sorted" in the Record Joiner stage.
  - (CDQE-64880) Add support for double-byte characters to the Audit Log.
  - (CDQE-65346) Add support for double-byte characters to the Enterprise Designer Math stage.
  - (CDQE-67365) Add support for double-byte characters to the Enterprise Designer dataflow option.
  - (CDQE-72342) In Job Executor, the double-byte character Dataflow option name is not replaced with the default value.

Spatial and Routing Module

This section lists fixes for the Spatial Module, which includes routing.

- (MID-45774) Some Spatial Calculator custom field names are not returned.
- (MID-46703) You can now create a named table, named layer, or named map that points to a SQL database with no records.

- (MID-48265) A "maximum open cursors exceeded" message displays when querying a database. This has been fixed so that queries do not leave a database cursor open (unclosed) when working with a database query table. This is a named table that contains a database-specific query rather than a reference to an existing database table or database view.
- (MID-49426) When querying a table with a primary key column that is a string data type, an error displays. Queries now work as expected.

Coordinate Reference Systems

- (MID-45771) A Describe Table request does not return the EPSG code for a TAB file created using a 3301 projection.
- (MID-49203) We have added support for the EPSG:3004 (Monte Mario / Italy zone 2) projection which replaces EPSG:26592.

  "--- Italian Coordinate Systems ---"

  "Italian National System (Gauss-Boaga), Zone 1 (West)\p26591", 8, 87, 7, 9, 0, 0.9996, 1500000, 0

  "Italian National System (Gauss-Boaga), Zone 2 (East)\p26592", 8, 87, 7, 15, 0, 0.9996, 2520000, 0

  For details, see **http://epsg.io/3004** and **http://epsg.io/26592**.

Spatial Manager fixes

- (MID-45110) Setting label layer visibility in Spatial Manager now works as expected when using the Map Uploader utility.
- (MID-45645) Setting translucency in Spatial Manager for raster and grid styles now works as expected.
- (MID-45851) The Spatial Manager returns an error when creating a view table with a geometry predicate function in the WHERE clause of a MISQL statement. This occurs on TAB files where at least one of the tab files is writable.
- (MID-46506) Spatial Manager is not reverting back to English or the default language selected in Management Console when the browser is set to an unsupported language. It shows internal variable names for the text. It now works as expected.
- (MID-47249) Spatial Manager displays a "file not found" message after moving a Tab file then attempting to change its path when the **Volatile** check box is selected. The issue has been fixed.

Documentation fixes

- (MID-45538) In the *Spectrum Spatial Guide*, the description to disable the Volatile attribute is incorrectly mentioned as true instead of false. The document has been corrected.
- (MID-47737) In the *Spectrum Spatial Guide*, the response part of the example to describe a map in mapping REST services includes an unnecessary *View Description* section. The example has been corrected.
- (MID-49501) The topic titled "Developing with the JavaScript API" has an unresolved Internet link. The linked to content is unavailable, so the link has been removed.

- (ROUT-7002) In the *Spectrum Spatial Guide*, describing how to delete the segment updates has an incorrect delete URL and parameter requirement in *Reset Parameter* section. This has been corrected.

Universal Addressing Module

- (CDQE-72614) Corrected issue that occurred after upgrading the Validate Address Global library.
- (CDQE-73271) Was unable to configure UAM International database on Spectrum Technology Platform 2018.2 Windows server.
- (CDQE-73353) Validate Address stage generated a pb.service.options.optionNotFound error in Management Console while saving any changes after upgrading from 11.1 S39 to 18.2 version.
- (CDQE-73659) Corrected an inconsistency with validate address results for the PO Box number component in Address Line 2 of some addresses.
- (CDQE-74411) Added a transaction tracker for Universal Addressing Module Loqate that records the number of valid records processed. Loqate now charges on the basis of the number of valid records processed.
- (CDQE-74778) Extended the CASS Cycle N license expiration date to August 1, 2020.
- (CDQE-75236) The USA Federal Information Processing Standards (FIPS) county number (USFIPSCountyNumber) was not being returned for failed addresses.
- (CDQE-75735) Corrected issue for the Validate Address Global stage.
- (CDQE-76021) Corrected ADDRSCAN callarea invalid version. Expecting 0920, received 0930.
- (CDQE-76929) Get City State Province Loqate stage was unable to return Country code while giving Addressline1, postal code, and country.
- (CDQE-77574) The Delivery Point Validation (DPV) date in the UAM produced VeriMove 250-byte detail data field incorrectly contained "01" in the DD position. The DD position should contain "15" in all cases.

Known Issues

This release contains the following known issues.

Analytics Scoring Module

- After Model Markup Language (PMML) library was upgraded from version 1.2.12 to 1.4.11, users can only publish models in UTF-8 encoding.

- (CDQE-78062) Naïve Bayes PMML models having continuous output types and using Poisson Distribution as statistical measure give wrong result. This is due to a bug in the PMML library version 1.4.11.

Data Normalization Module

- (CDQE-28304) Open Name Parser does not display custom domains.
- (CDQE-21062) Slow performance with Name Parser and user-defined table.
- (CDQE-3939) When a culture-specific grammar is used, all of the culture's RegEx rules are appended to the end of the grammar, regardless of whether they are used.

Data Quality Module

- (CDQE-59034) Some output addresses contain premise errors (India).
- (CDQE-65206) Address Doctor is confusing building names with company names are confused in Japanese addresses.
- (CDQE-66826) An address that was recognized with 5.11 UAM coding engine is no longer recognized in version 5.12.
- (CDQE-68892, CDQE-69778) Autocomplete issue in Loqate; Unexpected results with AutoCompleteLoqate service
- (CDQE-69757) Processing returns extra line breaks in output addresses.
- (CDQE-71704) Loqate adds churches to localities (Sweden).
- (CDQE-78340) Semantic type detection issue in Smart Data Quality - Columns names with dot does not work.
- (CDQE-78583) Connectivity issue with SugarCRM 7.7.1.1 bundle.

Enterprise Data Integration Module

- (CDQE-50342) In some cases, the Write to file/append option does not return the expected results.
- (CDQE-57085) In some cases, users see Issues when using variable file format source (for example, line sequential).
- (CDQE-59472) Active Query Builder support error when dropping in the AQB canvas: "Unable to Create the SQL query" (Sub query support under Spectrum).
- (CDQE-62858) Spectrum 12.1: DB2 z/OS driver connection issue - The connection ODS_Test was unable to connect to the data source.
- (CDQE-62344) When exporting the dashboard as a PDF file, double-byte characters are not exported properly. When exporting the dashboard as a PDF file set to a Japanese font, the

Japanese characters do not appear. If the setting “Allow to set language font” = OFF, the Japanese characters appear as expected.

- (CDQE-62140) Spectrum indicates that records are malformed after running some dataflows, although Altova XMLSpy says the records are correctly formed.
- (CDQE-62048) In some cases, the information log file path is not retained, despite selecting the "Log file folder" option.
- (CDQE-71420) Spectrum issues a Read XML/XSD validation error.
- (CDQE-72507) The DBLoader stage causes a "Value too large for column" error.
- (CDQE-73502) Unable to load the decimal value of TIMESTAMP.
- (CDQE-79087) Discovery halts at a point during semantic analysis in cluster environment, when run on multiple connections.
- (CDQE-79121) Insert, update, and delete operations are not working in the Netsuite connector.

Enterprise Designer

- (CDQE-28244) Unable to edit an expression in Conditional Router if the expression was created in a different locale.
- (CDQE-56311) Directories defined in directory access could not be opened in "Read from file." Currently, if you defined the same name for a datasource FTP connection and the Directory Access (Security > Directory Access), you could not access files in a dataflow from Remote Machine (Read from File, Write to File stages) in Enterprise Designer. We suggest this workaround: Recreate the existing FTP connection with a different name from the Directory Access, or recreate the Directory Access with a name other than "FTP."
- (CDQE-70303) Ungrouped embedded dataflow displays as unknown stage. This is fixed by refreshing Enterprise Designer.

Enterprise Tax Module

- (EGMI-4139) When running ETM on Linux RHEL 7.6 and using Internet Explorer 11 , the display may become unreadable when selecting a data file location. The workaround is to use another browser when running ETM such as Chrome.

Geocoding

Enterprise Geocoding Module

- (EGMI-1809) On SUSE 11, Management Console does not get updated when you import updated EGM service options using CLI.

- (EGMI-1808) Reverse geocoding does not return longitude/latitude candidates when Override default options is selected (default) and Keep multiple matches is not selected. As a workaround, either clear the Override default options check box or check the Keep multiple matches check box.
- (EGMI-1807) The Locale feature is not honoring a non-EN setting when reverse geocoding multiple countries.
- (EGMI-1595) Reverse geocoding returns a candidate even when the max candidate = 0.
- (EGMI-1481) Whenever a new database is added from Resources menu in Management Console, its stage is not shown in the Services menu until the browser is refreshed.
- (EGMI-1462) Database list does not display properly in Firefox.
- (EGMI-4074) No validation occurs on incorrect path in CLI egmGlobaldbResource.txt. CLI creates database on Management Console without giving an error. When you geocode, a null pointer exception will occur.
- (EGMI-4130) Exceptions may occur when saving changes to preferences in EGM USA. Press **F5** to refresh the screen and the error will go away.

Global Geocoding Module

- (EGMI-3033) USA data: GGM issues an exception when trying to geocode USA data containing Delivery Point Validation (DPV). To work around this issue, put the DPV and LACSLink files in a separate directory.
- In Management Console, when choosing EGM Global datasets to add as a resource, avoid clicking the check box at the top of the list of available datasets unless you know you have enough memory to consume the data.

  If the added datasets contain more than 250 options, Spectrum does not expose REST and SOAP services. You can still batch geocode with Enterprise Designer.

Global Addressing Module

- The Global Addressing Module requires the Q1 2019 data refresh for the Spectrum™ Technology Platform 2019.1 release and new Spectrum™ Technology Platform releases going forward. The Q3 2019 data refresh is recommended.
- (CDQE-78770) An issue occurs when the Global Address Parser parses some French addresses that contain street names that are also city names. For example, in the address **"10 Avenue de Colmar 68100 Mulhouse France"**, "Avenue de" is predicted as the street name and both "Colmar" and "Mulhouse" are predicted as city names. The expected behavior is that **"Avenue de Colmar"** should be predicted as a street name in the city **"Mulhouse"**. Additionally, only "Mulhouse" should be predicted as the city name. France includes multiple instances of street names that are identical to city names. Four minimum fields (city, state, postal code, and country) are not being supported in the France address parser.

Machine Learning Module

- (CDQE-68986) In both the Linear Regression and Logistic Regression stages, the Coordinate Descent Naive solver does not work.

Management Console

- (CDQE-62267) Lowering the "Remote Component Pool Size" in Management Console for “Location Intelligence” and running the workflow leads to an I/O exception error.

Server

- If you do not have your own CA-certified certificates, you will see an error when browsing with Internet Explorer to access Spectrum Technology Platform’s Welcome, Management Console, or Metadata Insights pages, with Pitney Bowes provided trust certificates:

```
The security certificate presented by this website was issued for a
different website's address. The security certificate presented by this
 website was not issued by a trusted certificate authority. Security
certificate problems may indicate an attempt to fool you or intercept
any data you send to the server. You can safely select “continue to
this website,” without compromising your system’s security.
```

- (CDQE-55352) Spectrum 11.1 Aggregator Stage includes/returns null Issues.
- (CDQE-62267) Lowering the "Remote Component Pool Size" in Management Console for Location Intelligence (Spatial), then running a workflow causes an I/O exception error.
- (CDQE-63234) At this time, Java heap memory settings are not retained in the wrapper.conf file after upgrading to the latest release of the Spectrum™ Technology Platform. To save your settings, back up your wrapper.conf and container.properties files before you re-install or upgrade.
- (CDQE-70303) When you ungroup an embedded dataflow, it is displayed as an unknown stage.
- (CDQE-72439) Service pool is not refreshed when a subflow used in a service is updated.

Spatial and Routing Module

This section lists known issues for the Spatial Module, which includes routing.

JDK: Spectrum no longer installs with a JDK because Oracle does not freely distribute Java. The Spectrum installer prompts for the JVM location on the server machine so you must download and

install either Azul or Oracle JVM before installing Spectrum. For a list of supported JDK, refer to the Spectrum Technology Platform Installation Guide for Windows or Linux.

Azul JDK on Linux: Users with Azul JDK on Linux require Lucida fonts for Spatial map rendering. Past releases installed this font with the Java Development Kit, which is no longer included with Spectrum. To obtain this font family, download and install the Zulu Commercial Compatibility Kit (ZCCK). Download and install instructions can be found at **https://www.azul.com/products/zulu-and-zulu-enterprise/cck-downloads**.

Single Sign-On: When Single Sign-On is configured for Spectrum, accessing JavaScript demo pages takes you through a sign-on flow to Active Directory Federation Services (ADFS), which prompts for a second log in. Logging in again gives access to samples.

Spatial data queries: Lowering the **Remote Component Pool Size** requires restarting the Spectrum server. Lowering the **Remote Component Pool Size** in Management Console (under **Resources**, **Spatial**) and running the workflow without restarting the server leads to an IOException error.

Setting security: New installations do not include security permissions in Management Console on the Spatial component (to let users who are not administrators change the spatial pool size, for example). This is a known issue for this release.

MISQL and Oracle 11g: Oracle 11g reports an invalid identifier error on a Spatial column with a lowercase table alias name when used in a MISQL search. To work around this, use an uppercase table alias in a MISQL search with Oracle 11g.

Universal Addressing Module

- (CDQE-7539) Incorrect result codes returned for city and state as "V" as opposed to expected "C".
- (CDQE-7583) Dropped address information not being returned in the AdditionalInputData field when using LACS/Link conversion.
- (CDQE-7654) For addresses that are LACS/Link converted, the output fields (xxxx.Input) contain the corrected address instead of the input address.
- (CDQE-8438) Validate Address is not returning the ISO country name for Lao People's Democratic Republic and Côte d'Ivoire.
- (CDQE-8872) Validate Address omits RRHC contents on some rural route addresses.
- (CDQE-9583) French Countries are truncated to 32 bytes in the output file.
- (CDQE-9682) Universal Addressing Module unable to validate address in Elmwood Park, NJ with a hyphen in the house number.
- (CDQE-9762) Address in Dallas, TX is returning a value of "V" in the StateProvince.result field even though no state was provided on input.
- (CDQE-10055) An address is concatenated and returned in the AddressLine1 field when the mixed casing option is on.
- (CDQE-10092) Incorrect French ISO country name was found in database.
- (CDQE-10120) Address that matches the database fails to match on AddressLine1.

- (CDQE-10470) City.Result is returning different results based on prior record processed.
- (CDQE-11095) Validate Address returns improper directional results when matching base and returning alias and vice versa.
- (CDQE-11850) Validate Address does not return a confidence score of 100 for an input address that is not changed during validation.
- (CDQE-12467) Validate Address is returning incorrect results and unavailable results when multiple results are expected.
- (CDQE-12653) Apartment information is missed when there is additional information in AddressLine2.
- (CDQE-15728) Normalized address line keeps growing when used as input to Validate Address.
- (CDQE-27149) Validate Address is incorrectly capitalizing "La" in La Crosse WI to LA Crosse WI.
- (CDQE-29859) A particular SOAP request to Validate Address takes a long time to process.
- (CDQE-31722) Get Candidate Addresses web service request is not returning multiple results as expected.
- (CDQE-34349) HouseNumber.Result is returning "V" even when the Validate Address stage does not provide a House Number.
- (CDQE-34456) Addresses in Colorado Springs, CO return unexpected value in LeadingDirectional.Result and TrailingDirectional.Result.
- (CDQE-35855) Unable to validate an address in Lafayette, LA.
- (CDQE-37168) Umlauts and accents are missing from addresses in Quebec.
- (CDQE-37836) Multiple addresses should be returned for specific addresses in New York but are not.
- (CDQE-38703) Incorrect apartment number for an address in White Plains, NY.
- (CDQE-44110) Validate Address Global not validating to the correct address.
- (CDQE-44426) Multiple address suggestions are returning same output for an address in Clifton Park, NY.
- (CDQE-44519) Issue with a Puerto Rico address not returning expected results.
- (CDQE-49087) An address in Bridgeville, PA is not being matched correctly.
- (CDQE-49257) Validate Address returning inconsistent responses for an address in Woodstock, CA.
- (CDQE-51856) Validate Address did not standardize specific addresses in Puerto Rico.
- (CDQE-55006) Address is being returned with 92% confidence even though the Universal Addressing Module is not changing any fields.
- (CDQE-57051) Issue occurred with unique ZIP Code processing for specific addresses.
- (CDQE-57765) Spectrum Validate Address correcting city and state but sometimes marking state as C(corrected) and sometimes as V(validated).
- (CDQE-57836) Issue occurred with a LACS field change.
- (CDQE-60786) Get Candidate Addresses is returning some city names with French characters which should not be there and the returned values are displaying in upper case.
- (CDQE-62335) Validate Address returning incorrect city return code for specific addresses.
- (CDQE-62508) Validate Address incorrectly returning warning messages in some instances.

- (CDQE-65206) Issue occurred with some Japan address where building name and company name were not processed correctly.
- (CDQE-65394) Get Postal Codes stage is not returning results for an address in Richmond Heights, OH.
- (CDQE-66381) The input postal code is being returned in the City field and the City.Input field when it should be returned in the PostalCode and PostalCode.input fields for an address in Colorado Springs, CO.
- (CDQE-69797) Validate Address is returning incorrect address for an address in Brooklyn, NY.
- (CDQE-70747) Match results in house number are changing with no indication as to why change occurred for an address in Camillus, NY.
- (CDQE-75152) Municipality RC not being set when municipality has been corrected for a Canadian address in St. John's NL.

Universal Name Module

- (CDQE-37883) Open Parser table missing Spanish names Apostoles and Covadol.
- (CDQE-36916) Open Name Parser fails to parse a conjoined name.
- (CDQE-14657) The name JOHN D does not parse correctly.

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