



An Overview of the ArcIMS[®] Data Delivery Extension

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An Overview of the ArcIMS Data Delivery Extension

The ESRI® ArcIMS® Data Delivery extension enables geographic information system (GIS) data publishing for ArcIMS. It allows ArcIMS users to make their data available in a wide variety of standard spatial formats. End users can translate the data being viewed to a desired spatial output format and projection, then download the translation results to their desktop. The results include feature attribute data supported by the chosen output format.

The Data Delivery extension uses Web-based technologies to provide this real-time distribution of spatial data. It performs translation requests using proven Feature Manipulation Engine (FME) technology from Safe Software. Safe Software is a leading supplier of spatial data translation software for the geospatial market.

Data Delivery Extension and ArcIMS

The Data Delivery extension is an extension product to ArcIMS. It is architecturally independent of ArcIMS but can be configured to work with ArcIMS. The integration requires minor modifications to the ArcIMS HTML Viewer. The presence of the Data Delivery extension has a minimal impact on the operation of an existing ArcIMS installation. The Data Delivery extension can be installed on the same or a different machine from ArcIMS, which allows flexibility in the use of hardware resources.

The Data Delivery extension maintains an independent, parallel view of the same source data viewed by ArcIMS and does not "go through" ArcIMS to access that data.

The main steps involved in installing the Data Delivery extension follow:

- Install and configure ArcIMS with a supported Web server and servlet engine.
- Install and configure the Data Delivery extension.
- Verify that the Data Delivery extension was installed correctly using supplied sample data.
- Configure the Data Delivery extension to read the same source data as ArcIMS.
- Configure the corresponding ArcIMS Web site for the Data Delivery extension.

Data Delivery Extension Features

The Data Delivery extension provides the following features:

- Translates to many FME-supported formats and coordinate systems

- Reads data from multiple sources that can have different formats and/or coordinate systems
- Performs parallel translations when multiple FME Servers are available
- Supports selective load distribution with multiple FME Servers based on a number of selection criteria
- Automatically restarts failed component processes
- Sends custom e-mail notification of translation results to end users
- Provides filtering to delay/block complex requests
- Provides application program interfaces (APIs) and accessible HTML, JavaScript, and FME mapping file code to allow customized access to and use of Data Delivery extension components

Data Delivery Extension Architecture

The Data Delivery extension consists of the following components:

- Translation Servlet
- QServer
- FME Server (FME licensed to run in its server mode)
- Process Monitor

Each of these components is described below.

Translation Servlet

The Translation Servlet is a Java servlet run by an independent servlet engine bundled with and internal to the Data Delivery extension.

In operation, the Data Delivery extension Web page order form sends a translation request encoded as an HTTP URL string to the Translation Servlet. The Translation Servlet builds an FME translation command from the parameter values contained within this URL and sends the command to the QServer (described next) for processing.

Once translation results are available, the Translation Servlet returns a Web page that includes a link pointing to the compressed translation results. Result delivery is then accomplished as a standard Web server download to the user via the embedded link.

QServer

The QServer is a stand-alone Java application that queues requests sent to it from the Translation Servlet and sends the requests to available FME Servers that are registered with the QServer.

If translation requests arrive while the FME Server is busy performing a translation, the QServer queues the requests and sends them to the FME Server when it becomes available again.

Multiple FME Servers can register themselves with the QServer, allowing parallel translations to be performed. This also enables the QServer to apply selective load distribution, wherein requests are sent to different FME Servers based on their complexity, selected source themes, desired output format or FME Server instance, or host name.

The QServer dynamically accepts registration requests from FME Servers as they come online while it runs. It does not require a restart to accept new FME Servers.

FME Server The FME Server is responsible for performing the requested translations and storing the compressed translation results on the Web server for subsequent download by the user.

As its name implies, the FME Server runs in server mode. Upon startup the FME Server registers itself with the QServer (described above), indicating that it is available to perform translations. It establishes and maintains a continuous network connection with the QServer and performs translations requests as they arise.

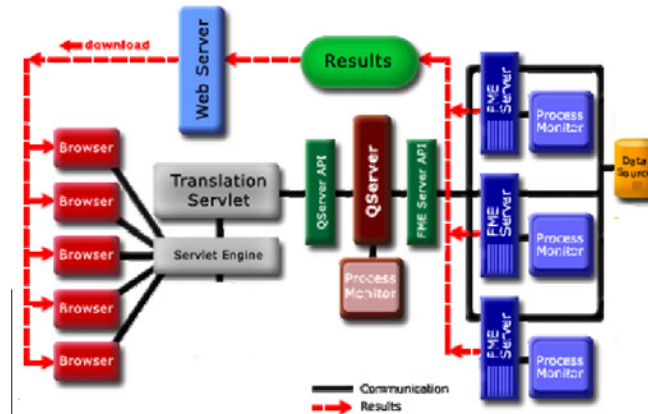
FME Server operation is highly configurable and includes the ability to perform arbitrary operating system commands both before and after each translation is performed. It also supports automatic results deletion on a periodic basis.

Process Monitor The FME Server is responsible for performing the requested translations and storing the compressed translation results on the Web server for subsequent download by the user.

The Process Monitor is a stand-alone Java application that starts the other Data Delivery extension components and automatically restarts them if they terminate for any reason. This enables a degree of fault tolerance to be built into the system.

Data Delivery extension component relationships are shown in Figure 1 below.

Figure 1
Data Delivery Extension Architecture



- Notes for Figure 1**
- Multiple browsers are shown at the far left. In a Data Delivery extension environment, each of these would be running the ArcIMS HTML Viewer and translation requests would originate from these points.
 - A multiple FME Server configuration is shown having three FME Servers.
 - The Process Monitor is shown monitoring the QServer and the FME Servers. It could also be configured to monitor the servlet engine running the Translation Servlet, which is usually done in typical configurations.
 - Although a single data source is shown at the far right, the Data Delivery extension can also be configured to read from multiple data sources.

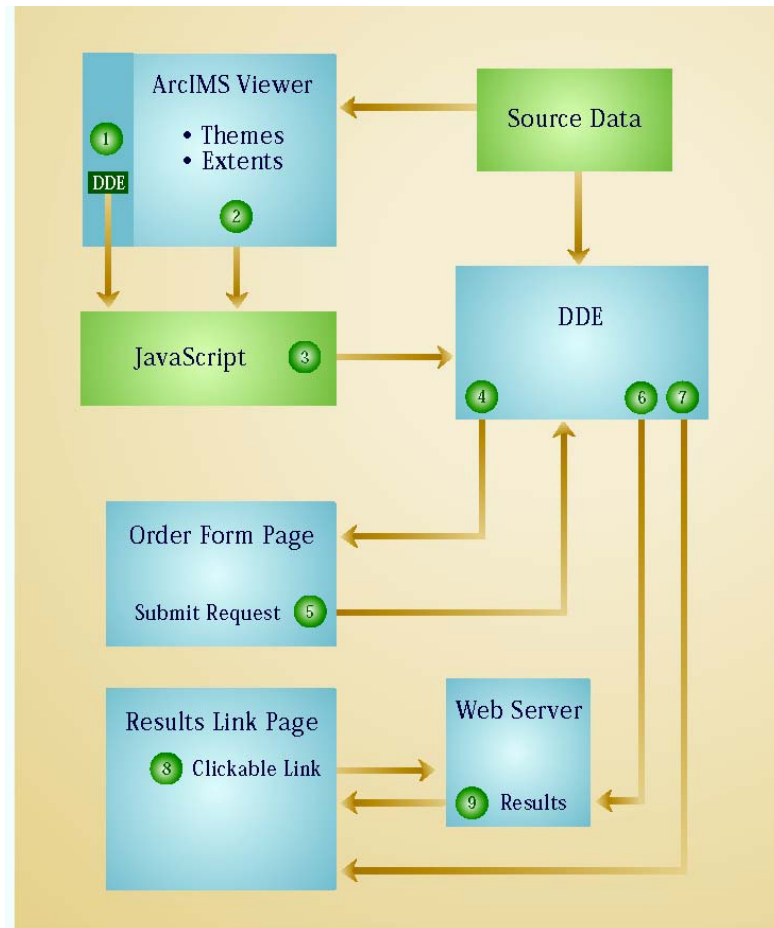
Data Delivery Extension—ArcIMS Integration

Integrating the Data Delivery extension with ArcIMS requires only minor modifications involving a small number of new and modified files. The Data Delivery extension documentation fully describes the steps involved to accomplish this.

Once the required files are in place, a new toolbar button is created in the ArcIMS HTML Viewer. The user first manipulates the ArcIMS Viewer (select/zoom/pan) to display the desired themes in the area of interest. Once this is done, the new Data Delivery extension button is clicked to initiate the translation request process.

Figure 2 below illustrates the sequence of operations that occurs between ArcIMS and the Data Delivery extension when a translation request is processed.

Figure 2
Request–Response Flow in a Typical Data Delivery Extension Setup



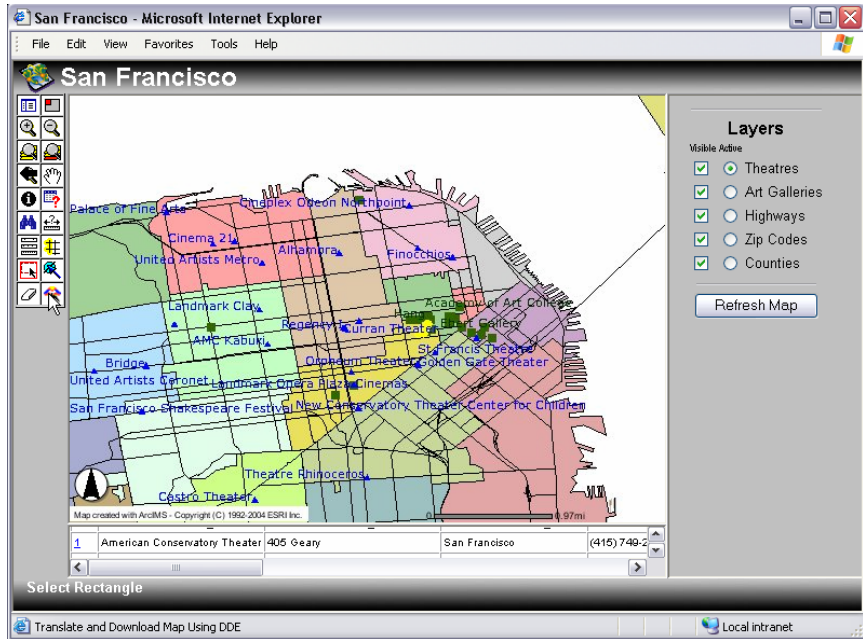
1. User clicks the Data Delivery extension button in the ArcIMS Viewer to run JavaScript code.
2. JavaScript code uses the ArcIMS HTML API to obtain the selected themes and area of interest extents being viewed within the ArcIMS Viewer.
3. JavaScript code sends a request for the order form to the Data Delivery extension, including in the request the selected themes and extents.
4. The Data Delivery extension sends the order form page to the browser that opens it in a separate window. The form is prefilled by the Data Delivery extension with the themes and extents selected in the ArcIMS Viewer.
5. User selects the desired output format and coordinate system in the order form, then submits the request to the Data Delivery extension.

6. The Data Delivery extension performs the requested translation and stores the compressed results on the Web server.
7. The Data Delivery extension sends the results link page to the browser, replacing the order form page in the same window. The results page contains a clickable link to the results stored on the Web server.
8. User clicks the link, sending a standard download request for the results file to the Web server.
9. The Web server downloads the requested results file to the user's browser.

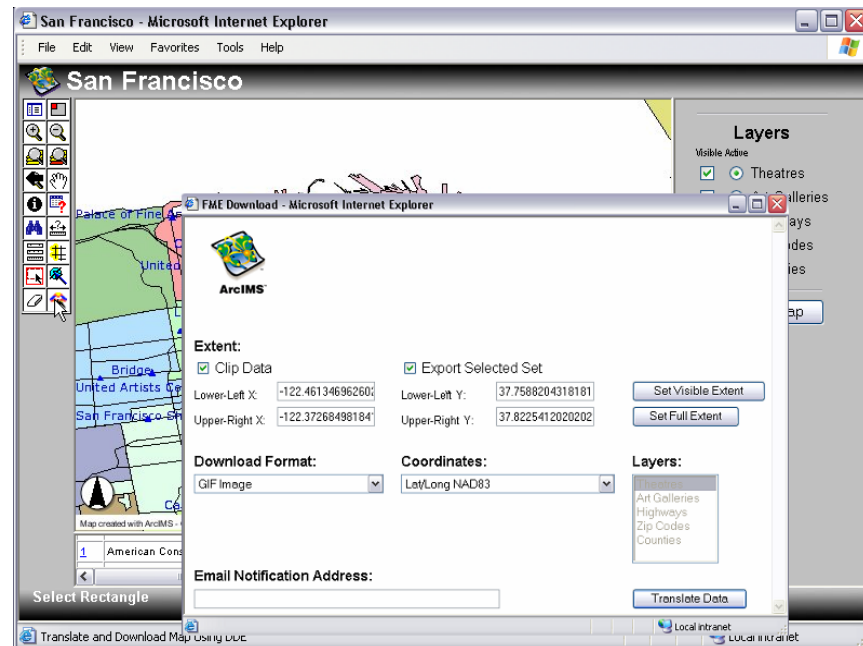
The user's experience in progressing through these steps is shown in Figure 3.

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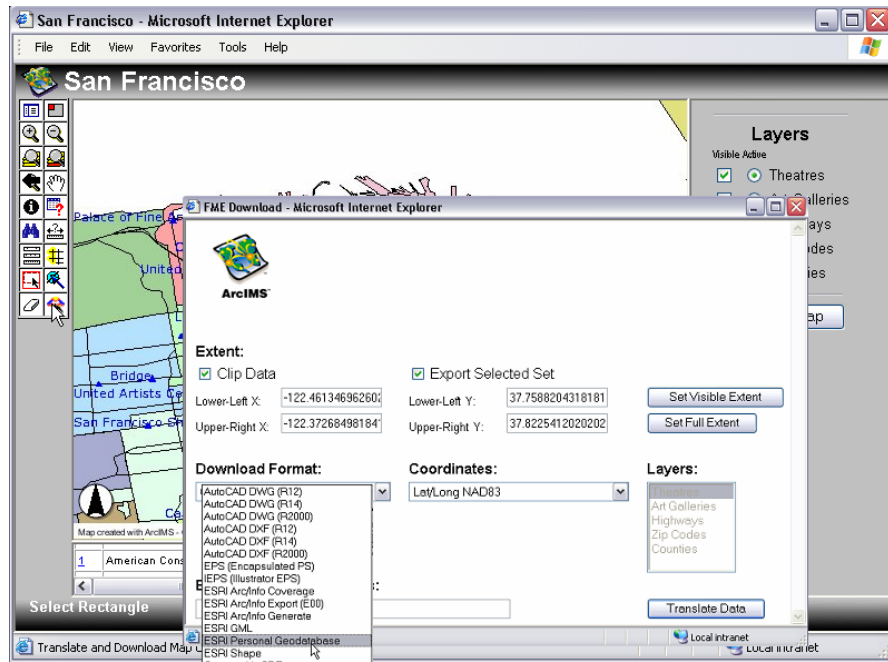
Figure 3
A Storyboard View of a Typical User Interaction
With an ArcIMS Server Implementing the Data Delivery Extension



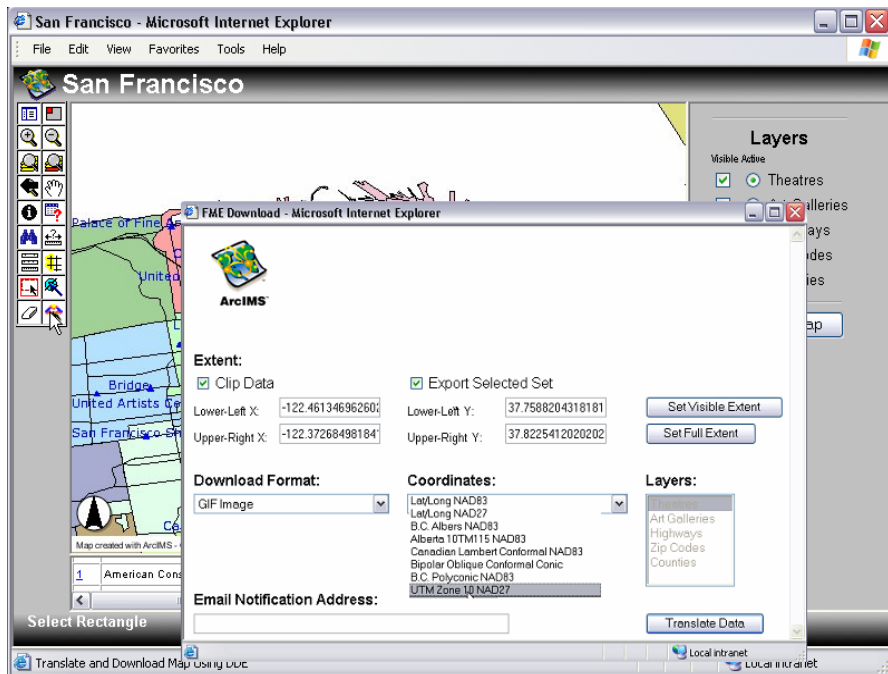
Click the Data Delivery extension Download toolbar button.



Clicking the button opens the Data Delivery extension data download form.

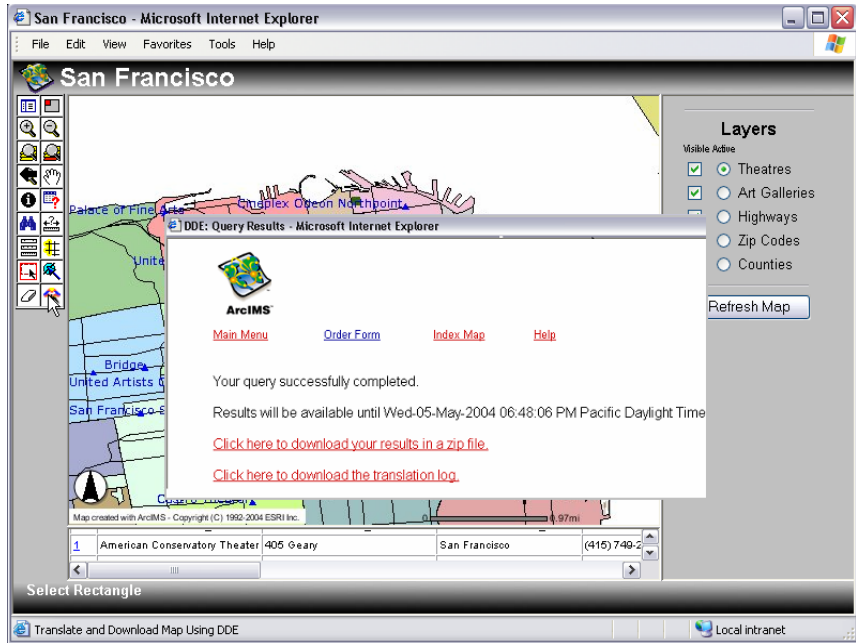


Choose the desired format.

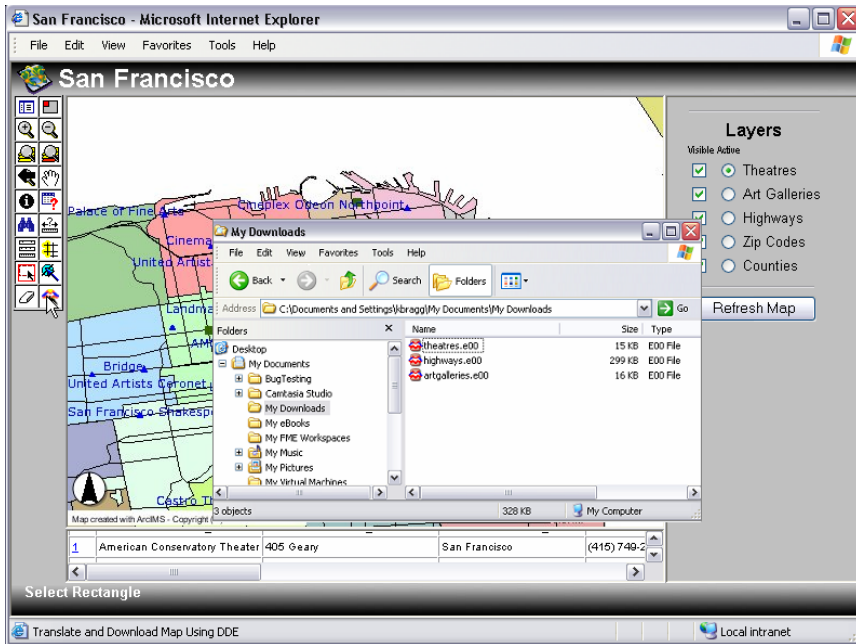


Choose the desired coordinate system.

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A Download dialog box that allows access to a zip file containing extracted data appears.



A view of the zip file containing the extracted data in the desired format and projection is shown.

Frequently Asked Questions

What downloadable formats does the Data Delivery extension support?

- Adobe Illustrator (Encapsulated PostScript [EPS])
- Autodesk AutoCAD DWG/DXF
- Autodesk MapGuide SDL
- Design Files (DGN) (Bentley/Intergraph)
- Design Files (V8)
- EPS
- ESRI ArcInfo® Coverage
- ESRI ArcInfo Export (E00)
- ESRI ArcInfo Generate
- ESRI GML
- ESRI Shapefile
- Geographix CDF
- GML 2
- MapInfo MID/MIF
- MapInfo TAB
- PenMetrics GRD
- Raster Image (PNG/GIF)
- Scalable Vector Graphics (SVG)
- VML
- VRML

Since this extension is jointly developed with Safe Software, who sells and supports the extension?

The extension is jointly developed with Safe Software; however, ESRI licenses and supports the extension.

What is the extracted data written to?

The extension writes data into a zip file to a location specified by the user.

Can imagery be extracted using the ArcIMS Data Delivery extension?

No. Only vector data is supported.

How is the areal extent of the extracted features defined?

Entire layers or features within the visible extent of the map in the HTML Viewer are extracted using the off-the-shelf interface.

What data sources does the ArcIMS Data Delivery extension support?

- ESRI ArcSDE® 8.x/Spatial Database Engine™ (SDE®) 3.x
- ESRI Personal Geodatabase
- ESRI Multiuser Geodatabase
- ESRI Shapefile