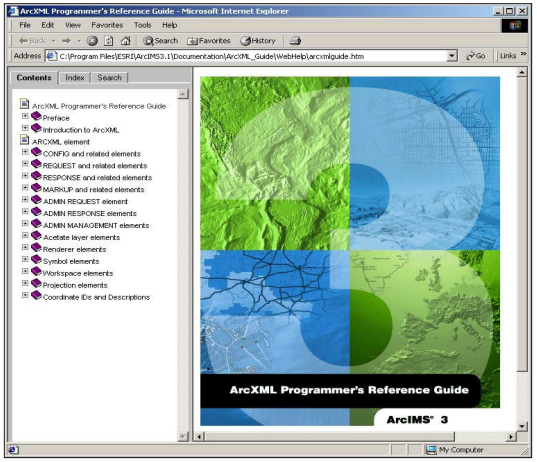
# Extending ArcIMS Using ArcXML —*Rendering*

Tutorial 1

This is the first of three companion tutorials for "Extending ArcIMS MapServices Using ArcXML," an article by Mark Ho that appeared in the January–March 2002 issue of *ArcUser* magazine. This tutorial discusses editing and adding ArcXML elements and attributes in a map configuration file to change the rendering of feature layers within a MapService. These edits can be typed into the map configuration file using a simple a text editor or modified elements and/or attributes can be copied and pasted directly from a text file, Tutorial1.txt, that is included with the sample dataset and located in the C:\Tutorial\Axlfile folder. If you choose to cut and paste from this file, do not add any special formatting (e.g., bolded characters, special fonts).




*The* ArcXML Programmer's Reference Guide *provides invaluable information about all ArcXML elements, attributes and the relationships between them.*

### What You Will Need

To successfully complete this tutorial, you must follow the instructions outlined in "Setting Up the Tutorials," a PDF document available from the *ArcUser Online* Web site. When finished setting up, you will have

- ArcIMS Administrator opened with the BritishColumbia Image MapService running
- The Administrator Message Console opened
- A Web browser running the Bcsite HTML Viewer
- A text editor with map configuration file (Bc.axl) open
- A version of the *ArcXML Programmer's Reference Guide* available

### Rendering Railroad Symbols

First you will modify how ArcIMS renders railroad symbols. Instead of symbolizing line features using a Railroad line type in ArcIMS Author, you will add attributes to the HASHLINESYMBOL element that will change how railroad lines are drawn. This process illustrates how additional attributes to an ArcXML element can significantly alter how features are rendered.

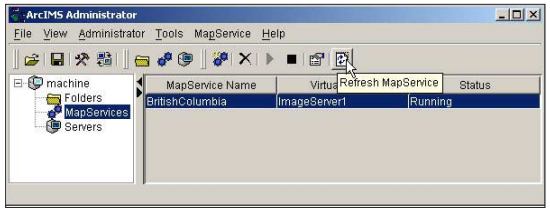
1. Make the text editor the active application.
2. In the map configuration file, Bc.axl, use the text editor's Find utility to locate the HASHLINESYMBOL element inside the railroad's LAYER element. Only the color of the railroad is defined. Adding attributes to this element will redefine the symbology of the line.

3. Open the *ArcXML Programmer's Reference Guide.*
4. Click the Index tab, type in HASHLINESYMBOL, and double click on the highlighted entry to invoke the documentation on this element in the right pane of the interface.
5. The entry for HASHLINESYMBOL contains descriptions for the interval and width attributes. The values for these attributes, set at the default of 8, will be lowered to 2.
6. In the text editor, add the attribute–value pairs shown in Figure 1 to the HASHLINESYMBOL element and save the Bc.axl file as text only (no formatting).
7. Make ArcIMS Administrator active. From the MapServices Manager, select the

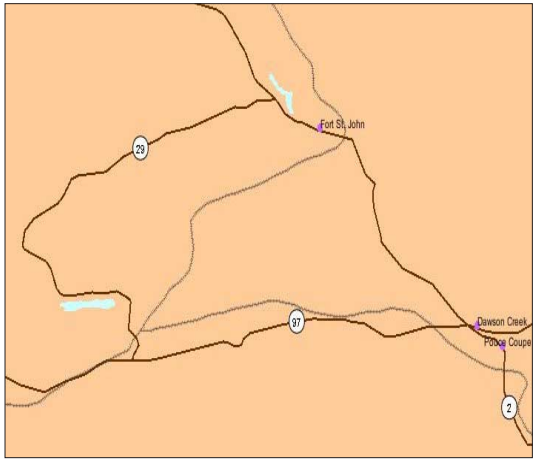
```
Figure 1
<LAYER type="featureclass" name="Railroads" visible="true"
id="3">
<DATASET name="rails" type="line" workspace="shp_ws-0" />
<SIMPLERENDERER>
  <HASHLINESYMBOL color="64,64,64" width="2" interval="2" />
</SIMPLERENDERER>
</LAYER>
```

BritishColumbia MapService and refresh the MapService by clicking the Refresh MapService button. Any edits to the map configuration file will not be displayed until the MapService is refreshed. If the MapService fails to refresh, use the Administrator Message Console to locate any errors made while editing the map configuration file. Do **not** proceed to the next step until the BritishColumbia MapService is running properly.

8. Open the Web browser and completely refresh the tutorial Web site **(http://your_machine_name/website/bcsite).** To completely refresh an ArcIMS Viewer, retype the entire URL or close and reopen the Web browser. In Internet Explorer, Ctrl + F5 completely refreshes an HTML Viewer. Notice how the rendering of the railroad line has changed. Experiment by changing values of other HASHLINESYMBOL element attributes to discover other ways a railroad line feature can be drawn.




*Click the Refresh MapService button in ArcIMS Administrator if changes are made to the map configuration file.*




*Adding the width and interval attributes to the HASHLINESYMBOL element changes how railroad lines are rendered.*

### Applying Gradient Polygon Fills

Using the GRADIENTFILLSYMBOL element you can render polygon feature layers using a color variance between a defined start and end colors. In this exercise, you will apply a gradient fill, light green to dark green, to the Parks layer.

1. In the text editor, reopen Bc.axl, the map configuration file, if it is not already open.
2. Find the SIMPLEPOLYGONSYMBOL element inside the Parks' LAYER element.
3. Delete this element or insert comment characters <!-- and --> around it to remove this element from the map configuration file.
4. Add the GRADIENTFILLSYMBOL with the attribute–value pairs shown in Figure 2 and save the Bc.axl file.
5. In ArcIMS Administrator, refresh the BritishColumbia MapService.

```
Figure 2
<LAYER type="featureclass" name="Parks" visible="true" id="1">
<DATASET name="parks" type="polygon" workspace="shp_ws-0" />
<GROUPRENDERER>
  <SIMPLERENDERER>
    <!-- <SIMPLEPOLYGONSYMBOL fillcolor="51,102,51"
boundary="false" /> -->
    <GRADIENTFILLSYMBOL type="vertical" startcolor="0,255,0"
     finishcolor="51,102,51" />
  </SIMPLERENDERER>
```


*The GRADIENTFILLSYMBOL element renders polygon features with a variant color scheme.*

6. In the Web browser, completely refresh the Bcsite Web site.

The Parks layer will be rendered as a ramped green fill. Try changing the RGB values for the start and end colors. The *ArcXML Programmer's Reference Guide* lists the types of gradient fills ArcIMS supports.

**Using TrueType Marker Symbols**

ArcIMS Author allows you to render point features with predefined symbols such as circles, squares, triangles, crosses, or stars or use an image to represent a point feature. Incorporating a symbol from a TrueType font, using the TRUETYPEMARKER-SYMBOL element, is another option. In this portion of the exercise, you will render the Cities layer using an industrial symbol from the ESRI Business font.

1. In the text editor, reopen the map configuration file, Bc.axl.
2. Find the SIMPLEMARKERSYMBOL element inside the Cities' LAYER element.
3. Delete or insert comment characters around the SIMPLEMARKERSYMBOL element to remove this element from the map configuration file.
4. Add the TRUETYPEMARKERSYMBOL element with the attribute-value pairs as

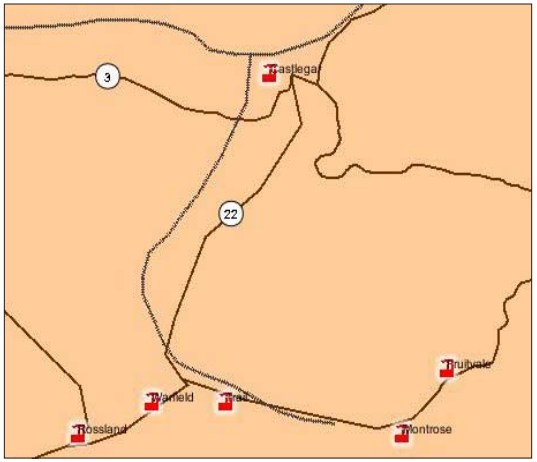
shown in Figure 3. Save Bc.axl file using the text editor.

5. In ArcIMS Administrator, refresh the BritishColumbia MapService.

```
Figure 3
<LAYER type="featureclass" name="Cities" visible="true" id="4">
<DATASET name="cities" type="point" workspace="shp_ws-0" />
<GROUPRENDERER>
  <SIMPLERENDERER>
    <!-- <SIMPLEMARKERSYMBOL color="204,102,255" width="8" />
-->
    <TRUETYPEMARKERSYMBOL fontcolor="255,0,0" fontsize="20"
     font="ESRI Business" character="67" glowing="255,255,255"/>
  </SIMPLERENDERER>
```

6. In the Web browser, completely refresh the Bcsite Web site.

The cities features will appear as industrial symbols. If you do not have the ESRI Business font, try using another ESRI font or a Windows symbols font such as Wingdings. Try changing the character attribute values using ASCII values between 32 and 255. To learn how to rotate marker symbols, consult the *ArcXML Programmer's Reference Guide.*




*You can render a point feature using any symbol from a TrueType font.*

**Render a Specific Feature Based a Tabular Value**

ArcIMS Author allows you to render the features in a layer using one symbol, graduated symbols, or unique symbols. Using the EXACT element within the VALUEMAP RENDERER element lets you render a specific feature based on an attribute field value. The OTHER element is used to set the rendering of all other features that do not have that attribute value. In this example, you will specify a TrueType marker symbol for the City of Victoria, the capital of British Columbia, and use industrial symbols from the last example for all other cities.

1. In the text editor, reopen the map configuration file, Bc.axl, if necessary.
2. Find the SIMPLERENDERER elements inside the Cities' LAYER element.
3. Delete this element or insert comment characters for both the opening and closing SIMPLERENDERER elements to remove this element from the map configuration file.
4. Add both opening and closing VALUEMAPRENDERER elements and identify the NAME field as the lookup field shown in Figure 4.

```
Figure 4
<LAYER type="featureclass" name="Cities" visible="true" id="4">
<DATASET name="cities" type="point" workspace="shp_ws-0" />
<GROUPRENDERER>
  <!-- <SIMPLERENDERER> -->
  <VALUEMAPRENDERER lookupfield="NAME">
    <!-- <SIMPLEMARKERSYMBOL color="204,102,255" width="8" />
-->
    <TRUETYPEMARKERSYMBOL fontcolor="255,0,0" fontsize="20"
     font="ESRI Business" character="67" glowing="255,255,255"/>
  </VALUEMAPRENDERER>
  <!-- </SIMPLERENDERER> -->
```

5. Add the EXACT and TRUETYPEMARKERSYMBOL elements inside the VALUE MAPRENDERER element to establish the rendering for the City of Victoria as shown in Figure 5.

```
Figure 5
  <VALUEMAPRENDERER lookupfield="NAME">
    <EXACT value="Victoria" label="Capital City">
      <TRUETYPEMARKERSYMBOL fontcolor="0,0,0" fontsize="20"
       font="ESRI Business" character="57" glowing="255,255,0" />
    </EXACT>
    <!-- <SIMPLEMARKERSYMBOL color="204,102,255" width="8" />
-->
    <TRUETYPEMARKERSYMBOL fontcolor="255,0,0" fontsize="20"
     font="ESRI Business" character="67" glowing="255,255,255" />
  </VALUEMAPRENDERER>
```

6. Add the OTHER elements above and below the existing TRUETYPEMARKERSYMBOL to establish the rendering for all other cities as shown in Figure 6.
7. In the text editor, save the Bc.axl file.
8. In ArcIMS Administrator, refresh the BritishColumbia MapService.
9. In the Web browser, completely refresh the Bcsite Web site.


*You can set specific renderers to a feature based on an attribute field value using the EXACT and OTHER elements..*

```
Figure 6
  <VALUEMAPRENDERER lookupfield="NAME">
    <EXACT value="Victoria" label="Capital City">
      <TRUETYPEMARKERSYMBOL fontcolor="0,0,0" fontsize="20"
       font="ESRI Business" character="57" glowing="255,255,0" />
    </EXACT>
    <!-- <SIMPLEMARKERSYMBOL color="204,102,255" width="8" /> -->
    <OTHER label="City">
      <TRUETYPEMARKERSYMBOL fontcolor="255,0,0" fontsize="20"
       font="ESRI Business" character="67" glowing="255,255,255"/>
    </OTHER>
  </VALUEMAPRENDERER>
```

Zoom in on the City of Victoria, the most southern city in British Columbia. The symbol marker for Victoria should appear as a capital building. The other cities are shown as industrial symbols. Open the Web site's legend to see how the label attributes for both the EXACT and OTHER elements are utilized.

**Summary**

In this tutorial, you added ArcXML elements and attributes to the map configuration file and extended the rendering capabilities of an ArcIMS Viewer. The second tutorial discusses how to apply ArcXML elements to enhance feature labeling. For more information on ArcXML elements, see the *ArcXML Programmer's Reference Guide*.