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ArcGIS Schematics SDK Quick-Start Tutorial

ESRI® ArcGIS™ Schematics SDK is a Windows®-based solution that meets network managers' needs for graphically visualizing and manipulating their network data. This software solution can be integrated in all compatible Microsoft® COM development environments.

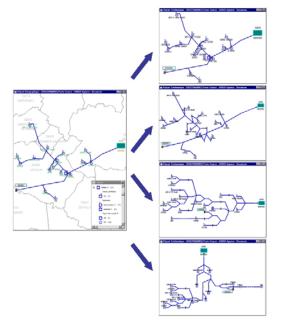
ArcGIS Schematics SDK delivers powerful tools that let you automatically generate a graphic representation of your network using its associated database information. You can analyze networks in geographical, geoschematic, and schematic layouts. It is also a high-end development platform that you can use to rapidly build a variety of graphic custom applications for your network information system. With its advanced functionality, network graphs and diagrams can be produced on the fly.

Powered by its workspace parameters file architecture and its data-driven graphics philosophy, ArcGIS Schematics SDK offers a high degree of flexibility. It is not limited by the evolutions of the data model and by changing database locations.

Included with the ArcGIS Schematics SDK components is ArcGIS Schematics Designer, a graphical user interface (GUI)-based design tool that supports configuration and customization of ArcGIS Schematics SDK.

Also included with ArcGIS Schematics SDK is a set of standard schematic layout algorithms ready to use with network data. ArcGIS Schematics SDK can be customized to support user-specific layout algorithms.

The following screenshots are a set of example schematic views that can be generated using ArcGIS Schematics SDK.



Through an example personal database, this tutorial guide allows you to rapidly get acquainted with the ArcGIS Schematics SDK, visualize the database information, and use some of the powerful ArcGIS Schematics SDK layout tools to generate various schematic representations of the network data.

Using your own definition and connection scheme (i.e., its own workspace parameters ".ini" file built with ArcGIS Schematics Designer), you can quickly connect to your database from within the integrated ArcGIS Schematics SDK.

Installing ArcGIS Schematics SDK

Installation of ArcGIS Schematics SDK will create all of the necessary references to the ArcGIS Schematics SDK components.

The template ".ini" file (C:\Schematics_SDK\Samples\WorkspaceExample\Session\Workspace_Example.ini, by default) will also be created in the installation process. This workspace parameter file has been designed with ArcGIS Schematics Designer and may be tested through the ArcGIS Schematics SDK, such as any ArcGIS Schematics workspace parameters file. This example template file shows different sets of behaviors, connection schemes, and customization choices for the production of schematic network diagrams.

About the DBExample database

The Workspace_Example workspace parameters file has been designed to graphically display the network data described in the DBExample.mdb personal database. The installation process may have copied this database in the C:\Schematics_SDK\Samples\WorkspaceExample\Database\DBExample.mdb folder (default location).

This personal database is composed of four tables:

0

- o "Feeder" table, which has the following 3 fields:
 - OBJECTID: feeder identifier (Integer)
 - X: feeder X-coordinate value (Double)
 - Y: feeder Y-coordinate value (Double)
- "Station" table, which has the following 6 fields:
 - OBJECTID: station identifier (Integer)
 - Feeder: feeder identifier the station belongs to (Integer)
 - X: station X-coordinate value (Double)
 - Y: station Y-coordinate value (Double)
 - NodeType: station type (a variable coded as "A", "B", "C", "D", "E", or "F")
 - NodeSize: station size (Double)
 - "HV_Links" table, which has the following 7 fields:
 - OBJECTID: HV_Link identifier (Integer)
 - FromNodeType: node type the link origin node is connected to (String)
 - FromNodeOID: link origin node identifier (Integer)
 - ToNodeType: node type the link end node is connected to (String)
 - ToNodeOID: link end node identifier (Integer)
 - GeoLength: geographical link length (Double)
 - ListPoints: list of link point coordinates that compose the link path
- o "LV_Links" table, which has the following 9 fields:
 - OBJECTID: LV_Link identifier (Integer)
 - FromNodeType: node type the link origin node is connected to (String)
 - FromNodeOID: link origin node identifier (Integer)
 - ToNodeType: node type the link end node is connected to (String)
 - ToNodeOID: link end node identifier (Integer)
 - LinkRate: ratio value associated with the LV_link (Double)
 - LinkType: link type, a variable coded as "S", "M", or "B" (String)
 - GeoLength: geographical link length (Double)
 - ListPoints: list of link point coordinates that compose the link path

> Opening the Workspace—Example Session

Launch NgDeveloper.exe (by default, C:\Schematics_SDK\Bin\NgDeveloper.exe).

Click the File menu and click Open Schematic Session. Choose the "

C:\Schematics_SDK\Samples\WorkspaceExample\Session\Workspace_Example.ini" workspace parameters file. This will create all of the necessary session data to view and manipulate the network data stored in the "DBExample" personal database.

The Workspace_Example parameters file manages two types of documents:

- MainNet contains the complete network stored in the database.

- FeederNet allows the display of data related to a single given part of the network (i.e., related to a given feeder).

> Opening a Schematic Document

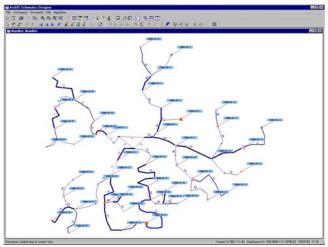
The Workspace_Example parameters file manages two types of documents:

- MainNet contains the complete network stored in the database.
- The second type of document allows you to display data related to a single given part of the network (i.e., related to a given feeder).

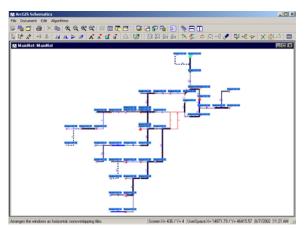
To open a schematic document, click the Document menu and click Open Document Form. The default Select document to open ArcGIS Schematics SDK dialog box opens.

Select document to ope	n	? ×
Document type	MainNet	-
Document name	MainNet FeederNet MainNet	
		_
ОК	Cancel	

Choose one of the two document types available from the Document Type dropdown list and select the desired document name from the Document name dropdown list. Next, select one of the Tile Views tools from the toolbar to arrange your schematic window and click the Fit All button to fit all the schematic objects displayed in the currently opened view.



Finally, use the ArcGIS Schematics SDK layout tools from the toolbar to arrange your network layout.



> Saving a Schematic Document

If your document is saved by using the Save Document command, the position of the nodes and links from the network layout as displayed are retained in the GraphicFolder directory in the ArcGIS Schematics SDK graphic database format. This database is independent from the applicative database (i.e., independent from the DBExample database, here). When a saved document is reopened, the graphic database is synchronized with the application's database, and the modifications (objects created or removed) introduced in the latter are then reflected.

Quick Start Summary

- 1. Launch the ArcGIS Schematics SDK (NgDeveloper.exe).
- Click the File menu and click Schematic Session. Click C:\Schematics_SDK\Samples\WorkspaceExample\Session\Workspace_Example.ini.
- 3. Open one of the predefined schematic documents managed by the opened workspace parameter file.
- 4. Increase the symbol sizes as required and select the desired layout types.
- 5. If you want to store your current network layout, save your document before closing it. If not, your document will be reopened with the default coordinates (those stored in the DBExample database); all changes introduced in the document since it was created (node and link positions) will not be taken into account.

About ArcGIS Schematics SDK toolbars

Press F1 while moving your mouse on any ArcGIS Schematics SDK menu to open the Using ArcGIS Schematics SDK 2.2 Toolbars online Help: the corresponding ArcGIS Schematics SDK command help page will automatically load.

Introducing ArcGIS Schematics Designer

> ArcGIS Schematics Designer Overview

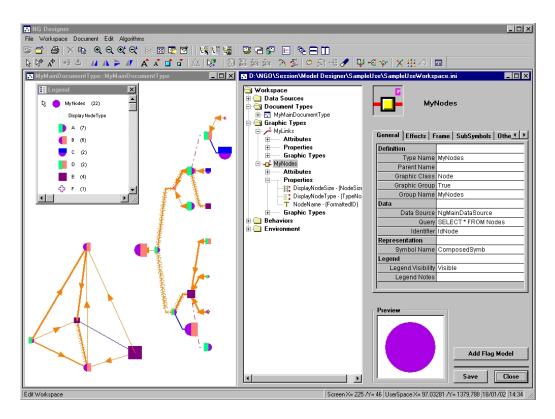
ArcGIS Schematics Designer is an essential component of the ArcGIS Schematics product line.

With this valuable and user friendly modelization interface, you will be able to:

>> Create a schematic workspace parameters file to:

- bring back graphic objects stored in the database,
- create properties to represent them graphically,
- define the document type in which they will be displayed,
- specify the application behaviors...
- >> Edit and update any schematic workspace parameters file created in previous versions

>> **Test instantly your schematic workspace** parameters file: any change is automatically taken into account and can be graphically visualized.



> ArcGIS Schematics Designer Menus

- The "File" menu allows you to access the main session management commands:
- "Open Schematic Session", to open a new schematic session
- "Close Schematic Session", to close the currently open schematic session
- "Print View", to print the currently active schematic view window content
- "Remove objects", to delete the selected graphic objects
- "Copy to Clipboard", to copy the selected graphic objects to the Clipboard
- "Zoom In Mode", to enable the "standard zoom in" mode
- "Zoom Out Mode", to enable the "standard zoom out" mode
- "Logical Zoom In Mode", to enable the "logical zoom in" mode
- "Logical Zoom Out Mode", to enable the "logical zoom out" mode
- "Fit Selected Set", to fit all the selected set graphic objects into the active view
- "Fit All Graphic Objects", to fit all visible objects into the active view
- "Pan Mode", to enable the pan mode
- "Repaint", to refresh the objects in the active view

- "Quit", to close ArcGIS Schematics Designer. If your current workspace's parameters file has been modified without being saved, you will be asked to save it.

- The "Workspace" menu allows you to access the three following workspace commands:
 - "New Workspace", to create a new workspace (i.e., for creating a new workspace parameters file)
 - "Edit Workspace", to edit the workspace parameters associated with the active schematic session
 - "Save Workspace", to save the currently open workspace parameters file
- The "Document" menu includes all the documents and views management commands:
 - "Open Document Form", to open a document
 - "New View", to open a new view for the active document
 - "Refresh Document", to update the currently open document

- "Show/Hide Legend", to turn legend display on or off for the active document

- "Cascade Views", to arrange all open schematic view windows as overlapping tiles

^{- &}quot;Tile Views Horizontally", to arrange all open schematic view windows as nonoverlapping horizontal tiles

^{- &}quot;Tile Views Vertically", to arrange all open schematic view windows as nonoverlapping vertical tiles

The "**Edit**" menu allows you to access text or symbol attribute modification commands, graphic object alignment commands, and copy and delete commands:

- "Selection Mode", to enable the "Selection" mode
- "Edit/Move Mode", to enable the "Select and Move" mode
- "Align Horizontally", to align the selected nodes horizontally
- "Align Vertically", to align the selected nodes vertically
- "No Mirroring", to cancel the symmetry effects applied to the currently active view
- "Y Axis Mirroring", to vertically mirror the objects in the currently active view
- "X Axis Mirroring", to horizontally mirror the objects in the currently active view
- "XY Axis Mirroring", to vertically and horizontally mirror the objects in the currently active view
- "Increase Text Sizes", to enlarge text sizes
- "Decrease Text Sizes", to decrease text sizes
- "Increase Symbol Sizes", to enlarge symbol sizes
- "Decrease Symbol Sizes", to decrease symbol sizes

- "Select Hierarchy", to select a hierarchy of objects starting from a parent node

- "Open Create Object Form", to enable the digitize mode for graphic object creation
- The "Algorithms" menu allows you to access the functions for running smart graph layout algorithms:
 - "Collapse Hierarchy", to collapse objects hierarchically, from a given node
 - "Collapse Selected Set", to collapse a selected set of ArcGIS Schematics graphic objects
 - "Expand by Level", to expand a set of collapsed nodes by one-level increments
 - "Expand All", to expand a selected collapse root node level-wise

- "Remove Link Points", to remove all link points from selected links

- "Find Loops", to find existing loops for the graph in the active view

- "Find Shortest Path", to find the shortest path route between two selected nodes in the active schematic view

- "Find Tree", to find the tree associated with the selected node in the active schematic view

^{- &}quot;Bypass Nodes", to reposition the links in a selected set so as to prevent them from crossing nodes

^{- &}quot;Remove Algorithms Graphic Effects", to remove all highlighting effects from the loops, path, or tree found by an algorithm

- "Orthogonal Layout", to lay out the nodes and links orthogonally in the active schematic view
- "Hierarchical Layout", to lay out the nodes and links hierarchically in the active schematic view

- "Backbone Layout", to lay out the loops around a chosen backbone geometry in the active schematic view

- "Separate Nodes", to separate nodes that are visually very close or near to overlapping in the active schematic view

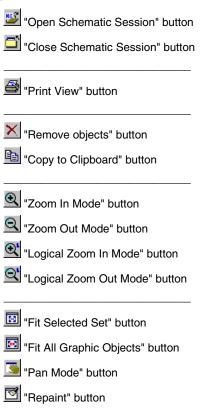
- "Grid Layout", to lay out the nodes so they snap onto an active magnetic grid in the active schematic view

- "Rotate Tree", to rotate the tree associated with the node selected in the active schematic view

- "Open Algo Parameters Form", to open the Algorithms Parameters dialog box

ArcGIS Schematics Designer "Standard" Toolbar

Main Commands



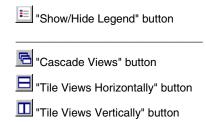
Workspace Commands

- 🔣 "Create a new workspace" button
- Edit the current workspace" button
- 📓 "Save the workspace on disk" button

Document and View Commands

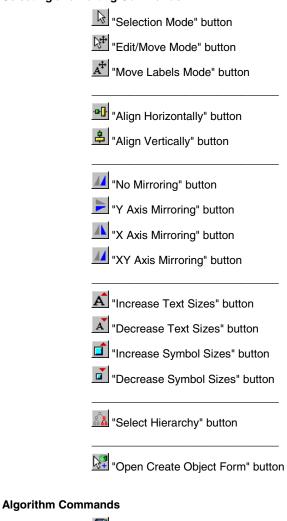


- d "New View" button
- Refresh Document" button



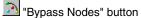
> ArcGIS Schematics Designer "Tools" Toolbar

Selecting and Editing Commands





- E "Collapse Selected Set" button
- ڬ "Expand by Level" button
- 🕮 "Expand All" button



🟂 "Remove Link Points" button

- "Find Loops" button
- Find Shortest Path" button
- خ "Find Tree" button
- IRemove Algorithms Graphic Effects" button
- 😼 "Orthogonal Layout" button
- 📧 "Hierarchical Layout" button
- 🝸 "Backbone Layout" button
- 🔀 "Separate Nodes" button
- "Grid Layout" button
- ⊿ "Rotate Tree" button

I "Open Algo Parameters Form" button

ArcGIS Schematics Designer Main Concepts

What Is a Workspace?

The workspace is the core object in your schematic application. It acts as the central point where access is gained to other objects in the system. The workspace provides access to the schematic components your application manages as data sources, document types, graphic types, etc.

A workspace and its associated characteristics can be created and defined through ArcGIS Schematics Designer or by Visual Basic[®] (VB) programming.

What Is a Document Type?

A network is made up of nodes and links. These nodes and links are displayed in different generic structures called "documents". A document is a collection of schematic views and is related to a single workspace.

A document type is a document model, and it brings together a set of documents that have common characteristics. A document type can inherit from another document type.

To define a document type, you typically declare:

- Its name
- Eventually, the name of its parent document type

You can complete your document definition by defining:

- The query returning all the documents of this type
- The fields used to build up each document identifier for this document type
- One or more attributes associated with this document type

A document type and its characteristics can be created and defined through ArcGIS Schematics Designer or by VB programming.

What Is a Graphic Object Type?

A graphic object type brings together a set of graphic objects that have common characteristics. A graphic object type can inherit from another graphic object type.

When you define a graphic object type, you typically declare:

- The name of this graphic object type
- The class of the graphic objects (node, link, drawing)
- Eventually, the name of its parent graphic object type

You can complete your graphic object type definition by defining:

- The query returning all the graphic objects of this type
- The fields used to build up each graphic object identifier for this type
- One or more attributes associated with this graphic object type
- One or more properties associated with this graphic object type
- One or more "user-datasets" associated with this graphic object type

A graphic type and its characteristics can be created and defined through ArcGIS Schematics Designer or by VB programming.

What Is a Group?

A graphic group is a set of graphic objects that have the same graphic effects. A group is associated with a graphic type. Properties that have an impact on the graphic representation of a network are defined as groups.

When you create a new graphic type, you have to decide if your new graphic object type will be associated with a graphic group or not. Even if you can redefine graphic types as a group at any time, this decision is important. It determines what you will later be authorized to define for your graphic type: when your graphic type is a group, you can define any graphic effects, and you can create any property on it. If your graphic type is not a group, it is impossible!

By default, if a graphic type inherits from another graphic type, and if it is not a group, it inherits the graphic effects and the properties defined for the first of its ancestor graphic object types, which is a group itself.

What Is a Node?

A node is a vertex in a network graph. It is represented by a symbol and may be assigned various graphic (color, fill style, etc.), geometric (scaling, rotation, etc.) or visual (visibility, highlighting, etc.) attributes.

Nodes can have geographic, semi-geographic, or graph coordinates. The coordinate system is independent of the graphic display window. Several nodes may be aligned along the same horizontal or vertical axis.

If the network is thickly populated, several nodes may be compacted into a single compaction node.

Two nodes can have a binding—logical and hierarchical—relationship, which means that certain rules will apply when these nodes are manipulated (e.g., moving or deleting a parent node will cause the associated child node to be moved or deleted accordingly).

What Is a Link?

A link is an edge in a network graph. A link can go through a number of "link points" that modify its path. It is represented either by a direct single line segment or by several line segments passing through one or several link points. The path between two link points may be graphically broken.

All types of patterns may be drawn up along a link path that may also have any given line style (dot, dash, etc.) and width.

A link can have a direction: arrows placed on its start and end points show this.

If a link path goes through one or several nodes, it can be modified so as to allow the nodes to be automatically bypassed.

What Is a Drawing?

Drawings are used to introduce additional graphic or text information relating to the network being represented: title block, frames, messages, and graphic scenery.

A drawing can be a basic (line, rectangle, circle, polygon, and text) or a complex graphic object made up of several basic graphic objects.

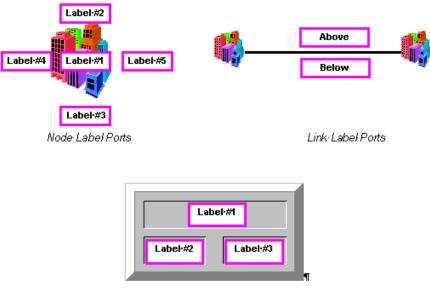
A drawing is created using a CGM-compliant graphic file.

What Is a Property?

Properties are used to define the characteristics of a group of objects that have an impact in the graphic representation of a network. The overall state a network is in is determined by the values taken by the existing set of properties at a given time.

A property is associated with a single group.

Any property can be represented by a label displayed either directly on the objects it applies to or inside a flag associated with these objects. The position of the text is determined either relatively to the objects (above/below, for links) or by a port number (for nodes or flags).



Flag Label Ports

A property created for the sole purpose of displaying a label on an object or inside the flag associated with it is said to be "**textual**".

To associate graphic effects with a property, the possible values of the property must first be specified. If these values belong to a finite set of numbers or of alphanumeric codes, the property is said to be "**discrete**". If the values are simply numeric and indifferent (i.e., they belong to a range of values), the property is said to be "**bounded**".

To assign specific graphic effects to that property, a filter must be defined for each of its possible values. Along with the textual, discrete, and bounded properties, a fourth property—the "**direct**" property—is also available for directly applying a given graphic effect depending on the values taken up by the property itself (e.g., scale factor, symbology, etc.).

The use of properties depends on whether or not its related graphic type is associated with a group. In fact, properties must only be created on a group. For a graphic type that is not a group, you can use properties defined on its ancestors (if they exist) in order to graphically highlight characteristics, but you cannot define new properties for such a graphic type.

So, for a graphic type that is a group, the "Create Property" menu lets you create any property, but for a graphic type that is not a group, you must use the "Associate property" menu that only lets you

associate a property defined for one of the ancestor graphic types with an existing attribute.

What Is a Property Filter?

A **discrete filter** refers to a specific value of a property. It can be assigned a name that may be displayed on its related objects.

One or several graphic effects matching the property value can be specified for each filter. The graphic effects thus defined apply to all the network objects that are then assigned this property value. In the following example, all the links in the network whose "Road Type" property value is equal to "IS" will be represented by a red dotted line.

Filter Name	Property Value	Type of Graphic Effect	Value of the Graphic Effect
MOTORWAY	"M"	Color	Orange
		Line Width	Twice as thick
INTERSTATE	"IS"	Color	Red
		Line Style	Dotted
STATE	"S"	Color	Yellow

Example: The "Road Type" Property and its Fitters

A **bounded filter** corresponds to a range of values a property can take. Besides specifying the lower and higher bounds of the value range, the filter can be assigned a name that can be displayed on the object it is related to.

One or several graphic effects matching the range of values defined for the property can be specified for each filter. The graphic effects thus defined apply to all the network objects that are then assigned a value within the corresponding value range. In the following example, all the links in the network whose "Traffic" property value is equal to "125" will be represented by a pattern composed of two red circles.

Filter Name	Property Lower Bound	Property Higher Bound	Type of Graphic Effect	Value of the Graphic Effect
LIGHT	0	10	Thickness	Twice as thick
			Color	Green
AVERAGE	10	50	Thickness	Three times as thick
				Blue
HEAVY	50	500	Pattern	

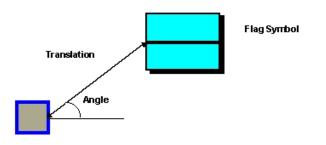
Example: The "Traffic" Property and its Filters

What Is a Flag Model?

A flag model is a generic object used to generate flags that will be placed automatically on network objects.

Each flag model contains the symbol used to represent a given flag, plus automatic placement—angle and translation—attributes.

To create a flag for an object, all you need to do is identify the flag model you want to use.



What Is a Flag?

A flag is a graphic object attached to a network object and containing labels associated with that object.

A flag is automatically inserted on, and attached to, an object according to the rules defined in the model it is based on. You can create your own flag models.

A flag can be associated with any kind of network graphic object (node, link, and drawing). To insert a flag on several objects, you must associate its base model with the corresponding object group.

Different flags based on different models can be associated with the very same object.

When an object is moved, its associated flag is automatically moved. However, moving a flag does not move the object but causes its connecting pole to be redrawn.

What Is a Pattern Model?

A pattern is a symbol that is repeated one or several times along a link path route.

The pattern is drawn on the link according to the rules defined in the model it is based on.

There are three types of pattern styles: continuous, discrete, and origin/endpoint patterns; directed patterns follow the link direction, going from its origin point to its endpoint.

What Is a Behavior?

When you define a behavior you specify how the application will respond to end user action on one of the application objects (i.e., following an event on one such object).

A behavior brings together four elements:

- EventName: an event name (action by end user)
- TypeName: an object type name
- MetaType: a metatype of objects
- Command: a command (response from the application)

which reads: such event (LeftClick, RightClick, etc.) on such object type of such metatype will trigger such command.

Some definitions:

EventName: It is the name of an event to be responded to. Possible event names depend on the
object MetaType. This event name can be a user event name or a predefined ArcGIS Schematics
Designer event name. For more details about ArcGIS Schematics Designer predefined event
names, see "List of ArcGIS Schematics Designer predefined eventnames" Help page.

• **MetaType**: It is the object Metatype to be impacted as Document, View, Graphic, LegendGroup, LegendProperty, or LegendPropertyFilter.

. The Document metatype encompasses all documents of the application, whatever their type. . The View metatype encompasses all of the views created by the application (a document includes one or several views).

. The Graphic metatype encompasses all graphic objects defined in the application whatever their graphic class (Node, Link, Drawing).

- . The LegendGroup encompasses legend entries associated with object groups.
- . The LegendProperty encompasses legend entries associated with properties.
- . The PropertyFilter encompasses legend entries associated with property filters.
- **TypeName**: It is the identifier for the graphic object type, used to filter command triggering. The object type must be defined for the currently open workspace. If the command is to apply to all object types of the MetaType metatype, this identifier is not required. If the metatype is equal to View, the TypeName parameter is set to the name of the document type associated with the views. This document type must be defined for the currently open workspace.
- **Command**: It is the ArcGIS Schematics Designer command to be triggered. This command must be defined for the currently open workspace. ArcGIS Schematics Designer offers a full set of predefined commands, each with its own area of action, which means that it will apply to a given metatype only.

ArcGIS Schematics Designer Example

> Introduction to the ArcGIS Schematics Designer Example

To exemplify ArcGIS Schematics Designer main concepts and functionalities, we are going to build an example based on the database described below:

> About the database used

The ArcGIS Schematics Designer example is exemplified with a database composed of four tables:

- "Nodes" table, with the following six fields:
 - IdNode: node identifier (string)
 - SizeN: node size (number)
 - Type: node type (a variable coded as "A", "B", "C", "D", "E", or "F")
 - SubNet: name of the subnet the node belongs to (a variable coded as "subnet1" or "subnet2")
 - X: coordinate value (number) of the X node
 - Y: coordinate value (number) of the Y node
- "Links" table, with the following six fields:
 - IdLink: link identifier (string)
 - IdNode1: link origin node identifier (string)
 - IdNode2: link end node identifier (string)
 - Rate: ratio value associated with the link (number)
 - Type: link type (a variable coded as "small", "medium", or "big")
 - Length: link length (number)
- o "NewLinks" table, with the following three fields:
 - IdNewLink: link identifier (string)
 - OrigNode: identifier of the link origin node (string)
 - ExtrNode: identifier of the link end node (string)
- o "SubNet" table, with the single following field:
 - IDSubNet: subnet identifier (a discrete variable coded as "subnet1" or "subnet2" [string]).

> Description of the sample workspace parameters we will build

We want to graphically display the network data described in this database. The "Links" and "NewLinks" tables list all the links of the network. The "Nodes" table concerns all the nodes. And the "SubNet" table contains the available subnets the data describes.

We want to build two types of documents:

- One will contain the complete network

and

 The other will allow us to display data related to a single given part of the network (i.e., related to a given subnet).

> Main Steps Description

(1) Creating Schematic Documents

- Step 1: Creating the Workspace
- Step 2: Defining the Workspace Parameters
- Step 3: Defining Your Data Source
- Step 4: Creating Your First Document Type
- Step 5: Creating Your First Node Graphic Type
- Step 6: Defining Your First Association
- Step 7: Creating Your First Link Graphic Type
- Step 8: Creating Mandatory Attributes for the Link Graphic Type
- Step 9: Associating the New Link Type and Displaying Your Network

(2) Animating Schematic Documents

Step 10: Creating Textual Properties to Display Node and Link Identifiers

Step 11: Using a Composed CGM Symbol to Display the Node Group

Step 12: Animating the Network Nodes According to the Node's "Type" Database Field

- Step 13: Animating the Network Links According to the Link's "Type" Database Field
- Step 14: Animating the Network Nodes According to the Node's "SizeN" Database Field
- Step 15: Creating a Flag Model and Using it to Modify the "NodeName" Property Display
- Step 16: Creating Pattern Models That Will be Used Afterwards to Represent a New Link Property
- Step 17: Using Pattern Models to Highlight the Links According to the "Rate" Database Field
- Step 18: Creating a New Document Type for the Different Subnetworks
- Step 19: Creating a New Node Type to Filter Out Nodes According to Their Subnetworks
- Step 20: Creating a New Link Type to Filter Out the Links According to Their Subnetworks

Step 21: Redefining the Inherited "NodeName" and "LinkName" Properties Displayed on the Subnetwork Documents

Step 22: Using Database Coordinates to Display Your Nodes

(3) Defining Behaviors

- Step 23: Defining the Behaviors That Will Impact the Views
- **Step 24**: Redefining the Default "LeftDblClick" Behavior Impacting a Legend Property Filter Entry **Step 25**: Defining the Behaviors That Will Impact Graphic Object Types

> Step 1: Creating the Workspace

Open ArcGIS Schematics Designer:

R NG Designer	
File Workspace Document Edit Algorithms	
◎◎ 参 ×■ ���� ◎◎◎◎ 號環蝠 ◎弓= = №日	
◎隆 青寺 111 〒11 氏え見り(20) (20) (20) (20) (20) (20) (20) (20)	(]]] 4 🔳
	05/01/2002 23:47 //

Click the "Workspace" menu and click "New Workspace" as follows:

🖪 NG Designer	
File Workspace Document Edit Algorithms	
📑 New Workspace 👔 🔍 🔍 🖓	🛛 🔊 🗹 👯 镬 👺 音 🖤 三 宅 🗆 🗰
Edit Workspace	▲「」(1)(1)(1)(1)(1)(1)(1)(1)(1)(1)(1)(1)(1)(
Ready	05/01/2002 23:49

The predefined "Save As" Microsoft Windows dialog box automatically opens. Select the folder in which your workspace parameters file are to be saved, enter a name for your workspace file, and validate:

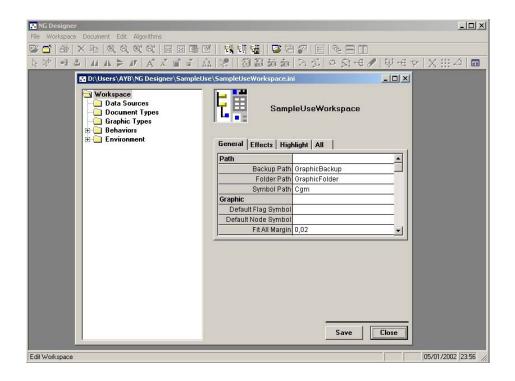
ArcGIS Schematics Designer	_ 🗆 ×
File Workspace Document Edit Algorithms	
S\$	
◎原本 ### ⅡⅡ⇒Ⅱ 及火見見 型	2
Save As	
The second se	
Save in: 🔁 SampleUse 🔽 🗢 🛅 📰 -	
History	
Desktop	
My Computer	
Mu Naturat P	
File name: SampleUseWorkspace Save	
Save as type: ArcGIS Schematics ini file Cancel	
	8/6/2002 11:55 AM

The ArcGIS Schematics Designer Editor window appears as follows:

NG Designer				_ 🗆 🗵
File Workspace Document Edit Algorithms				
👺 🗂 🖴 X 🖬 Q Q Q Q 🖂 🗃 🖉	利日城 頓 樋日 🖙 🖻			
			₩-€ P	X##4
D:\Users\AYB\NG Designer\SampleUs	and the second se	i		
Workspace Data Sources Document Types Graphic Types Behaviors Environment	General Effects Hig	leUseWorkspace hlight All		
	Path			
	Backup Path	GraphicBackup		
	Folder Path	GraphicFolder		
	Symbol Path	Cgm		
	Graphic			
	Default Flag Symbol			
	Default Node Symbol			
	Fit All Margin	0,02	<u> </u>	
		Save	Close	
Edit Workspace				05/01/2002 23:56

> Step 2: Defining the Workspace Parameters

When a new workspace is created, the ArcGIS Schematics Designer Editor window appears as:



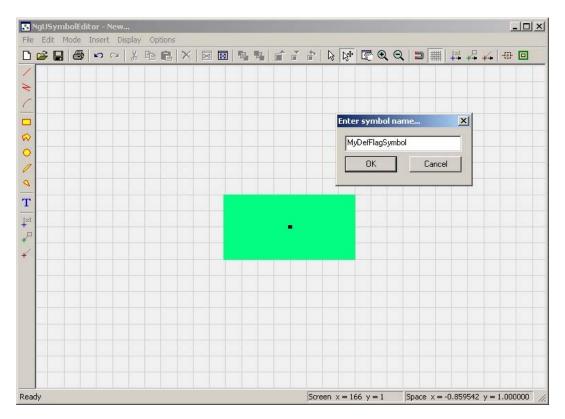
- Defining the Default Symbol for Flag Models

Clicking anywhere on the "Default Flag Symbol" field displays the

🖪 D:\NGO\Session\Model Designer\SampleUse\SampleUseWorkspace.ini					
Workspace Data Sources Document Types Graphic Types Behaviors Environment	General Effects Highlight All				
	Path				
		GraphicBackup			
		GraphicFolder			
	Symbol Path				
	Graphic				
	Default Flag Symbol	▼ 🗲			
	Default Node Symbol				
	Fit All Margin	0.02			
	Fit All Margin Mode	Relative			
	Fit Margin	0.05			
	Fit Margin Mode	Relative			
	Link Label Distance	1			
	Symbol Clipping	Disabled			
	Default Scaling	1			
	Miscellaneous				
	Error Testing				
	Log Recording	Disabled			
		Save Close			

Click this button to launch the CGM symbol editor and vector drawing tool (NgUSymbolEditor).

Use the NgUSymbolEditor drawing tools to build your CGM symbol as you wish. Select the "Save As..." item from the "File" menu, enter the name that will reference your first subsymbol, then exit the NgUSymbolEditor:

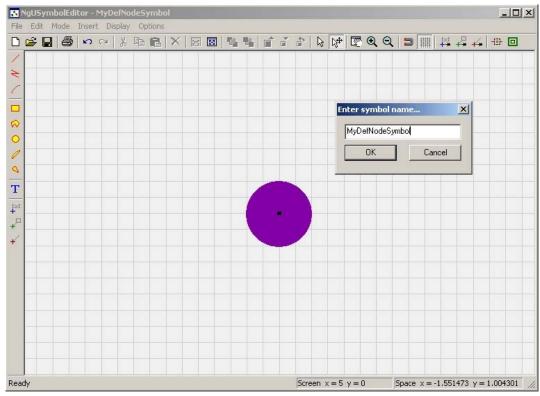


The "Default Flag Symbol" field is automatically completed by the name of the symbol you have created.

- Defining the Default Symbol for Nodes

Click the Default Node Symbol field and click this button to launch the CGM symbol editor and vector drawing tool (NgUSymbolEditor):

D:\NGO\Session\Model Designer\SampleUse\SampleUseWorkspace.ini					
Workspace Data Sources Document Types Graphic Types Behaviors Environment	SampleUseWorkspace				
	General Effects Highlight All				
	Path				
	Backup Path	GraphicBackup			
	Folder Path	GraphicFolder			
	Symbol Path	Cgm			
	Graphic				
	Default Flag Symbol	MyDefFlagSymbol			
	Default Node Symbol	T			
	Fit All Margin	0.02			
	Fit All Margin Mode	Relative			
	Fit Margin	0.05			
	Fit Margin Mode	Relative			
	Link Label Distance				
	Symbol Clipping				
	Default Scaling	1			
	Miscellaneous				
	Error Testing				
	Log Recording	Disabled			
		Save Close			



Use the NgUSymbolEditor drawing tools to build your CGM symbol as you wish. Enter a name for the current symbol and exit the NgUSymbolEditor:

The "Default Node Symbol" field is automatically completed by the name of the symbol you have just created.

- Defining the Workspace Default Scaling Factor

Click the "Default Scaling" field and enter a value:

D:\NGO\Session\Model Designer\SampleUse\SampleUse\Workspace.ini Workspace Data Sources Document Types Graphic Types Behaviors Environment				
	Path			
	Backup Path	GraphicBackup		
		GraphicFolder		
	Symbol Path			
	Graphic			
	Default Flag Symbol	MyDefFlagSymbol		
	Default Node Symbol	MyDefNodeSymbol		
	Fit All Margin	0.02		
	Fit All Margin Mode	Relative		
	Fit Margin	0.05		
	Fit Margin Mode	Relative		
	Link Label Distance	1		
	Symbol Clipping			
	Default Scaling	10		
	Miscellaneous			
	Error Testing			
	Log Recording	Disabled		
		Save Close		

- Defining the Workspace Line Color Effects

Click the "Effects" tab and click anywhere in the "Line Color" field to display a color box:

👪 D:\Users\AYB\NG Designer\SampleUse\SampleUseWorkspace.ini			
Workspace Data Sources Document Types Graphic Types Hold Behaviors Environment	General Effects Highli	eUseWorkspace	
	Line Effects		
	Line Color	1	
	Line Style		
	Line Width		
	Fill Effects		
	Fill Color	1	
	Fill Style		
	Hatch Style	HatchHorizontal	
	Text Effects		
	Separator		
	Text Alignment		
	Text Angle		
	Text Color		
	Text Font Text Size		
	InterLine Spacing		
	1		
		Save Close	

Click the color box to launch the Table Colors Editor. Select or define a color and validate:

D:\Users\AYB\NG Designer\Sample Workspace Data Sources Document Types Graphic Types Behaviors Environment	Use\SampleUseWorkspace.m SampleUseWorkspace General Effects Highlight All	
Colors	Default Colors	×
	Save	Close

- Defining the Workspace Line Width Effects

Click the "Line Width" field and modify the default line width value with the one you want:

强 D:\Users\AYB\NG Designer\SampleUse\SampleUseWorkspace.ini			
Workspace Data Sources Document Types Graphic Types Herein Behaviors Erein Environment	General Effects Highli	eUseWorkspace	
	Line Effects		
	Line Color	29	
	Line Style		
	Line Width		
	Fill Effects	<u> </u>	
	Fill Color	1	
	Fill Style	Solid	
	Hatch Style	HatchHorizontal	
	Text Effects		
	Separator	;	
	Text Alignment		
	Text Angle		
	Text Color		
	Text Font		
	Text Size		
	InterLine Spacing	0,1	
		Save Close	
J			

Click the "Text Color" parameter field to display a color box and click it to launch the Table Colors Editor if you want to change the text color default value:

🛃 D:\Users\AYB\NG Designer\SampleUse\SampleUseWorkspace.ini				
 Workspace Data Sources Document Types Graphic Types ⊕ ⊕ Behaviors ⊕ ⊕ Environment 	General Effects Highli	pace		
	Line Effects			
	Line Color	29		
	Line Style			
	Line Width			
	Fill Effects			
	Fill Color	1		
	Fill Style	Solid		
	Hatch Style	HatchHorizor	ntal	
	Text Effects			
	Separator			
	Text Alignment			
	Text Angle			
	Text Color	r		
	Text Font			
	Text Size			
	InterLine Spacing	0,1		
			Save	Close

> Step 3: Defining Your Data Source

Right-click the "Data Sources" tree entry and click "Add Data Source" from the popup menu:

🚼 D:\Users\AYB\NG Desig	jner\SampleUse\Sa	mpleUseWorkspace.ini
Workspace Data Sources Document Types Graphic Types Behaviors Environment	Add Data Source	l

The "New Data Source" dialog box automatically opens. Enter a name in the "Name" field to reference your data source:

🚮 New Data Sou	rce			×
Name	NgMainDatas	Source		
Туре	O DAO	• ADO		
V Automatical	y opened	Parameteriz	ed queri	es allowed
Udl File			E	lrowse
Connection strin	ng Edit Co	onnection	0K	Cancel

Click the "Edit Connection" button to open the UDL Editor Microsoft component. In the "Provider" tab, select a provider from the list:

🖶 Data Link Properties	x
Provider Connection Advanced All	
Select the data you want to connect to:	
OLE DB Provider(s)	
ESRI GeoDatabase OLE DB Provider Microsoft Jet 4.0 OLE DB Provider	
Microsoft OLE DB Provider for Indexing Service Microsoft OLE DB Provider for Internet Publishing Microsoft OLE DB Provider for ODBC Drivers Microsoft OLE DB Provider for OLAP Services Microsoft OLE DB Provider for Oracle Microsoft OLE DB Provider for SQL Server Microsoft OLE DB Simple Provider MSD ataShape OLE DB Provider for Microsoft Directory Services	
<u>N</u> ext >>	
OK Cancel Help	

From the "Connection" tab, browse your database file, check your connection by clicking the "Test Connection" button, and validate:

🖺 Data Link Properties 📃 🖸	×
Provider Connection Advanced All	
Specify the following to connect to Access data:	l
 Select or enter a database name: 	L
\WorkspaceExample\DataBase\DBExample.mdb	L
2. Enter information to log on to the database:	L
User name: Admin	L
Password:	
🔽 Blank password 🔲 Allow saving password	
	L
	L
	L
Test Connection	
OK Cancel Help	

The new data source tree entry is automatically created below the "Data Sources" entry:

🖪 D:\NGO\Session\Model Designer\SampleUse\SampleUseWorkspace.ini		
Workspace Data Sources NoMainDataSource Document Types Graphic Types Henaviors	NgMainDataSour	ce
⊕	General	
	Name NgMainDataSo	urce
	Type ADOConnection	n 🔤
	Parameter No	
	Automatically opened Yes	
		Edit
	Sav	e Close

> Step 4: Creating Your First Document Type

Right-click the "Document Types" tree entry and click "Create":

B:\Users\AYB\NG Designer\SampleUse\SampleUseWorkspace.ini	
Workspace Data Sources NgMainDataSource Document Types Graphic Types Behaviors Environment	

The ArcGIS Schematics Designer "Create Document Type" dialog box opens. Enter the name that will be used to reference your first document type and click OK:

🖪 Create Document Type	
Name	MyMainDocumentType
Father	
	OK Cancel

The new document type tree entry is automatically created below the "Document Types" entry:

D:\Users\AYB\NG Designer\SampleUse\SampleUseWorkspace.ini Workspace Data Sources NgMainDataSource Document Types Graphic Types Graphic Types General All			<u>-0×</u>
Environment	General Type Name Parent Name Data Data Source Query Identifier	MyMainDocumentType	
		Save	Close

For the first document type, we define no other parameter.

> Step 5: Creating Your First Node Graphic Type

Right-click the "Graphic Types" tree entry and click "Create":

🔀 D:\Users\AYB\NG Designer\SampleUse\SampleUseWorkspace.ini		

The ArcGIS Schematics Designer "Create Graphic Type" dialog box opens. Enter the name that will be used to reference your first node graphic type.

In the "Graphic Class" field, click "Node" from the dropdown list, and click OK:

💦 Create Graphic	: Туре	×
Name	MyNodes	
Graphic Class	Node	
Parent Name		
	🔽 Graphic Group	
	OK Cancel	

The new node graphic type tree entry is automatically created below the "Graphic Types" entry.

The preview window shows the symbol that will be used by default to represent all nodes of this type. Here, it is the workspace's default node symbol:

🛃 D:\Users\AYB\NG Designer\SampleUse\SampleUseWorkspace.ini		
Workspace Data Sources Signature Document Types MyMainDocumentType	MyNode	25
Graphic Types	General Effects Frame	Others All
🕀 🦲 Behaviors	Definition	
🗄 🧰 Environment	Type Name	MvNodes
	Parent Name	
	Graphic Class	Node
	Graphic Group	
	Group Name	MyNodes
	Data	
	Data Source	
	Query	
	Identifier	
	Representation	
	Symbol Name	
	Legend	
	Legend Visibility	
	Legend Notes	
	Preview	Add Flag Model Save Close

-Defining "Data" Parameters

(1) Select the data source name from the "Data Source" dropdown list. Here, we selected the single data source name existing: "NgMainDataSource".

🛃 D:\Users\AYB\NG Designer\SampleUs	e\SampleUseWorkspace.ini	
Workspace Data Sources MgMainDataSource Document Types MyMainDocumentType	- MyNode	25
Graphic Types	General Effects Frame	Others All
🕀 🦲 Behaviors	Definition	
🗄 🛅 Environment	Type Name	MyNodes
	Parent Name	
	Graphic Class	Node
	Graphic Group	
	Group Name	MyNodes
	Data	
	Data Source	<u> </u>
	Query	
		NgMainDataSource
	Representation	
	Symbol Name	
	Legend Legend Visibility	Vioiblo
	Legend Visibility Legend Notes	
	Preview	Add Flag Model Save Close

(2) Click the "Query" parameter field, then click the **____** button:

🚼 D:\Users\AYB\NG Designer\SampleUs	ce.ini					
Workspace Data Sources NgMainDataSource Document Types MyMainDocumentType	-0-	Му	/Node	:5		
Graphic Types MyNodes	General	Effects	Frame	Others All	1	
🗄 🧰 Behaviors	Definition	n				
🗄 🗀 Environment		Type Name		MyNodes		
		Parent	Name			
		Graphic	Class	Node		
		Graphic				
	Group Name			MyNodes		
	Data			- NeMain Data Cauraa		
				e NgMainDataSource		
		Id	Query entifier			
	Represe		enuner			
	10000	Symbol	Name			
	Legend	,				
		Legend V	isibility	Visible		
		Legend	Notes			
	Preview				Add Fl Save	ag Model

(3) The ArcGIS Schematics Designer "Query Editor" automatically opens. In our example, as the nodes query will be related to the "Nodes" table, we select the table called "Nodes" from the "Tables" list:

	NgMain	DataSource	_					
System Tables		IdNode	SizeN	Tumo	SubNet	x	Y	
ables		VarWChar	Smallint	Type VarWChar	VarWChar	Integer	r Integer	₽.
inks		N001	10		SubNet1	1540236	45258	
lewLinks lodes	2	N002	5		SubNet1	1540975		
iubNet	3	N003	2	в	SubNet1	1552360	45123	
	4	N004	3	A	SubNet1	1546980	45862	
	5	N005	6	A	SubNet1	1542378	45457	
Show Resul	ts							Y

(4) Next, we automatically define our query clicking the "All Records" button: the current graphic type concerns all the nodes in the database:

System Tables D les ks wLinks		ldNode	SizeN					
ks			INZEN		SubNet	14	Y	
		VarWChar	Smallint	Type VarWChar	VarWChar	X Integer	r Integer	-
		N001	3maiiini 10		SubNet1	154023		
		N002	5	A	SubNet1	154023		
des oNet		N002		в	SubNet1	155236		
JINEL		N004		A	SubNet1	154698		
		N005		A	SubNet1	154237		
						1 1 1 1 1 1 1 1		-
					-			_
VarWChar	Smallint	VarWCł		irWChar	Integer		eger	
1 N001		10 B		bNet1		540236	45258	
2 N002		5 A		bNet1		540975	47139	
		2 B		bNet1	_	552360	45123	
3 N003		3 A	LSu	bNet1	1 1	546980	45862	
4 N004 5 N005		6 A		bNet1		542378	45457	
All Recor		Түре	Su	bNet		Y		

(5) Click OK to validate these parameters. The just defined query is automatically displayed in the "Query" parameter field:

D:\Users\AYB\NG Designer\SampleUse\SampleUseWorkspace.ini						
Workspace Data Sources Superior Data Source Document Types MyMainDocumentType		M	yNode	95		
Graphic Types	General	Effects	Frame	Others All	1	
🕀 🦲 Behaviors	Definition	n				
🗄 🧰 Environment		Туре	Name	MyNodes		
		Parent	t Name			
		Graphic	: Class	Node		
		Graphic				
		Group) Name	e MyNodes		
	Data		_			
				NgMainDataS		
			Query Ientifier	SELECT*FR(JM Nodes	
	Represe		enuner			
	Represe	Symbol	l Name			
	Legend	Cynhoo	- Humb			
		Legend V	/isibility	Visible		
		Legend				
	Preview				Add F Save	Tag Model

(6) Click the "Identifier" parameter field and click the ---- button:

🚼 D:\Users\AYB\NG Designer\SampleUse	SampleUseWorkspace.ini	
Workspace Data Sources Symposium Optimization Optimization Document Types MyMainDocumentType	MyNode	95
Graphic Types	General Effects Frame	Others All
🗄 🦲 Behaviors	Definition	
🗄 🦲 Environment	Type Name	MyNodes
	Parent Name	
	Graphic Class	Node
	Graphic Group	
	Group Name	MyNodes
	Data	
		NgMainDataSource
	Identifier	SELECT * FROM Nodes
	Representation	[
	Symbol Name	
	Legend	
	Legend Visibility	Visible
	Legend Notes	
	Preview	Add Flag Model Save Close

(7) The ArcGIS Schematics Designer "Identifier Editor" automatically opens. Select the fields that will be used to identify the graphic objects of this type: as the "IdNode" field is the primary key in the "Nodes" table, we select this field to identify each node of this type.

Note: All the objects related to a graphic object type must be identifiable as a unique graphic object.

Identifier Editor
Fields
IdNode X Y NDSize Type SubNet NGG_DocumentType NGG_DocumentName
IdNode
OK Cancel

(8) Validate the selected fields by clicking the _____ button, then click OK:

👪 Identifier Editor		×
Fields		
IdNode X Y NDSize Type SubNet NGG_DocumentType NGG_DocumentName		
Identifier		
IdNode		
	ОК	Cancel

(9) The just defined identifier is automatically displayed in the "Identifier" field parameter:

🛃 D:\Users\AYB\NG Designer\SampleUse\SampleUseWorkspace.ini						
Workspace Data Sources Surces Document Types MyMainDocumentType	-	Му	/Node	!S		
Graphic Types	General	Effects	Frame	Others All		
🕀 🦲 Behaviors	Definition	n				
🗄 😑 Environment		Туре	Name	MyNodes		
		Parent	Name			
		Graphic	Class	Node		
		Graphic	Group			
	Group Name			MyNodes		
	Data					
				NgMainDataSource		
				SELECT * FR	OM Nodes	
	Represe	. –	entifier	IdNode		
	represe	Symbol	Name			I
	Legend	Cynhoor	Nume			
	Logona	Legend V	isibilitv	Visible		
		Legend				
	Preview				Add Save	Flag Model

> Step 6: Defining Your First Association

Right-click the document type tree entry (in our example it is "MyMainDocumentType") and click "Create Association" from the popup menu as follows:

🛃 D:\Users\AYB\NG Designer\:	5ampleUse\SampleU	lseWorkspace.i	ni	
Workspace		мум	ainDocumentType	
MyMainDocumentType Graphic Types Behaviors Environment	Delete Delete Recursively Create Attribute Create Association	AII		1
	Copy	Type Name Parent Name	MyMainDocumentType	=
	Data	Data Source		
		Query Identifier		
			Save	Close

The ArcGIS Schematics Designer "Create Association" dialog box automatically opens. Select the "MyNodes" already defined graphic type name and click OK:

🚼 Create A	ssociation	×
Name	MyNodes	T
	OK	Cancel

The "Associations" and the first associated graphic type "MyNodes" tree entries are automatically created below the currently selected document type:

🛃 D:\Users\AYB\NG Designer\SampleUse\SampleUseWorkspace.ini					
Workspace Data Sources Data Source Orgonizations Workspace Document Types Common Type Com	General Effects Frame Others All				
MyNodes	Type Name				
Behaviors	Parent Name				
Environment	Graphic Class	Node			
	Graphic Group	True			
	Group Name	MyNodes			
	Data				
	Preview	Add Flag Model Save Close			

> Testing and Displaying Your First Network

At the end of the sixth step, you should have defined all the primary elements necessary to graphically display your first schematic document and its content. In fact, you have defined:

- A workspace and its primary parameters

- **One document type:** "MyMainDocumentType". As you have declared no query for this document type, it is automatically related to one single document

and

- **One graphic node type:** "MyNodes". For this graphic type, you have defined a query that returns all the nodes stored in the database.

When **declaring the association between the document type and the graphic node type**, you have defined the main elements for your workspace's first component: a document containing all the nodes stored in the database and... you can display it!

1) Click the "Save" button, <u>Save</u>, at the bottom right corner of the ArcGIS Schematics Designer Editor window, to save all of your already defined parameters.

2) Use the "Close" button, ______, to close the ArcGIS Schematics Designer Editor window.

3) Now click the "Open Document Form" icon on the ArcGIS Schematics Designer toolbar, 🕍

or select "Open Document Form" from the "Document" menu.

4) The "Select document to open" predefined dialog box opens:

Select document to ope	n	? ×
Document type	MyMainDocumentType	-
Document name	MyMainDocumentType	•
ОК	Cancel	

The only document type called "MyMainDocumentType" is available from the "Document type" dropdown list, and the single "MyMainDocumentType" document is available from the "Document name" dropdown list.

53 P	NG Designer					×
		Document Edit Algorithms				
THE SA	🖆 😂 🔿	K 🖻 🔍 Q, Q, Q, Q, 🛛 🖾	💌 🗹 👯 🏭 🚟	👺 🖶 🚰 🔚 🔁 🚍	Ť	
B	M 🗐 🛱	///// 🎽 🖊 🔺 🖬 🖬	T 🔝 🔯 🛛 🗃 🗃	5 💩 🔿 🗲 🖉 🕤 🖓 ·	€∥₩~€∀ X !!! 4 ≣	3
	🛃 MyMainl	DocumentType::MyMainDocument	Гуре			
	•	•	•	•	•	
					-	
	•	•	•	•	•	
	•	•	•	•	•	
	•	•				
Rea	ady		Scr	een X= 215 /Y= 0 UserSpace X	= 245,5259 /Y= 270,451]06/01/2002]00:58	11.

Select this document and click OK. Your first schematic document opens as follows:

Note that as no geometric attributes are defined for any nodes (i.e., x and y coordinates are not specified for each node), ArcGIS Schematics Designer automatically places the nodes on a default grid.

> Step 7: Creating Your First Link Graphic Type

Right-click the "Graphic Types" tree entry and click "Create":



The ArcGIS Schematics Designer "Create Graphic Type" dialog box opens. Enter a name that will be used to reference your first link graphic type. Select "Link" from the "Graphic Class" dropdown list and click OK:

💦 Create Graphic	: Туре	×
Name	MyLinks	
Graphic Class	Link	
Parent Name		
	🔽 Graphic Group	
	OK Cancel	

The new link graphic type tree entry is automatically created below the "Graphic Types" entry.

The preview window shows the link appearance for the links of this type. Here, as no specific values are specified for the line color and line width fields, it is the workspace's default parameter values set for lines that are used:

D:\Users\AYB\NG Designer\SampleUs Vorkspace Data Sources NgMainDataSource Document Types D. MyMainDocumentType	SampleUseWorkspace.ini MyLinks	
🖻 🖳 Graphic Types	General Effects Others	All
MyNodes	Definition	
Behaviors	Type Name	MyLinks
🗄 🗀 Environment	Parent Name	
	Graphic Class	Link
	Graphic Group	True
	Group Name	MyLinks
	Data	
	Data Source	
	Query	
	Identifier	
	Representation	
	Pattern Model	
	Legend Legend Visibility	Vicible
	Legend Visibility	
	Preview	Add Flag Model Save Close

- Defining "Data" Parameters

(1) Select a data source name from the "Data Source" dropdown list. Here, we selected the existing single data source name: "NgMainDataSource".

Click the "Query" parameter field and click the _____ button:

🚼 D:\Users\AYB\NG Designer\SampleUs	e\SampleUseWorkspace.ini	
Workspace Data Sources NgMainDataSource Document Types MyMainDocumentType	MyLinks	
Eric Graphic Types	General Effects Others	All
MyNodes	Definition	
	Type Name	MyLinks
± Environment	Parent Name	
	Graphic Class	
	Graphic Group	
	Group Name	MyLinks
	Data Data Course	NgMainDataSource
	Query	
	Identifier	(cecc)
	Representation	
	Pattern Model	
	Legend	
	Legend Visibility	Visible
	Legend Notes	
	Preview	Add Flag Model Save Close

(2) The ArcGIS Schematics Designer "Query Editor" automatically opens. Here, in our example, as the links query will be related to the "Links" table, we select the table called "Links" from the "Tables" list:

System Tables		IdLink	IdNode1	IdNode2	Rate	Туре	
ables		VarWChar	VarWChar	VarWChar	Double	VarWChar	
_inks			N001	N002	3456,2421875		
NewLinks Nodes	2	L002	N002	N003	298765,4375		- -
Nodes SubNet	3	L003	N002	N004	314536,4375		
	4	L004	N003	N005	452456,46875		
	5	L005	N003	N006	57232,4375		
		L 000	luce (Lucot	005054.0405		
Juery All Records							Ŀ
luery All Records Show Result	-						
	-						

(3) Next, we automatically define our query clicking the "All Records" button: the current graphic type concerns all the links in the database:

		1.13.1.0	DataSource	<u>•</u>					
	ystem Tables		IdLink	IdNode1	IdNode2	Rate		Туре	
able	s	-	VarWChar	VarWChar	VarWChar	Double		VarWChar	-11-1
Links			L001	N001	N002	3456,24			
NewL		2		N002	N003			Medium	-
Node SubN			L002	N002	N004	314536	· .		
Sabri			L004	N003	N005	452456,	· .		
			L005	N003	N006		2,4375	-	
		SELEC	T * FROM Lin	ks	1.007				
)uerj	Y All Reco	SELEC			Lucot				
)uerj	Airrieco	SELEC	T * FROM Lin		Rate		Туре		
)uery	Show Re	sults	T * FROM Lin	ks					
	Show Real	sults	T * FROM Lin	ks IdNode2	Rate		Type Var/W		
1	IdLink VarWChar L001	sults IdNode1	T * FROM Lin	ks IdNode2 VarWChar	Rate Double 12345		Type VarW0 Small	Char	
1	IdLink VarWChar L001	sults SELEC	T * FROM Lin	ks IdNode2 VarWChar N002	Rate Double 12345 29	6,2421875	Type VarW0 Small Mediur	Char	
1 2 3	IdLink VarWChar L001 L002	sults SELEC	T * FROM Lin	ks IdNode2 VarWChar N002 N003	Rate Double 12345 29 31	6,2421875 8765,4375	Type VarW0 Small Mediur Small	Char	
1 2 3 4 5	IdLink VarWChar L001 L002 L003	sults SELEC	T * FROM Lin	ks IdNode2 VarWChar N002 N003 N004	Rate Double 12345 29 31 452 5	6,2421875 8765,4375 4536,4375	Type VarWC Small Mediur Small Big Small	Char	

(4) Click OK to validate these parameters. The just defined query is automatically displayed in the "Query" parameter field.

Now click the "Identifier" parameter field and click the **____** button:

🚼 D:\Users\AYB\NG Designer\SampleU:	se\SampleUseWorkspace.ini	
Workspace Data Sources Document Types MyMainDocumentType Graphic Types	MyLinks	
	General Effects Others A	All
MyNodes	Definition	
⊕ Behaviors ⊕ Environment	Type Name	MyLinks
	Parent Name	
	Graphic Class	
	Graphic Group	
	Group Name	MyLinks
	Data	
		NgMainDataSource
	Identifier	SELECT * FROM Links
	Representation	
	Pattern Model	
	Legend	
	Legend Visibility	Visible
	Legend Notes	
	Preview	Add Flag Model

(5) The ArcGIS Schematics Designer "Identifier Editor" component automatically opens. Select the fields that will be used to identify the graphic objects of this type. As the "IdLink" field is the primary key in the "Links" table, we select this field to identify each link of this type.

Note: All the objects related to a graphic object type must be identifiable as a unique graphic object.

Validate the selected fields by clicking the _____ button and click OK:

Identifier Editor
Fields
IdLink IdNode1 IdNode2 Rate Type NGG_DocumentType NGG_DocumentName
IdLink
V
Identifier
IdLink
OK Cancel

(6) The just defined identifier is automatically displayed in the "Identifier" field:

D:\Users\AYB\NG Designer\SampleUse	\SampleUseWorkspace.ini MyLinks	
Graphic Types	General Effects Others All	
	Definition	
E Behaviors	Type Name MyLinks	
in Environment	Parent Name	
	Graphic Class Link	
	Graphic Group True	
	Group Name MyLinks	
	Data	
	Data Source NgMainDataSource	
	Query SELECT * FROM Links	
	Identifier IdLink	
	Representation	
	Pattern Model	
	Legend	
	Legend Visibility Visible	
	Legend Notes	
	Add	Flag Model

> Step 8: Creating Mandatory Attributes for the Link Graphic Type

Suppose that you want to test the display of your network now: even if you associate your new link type with your document type (this step is essential to display your new links), your network will appear as follows:

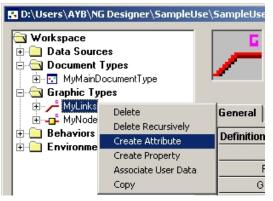
🔣 MyMainDocumentTy	pe::MyMainDocumentTyp	e		
Legend X	•••	•	•	•
	• •	•	•	•
		•	•	•
		•	•	

Even if the links appear in the legend subwindow, they are not displayed.

In fact, the links display is conditioned by their topological properties: origin and extremity nodes must be specified to display a link.

We need to create the two link's compulsory attributes: NGG_OriginNode and NGG_ExtremityNode.

(1) Right-click the "MyLinks" tree entry corresponding to your link type and select the "Create Attribute" menu:



The ArcGIS Schematics Designer "Create Graphic Type Attribute" dialog box automatically opens: select the "NGG_OriginNode" predefined attribute name from the "Name" dropdown list and, as the origin node is a unique field returned by the link type query, select "Field Attribute" from the "Type" dropdown list and

validate:

🚼 Create G	raphic Type Attribute	🚼 Create Gr	aphic Type Attribute	×
Name		Name	NGG_OriginNode	•
Туре	NGG_OriginNode NGG_ExtremityNode NGG_OriginPortNumber NGG_ExtremityPortNumber	Туре	Field Attribute	•
	NGG_InitialListPoints OK Cancel		ОК	Cancel

An "Attributes" new tree entry is automatically created below the "MyLinks" graphic type tree entry, and the "NGG_OriginNode" new attribute itself is referenced below this new entry:

🚼 D:\Users\AYB\NG Designer\Samp	leUse\SampleUseWorkspace.ini	
Workspace Data Sources Source Source Document Types Associations MyNodes	FIC NGG_OriginNode General	
MyNodes Graphic Types MyLinks Attributes Fid NGG_OriginNode MyNodes Behaviors Comment	Definition Name NGG_OriginNode Field Name Save	Close

(2) Select the "Field Name" parameter field and click the _____ button to open the ArcGIS Schematics Designer "Identifier Editor".

Select the fields that will be used to identify each link's origin node. In this example, the "IdNode1" field returned by the link type query is the field used to identify the link's origin. We select it from the "Fields"

area, click the _____ button to take our choice into account, and click OK:

🚼 Identifier Editor		×
Fields		
IdLink IdNode1 IdNode2 Rate Type NGG_DocumentType NGG_DocumentName		
IdNode1		
Identifier		
IdNode1		
	ОК	Cancel

The "IdNode1" value is automatically displayed in the "Field Name" field:

🔀 D:\Users\AYB\NG Designer\Sample	Use\SampleUseWorkspace.ini	
Workspace Data Sources SugmainDataSource Document Types MyMainDocumentType Associations MyNodes	FIC NGG_Origin	Vode
Graphic Types	Definition Name NGG_Orig	inNode
Attributes Fid NGG_DriginNode MyNodes	Field Name IdNode1	
Behaviors Environment		
	S	ave Close

(3) Repeat the first and second steps to create the second "NGG_ExtremityNode" mandatory attribute as follows:

🚼 D:\Users\AYB\NG Designer\SampleU	se\SampleUseWorkspace.ini	
Workspace Data Sources Superior NgMainDataSource Comment Types MyMainDocumentType MyMainDocumentType MyNodes	General NGG_Extrem	ityNode
Graphic Types MyLinks MyLinks MiGG ExtremityNode Fid NGG_OriginNode MyNodes Behaviors MyNoment	Definition Name NGG_Extre Field Name IdNode2	emityNode

Step 9: Associating the New Link Type and Displaying Your Network

(1) As already done when you defined the association between your first node type and your single document type, right-click the "MyMainDocumentType" tree entry and click "Create Association" from the popup menu.

Note: You can also choose the "Create" menu displayed when you right-click the "Associations" tree entry as follows:

🔀 D:\Users\AYB\NG Designer\SampleUse\SampleUseWorkspace.ini		
S Workspace	1	
📃 🗔 💭 NgMainDataSource		
🖻 🔄 Document Types		
🖻 🔂 MyMainDocumentType		
Associations MyNodes Create		
🖨 🔄 Graphic Types		
📄 🦯 MyLinks		
Attributes		
FId NGG_ExtremityNode		
Fld NGG_OriginNode		
MyNodes		
🗄 🛅 Behaviors		
Environment		

In both cases, the ArcGIS Schematics Designer "Create Association" dialog box opens as follows:

🚼 Create /	Association	×
Name	Mediate	•
	MyLinks	Cancel

Select the "MyLinks" value from the "Name" dropdown list and click OK.

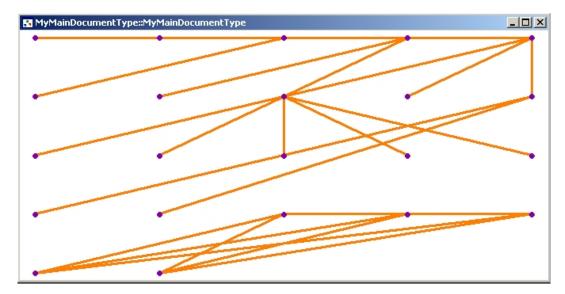
The just created association is automatically referenced below the "Associations" tree entry:

🔀 D:\Users\AYB\NG Designer\Samplel	Use\SampleUseWorkspace.ini
Workspace Data Sources Document Types Superior MyMainDocumentType Superior MyMainDocu	General Effects Others All
MyLinks Graphic Types MyLinks MyLinks	Definition Type Name MyLinks
Attributes Fid NGG_ExtremityNode Fid NGG_OriginNode Fid NGG_OriginNode Behaviors Behaviors Environment	Preview Add Flag Model Save Close

(2) Now that you have defined a document containing all the nodes and the links stored in the database you can display the complete network.

Click Save to save all your workspace parameters and click Close to close the ArcGIS Schematics Designer Editor window.

Click the "Open Document Form" icon on the ArcGIS Schematics Designer toolbar, or click the "Open Document Form" item from the "Document" menu. Select the single "MyMainDocumentType" document type name from the "Document Type" dropdown list and click OK. Your new schematic document opens as follows:



Step 10: Creating Textual Properties to Display Node and Link Identifiers

In this step, we are going to create two textual properties:

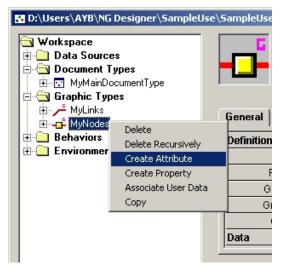
- The **"NodeName"** property will display the node name centered at the top of each node. The information will be formatted as follows: "Node ID: *IdNode*" where *IdNode* corresponds to the "IdNode" field returned by the node type query.

- The "LinkName" property will display the link name in blue, centered below each link, as follows: "From node *IdNode1* to *IdNode2*" where *IdNode1* and *IdNode2* correspond to the "IdNode1" and "IdNode2" fields returned by the link type query (i.e., the origin and extremity node identifiers, respectively).

>> Creating the "NodeName" Property

(1) As the "NodeName" property will use the "IdNode" field returned by the query as a formatted parameter of the property label that will be displayed, we must begin with creating an attribute corresponding to this field.

Right-click the "MyNodes" tree entry and select "Create Attribute" from the popup menu:



In the ArcGIS Schematics Designer "Create Graphic Type Attribute" dialog box, enter the name of the new attribute in the "Name" field ("NodeID", for example), select "Field Attribute" value in the "Type" dropdown list and validate:

🚼 Create G	iraphic Type Attribute	×
Name	NodelD	•
Туре	Field Attribute	-
	OK Ca	ncel

The "NodeID" new attribute is automatically referenced below the "Attributes" tree entry related to the "MyNodes" graphic type.

Select the "Field Name" field displayed in the right part of the ArcGIS Schematics Designer Editor window and click the _____ button to open the ArcGIS Schematics Designer "Identifier Editor". Select the "IdNode" field from the dialog box's "Fields" area, click the _____ button to take the chosen field into account, and click OK. The ArcGIS Schematics Designer Editor window appears as follows:

l	🖥 D:\Users\AYB\NG Designe	r\SampleUse\SampleUseWorkspace.ini	
	Workspace Data Sources Graphic Types MyLinks MyNodes MyNodes	General NodelD	
	FId NodelD	Definition	
	⊕	Name NodelD	
		Field Name IdNode	
		1	
		Save	Close

(2) The "NodeName" property that we are going to create will not directly use the "NodeID" attribute. The property label must be formatted as follows: "Node ID: *IdNode*". We have just created the "NodeID" attribute that will correspond to the *IdNode* label parameter. Now we must create a new attribute to format the label as well.

As in the previous step, right-click the "MyNodes" tree entry and select "Create Attribute" from the popup menu (you can also select the "Create" menu by right-clicking the "Attributes" tree entry displayed just below the "MyNodes" tree entry).

In the "Create Graphic Type Attribute" dialog box, enter the name of the second new attribute in the "Name" field ("FormattedNodeID", for example), select "Formatted Attribute" value from the "Type" dropdown list, and click OK:

💦 Create G	raphic Type Attribute	×
Name	FormattedNodeID	•
Туре	Formatted Attribute	•
	ОКС	ancel

Now, in the right part of the ArcGIS Schematics Designer Editor window corresponding to the "FormattedNodeID" new attribute's parameters, specify the format that will be used to build up the new attribute. When you validate the format parameter, ArcGIS Schematics Designer automatically detects that one attribute is needed to build the new attribute. So a new parameter field—"Attribute1"—is displayed:

👪 D:\Users\AYB\NG Designer\SampleUse\SampleUseWorkspace.ini		
Workspace Data Sources Document Types Graphic Types MyLinks MyNodes MyNodes	FormattedNodeID General	
Fint FormattedNodeID Fild NodeID Behaviors File Environment	Definition Name FormattedNodeID Format Node ID: %s Attribute1	
	Save	Close

From the "Attribute1" dropdown list select the "NodeID" attribute name and click OK:

5	D:\Users\AYB\NG Designer\SampleUs	e\SampleUse	Workspace.ir	1	
	Workspace Data Sources Common Types Graphic Types MyLinks MyNodes	Fmt	Form	attedNodeID	
	Attributes	General			
	Fmt FormattedNodeID	Definition			
	Fid NodelD		Name	FormattedNodeID	
	⊕		Format	Node ID: %s	
			Attribute1		-
		I		NodelD	
				Save	Close

(3) At the end of this step, we have built up the label that we want to display at the top of each node. Now we must create the textual property that will manage this information display.

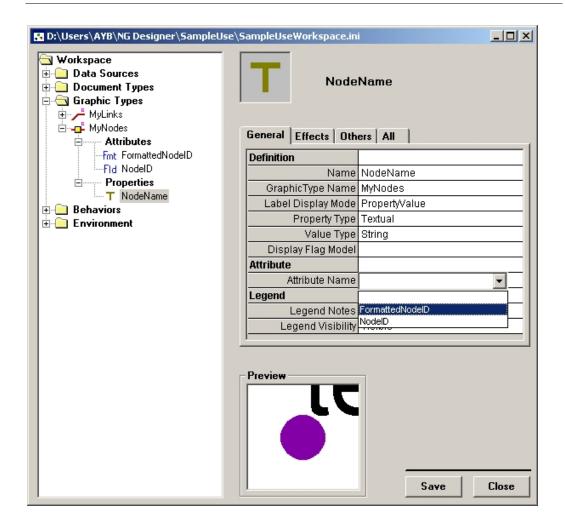
Right-click the "MyNodes" tree entry and select "Create Property" from the popup menu:

👪 D:\Users\AYB\NG Designer\SampleUse\SampleUse				
Workspace Data Source Document T MyMainDo Graphic Typ MyLinks	ypes ocumentType		General	
È⊶ _i MyNodes ⊕~` Behaviors ⊕-` Environmer	Delete Delete Recursively Create Attribute Create Property		Definition	
	Associate User Data Copy	3	Gi Gi	
			(Data	

In the "Create Property" dialog box that opens, set the name of the new property in the "Property Name" field. Because the default parameters set in this form ("Textual" property type and "String" value type) are those we need, click OK.

🚼 Create Property	×
Property Name	NodeName
	C Direct
	Textual
	C Discrete
	O Bounded
Value Type	String
	OK Cancel

Now, in the right part of the ArcGIS Schematics Designer Editor window corresponding to the "NodeName" new textual property's parameters, specify the attribute name that will be used to display the property label:

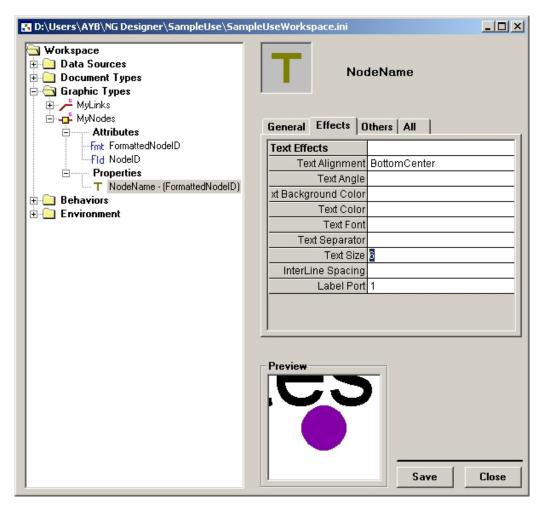


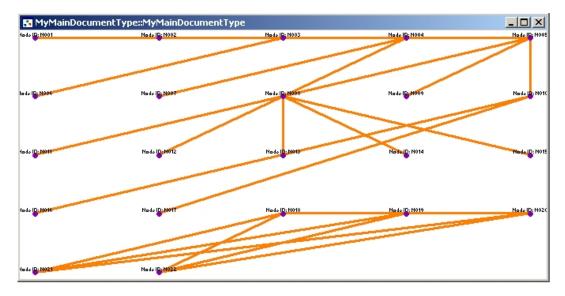
Click the "Effects" tab and select the "BottomCenter" value from the "Text Alignment" dropdown list.

Note: "BottomCenter" text alignment means that the graphic object will appear centered at the bottom of the property label (i.e., the label will be centered at the top of each node).

强 D:\Users\AYB\NG Designer\SampleUse\SampleUseWorkspace.ini		
Workspace Data Sources Document Types Graphic Types MyLinks MyNodes	General Effects Others All	
Attributes -Fint FormattedNodeID -Fid NodeID Properties - NodeName - (FormattedNodeID) - Behaviors - Environment	Text Effects Text Alignment Text Angle HalfCenter HalfLeft BottomRight Text Separator TopCenter InterLine Spacing Label Port	
	Save	Close

Now set the "Text Size" parameter as follows and click OK:





Save your workspace parameters, close the ArcGIS Schematics Designer Editor window, and test your network display. The result will be as follows:

>> Creating the "LinkName" Property

(1) Here, the "LinkName" property will use the "IdNode1" and "IdNode2" fields returned by the query as formatted parameters of the property label displayed. We have already defined two attributes corresponding to these fields, "NGG_OriginNode" and "NGG_ExtremityNode" attributes. These two attributes are those we need to build the property label as we want; we just have to create the corresponding formatted attribute.

As in the node case, right-click the "MyLinks" tree entry and select "Create Attribute" from the popup menu (you can also select the "Create" menu by right-clicking the "Attributes" tree entry displayed just below the "MyLinks" tree entry).

In the "Create Graphic Type Attribute" dialog box, enter the name of the new attribute in the "Name" field ("FormattedLinkID", for example), select "Formatted Attribute" from the "Type" dropdown list, and click OK:

🚼 Create G	raphic Type Attribute	×
Name	FormattedLinkID	•
Туре	Formatted Attribute	•
	OK Can	cel

Now, in the right part of the ArcGIS Schematics Designer Editor window corresponding to the "FormattedLinkID" new attribute's parameters, specify the format that will be used to build up the new attribute and validate. From the "Attribute1" and "Attribute2" dropdown lists, select the "NGG_OriginNode" and the "NGG_ExtremityNode" attribute names, respectively.

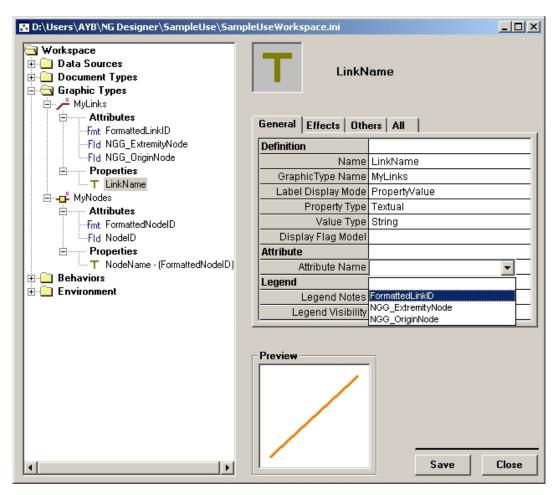
D:\Users\AYB\NG Designer\SampleUse\San Workspace Data Sources Document Types Graphic Types MyLinks MyLinks Attributes	E	_□×
Fid NGG_ExtremityNode Fid NGG_OriginNode MyNodes Attributes Fit FormattedNodeID Fit FormattedNodeID Fit NodeName - (FormattedNodeID) Behaviors Fit Environment	Format F Attribute1 1 Attribute2	FormattedLinkID From node %s to %s NGG_OriginNode VGG_ExtremityNode VGG_OriginNode

(2) At the end of this step, we have built up the label that we want to display below each link. Now we must create the textual property that will manage this information display.

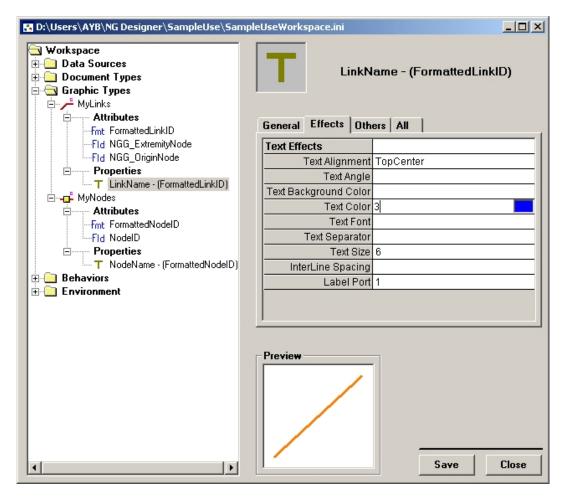
Right-click the "MyLinks" tree entry and select "Create Property" from the popup menu. In the "Create Property" dialog box that opens, set the name of the new property in the "Property Name" field and click OK:

💦 Create Property	/ <u>×</u>
Property Name	LinkName
	O Direct
	Textual
	O Discrete
	O Bounded
Value Type	String
	OK Cancel

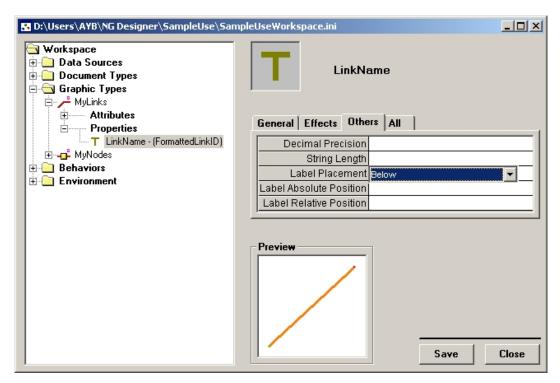
Now, in the right part of the ArcGIS Schematics Designer Editor window corresponding to the "LinkName" new textual property's parameters, specify the attribute name that will be used to display the property label.



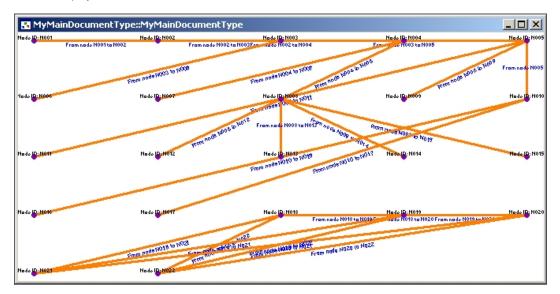
Click the "Effects" tab and select the "TopCenter" value from the "Text Alignment" dropdown list. Set the "Text Size" parameter value and select the blue color you want by using the ArcGIS Schematics Designer Color Editor. (Clicking the little rectangle displayed when you click anywhere in the "Text Color" parameter field automatically opens this component):



Now click the "Others" tab and select the "Below" value from the "Label Placement" dropdown list:



Save your workspace parameters, close the ArcGIS Schematics Designer Editor window, and test your network display. The result will be as follows:



Step 11: Using a Composed CGM Symbol to Display the Node Group

As the "MyNodes" symbol name is not specified, ArcGIS Schematics Designer uses the default node symbol set for the workspace to display each node of this type.

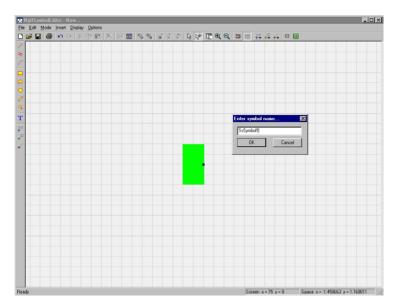
In this step, to represent the "MyNodes" node type, we decide to create a new symbol based on the already existing "MyDefNodeSymbol" CGM symbol and composed of two other subsymbols. At the node type level, each subsymbol will be invisible, but we will modify the subsymbols' visibility attribute afterwards when we define graphic effects related to a property filters in Step 12.

Activate the "MyNodes" tree entry, select the "Symbol Name" parameter displayed in the "General" tab, and click the solution to launch the NgUSymbol Editor.

🔛 D:\Users\AYB\NG Designer\SampleUse\SampleUseWorkspace.ini			
Workspace Data Sources Graphic Types MyLinks MyNodes Behaviors	General Effects Frame Others All		
🗄 🛅 Environment	Definition		
	Type Name MyNodes		
	Parent Name		
	Graphic Class Node		
	Graphic Group True		
	Group Name MyNodes		
	Data		
	Data Source NgMainDataSource Query SELECT*FROM Nodes]	
	Identifier IdNode	I	
	Representation	I	
	Symbol Name	▼ 🗲	
	Legend		
	Legend Visibility Visible		
	Legend Notes		
	Preview Ad	ld Flag Model	

(1) Creating the subsymbol CGM files

Use the <u>use</u> button to draw a green rectangle as in the following screenshot. Select the "Save As..." item from the "File" menu and enter the name that will reference your first subsymbol:

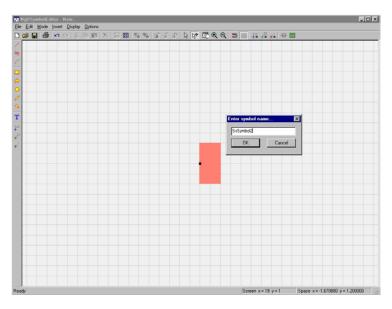


Note: Symbols are saved by default in the CGM folder in C:\arcgis\arcexe82\Schematics\Samples\VB\Session.

Next, select the "New" item from the "File" menu to create the new empty CGM file where a second subsymbol will be drawn.

👪 NgUSymbolEditor -			
<u>F</u> ile	<u>E</u> dit	<u>M</u> ode	Inse
<u>N</u> e	ew	Ctrl+l	V
<u>0</u> p	oen	Ctrl+(
Import			
<u>S</u> ave		Ctrl+9	3
Save <u>A</u> s			
Print Ctrl+P		>	
Exit			

Use the button to draw an orange rectangle as in the following screenshot. Select the "Save As..." item from the "File" menu and type the name that will reference your second subsymbol:



(2) Creating the node type CGM symbol

Now, we are going to create the node type CGM symbol. Select "New" from the "File" menu. Then, select "Import..." from the "File" menu as in the following screenshot:

🛃 NgUSymbolEditor - New					
File Edit	Mode	Insert	Display	Options	
New			× X	h C	$ \times$
Open	Ctrl	+0			_
Import					
Save	Ctrl	+S			
Save As					
Print	Ctrl	+P			
Exit					
0					
0					
4					

In the "Open" dialog box, select the "MyDefNodeSymbol" CGM file from the "CGM" directory:

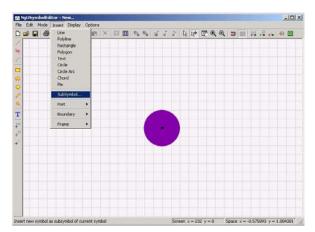
Open			? X
Look jn: 🔂) Cgm	- 🗧 🔁	➡ 🎟 •
MyDefFlag			
	leSymbol.CGM		
SsSymboli SsSymboli			
1			
File <u>n</u> ame:	MyDefNodeSymbol.CGM		<u>O</u> pen
Files of type:	Cgm files (*.cgm)	•	Cancel
	C Open as read-only		

Click "Open". The "Import" dialog box automatically opens. Check the "Import graphics" box and click OK:

mport	×
Filters	
🔽 Import gr	aphics
🔲 Import la	bel ports
🔲 Import lin	ik ports
🔲 Import po	ole ports
OK	Cancel

The "MyDefNodeSymbol" CGM circle is automatically imported and placed in the center of the NgUSymbol window.

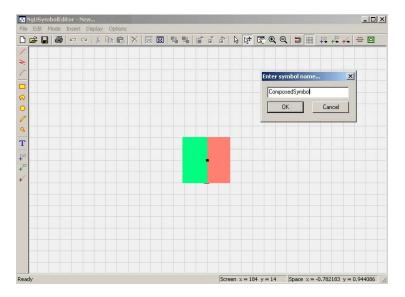
Now, select "SubSymbol..." from the "Insert" menu:



Select the CGM file corresponding to the first subsymbol (the green rectangle) and click OK:

Open			<u>? ×</u>
Look jn: 🔂	Cgm	- + E	-
MyDefFlag MyDefNod SSSymbol SSSymbol2	eSymbol.CGM .CGM		
i File <u>n</u> ame:	SsSymbol1.CGM		<u>O</u> pen
Files of <u>t</u> ype:	*.cgm	T	Cancel

Repeat the operation to insert the second subsymbol file (the orange rectangle) and save the CGM file result.



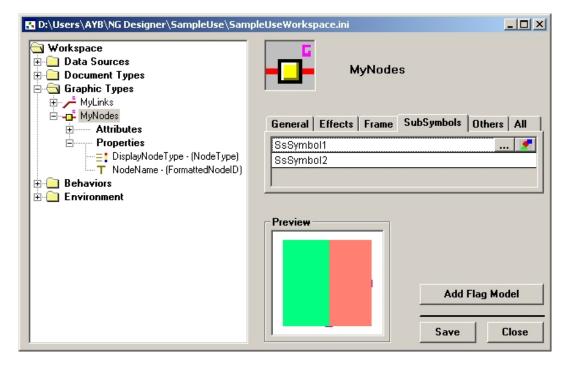
Exit the "NgUSymbolEditor" drawing tool. The just created CGM file is automatically used as the node type symbol:

D:\Users\AYB\NG Designer\SampleUse\Sample Workspace Data Sources Document Types Graphic Types	leUseWorkspace.ini
i myLinks i myNodes i myNodes i myNodes	General Effects Frame SubSymbols Others All
Properties DisplayNodeType - (NodeType) T NodeName - (FormattedNodeID)	Definition Type Name MyNodes
Behaviors Environment	Parent Name Graphic Class Node Graphic Group True
	Group Name MyNodes Data
	Data Source NgMainDataSource Query SELECT * FROM Nodes
	Identifier IdNode Representation Identifier
	Symbol Name ComposedSymbol V S
	Preview Add Flag Model Save Close

(3) Setting the subsymbols attributes to represent the node group

As this CGM symbol is composed of subsymbols, the "SubSymbols" tab lets you show and modify each

subsymbol attribute. Select this tab and click the _____ button, which is displayed when you click anywhere in the first subsymbol line to edit the subsymbol effects.



In the "SubSymbol Effect" form that automatically opens, click the "Others" tab, select "Invisible" from the "Visibility" dropdown list, and click OK. Repeat this operation for the second subsymbol.

SubSymbol Effect		
Effects Others		
Symbol Geomet	ry	
	Scaling	
	XScaling	
	YScaling	
	Symmetry	
	Rotation	
Visualization		
	Visibility	
		Visible Invisible
Preview		OK

When you are finished this step, the preview subwindow that shows the node appearance should appear as follows:

🚼 D:\Users\AYB\NG Designer\SampleUse\Sam	pleUseWorkspace.ini
Workspace Data Sources Document Types Graphic Types MyNodes MyNodes DisplayNodeType - (NodeType) NodeName - (FormattedNodeID) Environment	General Effects Frame SubSymbols Others All SsSymbol1 SsSymbol2
± Environment	Preview Add Flag Model Save Close

Step 12: Animating the Network Nodes According to the Node's "Type" Database Field

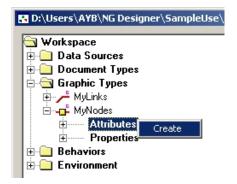
The "Type" field returned by the node graphic type query stores the type of each node. Each node is either an "A", "B", "C","D", "E", or "F" type.

In this step, we will take this information into account graphically: we are going to create the "DisplayNodeType" discrete property composed by six discrete filters; each filter corresponds to each "Type" value.

(1) Creating the "NodeType" Attribute Corresponding to the Node "Type" Field

As the "DisplayNodeType" property will use the "Type" field returned by the query, we must begin to create an attribute corresponding to this field.

Right-click the "Attributes" tree entry displayed below the "MyNodes" graphic type and select the "Create" menu:



In the ArcGIS Schematics Designer "Create Graphic Type Attribute" form:

- Set the name that will be used to reference the new attribute in the "Name" field.
- Select "Field Attribute" from the "Type" dropdown list and click OK:

🚼 Create G	raphic Type Attribute	×
Name	NodeType	•
Туре	Field Attribute	•
	OK Can	cel

Fill the "Field Name" parameter by selecting the "Type" field.

🔀 D:\Users\AYB\NG Designer\SampleUs	e\SampleUseWorkspace	.ini _ 🗆 🗙
Graphic Types ⊕, MyLinks ⊕, MyNodes ⊕ Attributes	General	Туре
	Definition Name No Field Name Ty	

(2) Creating the "DisplayNodeType" Discrete Property Now you will create the "DisplayNodeType" discrete property that will display each node according to the just created "NodeType" attribute value.

Right-click the "Properties" tree entry displayed below the "MyNodes" graphic type and select the "Create" menu:

🚼 D:\Users\AYB\NG Designer\Samj	oleUse\SampleU
Workspace Data Sources Document Types Graphic Types MyLinks MyNodes MyNodes Properties Create Create	

In the "Create Property" form, fill the "Property Name" field the same way as in the following screenshot, select "Discrete" as type property, and click OK:

🚼 Create Property	×
Property Name	DisplayNodeType
	C Direct
	🔿 Textual
	• Discrete
	O Bounded
Value Type	String
	OK Cancel

The new "DisplayNodeType" property is automatically referenced below the "Properties" tree entry.

Now associate this new property with the "NodeType" attribute by selecting "NodeType" from the "Attribute Name" dropdown list:

💀 D:\Users\AYB\NG Designer\SampleUse\Sampl	eUseWorkspace.ini	
Workspace Data Sources Graphic Types Graphic Types MyLinks MyNodes	General Effects 0	layNodeType
Properties DisplayNodeType	Definition	
T NodeName - (FormattedNodeID)		DisplayNodeType
	GraphicType Name	
Environment	Label Display Mode	
	Property Type	
	Value Type	
	Display Flag Model	
		Enabled
	Attribute	
	Attribute Name	NodeType
	Legend	
	Legend Notes	
	Legend Visibility	Visible
		Add Filter Save Close

(3) Creating the "DisplayNodeType" Discrete Filters

A discrete property exists through its discrete filters. So, we are going now to create the "DisplayNodeType" discrete filters:

Add Filter

button on the lower right-hand corner of the ArcGIS Schematics

Designer Editor window.

- Click the

- The ArcGIS Schematics Designer "Add a discrete filter" form automatically opens. Fill the "Name" field, set the first value that will be associated with this first filter (this value is one of the values taken by the "Type" field stored in the database), and click OK:

🔣 Add a disc	rete filter 🛛 🗙
Name	Туре А
Value	A
	OK Cancel

The "Filters" tab is automatically displayed. The filter you just created is referenced in this new tab:

🚼 D:\Users\AYB\NG Designer\SampleUse\Samp	eUseWorkspace.ini		
Workspace Data Sources Document Types Graphic Types MyLinks MyNodes MyNodes Properties DisplayNodeType - (NodeType] NodeName - (FormattedNodeID)	General Effect Number Nam 1 Type	e	Type - rs All Value A
🕀 🧰 Behaviors			
⊞ Environment			
			Delete Filter
			Add Filter
			ave Close

Repeat this operation to create five new other filters corresponding to the "B", "C", "D", "E", and "F" values available from the "Type" field in the database:

D:\Users\AYB\NG Designer\SampleUse\Sample			
Properties Properties DisplayNodeType - (NodeType) NodeName - (FormattedNodeID) Behaviors FormattedNodeID	Number 1 2 3	Name Type A Type B Type C	Value A B C
	4 5 6	Type D Type E Type F	D E F
		[Delete Filter
		[Add Filter
			Save Close

(4) Defining the Graphic Effects Corresponding to Each Discrete Filter

"Type" Value	Filter Graphic Effects
A	The first subsymbol is to be visible
В	The second subsymbol is to be visible
С	The second subsymbol is to be visible, with a rotation angle of 90 degrees, and its fill color is to be changed
D	The two subsymbols are to be visible
E	A new CGM symbol will be used
F	A character of the ESRI Cartography font will be used

This discrete property will display the nodes according to the "Type" field as follows:

>> Defining the "Filter A" Discrete Filter Graphic Effects (Activating the <u>"S</u>sSymbol1" Visibility)

- From the "Filters" tab, select the "Type A" first discrete filter and click the _____ button.

- The "Filter Effects" form automatically opens. As the node type's symbol is composed by subsymbols, a "SubSymbols" tab is displayed. Select this tab. Its content resumes all the subsymbols that composed the node type's symbol.

- Select the line corresponding to the first subsymbol and click the under button.

😽 Filter Effe	cts					<u> </u>
General	Effects	Frame	Others	All	SubSymbols	Synthesis
SsSymb SsSymb						
Preview			_			
					Add	SubSymbol
					Delete	SubSymbol
						Close

- The "SubSymbol Effect" form related to the "SsSymbol1" subsymbol opens. Click the "Others" tab and select the "Visible" value from the "Visibility" dropdown list:

👪 S	ubSymb	ol Effect		
Ē	Effects	Others	All	
[Symbol	Geometr	У	
			Scaling	
			XScaling	
			YScaling	
			Symmetry	
			Rotation	
	Visualiz	ation		
			Visibility	
				Visible Invisible
	Preview			OK

Click OK to close the "SubSymbol Effect" form. The preview subwindow in the "Filter Effects" form appears as follows:

🖥 Filter Effe	cts						_	
General	Effects	Frame	Others	All	SubSy	mbols	Synthesi	s
SsSymb	ol1							
SsSymb	ol2							
						Delete	G ubSymbo SubSymb	
						(Close	

>> Defining the "Filter B" Discrete Filter Graphic Effects (Activating the "SsSymbol2" Visibility)

For the "Filter B" discrete filter, you will repeat the same operations with the second subsymbol.

At the end of this step, the preview subwindow displayed in the "Filter Effects" form should appear as follows:

强 Filter Effe	cts						_	
General	Effects	Frame	Others	All	SubSym	bols	Synthesis	1
SsSymb	ol1							
SsSymb	ol2							
Preview					_	elete	ubSymbol SubSymbo Close	

>> Defining the "Filter C" Discrete Filter Graphic Effects (Activating the "SsSymbol2" Visibility, Changing the Default Subsymbol Rotation Angle, and Modifying the Default Fill Color)

Open the "Filter Effects" form corresponding to the third discrete filter. Click the "SubSymbols" tab and open the "SubSymbol Effect" form related to the "SsSymbol2" subsymbol.

In the "Others" tab, select "Visible" from the "Visibility" dropdown list and set an angle value in the "Rotation" field:

👪 SubSymbol Effect	
Effects Others A	ur
Symbol Geometry	
Scaling	
XScaling	
YScaling	
Symmetry	
Rotation	90
Visualization	
Visibility	Visible
Preview	ОК

Now click the "Effects" tab and change the "Fill Color" value:

SubSymbol Effect	
Effects Others A	M]
Line Effects	
Line Color	
Line Style	
Line Width	
Fill Effects	
Fill Color	226
Fill Style	
Hatch Style	
Preview	ОК

Click OK to close the "SubSymbol Effect" form. The preview subwindow in the "Filter Effects" form appears as follows:

🖪 Filter Effects		
General Effects	Frame Others All	SubSymbols Synthesis
SsSymbol1		
SsSymbol2		
Preview		Add SubSymbol Delete SubSymbol Close

>> Defining the "Filter D" Discrete Filter Graphic Effects (Activating the Two "SsSymbol1" and "SsSymbol2" Visibility)

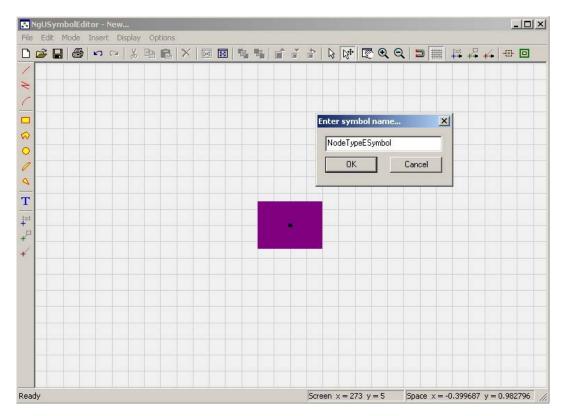
For this fourth discrete filter's graphic effects, modify the "Visibility" parameter related to each subsymbol, such as the two subsymbols displayed in the following preview subwindow:

Filter Effects		
General Effects	Frame Others All	SubSymbols Synthesis
SsSymbol1		
SsSymbol2		
Preview		Add SubSymbol Delete SubSymbol

>> Defining the "Filter E" Discrete Filter Graphic Effects (Creating a New CGM Symbol and This New Symbol to Represent the Filter)

In the "General" tab corresponding to the fifth discrete filter, open the "NgUSymbolEditor" from the "Symbol Name" parameter field:

ilter Effec	ts						_ 🗆
General	Effects Fram	e Others	All	SubS	ymbols	Synth	esis
Definition							
	Name	Type E					
	Value	E					
	Symbol Name						*
	Status	Enabled					
Legend							
	Legend Visibility	Visible					
	Legend Notes						
Preview -				[SubSym SubSy	
						Close	



Draw a rectangle, save it as NodeTypeESymbol, and exit from the "NgUSymbolEditor":

>> Defining the "Filter F" Discrete Filter Graphic Effects (Using a Specific Character Font)

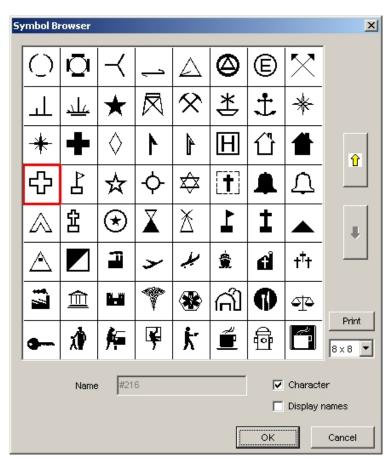
The symbol used to represent a node or a drawing graphic object is often a CGM symbol. But a specific character font can also be used to display that graphic object.

For the last discrete filter representation, you can represent the node with any character of the "ESRI Cartography" font.

Open the "Filter Effects" form related to this last discrete filter and click the "Effects" tab. Set the "ESRI Cartography" font in the "Text Font" field and choose the "Text Color" that will be used to display the character:

ilter Effe							_ 🗆
General	Effects	Frame	Others	All	Sub	Symbols	Synthesis
	Fil	l Color					
	Fi	ll Style					
	Hato	h Style					
Text Eff	ects						
	Text Alig	nment					
		t Angle					
		t Color 1					
			ESRI Cart	ograp	hy		
	Τe	ot Size					-
Preview						Add	SubSymbol
							SubSymbol
							Close

Now click the '"General" tab and, from the "Symbol Name" parameter field, click the **I** button to open the ArcGIS Schematics "Symbol Browser".



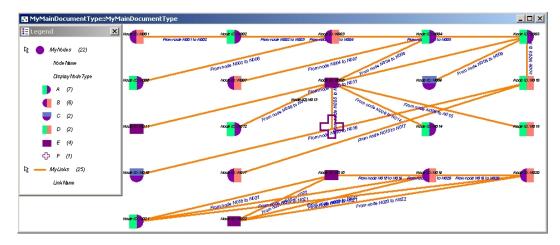
Select the desired ESRI Cartography TrueType[™] character and click OK to validate.

The chosen character ASCII code appears in the "Symbol Name" parameter field; it is preceded by the "#" character:

General	Effecte Frame	e Others All Synthesis
Definitio		
Dennicio		Туре F
	Value	
	Symbol Name	
		Enabled
Legend		
	Legend Visibility	Visible
	Legend Notes	
		-
Preview	<u></u>	Add SubSymbol Delete SubSymbol

(5) Testing Your Network Display

Click Save to save all your workspace parameters and click Close to close the ArcGIS Schematics Designer Editor window. Now click the "Open Document Form" icon on the ArcGIS Schematics Designer toolbar, or click the "Open Document Form" item from the "Document" menu. Select the single "MyMainDocumentType" document type name from the "Document Type" dropdown list and click OK. Your document opens as follows:



Step 13: Animating the Network Links According to the Link's "Type" Database Field

The "Type" field returned by the link graphic type query stores the type of each link. Each link is either a "Small", "Medium", or "Big" type.

In this step, you will decide to take this information into account graphically: we are going to create the "DisplayLinkType" discrete property composed by three discrete filters, with each filter corresponding to one type value. This property will display the links according to the "Type" field as follows:

"Type" Value	Filter Graphic Effects
Small	Width Line: 1.0
Medium	Width Line: 2.0
Big	Width Line: 4.0

(1) Creating the "LinkType" Attribute Corresponding to the Link "Type" Field

As the "DisplayLinkType" property will use the "Type" field values returned by the query, we must begin by creating an attribute corresponding to this field.

As for nodes, right-click the "Attributes" tree entry displayed below the "MyLinks" graphic type and select the "Create" menu from the displayed popup menu; the ArcGIS Schematics Designer "Create Graphic Type Attribute" form automatically opens. Set the name that will be used to reference the new attribute in the "Name" field, select the "Field Attribute" value from the "Type" dropdown list, and click OK:

🚼 Create G	raphic Type Attribute	×
Name	LinkType	•
Туре	Field Attribute	•
	ОК	Cancel

Fill the "Field Name" parameter by selecting "Type":

D:\NGO\Session\Model Designer\Sar	mpleUse\SampleUseWo	rkspace.ini
Workspace Data Sources Comment Types Graphic Types MyLinks Fid. LinkID	Fid Link	Туре
Fld LinkType	Definition	
FId NGG_ExtremityNode	Name	LinkType
Properties	Field Name	Туре
Behaviors ⊕ - ⊖ Behaviors ⊕ - ⊖ Environment		Save Close

(2) Creating the "DisplayLinkType" Discrete Property

Now you will create the "DisplayLinkType" discrete property. It will display each link according to the "LinkType" attribute value.

Right-click the "Properties" tree entry displayed below the "MyLinks" graphic type and select the "Create" menu from the displayed popup menu. In the "Create Property" form that opens, fill the "Property Name" field as in the screenshot below, select "Discrete" as the type property, and click OK:

ጜ Create Property	×
Property Name	DisplayLinkType
	 Direct Textual Discrete Bounded
Value Type	String 💌

Now associate this new property with the "LinkType" attribute by selecting "LinkType" in the "Attribute Name" dropdown list:

D:\NGO\Session\Model Designer\Sat	mpleUse\SampleUseWorl	kspace.ini
Workspace Data Sources Comment Types Graphic Types MyLinks Attributes H LinkID	General Effects Oth	ayLinkType hers All
Fid LinkType	Definition	
FId NGG_ExtremityNode		DisplayLinkType
Fld NGG_OriginNode	GraphicType Name	
	Label Display Mode	Disabled
T LinkName - (LinkID)	Property Type	Discrete
	Value Type	String
Behaviors Environment	Display Flag Model	
	Status	Enabled
	Attribute	
	Attribute Name	<u> </u>
	Legend	1.546
	Legend Notes	LinkiD
	Legend Visibility	NGG_ExtremityNode
		NGG_OriginNode
		Add Filter
		Save Close

(3) Creating the "DisplayLinkType" Discrete Filters

Like when you defined the "DisplayNodeType" property for the "MyNodes" graphic type, click the

Add Filter button on the lower-right corner of the ArcGIS Schematics Designer Editor window to create the property's first discrete filter. Fill the "Name" field in the ArcGIS Schematics Designer "Add a discrete filter" form, set the value that will be associated with this first filter (this value is one of the values taken by the "Type" field stored in database), and click OK:

🔀 Add a discrete filter					
Name	Small Type				
Value	Small				
	OK Cancel				

Repeat the preceding operation to create two other filters corresponding to the "Medium" and "Big" values available from the "Type" field database:

🔀 D:\NGO\Session\Model Designer\SampleUs	se\SampleUs	eWorkspace.ini		<u> </u>
Workspace Data Sources Comment Types Graphic Types Mulinks	Ξ	DisplayLir	nkType	
FId LinkID	General	Effects Others	Filters All	L
Fld LinkType	Number	Name	Value	
Fld NGG_ExtremityNode Fld NGG_OriginNode	1	Small Type	Small	
	2	Medium Type	Medium	
	3	Big Type	Big	
·····				
Environment				
			Delete	e Filter
			Add	Filter
			Save	Close

(4) Defining the Graphic Effects Corresponding to Each Discrete Filter

>> Defining the "Small Type" Discrete Filter Graphic Effects (Defining the "Line Width" Parameter)

From the "Filters" tab, select the "Small Type" first discrete filter and click the _____ button to open the "Filter Effects" form. Select the "Effects" tab and set the "Line Width" parameter as follows:

ilter Effe	cts					
General	Effects	Others	a All	5	ynthesis	
Line Effe	ects					
	Line Co	lor				
	Line St	yle				
	Line Wi	11.0 th				
Fill Effec	ts					
	Fill Co	lor				
	Fill St	yle				
	Hatch St	yle				
Text Eff	ects					
Τe	ext Alignm	ent				
	Text An					
	Text Co					
	Text F					
	Text S	ize				
Preview		/	~		Add Patter	n Model
/					DeletePatte	rnModel
1					Clos	e

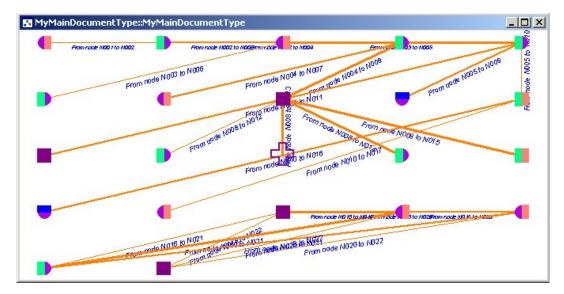
>> Defining the "Medium Type" and the "Big Type" Discrete Filters Graphic Effects (Defining the "Line Width" Parameter)

Click the button from the "Medium Type" second discrete filter to open the "Filter Effects" form related to this second discrete filter graphic effects. Set the "Line Width" parameter displayed in the "Effects" tab with the "2.0" value.

Repeat this operation for the third discrete filter ("Big Type"). Fill the "Line Width" parameter with the "4.0" value.

(5) Testing Your Network Display

Use the "Save" button to save all your workspace parameters and click the "Close" button to close the ArcGIS Schematics Designer Editor window. Click the "Open Document Form" icon on the ArcGIS Schematics Designer toolbar, or click the "Open Document Form" item from the "Document" menu. Select the single "MyMainDocumentType" document type name from the "Document Type" dropdown list and click OK. Your document opens as follows:



Step 14: Animating the Network Nodes According to the Node's "SizeN" Database Field

The "SizeN" field returned by the node graphic type query stored the size of each node as an integer value.

In this step, we decide to take this information into account graphically; we will create the "DisplayNodeSize" bounded property composed by four bounded filters, with each filter corresponding to one range of values. This property will display the nodes according to the "SizeN" field as follows:

"SizeN" Lower Value	"SizeN" Upper Value	Filter Graphic Effects
0	2	Scaling Factor: 1.0
3	5	Scaling Factor: 2.0
6	8	Scaling Factor: 3.0
9	10	Scaling Factor: 5.0

(1) Creating the "NodeSize" Attribute Corresponding to the Node "SizeN" Field

As the "DisplayNodeSize" property will use the "SizeN" field returned by the query, we must begin to create an attribute corresponding to this field.

Right-click the "Attributes" tree entry displayed under the "MyNodes" graphic type and select the "Create" menu from the popup menu.

In the ArcGIS Schematics Designer "Create Graphic Type Attribute" form, set the name that will be used to reference the new attribute in the "Name" field and select "Field Attribute" from the "Type" dropdown list:

💦 Create G	raphic Type Attribute	1
Name	NodeSize	
Туре	Field Attribute	
	OK Cancel	

Next, fill the "Field Name" parameter by selecting "SizeN":

Workspace Data Sources Data Sources Cocument Types Graphic Types Graphic Types Graphic Attributes	General	deSize	
-Fint FormattedID -Find IDNode	Definition		
-Fld NodeSize		NodeSize	
Fld TypeNode	Field Name	SizeN	
i in the second		Save	Close

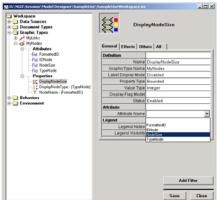
(2) Creating the "DisplayNodeSize" Bounded Property

Now we are going to create the "DisplayNodeSize" bounded property that will display each node according to the "NodeSize" attribute value.

Right-click the "Properties" tree entry displayed under the "MyNodes" graphic type and select the "Create" menu to open the "Create Property" form. Fill the "Property Name" field as in the following screenshot, select "Bounded" type property, select "Integer" from the "Value Type" dropdown list, and click OK:

Create Property	×
Property Name	DisplayNodeSize
	C Direct
	C Textual
	C Discrete
	Bounded
Value Type	Inleger 💌
	OK Cancel

The new "DisplayNodeSize" property is automatically referenced below the "Properties" tree entry. Associate this new property with the "NodeSize" attribute by selecting "NodeSize" from the "Attribute Name" dropdown list.



(3) Creating the "DisplayNodeSize" Bounded Filters

Now click the button on the lower-right corner of the ArcGIS Schematics Designer Editor window. The ArcGIS Schematics Designer "Add a bounded filter" form automatically opens. Fill the "Name" field, set the lower and the upper values that will define this first bounded range, and click OK:

🚼 Add a bounde	d filter	×
Name	Size 1	
LowerValue	0	
UpperValue	2	
	OK Cancel	

Repeat the preceding operation to create three new other filters corresponding to the "3 to 5", "6 to 8", and "9 to 10" values ranges. At the end of this step, the "Filters" tab should look like the following graphic:

R D:\NGO\Session\Model Designer\SampleUse	\SampleUseW	orkspace.ini			
Workspace Data Sources Graphic Types MyLinks	8	DisplayNodeSiz	e - (NodeSi:	ze)	
i MyNodes i MyNodes	General Effects Others Filters All				
Fmt FormattedID	Number	Name	LowerValue	UpperValue	
Fid IDNode	1	Size 1	0	2	
Fld NodeSize Fld TypeNode	2	Size 2	3	5	
Properties	3	Size 3	6	8	
	4	Size 4	9	10	
DisplayNodeSize - [NodeSize] DisplayNodeType - (TypeNode) T NodeName - (FormattedID) Behaviors Environment				e Filter Filter	

(4) Defining the Graphic Effects Corresponding to Each Bounded Filter >> Defining the "Size 1" Bounded Filter Graphic Effects (Defining the <u>"Scaling"</u> Parameter)

From the "Filters" tab, select the "Size 1" first bounded filter and click the _____ button to open the "Filter Effects" form. Select the "Others" tab and fill the "Scaling" parameter with the "1" value, as shown in the following graphic:

General Effects Frame	Others	All	Supsym	DOIS	Synthesis
Symbol Geometry					
Scaling	1				
XScaling					
YScaling					
Symmetry					
Rotation					
Visualization					
\ fi a i b i lite					
Visibility	<u> </u>				
				Add S	ubSymbol
Preview			1		ubSymbol SubSymbol

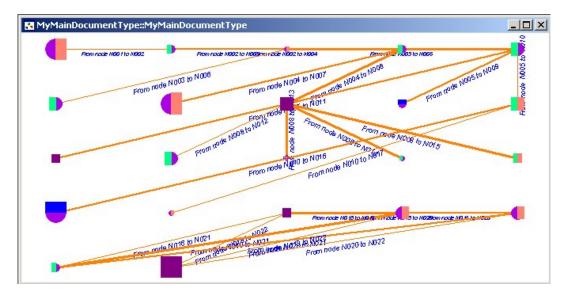
Click OK to close the "Filter Effects" form.

>> Defining the "Size 2", "Size 3", and "Size 4" Bounded Filters Graphic Effects (Defining the "Scaling" Parameter)

For the three other bounded filters, repeat the same operations and fill the "Scaling" parameter with the "2", "3", and "5" values, respectively.

(5) Testing Your Network Display

Now save all your workspace parameters and click the "Close" button to close the ArcGIS Schematics Designer Editor window. Click the "Open Document Form" icon, select the single "MyMainDocumentType" document type name from the "Document Type" dropdown list, and click OK. Your document opens as follows:



Step 15: Creating a Flag Model and Using it to Modify the "NodeName" Property Display

(1) Creating Your First Flag Model

Right-click the "Flag Models" tree entry displayed below the "Environment" entry and select the "Create" menu:



The ArcGIS Schematics Designer "Flag Model" dialog box opens. Enter the name that will be used to reference your first flag model and click OK:

🔣 Flag Mode	el	<u>_0×</u>
Name	FlagModel1	
	ОК	Cancel

The new flag model tree entry is automatically created below the "Flag Models" entry.

The preview window shows the symbol that will be used by default to represent all flags of this type. The workspace's default flag symbol is in the screenshot below:

5	D:\NGO\Session\Model Designer\5	ampleUse\	SampleUseW(orkspace.ini	
	Workspace Data Sources Cocument Types Cocument Types Cocument Types Cocument Types Cocument Types	•	Flagi	Model1	
	Environment	General	Effects Fra	me Others All	
	User Procedure Sets	Definitio	n		
	Flag Models FlagModel1		Name	FlagModel1	
	Pattern Models	Represe	ntation	-	
			Symbol Name	MyDefFlagSymbol	
		Preview		Save	Close

Use one of the two buttons (or call) displayed when you select the "Symbol Name" field if you want to change the CGM symbol.

Click the different tabs to set the parameters you want. For example, from the "Others" tab, you can set:

- The distance that will be used to display the flags of this type according to the position of the graphic objects with which it will be associated ("Shift Distance" parameter)

- The angle of the pole that will connect each flag to its associated graphic object ("Angle" parameter)

These are shown in the following graphic:

NGO\Session\Model Designer\SampleUse\SampleUseWorkspace.ini						
Workspace Data Sources Document Types Graphic Types Behaviors Environment User Attribute Sets	General Effects Fram					
	Symbol Geometry					
Flag Models	Scaling					
FlagModel1	XScaling					
	YScaling					
	Symmetry					
	Rotation					
	Shift Angle					
	Shift Distance					
	Position On Segment	0,5				
	Visualization					
	Visibility					
	Priority	Nothighlighted				
	Interactive Behavior	301				
	Selectability	Selectable				
		Movable				
		Resizable				
	Detectability					
	Preview	Save Close				

(2) Associating This Flag Model with the "MyNodes" Group

We want to modify the already defined "NodeName" property so that this new flag model is used to display the property label. Because no flag can be attached to the objects of a group if no association is set between the flag model and this objects group, we must begin to associate the new flag model with our "MyNodes" object group.

From the "MyNodes" graphic type Editor window, click the the right-bottom corner to open the "Add Flag" form. Choose the single "FlagModel1" already defined and click OK to automatically associate the new flag model with the nodes group:

D:\NGO\Session\Model Designer\ Workspace Data Sources Document Types Graphic Types MyLinks MyLinks Herein MyNodes Herein Behaviors	Му№	
🗄 🔄 Environment	Definition	
User Attribute Sets	Type Name	MyNodes
	Parent Name	
E G Flag Models	Graphic Class	Node
Pattern Models	Graphic Group	
	Group Name	MyNodes
	Data	
	Data Source	NgMainDataSource
	Query	SELECT * FROM Nodes
	Rep Leg Preview	Model1
		Add Flag Model Save Close

The "FlagModels" tab is created. The preview subwindow shows the new node appearance with its flag:

🚼 D:\NGO\Session\Model Designer	\SampleUse\SampleUseWorkspace.ini	
Workspace Data Sources Document Types Graphic Types MyLinks Behaviors Environment User Attribute Sets User Procedure Sets Flag Models FlagModel1	General Effects Frame SubSymbols FlagModel1	FlagModels Others All
Pattern Models	Preview	Delete Flag Model Add Flag Model Save Close

From this new "FlagModels" tab, select the "FlagModel1" flag model line and click the used to open the "Pole Effect" form. This form must be used to specify the graphic attributes of the pole that connects each flag to its associated object. For example, from the "Effects" tab, modify the "Line Color" and the "Line Width" as follows so that the pole line displays in blue and its width is enlarged:

Line Effects	
Line Cold	
Line Styl Line Widt	

(3) Modifying the "NodeName" Property Parameters

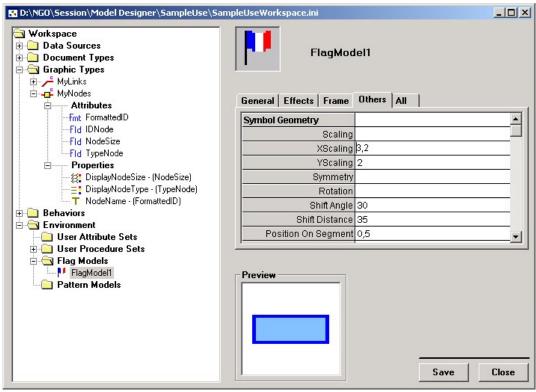
As the new flag model is now associated with the node group, we will modify the "NodeName" property parameters so that the property label is displayed in the flag.

Click the "NodeName" property tree entry and in the "General" tab, select the "FlagModel1" flag model from the "Display Flag Model" dropdown list.

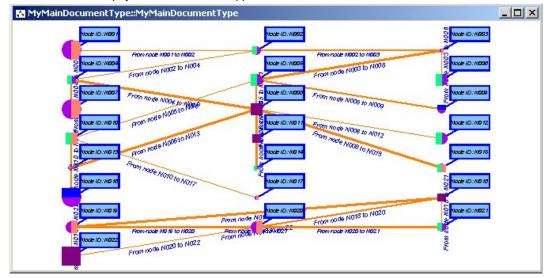
🖪 D:\NGO\Session\Model Designer\SampleUse\San	npleUseWorkspace.ini	-D×
Workspace Data Sources Document Types Graphic Types MyLinks	NodeName	
MyNodes	General Effects Others All	
-Fmt FormattedID	Definition	1
Fld IDNode	Name NodeName	
Fld NodeSize Fld TypeNode	GraphicType Name MyNodes	
Properties	Label Display Mode PropertyValue	
🕂 👯 DisplayNodeSize - (NodeSize)	Property Type Textual	
DisplayNodeType - (TypeNode)	Value Type String	
NodeName - (FormattedID) ■ Behaviors	Display Flag Model FlagModel1	
	Attribute	
User Attribute Sets	Attribute Name FormattedID	
User Procedure Sets	Legend	
Flag Models	Legend Notes	
Pattern Models	Legend Visibility Visible	
	Preview	e Close

Save your workspace parameters and test your network display.

If the flag size is not suited to the label length, you can modify the "XScaling" and "YScaling" flag model parameters, as shown in the following screenshot:



At the end of this step, your network should appear as follows:



Step 16: Creating Pattern Models That Will Be Used Afterwards to Represent a New Link Property

In this step, you will create two pattern models that you will then use to display the links according to a new property value.

(1) Creating a Pattern Model Symbol

The first "PatternSymbol1" pattern model we will create is a pattern model symbol that will display an arrow placed on the middle of each link path route.

Right-click the "Pattern Models" tree entry displayed under the "Environment" entry and select the "Create" menu:

D:\NGO\Session\Model Designer\SampleU
🔄 Workspace
🗄 🦲 Data Sources
🗄 🛅 Document Types
🗄 🦲 Graphic Types
🗄 🛄 Behaviors
E-G Environment
User Attribute Sets
🕀 🦲 User Procedure Sets
🗄 🦲 Flag Models
Pattern Models
Create

The ArcGIS Schematics Designer "Pattern Model" dialog box opens. Enter the name that will be used to reference your first pattern model, select the "Pattern Symbol" value from the "Type" dropdown list, and click OK.

🚼 Pattern	Model	×
Name	PatternSymbol1	
Туре	Pattern Symbol	•
	ОК	Cancel

The new pattern model tree entry is automatically referenced below the "Pattern Models" tree entry.

From the "General" tab, specify the CGM symbol that will represent each pattern; use the subtract displayed when you select the "Symbol Name" field to launch the NgUSymbolEditor and draw the new CGM file representing the desired symbol.

🛃 D:\NGO\Session\Model Designer\Sampl	eUse\SampleUseWorks;	oace.ini
Workspace Data Sources Graphic Types Behaviors	Patte	rnSymbol1
Environment	General Effects Oth	ers All
🗄 🦲 User Procedure Sets	Definition	
E Flag Models	Name	PatternSymbol1
Pattern Models	Representation	
	Symbol Name	T
	Preview	Save Close

The parameters needed to define the rules that will be used to repeat the patterns along the segment are those available in the pattern model "Others" tab.

Select this tab. The default values set for the "Positioning Mode", the "Shift Distance", the "Spacing", and the "Max Items On Segment" parameters are those we need to display a pattern on the middle of each link path route; our first pattern model definition is finished.

🗄 D:\NGO\Session\Model Designer\SampleUse\SampleUseWorkspace.ini			_ 🗆 🗙
Workspace Data Sources Comment Types Graphic Types Behaviors Environment User Attribute Sets		nSymbol1	
User Attribute Sets	Symbol Geometry		<u> </u>
🕀 🔁 Flag Models		SegmentRelativeSpacing	
E Carl Pattern Models	Shift Distance		
PatternSymbol1	Spacing		
Patern ext	Max Items On Segment		
	Orientation Mode		
	Scaling		
	Visualization		
	Color Mode	NotSlave	
	Draw Mode	Continuous	
	Preview	Save	Close

(2) Creating a Pattern Model Text

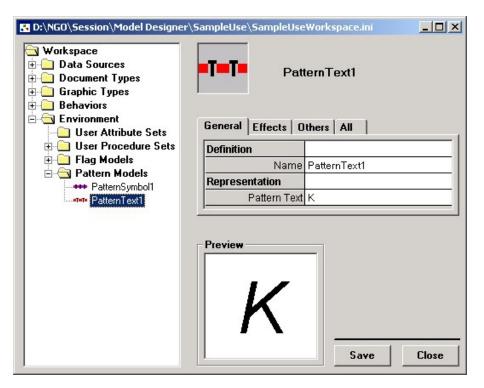
The second "PatternText1" pattern model we will create is a pattern model text that will display the "K" character along each link path route. The pattern color should automatically change according to the color of the link on which it will be displayed. The rules to repeat the pattern along the segment are as follows:

- Spacing between items: 5.0
- First item is 3.0 units away from link origin

As when you created your first pattern model, select the "Create" menu displayed when you right-click the "Pattern Models" tree entry to open the ArcGIS Schematics Designer "Pattern Model" dialog box. Enter the name that will be used to reference your second pattern model, select the "Pattern Text" value from the "Type" dropdown list, and click OK:

💦 Pattern	Model	X
Name	PatternText1	
Туре	PatternText	•
	OK Cance	el

Select the new pattern model tree entry displayed below the "Pattern Models" tree entry and set the "K" character in the "Pattern Text" parameter field displayed in the "General" tab as in the following screenshot:



Next, click the "Others" tab to define the rules that will be used to repeat the patterns along the segment. Select the "AbsoluteSpacing" value from the "Positioning Mode" dropdown list. Set the "Shift Distance" value that will be used to display the first pattern item.

Set the "Spacing" value that will be used to space each pattern item on the link.

Select the "Slave" value from the "Color Mode" dropdown list so that the pattern color automatically changes according to the link color:

👪 D:\NGO\Session\Model Designer\SampleUse\SampleUseWorkspace.ini			
Workspace Data Sources Comment Types Graphic Types Behaviors Comment User Attribute Sets	General Effects Othe	nText1 rs All	
E User Procedure Sets	Symbol Geometry		
Elag Models Elag Pattern Models	Positioning Mode	AbsoluteSpacing	
Pattern Models	Shift Distance	3	
PatternText1	Spacing	5	
	Max Items On Segment		
	Orientation Mode	Oriented	
	Scaling		
	Visualization		
	Color Mode		┚║
	Draw Mode	Continuous	
	K	Save	Close

The second pattern model definition is finished. Save your workspace parameters.

Step 17: Using Pattern Models to Highlight the Links According to the "Rate" Database Field

The "Rate" field returned by the link graphic type query stores the rate of each link as a double value.

In this step, we decide to take this information into account graphically; we are going to create the "DisplayLinkRate" bounded property composed by five bounded filters, with each filter corresponding to one range of values. This property will display the links according to the "Rate" field as follows:

"Rate" Lower Value	"Rate" Upper Value	Filter Graphic Effects
0	200 000	Use the "PatternSymbol1" pattern model
200 000	400 000	Use the "PatternText1" pattern model
400 000	600 000	Use the "PatternSymbol1" and "PatternText1" pattern model
600 000	800 000	Display the link in blue
800 000	1 000 000	Display the link in red with the dashed dotted line style

(1) Creating the "LinkRate" Attribute Corresponding to the Link "Rate" Field

As the "DisplayLinkRate" property will use the "Rate" field returned by the query, we must begin to create an attribute corresponding to this field.

Right-click the "Attributes" tree entry displayed under the "MyLinks" graphic type and select the "Create" menu from the displayed popup menu to open the ArcGIS Schematics Designer "Create Graphic Type Attribute" form. Set the name that will be used to reference the new attribute in the "Name" field, select the "Field Attribute" value from the "Type" dropdown list, and click OK:

🚼 Create G	raphic Type Attribute
Name	LinkRate
Туре	Field Attribute
	OK Cancel

Fill the "Field Name" parameter by selecting the "Rate" field:

D:\NGO\Session\Model Designer\Sa Workspace Data Sources Document Types Graphic Types MyLinks MyLinks MyLinks Fmt FormattedLinkID		kspace.ini
Fid LinkID Fid LinkRate Fid LinkRate Fid LinkRate Fid NGG_ExtremityNode Fid NGG_OriginNode Froperties MyNodes Behaviors Environment	Field Name	LinkRate Rate

(2) Creating the "DisplayLinkRate" Bounded Property

Now you are going to create the "DisplayLinkRate" bounded property. This will display each link according to the "LinkRate" attribute value.

Right-click the "Properties" tree entry displayed under the "MyLinks" graphic type and select the "Create" menu from the displayed popup menu. In the "Create Property" form that opens, fill the "Property Name" field as in the following screenshot, select "Bounded" as type property, select "Double" from the "Value Type" dropdown list, and click OK:

🔀 Create Property	×
Property Name	DisplayLinkRate
	O Direct
	C Textual
	O Discrete
	Bounded
Value Type	Double 🔽
	OK Cancel

Now associate this new property with the "LinkRate" attribute by selecting "LinkRate" from the "Attribute Name" dropdown list:

D:\NGO\Session\Model Designer\SampleUse Vorkspace Data Sources C. Document Types Graphic Types MyLinks	SampleUseWorkspace.ini	
Attributes	General Effects Others All	
E DisplayLinkRate	Definition	-1
	Name DisplayLinkRate	
···· ⊤ LinkName - (FormattedLinkID) ⊕ <mark>-</mark> MyNodes	GraphicType Name MyLinks	
Behaviors	Label Display Mode Disabled	
🗄 🦳 Environment	Property Type Bounded	
	Value Type Double	
	Display Flag Model	
	Attribute	-1
	Attribute Name	a -1
	Legend	4-1
	Legend Notes FormattedLinkID	
	Legend Visibility LinkRate	
	LinkType NGC_ExtremityNode	
	Preview NGG_OriginNode	
	Add Filter	
	Save Cl	ose

(3) Creating the "DisplayLinkRate" Bounded Filters

Click the **Add Filter** button on the lower-right corner of the ArcGIS Schematics Designer Editor window to create the property's first bounded filter. Fill the "Name" field in the ArcGIS Schematics Designer "Add a bounded filter" form and set the value that will be associated with this first filter (this value is one of the value taken by the "Type" field stored in the database). Click OK:

🚼 Add a bounde	d filter	×
Name	Rate 1	
LowerValue	0	
UpperValue	200000	
	OK	Cancel

Repeat the preceding operation to create four other filters that correspond to the value ranges specified above.

D:\NGO\Session\Model Designer\SampleUs Workspace Data Sources Document Types Graphic Types MyLinks MyLinks From Attributes Froperties	se\SampleUseWorkspace.ini					
<mark>∰</mark> DisplayLinkRate - (LinkRate)	Number	Name	LowerValue	UpperValue		
DisplayLinkType - (LinkType)	1	Rate 1	0	200000		
·····	2	Rate 2	200000	400000		
	3	Rate 3	400000	600000		
	4	Rate 4	600000	800000		
	5	Rate 5	800000	1000000		
	Preview			e Filter		

(4) Defining the Graphic Effects Corresponding to Each Bounded Filter >> Defining the "Rate 1", "Rate 2", and "Rate 3" Bounded Filters Graphic Effects (Use the "PatternSymbol1" or/and the "PatternText1" Pattern Models to Display the Links)

From the "Filters" tab, select the "Rate 1" first bounded filter and click the _____ button to open the "Filter Effects" form. Click the _____ Add Pattern Model button in the right-bottom corner to open the "Add Pattern

Model" form, and select the desired pattern model from the "Name" dropdown list:

General	Effects	Others	s All	Synthes	is		
Definition							
Name		Rate 1					
LowerValue		0					
	Uppe	rValue	200000				
			Enabled				
Legend	🛃 Ade	d Patte	rn Mode	el 🛛		×	
Preview			Pattern Pattern		Cance	21	
TETIEW			1				
ICTICW	/	/				d Pattern M	
	/	/				d Pattern M etePatternk	

The "Pattern Model" tab is created. It shows the pattern models that have been added to represent the link.

Repeat the same operation for the "Rate 2" and "Rate 3" bounded filter. For the "Rate 3" bounded filter, the "Pattern Model" should appear as it does in the following graphic:

ilter Effects	
General Effects Others All	Pattern Model Synthesis
PatternSymbol1	
PatternText1	
	Add Pattern Model

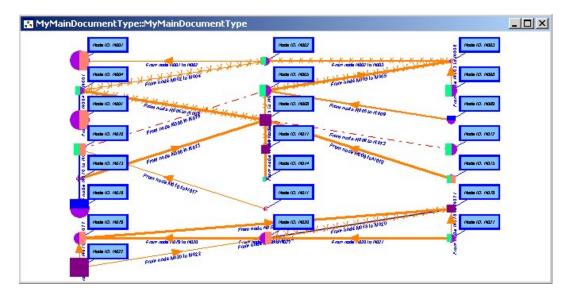
>> Defining the "Rate 4" and "Rate 5" Bounded Filters Graphic Effects (Setting the "Line Color" and/or the "Line Style" Parameter)

Click the button from the "Rate" second discrete filter to open the "Filter Effects" form related to the desired discrete filter graphic effects. Set the "Line Color" parameter displayed in the "Effects" tab. Repeat this operation for the "Rate 5" bounded filter and, for this last filter, specify the "Line Style", too:

	Effects	0	hers	All	9	ynthesis	
Line Effe							
	Line Col	lor	1				
	Line Sty	/le	Dash	edDot	ted		1.0
	Line Wid	ith					
Fill Effec	ts						
	Fill Col	lor					
	Fill Sty	/le					
	Hatch Sty	/le					
Text Eff	ects						
Te	ext Alignme	ent					
	Text Ang	jle					
	Text Col						
	Text Fo	-					
	Text Si	ze					
Preview						Add Patter	

(5) Testing Your Network Display

Now save all your workspace parameters and click the "Close" button to close the ArcGIS Schematics Designer Editor window. Click the "Open Document Form" icon, select the single "MyMainDocumentType" document type name from the "Document Type" dropdown list, and click OK. Your document opens as follows:



Step 18: Creating a New Document Type for the Different Subnetworks

The "SubNet" field stored in the "Nodes" table can be used to filter out the graphic objects according to the subnetwork to which they belong. It can be a good idea to create a new type of document whose associated documents will correspond to each subnetwork stored in the database.

(1) Creating the "MySubDocumentType" New Document Type

Right-click the "Document Types" tree entry and select the "Create" menu. It automatically opens the ArcGIS Schematics Designer "Create Document Type" form.

Fill the "Name" text box. Even if the "MyMainDocumentType" has no particular characteristics, it can be interesting that this new document inherits from the first one; in fact, if we decide to create specific behaviors for the parent document type, these behaviors will be automatically inherited at the child level. So, from the "Parent Name" dropdown list, select the single existing document type as follows:

🚼 Create Docur	nent Type 🔀	1
Name	MySubDocumentType	
Parent Name	MyMainDocumentType	
	OK Cancel	

(2) Defining the "MySubDocumentType" Data Source and Query

As this new document type must filter out the graphic objects that will be associated with it according to the subnetwork these objects belong to, each subnetwork in the database builds a single document of this type: the query that will return all the documents of this type should return the distinct occurrences of the subnetworks stored in the database.

Select the "NgMainDataSource" from the "Data Source" dropdown list:

💀 D:\NGO\Session\Model Designer\SampleUs	e\SampleUseWorkspace.ini	
Workspace Data Sources Document Types Associations MySubDocumentType	General All	
🕀 🦲 Graphic Types	General	
Behaviors Environment	Type Name MySubDocumentTyp	e
Environment	Parent Name MyMainDocumentTy	pe
	Data	
	Data Source NgMainDataSource	
	Query	
	Identifier	
	Save	close

Click the _____ button displayed when you select the "Query" field to open the ArcGIS Schematics Designer "Query Editor". Select the table called "Nodes" from the "Tables" list, and write the query that will return all the subnetworks stored in the database. Use the "Show Results" button to test your query and click OK to close the "Query Editor" form:

	Data Source	NgMain	DataSource	<u> </u>]				
Sy	stem Tables								
able	s		IdNode	SizeN	Туре	SubNet	X	Y	-
Links		_	VarWChar	SmallInt	VarWChar	VarWChar	Integer	Integer	
Links NewL	inks	1	N001	10	В	SubNet1	1540236	45258	
Node:	S	2	N002	5	A	SubNet1	1540975	47139	
SubN	et	3	N003	2	В	SubNet1	1552360	45123	
		4	N004	3	A	SubNet1	1546980	45862	
luery	Air fiecolds	SELEC	N005	0Net From Noc	A	SubNet1 SubNet1	1546980 1542378	45862 45467	
luery	Show Results	SELEC	N005	6	A			9 9 (1	
luery	SubNet	SELEC	N005	6	A			9 9 (1	
	SubNet VarWChar	SELEC	N005	6	A			9 9 (1	
1	SubNet SubNet SubNet1	SELEC	N005	6	A			9 9 (1	
1	SubNet VarWChar	SELEC	N005	6	A			9 9 (1	
1 2 3	SubNet SubNet SubNet1	SELEC	N005	6	A			9 9 (1	
1	SubNet SubNet SubNet1	SELEC	N005	6	A			9 9 (1	

(3) Defining the "MySubDocumentType" Identifier

Now you must specify the name that will be used to reference each document of this type. The "SubNet"

field returned by the query can be used to identify each document; click the _____ button displayed when you select the "Identifier" field to open the ArcGIS Schematics Designer "Identifier Editor" and use the



button to select this field:

🚼 Identifier Editor		×
Fields		
SubNet		
SubNet		
Identifier		
SubNet		
1		
	ОК	Cancel

(4) Creating Attributes

When such a document type is created to filter out graphic objects stored in the database, we must define the document type attribute that will later be used to filter the objects associated with a selected document in this document type. That way these graphic objects will be automatically associated with each document of this type. In this case, it is the "SubNet" field that we will need.

Right-click the "MySubDocumentType" entry and select the "Create Attribute" menu to open the ArcGIS Schematics Designer "Create Document Type Attribute" form:

🔣 D:\Users\AYB\NG Designer\Sample	eUse\SampleUseWorks
Workspace Data Sources Document Types MyMainDocumentType Associations	
Document Types MySubDocumentType Graphic Types Behaviors Environment	General All Delete Delete Recursively Create Attribute Create Association Copy

Fill the "Name" dropdown list, select "Field Attribute" value from the "Type" dropdown list, and click OK:

🚼 Create D	ocument Type Attribute
Name	SubNetFilter
Туре	Field Attribute
	OK Cancel

Next, fill the "Field Name" parameter by selecting the "SubNet" field:

🖥 D:\NGO\Session\Model Designer\Sample	eUse\SampleUseWorkspace.ini	
D:\\GO\Session\Model Designer\Sample Workspace Data Sources Document Types MyMainDocumentType Associations Document Types MySubDocumentType Attributes Fid SubNetFilter Graphic Types Environment	eUse\SampleUseWorkspace.ini File SubNetFilter General	
	Save	Close

Step 19: Creating a New Node Type to Filter Out Nodes According to Their Subnetworks

In this step, we will create the new graphic type node that will be used to filter out all the nodes stored in the database according to the subnetwork to which they belong.

(1) Creating the "SubNodes" New Node Type

Right-click the "Graphic Types" tree entry and select the "Create" menu that automatically opens the ArcGIS Schematics Designer "Create Graphic Type" dialog box. Fill the "Name" text box and select the "Node" graphic class.

Because it will be interesting to carry all the properties created for the already defined "MyNodes" node type over to the new node type, we can:

- Select the "MyNodes" type from the "Parent Name" dropdown list

and

- Check off the "Graphic Group" option so that this report becomes automatic.

🚼 Create Graphic	: Туре X
Name	SubNodes
Graphic Class	Node
Parent Name	MyNodes 💌
	Graphic Group
	OK Cancel

(2) Associating the New Node Type with the New Document Type

Even if the new node type definition is not finished, it is often useful to associate the new graphic type at this step of its creation. In fact, in the following step, when we define the query related to these nodes, we will need to filter these nodes according to the document chosen (i.e., if the chosen document is "SubNet1", the application has to automatically filter the nodes belonging to this "SubNet1" subnetwork, etc.) The "SubNetFilter" attribute we have created for the "MySubDocumentType" will be necessary for the node type query definition.

Right-click the "MySubDocumentType" entry and select the "Create Association" menu that automatically opens the ArcGIS Schematics Designer "Create Association" dialog box:

D:\Users\AYB\NG Designer\SampleUse\SampleUseWorks			
Workspace Data Sources Document Types Supervised Annual A			
Document Types MySubDocumentType Graphic Types Behaviors Environment	General All I Delete . . . Delete Recursively . . . Create Attribute . . . Create Association . . . Copy 		

From the "Name" dropdown list, select the new "SubNodes" graphic type and click OK:

🔀 Create As:	sociation	×
Name	SubNodes	•
	ОК	Cancel

(3) Redefining the New Node Type Query

As the new node type inherits from the "MyNodes" graphic type, the default query set for this new graphic object type is the "MyNodes" query. This query must be redefined so that it returns the nodes related to one subnetwork only.

From the "Query" parameter field displayed in the "General" tab related to the new node type, click the button to open the "Query Editor" window.

Write in the "Query" area the query that will return all the nodes related to a given document (i.e., related to one subnetwork); this query is parameterized. The parameter must correspond to the chosen document (i.e., to the document's "SubNetFilter" attribute value).

As the node type is already associated with the "MySubDocumentType", this attribute is available from the Parameters Name dropdown list:

	ldNode VarWChar N001	SizeN SmallInt	Туре	SubNet		1880 X	
2	VarWChar		Туре	SubNet		6.20 22	
2		Smallight		Subnot	Х	Y	-
2	N004	Smainne	VarWChar	VarWChar	Integer	Integer	
	10001	10		SubNet1	1540236	45258	
1000	N002	5	13372	SubNet1	1540975	47139	
3	N003	-		SubNet1	1552360	45123	
4	N004			SubNet1	1546980	45862	
5	N005	6	A	SubNet1	1542378	45457	-
J							
ual Value	e for testing	_					
	, tor tooting					8	
1.7							
				01 01 01			
							-
		USELECT * FROM No	SELECT * FROM Nodes where Su	SELECT * FROM Nodes where SubNet=?	SELECT * FROM Nodes where SubNet=?	USELECT * FROM Nodes where SubNet=?	SELECT * FROM Nodes where SubNet=?

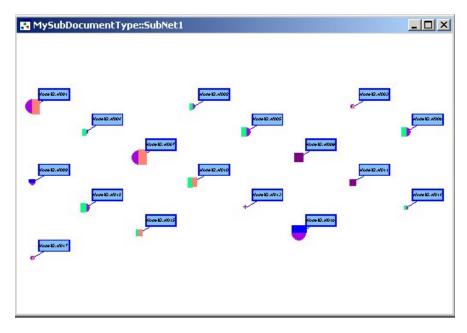
(4) Redefining the New Nodes Identifier

Due to the inheritance, the node identifier is "MyNodes" by default. This identifier can be redefined: for example, as shown in the following graphic, you can build up the node identifiers by concatenating the document name and the node identifier stored in the database so that each node graphic object has a unique identifier:

🚼 D:\NGO\Session\Model Designer\Sample	Use\SampleUseWorkspace.ini	_ 🗆 🗵
Workspace Data Sources MyMainDocumentType MyMainDocumentType Document Types MySubDocumentType	General All	5
Attributes	Definition	
Fid SubNetFilter	Type Name	SubNodes
	Parent Name	MyNodes
🖻 📇 Graphic Types	Graphic Class	
	Graphic Group	
HyNodes	Group Name	MyNodes
Attributes Froperties	Data	
Graphic Types		NgMainDataSource
-D- SubNodes		SELECT * FROM Nodes where SubNet=?
Behaviors Environment	Identifier	SubNet,IdNode
	Preview	Save Close

(5) Testing the Subnetworks Display

The new node type definition is finished. Click the "Save" button to save all your new workspace parameters and click the "Close" button to close the ArcGIS Schematics Designer Editor window. Now click the "Open Document Form" icon on the ArcGIS Schematics Designer toolbar, or click "Open Document Form" from the "Document" menu. Select the "MySubDocumentType" document type name from the "Document Type" dropdown list. Choose the desired document name from the "Document Name" dropdown list and validate. Your new schematic document opens as follows:



Note #1: The document names available from the "Document Name" dropdown list are those returned by the document type query.

Note #2: The new node type inherits from the "MyNodes" type, so all properties defined for the parent node type are automatically reported on the child node type. As the query set for the new node type returns the same parent fields needed by these inherited properties, the properties representation is effective.

Step 20: Creating a New Link Type to Filter Out the Links According to Their Subnetworks

In this step you will create a new graphic type link that will be used to filter out all the links stored in the database according to the subnetwork to which they belong.

(1) Creating the "SubLinks" New Link Type

Right-click the "Graphic Types" tree entry and select the "Create" menu that automatically opens the ArcGIS Schematics Designer "Create Graphic Type" dialog box.

Fill the "Name" text box and select the "Link" graphic class. As for the "SubNodes" node type, we decide that this new link type inherits from "MyLinks". Check the "Graphic Group" option so that the inheritance is complete:

🚼 Create Graphi	с Туре	×
Name	SubLinks	
Graphic Class	Link	
Parent Name	MyLinks 💌	
	🔽 Graphic Group	
	OK Cancel	

(2) Associating the New Link Type with the New Document Type

As for the node type, we are now going to associate the new link type with the "MySubDocumentType" document type so that the "SubNetFilter" attribute we have created for the "MySubDocumentType" will be available for the link type query definition.

Right-click the "MySubDocumentType" entry and select the "Create Association" menu that automatically opens the ArcGIS Schematics Designer "Create Association" dialog box:

🚼 D:\Users\AYB\NG Designer\Sample	Use\SampleUseWorks
Workspace Data Sources Document Types MyMainDocumentType Common Associations Document Types	
MySubDocumentType Graphic Types Behaviors Environment	General All Delete Delete Recursively Create Attribute Create Association Copy

From the "Name" dropdown list, select the new "SubLinks" graphic type and click OK:

🚼 Create As	sociation	×
Name	SubLinks	•
	OK	Cancel

(3) Redefining the New Link Type Query

Write the query that will return all the links related to a given document (i.e., related to one subnetwork) in the "Query" area. The "SubNodes" query is parameterized, and the parameter must correspond to the chosen document (i.e., to the document's "SubNetFilter" attribute value):

Query Editor							
Data Source	NgMair	nDataSource	<u>•</u>	J			
System Tables							
ables		ldLink	IdNode1	ldNode2	Rate	Туре	•
	_	VarWChar	VarWChar	VarWChar	Double	VarWChar	
.inks	1	L001	N001	N002	3456.2421875	Small	
lewLinks Iodes	2	L002	N002	N003	298765.4375	Medium	
iubNet	3	L003	N002	N004	314536.4375	Small	
	4	L004	N003	N005	452456.46875	Big	
	5	L005	N003	N006	57232.4375	Small	
Air fiecolds	((Node			let, Links.* FROM N I (Nodes.SubNet=?		nere	
Show Results	((Node		iks.idNode1) and	I (Nodes.SubNet=?))		
Show Results	((Node		iks.idNode1) and	I (Nodes.SubNet=?)) IdLink	IdNode1	lc 🔺
Show Results			iks.idNode1) and	I (Nodes.SubNet=?))		
Show Results		es.ldNode=Lin	ks.idNode1) and	I (Nodes.SubNet=?)) IdLink	IdNode1	
An records Show Results arameters lame Textu Y	_ ((Node	es.ldNode=Lin	ks.idNode1) and	I (Nodes.SubNet=?)) IdLink	IdNode1	
Show Results Show Results Vame Textu Vame VGG_DocumentName VGG_DocumentType	_ ((Node	es.ldNode=Lin	ks.idNode1) and	I (Nodes.SubNet=?)) IdLink	IdNode1	
Show Results Parameters	_ ((Node	es.ldNode=Lin	ks.idNode1) and	I (Nodes.SubNet=?)) IdLink	IdNode1	
Show Results Show Results Varianteers Vari	_ ((Node	es.ldNode=Lin	ks.idNode1) and	I (Nodes.SubNet=?)) IdLink	IdNode1	
An Hecolus Show Results Arameters Vame	_ ((Node	es.ldNode=Lin	ks.idNode1) and	I (Nodes.SubNet=?)) IdLink	IdNode1	
Show Results Show Results Varianteers Vari	_ ((Node	es.ldNode=Lin	ks.idNode1) and	I (Nodes.SubNet=?)) IdLink	IdNode1	

(4) Redefining the New Link Identifiers The default inherited identifier can be redefined: for example, as shown in the following screenshot, we can build up the link identifiers by concatenating the document name and the link identifier stored in the database so that each link graphic object has a unique identifier:

Workspace Data Sources Document Types MyMainDocumentType Graphic Types	ner\SampleUse\SampleUseWorks	pace.ini
inks in MyLinks in MyLinks	General All	
Properties	Definition	
Graphic Types	Type Name	SubLinks
∕~ SubLinks ⊡ MyNodes	Parent Name	
	Graphic Class	
Environment	Graphic Group	
	Group Name	MyLinks
	Data	
		NgMainDataSource
		SELECT Nodes.IdNode, Nodes.SubNet, Links. SubNet,IdLink
		Subiver, lacink
	Preview	Save Close

(5) Creating the "NGG_OriginNode" and "NGG_ExtremityNode" Link's Mandatory Attributes

A link can be displayed only when NGO core knows which origin and extremity node the link connects. The node identifiers have been redefined: each "SubNodes" node is identified by concatenating their subnetwork and their database identifier.

So, even if the NGG_OriginNode and NGG_ExtremityNode attributes defined for the "MyLinks" parent link type are automatically inherited at the "SubLinks" level, they must be redefined at the child level.

Right-click the "MyLinks" tree entry corresponding to your link type and select the "Create Attribute" menu:

🔀 D:\Users\AYB\NG Design	ner\Samplet	Jse\S	ampleU	seWorks
Workspace Data Sources Document Types Graphic Type	s j ypes cumentType		General	DN Type N Parent N Graphic (
Behaviors ⊕ Environment	Delete Delete Reci Create Attr Associate P Associate U Copy	ribute Propert	y y	Graphic (Group 1

From the ArcGIS Schematics Designer "Create Graphic Type Attribute" dialog box, choose the "NGG_OriginNode" predefined attribute name from the "Name" dropdown list, select "Field Attribute" from the "Type" dropdown list, and click OK:

🚼 Create Gi	aphic Type Attribute	🚼 Create Gr	×	
Name		Name	NGG_OriginNode	•
Туре	NGG_OriginNode NGG_ExtremityNode NGG_OriginPortNumber	Туре	Field Attribute	•
	NGG_ExtremityPortNumber NGG_InitialListPoints OK Cancel		ОК	Cancel

An "Attributes" new tree entry is automatically created below the "SubLinks" graphic type tree entry, and the "NGG_OriginNode" new attribute itself is referenced under this new entry. From the "Field Names"

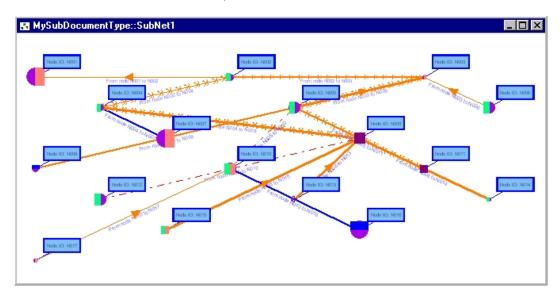
parameter, click the button to open the ArcGIS Schematics Designer "Identifier Editor". Select the fields that will be used to identify each link's origin node. Here, the "SubNet" and "IdNode1" fields returned by the link type query are the fields used to identify the link origin.

👪 Identifier Editor		×
Fields		
IdNode		_
SubNet IdLink		
IdNode1 IdNode2		
Rate		
Type NGG_DocumentType		•
[read_bootmonk()po		
IdNode1		
Identifier		
SubNet		
IdNode1		
	ок	Cancel

Repeat this operation to create the second "NGG_ExtremityNode" mandatory attribute obtained by concatenating the "SubNet" and "IdNode2" fields returned by the link type query.

(6) Testing the Subnetworks Display

The new link type definition is finished. Click the "Save" button to save all your new workspace parameters and click the "Close" button to close the ArcGIS Schematics Designer Editor window. Click the "Open Document Form" icon on the ArcGIS Schematics Designer toolbar, or click "Open Document Form" from the "Document" menu. Select the "MySubDocumentType" document type name from the "Document Type" dropdown list. Select the desired document name from the "Document Name" dropdown list and validate. Your new schematic document opens as follows:



Step 21: Redefining the Inherited "NodeName" and "LinkName" Properties Displayed on the Subnetwork Documents

Due to the inheritance, the "NodeName" and "LinkName" properties defined for the "MyNodes" and "MyLinks" graphic type are automatically reported on the "SubNodes" and "SubLinks" graphic type. Inherited properties can be redefined at the child level.

In this step, we will redefine these property labels as follows:

- In the subnetwork document, the "NodeName" property will only display the "IdNode" field stored in the database.

- In the subnetwork document, the "LinkName" property will display the link name as follows: "IdLink: OriginNode-ExtremityNode".

>> Redefining the "NodeName" Property

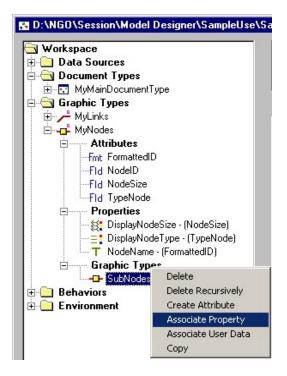
The "NodeID" attribute field defined for the "MyNodes" graphic type corresponds to the "IdNode" field stored in the database.

As the "SubNodes" graphic type inherits from the "MyNodes" one, this attribute is automatically inherited at the child level.

At the "MyNodes" graphic type level, the "NodeName" property is associated with the "FormattedID" attribute. In the subnetwork document, we want to associate this inherited property with the inherited "NodeID" attribute.

For the "SubNodes" graphic type, the "NodeName" property redefining only consists in the reassociating of this inherited property with the inherited "NodeID" attribute.

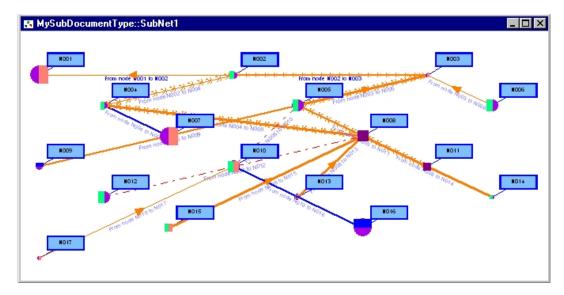
Right-click the "SubNodes" entry and select the "Associate Property" menu to open the ArcGIS Schematics Designer "Associate Property" dialog box:



Select the inherited "NodeName" property from the "Name" dropdown list, select the "NodeID" attribute among all the inherited attributes available from the "Attribute" dropdown list, and click OK:

🚼 Associate	Property	×
Name	NodeName	•
Attribute	FormattedID TypeNode NodeSize NodeID	

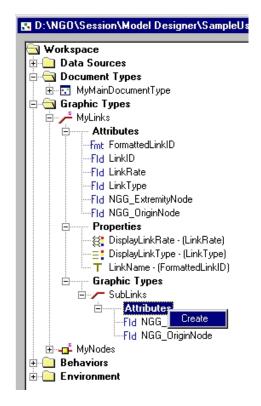
Save your new workspace parameters and test one of the subnetwork document displays:



>> Redefining the "LinkName" Property

At the "MyLinks" graphic type level, the "LinkName" property is associated with the "FormattedLinkID" attribute. In the subnetwork document, we want to change the inherited property label so that this property displays a formatted label built as follows: "IdLink: OriginNode-ExtremityNode".

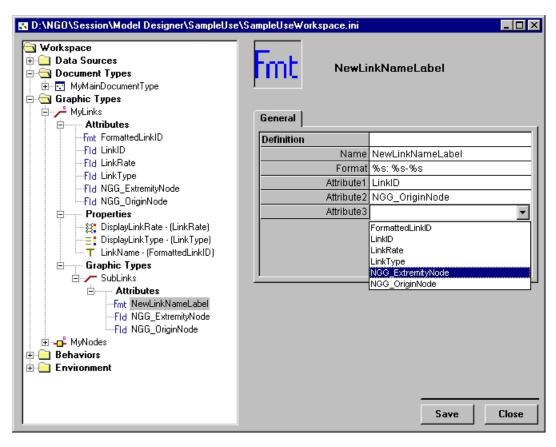
We must start by creating a new formatted attribute at the "SubLinks" level to build this new label. Right-click the "Attributes" tree entry displayed below the "SubLinks" entry and select the "Create" menu:



When the "Create Graphic Type Attribute" form opens, enter a name in the "Name" field and select "Formatted Attribute" from the "Type" dropdown list:

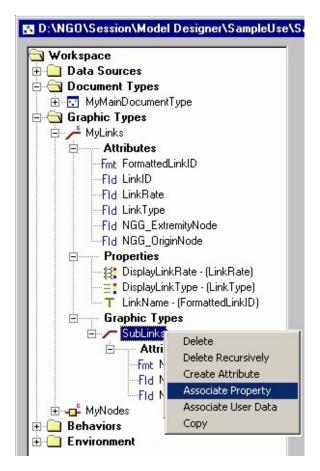
👪 Create G	iraphic Type Attribute	×
Name	NewLinkNameLabel	•
Туре	Formatted Attribute	•
	OK Ca	ancel

Next, define the new attribute's format and select the three attributes that will be used to build this attribute from the "Attribute1", "Attribute2", and "Attribute3" dropdown list. Note that all the inherited attributes from the "MyLinks" graphic type are available in these three attribute dropdown lists.



Now the "LinkName" property redefining only consists of the reassociating of this inherited property with the new "NewLinkNameLabel" attribute defined at the "SubLinks" level.

Right-click the "SubLinks" entry and select the "Associate Property" menu to open the ArcGIS Schematics Designer "Associate Property" dialog box:

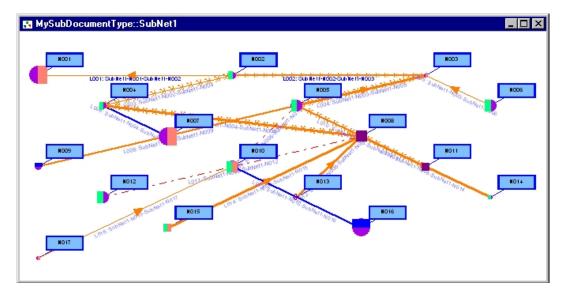


Select the inherited "LinkName" property from the "Name" dropdown list, select the "NewLinkNameLabel" attribute among all the attributes available from the "Attribute" dropdown list, and validate.

Note that the "Attribute" dropdown list lists all the inherited attributes from the "MyLinks" graphic type as well as the single "FormattedLinkID" attribute we have just defined at the "SubLinks" level.

🖪 Associate Property 🛛 🔀			
Name	LinkName	-	
411-1-1-1			
Attribute	NewLinkNameLabel		
	NGG_OriginNode		
	NGG_ExtremityNode		
	LinkRate		
	FormattedLinkID LinkType	Γ	

Save your new workspace parameters and test one of the subnetwork document displays:



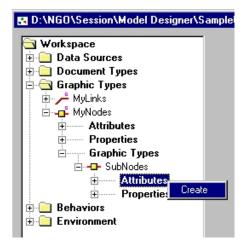
> Step 22: Using Database Coordinates to Display Your Nodes

Until now, because no coordinates have been specified for nodes, our graphic objects are automatically placed on a grid.

In this step, we will use nodes x,y coordinates stored in the database to display nodes. These coordinates can be automatically taken into account if we define two new specific attributes on the node graphic type: the "NGG_InitialXPosition" and "NGG_InitialYPosition" predefined attributes.

In this example, we will define these attributes at the "SubNodes" graphic type level. So, the nodes displayed in the "MyMainDocumentType" document will be displayed without their database coordinates, and the nodes displayed in a subnetwork document will be positioned with their real coordinates.

(1) Right-click the "Attributes" tree entry displayed under the "SubNodes" entry and select the "Create" menu to open the "Create Graphic Type Attribute" form:



(2) Select the predefined "NGG_InitialXPosition" attribute name from the "Name" dropdown list. As the x coordinates are clearly stored in a single field in the database, select "Field Attribute" from the "Type" dropdown list and validate:

🔀 Create Graphic Type Attribute			
Name	NGG_InitiaKPosition	•	
Туре	Field Attribute	•	
	ОК	ancel	

(3) From the new attribute "General" tab, click the _____ button displayed in the "Field Name" field to open the ArcGIS Schematics Designer "Identifier Editor".

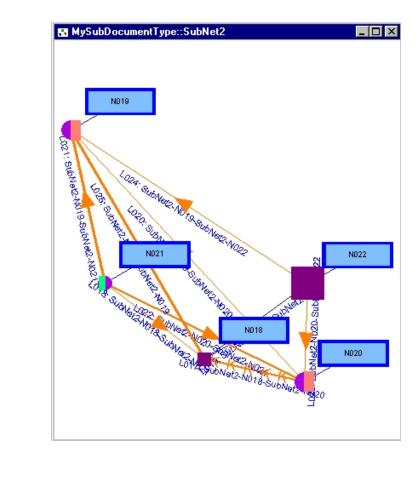
🖪 D:\NGO\Session\Model Designer\SampleUse\SampleUseWorkspace.ini			
Workspace Data Sources Document Types Graphic Types MyLinks MyNodes MyNodes Attributes Froperties Graphic Types Fid NGG_InitiaXPosition Environment	Image: Set		
	Save	Close	

Next, select the "X" field returned by the "SubNodes" query. This field stores each node X-coordinate:

🚼 Identifier Editor		×
Fields		
IdNode Girah		
SizeN Type		
SubNet X Y		_
NGG_DocumentType		
NGG_DocumentName		
×		
Identifier		
X		
		1
	<u> </u>	Cancel

Repeat these three steps to create the "NGG_InitialYPosition" attribute that will be used to display the nodes according to their Y-coordinates.

Save your workspace parameters and test one of your subnetworks view displays:



> Step 23: Defining the Behaviors That Will Impact the Views

Let's now go one step further in the application design process by defining the application behaviors.

In this Help page, we will define a behavior impacting any view when it is right-clicked.

Generally, the main useful commands needed from a view are as follows:

- Turning the legend subwindow display on/off
- Fitting all the graphic objects in the view
- Repositioning the graphic objects displayed in the view according to their last saved position

We are going to create a behavior that will display a popup menu for launching these three commands.

(1) Right-click the "View Types Behaviors" tree entry displayed under the "Behaviors" main entry and select the "Create" menu to open the "Create Behavior" form:

ļ	D:\NGO\Session\Model Designer\S	ampleUse\S
1	Workspace	
	🗄 🦲 Data Sources	
	🕂 🦲 Document Types	
	🗄 🦲 Graphic Types	
	🖻 🔄 Behaviors	
	🕀 🦲 Graphic Types Behaviors	
	🕀 🦲 Legend Behaviors	
	😟 🧰 View Types Behaviors	
	🗄 🦲 Environment	ate

Select the "RightClick" predefined event name from the "EventName" dropdown list. As the "Create Behavior" form has been opened from the "View Types Behaviors" tree entry, the "MetaType" dropdown list is already filled with the "View" value:

🚼 Create Behavi	or	×
EventName	RightClick	•
MetaType	View	•
ObjectType		•
	OK	Cancel

(2) Now, from the new behavior "General" tab, select "NGGCommandPopupMenu" from the "Command" dropdown list as follows:

💀 D:\NGO\Session\Model Designer\Sa	ampleUse\SampleUseWo	rkspace.ini 📃 🗖 🗙
Workspace Data Sources Graphic Types Behaviors Control Control Con	Rig	htClick
Graphic Types Behaviors Legend Behaviors	General Command	
	EventName	RightClick
	MetaType	View
Key0/25/0	Object Type Name	
	Command	
Key0/27/0 Key0/28/0 Key1/27/0 Key1/28/0 RightClick		NGGCommandPopupMenu NGGCommandPrint NGGCommandRemoveLinkPoints NGGCommandRepaint NGGCommandSaveSession NGGCommandSelectFromNetGraph NGGCommandSelectInVetGraph NGGCommandSelectTree

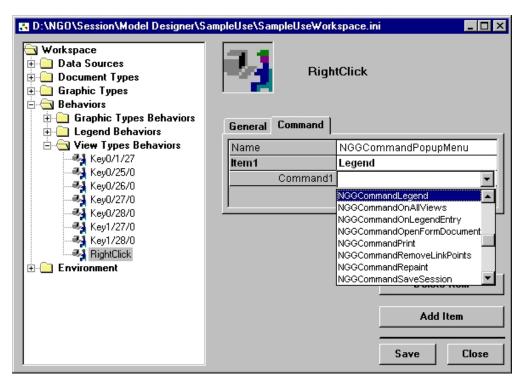
Click the "Command" tab and define the command that will correspond to the first popup menu item:

- Set the first item name that will appear in the popup menu

and

- Select "NGGCommandLegend" from the "Command1" dropdown list

The first item definition is finished; selecting this item will allow you to turn the legend subwindow on and off depending on if it is already displayed or not.



(3) Next, click the Add Item	button to create the second popup menu item and define its
related parameters as follows:	

- Set the second item name that will appear in the popup menu

- Select "NGGCommandFitAll" from the "Command2" dropdown list

The second item definition is finished; selecting this item will allow all the graphic objects displayed to fit in any view:

👪 D:\NGO\Session\Model Designer\S	ampleUse\Sam	pleUse₩ork	space.ini	_ 🗆 ×
Workspace Data Sources Document Types Graphic Types	RightClick			
⊡-← Behaviors ⊕- Graphic Types Behaviors ⊕- Legend Behaviors	General	Command		
🖻 🔄 View Types Behaviors	Name		NGGCommandPopup	Menu
Key0/1/27	ltem1		Legend	
		Command1	NGGCommandLegen	d
Key0/20/0	ltem2		Fit All	
		Command2	NGGCommandFitAll	<u> </u>
RightClick				
			Delete	ltem
			Add	ltem
			Save	Close
1				

and

(4) Click the ______ button to create the third popup menu item and define its related

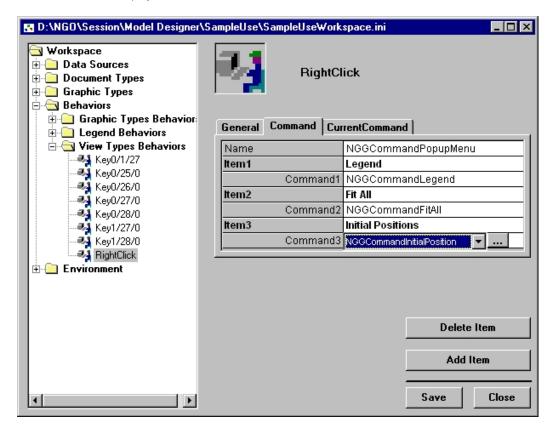
parameters as follows:

and

- Set the third item name that will appear in the popup menu

- Select "NGGCommandInitialPosition" from the "Command3" dropdown list

As this command is parameterized, click the _____ button that automatically appears on the right of the "Command3" field to display its associated "CurrentCommand" tab:



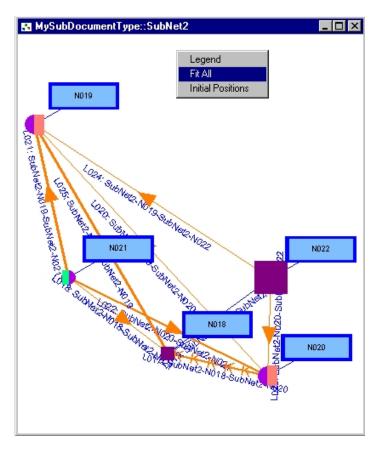
Select this tab and define the "ModeSet" and "ModeNotSet" parameter values as follows:

- For the "ModeSet" parameter, select the "DB" value from the dropdown list so that all graphic objects positioned with the "NGG_InitialXPosition" and "NGG_InitialYPosition" attributes are restored in their database positions.

- For the "ModeNotSet" parameter, select the "Nothing" value from the dropdown list so that graphic objects that do not contain "NGG_InitialXPosition" and "NGG_InitialYPosition" attributes are not moved.

D:\NGO\Session\Model Designer\S	ampleUse\SampleUseWorkspace.ini	_ 🗆 ×
Workspace Data Sources Document Types Graphic Types Behaviors Graphic Types Behaviors	RightClick	
E-gend Behaviors View Types Behaviors View Types Behaviors Key0/1/27 Key0/25/0 Key0/26/0 Key0/27/0 Key0/28/0 Key1/27/0 Key1/28/0 RightClick Environment	CurrentCommandN: NGGCommandInitialPo ModeSet DB ModeNotSet Center DB Nothing	Close

(5) Save your workspace parameters, close the ArcGIS Schematics Designer Editor window, and test your popup menu display:



Note: The "Initial Positions" item has a different impact when it is called from a view associated to the "MyMainDocumentType" or from a subnetwork view. In the first case, graphic objects are not repositioned. In the second case, their database coordinates are restored.

Step 24: Redefining the Default "LeftDblClick" Behavior Impacting a Legend Property Filter Entry

When your workspace was created, ArcGIS Schematics Designer automatically created some behaviors.

For the legend property filter, the "LeftDblClick" behavior allows you to automatically select the graphics objects associated with the property filter.

In this example, we will modify this behavior so that it chains the automatic selection of the graphics objects associated with the property filter and the centering of these objects in the view.

Because the "NGGCommantFit" command, which centers the graphic objects selected set in a view, can only be triggered from a view, you will have to delegate the selection from the legend property filter to the view. Two steps are necessary to define the new behavior:

1) Defining a user-event on the view that triggers the fitting of a graphic objects selected set

2) Modifying the "LeftDblClick" behavior already defined on the legend property filter so that it chains the selection of the associated graphic objects and the fitting of these objects in the view.

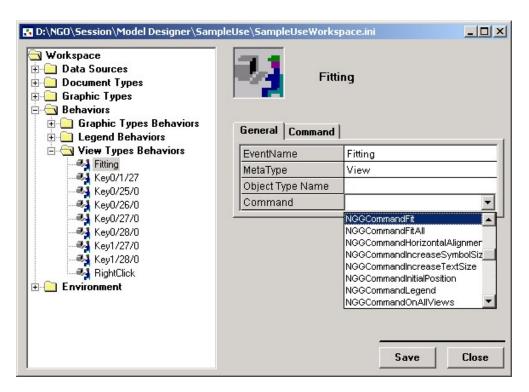
(1) Defining the "Fitting" User-Event

Right-click the "View Types Behaviors" tree entry displayed below the "Behaviors" main entry and select the "Create" menu to open the "Create Behavior" form.

Set the user-event name that will be used to reference this behavior in the "EventName" zone and validate:

💦 Create Behavi	Dr	×
EventName	Fitting	•
MetaType	View	•
ObjectType		•
	OK	Cancel

Now from the new behavior "General" tab, select "NGGCommandFit" from the "Command" dropdown list as follows:



As this command is not parameterized, the first step is finished.

(2) Redefining the "LefDblClick" Behavior Impacting Legend Property Filters

Select the "LeftDblClick" behavior entry displayed below the "Property Filter Behaviors" tree entry.

From the "General" tab, modify the "Command" parameter by selecting "NGGCommandContainer" from the dropdown list. (Note: The NGGCommandContainer is the command used to chain several commands.)

D:\NGO\Session\Model Designer\Samp Workspace Data Sources Document Types Graphic Types Behaviors	a •	tDblClick
Graphic Types Behaviors Graphic Behaviors	General Command	1
🕂 🧀 Group Behaviors	EventName	LeftDblClick
Property Filter Behaviors	MetaType	LegendPropertyFilter
	Object Type Name	
Environment	Command	
		NGGCommandCloseSession
		NGGCommandDelegate
		NGGCommandDigitConnectedLink
		NGGCommandDigitLink NGGCommandDigitNode
		NGGCommandExecuteProcedure
		NGGCommandOnLegendEntry
		Save Close

Click the "Command" tab. From the "Command1" dropdown list, select the "NGGCommandOnLegendEntry".

Click the _____ button that automatically appears on the right of the "Command1" field to display its associated "CurrentCommand" tab:

👪 D:\NGO\Session\Model Designer\Sampl	eUse\SampleUseWorks	pace.ini	
Workspace Data Sources Graphic Types Behaviors Graphic Types Behaviors Carphic Types Behaviors Carphic Types Behaviors	General Command	DblClick	
Cogena Denavors Group Behaviors G	Name Command1	NGGCommandContain NGGCommandOnLegendEn	
		Delete	Command
		Add C	Command
		Save	Close

Click the "CurrentCommand" tab that lets you specify the current "NGGCommandOnLegendEntry" parameters. Keep the default parameters and click the "Command" tab.

🛃 D:\NGO\Session\Model Designer\Sample	Use\SampleUseWorkspace	e.ini
Workspace Data Sources Comment Types Graphic Types Behaviors Comparison	General Command Cu	
⊕- Group Behaviors ⊡- ⊖- Property Filter Behaviors	CurrentCommandName Parameter	NGGCommandOnLegendEntry Select
LeftDblClick Types Behaviors Environment		
		Save Close

Add	Command
nuu	command

Click the Add Command button to create the second command we want to chain with the first one. Select "NGGCommandDelegate" from the "Command2" dropdown list:

D:\NGO\Session\Model Designer\Sample Workspace Data Sources Document Types Graphic Types Behaviors	11	ce.ini _ [] ×
Graphic Types Behaviors	General Command	
Group Behaviors	Name	NGGCommandContainer
Property Filter Behaviors	Command1	NGGCommandOnLegendEntry
LeftDblClick ⊕ View Types Behaviors	Command2	NGGCommandDelegate
		Delete Command
		Add Command
		Save Close

Click the _____ button that automatically appears on the right of the "Command2" field to display its associated "CurrentCommand" tab and select this tab.

As we want to delegate the behavior from the legend property filter to the view, select "View" from the "MetaType" dropdown list. Next, select the "Fitting" newly created user-event name from the "EventName" dropdown list:

D:\NGO\Session\Model Designer\Sample Workspace Data Sources Document Types Graphic Types Behaviors Graphic Types Behaviors Legend Behaviors	General Command	Click	
Group Behaviors	CurrentCommandName	NGGCommandDelegate	
ErfDblClick	MetaType	View	
	Туре		
Environment	EventName		-
		Fitting Key0/28/0 Key0/27/0 Key1/28/0 Key1/27/0 Key0/26/0 Key0/25/0 Key0/1/27	
		Save	Close

This "LeftDblClick" behavior definition is now finished. Save your workspace parameters, close the window, and test your new behavior.

Step 25: Defining the Behaviors That Will Impact Graphic Object Types

In this step we will create behaviors that will impact the "MyNodes" and "MyLinks" graphic types when an object of this type is right-clicked.

For example, for the "MyNodes" type, this behavior can display a popup menu that allows you to:

- 1. Rotate all the nodes by 45 degrees.
- 2. Center the clicked node in the view.
- 3. Activate or deactivate the "DisplayNodeType" property graphic effects.
- 4. Activate or deactivate the "DisplayNodeSize" property graphic effects.

If the first, third, and fourth popup menu items correspond to a single parameterized command, the second one must chain several commands. In fact, the command used to center an object in a view works on a selected object only. As right-clicking a node doesn't select it, we will have to select the node before centering it.

The "NGGCommandContainer" used to chain several commands cannot be directly called from a popup menu item. The solution consists of defining a user-event to trigger this command chaining that we will call from the popup menu item through a "NGGCommandDelegate" command.

For the "MyLinks" type, we can also display a popup menu that allows you to:

- 1. Activate or deactivate the "LinkName" property label.
- 2. Activate or deactivate the "DisplayLinkType" property graphic effects.
- 3. Activate or deactivate the "DisplayLinkRate" property graphic effects.

>> Defining the Sample Behavior Related to the Node Types

(1) Defining the "CenterNode" User-Event

Right-click the "Behaviors" tree entry and select the "Create" menu to open the "Create Behavior" form:



Set the user-event name that will be used to reference this behavior in the "EventName" zone, select "Graphic" from the "MetaType" dropdown list, choose the "MyNodes" graphic type, and validate:

🚼 Create Behavi	or 🔀
EventName	CenterNode
MetaType	Graphic
ObjectType	MyNodes 🔽
	OK Cancel

Now, from the new behavior "General" tab, select "NGGCommandContainer" from the "Command" dropdown list as follows:

D:\NGO\Session\Model Designer\Sam Workspace Data Sources Document Types Graphic Types Behaviors Graphic Types Behaviors CenterNode-MyNodes	111	ispace.ini _ [] X
🕀 🦲 Legend Behaviors	EventName	CenterNode
Environment	MetaType	Graphic
	Object Type Name	MyNodes
	Command	NGGCommandContainer
		Save Close

Next, click the "Command" tab. From the "Command1" dropdown list, select "NGGCommandSelectObject":

5	D:\NGO\Session\Model Designer\Sam	pleUse\SampleUseWo	rkspace.ini	
	Workspace Data Sources Document Types Graphic Types Behaviors	Ce	enterNode-MyNodes	
	Graphic Types Behaviors Graphic Types Behaviors Graphic Types Behaviors	General Command	d	
	🕀 🦲 Legend Behaviors	Name	NGGCommandContaine	er 🔤
		Command1	NGGCommandSelectObject	
			Delete Con	nmand
			Add Com	mand
			Save	Close

	~	
- Add	I OT	mand
nuu	CON	

button to create the second command that will chain with the first one. Click the Select "NGGCommandCenterObject" from the "Command2" dropdown list:

D:\NGO\Session\Model Designer\Sam		rspace.ini IIX
Graphic Types Behaviors Graphic Types Behaviors Graphic Types Behaviors	General Command	
🕀 🦲 Legend Behaviors	Name	NGGCommandContainer
E Price Types Behaviors Environment	Command1	NGGCommandSelectObject
	Command2	NGGCommandCenterObject
	,	Delete Command Add Command
		Save Close

As shown in the following screenshot, this user-event definition can end by calling the "NGGCommandUnselectAll" command so that object just selected is automatically unselected after it is centered in the view:

D:\NGO\Session\Model Designer\Sam	-	ispace.ini
Graphic Types Behaviors	General Command	<u> </u>
🕀 🦲 Legend Behaviors	Name	NGGCommandContainer
Environment	Command1	NGGCommandSelectObject
	Command2	NGGCommandCenterObject
	Command3	NGGCommandUnselectAll
		Delete Command
		Add Command

(2) Defining the "RightClick" Behavior Impacting the "MyNodes" Graphic Objects

Right-click the "Behaviors" tree entry and select the "Create" menu to open the "Create Behavior" form:

👪 Create Behavi	or	×
EventName	RightClick	•
MetaType	Graphic	•
ObjectType	MyNodes	
	OK	Cancel

Select "RightClick" from the "EventName" dropdown list, select "Graphic" from the "MetaType" dropdown list, choose the "MyNodes" graphic type, and validate.

Now, from the new behavior "General" tab, select "NGGCommandPopupMenu" from the "Command" dropdown list as follows:

👪 D:\NGO\Session\Model Designer\Sam	pleUse\SampleUseWork	space.ini	<u>_ </u>
Workspace Data Sources Document Types Graphic Types Behaviors	Rigi	htClick-MyNodes	
Graphic Types Behaviors	General Command		
RightClick-MyNodes	EventName	RightClick	
Legend Behaviors	MetaType	Graphic	
Environment	Object Type Name	MyNodes	
	Command	NGGCommandPopupMenu	
		Save	Close

Click the "Command" tab and start defining the command that will correspond to the first popup menu item parameter:

- Set the first item name that will appear in the popup menu

and

- Select the "NGGCommandRotate" from the "Command1" dropdown list:

Workspace Data Sources Document Types Graphic Types Behaviors CenterNode-MyNodes RightClick-MyNodes RightClick-MyNodes View Types Behaviors View Types Behaviors View Types Behaviors Command1 View Types Behaviors Delete Item Add Item	强 D:\NGO\Session\Model Designer\SampleUse\SampleUseWorkspace.ini				
RightClick-MyNodes RightClick-MyNodes Picker Legend Behaviors View Types Behaviors Environment Name NGGCommandPopupMenu term1 Rotate Command1 NGGCommandRotate Delete Item	 Data Sources Document Types Graphic Types Behaviors 		lick-MyNodes		
Legend Behaviors View Types Behaviors Environment Command1 NGGCommandRotate				1	
Image: Second					
Delete Item					
Add Item	🗄 🦲 Environment	Command1	NGGCommandRotate		
Add Item					
Add Item					
Add Item					
Add Item					
Add Item					
			Delete Ite	m	
				1	
Save Close			Add Iten	n	
Save Close					
			Save	Close	

Click the _____ button that automatically appears on the right of the "Command1" field to display its associated "CurrentCommand" tab. Select this tab and specify the "Parameter" value that corresponds to the angle that will be used to rotate the nodes:

🚼 D:\NGO\Session\Model Designer\SampleUse\SampleUseWorkspace.ini		
Workspace Data Sources Document Types Graphic Types Behaviors	RightClick-MyNodes	
Graphic Types Behaviors Graphic Types Behaviors Graphic Types Behaviors Graphic Click-MyNodes Graphic Dehaviors Graphic Dehaviors Graphic Dehaviors Graphic Dehaviors For Click - MyNodes Graphic Dehaviors For Click - MyNodes Graphic Dehaviors For Click - MyNodes For Click - MyNodes	General Command CurrentCommand CurrentCommandName NGGCommandRotate Parameter 45 Save	Close

Select the "Command" tab and click the ______ butto item parameters:

button to set the second popup menu

- Set the second item name that will appear in the popup menu
- Select the "NGGCommandDelegate" from the "Command2" dropdown list:

👪 D:\NGO\Session\Model Designer\SampleUse\SampleUseWorkspace.ini					
Workspace Data Sources Document Types Graphic Types Behaviors Graphic Types Behaviors			lick-MyNodes		
CenterNode-MyNodes	General				1
RightClick-MyNodes	Name		NGGComma	andPopupMenu	
	ltem1		Rotate		
Environment		Command1	NGGComma	andRotate	
	ltem2		Center		
		Command2	NGGCommand	Delegate	-
				Delete It	em
				Add Ite	m
				Save	Close

and

Click the _____ button on the right of the "Command2" field to display its associated "CurrentCommand" tab and select this tab.

The "MetaType" parameter default value is the right one. We just have to set the "EventName" parameter value; select the "CenterNode" behavior from the dropdown list:

👪 D:\NGO\Session\Model Designer\SampleUse\SampleUseWorkspace.ini				
Workspace Data Sources Comment Types Graphic Types Behaviors Graphic Types Behaviors ConterNode-MyNodes		lick-MyNodes rrentCommand		
RightClick-MyNodes	CurrentCommandName	NGGCommandDelegate		
Legend Behaviors	MetaType	Graphic		
Environment	Туре			
	EventName		•	
		CenterNode LeftDblClick Key0/28/0 Fitting Key1/28/0 Key0/27/0 Key0/26/0 Key1/27/0		
		Save	Close	

Select the "Command" tab and click the Add Item button to set the third popup menu item parameters:

- Set the third item name that will appear in the popup menu
- Select the "NGGCommandTogglePropertyState" from the "Command3" dropdown list:

🚼 D:\NGO\Session\Model Designer\Samp	leUse\SampleUseWorkspa	ce.ini		
Workspace Data Sources Document Types Graphic Types Behaviors	RightC	lick-MyNodes		
Graphic Types Behaviors	General Command			
RightClick-MyNodes	Name	NGGCommandPopupMenu		
	ltem1	Rotate		
Environment	Command1	NGGCommandRotate		
	ltem2	Center		
	Command2	NGGCommandDelegate		
	Item3 Node Size			
	Command3 NGGCommandTogglePropertyState			
		Delete Item Add Item		
		Save Close		

and

Click the _____ button on the right of the "Command3" field to display its associated "CurrentCommand" tab and select this tab.

Select "Enabled" from the "Status" dropdown list so that the property graphic effects are turned on/off according to the property current status. Select "MyNodes" from the "GraphicType1" and select the related property, "DisplayNodeSize":

🚼 D:\NGO\Session\Model Designer\Samp	oleUse\SampleUseWorkspa	ce.ini		<u> </u>
Workspace Data Sources Document Types Graphic Types Behaviors	RightC	lick-MyNode	s	
🗄 🔄 Graphic Types Behaviors	General Command Cu	rrentCommand	1	
CenterNode-MyNodes	Activate		1	
		Enabled		
Environment	Label Display Mode			
	GraphicType1			
	Property1 Desactivate	DisplayNodeSize		
	Status			
			Delete I	Parameter
			Add Pa	arameter
		Ē	Save	Close

Add Item

button to set the last popup menu item

Select the "Command" tab and click the parameters:

and

- Set the item name that will appear in the popup menu

- Select the "NGGCommandTogglePropertyState" from the "Command4" dropdown list:

🚼 D:\NGO\Session\Model Designer\Samp	leUse\SampleUseWorkspace	e.ini 📃 🔍 🗶
Workspace Data Sources Document Types Graphic Types Behaviors	RightCli	ck-MyNodes
Graphic Types Behaviors	General Command Curr	entCommand
RightClick-MyNodes	Name	NGGCommandPopupMenu
Elegend Behaviors	ltem1	Rotate
E·································	Command1	NGGCommandRotate
	ltem2	Center
	Command2	NGGCommandDelegate
	ltem3	Node Size
	Command3	NGGCommandTogglePropertyState
	ltem4	Node Type
	Command4	NGGCommandTogglePropertyState 🔽
		Delete Item
		Add Item
		Save Close

Click the ____ button on the right of the "Command4" field to display its associated "CurrentCommand" tab and select this tab.

Select "Enabled" from the "Status" dropdown list, select "MyNodes" from the "GraphicType1" field, and select the related property—"DisplayNodeType":

Workspace Document Types Graphic Types Behaviors Graphic Types Behaviors SightClick-MyNodes BightClick-MyNodes BightClick-MyNodes BightClick-MyNodes Wiew Types Behaviors View Types Behaviors Propertyl DisplayMode Bropertyl DisplayNodeType Desactivate Status CaraphicType MyNodes Propertyl DisplayNodeType Desactivate Status Label Display Mode GraphicType Desactivate Status Label Display Mode GraphicType Propertyl DisplayNodeType Desactivate Status Label Display Mode GraphicType	
RightClick-MyNodes Image: Constraint of the second secon	
Image: Status Enabled Image: Status Enabled Image: Status Label Display Mode Image: Status GraphicType1 Image: Status MyNodes Image: Status Status Image: Status Statu	-
Label Display Mode GraphicType1 MyNodes Property1 DisplayNodeType Desactivate Status Label Display Mode GraphicType1	
GraphicType1 MyNodes Property1 DisplayNodeType Desactivate Label Display Mode GraphicType1	
Desactivate Status Label Display Mode GraphicType1	
Status Label Display Mode GraphicType1	
Label Display Mode GraphicType1	
GraphicType1	
J Propertv11	
	<u> </u>
Add Para	

This behavior definition is now finished. Save your workspace parameters, close the window, and test the behavior.

Note that if this behavior is defined for the "MyNodes" type, it is also available for the inherited "SubNodes" type.

>> Defining the Sample Behavior Related to the Link Types

As for the nodes, right-click the "Graphic Types Behaviors" tree entry and select the "Create" menu to open the "Create Behavior" form.

Select "RightClick" from the form's "EventName" dropdown list, select the "MyLinks" graphic type, and validate:

💦 Create Behavi	or 🔀
EventName	RightClick 💌
MetaType	Graphic
ObjectType	MyLinks
	OK Cancel

From the new behavior "General" tab, select "NGGCommandPopupMenu" from the "Command" dropdown list as follows:

D:\NGO\Session\Model Designer\San Workspace Data Sources Document Types Graphic Types Behaviors Graphic Types Behaviors	Rig	ghtClick-MyLinks
CenterNode-MyNodes RightClick-MyLinks RightClick-MyNodes Cegend Behaviors View Types Behaviors Environment	General Command EventName MetaType Object Type Name Command	RightClick Graphic MyLinks NGGCommandPopupMenu Save Close

Click the "Command" tab to start defining the command that will correspond to the first popup menu item:

- Set the first item name that will appear in the popup menu

and

- Select "NGGCommandTogglePropertyState" from the "Command1" dropdown list:

D:\NGO\Session\Model Designer\Sam Workspace Data Sources Document Types Graphic Types Behaviors			e.ini ick-MyLinks		<u>_ ×</u>
Graphic Types Behaviors	General Comma	nd Curr	rentCommand		
RightClick-MyLinks	Name		NGGCommar	idPopupMenu	
RightClick-MyNodes Legend Behaviors	ltem1		Link Name		
	Co	mmand1	NGGCommandT	ogglePropertyStat	e 💌
Environment					
				Delete	ltem
				Delete	Item
				Add II	tem
				Save	Close

Now click the use button on the right of the "Command1" field to display its associated "CurrentCommand" tab and select this tab.

Select "PropertyValue" from the "Label Display Mode" dropdown list so that the property label is turned on/off according to the property current status. Select "MyLinks" from the "GraphicType1" field and select the related property—"LinkName":

🚼 D:\NGO\Session\Model Designer\Sam	pleUse\SampleUseWorkspace	e.ini	<u> </u>
Workspace Data Sources Graphic Types Behaviors	RightCli		
🗐 🔄 Graphic Types Behaviors	General Command Curr	entCommand	
	Activate		
RightClick-MyNodes	Status		
E C Legend Behaviors E C View Types Behaviors	Label Display Mode	PropertyValue	e
Environment	GraphicType1	MyLinks	
	Property1	LinkName	<u> </u>
	Desactivate		
	Status		
	Label Display Mode		
			Delete Parameter Add Parameter
			Save Close

Select the "Command" tab and click the ______ Add Item item parameters:

button to set the second popup menu

- Set the second item name that will appear in the popup menu

- Select "NGGCommandTogglePropertyState" from the "Command2" dropdown list:

🛃 D:\NGO\Session\Model Designer\Sam	pleUse\SampleU:	eWorkspace	e.ini	
Workspace Data Sources Document Types Graphic Types	3.	RightCli	ck-MyLinks	
Behaviors Graphic Types Behaviors Graphic Types Behaviors	General Con	imand		
RightClick-MyLinks	Name		NGGCommand	iPopupMenu
	ltem1		Link Name	
Uiew Types Behaviors		Command1	NGGCommand	TogglePropertyState
Environment	Item2		Link Type	
		Command2	NGGCommandTo	gglePropertyState
				Delete Item
				Add Item
				Save Close

and

Click the _____ button on the right of the "Command2" field to display its associated "CurrentCommand" tab and select this tab.

Select "Enabled" from the "Status" dropdown list so that the property graphic effects are turned on/off according to the property current status. Select "MyLinks" from the "GraphicType1" field and select the related property—"DisplayLinkType":

🚼 D:\NGO\Session\Model Designer\Samp	leUse\SampleUseWorkspace	e.ini	
Workspace Data Sources Document Types Graphic Types Behaviors Graphic Types Behaviors CenterNode-MyNodes	RightCli	ck-MyLinks entCommand	
	Activate		
RightClick-MyNodes	Status	Enabled	
Legend Behaviors Legend Behaviors End Sehaviors	Label Display Mode		
Environment			
		DisplayLinkType	<u> </u>
	Desactivate		
	Status		
	Label Display Mode		
			Delete Parameter
			Add Parameter
			Save Close

Select the "Command" tab and click the **Add Item** button to create the last popup menu item parameters. This item must turn the graphic effects related to the "DisplayLinkRate" property on and off according to its current state. The definition is similar to the second item you just created.

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