

Using Visio® Enterprise

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Preface

Whether you model software and databases or manage corporate information technology, the Visio® Enterprise drawing program can help you efficiently design and document your systems and processes.

Using Visio Enterprise is part of an integrated documentation set that includes this manual, *Modeling in Visio Enterprise*, *Developing Visio Solutions*, and a comprehensive collection of online help topics designed to present the information you need to design, document, and model your enterprise.

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Who this book is for

Using Visio Enterprise is for anyone who wants to learn fundamental techniques for creating drawings and working with shapes. This book assumes that you communicate with drawings as part of your job, and that you have used other Microsoft Windows–based programs and are familiar with Windows terminology and techniques.

Visio Enterprise provides tools for the corporate information technologist, consultant, or system integrator who is responsible for modeling and managing enterprise-level systems. In addition to these tools, Visio Enterprise provides the same powerful graphics engine, intuitive interface, and drag-and-drop drawing as Visio Standard and Visio Professional. With Visio Enterprise, you can also create any drawing type that you can create in either of those Visio products.

This book focuses on the tools and techniques you can use to create any drawing type in a Visio product, including Visio Enterprise. You'll learn the most efficient ways to work with the shapes and tools provided with Visio Enterprise as well as how to create your own shapes, stencils, and templates.

About this manual

This manual includes the following information about how to create any drawing types using the wizards, templates, stencils, and drawing tools in Visio Enterprise:

- Instructions for installing Visio Enterprise
- Conceptual discussions, step-by-step procedures, and helpful tips about how to work quickly and efficiently in any type of enterprise diagram
- Complete information about creating your own shapes, stencils, and templates
- An introduction to ShapeSheet® spreadsheets and other tools for customizing Visio shapes and controlling Visio shapes, pages, menus, and other objects using a programming language, such as Microsoft Visual Basic for Applications (VBA), that supports Automation

Because drawing solutions in Visio Enterprise can vary, some techniques you learn while working in one drawing type may not work in another. This book concentrates on describing the general techniques that work for most drawing types.

Visio Enterprise also includes *Modeling in Visio Enterprise* and *Developing Visio Solutions*. Here's the type of information you can find in each:

Modeling in Visio Enterprise

- Information about network modeling and working with the extensive database of network equipment shapes
- Details about creating software models using the Unified Modeling Language (UML)
- Details about how to design, document, reverse engineer, maintain, update, or generate a data model and its corresponding database schema

Developing Visio Solutions

- Everything you need to know about Visio Enterprise as a development platform, including sample code, tips, and techniques

Getting more information

Much of the assistance you need as you use Visio Enterprise is specific to the shapes and templates you work with on the screen. To give you immediate and targeted information as you work, use these additional sources of information:

Tips To find out what a specific tool or button on one of the toolbars does, float the pointer over it for a moment. A tip appears on the screen.

Shape help For information about the specific features of any Visio Enterprise shape, right-click the shape, then choose Shape Help from the shortcut menu. (You can print the topic by right-clicking the shape help window.)

Template help To discover the best sequence in which to work in specific templates, or how to work with the shapes or page settings, choose Help > Template Help, double-click Visio Templates, then choose the drawing type about which you want information.

Online help The Visio Enterprise online help is available on the screen when you press F1, choose a command from the Help menu, or click Help in a dialog box. The online help also presents information that does not appear in this manual, including a command and tool reference, a programming language reference, and procedures and reference information for working in the Visio ShapeSheet spreadsheet.

Drawing Resources This page on the Visio Web site contains links to resources for most drawing types included in the Visio templates. Choose Help > Visio On The Web > Drawing Resources.

Visio Introductory Tour This tour takes you through the basics of using Visio shapes and tools. To start the tour, on the Visio Enterprise CD, open the Intro Tour folder, and then double-click the IntroTour.exe file.

Sources for additional information More resources for getting the answers you need to work efficiently in your Visio application include the following:

- To reach Visio Corporation and the Visio Knowledge Base using the World Wide Web, choose Help > Visio On The Web > Visio Home Page. Or, use the Visio address: <http://www.visio.com>. The Visio Knowledge Base includes articles that answer frequently asked questions (FAQs) and offer the latest tips on using Visio products.

Technical support

Technical Support on the World Wide Web The Visio Technical Support department maintains an assortment of additional resources to help answer questions about working effectively in your Visio product. Visit the Visio Support & Service Web page at <http://www.visio.com/support/> to

- Browse through the Visio Knowledge Base, which includes articles that answer FAQs and offer the latest tips on using Visio products.
- Get answers to your technical support questions—contact Visio Technical Services.
- Contact your local Customer Service representative to answer your questions about Visio products.
- Learn about Visio product training opportunities.
- Download service releases and updates to Visio products.
- Access an online support forum. To post a question or find information on the Technical Support Forum, point your browser to www.visio.com/Support/forums/index.html.
- Upload sample files and download free utilities.
- Review a directory of links to other helpful drawing resources.

To reach the Visio Corporation Web site easily while you're working in your Visio product, choose Help > Visio On The Web > Visio Home Page.

Calling Visio Technical Support If you need more technical support for Visio products, you can call the Visio Technical Support department for assistance. If you call, it's helpful to be at your computer and to have your product serial number available. The serial number is located on your Visio product registration card.

As a registered customer, you receive

- Ninety days of technical support with the purchase of a new Visio product.
- Thirty days of technical support with the purchase of an upgrade to your Visio product.

The complimentary support period begins when you make your first phone call to Technical Support. To find phone numbers for Technical Support in your area, visit www.visio.com, or search online help for “Technical Support.”

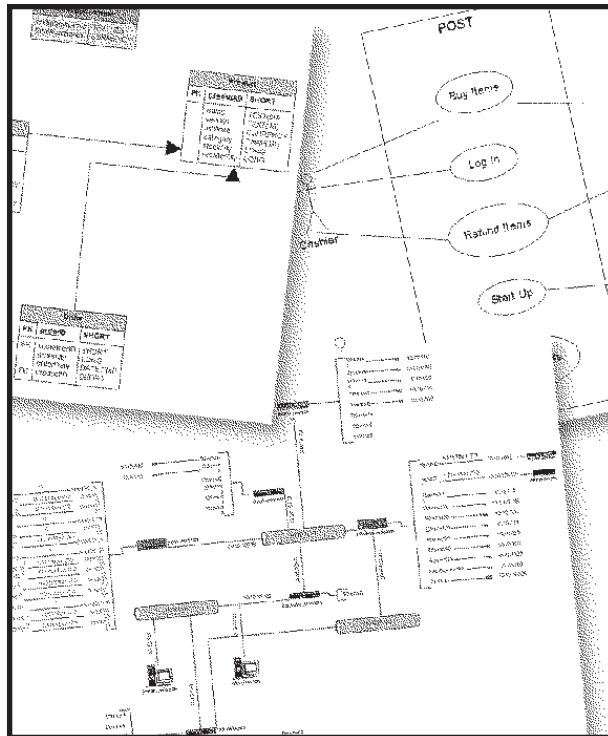
The Visio product family

Visio Enterprise is designed to fill a unique niche in a corporate enterprise that can also include other Visio products. Drawing files created in Visio Enterprise can be opened and edited by users of Visio Standard, Visio Professional, and Visio Technical.

Visio Enterprise provides automated tools that systems managers can use enterprisewide as they design and model company infrastructures through database re-engineering, object relational models, network and process diagrams, software development layouts, entity relationship diagrams, and so on.

In addition, Visio Enterprise includes features common to all Visio products that make it the program of choice for visualizing and communicating ideas. Those features include

- Easy-to-use drag and drop drawing.
- SmartShapes® technology—shapes programmed to behave the way you expect.
- Compatibility and consistency with Microsoft Windows 98, Office 97, and Windows NT 4.0.
- A quick and easy process for publishing drawings as Web pages.
- A built-in development tool, VBA, that you can use to customize the Visio interface and create custom solutions.



Learning Visio® Enterprise

Getting started

Visio® Enterprise offers a sophisticated set of modeling, design, and documentation tools for the systems manager. With Visio Enterprise, you can

- Model and re-engineer databases.
- Model software systems and design interface elements, and more.
- Design and diagram networks.

In addition, Visio Enterprise includes all the drawing types of the Visio Standard and Visio Professional software programs. You can create everything from flowcharts and marketing charts to Web diagrams. Visio Enterprise includes drawing tools for use across your enterprise.

This chapter provides installation instructions and introduces you to the tools in Visio Enterprise that you can use to create a host of models, diagrams, and documents.

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Installing Visio Enterprise

This section includes information about installing Visio Enterprise and where to go for help with installation.

System configuration

Required or recommended:

- Microsoft Windows 95, Windows 98, or Windows NT 4.0
- Intel Pentium, Pentium Pro, or Pentium II PC
- 32 MB of RAM
- Up to 130 MB of free hard-disk space for a typical installation; additional space may be required, depending on the number and type of stencils selected for installation
- VGA or better display; SVGA display recommended
- Desktop area set to 800 x 600 or higher recommended
- Mouse
- CD-ROM or DVD-ROM drive for installation

Optional:

- Windows-compatible printer or plotter
- Modem and Internet access
- Local area network (volume licenses available)

How to prepare for installation

- Close all programs and turn off virus protection software to prevent installation conflicts.
- If you have another Visio program installed on your computer and do not want to overwrite that version, change the default installation folder for Visio Enterprise during installation setup.
- To avoid overwriting stencils or templates you have customized or created, place them in a separate folder before you install.

Components that you can install

To select Visio Enterprise components to install, choose the Custom/Complete option. To further refine what is installed, select a component, then click the Change button.

Custom/Complete installation options

<i>Install button</i>	<i>Component</i>	<i>What it installs</i>
Standard Components	Graphic Filters	Installs filters for importing and exporting common file formats.
	Solutions	Installs Visio stencils, templates, and add-ons designed to address specific types of drawings.
	Add-ons – Typical	Installs these tools: Array Shapes, Custom Properties Editor, Flowchart Converter, Page And Document Linking, Page Layout Wizard, Property Reporting Wizard, and Save As HTML converter.
	Add-ons – Supplemental	Installs these tools: Print ShapeSheet, Shape Explorer™, SmartShape® Wizard, and Stencil Report Wizard.
	Sample Drawings	Installs samples of various Visio drawings and diagrams.
	Help Files	Installs online Help, which details how to use Visio Enterprise.
	Developing Visio Solutions	Installs the development environment for customizing Visio shapes and solutions—including Microsoft Visual Basic, Visual Basic for Applications (VBA), and C++ tools.
	Visio Documentation	<p>Installs PDF files of the following manuals: <i>Using Visio Enterprise</i>, <i>Modeling in Visio Enterprise</i>, <i>Developing Visio Solutions</i>, and <i>OMG Unified Modeling Language (UML) Specification</i>.</p> <p>To open, read, or print PDF files, install Adobe Acrobat Reader: on the Visio Enterprise CD, in the Acrobat folder, double-click the Ar32e301.exe file.</p>
Database Components	Database Diagrams	Installs Object Role Modeling (ORM) and Bachman diagrams.
	Database Modeling	Installs the solution for database design and re-engineering for database systems from leading vendors, including Corel, IBM, Informix, Inprise, Microsoft, Oracle, and Sybase.
	ActiveQuery®	Installs tools for querying your database in natural language, and retrieving and analyzing your data. Also installs a PDF file of <i>Guide to Active Query</i> .
	VisioModeler™	Installs tools for merging models created by individual team members, working through the intuitive business-rules based ORM methodology, and creating conceptual ad hoc queries. Also installs PDF files of the following manuals: <i>Guide to Visio Modeler</i> and <i>Guide to FORML</i> .

Table continued on next page.

Custom/Complete installation options (*continued*)

<i>Install button</i>	<i>Component</i>	<i>What it installs</i>
Network Components	Network Diagram	Installs the solution for documenting networks, WAN and LAN layouts, directory structures, and wiring systems.
	AutoDiscovery And Layout	Installs tools automatically identifying devices in your network, building a database of device and connectivity information, and developing a network layout.
	VNE – Manufacturers	Installs up to 14,000 exact-replica equipment shapes selectable by manufacturer for designing and documenting networks.
Software Components	Software Diagram	Installs the templates for diagramming and designing software projects, including Windows 95 and Office 97 user interfaces.
	UML	Installs tools for creating integrated software system models based on the UML diagram types, exporting models to Microsoft Repository 2.0, and reverse engineering Repository models or Microsoft Visual C++ and Visual Basic source code.

Installing Visio Enterprise from the CD

You must be running Microsoft Windows 95, Windows 98, or Windows NT 4.0 to install Visio Enterprise.

To install Visio Enterprise from the CD:

1. Insert the Visio Enterprise CD into your CD-ROM or DVD-ROM drive.
2. If the install screen does not automatically appear, from the Windows Start menu, choose Run. In the Run dialog box, type *d:\setup*, where *d* is the letter assigned to your CD-ROM or DVD-ROM drive, then click Next.
3. Follow the instructions on your screen.

The Setup program guides you through the installation process.

Installing Visio Enterprise on a network

There are two ways to set up Visio Enterprise on a network server:

- Install a copy on a network server so that multiple workstations can run it from the server.
- Place the Visio Enterprise installation files on a network server so the program can be installed onto the hard disks of individual workstations.

For details about network administrator installation options, see *Network.txt* at the root of your Visio Enterprise CD.

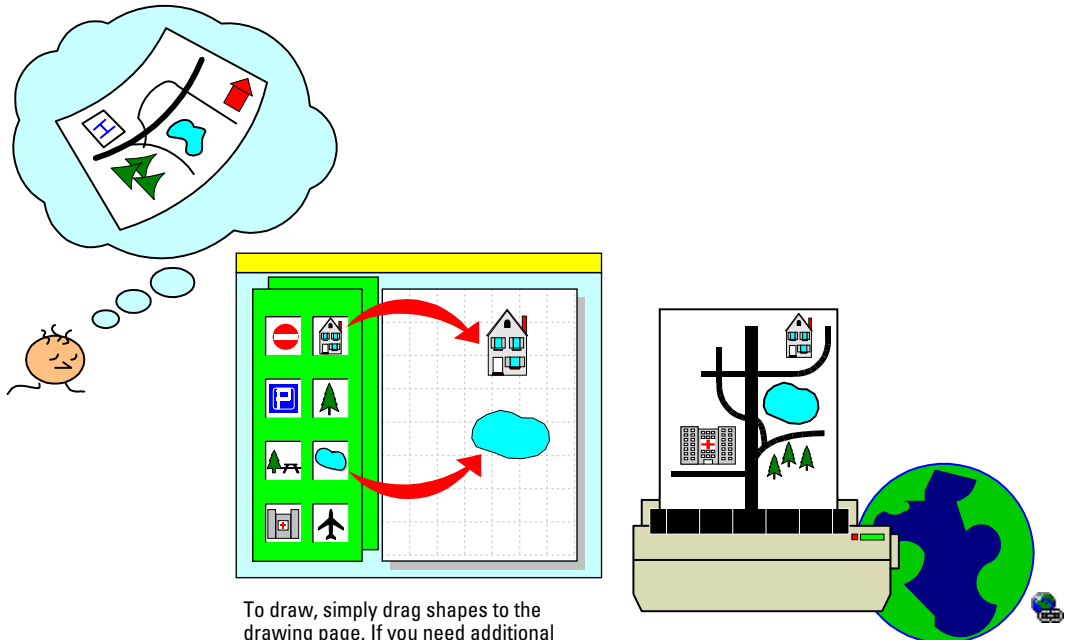
If you need help with installation

If you have questions about installing Visio Enterprise, contact Technical Support. To find phone numbers or to get help with technical issues, search on “Technical Support” in online Help or visit the Visio Support & Service Web page at <http://www.visio.com/support/>.

Creating and saving drawings

Whether you create database models, network diagrams, or something else altogether, Visio Enterprise provides a **template** that matches the type of drawing you want to create. A template includes everything you need to turn an idea into a drawing.

When you start with a Visio Enterprise template, you open a file that contains shapes, drawing pages, and other tools. Each template includes one or more **stencil** files on which shapes are stored. You can open additional stencils whenever you need them, no matter what template you’re working in.



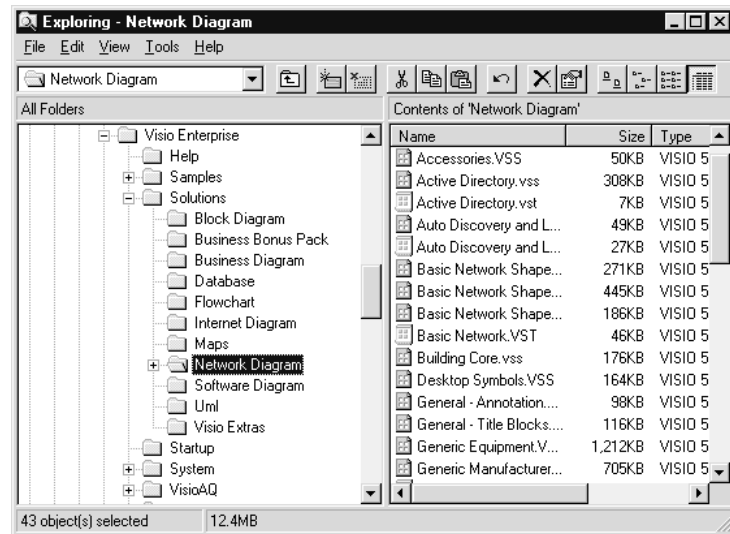
To draw, simply drag shapes to the drawing page. If you need additional shapes, you can create them.

HTTP://W W W

When your drawing is complete, you can print it, include it in other documents, or distribute it on an intranet or the World Wide Web.

Working with Visio Enterprise files

Because templates and stencils are types of files, you can find them in the Visio folder in Windows Explorer organized the same way solutions are organized under the File > New menu. The Visio folder includes a Solutions subfolder, where you can find a folder for each drawing type. Within a drawing-type folder, you can find template and stencil files. You can open a template or stencil from within Visio Enterprise or from Windows Explorer by double-clicking the file icon.



Template files (📄) have a .vss extension. Stencil files (📄) have a .vst extension. Drawing files have a .vsd extension.

Basing new drawings on templates

When you start a drawing with a template, a Visio file opens that contains the following:

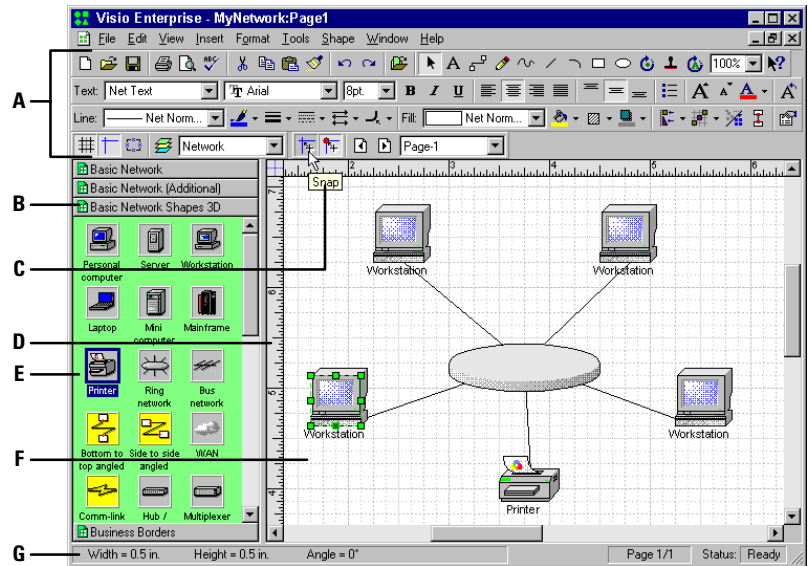
- One or more stencils containing related shapes
- A blank drawing page using a grid and measurement system that's appropriate for the type of drawing you're creating, saving you the time it takes to set up pages

In addition, certain scaled drawing types open with a blank drawing page set up with the correct scale and page size.

- Styles for text, lines, and fills appropriate to the type of drawing you're creating, saving you the time it takes to define styles

Each template comes with help explaining the most efficient way to use and combine shapes, how to perform specific actions using shape and page right-click menus, how and when to run wizards that automate tasks, and more. To

display template help, choose Help > Template Help, double-click Visio Templates, then choose the appropriate template.



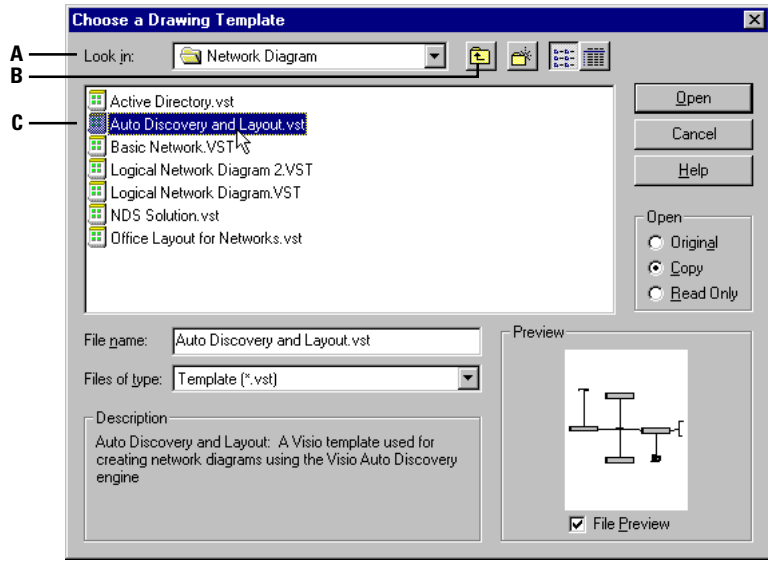
When you start Visio Enterprise and open a template, the main drawing window opens with a drawing page and one or more stencils.

- A** Tools on the toolbars are grouped in functional sets, such as the Standard and Text toolbars. You can choose which toolbars you want to display, saving space on the screen.
- B** By default, stencils dock to the left of the drawing page. To bring a stencil to the front, click that stencil's title bar, which may be at the top or bottom of the stencil.
- C** Tips appear when you pause the pointer over tools on the toolbar or control handles on shapes.
- D** The drawing page opens with size, orientation, scale, grid, and measurements appropriate for the drawing type.
- E** Stencils contain master shapes that you can drag to the drawing page.
- F** The drawing page has a drawing grid, which you can use to align shapes.
- G** The status bar shows the dimensions and locations of selected shapes and also displays the current task.


If the drawings you usually create require settings not available in any Visio Enterprise template, you can open a drawing with no template, revise an existing template, or create one of your own.

To start Visio Enterprise and open a new drawing file based on a template:

1. Click Start, then choose Programs > Visio Enterprise.
2. Double-click to open the folder that contains the type of drawing you want to create, choose a template, then click OK.



The Choose A Drawing Template dialog box

- A Choose the type of drawing you want to create.
- B Click to browse for other templates or drawing files saved on your computer.
- C Choose the template on which you want to base your drawing. The file icon  indicates which files are template files.

To open a new drawing file without basing it on a template:

- Choose File > New > Drawing. An unscaled drawing page opens with no stencils.


To display help for a particular template:

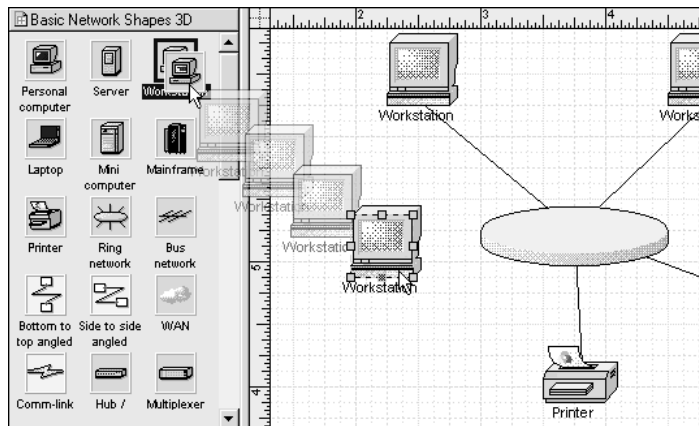
- Press F1, click the Index tab, then type the name of the template; or choose Help > Template Help, double-click Visio Templates, then choose the type and name of the template you want.

Adding shapes to drawings

The easiest way to create a drawing is to drag master shapes, or **masters**, from a stencil to the drawing page. When you drop a master on a drawing page, you create an **instance** of the master. The master itself remains on the stencil so you can reuse it to create instances.


When you create an instance, Visio Enterprise snaps the shape to the nearest grid line or ruler subdivision so that you can position it precisely. To place shapes even more accurately, you can zoom in or out from the drawing page. You can also change what you snap to by choosing Tools > Snap & Glue.

If you want to create multiple instances of a master quickly, you can use the stamp tool () on the Standard toolbar.




Dragging and dropping to create a drawing is accurate and fast when you use the grid and rulers to position shapes.

To drag and drop a shape:

1. Choose the pointer tool () from the Standard toolbar.
2. In the stencil, point to a master.
3. Hold down the left mouse button and drag the master from the stencil to the drawing page.
4. Release the mouse button to drop an instance of the master in the drawing.

To create, or stamp, multiple instances:

1. Choose the stamp tool () from the Standard toolbar.
2. In the stencil, click a master.
3. In the drawing window, place the pointer where you want the shape. The stamp tool places the shape's **pin** where the pointer is. In most shapes, the pin is in the center of the shape, so you would place the pointer where you want the center of the shape.
4. Click the left mouse button.


You can continue clicking the page to add as many instances of the stamped shape as you want.

5. When you're finished stamping, press the Esc key.

To delete a shape from the drawing page:

1. Select the shape.
2. Do one of the following:
 - Choose Edit > Clear.
 - Press the Delete key.

To delete a shape from the drawing page and place a copy on the Clipboard:

1. Select the shape.
2. Do one of the following:
 - Choose Edit > Cut.
 - Click the Cut button () on the Standard toolbar.

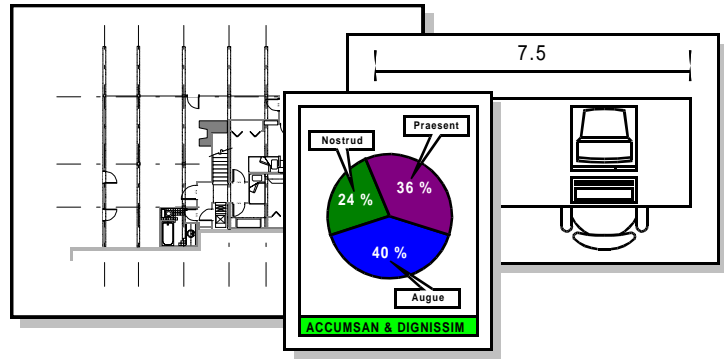
To display help for a particular shape:

- Right-click the shape, then choose Shape Help from the shortcut menu.

Adding and changing pages

New drawings in Visio Enterprise open with only one drawing page, but you can add as many new pages as you want. You can work with multiple pages in a single Visio drawing file to present and organize your information. Using pages, you can

- Keep related drawings in the same file. For example, for an office relocation project, you could include the pages that contain the building plan, the network topology, and departmental budget allocations.
- Keep all revisions of a single drawing in one file on successive pages, so that you can show the progression from the beginning of the project to the end.
- Present a series of drawings at full-screen view and navigate among them, like a slide show.
- Link pages together like a Web site. For example, you could jump from a workflow diagram shape to a detailed procedure on another page.
- Place items that you want to appear on every page, such as a company logo, on the background page.
- Rotate pages to make it easier to edit information that's at an angle, such as a room that isn't square, or a city plan with streets that are not perpendicular.



Each page in a multiple-page drawing can have its own settings. For example, each page can have a different drawing scale. Print settings, however, affect all pages.

Inserting and deleting pages

When you insert a new drawing page, it inherits the size, orientation, scale, measurement unit, shadow offset, and grid settings of the page displayed in the drawing window. You can change these settings in the Page dialog box when you insert the page, or later in the Page Setup dialog box.

You can delete pages you no longer need. If you delete the last page in a file, Visio Enterprise replaces that page with a blank page.

To create a new page:

1. Choose Insert > Page to open the Page dialog box.
2. On the Page Properties tab, type a name for the page or use the default name provided by Visio Enterprise.
3. If necessary, click the Drawing Scale tab to change the scale or the Page Size tab to change the page size for the new page.
4. Click OK.

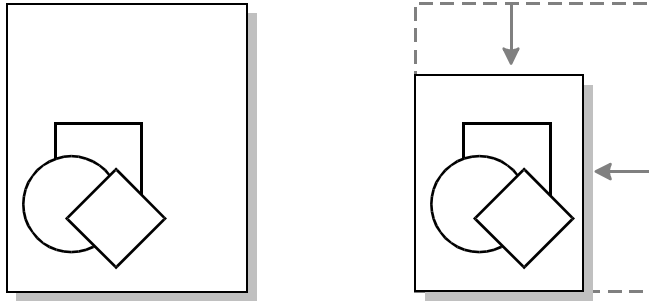
To delete a page:

1. Choose Edit > Drawing Page > Delete Page.
2. Choose the page you want to delete.
3. To update default page names to reflect the new page order, check Update Page Names.
Checking this option has no effect on pages without default names.
4. Click OK.

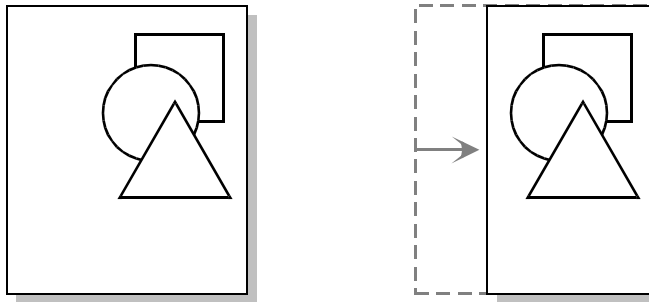
Resizing pages

Resizing pages enables you to add space to a page where you need it and to remove empty space you're not going to use from a page, both without changing the drawing scale. There are two ways to resize pages:

- Use the Page Setup dialog box to add space to or remove space from the top and right sides of the drawing. For example, if you want more white space around a drawing on which a reviewer can write comments, you can increase the dimensions of the page to create a margin of space on those sides.
- Use the Ctrl key with the pointer tool to remove space from a particular side of the drawing. For example, if you set the page size to be 9 by 12 inches, but discover later that your drawing extends off the right side of the page, you can drag out that side of the page to give yourself more room to draw.



You can use Page Setup to remove an equal amount of space from the top and right sides of a page.



Use the Ctrl key with the pointer tool to remove space from only the side you drag. In this example, the left side was dragged in to remove extra space.


When you resize a page using either method, the shapes on the page stay in their positions relative to the rulers. In other words, the x -, y -coordinates of the shape remain the same.

Resizing pages affects printing and the settings in the Page Setup dialog box. When you print, the page prints starting in the top left corner of the drawing page. Keep this in mind when you resize a drawing page to be larger than the paper you print it on, causing the drawing to be tiled on several pages when you print.

To resize a page using Page Setup:

1. Choose File > Page Setup.
2. On the Page Size tab, type the page dimensions you want or select a page size option, such as Size Page To Fit Drawing.
3. Under Target Printer Information, verify that the new page dimensions will print on the paper shown. To change the paper size, click Print Setup.
4. Choose the size you want for the printed page, then click OK.
5. In the Page Setup dialog box, click OK.

To resize a page with the pointer tool:

1. Choose the pointer tool () from the Standard toolbar.
2. Position the pointer at the edge of the page on the side you want to move, then hold down the Ctrl key.

The cursor changes to a double-headed arrow.

3. Drag the page edge to where you want it, then release the mouse button.

The new page size is reflected in the Page Setup dialog box.

NOTE If the drawing page you resized has backgrounds assigned to it, you must resize each of the backgrounds individually if you want the page sizes to match. For details, see “Using backgrounds for common page elements” later in this chapter.

Navigating between pages



Visio Enterprise stores pages in the order you create them and displays them one at a time in the drawing window. You can quickly navigate between pages and, if necessary, you can change page order. When you change the order, you can also change page names so they reflect the new arrangement.

You can also add navigational links to drawing pages or shapes that you can use to jump directly to another drawing page. For details, see Chapter 9, “Creating hyperlinked drawings and HTML pages.”

To navigate to a particular page:

1. Choose View > Toolbars > Page.

The Page toolbar is added to the drawing page window.

2. Choose the page that you want to go to from the Page list. Or use the Next Page () and Previous Page () buttons to navigate between pages.

To rearrange pages:

1. Choose Edit > Drawing Page > Reorder Pages.
2. Choose the page you want to move.

The list displays the page names in the order they are stored in the file.

3. Click Move Up or Move Down to change the position of the page.
4. To update default page names to reflect the new page order, check Update Page Names.

Checking this option has no effect on pages without default names.

5. Click OK.

Rotating pages

Using the rotation tool, you can create a drawing in which part of the drawing is at an angle to the rest and work in each part orthogonally, that is, at right angles or parallel to the rulers. For example, you can draw a building that isn't square or a city plan in which some streets run at an angle from the rest. Rotating, like zooming, is simply a way of viewing your page. It doesn't affect printing or the page orientation you select in the Page Setup dialog box. When you print the page, it appears just as it would if it were not rotated.

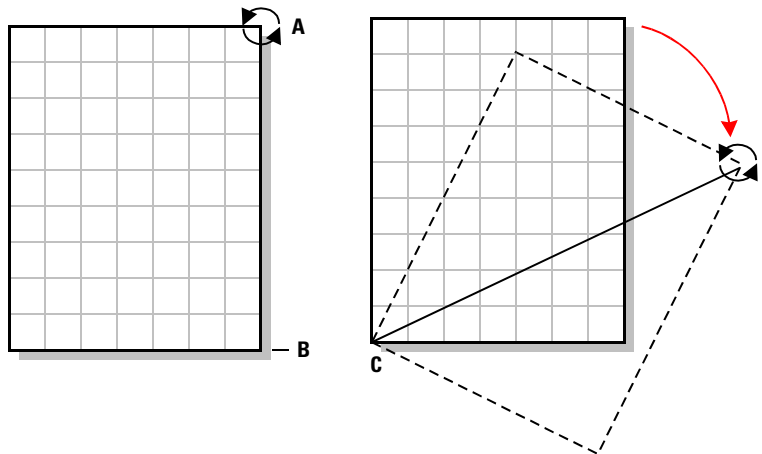
To rotate a page:

1. Choose Tools > Options, then click the Advanced tab.
2. Check Enable Page Rotation, then click OK.
3. Display the page you want to rotate, then choose the rotation tool (🌀) from the Standard toolbar.
4. Position the cursor over a corner of the page.

The cursor changes to a round rotation pointer (🌀) as shown by **A** in the figure. The page's drop shadow (**B**) indicates that the page is unrotated. Rotated pages have no drop shadow.

5. Drag the corner of the page to the rotation angle you want, then release the mouse button.

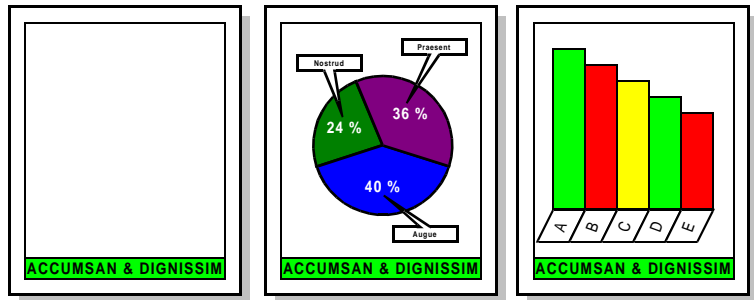
When you drag the round rotation pointer, the page rotates around the zero point (**C**), which is in the lowerleft corner by default. To change the center of rotation, move the zero point by Ctrl+dragging the crosshair from the intersection of the rulers to where you want the new zero point.



When you rotate a page, existing shapes and guides rotate with it. However, the rulers and grid stay at their original angle.

Using backgrounds for common page elements

Each Visio Enterprise drawing contains at least one **foreground** page and may also contain one or more **backgrounds**. A background is a page that appears behind another page. Create a background when you want the same shape to appear on more than one drawing page. For example, you can place a common graphical element, such as a company logo or a border, on a background. The element will appear on each page to which you assign the background.



Use a background to repeat a common element on several drawings. For example, on these three pages, the company name is repeated on each one.

You can assign only one background to each foreground, but each background can also have a background, so you can use backgrounds to create a layered effect. However, if you want to view, edit, print, or lock shapes in a drawing selectively, or if you want to have multiple depths of text and shapes within the same page, use layers instead of a background. For details, see Chapter 8, “Organizing shapes with layers.”

Creating and editing backgrounds

You can create a new page as a background or convert a foreground page to a background. When you create a background, Visio Enterprise adds it to the list of available backgrounds when you choose Insert > Page or File > Page Setup (Page Properties tab).

You edit the shapes on a background in the same way you edit the shapes on a foreground page. You cannot edit shapes on the background in the window that displays the foreground page.

To create a background:

1. Choose Insert > Page.
2. On the Page Properties tab, for Type select Background.
3. If necessary, click the Drawing Scale tab to change the scale or the Page Size tab to change the page size for the new page.
4. Click OK.

5. Create and edit shapes on the background page as you would for any page.
6. To return to a foreground page, choose Edit > Go To, then choose the page name.

To convert a foreground page to a background:

1. Display the foreground page you want to convert to a background.
2. Choose File > Page Setup, then click the Page Properties tab.
3. For Type, select Background.
4. Click OK.

Assigning and editing background pages

You can assign one background to each page in a drawing. You can assign the same background to as many pages as you want. If you no longer want a background assigned to a particular page, you can cancel the assignment.

When you assign a background to a foreground page, the shapes on the background are visible when you display the foreground page, but you cannot edit them from the foreground page. To edit the shapes on a background, you display that background in the drawing window, then edit the same way you edit a foreground page.

To assign a background to a page:

1. Display the page to which you want to assign the background.
2. Choose File > Page Setup, then click the Page Properties tab.
3. In the Background list, select the name of the background that you want to assign.
4. Click OK.

The background appears behind the shapes on the foreground page.

To edit a background page:

1. Choose Edit > Go To > Background.

The background page assigned to the current foreground is displayed.

2. Create and edit shapes on the background page as you would for any page.
3. To return to a foreground page, choose Edit > Go To > Foreground.

To cancel a page's background assignment:

1. Display the page to which the background is assigned.
2. Choose File > Page Setup, then click the Page Properties tab.
3. In the Background list, select None.
4. Click OK.

Saving drawing files

When you work on a drawing, you should save the drawing file frequently. When you change a stencil or template, you should also save that file.

After you have saved a file, click the Save button on the Standard toolbar or press Ctrl+S to save additional changes. By default, Visio Enterprise saves existing files in the format in which they were opened. To save in a different format, including earlier versions of a Visio product, use the Save As command.

Saving a drawing file for the first time

The first time you save a drawing, Visio Enterprise prompts you for document properties, such as title, author, keywords, and descriptions. Later, when you select the file name in the Open dialog box, these description and preview properties appear, to help you identify the file before opening it.

To save a drawing file for the first time:

1. Choose File > Save or Save As.
2. For File Name, type a name for the drawing file.
3. Under Save In, open the folder in which you want to save the file.
4. Click Save.
5. Enter properties information, then click OK to close the Properties dialog box.

Options for saving Visio Enterprise files

How you save a Visio Enterprise drawing file (*.vsd) influences what happens when you next open it. You can

- Change a file's properties by choosing File > Properties. To view these properties without opening the file, right-click the file in Windows, then choosing Properties.
- Save a preview of the first page or all of the pages of the drawing so that you can identify the file before you open it. In the Open dialog box in Visio Enterprise, you see only the first page. In Windows 98, Windows 95, or Windows NT 4.0 Quick View (right-click a Visio Enterprise file in Windows Explorer, then choose Quick View), you can see all of the pages. Saving previews of all of the pages can increase the file size considerably.
- Save a drawing file as a template (*.vst), which you can use as a model for other drawings.

- Save a drawing file in Visio 4.x format. When you open a 5.0 file in an earlier version of a Visio product, information and functionality specific to Visio 5.0 products will be lost or converted.
- Save a file as read-only to prevent it from being inadvertently edited or changed.
- Export a file in HTML, Windows Metafile, or another format.
- Save the workspace when you save a drawing file. When you next open the file, the stencil and drawing page windows will look just as they did when you saved the file. You can save a workspace as part of a drawing, stencil, or template, or as a separate file (*.vsw).

Working with shapes

The easiest way to create a drawing in Visio® Enterprise is to drag shapes from a stencil to a drawing page. Because Visio Enterprise comes with shapes for a wide variety of drawing types, many of which conform to the industry standards for a particular drawing type, you can create everything from marketing charts to software class diagrams with simple drag and drop drawing techniques.

This chapter introduces you to fundamental techniques for creating, revising, and formatting shapes. Whether you are documenting your local area network or diagramming a business process, you can take advantage of many timesaving features for working with shapes.

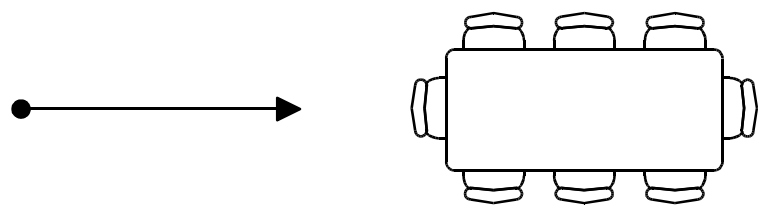
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Moving shapes	44
Working with shapes in groups	46
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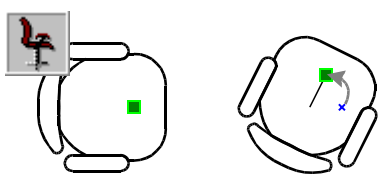
Shape anatomy

In Visio Enterprise, the term **shape** can refer to one line, arc, or spline; a series of segments; or several shapes grouped together.

Shapes include master shapes, or **masters**, which come with Visio Enterprise, as well as shapes you draw yourself. Visio shapes are programmed to act the way you need them to in a particular context. For example, shapes for doors, windows, desks—things that are built to standard industry sizes—are locked against sizing so you don’t accidentally stretch the shapes inappropriately as you are working with them.



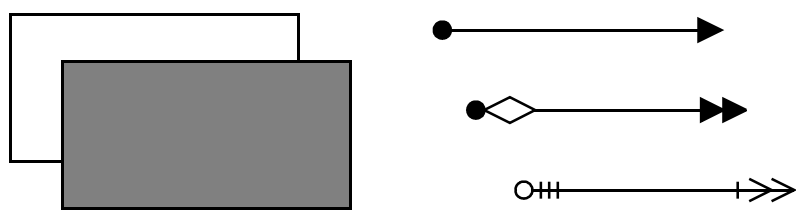
A single line is a shape, and so is a rectangle. The table with chairs is a Visio master composed of simpler shapes grouped together.



The desk chair is programmed to be easy to rotate.

Closed and open shapes

A shape can be closed or open. Shapes that are surrounded by a continuous outline, such as rectangles or circles, are closed shapes, which means that you can fill them with colors and patterns. Lines, arcs, or zigzag shapes are open shapes, which means that you can format their ends.



The rectangle, which is a closed shape, is filled with a pattern. The lines, which are open shapes, have line ends applied to them.

1-D and 2-D shapes

A shape can be one-dimensional (1-D) or two-dimensional (2-D).

A 1-D shape behaves like a line and displays endpoints that you can drag to resize the shape when you select it with the pointer tool. You can glue the endpoints of 1-D shapes to the sides of 2-D shapes to create connecting lines that stay in place when the shapes are moved.



A 1-D shape has only two endpoints. Some 1-D shapes also have other handles, such as this arc's control handle.

A 2-D shape behaves like a rectangle and displays selection handles that you can drag to resize the shape when you select it with the pointer tool.



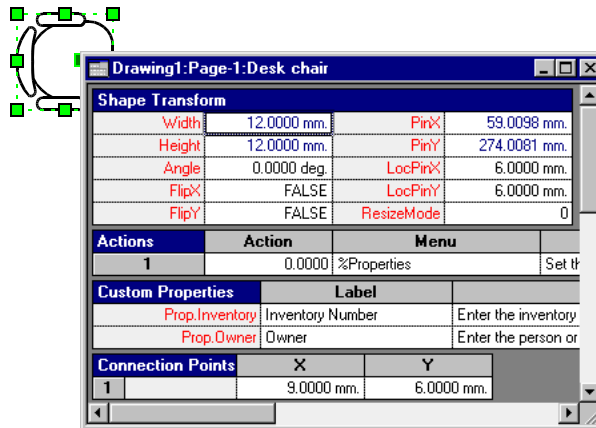
A 2-D shape has more than two handles and can be closed (like the ellipse) or open (like the zigzag line).

With all shapes, except those that are locked against specific behavior, you can do the following:

- Resize, move, flip, or rotate them.
- Change their stacking order relative to other shapes.
- Format and add text to them.
- Glue them to other shapes and guides.
- Snap them to a guide, guide point, grid, or the alignment box of another shape.
- Revise them by adding segments or changing the way they curve.
- Control how they appear on the screen, whether they print, and how they behave when you double-click them.
- Associate them with data and use the data to generate reports.
- Add jumps to them that go to other pages in the same drawing, to other files, or to World Wide Web sites.
- Control their behavior by modifying their ShapeSheet® spreadsheets.

Customizing shapes in the ShapeSheet window

To understand what makes a shape smart, it helps to know how shapes are drawn and stored in Visio Enterprise. You can view any Visio shape in its own ShapeSheet window, a spreadsheet-like view of a shape that describes the shape's geometry and other properties. For example, the ShapeSheet window contains the coordinates of each shape vertex and the shape's dimensions. Much of this information can be defined by formulas rather than by hard-coded numbers. This is important because it's what makes a shape smart; formulas allow a shape to behave differently based on how it is used, rather than always behaving the same way.



To display a ShapeSheet spreadsheet, select a shape, then choose Show ShapeSheet from the Window menu.

You can use Visio Enterprise to create accurate drawings without ever opening the ShapeSheet window for a shape. However, for added precision with certain operations, particularly when you are drawing from scratch, you may want to work in the ShapeSheet window.

For details about working in the ShapeSheet window, see Chapter 11, “Creating Custom Solutions,” or refer to *Developing Visio Solutions*.

Modifying shapes using shape handles

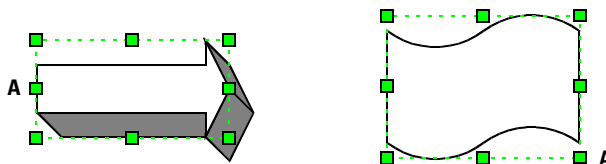
Visio shapes come with a variety of handles, which you can drag to modify shape appearance, position, or behavior. For example, you can use handles to glue one shape to another, move a shape's text, or change the curve of an arc.

This section discusses the various types of shape handles and how to use them.

Selection handles and endpoints

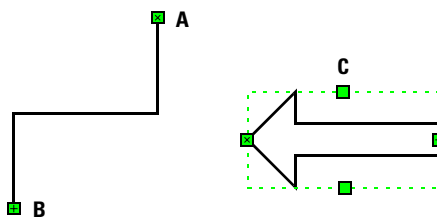
Selection handles and endpoints appear when you select shapes with the pointer tool (☞) on the Standard toolbar. To resize a shape, drag its selection handles or endpoints.

Most shapes are two-dimensional (2-D) shapes. Two-dimensional shapes have corner selection handles, which you drag to resize the shapes proportionally, and side selection handles, which you drag to resize that side of the shape.

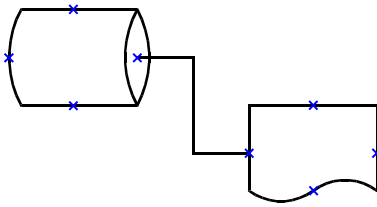


Two-dimensional shapes The small green boxes on the corners and sides of each shape (A) are its selection handles.

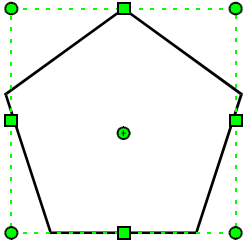
Some shapes, including all connector shapes, are one-dimensional (1-D) shapes. One-dimensional shapes have endpoints—a begin point (■) and an end point (■).



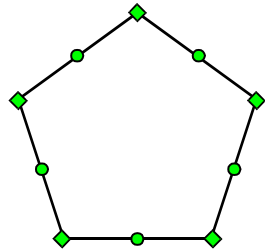
One-dimensional shapes In addition to begin points (A) and end points (B), some 1-D shapes have two selection handles (C).



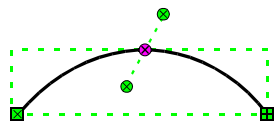
A connection point appears as a blue X on a shape.



Rotation handles appear as round corner handles. The rotation pin appears as a circle with a plus in the center.



Vertices appear as green diamond-shaped handles. Control points appear as round handles.



Eccentricity handles appear as circles on each end of a dashed line.

Connection points

Some 2-D shapes have connection points, where you can glue the endpoints of a 1-D shape to the 2-D shape. You can create new connection points using the connection point tool (X) on the Standard toolbar.

Rotation handles

Rotation handles appear when you select a shape with the rotation tool (C) on the Standard toolbar. They are indicated by green round corner handles and a pin, which marks the center of rotation. To rotate a shape, drag a corner handle. To change the center of rotation, move the rotation pin.

Vertices

Vertices appear when you select a shape with the pencil (P), line (L), arc (A), or freeform (F) tool on the Standard toolbar. A vertex is marked by a green diamond-shaped handle. To change the form of a shape, you drag a vertex with the tool used to create the shape. (The vertex turns magenta to indicate that it's selected.) To add or delete segments, you add or delete vertices using the pencil, line, arc, or freeform tool on the Standard toolbar.

Control points

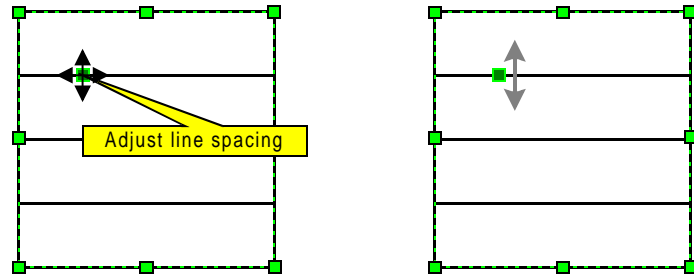
Control points appear on lines, arcs, and freeform curves when you select them with the pencil tool. These are green round handles that appear between two vertices. You can drag control points to change the curve or symmetry of a segment.

Eccentricity handles

With eccentricity handles, you can adjust the angle and magnitude of an elliptical arc's eccentricity. To display eccentricity handles, first select an arc. Then select the pencil tool and click the control point at the center.

Control handles

Some master shapes have control handles that let you work with shapes in ways you can't with standard 1-D and 2-D shapes. The control handle looks like a selection handle with darker shading. Each control handle has a function unique to the shape on which it appears. For example, it may adjust the roundness of a shape's corners or reshape an arrow. To display a tip about what a control handle does, pause the pointer over the control handle.

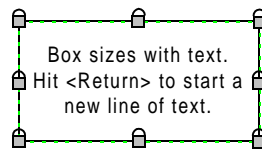


Tips explain the use of control handles. In this example, dragging the control handle (■) adjusts the line spacing. This behavior is programmed into the shape's ShapeSheet spreadsheet.

Padlocks

Padlocks appear in place of selection handles to indicate when you have selected a shape that is locked against specific changes. Some shapes are locked against flipping, rotating, sizing, or other changes that would destroy their specially programmed behavior. You can lock shapes using the Protection command.

NOTE Padlocks appear only when a shape is locked against sizing or rotating. When a shape is locked against repositioning, deleting, or selecting, no padlocks appear, but you can't perform the action.



When you select a shape locked against sizing or rotating, the selection handles appear as padlocks.

Selecting shapes

To work with a shape you must select it. In most cases you select shapes by clicking them with the pointer tool, but you can also use other tools or drag the pointer tool to create a selection net around multiple shapes.

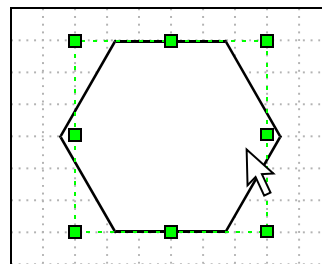
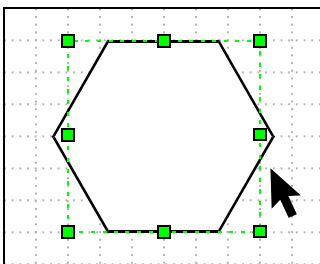
Methods for selecting shapes	
To	Do this
Select one shape	Move the pointer over the shape. When the pointer changes from a black arrow to a white arrow, click to select the shape. The shape’s selection handles appear in green.
Select multiple shapes by clicking	Select the first shape, hold down the Shift key, then click to select other shapes one at a time. The primary shape has green selection handles, and all other shapes have blue selection handles.
Select multiple shapes by dragging	Use the pointer tool (☞) from the Standard toolbar and drag a selection net around all of the shapes you want to select.
Select all shapes on the page	Choose Edit > Select All. If there are more than 25 shapes, they appear with a magenta outline to show that they are selected. Otherwise, shapes appear selected as described above.
Select all of a particular kind of object	Choose Edit > Select Special, then check the type of objects that you want to select, such as shapes, groups, or guides.
Cancel a selection	Click away from the selected shape or press the Esc key.
Cancel the selection of one shape when several are selected	Shift+click the shape.

Moving shapes

You can change the location of a single shape or move multiple shapes so they keep their positions in relation to one another.

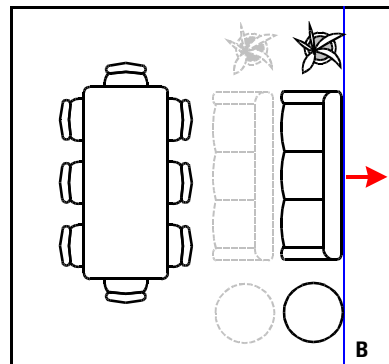
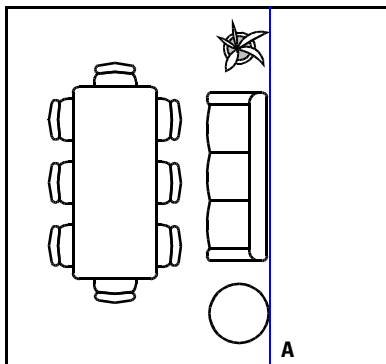
To move a shape, point to it, then drag the mouse. To move multiple shapes, select all the shapes, then point and drag. For more control, do the following:

- To constrain the movement of a shape to vertical or horizontal, hold down the Shift key while you drag the shape.
- To snap a shape to the nearest grid line while dragging, choose Tools > Snap & Glue, then check Grid under Snap To.



When you move a shape, watch the pointer. If the pointer is black, it's not positioned over the shape, so you cannot move the shape. The pointer turns white to indicate that you can move the shape. If one of the objects you're moving is a group, the pointer needs to be over one of the shapes in the group in order to turn white.

If several shapes are related to each other, you can move them together. To keep them aligned as you move them, glue the shapes to a guide, then move the guide. You can group some shapes first, so that even shapes that don't actually touch the guide move with it.



When shapes are glued to a guide (A), you can move the guide to make several adjustments to the drawing at once (B). In this example, the shapes that represent the plant, couch, and side table are glued to a guide, which is then moved to the right to put more space between them and the table shape.

To use a guide to move several related shapes:

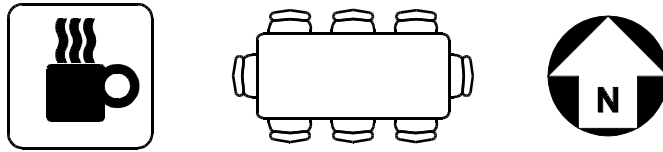
1. Choose Tools > Snap & Glue, then in the Snap & Glue dialog box make sure Guides is checked in the Snap To and Glue To lists.
2. Drag a guide from the appropriate ruler and glue shapes to the guide. Shapes' endpoints and selection handles turn red when glued.
3. Drag the guide to the shapes' new location.

Here are additional tips for moving shapes:

- Be careful not to point to a selection handle. If you accidentally resize a shape, choose Edit > Undo (or press Ctrl+Z).
- Faint lines on each ruler indicate the location of the shape or group of shapes. You can also use the grid or guides to help you position shapes.
- If you drag the shape quickly, a rectangle (representing a 2-D shape) or a line (representing a 1-D shape) shows the location of the shape or group of shapes on the page.
- If you pause while dragging and continue to hold down the left mouse button, you'll see the shape or group of shapes instead of the rectangle or line that represents it, so you can position it more precisely.
- If you want to place a shape or group of shapes exactly in a certain position, you can use the Shape > Size & Position command and then type the shape's x -, y - coordinates relative to the zero point of the drawing.

Working with shapes in groups

In Visio Enterprise, you can group shapes so they function as a unit. It's useful to group shapes when you regularly use them together. You can group any combination of Visio shapes and shapes you draw yourself. Groups can also include guides, other groups, and objects from other programs.



Some Visio shapes are groups—that is, sets of shapes grouped to form single shapes.

Keep these points in mind as you work with groups:

- You can manipulate groups or individual shapes; for example, you can format, move, rotate, flip, and reverse groups or individual shapes. You can also set behaviors for how an individual shape acts in relation to the group to which it belongs.
- When you create a group, Visio Enterprise builds a group ShapeSheet spreadsheet, which describes the group's attributes but not those of the individual shapes within it. Each shape in the group retains its own ShapeSheet spreadsheet; Visio Enterprise puts references to the group's ShapeSheet spreadsheet into the individual shapes' ShapeSheet spreadsheets. When you ungroup shapes, Visio Enterprise discards the group's ShapeSheet spreadsheet.

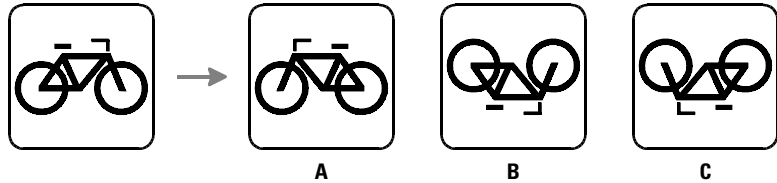
- If you add a guide and the shapes glued to it to a group, be sure to select both the guide and shapes before you add them to the group; otherwise the glue breaks. You can add guides to a rotated group only when the group is displayed in the group window, which is where you can edit the shapes that make up the group.
- Bitmaps or other imported objects cannot be rotated even when you rotate the group that contains them. To rotate an imported object that is not a bitmap, you must first convert it to a Visio group.
- After you reposition, add, or delete individual shapes within a group, the alignment box that appears when you select the group may no longer fit its dimensions. To adjust it, choose Tools > Update Alignment Box.

Methods for working with groups

<i>To</i>	<i>Do this</i>
Group shapes and objects	Select the shapes and objects you want to group. Choose Shape > Grouping > Group
Ungroup shapes and objects	Select the group, then choose Shape > Grouping > Ungroup.
Open a group so that you can work with the shapes in it	Select the group, then choose Edit > Open Group to open the group window.
Add a shape to a group	Select the group. Press the Shift key and select the shape you want to add. Choose Shape > Grouping > Add To Group. You can also open the group window as described above, then drag a shape from the drawing page or a stencil into the group window.
Remove a shape from a group	Select the group, then click the shape you want to remove to subselect it. Choose Shape > Grouping > Remove From Group.

Flipping, reversing, and rotating shapes

You can change the direction shapes face by flipping, reversing, or rotating them. Flipping moves a shape across its horizontal or vertical axis; reversing flips it both horizontally and vertically.

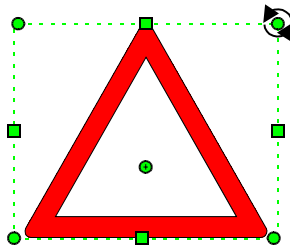


A Flipping shapes horizontally

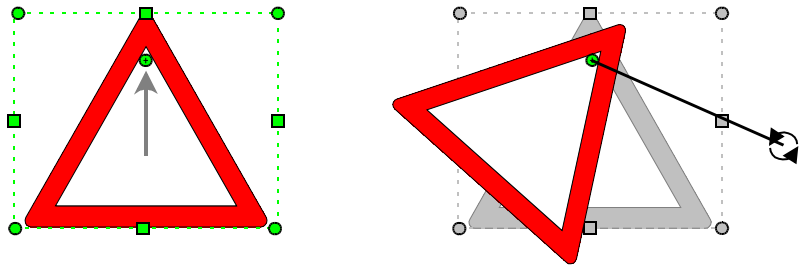
B Flipping shapes vertically

C Reversing ends to flip shapes both horizontally and vertically

Rotating moves a shape around its **pin**, or center of rotation. You can rotate a shape at any angle or in 90-degree increments. The status bar at the bottom of the Visio Enterprise window displays the exact angle of rotation.





When you select a shape with the rotation tool, rotation handles appear in the corners, and a pin (center of rotation) appears in the center. As it moves over a rotation handle, the pointer changes to a round arrow indicating that you can rotate the shape.





You can rotate a shape around any point by moving the shape's pin to that point.


Methods for flipping and reversing shapes

<i>To</i>	<i>Use this tool</i>	<i>Do this</i>
Flip a shape		Select the shape and click the Flip Vertical or Flip Horizontal button on the Shape toolbar. Or choose Shape > Flip Vertical (Ctrl+J) or Shape > Flip Horizontal (Ctrl+H).
Reverse a shape		Select the shape. Choose Shape > Reverse Ends.
Flip or reverse a group		Flip or reverse as you would any shape.
Flip or reverse a shape within a group		Select the group, then choose Edit > Open Group. In the group window, flip or reverse individual shapes as you would any shape. Click the group window's close box.

Methods for rotating shapes

<i>To</i>	<i>Use this tool</i>	<i>Do this</i>
Rotate a shape 90 degrees		Select the shape. Choose Shape > Rotate Left (Ctrl+L) to rotate counterclockwise or Rotate Right (Ctrl+R) to rotate clockwise. Or select the shape, then click the Rotate Right or Rotate Left button on the Shape toolbar.
Rotate a shape by any amount		Click the shape to select it. Drag a rotation handle. For more control, drag the pointer farther from the rotation pin.
Rotate a group		Rotate as you would any shape.
Rotate a shape within a group		Select the group, then choose Edit > Open Group. In the group window, rotate individual shapes as you would any shape. Click the group window's close box.

Keep these points in mind as you rotate shapes:

- You can rotate a 1-D shape by dragging one of its endpoints with the pointer tool (). However, it's easy to resize the shape when you do this. If you don't want to resize the shape it's better to use the rotation tool.
- You cannot rotate imported bitmaps or OLE objects.
- For precise rotation of a shape, use the Shape > Size & Position command to enter a numerical value for Angle.

Duplicating shapes

You can duplicate shapes within the same drawing, or copy shapes from one Visio drawing to another or to a document in another Windows application. You can also drag shapes from one drawing to another or from Visio Enterprise to another Windows application that is compatible with OLE 2.

You can place shapes exactly where you want them in relation to one another as you duplicate them. For example, you can easily replicate a number of workstation configurations or design an auditorium with dozens of rows of seats.

Methods for duplicating shapes

<i>To</i>	<i>Do this</i>
Add several copies of a master to a drawing	Select the stamp tool from the Standard toolbar, then click a master on a stencil to select it. In the drawing window, click the pointer where you want the center of the shape to appear. Continue clicking where you want additional copies of the shape.
Duplicate a shape within the same drawing	Select the shape you want to duplicate, then choose Edit > Duplicate (Ctrl+D). The copy appears on the page slightly offset from the original.
Duplicate a shape at a specific location	Select the shape. Hold down the Ctrl key and drag to where you want the copy.
Repeatedly duplicate a shape and the offset between copies	Select the shape. Hold down the Ctrl key and drag to where you want the copy. Release the mouse button. Press F4 for each copy you want.
Drag and drop shapes from a Visio drawing into another application that supports OLE 2	Display the drawing page that contains the shape you want to copy. Open the document into which you want to copy the shape. Hold down the Ctrl key and drag the shape from Visio Enterprise into the other document.
Copy and paste shapes from a Visio drawing into another application that doesn't support OLE 2	Select the shape you want to copy. Choose Edit > Copy. In the document in which you want to copy the shape, choose Edit > Paste.

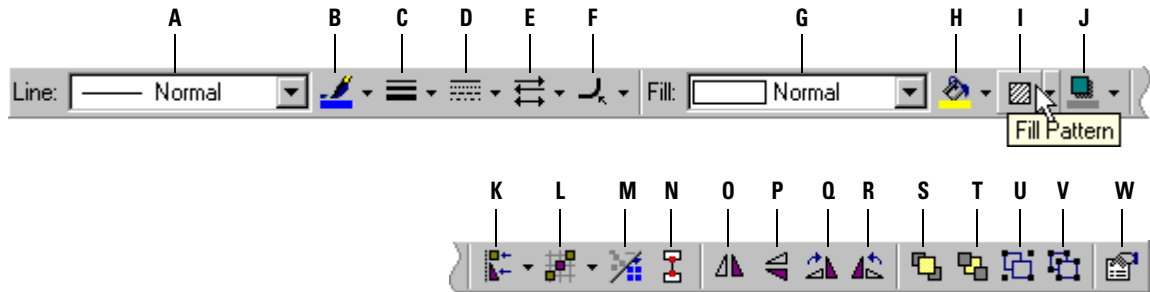
Formatting shapes

You can format shapes in your drawing by changing any one or all of their attributes, such as line weight and pattern, fill color and pattern, or text. For example, you might use color to make a drawing for a slide presentation more effective, or use line patterns to represent a specific type of connection between shapes.

The type of formatting you apply to a shape depends on whether the shape is open or closed. For example, you can add fills to closed shapes, such as circles or rectangles, but not to open ones. You can add line ends to open shapes, such as arcs or zigzag lines, but not to closed ones.

To format shapes, do one of the following:

- Select the shape or shapes you want to format, then choose the appropriate button or style list from the Shape toolbar.
- Select the shape or shapes, then choose the appropriate command from the Format menu.



The Shape toolbar Pause the pointer over a tool or button to see a tip.

- | | |
|--------------------------------|----------------------------|
| A Line style list | M Lay out shapes |
| B Line color palette | N Connect shapes |
| C Line weight list | O Flip horizontal |
| D Line pattern list | P Flip vertical |
| E Line ends list | Q Rotate right |
| F Corner roundings list | R Rotate left |
| G Fill style list | S Bring to front |
| H Fill color palette | T Send to back |
| I Fill pattern list | U Group |
| J Shadow color palette | V Ungroup |
| K Align shapes | W Custom properties |
| L Distribute shapes | |

NOTE Buttons S–V appear only at resolutions higher than 800x600.

Formatting multiple shapes

You can format several shapes at once by doing one of the following:

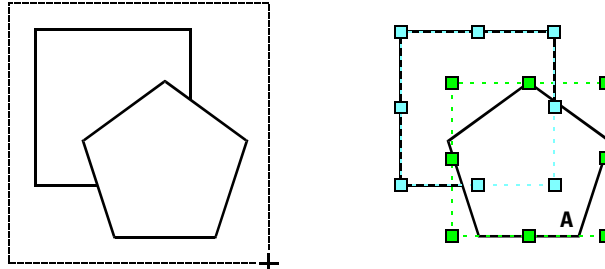
- Selecting multiple shapes at the same time.
- Selecting shapes in a group.

When you select multiple shapes and then apply a command, the result depends on the primary shape, the order in which you select, and the stacking order of the shapes.

When you are working with multiple shapes, the primary shape determines

- How all the shapes align when you use the Align Shapes command.
- How the selected shapes are affected when you edit or position them.
- The attributes that appear in any dialog boxes or style lists you open.
- The order in which shapes connect when you use the Connect Shapes command.

The shape that is primary is determined by one of two things: the selection order or the stacking order.



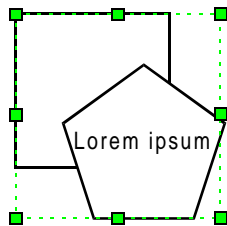
When you select shapes by dragging a selection net around them, the primary shape (**A**) is the one you dropped most recently on the page. The most recently dropped shape is at the front of the stacking order.

How a command affects multiple shapes in a selection is also determined by the stacking order of the shapes on the page. The first shape you draw or drop on the page is at the back of the stack; the most recently created shape is at the front. Stacking order determines

- Which shape is positioned in front of another if they overlap.
- How multiple shapes are affected by commands. For example, when you type in a group, the text appears on the frontmost shape in the stacking order.
- The selection order when you select multiple shapes by dragging a selection net around them. The shape at the front of the stacking order becomes the primary shape, displaying green handles. (When you select multiple shapes by Shift+clicking, the stacking order doesn't affect the selection order. The first shape you click becomes the primary shape.)

NOTE Shapes on a background always appear behind shapes on a foreground. Layers, however, have no effect on stacking order.

When you group shapes using the Shape > Grouping > Group command, you can apply formatting to the group or to individual shapes in the group.



When you select a group and type text, the text appears on the frontmost shape in the stacking order.

Methods for selecting multiple shapes

<i>To</i>	<i>Do this</i>
Select multiple shapes by clicking	Select the first shape, hold down the Shift key, then click to select other shapes one at a time. The primary shape has green selection handles; all other shapes have blue selection handles.
Select multiple shapes by dragging	Using the pointer tool (☛) on the Standard toolbar, drag a selection net around all of the shapes you want to select. The shapes appear selected as described above.
Select all shapes on the page	Choose Edit > Select All. If there are more than 25 shapes, they appear with a magenta outline to show that they are selected. Otherwise, shapes appear selected as described above.
Select all of a particular kind of object	Choose Edit > Select Special, then check the type of objects that you want to select, such as shapes, groups, or guides. The shapes appear selected as described above.
Cancel the selection of one shape when several are selected	Shift+click the shape.

Methods for selecting shapes in groups

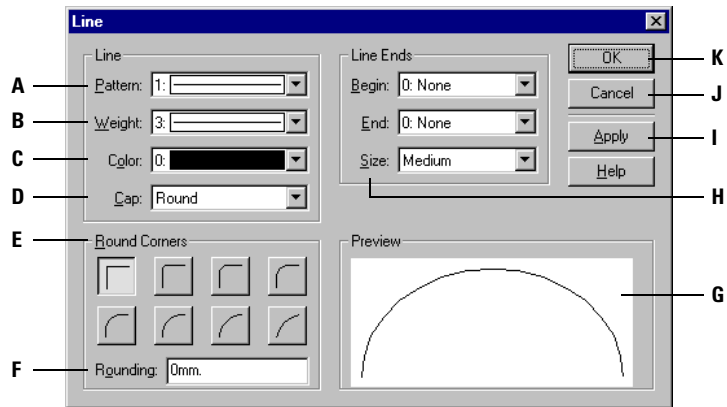
<i>To</i>	<i>Do this</i>
Format all the shapes in a group	Select the group, then change the style or attribute.
Format a shape within a group	Select the group, then choose Edit > Open Group to open the group in the group window. Select the shape and format it as you would any shape, then click the group window's close box.
Format several shapes at once	Select all the shapes, then change the style or attribute.

Formatting lines

A line can be an open straight line, freeform line, or arc; or the border around a closed shape, such as a rectangle. You can format lines or arcs by adding a pattern or color, changing the line weight, adding or removing line ends, changing the line caps, or rounding the line corners. You can also add a shadow and format the shape's text.

By applying line ends, you can turn any line or other open shape into an arrow. You can apply an arrowhead or other line end to the begin point, the end point, or both endpoints of a shape. You can also choose options for the size of line ends. You can turn an arrow into a straight line by removing any line ends that are applied to it.

Rounded corners can be applied to any corner where two segments meet on open or closed shapes.



- A** Choose among no lines, solid lines, and dashed lines. The spaces between dashes are transparent.
- B** Choose among various line widths.
- C** Choose among colors that are set in the Visio color palette. To add a new color to the color palette, choose Custom. All the colors applied are solid (not dithered) and opaque, including white.
- D** Choose Round or Square. This applies to open shapes only.
- E** Choose among various corner formats. This applies only to shapes with corners.
- F** You can enter a numerical equivalent for the roundness of the corners instead of choosing one of the corner options—the higher the number, the rounder the corners.
- G** Displays a sample line with the formatting options you have selected.
- H** For Begin and End, choose among various line ends for the line. For Size, choose the size of the line end. Line ends apply only to open shapes.
- I** Click to apply formats without closing the dialog box.
- J** Click to close the dialog box without applying any of the formatting you've selected, even if you clicked Apply previously.
- K** Click to apply the formatting options you selected and closes the dialog box.

To change formatting for a line:

1. Select the shape, then choose Format > Line.
2. Choose the options you want.

You can see how the options you select will look in the Preview box.

3. Click Apply to apply the formatting options you've chosen and view the changes before closing the dialog box, or click OK to apply the formatting and close the dialog box.

Adding color and shadows to shapes

You can fill closed shapes and give shadows to both closed and open shapes.

Fills and shadows can have a solid or bitmap pattern. Fills can also have a gradient pattern. You choose colors and a pattern from set lists to which you can add custom colors or patterns you create.

Both fills and shadows function in the same way. The only difference is that a shadow is a copy of the shape that is offset from and behind the shape to which it's applied.

To apply a fill to a closed shape:

1. Select the shape.
2. Choose Format > Fill.

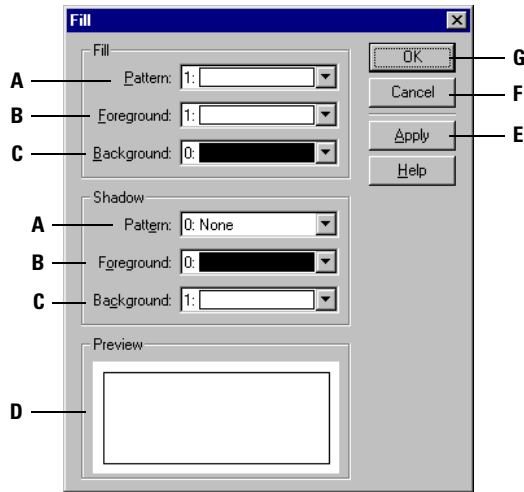
NOTE You can also use fill formatting palettes on the Shape toolbar. Pause the pointer over the palettes to see tips that identify them.

3. In the Fill section, choose options from the Pattern, Foreground, and Background lists. (You can also choose the same options in the Shadow section.) You can see how the options you select will look in the Preview box.

Visio Enterprise comes with 40 patterns: 0 is no pattern (transparent); 1 is a solid one-color pattern; 2–24 are bitmap patterns; and 25–40 are gradient patterns (for fills only).

If you choose a bitmap pattern, Visio Enterprise uses the foreground color for the pattern and the background color for the background.

4. Click Apply to apply the formatting options you've chosen and view the changes before closing the dialog box, or click OK to apply the formatting and close the dialog box.



- A** For both Fill and Shadow, you can specify a blank (transparent), solid, or bitmap pattern. For Fill, you can also specify a gradient pattern. When you specify colors for Foreground and Background, Visio Enterprise changes the display of the Pattern list according to your color choices. The numbers preceding the patterns and colors in the Pattern, Foreground, and Background lists act as labels.
- B** For both Fill and Shadow, you can specify a foreground color. If you choose the solid pattern, Visio Enterprise uses the foreground color for the fill or shadow. Each bitmap and gradient pattern uses both the foreground and background colors. The foreground color is applied to the dots and lines making up the pattern. Some colors in the Foreground and Background lists are quite dark. For those colors, the left half of the color sample shows how each color will look as a solid (pattern 1). The right side shows how each color will appear in any bitmap or gradient pattern.
- C** Choose the color you want for the background of a bitmap pattern or for the second color in a gradient pattern.
- D** Displays a sample fill with the formatting options you have selected.
- E** Applies formats without closing the dialog box.
- F** Closes the dialog box without applying any of the formatting you've selected.
- G** Applies the formatting options you've selected and closes the dialog box.

TIP To hide a shape completely, apply to it a fill of 0 (transparent) in the Fill dialog box and a pattern of None in the Line dialog box. To temporarily hide a shape, assign the shape to a layer, then hide the layer in the Layer Properties dialog box.

To apply a shadow to a closed or open shape:

1. Select the shape.
2. Choose Format > Shadow.
3. In the Shadow section, choose options from the Pattern, Foreground, and Background lists.
4. Click OK.

TIP To delete a shadow, choose None from the Pattern list for Shadow.

Finding shapes on stencils

When you want to find a shape but aren't sure which stencil it's on, you can quickly search with Visio Shape Explorer™ instead of opening multiple stencils. Shape Explorer provides an easy way to search for and catalog Visio shapes, stencils, and templates that are provided with Visio products, that are on the World Wide Web, or that are in databases you create. In the Visio Enterprise Setup program, Visio Shape Explorer is an installable option under Add-ons – Supplemental for Standard components.

For example, if you know a 3-D Box shape exists but don't know where to find it, use Shape Explorer to determine which stencil contains the shape, then open the stencil or use Shape Explorer to add the shape to your drawing.

You search with Shape Explorer by typing the keywords you want to use in the Search For box on the Search tab. A keyword can be a shape or stencil name, or a word or phrase that describes the shape you're looking for, or the type of drawing you want to create.

To open Shape Explorer:

1. Choose File > Stencils > Shape Explorer.
2. On the Search tab, in the Search For box, type a name, word, or phrase that describes what you want to find.
3. Click Find Now.

The status bar at the bottom of Shape Explorer window indicates the progress of the search.

TIP To learn more about how Shape Explorer works, click Help in the Shape Explorer dialog box.

Connecting and laying out shapes

To show relationships, many drawings include lines, or one-dimensional (1-D) shapes, that indicate connections between two-dimensional (2-D) shapes. These drawings, called **connected drawings**, include flowcharts, which use 1-D shapes to connect the stages in a process.

In Visio® Enterprise, these 1-D shapes are called **connectors**, and they include special behavior to make it easier and faster for you to create, and later change, connected drawings. You can use this behavior—called **glue**—to ensure that shapes that need to stay connected do so when you revise the drawings.

This chapter explains several techniques for connecting shapes and taking advantage of automatic layout behavior in Visio Enterprise.

Topics in this chapter

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Adding connectors to your drawings	64
Displaying line jumps on crossing connectors	67
Laying out shapes automatically	68

Using glue to connect shapes

Glue is what keeps shapes connected when you move them. When you want to reposition shapes in your drawing, glue saves you the time it would take to drag each shape individually and reattach connectors.

While you're working with glue, it helps to keep the following in mind:

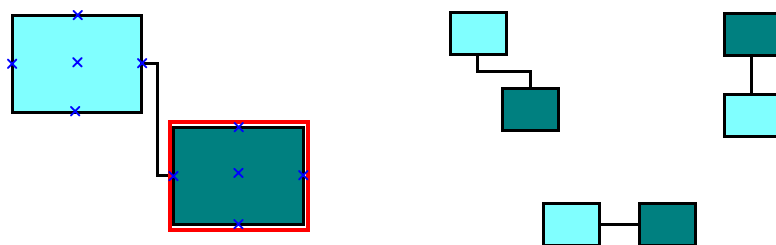
- You can use **dynamic** or **static glue** to create connections between shapes or specific points on them.
- You can change glue settings to determine the types of points to which connectors and shapes can glue.
- You can add new connection points to shapes to make your connections more precise.

Gluing connectors to shapes

When you want any point on one shape to stay connected to any point on another, use dynamic glue. When you want a specific point on one shape to stay connected to a specific point on another, use static glue.

With dynamic glue, the connector is glued to the shapes and changes the points at which it's connected when you reposition the shapes. Dynamic glue keeps the shapes connected at the closest available points.

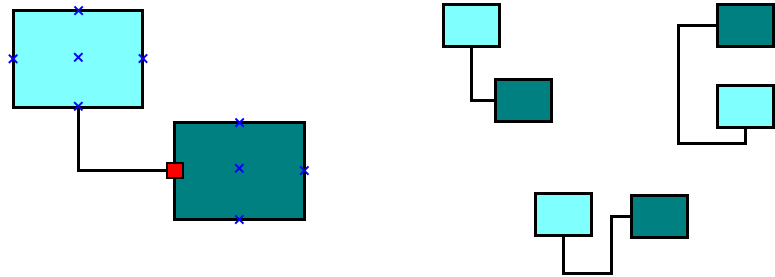
For example, dynamic glue is appropriate for a flowchart, which represents the flow of a process. Each subsequent step must be connected to the previous step, but the specific point on the shape representing the previous step doesn't matter. When you move a step, you want the connector to shift to a point on the previous step that is closest to the subsequent step's new location.



Dynamic glue When you glue a connector to an entire shape, a box appears around the shape before you drop the connector endpoint onto it. If you move one of the 2-D shapes, the connector adjusts to glue to the point that's closest to the other shape.

With static glue, the 1-D connector is glued to one specific point on each 2-D shape and stays glued to those specific points when you reposition one of the shapes.

For example, static glue is appropriate for an organization chart, which represents a reporting hierarchy. Position shapes appear under and are connected to the bottom center of Manager shapes. When you move a Position shape, you don't want the connector to shift to any other point on the Manager shape.



Static glue When you glue a connector to a specific point on a shape, a box appears around that point before you drop the connector endpoint on the shape. If you move one of the 2-D shapes, the connector remains glued at the specific points.

You can recognize a properly glued connector endpoint or control handle by the color and size of its selection handle. If an endpoint is light red and slightly larger than a normal selection handle, it's glued using dynamic glue. If it's darker red and the same size as normal selection handles, it's glued using static glue.

To switch from static to dynamic glue:

- Hold down the Ctrl key, then drag a connector endpoint away from the shape and then back to one of the shape's connection points.

When you drag the endpoint back to the shape, a box appears around the entire shape.

To switch from dynamic to static glue:

- Drag a connector endpoint away from the shape and then back to one of the shape's connection points.

When you drag the endpoint back to the shape, a box appears around only the connector endpoint.

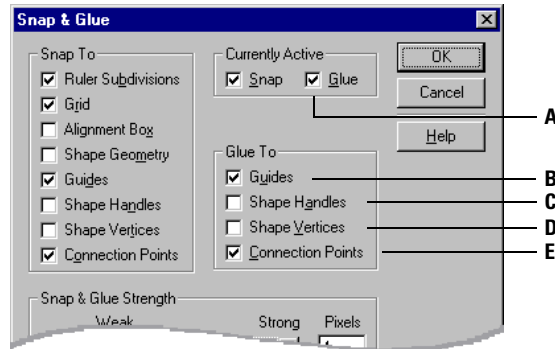
NOTE Some connector shapes are designed to use only static glue, no matter how you connect them. For example, the control handle connectors that you drag from organization chart shapes can glue only to a specific point.

Setting glue options

You can control what types of objects shapes glue to and what their **glue strength** is. Glue strength is the amount of pull (measured in pixels) that a guide, selection handle, vertex, or connection point exerts. If you don't want endpoints to glue to guides or any points on shapes, you can turn off glue completely.

The glue settings you choose in the Snap & Glue dialog box apply to all shapes on the current drawing page. If you have more than one page in your drawing, you can set different glue options for each page.

TIP Options you set in the Snap & Glue dialog box don't affect connections you make with the Connect Shapes command or with the connector tool.



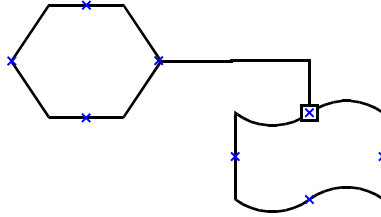
- A** Check to turn glue on or off.
- B** Check to glue endpoints to guides. This option is checked by default.
- C** Check to glue endpoints to selection handles on shapes, groups, objects from other programs, or to other 1-D shape endpoints.
- D** Check to glue endpoints to shape vertices.
- E** Check to glue endpoints to connection points (blue Xs) on shapes. This option is checked by default.

To set glue options:

1. Choose Tools > Snap & Glue.
2. Under Currently Active, make sure the Glue option is checked.
3. Under Glue To, check the options you want, then click OK.

Adding connection points to shapes

You can specify the points on a 2-D shape to which connectors can glue. If you need to show a connector attached to a particular location on a shape, you can add a connection point at that location. Connection points can lie on the perimeter, inside, or even outside the shape. They appear on the screen but don't print, and you can prevent connection points from appearing on the screen.



By default, 1-D endpoints and control handles glue to connection points (x) on shapes. You can also choose to have endpoints glue to selection handles and vertices, and you can add new connection points.

To add a connection point to a shape:

1. Select the shape to which you want to add a connection point.
2. From the Standard toolbar, choose the connection point tool (X).
3. Hold down the Ctrl key and click on, inside, or outside the selected shape's boundaries.

TIP To delete a connection point, click the point with the connection point tool (the connection point turns magenta), then press the Delete key.

To prevent connection points from displaying on the screen:

- Choose View > Connection Points.

When the command is unchecked, connection points do not display on the screen.

Adding connectors to your drawings

Depending on the drawing type, you can use one or more of the following methods to add connectors to your drawings. Shape behavior can vary depending on the solution. What works best in a network diagram may not work in an organization chart. To determine the best way to connect shapes in a particular type of drawing, right-click a shape, then choose Shape Help.

Drawing connectors with the connector tool You can choose the connector tool from the Standard toolbar to draw a connector between 2-D shapes.

Pulling connectors from shapes Some 2-D shapes, such as organization chart shapes, include control handles that you can drag to pull a connector from the shape.

Using the Connect Shapes command You can connect a series of shapes at once, such as in a flowchart, by choosing Tools > Connect Shapes to add connectors between the shapes.

Dragging and dropping connector shapes Many Visio stencils, such as the network stencils, include connectors that you can drag to your drawing page and drop in place.


Which method you use depends on the type of drawing you're creating, whether you expect to make extensive revisions later, and how much control you want over the connections you have. Some drawing types, such as organization charts, provide additional methods of connecting shapes.

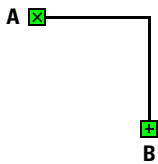
Working with connectors

Connectors are 1-D shapes with endpoints. You glue these endpoints to 2-D shapes to create connections that are maintained when you reposition the 2-D shapes. Certain connectors, such as the built-in Dynamic Connector and other routable connectors, also display midpoints and vertices when you select them.

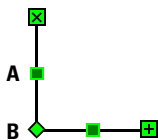
By default, connectors glue to connection points on a 2-D shape, but they can glue to other points. To glue to selection handles or vertices of a 2-D shape, choose Tools > Snap & Glue, choose options under Glue To, then click OK.

To connect 2-D shapes with a Dynamic Connector using dynamic glue:

1. Choose the connector tool () from the Standard toolbar.
2. Position the connector tool over the center of the first shape, until a box appears around the entire shape, then hold down the mouse button and drag to draw a connector.
3. While holding the mouse button, position the connector tool over the center of the other shape, until a box appears around it, then release the mouse button.



Connectors have begin points (A) and end points (B) that are indicated by an x and a + respectively.




Routable connectors display midpoints (A) and vertices (B) for additional editing capabilities.

In some cases, you want to connect shapes with a particular connector shape. For example, in a network diagram, you can use a particular cable connector shape to connect two pieces of network equipment. One way to do this is simply to drag the connector shape you want onto the drawing page, then position its endpoints on the connection points of the 2-D shapes you're trying to connect. But this method is slow, particularly if you have a lot of shapes to connect. A faster way is to "tell" the connector tool to use the connector shape you want, as the procedure below describes.

To use the connector tool to connect using a specific connector shape:

1. Add 2-D shapes to your drawing page without connecting them.

For example, in a network diagram, add the equipment shapes to the page.

2. Choose the connector tool () from the Standard toolbar.
3. In the stencil window, click the master icon for the connector shape you want to use.

For example, click the Network Cable 4 shape. The master icon is highlighted in blue.


4. Position the connector tool over a shape, then drag to a connection point on another 2-D shape.

The shapes are connected using an instance of the selected master. As long as the master remains selected on the stencil, the connector tool will connect using an instance of that shape.

Connecting shapes as you drop them on the page

The fastest way to connect a number of shapes, such as when you're building a big flowchart, is to connect them automatically as you drop them on the page. To do this, you use the connector tool to drag and drop. Visio Enterprise adds a Dynamic Connector between the selected shape on the page and the next shape you drop. To create new branches in a chart or diagram, select the shape from which you want to start the new branch, then drag a new shape to the drawing page.

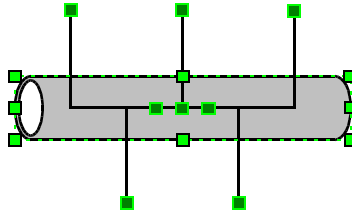
To connect shapes as you drag and drop them:

1. Choose the connector tool () from the Standard toolbar.
2. Drag and drop a 2-D shape from the stencil onto the drawing page.
3. With the first shape still selected, drag and drop another 2-D shape onto the drawing page.

Visio Enterprise automatically connects the shapes with an instance of the Dynamic Connector.

Dragging connectors from control handles on shapes

Some 2-D shapes, such as Ethernet and Token ring shapes on the Basic Network stencil, function as specialized connectors. These shapes have built-in connectors: control handles that you can drag and glue to other 2-D shapes.



Some shapes have control handles (■) that you can drag to glue to other 2-D shapes.

You can often tell which shapes contain control handle connectors by looking at master icons in the stencil. Connectors appear as yellow lines extending from the main shape.

To drag a connector from a control handle on a shape:

1. Drag and drop organization chart shapes or a Token ring or Ethernet shape from a network diagramming stencil.
2. Select a shape and position the pointer over the shape's control handle (■).
3. Drag the control handle to a connection point on the other 2-D shape.

Connecting a series of shapes at once

You can use the Connect Shapes command on the Tools menu to add connectors between multiple shapes at once in a drawing.

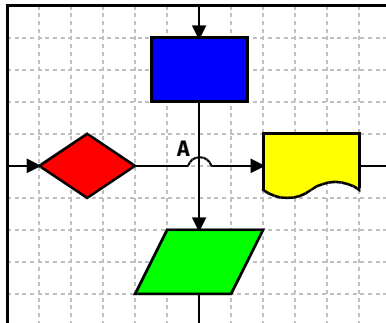
To connect a series of shapes at once:

1. Select the 2-D shapes in the order you want to connect them.
Click the first shape, then press the Shift key and click the other shapes.
2. If you want to use a particular connector, select its master icon in the stencil.
If you don't select a connector, Visio Enterprise uses the Dynamic Connector. If a connector is selected and you want to cancel its selection, click the green stencil background with the pointer tool.
3. Choose Tools > Connect Shapes, or click the Connect Shapes button (■).
Visio Enterprise creates an instance of the connector and, if the connector you select can use dynamic glue, connects the shapes with dynamic glue.

Displaying line jumps on crossing connectors

In some drawings, such as flowcharts or network diagrams, connectors may cross over one another. In a complex drawing, it can be hard to follow the path of a connector if it crosses over another of the same type.

To make connections easier to follow when you or others analyze your drawing, you can have routable connectors display **line jumps** when they cross over other connectors.



Line jumps (A) make it easier to see the route a connector takes.

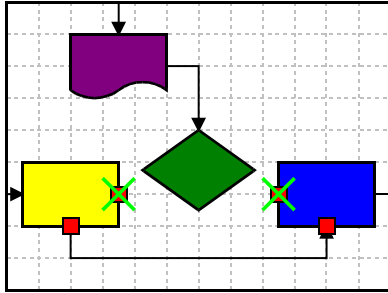
To enable line jumps and specify which connectors show them:

1. Display the drawing in which you want to display connector line jumps.
2. Choose File > Page Setup, then click the Page Properties tab.
3. Under Add Line Jumps To, select the type of connectors that, when two lines cross, display a line jump. Choose one of the following:
 - None to turn off all line jumps.
 - Horizontal Lines to add a line jump to the connector that runs horizontally.
 - Vertical Lines to add a line jump to the connector that runs vertically.
 - Last Routed Line to add a line jump to the connector you added or modified most recently (default).

NOTE Changing this setting changes line jumps on connectors that already exist in the drawing, as well as those you add after changing the setting.

4. Click OK.

Laying out shapes automatically



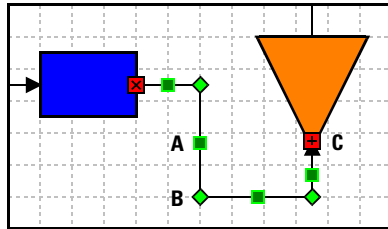
A routable connector can detect placeable shapes and change its path to avoid crossing through them.

With certain types of connected drawings, such as flowcharts, you can use the Lay Out Shapes command to automatically position and reposition shapes. Using this command to reposition shapes can help you revise large drawings more quickly than using the pointer tool to select and drag each shape to a new location. For example, if you're updating a large flowchart to include a new process, you can add and connect the shapes that make up the process, then use the Lay Out Shapes command to lay out the updated drawing automatically.

When you start a drawing from a template that is set up for automatic layout, the connectors draw a path around other shapes rather than crossing over them. These connectors are called **routable**, and they work with 2-D shapes that are set to work with them, called **placeable shapes**.

When a routable connector encounters a placeable shape between the two shapes it connects, it draws a path around the shape rather than crossing through it. Routable connectors can route around only shapes set as placeable.

A routable connector changes its path from one shape to another when you drop a placeable shape on top of a connector that's already in the drawing.



To change a routable connector's path manually, you can edit its midpoints (A), vertices (B), and endpoints (C). Endpoints and vertices look the same as they do on other 1-D shapes. Midpoints look like control handles—green squares with darker shading—but function differently on routable connectors.

After you glue a routable connector to a shape, you can manually edit the connector's midpoints and vertices to change the path it takes from one shape to another.

If you use the connector tool or Connect Shapes command, you can create routable connectors by first making sure a connector is not selected on the stencil. When you do not select a connector, Visio Enterprise connects shapes with a Dynamic Connector, which is always routable.

To set a 2-D shape as placeable:

1. Select the shape, then choose Format > Behavior.
2. Under Layout Behavior, choose one of the following:
 - Layout And Route Around to set the shape as placeable.
 - Do Not Layout And Route Around to set the shape as non-placeable. (It does not become placeable even when you glue a routable connector to it.)
 - Let Visio Decide to have Visio Enterprise determine when to make the shape placeable, according to the type of connector you glue to the shape. If you glue a Dynamic Connector to the shape, it is set to be placeable.
3. Click OK.

Preparing for automatic layout

For best results with automatic layout, use the following guidelines when you create connected drawings:

- Connect shapes using connectors that can be automatically routed, as described earlier.
- Set all 2-D shapes so that connectors can detect them.
- Orient connectors so that begin and end points direct the flow of your drawing.

Visio Enterprise determines where to position shapes based on begin and end point locations. A connector may have an arrow on one or both ends, but the direction the arrow points doesn't necessarily indicate the begin and end point locations.

- Ensure that begin and end points of connectors are properly glued to other shapes. When you select a glued connector, its begin and end points turn red.

Lay Out Shapes works best with flowcharts, network diagrams, or other typical connected-drawing types. If you try to use automatic layout with a drawing that you did not create with these shapes, a message appears to let you know that the results may not look as you expect. You can choose to continue or cancel the layout process. If you continue and are not satisfied with the results, you can choose Edit > Undo Lay Out Shapes to undo it.

NOTE Some connectors are designed for a specific purpose and are not routable. For example, the Tree and Crow's Foot connectors, and control handle connectors that you can drag out directly from other shapes, are not routable.

Setting layout style, depth, and routing

When you automatically lay out a drawing, you can specify the style of layout you want, as well as the layout depth and the connector routing style.

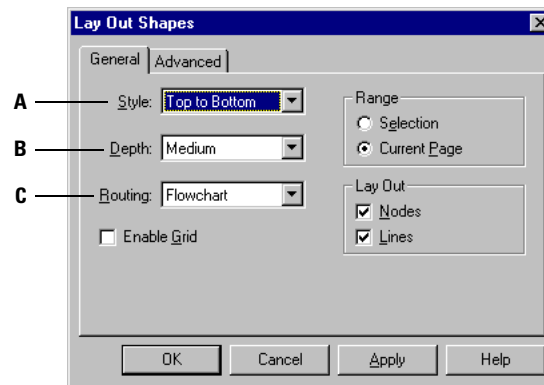
Layout style You can choose one of three styles: Top To Bottom, Left To Right, and Radial. Choose Top To Bottom or Left To Right for directed drawings, such as organization charts and process flow diagrams. Choose Radial for undirected drawings, such as some types of network diagrams.

Depth The Depth setting determines the number of levels of the drawing Visio Enterprise looks at before creating the layout. When choosing Depth settings, Shallow means a shallow layout. That is, in a top-to-bottom organization chart, a shallow layout requires more horizontal space than a deep layout.

In addition, Depth settings refer to the type of layout you want. If you set the Depth to Shallow, Visio Enterprise checks more levels of the drawing than it does if you set the Depth to Deep. The more levels Visio Enterprise checks, the better it can determine, in a top-to-bottom chart, how much space to leave between top-level shapes so that shapes in lower levels can fit on the same horizontal line. In this case “shallow” refers to the layout, because it requires more horizontal and less vertical space than it would if you had set the depth to Deep.

Whatever the Depth setting, the number of levels Visio Enterprise looks at depends upon the style and complexity of the drawing you’re working on. You may want to try different Depth settings on the same drawing to find the one that works best.

Routing style The routing style determines the path automatic layout takes to connect 2-D shapes. You can choose one of two routing styles: Flowchart and Right Angle. The Flowchart routing style uses both straight and right-angle connectors; the Right Angle routing style uses only right-angle connectors.



- A Choose the layout style.
- B Choose the depth.
- C Choose the connector routing style.

To lay out shapes and change layout style, depth, and connector-routing style:

1. Display or create the drawing you want to lay out.
2. Choose Tools > Lay Out Shapes.
3. Select the layout style, the depth, and the routing style you want, then click OK.

TIP If you continue and are not satisfied with the results, you can choose Edit > Undo Lay Out Shapes to undo it.

Customizing shape spacing and connector routing settings

When you use automatic layout, you can fine-tune the way Visio Enterprise places shapes (or **nodes**) and connectors (or **lines**). You can

- Change shapes' placement settings to affect the way Visio Enterprise routes connectors between shapes.
- Change the minimum amount of space you want between shapes and connectors, and between connectors' parallel segments.

The settings on the Advanced tab in the Lay Out Shapes dialog box are based on the layout grid. You turn on the grid by checking the Enable Grid box on the General tab. The layout grid is set up with blocks and avenues, like a city map. On the Advanced tab, you can set the Block Size to the size of the shapes in your drawing, and the Avenue size to the amount of space you want between them.

NOTE The grid you create here serves as an internal guide only—it does not correspond to the drawing page grid and does not appear on the drawing page when you enable it.

Avoid using the grid if your drawing contains shapes of various sizes, particularly shapes that exceed the size of the grid blocks. Visio Enterprise can position these shapes more precisely when they do not need to fit within a fixed grid block.

To customize routing and grid options:

1. Choose Tools > Lay Out Shapes to open the dialog box.
2. Click General to display the General tab, then check Enable Grid.
3. Click Advanced, and on the Advanced tab, do the following:

Line To Line Spacing Set the minimum amount of space you want between connectors' parallel segments.

Line To Node Spacing Set the minimum amount of space you want between connectors and shapes.

Block Size Type values that match the size of the shapes in your drawing.

Avenue size Type the minimum amount of space you want between the shapes (this should be at least twice the values of the Line To Node settings).

4. When you've finished fine-tuning the settings on the Advanced tab, click OK to close the dialog box and create the automatic layout, or click Apply to create the automatic layout without closing the dialog box.

TIP If you are not satisfied with the layout, choose Edit > Undo Lay Out Shapes (or press Ctrl+Z).

Adding text to drawings

Text can clarify the meaning of your diagrams, list shape attributes, or document changes you or other Visio® Enterprise users make to a drawing. For example, you can

- Describe the process a shape represents in a process flow diagram.
- Add title blocks and bulleted lists to your drawings.
- Annotate a software model diagram.

This chapter explains how to create, edit, move, and format text in your drawings and diagrams.

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Adding text to shapes and drawings

To add text to most Visio Enterprise shapes, including connectors, select the shape and start typing.

The part of the shape in which you type text is called the **text block**. A text block can differ from its shape in size, angle, and relative location, so you can place text where you want it in relation to a shape. Each shape has only one text block.

NOTE Not all shapes have the default text behavior described here. For example, you cannot type in an Entity shape in the Database Model solution, because its text comes from values you type in a dialog box. To discover the best way to add text to a shape, right-click the shape, then choose Shape Help.

To type text in a shape:

1. Select the shape, then type.

Visio Enterprise zooms in on the drawing so that you can see what you are typing.

2. When you finish typing, press the Esc key or click outside the text block.

You can create text-only shapes to add titles and lists to a drawing. In a text-only shape, the shape has no line or fill, so only text you type in the shape is visible. Text-only shapes also enable you to add text to objects from other programs—position the text-only shape where you want to type text for the imported object.

To create a text-only shape:

1. Choose the text tool (**A**) from the Standard toolbar.
2. Click where you want to start typing, or click and then drag until the text block is the size you want, then release the mouse button.
3. Type the text.


When you start typing, Visio Enterprise creates a text-only shape and zooms in on its text block.

4. When you finish typing, press the Esc key or choose the pointer tool from the Standard toolbar.

To turn off automatic zooming when editing text:






1. Choose View > Zoom > Custom.
2. Uncheck Zoom When Editing Text.

Selecting text

When you use a non-text tool, such as the pointer tool, to select a shape, Visio Enterprise selects all of the existing text so that when you type, the existing text is replaced with the new text. To select only a part of the existing text or to place an insertion point in the text, use the text tool (). The text tool selects the shape and opens the shape's text block. After you select text within a text block, you can delete, cut, copy, or format the selection, or you can type or paste to replace it. To add text without replacing any of the existing text, click with the text tool to place an insertion point where you want to type new text.

To rotate, resize, or move an entire text block, select its shape with the text block tool (.

Methods for selecting text




<i>To</i>	<i>Use this tool</i>	<i>Take these steps</i>
Select a text block		Click the shape with the text block you want to select. If the handles are gray, the shape is grouped. Use the Open Group command to view the shape in the group window.
Select all text in a block or, if there's no text, to display the insertion point		Double-click the shape. Or select the shape, then press F2.
Select part of the text in a text block		Click the shape, then drag the insertion point.
Select a word or paragraph		Click the shape, then double-click a word or triple-click a paragraph.
Place the insertion point in text		Click the shape.

Cutting, copying, and pasting text

You cut, copy, or paste text in Visio Enterprise the same way you do in many word-processing programs. You can also undo text changes by choosing the Undo command.

NOTE When you paste text from another application, the formatting information is lost.

Methods for cutting, copying, and pasting text

<i>To</i>	<i>Use this tool</i>	<i>Take these steps</i>
Cut or copy selected text to the Clipboard		Select the text, then press Ctrl+X to cut or Ctrl+C to copy.
Copy all text to the Clipboard		Click the shape, then press Ctrl+C.
Paste text from the Clipboard		Click to place the insertion point, then press Ctrl+V.
Repeat a text action, such as pasting text		Press F4.

Editing text

After you've added text to a shape, you can edit it by placing an insertion point into the text and typing; double-click the shape to open the text block, or click the text with the text tool on the Standard toolbar (**A**). Press the Esc key when you are done.

You can also edit existing text in shapes that come with Visio Enterprise. If that shape is a group, such as the 3-D bar shapes in the charting stencils, the text you type is added to the frontmost shape in the shape's stacking order. The group itself doesn't have its own text block. When you double-click a grouped shape, the group window opens rather than the text block. In the group window, you can double-click shapes within the group to edit their text blocks.

To delete text from a shape:

1. Choose the text tool from the Standard toolbar.
2. Click the shape that contains the text you want to delete.
When you click the shape, the text block opens, and the insertion point appears at the end of the text.
3. Select the text to delete, or press Ctrl+A to select all text in the text block.
4. Press the Delete key.
5. Choose the pointer tool from the Standard toolbar to close the text block.

To delete a text-only shape:

- Select the shape with the pointer tool, then press the Delete key.

To add or edit text in a shape within a group:

1. Select the group.
Green selection handles appear on the group.
2. Click the shape you want to work with to subselect it.
Gray selection handles appear on the shape.
3. Type to add or edit the text just as you would in an ungrouped shape.
4. *Optional* To change which shape in the group receives text, change its stacking order: Select the shape, then choose Shape > Bring To Front.

Formatting text

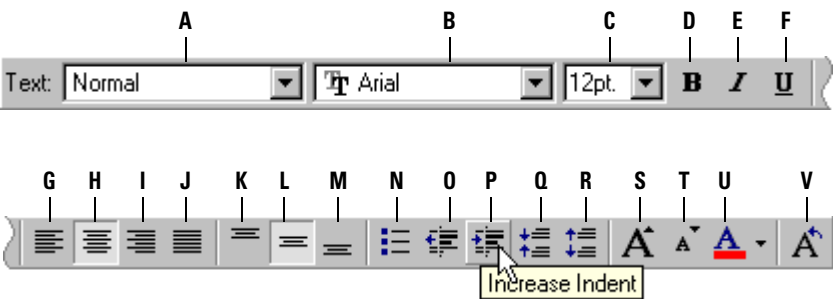
You can format text in your drawing by changing any one or all of the text's attributes, such as color, alignment, font, and size.

To change the appearance of your text, you can:

- Use tools from the Text toolbar to apply local formatting, so that you can quickly change size, color, font, style, and so on.
- Use the commands on the Format menu to apply local formatting, which provides a few additional options not available from the Text toolbar. For example, you can enter the precise font size in the Text dialog box.
- Use the Text style list to apply a style, which you can use to apply many formatting attributes to many different shapes.

To display the Text toolbar:

- Choose View > Toolbars > Text. A check mark next to a toolbar name indicates that it is displayed.

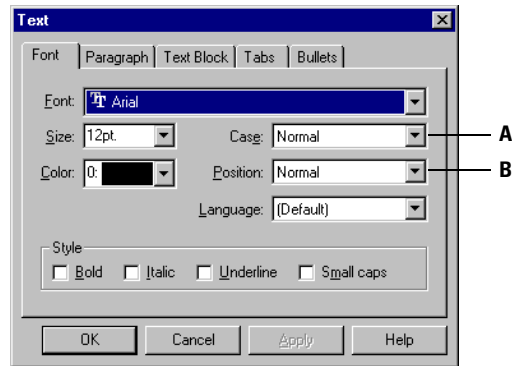


The Text toolbar Pause the pointer over a tool or button to see a tip.

- | | |
|--------------------------|-------------------------------------|
| A Text style list | L Middle align |
| B Font list | M Bottom align |
| C Font size list | N Bullets |
| D Bold | O Decrease indent |
| E Italic | P Increase indent |
| F Underline | Q Decrease paragraph spacing |
| G Left align | R Increase paragraph spacing |
| H Center align | S Increase font size |
| I Right align | T Decrease font size |
| J Justify | U Text color |
| K Top align | V Rotate text 90° |

To format text using the Text dialog box:

1. Double-click the shape to open the text block.
To format part of the text block, select the text you want to format.
2. Choose Format > Text, then click the Font tab.
3. Choose the formatting options you want.
4. Click Apply to apply the attributes and continue working in the dialog box, or click OK to apply the attributes and close the dialog box.



For options that aren't on the Text toolbar, such as text position and case, and for finer control over text, choose Format > Text to open the Text dialog box.

A Choose Normal, All Caps, or Initial Caps.


B Choose Normal, Superscript, or Subscript.

To quickly format individual paragraphs, words, or characters:

- Choose the text tool (**A**) from the Standard toolbar, select the text you want to format, then choose formatting options from the Text toolbar or Format menu.

To format all the text in a shape's text block:

1. Select the shape with any tool that can select shapes. Or choose the text tool from the Standard toolbar, then click to place an insertion point in the shape.
2. Choose the formatting options you want from the Text toolbar or Format menu.

TIP To quickly copy just the text formatting from one shape to another, click the text tool (**A**), then click in the shape that has the format you want to copy. Click the format painter button () on the Standard toolbar, then click the new shape you want to format.

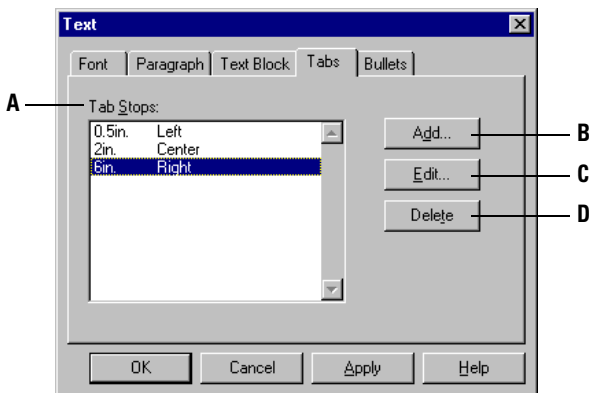
Setting tabs to align text

29.95	29.95	29.95	29.95
4.630	4.630	4.630	4.630
134.29	134.29	134.29	134.29
.250	.250	.250	.250

A **B** **C** **D**

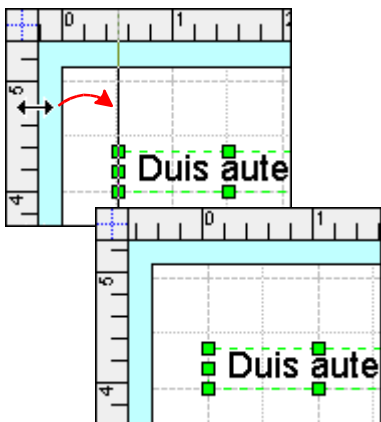
Tab options in Visio Enterprise include Left alignment (A), Center alignment (B), Right alignment (C), and Decimal alignment (D).

You can use tabs to align text in table form or to create bulleted or numbered lists. Tabs can be left-, center-, or right-aligned. You can also use decimal tabs to align columns of numbers. A text block can have up to 10 tab stops. Tabs can be applied only to an entire paragraph, not to selections within a paragraph.



You can set tab positions and alignment for selected text by choosing Format > Text, then clicking the Tabs tab.


- A** Lists the existing tab stops for the selected text.
- B** Click to open the Tab Properties dialog box, and type the position and alignment for a new tab.
- C** Click to open the Tab Properties dialog box, and set the position and alignment of the tab selected in the list.
- D** Click to delete the tab stop selected in the list.



To return the ruler's zero point to its original position after setting tabs, double-click the ruler intersection.

Tab positions are based on the width of the text block, not the width of the shape or the shape's distance from the edges of the page. If you are working at a scale of 1:1, you can make setting tabs easier if you move the horizontal ruler's zero point to the edge of the text block before you choose tab positions.

If you're working at a scale other than 1:1, such as 1/4"=1', the rulers measure in drawing units (in this case, feet), while the tabs are measured in page units (in this case, inches). This difference can be confusing when you're trying to use the ruler to determine tab positions. You can use the rulers; it just requires a little math. For example, if your scale is 1/4"=1', every foot on the ruler is 1/4", so if you want to set a tab where the ruler reads 3', multiply 3 by 1/4 and set your tab at .75".

To set a tab that applies to the entire text block, click an insertion point anywhere within the text (without selecting the text) or select the whole text block with the pointer or text block tool ()


Lorem	1	31	22
Ipsum	33.3	2.8	4
Dolor	16	24	06

Select specific paragraphs to set tabs for part of a text block.

Lorem	1	31	22
Ipsum	33.2	2.8	4
Dolor	16	24	06

Select a text block or place an insertion point in the text to set tabs for the whole text block at once.

To move the ruler's zero point to the left edge of a text block:

1. Select the shape with the text tool () so you can see the edge of the text block.
2. Hold down the Ctrl key and point to the vertical ruler to the left of the drawing window, then drag a vertical line to the left edge of the text block.

When you release the mouse button, the line disappears and the horizontal ruler's zero point appears at the left edge of the text block.


To set tabs for table text:

1. With the text tool, select an existing text block or shape.
2. Choose Format > Text to open the Text dialog box, then click the Paragraph tab.
3. Set Horizontal Alignment to Left and Indentations to zero, then click OK.
4. Move the vertical ruler's zero point to the left edge of the text block. To do this, hold down the Ctrl key and drag from the vertical ruler.
5. Choose Format > Text to open the Text dialog box again, click the Tabs tab, then drag the Text dialog box so that you can see the text block.
6. Click Add in the Text dialog box to open the Tab Properties dialog box, enter the position and set the alignment for the first tab in your table, then click OK.

Because you moved the zero point, you can set tab stops as the distance from zero.

7. Repeat step 6 for each tab in your table, then click OK in the Text dialog box.

Creating numbered and bulleted lists

The quickest way to create bulleted lists is to select a shape with text, then click the Bullets button () on the Text toolbar. For a greater variety of bullets, choose Format > Text, and use the Bullets tab. To create numbered lists, or to format lists with greater control, you can set tabs and hanging indents, then type numbers or bullets before each paragraph.

- Lorem ipsum dolor sit amet, consectetur adipiscing elit.
- Sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat.
- Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper.

Click the Bullets button to quickly format each paragraph as a bullet item. The bullets Visio Enterprise uses do not change shape when you apply a different font to the list text. To choose different bullets, select the shape, choose Format > Text, then click the Bullets tab.

To create a numbered list using tabs and indents:

1. Use the text tool to select an existing text block or shape.
2. Choose Format > Text to open the Text dialog box, then click the Paragraph tab.
3. Set Horizontal Alignment to Left, then for Left enter a value that leaves enough room for a bullet and a blank space, such as 1 pica.
4. For First enter a negative value, such as -1 pica.
5. Click the Tabs tab, then click Add. For Position, enter the same value you used in step 3, then click OK.
6. To create a list item, type the number in the style you want, press Tab, then type.

To create custom bullets or bullets that are a different size from the list text, you must create them manually using tabs and indents.

To create a bulleted list that uses custom bullets:

1. Follow the procedure above for creating a list using tabs and indents.
2. In the last step, instead of typing a number, press Ctrl+Shift+8 to create a bullet, which you can then format using any font.

Rotating, resizing, and moving text blocks

When you rotate, resize, or move a shape, its text block rotates, resizes, or moves with it. You can also rotate, resize, and move a text block separately from its shape using the text block tool on the Standard toolbar. This tool moves or rotates only the text block, whereas the rotate tool and pointer move or rotate the whole shape.

In addition, Visio Enterprise masters often include a control handle that you can use to reposition the text block, but if you draw your own shape or want to change the text block size, you can move or resize a text block manually.

To rotate text independently of its shape:


1. Select the text block tool (.


The text block cursor looks like a page (.

2. Click the shape to select its text block.

Green selection handles appear around the shape, indicating that it is selected. If the handles are gray, the shape is grouped. Choose Edit > Open Group to view the shape in the group window.


3. Drag a corner handle to rotate the text block.

When it is over a rotation handle, the pointer changes to a pair of arrows forming a circle (). If the text block is so small that you don't see rotation handles, drag the selection handle at the center of the shape to resize the text block until you see the rotation handles.

TIP To rotate text in 90° increments, use the rotate text 90° tool () instead of the text block tool.

To resize a text block independently of its shape:

1. Select the text block tool (.

The text block cursor looks like a page (.


2. Click the shape to select its text block.

Green selection handles appear around the shape, indicating that it is selected. If the handles are gray, the shape is grouped. Choose Edit > Open Group to view the shape in the group window.

3. Drag a side selection handle until the text block is the width or height you want.

To move a text block independently of its shape:

1. Select the text block tool ()

The text block cursor looks like a page (+)

2. Click the shape to select its text block.

Green selection handles appear around the shape, indicating that it is selected. If the handles are gray, the shape is grouped. Choose Edit > Open Group to view the shape in the group window.

3. Point to the dotted green line, which indicates that the text block is selected.

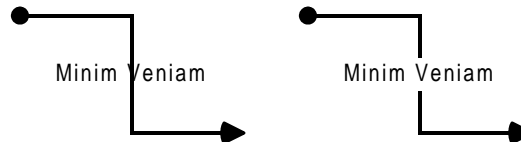
When it is over the dotted line, the pointer changes to a double rectangle.

4. Drag the text block to a new position.

The text block remains part of the shape, so you can move the text block completely outside the shape's borders and it will still move, rotate, and resize with the shape, keeping its new position relative to the shape.

Changing the background color of text blocks

In most Visio Enterprise shapes, the area around the text, or **text background**, is transparent. You can apply color to text backgrounds to make them opaque, so elements of the shape don't show through and make the text unreadable. For example, you can add a text block background to "break" a connector line when it crosses through the text.



Changing the text background to solid white makes the connector line "break" before and after the text block, ensuring the text is readable.

NOTE Because the background color fills in the area around the text, the color appears only when the shape contains text.

To change the color of a text background:

1. Select the shape.
2. Choose Format > Text, then click the Text Block tab.
3. For Text Background, select Solid Color, then choose a color from the list.
The color fills the area around the text, not the whole text block.
4. Click OK.

Adding text to layers

You can create a layer in a drawing specifically for adding text, such as review comments or annotations. For example, if you distribute your drawing for review by others in your group, you can create a layer for review comments, so later you can more easily incorporate the comments. Placing the comments on a layer by themselves makes them easy to view, print, and color separately from the rest of the drawing.

To add and set up a separate layer for review comments:

1. In the drawing you want to add comments to, choose View > Layer Properties.
2. Click New, type a name for the layer, then click OK.

For example, type *Redlining* or *Comments* to create a layer with that name.

3. Select your new layer, then click the Active button.

A check mark appears next to your layer in the Active column.

4. *Optional* With the new layer still selected, click the Color button, then choose a color from the Layer Color list.
5. Click OK to close the dialog box.

TIP If more than one person is reviewing a drawing, create a redlining layer for each reviewer and give each layer a different display color.

A List of layers in the drawing, including a layer for comments called Redlining. Click a layer to select it.

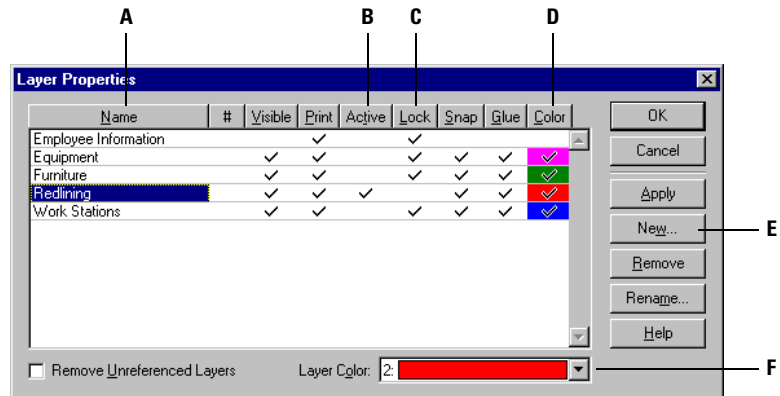
B Click to make the selected layer active. If you make only the layer for comments active, all changes to the drawing will be added to that layer.

C Click to lock the selected layer against changes before sending the file out for review.

D Click to color all shapes and text added to the selected layer.

E Click to add a new layer to the drawing. You can name the layer—for example, Redlining.

F Choose the color for the selected layer from this list.



Use the Layer Properties dialog box to set up one or more redlining layers for your reviewers to annotate a file.

Creating text fields

You can automate the display of some types of text by creating a **field**. A field is a placeholder in text that displays information such as a date, time, or measurement. Information in fields changes automatically when you update a drawing. For example, you can use fields to add a drawing legend that automatically shows the drawing's date of creation and file name.

A text block can contain as many fields as you want. When you insert a field in text, Visio Enterprise inserts the field at the insertion point. You can add phrases before or after fields. For example, before the Current Date field, you might type the phrase *Today's date is* followed by a space.

Use fields from existing categories or create your own formulas for fields. You can format or delete fields just as you format or delete other text.

To insert a field into text:

1. Double-click the shape to open the text block (or click the text with the text tool), then click where you want to insert the field.

If you want the field to replace the text in the shape, select the shape. You don't need to open the text block and place the insertion point.

2. Choose Insert > Field to open the Field dialog box.

3. In the Category section, choose a field category.

For details about each category, click Help in the Field dialog box.

4. In the Field section, choose a field.

5. In the Format section, choose a format for the field information.

6. Click OK.

NOTE When you cut or copy a field and then paste it, the pasted text is no longer a field. The field text becomes static.

Printing and distributing drawings

In offices today, distributing your drawings can mean printing them for others to review, exporting them to other formats for inclusion in larger documents, or sending them via electronic mail. Visio® Enterprise provides options for printing large-scale and multiple-page drawings and supports a variety of export formats that make distributing drawings easy and convenient.

This chapter explains how to distribute your Visio Enterprise drawings—either by printing them, exporting them, or sending them in e-mail.

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Printing drawings

For the most part, you can print your Visio Enterprise drawings by choosing File > Print, then clicking OK. Most Visio Enterprise templates are set up so that the drawing page and printed page sizes are the same, so you don't have to change page settings to get the printed drawing you expect.

To print a drawing:

1. Choose File > Print.
2. For Page Range, choose an option for which pages to print:
 - Choose All or Current Page, or specify a range of pages in the Pages From and To boxes.
 - If a foreground page is displayed, choosing Current Page prints the foreground page, its background, and subsequent background layers. If a background is displayed, Current Page prints that background page and subsequent background pages.
3. For Copies, enter the number of copies you want.
4. For Printer, specify to print to a file or to print all colors as black.
5. Click OK.

Sometimes, however, you may want to change the size, orientation, or scale of the drawing page as you create your drawing. If so, you'll need to keep the following terms in mind as you set up your drawing for printing:

- The **drawing page**—the white page you see on the screen
- The **printed page**—the paper in the printer on which you print your Visio drawing
- The **printed drawing**—your end result: the image on your drawing page printed onto one or more printed pages

If you change drawing page settings, to make sure the drawing prints correctly, you may need to change the printed page settings as well.

For example, if you base a new drawing on a flowchart template with a portrait (tall) drawing page orientation, but you create a left-to-right flowchart, you may want to change the drawing page orientation to landscape (wide). To print the drawing the way it appears on the screen, you also need to change the printed page orientation.

Previewing drawings before you print

Before you print a drawing, you can preview it to see whether the shapes on the drawing page fit as you intend on the printed page. In the print preview window, gray lines indicate where the drawing continues onto multiple pages, or **tiles**.

If the print preview window shows that the drawing will tile, or print across several sheets of paper, you may want to reposition some shapes so they print on the correct page. To see how repositioning shapes on the drawing affects the printed page, you can display the drawing window alongside the print preview window.

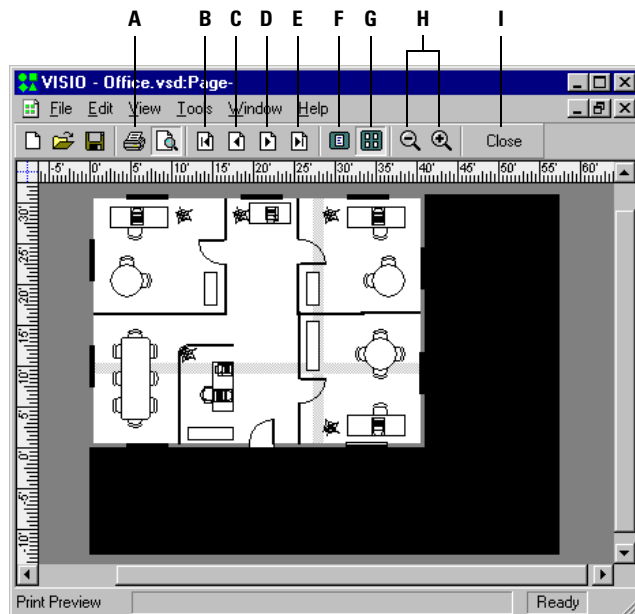
If, after you see the print preview, you want to make changes to the drawing page or printer settings, such as orientation, size, margins, and so on, choose Page Setup from the File menu.

To preview a drawing before printing:

- From the Standard toolbar, choose the print preview button (🖨️).

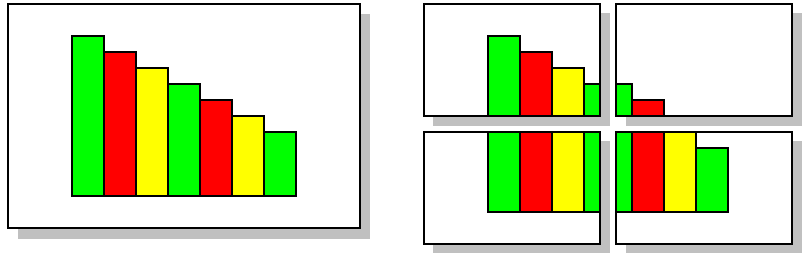
TIP While working with your drawing you can quickly determine whether it fits within the printable area by choosing View > Page Breaks.

- A** Click to print the drawing. The number of pages it prints on corresponds to the number of tiles, or printed pages, in the print preview window.
- B** Click to move to the first tile.
- C** Click to move to the previous tile.
- D** Click to move to the next tile.
- E** Click to move to the last tile.
- F** Click to see one tile, or printed page, at a time.
- G** Click to see how the drawing page will tile.
- H** Click to zoom in or out.
- I** Click to close the print preview window.



Printing large drawings

If the size of a drawing is larger than the paper in your printer, Visio Enterprise tiles the drawing—that is, the drawing prints across several sheets of paper. You can control the way large drawings tile. For example, you can control the amount the drawing overlaps on adjacent pages. You can also specify the number of pages across which a drawing tiles. Visio Enterprise reduces or enlarges the drawing to fit the number of pages you specify. Visio Enterprise does not crop a drawing to fit within the margins.



A drawing on a large drawing page will print by tiling across several sheets of printer paper.

To avoid printing a large drawing across several tiled pages, you can

- Change the drawing orientation to see if everything will fit. For details, see “Changing the page orientation” later in this chapter.
- Choose to reduce the drawing by a percentage in the Print dialog box when you print, so that it fits on the current page size. For details, search online help for “reducing and enlarging drawings for printing.”
- Set a drawing scale that represents larger real-world dimensions in a smaller scaled space. For details, see “Setting drawing scales” in Chapter 7, “Measuring and dimensioning.”
- Set a larger printed page size by choosing File > Page Setup, then clicking the Page Size tab.

To determine whether a large drawing will tile:

- Choose View > Page Breaks.

Gray lines appear on the drawing page, indicating the printed page size and margins selected in the Print Setup dialog box.

To increase the area where tiled drawings overlap:

1. Choose File > Page Setup, then click the Page Size tab.
2. Under Target Printer Information, click Print Setup.
3. Type larger amounts for the margin settings, then click OK.
The larger the margins, the greater the overlap.
4. Click OK in the Page Setup dialog box.

To specify the number of pages for a tiled drawing:

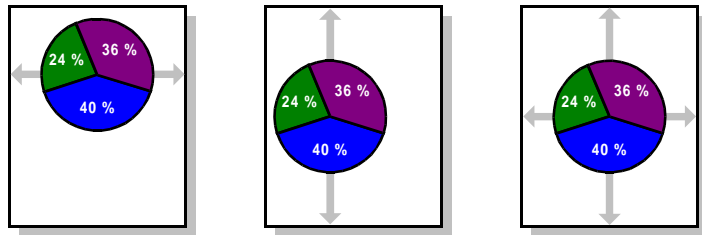
1. Choose File > Page Setup, then on the Page Size tab, click Print Setup.
2. For Reduce/Enlarge, select Fit On, then specify the number of sheets across and down.

TIP Choose the number of pages that represents an area proportionate to the drawing page. For example, if the drawing is square and you specify two sheets down and four sheets across, Visio Enterprise fits the drawing on an area that is no more than two sheets either way so the drawing stays in proportion.

3. Click OK in the Print Setup dialog box, then click OK in the Page Setup dialog box.

Printing small drawings

Small drawings print on part of a page. By changing margin settings, you can print a small drawing at various locations on a sheet of paper. Before you can control the drawing's position, you must adjust the drawing page size to eliminate all the white space around the drawing.



You can control where the image on a small drawing prints on a printed page.

To adjust the drawing page size to fit the drawing contents:

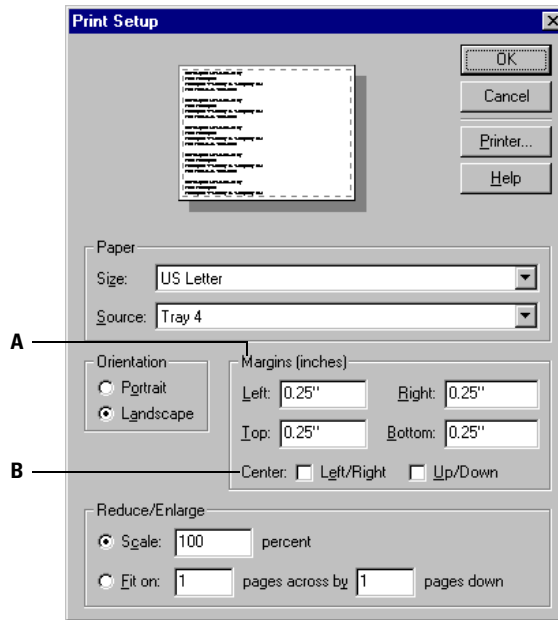
1. Choose File > Page Setup, then click the Page Size tab.
2. For Page Size, select Size Page To Fit Drawing, then click OK.

The page size changes to fit the drawing without any surrounding white space. On the screen it may appear as though you zoomed in on the drawing.

After you size the page to fit the drawing contents, you can specify the drawing's placement on the printed page.

To specify where on the page a small drawing prints:

1. Choose File > Page Setup.
2. On the Page Setup tab, click Print Setup.
3. For Margins, type the margin settings you want.
4. To center the drawing, under Center, check Left/Right, Up/Down, or both.
5. Click OK in the Print Setup dialog box, then click OK in the Page Setup dialog box.



A Type the margin settings you want.

B Check Left/Right to center a drawing between the left and right margins. Check Up/Down to center it between top and bottom margins.

Another way to fine-tune a drawing's placement on the page is to center it on the drawing page before you print.

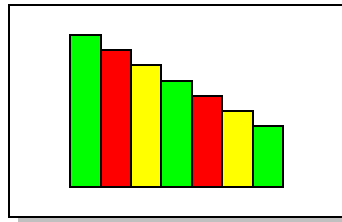
To center a drawing on the drawing page:

- Choose Tools > Center Drawing.

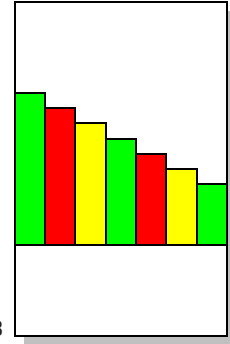
Visio Enterprise centers the drawing. If the drawing page and printer paper are the same size, the drawing will be centered on the printed page as well.

Changing the page orientation

All Visio Enterprise templates include page settings for orientation and scale that affect how you work in a drawing and how it prints. If you change these settings as you work in a drawing, you need to make sure the orientation is the same for both the drawing page and the printed page. For example, if you change a drawing page's orientation to landscape (A) without changing the printed page settings from the default portrait orientation, the drawing prints on a portrait page (B).



A



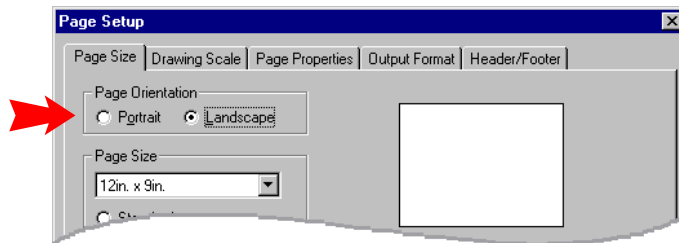
B

Changes you make to drawing page settings aren't automatically reflected in printed page settings.

To set drawing page and printed page orientations:

1. Display the drawing page you want to change, then choose File > Page Setup.
2. On the Page Size tab, select an option under Page Orientation.
3. Under Target Printer Information, verify the setting for Paper Orientation. If it does not match the Page Orientation, click Print Setup.
4. Choose the orientation you want for the printed page, click OK, then click OK in the Page Setup dialog box.

Now the drawing page orientation matches the printed page orientation. Choose File > Print to print the drawing.



You can set the orientation of the drawing page to Portrait (tall) or Landscape (wide) in the Page Setup dialog box.

Printing headers, footers, and page numbers

When you print a multiple-page drawing you may want certain information, such as the name of the drawing file, a border, a title block, or your company logo, to appear on each page. You may also want each page numbered automatically. You can add this type of information in two ways depending on whether you want it to appear only on the printed page or in the drawing as well:

- To add common items that appear in the printed drawing only—for example, page numbers, the drawing file name, and the date and time—insert a **header** or **footer**.
- To add information, such as a border, that automatically appears on the screen and prints on every page of a drawing, insert a background page.

You can add automatic headers, footers, and page numbers on the Header/Footer tab of the Page Setup dialog box. You type formatting codes for common elements, such as page number, time, and date, and specify whether you want the elements to appear in the upper or lower left, center, or right portion of the page.

A formatting code is simply an ampersand (&) followed by a letter. For example, to add a page number, type &p.

Header and footer formatting codes

<i>For</i>	<i>Type</i>
Page number	&p
Current time	&t (long) or &T (short)
Current date	&d (short) or &D (long)
Ampersand	&&
File extension	&e
File name	&f
File name and extension	&f&e
Page name	&n
Total printed pages	&P

To add headers, footers, or page numbers to the printed drawing only:

1. Choose File > Page Setup, then click the Header/Footer tab.
2. For Header And Footer, type the formatting code you want in the box that corresponds to the section of the printed page on which you want the header or footer to appear.
3. For Margins, type a value to specify how far the header or footer prints from the top or bottom of the page.
4. To open the Font dialog box and edit the header or footer text, click Choose Font.
5. Click Apply to apply the header/footer settings and continue working in the dialog box. Click OK to apply the settings and close the dialog box.

To add information that appears on the drawing page and the printed page:

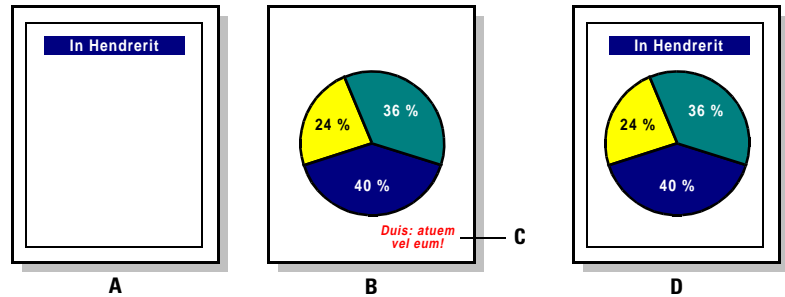
1. Start a new drawing.
2. Choose File > Page Setup, click the Page Properties tab, then make the first page a background.
Note the name of this page—you'll need to use it when assigning the background to a foreground page.
3. On the background, add any shapes you want to repeat on each page of the drawing; for example, a company logo, a border, or a text field that displays up-to-date drawing information.
To add border shapes, choose File > Stencils > Visio Extras > Borders to open the Borders stencil.
4. Choose Insert > Page to add a new page, then on the Page Properties tab, for Type choose Foreground. Under Background, assign the background you just created to this foreground page.
5. Click OK.

NOTE Setting up drawing elements that repeat on each page works best when you're starting a new drawing. If you start by creating the background and assigning it to the first foreground page, it is automatically assigned to each subsequent page you add within the file.

Printing selected shapes or pages

When you don't want to print your entire drawing, you can print only pages you specify, only the currently displayed page, or only a page's background. You can also define shapes or layers as nonprinting so they show up on the screen but not on the printed page.

- A Background shapes
- B Foreground shapes
- C Shape assigned to a nonprinting layer
- D Printed page



The printed page includes all background and foreground shapes except the nonprinting shape.

To print only the pages you specify:

1. Open the drawing you want to print, then choose File > Print.
2. Under Page Range, click Pages, then type the page number range in the From and To boxes.

To print only the page that's displayed on the screen, click Current Page.

To print a background separately:

1. Display the background you want to print.
2. Choose File > Print.
3. Under Page Range, click Current Page, then click OK.

TIP To print a page without its background, display the page and cancel its background assignment before printing. To cancel a background, choose File > Page Setup, then click the Page Properties tab. Under Background, select None, then click OK. After printing, you can reassign the background by selecting it from the list of backgrounds on the Page Properties tab.

To set a shape as nonprinting:

1. Select the shape, then choose Format > Behavior.
2. Check Non-Printing Shape, then click OK.

TIP To set all shapes on a layer to nonprinting, you can choose View > Layer Properties to set the layer to nonprinting.

Previewing drawings in full-screen view

If you want to preview or present Visio Enterprise drawings, you can use full-screen view to maximize the amount of space for your drawing. In full-screen view, the Visio Enterprise toolbars, title bars, status bar, menus, scrollbars, and stencils are hidden, and the drawing page takes up the entire screen. The drawing page grid is also turned off. Full-screen view is a view-only mode—you cannot edit or change the pages you view.

To enter full-screen view:

- Choose View > Full Screen.

To exit full-screen view:

- Press the Esc key.

To navigate between pages in full-screen view:

- Press the left arrow, Page Up, or P keys on your keyboard to display the previous page.
- Press the right arrow, Page Down, or N keys to display the next page.
- Click the left-mouse button (when it's not over a hyperlink) to display the next page.
- Right-click anywhere in the window and choose Previous Page, Next Page, or Go To > <page name>.

To navigate hyperlinks in full-screen view:

- Click a hyperlinked shape once to jump to the link.

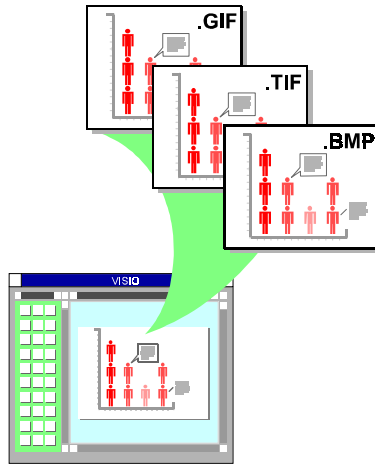
Exporting shapes and drawings

When you export Visio data, it is directed through a filter that converts the Visio data to an independent non-Visio file. You then open that file or import it as a picture in the other program. Exporting works best when you want to include Visio data in a document that is not compatible with OLE, or if you want to include a Visio drawing in an HTML document you want to post on the Web.

After you export a Visio drawing to another format and insert it in another document, it's considered a **static picture**. That means you will not be able to open Visio Enterprise to edit it from within the other program. In addition, because your Visio file can go through up to two translations before it appears in the other program—one when you export from Visio Enterprise, and one if you import into the other program—the graphic image may not look exactly the way it does in the Visio drawing.

For example:

- By exporting a Visio drawing in .jpg format, you can incorporate the drawing as a graphic on a Web page.
- By exporting a Visio shape as a Windows bitmap, you can open the bitmap in any program that supports the .bmp format.
- By exporting a Visio drawing in a format another program can open, you can include Visio data as a graphic image in the other program's documents.



Exporting translates a file to a non-Visio format that the other program can import.

TIP If the other program in which you want to include Visio data supports OLE, it's best to link or embed the Visio data rather than export it. OLE produces more consistent results and allows you to edit the data after you include it in the other program.

To export shapes or drawings to another file format:

1. To export all the shapes on a page, display the page you want to export.
To export specific shapes, select the shapes you want to export. (Use Shift+click to select more than one shape.)
2. Choose File > Save As, then do the following:
Save As Type Choose the format you want.
File Name Type a name for the file.
3. Click Save.

Some formats, such as Bitmap, display a Filter Setup dialog box, where you can choose filter-specific export settings, then click OK.

Visio Enterprise exports the shapes or page in the specified format. You can use the file in any program that can read files in that format.

Sending drawings through electronic mail

You can send a Visio Enterprise drawing to another user via e-mail. Visio products are compatible with e-mail programs that support the Messaging Application Program Interface (MAPI) protocol.

You can also take advantage of such routing features as sending drawings to Microsoft Exchange folders, adding routing slips to drawings you send through e-mail, and adding journal entries to Microsoft Outlook.

To include a drawing file in an e-mail message:

1. While the drawing file is open, choose File > Send To > Mail Recipient.
If your mail program hasn't been running, it starts; then a new e-mail message containing the Visio icon and the file name appears.
2. Address the message, type any accompanying data, then send the e-mail message as you would any other message.

To view a Visio file sent by e-mail:

- Open the e-mail message, then double-click the Visio icon.

NOTE Visio Enterprise or another Visio product must be installed to open Visio drawings you receive in e-mail.

Routing documents

You can send a drawing with a routing slip or send a drawing directly to a folder in Microsoft Exchange.

- A** Click Address to add recipients to the To list.
- B** Type your message here.
- C** Select whether to route the drawing to one person at a time or to everyone at once.
- D** Click Add Slip to add the routing slip to the drawing. After you add the slip you can route the drawing.



To send a drawing with a routing slip:

1. Display the drawing you want to send, then choose File > Send To > Routing Recipient.
2. Click Address to open your post office address list and select the individuals or groups to whom you want to route the drawing. When you've finished adding to the recipient list, click OK.
3. If you need to route the drawing to people in a specific order, select a person's name, then click the up or down arrow in the Move section to change that person's position on the list.
4. Under Route To Recipients, select whether to route the drawing to one person at a time or to everyone at once.

If you choose to route the drawing to one person at a time, the first person on the list views or updates the drawing, then routes the drawing to the next person, and so on.

If you route a drawing to a group alias, everyone in the group will receive the drawing at the same time. To send the drawing to one group member at a time, list each name rather than the group alias.

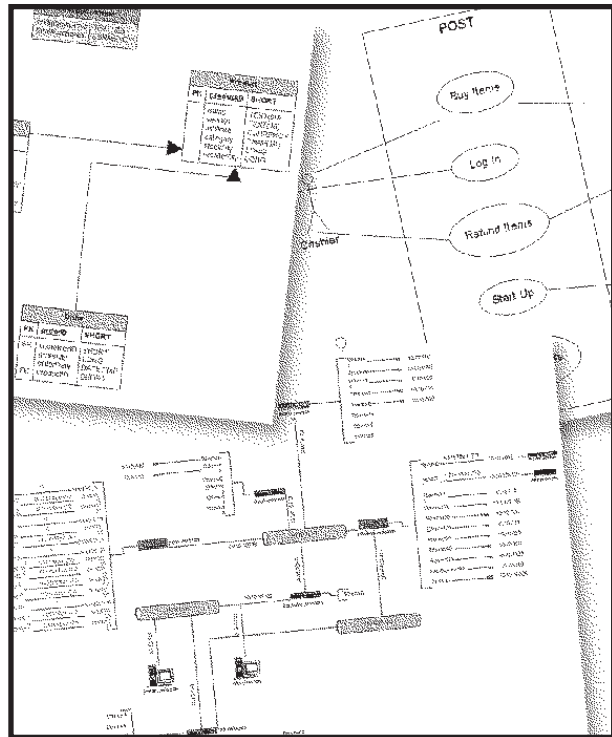
5. Check Track Status or Return When Done to receive an update as each person on the list passes the drawing to the next person or to have the drawing sent back to you after everyone has seen it.
6. Under Message Text, type the text you want in the e-mail message. When you're finished, click Add Slip.
7. Choose File > Send To > Next Routing Recipient to send the drawing to the first person on the routing list.

TIP If you receive a routed drawing and want to route it to the next person, choose File > Next Routing Recipient. If you want to route the drawing to someone who isn't on the list, choose File > Other Routing Recipient, then follow steps 2–7 above.

To send a drawing directly to a Microsoft Exchange folder:

1. Display the drawing you want to send, then choose File > Send To > Exchange Folder.
2. Select the folder in which you want to place the drawing, then click OK.

Visio Enterprise saves the drawing in the Microsoft Exchange folder as an embedded object, so you can open the drawing in Visio Enterprise from within Microsoft Exchange.



Going beyond: Customizing shapes and solutions

Creating and revising shapes

You can create your own shapes in several ways. You can

- Draw a shape from scratch using the Visio® Enterprise drawing tools. For example, if you want to add a freeform arrow to a block diagram, you can draw the arrow with the freeform tool.
- Merge a shape with other shapes to create a new, unique shape. For example, if you want to create a round sign with an arrow cut out of its center, you can place an arrow shape on top of a circle, then use the Combine command to create the shape you want.
- Revise an existing Visio shape. For example, if your company uses a special process shape in its flowcharts, you can modify the existing Visio Process shape, save it on the Flowchart stencil, and use it in all the flowcharts you draw.

You can revise an individual shape for use in a specific drawing, or you can revise all instances of a shape in a drawing at the same time. You can also convert a new shape you create into a master and place the master on a stencil so you can reuse the shape in many drawings.

Topics in this chapter

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Drawing shapes

To draw a shape, use one or more of the drawing tools on the Standard toolbar. If you want, choose View > Toolbars > Toolbars to hide other toolbars and display only the Standard toolbar while you're drawing.

TIP When drawing shapes, it's often helpful to use guides and grid lines to help you position the shapes.

Drawing lines or arcs



If you move the pencil tool in a straight line, it draws a line. If you move it in a curve, it draws an arc. Each arc is a portion of a circle; its size is determined by the distance you move the mouse.



The line tool is best for drawing shapes composed only of straight lines. To constrain a line to any 45-degree angle, hold down the Shift key as you drag.



The arc tool draws arcs that are always one-quarter of an ellipse. The direction you drag the mouse determines which way the arc bows.

To draw a line or an arc:

1. Choose the pencil tool from the Standard toolbar.
Or choose the line tool or the arc tool.
2. Point to where you want to start the line or arc.
3. Drag to draw the line or arc, then release the mouse button.

Drawing freeform shapes



The freeform tool works like a pencil on paper. Select it and drag to draw splines and freeform curves. For smoother curves, turn off snapping first: Choose Tools > Snap & Glue, then under Currently Active, uncheck Snap.

To draw a freeform shape:

1. Choose the freeform tool from the Standard toolbar.
2. Hold down the left mouse button as you drag in various directions to draw a freeform shape, then release the mouse button.

Drawing rectangles and squares



The rectangle tool draws rectangles and squares.

To draw a rectangle or square:

1. Choose the rectangle tool from the Standard toolbar.
2. Point to where you want a corner of the shape.
3. Drag until the shape is the size you want, then release the mouse button.
To draw a square, hold down the Shift key as you drag.

Drawing ellipses and circles



The ellipse tool draws ellipses and circles.

To draw an ellipse or circle:





1. Choose the ellipse tool from the Standard toolbar.
2. Point to where you want to start drawing the shape.
3. Drag until the shape is the size you want, then release the mouse button.

To draw a circle, hold down the Shift key as you drag.

Drawing shapes with multiple segments

Shapes with multiple segments are two-dimensional (2-D) shapes. To draw a 2-D shape, start each new segment at one of the endpoints or at a vertex of another segment. After you complete a shape, you can add, adjust, or delete segments.

To draw a shape with multiple segments:

1. Choose the pencil tool () from the Standard toolbar.
Or choose the line tool (), arc tool (), or freeform tool ().
2. To draw the first segment, point to where you want to start the shape. Hold down the mouse button and drag until the segment is the size you want, then release the mouse button. This first segment is a 1-D shape with endpoints.
3. To draw the second segment, point to the endpoint of the first segment (the pointer looks like a plus sign) and drag, then release the mouse button.

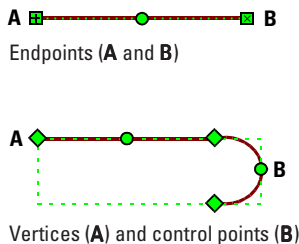
When you are creating the second and subsequent segments, be careful not to click the endpoint of the first segment, which selects it. A selected endpoint turns magenta. Dragging the selected endpoint resizes the existing segment instead of starting a new one. (If you resize a segment, rather than draw a new one, choose Edit > Undo.)

After you draw the second segment, the shape displays vertices instead of endpoints, to indicate that it's a 2-D shape.

4. To draw additional segments, point to the vertex at the end of the last segment you added, then drag to draw the next segment.
5. If you want to close the shape, drag the endpoint of the last segment you create over the vertex at the beginning of the first segment, then release the mouse button.

To undo a segment while drawing:

- Before you release the mouse button at the end of a segment, drag back to the vertex at the beginning of the segment. Make sure you position the cursor directly over the vertex; otherwise, you could create a new segment.



To undo several segments while drawing:

- After you've drawn one or more segments, but before you do anything else, choose Edit > Undo. Keep choosing Undo until you've deleted all of the segments you no longer want. Segments are deleted in the reverse order in which they were drawn. By default, you can undo up to 10 actions.

You can also undo an action, such as drawing a segment, by clicking the Undo button on the Standard toolbar, or pressing Ctrl+Z or Alt+Backspace.

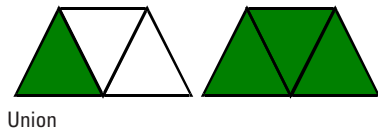
Merging shapes to create new ones

The easiest way to create a complex shape is to draw its simple parts, then use the Boolean operation commands (described in the following sections) to merge the parts into one complex whole. The result of a merge operation depends partly on the shape you select first (the **primary shape**). The primary shape's formatting is used in the resulting shape, and, in some cases, it even determines the shape of the new shape (with the Subtract command, for example). You can also use Boolean operation commands to convert polygonal lines and polygons to lines, arcs, and freeform curves (or **splines**).

Merging operations create new shapes. The old shapes, including any smart behavior defined in the ShapeSheet® window, are discarded.

Union

Union creates a new shape from the perimeter of two or more overlapping shapes. The new shape is a set of all the points that were either in one original or another. If the shapes do not overlap, the Union command creates one shape, but the shapes appear unchanged. If a shape is open, Visio Enterprise discards the open shape when you choose Union. Union is the equivalent of the Boolean operator OR.



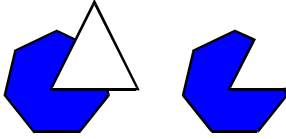
NOTE Do not use the Union command when you simply want to group shapes together. Group and Union are two separate operations in Visio Enterprise and do not produce the same results. Union is also different from Combine, which deletes areas where the combined shapes overlap.

To unite shapes:

1. Arrange the shapes that you want to unite on the drawing page.
2. Select the primary shape, then the other shape.

The new shape will inherit the text and formatting of the primary shape.

3. Choose Shape > Operations > Union.



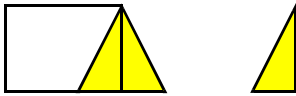
Subtract

Subtract

Subtract creates a new shape by “subtracting” from the primary selection the areas where subsequent selections overlap. For example, if you overlap a polygon and a triangle and select the polygon, then the triangle, Subtract removes the overlapping segment of the triangle from the polygon.

To subtract shapes:

1. Arrange the shapes you want to subtract on the drawing page.
2. Select the primary shape, then the other shape.
The new shape will be subtracted from the primary shape.
3. Choose Shape > Operations > Subtract.



Intersect

Intersect

Intersect forms a new closed shape from the area where selected shapes overlap, eliminating nonoverlapping areas. Because Visio Enterprise doesn’t define specific points on a line, nothing is left if you intersect two overlapping lines.

To intersect shapes:

1. Arrange the shapes you want to intersect on the drawing page.
2. Select the primary shape, then the other shape.
The new shape will inherit the text and formatting of the primary shape.
3. Choose Shape > Operations > Intersect.



Fit Curve

Fit Curve

Use the Fit Curve command to create a spline from a polygonal line. The spline goes exactly through the polygonal line’s vertices. If the polygonal line is a closed polygon, the result is a periodic (seamless) spline.

To create a spline from a polygonal line:

1. Select the polygonal line.
2. Choose Shape > Operations > Fit Curve.

Custom Fit

Use the Custom Fit command to reduce the number of segments in clip art or other shapes you import. Custom Fit makes an imported shape easier to edit and may reduce its size.

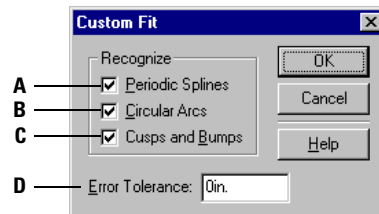
When a shape is imported, the exchange process converts it into a relatively unintelligent format. For example, an imported clip art shape is a dense series of points that is almost impossible to edit. Using the Custom Fit command, you can convert polygonal lines into splines. By dragging the control points on a spline, you can edit the converted clip art shape.

When you use the Custom Fit command, you can specify the error tolerance. The more loosely you set the tolerance (that is, the greater the acceptable error), the more likely you are to reduce the size of the converted shape.

Some shapes on which you use the Custom Fit command occupy less disk space because Custom Fit replaces the many LineTo rows in the shape's ShapeSheet spreadsheet with fewer SplineKnot rows. When enough LineTo rows are replaced, the shape requires less disk space.

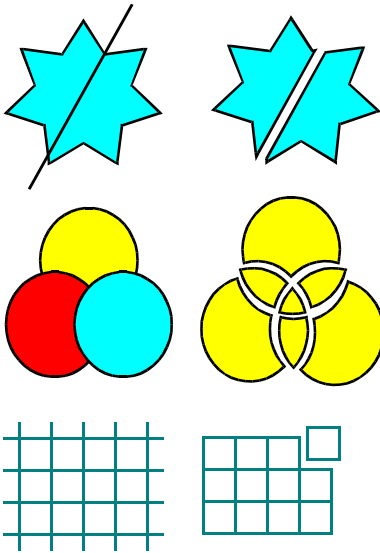
To convert an imported object into an editable format:

1. Select the shape. If the shape is a group, choose Shape > Grouping > Ungroup to ungroup it.
2. Choose Shape > Operations > Custom Fit.
3. Choose the options you want, then click OK.



- A** Check to create a periodic (seamless) spline if the original shape is closed and smooth. If Cusps And Bumps is unchecked, the original shape need not be smooth.
- B** Check to replace polygonal line vertices with either line segments or circular arcs. For this option to work, the polygonal line vertices must be close to a line segment or circular arc within the specified tolerance.
- C** Check to preserve sharp angles and other features in the original shape.
- D** Type a tolerance value. The looser the tolerance (that is, the higher the amount of error tolerated), the simpler (less data, smaller disk size) the arc or spline. Zero tolerance results in no reduction in data. The typical error tolerance for converting clip art should be about 0.1 mm (.004 inches).

If you check Periodic Splines, uncheck Circular Arcs and Cusps And Bumps, and type an Error Tolerance of zero, you convert a polygonal line to a spline that goes exactly through the polygonal line's vertices. If the polygonal line is closed (that is, if it's a polygon), the result is a periodic spline. These particular Custom Fit settings are equivalent to choosing the Fit Curve command.



Fragment

Fragment

The Fragment command can break a shape into smaller parts. You can also use it to create new shapes from intersecting lines or from 2-D shapes that overlap. The Fragment command provides an ideal way to create Venn diagrams and marketing pyramids. Fragment can

- Divide selected shapes into smaller shapes.
- Create a new closed shape where two or more closed shapes overlap.
- Create new shapes from the enclosed spaces of three or more intersecting lines.

To break a 2-D shape into smaller parts:

1. Draw lines through the shape where you want to break it.
2. Select the shape and the lines.
3. Choose Shape > Operations > Fragment.

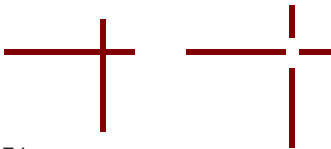
To create new shapes where 2-D shapes overlap or where lines intersect:

1. Select the topmost overlapping shape or intersecting lines.
2. Choose Shape > Operations > Fragment.

TIP After you fragment shapes, delete the pieces you don't need.

Trim

You can create new shapes from existing intersecting shapes by trimming them. Trim resembles the trim operation in Autodesk AutoCAD, although in Visio Enterprise you can trim more than two objects at a time. Trim splits selected objects at their intersections, including where a shape intersects itself. It creates a new shape for each piece, preserving the styles. If closed shapes are split open, they lose their fill.



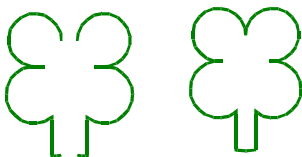
Trim

To trim shapes:

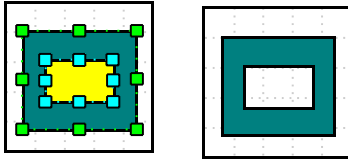
1. Select the shapes you want to trim.
2. Choose Shape > Operations > Trim.

Join

Join assembles individual 1-D segments into one or more continuous paths. The number of paths depends upon the configuration of the selected shapes. For example, if the segments lie along a straight line, the new shape will have one path. If the segments lie in the form of a 2-D shape such as a rectangle, the new shape will become a closed 2-D shape that you can fill.



Join



In this example, selecting the large rectangle first makes it the primary shape, so that when the two rectangles are combined, the small rectangle will be discarded, leaving a hole in the large rectangle.

To join shapes:

1. Select the segments you want to join.
2. Choose Shape > Operations > Join.

Combine

Combine creates a new shape from selected shapes. If the selected shapes overlap, Visio Enterprise cuts out, or discards, the area where they overlap. This creates holes in the new shape that make the drawing page grid visible through the shape. Combine converts multiple shapes into one shape with multiple paths, represented by the same number of geometry sections in the ShapeSheet window (rather than multiple ShapeSheet representations).

You can also combine 1-D shapes and combine 1-D and 2-D shapes. In these cases, Visio Enterprise creates one shape from the selected shapes, but the new shape might not look different from the old ones. The difference is that the new shape has one ShapeSheet representation with multiple sections so that when you apply a style, such as a fill, the style formats the entire shape. This is different from using the Group command, with which each shape in the group retains its own ShapeSheet representation, in addition to the group's ShapeSheet representation.

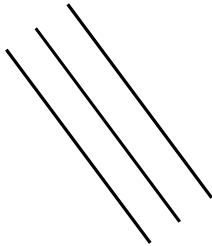
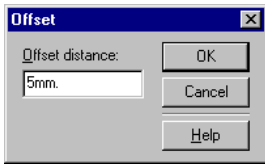
NOTE Take care not to use the Combine operation when you simply want to group shapes together. Group and Combine are two separate operations in Visio Enterprise and do not produce the same results. Combine is also different from Union, which creates a new shape from the perimeter of two or more overlapping shapes, without deleting any areas of the shapes.

For example, to create a picture frame shape (a rectangle with a hole in the middle through which you can see what's beneath), place a small rectangle in the middle of a larger one. Select the large rectangle first, then the small one, and then choose Shape > Operations > Combine to combine them.

To combine shapes:

1. Arrange the shapes you want to combine on the drawing page.
2. Select the shapes.
(Remember that the new shape will inherit the shape and formatting of the first shape you select.)
3. Choose Shape > Operations > Combine.

Offsetting shapes to create parallel lines and curves



The Offset command positions the offset shapes on either side of the original shape, at a distance that you specify.

The Offset command creates a set of parallel lines and curves to the right and left of the original shape. For example, you can create a representation of a two-way road by offsetting a line.

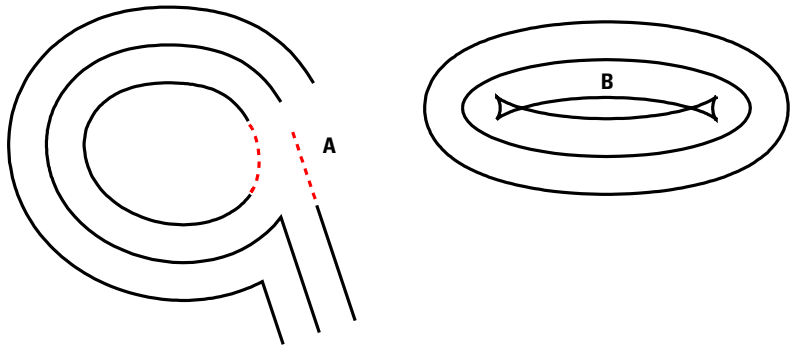
You can set the distance you want between the original shape and the offset shapes.

The Offset command reproduces the points of a line at a fixed distance from the line and then attempts to connect those lines, based on where they intersect. If the offset lines don't intersect, Visio Enterprise extends them until they do.



When creating an offset shape such as the one left of this angle (**A**), Visio Enterprise extends the duplicate lines to make them meet.

When creating an offset shape such as the one right of this angle (**B**), Visio Enterprise deletes a portion of the duplicated lines to prevent them from crossing.



In this example (**A**), extending the arc and the line doesn't result in an intersection, so Visio Enterprise creates offset duplicates of each shape and leaves them unconnected.

If the offset is wide, especially inside curves, the offset may not look like the original (**B**).


Once you've offset a shape, the result is two new shapes that you can work with independently. For example, if you want only one duplicate, you can delete the other.

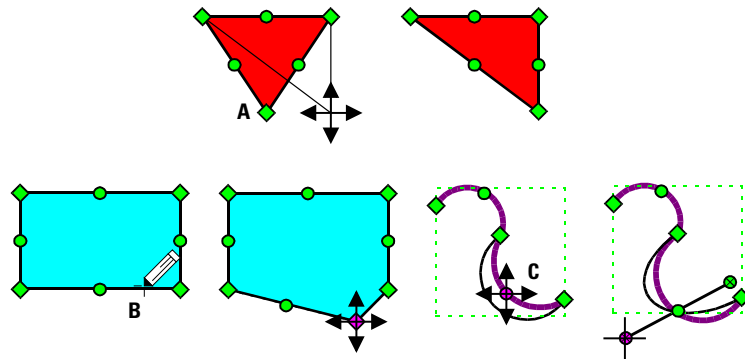
To create an offset shape:

1. Select the shape from which to create the offset shape.
2. Choose Shape > Operations > Offset.
3. Type a value for the distance you want between the duplicate and the original, then click OK.

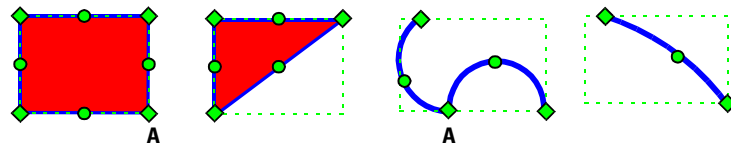
Revising existing shapes

You can revise any Visio Enterprise shape or shape you draw from scratch as long as the shape isn't locked to prevent changes.

To revise a shape, select it with the pencil tool () , then drag, add, or delete vertices. To change curves, drag a control point or a point's eccentricity handles.



To reshape a shape, you can drag a vertex (**A**); add, then drag a vertex (**B**); or drag control points to edit curves (**C**).



Deleting vertex **A** in either of these shapes deletes the segment with which the vertex is associated. The remaining segments are reshaped accordingly.

Methods for revising shapes

To	Do this after selecting the shape with the pencil tool
Select a vertex or control point	Click the vertex or control point you want to select. The selected item turns magenta.
Reshape angles	Select one or more vertices and drag. (Hold down the Shift key to select more than one.)
Add a segment	Point to where you want to add a segment, hold down the Ctrl key, then click.
Delete a segment	Select a vertex associated with the segment you want to delete, then press the Delete key.
Change the curvature of an arc or freeform curve	Drag a control point until the segment looks the way you want.
Change the eccentricity (or symmetry) of an arc	Select a control point, hold down the Ctrl key, drag the pointer slightly away from the point to display the eccentricity handles, then release the mouse button. Drag one handle farther from or closer to the control point or rotate it around the control point until the arc is shaped the way you want.
Move the end of a freeform curve	Select the curve, then drag a handle associated with the curve's endpoint.

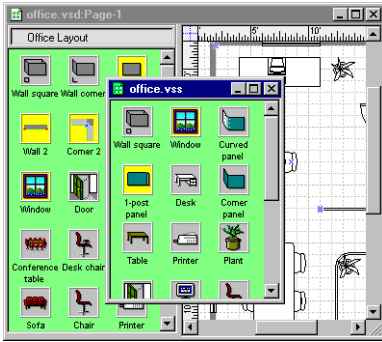
TIP If you select a shape with the pencil tool and don't see any vertices or control handles, the shape is probably a group. To find out if the shape is a group, select it, choose **Format > Special**, then check the **Special** dialog box to see if **Group** is listed for **Type**. To revise the group, select it, then choose **Edit > Open Group**. A group window opens in which you can revise the shape using the pencil tool.

Revising several identical shapes at once

When you create a drawing, Visio Enterprise creates a stencil specific to that drawing file called the **local stencil**. Each time you drag a master to the drawing page, Visio Enterprise copies the master to the local stencil, then creates an **instance** of the master on the drawing page. Instances inherit formatting and other properties from masters on the local stencil.

In the local stencil, you can

- Track which shapes you've used in your drawing.
- Quickly revise all instances of a shape on all pages in a drawing file by revising the master on the local stencil.
- Save the local stencil as a stand-alone stencil so you can distribute it to others who want to use the shapes in other drawings.
- Add shapes to the local stencil directly to make them easier to reuse later.



When you first open the local stencil, it lines up along the left side of the screen. You can drag the stencil's title bar to move it anywhere you want, and you can drag a side or corner to change the stencil's size.

To open a local stencil and display the shapes you've used in your drawing:

- Choose Window > Show Master Shapes.

Revising all shape instances at once

Local stencils provide a way for you to update all instances of a shape at once. Each shape instance in a drawing is linked to its master in the local stencil, so to change all shape instances at once, you simply modify the master. For example, in an organization chart, if you want to change the color of all the Position shapes' text to blue, you can simply modify the Position master on the local stencil. All instances of the Position shape in the drawing inherit the change.

Shape instances in the drawing remain linked to their masters in the local stencil unless you perform an action that severs the link, such as ungrouping a shape in the drawing. In this case, a message appears on the screen letting you know the action will sever the link, and you can choose to continue or cancel the action.

NOTE In some cases, applying local formatting to a shape instance on the drawing page may break that individual attribute's link to the master on the local stencil. For example, if you resize an instance on the drawing page and then, in the local stencil, size its master, all instances except the one you resized manually inherit the new size.

To revise a master on the local stencil and all of its instances on the drawing page:

1. Open the drawing you want to modify, and choose Window > Show Master Shapes.
2. Click the local stencil's title bar to make sure it's the active window, then double-click the master you want to modify to open it in the master drawing window.
3. In the master drawing window, revise the master.

When you're finished revising, close the master drawing window by clicking the close box. When Visio Enterprise asks if you want to update the master and its instances, click Yes.

The instances of the shape update to show the changes.

Saving a local stencil for use in other drawings

You can save a local stencil as a stand-alone stencil (.vss) file. After you save it, you can use it with any drawing, or distribute it, just as you do stencils that come with Visio products.

To save a local stencil as a stand-alone file:

1. Click the local stencil's title bar to make it the active window.
If the local stencil isn't open, display the drawing to which it's associated, then choose Window > Show Master Shapes.
2. Choose File > Save As, then, in the Save As dialog box, do the following:
 - Save In** Find the folder in which you want to save the stencil. (If you save the stencil in a Solutions subfolder, it appears when you choose File > Stencils.)
 - File Name** Type a name for the stencil.
 - Save As Type** Select Stencil (*.vss).
 - Save** Uncheck the Workspace box if it's checked.
3. Click Save.

For details about working with masters and stencils, see Chapter 11, "Creating custom solutions."

Adding shapes to the local stencil

You can add shapes you draw to the local stencil. Not only does this make revising instances of those shapes easier, it also makes it easy to quickly reuse a shape by dragging it from the local stencil. If you plan to add a shape you draw to the local stencil, it's best to do so before duplicating and copying the shape—revising the shape on the stencil doesn't revise copies of the shape that are on the page before you add the shape to the local stencil.

To add a shape to the local stencil:

1. Open the local stencil by choosing Window > Show Master Shapes. To arrange the windows, choose Window > Tile.
2. Press Ctrl, then drag the shape and drop it onto the local stencil.
 - TIP** To align the new master shape icon with the existing ones, right-click the green stencil background, then choose Arrange Icons.

Revising existing masters

You can revise the way an existing master will look when you drop it on the drawing page. For example, you can add arms to an office chair master or change its model number.

To revise every instance of a master in a drawing, edit the master stored in the local stencil. When you edit the master locally, you change each instance of the shape in the drawing file. You do not, however, change the master in any stand-alone stencil you may have used to create the drawing.

You can also revise a master on a stand-alone stencil so that every time you use that stencil to create a drawing, the revised master appears on the local stencil.

If you no longer need a master, you can delete it. Deleting a master breaks the connection between the master and any instances in a drawing.

To revise the way a master will look on the drawing page:

1. To revise a master on the local stencil, make sure the drawing window is active by clicking the title bar, then choose **Window > Show Master Shapes** to display the local stencil.

To revise a master on a stand-alone stencil, open the stencil as an original or as a copy that contains the master you want to change, then click in the stencil window to make it active.

2. Double-click the icon of the master you want to edit, or select it, then choose **Master > Edit Master**.

The master opens in the master drawing window.

3. To modify the master, use the same tools and techniques that you use to create and edit shapes in a drawing.
4. When you've finished revising the master, click the close box to close the master drawing window.

To delete a master:

1. Open the stencil file that contains the master you want to delete.

Make sure to open the stencil as **Original** or **Copy**.

2. Select the stencil window, then select the master.
3. Choose **Edit > Clear**.

When Visio Enterprise prompts you, click **OK** to delete the master or **Cancel** to cancel the deletion.

4. Choose **File > Save**.

Measuring and dimensioning

When precision counts, the tools in Visio® Enterprise help you set the measurements you need to draw and place shapes accurately. In particular, precise placement counts when you work with diagrams that are drawn to scale, such as a physical network layout. In a scaled drawing, shapes on the drawing page represent real-world objects that are larger than the paper size. For example, 1cm on the drawing page of an office layout might represent 1m of the actual office.

In Visio Enterprise, the units of measure that appear on the rulers, or **drawing units**, are sizes in the real world. In the example above, 1m is the drawing unit. **Page units** are sizes on the printed page—1cm in the network layout example. The ratio of page units to drawing units is the **drawing scale**. You can change the units of measure and the drawing scale settings to accommodate the particular type and size of drawing you want to create.

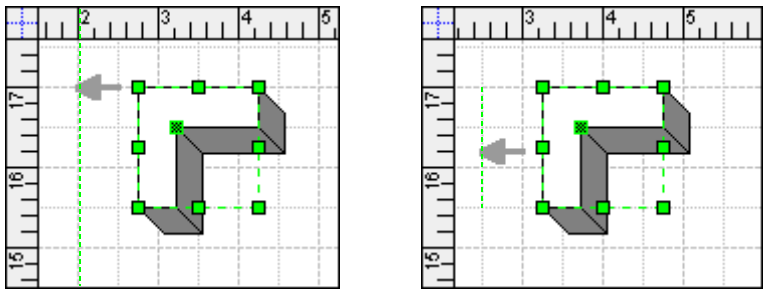
By starting a drawing with a template, the drawing scale and units of measure are already set up for you. This chapter shows you how to use the rulers, guides, grid, and alignment and positioning tools to draw and place shapes accurately and explains how to work with drawing scales.

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Snapping shapes for automatic alignment

You can rely on snap behavior to position and align shapes exactly. Snapping pulls shapes to one another or to ruler subdivisions, grid lines, guides, or guide points so you can control placement and alignment. You can control what types of objects shapes snap to and the snap strength, which is the amount of pull that an object exerts.



By default, shapes snap to both ruler subdivisions and grid lines. To snap shapes more easily to ruler subdivisions, turn off snapping to grid lines.

Methods for snapping shapes into position

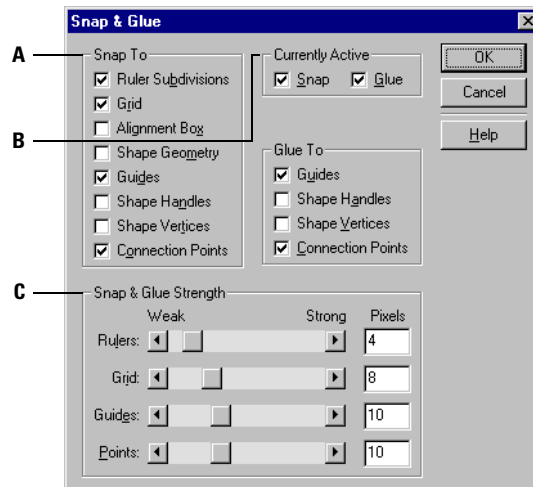
To	Choose these snap settings
Align several shapes	Guides
Align shapes by their corners	Guide points
Position shapes equidistant from one another	Grid, ruler subdivisions, or guides
Position 1-D shapes against 2-D shapes	Shape geometry, handles, vertices, or connection points
Position 2-D shapes against one another	Shape's alignment box

The snap settings you choose apply to all shapes in the current drawing. When you set snap options, set only the options you need. For example, if you want to snap to guides, you do not need to set the Grid option.

To set how shapes snap:

1. Choose Tools > Snap & Glue.
2. Under Snap To, check the options you want.
Use the Ruler Subdivisions, Grid, and Guides options for positioning and aligning shapes.
Use the Shape Handles (selection handles), Shape Vertices, and Connection Points options for gluing shapes together.
3. Under Currently Active, check Snap, then click OK.

TIP To place shapes as precisely as possible, set the snap strength to a high setting, press Ctrl+Shift+click the left mouse button to zoom into the drawing, then move the shapes into place.



- A** Check to determine what to snap to.
- B** Check or uncheck to turn Snap or Glue on or off.
- C** Move a slider to change the amount of pull an option exerts, measured in pixels. When you increase the snap strength, a shape is pulled toward an item from farther away. "Points" refers to selection handles, vertices, and connection points.

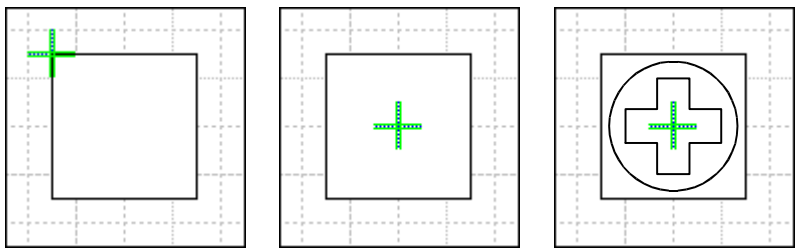
TIP You may not always want to snap shapes. For example, by turning off snapping, you may find it easier to draw a smooth freeform curve.

Creating guides and guide points

You can use guides and guide points when you want to position shapes precisely or align several shapes and keep them in the same position even when you move them. Guides are useful in ways rulers and grid lines are not. For example,

- You can rotate existing guides by rotating the entire page or by rotating a single selected guide using the Size & Position command.
- You can glue shapes to guides so that when you move the guides the shapes move too.
- You can place guides anywhere on the page and use the Snap & Glue command to make shapes snap to the guides.
- Guides don't print.

NOTE You can glue shapes to rotated guides, but if you rotate a guide after a shape is glued to it (whether the guide was rotated when you glued the shape to it or not), the glue breaks.



Guide points are two short, crossed guides that you can use to align shapes at their corners or to center shapes on top of one another.

Methods for creating guides and guide points

To	Do this
Prepare to create guides and guide points	On the View menu, check both Guides and Rulers.
Place a guide on the drawing page	Drag a guide from the horizontal or vertical ruler onto the drawing page, then release the mouse button.
Place a guide point on the drawing page	Drag from the intersection of the two rulers onto the drawing page, then release the mouse button.
Delete a guide or guide point	Click to select the guide or guide point you want to delete. Press the Delete key, or choose Edit > Clear.
Rotate a guide	Select the guide, then choose Shape > Size & Position. In the Size & Position dialog box, select Rotated, then type values for X, Y, and Angle. The x-, y-coordinates and angle are relative to the zero point. Negative values for Angle rotate the guide counterclockwise; positive values rotate the guide clockwise.

You can use guides and guide points when you need to precisely align several shapes and keep them in the same position even when you move them. You can glue shapes to guides and guide points so that when you move the guide the shapes move with it.

Methods for using guides to reposition multiple shapes

<i>To</i>	<i>Do this</i>
Align shapes with a guide or guide point	Drag shapes until their selection handles, endpoints, or connection points align with the guide or guide point.
Glue a 1-D shape to a guide	Drag one of the shape’s endpoints to the place on the guide where you want to glue it. When the shape is glued, the endpoint turns red.
Glue a 2-D shape to a guide	Drag the shape to the place on the guide where you want to glue it. When the shape is glued, the selection handles on the glued part of the shape turn red.

Controlling grid spacing and origin

Each drawing page is crisscrossed by grid lines like those on traditional graph paper. To help you position shapes, you can control the grid spacing, set whether the grid is **variable** or **fixed**, or change the grid origin in the Ruler & Grid dialog box. You can even set spacing separately for the horizontal and vertical grid lines. The intervals of the grid correspond to the unit of measure you set in the Options dialog box.

By default, Visio Enterprise uses a variable grid. Variable grid lines change depending on the magnification at which you are viewing your drawing. If you zoom in on your drawing, grid lines may be closer together; if you zoom out, they may be farther apart. (You can check this by changing the magnification and then looking at how the grid lines line up with the rulers.) Visio Enterprise determines the best grid spacing for the view. Variable grids are useful when you want to zoom in to align something precisely.

For some drawings, such as space plans and engineering diagrams, you may want to set a fixed grid, so that grid lines stay the same distance apart regardless of magnification. For example, you can set the grid to match the size of ceiling tiles. If you set a fixed grid for tiles that are 40cm by 40cm, you’ll notice that the grid lines always match this distance on the ruler, regardless of the magnification.

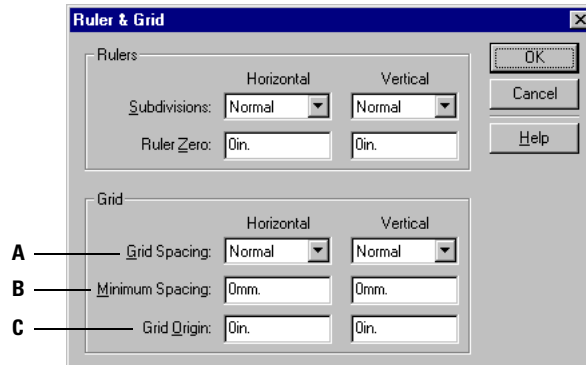
A Specifies how far apart the grid lines are. You can choose Fine, Normal, Coarse, or Fixed. Fine, Normal, and Coarse set the grid to a variable grid; the grid spacing changes as you zoom in and out. Fixed sets the grid to a fixed grid; if you zoom in or out, the spacing between grid lines does not change.

B For Fine, Normal, or Coarse, specifies the minimum grid lines. For Fixed, specifies how far apart the grid lines are.

C Specifies where to place the grid origin. For example, you could move the grid in increments different from the ruler to align the grid with a shape or part of the diagram. By default, the grid origin is in the lower left corner.

To hide or show the grid:

- Choose View > Grid.



To set grid spacing between lines for a variable grid:

1. Choose Tools > Ruler & Grid.
2. In the Grid Spacing Horizontal and Vertical list boxes, select Fine, Normal, or Coarse. Fine is the smallest grid spacing, and Coarse is the largest.
3. Click OK.

To set a fixed grid:

1. Choose Tools > Ruler & Grid.
2. In the Grid Spacing Horizontal and Vertical list boxes, select Fixed.
3. For Minimum Spacing, type the spacing you want for the fixed grid, then click OK.

To change the point where a fixed grid originates:

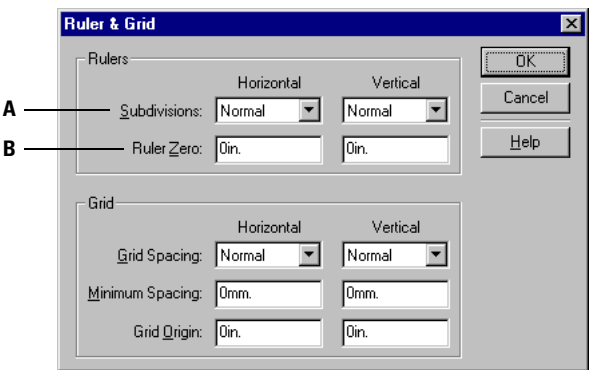
1. Choose Tools > Ruler & Grid.
2. For Grid Origin, enter x - (horizontal) and y - (vertical) coordinates for the point from which you want the grid to originate, then click OK.

Setting ruler units and the zero point

Each drawing window has vertical and horizontal rulers, which show measurements at the scale of the drawing. The intervals of the rulers correspond to the unit of measure you set in the Options dialog box (choose Tools > Options). You can specify both the units that appear on the ruler and where the zero point, or starting point, for both rulers is located in the Ruler & Grid dialog box. The zero point is typically in the lower left corner of the page, but sometimes it's helpful to move it to make it easier to measure the distances in a specific drawing. For example, you might want the zero point to line up with a wall in a floor plan.

If you rotate your page or a guide, Visio Enterprise uses the zero point as the center of the rotation.

- A Specifies how many tick marks are on the vertical or horizontal ruler. You can choose Fine, Normal, or Coarse.
- B Specifies the location of zero on the horizontal and vertical rulers. By default, the horizontal ruler's zero point is the top left corner of the page, and the vertical ruler's zero point is the bottom left corner of the page.



Methods for setting rulers

To	Do this
Set ruler measurement units	Choose File > Page Setup, then click the Page Properties tab. For Measurement Units, choose the units you want, then click OK.
Change the position of the zero point on both rulers	Hold down the Ctrl key, then drag from the intersection of the two rulers to where you want the new zero point.
Change the position of the zero point on one ruler	Hold down the Ctrl key, then drag from the other ruler.
Return the zero point to the lower left corner of the page	Double-click the intersection of the two rulers.
Change ruler subdivisions	Choose Tools > Ruler & Grid. Under Rulers, choose the subdivisions you want.
Hide the rulers	Choose View > Rulers to uncheck Rulers.
NOTE To create guides and guide points, rulers must be visible.	

Specifying exact size and position for shapes and guides

Using the Shape > Size & Position command, you can

- Set the position and degree of rotation of shapes and guides on the page, as well as the dimensions of shapes, using precise numerical values.
- Obtain precise size and position information about selected shapes or guides.
- Resize and move one shape or several shapes at once.

To set a 1-D shape's size or position precisely:

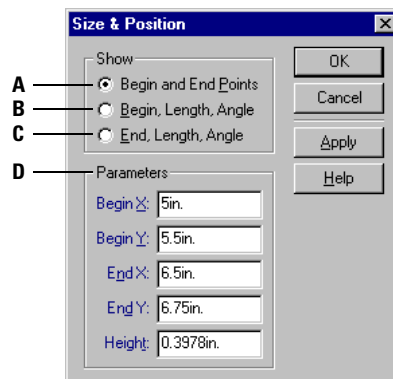
1. Select the shape.
2. Choose Shape > Size & Position, or click the status bar.
3. Under Show, choose an option to set the values that appear under Parameters.
4. Under Parameters, specify values for any or all of the options.
5. Click Apply to see the results before you close the dialog box, or click OK to apply the changes and close the dialog box.

A Click to display the shape's begin and end points and its height in the Parameters section.

B Click to display the shape's begin point, angle of rotation, length, and height in the Parameters section. Visio Enterprise calculates the end point.

C Click to display the shape's end point, angle of rotation, length, and height in the Parameters section. Visio Enterprise calculates the begin point.

D Type values in this section depending on what you click in the Show section. For example, if you click Begin And End Points, then you can type x-, y- coordinates for the shape's begin and end points, as well as its height.



In the Size & Position dialog box for 1-D shapes, you enter values specific to 1-D shapes, such as begin and end points.

TIP To move a 1-D shape without resizing or rotating it, change the values in the Begin X and End X or Begin Y and End Y boxes by the same amount. For example, to move a shape down 1 inch, decrease the values of Begin Y and End Y by 1 inch each. To resize and rotate the shape at the same time, enter new values for both the x- and y-coordinates.

For a 2-D shape, use the Size & Position command to

- Change the width and height of a shape.
- Change a shape's angle of rotation.
- Flip a shape vertically or horizontally.
- Move a shape by changing the x - and y -coordinates of its pin, or point of reference.
- Change the position of a shape's pin.

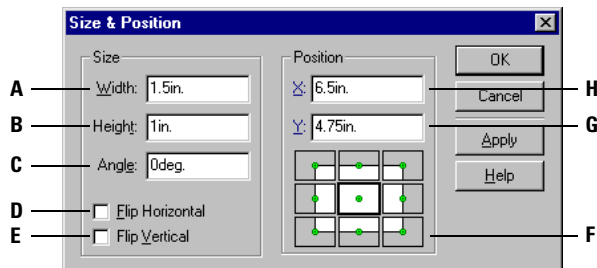
To set a 2-D shape's size or position precisely:

1. Select the shape.
2. Choose Shape > Size & Position, or click the status bar.
3. Under Size, specify values for the shape's width, height, and angle of rotation. You can also check options to flip the shape vertically or horizontally.
4. To move the shape, under Position, specify values in the X and Y boxes.
5. To change the shape's pin, click the grid section on the shape diagram that corresponds to the point to which you want to move the pin.

The X and Y coordinates in the dialog box indicate the location of the shape's pin on the drawing page. When you change the location of the pin on the shape, the shape's position on the drawing page changes.

6. Click Apply to see the results without closing the dialog box, or click OK to apply the changes and close the dialog box.

- A** Type the width of the shape.
B Type the height of the shape.
C Type the shape's angle of rotation.
D Check to flip the shape horizontally.
E Check to flip the shape vertically.
F Click a section to move the shape's pin in relation to the shape and the page.
G Type a new value for the y -coordinate of the shape's pin to change the shape's vertical position on the page.
H Type a new value for the x -coordinate of the shape's pin to change the shape's horizontal position on the page.



In the Size & Position dialog box for 2-D shapes, you enter values specific to 2-D shapes, such as height, width, and pin location.

For a guide or guide point, use the Size & Position command to set the orientation and position.

TIP To set the size and position of multiple shapes precisely, select all of the shapes you want to size, then choose Shape > Size & Position.

Aligning and distributing shapes







You can easily align shapes with ruler intervals and grid lines. You can also

- Align shapes to other shapes. You can align the tops, bottoms, left sides, right sides, or centers of shapes.
- Create guides or guide points and align shapes to them. When shapes are glued to a guide, the aligned shapes move with the guide.
- Distribute three or more shapes to create an equal distance between the ends or centers of the shapes.

When you're aligning shapes to one another, the primary shape, indicated by green selection handles, is the shape to which other shapes align. You can establish a shape as primary by selecting that shape first, then Shift+clicking to select the other shapes you want to align to the primary one. If you drag a selection net around several shapes, the top shape in the stacking order is the primary shape.

To align shapes to a primary shape:

1. Select the shape to which you want to align other shapes, then Shift+click to select the shapes you want to align.
2. Choose Tools > Align Shapes.

NOTE You can also use one of the six align shapes buttons on the Shape toolbar: align left () , align center () , align right () , align top () , align middle () , or align bottom () .

3. Select the alignment options you want.

Each Alignment option is represented by an illustration. Choose an Up/Down Alignment or a Left/Right Alignment option, or one of each. To cancel the selection of either Alignment option, click the red X in that section.

4. To create a guide and glue the shapes to it, check Create Guide And Glue Shapes To It.

If you choose this option, you can move all the shapes and maintain their alignment by selecting and moving the guide.

5. Click OK.

To align shapes to a guide:

1. Drag a guide from a ruler onto the drawing page. The guide appears as a green line (when unselected, it appears as a blue line).
2. Choose Tools > Snap & Glue, then make sure that Glue is checked under Currently Active and Guides is checked under Glue To. Click OK.

To align shapes to a guide point:

1. Point to the crossbar at the intersection of the two rulers, then drag to where you want the guide point.





The guide point appears as two blue crossed lines.

2. Position shapes you want to align with their centers, selection handles (for 2-D shapes), or endpoints (for 1-D shapes) on the guide point.

TIP You can automatically create a guide and glue shapes to it using the Align Shapes command. Simply check Create Guide And Glue Shapes To It in the Align Shapes dialog box.

To distribute shapes using the Distribute Shapes command:

1. Shift+click to select three or more shapes.
2. Choose Tools > Distribute Shapes.

You can also use one of four Distribute Shapes buttons on the Shape toolbar: distribute centers horizontal () , distribute horizontal spacing () , distribute centers vertical () , or distribute vertical spacing () .

3. Choose a distribution option.
4. To add guides and glue the shapes to them, check Create Guides And Glue Shapes To Them.

If you choose this option, you can move an outermost guide to redistribute all the shapes.

5. Click OK.

Visio Enterprise distributes the shapes evenly between the two outermost shapes.

To distribute shapes using evenly spaced guides:

1. Drag the first guide from the appropriate ruler.
2. To create the second guide, hold down the Ctrl key and drag from the first guide to where you want the second guide.
3. Press F4 to create additional guides.
4. Glue shapes to the guides so they're distributed the way you want.

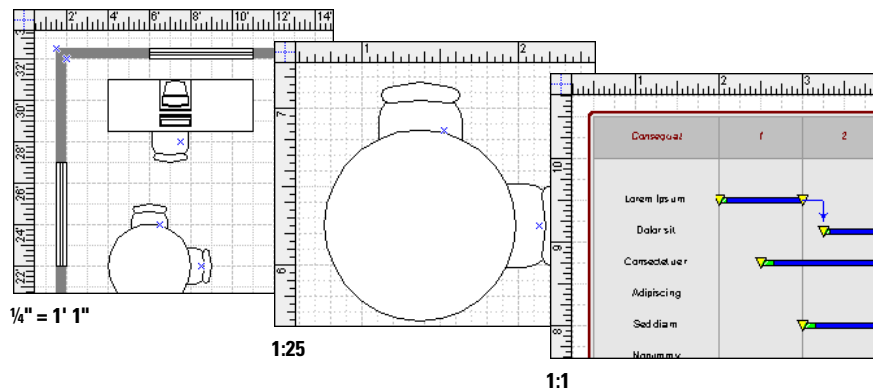
Setting drawing scales

Whenever you need to re-create the exact spatial relationships of very small or very large objects in the space of a drawing page, you can set a drawing scale.

You can set a drawing scale in any drawing. Some templates, such as the Office Layout Template, open with a drawing scale already set. If you want to work with a different drawing scale, you can change the setting.

When you set a drawing scale, keep the following points in mind:

- Changing the scale of a drawing page does not change any background pages assigned to it, so you must set their scale separately if you want the foreground and background pages to match. This feature allows a single drawing to contain multiple scales.
- Most masters are designed for drawings with a scale of 1:1. Visio Enterprise adjusts an instance of a master automatically if its drawing scale is more than eight times larger or smaller than the drawing scale of the page. If the difference in scales is less, Visio Enterprise doesn't adjust the shape.



Scale is a page property. In a multiple-page drawing, each page can have a different scale. The rulers in each of these drawings reflect a change in scale.

Because drawing scale is the ratio of page units (measurements on the printed page of a drawing) to drawing units (units of measure that appear on the rulers and represent the real-world measurements), make sure that you choose the appropriate measurement unit for each before you set your drawing scale.

For example, a drawing of a bolt may have a drawing scale of 10:1, meaning that every 10mm on the printed drawing represents 1mm on the actual bolt. In that case, you would set both the page units and the drawing units to millimeters.

In some cases, however, you may want to have a drawing scale in which the ratio is made up of two different measurement units. For example, in a landscape layout, 1 inch on the printed drawing may need to represent 3 feet or even 3 yards. If you set the drawing scale as 1:3 and both the page and drawing units are set to inches, you won't get the scale you want. Instead, 1 inch on the page will represent 3 inches in the landscape, which would require a very large drawing.

To set default page units:

1. Choose Tools > Options, then click the Default Units tab.
2. For Page, choose the units of measure you want.

You can also set default Text, Angle, and Duration units.

3. Click OK.

To set drawing units for a particular page:

1. Display the page for which you want to change the drawing units.
2. Choose File > Page Setup, then click the Page Properties tab.
3. Choose the units of measure you want, then click OK.

The rulers will show the new measurement units.

To set a drawing scale:

1. Display the page for which you want to set a scale.
2. Choose File > Page Setup, then click the Drawing Scale tab.
3. Choose a standard architectural or engineering scale, or enter a custom scale in the Drawing Scale box, then click OK.

Visio Enterprise redraws the page and adjusts the rulers for the new settings.

A Choose or type the ratio of the page units to the drawing units.

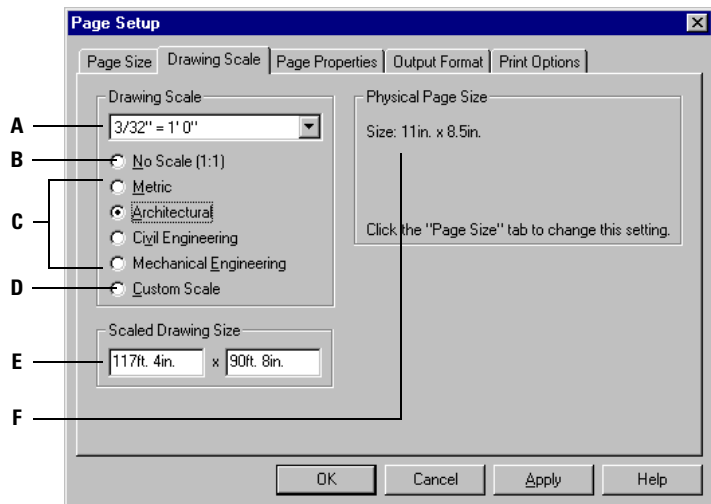
B If the drawing should print at its actual size, select No Scale, then select 100% scale in the Print Setup dialog box (on the Page Size tab, click Print Setup).

C From the list of scales, choose a type of drawing scale relevant to a particular discipline.

D Choose to enter a custom ratio of page size to drawing size.

E Specifies the size of the drawing page, based on the Drawing Scale and the Physical Page Size.

F Indicates the size of the printed page. You can change this setting in the Page Size tab.



Organizing shapes with layers

In Visio® Enterprise, you can use **layers** to organize related shapes on a drawing page. You can selectively view, edit, print, or lock layers, and you can control whether objects snap or glue to shapes on a layer.

You can take advantage of layers in many types of drawings, from network diagrams to directional maps to charts that illustrate progress over a length of time. This chapter describes how to use layers to organize shapes on different types of drawings.

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Using layers in Visio Enterprise

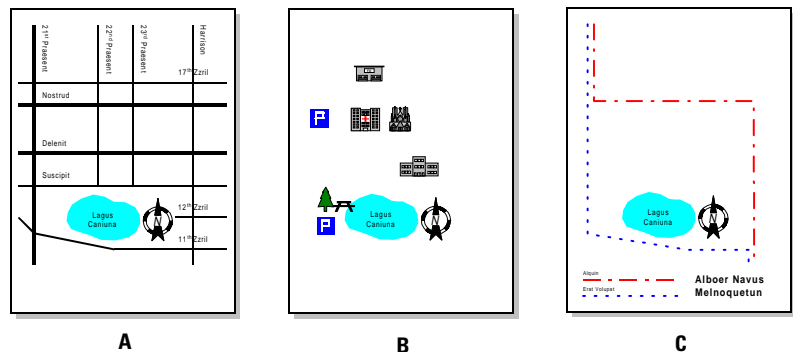
A layer is a named category of shapes. Using layers, you can

- Show, hide, or lock shapes and guides on specific layers so you can edit certain layers without viewing or affecting others.
- Select and print shapes based on their layer assignments.
- Temporarily change the display color of all shapes on a layer to make them easier to identify.
- Assign a shape to more than one layer, as well as assign the member shapes of a group to different layers.
- Control whether shapes on a layer can be snapped to or glued to.
- Create reports based on data stored in shapes assigned to a particular layer.

For example, if you're creating a physical network diagram, you can assign the building layout shapes, such as walls, doors, and windows, to one layer, network equipment shapes to another layer, and electrical outlets to a third layer. That way, when you work with the network shapes, you don't have to worry about accidentally rearranging the walls. You can then lock the wall and electrical layers and distribute the network layout to other information systems co-workers for review and editing without disturbing the underlying office layout.

Some shapes, such as network equipment shapes, are already assigned to pre-existing layers. If you want to use layers with shapes from other stencils, you need to create the layers and assign the shapes to them. A shape can be assigned to multiple layers or no layers, and every page in a drawing can have a different set of layers.

NOTE Layers do not determine how shapes appear on the page. The way shapes overlap is determined by their stacking order and whether backgrounds are assigned to the page.

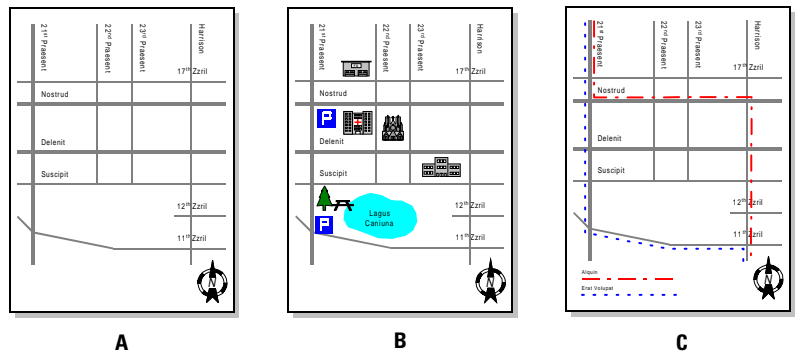


Shapes can belong to more than one layer. Here, the lake and compass shapes belong to the Streets layer (A), the Landmarks layer (B), and the Routes layer (C).

Using layers on backgrounds

A background is a page that appears behind another page. It can have its own set of layers. Because a background can be shared by more than one page, but layers cannot, you may want to use layers on background pages. For example:

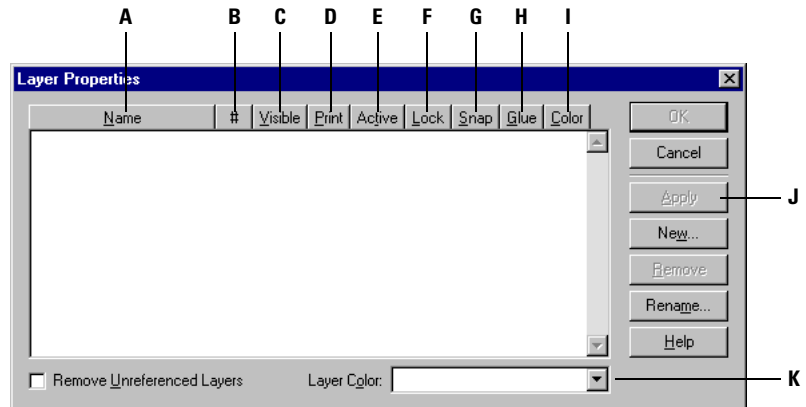
- In a drawing where the same map is used on multiple pages, you can put the map on the background and assign its parts to different layers, such as the Road layer or River layer. If you want to hide the roads on all the pages, you can then hide the background's Road layer.
- In a drawing with a title block on the background, you can assign the title block to a Revision History layer, then hide that layer if you don't want to print it.
- If the background includes information you don't want modified, such as your company logo and name, but you need to give the file to your client for modifications, you can assign those shapes to a Corporate layer, lock it, then pass the file on to your client.



Background page elements (A) appear on the foreground pages to which they are assigned (B and C). When you open a Visio file, the drawing page on the screen is a foreground page. If you want to use backgrounds, you need to create them. For details, see "Using backgrounds for common page elements" in Chapter 1, "Getting started."

Creating, removing, and renaming layers

Many Visio Enterprise masters are already assigned to layers so, when you drop them on the page, the layer is added as well. You can create new layers to organize custom categories of shapes, then assign your shapes to those layers, as well as to the layers that Visio Enterprise provides. For example, when you open the Office Layout Template, the masters are already assigned to the layers. As you drop instances of the masters, the layout layers are set up for you.



- A** Specifies the names of the layers in the diagram. Clicking this button opens the Rename Layer dialog box, in which you can change the name of the selected layer.
- B** Displays the number of shapes assigned to each layer.
- C** Specifies whether the shapes on a layer are visible or hidden. Check to show the layer; uncheck to hide the layer.
- D** Specifies whether to print the shapes on a layer. Check to have the layer print; uncheck so that the layer does not print.
- E** Specifies the active layer to which shapes without a pre-assigned layer are automatically assigned. Check to make the layer active, or uncheck to deactivate the layer. The active layer cannot be locked.
- F** Prevents shapes on a layer from being selected or altered. Check to lock the layer, or uncheck to unlock the layer. If a layer is locked, it cannot be the active layer.
- G** Specifies whether other shapes can snap to shapes assigned to the layer. A shape on a layer that has Snap unchecked can still snap to other shapes, but other shapes cannot snap to it.
- H** Specifies whether other shapes can glue to shapes assigned to the layer. A shape on a layer that has Glue unchecked can still glue to other shapes, but other shapes cannot glue to it.
- I** Specifies that all shapes assigned to the layer appear in the specified color; this option does not permanently change the shape colors. Check to override each shape's original color in favor of the layer color; uncheck to return shapes to their original colors.
- J** Applies the current settings to the drawing page without closing the dialog box.
- K** Adds color to a layer so that all objects assigned to the selected layer appear in the layer color.

Creating layers

When you create a new layer, Visio Enterprise adds it only to the current page, not to all pages in the file. Similarly, when you create a new page, you must define its layers; the new page does not inherit layers from the previous page. However, when you copy a shape with a layer assignment from one page to another, whether in the same drawing or between drawings, Visio Enterprise adds the layer to the new page. If the page already has a layer with the same name, the shape is added to the existing layer.

To create a layer:

1. Choose View > Layer Properties.
2. Click New.
3. In the New Layer dialog box, type a name for the layer, then click OK.
4. In the Layer Properties dialog box, click to place a check mark below properties you want the layer to have, then click OK.

Removing and renaming layers

When you no longer need a layer, you can remove it. If you remove a layer, all shapes assigned only to that layer are removed as well. If you don't want to remove the shapes along with the layer, change or remove each shape's layer assignment before you remove the layer.

When you rename a layer, only the layer's name is changed—the shapes on the layer are not removed or changed.

TIP To see how many shapes are assigned to a layer, choose View > Layer Properties, then click the number button (#) in the Layer Properties dialog box.

To remove a layer:

1. Choose View > Layer Properties.
2. Select the layer you want to delete, then click Remove.
3. Click OK.

TIP To delete all unused layers, check Remove Unreferenced Layers.

To rename a layer:

1. Choose View > Layer Properties.
2. Select the layer you want to rename, then click Rename.
3. For Layer Name, type a new name, then click OK.
4. Click OK.

Assigning shapes to layers

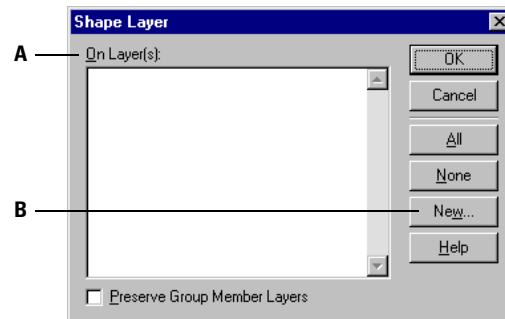
You can assign shapes to one or more layers by selecting the shapes, then choosing the layer to which you want to assign them. For example, you can add walls and network peripherals, then assign them to corresponding layers.

When you drop an instance of a master that is pre-assigned to a layer, the instance inherits the master's layer assignments. If a layer of that name does not already exist on the drawing page, dropping the instance adds the layer. If you have designated an active layer for the page, that instance is assigned only to the layer it inherited from its master, although you can later assign it to the active layer or to another layer.

To assign a shape to a layer:

1. Select the shape.
If the shape is part of a group, click to select the group (green selection handles indicate it's selected), then click to subselect the shape in the group (gray selection handles indicate it's selected).
2. Choose View > Shape Layer.
3. Choose the layer to which you want to assign the shape, then click OK.

TIP To assign a shape to more than one layer, press Ctrl to choose multiple layers.



A Assigns the selected shape to one or more layers. You can assign a shape to multiple layers.

B Opens the New Layer box, in which you can type a name to create a new layer.

In the Shape Layer dialog box, you can check Preserve Group Member Layers to specify that individual shapes in a group retain their current layer assignments. For example, you might assign a desk to the Furniture layer and a computer to the PC layer, then group them. If you then assign the group to the Workstation layer, the desk and computer retain their previous layer assignments as well. If this option is unchecked when you assign a group to a layer, all of the group members become members of the new layer. Their previous layer assignments are canceled.

To assign a group to a layer:

1. Select the group.
2. Choose View > Shape Layer.
3. Click the layer to which you want to assign the group, check Preserve Group Member Layers, then click OK.

Making a layer active

When you create a shape that doesn't already have a predefined layer assignment, it is automatically assigned to the active layer. You can change the active layer as you work to make sure that new shapes are added to the appropriate layer. For example, if you are going to add electrical wiring shapes to a drawing of an office layout, you can make the Electrical layer active. All the shapes you add from then on are assigned to the Electrical layer. When you begin to add windows, you can designate the Wall layer as the active layer.

In a drawing with many shapes and layers, you may find it more efficient to designate one or more active layers, so that all shapes you subsequently draw or drop are automatically assigned to those layers.

To designate a layer as active:

1. Choose View > Layer Properties.
2. Click in the Active column to add a check for each layer you want to make active.
3. Click OK.

TIP If a layer is locked against editing, you cannot make it the active layer.

Controlling shape behavior using layers

After you've assigned shapes to a layer, you can control the behavior and appearance of the shapes as a group. You can

- Select all shapes on a layer.
- Show or hide the shapes on a layer. For example, in a physical network diagram, you can view the layers that contain the cables and routers, and hide the layers that contain walls and workstations.
- Lock shapes on a layer, so that you cannot select, move, or edit the shapes on the locked layer. To identify these shapes, you can also temporarily change their color by setting color property for the locked layer. You cannot add shapes to a locked layer.
- Specify whether other shapes can snap or glue to the shapes assigned to a layer. If a shape is on a layer that has Snap or Glue unchecked, you can snap or glue it to other shapes, but you can't snap or glue other shapes to it.
- Print only the shapes assigned to particular layers.
- Use color to highlight shapes on a layer. For example, in an office layout you can create a layer for each department, then assign each layer a unique color so that, at a glance, you can see which department owns different equipment.

The color you assign to shapes on a layer temporarily overrides each shape's original color. If you turn off the layer color, each shape returns to its original color. If you have assigned a shape to more than one layer, the shape will not use a layer color, but instead will appear in its original color. Layer colors are temporary and intended for display only, but they can affect printed output.

To select all the shapes on a layer:

1. Choose Edit > Select Special.
2. For Selection By, click Layer, then choose the layer with the shapes you want to select. Or choose No Layer to select shapes that are not assigned to any layer. To choose multiple layers, press Ctrl, then click the layers you want.
3. Click OK.

To control shapes on layers:

1. Choose View > Layer Properties.
2. Check the options you want. Uncheck an option to deactivate it for that layer.
3. Click OK.

Creating hyperlinked drawings and HTML pages

Visio® Enterprise includes hyperlinking and Internet tools, which you can use to link shapes and pages to other pages, drawings, or documents—or even to the World Wide Web. With these Internet tools, you can

- Add a hyperlink to each Visio Enterprise shape and drawing page that jumps to another page, another Visio drawing, or a non-Visio document.
- Link Visio Enterprise shapes and drawing pages to locations (URLs) on the Web.
- Save drawings as HTML pages that can be viewed with a Web browser, such as Microsoft Internet Explorer or Netscape Navigator.
- Export Visio Enterprise shapes and drawings in a graphics format (JPG, GIF, or PNG) that Web browsers can read.

This chapter explains how to design navigational links within a drawing as well as how to prepare Visio Enterprise drawings so they can be viewed using a Web browser.

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Adding hyperlinks to shapes and pages

You can add a hyperlink to each Visio Enterprise shape and drawing page. The link can jump to

- Another page in the same Visio Enterprise drawing.
- Another Visio Enterprise drawing.
- A non-Visio document.
- A World Wide Web location (URL).

For example, from a Process shape in a flowchart, you can jump to a drawing page that shows the detailed steps the process involves.

After you add a hyperlink, right-click the shape or drawing page and choose **Hyperlink > Open** to jump to the destination. In full-screen view, you can click the shape or page to open the hyperlink. (Keep in mind that, for the URL links to work, you or the person using your drawing must have a Web browser installed on your computer.)

If you intend to save a drawing as HTML pages using the **Save As HTML** add-on, you can preserve your hyperlinks as image maps.

In a Web browser, the linked shapes will be “hot.” Links to other Visio Enterprise drawing pages remain active in the HTML file only if you save the page that the shape is linked to, as well as the page the linked shape is on, in HTML format.

You can also paste objects created in other programs into Visio Enterprise drawings as hyperlinks and paste Visio Enterprise shapes and drawings into other documents as hyperlinks.

Adding, modifying, and deleting hyperlinks

When you add a navigational hyperlink to a shape or drawing page, you can navigate to the link by right-clicking the shape or page, then choosing **Hyperlink > Open**. Once you’ve added a link to a shape or page, you can modify or delete the link.

When you link a shape or page, you can decide whether the path to the link should be **relative** or **absolute**. A relative path describes the location of the linked file in relation to the Visio Enterprise drawing or a hyperlink base. You can move the Visio Enterprise drawing and the linked file together (that is, move the entire path structure) without breaking the link. An absolute path spells out the exact location of the linked file in terms of drives, folders, and subfolders. You can move the Visio Enterprise drawing file without affecting the link, but if you move the linked file, you must reset the path. To specify an absolute path, uncheck **Use Relative Path For Hyperlink**.

If you want to use a relative path that is not based on the location of the Visio Enterprise drawing, you can set a base path in the Properties dialog box for the file. Choose File > Properties, then type the base path in the Hyperlink Base box. This base path is then displayed in the Hyperlink dialog box.

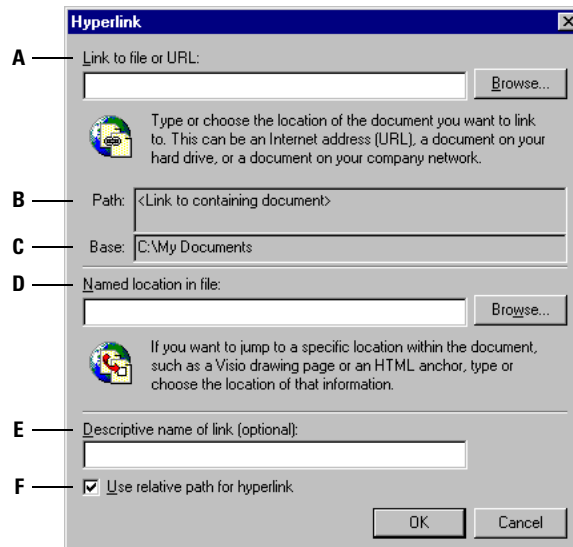
To link a shape or page to another Visio Enterprise drawing page, a Web URL, or a non-Visio file:

1. In Visio Enterprise, create or open a drawing. To add a link to a page, display the page with nothing selected. To add a link to a shape, select the shape.
2. Choose Insert > Hyperlink.
3. Under Link To File Or URL, click Browse to locate the local file or Internet address (URL) to which you want to link. Or, to link to a shape or page in the current drawing, skip to step 4.

The path to the linked file is displayed under Path.

4. *Optional* To link to a Visio file or URL, under Named Location In File, type the page name within the file or anchor on the Web page to which you want to link. To link to the current open file or another Visio file that is open, click Browse to see a list of the pages in that file.
5. *Optional* Under Descriptive Name Of Link (Optional), type a name for the link that identifies the location to which you're linking.
6. Choose whether you want a relative path for the hyperlink, then click OK.

- A** Specifies the file or Web site to which you want to link.
- B** Indicates the full or relative path to the file or URL.
- C** Indicates the base path specified in the Properties dialog box for the file.
- D** Specifies the location in a file or Web site that you want to link to, such as a specific page or anchor.
- E** Specifies a name for the link that appears in the shape's or page's ShapeSheet® Hyperlink section.
- F** If checked, specifies a relative path; if unchecked, an absolute path.



To paste a Visio Enterprise shape or drawing into another document as a hyperlink:

1. Right-click the hyperlinked shape, then choose **Hyperlink > Copy Hyperlink**.
2. In the destination document, choose **Edit > Paste As Hyperlink**.

To paste an object into Visio Enterprise as a hyperlink:

1. After you've copied the hyperlinked object, go to the drawing page on which you want to paste it.
2. Choose **Edit > Paste As Hyperlink**.

To modify a hyperlink:

1. To modify a link on a page, display the page, with nothing selected. To modify a link on a shape, select the shape.
2. Right-click the page or shape, then choose **Hyperlink > Edit Hyperlink**.
3. Make the changes you need, then click **OK**.

To remove a hyperlink from a shape or page:

1. In Visio Enterprise, create or open a drawing. To remove a link from a page, display the page with nothing selected. To remove a link from a shape, select the shape.
2. Choose **Insert > Hyperlink**.
3. Click **Remove Link**, then click **OK**.

Jumping between hyperlinked shapes and pages

You always jump from a linked shape or drawing page by right-clicking the shape or page, then choosing **Hyperlink > Open**. How you get back to the original location in Visio Enterprise depends upon the destination of the link.

To activate a hyperlink on a shape or page, do one of the following:

- Right-click the shape or page and choose **Hyperlink > Open**.
- To be able to see both the drawing page and the link destination, choose **Hyperlink > Open In New Window**.
- If you are in full-screen view, click the shape or page.

To go to the next hyperlink:

- Click the forward button () on the Web toolbar or press **Alt+right arrow**.

To return from another Visio page in a drawing or another document, application, or Web site:

- Click the back button (←) on the Web toolbar or press Alt+left arrow.

NOTE You can use the forward and back buttons to navigate only between a Visio Enterprise drawing and other ActiveX documents, such as other Visio drawings, Microsoft Office 97 or later documents, and HTML pages loaded into Microsoft Internet Explorer 3.01 or later.

Publishing drawings on the Internet

You can easily prepare Visio Enterprise drawings so they can be viewed using a Web browser. You can prepare drawings in two ways:

- Save them as HTML pages. For example, you have a new departmental organization chart you want everyone in the company to see. To make the chart immediately available on the intranet, save it as an HTML page.
- Export them in .jpg, .gif, or .png format. For example, you have a Web page on the intranet where you've explained the complex process your department uses to handle customer inquiries. Recently, you created a block diagram that makes the process easier to understand. To include the graphic on your existing Web page, export it in .gif format, then add an tag to your Web page HTML code.

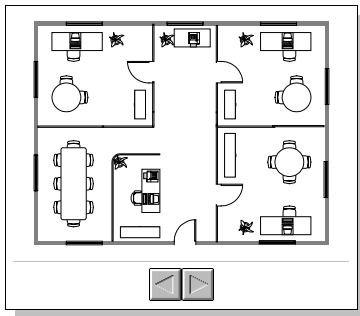
Saving drawings as HTML pages

When you save a drawing as an HTML page, Visio Enterprise creates a Web page that contains the drawing and HTML source code. You can immediately view the HTML page using a Web browser.

Save drawings as HTML pages when

- You want to export more than one page of a multiple-page drawing simultaneously.
- Shapes in your drawing include navigational links (hyperlinks) and you want to make your drawing an image map on the Web page.
- You want Visio Enterprise to create an HTML-coded page and convert a drawing to a format Web browsers can use.

If your drawing has multiple pages, Visio Enterprise creates an HTML page for each drawing page and adds navigation buttons to each page.



Visio Enterprise adds navigation buttons to each page of a multiple-page drawing when you save it as an HTML page.

By default, if shapes in your drawing have navigational links to other Visio drawing pages, files created in different applications, or to Web sites, Visio Enterprise preserves these links as active on the HTML page. The Visio drawing becomes a **client-side image map**. An image map is a graphic with different regions, some of which are “hot.” In client-side image maps, all the information a Web browser needs to process a click on a hot region is stored in the HTML file with the image data.

You can also save a drawing with navigational links as a **server-side image map**. In server-side image maps, a program on the Web server examines map data associated with the hot regions and processes the links.

Visio Enterprise formats the saved HTML files with a template. The template is an HTML file with HTML tags and codes that correspond to elements from the drawing, such as the page number, the page graphic, and anchors or jumps to other HTML pages or files. You can create your own template for saving Visio drawings as HTML files by modifying the default template.

To save a drawing as HTML pages:

1. In Visio Enterprise, display the drawing you want to save.
2. Choose File > Save As.
3. Type a name for the HTML file using the .htm extension, such as *Drawing.htm*.
4. For Save As Type, choose HTML files (*.htm, *.html), choose where to save the file, then click Save.
5. In the Save As HTML dialog box, choose the graphics format and the drawing pages you want the HTML file to include.
6. Click Filter Settings to control the on-screen image size of the saved drawing or to choose options specific to the graphics format, then click OK twice.
7. When you are prompted to view the HTML pages, click Yes to open your Web browser and view the first HTML page.

To save a drawing as HTML pages without preserving links:

1. In Visio Enterprise, display the drawing you want to save.
2. Choose File > Save As.
3. Type a name for the HTML file using the .htm extension, such as *Drawing.htm*.
4. For Save As Type, choose HTML files (*.htm, *.html), choose where to save the file, then click Save.
5. In the Save As HTML dialog box, choose the graphics format and the drawing pages you want the HTML file to include, then click Options.

6. In the Export Options dialog box, uncheck Enable Image Maps, then click OK twice.
7. When you are prompted to view the HTML pages, click Yes to open your Web browser and view the first HTML page.

Creating templates for saving and formatting HTML pages

Visio Enterprise formats saved HTML pages with a template. The template is an HTML page with regular HTML tags and special substitution codes that correspond to elements from the drawing, such as the page number, the Visio graphic, and links (or anchors) to other HTML pages or files. When you export, Visio Enterprise substitutes drawing elements for the codes.

You can create a custom template for saving and formatting HTML pages by modifying the Visio default template and by including substitution codes. When you save a drawing as an HTML file, you can choose which template you want to use.

To create a custom template:

1. Copy the default HTML template, Dfltdoc.htm, which is located in the \Visio\Solutions\Visio Extras folder.
2. Open the copy in a program that can open and edit HTML files, such as Notepad.
3. Change or delete the existing HTML tags or add new ones. Rearrange or delete the substitution codes.
4. Save the revised template under a new name with an .htm extension.

To use a custom template when you save a drawing as HTML pages:

1. In Visio Enterprise, create or open the drawing you want to save, then choose File > Save As.
2. Type a name using the .htm extension, such as *Drawing.htm*.
3. For Save As Type, choose HTML files (*.htm, *.html), choose where to save the file, then click Save.
4. In the Save As HTML dialog box, choose the graphics format and the drawing pages you want the HTML file to include, then click Options.
5. In the Export Options dialog box, under HTML Template, check Use Custom Template, click Browse to locate your custom template, then click OK.
6. In the Save As HTML dialog box, click OK. You are prompted to view the HTML pages. Click Yes to open your Web browser and view the first HTML page.

Exporting in Web-readable graphics formats

To distribute a Visio Enterprise shape or drawing over the Internet or intranet, you can export it as a JPG (Joint Photographic Experts Group), GIF (Graphics Interchange Format), or PNG (Portable Network Graphic) graphic. These formats are supported by virtually all Web browsers. Exporting a shape or drawing as a graphic rather than as HTML is useful when

- You already have an HTML-coded page in which you want to insert a Visio Enterprise drawing.
- You want to export only a portion of a drawing.

After you export a Visio Enterprise drawing, you can include it in an HTML page by adding the HTML tag to the page (for example, ``).

If a drawing includes shapes with navigational links to other Visio drawing pages, to files created in different programs, or to Web sites, the links are lost when you export.

To export a drawing in JPG or GIF format:

1. In Visio Enterprise, select the shape or drawing you want to export.
2. Choose File > Save As.
3. For Save As Type, choose JPEG Format (*.jpg), Graphics Interchange Format (*.gif), or Portable Network Graphics Format (*.png), then click Save.
4. In the Output Filter Setup dialog box, choose the options you want, then click OK.

Associating data with shapes

A Visio® Enterprise drawing can serve as more than a picture. It can become a valuable medium for storing data. For example, a shape can act as a visual database field that stores data you can retrieve in a report. You can also establish connections between shapes and database records, so that you can create Visio Enterprise drawings that function as visual representations of data. Once you've established a shape-record connection, you can pass information back and forth between Visio Enterprise and the database and keep the two versions of the data synchronized.

NOTE Using a drawing to store data is different from representing data models in a drawing. For details about modeling and reverse engineering existing databases, refer to *Modeling in Visio Enterprise*.

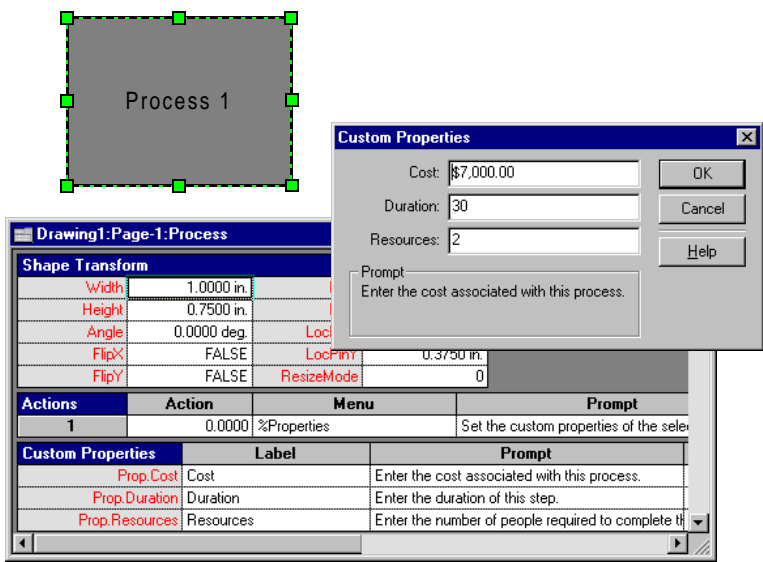
This chapter explains how to associate data with shapes and how to create reports from that data. In addition, it describes how to use the Database Wizard to connect Visio Enterprise drawings to certain types of databases.

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Storing data in shapes

A Visio Enterprise drawing can be a valuable medium for storing data. A shape can act as a visual database field that stores data you can retrieve in a report. For example, a shape in a flowchart can store data about the cost, duration, and resources involved in the process the shape represents.



Custom-property fields are stored in their own section of the shape’s ShapeSheet® spreadsheet. You can add fields using the Custom Properties Editor.

To store data with a Visio Enterprise shape, give the shape **custom-property fields** in which others can enter custom-property data. Many Visio shapes come with some custom-property data already assigned in custom-property fields. All you have to do is enter the data. For example,

- Flowchart shapes include custom-property fields in which you can enter cost, duration, and resources.
- Network equipment shapes include fields for manufacturer, product number, and part number.

If the fields you want don’t already exist, you can also create your own.

To find out if a shape has custom-property fields:

- Select the shape, then choose Shape > Custom Properties.
If the shape has property fields, the Custom Properties dialog box appears, listing the property fields and describing their purpose. If the shape doesn’t contain custom-property fields, a message appears to that effect.

To enter values in a shape's custom-property fields:

1. Select the shape to which you want to add the data.
2. Choose Shape > Custom Properties.
3. Enter the data you want in each field, then click OK.

TIP You can also enter custom-property data by right-clicking the shape, then choosing Properties or, for some shapes, a “Set...” command for setting a particular property.

Adding, editing, and deleting custom-property fields

To develop your own custom solution, you can add custom-property fields to new and existing shapes, edit fields, or delete fields you don't need. The easiest way to work with custom-property fields is to use the Custom Properties Editor, which applies changes only to masters on stencils.

When you use the Custom Properties Editor, you can add, edit, or delete fields for shapes on the following stencils:

- A stand-alone stencil that comes with Visio Enterprise. Do this when you want to permanently change existing Visio shapes.
- A stencil that you created.
- A particular drawing's local stencil. Do this when you want the changes to apply only to the shapes in the current drawing. Changing the shapes on a drawing's local stencil updates the instances on the drawing page.

For details about working with stand-alone and local stencils, search online help for “Custom properties: adding or editing fields.”

To add, edit, or delete custom-property fields:

1. Choose Tools > Macro > Custom Properties Editor.
2. On the first screen, choose the location of the masters you want to edit, then click Next.
3. Follow the remaining screens.

NOTE Many Visio shapes come with custom-property fields already assigned. It's best not to delete these fields because they can affect other aspects of shape behavior.

To see the changes you've made to a shape's custom-property fields:

1. If you edited a master on a stand-alone stencil, drop an instance of the master with the custom properties you edited onto a drawing page.

If you edited a master on a local stencil, select an instance of that master on the drawing page.

2. With the shape selected, choose Shape > Custom Properties, or right-click the shape and choose Properties.

The Custom Properties dialog box appears, showing the changes you made.

Creating reports from custom data

If shapes have custom-property fields in which you have entered data, you can generate inventory and numeric reports based on that data. Visio Enterprise places your report data in a spreadsheet, which you can save as a Microsoft Excel worksheet (.xls) or a text file (.txt). The results appear in one or more report shapes in your drawing.

Property Report	
Created: 5/2/97, 10:55:40 AM	CONFIDENTIAL
ITEM	TOTAL
Cost	1000
Duration	9
Resources	8

A numeric report can include simple calculations, such as totals, or any advanced calculation you can perform using formulas in a spreadsheet.

Layers and reports

When you want to generate more than one report for a drawing, you can use layers to assign your shapes to separate categories, then create reports based on the categories. For example, in a process flowchart, you can assign the shapes associated with each subprocess to a separate layer. Then you can easily generate an inventory report for the entire process that lists the cost, time, and resources associated with each step. You can also generate separate numeric reports for each subprocess that calculate the total or average costs for each step in the subprocess.

If you generate a report on shapes not on a layer, Visio Enterprise creates a new layer and assigns the selected shapes to it. The layer doesn't affect the appearance of your drawing—it places the shapes in a category that you can select, hide, lock, print, or color separately. Having shapes on a layer also makes it easier to update a report.

Generating numeric and inventory reports

You have options for limiting and presenting reports. For example, you can report on all shapes in a drawing or only on selected shapes, and you can choose the properties you want the report to include. You can decide which drawing page to place the report shape on, and you can add subtotal reports to each drawing page. Your report shapes can include document information, such as creation date and time.

To generate a numeric or inventory report:

1. Choose Tools > Property Report.
2. On the first screen of the Property Reporting Wizard, click Next.
Note In the Visio Enterprise Setup program, the Property Reporting Wizard is an installable option under Add-Ons – Typical for Standard Components.
3. On the second screen, choose the shapes you want to report on, then click Next.
4. Follow the wizard screens.

TIP When you run the Property Reporting Wizard, you have the option of saving the spreadsheet. If you save it, you can open it in any program, such as Microsoft Excel or Notepad, that can open .xls or .txt format files.

Generating quick inventory reports

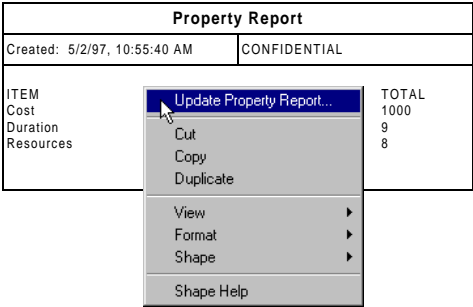
For certain types of drawings in which you may incorporate data frequently, such as network diagrams, office layouts, and organization charts, you can quickly export an inventory report based on the shapes you specify and their custom properties. You save the exported information in a Microsoft Excel file, a Microsoft Access file, or a text file.

To generate a quick inventory report:

1. Select the shapes on which you want to report.
2. Choose Tools > Export [data].
3. Click the Properties button to choose which properties to include in your report.
4. Choose whether to report on all pages in the document, whether to report on all shapes or selected shapes, and whether to create a report in Excel, Notepad, or Access.
5. Type a name for, or navigate to locate, the report file, then click OK.

Updating and revising reports

When you run the Property Reporting Wizard to create an inventory report, it creates a report shape that contains the data you specified. Once a report shape is on a drawing page, you can edit the shape data to update the report.



When you update a report, you also update the spreadsheet if you saved it when you first generated the report. You can save the revised spreadsheet under a new name or replace the original.

To update a report:

- Right-click the report shape, then choose Update Property Report from the shortcut menu.

If you saved the spreadsheet when you first generated the report, the wizard opens a new spreadsheet that includes the revised report results. You can save the revised spreadsheet under a new name or replace the original one.

To replace the title for a report shape:

1. Select the report shape.
2. Choose the text tool from the Standard toolbar, click the existing title, select the text, then type a new title.

Creating databases from shape properties

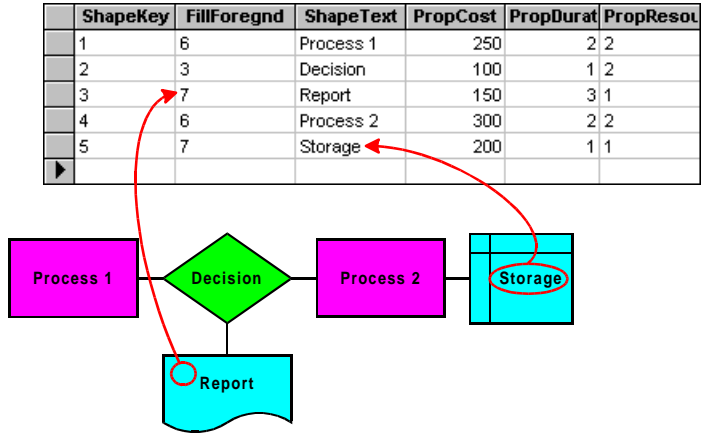
You can run the Database Export Wizard to export data from shapes into a database table. For example, you can create an inventory report for shapes in an office layout or network diagram. In the process of running the wizard, you can select the ShapeSheet cells from which you want data exported.

You can either generate a new database, overwrite data in an existing database table, or insert a new table into an existing database. The wizard works with any ODBC (Open Database Connectivity)-compliant database application.

If you want to insert a table into an existing database, the database must be defined as an ODBC data source. You can define the database as a data source within the Database Export Wizard. When you create a new database in the wizard, you also define it as a data source.

You can export data for every shape in the drawing or for selected shapes. You can select the shapes with data you want to export by placing those shapes on a separate layer. The wizard prompts you for the appropriate layer.

When you export, the wizard determines the most appropriate data type for the information in each cell or field you're exporting. You can change the data type settings, and you can specify how you want to interpret the data (for example, as a formula, value, number, or number with a particular set of units).



Each shape in the drawing is represented by a record (or row) in the database table, and each custom-property field or ShapeSheet cell is represented by a field (or column). Data you enter in the custom-property fields in Visio Enterprise or in ShapeSheet cells appear as values in the database table cells.

To create a database from shape properties:

1. Open the drawing with shape data you want to export.
2. Choose Tools > Macro > Database > Database Export.
3. On the first wizard screen, click Next.
4. Follow the wizard screens.

TIP When you run the Database Export Wizard to export shape data, the wizard stores export-related information with the drawing page. If you make changes to the shapes and want to re-export the data, you can right-click the drawing page and choose Database Table Export.

Connecting Visio drawings to databases

You can use the Database Wizard to connect Visio drawings to databases created in applications compliant with the ODBC standard, a Microsoft interface that allows applications to access, view, and modify data from a variety of databases. ODBC-compliant applications include Microsoft SQL Server, Microsoft Access, and Oracle SQL Server.

For example, from a parts-specifications database, you can generate masters for your employees to use in drawings. Or by connecting an inventory database to an office space plan, you can track furniture and equipment. If you delete a chair from the office plan, you also delete a record from the database.

Preparing to use the Database Wizard

Before you can connect Visio shapes and drawings to database records, you must have the appropriate ODBC components and database drivers installed on your computer. In addition, the database you want to connect to must be defined as an ODBC data source.

You can define a database as an ODBC data source through the Windows Control Panel. Or you can run the Database Wizard to link a shape or drawing to a database and define your database as a data source without leaving the wizard.

To define a database as an ODBC data source:

1. From the Start menu, choose Settings > Control Panel.
2. In the Control Panel, double-click the ODBC icon. The icon may be called 32-bit ODBC.

If the icon doesn't appear, you must install the ODBC components from the Visio Enterprise Setup program. For details, see Chapter 1, "Getting Started."

3. If you're using Microsoft Office 97, in the ODBC Data Source Administration dialog box, the databases that are set up as data sources appear under User Data Sources. If your database isn't listed, click Add.

If you're using Microsoft Office 95, in the Data Sources dialog box, the databases that are set up as data sources appear under User Data Sources. If your database isn't listed, click Add.

4. If you're using Office 97, in the Create New Data Source dialog box, select the driver for the application in which you created your database, then click Finish.

If you're using Office 95, in the Add Data Source dialog box, select the driver for the application in which you created your database, then click OK.

5. In the Setup dialog box for the driver, locate the database you want to link to a Visio shape or drawing. Supply other information and options as needed, then click OK.
6. In the Data Sources dialog box, click Close. Click OK.

ODBC settings

If you connect to databases in multiuser environments, you may want to control certain ODBC settings, such as how many times the wizard attempts to update the database or how long it waits before the operation fails.

To control ODBC settings:

1. In Visio Enterprise, choose Tools > Macro > Database > Database Settings.
2. Choose the number of retries, retry interval, or timeout interval you want, then click OK.

Understanding database connections

When you connect a shape to a database, you actually connect ShapeSheet cells to fields in a database table. The Database Wizard lets you choose which ShapeSheet cells link to fields in the database. If no appropriate cells exist, the wizard creates new cells in the Custom Properties section of the ShapeSheet window.

As a simple example, assume you had a database for colored blocks that includes fields for Block Name, Color, Height, and Width. In the ShapeSheet window of a block master, the Shape Transform section includes cells for Height and Width, and the Fill Format section includes a cell called FillForegnd. In the process of linking a master to the colored blocks database, you can choose to connect the master's Height, Width, and FillForegnd cells to the Height, Width, and Color fields in the database. Because the master contains no cells that correspond to Block Name, you can have the wizard create such a cell in the Custom Properties section.

When it links a shape to a database, Visio Enterprise creates a User-defined Cells section for the shape, if that section doesn't already exist. In this section, the wizard creates the following rows to store information about the primary key for the database table, which database fields are associated with which ShapeSheet cells, and the last valid data retrieved from the database:

- **ODBCDataSource** Contains the ODBC data source name.
- **ODBCQualifier** Stores the name of the database or directory that contains the linked table. This cell contains a value only for ODBC data sources in which a single data source can support multiple databases or directories.
- **ODBCTable** Contains the name of the linked data source table or view.
- **ODBCKeyField1 to ODBCKeyField5** Contain the names of the fields (key fields) that make up the primary key for the linked table.
- **ODBCKeyCell1 to ODBCKeyCell5** Contain the names of the custom properties that are used to store the values for the key fields named in the ODBCKeyFields cells.

- **ODBCLink1, ODBCLink2, ...** Specify which data source table fields correspond to which ShapeSheet cells. Information about how Visio Enterprise evaluates data copied from the field to the cell (that is, as a string or as a number) is also stored here, and, if the number is a measurement, the row includes measurement units.

Information about how Visio Enterprise evaluates data is stored in the form of numeric codes. Value (string) is indicated by a 0, Formula (string) by a 1, and Number by 32. For a list of the numeric codes corresponding to measurement units, search in online help for “result property.”

- **ODBCKeyMirror1 to ODBCKeyMirror5** Contain the last valid key values used when transferring information to or from the data source. The wizard monitors these cells to determine which record a shape was linked to when you changed its key values. Changes to key values in a monitored shape are reflected in the corresponding data source table record.
- **ODBCMirror1, ODBCMirror2, ...** Store the last valid values retrieved from linked data source table fields. There is one ODBCMirror cell for each cell-field link defined in the ODBCLink cells. The wizard uses these cells to determine whether values have changed, in the database or shape, since the most recent synchronization of the data.

	A	B	C	D
1	Name	Color	Height	Width
2	Red Block	2	1 in.	2 in.
3	Green Block	3	2 in.	3 in.
4	Blue Block	4	3 in.	4 in.

The screenshot shows the ShapeSheet window for 'Block.vsd Page-1: Sheet.1'. The 'Custom Properties' tab is active, displaying a table with the following data:

Label	Prompt	Value
Prop.Name	Name	Custom property generated from database
		Red Block

Values in ShapeSheet cells match values in the database records to which the cells are connected. If you change the shape, you can pass the new values to the database. If you change the database, you can pass the new values to the shape's ShapeSheet cells.

Synchronizing drawings and databases

To pass information between Visio Enterprise and the database application, you can add right-mouse actions and ShapeSheet events to shapes or to a drawing page. Right-mouse actions are available on a shortcut menu that appears when you right-click a shape or page. Events represent responses from Visio Enterprise to a user action, such as opening a drawing.

NOTE If you create a drawing that is a graphical representation of a database table, you can also use the drawing monitor to pass information between the drawing and the database. For details, see “Creating a drawing from a database” later in this chapter.

Right-mouse actions and events

<i>Action or event</i>	<i>Added to</i>	<i>Result</i>
Refresh shape on-drop event	Shape	When you drop a master or copy a shape, the values in the linked ShapeSheet cells for that shape (or instance) are automatically refreshed to match values in the database.
Select record on-drop event	Shape	When you drop a master or copy a shape, you’re prompted automatically to select the database record that links to the shape instance.
Refresh linked shapes on document-open event	Page	Refreshes ShapeSheet cell values for all the shapes in your drawing each time you open the drawing.
Refresh based on the NOW function event	Page	Allows you to switch on or off refreshing ShapeSheet cell values for all the shapes in a linked drawing at specific intervals as defined by the NOW function.
Select database record action	Shape	Allows you to select the database record to which you want a shape linked.
Refresh shape cells action	Shape	Refreshes the values in the shape’s linked ShapeSheet cells to match the values in the database.
Refresh shapes on page action	Page	Refreshes the values in the shapes’ linked ShapeSheet cells to match the values in the database for all the shapes on the drawing page.
Update database record action	Shape	Updates the values in the database to match the values in the shape’s linked ShapeSheet cells.
Update shapes on page action	Page	Updates the values in the database to match the values in the shapes’ linked ShapeSheet cells for all the shapes on the drawing page.
Delete shape and database record action	Shape	Deletes the shape and the database record to which the shape is linked.

Connecting a shape to a database record

The first step in establishing a connection between Visio Enterprise and a database is to connect a shape to a database record. You can connect a shape instance, a master on the local stencil, or a master on a stand-alone stencil.

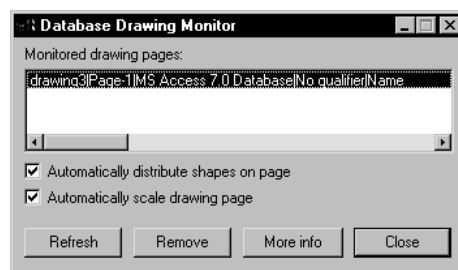
- When you connect a shape instance, no other shapes are affected. If you make copies of the shape, the copies are also linked.
- When you connect a master on a local stencil (the stencil made up of all the masters you've used in a drawing file), you also automatically connect all instances of that master in the drawing.
- When you connect a master on a stand-alone stencil (one of the stencils that came with Visio Enterprise or one you created), each time you drop the master, the new instance is also connected.

To connect a shape to a database record:

1. In Visio Enterprise, choose Tools > Macro > Database > Database Wizard.
2. On the first wizard screen, click Next.
3. On the second screen, choose Link A Shape To A Database Record, then click Next.
4. Follow the remaining wizard screens until you've completed the connection.

Creating a drawing from a database

After you've connected a master on a stencil to a database, you can run the Database Wizard and create a drawing in which each database record is represented by a shape on the Visio drawing page. When you create a drawing with one-to-one connections to database records, the wizard launches a drawing monitor. The monitor manages the connections between the Visio shapes and database records. If you delete a shape, the monitor informs the database table, which deletes the corresponding record. If you add a shape, the monitor informs the database table, and a record is added. If you change a shape, the monitor passes on the changes, and values in the database table are updated.



In the Database Wizard, you can set an option for opening the drawing monitor each time you open a drawing connected to a database. Or, you can add a Launch Monitor action to the drawing page's shortcut menu, so that by right-clicking the page, you can launch the monitor.

To create a drawing that represents a database table:

1. Run the Database Wizard and connect a master to a database record. Link each database field to a ShapeSheet cell.
2. After the master is connected to a database record, choose Tools > Macro > Database > Database Wizard to run the wizard again.
3. On the first wizard screen, click Next.
4. On the second screen, choose Create A Linked Drawing Or Modify An Existing One, then click Next.
5. On the third screen, choose Create A Drawing Which Represents A Database Table, then click Next.
6. Follow the remaining wizard screens to create the drawing.

TIP If you want to open an existing drawing that is connected to a database or add events and right-mouse actions to synchronize the database and drawing, run the Database Wizard. On the second screen, choose Create A Linked Drawing Or Modify An Existing One, and on the third screen, choose the option you want.

Setting drawing monitor options

When you run the Database Wizard to create a drawing that represents a database table, you can control how the drawing monitor will behave when you subsequently open the drawing. You can also establish a connection that allows you to pass changes from the database to the drawing, but not from the drawing to the database.

With a global setting that affects all ODBC database-drawing connections, you can set the drawing monitor to refresh shapes (that is, pass any changes made in the database to the shapes' ShapeSheet cells) at regular intervals (the interval you set depends upon how frequently you update the database). In the Database Wizard, when you're creating a particular drawing, you have the option of turning off the refresh-interval setting for a particular master-database table link. Turning off global refresh for one link doesn't affect other links.

To set a global refresh interval for the drawing monitor:

1. In Visio Enterprise, choose Tools > Macro > Database > Database Settings.
2. Check Automatically Refresh Drawing Page, type the number of seconds in the interval, then click Save.

TIP When you run the Database Wizard to create a particular drawing, you have the option of turning off the refresh setting for a particular master-database table link.

Creating new masters from database tables

Using the Database Wizard, you can generate a set of masters that graphically represents the records in a database table, then save the masters on a stencil.

For example, if you maintain an inventory database of bookcases that your company manufactures, you can generate a master for each specific bookcase, save the masters on a new stencil, then distribute the stencil so everyone in the company can include bookcase shapes in their drawings and other documents.

If you expect to revise the database table, you can save the connections between the masters and the database records. Then, when you revise the table, you can refresh the masters so the values in their ShapeSheet cells match the values in the database records.

NOTE If you don't save the connections, the masters' ShapeSheet cells contain a snapshot of the data that existed in the database fields at the time you created the new masters, but no information about which database records the data came from. If you make changes to the database, you can't refresh the existing masters to reflect the changes. You must run the Database Wizard again and generate new masters.

To generate new masters from a database table:

1. In Visio Enterprise, choose Tools > Macro > Database > Database Wizard.
2. On the first wizard screen, click Next.
3. On the second wizard screen, choose Generate New Masters From A Database, then click Next.
4. Follow the screens until you create the masters.

Creating custom solutions

Visio® Enterprise includes hundreds of masters, stencils, templates, and styles—the building blocks that make it so straightforward to work the built-in diagramming solutions. However, you can customize any of these items and develop your own solutions. In addition, you can develop combinations of shapes and programs that model the real world and solve specific drawing problems, and customize the Visio Enterprise user interface.

To create your own custom solutions, you can

- Draw your own masters, or save shapes you modify as new masters.
- Create your own stencils to save the masters you use most frequently.
- Design your own templates to create drawings with the shapes, size, scale, and styles you use most.
- Modify existing text, line, and fill styles or create your own styles.
- Work in the ShapeSheet® window, which takes you under the surface of shapes to create formulas for specific shape behavior.
- Create macros in Microsoft Visual Basic for Applications (VBA) that control Visio Enterprise through Automation.

This chapter explains how to customize and create the components that make up Visio Enterprise solutions, including how to protect files from unauthorized or accidental changes. It also introduces the development environment in Visio Enterprise. For details about the developer tools, refer to *Developing Visio Solutions*.

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Creating masters

If you want to create a new shape and reuse it in many drawings, create the shape as a master. To create a master, you can

- Convert a shape to a master by moving it onto an existing Visio Enterprise stencil or onto a new stencil you create.
- Develop a new master from scratch.
- Revise an existing master.

Before you can create a master, you must open a stencil as an original file, with read/write access. Normally, stencils open with read-only access. To work with a read/write stencil while maintaining the original, open a copy of the original.

The masters supplied by Visio Corporation are copyrighted. You may copy and reorganize them for your own use, modify them for your own use, and distribute drawings that contain them. You may not sell or distribute original or modified Visio masters (SmartShapes® symbols).

NOTE You cannot open an original stencil if a read-only copy of that stencil is open already. Close the read-only copy, then open the original.

To open an original stencil:

1. Choose File > Stencils > Open Stencil.

You can also click the Open Stencil button () on the Standard toolbar.

2. Open the folder that contains the stencil you want.
3. Select the stencil to which you want to add the new shape.
4. Click Original in the Open section, then click Open.

The stencil window opens, undocked, with read/write access.

TIP To open a copy of the original stencil, click Copy instead of Original in step 4.

Converting shapes to masters

You can use shapes you draw or revise, or objects from other programs, as masters. You may not be able to edit an object, however, in all the ways you can edit a Visio Enterprise shape.

When you drag a shape to a stencil, a master shape icon based on the shape and a default name for the master appear in the stencil window. You can then name the master, align its name, choose options for the icon size, and write a prompt that provides information about how to use the master.

To convert a shape to a master:

1. In the drawing window, display the shape you want to convert to a master, or draw a shape to convert.
2. Open the stencil file in which you want to store the new master.
Make sure to open the original stencil or a copy.
3. Click the drawing page to make it active, then drag the shape from the drawing page and drop it on the stencil. You can create a copy of the shape by holding down the Ctrl key while you drag.
The shape icon appears, with a label “Master.X,” where X is a number representing the number of shapes on the stencil.
4. Choose View > Arrange Icons.
Visio Enterprise rearranges the existing icons to align the new icon.
5. Choose File > Save to save the changes to the stencil.

Developing masters from scratch

When you develop a master from scratch, you can change or specify the way the master displays in the stencil. For example, you can rename the master’s icon and choose options for how the name aligns.

TIP You can also change the way any master on an original stencil displays by right-clicking the master and choosing Properties.

To develop a new master from scratch:

1. Open the stencil file you want to add a master to, or open a blank stencil.
Make sure to open the original stencil or a copy.
2. With the stencil selected, choose Master > New Master.
3. Specify characteristics for the master:
 - Master Name** Specify the name of the new master and how to align the name.
 - Icon** Choose an option for the size and how to update the master shape icon.
 - Prompt** Type information about the master that appears when you point to it.
 - Match Master By Name On Drop** Check to preserve the formatting you’ve applied to the stencil’s masters.
4. Click OK.
A blank master shape icon appears in the stencil window. (You may need to scroll to see it.)
5. Choose Master > Edit Master, or double-click the master to open the master drawing window.

6. Create the master.

You can create it just as you would in a regular drawing page by using shapes from different stencils, drawing the shape with the drawing tools, or pasting an object from another application.

7. Click to close the master drawing window. When you are prompted to update the master, click Yes.

8. While the stencil is still active (that is, the stencil title bar is blue), choose File > Save to save the changes to the local stencil.

Saving shapes you create on stencils

Although Visio Enterprise includes hundreds of stencils, you can organize shapes differently by creating your own stencils of shapes. For example, create your own stencil when

- You've created shapes of your own that you plan to reuse or share with others.
- You frequently use shapes from several Visio Enterprise stencils, and you want to consolidate them on one stencil.

Creating a custom stencil involves either adding or deleting shapes from an existing Visio Enterprise stencil, or building an entirely new stencil using shapes that you create from scratch and save in the stencil file.

There are two types of stencils:

- A **stand-alone stencil** is a stencil file with the extension .vss that can be opened separately or with a template. If you save a stencil with a template, the stencil opens with the template, along with a drawing page that has the scale, styles, and other features appropriate for the shapes on the stencil.

When you add or edit masters in a stand-alone stencil, the new or revised masters become available for any new drawing you create using that stencil or a template that opens the stencil. Instances of the masters in existing drawings are not affected.

- A **local stencil** is a stencil stored in a drawing file. It contains copies of the masters used in that drawing file.

When you add or edit masters in a local stencil, the changes affect only that drawing file. The masters are linked to their instances in the drawing, so changes you make to masters in a local stencil are reflected in each instance of the shape in the drawing.

Methods for creating new stencils

<i>To</i>	<i>Do this</i>
Base a new stencil on an existing stencil	Choose File > Stencils > Open Stencil. In the Open Stencil dialog box, open the folder that contains the stencil on which you want to base the new stencil. Select the stencil and, in the Open section, click Copy. Click Open.
Create a new stencil from scratch	Choose File > Stencils > Blank Stencil.
Create a new stencil from a drawing file's local stencil	With the local stencil window selected, choose File > Save As, type the file name you want, choose Stencil (*.vss) for Save As Type, then click Save.
Copy a master from one stencil to another	Open both stencils, then drag the master from one stencil to another.
Move or copy a shape from the drawing page to a stencil	To move the shape, drag it from the drawing page to the stencil. To copy the shape, hold down the Ctrl key as you drag the shape.
Change the order of the stencil's icons	Open the original stencil file, then drag each master shape icon to arrange them in the order you want.
Align the icons in rows on the stencil	Open the original stencil file, then choose View > Arrange Icons to align the icons vertically and horizontally.
Set the stencil so that its icons stay in rows even when the window is resized or when icons are added or deleted	Open the original stencil or a copy, then right-click the stencil and choose Auto Arrange from the shortcut menu.
Save a new stencil as a local stencil	Save the drawing that includes the local stencil. The stencil is stored in the drawing. Choose File > Save As, choose Drawing (*.vsd) for Save As Type, name the file, then click Save.
Save a new stencil as a stand-alone stencil	Click the stencil title bar to make it active. Choose File > Save As. For Save As Type, choose Stencil (*.vss), name the file, then click Save.

Creating a template

You can save any Visio Enterprise drawing as a template, which you and other users can open and reuse. A template opens any stencils, styles, and page settings that you want to work with as you create diagrams and models. A template can even open with shapes already on the drawing page. For example, it makes sense to create your own templates when

- You frequently use a particular combination of stencils not included in an existing Visio Enterprise template.
- Your drawings require customized settings for page size or scale, window size and position, shape or text styles, color palette, snap and glue, or printing; create a template with the appropriate settings in place.
- Your drawings often use a standard background or set of layers. For example, if you want to place your company logo in every drawing, create a template with a background containing the logo.

The easiest way to create a template is to set up a drawing file the way you want, open the stencils you want, then save the settings as a template (.vst) file. If you simply want to change some of the settings of an existing Visio Enterprise template, you can base a drawing on that template, save it with a new name, and make your changes.

To create a template from a drawing file or an existing template:

1. Open the drawing or start a new drawing based on the template you want to modify.
2. Open any additional stencils you want to save with the template.
3. Modify drawing page settings and styles you want to use in future drawings you base on this template.

For example, if you want to have a background page that displays your company logo, or a title block that contains fields such as the date a drawing is created and so on, create it and assign it to the foreground page.

4. Choose File > Save As, then do the following:

Save As Type Select Template (*.vst).

File Name Type a name for your template.

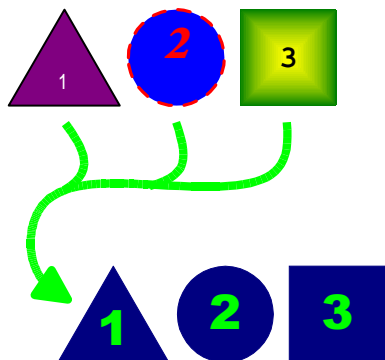
Save Check Workspace.

Save In Select the folder in which you want to save the template.

TIP If you want the template to display when you choose File > New, save it in the Solutions folder or one of its subfolders.

5. Click Save.

Using styles



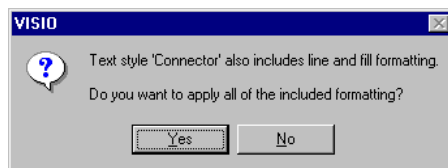
Select three shapes and apply one style to make them look the same.

A **style** is a named collection of formatting attributes—for example, blue fill and magenta bold text—that you can apply to your shapes to give them a consistent look and make them easier to revise. By editing the style, you can simultaneously change the look of all shapes formatted with that style.

A style can contain line, fill, and text formatting attributes—a single attribute or any combination of the three. Visio Enterprise templates come with styles built in, but you can also define your own.

Applying styles

Some styles include formatting for all three attributes (line, fill, and text); others are specific to one attribute. For example, one style may contain text formatting, such as the font, size, and color, as well as fill color and pattern, and line color and pattern. Another style may contain only text formatting.



You can apply formatting to a shape by choosing the style from one of the style lists (for example, the Text style list) on the toolbars. If the style also includes line or fill formatting, you are asked if you want to apply all of the style's formatting, rather than just the text formatting. Click Yes to apply all formatting to the shape. Click No to apply formatting for the single attribute you initially chose from the list.

To apply a style:

1. Select one or more shapes you want to format.
2. From the Line or Fill style lists on the Shape toolbar, or from the Text style list on the Text toolbar, choose the style you want to apply.

TIP You can apply styles to a shape by choosing Format > Style, then selecting the styles you want from the lists. All the styles available in a drawing, both those predefined in a template and those you define yourself, are listed in the Style dialog box.

Defining and editing styles

In the Define Styles dialog box, you can edit and rename existing styles, define your own styles from scratch, and delete styles you no longer need.

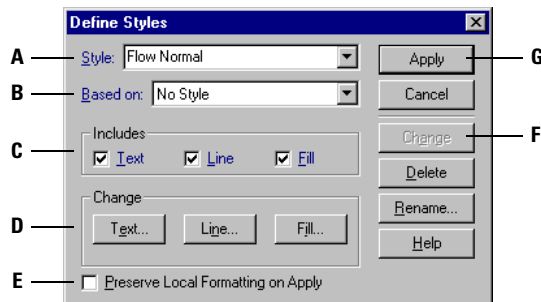
When you define or edit styles in a drawing file, the changes you make are available only in the current drawing. To make a style available across many future drawings, you can define or edit it in an existing template, or save the drawing file in which you created the style as a new template. The style will be included in every new drawing you create using that template.

When you edit or define a style, the colors you can choose are determined by the color palette in the template on which you base your drawing. All Visio Enterprise templates use a default color palette. You can change the color palette a drawing uses, or modify the colors within the default color palette.

To define a new style:

1. Choose Format > Define Styles.
2. Type a name for the new style.
3. To base the new style on an existing style, for Based On, choose that style.
4. Under Includes, check the attributes that your style includes. A style can include formatting from any combination of the three attributes.
5. Under Change, click Text, Line, or Fill to change the settings for that attribute. Choose settings you want for each attribute you included in step 4.
6. When the style contains the settings you want, do one of the following:
 - Click Apply to add the new style, apply it to selected shapes, and close the dialog box.
 - Click OK when no shapes are selected to add the new style and close the dialog box.
 - Click Add to add the new style and continue working in the dialog box.

- A** Type a name for a new style or choose the name of the style you want to edit.
- B** Choose an existing style on which you want to base a new style. Editing the base style changes the new style as well.
- C** Check the characteristics that your style includes, so that the style name will be displayed in the corresponding toolbar list.
- D** Click the Text, Line, or Fill button to define those characteristics.
- E** Check to preserve selected shapes' formatting, such as bold text, even after you apply the style.
- F** Click to add a new style or change an existing one, then start creating or changing another style.
- G** If shapes were selected when you chose Define Styles, this button is labeled Apply; otherwise, it is labeled OK. Click to create and apply a new style.



To edit a style:

1. Choose Format > Define Styles.
2. In the Style list, select the style you want to edit.
3. To rename the style, click Rename, type a new name for the style, then click OK.
4. To change the style settings, under Change, click the attributes you want to edit. When you finish editing the attributes, do one of the following:
 - Click OK (when no shapes are selected) or Apply (when shapes are selected) to add the changes to the style and close the dialog box.
 - Click Change to add the changes and continue working in the dialog box.

To delete a style:

1. Choose Format > Define Styles.
2. Choose the name of the style you want to delete.
3. Click Delete, then click OK.

Copying styles from one drawing to another

If you want to transfer a style you created in one drawing to another drawing, you can copy and paste a shape to which the style is applied from the first drawing into the second.

NOTE If a style with the same name already exists in the second drawing, the style of the shape you copy does not replace the original style. Instead, it inherits the formatting of the style as it is defined in the second drawing. In this situation, if you want to copy the style, rename the style in either of the drawings before you begin.

To copy a style from one drawing to another:

1. Select a shape in the first drawing and apply to it the style or styles you want to copy to the new drawing.
2. Choose Edit > Copy (or press Ctrl+C).
3. Open the new drawing.
4. Choose Edit > Paste (or press Ctrl+V).

The shape is copied to the new drawing, along with the styles you assigned to it in the original drawing.

Preserving individual shape formatting

You can apply special, or local, formatting to an individual shape even when the shape has a formatting style assigned. For example, if a computer shape in a network diagram has the Net-Normal style assigned, you can change the computer shape's text style from normal to italic. If a Process shape in a flowchart has the Flow-Normal style assigned, you can change the fill color of the shape from white to blue.

If you apply a new style to a shape for which you've defined local formatting or edit the style already assigned to the shape, the style's attributes replace any local formatting you've applied.

To prevent a style from overriding a shape's local formatting, you can choose to assign all of the style's attributes except those you assigned locally. Or you can preserve a shape's local formatting when you create or apply a style in the Define Styles and Style dialog boxes.

If you experiment with local formatting and then decide you preferred the formatting the shape originally displayed, you can revert to the styles associated with the shape's master.

To preserve local formatting when applying a style:

1. Select the shape, then choose Format > Style.
2. From the Text, Line, and Fill style lists, choose the styles to apply.
3. Check Preserve Local Formatting.

TIP In the Define Styles dialog box, the setting is called Choose Preserve Local Formatting On Apply.

4. Click OK.

To revert to a master's style:

1. Select the shape, then choose Format > Style.
2. Choose Use Master's Format from the Text, Line, and Fill style lists.

The Use Master's Format item appears at the top of each style list; you may need to scroll up to see it.

3. Click OK.

Protecting shapes and files

If you plan to share drawings, stencils, or templates with other people, you may want to protect the files, the shapes you create, or certain aspects of a drawing to prevent inadvertent changes.

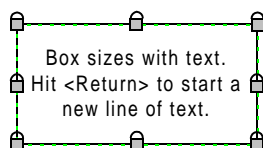
You can protect shapes and drawings using the following methods:

- Lock shapes to prevent them from being modified in specific ways. For example, you can lock a shape against rotation or resizing.
- Lock a layer so no shape on that layer can be modified. For example, if you give an office layout to an electrical wiring planner, you can lock all layers except the one for the wiring so that no other aspects of the layout are available for editing.
- Place shapes, such as logos or title blocks, on a background so they won't be affected by changes made to the drawing page.
- Prevent attributes of a drawing, such as styles, from being modified.
- Save a file as read-only, so it can't be modified in any way.

Locking shapes against changes

You can lock shapes by using the Protection command to protect them from resizing, repositioning, rotating, deleting, and selecting.

When a shape is locked against resizing or rotating, it displays padlocks where the resizing and rotation handles usually appear, to indicate that those handles cannot be selected.



Padlocks over a shape's selection handles indicate that the shape is locked against changes. Some Visio Enterprise shapes are locked against editing in this way, such as the Auto-Size Box shape on the Blocks stencil, which is locked against manual sizing because its size is determined by the amount of text you type in the shape. Unlocking and changing these shapes may cause them to behave in unexpected ways.

NOTE The ShapeSheet® Protection section includes protection options not available in the Protection dialog box, such as locking against cropping, editing with any drawing tool, text editing and formatting, group editing, and recalculation of height and width when you size the shape.

To lock a shape against selection:

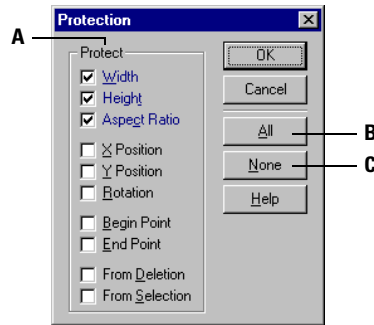
1. Select the shape you want to protect.
2. Choose Format > Protection.
3. Check From Selection, then click OK. When a message box appears, click OK.
4. Choose Tools > Protect Document. Check Shapes, enter a password if you want, then click OK.

NOTE After you click OK, you won't be able to see your password, so make sure you memorize it or write it down.

A Lists characteristics you can lock on the selected shape. When an item is checked, the characteristic is locked against changes. You can choose as many of the characteristics as you want.

B Locks all Protect options.

C Unlocks all Protect options.



To unlock shapes so you can select them:

1. Choose Tools > Protect Document, then uncheck Shapes.
2. Choose Format > Protection, then uncheck From Selection.

To lock or unlock other shape behaviors:

1. Select the shape.
2. Choose Format > Protection.
3. Check the shape behaviors you want to lock or uncheck the behaviors that you want to unlock, then click OK.

TIP You can also use the SmartShape Wizard to lock shape behaviors. To run the wizard, choose Tools > Macro > Visio Extras > SmartShape Wizard. The SmartShape wizard is an installable option in the Visio Enterprise Setup program under Add-Ons – Supplementa for Standard Components.

Saving files as read-only to prevent changes

When you base a drawing on a template, or open a stencil separately, the stencil opens as read-only by default. That way, if you share a stencil you created with other Visio users, they can't accidentally change masters on your stencil. However, unless you save the stencil as read-only, other users have the option to open it in read/write mode by choosing Original in the Open section of the Open Stencil dialog box.

To prevent others from changing an original stencil, template, or drawing file you create, you can save it as read-only. If a Visio Enterprise stencil, template, or drawing file is saved as read-only, you can open a copy of the file for editing, but the only way to change the original file is to reset the file properties through Windows. For details about resetting the file properties through Windows, see your Windows documentation.

To save a file as read-only:

1. Open the file and make the appropriate window active. For example, if you're saving a stencil, open the original stencil, then click the stencil window title bar.
2. Choose File > Save As.
3. For Save In, navigate to the folder in which you want to save the file.
4. For File Name, type a file name for the read-only file.
5. For Save As Type, choose the type of file you want to save, for example, Stencil (*.vss).
6. Under Save, check Read Only.
7. Click Save.

TIP After you have saved a file as read-only, to make the file read/write again, use the Save As command to save the file with another name.

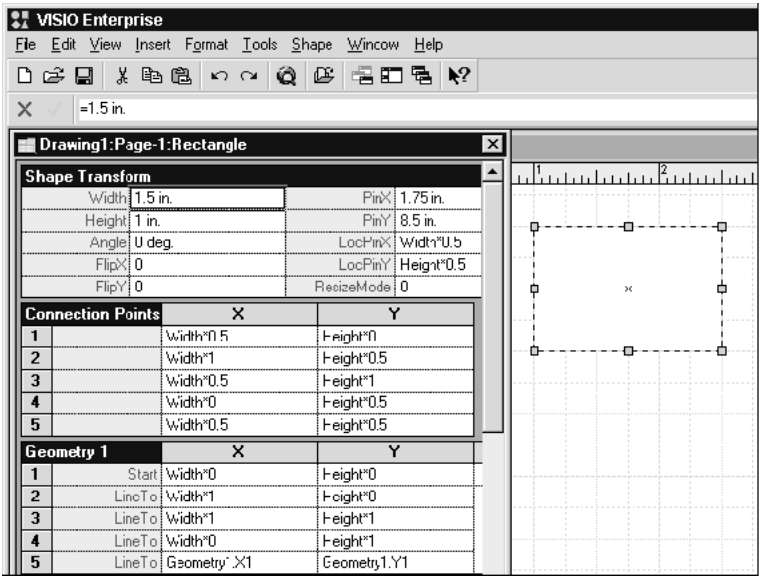
To open a copy of a read-only file:

1. Choose File > Open.
2. Select the file icon for the read-only file you want to open.
3. Under Open, check Copy, then click OK.

Working in the ShapeSheet window

When you want to create specialized shapes that model the behavior and appearance of the real-world objects they represent, you can write “smart” formulas in the ShapeSheet window.

You can view each Visio Enterprise shape or shape you draw in the ShapeSheet window to see the formulas that determine how the shape behaves. When you make changes to a shape on the drawing page, you update its ShapeSheet formulas. You can also make changes directly in the ShapeSheet window, where you have more precise control over a shape’s appearance and behavior. For example, you can add formulas that create a control handle, change a shape’s fill color if it reaches a certain size, or make one shape’s behavior dependent upon the behavior of another shape on the drawing page.



The ShapeSheet window contains sections, each of which controls part of the shape. Each section contains cells with formulas, which further define the shape’s properties and attributes. For example, the Connection Points section contains cell formulas that represent the x- and y-coordinates of each connection point on the shape.

To display a shape in the ShapeSheet window:

- Select the shape, then choose Window > Show ShapeSheet.

TIP To find what a ShapeSheet cell does, select a cell in the ShapeSheet window, then press F1.

Once you’ve created specialized shapes, you can make the shapes part of a drawing solution by storing them on new stencils and distributing the shapes and stencils in a template, as described earlier in this chapter.

Working with Automation

You can take advantage of the open architecture in Visio Enterprise to solve graphics problems and create custom solutions. Open architecture means that Visio Enterprise exposes its objects, such as windows, drawing pages, shapes, layers, menus, and toolbars, through a well-structured Automation interface. Using a development environment that supports Automation, you can write programs to control Visio Enterprise objects. For example, you can automatically update drawings you create from data that changes from day to day or automate routine shape development tasks that you perform over and over.

To write the programs, or macros, that control Visio Enterprise objects, you can use the fully licensed version of Microsoft Visual Basic for Applications (VBA) that comes with Visio Enterprise, or you can use Visual Basic, C/C++, or any other Automation controller.

Visio Enterprise includes a type library—a file that contains Automation descriptions of the objects, properties, methods, events, and constants that Visio Enterprise exposes to Automation controllers. Object types can help you write code more effectively because you can view Visio Automation descriptions in and copy code templates from the Object Browser.

To open the Visual Basic Editor and create, debug, or run VBA programs:

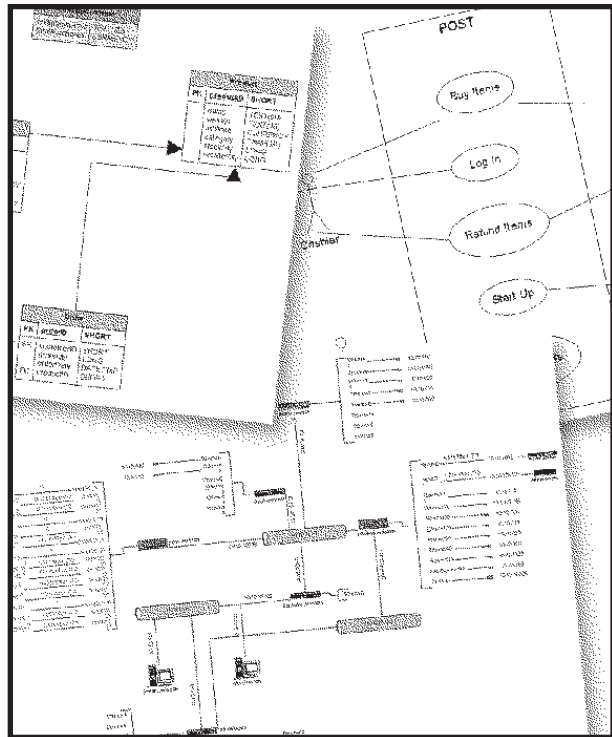
- Choose Tools > Macro > Visual Basic Editor. Or press Alt+F11.

For details about using the Visual Basic Editor, refer to *Developing Visio Solutions* or search online help for “Visual Basic Editor.”

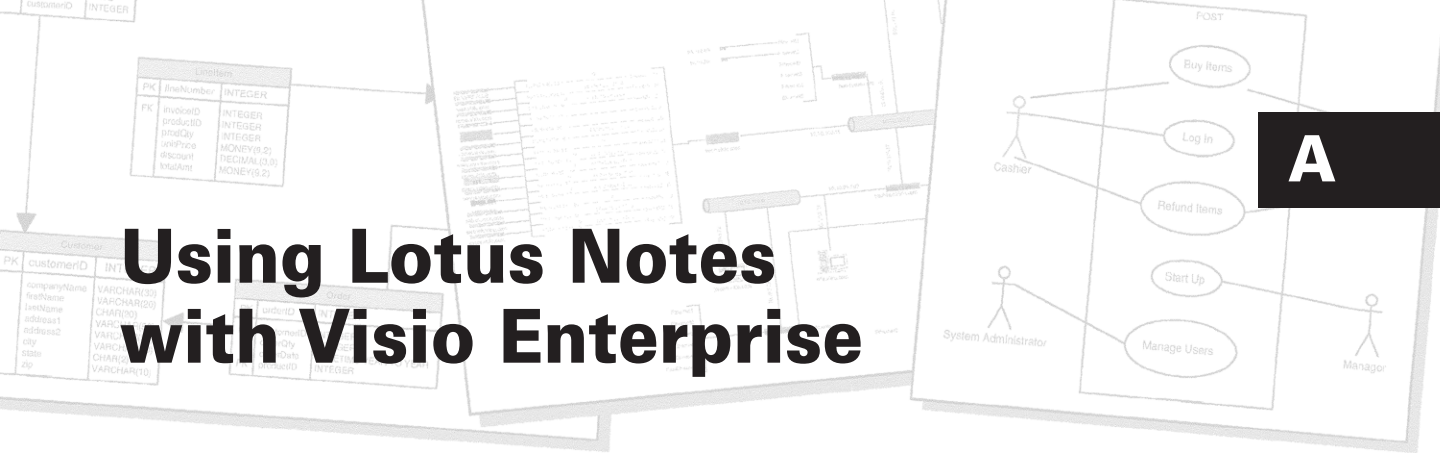
Resources for developing solutions

Developing Visio Solutions contains everything you need to know about using Visio products as a development platform, including sample code and tips and techniques. In addition, you can view the online Automation Reference by choosing Help > Automation Reference in Visio Enterprise.

You can also visit the Visio Solutions Development section of the Visio Corporation Web site (<http://www.visio.com/devweb/>), where you can learn more about Visio Enterprise as a development platform and find other developer resources.



Appendixes



Using Lotus Notes with Visio Enterprise

Visio® Enterprise supports a two-way exchange of data with Lotus Notes. You can

- Write Visio Enterprise data from a shape, a custom formula, or the Properties dialog box to a Lotus Notes field.
- Read data from a Lotus Notes field and display it in Visio Enterprise.

For example, in a timeline, you can have a Lotus Notes date field automatically update the Visio Enterprise timeline. Visio Enterprise and Lotus Notes can interact in more complex ways as well to track enterprise processes, such as writing and prototyping specifications. For example, in Lotus Notes, you can embed a Visio Enterprise diagram for each process. Then you can create a table that shows only the titles of the processes (which is data you wrote from Visio Enterprise to Lotus Notes). Anyone who needs to see the process can click the flowchart's title to see the embedded diagram. Then, to edit it, the user can double-click the embedded diagram to start Visio Enterprise.

Because of the way Lotus Notes and Visio Enterprise interact, incompatibilities can arise when one of the programs is 32-bit and the other is 16-bit. The following combinations are compatible:

- 32-bit Visio products and 32-bit Lotus Notes 4.x on any 32-bit Microsoft Windows platform.
- 32-bit Visio products and Lotus Notes 3.x on Windows 95. (This combination is not compatible on Windows NT 3.51.)

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Writing data from Visio to a Lotus Notes field

You can pass data from a Visio Enterprise diagram to a Lotus Notes database field. Each field in Lotus Notes that contains Visio Enterprise data is based on either the Visio Enterprise diagram's Properties dialog box, a shape, or a custom formula.

NOTE Make sure the fields in both programs have exactly the same name.

To include Visio Enterprise data in a Lotus Notes field:

1. In Lotus Notes, set up the fields you want to fill in with Visio Enterprise data.
Note the names of these fields. You will use them in Visio Enterprise.
2. Choose Insert > Object, then insert a Visio Enterprise drawing.
You can create a new Visio Enterprise drawing or insert an existing file.
3. If the Lotus Notes fields are not based on the drawing's Properties dialog box, add the shapes that will be associated with the Lotus Notes fields.
4. For each shape that will be associated with a Lotus Notes field, select the shape, then choose Format > Special.
Note the Shape ID. You'll use it in step 8.
5. Choose Insert > Lotus Notes Fields, then, for Field Name And Direction, type a name for the field that exactly matches the name of the field you defined in Lotus Notes.
6. Check Write To Notes.
7. For Data Type, select the type of data you want to exchange: Text, Time, or Number.
8. If you select Text under Data Type, type the Shape ID from step 4. The data you write to Lotus Notes can be the shape's name, text, copyright, or data you enter in the Data 1, 2, and 3 sections of the Special dialog box.
If you select Time or Number, enter a custom formula in the Custom Formula box.
9. Click Add, then click OK.

Here is an example that uses the Number data type (in step 8 above). In the equation below, "sheet.1" is a shape representing an office plan's perimeter. The office plan is set up in inches. The formula multiplies the width and height of the walls, then divides that total by 144 to get the square footage of the office.

```
=(sheet.1!Width*sheet.1!Height)/144
```

To include the Visio Enterprise Properties dialog box data in a Lotus Notes field:

- In Lotus Notes, use field names that correspond with settings in the Visio Enterprise Properties dialog box (File > Properties). The Visio Enterprise drawing's properties are then automatically included.

The Properties dialog box fields are Title, Subject, Author, Manager, Company, Category, Keywords, Description, and Hyperlink Base.

Displaying Lotus Notes data in Visio Enterprise

You can read data from a Lotus Notes database field, then display it in a Visio Enterprise diagram. You can also use the Lotus Notes field data in formulas.

TIP You may want to lock the Visio Enterprise shape in which you place data from Lotus Notes so that users cannot edit it. For details, see “Protecting shapes and files” in Chapter 11, “Creating Custom Solutions.”

To display data from Lotus Notes in Visio Enterprise:

1. In Lotus Notes, set up the fields you will read into Visio Enterprise.
Note the names of these fields. You will use them in Visio Enterprise.
2. In Visio Enterprise, open or create a drawing with which you want to exchange data with Lotus Notes.
3. Choose Insert > Lotus Notes Fields, then, for Field Name And Direction, type a name for the field that exactly matches the name of the field you defined in Lotus Notes.
4. Check Read From Notes.
5. Under Data Type, select the type of data you want to exchange: Text, Time, or Number.

For Number, choose the units for the number (such as centimeters) so that the user knows how to interpret the number. For example, a number might represent inches or centimeters; the distinction for the user may be very significant.

6. Click Add, then click OK.
7. Follow one of the next procedures to either insert the Lotus Notes field in a shape as a text field or insert it in a shape's ShapeSheet® view.

To insert a Lotus Notes field in a shape as a text field:

1. Select the shape in which you will insert the Lotus Notes data.
2. Press F2 to open the shape's text block, then place the insertion point where you want to insert the data.
3. Choose Insert > Field.
4. Under Category, select Lotus Notes Field. Under Field, select the specific Lotus Notes field. Under Format, select the way you want to view the data, then click OK.

Data is passed between Visio Enterprise and Lotus Notes when the programs are started, so the next time you open this Visio Enterprise drawing file, these fields will include data from the Lotus Notes field you inserted.

To insert a Lotus Notes field in a shape's ShapeSheet view:

1. Select the shape, then choose Window > Show ShapeSheet.
2. Select the cell in which you want to insert the Lotus Notes field, place the insertion point in the formula bar, then choose Insert > Function.
3. Under Select Function, choose LOTUSNOTES, then click OK.
4. In the formula bar, for "notename," type the name of the Lotus Notes field.

Data is passed between Visio Enterprise and Lotus Notes when the programs are started, so the next time you open this Visio Enterprise drawing file, the ShapeSheet window will include data from Lotus Notes.

To display help for a cell while working in the ShapeSheet window, select a cell, then press F1. For details about working in the ShapeSheet window, refer to *Developing Visio Solutions*.

Wizards and other tools

Wizards and other automated tools in Visio® Enterprise create special drawing types from scratch, automate routine tasks, and perform unique functions.

When you open certain templates, such as the Project Timeline Wizard Template, a wizard that you can use to create the drawing starts automatically. When you open other templates, Visio Enterprise adds a command you can choose to start a wizard to the top of the Tools menu. For example, when you open the Organization Chart 98 Template, Visio Enterprise adds a command so that you can choose Tools > Organization Chart Wizard.

Regardless of the template you start with, you can run any wizard or automated tool by choosing Tools > Macro > Macros.

TIP You can display background information about certain wizard screens by clicking the More Info button on the screens.

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Visio Enterprise wizards

<i>Wizard</i>	<i>What it does</i>	<i>How you run it</i>
Advanced Discovery Wizard	Locates devices in an enterprise network and creates a database with the network information. This wizard allows you to customize the discovery process to specifically include and exclude network devices. Available only when using the AutoDiscovery And Layout template.	AutoDiscovery > Discover > Advanced Discovery
Basic Discovery Wizard	Locates devices in an enterprise network and creates a database with the network information. Available only when using the AutoDiscovery And Layout template.	AutoDiscovery > Discover > Basic Discovery
Build Region Region	Assembles selected geographic shapes into a region. For use with the Geographic Maps Template.	Tools > Macro > Maps > Build
Chart Shape Wizard	Creates stackable and extendable shapes you can use to add special effects to charts.	Tools > Macro > Business Diagram > Chart Shape Wizard
Custom Properties Editor	Edits, adds, or deletes custom-property fields from masters.	Tools > Macro > Custom Properties Editor
Database Export	Generates a database table that reflects the data in custom-property and other ShapeSheet® cells.	Tools > Macro > Database > Database Export
Database Wizard	Links Visio shapes and drawings to databases created in ODBC-compliant database programs. After establishing links, you can pass information between a drawing and database, create drawings that represent database tables, and generate new masters that represent data stored in database records.	Tools > Macro > Database > Database Wizard
Export [data]	Exports an inventory report based on shape properties. The Export [data] command is available in the Network Diagram, Office Layout, and Organization Chart Templates.	Tools > Export [data]
Flowchart-TQM Diagram Wizard	Guides you through the process of laying out and formatting a Cause/Effect, Force Field, Top Down, or Cross-Functional (Rummler-Brache) diagram.	Tools > Macro > Flowchart > Flowchart-TQM Diagram Wizard
Generate Wizard	Generates a database schema or DLL script for a target DBMS. Available only when using the Database Model template.	Database > Generate
Office Layout Wizard	Guides you through the process of setting the drawing scale, choosing the page size and orientation, and creating the basic wall structure for an office layout diagram.	Tools > Macro > Business Diagram > Office Layout Wizard

Table continued on next page.

<i>Wizard</i>	<i>What it does</i>	<i>How you run it</i>
Organization Chart 98	Generates an organization chart from a data file in Microsoft Excel (.xls), Org Plus (.txt), or comma- or tab-delimited text (.txt) format, or from a database table created in an ODBC-compliant program. Or, generates a basic organization chart structure into which you can add data.	Tools > Macro > Business Bonus Pack > Organization Chart 98 Wizard
Page Layout Wizard ¹	Automates setting up the drawing page size, orientation, and scale. Assists you in adding a title block and border to the pages in a new or existing drawing.	Tools > Macro > Visio Extras > Page Layout Wizard
Print ShapeSheet ²	Opens the Print ShapeSheet dialog box, where you can choose which ShapeSheet sections to print and whether to print the ShapeSheet sections to a printer, the Clipboard, or a file.	Tools > Macro > Visio Extras > Print ShapeSheet
Project Timeline Wizard	Generates a project timeline from a data file in Microsoft Excel (.xls), comma- or tab-delimited text, or Microsoft Project Exchange (.mpx) format. Or, generates a project timeline structure into which you can enter data.	Tools > Macro > Business Diagram > Project Timeline Wizard
Property Reporting Wizard ¹	Generates inventory reports, such as bills of materials or equipment and furniture inventories, and numeric reports, such as cost totals or averages, from data stored in shapes.	Tools > Property Report
Report Wizard	Creates formatted reports about a data model. Available only while using the Database Model template.	Database > Report
Reverse Engineer Wizard	Generates a data model of the schema of a database. Available only when using the Database Model template.	Database > Reverse Engineer
Shape Explorer ²	Locates specific shapes and stencils in Visio products. You can open stencils and templates from within Shape Explorer™.	Tools > Macro > Shape Explorer
SmartShape Wizard ²	Customizes the appearance or behavior of a selected shape's text, connectors, notes, or protection.	Tools > Macro > Visio Extras > SmartShape Wizard
Stencil Report Wizard ²	Generates a Visio drawing of the masters on a selected stencil.	Tools > Macro > Visio Extras > Stencil Report Wizard
Update Database Wizard	Synchronizes a data model with a physical database, then alters the database to match the model. Available only while using the Database Model Template.	Database > Update
Update Model Wizard	Synchronizes a data model with a physical database. Available only while using the Database Model Template.	Database > Model > Update

¹ An installable option. In the Visio Enterprise Setup program, this wizard is a Standard Component option under Add-Ons – Typical.

² An installable option. In the Visio Enterprise Setup program, this wizard is a Standard Component option under Add-Ons – Supplemental.

Importing other file formats

When you import data into a Visio® Enterprise drawing, it exists in Visio Enterprise only as a picture. That is, the only editing capabilities you have are resizing, repositioning, and cropping.

To do this, you export the other program's file to a format Visio Enterprise can import. When you export, the file's data is directed through a filter, which translates it and saves it to a separate file in a different format. Then, when you import the file into the Visio Enterprise drawing, Visio Enterprise uses a filter to translate the data and display the file.

Because the data can go through up to two translations before it appears in the Visio Enterprise drawing—one when you export from the other program, and one when you import into the Visio Enterprise drawing—the picture may not look exactly the way it does in the original program.

To import a non-Visio Enterprise file as a graphic image:

1. Display the Visio Enterprise drawing that you want to import the graphic into, then choose Insert > Picture.
2. Under Files Of Type, select the file format you want to import, under File Name, type the path and file name of the file you want to import, then click Open.

If you don't know the path and file name, you can look for the file in the Look In section of the dialog box.

In Visio Enterprise, you can import files in over 20 formats. For a complete list, in the Picture dialog box, see the list under Files Of Type.

Most files you import into Visio Enterprise drawings as graphic images appear as metafiles. However, bitmap files, such as .dib, .bmp, .pcx files and so on, remain bitmaps in the Visio Enterprise drawing.

With some vector-based graphics, such as Adobe Illustrator (.ai), CorelDRAW! (.cdr), Encapsulated PostScript (.eps), and Micrografx Designer (.drw) files, lines may appear jagged in the Visio Enterprise drawing. You may get better results with these file formats if you convert rather than import them. For details, search online help for “converting files.”

For most files you import, Visio Enterprise displays an import settings dialog box, where you can specify how you want the imported file to appear in a drawing. For example, if you're importing a file in .pct format, you can specify whether to retain gradients and background and how to translate colors.

NOTE For details about importing ERwin® and VisioModeler™ files while working in the Database Model solution, refer to *Modeling in Visio Enterprise*.

Automation A means by which an application can incorporate or extend the functionality of another application by using its objects. See also *object*, *OLE*.

Background A page that appears behind another page in a drawing. Shapes on a background are visible from the foreground page, but you cannot select or edit shapes on the background unless it is active. See also *active page*, *drawing page*, *foreground page*.

Beginning point The selection handle at the beginning of a 1-D shape. The beginning point is marked by an ×. Also called *begin point*.

Bitmap An image stored as a pattern of dots. A scanned photograph or graphic created in a paint program is stored as a bitmap.

Center of rotation See *pin*.

Chord A line that connects the endpoints of an arc.

Connection point A point on a shape to which a connector can be glued. Each connection point is marked with a blue × when Connection Points is checked on the View menu.

Connector A 1-D shape designed primarily to connect other shapes. See also *1-D shape*.

Control handle A handle that controls a shape's behavior in special ways. For example, a control handle can adjust the roundness of a shape's corners, reshape an arrow, or drag a connector directly out of a 2-D shape. Control handles have ToolTips. Pause the pointer over a control handle to see the tip explaining what the handle does. See also *2-D shape*, *handle*.

Control point 1. The circular handle that appears on a line, arc, or spline (or a line, arc, or spline segment) when it is selected with the pencil tool. You can drag a control point to change the curve of an arc or ellipse. 2. A point that influences the curve of a spline segment. See also *spline*.

Coordinates A pair of numbers that indicates the position of a point in relation to the origin of a shape, a group, or the page. The *x*-coordinate indicates the horizontal position, and the *y*-coordinate indicates the vertical position. This information appears in the ShapeSheet window. See also *origin*.

Custom color A color in Visio Enterprise that is stored with the shape as an RGB or HSL value rather than as an index to the document's color palette. A custom color is saved only with the shape to which it is applied.

Custom property User-specified data associated with a shape. For example, a shape that represents an engine part could have custom properties that identify its part number, price, and number of items in stock.

Docked stencil A stencil that is attached to the drawing window and moves when the drawing window moves. By default, stencils are docked on the left side of the window. You can make stencils float, or you can dock them on the right side of the drawing window. See also *floating stencil*, *stencil*.

Drag and drop drawing Creating an instance of a master in a drawing by dragging the master from a stencil and dropping it on a drawing page. See also *master*, *stencil*.

Drawing All the shapes on a foreground page together with all the shapes on any assigned backgrounds.

Drawing file A file that stores one or more Visio drawings. By default, drawing files have the file extension .vsd.

Drawing file stencil See *local stencil*.

Drawing page The printable area in a drawing window that contains a drawing. A page can be either a foreground page or a background page. Each page has a size, which usually corresponds to a standard paper size, and it has a scale. See also *background*, *foreground page*.

Drawing scale The ratio of a page scale to a specified number of drawing units, such as 10 cm = 1 m. See also *page unit*.

Drawing unit Unit of measurement that reflects the actual size of shapes represented in a Visio Enterprise drawing. For example, in an architectural drawing that uses the scale 1 mm = 1 m, the drawing unit is meters. See also *page unit*.

Drawn shape A shape created using the Visio Enterprise drawing tools.

Drop shadow A shadow that appears to be behind and offset from a shape.

Dynamic glue A type of glue behavior in which the endpoint of a connector can move from one connection point to another as connected shapes are moved. See also *glue*, *static glue*.

Eccentricity handle The circle that appears at each end of a dotted line when a control point of an elliptical arc is selected with the pencil tool. Moving an eccentricity handle changes the angle and magnitude of an arc's eccentricity. See also *handle*.

Embed To create a static copy of an object from one application, called the server application, in a file of another application, called the container application, through the OLE protocol, or to create an embedded object in place in a container application. Changes made to the original object file, if there is one, have no effect on the embedded object in the container application. See also *link*, *object*, *OLE*.

Ending point The selection handle at the end of a 1-D shape. The ending point is marked by a +. Also called *end point*. See also *1-D shape*.

Endpoint Either of the selection handles that appear at the beginning or end of a selected 1-D shape. The endpoint at the beginning of the shape (beginning point) is marked by an X. The endpoint at the end of the shape (ending point) is marked by a +.

Event An occurrence, such as a mouse being double-clicked or a shape being moved or resized, that the shape can detect and respond to by initiating an action.

Expression A combination of constants, operators, functions, and references to ShapeSheet cells that results in a value. See also *formula*, *number-unit pair*, *ShapeSheet window*.

Field A placeholder in text that displays current (automatically updated) information, such as dimensions, dates, and times, in a specified format. A field can also read information from Lotus Notes.

Fill The color and pattern inside a closed and filled shape. The default fill is solid white.

Floating stencil A stencil that appears in a separate window that is always on top of other Visio windows. By default, stencils are docked on the left side of the drawing window. You can make stencils float, or you can dock them on the right side of the drawing window. See also *docked stencil*, *stencil*.

Foreground page The top page of a drawing. Shapes on the foreground page appear in front of shapes on any background pages assigned to the drawing. While a background is active, the shapes on the foreground are not visible. See also *background*, *drawing page*.

Format 1. To affect the appearance of a shape (such as the thickness and color of its lines, the color and pattern inside the shape, and its font) either by using a style or by applying individual attributes. 2. The appearance of a shape. See also *attribute*, *style*.

Formula An expression that is entered in a ShapeSheet cell, which returns a value. See also *expression*, *number-unit pair*, *ShapeSheet window*.

Formula bar The portion of the ShapeSheet window in which you enter a formula for the selected ShapeSheet cell.

Glue Shape behavior that causes one shape to stay connected to another, even if the shape to which it is glued moves. Gluing is a directional operation: If shape A is glued to shape B, shape B is not automatically glued to shape A. See also *dynamic glue*, *static glue*.

Grid Nonprinting horizontal and vertical lines displayed at regular intervals on the page. The grid makes it easier to align shapes and position them precisely. See also *origin*, *snap*.

Grid lines The faint vertical and horizontal lines that appear in the drawing window when the grid is turned on.

Grid origin The point that defines the layout of grid lines on the drawing page. A vertical grid line and a horizontal grid line pass through the grid origin, and all other grid lines are drawn at specified intervals from these reference lines. By default, the grid origin is the lower left corner of the drawing page.

Group A shape composed of one or more shapes. A group can also include other groups and objects from other applications. A group can be moved and sized as a single shape, but its members retain their original appearance and attributes. A group's members can be edited individually in the group window, without ungrouping the group.

Guide A visual reference line that can be dragged into the drawing window to help position and align shapes precisely. A horizontal guide is dragged from the horizontal ruler, a vertical guide from the vertical ruler. Guides do not print. See also *guide point*, *snap*.

Guide point A visual reference point that can be dragged into the drawing window to help position shapes precisely. A guide point is dragged from the upper left corner of the drawing window, where the horizontal and vertical rulers meet. Guide points do not print. See also *guide*, *snap*.

Handle A control that appears when you select a shape. You can use handles to edit a shape. Handles vary according to the shape you select and the tool you use to select it. For example, when you select a shape with the pointer tool, the shape displays selection handles that you can drag to change its size and proportions. When you select a shape with the rotation tool, the shape displays rotation handles that you can drag to rotate the shape. See also *control handle*, *eccentricity handle*, *rotation handle*.

Instance 1. A shape that is based on a master. When you drag a master from a stencil onto the drawing page, the shape on the drawing page is an instance of the master. 2. A running image of a Windows application. See also *master*.

Layer A named category of shapes. You can organize shapes in your drawing by assigning them to layers. You can selectively view, edit, print, or lock layers, as well as control whether shapes on a layer can be snapped to or glued to.

Link To establish a dynamic link from an object from one application, called the server application, to a file of another application, called the container application, through the OLE protocol. When changes are made to the original file, you can update the link so that the most recent version of the object appears in the linked file. See also *embed*, *object*, *OLE*.

Local coordinates The coordinate system whose origin is the lower left corner of a shape's width-height box. The geometry of a shape is expressed in local coordinates. See also *origin*, *page coordinates*.

Local formatting Line, fill, and text formatting that is applied to a shape in preference to formatting it has inherited from a master or from a previously applied style. Local formatting of a shape overrides the formatting applied to the master of which the shape is an instance. If a style is applied to the shape on the drawing page, the formatting in the style overrides local formatting unless you specifically preserve local formatting.

Local formula A formula that is stored locally in a cell of a shape instead of being inherited from a master or a style. A local formula overrides the formula in the corresponding cell in a master. If the cell normally inherits its formula from a style, the formula overrides the local formula unless you explicitly preserve local formatting. Also called *local override*.

Local stencil A stencil stored in a drawing or template file, which contains a copy of any master ever used on any page in the file. Masters on the local stencil are used to display their instances in the drawing file. Customizing a master on the local stencil changes all the instances of that master within the file. Also called *drawing file stencil*. See also *drawing file*, *stand-alone stencil*, *stencil*.

Lock A setting that limits the ways that users can change a shape. For example, a lock on a selection handle prevents the user from resizing a shape using the selection handle.

Macro A VBA program that extends Visio Enterprise through Automation references to Visio objects, methods, and properties.

Master A predefined shape contained in a stencil. You drag and drop a master from a stencil onto a drawing to create an instance of the master. Also called *master shape*. See also *drag and drop drawing*, *instance*.

Master icon A representation of a master that appears on a stencil. You select a master by clicking its icon.

Master shape See *master*.

Nonperiodic spline A spline with defined endpoints. If a spline's beginning point and ending point coincide, the spline is closed. See also *periodic spline*, *spline*.

Number-unit pair An expression that includes a number and a corresponding dimension. For example, "1 cm" is a number-unit pair. See also *expression*, *formula*.

Object 1. Information created in one application and imported into another application. 2. A program element that an application makes available to OLE container applications for linking and embedding. Objects in Visio Enterprise are hierarchically related as specified in the Visio object model. See also *Automation*, *embed*, *link*, *OLE*.

Object linking and embedding See *OLE*.

OLE A Windows protocol that makes it possible to link or embed an object created in one Windows application, called the server application, into a document created in a different Windows application, called the container application. See also *Automation*, *embed*, *link*, *object*.

Origin The (0,0) point of a Cartesian coordinate system. In Visio Enterprise, the origin is always the lower left corner of the coordinate system of a shape, group, or page. See also *coordinates*, *grid origin*, *local coordinates*, *page coordinates*.

Page See *drawing page*.

Page coordinates The coordinate system whose origin is the lower left corner of a drawing page. See also *coordinates*, *origin*.

Page sheet The ShapeSheet representation of a page. See also *ShapeSheet window*.

Page unit Unit of measurements that reflects the size of shapes as drawn on a Visio drawing page. For example, in an architectural drawing that uses the scale 1 mm = 1 m, the page unit is millimeters. See also *drawing scale*, *drawing unit*.

Path A series of contiguous line, arc, or spline segments. A shape can have more than one path. See also *segment*.

Periodic spline A closed spline with no defined endpoints. See also *nonperiodic spline*, *spline*.

Pin The point around which a shape or text block rotates. When you select a 2-D shape with the rotation tool, its pin is marked by a circle with a plus sign inside it. A shape's pin defines the shape's location on the drawing page. Also called *center of rotation*.

Primary shape The first selected shape in a multiple selection. When a multiple selection is merged using a shape operations command such as Combine, the formatting of the primary shape is applied to the new shape. See also *selection*.

Range of eight A rule for handling instances of masters whose scale is different from that of the drawing page. If the ratio of a master's drawing scale differs from that of the drawing page by less than a factor of eight, the instance is scaled appropriately for the drawing page. Otherwise, the instance is antiscaled. See also *antiscaling*.

Resize To change the dimensions of a shape.

Rotation handle A circular handle that appears at a corner of a shape's selection rectangle when you select the shape with the rotation tool. Dragging a rotation handle changes the shape's angle of rotation. See also *handle*.

Segment A line, arc, or part of a spline. Most shapes are composed of a path made up of several segments.

Selection The focus of the next action. Selected shapes display handles. Selected text is highlighted. See also *primary shape*.

Selection handle One of the handles that appear on a selected shape. The appearance and behavior of selection handles depend on the tool that was used to make the selection.

Selection rectangle The dotted line that surrounds a shape or an object from another application to indicate that it is selected.

Shape 1. An open or closed object that is created using the Visio drawing tools or commands. 2. A grouped collection of shapes. 3. An instance of a master dropped in a drawing. 4. In a program, any item represented by a Shape object—a shape, group, guide, or guide point, or the page sheet of a drawing page or a master.

ShapeSheet window A spreadsheet-like view of a shape, group, guide, guide point, page, or object from another application. For example, in the ShapeSheet window for a shape, the shape's dimensions, angle of rotation and center of rotation are shown as well as the styles that determine the shape's appearance. The ShapeSheet window can contain formulas that define how an object behaves when it is moved or sized and how it responds to events. See also *expression*, *formula*.

Shortcut menu The menu opened by right-clicking a shape. Visio Enterprise shapes often have special behaviors accessible through the shortcut menu.

SmartShapes® symbol A shape with custom formulas to control its behavior.

Snap The behavior of a shape that automatically aligns itself with the nearest guide, guide point, or grid line. See also *grid*, *guide*, *guide point*.

Spline A freeform curve that is based on a polynomial equation. See also *control point*, *nonperiodic spline*, *periodic spline*.

Stacking order The order in which shapes overlap other shapes on the page.

Stamp To create an instance of a master with the stamp tool.

Stand-alone stencil A Visio stencil file that is normally opened as read-only to supply masters to a drawing file. A stand-alone stencil has the file extension .vss. See also *local stencil*, *stencil*.

Static glue A type of glue behavior in which the endpoint of a connector remains fixed to a particular connection point, no matter how the shape to which it is glued moves. See also *dynamic glue*, *glue*.

Stencil A collection of masters that you can drag and drop into a drawing. See also *docked stencil*, *drag and drop drawing*, *floating stencil*, *local stencil*, *stand-alone stencil*.

Style A named collection of attributes that defines a shape's text, line, and fill formats. You can use a style to apply a set of attributes to a shape with a single action. See also *attribute*, *format*.

Subdivision The division between grid lines and between intervals of the ruler. The choices are Fine, Normal, and Coarse.

Subselect To select individual shapes within a group.

Template A Visio file that opens one or more files and windows and can contain styles and settings for a particular kind of drawing, for example, the appropriate scale and grid. You can create a new drawing that has a template's styles and settings by opening the template file. Template files have the file extension .vst.

Text block The text area associated with a shape that appears when you click the shape with the text tool or text block tool, or when you select the shape and start typing. You can size, move, and rotate a text block with respect to the shape.

Tile 1. To print oversized drawing pages on multiple sheets of paper so they can be assembled into a complete drawing. 2. To arrange open windows side by side in the Visio Enterprise main window.

Toolbar A row of boxes, buttons, and tools that appears below the menu bar in the Visio Enterprise window.

ToolTip Descriptive text that appears in a box when you pause with the mouse pointer over an item on the toolbar, a master icon on a stencil, or a control handle on a shape.

Unscaled drawing page A drawing page whose drawing scale is 1:1. See also *drawing page*, *drawing scale*.

Vertex A point on a path that defines the beginning or end of a segment. Vertices appear as diamond-shaped handles when you select a shape with the pencil tool.

Wizard An add-on that prompts the user for information and then performs specific tasks based on that information. For example, the Organization Chart 98 Wizard automatically creates an organization chart.

Workspace 1. An option in the Save As dialog box that when checked saves not only the content of a drawing file, but also the arrangements of all open stencils and other windows, so that they also open when you reopen the drawing file. 2. A file that contains a list of files and windows to be opened, as well as the size and location of the windows. Workspace files have the file extension .vsw.

Zero point 1. The location of the 0 on the horizontal or vertical ruler. 2. The point in the drawing window where the zero points of each ruler intersect. By default, the zero point is the lower left corner of the drawing page.

Zoom The degree of magnification of a drawing in the drawing window. A zoom of 100% (or Actual Size) displays the drawing at the same size it will be when it is printed, unless you reduce or enlarge the printed output in the Print Setup dialog box.

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