NodeBuilder® Resource Report Generator User's Guide

Release 1
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www.echelon.com

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Introduction

The NodeBuilder Resource Report Generator is a NodeBuilder Resource Editor plug-in that helps you create reports that document resources that you select. You can create reports for standard and user-defined network variable types (NVTs), configuration property types (CPTs), enumeration types, and functional profiles. The report generator converts the resource definitions that you select to extensible markup language (XML) format. The report generator includes an extensible stylesheet language transformation (XSLT) that allows a Web browser or any other application that supports XSLT to format the data in the XML report. You can modify the XSLT files to create custom reports for your resource data. You can host and view reports on your computer, or you can host your reports on a Web server for remote, multi-user access. You can see examples of hosted reports created by the report generator at **types.echelon.com** and **types.lonmark.org**.

In addition to viewing reports with a Web browser, you can easily convert reports into Microsoft Word documents, and with XSL or JavaScript knowledge, convert reports into text, RTF, PDF, or any other format.

2

Getting Started

The following section provides you with information on how to set up your computer to view, generate, and maintain resource reports.

System Requirements

To generate reports, you need a computer with the NodeBuilder software and Internet access (optional). To view reports, you only need a computer with a Web browser (Internet Explorer 6.0 or later).

Software

Before installing the Report generator, you should have the following software programs installed on your computer:

- NodeBuilder software version 3.1 or later (required)
- Internet Explorer 6.0 or later (required for viewing reports)
- A compression utility such as WinZip for opening downloaded support files(recommended)

Hardware

If you want to host reports on a Web server, your computer should be connected to the Internet. An Internet connection is required for downloading software updates, hosting and accessing remotely hosted reports, and viewing the LONMARK® Web site for support information.

Report Generator Updates

For the latest report generator updates, visit **http://www.echelon.com /downloads/**.

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Viewing Reports

This section describes how to view and analyze reports. A description of the report structure is also provided.

Report Structure

Each report created by the report generator contains a single HTML page that serves as an *index page*. This page, also known as the *root index*, contains links to pages with report data that describes network variable types, configuration property types, functional profiles, and enumeration types. The root index is also linked to an XSLT stylesheet.

Each report page may also contain links to the LONMARK Web site, or to other sites on your local network or the Internet. The LONMARK Web site at types.lonmark.org provides a report for the standard resources, and it provides utilities that may be referred to by resource reports. For example, if your design contains the SCPTbypassTime configuration property type, the report can link to the LONMARK Web site to show details of this configuration property type. The SCPTbypassTime variable is based on the SNVT_time_min network variable type.

Hint: For a practical experience, you may launch your Microsoft Internet Explorer and point it to **types.lonmark.org** to view the standard resource report.

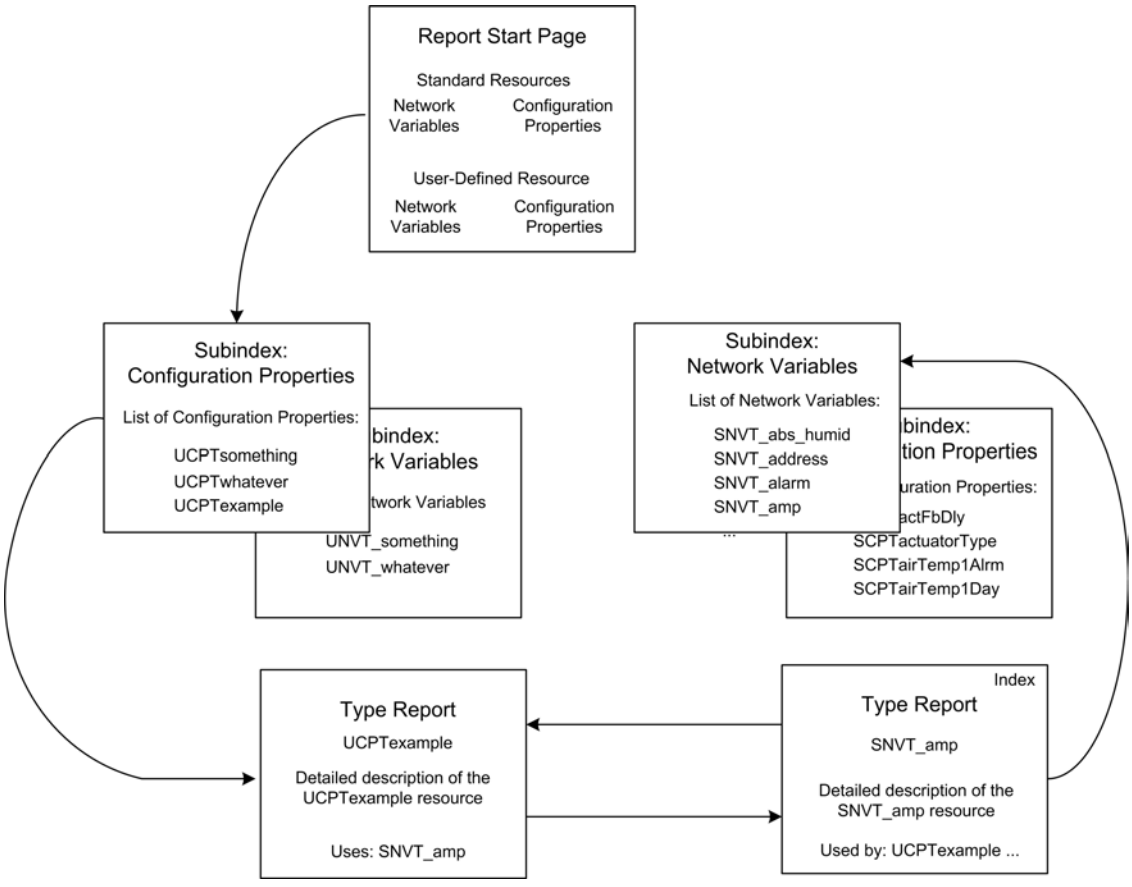
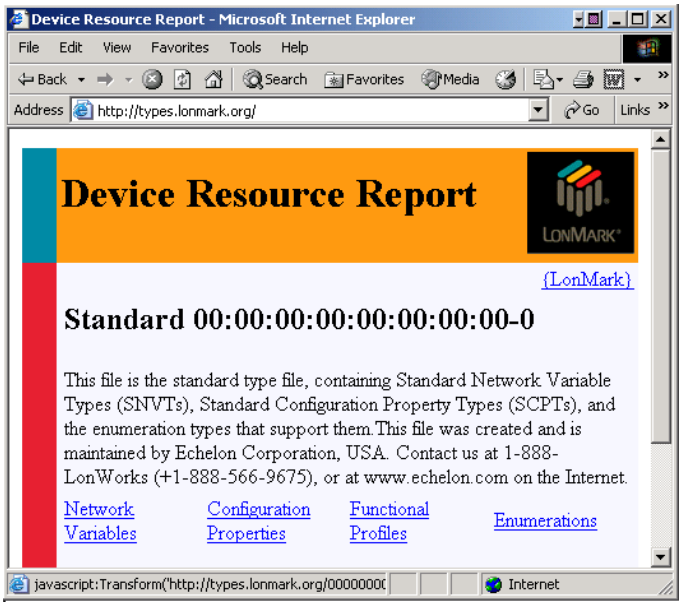


Figure 3.1 Report Structure

Navigation

The resource report resembles a Web page and navigating through a report is much like navigating through a Web site. To view a report, launch your Web browser and open the report index page. For example, point your browser to types.lonmark.org to view the following report.



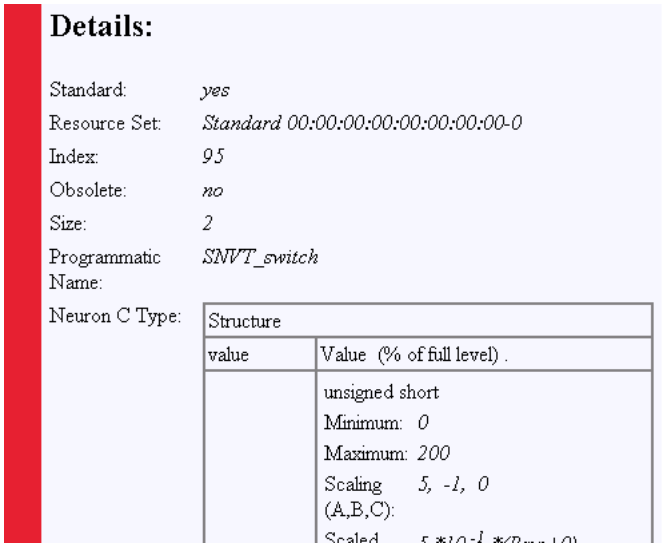
In addition to using your Web browser to navigate through a report, each report page may contain navigation options that allow you to perform a variety of functions. Table 3.1 describes these functions.

Table 3.1 Resource Report Navigation Functions

Navigation Item	*Description*
Root	Brings you back to the main report page (or root index)
Show All	Lists all report items on a single page
Contact	Links to the resource file set developer
LonMark	Links to the LonMark Web site
Search box	Allows you to perform a specific search on the report page in the reported items by typing a name fragment
Print	Prints the current report page

Reading Reports

Each resource is listed on its own page and contains detailed information about its type, attributes, related formats, and other useful information. The report page may also list all resources referenced by the reported resource as well as those resources that refer to the reported resource.



Details:

Standard:	*yes*
Resource Set:	*Standard 00:00:00:00:00:00:00:00:00-0*
Index:	*95*
Obsolete:	*no*
Size:	*2*
Programmatic Name:	*SNVT_switch*
Neuron C Type:	Structure

value	Value (% of full level) .
	unsigned short Minimum: *0* Maximum: *200* Scaling (A,B,C): *5, -1, 0*

Note: Language string resources are not reported separately, but are used by the report pages in place of the appropriate references.

Saving and Converting a Resource Report

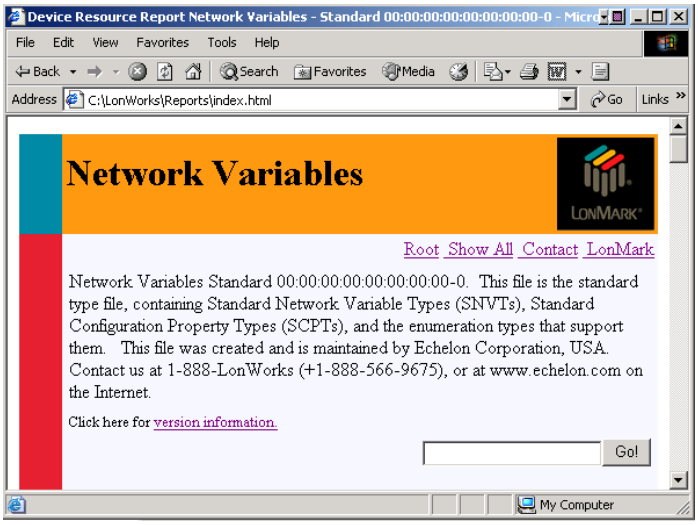
You can convert a resource report into a variety of formats including Word documents, PDF files, RTF files, or text files. You can then
e-mail, print, or archive these reports. For changing the appearance of a report or more complex format conversions, see the *Customizing Report Presentations* section.

Saving a Resource Report as a Word, RTF, or Text File

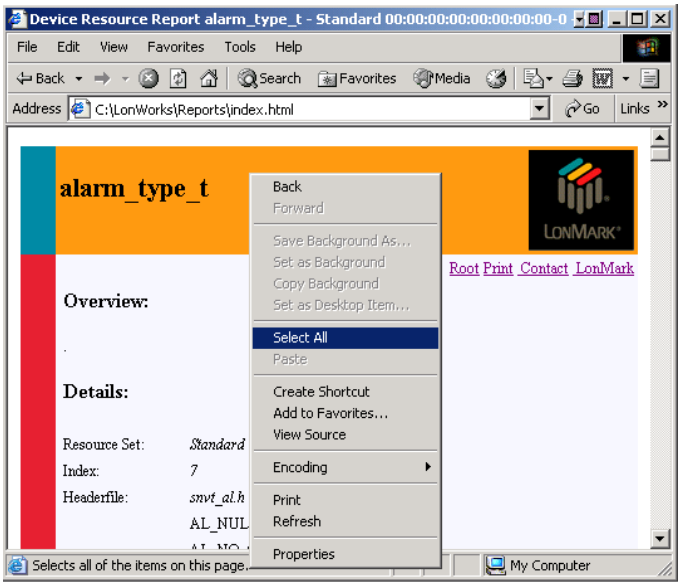
You can save a resource report as a Microsoft Word, RTF, text file, or other word processing document. To save a resource report as a word processing document, follow these steps:

1. Open an existing report with your browser. See the *Generating Reports Locally and for Hosting* section for instructions on how to generate a report.

2. Navigate to the desired section (Network Variables, Configuration Properties, Functional Profiles, or Enumerations) from the index page.



3. Select **Show All** from the report page. This displays all resources in that category (for example, all network variable types).
4. Right click the page and choose **Select All**.



5. On the **Edit** menu, click **Copy**.
6. Start a word processing application that supports HTML content such as Microsoft Word.
7. Create a new document. For example, on the Word **File** menu, click **New**.
8. Paste the clipboard into the new document. For example, on the Word **Edit** menu, click **Paste**. The report contents appear with formatting intact.
9. Repeat steps 2 through 8 for each section (**Network Variables**, **Configuration Properties**, **Functional Profiles**, or **Enumerations**) from the root directory to save an entire report. You can skip steps 6 and 7 and use the same document for all sections.
10. Save the new document. For example, on the Word **File** menu, click **Save As**.
11. Enter a file name and select the appropriate file type from the **Save as Type** list.

12. Click **Save**.

Saving a Resource Report as a PDF File

You can convert a resource file to an Adobe Portable Document Format (PDF) file, using Adobe Acrobat or any other tool capable of generating PDF documents. For example, to convert a Word format resource report to PDF format, follow these steps:

1. Follow the procedure described above in the *Saving a Resource Report as a Word, RTF, or Text File* section. Use Microsoft Word as save the file in Word format.
2. On the **Acrobat** menu, click **Convert to Adobe PDF**. The Acrobat software converts the report to PDF.

Printing a Resource Report

You can print a resource report. Depending on the resources contained within your report, the printed output may be very large. For example, a report of all standard resources will contain over 500 pages. For large reports, hosting a report on a Web server or creating a report CD may be better alternatives to printing a report. If you choose to print a full report, the following guidelines will assist you in conserving paper while still promoting readability.

Printing a Single Resource Definition

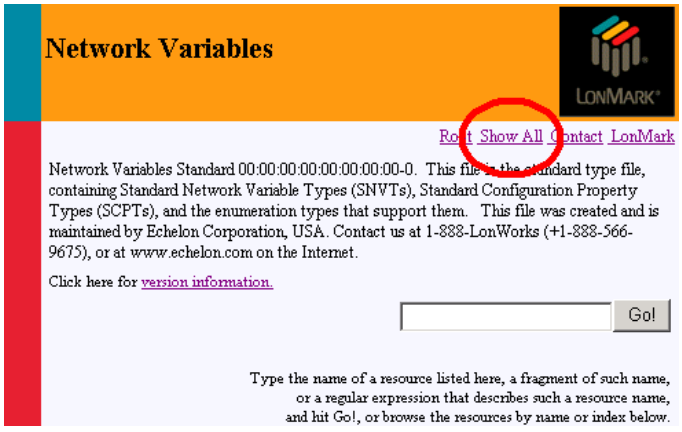
To print a single resource report page, perform the following steps:

1. Navigate to the desired resource definition from the index page in the report.
2. Select **Print** from the resource report page or open the **File** menu and then click **Print**. The print dialog box appears.
3. Click **Print**.

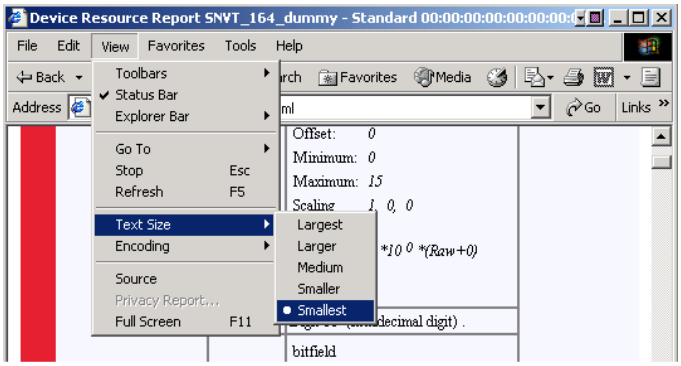
Printing a Section

To print an entire section, perform the following steps:

1. Navigate to the desired section from the root directory.
2. Select **Show All** from the report page. This displays all resources associated with your section.



3. On the **View** menu, point to **Text Size**, and then click **Smallest**. This compresses the size of the Web page text and significantly reduces the page count of your report.



4. On the **File** menu, click **Print Preview**. The **Print Preview** screen appears.
5. Click **Print**. The **Print** dialog box appears.
6. Click the **Layout** tab.
7. Select the **Landscape** orientation.
8. Specify **2 Pages Per Sheet**.
9. Click **Print**.

This report may contain several hundred pages.

4

Resource Report Generator Wizard

The NodeBuilder Report Generator Wizard provides a simple, easy-to-use interface for generating resource reports. The wizard allows you to control many aspects of the generated report.

The wizard guides you through the process of generating a resource report. An explanation of each wizard page is provided below.

Generating a Resource Report

You can create a resource report using the NodeBuilder Resource Report Generator Wizard. To generate a report, follow these steps:

1. Start the NodeBuilder Resource Editor as described in Chapter 7 of the *NodeBuilder User's Guide*.

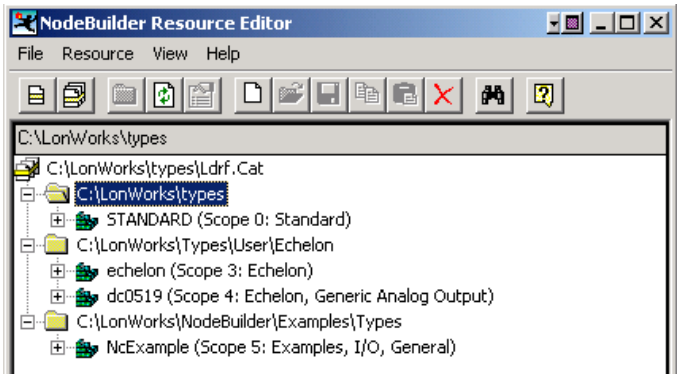
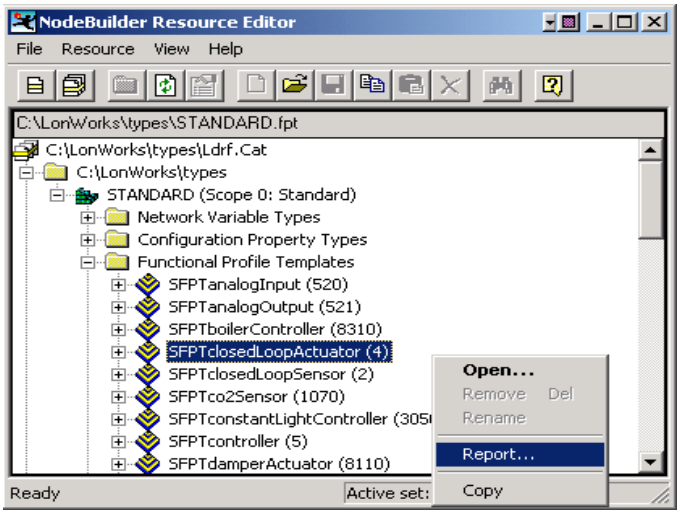


Table 4.1 provides a brief description of the functionality of the Resource Editor.

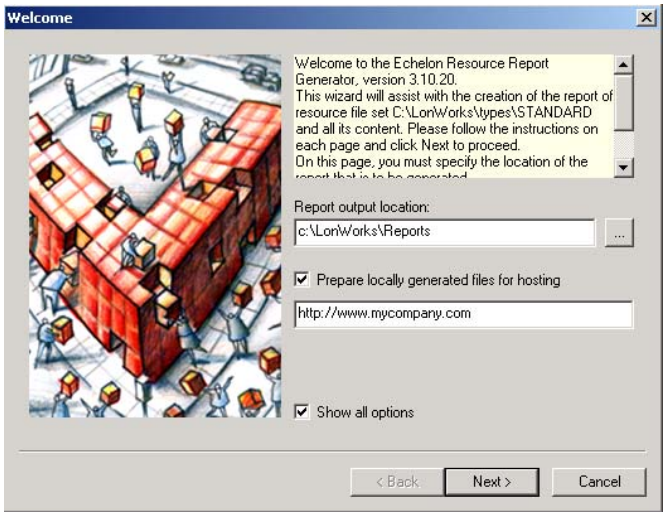
2. Right-click the resource catalog, a resource folder, a resource file set, or an individual resource definition, and then click **Report** on the shortcut menu. The wizard appears and allows you to generate a resource report for the resource or resources that you selected. If you selected the resource catalog, the wizard creates a report for all resource definitions contained within your resource catalog.



The following sections describe the individual pages on the wizard.

Welcome Page

You can choose the report output destination folder and prepare reports for hosting using the **Welcome** page.



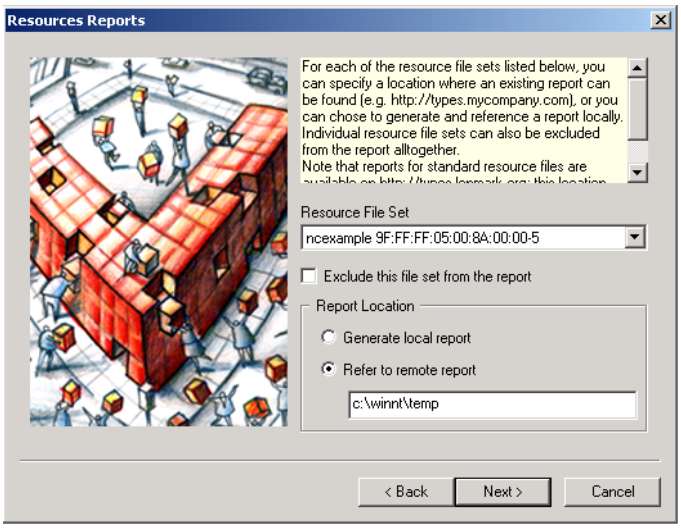
Set the options as described in Table 4.2 and then click **Next**.

Table 4.2 Welcome Screen Control Options

Item	*Description*
Report Output Location	Specifies the location of the output folder in this box. This is the folder is where the generated report is be stored.
Prepare Locally Generated Files for Hosting	Enabling this option formats the report for posting at a specified URL. The default setting is cleared. See the *Generating Reports Locally and for Hosting* section for more information.
Show All Options	Shows all pages of the report wizard screen. Clear this checkbox to skip directly to the **Finish** page with the last report settings intact. The default setting is set. You must visit each wizard page at least once for this option to become enabled.

Resource Reports Page

You can specify the location of the resource report using the **Resource Reports** page. You can specify a location on a local computer, your local network, or an Internet address. By default, resource reports are generated for your computer.



Set the options for each resource file set as described in Table 4.3, and then click **Next**. To set the options for a resource file set, select it in the **Resource File Set** list.

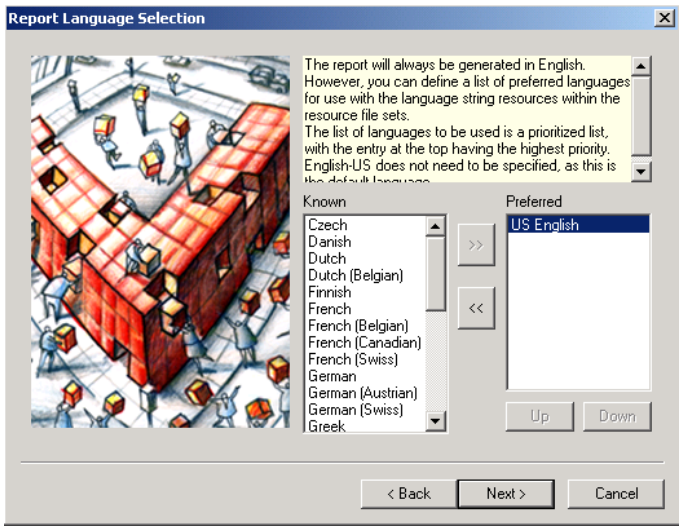
Table 4.3 Resources Reports Control Options

Item	*Description*
Resource File Set	Lists all available resource file sets available and shows their name, program ID and scope selector value. Selecting a resource file set displays the **Report Location** for the selected set.
Exclude this File Set from the Report	Excludes a resource set from the report. Set this checkbox when a file set is still being constructed, and you do not want to include it in your report. This checkbox is cleared by default.
Generate Local Report	Specifies that the resource report will be stored on your computer's file system and promotes viewing of the report without an active Internet connection. This checkbox is set by default.
Refer to Remote Report	Specifies that the resource report will link to a previously generated resource report via the Internet. For example, you can generate the standard resource file set locally or have your report link to the LONMARK Web site. Note that you cannot change the remote hosting location of the standard resource report. However, you can provide a valid URI for non-standard resource reports.

Report Language Selection Page

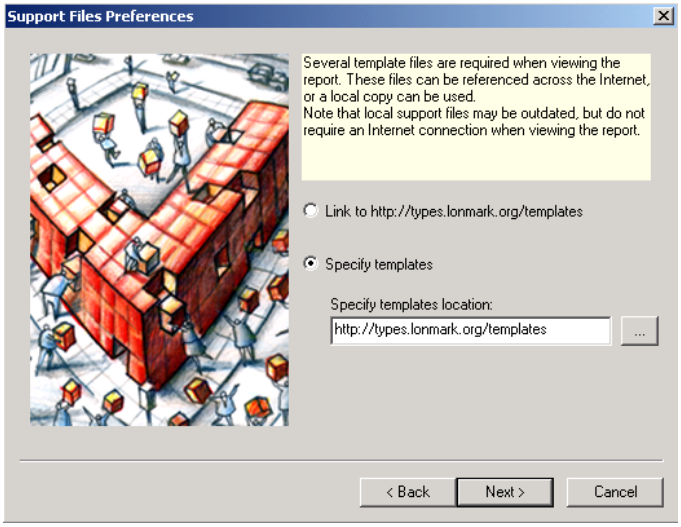
You can choose between 29 different report languages using the **Report Language Selection** page. You can define a list of preferred languages for use with the language string resources within the resource file sets. The default setting is U.S. English. The language selection only affects language resources obtained from the resource files. Other details (such as column headers and field labels) in the report are presented in U.S. English.

You can specify multiple languages using the **Preferred** list. The report displays as much information in the first preferred language as possible. If information is unavailable in the first preferred language, the report displays information in the second preferred language, and so on.



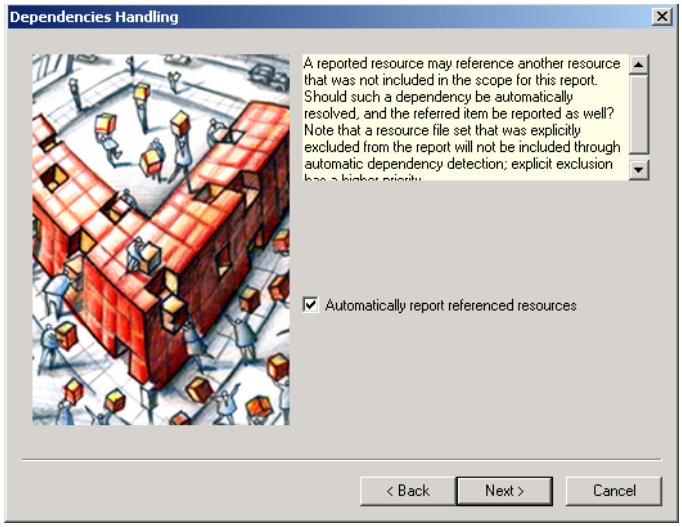
Support Files Preferences Page

You can specify the location of the support files that are required to view a report using the **Support Files Preference** page. These files can be located in the Templates folder on your computer or referenced over the Internet. This page allows you to choose between using a local copy of the Templates folder or linking to the standard Templates folder on **http://types.lonmark.org/templates** (default setting). Local template folders may become outdated, but allow you to view resource reports without an active Internet connection.



Dependencies Handling Page

You can include resource definitions for resources that are referenced by your report using the **Dependencies Handling** page. To include referenced resources, set the **Automatically Include Reports for Referenced Resources** checkbox. For example, if you have a UNVT that references an enumeration type defined within the same resource file set, then setting this checkbox automatically adds the enumeration type definition to the report. References to occurrences in other resource file sets are included as well. If you exclude resource file sets from your report, the new report omits references to those sets. Clear this checkbox to only include resource file references without links in the new report. The default setting is set.

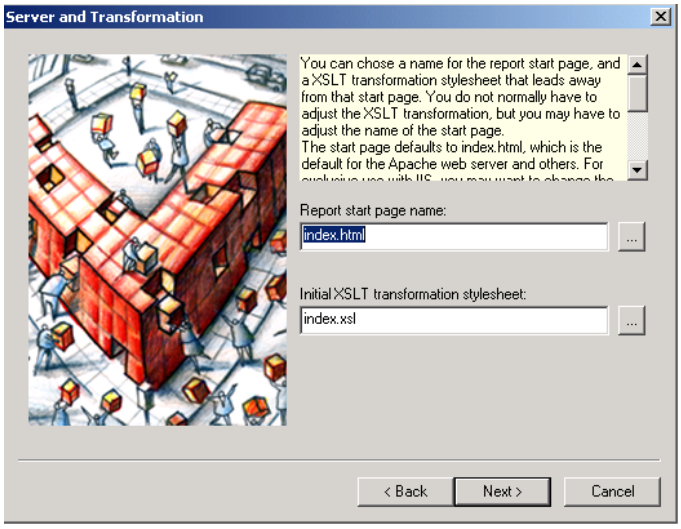


Server and Transformation Page

You can specify the index page file name and the transformation stylesheet on the **Server and Transformation** page. The default names are **index.html** and **index.xsl**.

For viewing local reports, you may enter any index page name with an .html or .htm file extension in **Report Start Page Name**. When preparing the resource report for hosting, you should change the default page name to suit your Web server software. The Microsoft Internet Information Server (IIS) software works best using **default.htm** as the file name. The Apache Web server software works best using **index.html**. Other Web server software may have other naming conventions for default pages, please consult your Web server user's guide for details.

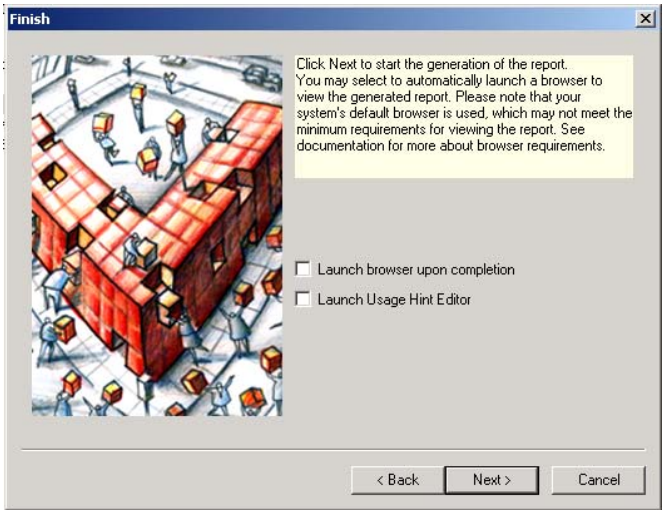
If you are not providing your own transformation stylesheets, use the default name **index.xsl** in **Initial XSLT Transformation Stylesheet**. See the *Customizing Resource Reports* section for more information.



Finish Page

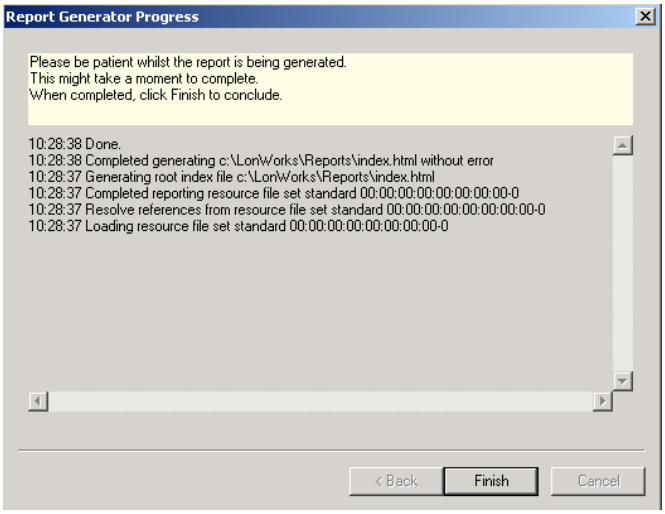
You can generate your report using the options that you specified in the wizard using the **Finish** page. Set the **Launch Browser upon Completion** checkbox to start your browser with the newly generated report. If you set this checkbox and your report does not display properly, you may need to update your browser. For browser requirements, see *Getting Started*.

Set the **Launch Usage Hint Editor** checkbox to enter or edit *usage hints* that provide additional descriptive information for your resource definitions. See *Providing Supplementary Information* for information on how to use usage hints.



Report Generator Progress Window

The **Report Generator Progress** window displays the status of your report while the report is being created. Depending on the complexity of your report, this process may take several minutes. The window displays report status and any errors or warnings that occur. Upon completion, the report generator starts your Web browser and/or the Usage Hint Editor if you selected these options. Click **Finish** to exit the report generator. For more information about errors and warnings, see the *Resource File Validations* section. See the *Viewing Reports* section for information on interpreting report information.



5

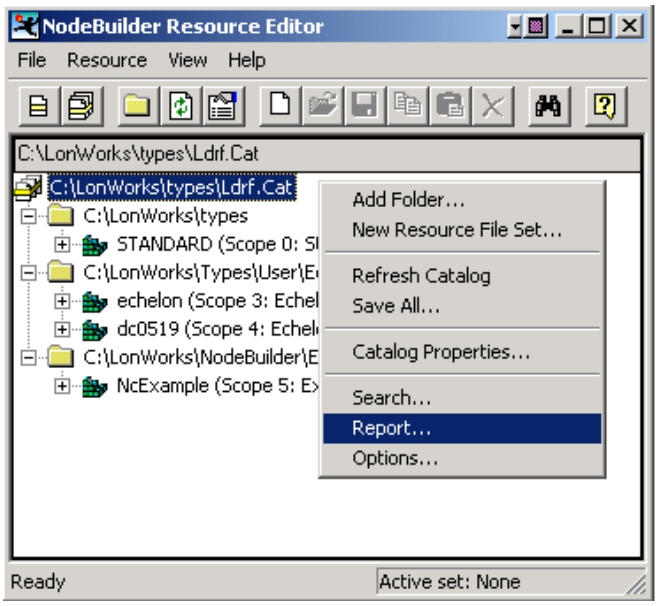
Generating Reports Locally and for Hosting

You can prepare resource reports for local use and for hosting on a server. Locally stored reports remain secure and do not require an Internet connection for viewing. Hosted reports allow viewing by multiple users with Internet or intranet access. You can convert resource reports into Word or PDF documents. For information on converting a resource report, see *Viewing Reports* and *Customizing Report Presentations*.

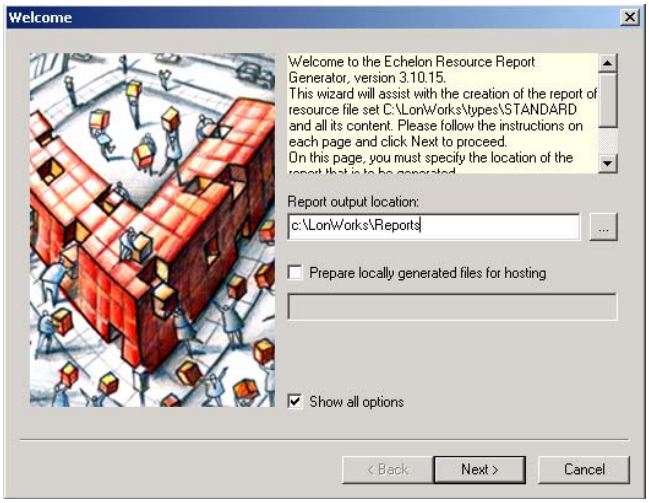
Generating a Local Report

You can generate and view a report on your local hard disk. To generate a local report, follow these steps:

1. Start the NodeBuilder Resource Editor as described in Chapter 7 of the *NodeBuilder User's Guide*. The NodeBuilder Resource Editor window appears.
2. Right-click the resource catalog file at the top of the resource catalog, and then click **Report** on the shortcut menu. The report generator **Welcome** window appears.



3. Type a directory name in **Report Output Location**. For example, type "C:\MyReports\Reports."

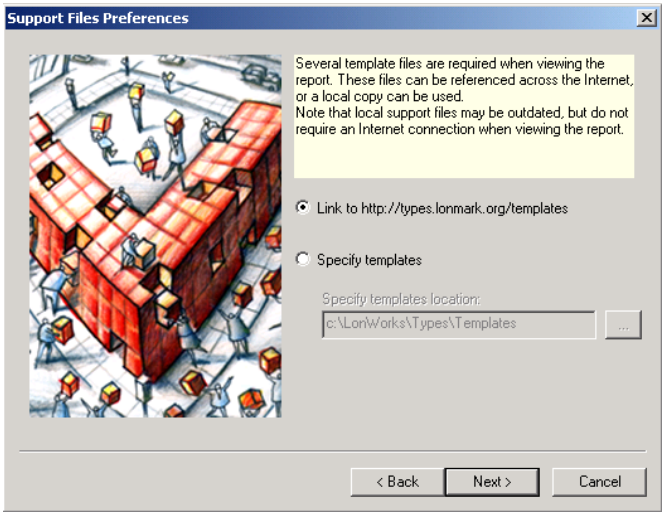


4. Clear the **Prepare Locally Generated Files for Hosting** check box.
5. Set the **Show All Options** check box (this is the default setting).
6. Click **Next**. The **Resources Report** window appears.

7. Select a resource file set from the **Resource File Set** list.
8. Choose whether or not you want to exclude any file sets from your report with the **Exclude this File Set from the Report** check box. You can use this option to leave out file sets that are under development.
9. Set the **Generate Local Report** check box in **Report Location**.
10. Repeat steps 7, 8, and 9 for each resource file set listed in the **Resource File Set** list.
11. Click **Next**. The **Report Language Selection** window appears.

Note: The standard resource file set report (standard 00:00:00:00:00:00: 00:00-0) is available at **types.lonmark.org**. For this file set, you may choose to generate a local report or refer to the LONMARK Web site by setting **Refer to Remote Report**. Unlike user file sets, you cannot change the standard file set's hosting location. File set data hosted on **types.lonmark.org** is updated regularly and may be more recent than data stored on your hard disk.

12. Select the preferred report language or languages.
13. Click **Next**. The **Support Files Preferences** window appears.
14. Select your support files preference. The support files include templates that are required to view a report. You can link to support files on the LONMARK Web site, or you can link to local copies of the support files.



Set **Link to http://types.lonmark.org/templates** to reference support files on the LONMARK Web site. This option is the default setting and provides you with updated reference files, but requires an Internet connection for viewing the report. Set **Specify Templates** to use support files stored on your hard disk or a remote location. The report generator installs a set of support files in your LONWORKS Types\Templates directory (this is c:\LonWorks\Types\Templates by default). You can use these or create your own custom templates

15. Click **Next**.
16. Set or clear **Automatically Report Referenced Resources**. The default setting is set and is suitable for most reports.
17. Click **Next**.
18. Type names in **Report Start Page Name** and **Initial XSLT Transformation Stylesheet**.

The default names are **index.html** and **index.xsl**. For viewing local reports, enter any report start page name with an .html or .htm file extension. For **Initial XSLT Transformation Stylesheet**, use the default name unless you are providing your own transformation stylesheets. For more information on modifying transformation stylesheets, see *Customizing Report Presentations*.

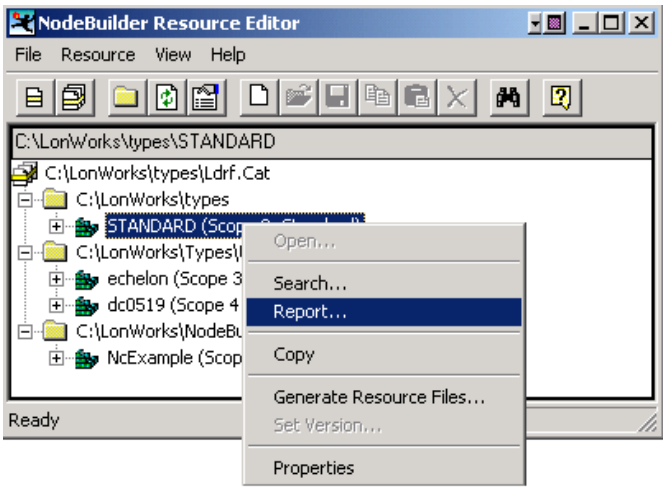
19. Click **Next**. The **Finish** window appears.
20. Set or clear **Launch Browser upon Completion** and **Launch Usage Hint Editor**. The default settings are clear.
21. Click **Next**. The **Report Generator Progress** window appears and report data is generated.
22. Click **Finish** to exit the report generator.

To view previously generated reports, go to the directory you specified in step 3. You do not have to run the Wizard again unless you wish to change your reporting preferences or you modified the reported resource data.

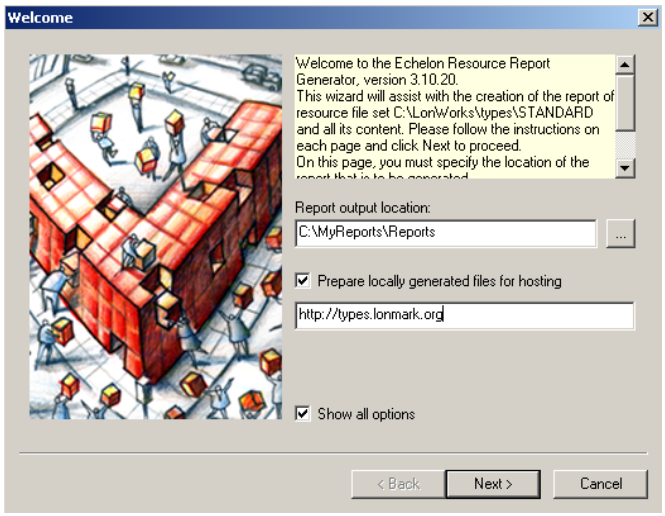
Generating a Report for Hosting

You can generate a report to be hosted on a Web server. This allows multiple users to view your report. The following procedure includes examples that describe how the standard resource report at **types.lonmark.org** was generated.

1. Start the NodeBuilder Resource Editor as described in Chapter 7 of the *NodeBuilder User's Guide*. The NodeBuilder Resource Editor window appears.
2. Right-click the **STANDARD (Scope 0, Standard)** resource file set, and then click **Report** on the shortcut menu. The report generator **Welcome** window appears.

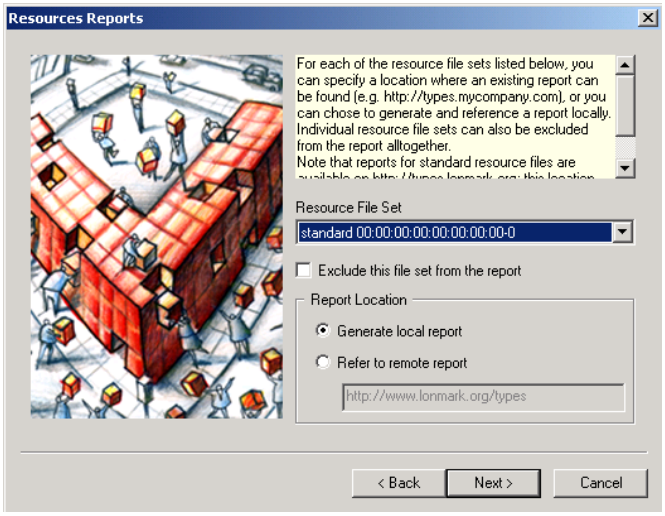


3. Type a directory name in **Report Output Location**. For example, type "C:\MyReports\Reports".



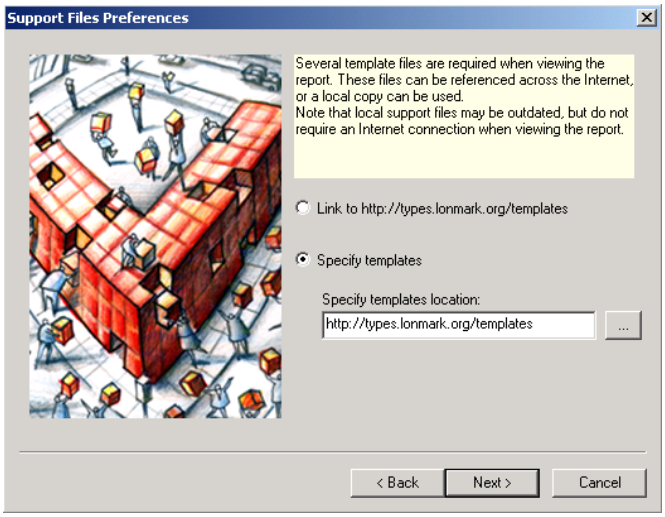
4. Set the **Prepare Locally Generated Files for Hosting** check box.
5. Type a base URL in the box (i.e., **http://types.lonmark.org**) as the host location.
6. Set the **Show All Options** check box (this is the default setting).
7. Click **Next**. The **Resources Report** window appears.
8. Select the standard resource file set (**standard 00:00:00:00:00:00:00:00-0**) from the

Resource File Set list. Preferences are ignored for all other file sets listed in the **Resource File Set** list.



9. Clear the **Exclude this File Set from the Report** check box.
10. Select **Generate Local Report** in **Report Location**. This report must be generated locally before posting.
11. Click **Next**. The **Report Language Selection** window appears.
12. Select the preferred language or languages. The default language is US English.
13. Click **Next**. The **Support Files Preferences** window appears.
14. Select **Specify Templates** and type the name of the location of the templates you wish to use (i.e., **http://types.lonmark.org/templates**). The default setting is a link to **http://types.lonmark.org/templates**.

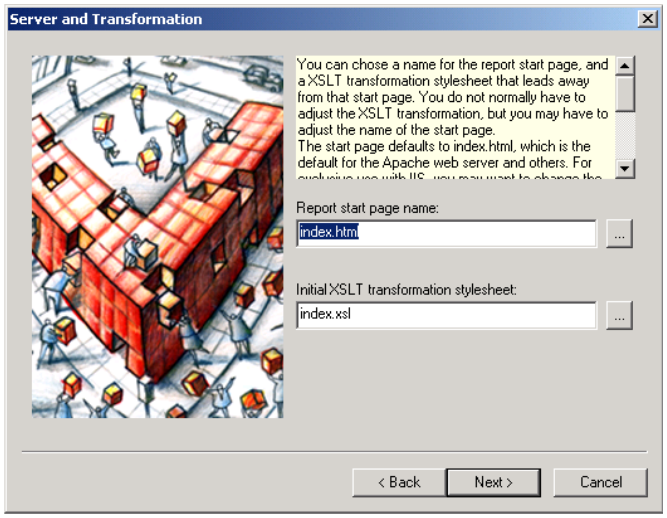
You can use local or remote (hosted) templates for local reports, but you must use hosted templates for reports generated for hosting.



15. Click **Next**.
16. Set or clear **Automatically Report Referenced Resources**. It is set by default, which is suitable for most reports.

17. Click **Next**.

18. Type names in **Report Start Page Name** and **Initial XSLT Transformation Stylesheet**.



Consult your Webmaster before setting the names of these fields. Typically, these pages are named **default.html**, **default.html**, or **index.html**. The Microsoft Internet Information Server (IIS) software works best using **default.htm**, and the Apache Web server works best with **index.html**. Other servers may require different names.

For **Initial XSLT Transformation Stylesheet**, use the default name (**index.xsl**) unless you are providing your own transformation stylesheets.

19. Click **Next**. The **Finish** window appears.

20. Set or clear **Launch Browser upon Completion** and **Launch Usage Hint Editor**. They are set by default.

21. Click **Next**. The **Report Generator Progress** window appears and the software generates report data. Your browser starts if you set **Launch Browser upon Completion**.

22. Click **Finish** to exit the report generator.

You can only view the report from the intended hosting location. The hosting location specified in the report setup is the only URI that can host your report.

23. Copy the contents of the report output folder (the location is specified in Step 4) and the entire Templates folder (a copy can be found in your LONWORKS Types\Templates directory—c:\LonWorks\Types\Templates by defult) for hosting. In this example, the report will be hosted on **http://types.lonmark.org**. Make sure that you preserve the hierarchy of the folders when you post the contents. If the hierarchy is not preserved, the report will not display properly. Consult your Web server administrator for details on hosting a report.

24. Verify access to the reports by launching a Web browser and opening the following URLs, substituting your report URL for **type.lonmark.org**. Ignore the presentation of the data, but make sure the browser does not report any errors.

http://types.lonmark.org
http://types.lonmark.org/templates/rrg.xsl
http://types.lonmark.org/templates/art/lonmark.gif
http://types.lonmark.org/0000000000000000-0/enums.xml

Note: This procedure only tests that the report was successfully hosted and that the links work properly. It does not verify each file of the report.

You must configure your Web server and firewall software to allow for serving XML files with ".xml" and ".xsl" file extensions and JavaScript source files with a ".js" extension.

To view previously generated reports, start your browser and go to the directory you specified in Step 4. You do not have to run the wizard again unless the resource file set has changed or you want to change your report preferences.

Verifying Hosted Reports

You can verify that a report has been hosted correctly and that the Web server and related infrastructure have been set up correctly. To do this, follow these steps:

1. View the hosted report from outside of the network (like a normal visitor would view the report). For example, if the report is hosted on a Web server that is protected by a firewall, connect from outside of the firewall.

2. Visit the start index page, e.g. **http://types.echelon.com**, and make sure the page displays correctly.

3. Visit at least one sub index for each resource file set listed on a start index page. For example, visit the list of network variables for the first reported resource file set, the list of configuration properties for the second one, and so forth.

4. Visit at least one detailed report for each type of reported resource. Make sure to view at least one network variable type report, one configuration property report, and so forth.

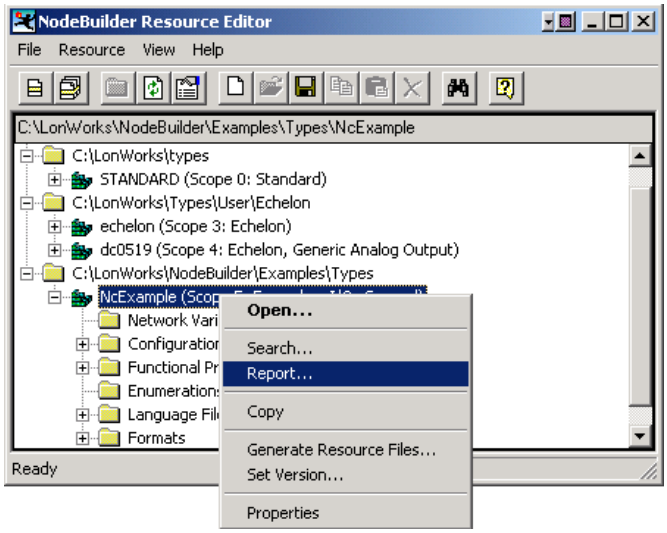
5. Follow at least one internal cross-reference (if applicable). For example, if the report contains a configuration property type that refers to a network variable type, and that network variable type is also hosted on the same server, make sure to view this configuration property type and follow the link to the network variable type.

6. Follow at least one external cross-reference (if applicable). For example, if the report contains a configuration property type that refers to a standard network variable type, and that standard network variable type is referred to on the standard location at **http://types.lonmark.org**, make sure to view this configuration property type and follow the link to the network variable type. Note that external references may not be bi-directional (the standard network variable type may not link back to your configuration property type), whereas internal references are.

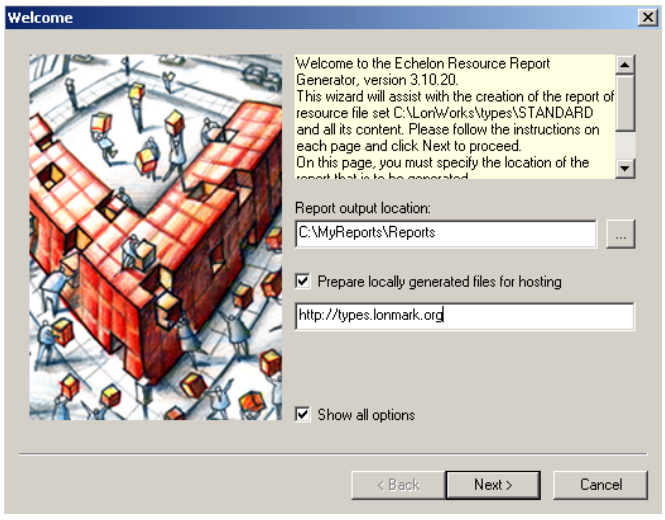
Hosting Reports for User-Defined Resources

This example shows you how to report generate and host user-defined, non-standard resource reports.

1. Start the NodeBuilder Resource Editor as described in Chapter 7 of the *NodeBuilder User's Guide*. The NodeBuilder Resource Editor window appears.
2. Right-click a user-defined resource file set and then click **Report** on the shortcut menu. The **Welcome** dialog appears.

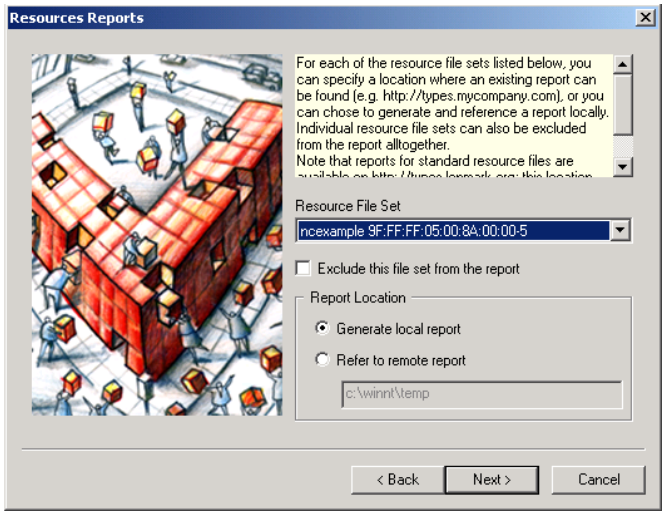


3. Enter a folder name in **Report Output Location**. For example: enter "c:\MyReports\Reports" to create reports in the c"\MyReports\Reports directory.



4. Set the **Prepare Locally Generated Files for Hosting** checkbox.
5. Type in a base URL in the box (e.g., **http://types.mycompany.com**) as the host location. This is the location you use for accessing the report once it has been generated.
6. Set the **Show All Options** checkbox (this is the default setting).

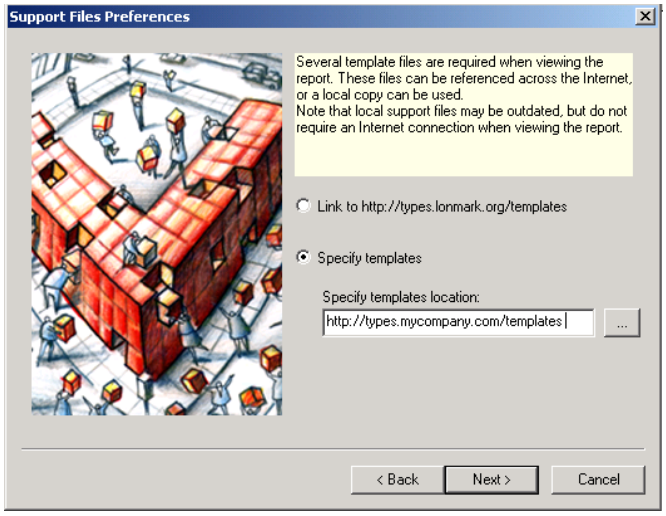
7. Click **Next**.
8. Set your reporting preferences for each resource file set listed in the **Resource Reports** page.
9. Choose whether or not you want to exclude any file sets from your report in the **Exclude this File Set from the Report** checkbox. This option is useful for leaving out file sets that are under development.



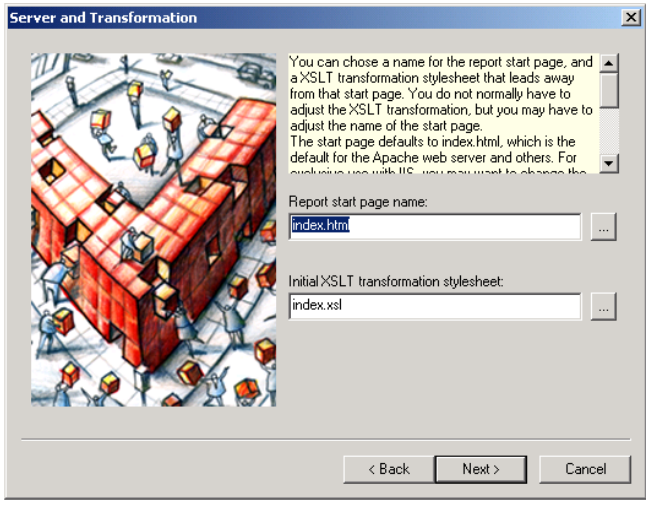
10. Set the **Generate Local Report** option in **Report Location**. You must generate a report before posting it.

Note: The standard resource file set (standard 00:00:00:00:00:00:00:00-0) is available at the **types.lonmark.org** Web site. For this file set, you should enable the **Refer to Remote Report** feature. You can change the standard file set's remote hosting location by generating the standard report locally and hosting it on your own Web server. The advantage of referencing **types.lonmark.org** is that the types.lonmark.org copy of the standard resource file set is automatically updated when a new standard resource file set is released.

11. Click **Next**. The **Report Language Selection** dialog appears.
12. Select the preferred language or languages. The default language is **US English**.
13. Click **Next**. The **Support Files Preferences** dialog appears.
14. To link to the standard templates on the LONMARK Web site, set **Link to http://types.lonmark.org/templates**. To link to your own server with custom templates or to a local copy of the templates, set **Specify Templates** and enter the name of the location of the templates you wish to use (i.e., **http://types.mycompany.com/templates** or any other location you wish to specify). The default setting is **Link to http://types.lonmark.org/templates**. If you are generating a hosted report, you must link to hosted templates, either at **http://types.lonmark.org/templates** or at your own server. If you are generating a local report, you can either use a local copy of the templates, link to hosted templates.



15. Click **Next**.
16. Clear the **Automatically Report Referenced Resources** checkbox if you do not want referenced resources to be included in the report. Referenced resources are included by default.
17. Click **Next**.
18. Enter a name for your report start page in **Report Start Page Name**. Consult your Webmaster before setting the start page name. Typically, these pages are named **default.html**, **default.html**, or **index.html**. The Microsoft Internet Information Server (IIS) software works best using **default.htm**, and the Apache Web server works best with **index.html**. Other servers may require different names.
19. Enter a name for an initial stylesheet in **Initial XSLT Transformation Stylesheet**. Use the default name (**index.xsl**) unless you are providing your own transformation stylesheets.



Configure your Web server and firewall software to allow for serving XML files with ".xml" and ".xsl" file extensions and JavaScript source files with a ".js" extension.

20. Click **Next**. The **Finish** dialog appears.
21. Set **Launch Browser upon Completion** to automatically start your browser upon completion of the wizard.

22. Set **Launch Usage Hint Editor** features to start the Usage Hint Editor upon completion of the Wizard. You can start the Usage Hint Editor at any time to create or edit usage hints.
23. Click **Next**. The Report Generator Progress window appears and the report generator generates your report data.
24. Click **Finish** to exit the report generator.
25. Copy the contents of the report output folder (the location that you specified in Step 3) and the entire Templates folder (you can find a copy in your LONWORKS Types\Templates folder—this is **c:\LonWorks\Types\Templates** by default) for to your Web server for hosting. Make sure that you preserve the hierarchy of the folders when you post the contents. If the hierarchy is not preserved, the report may not display properly.
26. Verify access to the reports and check all links by starting a Web browser and opening the following URLs (substitute your server location for **types.mycompany.com**). You can ignore the presentation of the data, but make sure the browser does not report any errors.

http://types.mycompany.com
http://types.mycompany.com/templates/rrg.xsl
http://types.mycompany.com/(subfolder name)/enumbs.xml
http://types.lonmark.org/0000000000000000-0/enums.xml

This procedure tests that the report was successfully hosted and that some of its components can be accessed properly, but does not verify each file of the report.

To view previously generated reports, start your browser and open the directory you specified in Step 3. You do not have to run the Wizard again unless the resource file set changes or you want to change your report preferences.

Resource File Validations

When you generate a resource report with the report generator, it reports problems in the resource file set. Problems may be *fatal errors* or *warnings*. Fatal errors mean that the report information is not valid. A write protected output folder or an unavailable device resource file can cause a fatal error. Warnings will not stop the report generator from producing a valid resource report, but may indicate problems listed in Table 5.1.

A list of warnings and errors are stored in a file named **ReportGeneratorErrors.log**. This log is generated or deleted as needed in the output folder. Table 5.1 lists all warnings or errors that might be reported.

Table 5.1 Resource File Validation Warnings		
Warning	***Message Displayed***	***Description***
Missing Strings	Warning: String ^<scope selector>:<index> can not be located for program ID <program_id>: <detailed reason>	This warning occurs if a string with scope selector and index as detailed in the message cannot be located for the given program ID. The typical reason is that the string is missing or the resource file set's scope scope selector was lowered after a resource was created.
Min/Max Data Validation	Warning: <type name> minimum value (<value>) exceeds maximum value (<value).	You should contact the resource file set manufacturer. Minimum values must not exceed maximum values (but the minimum might be equal to the maximum). This validation is not currently being performed for configuration property types, or configuration property members of functional profiles.
Missing Format	Warning: No format definition was found in <format file> to match type <typename>	This may be as designed, but generally indicates a missing or misnamed format file entry. Each network variable and configuration property type should have at least one distinct format each.
Invalid Format #1	Warning: Cannot validate existing format(s) for type <typename>: <reason>	A problem occurred while validating the formats for <*typename*>. This warning can point to a missing or corrupt format file, or to a corrupted installation of the local machine.
Invalid Format #2	Warning: Format <name> cannot be used with type <typename> (and test data that is <number> bytes of 0x00): <reason>	This warning is a result of an attempt to use format <name> with type <typename>, and <number> bytes of test data (all zeroes). This message might be benign (in case a test vector of all zeroes is inappropriate and the formatter fails to apply the format to the data offered), but more typically suggests an invalid syntax being used within the format specification.
CP "Applies To" Validation	Warning: Cannot resolve 'apples to' information: <fpt-name>::<cp-member-name> applies to NV with index <nv-index>, no such NV found"	This is a serious problem. The functional profile <fpt-name> is invalid. It might be possible to use the functional profile in case the CP <cp-member-name> is optional and not implemented, but the profile must be corrected so that the CP applies to the entire functional profile, or to an existing member-NV.
Overloading FPT	Warning: Functional profile <fp-name> uses key <key-value>, without using inheritance. Consider inheriting rather than overriding, or adjust the FPT key to a value >= 20000.	This is a recommendation, and may be as designed by the resource file set developer. Generally it is better to derive a user functional profile from a standard functional profile by inheritance rather than by re-defining (overriding). This warning is only shown for user functional profiles.
Bad FPT Inheritance	Warning: Functional profile <fp-name> uses key <key-value> and inheritance. You cannot inherit from a UFPT; consider correcting the inheritance preference, or indicate the correct SFPT to inherit from by setting the key to < 20000.	This is a serious problem. The implementer of the user functional profile <*fp-name*> plans to inherit from a functional profile that is not defined with a profile number that indicates it being part of the standard functional profile range.

Table 5.1 Resource File Validation Warnings		
Warning	***Message Displayed***	***Description***
Dangling Reference	Warning: Fail to resolve reference for <referring-type> to <scope selector>::<index>: no such referee	This is a serious problem. A resource R1 refers to another resource R2, where R2 doesn't exist. Removing resource R2 after defining R1 might cause this problem. It might be caused by an incomplete resource file catalog (the resource file set that contains R2 is missing).
Format Rollover	Warning: Cannot format <type detail>: <reason> (now using alternative formatting policy)	This might be benign and may have been designed by the resource file set developer. The resource report will finish generating the report, listing the detail in question using a built-in, alternative, formatting strategy.
Reverse Reference	Warning: Set <set-id> attempts to reference an item from a higher scope (<target scope selector>). This reference cannot be resolved!	This is a serious problem. The resource file set in question is defined with a scope selector S1, and it contains one or more references to scope selector S2, with S2 > S1. Such a reference cannot be resolved. This may be caused by changing the set's scope selector to S1, where the original selector S0 was used with S0 > S2.
Bad CP Inheritance	Warning: Functional profile member <member> implements a configuration property <CPT name>, which is of an inheriting type, applying to the entire profile. However, the functional profile does not implement a principal NV from which this CP could inherit its type.	This is a serious problem, preventing this functional profile from being implemented. Make sure all inheriting CPs apply to a well-defined NV, or specify a principal network variable.
Bad Profile Number	Warning: Standard functional profile <*name*> specifies key <*profile number*>, which is within the range of FPT keys defined for user profiles. Consider correcting the key to < 20000.	Standard functional profiles must use profile numbers (keys) less than 20000.

6

Providing Supplementary Information

When the report generator generates a report, only data that is present in the selected resource file sets is included in the report. You can add additional documentation to help describe complex resources such as functional profiles. This additional documentation is called *usage hints*. The report generator includes a *Usage Hint Editor* that allows you to easily create and edit XHTML-based usage hints.

Each resource report generated by the report generator includes a **usage.xml** file. This file stores usage hint information and can provide supplementary information for any resource (an NVT, CPT, enumeration type, or functional profile) or a component of a resource such as a field within a structure or a member within a functional profile. You can include an unlimited number of usage hints within a **usage.xml** file. Each usage hint identifies the resource, or part of a resource, through its *hint ID*.

Usage.xml Data

A **usage.xml** file contains usage hints displayed in XHTML text. Each hint can include any XHTML and HTML tags that can be included in an HTML table cell (**<td> </td>** tags). However, the markup must conform to XHTML rules. Additional restrictions apply and are listed later in this document.

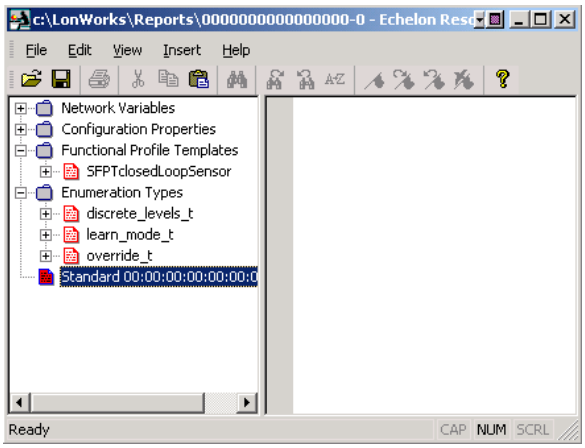
Each usage hint applies to a part of the report. The **usage.xml** file contains an unlimited number of hint nodes, whose value contains the usage hint. Each usage hint element also carries a hint identifier, whose value determines the reported item to which the usage hint applies. You can include any of the hint references listed in Table 6.1:

Table 6.1 Usage Hint Data: Supported Hint References

Hint applies to…	*ID Attribute*	*Example*
The entire resource file set	set	<hint id=”set”> description here </hint>
	<fully qualified set name>	<hint id=”Echelon 80:00:01:00:00:00:00:00-3”> description here </hint>
Network Variable	<nvt-name>	<hint id=”SNVT_switch”> description here </hint>
Configuration Property	<cpt-name>	<hint id=”SCPTgain”> description here </hint>
Functional Profile	<fpt-name>	<hint id=”SFPTopenLoopSensor”> description here </hint>
Enumeration	<enum-tag>	<hint id=”boolean_t”> description here </hint>
Network Variable Member (for structures or union types)	<nvt-name>::<member-name>	<hint id=”SNVT_switch::value”> description here </hint>
Configuration Property (for structures or union types)	<cpt-name>::<member-name>	<hint id=” SCPTgain::multiplier”> description here </hint>
Enumeration member	<enum-tag>::<enum-member>	<hint id=”occup_t::OC_BYPASS”> description here </hint>
Functional Profile member	<fpt-name>::<fpt-member>	<hint id=”UFPTmyFpt::nvoValue”> description here </hint>

Using the Usage Hint Editor Software

The Usage Hint Editor provides a simple interface with three main components: a Resource pane, a Hint pane, and the main menu.



Resource Pane

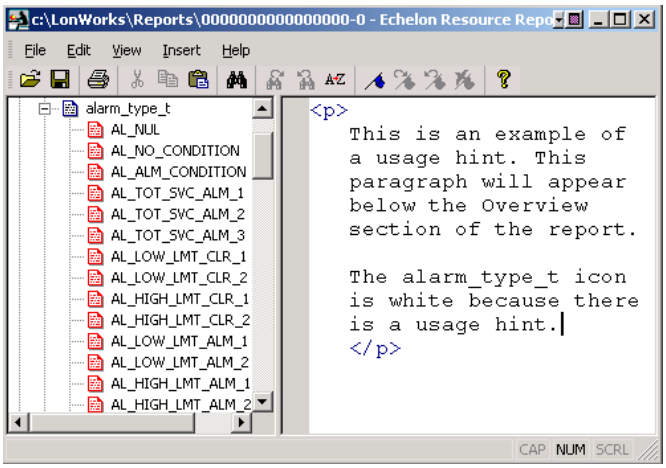
The Resource pane shows a list of all resources and resource components within a resource report that may include a usage hint. Only one resource report may be open at a time. The resource items are grouped into separate categories. Table 6.2 explains the different categories used in the usage hint editor.

Table 6.2 Usage Hint Editor Resource Categories

Category	***Description***
Network Variables	If the report includes any NVT definitions, the Network Variables folder lists all network variable types. Structured NVTs contain field members NVT may contain sub levels representing sub-elements of this NVT (structure or union members).
Configuration Properties	If the report includes any CPT definitions, the Configuration Properties folder lists all configuration property types. Structured CPTs contain field members.
Functional Profile Templates	If the report includes any functional profile definitions, the Functional Profile Templates folder lists all functional profiles. Each functional profile may include Member Network Variables and Member Configuration Properties folders listing the profile members.
Enumeration Types	If the report includes any enumeration type definitions, the Enumeration Types folder lists all enumeration types. Each enumeration type may contain a list of enumerators.
Orphan Hints	If the report includes any hints that cannot be mapped to resources or resource components within the report, the Orphan Hints folder contains these hints. When an orphan hint is detected during the loading of a resource report, the Usage Hint Editor issues a warning and advises you to review the content of the Orphan Hints group. You cannot create orphan hints with the Usage Hint Editor, but they may appear if you manually create or edit a usage hint file.
Set	If the report includes a Set hint, it is shown at the top of the Resource hierarchy within the Resource pane. It includes the hint-ID set, if available.
<fully qualified setname>	An entry at the top of the Resource hierarchy that displays the value of the control/title element (e.g., “Echelon 80:00:01:00:00:00:00:00-3”).

Table 6.2 Usage Hint Editor Resource Categories	
Category	***Description***
	This entry represents a hint that applies to the entire set.

You can click the plus ("+") sign next to any folder to view the resource items within the folder. If a folder is red, it does not currently contain any usage hints, but you may add one or more. If a folder is yellow, it contains usage hints that you have modified since you started the Usage Hint Editor. If a folder is white, it contains usage hints.



To view, add, modify, or delete a usage hint, click a red, yellow, or white resource item. The associated hint, if any, displays in the Hint pane. To add a hint, enter the hint text into the blank Hint pane. To modify a hint, edit the text in the Hint pane. To delete a hint, delete all text in the Hint pane. The color of the resource item changes to red, except for the following circumstances:

- Deleting all hint text for the **Set** hint removes this hint entirely. The Usage Hint Editor supports this hint when it exists, but does not support the creation of the set hint. The Usage Hint Editor uses the fully -qualified set name to promote a set-wide hint. See Table 6.1.
- Deleting all text associated with an orphan hint removes the orphan.
- Selecting an item in the Resource pane that does not support hints such as the Network Variables folder disables the edit pane entirely.

Hint Pane

The Hint pane shows the usage hint text for the currently selected resource item in the Resource pane. The Hint pane provides a simple XHTML source editor that you can use to view, add, modify, and delete hints.

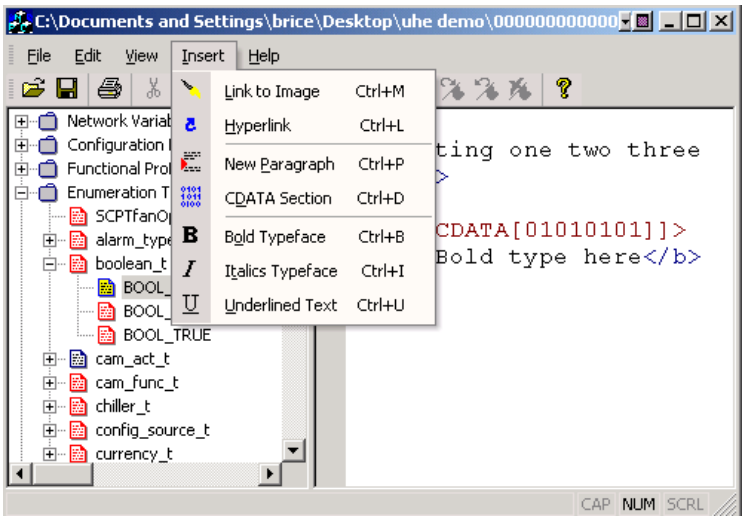


Table 6.3 shows the hint editor features:

Table 6.3 Hint Editor Features	
Feature	***Description***
Syntax Coloring	Strings, tags, CDATA sections, and comments are indicated with different text colors.
Fragment Insertion	You can insert XHTML fragments into hint text.
Code Validation	The hint editor validates the XHTML content of a usage hint when you select a new resource item, and when the hint editor otherwise saves the hint data. You cannot save usage hints with XHTML syntax violations. Due to browser software versions, operating systems and evolving standards, this validation process is not comprehensive. Always verify that any complex hints work correctly by opening your resource report in a Web browser. This is also important if you create custom transformation stylesheets.

Main Menu

From the main menu, you can perform a variety of tasks including:

- Open and save a usage hint file
- Insert XHTML fragments
- Insert images
- Find help on a variety of topics

Starting the Usage Hint Editor

You can start the Usage Hint Editor automatically when you run the report generator, or you can start the Usage Hint Editor from Windows.

To start the Usage Hint Editor automatically, set the **Launch Usage Hint Editor** checkbox in the Finish window of the report generator. The Usage Hint Editor appears when you click **Next**. The checkbox will not be available if you have not previously used the Usage Hint Editor.

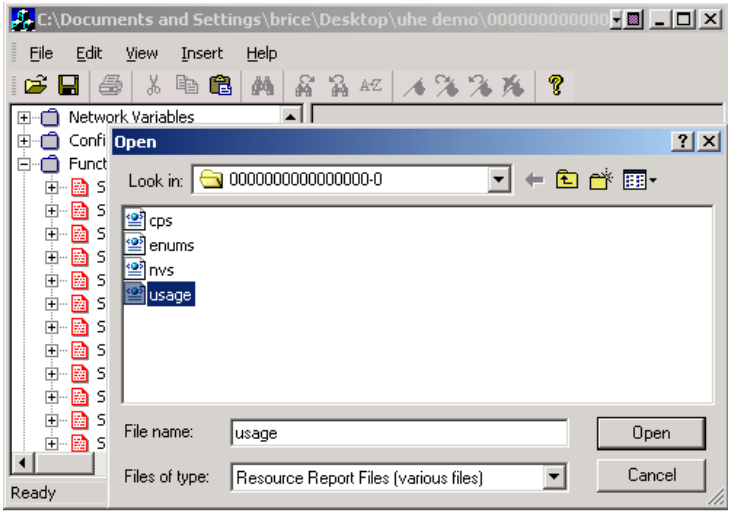
To start the Usage Hint Editor from Windows, follow these steps:

1. Open the Windows **Start** menu and then click **Run**.
2. Click **Browse**.
3. Browse to the LONWORKS NodeBuilder folder. This is c:\LonWorks\NodeBuilder by default.
4. Double-click the **UsageHintEditor.exe** file. The Usage Hint Editor appears.

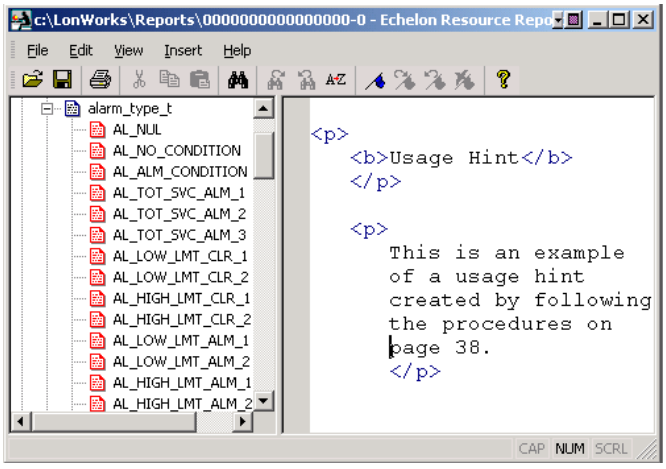
Creating a Usage Hint

You can create a usage hint for any resource item. To create a usage hint for a resource item, follow these steps.

1. Start the Usage Hint Editor as described in *Starting the Usage Hint Editor*.
2. Open the **File** menu, and then click **Open**.



3. Browse to a folder with an existing resource report, select a file, and then click **Open**.
4. Browse to the resource item in the Resource pane and click it. The Hint pane switches from grey to white.
5. Click inside the Hint pane. A blinking cursor appears.
6. Enter the usage hint by typing text or by selecting the hint items from the **Insert** menu. For example, your usage hint could be a hyperlink to support documentation or a full explanation on how to use the selected resource.



7. Open the **File** menu, and then click **Save**. The Usage Hint Editor saves your usage hint in the **Usage.xml** file.

XHTML Restrictions

You must enter usage hints in an XHTML compliant format. However, not all data that may appear in an XHTML page may also appear in a usage hint. Variations with browser technology present challenges when creating usage hints. Before finalizing a project with complex usage hints, test and view your files before releasing your final report. Below is a short summary of XHTML details as they apply to individual usage hints:

- XHTML, unlike HTML, requires you to follow XML syntax rules. These rules require element names to be case sensitive and in lower case, and require all elements to be fully balanced and fully closed.
- XHTML tags used in table cells (i.e., between <td> and </td>) are typically OK. XHTML tags that may not appear in table cells are not supported, an unlikely to work correctly.
- You cannot use DTD records, XML headers, DOCTYPE tags, and METATAG elements.
- Host any script source code in a separate file, and reference it using a **<script src="**....**" />** tag.

7

Customizing Report Presentations

This section shows you how to change the appearance of resource reports. This section provides only information about the principles of operation and does not address specific technologies.

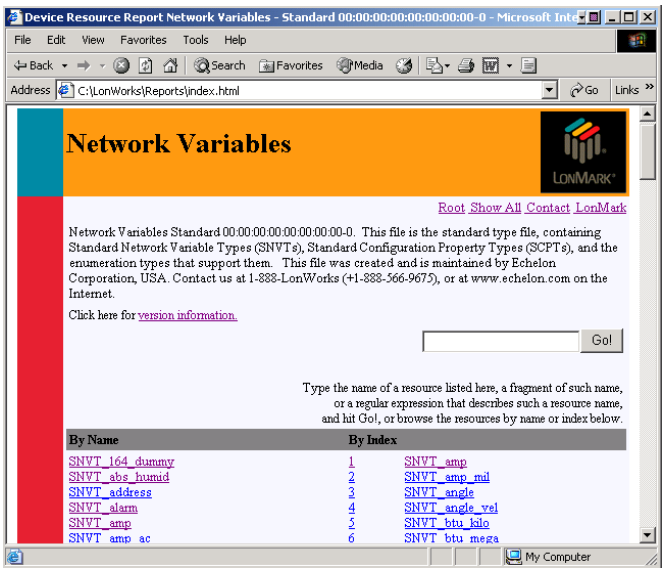
XSLT Transformations

A resource report consists of a set of XML files that can be viewed in a Web browser. The XML files contain unformatted data. They also contain references to an *XSLT transformation* that defines how information is presented in a generated report page. The XSLT transformation is responsible for converting information into HTML for viewing reports using a Web browser. You can create transformations that produce different report formats (such as XML file based reports with different markup), or a PDF-based report. The number of variations is unlimited.

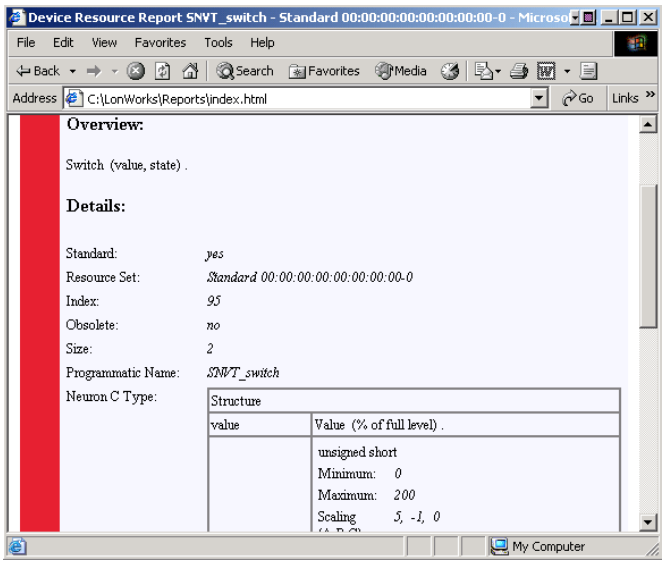
Transformations written in the XSLT programming language can be executed in many environments, including Web servers or Web browsers. However, XSLT engines are also available through command line tools such as Saxon.exe or MSXSL.exe (and any other APIs, such as Microsoft's comprehensive MSXML4 package). Using these tools allows you to customize resource reports without visiting the report start page. You could, for example, convert the entire resource report into an eBook using an XSLT-based CGI application and send it to an eBook subscriber.

Report Generator Templates Folder

The default implementation of the report viewing process uses a two-step transformation process. The index transformation creates a list of sub-indexes.



The type transformation converts information from the sub indexes and displays reported resources. See below.



XSLT transformation stylesheets and JavaScript code control the entire transformation process. These files are all stored in the **Templates** folder on your local hard drive. The default location for the **Templates** folder is c:\LonWorks\Types\Templates. You can also access standard template files at the LonMark Web site (**http://types.lonmark.org/Templates**).

Table 7.1 shows a list of available template files and a short description for each file.

Table 7.1 Template Files

File	***Description***
index.xsl	XSLT stylesheet containing the *index transformation* templates
types.xsl	XSLT stylesheet containing the *type transformation* templates
rrg.xsl	XSLT stylesheet containing common variables and transformation templates that are used by both the index transformation and the type transformation. Both index.xsl and types.xsl include rrg.xsl automatically.
rrg.js	JavaScript source code that is included in all HTML pages: the report start index page, the sub index HTML pages, and the type report pages. A JavaScript function, Transform, controls the application of a given XSLT transformation (type transformation, or index transformation) to a given report component (described by the relevant XML data location and an XPath expression identifying a portion of that XML data) is included in this file. The Transform function uses an essential function (XSL transformation on single, selected nodes) that is currently only available in Microsoft's Internet Explorer version 6.0 or higher. If you want to customize report presentations or add support for resource report viewing by other browser platforms, please thoroughly review the information provided in the rrg.js file.
Art/	This folder contains artwork that is referred by the various HTML pages generated. The content of the Art folder is specific to the default report presentation and transformations, and may not be required for custom report presentations.

When hosting a set of custom templates on a Web server, you must configure the Web server to host these files correctly. type/xml is a sufficient mime type for the XSLT stylesheet, and type/text is a good choice for rrg.js.

Creating a Custom Report Presentation

You can customize reports in two ways: you can change the layout and look of a report or you can change how a report is viewed.

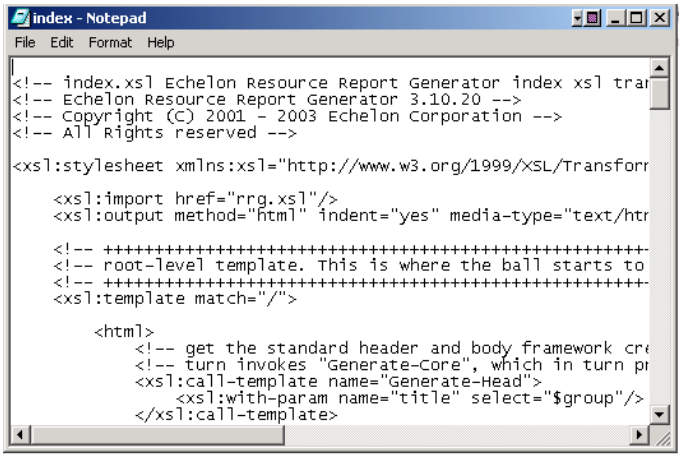
Changing the Report Layout

You can customize the look and feel of a report (adding company logos and CI features or excluding certain data, for example), by modifying the transformations of the generated report (the index.xsl file for sub index pages and the types.xsl file for type transformation pages). You cannot, however, change the format of the start index page since a transformation does not take place before this page is being viewed.

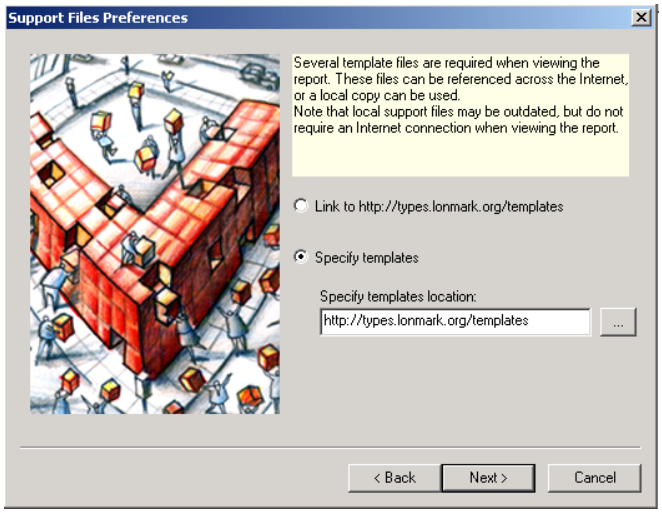
You can modify the index transformation independently. Changes to the type transformation, however, require that you also make changes to the index transformation. The report generator asks for the name and location of the index transformation when the report is being generated. This index transformation holds information that is referenced when the report is being generated. You may need to create a custom index transformation after the report is generated.

General procedures for changing the layout of the report are listed below:

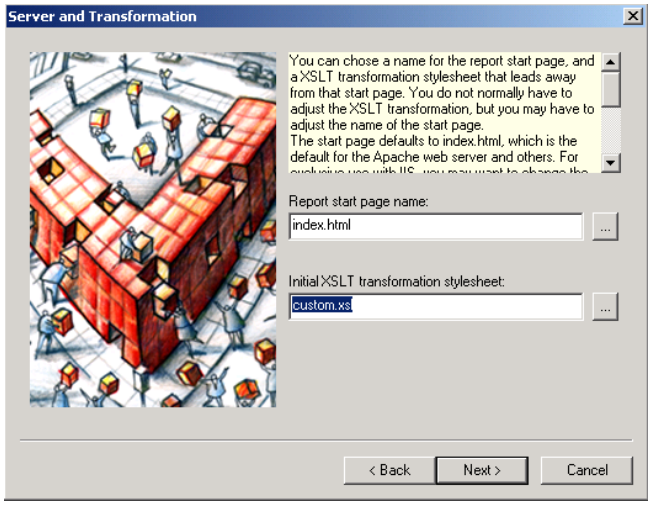
1. Generate a report. For instructions on how to create a report, see the *Generating Reports Locally and for Hosting* section in this document.
2. Open the **Templates** folder. The default location is C:\LonWorks\Types\templates.
3. Open the index.xsl file using a suitable editor.



4. Make and save desired changes using a new name and rerun the report generator. Running the report generator is not necessary if you do not rename and save this file.
5. Specify the location of the modified file in the **Support Files Preferences** dialog box in the report generator.



6. Specify the name and location of your modified XSLT transformation stylesheet in the **Server and Transformation** dialog box.



7. Finish generating the report. The changes you made to the report should appear after the report is finished compiling.

Changing the Report Structure

You can change the physical appearance of your report by providing your own, customized index and type transformations. These transformations process XML data produced by the report generator. You can, for example, create a tool based on XSL Formatting Objects (XSL-FO), and use it to turn your report into a book, complete with index tabs and a table of contents.

This level of customization is beyond the scope of this document, but you can find a variety of documentation about XML-related technologies on the Internet or in bookstores.