Template-based Product Specifications Concepts and Processes Guide

The MetaSolv Solution.™

5.1

METASOLV®
SOFTWARE

MetaSolv Solution™ M/5.1

Template-based Product Specifications

Concepts and Processes Guide
SECOND EDITION

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S O F T W A R E

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Introduction

This chapter introduces this guide, provides an overview of the features and functions that are addressed in detail in the Concepts and Processes chapters, and highlights some of the benefits of template-based product specifications.

ABOUT THIS GUIDE

This section defines the purpose of this guide and the audience for whom it is written. The Before you begin section describes what must be in place before you can approach defining template-based product specifications. Ensure these assumptions have been met before attempting any of the processes described in the Processes chapter. The Related documentation section lists the other Concepts and Processes (CAP) guides in the book set plus guides on the technology modules.

Purpose

This guide describes the concepts and processes related to setting up product specifications and product catalog items to support orders for customer network systems and bundled network connections in the MetaSolv Solution. It tells you how to set up template-based product specifications and the corresponding product catalog service offerings and explains how these processes use templates in the MetaSolv Solution.

The information presented includes:

- An introduction to template-based features in Product Specifications and Product Catalog windows.
- A description of how details about the new item types are achieved through association with template type components, where examples are derived from the template components included with the MetaSolv technology modules.
- An explanation of how to work with template-based product specifications and product catalog.
- A set of scenarios that illustrate the creation of product specifications and product catalog for representative services, such as xDSL and VPN.

Audience

If you are responsible for setting up product specifications and the product catalog for template-based offerings such as customer networks and customer connections, this guide is written for you. The audience includes anyone involved in implementing and supporting such product specifications or product catalog in the M/5.1 MetaSolv Solution.

It also extends to those who are interested in how template-based functionality is employed in the product specifications and product catalog.

Before you begin

Before you can create product specifications or product catalog items for template-based products, certain things must be made ready.

❏ The MetaSolv Solution M/5.1 must be installed. See the *System Guide* for M/5.1 for information on database installation and upgrade. See online help for information on client and server installation.

❏ The PSR migration must be complete. See the *Migration Guide* for M/5.1.

❏ A working copy and a reference copy of the MetaSolv technology modules must exist. See the *Network Templates Concepts and Processes Guide* for this procedure.

❏ Template components and custom attributes must be tailored for your business. See the *Network Templates Concepts and Processes Guide.*

Organization

This book is organized into four chapters. Use the following table to identify the chapter that focuses on the information you need.

Table 1: Document organization

To learn about	See chapter
The features of template-based product specifications and product catalog items and supporting functions	Introduction
What template-based product specifications and product catalog offerings can include and where they fit in the end-to-end process of using templates in the MetaSolv Solution	Concepts
The processes of creating and modifying template-based product specifications and product catalog items	Processes
The process flow of setting up product specs and catalog items for bundles of customer connections and customer network systems through examples	Scenarios

Related documentation

This section lists the documentation related to template-based functionality in MetaSolv Solution release 5.1 (M/5.1). CAP guides and white papers are available through the customer and partner portals on the MetaSolv web site. Technology module guides are available with the purchase of the related technology module. Online help can be accessed by clicking the Help button on the main toolbar of the

MetaSolv Solution. For information and enrollment details for MetaSolv Education Services courses, access the MetaSolv Web site and navigate to Education Services.

Concepts and processes (CAP) guides

- *Network Templates Concepts and Processes Guide*
- *Template-based Network Design Concepts and Processes Guide*
- *Template-based Ordering Concepts and Processes Guide*
- *Template-based Service Provisioning Concepts and Processes Guide*

Technology module guides

- *ATM/Frame Relay Technology Module Guide*
- *Digital Loop Carrier Technology Module Guide*
- *Digital Subscriber Line Technology Module Guide*
- *Ethernet Technology Module Guide*
- *Internet Protocol Technology Module Guide*
- *Multiprotocol Label Switching Technology Module Guide*

Additional resources

- MetaSolv Solution online help

Other documents

- Next Generation Networks White Paper
- *Migration Guide*
- *System Guide*

MetaSolv Education Services M/5.1 template-based courses

- Template-Based Technologies 5.1
- Template Customization 5.1
- Custom Attributes 5.1
- Template-Based Network Design 5.1
- Template-Based Ordering 5.1
- Template-Based Service Provisioning 5.1

FEATURES

When you identify a product or service you want to provide to your customers and you want to record customer orders for that product through MetaSolv's Product Service Request (PSR), you begin by defining product specifications for each orderable part of that product. When defining a product specification, the first thing you define is the type of product it is. This is done by selecting from a list of MetaSolv-defined item types the item type that most closely matches your product or service.

A template-based product specification is one that can be associated with a template component. Whether a product spec can be associated with a template component

depends on its item type. Only product specs built with network system, network element, or network connection item types can be associated with a template component.

The MetaSolv Solution features comprising template-based product specifications and template-based product catalog items include:

- Template-based item types for product specifications
- Template components that can be associated with template-based item types
- The Network Template Types tab on the Product Specifications and Product Catalog windows that includes MetaSolv-defined data from each technology module you use

Template–based product specification item types

Four template-based item types enable you to create product specifications for a network system, a network element, a network connection, or a bundle of standalone connections. These item types are:

- SYSTEM
- ELEMENT
- CONNECTOR
- PRDBUNDLE

The **Type** drop-down containing these item types appears on the General tab of the Product Specifications window when you add a new product specifications item. The four new item types are annotated on the following figure.
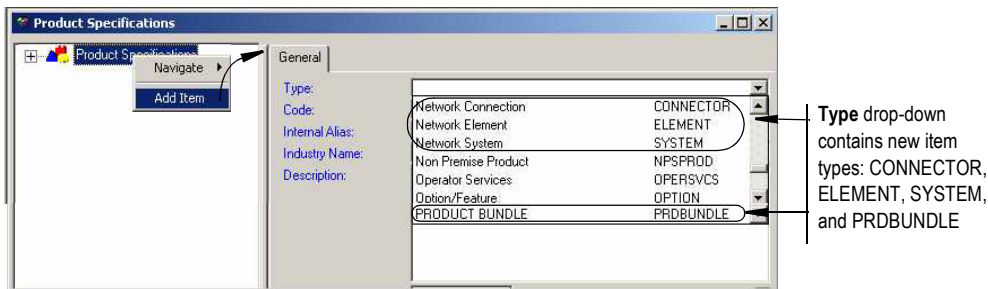
Figure 1: Type drop-down with template-based item types

The following table summarizes how each template-based item type is used in defining product specifications.

Table 2: Template-based item types used in product specifications

Item type	Product specification	Product specification description
SYSTEM	Network system	A level 1 product specification for a provider-configured or provider-managed customer network such as a Virtual Private Network (VPN)

Table 2: Template-based item types used in product specifications

Item type	Product specification	Product specification description
ELEMENT	Network element	A level 2 product specification that specifies a customer node, such as a branch office within the related network system
CONNECTOR	Network connection	A level 2 product specification related to either a network system or a product bundle When related to a network system, it describes a physical connection from the customer network to the provider or a virtual connection such as one that connects branch offices of a VPN When related to a product bundle, it describes a physical or virtual connection that is independent of a provider-managed customer network
PRDBUNDLE	Product bundle	A level 1 product specification that is not related to any template component itself, but contains subordinate physical and/or virtual connections that may or may not have a functional relationship with each other

The SYSTEM item type enables you to define a network system, such as a VPN, as a level 1 product. The ELEMENT item type enables you to define product specs for the nodes within the network system without any requirement for identifying their locations or equipment. The CONNECTOR item type enables you to define product specs for any physical (bandwidth) or virtual network connection that can be ordered by a customer.

The network system defined with the SYSTEM item type is a customer network that may be provider-managed. The network element defined with the ELEMENT item type can be a customer node, like a home office or branch office within an Intranet VPN, or it may be a partner node that the customer wants included in an extranet VPN. The network connections defined with the CONNECTOR item type include both customer connections related to a customer's network system and standalone connections that are not part of a provider-managed customer network. Standalone connections are considered to be extensions of the provider network to the customer site. Customer connections that do not belong to a network are defined as level 2 products under product bundle (PRDBUNDLE).

Source template types

Each technology module is based on a different template type. Each template type is composed of sample data defined by MetaSolv to get you up and running as quickly as possible. The following table lists the technology modules and the template types they

contain. The table includes only those technology modules that include template components that can be used when creating template-based product specs. That is, it does not include technology modules, such as DLC, that are used exclusively for the design of internal networks.

Table 3: Template types by MetaSolv technology module

Technology Module[a]	Template Type
ATM/Frame Relay	ATM_FR
DSL	DSL
Ethernet	ETHERNET
IP	IP
MPLS	MPLS

a.Your software displays MetaSolv-defined data from only those technology modules you have installed.

Network Template Types tab with MetaSolv–defined data

The new tab on the Product Specifications window is the Network Template Types tab. The purpose of this tab is to display candidate template components for association with a template-based product specification. You must associate the product specifications for any network system, network element, or network connection you define with one or more template components. The template components include the network template, element type, and connection spec type. When you create a product catalog item from a template-based product specification, you must associate it with one or more of the template components previously associated with the corresponding product spec.

The Network Template Types tab layouts are based on the selected item type, where

- Network template layout displays when an item with type SYSTEM is selected
- Element type layout displays when an item with type ELEMENT is selected
- Connection type layout displays when an item with type CONNECTOR is selected

The columns displayed on this tab vary by the type of product spec selected for association. See the following figure for an example of each layout.
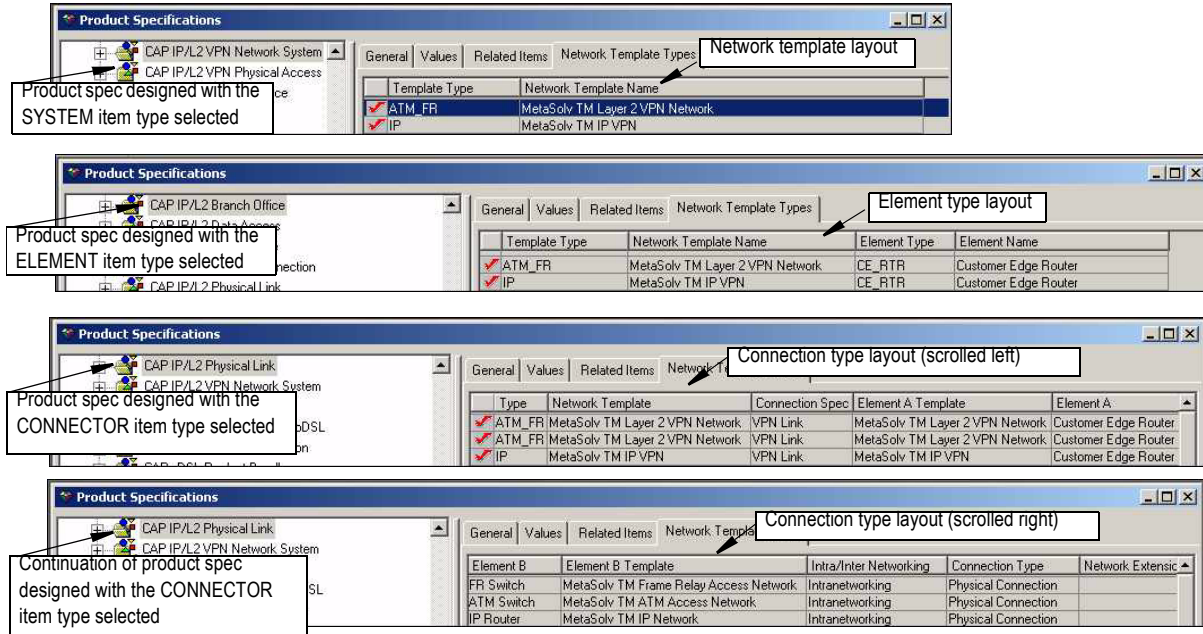
Figure 2: Layouts of the Network Template Types tab based on item selection

The Network Template Types tab on Product Catalog has the same layout as that for Product Specs. However, only the data previously associated on the corresponding product spec displays.

Some of the network templates are designed specifically to support product specifications for customer networks with their network elements and network connections, which are used for VPN products in the product catalog. Others are designed to support product specifications for standalone connections. Standalone connections can be bundled together as a single product catalog item in any combination or for specific services such as xDSL.

All three layouts of the Network Template Types tab include the template type and the network template name. The network templates by template type shown on the following

table include only network templates that can be displayed on the Network Template Types tab.

Table 4: Network templates by template type

Template Type	Network Template Name
ATM_FR	MetaSolv TM ATM/Frame Relay Network
	MetaSolv TM ATM Access Network
	MetaSolv TM Frame Relay Access Network
	MetaSolv TM Layer 2 VPN Network
DSL	MetaSolv TM DSL
ETHERNET	MetaSolv TM Ethernet Network
IP	MetaSolv TM IP VPN
	VPN - Basic Configuration
MPLS	MetaSolv TM MPLS
	MetaSolv TM MPLS VPN

Network template layout

When you define a product specification for a network system, you must associate that network system with a template component called *network template*. You make that association from the Network Template Types tab.

The MetaSolv-defined network templates available for association to a network system depend on the technology modules you have installed. The following table lists MetaSolv-defined data from all of the technology modules.

Table 5: Network templates that can be associated with an external network system

Template Type	Network Template Name
ATM_FR	MetaSolv TM Layer 2 VPN Network
IP	MetaSolv TM IP VPN
	VPN - Basic Configuration
MPLS	MetaSolv TM MPLS VPN

Element type layout

When you define a product specification for a network element, you must associate that network element with a template component called an *element type*. You make that association from the Network Template Types tab.

The MetaSolv-defined element types available for association to a network element depend on the technology modules you have installed. The following table lists MetaSolv defined data from all of the technology modules.

Table 6: Element types that can be associated with an external network's network element

Template Type	Network Template Name	Element Type
ATM_FR	MetaSolv TM Layer 2 VPN Network	CE_RTR
IP	MetaSolv TM IP VPN	CE_RTR
	VPN - Basic Configuration	EUL
MPLS	MetaSolv TM MPLS VPN	CE_RTR

The CE_RTR element type stands for Customer Edge Router. This element type is part of each network template that can be associated with a network system. The assumption is that a customer edge router will be installed at each node of a VPN. When you create a product spec for a home office or branch office, you will associate that product spec to the element type, CE_RTR, within the same network template in which you associated the network system representing the VPN.

Connection spec type layout

When you define a product specification for a network connection, you must associate that network connection with a template component called a *connection spec type*. You make that association from the Network Template Types tab.

The MetaSolv-defined connection spec types available for association to a network connection depend on the technology modules you have installed. The connection spec types that are candidates for association also depend on whether the network connection is to be related to a network system or to a product bundle. The tables that follow address each scenario separately.

The connection spec types on the following table are candidates for associating with a product specification for a network connection that is to be related to a network system. VPN Link represents a physical connection; the others are virtual connections.

Table 7: Connection spec types that can be associated with a network's network connection

Template Type	Network Template Name	Connection Spec Type
ATM_FR	MetaSolv TM Layer 2 VPN Network	Internet Connection Layer 2 VPN Connection VPN Link
IP	MetaSolv TM IP VPN	CPE-based VPN Connection Network-based VPN Connection VLAN - Internet Connection VPN Link
MPLS	MetaSolv TM MPLS VPN	CE Community Internet Connection VPN Link

The following connection spec types apply only to VPNs designed with a release prior to the introduction of template-based product specs. The migration process makes these connection spec types available for association with connections comprising the migrated VPN.

Table 8: Connection spec types that can be associated with migrated VPNs

Template Type	Network Template Name	Connection Spec Type
IP	VPN - Basic Configuration	Bandwidth Circuit Facility Circuit Product Circuit Remote Dial-Up Access Special Circuit Trunk Circuit Virtual Circuit

The connection spec types on the following table are candidates for associating with a product specification for a network connection that is to be related to a product bundle.

Table 9: Connection spec types that can be associated with a standalone network connection

Template Type	Network Template Name	Connection Spec Type
ATM_FR	MetaSolv TM ATM/Frame Relay Network	Assignable Bandwidth Link Enterprise Connection Internet Connection Unassignable Bandwidth Link
	MetaSolv TM ATM Access Network	Assignable Bandwidth Link Switched Virtual Circuit (SVC) Unassignable Bandwidth Link Voice Connection
	MetaSolv TM Frame Relay Access Network	Assignable Bandwidth Link Unassignable Bandwidth Link
DSL	MetaSolv TM DSL	Assignable Bandwidth Link DSL Link Enterprise Connection Internet Connection Switched Virtual Circuit (SVC) Voice Connection
ETHERNET	MetaSolv TM Ethernet Network	Ethernet Link TLAN - Transparent LAN VLAN - Internet Connection VLAN - Virtual LAN
MPLS	MetaSolv TM MPLS	Assignable Bandwidth Link Enterprise Connection Internet Connection Unassignable Bandwidth Link

FUNCTIONS

This section addresses only functions that you can use on the new Network Template Types tab. These template-based functions for defining product specs and product catalog items include Associate, Disassociate, and Set effective dates. The popup shown on the following example is the same popup that appears, whether the tab displays data to be associated with a network system, a network element, or a network connection.

Functions available from the Network Template Types tab
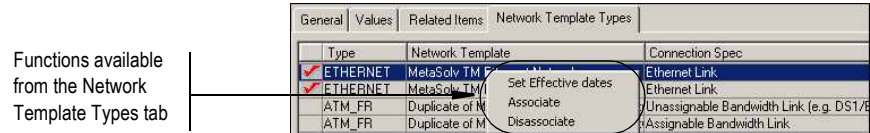
Figure 3: Functions popup on Network Template Types tab

Associate item type with template component

The product specification and product catalog for a network system, network element, or network connection must be associated with at least one template component. When you associate a selected item from the treeview with a template component, a checkmark appears in the first column. The only template components available for association with a product catalog item are those that are associated with that item's product specification.

In this example, both available items were associated at the product catalog level, but it would also be valid to associate just one of them.
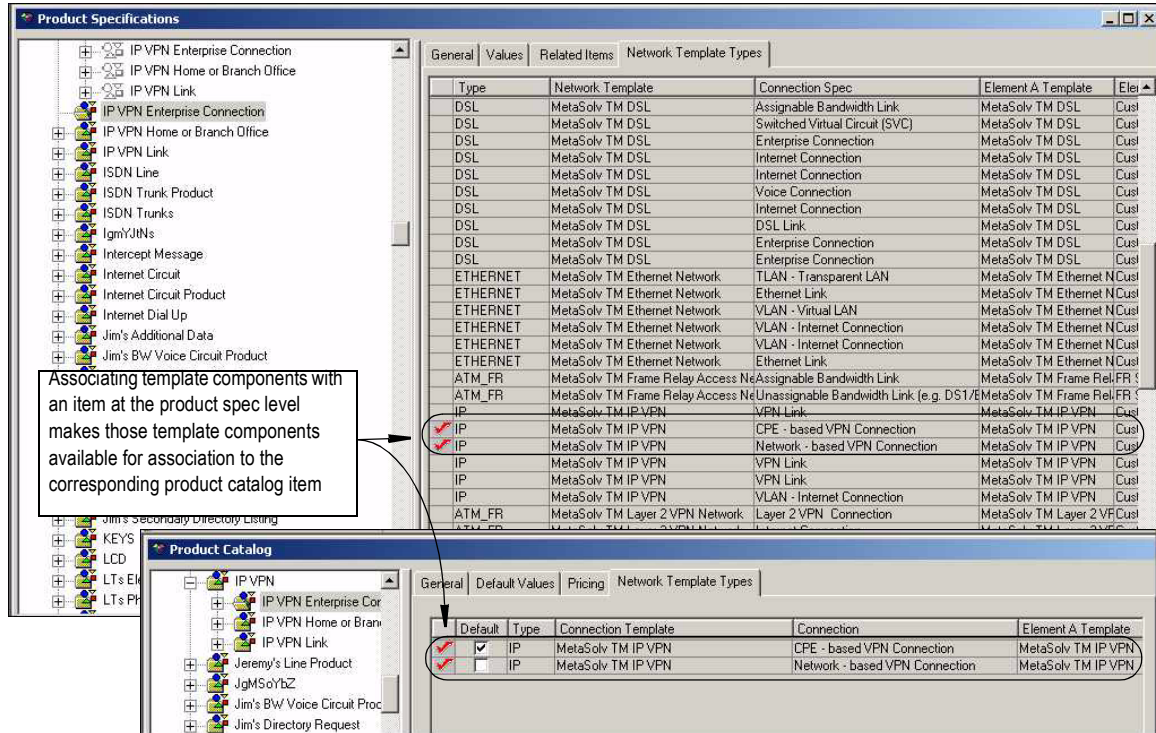
Figure 4: Association to product spec determines availability to product catalog

You associate template components with the product specifications for the network system, network element, and network connections before relating the subordinate network elements and network connections to the network system. Be sure the network template for the element type you associate with the network element is the same as the network template you have associated with the network system.

Likewise, be sure the network template for the connection spec you associate with the network connection is the same as the network template you have associated with the network system.
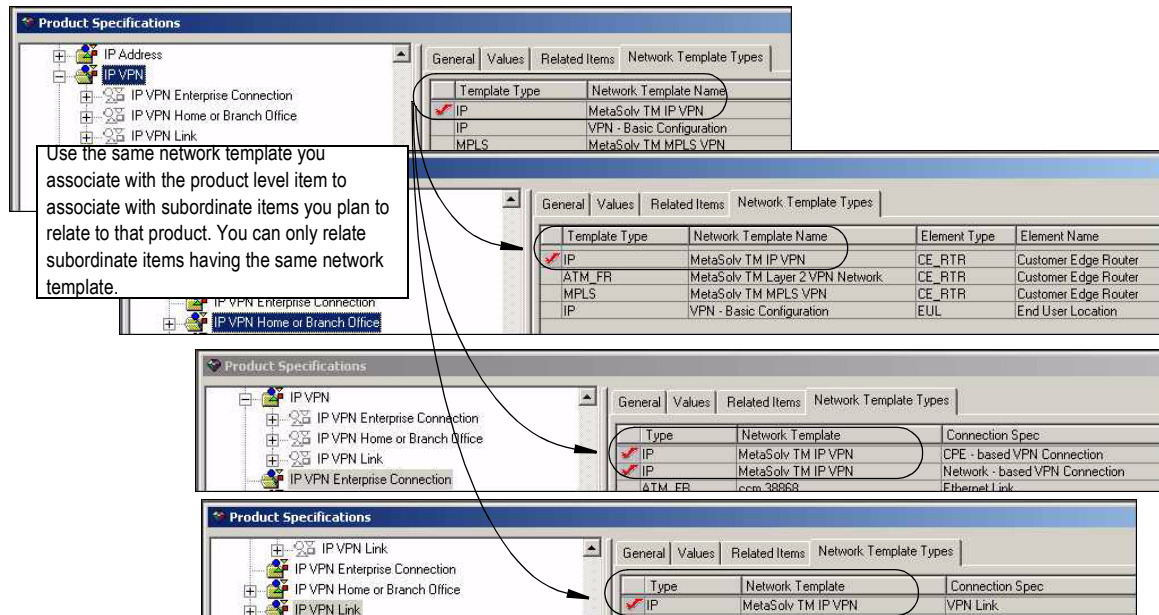
Figure 5: Associate related items with components in the same network template as the parent

Disassociate item type from template component

You can disassociate any template component from a template-based product specification as long as that template component is not associated with an effective product catalog item. If you want to disassociate a set of related items from a template, it is a good business practice to do the disassociation from the bottom up—that is, disassociate the template component from the network element or network connection before disassociating it from the parent network system.

Set effective dates

Prior to association, the *Set effective dates* option on the pop-up is disabled. Once a template component is associated with the item, you can set effective dates. Example windows follow. Notice the data displayed and the window title vary by the item type for which the effective date is being set. In all cases, the field for setting the **From** effective date contains, by default, the date when the template component was associated with the product specification item. The field for setting the **To** effective date is blank. When you click on this field, a calendar drops down, and you can select the date from the calendar view. If you set a **To** effective date by making an entry in the **To Eff Dt.** field, the product

specification for the corresponding item expires on that date. An expired product spec is not available for selection when creating a new product catalog item.
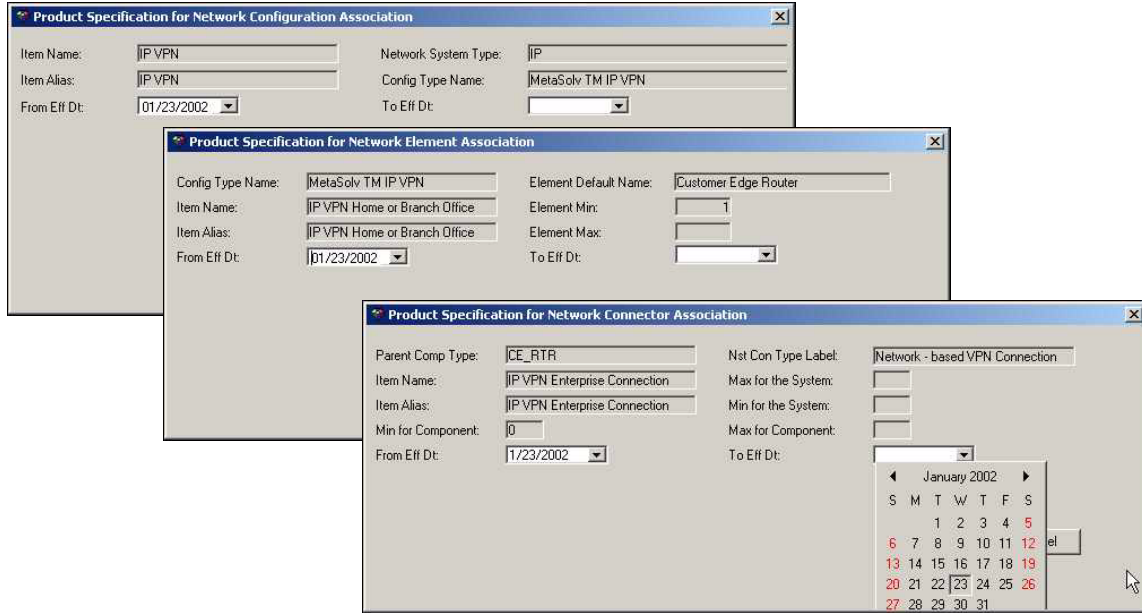
Figure 6: Product specification windows for setting effective dates for template-based products

The windows for setting effective dates for product catalog items are formatted similarly. There are no dependencies between the corresponding windows in product specs and product catalog. That is, you can expire a product specification before or after the date you

set to expire the corresponding product catalog item. An expired product catalog item is not available for selection when you add a new item to an order.
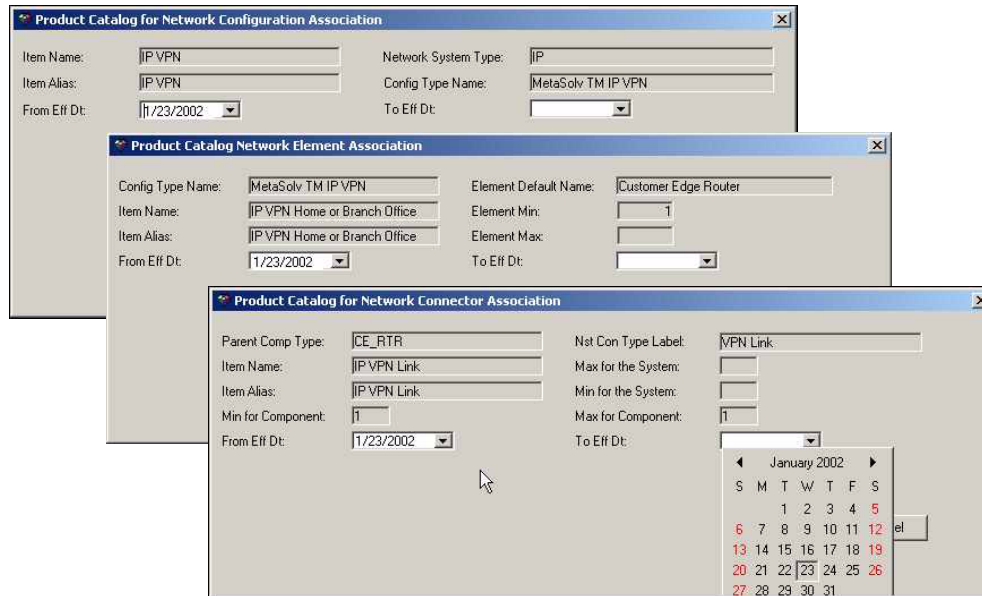
Figure 7: Product catalog windows for setting effective dates for template-based products

BENEFITS

Two major benefits of template-based product specifications and product catalog items include:

- The ability to create refined product specifications for any type of VPN over any technology
- The ability to create product specifications for any type of orderable connection over any technology—and tailor the attributes for the specific technology

Ability to package any type of VPN you sell and service

Until now, product specifications for a VPN were limited to the basic VPN.

With M/5.1, product specifications for VPNs use three new item types: network system (SYSTEM), network element (ELEMENT), and network connection (CONNECTOR). M/5.1 provides the ability to associate these item types with template components that can be tailored to reflect your configuration. That is, you can create product specifications for a network system called ATM VPN or Frame Relay VPN and associate it with the MetaSolv TM Layer 2 VPN network template. Later when the corresponding product catalog item is selected for an order, the *Ordering Dialog* provides assistance with defining the locations, network nodes, connections, as well as technology-specific attributes of the VPN connections.

Ability to package technology–specific connections for services you offer

Up until now, product specifications for orderable circuits used for data services have been represented under the Circuit Product (CKTPROD) level 1 item type, where:

- Each circuit type was represented by a separate item type, for example BWCKT (bandwidth circuit), VIRTCKT (virtual circuit), and INTRNTCKT (Internet circuit).

- Hierarchical relationships were required between certain circuit types, for example VIRTCKT was a related item to BWCKT.

- Technology-specific attributes for connections were defined through MetaSolv-defined labels (MDLs).

- The ability to specify attributes for a connection was limited to the use of the Values tab, which permitted the specification of valid values and a default value.

- Checking the circuit provisioning indicator was required to ensure circuit information would appear on the CLR.

- If multiple connections were to be allowed in the order, a minimum and maximum quantity had to be specified.

- There was no way to accommodate any new circuit types beyond those for which specific item types were provided as base data, that is, system-provided. For example, if you offered VoDSL, there was no way to represent this as an item type for which you could create a product specification.

With M/5.1, product specifications for orderable circuits used for data services are represented under the Product Bundle (PRDBUNDLE) level 1 item type, where:

- Each connection type is represented by the same item type, CONNECTOR.

- No hierarchical relationships between connections is required; that is, all CONNECTORs are related directly under PRDBUNDLE.

- Technology-specific attributes for connections are defined through the new custom attributes functionality. The ATM/FR technology module includes custom attributes for all the attributes previously defined through MDLs.

- The ability to specify attributes for a connection has been greatly enhanced with the addition of the custom attributes tool.

- There is no need to check indicators; the system automatically ensures that pertinent information for ordered connections appears on the GLR, the new graphical layout record, the CLR (circuit layout record), and the activation summary report.

- You will be able to use the CONNECTOR item type to define a product specification for *any* type of connectivity service you provide; all that's required is the creation of a user-defined connection spec type through Templates, a new M/5.1 feature.

- Each technology module you use includes a starter kit of MetaSolv-defined data that includes connection spec types for common types of connections.

Concepts

This chapter begins with an overview of template-based functionality across the MetaSolv Solution and presents concepts that support the features for defining template-based product specifications and related product catalog items. Read this chapter to understand how template components are used with product specifications, and to become familiar with the MetaSolv-defined template components that can be associated with the product specification item types. This chapter provides a conceptual context for setting up:

■ Product specifications for network systems or network connections
■ Product catalog items for network systems or network connections

In practice, you will have available a subset of the template components described here—those for the technology type(s) representing your internal networks, plus any template components your company defines for the services you offer.

WHAT IS TEMPLATE-BASED FUNCTIONALITY IN M/5.1?

Template-based functionality in M/5.1 allows you to:

■ Compare the template components provided with your technology modules to the requirements for representing your internal network in MetaSolv Solution, inactivate what you don't need, make any needed adjustments to components you plan to use, and add any company-specific components that are not included with the technology modules
■ Use template components to build a software representation of your internal networks
■ Define template-based product specifications for VPNs and any additional types of network systems you may have defined. Define template-based product specifications for physical access connections (links) and virtual connections with the parent product bundle
■ Add items to your product catalog that use the template-based product specs
■ Process orders for template-based products with the Ordering Dialog
■ Provision orders for template-based products across the ordered access links and internal networks

The template-based MetaSolv Release 5.1 (M/5.1) functionality provides all users of the MetaSolv Solution—regardless of size or business focus—the tools they need to easily replicate in the software the design of the networks over which they provision services. MetaSolv's network design canvas supports drag-and-drop additions of network elements or nodes, and right-click-and-drag capability for designing connections between the nodes.

Information subject to change without notice.

Once the network is designed, any customer service that uses virtual connections can be provisioned on the graphical layout record (GLR), which supports virtual connection assignments across access links and connections composing the internal networks.

Network elements and network connections that make up a network system are defined with template components.

- The template component for defining network systems is called the *network template*.
- The template component for defining network elements is called an *element type*.
- The component for defining network connections is called a *connection spec type*.

The same three template components that are used to define internal networks are also used to design customer networks, such as virtual private networks (VPNs). The M/5.1 MetaSolv technology modules for technology types such as ATM, Frame Relay, MPLS, Ethernet and IP include starter-kits composed of sample network templates, element types, and connection spec types. Some of these template components can be used out-of-the-box to design your internal networks. Others can be used to design customer networks and other customer connections that use your internal network. Regardless of use, the sample MetaSolv-defined template components can be tailored. The best feature however, is the ability for each company using the MetaSolv Solution to define their own customized template components that exactly reflect their business requirements.

When you create product specifications for template-based products, you associate them with one or more occurrences of their respective template component. Template-based products that are customer connections, like an Internet connection, are defined with a new item type called CONNECTOR and associated with connection spec types. Products that are customer elements are defined with a new item type called ELEMENT and associated with element types. Products that are customer network systems are defined with a new item type called SYSTEM and associated with network templates.

Template-based ordering begins with adding a template-based product offering to the order. Template-based products include any product bundle of customer connections or any customer network system that is defined in the product catalog with associated template components. From an ordering perspective, network systems refer to customer networks. The type of customer network that comes predefined with the ATM_FR (ATM/ Frame Relay), MPLS, and IP technology types is the VPN. A customer's VPN is created by joining the customer's home office with each of its branch offices; optionally, all branch offices can be fully meshed. Customer locations in the VPN are joined together through connectivity offered by the provider's network. If you have a network that spans a large geographical area, you could support VPNs of customers who have offices in any location along your network routes. If your network does not extend to locations needed by some customers, you can provide VPN service through IP VPNs.

In summary, each MetaSolv Technology Module (TM) is composed of technology-specific templates that support the design of your internal networks and provide rules for processing and provisioning orders for services over these networks. Orders for network systems and connections to your internal network are validated on the basis of the rules defined within the template components associated with the ordered network system or network connection.

WHAT ARE TEMPLATE-BASED PRODUCT SPECIFICATIONS?

This section introduces the new item types to which template-based product specifications apply and the template components with which these item types can be associated. This introduction is followed by a view of where template-based product specifications fit into the workflow of other template-based functionality.

Overview

Product specifications, which provide the rules that govern how a product catalog is built, are based on item types. When you add a new item to your product specifications, the first thing you do is specify its type by selecting an option from the **Type** drop-down. New template-based item types are available for selection with MetaSolv Release 5.1 (M/5.1). See Figure 1 on page 4.

A product specification using the PRDBUNDLE item type is much like the former CKTPROD in that it is a product-level item type that can have related connections. Product specifications for the SYSTEM, ELEMENT, and CONNECTOR item types are different from PRDBUNDLE and other item types in that they allow you to choose template components with which to associate the item type based on the services your business or organization provides. Template-based product specifications enable you to make the following associations:

Table 10: Product specification item types and template components

A product specification for	Built with this item type	Can be associated with one or more of these template components	from one or more of these template types
Network system	SYSTEM	Network template types	Layer 2 VPN, MPLS VPN, or IP VPN
Network element	ELEMENT	Element types	Layer 2 VPN, MPLS VPN, or IP VPN
Network connection	CONNECTOR	Connection spec types	ATM/Frame Relay Network, MPLS Network, Ethernet Network, IP Network or the Layer 2 VPN, MPLS VPN, or IP VPN

Representations of the three major template-based item types are annotated on the following figure: SYSTEM, ELEMENT, and CONNECTOR. This figure provides an example of a SYSTEM item type representing a customer virtual private network (VPN) composed of three offices: one home office and two branch offices. These offices, which are represented by a graphic of a customer edge router, are specified with the ELEMENT item type in a product specification. Various physical and virtual connections between two customer routers and between one customer router and the provider network are defined in product specifications with the CONNECTOR item type.
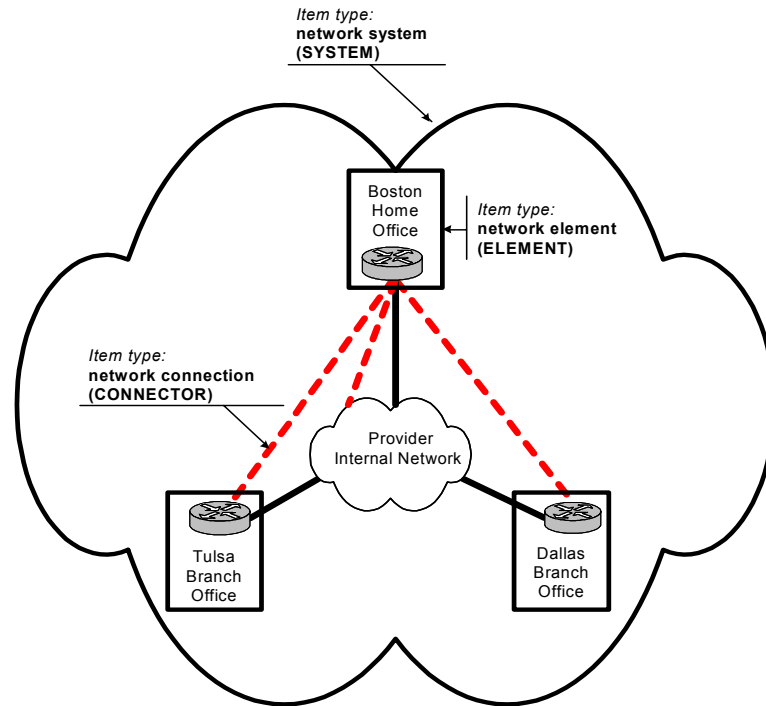
Figure 8: Example customer network system with network elements and network connections

At the highest level, most template types represent a technology type, for example, ATM/ Frame Relay, Ethernet, IP, or MPLS. Within a template type, the next level is the network template. Each network template contains element-level and connection-level template components, called element types and connection spec types, respectively.

The example in the following figure uses template components from the ATM_FR (ATM/ Frame Relay) template type. The template components of the ATM_FR template type are typical of most template types used by product specifications in that they include network templates, element types, and connection spec types defined as "orderable."

Orderable template components are those that can be associated with the network system, network element, or network connection item types.

Item type:
network system
Network template:
MetaSolv TM Layer 2 VPN network

Boston
Home
Office

Item type:
network connection
Connection spec type:
Internet connection

Item type:
network element
Element type:
CE_RTR

Item type:
network connection
Connection spec type:
Layer 2 VPN connection

Provider
ATM Internal Network

Item type:
network connection
Connection spec type:
VPN link

Tulsa
Branch
Office

Dallas
Branch
Office
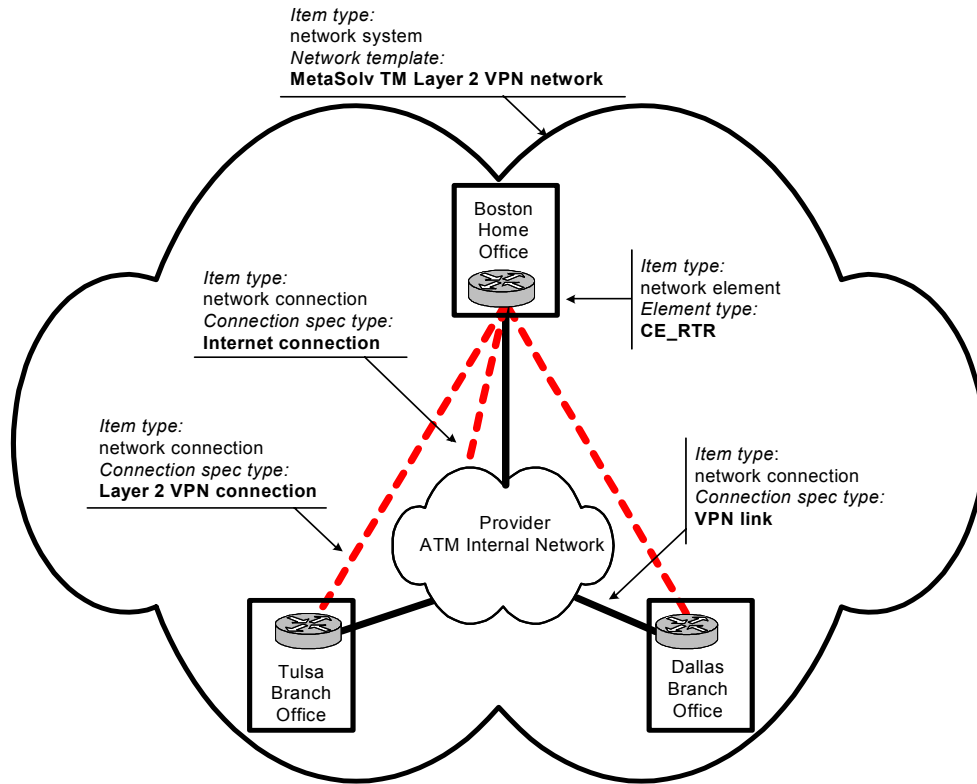
Figure 9: Example customer network system with associated template components

Let's examine the components of the preceding figure, one at a time:

- The large cloud represents a customer VPN network. Network systems are defined in product specifications with the network system (SYSTEM) item type and associated with the template component, *network template*. In this example, the item type representing the VPN network system is associated with the network template called MetaSolv TM Layer 2 VPN network.

- The rectangles around the home and branch office descriptions and router symbols represent the three customer nodes comprising the VPN. Network elements are defined in product specifications with the network element (ELEMENT) item type and associated with the template component, *element type*. In this example, the item type representing the network element is associated with the element type, CE_RTR.

- The heavy lines between the customer edge routers and between a given customer edge router and the provider network represent network connections. Network connections are defined in product specifications with the network connection (CONNECTOR) item type and associated with the template component, c*onnection spec type*. In this example, three connection spec types are used: 1) the VPN link, which is the physical connection from each site to the provider network, 2) the Layer 2

VPN connections that connect the customer sites to each other, and 3) an Internet connection.

The network connection (CONNECTOR) item type can also be used in a product specification under the product-level item type called Product Bundle (PRDBUNDLE). See the following figure. The item type product bundle is not associated with a connection spec type; connections of many types can be bundled together. In the following example, the connections are from network templates of the DSL template type.

Item type:
network connection
Connection spec type:
DSL Link

Item type:
network connection
Connection spec type:
Internet connection

Item type:
network connection
Connection spec type:
Voice connection

Provider
ATM Access Network

Customer
Site

Item type:
product bundle
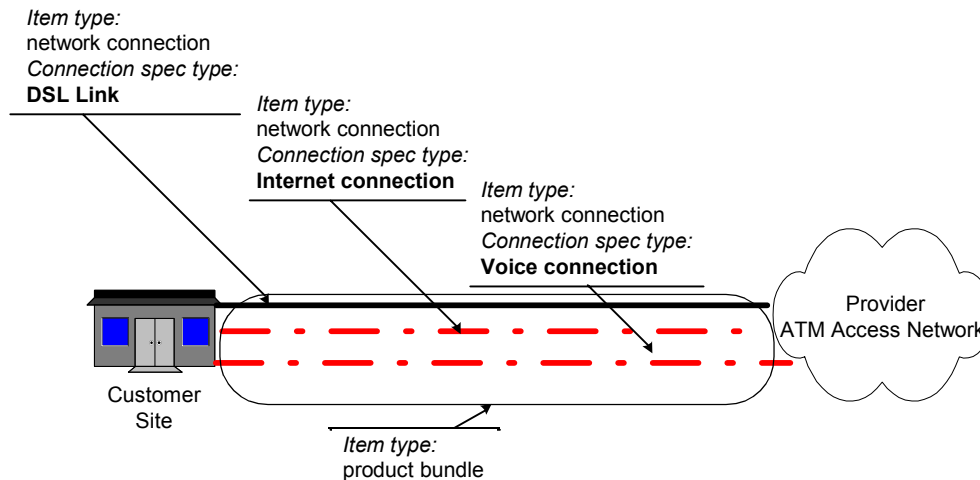
Figure 10: Example product bundle with network connections

How are template–based product specifications related to templates?

Each MetaSolv technology module (TM) has a template type that represents a distinct technology. The template type for each technology contains multiple network templates. Some template types contain a network template to be used just for customer networks, sometimes called external network systems.

The network templates for customer networks contain rules used exclusively by product specifications, product catalog, the Ordering Dialog, and the Service Provisioning Dialog; that is, they are used by network design only when designing customer networks. For example, the ATM/Frame Relay, IP, and MPLS template types all contain a VPN network template that provides rules for customer networks, elements within customer networks, and customer connections; that is, connections between elements within the customer network and connections from the customer network to the provider network.

Access and core network templates within a template type are used to design the internal network systems belonging to the service provider. Access network templates permit extending the internal network to the customer site. For example, the ATM/Frame Relay, Ethernet, MPLS, and DSL template types contain network templates that provide rules for connections that act like extensions of the internal access network to the customer site.

Core network templates are used exclusively for the design of internal networks and are out of scope for this book.

This section provides all the details of the network templates used for customer networks and the network templates that allow extensions from internal networks to customer sites. Specifically, it describes the relationship between template components and product specifications for:

- Virtual private networks (VPNs)
- Product bundles of connections

This section defines the template-based product specification item types, describes the related MetaSolv-defined template components with examples of how they are tied to item types, and summarizes the valid types of relationships. Many template components you associate with template-based items in product specs are those that you define yourself. This section does not attempt to address such user-defined template components. All examples in this section are based on the use of MetaSolv-defined technology module components.

Template–based product spec item types

The template-based product specification item types discussed in this section include: 1) network system (SYSTEM), 2) network element (ELEMENT), which can be related only to network system, and 3) network connection (CONNECTOR), which can be related to either network system or product bundle (PRDBUNDLE). Because the terms *network system*, *network element*, and *network connection* are used more broadly in network design, an attempt is made to define what these terms mean in the context of product spec item types.

Network system item type

The SYSTEM item type, called *network system*, is a product-level item type (level 1) used within product specifications to represent a customer's virtual private network (or another user-defined customer network). A VPN customer network is composed of a collection of network elements, where the network elements are connected to each other and to the provider's network by network connections. (The *collection* of network elements are represented with the ELEMENT item type; the network connections are represented with the CONNECTOR item type.)

The usage of the term *network system* to describe the product specification SYSTEM item type is closely related to the same term used to define a customer network system. This is the difference:

- Network system, *the item type*, is a product-level item type in product specifications that is associated with a network template and related to network elements and network connection item types.
- Network system, *a customer network*, is an external network designed by the provider using ordered customer connections and ordered customer elements, as well as selected (non-ordered) connections within the internal network over which virtual customer connections are provisioned.

Network system, the *term*, is also used to described an internal network. An internal network is designed by the provider for the purpose of providing services to customers. Internal networks do not include any customer network components.

Network element item type

The ELEMENT item type, called network element, can be used within product specifications to represent a point in the customer's network where an ordered connection terminates. Within the context of an ordered VPN network system, a network element refers to the home office or branch office within the VPN network system. The VPN product offering is supported by the MetaSolv-defined template components. During ordering, the home office and branch office network elements are always associated with locations in the customer network. By associating the network element item type to an element type named customer edge router, the network element concept expands to suggest a type of equipment. If the equipment is to be part of the product offering, the EQUIPMENT item type would be related to the ELEMENT item type, where the equipment item type would be associated with one or more equipment specifications. Associating equipment with equipment specs is a requirement for order validation.

Network connection item type

The CONNECTOR item type, called network connection, represents connectivity between two network elements where at least one is a customer network element. When the network connection item type is related to a network system item type, one of the network elements being connected represents a customer network element, such as the home or branch office associated with the pre-defined CE_RTR element type. Ordered network connections can be associated with customer locations, non-customer locations, or the provider network "cloud" during the ordering process. Ordered network connections can represent WAN links such as bandwidth circuits, Internet circuits that connect the customer site to an IP router, other types of virtual circuits such as Enterprise PVCs, and all new types of connections that have had no representation before, such as Voice over DSL (VoDSL). The difference between types of customer connections is specified through the association of the CONNECTOR item type with a connection spec type.

Product bundle item type

The PRDBUNDLE item type is a product-level (level 1) "container" item type to which one or more customer connections can be related. Like connections orderable under SYSTEM, these stand-alone connections use the CONNECTOR item type. Unlike connections orderable under a SYSTEM, which are associated with the customer's network, customer connections ordered under PRDBUNDLE are considered to be extensions from the service provider's network. For example, when an Internet connection is ordered under a network system, it is considered part of the customer network, but when it is ordered under a product bundle, it is considered to be an extension of the provider network. In both cases, one terminating element can be the provider's IP router or SMS. Customer network connections related to a product bundle normally terminate at the customer site. Unlike SYSTEM, PRDBUNDLE is not associated with any network template and its related CONNECTORs may be associated with network template(s) from different template types.

Source template components for template–based specs

This section provides examples of how MetaSolv-defined template components are related to template-based product specification item types.

Network template

Template types are composed of multiple network templates. Network templates supporting customer networks can be associated with the network system (SYSTEM) item type within product specifications.

The technology modules contain network templates for providing orderable customer networks and for designing internal networks. The network templates for designing internal networks such as access networks can include "extensions" to the customer site. These extensions are designed during the service provisioning process. Such extensions are orderable connections. Two categories of network templates are of concern to the designer of the product specifications for customer network systems and customer connections. The categories of concern are those that:

- Can be associated with the network system item type for the customer VPN networks
- Contain connection spec types that can be associated with network connection item types for bundles of customer connections

Template types with their corresponding network templates have been developed for customer virtual private networks, including Basic VPNs (migrated from previous releases), layer 2 VPNs, MPLS VPNs, and IP VPNs. The product specification for a network system (SYSTEM) can be associated with one or more of these network templates. (Product specifications for related network elements and connections must be associated with template components belonging to a network template associated with the network system.)

Product specifications for network connections (CONNECTORs) related to a product bundle (PRDBUNDLE) are normally associated with connection spec types belonging to a the same network template type, but this is not a requirement. Only when a virtual connection is ordered with the bandwidth link it is to be allocated to, must the network template types of the connection specs associated with these two connections be the same. The following diagram shows how the network template names displayed in Product Specifications tie back to Templates.
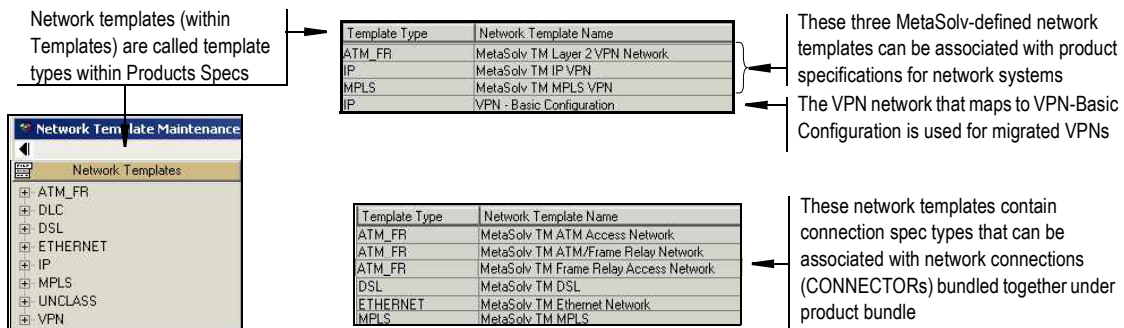
Figure 11: Network template—view from Templates and Product Specifications

Element type

A network template can contain one or more element types. The IP VPN, MPLS VPN, and Layer 2 VPN network templates each contain only one element type—the customer edge router (CE_RTR). The CE_RTR is the only MetaSolv-defined element type available for association with a network element. You can define other element types to associate with network elements.

A customer network element item type can be associated only with an element type belonging to a network template associated with the related customer network system. That is, if the element's network system item type is associated with only the MetaSolv TM MPLS VPN network template, then the related network element must be associated with the CE_RTR belonging to the MetaSolv TM MPLS VPN; it cannot be associated with a CE_RTR belonging to a different network template.

A product specification for a network element (ELEMENT) must be associated with at least one element type. Element types can be displayed in one other place in Product Specs— that is as terminating elements (Element A and Element B) for a connection spec type. The following diagram shows how the element type displayed in Product Specifications ties back to Templates.
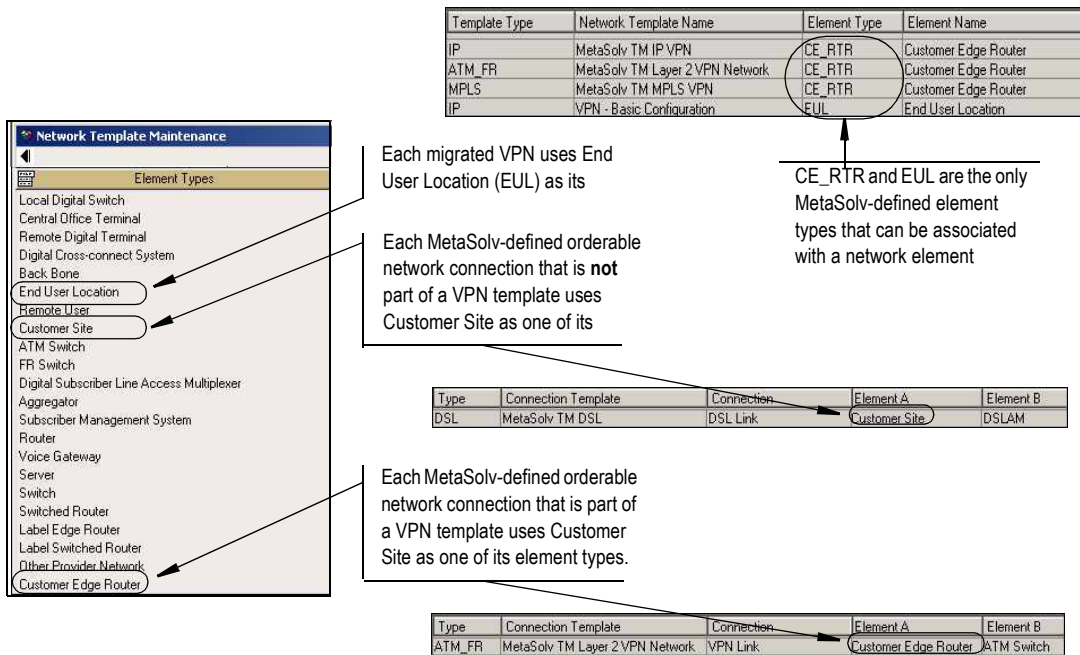
Figure 12: Element type—view from Templates and Product Specifications

Connection spec type

Network templates contain multiple connection spec types, many of which can be associated with the customer network connection (CONNECTOR) item type. From the product specifications perspective, there are two classes of connection spec types—those

associated with network connections related to network system items and those associated with network connections related to product bundle items.

Let us first consider the connection spec types that can be associated with a network connection related to a network system. Such connection spec types connect two element types, one of which is the CE_RTR associated with a network element related to the same network system. This network connection item type must be associated only with connection spec types belonging to the network template associated with the related customer network system item type. That is, if the connection's network system is associated with only the MetaSolv TM MPLS VPN network template, the related network connection should be associated with the connection spec type that also belongs to the MetaSolv TM MPLS VPN.

Now let us consider the MetaSolv-defined connection spec types that can be associated with a network connection related to a product bundle. Such connection spec types connect two element types, one of which is a special element type called CUST_SITE (customer site). The existence of the customer site element type indicates the connection spec type is for a connection that is an extension to the provider's network. It can represent any equipment that might be present at the customer site. Most element types are named for the type of equipment they represent, such as *switch*, *router*, or *DSLAM*. As you define your own connection spec types, you can indicate whether they are network extensions.

Customer connections combined into a single product offering, whether related to a customer network system or to a product bundle, normally include two connection types: one physical connection and one or more virtual connections. When the physical connection is for a network system, it is a bandwidth link from the customer edge router to the provider network. When the physical connection is part of a product bundle, it is a bandwidth link extending from the provider network to the customer site. In either case, the virtual connections are allocated to the ordered bandwidth link as well as to other legs or segments of the provider network.

In general, any network connection designed to connect two orderable network elements is a virtual connection. Network connections that connect an orderable network element to an element on the provider network may be physical or virtual. An orderable physical network connection is always a single-hop link between an orderable network element and a provider network element. An orderable virtual connection between an orderable network element and a provider network element is normally allocated over multiple hops, where only the terminating points are defined. That is, a virtual connection is defined by its terminating points, but it may comprise multiple hops.

Product specifications for network connections (CONNECTORs) must be associated with one or more connection spec types. The following diagram shows how the connection spec type displayed in a Product Specification for a product bundle ties back to Templates. Notice that the list contains only bandwidth links and virtual connections. Group connections are not orderable. It is important to know whether a connection is a

bandwidth link or a virtual connection since a bandwidth link must be in place for a virtual connection to be provisioned.

Refer to the Template view to determine the connection spec designation of Bandwidth Link and Virtual Connection for the corresponding connection spec type in Product Specs

Connection specs within Templates are called connection spec types within Product Specs.
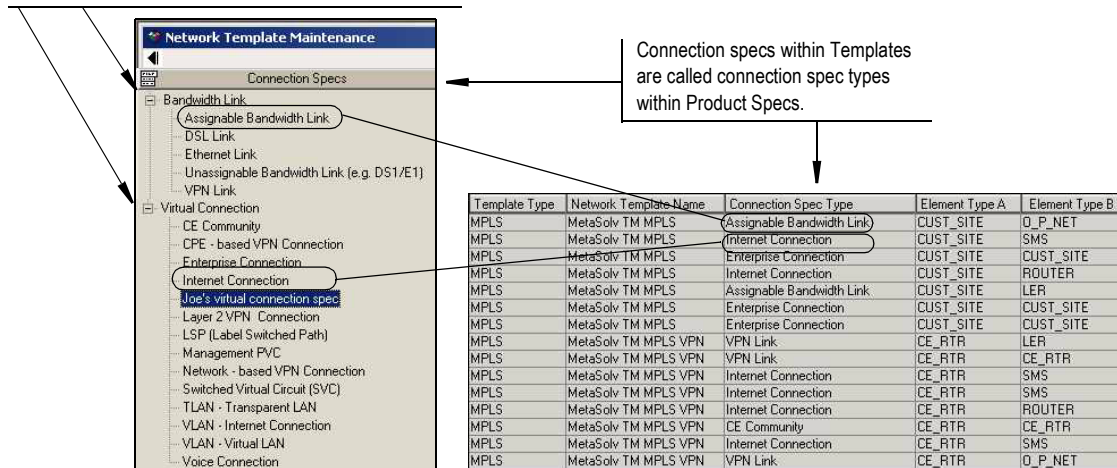
Figure 13: Connection spec type—view from Templates and Product Specifications

The element types being connected by the connection spec type are labeled Element Type A and Element Type B. The end-point definitions are interchangeable; that is, there is no rule saying that the customer site or customer router must be Element Type A. If you examine the data, you will recognize the element type, CE_RTR, which is used only in the VPN-related network templates and the CUST_SITE element type, which is an endpoint of a connection spec type associated with the network connection item type related to a product bundle.

The connection spec type associated with the customer connection item type is what determines whether the connection is a virtual connection or a bandwidth link (a physical connection). For example, the connection spec type called *Internet connection* provides connectivity from the customer site to a router belonging to an Internet service provider. A connection spec type called *Enterprise connection* provides LAN-LAN connectivity between locations within an enterprise, that is, customer site to customer site. Because both the Internet connection and the Enterprise connection are virtual connections, a product offering that includes them must also include a connection representing a physical access link unless this link was previously ordered. This link between the customer site and the provider network must be ordered or currently existing so the virtual connection(s) can be allocated during provisioning. For simple product offerings such as those for Internet connectivity or LAN-to-LAN connectivity, this physical connection has the connection spec type name of *Assignable bandwidth link.*

Details on how network connection item types in product specifications are associated with connection spec types are presented separately for network connections related to a network system and network connections related to a product bundle. See "Network

connections related to product bundles" on page 33 See "Network elements and network connections related to network systems" on page 38

How template-based item types tie back to templates

The following graphic summarizes the relationship between product specifications for template-based item types and template components.
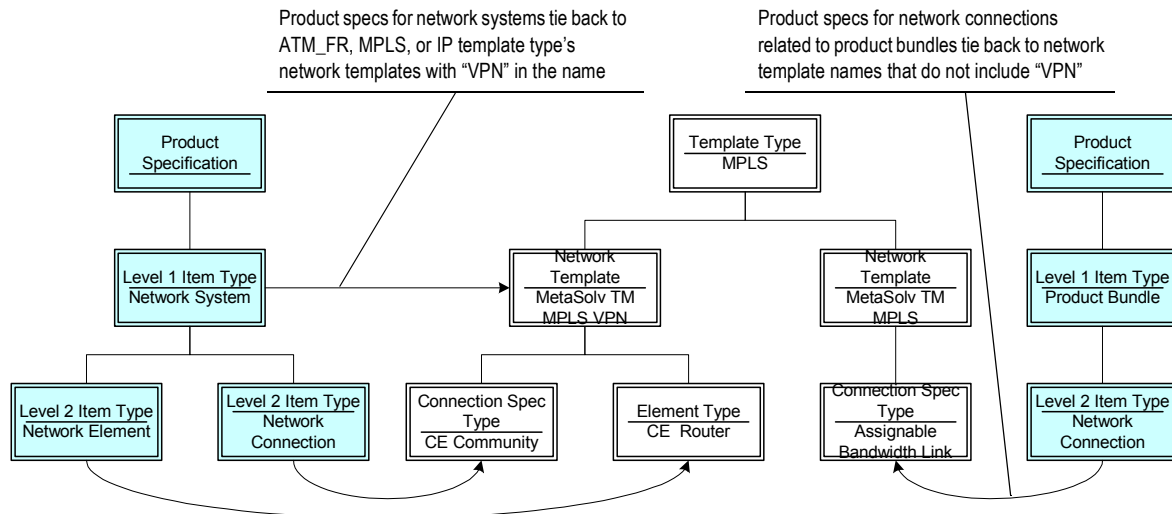
Figure 14: Relationships between product specifications and templates

The template type example is MPLS. The MPLS template type contains two functional types of network templates—one to support the customer networks (VPNs), the other to support only customer connections to the provider network. The network template type that supports customer networks can be associated with the network system item type. The association between the network system item type and the network template name containing VPN is indicated by the connecting arrow. However, the network templates like MetaSolv TM MPLS (see Figure 14 on page 31) support only customer connections and are not directly associated with any product-level item type. The ATM_FR (ATM/ Frame Relay) template type is like MPLS in that it supports both types of relationships. The IP template type and the Ethernet template type are not like MPLS and ATM_FR. The IP template type contains only a the network template (MetaSolv TM IP VPN) that can be associated with the network system item type. The Ethernet template type contains only the network template (MetaSolv TM Ethernet) that is conceptually related to product bundle at the connection level.

Product spec item types are all "orderable." Therefore, they can be associated only with template components designed for association with orderable items. The MetaSolv-defined network templates that can be associated with a VPN network system item are all defined as external. For a user-defined network template to be available for association with an orderable network system, it also must be defined as external. The MetaSolv-defined element type called customer edge router is defined as orderable. For a user-defined element type to be available for association with an orderable network element, it

also must be defined as orderable. For any network connection related to a network system to be orderable, it must have at least one orderable element as a termination point. The following figure shows how a network template and an element type must be defined to be available for association with the corresponding product specification item type.
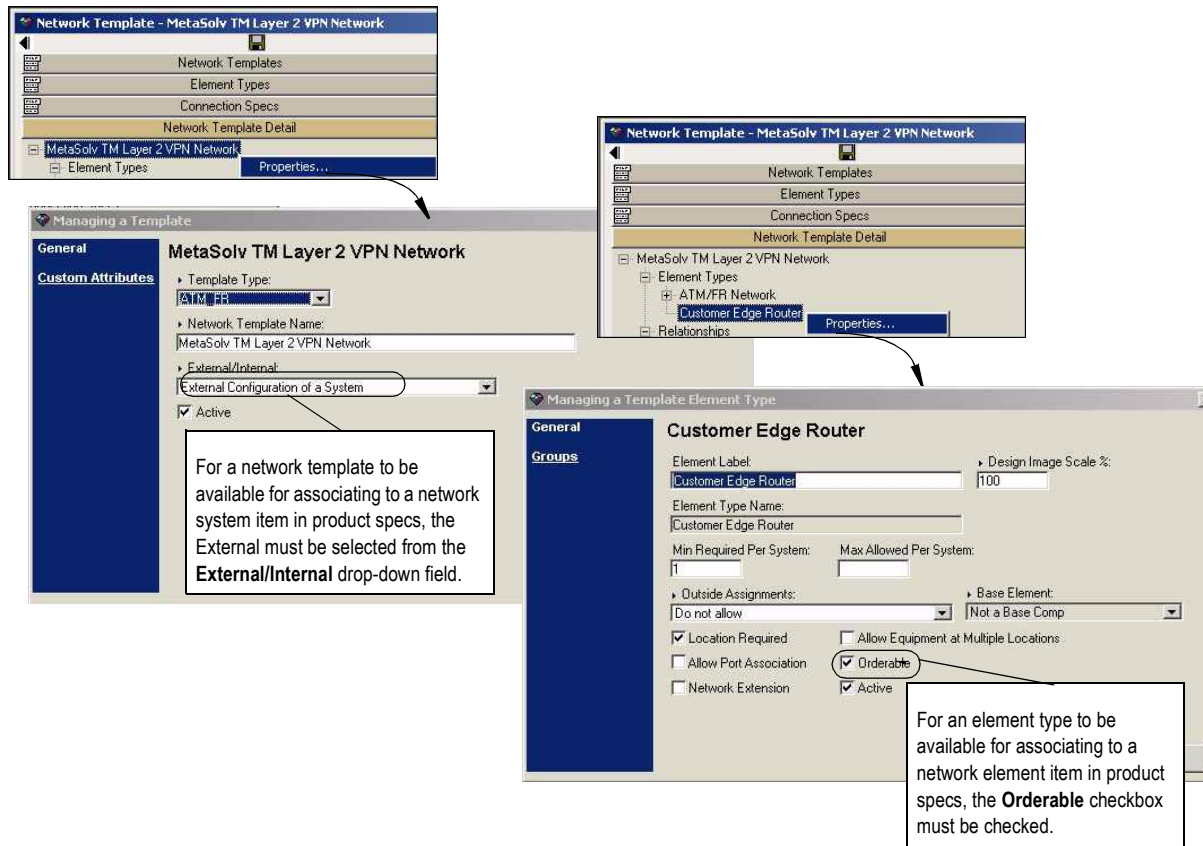
Figure 15: When template components can be associated with product specification items

What can template–based product specifications include?

This section provides details on template-based product specifications—from the simplest product specs for Internet connectivity and LAN-to-LAN connectivity to the more involved product specs for xDSL products and various types of VPN products.

Product bundles

Following is the hierarchy of items that can be related to a product bundle. Duplicates and customer-specific item types are not shown. Where duplicates exist, only the highest level occurrence is shown.
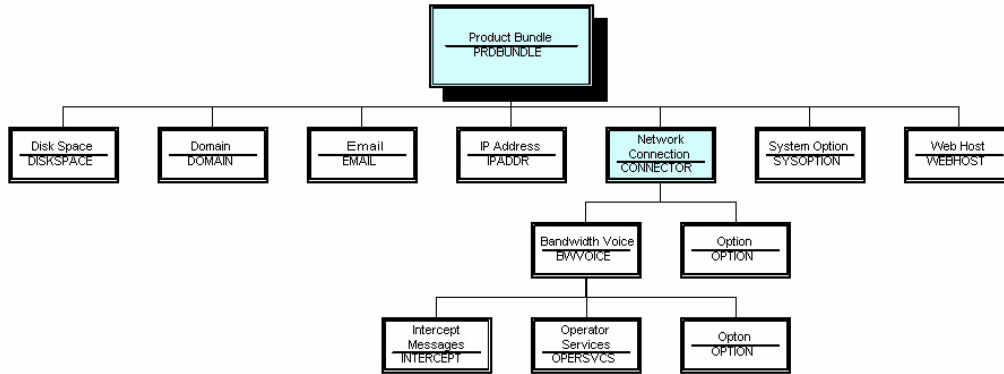
Figure 16: Hierarchy of items that can be related to a product bundle

The following is an example treeview of product specifications and corresponding product catalog entries for a product bundle with network connections. This example illustrates how multiple product catalog items can be built from a single set of product specifications. In this example, the PVC Access connection was associated with two connection specs in Product Specifications—one where the connection from the customer site terminates at an ATM switch, the other where it terminates at a frame relay switch. In the Product Catalog, however, the item called ATM PVC access is associated with the connection spec for the connection that terminates at an ATM switch, while the item called Frame Relay PVC access is associated with the connection spec for the connection that terminates at a frame switch. Likewise, the product specification for the PVC Enterprise item is associated with three connection spec types, but each of the product catalog items for PVC Enterprise is associated with a single connection spec, where each is different from the other.
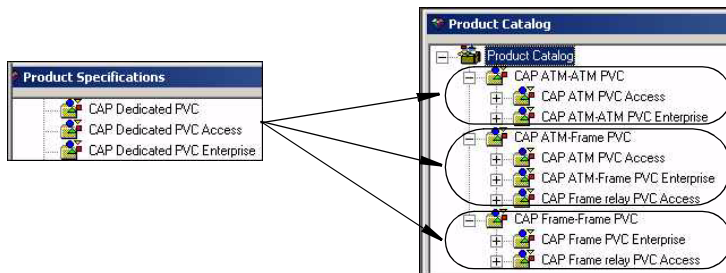
Figure 17: Example product specification and catalog of product bundle

Network connections related to product bundles

Template-based network connections are different from circuits typically ordered under a circuit product in that there is only one item type, CONNECTOR, and it gains its definition from being associated with different connection spec types. This section describes the

different connection spec types within each of the technology modules for various orderable connection products.

Frame Relay access network template association options

The Frame Relay Access Network template, contains (that is, uses) the MetaSolv TM ATM/ Frame Relay network template. It includes an assignable bandwidth link and an unassignable bandwidth link. These connection spec types support the following level 2 products:

- Physical access connection
- Physical access connection that is part of a group connection

The physical access connection that is part of a group connection supports the link from the customer site that uses an inverse multiplexing group connection to get the bandwidth equivalent of, for example, two T1s.

Enterprise connections and Internet connections used by the access network are included in the parent MetaSolv TM ATM/Frame Relay network template.

ATM access network template association options

The ATM Access Network template also uses the MetaSolv TM ATM/Frame Relay Network. This template includes two connection specs for assignable bandwidth links where the differences are in the terminating element types. Like the frame relay access network template, it includes an unassignable bandwidth link. This template also includes an SVC and a voice connection.

The connection spec type called voice connection can be associated with the product specification called VoATM, a virtual connection. The VoATM could be defined as a level 2 item under a level 1 voice connection product, which would also include a level 2 physical access connection under a voice connection.

The ATM access network template includes connection spec types that can be associated with the following level 2 products:

- Physical Access Connection
- Physical Access Connection that is part of a group connection
- Enterprise SVC
- Voice over ATM (VoATM)

ATM/frame relay network template association options

Consider the MetaSolv TM ATM/FR Network template, which is used by both the ATM Access Network template and the Frame Relay Access Network template. This template includes some of the connection spec types used by the Frame Relay Access Network template and in the ATM Access Network template, plus the virtual connections (Internet PVC and Enterprise PVC) that will be used by these access networks. It also includes another variation of the Assignable Bandwidth Link—one that terminates at another provider's network. This connection is for companies that administer a physical customer connection (a user-to-network interface, abbreviated UNI) that exists totally in another provider's environment. In this case, the MetaSolv Solution user would directly serve one UNI and the other provider would serve the other UNI.

The ATM/frame relay network template includes connection spec types that can be associated with the following level 2 products:

- Physical Access Connection
- Physical Access Connection that is part of a group connection
- Enterprise PVC
- Internet PVC

MPLS network template association options

The MPLS network template embeds the ATM/Frame Relay network template with its embedded network templates. You will recognize the resulting similarities in the supported connection associations. The one MPLS-specific connection is that of the assignable bandwidth link that terminates at the label edge router (LER). The LER element is part of the MPLS access network.

The MPLS network template includes connection spec types that can be associated with the following level 2 products:

- Physical Access Connection
- Physical Access Connection that is part of a group connection
- Enterprise PVC
- Internet PVC

Ethernet network template association options

The Ethernet network template supports the same kind of level 2 products that the ATM, Frame Relay, and MPLS templates support. The connection spec type names vary. In the Ethernet technology module, the Ethernet Link corresponds to the Assignable Bandwidth Link used in the other templates. Likewise the VLAN - Internet Connection corresponds to the Internet Connection while the TLAN and VLAN correspond to the Enterprise Connection.

The Ethernet network template includes connection spec types that can be associated with the following level 2 products:

- Physical Access Connection
- Enterprise PVC
- Internet PVC

DSL network template association options

MetaSolv technology modules include a variation on the MetaSolv TM ATM/Frame Relay Network called the MetaSolv TM DSL Network. This technology module is designed for MetaSolv users who provide xDSL services over their ATM/Frame Relay networks. It includes a DSL Link connection spec type that traverses a path from the customer site to a DSLAM. This is the only technology module that includes a DSLAM element type in the provider network and predefines valid connections from the DSLAM for both ordered xDSL service and for network design. DSL level 2 products may be named somewhat differently than corresponding connections unrelated to xDSL service; for example, DSL Internet Connection rather than Internet PVC.

The DSL network template includes connection spec types that can be associated with the following level 2 products:

- DSL Access Line (Physical) (with level 3 BWVOICE)
- DSL Access Connection
- Enterprise PVC
- Enterprise SVC
- DSL Internet Connection
- Voice over DSL Connection (VoDSL)

Examples of Product Specifications for xDSL service follow.
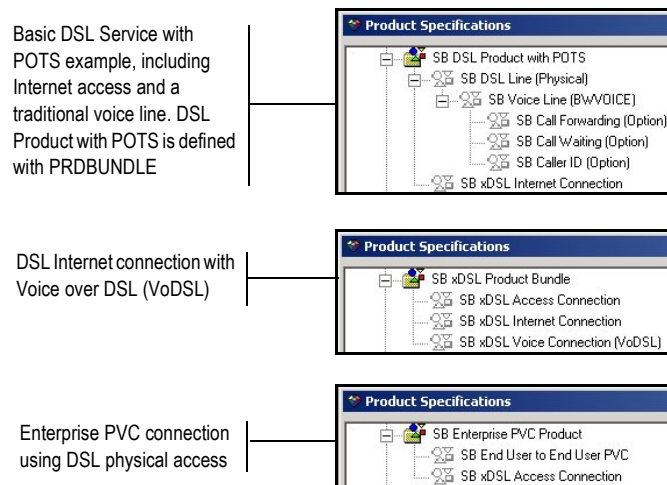
Figure 18: Examples of product offerings based on the DSL template

Network systems

Product specifications should be defined such that a network system is a level 1 item; network elements and network connections are level 2 items under the network system. Certain item types that are not template-based can be related to template-based items. For example, EQUIPMENT (Customer Premise Equipment) can be selected as a related item to ELEMENT. IPADDR (IP Addresses) can be related to SYSTEM and to EQUIPMENT. Additionally, SYSOPTION can be related to SYSTEM, and OPTION can be related to ELEMENT and CONNECTOR. Following is the supported hierarchy for SYSTEM (network

system). Duplicates and customer-specific item types are not shown. Where duplicates exist, only the highest level occurrence is shown.
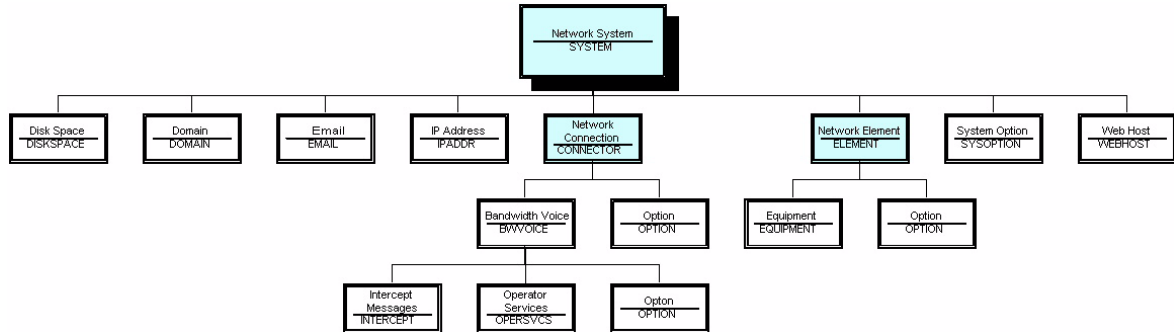
Figure 19: Hierarchy of items that can be related to a network system

Product specifications for network systems, such as VPNs, are different from those for bundles of connections in two ways. First, VPNs are ordered with the SYSTEM level 1 item type, rather than with PRDBUNDLE. Second, VPNs always include level 2 items representing the customer edge router in each location being connected; these are defined using the new ELEMENT item type. In the VPN templates, the orderable CE_RTR (customer edge router) element type replaces the non-orderable CUST_SITE (customer site) element type used in templates supporting only product bundles of connections. The customer edge router is the only element type predefined in the IP, ATM_FR, and MPLS templates that is marked as orderable.

Following is an example treeview of Product Specification entries and corresponding Product Catalog entries, where the hierarchies for the network system are annotated.
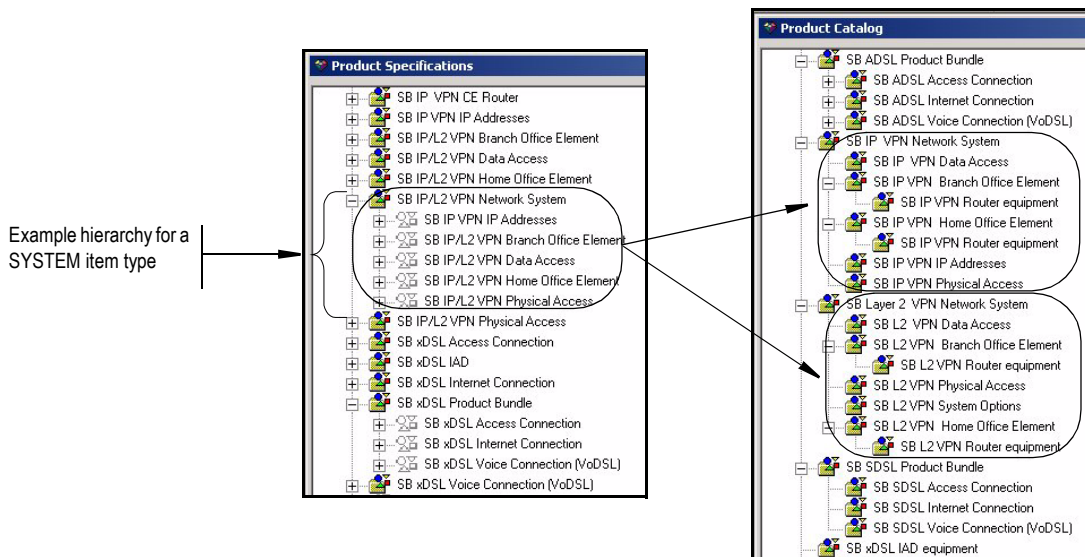
Figure 20: Example product specification and catalog of network system and product bundle

Network System template options

There are three predefined templates that can be associated with orderable network systems. These are all VPN templates and include the following:

- MetaSolv TM Layer 2 VPN
- MetaSolv TM MPLS VPN
- MetaSolv TM IP VPN

A fourth option, VPN - Basic Configuration, accommodates migrated VPNs.The following sections focus on product specifications for CONNECTORs and ELEMENTs related to the SYSTEM item type. This set of related item types supports ordered VPNs to be provisioned over networks designed with the ATM/FR, MPLS, and IP template types. Notice that all VPN template options for network elements are identical.

Network elements and network connections related to network systems

Layer 2 VPN network template association options

The Layer 2 VPN network template contains the MetaSolv TM ATM/Frame Relay network. In the Layer 2 VPN network template, the orderable CE_RTR (Customer Edge Router) element type replaces the non-orderable CUST_SITE (Customer Site) element type used in templates supporting only product bundles of connections. You can add an element type called VPN partner office to support an extranet VPN product offering. However, accommodating remote user access to the VPN requires a different approach. Because all elements must be able to be defined with a location on the Ordering Dialog and because the location of the *road warrior* type of remote user is variable, the recommended approach is to use the **Notes** field in the Network Attributes - network name page of the Ordering Dialog to order such an element with its corresponding connection.

Table 11: Element association option—MetaSolv TM Layer 2 VPN Network template

For this level 2 product	Select this Element Type
VPN Home Office	CE_RTR
VPN Branch Office	CE_RTR
VPN External Partner Office	**a**
VPN Remote User	**b**

a. Requires a user-defined element type representing the extranet partner site.
b. The remote user element can be added during the design of the customer VPN; such a request can be conveyed via the Notes field of the Network Attributes - network name page of the Ordering Dialog.

In the Layer 2 VPN template, the VPN Physical Access level 2 product replaces the Physical Access Connection, and the corresponding VPN Link replaces the Assignable

Bandwidth Link used in the ATM/Frame Relay template. Unlike those templates, which are used for extensions to the provider network, the VPN connections are all classified as customer-owned. Additionally, the Layer 2 VPN Connection replaces the Enterprise Connection; this new level 2 product name is associated with the orderable form of customer equipment, CE_RTR. The product specification for Internet connectivity is the same except that one of its termination points is an ordered customer edge router

The Layer 2 VPN network template includes connection spec types that can be associated with the following level 2 products:

- VPN Physical Access
- VPN Enterprise Data Access
- Internet Data Access

MPLS VPN network template association options

The MPLS VPN Network template contains the MetaSolv TM MPLS Network. In the MPLS VPN template, the orderable CE_RTR (customer edge router) element type replaces the non-orderable CUST_SITE (customer site) element type used in templates supporting only product bundles of connections. For guidelines on adding the VPN partner office and VPN remote user, see Layer 2 VPN network template association options

In the MPLS VPN template, the VPN Link can terminate at either the label edge router or at another provider's network. The MPLS connection type for enterprise connectivity is called CE community. This connection type is used differently than the ATM enterprise data access inasmuch as only one occurrence needs to be ordered to support the entire VPN.

The MPLS network template includes connection spec types that can be associated with the following level 2 products:

- VPN Physical Access
- VPN Enterprise Data Access
- Internet Data Access

IP VPN network template association options

The IP VPN Network template contains the MetaSolv TM IP Network. For guidelines on adding the VPN partner office and VPN remote user, see Layer 2 VPN network template association options

The IP VPN template uses many of the connection spec types that are part of the MetaSolv TM IP Network. Consider the VLAN - Internet Connection. There are two basic forms of VLAN connections—Internet and Enterprise. VLAN connections are tagged-based, or connection oriented, as opposed to network oriented. Network oriented connections are either port-based in that they are identified by port addresses, policy-based in that they are identified by IP addresses, or dynamic in that they are identified by MAC addresses.

The IP network template includes connection spec types that can be associated with the following level 2 products:

- VPN Physical Access

- VPN Enterprise Data Access
- Internet Data Access

Should a product item be associated with multiple template components?

This section describes the implications of selecting one or more valid template components for association with template-based product specifications and product catalog items.

How product spec associations affect corresponding product catalog item

When you associate multiple template components with a product specification item, those template components will be available for associating to the corresponding product catalog item. For example, you can associate a VPN network system product specification to both an IP VPN network template and a Layer 2 VPN network template. When you define a product catalog item using this VPN network system, you can choose to associate the product catalog item with any or all of the network templates that have been associated to the product specification. In this example you could associate the VPN network system product catalog item to just the IP VPN network template, just the Layer 2 VPN network template, or both network templates.

How product catalog associations affect template availability at order time

When you associate multiple template components with a product catalog item, those template components are available for selection at order time, with one caveat. When a network system associated with multiple network templates is ordered, the first page presented by the Ordering Dialog requires you to choose the network template to use for the order. Once that choice is made, the template components available for associating with network elements and network connections that are part of that system are filtered to include only those that are child items of the selected network template.

Approaches to template associations

There are two approaches to setting up template-based product specification items and product catalog items:

- Generic approach: Associate each product spec or product catalog item with all valid template components. This approach results in the fewest possible product specs.
- Granular approach: Associate each product spec item with only one template component. This approach results in a separate product spec for each possible use.

In practice, you will likely choose neither extreme, but may lean in one direction or another. You may want to set up as few product specifications as possible, and proceed with a more granular breakout when you define product catalog items. Or you may choose to associate no more than one network template with any network system item, but then associate all valid connection spec types with each child network connection.

When associating a network connection to multiple connection spec types, those connection spec types must be either all physical (bandwidth) connections or all virtual

connections. The software prevents you from associating different kinds of connection spec types to the same network connection item. If you attempt to do this inadvertently, an error message appears explaining why this is not permitted.

It is recommended that you let the name of the product item be your guide when choosing the template component for association. Consider, for example, the connection association options for Internet access. If you have both routers and SMSs in your network, you would probably want to associate the Internet access item to both connection spec types for Internet connections—the one that terminates at the router and the one that terminates at the SMS. It probably would not be worthwhile to require this level of distinction among product catalog items.

VPNs are technology specific. For example, the network template Layer 2 VPN network can be used to support both ATM VPNs and frame relay VPNs. If using the MetaSolv-defined template components, the VPN links for ATM VPNs would use the connection spec type with element types CE_RTR to ATM_SW, whereas the frame relay VPN would use the connection spec type with element types CE_RTR and FR_SW. If you build product catalog items for both types of VPNs, it might be easier for the order taker if the ATM VPN and the frame relay VPN were defined as separate product catalog items so that the appropriate VPN link can be selected by the product catalog designer.

How do templates affect existing product specifications?

Most existing product specification packages and products are unaffected by the functionality incorporated in the MetaSolv technology modules. Two existing product specification packages will be migrated to take advantage of the technology modules. These include Basic xDSL and Basic VPN.

Basic xDSL services that formerly were provided with the following product catalog item type hierarchy, now can be provided as illustrated in Figure 18, "Examples of product offerings based on the DSL template," on page 36.

- DSL Circuit Product (CKTPROD)
  - ⇒ DSL Bandwidth Circuit (BWCKT)
    - ⇒ DSL Virtual Circuit (VIRTCKT)
    - ⇒ Bandwidth Voice (BWVOICE)

Basic VPN services were formerly provided with the following hierarchy:

- Basic VPN Product (CKTPROD)
  - ⇒ Bandwidth Circuit (BWCKT)
    - ⇒ Internet Circuit (INTRNCKT)
  - ⇒ Related Bandwidth Circuit (BWCKT)

PSR migration creates new product catalog and product specifications for items created with the item types included in the following table. The migration tool determines the technology type of the internal network to which the service items using the product catalog CKTPROD item type were provisioned and the type of element to which the circuit is assigned. This information is used to associate the CONNECTOR item types to the

correct connection spec types from the correct network template(s). See the *Migration Guide* for details.

Table 12: Migration of bandwidth connections and virtual connections

This item type	Is migrated to:	For subsequent association with:
CKTPROD	PRDBUNDLE	
BWCKT	CONNECTOR	an assignable bandwidth link
VIRTCKT	CONNECTOR	a virtual connection
INTRNTCKT	CONNECTOR	an Internet connection

After MetaSolv Solution M/5.1 is installed, you should create a reference copy of the sample network templates in the MetaSolv technology modules. As the delivered template components are customized, you can compare your version with the reference copy to identify what has been added, modified, or removed. To learn about making a reference copy, see the *Network Templates Concepts and Processes Guide.*
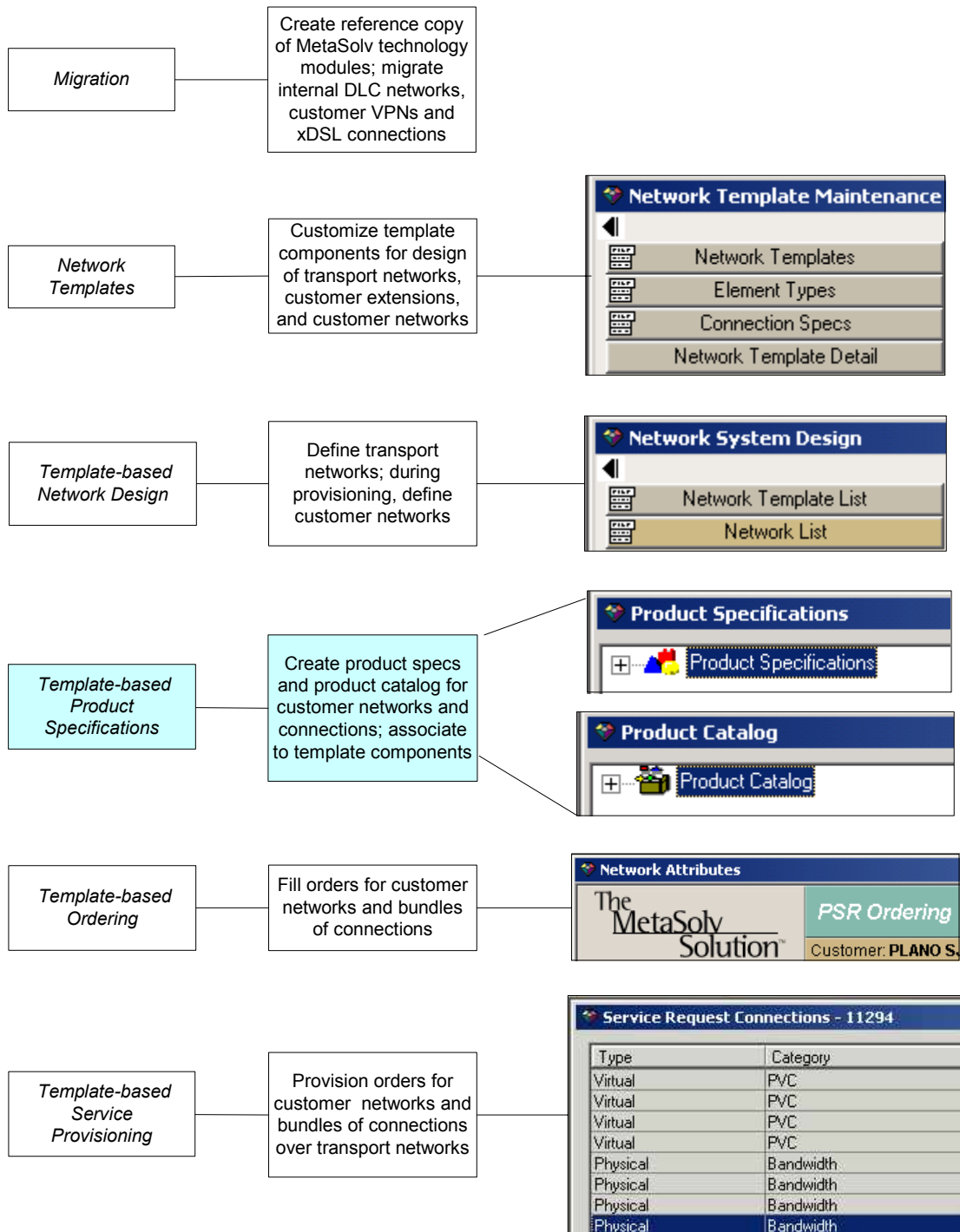
When the reference copy of the MetaSolv technology module(s) is created, the template will be set to inactive and names changed to *Reference of <original name>* to ensure that its components won't be available for associating with a product specification.

WHERE DO PRODUCT SPECS/CATALOG FIT IN THE END-TO-END PROCESS?

CAP guide view

The following figure shows where the creation of template-based product specifications and product catalog items fit into the end-to-end process. The end-to-end process begins with defining your own template components to augment those that are MetaSolv-supplied, designing your internal networks using these template components, taking orders for the product offerings you have defined within product catalog, and provisioning those services over your internal network, where services can include such things as managing your customers' VPNs.

Migration	Create reference copy of MetaSolv technology modules; migrate internal DLC networks, customer VPNs and xDSL connections	
Network Templates	Customize template components for design of transport networks, customer extensions, and customer networks	**Network Template Maintenance** — Network Templates / Element Types / Connection Specs / Network Template Detail
Template-based Network Design	Define transport networks; during provisioning, define customer networks	**Network System Design** — Network Template List / Network List
Template-based Product Specifications	Create product specs and product catalog for customer networks and connections; associate to template components	**Product Specifications** — Product Specifications / **Product Catalog** — Product Catalog
Template-based Ordering	Fill orders for customer networks and bundles of connections	**Network Attributes** — The MetaSolv Solution™ / PSR Ordering / Customer: PLANO S.
Template-based Service Provisioning	Provision orders for customer networks and bundles of connections over transport networks	**Service Request Connections - 11294**

Service Request Connections - 11294

Type	Category
Virtual	PVC
Virtual	PVC
Virtual	PVC
Virtual	PVC
Physical	Bandwidth
Physical	Bandwidth
Physical	Bandwidth
Physical	Bandwidth

Figure 21: Template-based features and processes within the MetaSolv Solution

Work flow view

Following is a detailed workflow. The process in the workflow that is addressed in this CAP guide is highlighted in the following diagram.
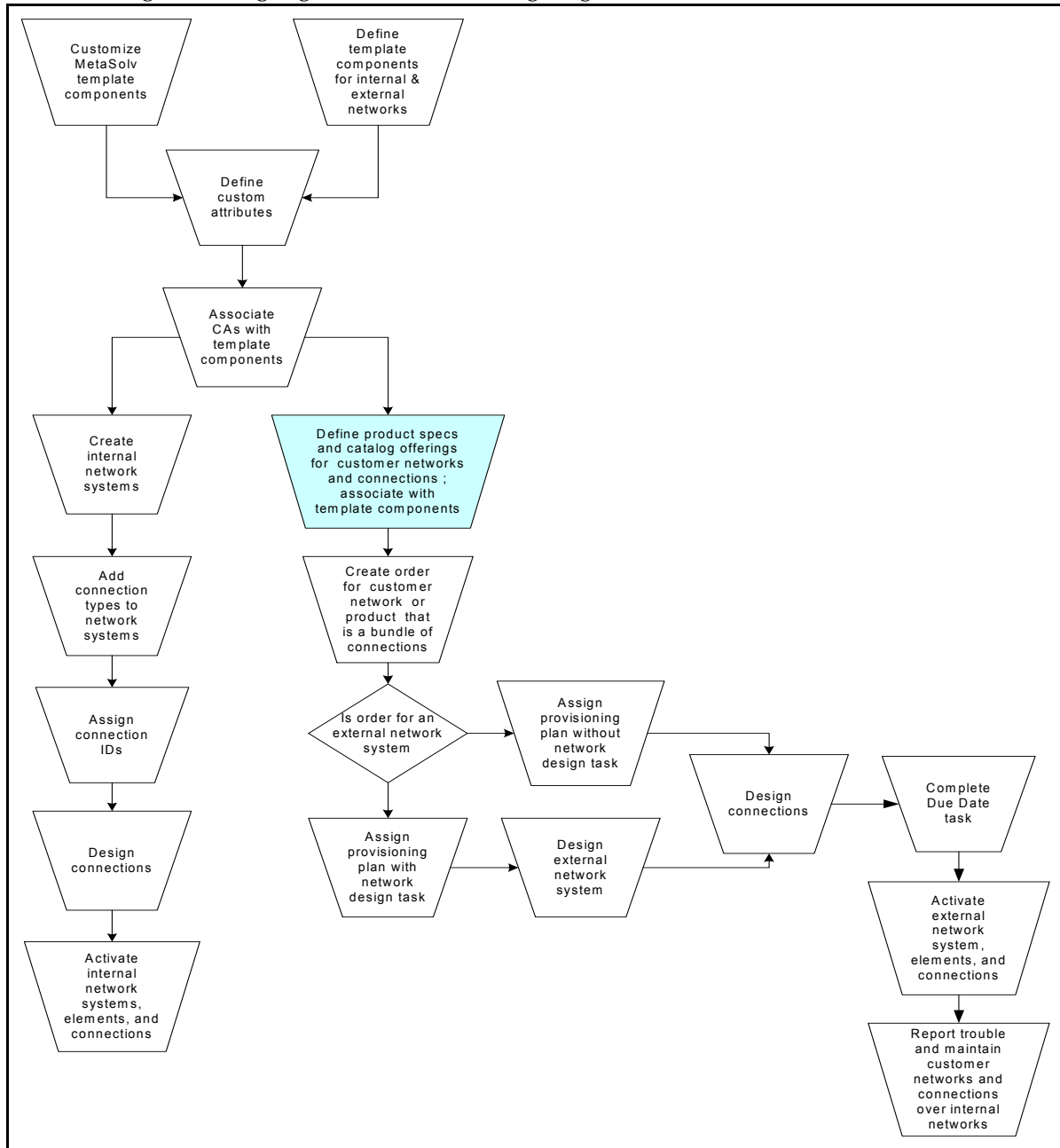

Figure 22: Work flow for template-based functionality

Subsystem and module–level view

Tool/Utilities

- Migration utilities include a PSR migration. This migration process is required if you use the current Digital Subscriber Line (DSL) functionality with the Broadband Design module. When you upgrade to release 5.1.x, your Digital Loop Carrier (DLC) and Basic VPN will be upgraded. See the *MetaSolv Migration Guide* for details.

- MetaSolv Solution Utility Application, a separate executable from the MetaSolv Solution, is the application through which you create and maintain custom attributes. The purpose of custom attributes and brief descriptions of the processes involved in creating and maintaining them are included in the *Network Templates Concepts and Processes Guide.*

Engineering

- Templates based on MetaSolv technology modules are available as software options for technologies such as ATM/Frame Relay, MPLS, Ethernet, and IP for services such as virtual private networks (VPNs) and digital subscriber line (xDSL), and for existing networks such as digital loop carrier (DLC). See the *Network Templates Concepts and Processes Guide* for details.

- Internal network systems based on templates can be designed on the new graphical canvas with the enhanced network systems functionality. See the *Template-based Network Design Concepts and Processes Guide* for details.

Infrastructure

- Customer and non-customer locations can be defined or queried for using the Ordering Dialog. The definition of locations containing customer edge routers is critical to defining ordered VPN systems. Completing the connectivity matrix for ordered standalone network connections requires the definition of locations. See the *Template-based Ordering Concepts and Processes Guide* for details.

- Product catalog is used to develop product offerings for network systems and bundled network connections that are based on new item types. See Creating product catalog items for template-based products on 68.

- Network items that can be associated with network areas have been extended to include network systems, network elements within a network system, and network elements, where the related network system is not associated with network area. IP addresses associated with the network area can then be further associated at the network system level and/or the network element level. When querying for IP addresses to assign to connections, the query criteria can be set to retrieve only those IP addresses previously associated with the network element or network system used by the network connection. See online help on network areas for details.

- Number inventory includes the inventory of IP addresses. IP addresses are assigned during the provisioning of Internet circuits. See the *Template-based Service Provisioning Concepts and Processes Guide* for details. IP addresses may also be assigned during the design of the internal network. See online help on IP address

management and the *Template-based Network Design Concepts and Processes Guide* for details.

Equipment

- Product specifications for equipment can be related to product specifications for network elements, and can be associated with equipment specs. The ability to associate an equipment spec for a customer router to equipment related to VPN locations is supported. See page 67 and page 50 for details.

- The Ordering Dialog includes a page titled, What kind of equipment do you want to order? This page permits retrieval of an existing equipment specification. See the *Template-based Ordering Concepts and Processes Guide* for details.

- Equipment specifications can be associated with network elements selected from the templates when building internal networks. See the *Template-based Network Design Concepts and Processes Guide* for details.

- Connection assignments to equipment—specifically port addresses—is part of service provisioning. Service provisioning of any product offering processed through the Ordering Dialog is provisioned with the Provisioning Dialog. See the *Template-based Service Provisioning Concepts and Processes Guide* for details.

Preferences

- Engineering preferences include a new Design Mode preference that replaces the former Use Path Analysis preference. It is used to indicate whether virtual connections are to be designed with path analysis based on the number of hops, with path analysis based on distance, or manually configured.

- System preferences include a new Use Default Connection ID format which was added for the Connection ID task. When set, the default format used is Location 1/Location 2/label/circuit design ID.

Customer care

- Customer management information for customer accounts is accessed when creating any change order in PSR. Existing customer account information can be accessed through the new Customer Profile functionality. See online help on customer profile for details.

- Product service request information is collected on the new Ordering Dialog when a network system or product bundle of connections is selected from the product catalog. See the *Template-based Ordering Concepts and Processes Guide* for details.

Work management

- Task types include a new task type called NET DSGN for provisioning a VPN network system. See the *Template-based Service Provisioning Concepts and Processes Guide* for details.

Processes

This chapter describes each task in the processes of developing product specifications and product catalog offerings for customer networks. Specifically, VPNs and standalone customer connections, both *bundled* (as in an xDSL service) and *unbundled* (as in a simple Internet connection). This information includes usage guidelines, prerequisites, and step-by-step instructions for the underlying tasks. The chapter begins with a description and a screenshot of each entire window. You can refer to these entire-window figures when reading about the tasks and scenarios, where the figures show only the relevant, partial area of the window in the screenshot.

Read this chapter if you are responsible for setting up product specifications or the product catalog for services that include VPNs or customer connections. This chapter can also help you learn how to create or change templates-based product specifications and the corresponding product catalog service items in the MetaSolv Solution.

IMPLEMENTATION SEQUENCE

This section describes the end-to-end workflow for creating template-based product specifications and product catalog offerings based on these product specs. The workflow begins with prerequisites and ends with the steps for creating the template-based product catalog offerings. This section addresses processes with the assumption that only the MetaSolv-defined template components will be used; it does not address processes that would be valid with the development of user-defined template components.

The implementation sequence for setting up the product specifications and product catalog items for template-based products is:

1. Planning catalog contents for template-based products

   a. Understand templates and template-based item types

   b. Plan product offerings and determine pricing

2. Creating product specifications for template-based products

   a. Add product specifications

   b. Associate product specifications to templates

   c. Establish relationships among product specifications

3. Creating product catalog items for template-based products

   a. Add items to the product catalog

b. Associate product catalog items with templates

c. Establish prices for product offerings

4. Maintaining template-based product specifications and catalog items

a. Set effective dates for template associations

b. Modify effective dates for product offering

After creating product offerings in the product catalog for network systems and bundles of connections that are offered together as products, these items can be included as service items on a PSR order. For details, see the *Template-based Ordering Concepts and Processes Guide.*

Details and scenarios describing how such product offerings are provisioned are included in the *Template-based Service Provisioning Concepts and Processes Guide.*

PROCEDURES LIST

This section contains step-by-step instructions for the processes described in the implementation sequence. Page number references by processes are shown on the following table.

Table 13: Processes cross-reference

For details on this process:	See
Planning catalog contents for template-based products	Understand templates and template-based item types
	Plan product offerings and determine pricing
Creating product specifications for template-based products	Add product specifications
	Associate product specifications to templates
	Assign valid values (optional)
	Relate subordinate product specifications to a selected product specification
Creating product catalog items for template-based products	Add items to the product catalog
	Associate product catalog service items with templates
	Establish prices for product offerings

Table 13: Processes cross-reference

For details on this process:	See
Maintaining template-based product specifications	Set effective dates for a relationship to a template-based product spec
	Remove a relationship between product specifications
	Disassociate a product specification from a template component
	Set effective dates for a template association with a product specification
Maintaining template-based product catalog items	Display all or specified items in the product catalog treeview
	Set effective dates for a template association with a product catalog item

PROCESSES

This section describes the following processes:

- Planning catalog contents for template-based products
- Creating product specifications for template-based products
- Creating product catalog items for template-based products
- Maintaining template-based product specifications
- Maintaining template-based product catalog items

Planning catalog contents for template-based products

This section describes processes you can complete while your internal network is being designed with template-based functionality and while the predefined network templates and their components are being customized and extended.

Understand templates and template-based item types

Before creating product specifications for template-based products, use the following guidelines to understand templates and template-based item types. Or, just jump right in and reference these steps only if you have questions.

Steps

1. Familiarize yourself with templates-based product spec item types and the template components that you will need to associate with the product specs.

To understand the predefined template components, read the following sections of this book:

- Template-based product spec item types
- Source template components for template-based specs
- How template-based item types tie back to templates

2. Analyze the product directly to understand any user-defined network templates, element types, or connection spec types built with the Templates functionality.

Plan product offerings and determine pricing

Before beginning formal definitions, identify how you want to bundle product offerings that are either VPN network systems or bundles of connections from your network to the customer site. Use the following guidelines.

Steps

1. Identify the level 1 products you plan to offer that will use the new Network System (SYSTEM) and Product Bundle (PRDBUNDLE) item types. Possibilities include the following:

   - Intranet VPN service using associations to the predefined network template, element type and connection spec type
   - Extranet VPN service, using user-defined template components
   - xDSL service
   - Bundled connectivity service (other than xDSL)

2. If your company is defining its own network templates, element types, and connection spec types, you will want to work with the individuals responsible for those definitions as you determine whether to use the SYSTEM or the PRDBUNDLE item type for each of the services you are offering.

3. For each level 1 product you identify, identify the supporting level 2 products.

4. If you plan to relate equipment to a network element item type such as a customer edge router, define the needed equipment specifications and ensure that they are marked as CPE-capable.

5. For ease of use, plan naming conventions for customer networks and customer product bundle connections and their related service items that will become product offerings. Suggested naming conventions are shown in the following figure.

All specifications related to the VPN product offering will be prefixed with a common prefix and "'IP/L2 VPN." The same spec will be used to create separate product catalog items for IP VPN and Layer

All specifications related to the SDSL product offering will be prefixed with a common prefix and "SDSL." This standard enables the SDSL IAD (Interface Access Device) level 1 Equipment spec to be sorted adjacent to the corresponding product bundle item.

Figure 23: Example naming conventions for specs that will be related to each other

6. Plan the naming conventions for the product catalog items to be created.

Both the ADSL and SDSL Product Bundle product catalog items will be created from the xDSL product specification

Both the IP VPN and the Layer 2 VPN Network Systems will be created from IP/L2 VPN Network
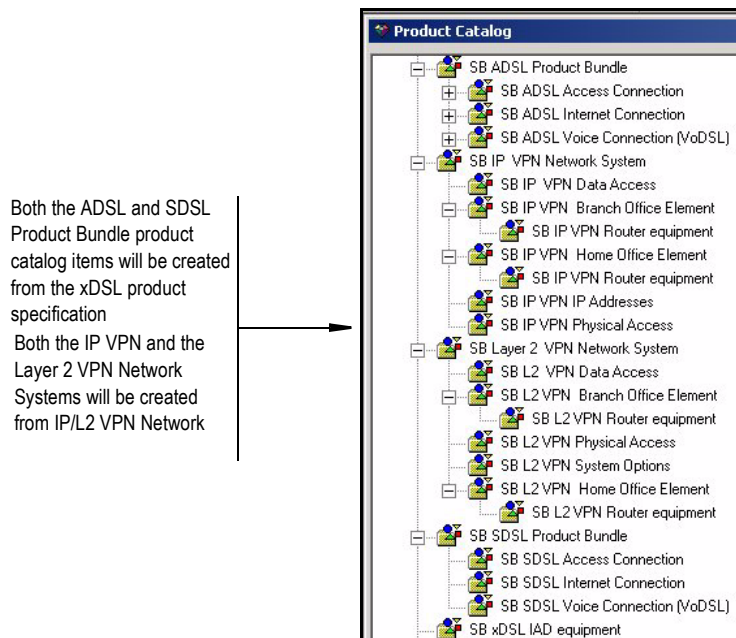
Figure 24: Example naming conventions for template-based product catalog items

7. For each product offering to be added to the product catalog, determine pricing information.

Creating product specifications for template-based products

This section describes the process of creating product specifications for template-based products, which involves the following three tasks:

1. Add product specifications

2. Associate product specifications to templates

3. Establish relationships among product specifications

Each task is addressed in terms of its purpose, then navigation requirements, and finally product-specific tips. References to the source windows and to the scenarios are included.

Add product specifications

This section describes the procedure for adding new template-based items to product specifications. The first process in the end-to-end workflow for creating template-based product specifications is to add the new item to product specifications and specify general information for the added item. Use the following steps if adding product specs for template-based products such as customer network systems (VPNs) or bundles of customer connections including PVCs.

Steps

1. Access the Product Specifications window with **Infrastructure > List > Product Catalog > Product Specifications**.
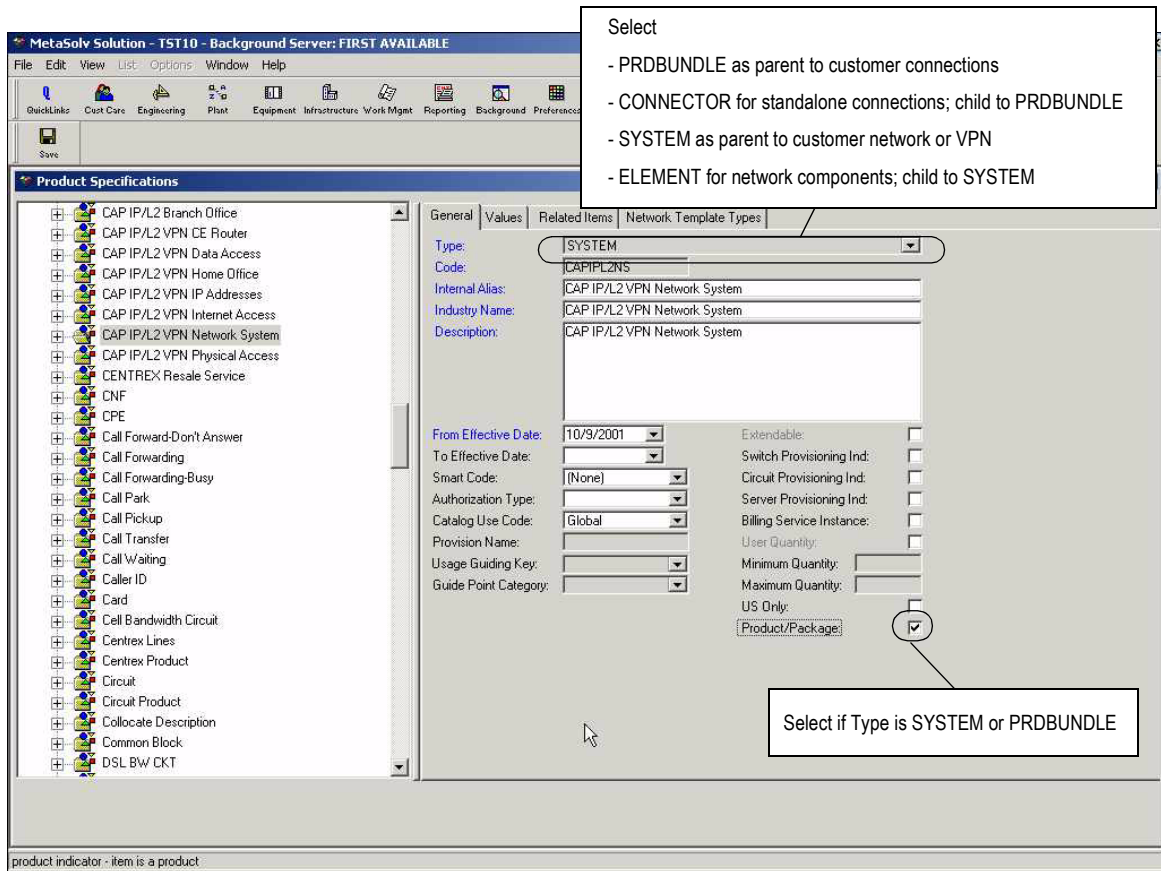
Figure 25: Product Specifications—General tab

2. For each product specification to add, highlight the Product Specifications treeview root item and select **Add Item** from the popup menu.

3. If you provide VPN services, see Scenario 3—Setting up product specs and catalog for VPN service step 2. on page 108 for an example of product specifications to add for a VPN scenario, then proceed as follows:

   a. Add a product specification for each level 1 product offering that uses the Network System (SYSTEM) item type

   b. Add a product specification using the Network Element (ELEMENT) item type. This item can be used to define services for any location where a customer router will be installed.

   c. Add product specifications for each required virtual and physical connection using the Network Connection (CONNECTOR) item type. Be sure to add a network

connection for a physical link from a network element representing a customer edge router to the provider network. Be sure to add a network connection for use as an enterprise connection among the network elements composing the VPN.

4. If you provide xDSL connectivity:

   a. Add a product specification for the xDSL service offering using the Product Bundle (PRDBUNDLE) item type.

   b. Add a product specification for each connector type. See Figure 18 on page 36 which provides three sample sets of supporting level 2 products for the xDSL Service.

5. If you provide bundled connectivity other than xDSL:

   a. Add a product specification for each level 1 product offering that uses the Product Bundle item type.

   b. Add a product specification for each other bundled connectivity service or unbundled connectivity service using the Network Connection (CONNECTOR) item type. You can relate the same level 2 item to more than one level 1 product offering, so there is no need to define duplicates.

6. Complete the fields on the General tab. Use the following tips for determining the data to enter:

   - Select **Type**, where new types include SYSTEM, ELEMENT, CONNECTOR, and PRDBUNDLE. Optionally, define product specifications for types of EQUIPMENT that are to be related to each ELEMENT. Optionally, define occurrences of the SYSOPTION type to be related to SYSTEM, as well as occurrences of the OPTION type to be related to ELEMENT or CONNECTOR.

   - Enter user-defined code.

   - Enter **Internal Alias/Industry Name/Description** that will easily map to the corresponding building block on the Network Template Types tab.

   - Accept today's date as **From Effective Date**, unless you want to defer putting the spec into effect until a later date.

   - Leave **To Effective Date** blank unless you want to indicate an expiration date for this spec.

   - Check **Product/Package** if **Type** is SYSTEM or PRDBUNDLE to indicate that the item will be a level 1, or the top level in a hierarchy of related items.

   - Do *not* check any of the provisioning indicators for a customer network connection. This is a change from release 5.0 and earlier, where it was sometimes necessary to check the **Switch Provisioning Ind.**, the **Circuit Provisioning Ind.**, or the **Server Provisioning Ind.** for an ordered circuit.

7. Click **Save**.

Associate product specifications to templates

This section describes the procedure for associating template-based product specification items to one or more template components within the MetaSolv technology modules.

Table 14: Candidate associations between product spec items and template components

A product specification for:	Can be associated with one or more:	From MetaSolv TM templates such as:
Network system	Network templates	Layer 2 VPN, MPLS VPN, or IP VPN
Network element	Element types	
Network connection associated with a network system	Connection spec types from VPN network templates	
Network connection associated with product bundle	Connection spec types defined as extensions from non-VPN network templates	ATM/Frame Relay Network, DSL Network MPLS Network, or Ethernet Network

The second process in the end-to-end workflow of creating template-based product specifications is to plan and then implement associations of the product specs for the template-based item types to the appropriate template component.

If you provide any VPN service, see Scenario 3—Setting up product specs and catalog for VPN service, step 3. on page 109 for an example.

Use the following procedure if associating product specs for template-based products such as customer networks (VPNs) or customer connections to their corresponding template component.

Steps

1. Display the Product Specifications window.

   Access the Product Specifications window with **Infrastructure > List > Product Catalog > Product Specifications**.

2. If associating the product specification for a network system or a network element or network connection that will be related to that network system, continue with the next step. If associating the product specification for a network connection that will be related to a product bundle, skip to step 10. on page 62

3. Highlight a network system item on the treeview and display the Network Template Types tab.

4. Determine the network templates to associate based on your technology type(s). For details, refer to the following table.

Table 15: VPN template association options—MetaSolv's technology modules

For this level 1 product	Select one or more network templates	From the corresponding template type
VPN	MetaSolv TM Layer 2 VPN Network	ATM_FR
VPN	MetaSolv TM MPLS VPN	MPLS
VPN	MetaSolv TM IP VPN	IP
VPN	VPN - Basic Configuration	IP

5. Highlight one or more network templates to associate with the selected network system and select the right-click menu option **Associate**.

Upon association, a checkmark appears in the first column of the row containing the selected network template.
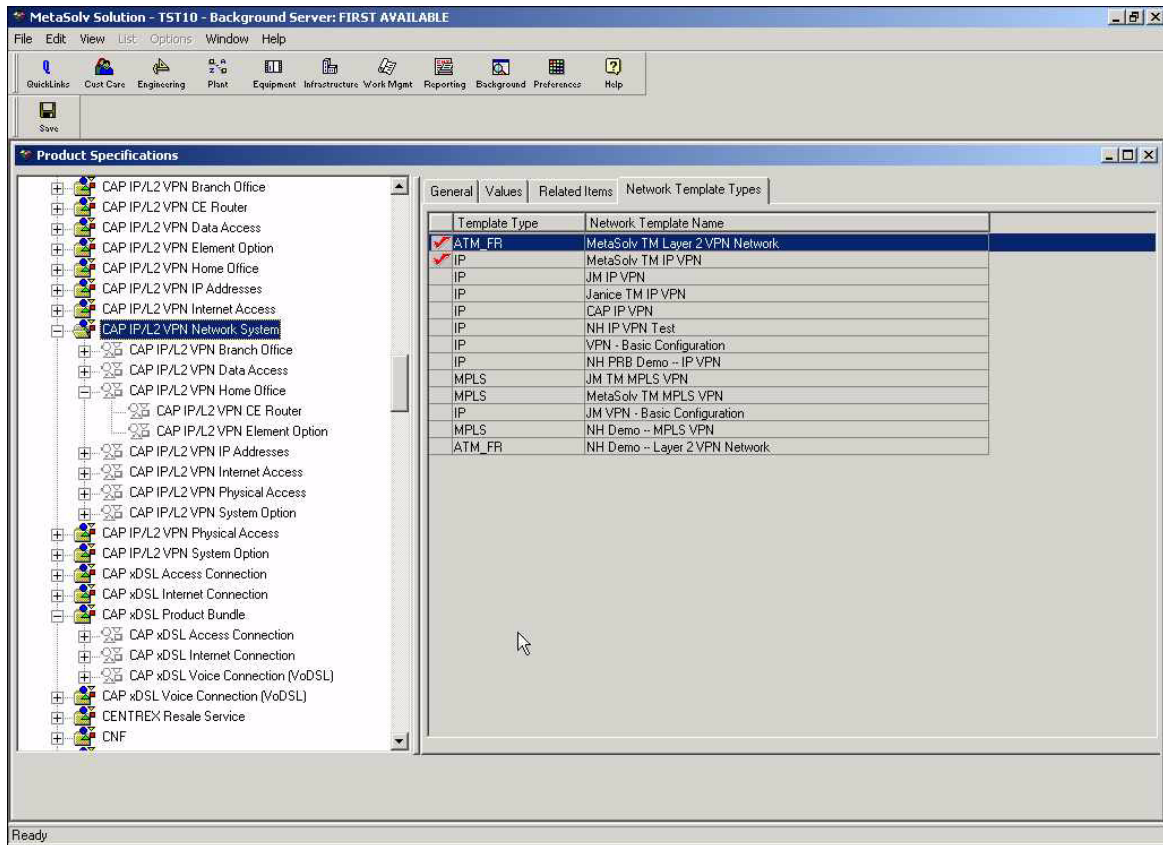
Figure 26: Product Specifications Network Template Types tab—network system

6. For each network element to be related to the network system just associated, determine the element type(s) to associate with it. Only element types belonging to a network template that you associated with the network system that is to be the parent of this network element are eligible. MetaSolv-defined element types for a VPN network element are the same within the following network templates:

   ⇒ MetaSolv TM Layer 2 VPN

   ⇒ MetaSolv TM MPLS VPN

   ⇒ MetaSolv TM IP VPN

Element type options follow:

Table 16: VPN element type association options

For this level 2 product	Select this Element Type
VPN Home Office	CE_RTR
VPN Branch Office	CE_RTR
VPN External Partner Office	a
VPN Remote User	b

a.User-defined element type representing the extranet partner site
b.The remote user element can be added during the design of the customer VPN; such a requirement can be ordered via Notes.

7. Highlight one or more element types to associate with the selected network element. If using predefined element types, select CE_RTR. Then select the right-click menu option **Associate**.

Repeat this step to associate the product specification for each network element belonging to the current network system, if more than one, to the appropriate element type.
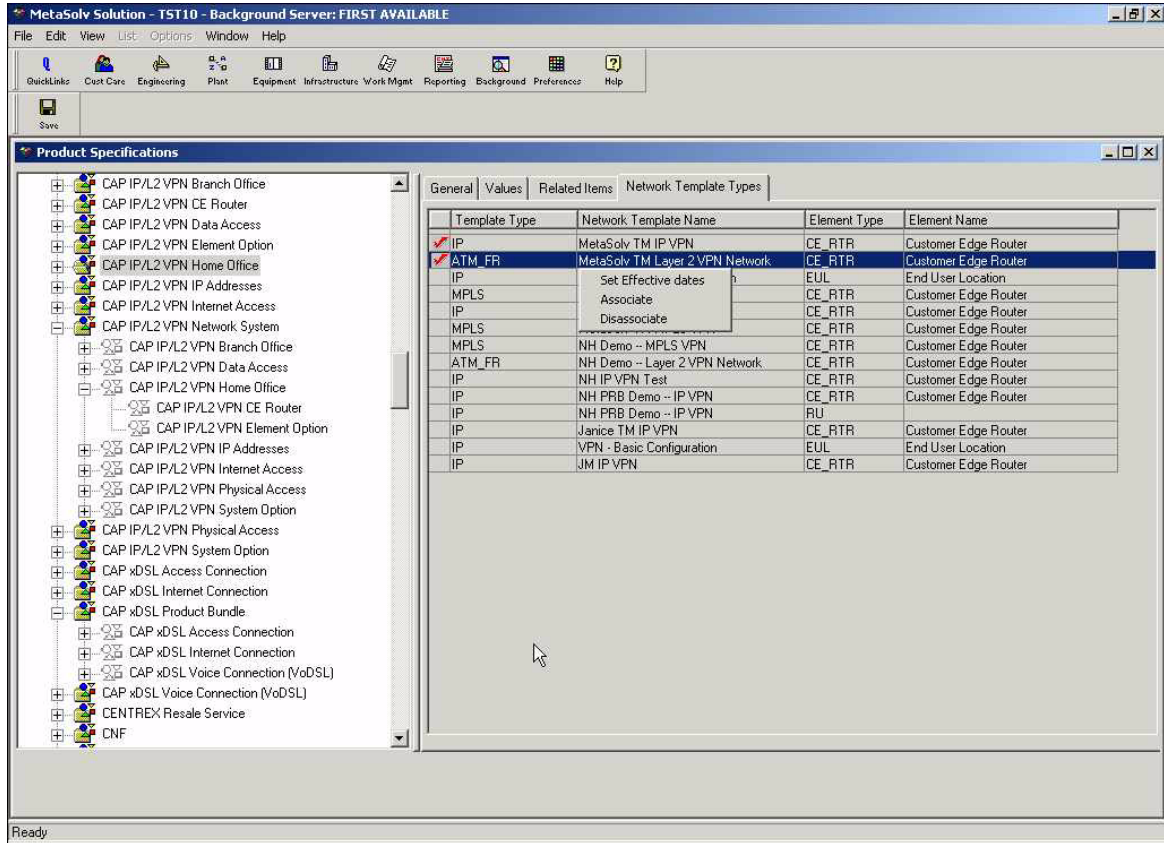
Figure 27: Product Specifications Network Template Types tab—network element

8. For each network connection to be related to the network system just associated, determine the connection spec type(s) to associate with it.

Only connection spec types belonging to a network template that you associated with the network system that is to be the parent of this network connection are eligible. Details on MetaSolv-defined connection spec types for a VPN network connection differ by technology type(s).

a. If using ATM/frame relay, see the following table.

b. If using MPLS, see Table 18 on page 60.

c. If using IP, see Table 19 on page 61.

Table 17: Connection association options—MetaSolv TM Layer 2 VPN Network template

For this level 2 product	Select this Connection Spec Type	With this Element Type A	And this Element Type B
VPN Physical Access	VPN Link	CE_RTR	FR_SW
VPN Physical Access	VPN Link	CE_RTR	ATM_SW
VPN Physical Access	VPN Link	CE_RTR	O_P_NET
VPN Enterprise Data Access	Layer 2 VPN Connection	CE_RTR	CE_RTR
Internet Data Access	Internet Connection	CE_RTR	ROUTER
Internet Data Access	Internet Connection	CE_RTR	SMS

Table 18: Connection association options—MetaSolv TM MPLS VPN Network template

For this level 2 product	Select this Connection Spec Type	With this Element Type A	And this Element Type B
VPN Physical Access	VPN Link	CE_RTR	LER
VPN Physical Access	VPN Link	CE_RTR	O_P_NET
VPN Physical Access	VPN Link	CE_RTR	CE_RTR
VPN Enterprise Data Access	CE Community	CE_RTR	CE_RTR
Internet Data Access	Internet Connection	CE_RTR	ROUTER
Internet Data Access	Internet Connection	CE_RTR	SMS

Table 19: Connection association options—MetaSolv TM IP VPN Network template

For this level 2 product	Select this Connection Spec Type	With this Element Type A	And this Element Type B
VPN Physical Access	VPN Link	CE_RTR	CE_RTR
VPN Physical Access	VPN Link	CE_RTR	ROUTER
VPN Physical Access	VPN Link	CE_RTR	O_P_NET
VPN Enterprise Data Access	CPE-Based VPN Connection	CE_RTR	CE_RTR
VPN Enterprise Data Access	Network -Based VPN Connection	CE_RTR	CE_RTR
Internet Data Access	VLAN - Internet Connection	CE_RTR	ROUTER

9. For each connection spec type you identified for association to a selected network connection, highlight the connection spec types and select the right-click menu option **Associate**.

Repeat this step to associate the product specification for each network connection belonging to the current network system, if more than one, to the appropriate connection spec type.
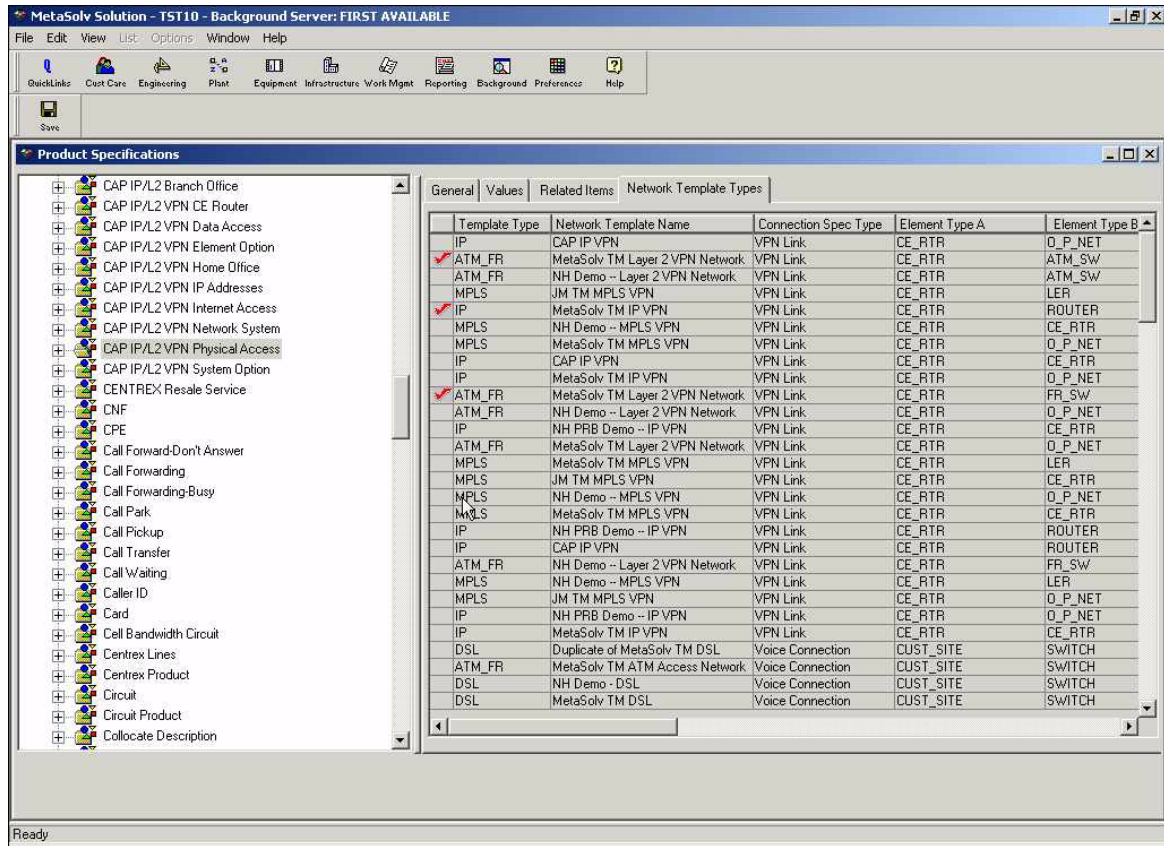
Figure 28: Product Specifications Network Template Types tab—network connection

10. If you provide xDSL connectivity, determine the connection spec type to associate with the product specs for each customer connection. Review the following table for options. Then highlight the desired row on the tab and select **Associate** from the pop-up menu.

Table 20: Connection association options—MetaSolv TM DSL Network template

For this level 2 product	Select this Connection Spec Type	With this Element Type A	And this Element Type B
DSL Line (Physical) (Relate to Voice Line (BWVOICE))	Assignable Bandwidth Link	CUST_SITE	SWITCH
DSL Access Connection	DSL Link	CUST_SITE	DSLAM

Table 20: Connection association options—MetaSolv TM DSL Network template

For this level 2 product	Select this Connection Spec Type	With this Element Type A	And this Element Type B
Enterprise PVC	Enterprise Connection	CUST_SITE	CUST_SITE
DSL Internet Connection	Internet Connection	CUST_SITE	ROUTER
DSL Internet Connection	Internet Connection	CUST_SITE	SMS
Enterprise SVC	Switched Virtual Circuit[a]	CUST_SITE	ATM_SW
Voice over DSL Connection (VoDSL)	Voice Connection	CUST_SITE	SWITCH

a. MetaSolv considers an SVC like 1/2 of a PVC. The end user can switch to any other SVC they want, when they want, rather than be "dedicated" to one end user. SVCs use a CA called "ATM Addresses."

11. If you provide bundled connectivity other than xDSL, determine the connection spec type to associate with the product specs for each customer connection, then associate each product specification standalone connection to the appropriate connection spec type. Highlight the desired row on the tab and select **Associate** from the pop-up menu. For available options, see the table corresponding to the technology type you use.

    a.   If using ATM/frame relay, refer to the following table.

    b.   If using MPLS, refer to Table 22 on page 64.

    c.   If using Ethernet, refer to Table 23 on page 65.

Table 21: Connection association options—MetaSolv TM ATM/frame relay network template

For this level 2 product	Select this Connection Spec Type	With this Element Type A	And this Element Type B
Enterprise PVC	Enterprise Connection	CUST_SITE	CUST_SITE
Enterprise SVC	Switched Virtual Circuit (SVC)[a]	ATM_SW	CUST_SITE
Internet PVC	Internet Connection	CUST_SITE	ROUTER

Table 21: Connection association options—MetaSolv TM ATM/frame relay network template

For this level 2 product	Select this Connection Spec Type	With this Element Type A	And this Element Type B
Internet PVC	Internet Connection	CUST_SITE	SMS
Physical Access Connection	Assignable Bandwidth Link	ATM_SWITCH	CUST_SITE
Physical Access Connection	Assignable Bandwidth Link	FR_SW	CUST_SITE
Physical Access Connection	Assignable Bandwidth Link	CUST_SITE	AGGREGATOR[b]
Physical Access Connection	Assignable Bandwidth Link	CUST_SITE	O_P_NET
Physical Access Connection part of a group connection	Unassignable Bandwidth Link	ATM_SWITCH	CUST_SITE
Physical Access Connection part of a group connection	Unassignable Bandwidth Link[c]	FR_SW	CUST_SITE
Physical Access Connection part of a group connection	Unassignable Bandwidth Link	CUST_SITE	O_P_NET
Voice over ATM (VoATM)	Voice Connection	CUST_SITE	SWITCH

a. Select this option to be able to switch to different end users as needed rather than be "dedicated" to one end user. SVCs use a CA called "ATM Addresses."
b. Select this option for physical access when an aggregator is available.
c. Select this option for physical access when the link from the customer site uses an inverse multiplexing group connection to get the bandwidth equivalent of, for example, two T1s.

Table 22: Connection association options—MetaSolv TM MPLS Network template

For this level 2 product	Select this Connection Spec Type	With this Element Type A	And this Element Type B
Physical Access Connection	Assignable Bandwidth Link	CUST_SITE	O_P_NET

Table 22: Connection association options—MetaSolv TM MPLS Network template

For this level 2 product	Select this Connection Spec Type	With this Element Type A	And this Element Type B
Physical Access Connection that is part of a group connection	Unassignable Bandwidth Link[a]	CUST_SITE	O_P_NET
Physical Access Connection	Assignable Bandwidth Link	CUST_SITE	LER
Physical Access Connection	Unassignable Bandwidth Link	CUST_SITE	LER
Enterprise PVC	Enterprise Connection	CUST_SITE	CUST_SITE
Internet PVC	Internet Connection	CUST_SITE	ROUTER
Internet PVC	Internet Connection	CUST_SITE	SMS

a.Select this option for physical access when the link from the customer site uses an inverse multiplexing group connection to get the bandwidth equivalent of, for example, two T1s.

Table 23: Connection association options—MetaSolv TM Ethernet Network template

For this level 2 product	Select this Connection Spec Type	With this Element Type A	And this Element Type B
Physical Access Connection	Ethernet Link	CUST_SITE	O_P_NET
Physical Access Connection	Ethernet Link	CUST_SITE	SW_RTR
Enterprise PVC	TLAN - Transparent LAN	CUST_SITE	CUST_SITE
Enterprise PVC	VLAN - Virtual LAN	CUST_SITE	CUST_SITE
Internet PVC	VLAN - Internet Connection	CUST_SITE	ROUTER
Internet PVC	VLAN - Internet Connection	CUST_SITE	SMS

12. Click **Save**.

Assign valid values (optional)

Unless you wish to assign values to a product bundle specification, this process may be omitted from the end-to-end workflow of preparing the product catalog for ordering. The functionality of assigning valid values with defaults and labels for network systems, network elements, and network connections is better accommodated with the new custom attributes feature.

Relate subordinate product specifications to a selected product specification

This section describes the procedure for establishing relationships among template-based product specification items as well as the interface used to complete this process.

The Product Specifications window displays tabs for the item selected in the treeview. The Related Items tab displays a grid listing all items defined in Product Specs with an item type that can be related to the item type of the selected item. For example, highlighting an item defined with the network system item type, would display on the related items tab all items defined with items types that are valid to relate to a network system. Items can be related one at a time. Relationships are established by selecting an item that is subordinate to the item selected in the treeview. The network system, network element, and network connection item types must be associated with at least one template component before relationships can be established.

Use this procedure to relate the product specifications for:

- Each of the appropriate network element and network connection items that share one or more of a network system's selected network templates to that network system. You can also add relationships such as IP address or system option to a network system.
- Each network connection item to be bundled together to a product bundle. Ensure that the product bundle includes at least one physical connection representing bandwidth available from the provider network to the customer site and one or more virtual connections that will be allocated to this link. You can also add a relationship for a system option to a product bundle.
- An equipment item or an option item to a network element.
- Internet services options (email, domain, webhosting), bandwidth voice, or options for features to a network connection.

The third process in the end-to-end workflow of creating template-based product specifications is to relate each item to its subordinate items. This involves the following steps:

Steps

1. Display the Product Specifications window.

   Access the Product Specifications window with **Infrastructure > List > Product Catalog > Product Specifications**.

2. For each product specification item to relate, highlight the item in the treeview, display the Related Items tab, highlight the subordinate item to relate, select **Add** from the pop-up menu, and click **Save**.
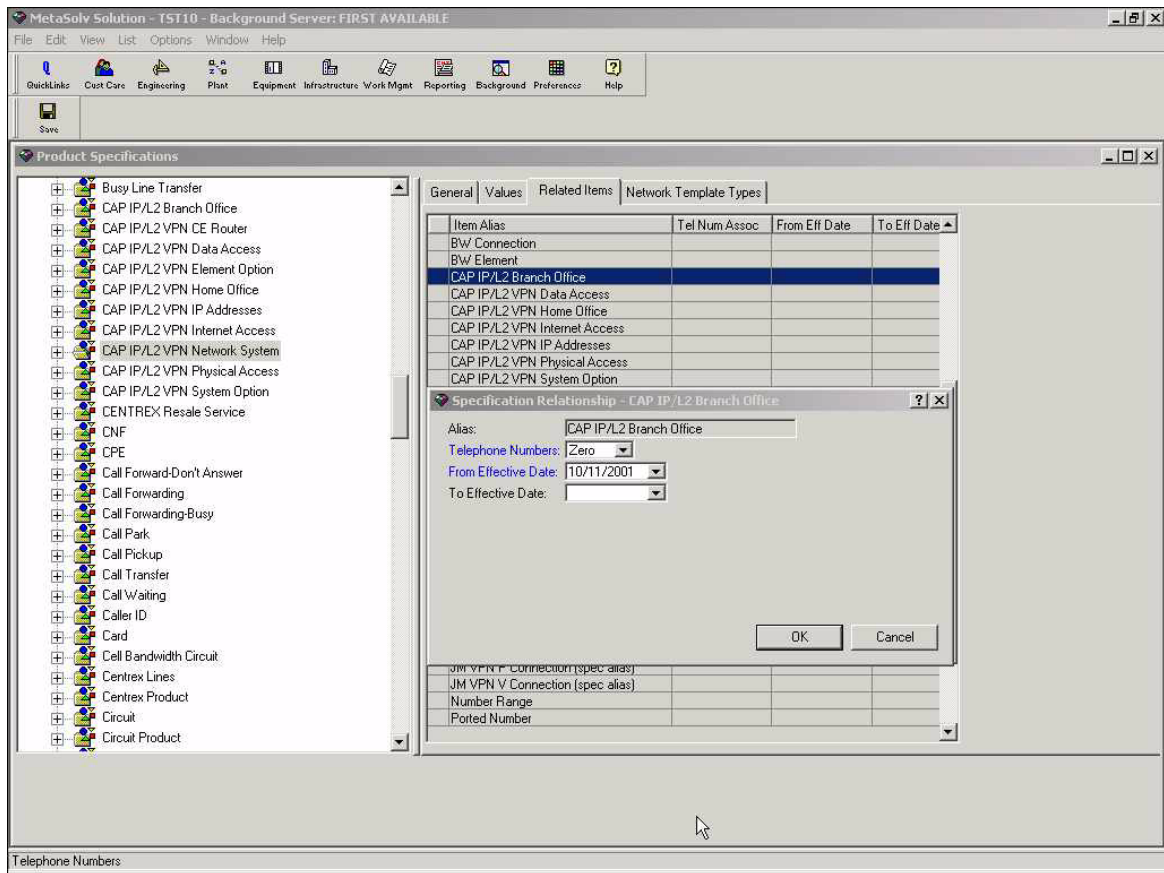
Figure 29: Product Specifications - Related Items tab

3. If you provide VPN services, see Scenario 3—Setting up product specs and catalog for VPN service step 4. on page 110, then proceed as follows:

   a. Relate the network system product to the network elements and network connections that are to be part of the product offering. Be sure to relate a physical link and an enterprise connection.

b. Optionally, relate the network system product to system options, such as IP addresses.

c. Relate the network elements to equipment, if equipment is being provided as part of the service. See Figure 19 on page 37.

4. If you provide xDSL or other bundled or unbundled connectivity, relate the product bundle product to the network connections that are to be part of the product offering. Be sure to relate both a physical bandwidth link (a DSL link for xDSL) and a virtual connection from the provider's network to the customer site. That is, relate both a physical connection and a data connection to the product bundle. See Figure 16 on page 33.

Creating product catalog items for template-based products

This section describes the process of creating product specifications for template-based products, which involves the following three tasks:

1. Adding items to the product catalog.

2. Associating product catalog items with templates.

3. Establishing prices for product offerings.

Each task is addressed in terms of its purpose, then navigation requirements, and finally product-specific tips. References to the source windows and to the scenarios are included.

Add items to the product catalog

This section describes the procedure of creating product catalog offerings for the following:

- Network systems composed of network elements and network connections, and optionally, IP addresses and system options

- Product bundles composed of network connections, and optionally, options

The first process in the end-to-end workflow of creating product catalog items from template-based product specs is to add items to the product catalog. Use the following procedure to add template-based products such as network systems and product bundles of network connections to the product catalog.

Steps

1. Access the Product Catalog window with **Infrastructure > List > Product Catalog > Product Catalog**.

2. For each template-based product-level item, such as a VPN or product bundle, to be added to the product catalog, complete the following steps:

a. Highlight the Product Catalog treeview root item and select **Add Item** from the pop-up menu.

b. From the Product Catalog-Available Specifications window, select the item to add it to the product catalog treeview. Examples follow:

⇒ VPN product

⇒ xDSL product

⇒ Product bundle of standalone connections other than xDSL

c. Highlight the item on the treeview to display the General tab for the selected item.
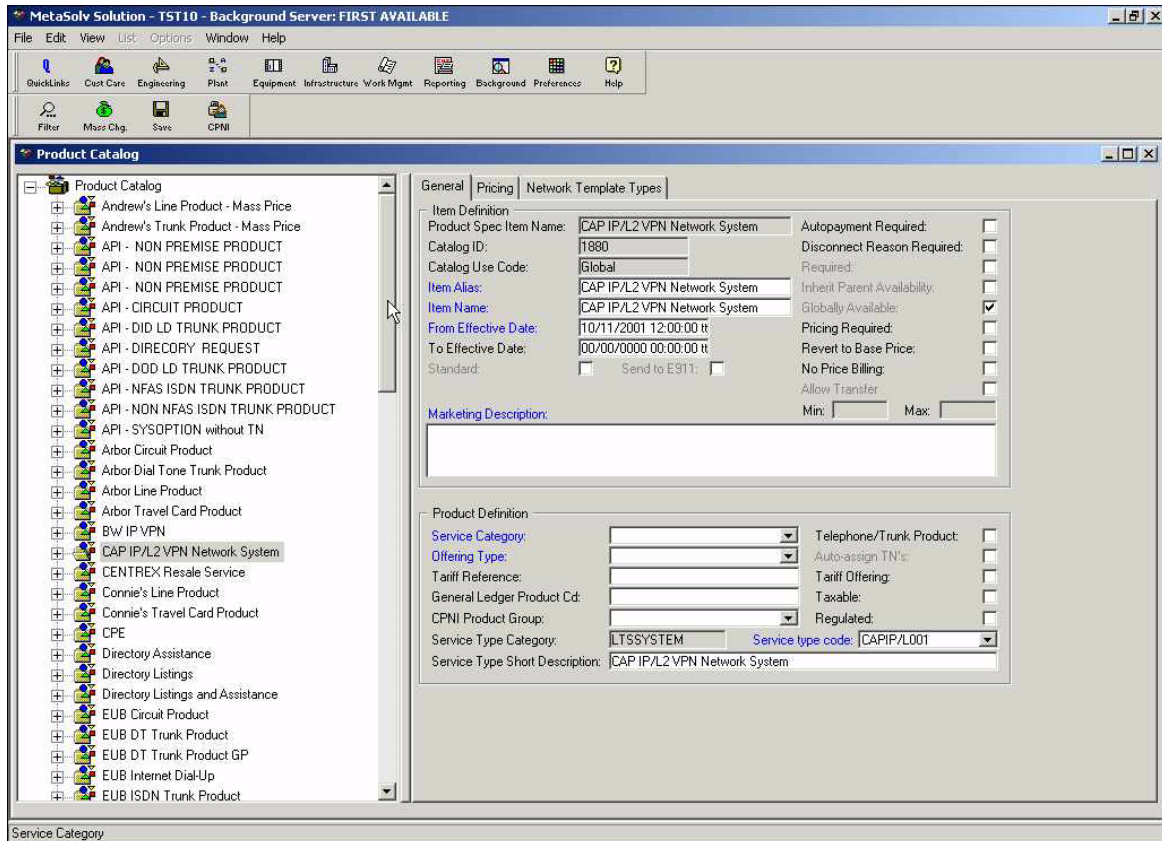
Figure 30: Product Catalog - General tab for network system or product bundle

d. Complete the General tab. Specify the service category, for example business, and offering type, for example wholesale or retail, and provide a marketing description.

3. For each template-based item subordinate to level 1, such as a VPN home office network element or an Enterprise PVC, complete the following steps:

a. Highlight the level 1 item it is related to and select **Add Item** from the pop-up menu.

b. From the Product Catalog-Available Specifications window, select the item to add it to the product catalog treeview.

c. Highlight the item on the treeview to display the General tab for the selected item.
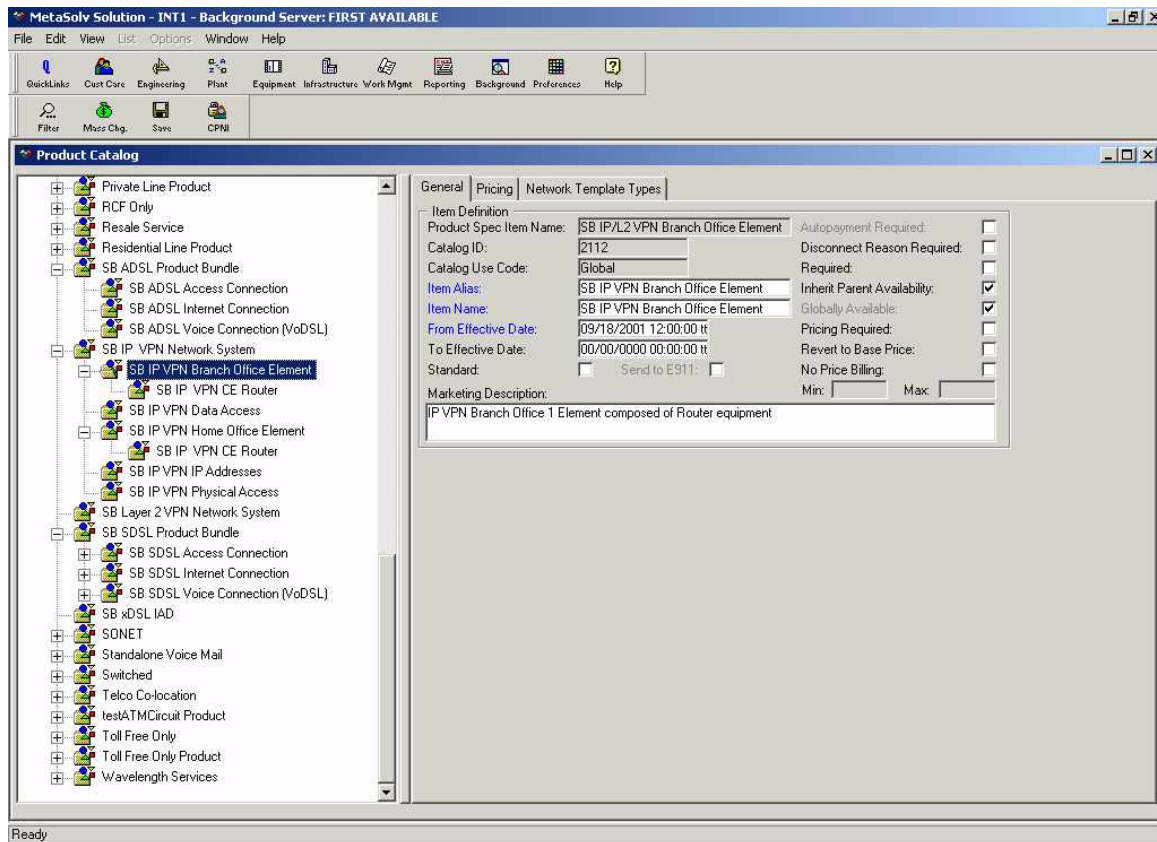
Figure 31: Product Catalog - General tab for network element or network connection

d. Complete the General tab.

4. If you provide VPN services, see Scenario 3—Setting up product specs and catalog for VPN service, step 6. on page 112 and step 7. on page 113 for an example of adding items to the product catalog. The proceed as follows:

a. Add the related network elements such as the Home Office and Branch Office to the VPN network system.

b. Add the related network connections. Include the physical link from a network element at one of the customer sites to the provider network and the virtual connection type that provides data access among customer sites. Optionally, include a virtual connection for Internet access. This will accommodate product offerings for new users.

c. For each network element and network connection related to the VPN system, modify the Item Alias and Item Name defined with the product catalog item. Change the From Effective Date, if needed.

5. If you provide standalone connectivity, proceed as follows:

a. Add the related network connection service items to the product bundle.

b. For each network connection related to the product bundle, modify the **Item Alias** and **Item Name** defined with the product catalog item. Change the **From Effective Date**, if needed.

Associate product catalog service items with templates

This section describes the procedure for creating the following associations with defaults:

- Network system with one or more of the templates associated with its product specification
- Network element with one or more of the element types associated with its product specification
- Network connection with one or more connection spec types associated with its product specification

Use this procedure when you have associated multiple template types to the selected product specification.

Steps

1. Associate the network template type that corresponds to the customer network product catalog item you are defining. A checkmark indicates the item has been associated. Set one network template type as the default. A default must be set even if only one template type is associated.

Product catalog network systems can be associated with multiple network templates. If this is done, one of the associated network templates is selected during ordering.
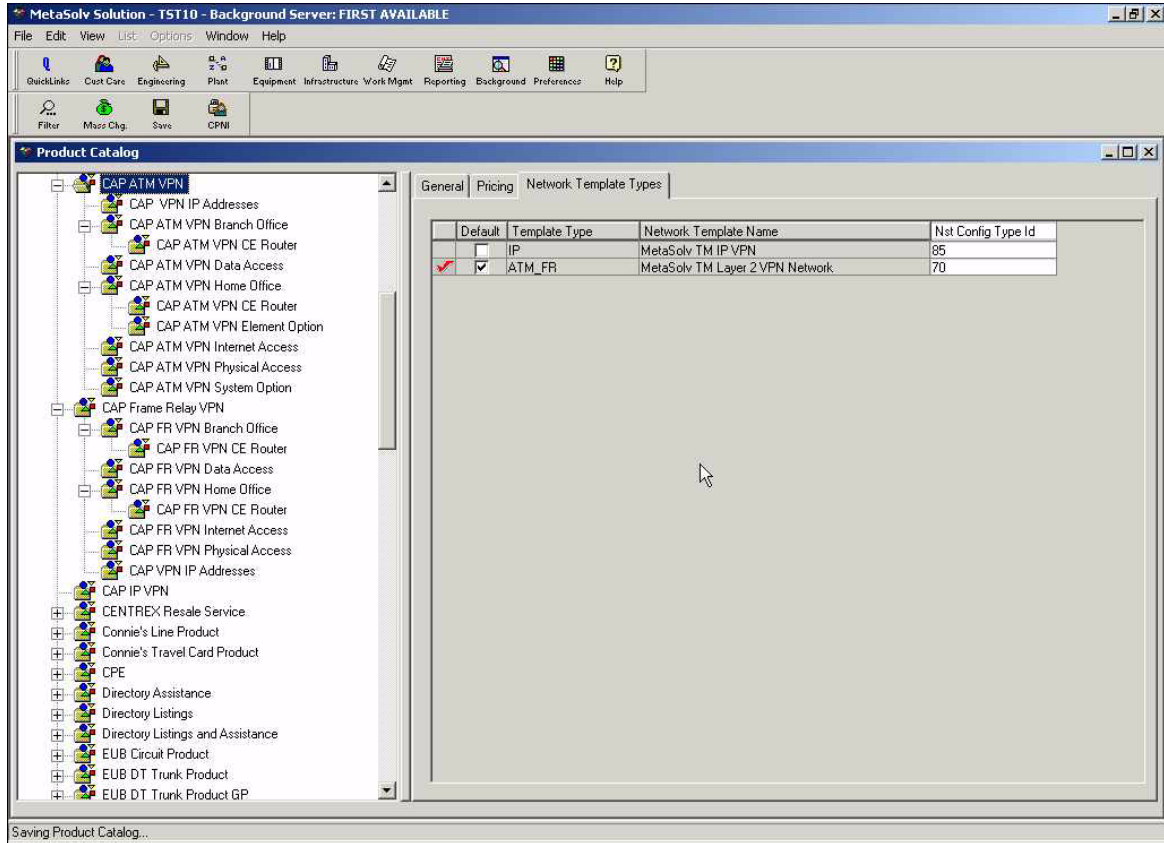
Figure 32: Product Catalog Network Template Types tab—network system

2.   Associate the element type that corresponds to the customer network element product catalog item you are defining. A checkmark indicates the item has been associated. Set

one network template type as the default. A default must be set even if only one template type is associated.
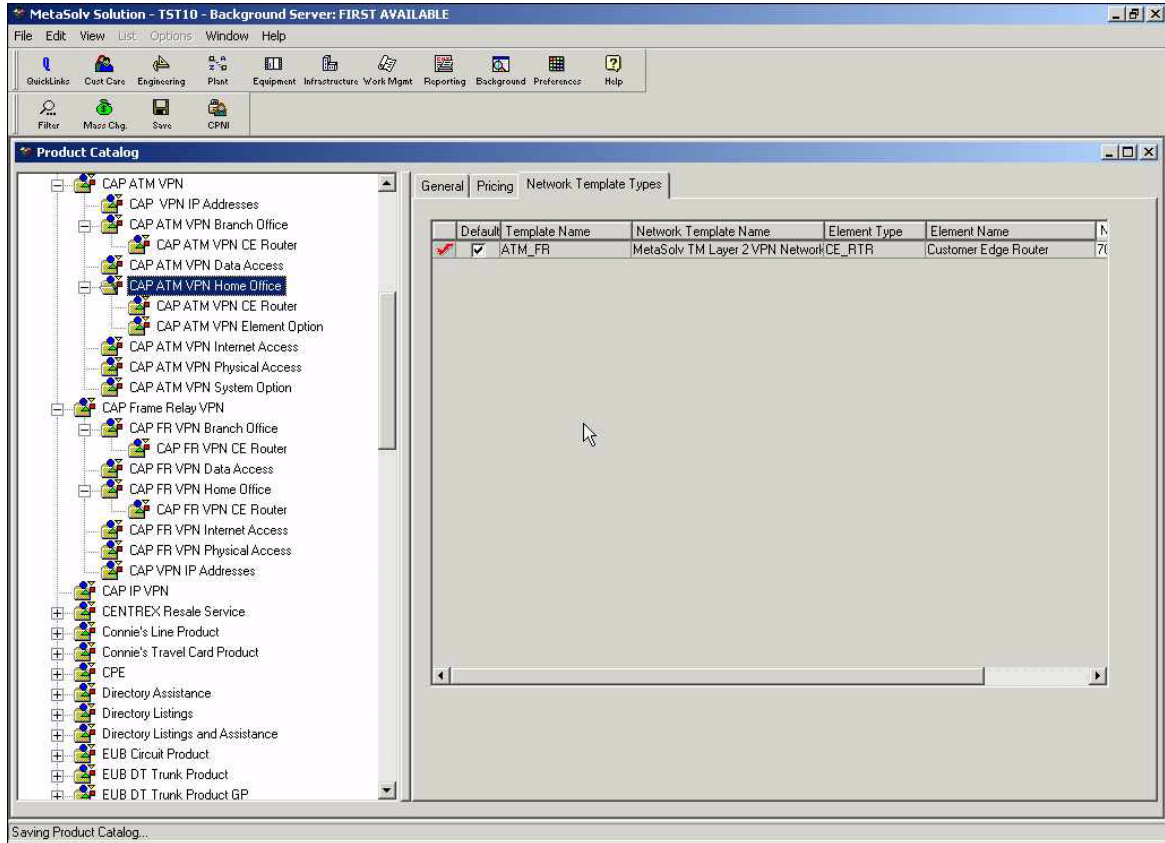
Figure 33: Product Catalog Network Template Types tab—network element

3. Associate the connection spec type that corresponds to the customer network connection product catalog item you are defining. A checkmark indicates the item has

been associated. Set one network template type as the default. A default must be set even if only one template type is associated.
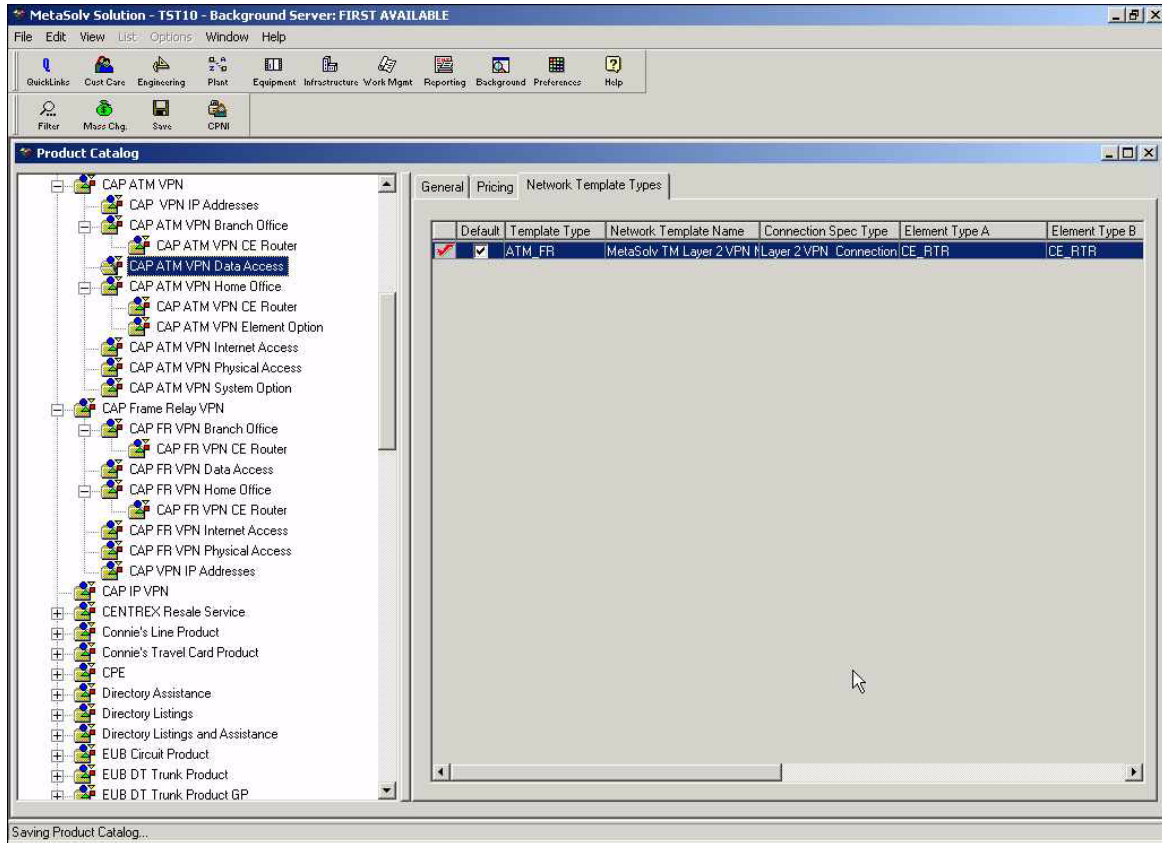
Figure 34: Product Catalog Network Template Types tab—network connection

4. If you provide VPN services, see Scenario 3—Setting up product specs and catalog for VPN service step 8. on page 114, then proceed as follows:

a. Associate the templates you want to have available for the level 1 VPN network system and for each related network element and network connection. If there are multiple associations, set as the default the template you want to appear first in the drop-down.

b. Associate the element types you want to have available for each related network element (home office and branch office). Be sure the element types selected belong to the template associated with the parent network system. If there are multiple associations, set a default.

c. Associate the connection spec types you want to have available for each related network connection (physical link, enterprise connection, and optionally Internet connection). Be sure the connection spec types selected belong to the template associated with the parent network system. If there are multiple associations, set a default.

5. If you provide standalone bundled or unbundled connectivity, associate the connection spec types you want to have available for each related network connection.

Note that each network connection within a product bundle can be associated with a connection spec type from a different network template or even a different technology type.

Establish prices for product offerings

The fifth process in the end-to-end workflow of preparing the product catalog for ordering is to establish pricing for the product catalog offering. Use the same procedures for establishing pricing for network system and bundles of connections that you use for other product offerings.

Steps

1. From the Product Catalog window, highlight the product catalog item for which pricing is to be established and display the Pricing tab.

2. On the Pricing tab for the selected Product Catalog item, select **Add Base Price**.
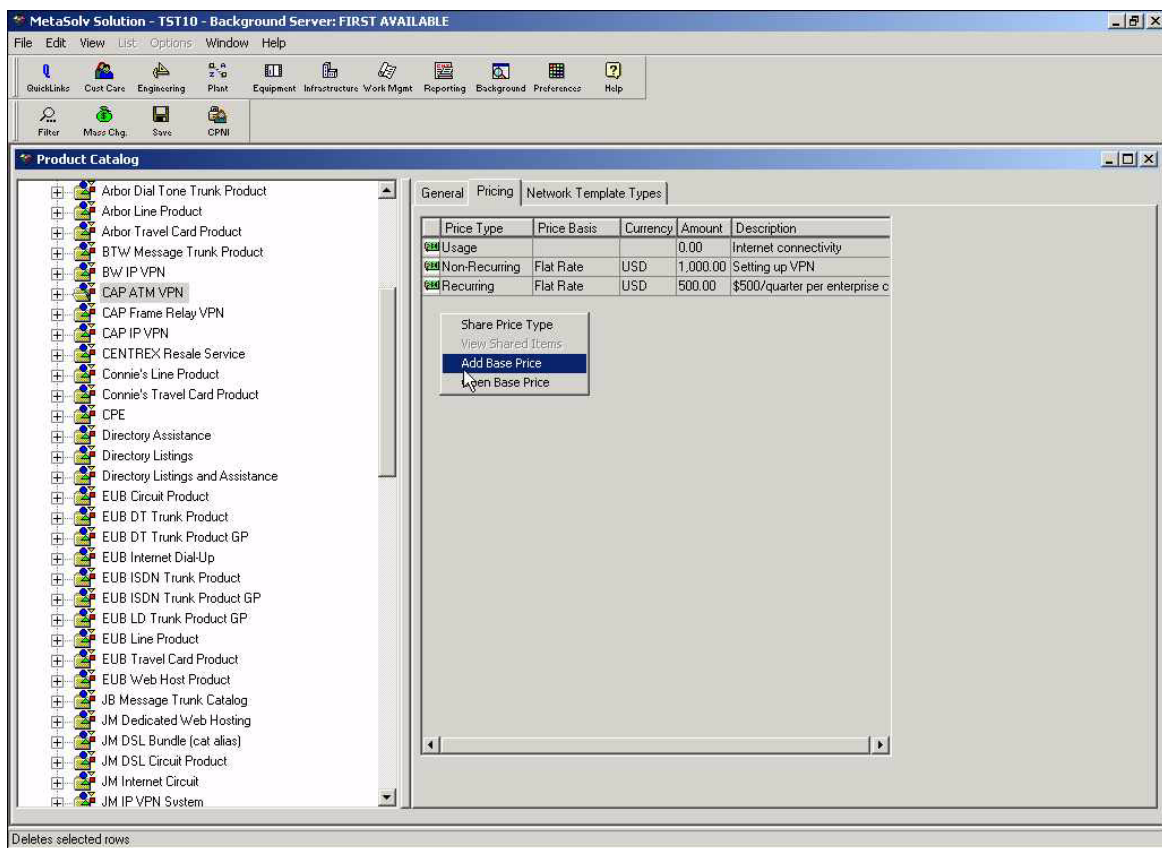
Figure 35: Product Catalog - Pricing tab for product offering

3. Based on the pricing decisions made during the planning step, complete the fields as required to establish base price information.
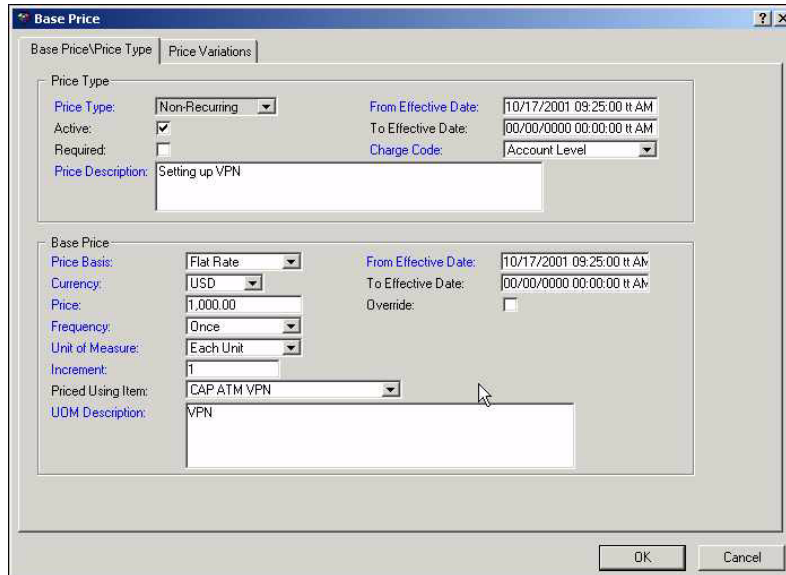
Figure 36: Base Price window - Base Price/Price Type tab

4. Establish base prices for non-recurring charges such as installation fees and recurring charges that are assessed periodically.
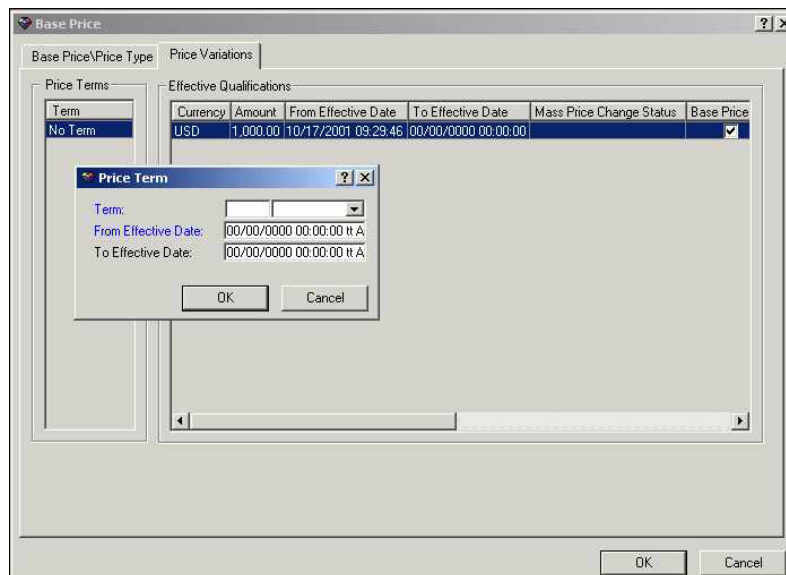
Figure 37: Base Price window - Price Variations tab

5. Verify all pricing has been added; verify accuracy and completeness of price settings, including price type, price basis, currency, amount and description.

Maintaining template-based product specifications

Maintenance tasks for template-based product specifications include:

■ Setting effective dates for a relationship to a template-based product spec.

■ Removing an existing relationship of a child item to a parent item.

■ Setting effective dates for a template association to a product specification.

■ Disassociating a product specification from a template component.

Set effective dates for a relationship to a template-based product spec

You can set effective dates for a relationship of a subordinate item to a template-based product any time after you create the relationship.

Steps

1. Access the Product Specifications window by selecting **Infrastructure > List > Product Catalog > Product Specifications**.

2. Highlight the parent item in the treeview, display the Related Items tab, highlight the related subordinate item.

3. Click **Open** to open the Specifications Relationship window.

4. From this pop-up, do any of the following, then click **OK**.

⇒ Reset the **From Effective Date**

⇒ Enter a new **To Effective Date**

⇒ Delete an existing **To Effective Date**

⇒ Change the **Telephone Number** relationship selection

Remove a relationship between product specifications

Removing an existing relationship is permitted as long as the relationship is not for an effective product. To remove a relationship for a product that is in effect, delete the item from the product catalog.

Steps

1. Access the Product Specifications window by selecting **Infrastructure > List > Product Catalog > Product Specifications**.

2. Highlight the parent item in the treeview, display the Related Items tab, highlight the related subordinate item to remove.

3. Click **Remove.**

Disassociate a product specification from a template component

Steps

1. Access the Product Specifications window by selecting **Infrastructure > List > Product Catalog > Product Specifications**.

2. Select the template-based product with the association to be removed. Click the Network Template Types tab.

3. For each template component to disassociate with the selected item, highlight the desired row on the tab and select **Disassociate** from the pop-up menu.

   - If the selected product specification is not in use, the checkmark is removed. Continue with step 5. on page 78.

   - If a product catalog item uses the spec selected for disassociation, the following message appears:

4. If the preceding error message appears, either disassociate the corresponding item in the product catalog or set the to effective date to today to expire the current association. Then repeat the preceding step

5. Click **Save**.

Set effective dates for a template association with a product specification

Setting effective dates for template associations for a product spec item is an optional task. When a template-based product is associated with a template component, the From Effective Date is automatically set to the current date; the To Effective Date is not set. These settings allow the association to take effect immediately and have no expiration. While an association is active, it is an available option on the product catalog. It is possible to manually set different effective dates for an association of a template-based product with a template component. Effective dates can be set immediately after making the association, or at any time thereafter. Setting a From Effective Date to a future date defers making the association active. Setting a To Effective Date to the current or future date specifies when the association is to expire. Inactive and expired associations are not available to the product catalog.

Steps

1. Access the Product Specifications window by selecting **Infrastructure > List > Product Catalog > Product Specifications**.

2. Select the template-based product in the association to be modified from the treeview and click the Network Template Types tab.

3. Click the head of the first column once or twice to display the associated template components at the top of the list. Associated components are marked with a checkmark in the first column.

4. Highlight the associated template component to be modified, right-click to display the popup menu, and select **Set Effective date**. See Figure 27 on page 59 for an example of this popup menu.

5. When the pop-up window similar to the following is displayed, notice that the fields for **From Effective Date** and **To Effective Date** are editable.
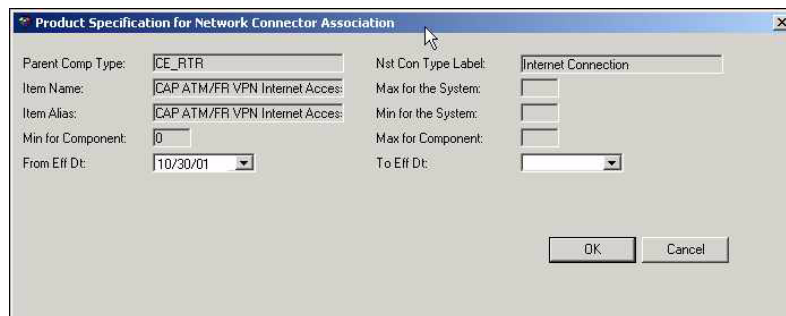
Figure 38: Product Specification for Network Connection Association

6. Change the **From Effective Date** or specify a new or different **To Effective Date** and click **OK**.

Maintaining template–based product catalog items

Maintaining template-based product catalog items can include making changes to the initial product catalog definition, such as changing the information specified on the General tab, the Pricing tab, and the Network Template Types tab. For example, you can change the template component association, that is, make a new association, disassociate an existing association, or change the specified default. Such tasks will not be addressed in this section. You may perform the following tasks on a mature product catalog:

- Set filter for the product catalog treeview
- Expire a product catalog item by setting the to effective date for a template association
- View qualifications of price variations including effective, pending, and expired variations

The process of viewing price variations is the same for template-based products as for any product. Therefore, explicit steps are not included.

Display all or specified items in the product catalog treeview

You can limit what is displayed on the product catalog treeview by setting criteria for items to display. You can reset the criteria to display all.

Steps

1. Access the Product Catalog Filter window by selecting **Infrastructure > List > Product Catalog > Product Catalog > Filter**.
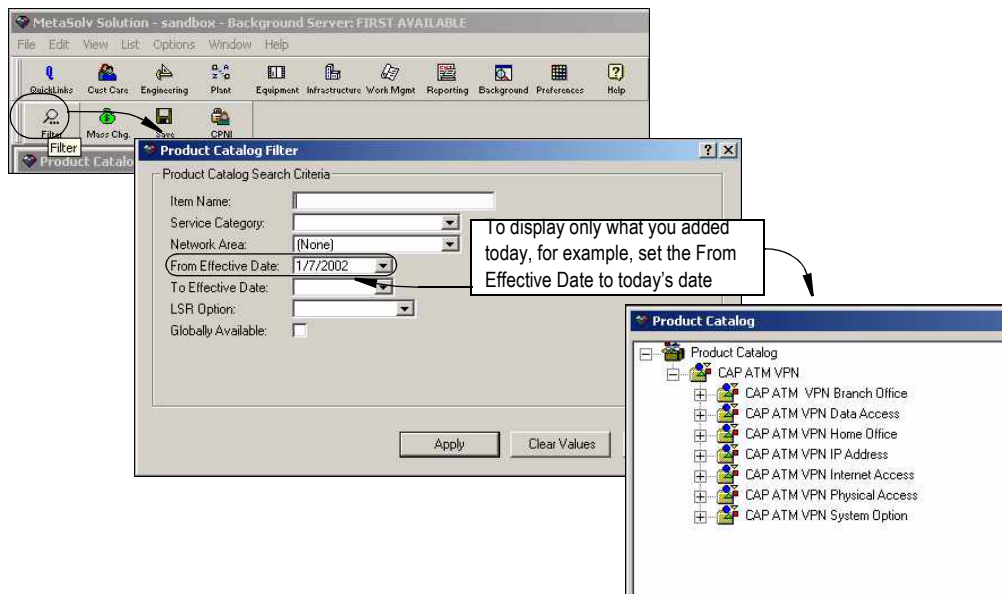
2. Enter criteria for treeview items to display and click **Apply**.

   The treeview displays only those items that meet all of your criteria.

3. To redisplay the entire treeview, access the Product Catalog Filter window and click **Clear Values**.

Set effective dates for a template association with a product catalog item

Setting effective dates for a template association with a product catalog item is an optional task. When a template-based product is associated with a template component, the effective dates are inherited from those specified on the corresponding product specification. If the default is used, the **From Effective Date** is the date the spec was created; the **To Effective Date** is not set. The default settings allow the association to take effect immediately and have no expiration.

While an association is active in the product catalog, it is an available option for the Ordering Dialog. It is possible to manually set effective dates for an association of a template-based product with a template component. Effective dates can be set immediately after making the association, or at any time thereafter. Setting a from effective

date to a future date defers making the association active. Setting a **To Effective Date** to the current or future date specifies when the association is to expire. Inactive and expired associations are not available to the Ordering Dialog.

Steps

1. Display the Network Template Types tab: Access the Product Catalog window by selecting **Infrastructure > List > Product Catalog > Product Catalog**. Select the template-based product in the association to be modified. Click the Network Template Types tab.

2. Highlight the associated template component to be modified, right-click to display the pop-up menu, and select **Set Effective date**.

3. When the pop-up window similar to the following appears, set the effective dates as desired and click **OK**.
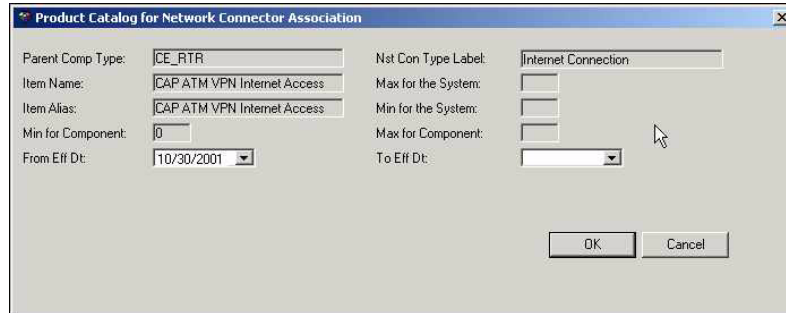
Figure 39: Product Catalog for Network Connection Association

Scenarios

This chapter presents end-to-end scenarios for setting up template-based product specifications and product catalog items for a dedicated PVC, xDSL service, and a VPN product. These scenarios put features and functionality together to guide you through the process of setting up product specs and product catalog offerings using specific examples and steps. Only MetaSolv-defined template components are used in the scenarios. You can relate these examples to your own scenarios and adapt the instructions to accommodate your business needs when you work with customized templates and create your own template components.

You should read this chapter if you are a Customer Service Representative or Sales Engineer responsible for using MetaSolv Solution to set up template-based product specifications and product catalog items.

SCENARIO 1—SETTING UP PRODUCT SPECS AND CATALOG FOR PVCS

This scenario presents a simple example of establishing product specifications and product catalog items for a dedicated PVC. This example uses only MetaSolv-defined template components that are part of the technology modules; that is, none of the template components referenced here are user-defined. The internal network supporting this scenario is built with network templates from the ATM_FR technology module. The network templates within the MetaSolv TM ATM/Frame Relay Network used for the internal network include the ATM core network, the ATM access network, and the frame relay access network.
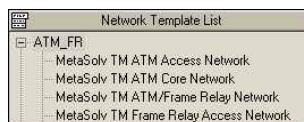
The product specifications are built with the template-based PRDBUNDLE and CONNECTOR item types. The CONNECTOR item type is considered template-based because items built with it must be associated with one or more connector spec types, a template component.

The companion scenario, Scenario 1—Ordering a dedicated PVC, can be found in the *Template-based Ordering Concepts and Processes Guide*. This companion scenario demonstrates how the product catalog offering created in this scenario is ordered through the Ordering Dialog.

Description

This simple scenario shows how to set up the required product specifications and the product catalog items for a dedicated PVC to support customer orders. It demonstrates how to use product specifications for a product bundle, an access connection, and an enterprise connection to create three product catalog entries each based on the same set of product specs, but for different combinations of technologies.
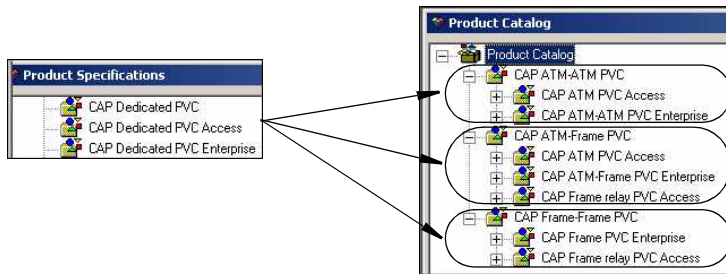
The product specification will include:

- Product bundle
  ⇒ CAP Dedicated PVC
- Network connections
  ⇒ CAP Dedicated PVC Access
    ⇒ from Customer site to ATM switch
    ⇒ from Customer site to frame relay switch
  ⇒ CAP Dedicated PVC Enterprise
    ⇒ from customer site that terminates an extension from an ATM access network to a customer site that terminates an extension from a frame relay access network
    ⇒ between customer sites that both terminates an extension from an ATM access Product bundle
    ⇒ between customer sites that both terminate an extension from a frame relay access network

The three product catalog items will include:

Product bundle

  ⇒ CAP ATM-Frame PVC
- Network connections
  ⇒ CAP ATM-Frame PVC access
    ⇒ from Customer site to ATM switch
    ⇒ from Customer site to frame relay switch
  ⇒ CAP ATM-Frame PVC enterprise
    ⇒ from customer site that terminates an extension from an ATM access network to a customer site that terminates an extension from a frame relay access network

Product bundle

> ⇒ CAP ATM-ATM PVC

- Network connections
  - ⇒ CAP ATM PVC access
    - ⇒ from Customer site to ATM switch
  - ⇒ CAP ATM-ATM PVC enterprise
    - ⇒ between customer sites that both terminate extensions from TM access networks

Product bundle

> ⇒ CAP Frame-Frame PVC

- Network connections
  - ⇒ CAP Frame PVC access
    - ⇒ from Customer site to frame relay switch
  - ⇒ CAP Frame-Frame PVC enterprise
    - ⇒ between customer sites that both terminate an extensions from frame relay access networks

Assumptions

The product specifications in this scenario were set up to demonstrate the versatility of connection spec types within the ATM/FR technology type. Consider the following assumptions when reviewing this scenario:

- The template type ATM_FR is available
- The provider network has been designed using the MetaSolv-provided ATM core network, with multiple occurrences of the ATM access network, and multiple occurrences of the frame relay access network
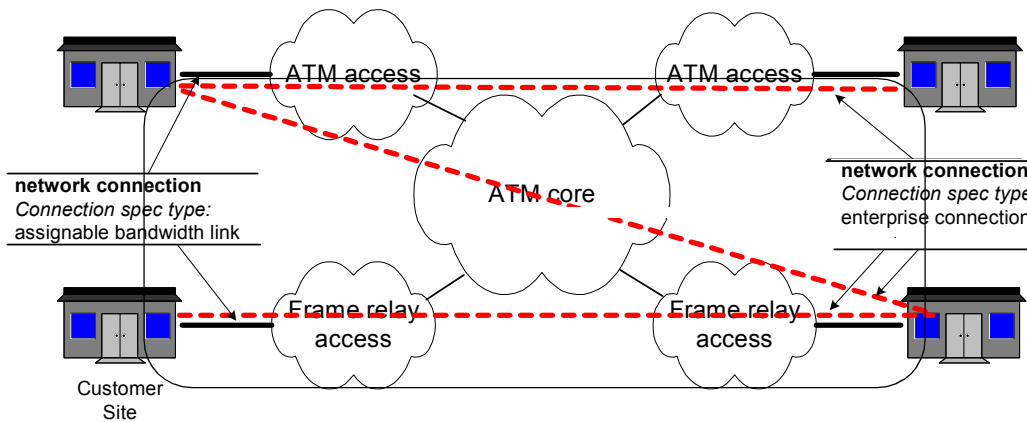
Figure 40: PVC product bundle of customer connections

- Each ATM access network contains an ATM switch; customer access to one of the provider's ATM access networks is configured with an extension from the ATM switch to the customer site

- Each frame relay access network contains a frame relay switch; customer access to one of the provider's frame relay access networks is configured with an extension from the frame relay switch to the customer site

- Any pair of customer sites can be connected with a dedicated PVC using an enterprise connection. An enterprise connection is configured over an access connection from one customer site, across the ATM core network, and finally over the access connection to the other customer site. The two physical access connections over which the virtual enterprise connection is allocated can be any of the following combinations:

    ⇒ ATM and ATM

    ⇒ frame relay and frame relay

    ⇒ ATM and frame relay

Execution

Use the following steps to complete product specifications and create a product catalog offering for dedicated PVCs.

1. Access the Product Specifications window by selecting **Infrastructure > List > Product Catalog > Product Specifications**.

2. Add a product specification for the Dedicated PVC product bundle, which includes a physical (bandwidth) extension from the provider network to a customer site and a virtual connection between customer sites. The provider's access networks include ATM access networks and frame relay access networks, both of which are connected to the provider's ATM core network. The virtual connection is an enterprise connection, which can be between two ATM switches, two frame relay switches, or one ATM switch and one frame relay switch. All additions are implemented by highlighting the top leaf in the Product Specifications treeview, and selecting the right-click menu option, **Add Item**, completing the General tab fields, and clicking **Save**.

Step-by-step details follow:

a. Add a product specification for the dedicated PVC product bundle using the Product Bundle (PRDBUNDLE) item type. Check the Product/Package checkbox to

indicate it is a level 1 item. For this scenario, we added the CAP xDSL Product Bundle and completed the General tab as shown on the following figure.

b. Add a product specification for the two types of connections using the network connection (CONNECTOR) item type—physical connection for access and virtual connectivity between the two sites of the enterprise. For example, add data similar to that shown on the following figures.

c. Verify the treeview contains product specifications for the product bundle, the physical connection and the virtual connection needed for a dedicated PVC.

3. Click on the CAP Dedicated PVC Access connection on the treeview and display the Network Template Types tab. Preview the options where the template type is ATM/FR and the connection spec type is assignable bandwidth link. Locate one assignable bandwidth link from the ATM switch to the customer site and another assignable bandwidth link from the frame relay switch to the customer site. Be sure that the parent templates for the elements are both ATM access and frame relay access, respectively

To get these to appear together as a group like the following diagram, associate each of the candidates and click the first column twice. Then you can scroll left to right and

peruse the relevant data in one block. You can then disassociate the ones you reject instead of doing the association as explained in the next step.

Type	Network Template	Connection Spec	Element A Template	Element A	Element B	Element B Template
ATM_FR	MetaSolv TM ATM/Frame Relay Network	Assignable Bandwidth Link	MetaSolv TM ATM/Frame Relay Network	Customer Site	ATM Switch	MetaSolv TM ATM Access Network
ATM_FR	MetaSolv TM ATM/Frame Relay Network	Assignable Bandwidth Link	MetaSolv TM ATM/Frame Relay Network	Customer Site	Other Provider Network	MetaSolv TM ATM/Frame Relay Network
ATM_FR	MetaSolv TM ATM/Frame Relay Network	Assignable Bandwidth Link	MetaSolv TM ATM/Frame Relay Network	Customer Site	FR Switch	MetaSolv TM Frame Relay Access Network
ATM_FR	MetaSolv TM ATM Access Network	Assignable Bandwidth Link	MetaSolv TM ATM Access Network	ATM Switch	Customer Site	MetaSolv TM ATM Access Network
ATM_FR	MetaSolv TM Frame Relay Access Network	Assignable Bandwidth Link	MetaSolv TM Frame Relay Access Network	FR Switch	Customer Site	MetaSolv TM Frame Relay Access Network
ATM_FR	MetaSolv TM ATM Access Network	Assignable Bandwidth Link	MetaSolv TM ATM Access Network	Customer Site	Aggregator	MetaSolv TM ATM Access Network

4. Associate the PVC access connection item to the two connection specs you identified in the previous step. To make an association, highlight the row for a desired option and select the right-click menu option, **Associate**.

	Type	Network Template	Connection Spec	Element A	Element B
✓	ATM_FR	MetaSolv TM ATM Access Network	Assignable Bandwidth Link	ATM Switch	Customer Site
✓	ATM_FR	MetaSolv TM Frame Relay Access Network	Assignable Bandwidth Link	FR Switch	Customer Site

(General | Values | Related Items | Network Template Types)

5. Click on the CAP Dedicated PVC Enterprise connection on the treeview and display the Network Template Types tab. Preview the options for Enterprise Connection. It is important the parent templates for the customer site elements be the same as those for the bandwidth circuit to which the virtual circuit will be assigned. Since the Customer Site elements for the bandwidth connections were from the ATM access network template and the Frame Relay access network template, the connection specs you select for the virtual connections to be provisioned over these physical connections must terminate at the customer site element in the same templates. For a scenario where both ATM access and Frame access networks are used, there are three combinations to associate (ATM to ATM, frame to frame, ATM to frame).

Type	Network Template	Connection Spec	Element A Template	Element A	Element B	Element B Template
ATM_FR	MetaSolv TM ATM/Frame Relay Network	Enterprise Connection	MetaSolv TM ATM/Frame Relay Network	Customer Site	Customer Site	MetaSolv TM Frame Relay Access N
ATM_FR	MetaSolv TM ATM/Frame Relay Network	Enterprise Connection	MetaSolv TM ATM Access Network	Customer Site	Customer Site	MetaSolv TM ATM Access Network
ATM_FR	MetaSolv TM ATM/Frame Relay Network	Enterprise Connection	MetaSolv TM Frame Relay Access Netwo	Customer Site	Customer Site	MetaSolv TM Frame Relay Access N
ATM_FR	MetaSolv TM ATM/Frame Relay Network	Enterprise Connection	MetaSolv TM ATM/Frame Relay Network	Customer Site	Customer Site	MetaSolv TM ATM Access Network
ATM_FR	MetaSolv TM ATM/Frame Relay Network	Enterprise Connection	MetaSolv TM ATM Access Network	Customer Site	Customer Site	MetaSolv TM Frame Relay Access N
ATM_FR	MetaSolv TM ATM/Frame Relay Network	Enterprise Connection	MetaSolv TM ATM/Frame Relay Network	Customer Site	Customer Site	MetaSolv TM ATM/Frame Relay Net

6. Associate the PVC enterprise connection item to the three connection specs you identified in the previous step. To make an association, highlight the row for a desired option and select the right-click menu option, **Associate**.

	Type	Connection Spec	Element A Template	Element A	Element B	Element B Template
✓	ATM_FR	Enterprise Connection	MetaSolv TM Frame Relay A	Customer Site	Customer Site	MetaSolv TM Frame Relay Ac
✓	ATM_FR	Enterprise Connection	MetaSolv TM ATM Access N	Customer Site	Customer Site	MetaSolv TM Frame Relay Ac
✓	ATM_FR	Enterprise Connection	MetaSolv TM ATM Access N	Customer Site	Customer Site	MetaSolv TM ATM Access Ne

(General | Values | Related Items | Network Template Types)

7. Relate the product specification for the CAP Dedicated PVC product bundle to the corresponding access connection and enterprise connection.

    a. To implement a relationship, highlight the product bundle item on the Product Specifications treeview, display the Related Items tab.

b. Highlight CAP Dedicated PVC Access and select the **Add** option from the popup menu.

c. When the following popup appears, click **OK** to continue unless the selected relationship involves adding telephone numbers or when an expiration date is known, for example, for a temporary system option.

d. Highlight CAP Dedicated PVC Enterprise and select the **Add** option.

e. When the popup appears, click **OK.**

f. Verify all items that need to be related have been related and click **Save**.
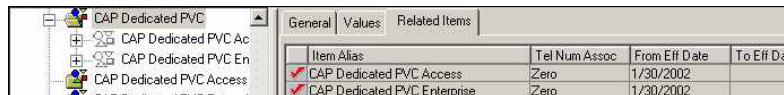
g. Verify the treeview resembles the following:

8. Access Product Catalog by selecting **Infrastructure > List > Product Catalog > Product Catalog**.

9. Add a product catalog item using the product specifications for CAP Dedicated PVC.

Step-by-step details follow:

a. Highlight the top leaf on the Product Catalog treeview and select the popup menu option, **Add Item,** to add a product-level service item.

b. When the resulting window appears, listing all items defined as level 1 products in Product Specifications, highlight CAP Dedicated PVC and click **OK**.
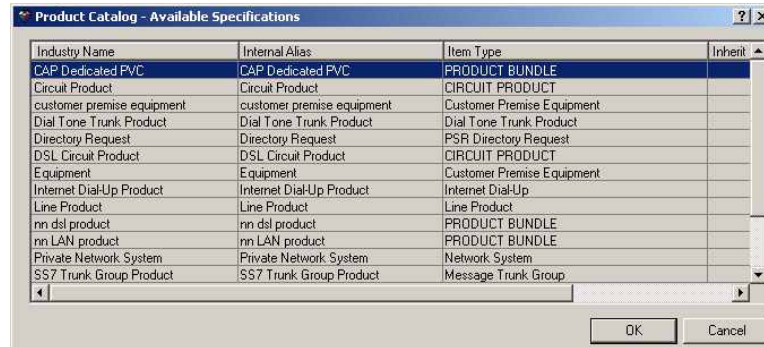
10. Complete the General tab. First, we will define a product bundle to be used for PVC orders where the access connections are both extensions to ATM access networks.
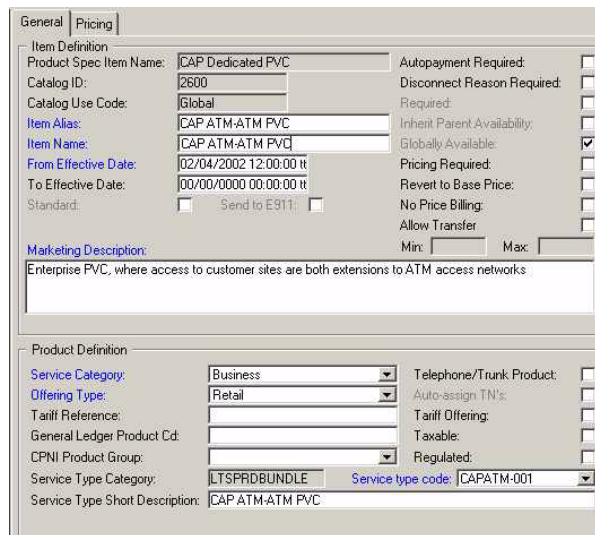
a. Rename the Item Alias and Item Name as CAP ATM-ATM PVC. This differentiates this product catalog item from the other two to be created from the same product specification.

b. Enter the marketing description, Enterprise PVC where access to customer sites are both extensions to ATM access networks

c. Select Business as the service category and Retail as the offering type.

11. Add and configure the access connection to an ATM access network. Even though a PVC requires two access connections, you need only configure one since you can associate it to both instances during the ordering process.

Step-by-step details follow:

a. Highlight CAP ATM-ATM PVC on the Product Catalog treeview, and select **Add Item** from the right-click menu.
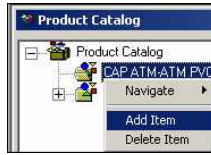
b. Select CAP Dedicated PVC Access from the Product Catalog - Available Specifications window.
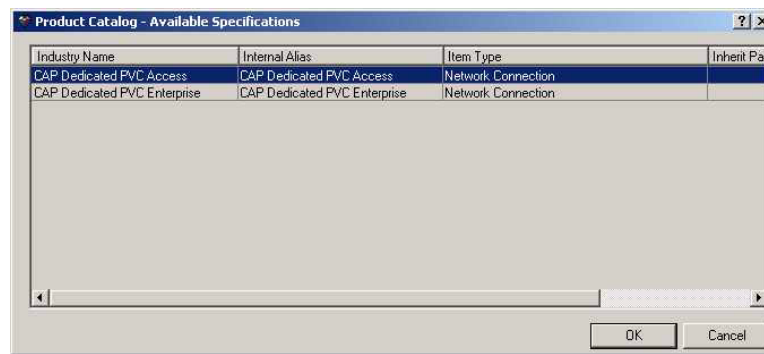
c. Revise the General tab entries for Item Alias and Item Name to CAP ATM-ATM PVC Access.
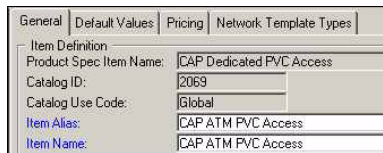
d. Access the Network Template Types tab, highlight the connection spec type where the provider network is the ATM access network, and select **Associate** from the right-click menu.
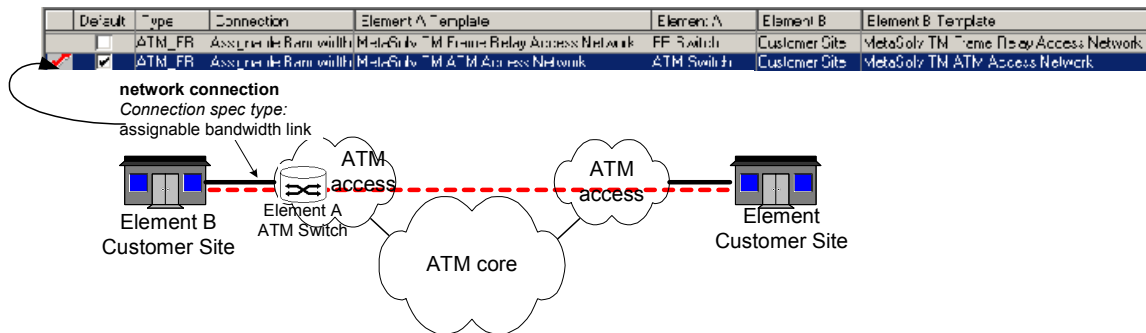
12. Add and configure the enterprise connection to be configured over access connections that are both extensions of an ATM access network.

Step-by-step details follow:

a. Highlight CAP ATM-ATM PVC on the Product Catalog treeview, and select **Add Item** from the right-click menu.

b. Select CAP Dedicated PVC Enterprise from the Product Catalog - Available Specifications window and click **OK**.
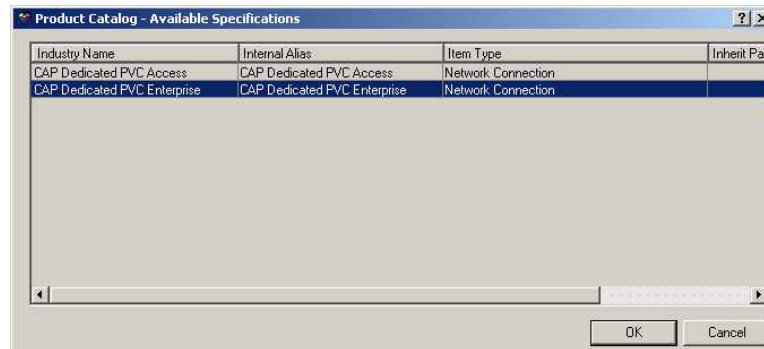
c. On the General tab of the CAP Dedicated PVC Enterprise, modify the Item Alias and Item Name to *CAP ATM-ATM PVC Enterprise*.

d. Display the Network Template Types tab, and highlight the row where Element A Template and Element B Template are both *ATM Access Network,* and select

Associate from the right-click menu. Then click the Default checkbox in that same row.
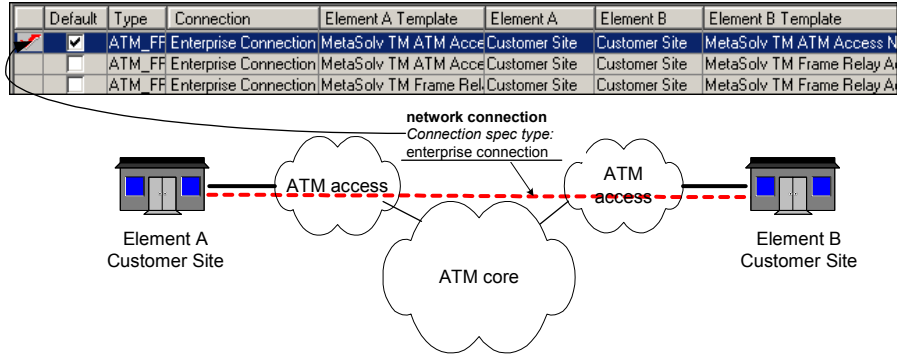
13. Add the second item for this scenario to the Product Catalog. Repeat step 9. on page 89 and complete the General tab as shown on the following figure:

14. Add and configure the access connection to a frame relay access network, using step 11. on page 90 as a model. Even though a PVC requires two access connections, you need only configure one since you can associate it to both instances during the ordering process.

Step-by-step details follow:

a. Complete General tab.

b. Add the access connection item to the product and associate it to the correct connection spec.

Default	Type	Connection	Element A Template	Element A	Element B	Element B Template
		ATM_FF	Assignable Bandwidth	MetaSolv TM ATM Acce	ATM Switch	Customer Site	MetaSolv TM ATM Access Netwo
✓	☑	ATM_FF	Assignable Bandwidth	MetaSolv TM Frame Rel	FR Switch	Customer Site	MetaSolv TM Frame Relay Access

network connection
Connection spec type:
assignable bandwidth link

Frame relay access

Frame relay access

Element A
Customer Site

ATM core

Element B
Customer Site

c. Add the enterprise connection item to the CAP Frame-Frame PVC product.

General | Default Values | Pricing | Network Template Types

Item Definition
Product Spec Item Name: CAP Dedicated PVC Enterprise
Catalog ID: 2623
Catalog Use Code: Global
Item Alias: CAP Frame-Frame PVC Enterprise
Item Name: CAP Frame-Frame PVC Enterprise

d. Associate the enterprise connection to the correct connection spec for CAP Frame-Frame PVC.

Default	Type	Connection	Element A Template	Element A	Element B	Element B Template
✓	☑	ATM_FF	Enterprise Connection	MetaSolv TM Frame Relay Access N	Customer Site	Customer Site	MetaSolv TM Frame Relay Access Network
	☐	ATM_FF	Enterprise Connection	MetaSolv TM ATM Access Network	Customer Site	Customer Site	MetaSolv TM Frame Relay Access Network
	☐	ATM_FF	Enterprise Connection	MetaSolv TM ATM Access Network	Customer Site	Customer Site	MetaSolv TM ATM Access Network

network connection
Connection spec type:
enterprise connection

Frame relay access

Frame relay access

Element A
Customer Site

ATM core

Element B
Customer Site

15. Add and configure the third product using the CAP Dedicated PVC, this time for ATM-Frame Relay.

a. Complete the General tab as follows:

b. Add secondary product for ATM access and complete the General tab.

c. Associate the ATM access connection to the correct connection spec.
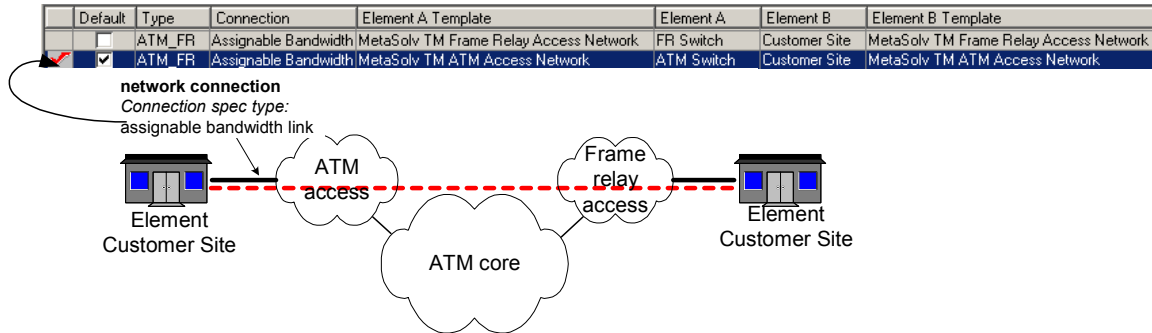
d. Add a secondary product for Frame Relay access and complete the General tab.

e.   Associate the Frame Relay access connection to the correct connection spec.

	Default	Type	Connection	Element A Template	Element A	Element B	Element B Template
✏	☑	ATM_FR	Assignable Bandwidth	MetaSolv TM Frame Relay Access	FR Switch	Customer Site	MetaSolv TM Frame Relay Access N
	☐	ATM_FR	Assignable Bandwidth	MetaSolv TM ATM Access Netwo	ATM Switch	Customer Site	MetaSolv TM ATM Access Network

f.   Add a secondary product for an enterprise connection to CAP ATM-Frame PVC
     and complete the General tab.

g.   Associate the enterprise connection item to the correct connection spec.
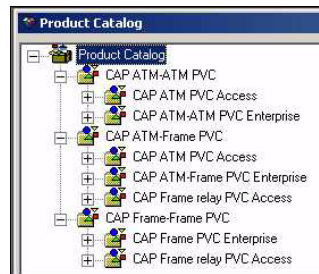
	Default	Type	Connection	Element A Template	Element A	Element B	Element B Template
	☐	ATM_FR	Enterprise Connection	MetaSolv TM ATM Access Network	Customer Site	Customer Site	MetaSolv TM ATM Access Network
	☐	ATM_FR	Enterprise Connection	MetaSolv TM Frame Relay Access N	Customer Site	Customer Site	MetaSolv TM Frame Relay Access Net
✏	☑	ATM_FR	Enterprise Connection	MetaSolv TM ATM Access Network	Customer Site	Customer Site	MetaSolv TM Frame Relay Access Net

16. Save and review the treeview.

This completes the scenario for creating product specifications and a product catalog offering for a dedicated PVC. To see how this product offering is ordered through the Ordering Dialog, see Scenario 1—Ordering a Dedicated PVC in the *Template-based Ordering Concepts and Processes Guide.*

SCENARIO 2—SETTING UP PRODUCT SPECS AND CATALOG FOR XDSL SERVICE

This scenario presents one example of establishing product specifications for a product bundle, with its related network connections. This example uses only MetaSolv-defined template components that are part of the technology modules; that is, none of the template components referenced here are user-defined. The product specifications are built with the template-based PRDBUNDLE and CONNECTOR item types. The CONNECTOR item type is considered template-based because items built with it must be associated with one or more connector spec types, a template component.

The companion scenario, Scenario 2—Ordering DSL Service, can be found in the *Template-based Ordering Concepts and Processes Guide.* This companion scenario demonstrates how the product catalog offering created in this scenario is ordered through the Ordering Dialog.

Description

This scenario presents one example of setting up a product offering for DSL service to support customer orders. The scenario includes setting up the required product specifications and the product catalog service items.

This scenario demonstrates, by example, how to set up product specifications and product catalog items for any product bundle. DSL service is a special usage of product bundle, in that the network connections are associated with network connection specs from the DSL template type. Other types of bundled connections can be associated with connection spec types from the following technology types: ATM_FR, MPLS, and Ethernet.

The product specifications in this scenario were set up to accommodate the DSL technology type.

- Product bundle

⇒ CAP xDSL Product Bundle[1]
- Network connections
  ⇒ CAP xDSL Physical Connection (DSL Link)
  ⇒ CAP xDSL Internet Connection
  ⇒ CAP xDSL Voice Connection (VoDSL)
- System option
  ⇒ Hunt group for voice connections

Notice the DSL Link, Internet Connection, and Voice Connection. These are the connections that are referenced with the network connection (CONNECTOR) items in this scenario.
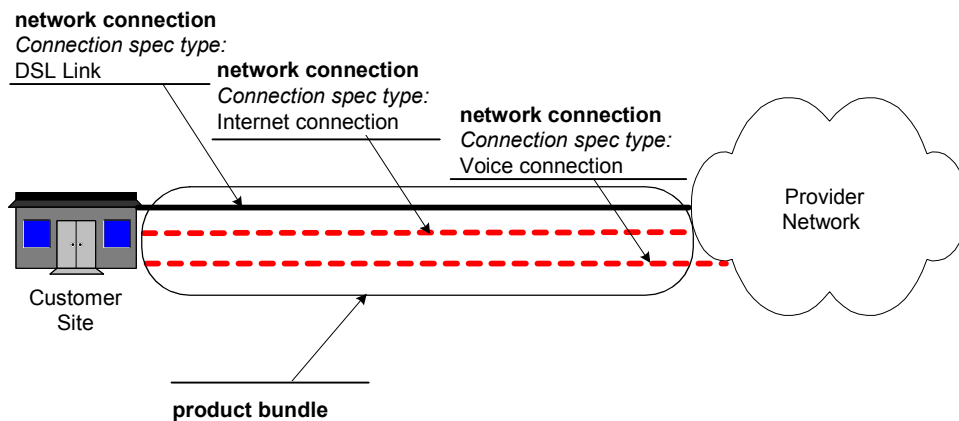
Figure 41: DSL product bundle of customer connections

Assumptions

Consider the following prerequisites.

- Familiarity with the DSL template. See "DSL network template association options" on page 35
- Identification of xDSL Service as the level 1 product offerings that will use the new Product Bundle (PRDBUNDLE) item type.
- For the xDSL level 1 product offering, identification of the supporting level 2 products or services as xDSL Access Connection, xDSL Internet Connection, and xDSL Voice Connection (VoDSL) as described in Examples of product offerings based on the DSL template.

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1. Name includes the term "product bundle" just for clarity.

Execution
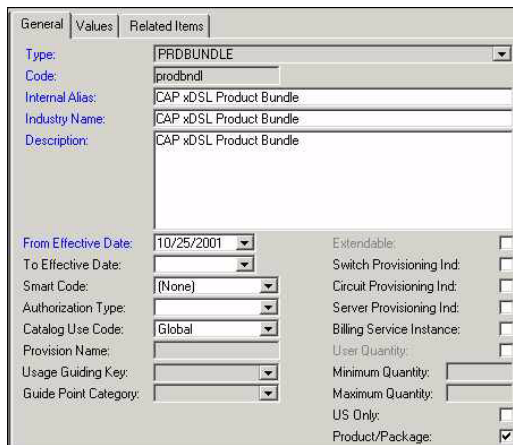
The following steps demonstrate how to complete product specifications and create a product catalog offering for an xDSL product bundle.

1. Access the Product Specifications window by selecting **Infrastructure > List > Product Catalog > Product Specifications**.

2. Add a product specification for the DSL product bundle and three extensions from the provider network to the customer site, including the DSL link from the DSLAM, an Internet connection from the provider's IP router, and a VoDSL connection from the PSTN switch. All additions are implemented by highlighting the top leaf in the Product Specifications treeview, and selecting the right-click menu option, **Add Item**, completing the General tab fields, and clicking **Save**.

Step-by-step details follow:

a. Add a product specification for the xDSL product bundle using the Product Bundle (PRDBUNDLE) item type. Check the Product/Package checkbox to indicate it is a level 1 item. For this scenario, we added the CAP xDSL Product Bundle and completed the General tab as shown on the following figure.

     b. Add a product specification for the three types of connections using the network connection (CONNECTOR) item type. For this scenario, we added the data shown on the following figures.

     c. Add a product specification for any optional items. See Figure 16, "Hierarchy of items that can be related to a product bundle," on page 33. In this example, we will add a Hunt Group system option (SYSOPTION) and specify smart code as hunt group.

     d. Following is the treeview of all the new product specifications added for this xDSL example.

3. Associate each product specification of a network connection item type to the appropriate connection spec type(s). The predefined association options for any xDSL scenario are detailed in DSL network template association options. To make an association, highlight the desired item on the Network Templates tab and select the

right-click menu option, **Associate**. This selection adds a checkmark in the first column. To display checked items together, click the header of the first column.

Step-by-step details with examples follow:

a. Associate the xDSL physical connection item with the connection spec type called DSL Link.

b. Associate the xDSL Internet connection item with the connection spec type for Internet connection that terminates at a router.

c. Associate the VoDSL connection item with the connection spec type for a voice connection.

4. Relate the product specification for the xDSL product bundle to each product specification for a network connection plus any optional item that can be related directly to a product bundle. See Hierarchy of items that can be related to a product bundle. To implement a relationship, highlight the product bundle item on the Product Specifications treeview, display the Related Items tab, and select the **Add** option from the popup menu.
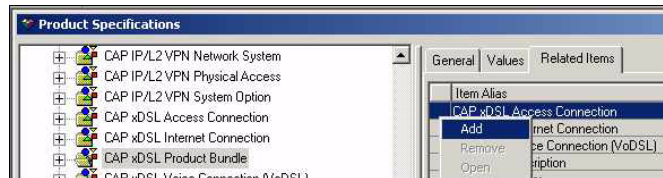
When the following popup appears, click **OK** to continue unless the selected relationship involves adding telephone numbers or when an expiration date is known, for example, for a temporary system option.

Step-by-step details follow:

a.   Relate the xDSL product bundle to the xDSL physical connection item and accept the default specification relationship.

b.   Relate the xDSL product bundle to the xDSL Internet connection item and accept the default specification relationship.

c.   Relate the xDSL product bundle to the xDSL voice relationship and specify One for telephone numbers; each voice line that will be added will have its own telephone number.

d.   Relate the xDSL product bundle to Hunt Group and accept the default specification relationship.

e.   Verify all items that need to be related have been related.
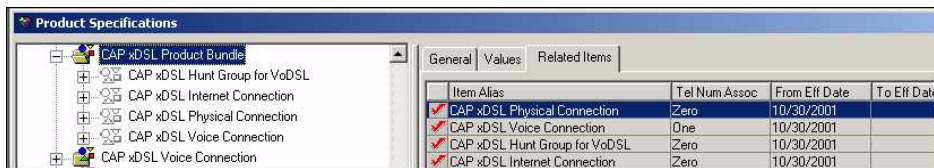
5.   Access Product Catalog by selecting **Infrastructure > List > Product Catalog > Product Catalog**.

6.   Add the product offering CAP SDSL Product Bundle using the product specifications for CAP xDSL Product Bundle. To add a product-level service item, highlight the top leaf on the Product Catalog treeview and select the popup menu option, **Add Item**.

7. The resulting window lists all items defined as level 1 products in Product Specifications. To select an item, highlight it and click **OK**.
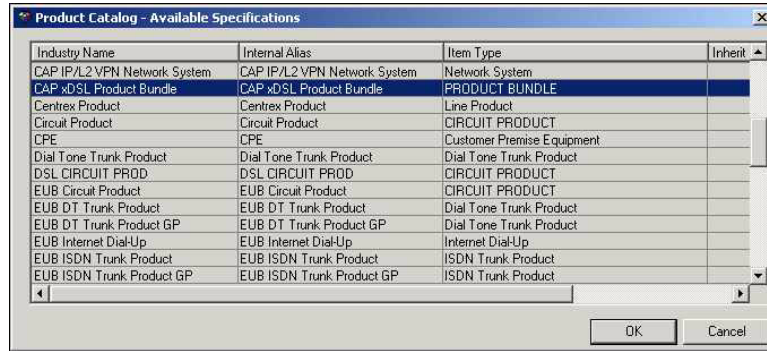
Step-by-step details follow:

a. Select the product bundle. In this scenario, the CAP xDSL Product Bundle was selected.

b. Complete the General tab. For this scenario, the product specifications name was changed from CAP xDSL Product Bundle to the product offering name of CAP SDSL Product Bundle and a marketing description was added.
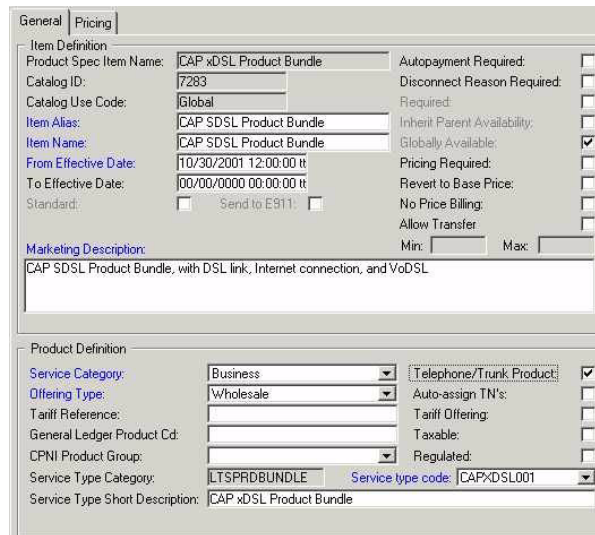
8. Add the second level product catalog items under the CAP SDSL product bundle. For this scenario, we will add each of the items available to the CAP SDSL. Subordinate product additions are implemented by highlighting the level 1 product, CAP SDSL

Product Bundle in the Product Catalog treeview, and selecting the right-click menu option, **Add Item**.
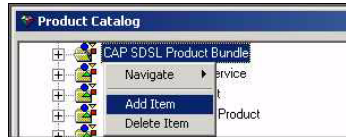
Selecting Add Item brings up a list of product specifications available for selection. You will recognize these as the items related to the CAP xDSL Product Bundle item. Items are selected one at a time so that needed modifications can be made.
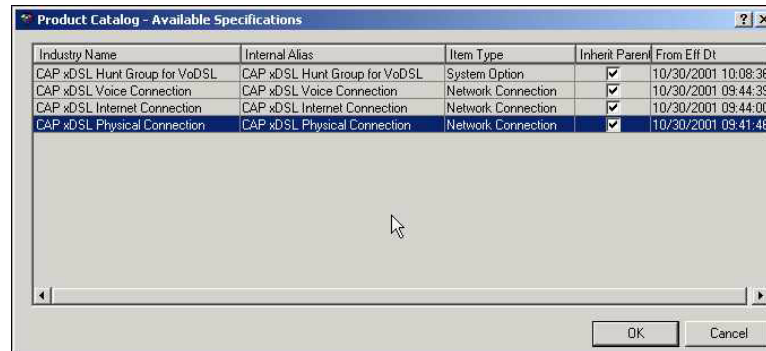
Step-by-step details follow:

a. Add the CAP xDSL Physical Connection and modify the name.
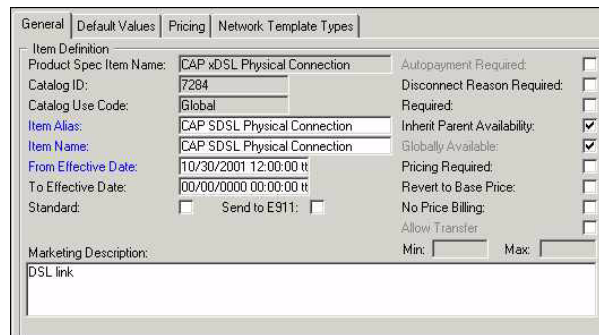
b. Repeat additions for the CAP xDSL Internet Connection, the CAP xDSL Voice Connection, and the Hunt Group. Verify the additions.
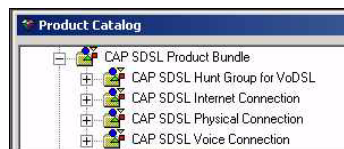
9. Associate each product catalog item built with a network connection item type to the appropriate connection spec type. In this scenario, only one connection spec type was associated in the product spec, so there is only one choice. The choice still needs to be

made manually. To associate an item, highlight it in the treeview, display the Network Template Types tab, and select **Associate** from the right-click menu.
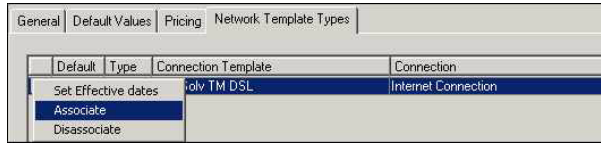
Step-by-step details follow:

a. Associate the CAP SDSL Physical Connection with the connection spec type called DSL Link:
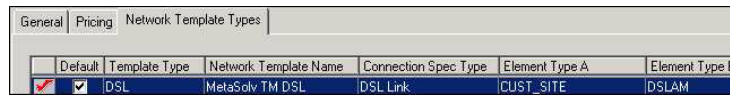
b. Associate the CAP SDSL Internet connection with the connection spec type called Internet Connection.

c. Associate the CAP SDSL Voice Connection with the connection spec type called Voice Connection.

This completes the scenario for creating product specifications and a product catalog offering for a product bundle for an xDSL product that includes Internet connectivity and VoDSL. To see how this product offering is ordered through the Ordering Dialog, see Scenario 2- Ordering xDSL Service in the *Template-based Ordering Concepts and Processes Guide*.

SCENARIO 3—SETTING UP PRODUCT SPECS AND CATALOG FOR VPN SERVICE

This scenario presents one example of establishing product specifications for a network system, with its related network elements and network connections. This example uses only predefined template components; that is, none are user-defined. The product specifications are built with the template-based SYSTEM, ELEMENT, and CONNECTOR item types. These item types are considered template-based because the items are associated with template components.

The companion scenario, Scenario 3—Ordering a VPN System, can be found in the *Template-based Ordering Concepts and Processes Guide.* This companion scenario demonstrates how the product catalog offering created in this scenario is ordered through the Ordering Dialog.

Description

This scenario demonstrates, by example, how to set up product specifications and product catalog items for any VPN network system. VPNs can be set up with the predefined templates using the following technology types: ATM_FR, MPLS, and IP.

The product specifications in this scenario were set up to accommodate either the IP technology type or the ATM_FR technology type.

- Network system
  ⇒ CAP IP/L2 VPN Network System
- Network elements
  ⇒ CAP IP/L2 VPN Home Office
  ⇒ CAP IP/L2 VPN Branch Office
- Network connections
  ⇒ Physical connections
    ⇒ CAP IP/L2 VPN Physical Access
  ⇒ Virtual enterprise connections
    ⇒ CAP IP/L2 VPN Data Access
  ⇒ Virtual Internet connection
    ⇒ CAP IP/L2 VPN Internet Access

The IP/Layer 2 VPN product specification can accommodate product catalog offerings that include an IP VPN, an ATM VPN, and a Frame Relay VPN. This scenario shows how to set up the product catalog item for the ATM option.

- Network system
  ⇒ CAP ATM VPN
- Network elements
  ⇒ CAP ATM VPN Home Office
  ⇒ CAP ATM VPN Branch Office

- ■ Network connections
  - ⇒ Physical connection
    - ⇒ CAP ATM VPN Physical Access
  - ⇒ Virtual enterprise connection
    - ⇒ CAP ATM VPN Data Access
  - ⇒ Virtual Internet connection
    - ⇒ CAP ATM VPN Internet Access

Assumptions

Consider the following assumptions when reviewing this scenario:

- ■ The template types, ATM_FR and IP are available.
- ■ The ATM_FR template type includes the MetaSolv TM Layer 2 VPN network template. The IP template type includes the MetaSolv TM IP VPN network template.
- ■ Both the Layer 2 VPN and the IP VPN network templates contain the element type, CE_RTR.
- ■ Both the Layer 2 VPN and the IP VPN contain connection spec types for physical access, data access, and Internet access. For example, the connection spec types associated for Layer 2 in this scenario include the VPN Link for physical access, the Layer 2 VPN Connection for data access, and the Internet Virtual Connection for Internet access. These are shown on the following diagram, which represents a customized version of a template, that includes the connection types and element type used in this scenario in the context of the internal networks. The connections are shown as heavy solid (physical) and heavy dashed (virtual) lines.
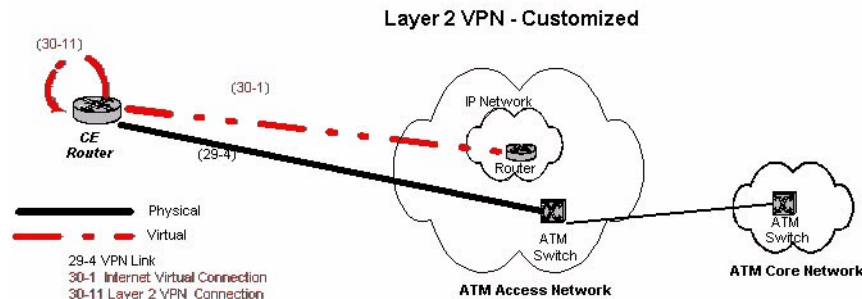
Figure 42: Example of Layer 2 VPN connections to internal network components

Execution

The following steps explain how to complete product specifications and create a product catalog offering for a VPN system.

1. Access Product Specifications by selecting **Infrastructure > List > Product Catalog > Product Specifications**.

2. Add a product specification for the VPN network system, the network sites being incorporated into the VPN, the physical connection type needed for access from each site to the provider network, the virtual connection type needed to connect network sites to each other, and optionally, the virtual connection type needed to provide Internet access. All additions are implemented by highlighting the top leaf in the Product Specifications treeview, selecting the right-click menu option, **Add Item,** completing the General tab, and clicking **Save**.
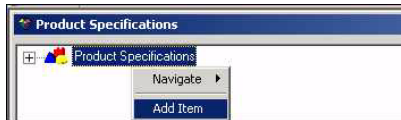
Step-by-step details follow:

a. Add a product specification for the VPN Network System using the Network System item type and mark it as a level 1 item. For this scenario, we added the CAP IP/L2 VPN Network System and completed the General tab as follows:

b. Add a product specification for the network sites using the Network Element item type. This item can be used to define services for any location where a customer router will be or is installed, such as a home office, a branch office, or a partner location. In this example, we created separate items for the home office and branch office in order to associate different equipment to each. For this scenario, we added the CAP IP/L2 VPN Home Office and the CAP IP/L2 VPN Branch Office. We completed only the first three fields and accepted the default for the next two required fields and the current date.

c. Add a product specification for the three types of connections using the Network Connection item type. For this scenario, we added the following.
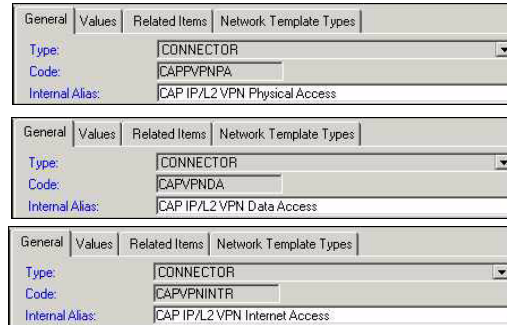
d. Add product specifications for any optional items. See Figure 19, "Hierarchy of items that can be related to a network system," on page 37. In this scenario, we added equipment for installation at the branch office or home office and IP addresses that the user requires for LAN-side assignment. Following is the treeview of all the product specifications added for this example VPN product offering.

3. Associate each product specifications of the network system, network element, or network connection to the appropriate template(s). Association options for any VPN scenario are detailed in Network elements and network connections related to network systems. All associations are implemented by highlighting the desired item on the Network Templates tab, and selecting the right-click menu option, **Associate**. This selection adds a checkmark in the first column. To display checked items together, click the blank column header.
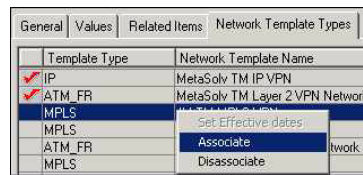
Step-by-step details follow:

a. Associate the product specification for the network system to the appropriate template(s). In this scenario, we associated the product spec for CAP IP/L2 VPN Network System to two templates, one per technology type. An example follows:

	Template Type	Network Template Name
✓	IP	MetaSolv TM IP VPN
✓	ATM_FR	MetaSolv TM Layer 2 VPN Network

b. Associate the product specification for the network elements to the appropriate template(s). In this scenario, we associated the product spec for CAP IP/L2 VPN Home Office and CAP IP/L2 VPN Branch Office as follows:

	Template Type	Network Template Name	Element Type	Element Name
✓	IP	MetaSolv TM IP VPN	CE_RTR	Customer Edge Router
✓	ATM_FR	MetaSolv TM Layer 2 VPN Network	CE_RTR	Customer Edge Router

c. Associate product specification for the VPN connection type that enables physical access from each VPN site to a provider network to the appropriate templates. In this scenario, we associated the product spec for CAP IP/L2 VPN Physical Access as follows:

	Type	Connection Template	Connection	Element A	Element B
✓	ATM_FR	MetaSolv TM Layer 2 VPN Network	VPN Link	Customer Edge Router	ATM Switch
✓	ATM_FR	MetaSolv TM Layer 2 VPN Network	VPN Link	Customer Edge Router	FR Switch
✓	IP	MetaSolv TM IP VPN	VPN Link	Customer Edge Router	IP Router

d. Associate product specification for the VPN virtual connection type that enables enterprise connectivity or data access among VPN sites to the appropriate templates. In this scenario, we associated the product spec for CAP IP/L2 VPN Data Access as follows:

	Type	Connection Template	Connection	Element A	Element B
✓	ATM_FR	MetaSolv TM Layer 2 VPN Network	Layer 2 VPN Connection	Customer Edge Router	Customer Edge Router
✓	IP	MetaSolv TM IP VPN	Network - based VPN Connec	Customer Edge Router	Customer Edge Router
✓	IP	MetaSolv TM IP VPN	CPE - based VPN Connection	Customer Edge Router	Customer Edge Router

e. Associate product specification for the VPN virtual connection type that enables Internet connectivity for the VPN sites, an optional feature for a VPN. In this scenario, we associated the product spec for CAP IP/L2 VPN Internet Access as follows:

	Type	Connection Template	Connection	Element A	Element B
✓	ATM_FR	MetaSolv TM Layer 2 VPN Network	Internet Connection	Customer Edge Router	IP Router
✓	ATM_FR	MetaSolv TM Layer 2 VPN Network	Internet Connection	Customer Edge Router	SMS
✓	IP	MetaSolv TM IP VPN	VLAN - Internet Connection	Customer Edge Router	IP Router

4. Relate the product specifications for the VPN network system to the product specifications of the VPN network elements, VPN network connections, and any optional item that can be related directly to a network system. See Hierarchy of items that can be related to a network system for all valid options. All relationships are implemented by highlighting the parent item on the Network Templates tab, and

selecting the right-click menu option, **Add**. This selection adds a checkmark in the first column preceding the child item.

When the following popup appears, click OK to continue. This popup should be used only if the selected relationship involves adding telephone numbers or when an expiration date is known, for example, for a temporary system option.

Step-by-step details follow:

a. Relate the product specification for the VPN network system to all of the related VPN items. In this scenario we related the product specification for CAP IP/L2 VPN Network System as follows:

b. Relate the product specifications for the VPN network elements. In this scenario we related the product spec for CAP IP/L2 VPN Home Office to both the CE Router equipment and to the unspecified "option." The relationship to the CAP IP/L2 VPN Branch Office was limited to just the equipment.

Information subject to change without notice.

c. Verify relationships by examining the expanded treeview for the network system.
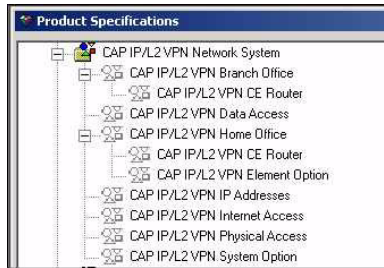
Product Specifications

CAP IP/L2 VPN Network System
  CAP IP/L2 VPN Branch Office
    CAP IP/L2 VPN CE Router
  CAP IP/L2 VPN Data Access
  CAP IP/L2 VPN Home Office
    CAP IP/L2 VPN CE Router
    CAP IP/L2 VPN Element Option
  CAP IP/L2 VPN IP Addresses
  CAP IP/L2 VPN Internet Access
  CAP IP/L2 VPN Physical Access
  CAP IP/L2 VPN System Option

5. Access Product Catalog by selecting **Infrastructure > List > Product Catalog > Product Catalog**.

6. Add the product offering using the product specifications. For this scenario, we will add a CAP ATM VPN from the product specifications. product-level additions are implemented by highlighting the top leaf in the Product Catalog treeview, and selecting the right-click menu option, **Add Item**.

Product Catalog

Product
  Navigate ▶
  Add Item
  Delete Item

The resulting window lists all items defined as products in Product Specifications.

Product Catalog – Available Specifications

Industry Name	Internal Alias	Item Type	Inherit
CAP IP/L2 VPN Network System	CAP IP/L2 VPN Network System	Network System	
Centrex Product	Centrex Product	Line Product	
Circuit Product	Circuit Product	CIRCUIT PRODUCT	
CPE	CPE	Customer Premise Equipment	
Dial Tone Trunk Product	Dial Tone Trunk Product	Dial Tone Trunk Product	
DSL CIRCUIT PROD	DSL CIRCUIT PROD	CIRCUIT PRODUCT	
EUB Circuit Product	EUB Circuit Product	CIRCUIT PRODUCT	
EUB DT Trunk Product	EUB DT Trunk Product	Dial Tone Trunk Product	
EUB DT Trunk Product GP	EUB DT Trunk Product GP	Dial Tone Trunk Product	
EUB Internet Dial-Up	EUB Internet Dial-Up	Internet Dial-Up	
EUB ISDN Trunk Product	EUB ISDN Trunk Product	ISDN Trunk Product	
EUB ISDN Trunk Product GP	EUB ISDN Trunk Product GP	ISDN Trunk Product	
EUB LD Trunk Product	EUB LD Trunk Product	Long Distance Trunk Product	

OK   Cancel

Step-by-step details follow:

a. Select the product-level item for the VPN from the available specifications to add it to the product catalog. For this scenario, we selected the CAP IP/L2 VPN Network System and completed the General tab as follows, naming the product catalog item, CAP ATM VPN. (You can associate multiple network templates to a

network system and the CSR can select the appropriate network template to use at order time.)

b. Optionally, repeat the preceding step, naming the level 1 product catalog items CAP Frame Relay VPN and CAP IP VPN

7. Add the second level product catalog items under the VPN network system products. For this scenario, we will add each of the items available to the CAP ATM VPN. Subordinate level additions are implemented by highlighting the level 1 product, CAP ATM VPN in the Product Catalog treeview, and selecting the right-click menu option, **Add Item**.
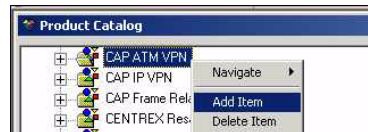
Selecting Add Item brings up a list of product specifications available for selection. You will recognize these as the items related to the CAP IP/L2 VPN Network System in

Product Specifications. Items are selected one at a time so that needed modifications can be made.
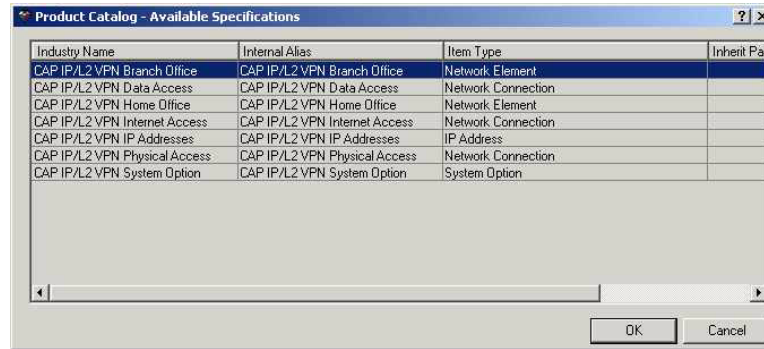
Step-by-step details follow:

a. Select an item from the Product Catalog - Available Specifications window to add it to the product catalog under the highlighted item.

b. Rename the item to reflect the product offering. In this scenario, each item is renamed such that "ATM" replaces IP/L2 (IP/Layer 2, where Layer 2 stands for ATM and Frame Relay). The Product Catalog appears as follows following the additions.
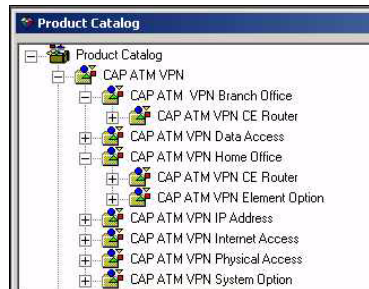
8. Associate each product catalog item built with a network system, network element, or network connection item type to the template that is appropriate for the product offering. In this scenario, we associated the templates for ATM/FR (and did not associate those for IP). Association is performed by highlighting the desired row on the Network Templates tab and selecting **Associate**. When a single row is selected, specifying a default is optional. Save after each association. Note that this step does not apply to IP addresses, system options, or equipment that is part of this product offering.

Step-by-step details follow:

a. Associate the CAP ATM VPN with the Layer 2 VPN template.

b. Associate the CAP ATM VPN Home Office as follows:

c. Associate the CAP ATM VPN Branch Office as follows:

d. Associate the CAP ATM VPN Physical Access connection to the connection spec type that terminates at the ATM switch as follows:

e. Associate the CAP ATM VPN Data Access connection as follows:

f. Associate the CAP ATM VPN Internet Access connection as follows:

9. If the network elements have related equipment, associate that equipment to an equipment specification. In this scenario, the CAP ATM VPN Home Office and the CAP ATM VPN Branch Office are related to Customer Edge Router equipment. This process is initiated by highlighting the CE Router equipment item, selecting the Equipment Spec tab, and selecting **Add**.

This action brings up the Product Spec/Equipment Spec Query window with the list of equipment associated with the corresponding product spec. In this scenario, just one spec was associated. This is the spec that was added.
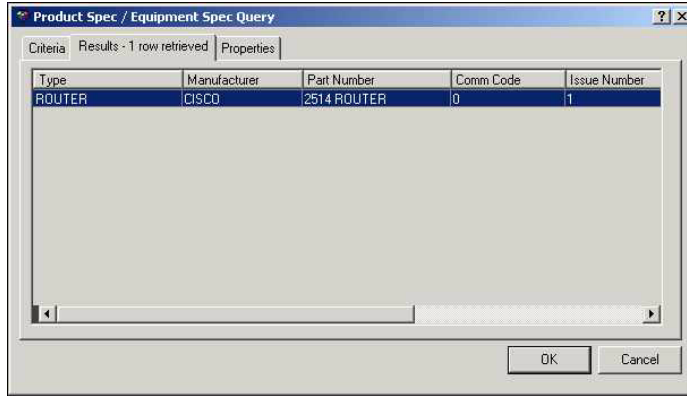
Step-by-step details follow:

a. Select the equipment spec. In this scenario, select the CAP ATM VPN CE Router under the CAP ATM VPN Home Office.

b. Indicate the default if there are multiples. Optionally, indicate override preference.
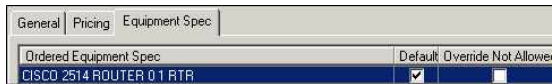
c. Repeat for the equipment under the CAP ATM VPN Branch Office.

This completes the scenario for creating product specifications and a product catalog offering for an ATM VPN. To see how this product offering is ordered through the Ordering Dialog, see Scenario 3—Ordering a VPN System in the *Template-based Ordering Concepts and Processes Guide.*

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System Requirements

The MetaSolv Solution employs an n-tiered architecture consisting of an Oracle database, UNIX or Windows NT servers (for application and database servers), and Windows or browser-based clients. For more information specific to your application or version of the MetaSolv Solution, please contact your MetaSolv representative.