SYSPRO

e.net solutions

Teach Yourself

SYSPRO™
Simplifying
your Success

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Teach Yourself e.net solutions

First Edition

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Introduction

This book is written to introduce you to the concepts involved when programming with SYSPRO e.net solutions. It will help you learn and utilize the power of SYSPRO's e.net solutions in building your own custom applications and integrating SYSPRO with other applications. This book cannot tell you everything about SYSPRO e.net solutions, nor can it provide you with all the tools that you will need to successfully program your own application with SYSPRO e.net solutions. It can only teach you about what SYSPRO e.net solutions is and how to apply the functionality of the system to your applications. In a sense, this book will provide you with the basic tool box and parts that you will be able to use to assemble a powerful, integrated, SYSPRO e.net solutions enabled application. It remains up to you to do the assembly, and to learn to use the tools.

There are many reasons for learning the concepts and programming logic of SYSPRO's e.net solutions. All the various reasons given, however, will typically relate to one of the following basic reasons:

- The ability to create your own custom application
- The ability to extend the SYSPRO core system to a Web based system
- The ability to add custom content and processes to the SYSPRO system
- The ability to integrate the core SYSPRO system with another system

Whatever your reasons for learning and using the methods and functions of programming with e.net solutions, this book will help you realize your own potential and the potential of your company or enterprise as you create new applications, extend specific functionality, and integrate your SYSPRO system with other applications and services.

1.1. Audience

This book is written for system programmers. We assume that you already know the basic structures of programming in Visual Basic or C#, and are familiar with ASP.NET. You do not need to be an expert in these languages to understand the logic and examples presented in this book, you only need to be familiar enough with them so that you can see the processes involved (most programmers are able to look at any object oriented programming language and follow the process, even if the syntax is different). As you will find out later in this book, e.net solutions based applications can be programmed using any COM or Web Service enabled language, so you are not limited to the language examples given in this book. We have used these languages as they have been the most commonly used to date.

This book also assumes that you know and understand the basics of the SYSPRO system. What SYSPRO is, an ERP core application that is extended using COM and .NET to provide SOA capabilities. What a SYSPRO system does, Accounts Receivable, Bill of Material, etc., and how to connect to a SYSPRO application server (basic networking knowledge). If you do not have access to a SYSPRO application server then you will not be able to utilize the information provided in this book.

1.2. Objectives

The main objective of this book is to provide an overview of the classes and methods of the SYSPRO e.net solutions environment so that the reader is able to create a custom application or integrate a SYSPRO process within their current system. Each chapter is written with a specific objective in mind, so that by the end of the book the reader has been exposed to the concepts of e.net solutions, has been shown specific examples of the classes and methods of e.net solutions, and has seen a sample application created using these examples as a foundation.

By the time that you have finished working through this book you will understand the interaction of the e.net solutions package with the core SYSPRO product. You will also be able to create, modify, and troubleshoot e.net solutions programs yourself. This book will provide the foundation knowledge for building an integrated and extended ERP system.

1.3. Requirements

Programming and deploying enterprise level applications through e.net solutions requires the following:

- Previous programming experience in Visual Basic (VB) or C#, and familiarity with ASP.NET
- SYSPRO 6.0 server with e.net solutions installed (this book was written using Issue 010) and running on Windows Server 2000/2003

  (For ASP.NET applications this book assumes the use of IIS 4.0 or higher as the installed web server.)
- The .NET 1.1 Framework (This is not needed for VBScript but is recommended for using this book as we deal with both VBScript, COM, and .NET programming examples)
- Microsoft Internet Explorer 6.0 or higher
- Microsoft XML 3.0 or higher
- SYSPRO e.net solutions DCOM Remote Client (only required when the Web Server is located on a host other than the SYSPRO application server, or the application resides on a machine that is not the SYSPRO application server).
- SYSPRO Web Applications

It is highly recommended that you request a SYSPRO 6.0 Issue 010 Evaluation Version from your local SYSPRO VAR and install it on a test server. On this test server also install the supplied Sample Data and the SYSPRO Web Applications. We will be using the Sample Data within the code examples of this book. It is also highly recommended that you install the e.net Diagnostics suite (see Section 4.2, “e.net Diagnostics Suite” [4–1]).

If you do not have .NET programming experience please take time to read Chapter 2, *Defining e.net solutions* [2–1] so that you understand the relationship between e.net solutions, COM, and Microsoft's .NET Framework. After reading the chapter, do an introductory ASP.NET course, either online, at a training institution, or from a 'Teach Yourself .NET' type of book. This book will teach you how to use e.net solutions with the .NET Framework, and as such the programming knowledge of .NET is assumed to be known.

2

Defining e.net solutions

Objectives - The objective of this chapter is to expose you to the concepts behind SYSPRO e.net solutions. At the end of this chapter you will know about SYSPRO business objects, the Component Object Model (COM), SYSPRO Web Services, XML Schemas, SYSPRO Web Based Applications, and the relationship between e.net solutions and Microsoft's .NET Framework.

Before learning how to program with e.net solutions it is essential to understand what e.net solutions is. Simply defined, e.net solutions provides a Component Object Model (COM) interface that allows VB, C++, C#, Java, JBOS, ASP 3.0 and ASP.NET developers to access SYSPRO functionality via an object model. For this reason, any COM or Web Services enabled language or application can use the e.net solutions object model (for simplicity we focus on VBScript, ASP.NET C# and VB examples in this book). Component-based concepts and principles permeate throughout the entire design of the SYSPRO system, particularly the e.net solutions functionality that is part of the core system.

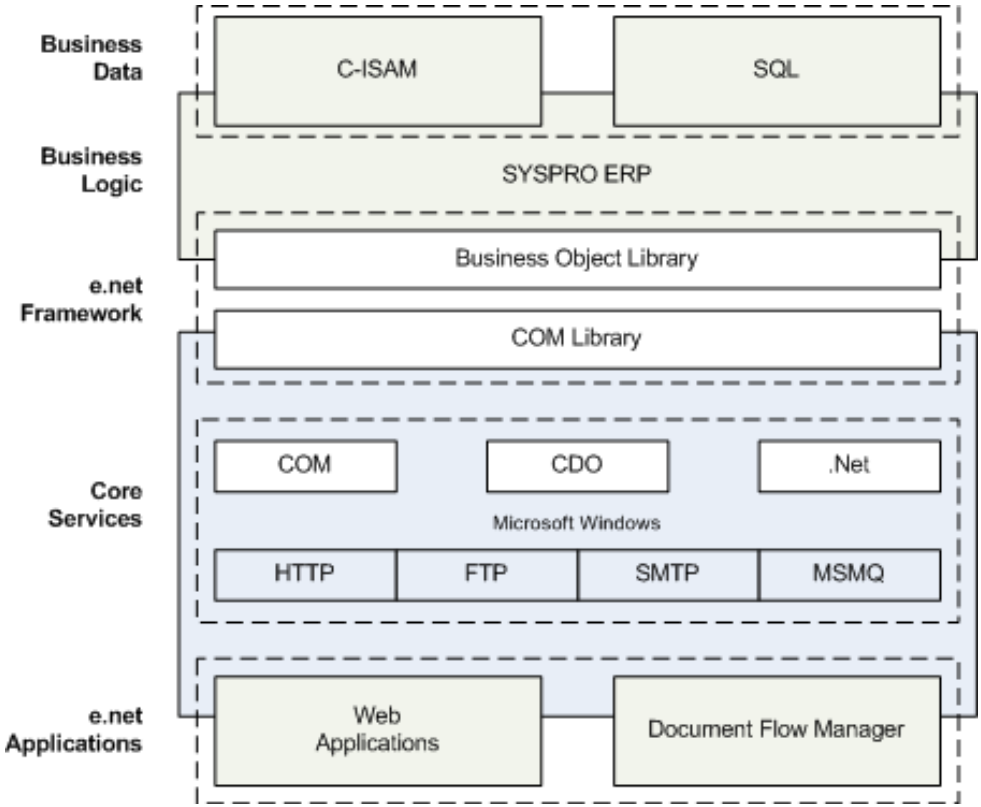
At the high-level, the SYSPRO e.net solutions framework is comprised of four components:

- **Business Objects** - proprietary SYSPRO technology, a business object is an executable piece of code that implements an area of business logic or functionality that is inherent to the SYSPRO ERP.
- **A COM Object** - A Component Object Model (COM) object is basically a black box that can be used by applications to perform one or more tasks. COM objects are commonly implemented as a dynamic-link library (DLL). Like a conventional DLL, COM objects expose methods that an application can call to perform any of the supported tasks.
- **Web Services** - Preconfigured web based services that extend the full functionality of the SYSPRO system to an Internet type environment.
- **XML Schemas** - An XML Schema is an XML file that uses the *XML Schema Definition* (XSD), a language, to describe the structure of an XML document.

As shown in Figure 2.1, “e.net solutions Framework Architecture” [2–2], the COM and business object components are implemented as separate interfaces. The fourth component, XML Schemas, are used by developers to validate XML instances passed between the e.net solutions applications and the business objects. We will discuss this a little later in more detail. Combined, these components provide:

- A component architecture that simplifies integration development around the SYSPRO environment.
- A standard way of directly accessing the business functionality within SYSPRO without compromising the business rules or security of the system.

Figure 2.1. e.net solutions Framework Architecture



2.1. Business Objects

Proprietary SYSPRO technology, a business object is an executable piece of code that implements an area of business logic or functionality that is inherent to the SYSPRO ERP. A default part of the SYSPRO installation, business objects abstract the business logic or functionality of multiple SYSPRO programs into a single executable piece of code that serves as a simplified interface to the core system.

At time of writing there were 177 business objects as compared to 1200 programs. These business objects implement approximately 45% of the business logic and functionality inherent within the 31 SYSPRO modules. The SYSPRO modules are briefly listed below. We have purposely not listed the business objects associated with each module. The reason for this is that knowing their names is, at this introductory stage, of little importance or value. It is sufficient to understand that they exist, and that the business objects are organized by these modules.

- System Manager
- Accounts Payable
- Accounts Receivable
- Cash Book
- General Ledger
- Assets Register
- Inventory
- Purchase Orders
- Sales Analysis
- Sales Orders
- Bill of Materials
- Quotations
- Requirements Planning
- Lot Traceability
- Report Writer / SYSPRO Reporting Services
- Work in Progress
- Office Automation
- Interface/EDI
- Screen Customization
- Electronic Funds Transfer
- Project & Contracts
- Activity Based Costing
- Landed Cost Tracking
- Counter Sales
- Blanket Sales Orders and Releases
- Return Merchandise System

- Product Configurator
- Factory Documentation
- Engineering Change Control
- Inventory Optimization (Forecasting)
- SYSPRO Analytics

SYSPRO will also be releasing these two modules in the near future:

- Contact Management
- Trade promotions

In order to invoke the functionality of a business object with an e.net solutions based application or one of the e.net solutions web-based applications shipped with SYSPRO, the business object module must be licensed. The only exception to this is the e.net solutions Document Flow Manager (DFM) which by default is able to invoke the functionality of any business object regardless of licensing constraints.

Business objects are called and passed information using a text-based format called XML. When a business object accepts this XML it is known as “consuming” it. The business objects also return information in XML format. The deviation from this is when the supplied XML contains incorrect information, in which case the business object may "throw an exception".

To ensure data integrity, each business object is designed to check that the XML instance passed is in a form and structure that is acceptable for processing. If the XML is acceptable, processing continues and the result is returned to the e.net solutions application as a new XML instance, otherwise an exception is raised.

An exception is a program execution error which in context of the e.net solutions framework is trapped by the COM service provided by the operating system. An exception typically results in the abrupt termination of a program. To help developers avoid exceptions an XML Schema is provided for each business object. The XML Schemas enable developers to validate the XML strings constructed by their e.net solutions applications.

2.2. COM Object

As we have mentioned before, a Component Object Model (COM) object is basically a black box that can be used by applications to perform one or more tasks, commonly implemented as a dynamic-link library (DLL). Like a conventional DLL, COM objects expose methods that an application can call to perform any of the supported tasks.

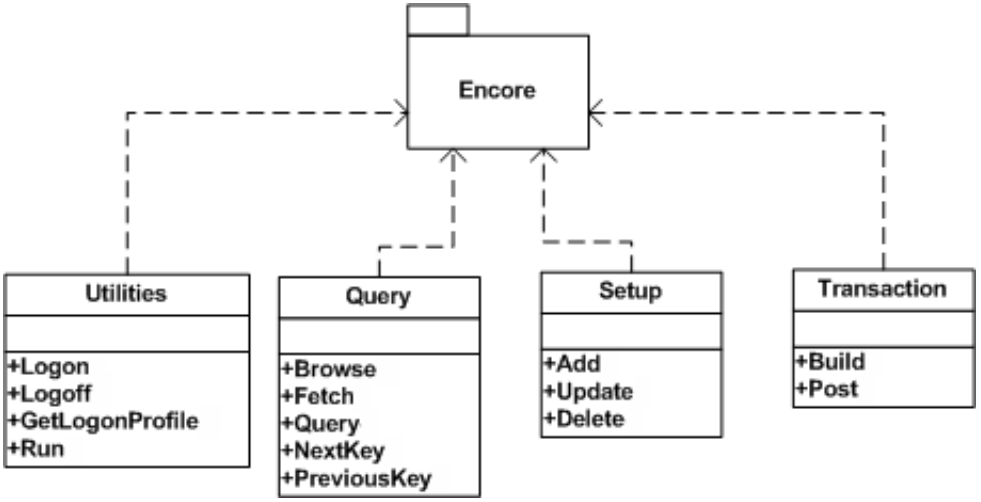
In SYSPRO e.net solutions the COM object is implemented as a *Dynamic Linked Library* (DLL) called **ENCORE.DLL**. In case you're wondering where this name came from, it is a legacy carry-over from the days when the SYSPRO product was called Encore. As to the reasons why the filename was not changed when the product was re-branded, they will soon become apparent.

When SYSPRO e.net solutions is installed on a SYSPRO application server, **ENCORE.DLL** is installed to the SYSPRO base folder and registered to expose a number of interfaces as Public Objects. Each of these objects is essentially a class that categorizes methods according to the class function.

As shown in Figure 2.2, “The COM Object” [2–5], the COM interface is extremely simple and compact. The classes and methods provided are also designed to be as abstract or generic as possible. The implication of this is that the COM Object will rarely, if ever, need to be modified. For developers, this means that the integrity of the interface on which their e.net solutions applications are built is more or less guaranteed to remain unchanged, regardless of the version number of the underlying SYSPRO application.

If you are still wondering why **ENCORE.DLL** has not been renamed, consider what would happen to e.net solutions web-based applications if the Encore COM object was renamed to **SYSPRO.DLL**. The COM object interface would be broken and e.net solutions would not be serviceable. This backward compatibility is essential for the smooth transition of upgrades and updates.

Figure 2.2. The COM Object



Each class is a purposeful interface with methods that can be used to perform operations, as follows:

- **`Utilities`** , this class provides methods for authentication, profile retrieval and running of Net Express programs, including:
  - *`Logon`*
  - *`Logoff`*
  - *`GetLoginProfile`*
  - *`Run`*
- **`Query`** , this class provides methods to query data in a generic way, including:
  - *`Browse`*
  - *`Fetch`*
  - *`Query`*
  - *`NextKey`*
  - *`PreviousKey`*
- **`Setup`** , this class provides methods that can be used to modify information contained in the database, the SYSPRO data structures.
  - *`Add`*
  - *`Update`*
  - *`Delete`*
- **`Transaction`** , this class provides methods that can be used to build and post transactions, including:
  - *`Build`*
  - *`Post`*

At run-time, e.net solutions creates copies or new instances of these objects. Once this is done, information can be dynamically passed using an XML string that is defined by the method called. This information is passed to the business object interface where further processing takes place.

2.3. Web Services

Web Services extend all the core functions of the SYSPRO system to a Web interface. The Web Services enable the core SYSPRO ERP system to support direct interactions with other software applications using XML-based messages. These messages are typically exchanged via Internet based protocols (such as HTTP , FTP, and SMTP). In other words the Web Services deliver the core SYSPRO ERP application in an integrated and cohesive way across a variety of different protocols to almost any client device.

By using the SYSPRO Web Services you enable other web applications and programs to access and utilize the functionality of your SYSPRO system. This is where SYSPRO becomes the core functioning system of an SOA (see Section 2.7, “Service Oriented Architecture (SOA)” [2–13]).The core functionality of the SYSPRO system is made available through web services.

The SYSPRO Web Services are typically used when the SYSPRO application server is

hosted on a different network. If an Internet Service Provider (ISP) is hosting the SYSPRO application server then it is easier to connect to the Web Services than to connect through DCOM (mainly due to firewall issues). The Web Services are also used when a custom application has been created that is being used on different operating systems and at different locations within the enterprise controlled network.

The Web Services are not part of a default SYSPRO install and so will need to be installed separately (see Appendix A, *Installing the SYSPRO Web Services* [A–1]).

2.4. XML Schemas

An XML Schema is an XML file that uses the *XML Schema Definition* (XSD), to describe the structure of an XML document. All XML documents have to conform to the W3C Schema specification in order to be considered true XML. These XML documents are said to be "well-formed". Any document that does not conform to the standard cannot be read or processed as an XML document and will return an error. The following four requirements of a well-formed XML document are where most of the XML mistakes occur:

1. All attribute values must be enclosed in single or double quotation marks
2. All elements must have both begin and end tags (unless they are empty).
3. All empty elements must contain an empty element identifier (/) at the end of the begin tag.
4. Elements must be nested properly.

While discussing XML it is important to also mention that the W3C has produced XML specifications for XML versions 1.0, and 1.1 (and is due to release specifications for 2.0 in the near future). SYSPRO e.net solutions and the associated business objects require the use of XML 1.0.

Previously we mentioned that business objects can be passed information in the form of XML strings and that the structure of these XML instances must be acceptable to the business object in order to continue processing. The XML Schemas shipped with SYSPRO enable developers to check that the form and structure of XML instances created by their e.net solutions applications, making sure that they are acceptable to the business object which is being invoked to perform an operation. In XML terms this is called "Validation".

The process of validation is performed by an XML Parser. An XML Parser is a processor that reads an XML document and determines the structure and properties of the data. It breaks the data up into parts and provides them to other objects or components. When reading an XML document the parser checks that the document is well-formed and validates the structure of the document against the XML Schema (XSD).

As SYSPRO e.net solutions is designed to operate on the Microsoft Windows operating system, the Microsoft *XML Parser* (which has now been renamed Microsoft XML Core Services) is the processor of choice.

For each business object within SYSPRO there are corresponding XML Schemas (XSD) that are specifically designed for use with only that business object. Setup and Transaction class business objects utilize two XML inputs (what we will later call XmlIn and Xml Parameters). Each of the XML inputs has its own corresponding schema. To validate their XML instances, developers can pass their XML, which they have constructed for consumption by a specific business object, to the MSXML Parser together with the XSD provided for the target business object. The parser will check that the XML is well-formed and that its structure conforms to the rules defined in the XSD. Assuming that the XML is acceptable, it can then be passed to the designated business object with the peace of mind that an exception will not be returned because of incorrect XML structure (there could be exceptions due to other errors - i.e. the if a Query Key is invalid) and that a new XML instance will be generated once processing is completed.

When the core SYSPRO ERP is installed, the complete XML Schema Library is copied to the **`base\schemas`** folder.

2.5. SYSPRO Web Based Applications

SYSPRO have developed a set of web based applications that utilize the business objects through an ASP.NET programmed interface. In this book we will be using some similar programming structures and XSL formatting ideas as the web based applications. As we have already mentioned in the requirements section of the previous chapter, we highly recommend that you obtain the evaluation version of SYSPRO 6.0 Issue 010 (or higher) and install the SYSPRO Application Server, the SYSPRO Web Applications, and the Sample Data on a test or development system.

2.6. .NET and e.net solutions

Although the name 'e.net' implies a close connection between the system and the .NET Framework, we cannot assume that everyone knows what .NET is and what the relationship between .NET and the SYSPRO system is. In this section of the introduction we will briefly discuss what .NET is and what the major components are. In the next section we will examine the relationship between the SYSPRO system and .NET through e.net solutions.

2.6.1. What is .NET?

For many people learning e.net solutions, one of the most pressing questions at this juncture may be "What is .NET?". The simplest answer is: “.NET is a Framework in which Windows applications may be developed and run”. I agree that this answer does not tell much, as true a definition as it is. In order to truly understand .NET we must go back in time and follow the development of Windows and the advent of Windows programming.

The historical framework and working definitions of .NET used in this section are based on the information presented in the codeproject [http://www.codeproject.com/dotnet/dotnet.asp] introductory article on .NET written by Kashif Manzoor.

2.6.1.1. The Road to .NET

The Windows operating system provides programmers with various functions - called API (Application Programming Interfaces). Starting from the earliest version of Windows on the commercial market to the most recent version of WindowsXP, APIs are the basic tools that let the operating system know what you want it to do. If you want to create a Dialog Box you need to call a specific API provided by Windows. Creating a button requires another API call. And so the list goes on. As new and updated GUIs appeared on the scene, new APIs were introduced in Windows. But using these native APIs became a very challenging task. Making a simple Window that prints "Hello World" could take more than hundred lines of code. Compare this to the 5 lines of a "Hello World" program in DOS. Due to this difficulty, Windows programming was considered something better left to the experts. Microsoft and other commercial organization's were aware of this trend, and started marketing Visual Tools that made the programmer's life easier. Using Visual C++, Visual Basic, Borland's C++ and other such IDEs, it became much simpler to make Windows programs.

Microsoft also realized that applications needed a solid way to talk to each other. This realization resulted in the introduction of Object Linking and Embedding (OLE). OLE was an extremely useful concept, but it had two major flaws : it was notoriously difficult to program, and it was very limited in its scope - i.e. it only did a few things like drag and drop, clipboard sharing, OLE client, OLE server, etc. Microsoft addressed (or at least tried to address) both of these problems. They upgraded OLE to COM. COM was much more

capable than OLE, and it introduced other new concepts, like ActiveX controls. These could directly compete with Java Applets. As for the difficulty of programming OLE/COM; Microsoft expanded the MFC (Microsoft Foundation Classes) and VBRun to take care of most of the dirty work. Although making an ActiveX application still was slightly tricky in Visual C++, developing an ActiveX application in Visual Basic was extremely easy. For this reason Visual Basic became the foremost ActiveX development media.

The Internet revolution then posed new problems and challenges. C/C++ (which was the tool of programming champions) was not suited or ready for Web Development. Microsoft tried expanding MFC, and included several network oriented classes - like CSocket, CASyncSocket, and several HTTP based classes. By using these classes a programmer could very quickly develop a distributed application, but it took considerable effort. These applications were also always customized and targeted to the specific task. The developers had to take care of the gory network communication details themselves. By now object-oriented analysis and development had started becoming ubiquitous. Although technologies like Remote Procedure Call (RPC) was a great help to the programmers; it was limited in its scope. For programmers following Object-Oriented development, RPC was not much help at all as it did not allow the passing of objects as parameters. This major issue was addressed by the introduction of industry agreed upon standards, like CORBA, IIOP, RMI, DCOM etc. All these standards used customized protocols to transmit an object over the network. They also required a tight coupling between the server and the client - i.e. the client needed to be fully aware of how to talk to the server. Due to this tight client-server coupling all these protocols needed considerable deployment efforts in order for distributed applications to function properly. Sun did come up with another layer on top of RMI - the famous Enterprise Java Beans (EJB). The EJB container provided lot of services for free - all that a programmer had to do was to extend (inherit) from an appropriate EJB base class, and there you have it - a fully functional distributed application. EJB made programmer's lives considerably easier; but it did not eradicate the client-server coupling issue.

Microsoft realized that upgrading their existing technologies would not work. What was needed was a complete change in their philosophy. Historically, OLE was upgraded to COM - and it was welcomed by all. COM was then upgraded to COM+. Microsoft addressed the distributed programming issue with the introduction of DCOM. Although COM/COM+/DCOM were all good technologies, they all required a significant learning curve. Sun on the other hand was making things easier and so a majority of developers were turning towards Java based technologies for distributed enterprise applications.

Microsoft got their programming gurus together and asked them to reflect back on their Windows DNA and to come up with a future vision. This group came up with so many new and great ideas that Microsoft realized that no amount of up upgrading or extending of their MFC/VBRun/WFC, COM/COM+/DCOM, ASP, APIs etc. would even come closer to realizing the possibilities of this new vision. So they made a radical but correct decision - and this was the decision of coming up with something big, something new, and something that let Microsoft overcome their legacy problems - the .NET Framework.

2.6.1.2. Major Components of .NET

At the core of The .NET Framework is a component called the Common Language Runtime (CLR). The CLR can be thought of as a separate operating system that runs within the context of another operating system (such as Windows XP or Windows 2000). This idea is not something new. We have seen this with the Java Virtual Machine, as well as the environments of many interpreted languages such as BASIC and LISP which have been around for decades. The purpose of a middleware platform like the CLR is simply that a common OS like Windows is often too close to the hardware of a machine to retain the flexibility or agility required by software targeted for business on the Internet. Software running on the CLR (referred to as Managed Code) has the needed flexibility and is exceptionally agile.

Unlike interpreted languages, managed code runs in the native machine language of the system on which it is launched. In short, this is how the .NET process works:

1. Developers write their code in a .NET enabled language.
2. The compiler generates binary executable software in a p-code format called Common Intermediate Language (or CIL for short).
3. When the software is launched, the CLR re-compiles or JIT-compiles (Just In Time) the CIL into native code such as x86 machine language.
4. Then the code is then executed at full speed.

Another component of the .NET Framework is the massive library of reusable object-types called the Framework Class Library or FCL. The FCL contains hundreds of classes that perform tasks ranging from file reads and writes to advanced cryptography and web services.

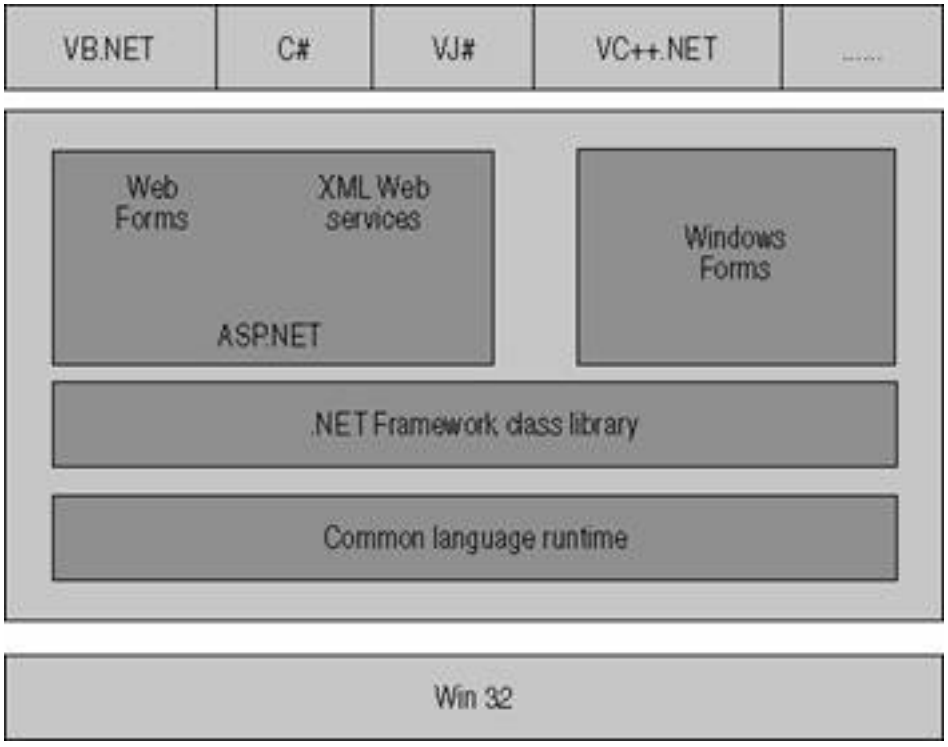
The CLR is intrinsically object-oriented; even its CIL (the p-code, which can be viewed as a virtual assembly language) has instructions to manipulate objects directly. The Framework Class Library reflects the platform's object-oriented nature. For most programmers, the FCL is the most extensive and extendable class library that they will have ever worked with.

Finally, the .NET Framework contains a collection of tools and compilers that help to make programming productive and enjoyable. Up until now we have not mentioned much about C# (pronounced See-Sharp) or Visual Basic.NET (we'll be programming in these languages later). The reason is that the real core of .NET is the CLR. However, over twenty language compilers are currently being used in the .NET Framework, including the original five .NET languages from Microsoft: Visual Basic, C#, C++, JavaScript and CIL.

The CLR and the .NET Framework have been designed in such a way that code written in one language can not only seamlessly be used with another language, but it can also be naturally extended by code written in another programming language. This means that

(depending on the needs of a project's work-force) developers will be able to write code in the language in which they are most comfortable.

Figure 2.3. .NET Framework



2.6.2. SYSPRO ERP integrated with .NET

SYSPRO e.net solutions is based on the Windows Distributed Network Architecture (DNA) model, which in turn is based on the Component Object Model (COM). As we have seen, COM is basically a black box that can be used by applications to perform one or more tasks. Like a conventional DLL, COM objects expose methods that an application can call to perform any of the supported tasks. SYSPRO have taken the business logic of the SYSPRO ERP system and programmed it into individual executable pieces of code called *business objects*. These business objects are available through the COM (or DCOM) interface and are accessible to .NET programming through the **`ENCORE.dll`** of e.net solutions. This reflects the fact that SYSPRO e.net solutions is a COM object platform that integrates the .NET Framework within the SYSPRO application. This enhances the core SYSPRO ERP system with the capabilities of .NET - extending the messaging, security,

identity and transaction capabilities that are required in order to enable the efficient management of interactions across a service-orientated architecture (SOA).

SYSPRO e.net solutions is a component architecture that gives authorized individuals the ability to interact with SYSPRO data over the Web as well as from remote devices, including PDAs and cell phones. SYSPRO e.net solutions provides a standard way of directly accessing the business functionality within the SYSPRO system while maintaining the software's built-in business rules and security. In addition to enabling such functions as *remote purchase order entry* and *inventory status determination*, SYSPRO e.net solutions also facilitates the integration of other best-of-breed applications with the SYSPRO software. The .NET integration within SYSPRO's e.net solutions COM architecture opens the whole application to collaborative networks and Web based interaction.

In order to utilize the .NET Framework capabilities of e.net solutions presented in this book you will need to already understand programming in .NET (particularly ASP.NET). You will also need to learn and know the functions of the business objects that are part of SYSPRO e.net solutions. This book will introduce you to the concepts needed in order to create programs that interact effectively with the business objects. The *Business Object Library* of the Section 4.2, “e.net Diagnostics Suite” [4–1] lists the many business objects that are currently available. The SYSPRO online Support Zone provides a more extensive in the e.net solutions Business Objects Reference Library section. The Business Objects Reference Library also provides greater detail about each business object and is updated with any new business object or information about a business object. Remember that the business objects are available through the COM interface as well as through the web-based applications that are written in ASP.NET. So if you only know Visual Basic Scripting and only want to program your application through the COM interface then you will not need to know .NET programming. In this book we will provide you with the foundational information that will allow you to do both. Many of the sample applications through out this book will however be presented in ASP.NET.

2.7. Service Oriented Architecture (SOA)

One of the key features of SYSPRO's e.net solutions is the extension of the core SYSPRO ERP system to the wider network, including the Internet. This capability creates the functionality required for a Service Oriented Architecture (SOA).

SOA capability is becoming increasingly sought after and utilized in the business software arena. Using SOA brings increased flexibility and agility to your system, resulting in greater information exchange, reduced programming expenditure and increased return on investment. The concept underlying the architecture is based on the principles behind object oriented programming, but extended to deal with the whole system or architecture. The central feature of SOA is the creation of re-usable *objects* of code defined as **services**. Each service is dynamically discoverable (i.e. you can perform a search for it, and for the type of service that it performs), network enabled (usually web based), and part of a larger group of services that together form components or modules.

In SYSPRO, SOA capability is easily seen through the exposure of the core SYSPRO ERP

through e.net solutions web-based and COM based applications. The business objects exposed through a web-based application and through the web services are the core SOA services that create the extension of the SYSPRO ERP. The COM/DCOM system is also part of the extension of the core SYSPRO ERP. Your custom built e.net solutions application will use the SOA functionality present within SYSPRO, and could become the core SOA enablement of the enterprise that you are programming for (depending on your enterprises SOA goals and management strategies).

For more information on SOA and the use of SYSPRO within an SOA please contact your local SYSPRO VAR office and request a copy of the book: *SYSPRO on SOA*.

2.8. Net Express and other Programming Tool environments

Many of the programmers at SYSPRO and within their customer base use Net Express as their Integrated Development Environment (IDE). The SYSPRO Forums at support.syspro.com [http://www.support.syspro.com] has a specific development forum for these users.

There are other IDEs that are available for the .NET Framework. Microsoft offers Visual Studio 2005 as its core .NET IDE, and offers related free products, known as 'Express Editions' (Visual Web Developer 2005 Express Edition, Visual Basic 2005 Express Edition, and Visual C# 2005 Express Edition). It is possible to use these tools to develop your enterprise level applications, or any another IDE that is integrated with the .NET Framework.

3

Getting Started with e.net solutions

Objectives - In this chapter we will introduce the basic structure of programming with e.net solutions. We will demonstrate the capabilities of programs that interact with the e.net solutions framework by using two different models: the Basic model, and the Abstraction Model. By the end of this chapter you will have created your first program, sending and receiving information from the SYSPRO application server through the e.net solutions framework.

3.1. The Structure of Program

Having seen what SYSPRO e.net solutions is comprised of, and how SYSPRO is accessible to COM and .NET programming through e.net solutions, we now turn our attention to the concepts of programming that will access the e.net solutions framework. Development of e.net solutions based applications requires the programmer or development team to consider questions of programming organization and structure. As we consider programming with e.net solutions, there are two development models that we can use to define our development methods and application structure:

- The Basic Model
- The Abstraction Model

3.1.1. The Basic Model

The Basic Model is centered around the e.net solutions COM interface. As such it requires that an application will, for each interaction with SYSPRO, call a method, a business object if required, and pass/receive parameters or data as XML strings. The Basic Model, while simple, enables rapid development of rich and fully functional applications. Understanding of the Basic Model provides the foundation for developers that wish to structure their application using the The Abstraction Model.

As with any application development, developers need to have a clear understanding of their business's or customer's requirements in order to design an application that will provide the required functionality. If this objective is clear, the basic structuring and functionality of an e.net solutions application is easily described using *Unified Modeling Language* (UML) Sequence-Diagramming.

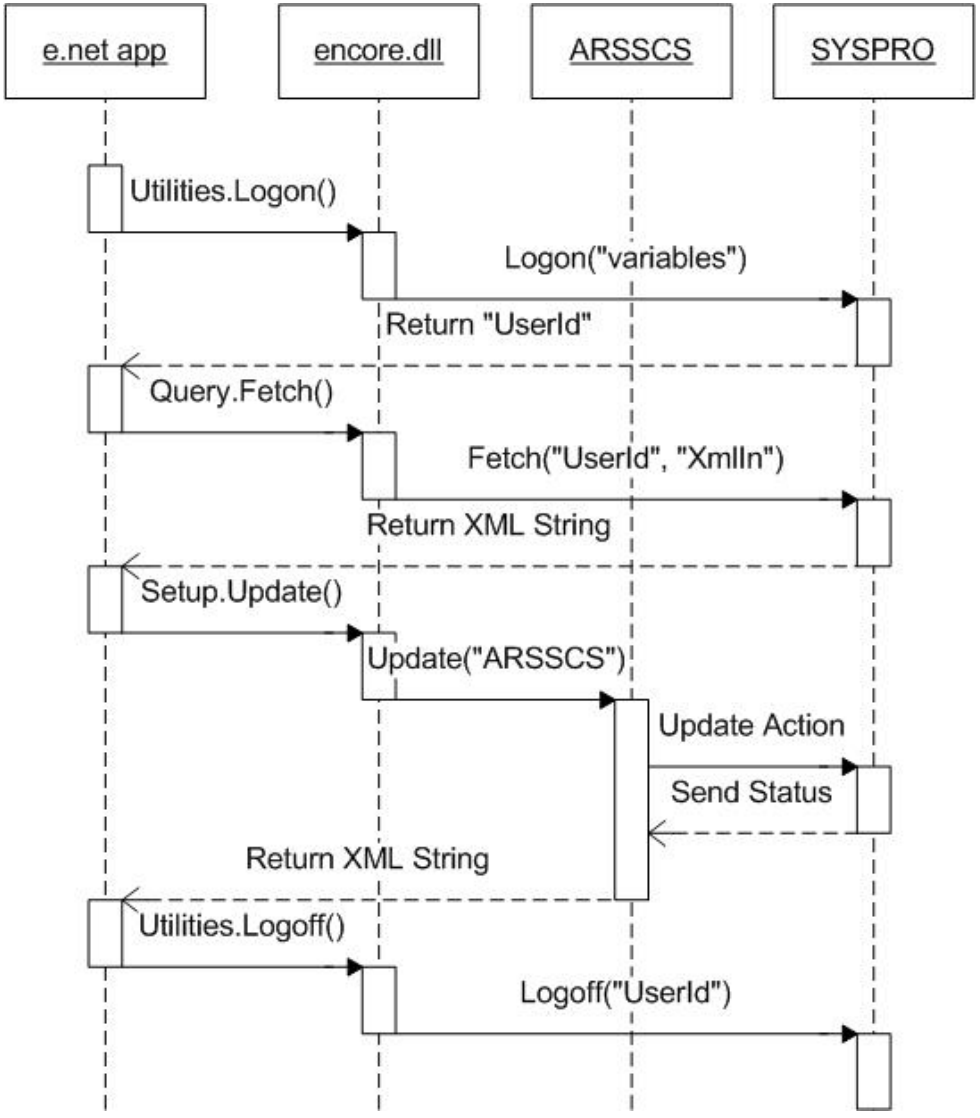
The application shown in Figure 3.1, “Basic Program Structure” [3–3] illustrates the use of the e.net solutions framework and business object components to create an application

that will enable a user to 'Update a Customer Record'. The application is comprised of four components:

- The e.net solutions web-based application. The application that will enable Customer Records to be updated.
- **ENCORE.DLL**. The e.net COM interface.
- **ARSSCS**. The Accounts Receivable Customer Maintenance business object that provides the functionality to add, update or delete customer records.
- SYSPRO. A SYSPRO application server with support for SYSPRO e.net solutions.

The application assumes that the user already has knowledge of a valid Customer ID.

Figure 3.1. Basic Program Structure



We have oversimplified the content of this diagram so that it is easy to see the process. Other UML sequence diagrams will contain more information when used later in this book.

Our "Customer Record Update" application first enables users to authenticate themselves. In so doing a UserID is obtained, this will be used to authenticate the session. Having obtained a UserID, the application enables the user to input a known Customer ID and uses the `Query.Fetch` method to retrieve the record containing the Customer Details. The Customer ID is passed to SYSPRO in an XML string by way of the `XmlIn` variable. It is the value for the `Query.Fetch` `<Key>` element of the XML input within the above example. Don't worry if you don't yet know what a `<Key>` element is, you will be introduced to the XML input requirements of the business objects as you continue reading and applying what you learn from this book.

SYSPRO returns the record details of the specified Customer ID as an output XML string to the e.net solutions application where the information is displayed on screen and can be modified by the user. When the user has finished modifying the details, the changes must be updated on SYSPRO. The e.net solutions application would provide a **Save** or **Update** button that will enable the user to instruct the application to save the changes back to SYSPRO.

The `Setup.Update` method is then used to call the **ARSSCS** business object. The `Setup.Update` method requires that two XML strings are passed to it: `XmlParameters` (**`ARSSCS.XML`**) and `XmlIn` (**`ARSSCSDOC.XML`**). SYSPRO returns the operation status back to **ARSSCS** which returns an XML string to the e.net application (**`ARSSCSOUT.XML`**).

The e.net solutions application then enables the user to repeat the operation on another Customer or to Logoff from the application.

This is a simple e.net solutions application. In this case it has served to illustrate the principle of the Basic Model that can be used to describe and structure e.net solutions applications. While it is a fully functional, self-contained application, it can be included as a functional part of a much larger application.

3.1.2. The Abstraction Model

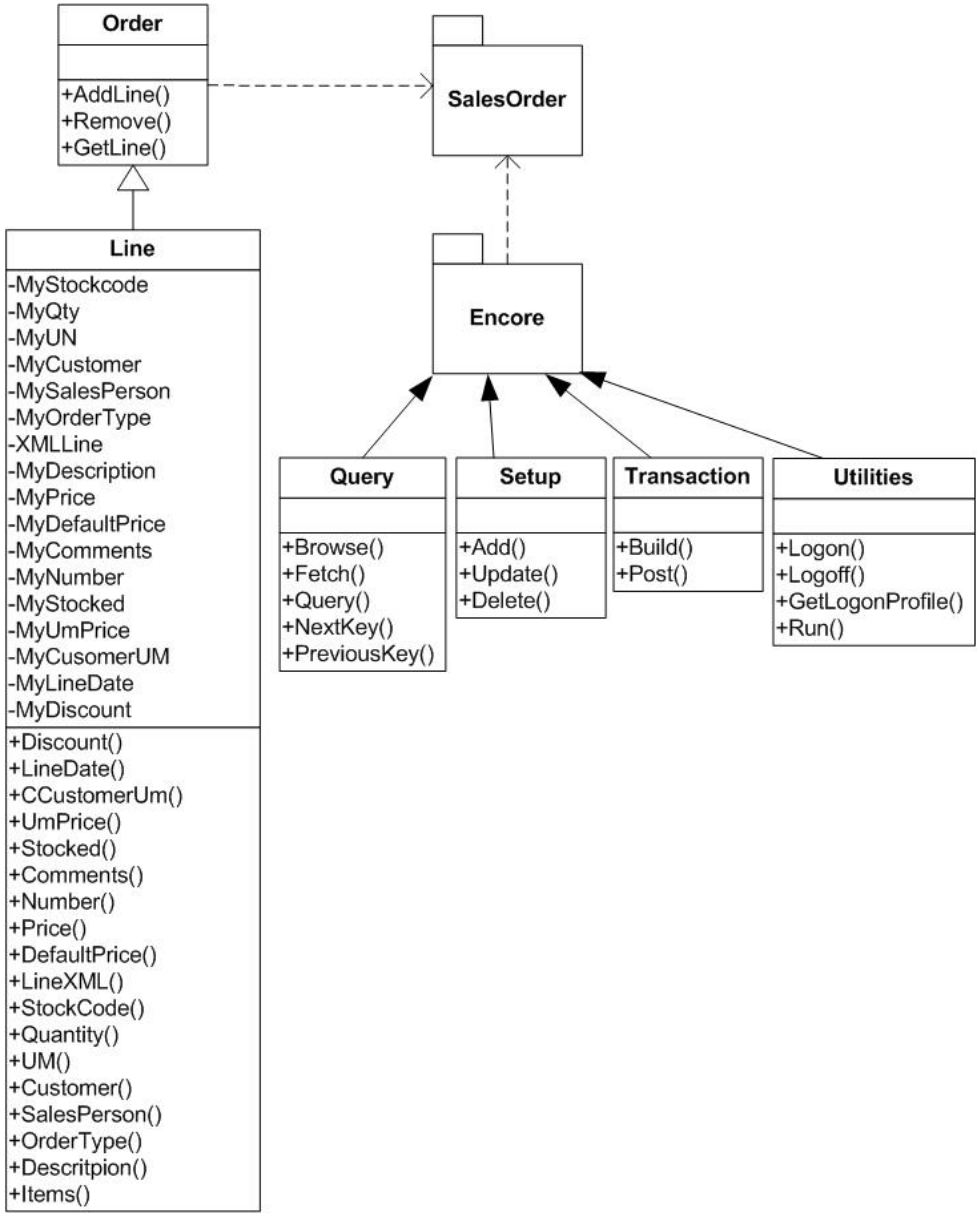
The Abstraction Model is really a natural extension to The Basic Model described in the previous section. The Abstraction Model employs the ability of Object Orientated programming to abstract away lower-level or complex programming functionality to produce a simpler API.

This model centers around the imagination and ability of developers to develop new class libraries that abstract the e.net solutions framework. The advantage of doing so is that an

API can be simplified and tailored to better describe the application. It also enables extended functionality to be developed in layers within the application.

A simple example of how the e.net solutions framework may be abstracted is shown Figure 3.2, “Abstracting e.net solutions framework” [3–6]. This abstraction defines a new class library package called `Order` that contains the `Encore` classes and one new class called `Lines`. The `SalesOrder` class abstracts the standard interaction used to interact with the Sales Order business object (**SORTOI**) and extends the functionality of Sales Order functionality within the application.

Figure 3.2. Abstracting e.net solutions framework



3.2. Your First e.net solutions program

It's now time to put the knowledge that you have just gained into use. Using the Basic Program Structure mentioned earlier in this chapter we will now create our first e.net program together. We will be creating a simple logon script using Visual Basic Scripting...

1. Open the Programming Editor that you are most comfortable with (or just open the Windows Notepad)
2. Declare the variables that will be used for the Logon:

   - *UserID*
   - *Encore*

   To do this we type in the following code:

```
Dim UserID, Encore
```

3. We next set the Encore variable to the **Encore.Utilities** class

   Type in the following code:

```
Set Encore = createobject("Encore.Utilities")
```

4. We will now perform the e.net solutions logon function, using the Utillities.Logon method

   Type in the following code:

```
UserID = Encore.Logon("ADMIN", "password", "0", " ", 5, \
     0, 0, " ")
```

Where you see \ at the end of a line of code and the next line indented, this means that the text was too long for the page size of this book but the indented text belongs of the code line above.

(for your logon string change *ADMIN* to your SYSPRO operator code, change *password* to your SYSPRO operator password, the first *0* to your SYSPRO company

number [0 is the company number of the evaluation version's *The Outdoors Company*], and the following " " to your SYSPRO company password)

5. Now we need to display the logon details that the previous method created in the SYSPRO system.

   Type in the following code:

```
msgbox UserID,  , "This is the User ID created by \
      logon"
```

6. Finally, we need to logoff of the SYSPRO system. To do this we will use the Utilities.Logoff function.

   Type in the following code:

```
Encore.logoff(UserID)
Set Encore = Nothing
```

7. Now that you have entered the text, save the file as Logon.vbs. You can now execute the script and receive the UserID results from the e.net solutions SYSPRO application server.

Congratulations! You have now successfully created your first e.net solutions program. This example is created in Visual Basic Scripting, but other examples and sample code sections will be presented in Visual Basic or C#. We have also provided sample ASP.NET code later in the book to illustrate the functions in use.

While you might not yet fully understand everything that you did in the previous procedure, you already know enough to be able to look at more sample code and work out what function the program is performing. Relax, we will not ask you to do that. Instead we will discuss some tools that will help you as you explore e.net solutions and create applications for yourself before we delve more deeply into the e.net solutions Classes and Methods.

4

Programming Tools

Objectives - In this chapter we will equip you with specific tools that will enable you to understand and build e.net solutions applications faster and with greater ease. We will discuss the Software Development Kit (SDK) and the e.net Diagnostics suite.

You now have a better idea of what e.net solutions programming requires. Before we examine the various classes and methods available in e.net solutions, we need to introduce a few tools that will greatly assist your learning of and programming with e.net solutions. Most of this chapter will be focused on the e.net Diagnostics suite that can be installed as an add-on to the core SYSPRO 6.0 system, from Issue 010 and onwards.

4.1. SYSPRO Software Development Kit (SDK)

One of the biggest programming resources already produced by SYSPRO for programmers and developers is the Software Development Kit Documentation. This is accessible from within the SYSPRO program (click on **help**, then click on **SYSPRO SDK**). This will load the SDK documentation help file, which is full of information and resources related to programming and development in e.net solutions.

To access the latest version of the SDK from the online SupportZone, use the "Developers" link from the Key Topics drop down list and select **Open/Download: SDK Documentation**

The SDK documentation will be more useful to you once you have finished reading this book. It is an excellent reference resource and we encourage you to make full use of it as part of your learning process.

4.2. e.net Diagnostics Suite

With the release of SYSPRO 6.0 Issue 010 comes a great diagnostic and programming tool, the e.net Diagnostics suite. This is a stand alone addition to the SYSPRO system that will aid you in using e.net solutions business objects and creating and testing code your own applications.

In the following sections we will be referring to use of the e.net Diagnostics suite, particularly in regard to forming XmlIn and XmlOut statements and testing particular custom Xml statements. It is also a useful tool for familiarizing yourself with the business objects available for programming with e.net solutions.

If you configure e.net solutions to point to your live data and post anything (with a `Setup` or `Transaction` class business object) the posting **will** affect your LIVE data.

The e.net Diagnostics suite can be downloaded from the online SYSPRO SupportZone for use with issue 010 or other SYSPRO issues.

4.2.1. Install Procedure

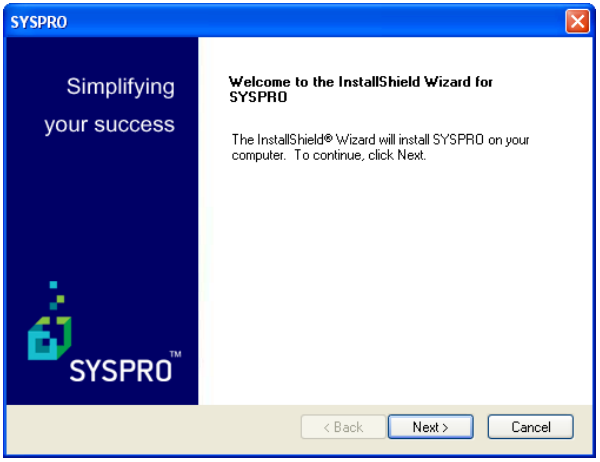
This installation procedure assumes that you have already installed e.net solutions with all the other required software.

1. Insert the SYSPRO Version 6.0 Issue 010 CD into your CD ROM drive. Inserting the CD initiates the Autorun.exe. If this does not occur, select the Autorun application on the CD drive.

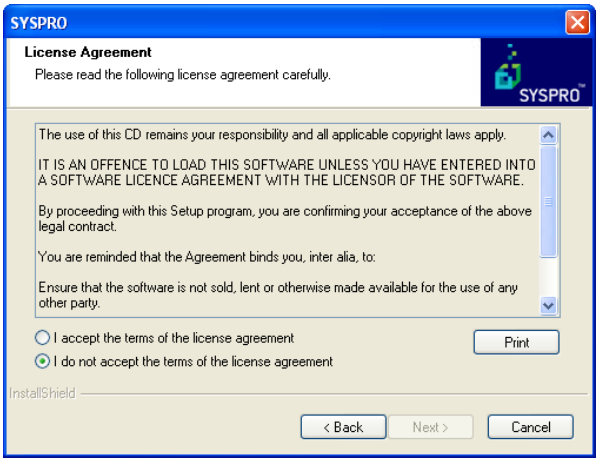
   The SYSPRO 6.0 setup window is displayed.

2. Select **Install Product** to begin the installation. The Install SYSPRO 6.0 window is displayed.

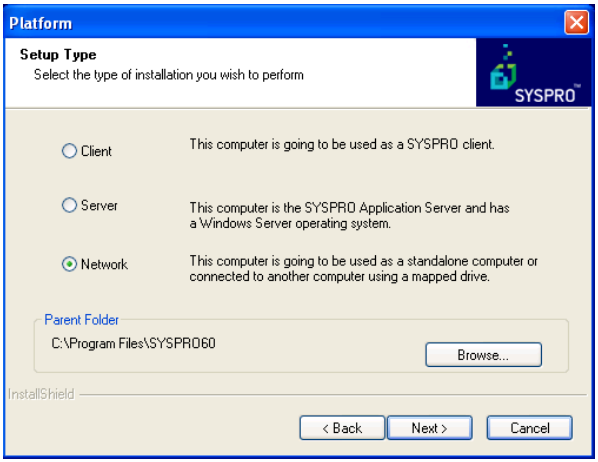
3. Select **Core Product**. If SYSPRO 6.0 Issue 010 has already been installed without the e.net Diagnostics suite do not worry about it, your core installation will not be overwritten during this procedure. The InstallShield Wizard window is displayed.



4. Select **Next** to continue. The License Agreement window will then be displayed.



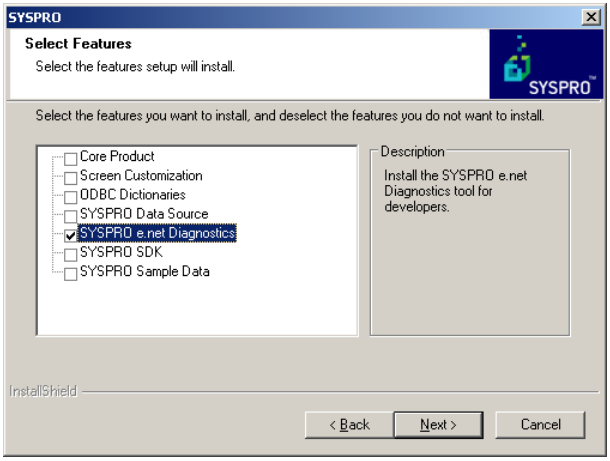
5. Read the license agreement terms, then select **I accept the terms of the license agreement**. The **Next** button becomes enabled once you accept the terms.
6. Select **Next** to continue. You will now see the **Setup Type** window is displayed.



7. We have selected the **Network** option, but you may select whatever setup type describes your particular installation requirement. The **Parent folder** displays the default path to where the software will be installed. It is suggested that you always install SYSPRO to this default path.

If you have already performed a client installation the screen will prompt you to install a new installation or an upgrade. If upgrade is selected you will not be able to choose Client / Server / Network as it will already be known. You will also not be able to change the path.

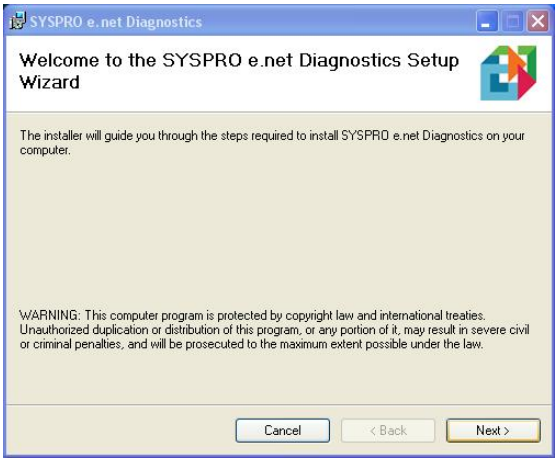
8. Select **Next** to continue. The Select Features window is displayed.
9. De-select **Core Product** and select **SYSPRO e.net Diagnostics** instead.



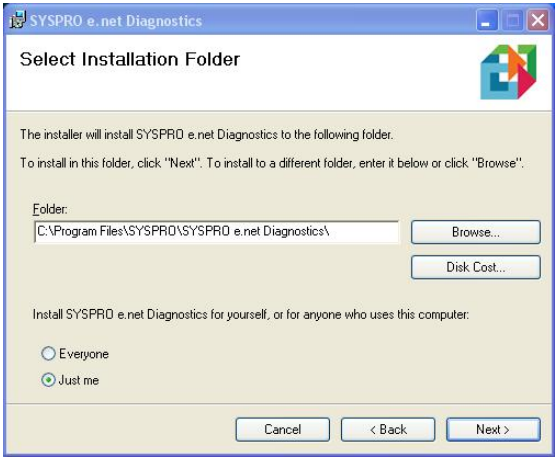
10. Select **Next** to continue The *Start Copying Files* window is displayed, showing the program files and directories that will be copied to your computer.
11. Select **Next** to continue. The SYSPRO 6.0 e.net Diagnostics install file is now being copied to your machine.
12. Select **Finish** to complete the installation.

    You now need to run the e.net Diagnostics Install program that has been saved onto your harddrive.

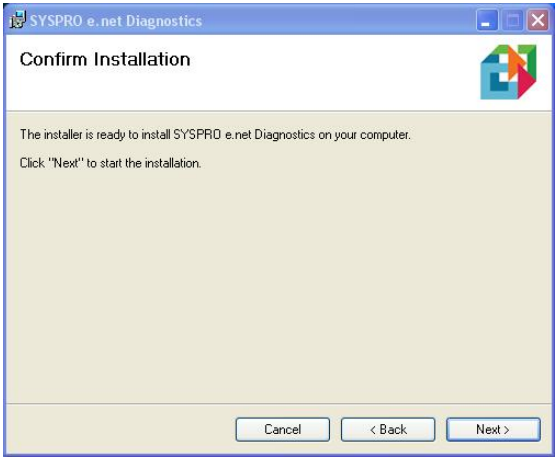
13. Using Windows Explorer, browse to the **`\tools`** folder of your SYSPRO 6.0 installation and double click on EnetDiagnosticsSetup.msi,
14. Click '**Next**' on the 'Welcome to the SYSPRO e.net Diagnostics Setup Wizard' install screen.



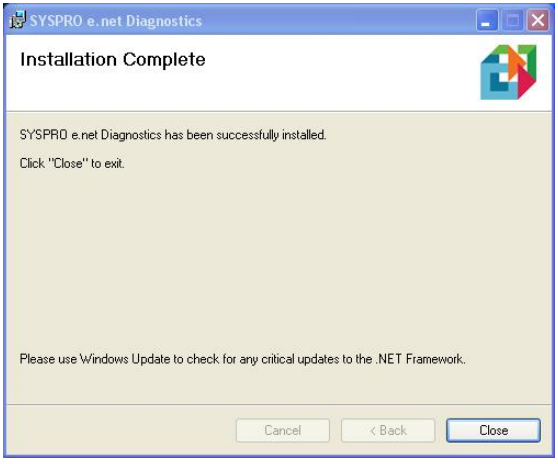
15. Select '**Everyone**' if other users will be utilizing the e.net Diagnostics suite or leave '**Just me**' selected if you will be the only one using it.



16. Click '**Next**' on the 'Confirm Installation' screen.



17. Click on '**Close**' on the 'Installation Complete' screen



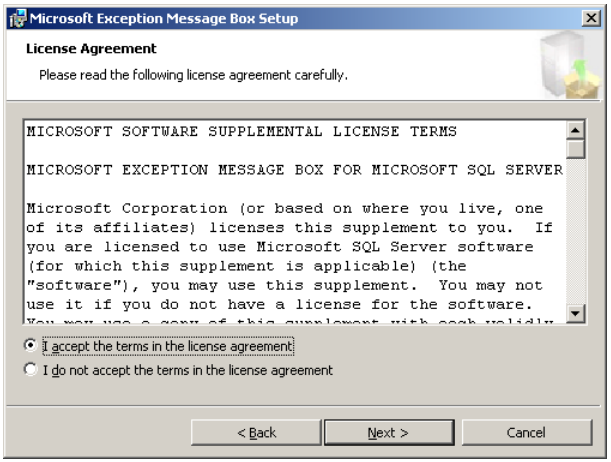
4.2.1.1. Installing the Error Message Handler

If you are using Microsoft Visual Studio 2005 (or higher) or Microsoft SQL 2005 (or higher), the error handling program will already be installed on your machine. If you are not using the above products, then you will need to install the error message handling program.

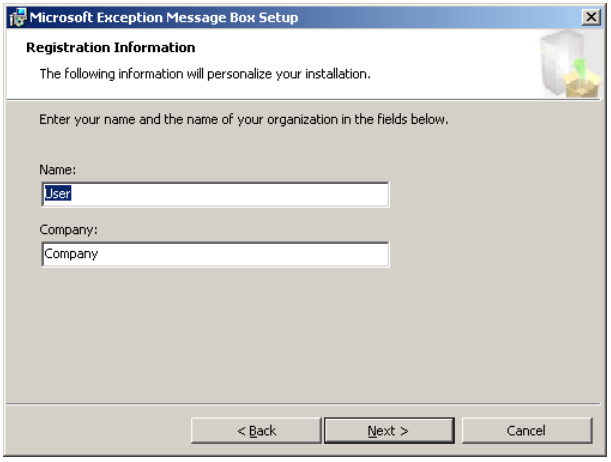
1. Using Windows Explorer, browse to **`c:\Program Files\SYSPRO\SYSPRO e.net Diagnostics\`** and double click on MessageBox.msi.
2. Click '**Next**' on the 'Welcome to the Install Wizard for Microsoft Exception Message

Box' install screen.

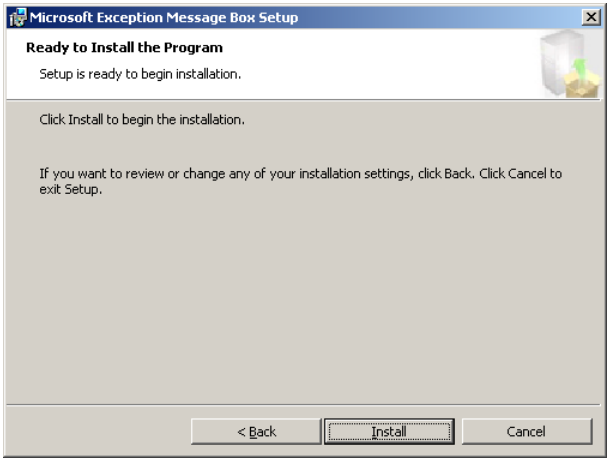
3. Select the **I accept the terms of the license agreement** option.
4. Click the **Next** button to continue with the installation.



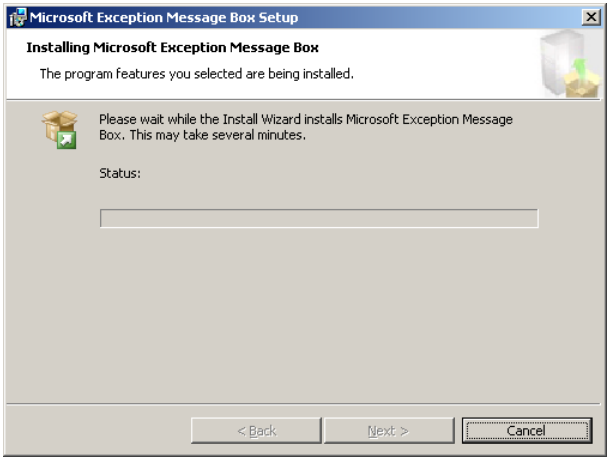
5. Enter your **Name** and **Company** information, then click the **Next** button to continue with the installation.



6. Click on the **Install** button to install the Microsoft Exception Message Box program.



7. The install wizard will now install the Microsoft Exception Message Box program.



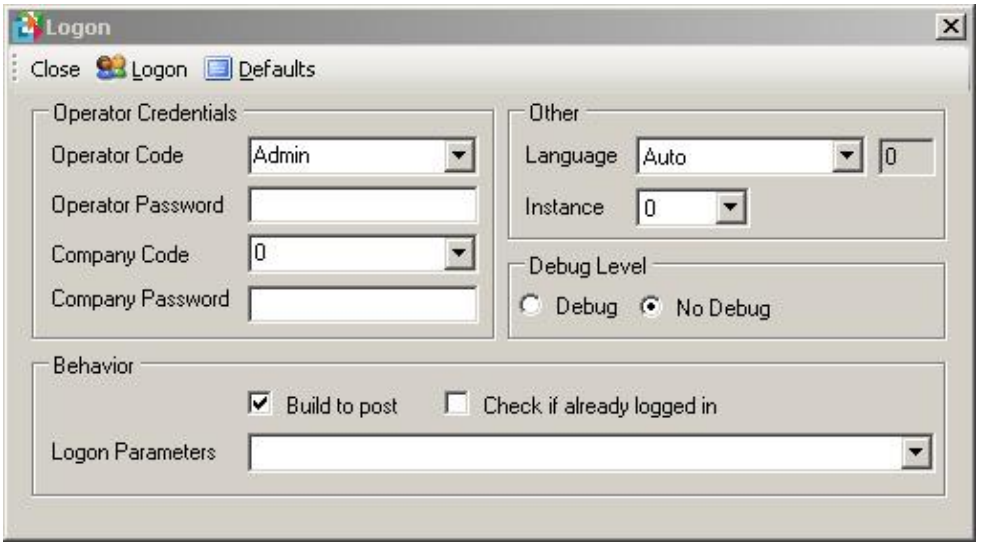
8. Once the install wizard has finished copying the necessary files it will display the *Successful* install screen. Click on the **Finish** button to complete the install.

4.2.2. Menus and Buttons

The default screen of the e.net Diagnostics suite contains a menu bar, an icon-menu bar, and a status bar (set at the bottom of the window). In this introduction to the e.net Diagnostics suite we will briefly go through the icon-menu bar and explain the function of each button. Then we will mention some of the other pertinent options available from the top drop-down menu.

4.2.2.1. Global Log On

This tool allows the user to input one operator username and company for all the debugging activities, rather than entering these details each time a new programming or XML sequence is loaded or edited. In order to use this feature you will need your Operator Code and password, as well as the Company Code and Password. If you are using the sample data supplied with the evaluation distribution of SYSPRO then the Company Code will be '0' and the password box will remain blank.

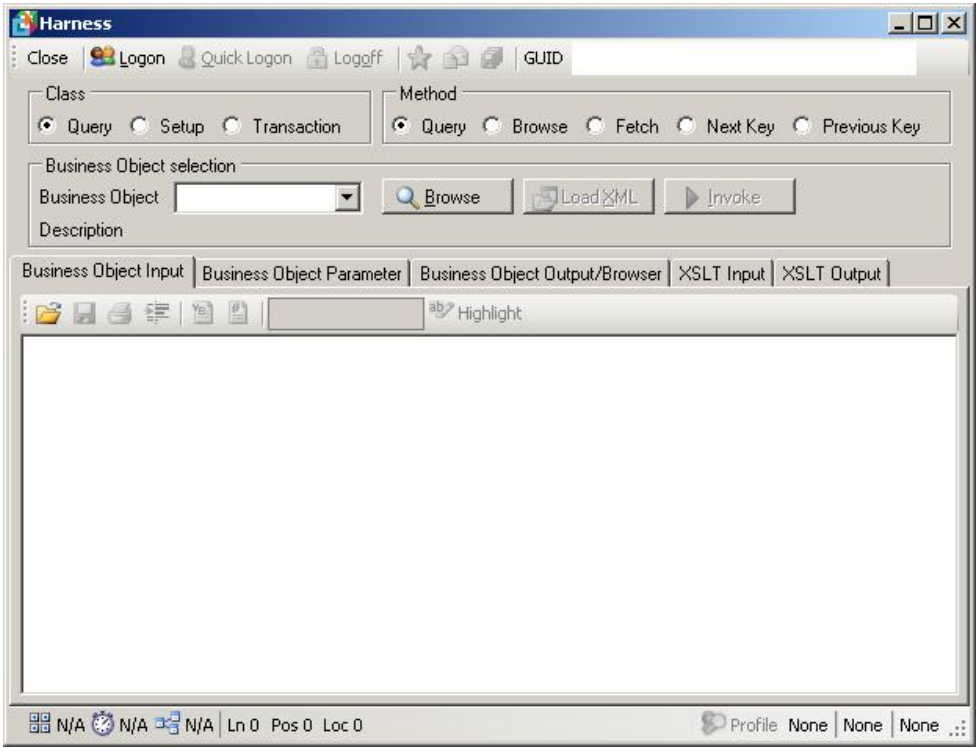


4.2.2.2. New Harness

The harness is the main e.net solutions programming diagnostics/debugging tool. The business objects used in e.net solutions programming are of three different Classes: Query, Setup, and Transaction. Various business objects within these Classes are available for each of modules of the core SYSPRO system. Once you have selected which type of Class

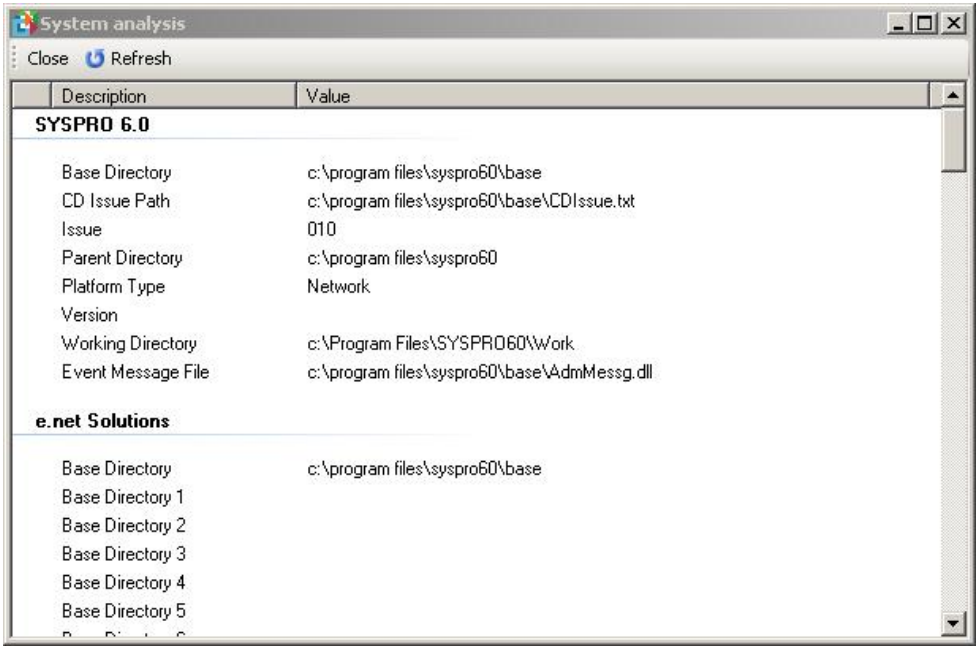
you are dealing with you can click on the business object browse button and load the business object library which lists each business object available for each SYSPRO module (System Manager, Accounts Receivable, etc.).

We will go into the usage of the **Harness** in greater detail in Section 4.3, “Using the e.net Diagnostics suite's Harness” [4–21].



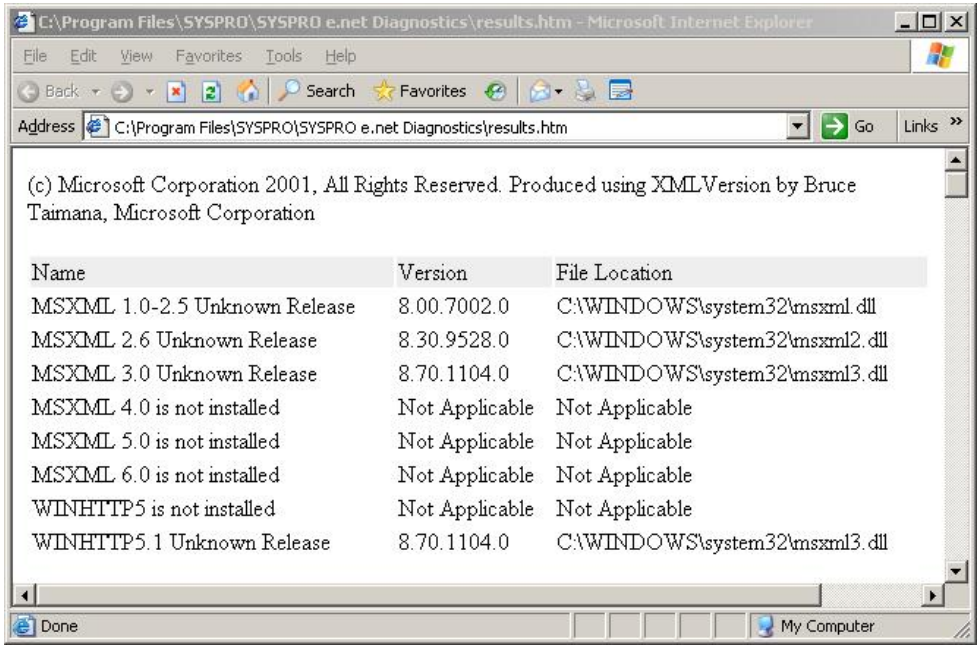
4.2.2.3. System Analysis

The System Analysis button gives a report of all the basic SYSPRO and database directories, as well as various registry entries and settings. It is used to check that all the SYSPRO basics are installed and correctly identified before deeper troubleshooting a SYSPRO system. It would be useful to familiarize yourself with the basics of the SYSPRO system from this report before attempting to change anything in the system.



4.2.2.4. Parser Checker

This tool checks the XML parsing capabilities of your Windows installation. It will present an HTML report identifying the XML version in use, as well as the XML mode, the various ProgIDs used by the XML installation, the Microsoft Data Access (MDAC) version, and the Window's system database drivers.



4.2.2.5. Check Dataset Compliance

Some enterprises create custom solutions or utilize legacy systems using the SYSPRO base system and use dataset definitions to access the SYSPRO data. The XML structure of the datasets may not be fully recognized by 3rd party applications. This tool may be used to test a dataset's compliance. It is usually more useful to use XSL functions within SYSPRO, alleviating the need for datasets.

4.2.2.6. Check Machine Availability

It is often useful to be able to test whether another machine is present on the network that you are working on. For this reason the 'check machine availability' tool has been included in the e.net Diagnostic Utility. You will need to enter the network name or IP address of the computer that you are trying to connect to.

4.2.2.7. Register e.net Solutions

There are some situations that require the Encore.dll file to be registered or unregistered within the Windows System Registry. This tool automates the process. If you need to re-register the Encore.dll simply click on the menu item 'register Encore.dll', and it will be registered for you.

4.2.2.8. Text Editor

This tool will load your default text editor. If you have not changed the setting within the 'tools - settings' option then this will load 'notepad'. You can change this to WordPad, or an editor of your choice.

4.2.2.9. Registry Editor

In some programming situations it is useful to be able to quickly edit a property within the Windows registry. This tools loads the Windows **regedit** application.

4.2.2.10. Command Prompt

Many programmers have their own command line scripts or are more comfortable using command line interfaces. This tool opens a command prompt window.

4.2.2.11. DCOM Configure

This tool loads the Windows DCOM configuration utility.

4.2.2.12. Windows Explorer

This button will load Windows Explorer in a new window.

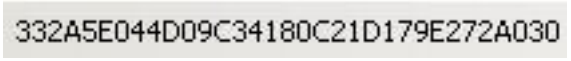
4.2.3. Status Bar

The status bar at the bottom of the e.net Diagnostics screen presents the following information:

4.2.3.1. COM/DCOM or Web Services

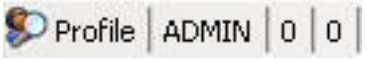
This reports the connection to the e.net solutions server. You can change the type of connection from the **settings** options on the 'tools' menu.

4.2.3.2. Session ID



The session ID only appears in the status bar if this was a global logon. For normal logons and quick logons it appears at the top of each individual instance of the harness.

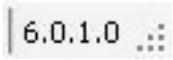
4.2.3.3. Profile



The 'Profile is made up of three parts:

- Operator - This reports the logon name of the user (in this example it is **ADMIN**).
- Company ID - This reports the company name that is logged into (in this example The Outdoors Company with Company ID **0**).
- Instance - This reports which instance of e.net solutions the operator is logged on to. In a test / demo environment it is quite common for there to be more than one instance of e.net solutions installed on a machine. The operator may need to be able to logon to these different instances of SYSPRO. This can be configured in the registry against the e.net solutions section. When the operator logs on they can specify which instance they want, or let it default to instance 0.

4.2.3.4. Version



This reports the version of e.net Diagnostics that you are running.

Using the status bar you can instantly see your logon details and the status of your connection with the SYSPRO application server.

4.2.4. Other Menu Items

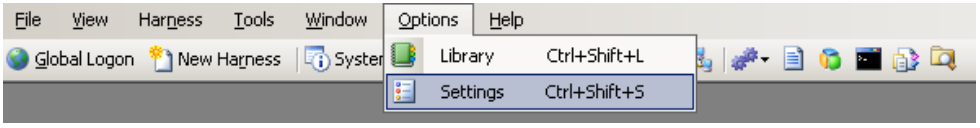
There are two other menu options under the 'options' menu that are not present in Icon-Menu bar. You can locate them by clicking on 'Options' icon the main menu bar.

4.2.4.1. Business Object Library

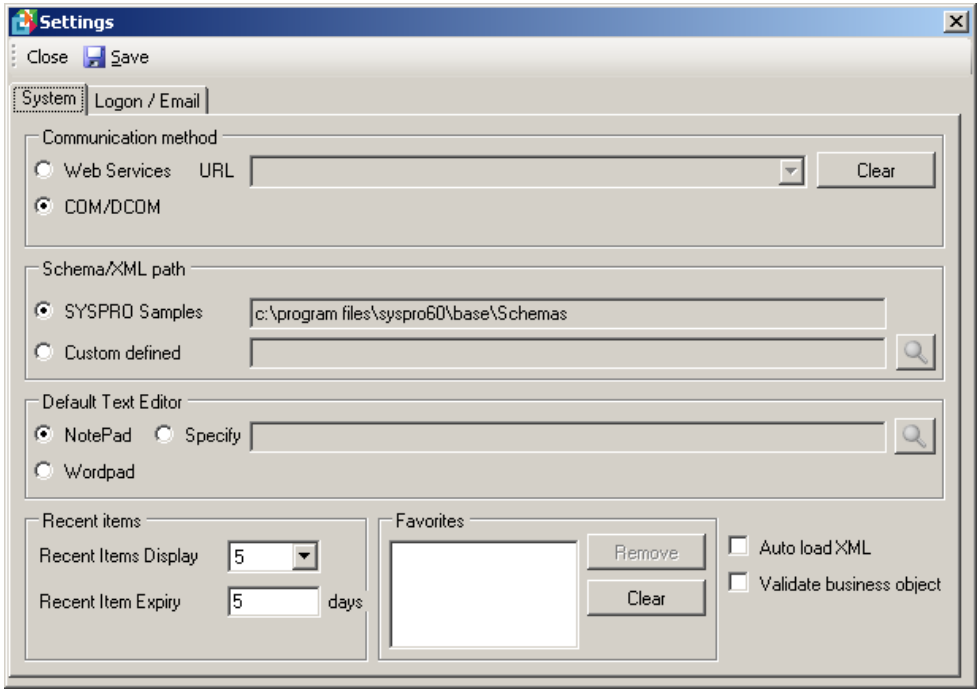
The Business Objects Library will open the list of business objects organized within the module areas of the SYSPRO ERP system. Within each module folder is a list of all the business objects that pertain to that module's business logic with a brief description of the object, a class identification (Query, Transaction, or Setup), and a method identification (Browse, Query, Fetch, NextKey, PrevKey, Post, Add, Delete, Update, Build). You can expand the modules to see the functional areas. When you select a functional area it will show just the business objects associated with it.

4.2.4.2. Settings

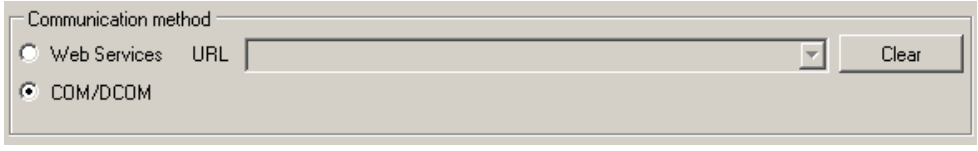
The settings options are found under the **Options** menu. Simply click on **Options** and then click on **Settings**.



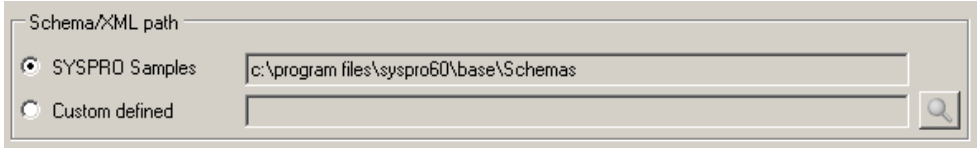
The first window contains the **System** tag, and contains options that control how you connect to the SYSPRO application server, where the XML Schema files are located, the default text editor used, and various other system settings:



Within the **Communication method** settings box you are able to choose between connecting via COM/DCOM or via the SYSPRO Web Services. If you are using the Web Services then you will need to enter the URL of the SYSPRO Web Services server.

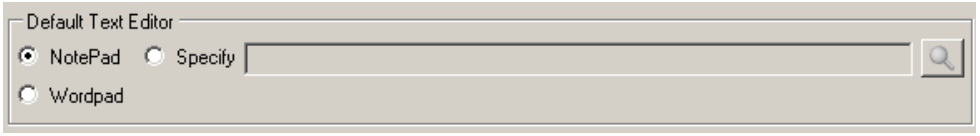


The next option box contains the Schema/XML path settings. These are set to the assumed default path installed by the SYSPRO installation. If you have installed SYSPRO to a different directory or have your own XML Schema files that you need to use then change the path from **SYSPRO Samples** to **Custom Defined**.

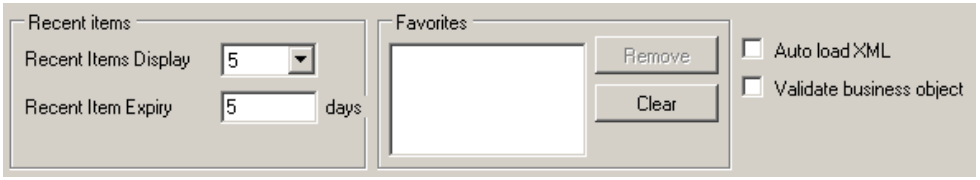


The e.net Diagnostics Suite uses the Windows Notpad application as your default Text Editor. In the next option box you are able to change this setting, either to use the Wordpad application, or to define a Text Editor of your own choice. If you use a text

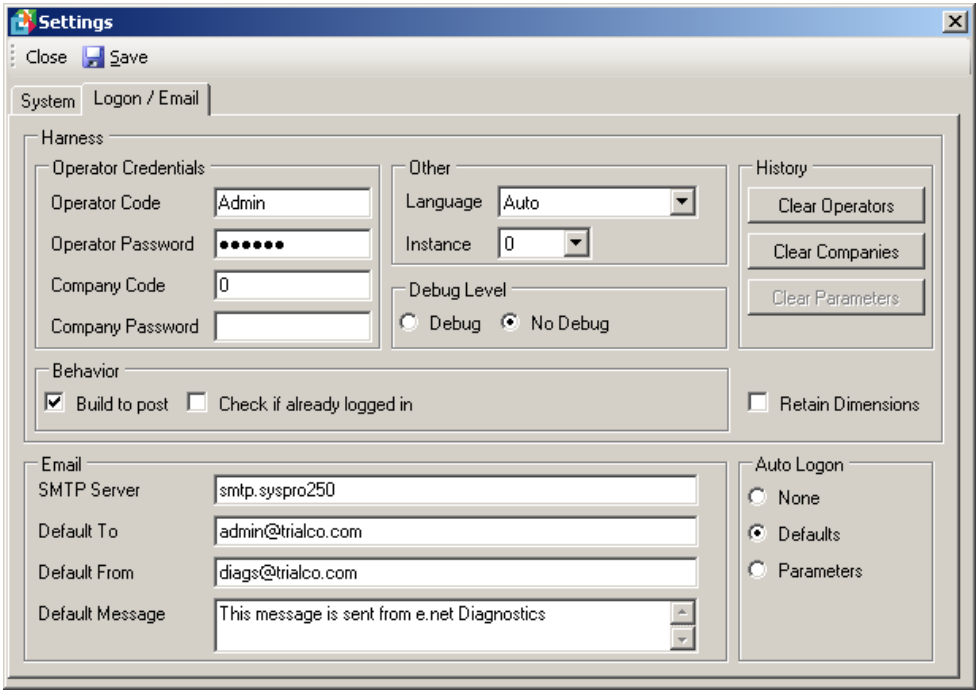
editor other than those proved with the Windows operating system then enter the command path to the executable file for that text editor in the space provided.



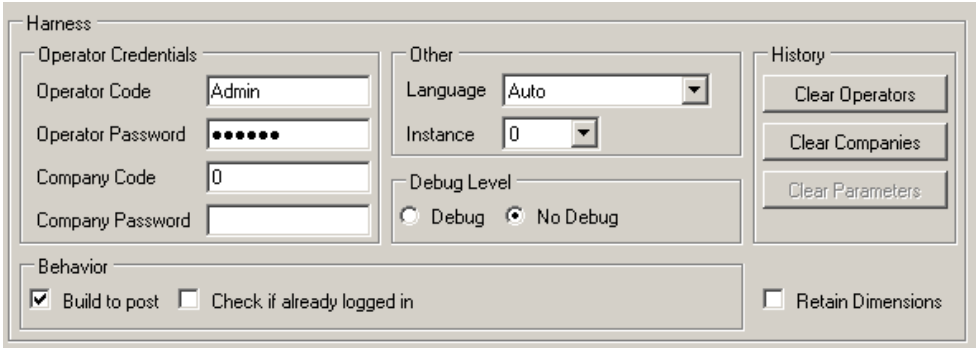
At the bottom of the system settings tab are the **recent items**, **favorites**, and the **auto load XML** and **validate business objects** options. They are fairly self explanatory. In the **recent items** box you are able to set the number of recent options and the number of days until recent items expire. In the **favorites** box you are able to select and remove specific business objects, or clear the whole list. The **auto load XML** and **validate business objects** options are simple check boxes.



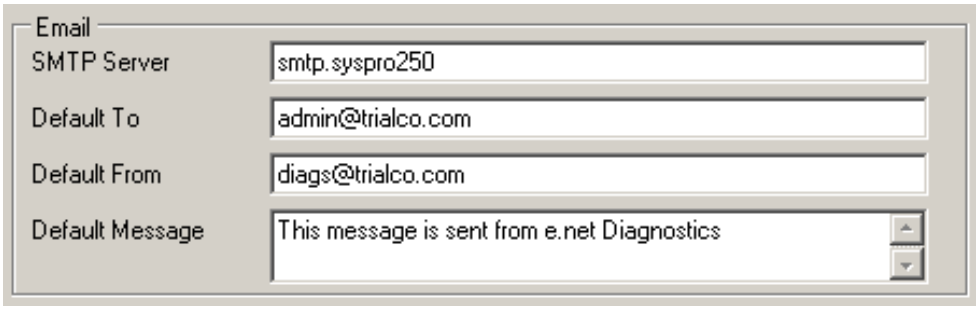
The next tab, **Logon/Email**, contains the **harness**, **email**, and **auto logon** option areas.



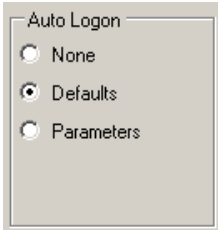
Within the **harness** section you are able to enter and save logon details. This is useful if you are the only user of the e.net Diagnostics on the machine, or if you share logon details with other members of your development team. Filling in these items sets the default logon option fields (Operator Code, Operator Password [if auto logon in enabled], Company Code and Company Password). Within the **harness** section you are also able to set the **language**, **instance**, **debug level**, **behavior**, and **history** settings.



Within the **Email** options box you are able to set the default email settings: **SMTP server**, **default 'TO'** and **'FROM'** options, and set a **default message**.



The final section of the **Logon/Email** tab are the **auto logon** settings. Setting this option to **Defaults** will enable the password options of the **harness** logon settings.



Once you have entered or changed the settings to suit you needs, click on the **Save** icon. The options that you have selected will now be available.

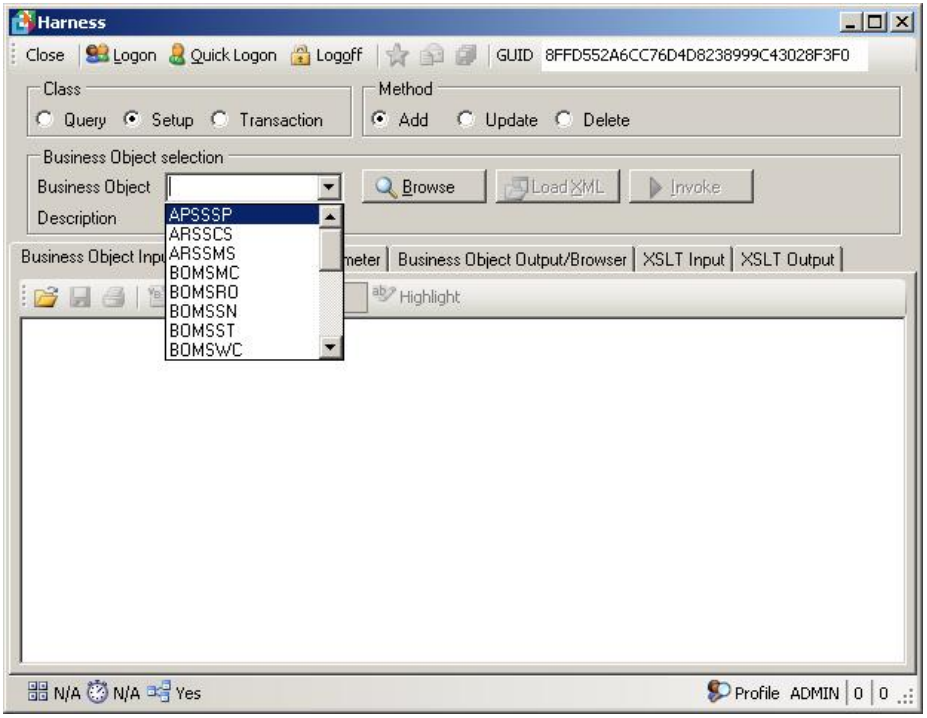
4.3. Using the e.net Diagnostics suite's Harness

The previous section introduced the functions within the e.net Diagnostics suite. In this section we will examine the process of selecting a business object, viewing the sample XmlIn, processing the sample XmlIn and viewing the XmlOut results. We will then deal with customizing the XmlIn. The e.net Diagnostics suite's Harness will become a useful testing ground for your custom XmlIn as you develop your own e.net solutions applications.

Procedure 4.1. The Process of XML In and Out

1. **Selecting a business object**

   As we saw in the previous section, selecting a business object is very easy. You may either use the business object library and select the required object from the alphabetical listing, or select the e.net Class and Method from the tool bar and select the object from the dropdown menu.

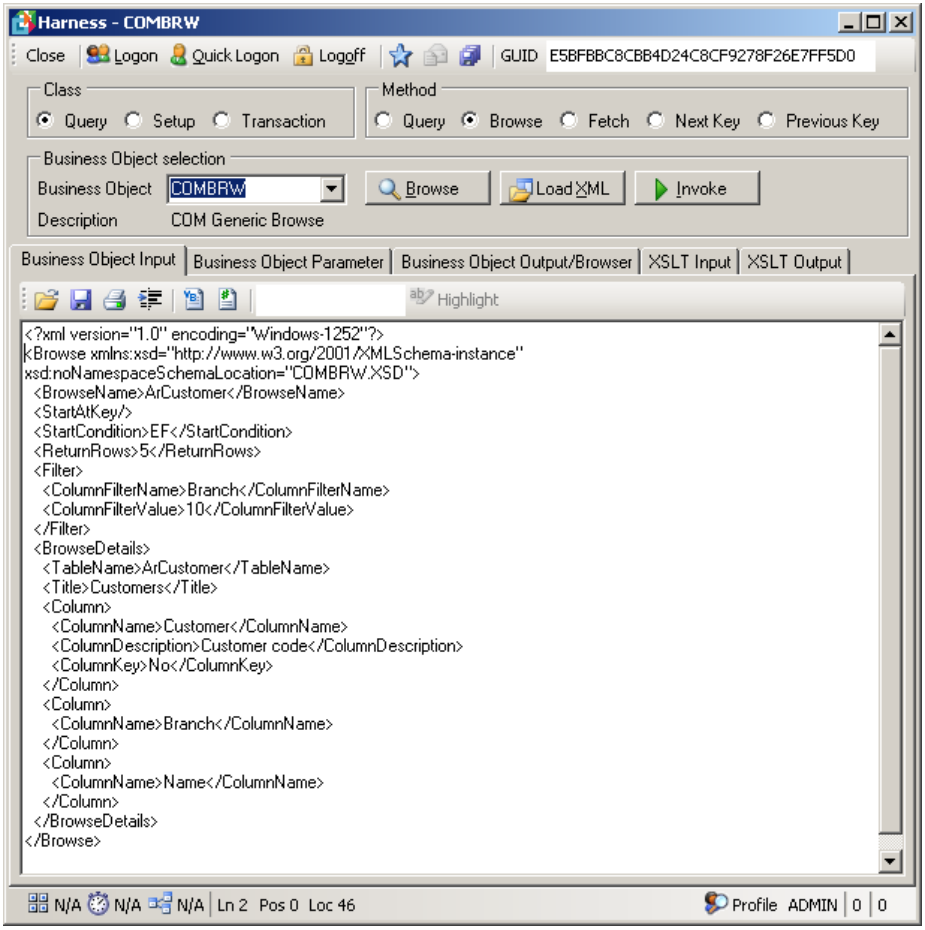


   Do not worry if you are not yet familiar with the Class and Method types of e.net solutions, as we have a whole chapter devoted to discussing them later in the book (see Chapter 5, *The Class Library Reference* [5–1]).

2. **Getting the Sample XmlIn**

Each business object requires an input sting with specific data to process (and those in the Setup & Transaction Classes require two - XmlIn and XmlParameters). We pass the relevant information to the business object through the XmlIn string. The e.net diagnostics application provides an example XmlIn for each of the business objects (and sample XmlParams when needed). Once you have selected the business object you can click on the **Load XML**

and the sample XmlIn for that business object will be displayed in the window area beneath the *Business Object Input* tab.

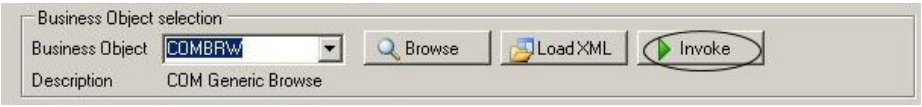


As you can see from the above screen shot, the XML instance presented is for the COMBRW business object. The example presents all the XML elements that can be used to input data to the Object.

As we have mentioned, Setup and Transaction class business objects require two XML input strings - XmlIn and XmlParameters. These can be found within the *Business Object Input* tab and the *Business Object Parameter* tab.

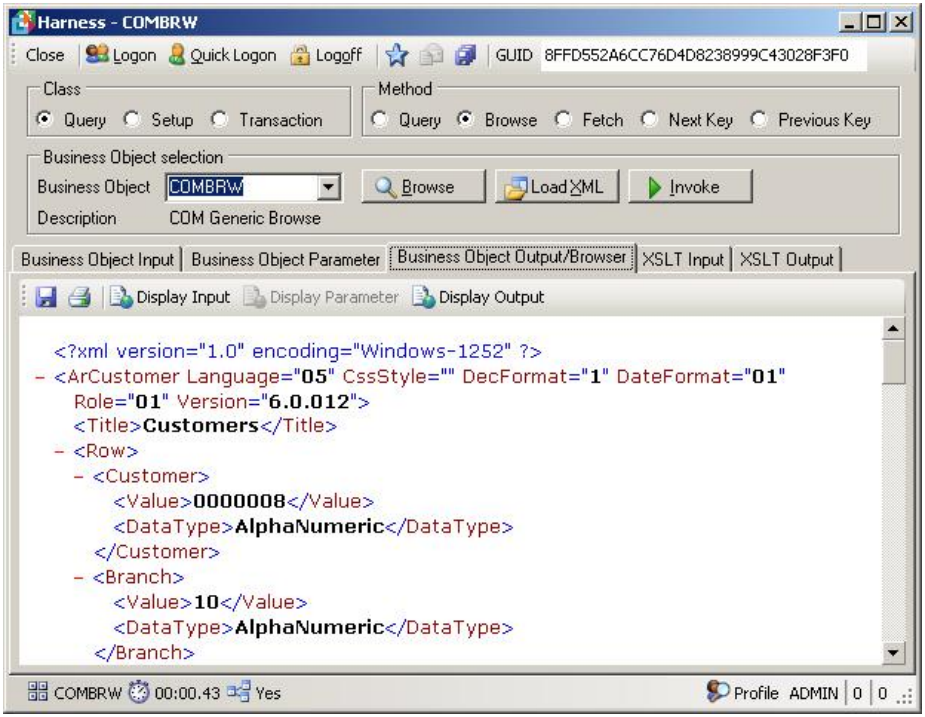
3. **Processing the XmlIn**

Once you have spent some time familiarizing yourself with the example XML instance that will be sent to the business object, click on the **Invoke** button (next to the Load XML button). This will send the XmlIn string to the business object selected to be processed.



4. **Viewing the XmlOut**

The result will now be displayed in the window beneath the *Business Object Output/Browser* tab.



It is now possible to view the data contained in each of the XML documents used or returned by the business object.

If you need to use the output XML in text format (which is difficult to use from the browser control) you can right-click on the browser control and select **View Source**, then copy and paste the text.

As you read through the following chapters, we recommend that you install the e.net Diagnostics suite on a test server and experiment with loading, reading, and customizing the XmlIn strings of the various business objects that you will be using.

4.3.1. Customizing XmlIn

Now that you know how to load the XmlIn example and process it through the e.net solutions system to get an XmlOut result, you can make changes to the XmlIn string and observe the different outcomes from processing. You now know enough about the e.net diagnostic's harness to test your own code. Once you have read and understood the e.net solutions classes and the various methods available in each class you will be able to interact with the e.net solutions server to create and test your own XML instances. There are, however, a few more introductory things that we need to discuss before we get there.

4.3.2. Wrapping XmlIn

When using the e.net Diagnostics Harness tool, it is also possible to '*wrap*' the XmlIn statement for use in VB.NET or C#.NET as a `string` variable. This will be extremely useful later on as we create our own applications. We will discuss this in more detail when dealing with XmlIn statements, but the basic function of these two buttons will save you some time and effort while programming your application.

To wrap the XmlIn statement for use in VB.NET you simply click on the **VB** button:

Your selected text editor will now open and display the XmlIn string wrapped for use as a VB.NET variable named `Document`. The same is true for wrapping the XmlIn string for use in C#.NET. Simply click the **C#** button:

and your selected text editor will now open and display the XmlIn string wrapped for use as a C#.NET variable named `Document`.

5

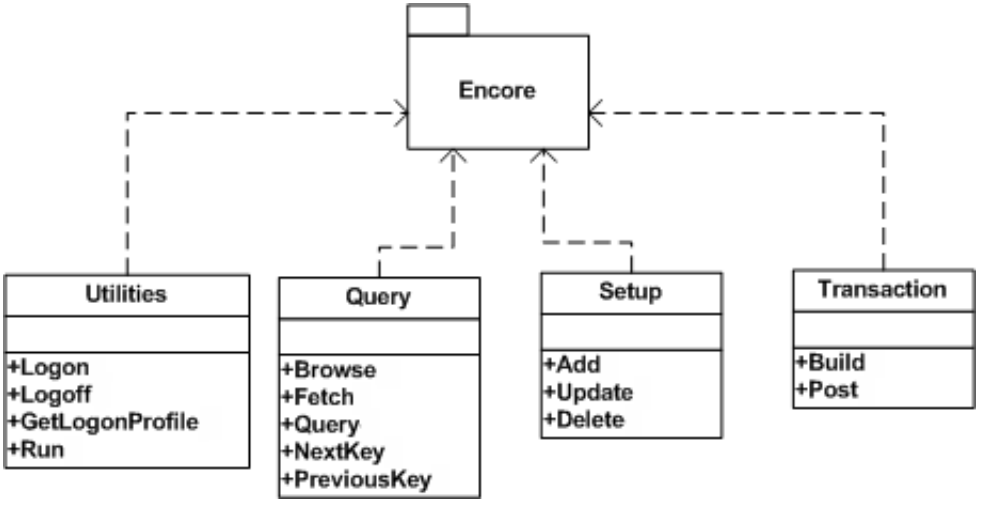
The Class Library Reference

Objectives - The objective of this chapter is to present the underlying framework of the e.net solutions Classes and Methods. By the end of this chapter you will have the basic grounding in e.net solutions that you require in order to interact with the SYSPRO application server.

As we saw in the introductory section, in SYSPRO e.net solutions the COM object is implemented as a dynamic-link library (DLL) called **`ENCORE.DLL`**. When SYSPRO e.net solutions is installed on a SYSPRO application server, **`ENCORE.DLL`** is installed in the SYSPRO base folder and registered to expose a number of interfaces as Public Objects. Each of these objects is essentially a class that categorizes methods according to the functionality of the class (see Figure 5.1, “The COM Object” [5–1]).

We also saw that at run-time, e.net solutions creates new instances of these objects. Information could then be dynamically passed using an XML string that was defined by the method called.

Figure 5.1. The COM Object



Remember that each class is an interface with methods that can be used to perform operations, as follows:

- **`Query`** class provides methods to query data in a generic way, including:
  - Query.Browse
  - Query.Fetch
  - Query.Query
  - Query.NextKey
  - Query.PreviousKey
- **`Setup`** class provides methods that can be used to create and modify predominantly static information contained in the database (the SYSPRO data structures).
  - Setup.Add
  - Setup.Update
  - Setup.Delete
- **`Transaction`** class provides methods that can be used to build and post transactions, including:
  - Transaction.Build
  - Transaction.Post
- **`Utilities`** class provides methods for authentication, profile retrieval and running of Net Express programs, including:
  - Utilities.Logon
  - Utilities.Logoff
  - Utilities.GetLogonProfile
  - Utilities.Run

The following is a list of the variables and their definitions that we will use in this book to demonstrate and explain the classes and methods of e.net solutions:

Variables

`BusinessObject`	The name of a SYSPRO business object to be run.
`CompanyId`	Used to select a specific company, by its' SYSPRO Company id number.
`CompanyPassword`	The password corresponding to the passed `CompanyId` variable.
`LanguageCode`	Defines the language to be used for error messages

	and for determining the language to be applied in the Web Applications interface (see Section 9.1, “Error Handling” [9–1] and Table 9.1, “Language Code Examples” [9–3] respectively).
LogLevel	This is a flag indicating the level of information to be returned. Valid options are: • **0**: Normal - this is to be used for normal e.net solutions usage. • **1**: Debug assistance mode - warns if XML strings contain incorrect parameters - normally these are ignored.
Operator	The name of an account defined in the SYSPRO application server. Depending on the SYSPRO system setup options, this may be either a SYSPRO Operator Code, or a Network User logon. This is required with corresponding `OperatorPassword` variable on creation of a new session, following which connection authentication is performed against the returned `UserID`.
OperatorPassword	The password associated with the account name passed to the `Operator` variable. This is required with corresponding `Operator` variable on creation of a new session, following which connection authentication is performed against the returned `UserID`.
Parameter	A string parameter. Use spaces if you do not require a parameter. This string can be up to 1,000 bytes long. Note that in your SYSPRO program the string will be null terminated.
SysproInstance	The `SysproInstance` variable is required in environments running multiple instances of SYSPRO. If a single instance of SYSPRO is running, then set this value to "0". To select an instance, set the SysproInstance to a value between 1 and 9.
UserID	The `UserID` is a returned string obtained at the start of a new session by means of the `Logon` method. During a session the `UserID` **must** be passed to all subsequent e.net solutions method calls.
XmlIn	This is a valid and well formed XML string used to

pass additional parameters to the business object.

XmlParameters This is a well formed XML string providing parameters to the Post method.

All the example code in this chapter assumes an operator code called "ADMIN" with no password and the use of company "1" with no password.

When a method is invoked the return is provided by the business object specified. If the output of a business object is an XML instance, it will be "Well-Formed" and "Valid". The tree structure and element values contained in the returned XML will depend on the Business Logic embodied by the business object and the parameters passed within the input XML instances. Return information can then be used within the e.net solutions application. If an exception is raised, the return will contain the errors (see Section 9.1, “Error Handling” [9–1]).

The application of XML within SYSPRO e.net solutions, combined with the generic nature of the class library, provides maximum flexibility in developing truly dynamic, scalable applications that preserve the integrity of data stored within SYSPRO. It also means that enhancements to existing e.net solutions applications are relatively easy to develop as the application is independent from the SYSPRO version or the specific implementation of SYSPRO within an organization.

5.1. Utilities Class

There are four *Methods* in the SYSPRO Utilities class structure: Logon, Logoff, GetLogonProfile, and Run. As their names suggest, they are used for logging on and off of the SYSPRO e.net solutions system, retrieving user settings and running custom written programs.

5.1.1. Utilities.Logon

Syntax:

Utilities.Logon(Operator, OperatorPassword, CompanyId, CompanyPassword, LanguageCode, LogLevel, SysproInstance, XmlIn)

The Logon method enables authentication. If authentication is successful a unique UserID is returned. The UserID is a string that uniquely identifies an e.net solutions session. The UserID is therefore used to create a new session and authenticate the connection throughout the session and **must** be passed to all subsequent e.net solutions method calls for the duration of a session. To close a session use the Logoff method (see Section 5.1.2, “Utilities.Logoff” [5–6]).

Business objects available to this method include:

- COMLGN

Example 5.1. ASP.NET Visual Basic codebehind for Utilities.Logon

```
'Logon and trap any exceptions
Dim UserID As String
Dim Obj As New Encore.Utilities()
Try
UserID = Obj.Logon ("ADMIN", " ", "1", " ", 5, 0, 0, " ")
Catch exc As Exception
Response.Write("Exception - message:" & exc.Message)
Exit Sub
End Try
```

Using the above sample code we can see that the script is calling the Encore.dll COM object's Utilities Class and passing a string variable containing the logon data. The Utilities.Logon method returns the UserID string, which we then display using the Response.Write command.

Example 5.2. ASP 3.0 Code Sample for Utilities.Logon

```
' Logon
Set Obj = Server.CreateObject("Encore.Utilities")
UserID = Obj.Logon ("ADMIN", " ","1", " ", 5, 0, 0, " ")

' Fetch Logon profile Information
LoginProfile = Obj.GetLogonProfile(UserID)

' Logoff and Cancel your current Session
ReturnCode = Obj.Logoff(UserID)
Set Obj = Nothing
```

Here is a similar procedure using ASP.NET C#:

Example 5.3. ASP.NET C# codebehind for Utilities.Logon

```
string UserId;
Encore.Utilities Obj = new Encore.Utilities();
try {
UserId=Obj.Logon("ADMIN", " ", "1", " ", 5, 0, 0, " ");
}
catch (Exception exc) {
Response.Write(("Exception - message:" + exc.Message));
return;
}
```

If you compare the VB and the C# code you will see that they are almost identical once you take into account syntax differences. This shows that the Classes and Methods of e.net solutions are generic enough to be easily accessed by either language, and specific enough to perform the business functions necessary for an enterprise application.

5.1.2. Utilities.Logoff

Syntax:

`Utilities.Logoff(UserID)`

The `Logoff` method closes the e.net solutions session for a given `UserID`.

Failure to use the `Logoff` method when exiting e.net solutions leaves the session associated with the `UserID` as active within the SYSPRO server. This may result in exceptions being returned as a result of concurrency issues related to licensing. To avoid this it is recommended that sessions are always gracefully terminated using the `Logoff` method (see Section 8.1.3, “Concurrency Issues” [8–5]).

Business objects available to this method include:

- COMLGN

Example 5.4. ASP.NET Visual Basic codebehind for Utilities.Logoff

```
'Logoff and Cancel your current Session
Dim ReturnCode As Long
ReturnCode = Obj.Logoff(UserID)
Obj = Nothing
```

5.1.3. Utilities.GetLogonProfile

Syntax:

`Utilities.GetLoginProfile(UserID)`

The `GetLoginProfile` method returns an XML string containing additional details about your current SYSPRO session.

Business objects available to this method include:

- COMLGN

Example 5.5. ASP.NET Visual Basic codebehind for Utilities.GetLogonProfile

```
'Fetch Logon profile Information
Dim LoginProfile As String
Try
LoginProfile = Obj.GetLogonProfile(UserID)
Catch exc As Exception
Response.Write("Exception - message:" & exc.Message)
Exit Sub
End Try

'Display as an XML string
Response.Write(LoginProfile)
Response.ContentType = "text/xml"
```

Example 5.6. ASP.NET C# codebehind for Utilities.GetLogonProfile

```
string UserId;
Encore.Utilities Obj = new Encore.Utilities();
try
{
    UserId = Obj.Logon("ADMIN", "", "1", "",  \
         Encore.Language.ENGLISH, 0, 0, " ");
}
catch (Exception exc)
{
    Response.Write(("Exception - message:" + exc.Message));
    return;
}

string LogonProfile;
try
{
    LogonProfile = Obj.GetLogonProfile(UserId);
}
catch (Exception exc)
{
    Response.Write(("Exception - message:" + exc.Message));
    return;
}

// Display as an XML string
Response.Write(LogonProfile);
Response.ContentType = "text/xml";
long ReturnCode;
ReturnCode = Obj.Logoff(UserId);
Obj = null;
```

Remember that where ever you see \ at the end of a line of code and the next line indented, this means that the text was too long for the page size of this book but the indented text belongs of the code line above.

5.1.4. Utilities.Run

Syntax:

`Utilities.Run(UserID, BusinessObject, Parameter)`

The Run method allows a program developed using **Micro Focus Net Express** and built to SYSPRO guidelines, to be invoked from the COM interface without the developer having to be concerned with XML technologies. This method cannot be used to invoke any proper e.net solutions business object.

business objects available to this method are user defined.

Example 5.7. ASP.NET Visual Basic codebehind for Utilities.Run

```
' Logon and trap any exceptions
Dim UserID As String
Dim Obj As New Encore.Utilities()
Try
UserID = Obj.Logon ("ADMIN", " ", "1", " ", 5, 0, 0, " ")
Catch exc As Exception
Response.Write("Exception - message:"  \
     & exc.Message)
Exit Sub
End Try

' Run SDKRUN and read stock code B100

Dim ReturnString As String
Try
ReturnString = Obj.Run(UserID, "SDKRUN", "B100")
Catch exc As Exception
Response.Write("Unable to run SDKRUN - Exception:" \
     & exc.Message)
Exit Sub
End Try
Response.Write ("The Stock Description for item B100 is " \
     & ReturnString)

' Logoff and Cancel your current Session
Dim ReturnCode As Long
ReturnCode = Obj.Logoff(UserID)
Obj = Nothing
```

5.2. Query Class

There are five *Methods* within the `Query` class structure: `Query`, `Browse`, `Fetch`, `NextKey`, `PreviousKey`.

Use the e.net Diagnostics suite and open the *'Harness'* tool to see the method options displayed when you select the **Query** class:

By selecting each different method and clicking on the business object dropdown menu you can see which business objects are available for that particular method within the `Query` class.

5.2.1. Query.Query

Syntax:

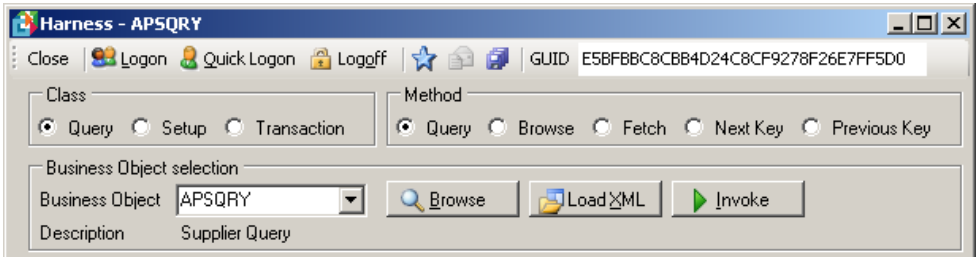
`Query.Query(UserID, BusinessObject, XmlIn)`

The `Query` method enables generic access to any Query business object in order to return data in the form of an XML string.

The return data is specified by passing parameters in an XML string via `XmlIn`. The structure and parameters allowed in `XmlIn` is dependent on the business object being called.

Business objects available to this method can be found in the **Business Object Reference Library** list available on the SYSPRO SupportZone e.net solutions menu.

Use the e.net Diagnostics suite's Harness and select `Query.Query`. Now select the APSQRY business object:



Click on the **Load XML** button to view the sample XmlIn.

By using the e.net Diagnostics suite's Harness tool you can view and edit the sample XmlIn and process it through the e.net solutions application server, receiving the XmlOut

in the **Business Object Output** tab of the *Harness* screen. This is possible with all the business objects listed for the `Query.Query` method.

The sample XmlIn, XmlParameters, and XmlOut available in the **Business Object Reference Library** list available on the SYSPRO SupportZone e.net solutions menu contains the most up-to-date information on each business object.

Example 5.8. ASP.NET Visual Basic codebehind for Query.Query

```
'Logon and trap any exceptions
Dim UserId As String
Dim Obj As New Encore.Utilities()
Try
    UserId = Obj.Logon("ADMIN", "", "1", "",  \
         Encore.Language.ENGLISH, 0, 0, " ")
Catch exc As Exception
    Response.Write("Exception - message:" & exc.Message)
    Exit Sub
End Try

Dim Qry As New Encore.Query()
Dim XmlOut As String
'Build an XML string to pass parameters

Dim XmlIn As New System.Text.StringBuilder()
XmlIn.Append("<?xml version='1.0'encoding='Windows-1252'?>")
XmlIn.Append("<Query>")
XmlIn.Append("<Option>")
XmlIn.Append("<IncludeCancelledOrders>Y \
     </IncludeCancelledOrders>")
XmlIn.Append("<IncludeCompletedOrders>Y \
     </IncludeCompletedOrders>")
XmlIn.Append("</Option>")
XmlIn.Append("</Query>")

Try
    XmlOut = Qry.Query(UserId, "SORQSO", XmlIn.ToString())
Catch exc As Exception
    Response.Write("Unable to run business object SORQSO  \
         - Exception:" & exc.Message)
    Exit Sub
End Try
Response.Write(XmlOut)
Response.ContentType = "text/xml"

'Logoff and Cancel your current Session
Dim ReturnCode As Long
ReturnCode = Obj.Logoff(UserId)
Qry = Nothing
Obj = Nothing
```

Example 5.9. ASP.NET C# Sample Code for Query.Query

```
// Logon
string UserId;
Encore.Utilities Obj = new Encore.Utilities();
try
{
    UserId = Obj.Logon("ADMIN", " ", "1", " ",  \
         Encore.Language.ENGLISH, 0, 0, " ");
}
catch (Exception exc)
{
    Response.Write(("Exception - message:" + exc.Message));
    return;
}

Encore.Query Qry = new Encore.Query();
string XmlOut;
System.Text.StringBuilder xmlin = new System.Text. \
     StringBuilder();
xmlin.Append("<?xml version='1.0' encoding='Windows-1252'?>");
xmlin.Append("<Query>");
xmlin.Append("<Option>");
xmlin.Append("<IncludeCancelledOrders>Y \
     </IncludeCancelledOrders>");
xmlin.Append("<IncludeCompletedOrders>Y \
     </IncludeCompletedOrders>");
xmlin.Append("</Option>");
xmlin.Append("</Query>");

try
{
    XmlOut = Qry.Query(UserId, "SORQSO", xmlin.ToString());
}
catch (Exception exc)
{
    Response.Write("Unable to run business object SORQSO: " \
         + exc.Message);
    return;
}
Response.Write(XmlOut);
Response.ContentType = "text/xml";
//Logoff
long ReturnCode;
ReturnCode = Obj.Logoff(UserId);
Qrry = null;
Obj = null;
```

5.2.2. Query.Browse

Syntax:

`Query.Browse(UserID, XmlIn)`

The `Browse` method enables generic retrieval of rows of one or many columns from a specific SYSPRO table. The input parameter is an XML string that defines the table, an initial starting key and various other parameters. The output is returned as an XML string containing the data residing in the specified rows.

Business objects available to this method include:

- COMBRW

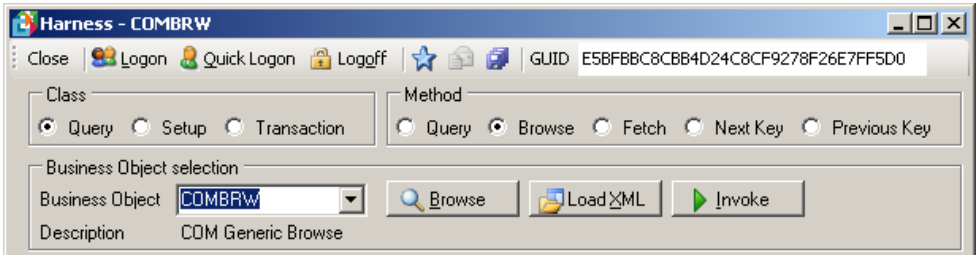
The `Browse` method automatically calls the COMBRW Business Object.

Example 5.10. XmlIn with Query.Browse (`COMBRW.XML`)

```
<?xml version="1.0" encoding="Windows-1252"?>
<Browse>
  <BrowseName>ArCustomer</BrowseName>
  <StartAtKey/>
  <StartCondition>EF</StartCondition>
  <ReturnRows>5</ReturnRows>
  <BrowseDetails>
    <TableName>ArCustomer</TableName>
    <Title>Customers</Title>
    <Column>
      <ColumnName>Customer</ColumnName>
      <ColumnDescription>Customer code</ColumnDescription>
      <ColumnKey>No</ColumnKey>
    </Column>
    <Column>
      <ColumnName>Branch</ColumnName>
    </Column>
    <Column>
      <ColumnName>Name</ColumnName>
    </Column>
  </BrowseDetails>
</Browse>
```

Validate **COMBRW.XML** with **COMBRW.XSD**.

Use the e.net Diagnostics suite Harness and select `Query.Browse`. Load the COMBRW business object:



Click on the **Load XML** button to view the sample XmlIn.

By using the e.net Diagnostics suite's Harness tool you can view and edit the sample XmlIn and process it through the e.net solutions application server, receiving the XmlOut in the **Business Object Output** tab of the *Harness* screen. Using this tool enables you to test and troubleshoot your application's XmlIn and quickly see the results and the XML structures used to convey the required data.

Example 5.11. ASP.NET Visual Basic codebehind for Query.Browse

```
' Logon and trap any exceptions
Dim UserId As String
Dim Obj As New Encore.Utilities()
Try
    UserId = Obj.Logon("ADMIN", " ", "1", " ", 5, 0, 0, " ")
Catch exc As Exception
    Response.Write("Exception - message:" & exc.Message)
    Exit Sub
End Try

' Run generic fetch returning a warehouse row
Dim Qry As New Encore.Query()
Dim XmlOut As String

' Build an XML string to pass the table name and key
Dim XmlIn As New System.Text.StringBuilder()
XmlIn.Append("<?xml version='1.0'encoding='Windows-1252'?>")
XmlIn.Append("<Browse>")
XmlIn.Append("<BrowseName>ArCustomer</BrowseName>")
XmlIn.Append("<StartAtKey>0000001</StartAtKey>")
XmlIn.Append("<StartCondition>GE</StartCondition>")
XmlIn.Append("<XslStylesheet>browse.xsl</XslStylesheet>")
XmlIn.Append("</Browse>")

 Try
    XmlOut = Qry.Browse(UserId, XmlIn.ToString())
Catch exc As Exception
    Response.Write("Unable to run generic browse - \
         Exception:" & exc.Message)
    Exit Sub
End Try
Response.Write(XmlOut)
Response.ContentType = "text/xml"

' Logoff and Cancel your current Session
Dim ReturnCode As Long
ReturnCode = Obj.Logoff(UserId)
Qry = Nothing
Obj = Nothing
```

The Generic Browse can use an XML configuration file that describes the browses available (the browse names), the tables and the columns to be shown together with a browse title and a default number of rows. This file allows an administrator to configure the columns to be shown and if required can configure different views of data for each operator. This configuration file can be accessed using the Browse Setup program from the e.net solutions menu item within SYSPRO.

5.2.3. Query.Fetch

Syntax:

`Query.Fetch(UserID, XmlIn)`

The `Fetch` method enables generic retrieval of a single row from a SYSPRO table. The `XmlIn` is an XML string defining the parameters required. The `Fetch` method returns the row data as an XML string.

Business objects available to this method include:

- COMFCH

The `Fetch` method automatically calls the COMFCH Business Object.

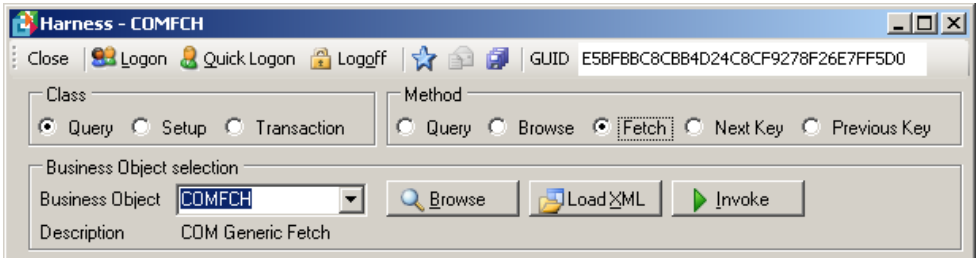
This example uses the customer account number of "0000019", the invoice number of "100514" and the document type of "I" to form the <Key>. It is also possible to split the different parts of the <Key> element using the <Key> and <Optional Key> elements (as demonstrated in the example following this one).

Example 5.12. XmlIn with Query.Fetch (COMFCH.XML)

```
<?xml version="1.0" encoding="Windows-1252"?>
<Fetch>
  <TableName>ArInvoice</TableName>
  <Key>0000019100514I</Key>
  <FullKeyProvided>Y</FullKeyProvided>
</Fetch>
```

Validate **COMFCH.XML** with **COMFCH.XSD**.

Use the e.net Diagnostics suite's Harness tool and select `Query.Fetch`. Load the COMFCH business object:



Now click on the **Load XML** button to view the sample XmlIn.

By using the e.net Diagnostics suite's Harness tool you can view and edit the sample XmlIn and process it through the e.net solutions application server, receiving the XmlOut in the **Business Object Output** tab of the *Harness* screen. By using this tool you can test and troubleshoot your application's XmlIn and quickly see the results and the XML structures used to convey the returned data.

Example 5.13. ASP.NET Visual Basic codebehind for Query.Fetch

```
' Logon and trap any exceptions
Dim UserId As String
Dim Obj As New Encore.Utilities()
Try
    UserId = Obj.Logon("ADMIN", " ", "1", " ", 5, 0, 0, " ")
Catch exc As Exception
    Response.Write("Exception - message:" & exc.Message)
    Exit Sub
End Try

' Run generic fetch returning a warehouse row
Dim Qry As New Encore.Query()
Dim XmlOut As String

' Build an XML string to pass the table name and key
Dim XmlIn As New System.Text.StringBuilder()
XmlIn.Append("<?xml version='1.0'encoding='Windows-1252'?>")
XmlIn.Append("<Fetch>")
XmlIn.Append("<TableName>ArInvoice</TableName>")
XmlIn.Append("<Key>0000019</Key>")
XmlIn.Append("<OptionalKey1>100514</OptionalKey1>")
XmlIn.Append("<OptionalKey2>I</OptionalKey2>")
XmlIn.Append("</Fetch>")

Try
    XmlOut = Qry.Fetch(UserId, XmlIn.ToString())
Catch exc As Exception
    Response.Write("Unable to run generic fetch - \
         Exception:" & exc.Message)
    Exit Sub
End Try
Response.Write(XmlOut)
Response.ContentType = "text/xml"
Response.Write(XmlOut.ToString())
Response.End()

' Logoff and Cancel your current Session
Dim ReturnCode As Long
ReturnCode = Obj.Logoff(UserId)
Qry = Nothing
Obj = Nothing
```

5.2.4. Query.NextKey

Syntax:

`Query.NextKey(UserID, XmlIn)`

The `NextKey` method provides a generic method with which to retrieve a key that is alphabetically higher than the current key. In combination with `PreviousKey`, `NextKey` provides a next/previous function within your application. The `NextKey` method is passed the current key as an XML string and returns the next alphabetically higher key as an XML string.

Business objects available to this method include:

- COMKEY

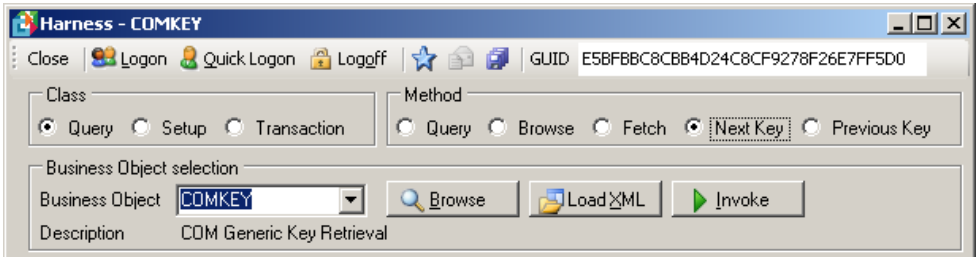
The `NextKey` method automatically calls the COMKEY Business Object.

Example 5.14. XmlIn with Query.NextKey (`COMKEY.XML`)

```
<Keys>
  <TableName>ArInvoice</TableName>
  <Key>0000019</Key>
  <OptionalKey1>100514</OptionalKey1>
  <OptionalKey2>I</OptionalKey2>
</Keys>
```

Validate **`COMKEY.XML`** with **`COMKEY.XSD`**.

Use the e.net Diagnostics suite's Harness tool and select `Query.Next Key`. Load the COMKey business object:



Now click on the **Load XML** button to view the sample XmlIn.

By using the e.net Diagnostics suite's Harness tool you can view and edit the sample XmlIn and process it through the e.net solutions application server, receiving the XmlOut in the **Business Object Output** tab of the *Harness* screen.

Example 5.15. ASP.NET Visual Basic codebehind for Query.NextKey

```
' Logon and trap any exceptions
Dim UserId As String
Dim Obj As New Encore.Utilities()
Try
    UserId = Obj.Logon("ADMIN", " ", "1", " ", 5, 0, 0, " ")
Catch exc As Exception
    Response.Write("Exception - message:" & exc.Message)
    Exit Sub
End Try

' Run generic fetch returning a warehouse row
Dim Qry As New Encore.Query()
Dim XmlOut As String

' Build an XML string to pass the table name and key
Dim XmlIn As New System.Text.StringBuilder()
XmlIn.Append("<?xml version='1.0'encoding='Windows-1252'?>")
XmlIn.Append("<Keys>")
XmlIn.Append("<TableName>ArInvoice</TableName>")
XmlIn.Append("<Key>0000019</Key>")
XmlIn.Append("<OptionalKey1>100514</OptionalKey1>")
XmlIn.Append("<OptionalKey2>I</OptionalKey2>")
XmlIn.Append("</Keys>")

Try
    XmlOut = Qry.NextKey(UserId, XmlIn.ToString())
Catch exc As Exception
    Response.Write("Unable to get next key - Exception:" \
       & exc.Message)
    Exit Sub
End Try
Response.Write("The next key is " & XmlOut)

' Logoff and Cancel your current Session
Dim ReturnCode As Long
ReturnCode = Obj.Logoff(UserId)
Qry = Nothing
Obj = Nothing
```

5.2.5. Query.PreviousKey

Syntax:

`Query.PreviousKey(UserID, XmlIn)`

The `PreviousKey` method provides a generic method with which to retrieve a key that is alphabetically lower than the current key. In combination with `NextKey`, `PreviousKey`, provides a next/previous function within your application. The `PreviousKey` method is passed the current key as an XML string and returns the next alphabetically lower key as an XML string.

Business objects available to this method include:

- COMKEY

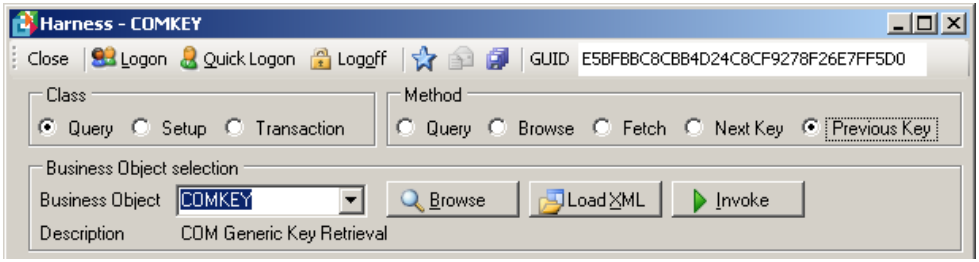
The `NextKey` method automatically calls the COMKEY Business Object.

Example 5.16. XmlIn with Query.PreviousKey (`COMKEY.XML`)

```
<Keys>
  <TableName>ArInvoice</TableName>
  <Key>0000019</Key>
  <OptionalKey1>100514</OptionalKey1>
  <OptionalKey2>I</OptionalKey2>
</Keys>
```

Validate **`COMKEY.XML`** with **`COMKEY.XSD`**.

Use the e.net Diagnostics suite's Harness and select `Query.Previous Key`. Load the COMKey Business Object:



Now click on the **Load XML** button to view the sample XmlIn.

By using the e.net Diagnostics suite's Harness you can view and edit the sample XmlIn and process it through the e.net solutions application server, receiving the XmlOut in the Business Object Output tab of the *Harness* screen.

Example 5.17. ASP.NET Visual Basic codebehind for Query.PreviousKey

```
' Logon and trap any exceptions
Dim UserId As String
Dim Obj As New Encore.Utilities()
Try
    UserId = Obj.Logon("ADMIN", " ", "1", " ", 5, 0, 0, " ")
Catch exc As Exception
    Response.Write("Exception - message:" & exc.Message)
    Exit Sub
End Try

' Run generic fetch returning a warehouse row
Dim Qry As New Encore.Query()
Dim XmlOut As String

' Build an XML string to pass the table name and key
Dim XmlIn As New System.Text.StringBuilder()
XmlIn.Append("<?xml version='1.0'encoding='Windows-1252'?>")
XmlIn.Append("<Keys>")
XmlIn.Append("<TableName>ArInvoice</TableName>")
XmlIn.Append("<Key>0000019</Key>")
XmlIn.Append("<OptionalKey1>100514</OptionalKey1>")
XmlIn.Append("<OptionalKey2>I</OptionalKey2>")
XmlIn.Append("</Keys>")

Try
 XmlOut = Qry.PreviousKey(UserId, XmlIn.ToString)
Catch exc As Exception
 Response.Write("Unable to get previous key - Exception:" \
                & exc.Message)
Exit Sub
End Try
Response.Write("The previous key is " & XmlOut.ToString)
' Response.ContentType = "text/xml"

' Logoff and Cancel your current Session
Dim ReturnCode As Long
ReturnCode = Obj.Logoff(UserId)
Qry = Nothing
Obj = Nothing
```

5.3. Setup Class

There are three *Methods* within the `Setup` class: `Add`, `Update`, and `Delete`.

Use the e.net Diagnostics suite's Harness tool and see the method options displayed when you select the **Setup** class:

By selecting each different method and clicking on the business object drop down menu you can see which business objects are available for that particular method within the `Setup` class.

5.3.1. Setup.Add

Syntax:

`Setup.Add(UserID, BusinessObject, XmlParameters, XmlIn)`

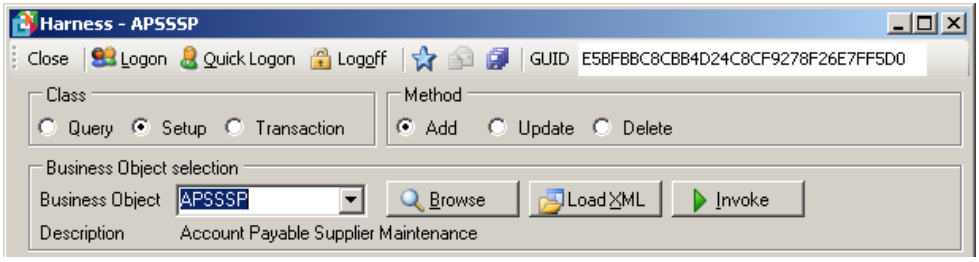
The `Add` method enables one or more data items to be added to the SYSPRO data structures.

The `Setup.Add` method requires two XML input strings. The first, `XmlParameters`, is used to pass parameters to the specified Business Object. The second, `XmlIn`, contains the data to be added to SYSPRO. The Business Object will return an XML string indicating success or failure. The `Add` method can be used as the basis for an import function.

The structure and parameters allowed in `XmlParameters` and `XmlIn` is dependent on the business object being called.

Business objects available to this method can be found in the **Business Object Reference Library** list available on the SYSPRO SupportZone e.net solutions menu.

Use the e.net Diagnostics suite's Harness tool and select `Setup.Add`. Load the APSSSP business object:



Now click on the **Load XML** button to view the sample XmlIn.

By using the e.net Diagnostics suite's Harness tool you can view and edit the sample XmlIn and process it through the e.net solutions application server, receiving the XmlOut in the **Business Object Output** tab of the *Harness* screen. Using this tool enables you to test and troubleshoot your application's XmlIn and quickly see the results and the XML structures used to convey the returned data. This is possible with all the business objects listed for the `Setup.Add` method.

Example 5.18. ASP.NET Visual Basic codebehind of Setup.Add

```
'Logon and trap any exceptions
Dim UserId As String
Dim Obj As New Encore.Utilities()
Try
    UserId = Obj.Logon("ADMIN", " ", "1", " ", 5, 0, 0, " ")
Catch exc As Exception
    Response.Write("Exception - message:" & exc.Message)
    Exit Sub
End Try

'Run generic query returning a sales order
Dim Setup As New Encore.Setup()
Dim XmlOut As String


' Build an XML string to pass parameters
Dim XmlParameters As New System.Text.StringBuilder()
XmlParameters.Append("<?xml version='1.0'encoding= \
                'Windows-1252'?>")
XmlParameters.Append("<SetupArCustomer>")
XmlParameters.Append("SetupArCustomer>")
XmlParameters.Append("<Parameters>")
XmlParameters.Append("<IgnoreWarnings>N</IgnoreWarnings>")
XmlParameters.Append("<ApplyIfEntireDocumentValid>Y \
     </ApplyIfEntireDocumentValid>")
XmlParameters.Append("<ValidateOnly>N</ValidateOnly>")
XmlParameters.Append("</Parameters>")
XmlParameters.Append("</SetupArCustomer>")


' Build an XML string to add a customer
Dim XmlIn As New System.Text.StringBuilder()
XmlIn.Append("<?xml version='1.0'encoding='Windows-1252'?>")
XmlIn.Append("<SetupArCustomer>")
XmlIn.Append("<Item>")
XmlIn.Append("<Key>")
XmlIn.Append("<Customer>0000002</Customer>")
XmlIn.Append("</Key>")
XmlIn.Append("<Name>Bikes and Blades - North</Name>")
XmlIn.Append("<Branch>20</Branch>")
XmlIn.Append("<Salesperson>200</Salesperson>")
XmlIn.Append("</Item>")
XmlIn.Append("</SetupArCustomer>")

Try
    XmlOut = Setup.Add(UserId, "ARSSCS", XmlParameters. \
```

```
        ToString(), XmlIn.ToString())
Catch exc As Exception
    Response.Write("Unable to run business object ARSSCS - \
         Exception:" & exc.Message)
    Exit Sub
End Try
Response.ContentType = "text/xml"
Response.Write(XmlOut)
Response.End()

'Logoff and Cancel your current Session
Dim ReturnCode As Long
ReturnCode = Obj.Logoff(UserId)
Setup = Nothing
Obj = Nothing
```

Example 5.19. ASP.NET C# codebehind for Setup.Add

```
string UserId;
Encore.Utilities Obj = new Encore.Utilities();
try
{
    UserId = Obj.Logon("ADMIN", " ", "1", " ",  \
         Encore.Language.ENGLISH, 0, 0, " ");
}
catch (Exception exc)
{
    Response.Write(("Exception - message:" + exc.Message));
    return;
}

Encore.Setup Setup = new Encore.Setup();
string XmlOut;

System.Text.StringBuilder XmlParameters = new System.Text. \
     StringBuilder();
XmlParameters.Append("<SetupArCustomer>");
XmlParameters.Append("<Parameters>");
XmlParameters.Append("<IgnoreWarnings>N</IgnoreWarnings> ");
XmlParameters.Append("<ApplyIfEntireDocumentValid>Y \
     </ApplyIfEntireDocumentValid>");
XmlParameters.Append("<ValidateOnly>N</ValidateOnly>");
XmlParameters.Append("</Parameters>");
XmlParameters.Append("</SetupArCustomer>");

System.Text.StringBuilder xmlin = new System.Text. \
     StringBuilder();
xmlin.Append("<?xml version='1.0' encoding='Windows-1252'?>");
xmlin.Append("<SetupArCustomer>");
xmlin.Append("<Item/>");
xmlin.Append("<Key>");
xmlin.Append("<Customer>0000002</Customer>");
xmlin.Append("</Key>");
xmlin.Append("<Name>Bikes and Blades - North</Name>");
xmlin.Append("<Branch>20</Branch>");
xmlin.Append("<Salesperson>200</Salesperson>");
xmlin.Append("</Item>");
xmlin.Append("</SetupArCustomer>");

try
{
    XmlOut = Setup.Add(UserId, "ARSSCS", XmlParameters. \
         ToString(), xmlin.ToString());
}
```

```
catch (Exception exc)
{
    Response.Write("Unable to run business object ARSSCS -  \
         Exception:" + exc.Message);
    return;
}

Response.ContentType = "text/xml"
Response.Write(XmlOut)
Response.End()
long ReturnCode;
ReturnCode = Obj.Logoff(UserId);
Setup = null;
Obj = null;;
```

5.3.2. Setup.Update

Syntax:

`Setup.Update(UserID, BusinessObject, XmlParameters, XmlIn)`

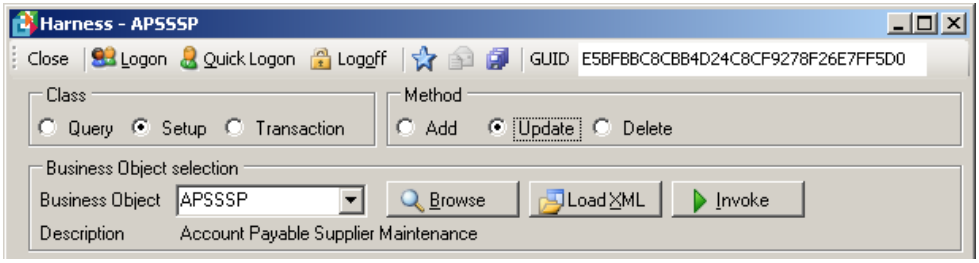
The `Update` method enables data contained in the SYSPRO data structures to be modified.

The `Setup.Update` method requires two XML input strings. The first, `XmlParameters`, is used to pass parameters to the business object. The second, `XmlIn`, contains the data that will replace the current data contained in SYSPRO. The business object will return an XML string indicating success or failure.

The structure and parameters allowed in `XmlParameters` and `XmlIn` is dependent on the business object being called.

Business objects available to this method can be found in the **Business Object Reference Library** list available on the SYSPRO SupportZone e.net solutions menu.

Use the e.net Diagnostics suite's Harness tool and select `Setup.Update`. Load the APSSSP business object:



Now click on the **Load XML** button to view the sample XmlIn.

By using the e.net Diagnostics suite's Harness tool you can view and edit the sample XmlIn and process it through the e.net solutions application server, receiving the XmlOut in the **Business Object Output** tab of the *Harness* screen. Using this tool enables you to test and troubleshoot your application's XmlIn and quickly see the results and the XML structures used to convey the returned data. This is possible with all the business objects listed for the `Setup.Update` method.

Example 5.20. ASP.NET Visual Basic codebehind for Setup.Update

```
' Logon and trap any exceptions
Dim UserId As String
Dim Obj As New Encore.Utilities()
Try
    UserId = Obj.Logon("ADMIN", " ", "1", " ", 5, 0, 0, " ")
Catch exc As Exception
    Response.Write("Exception - message:" & exc.Message)
    Exit Sub
End Try

' Run generic query returning a sales order
Dim Setup As New Encore.Setup()
Dim XmlOut As String


' Build an XML string to pass parameters
Dim XmlParameters As New System.Text.StringBuilder()
XmlParameters.Append("<?xml version='1.0'encoding='Windows- \
     1252'?>")
XmlParameters.Append("SetupArCustomer>")
XmlParameters.Append("<Parameters>")
XmlParameters.Append("<IgnoreWarnings>N</IgnoreWarnings>")
XmlParameters.Append("<ApplyIfEntireDocumentValid>Y \
     </ApplyIfEntireDocumentValid>")
XmlParameters.Append("<ValidateOnly>N</ValidateOnly>")
XmlParameters.Append("</Parameters>")
XmlParameters.Append("</SetupArCustomer>")


' Build an XML string to add a customer
Dim XmlIn As New System.Text.StringBuilder()
XmlIn.Append("<?xml version='1.0'encoding='Windows-1252'?>")
XmlIn.Append("<SetupArCustomer>")
XmlIn.Append("<Item>")
XmlIn.Append("<Key>")
XmlIn.Append("<Customer>0000002</Customer>")
XmlIn.Append("</Key>")
XmlIn.Append("<Name>Bikes and Blades - Northern</Name>")
XmlIn.Append("</Item>")
XmlIn.Append("</SetupArCustomer>")


Try
    XmlOut = Setup.Update(UserId, "ARSSCS", XmlParameters. \
         ToString(), XmlIn.ToString())
Catch exc As Exception
```

```
    Response.Write("Unable to run business object ARSSCS -  \
         Exception:" & exc.Message)
    Exit Sub
End Try
Response.Write(XmlOut)
Response.ContentType = "text/xml"

' Logoff and Cancel your current Session
Dim ReturnCode As Long
ReturnCode = Obj.Logoff(UserId)
Obj = Nothing
```

5.3.3. Setup.Delete

Syntax:

`Setup.Delete(UserID, BusinessObject, XmlParameters, XmlIn)`

The `Delete` method enables specified data to be deleted from the SYSPRO data structures.

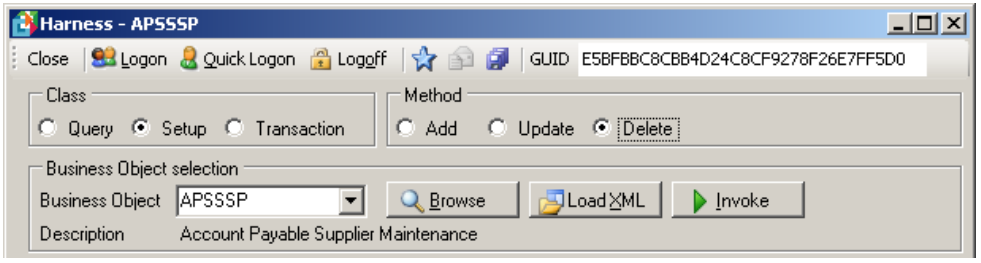
The `Setup.Delete` method requires two XML input strings. The first, `XmlParameters` is used to pass parameters to the business object. The second, `XmlIn` specifies the data keys to be deleted from SYSPRO. The Business Object will return an XML string indicating success or failure.

The structure and parameters allowed in `XmlParameters` and `XmlIn` is dependent on the business object being called.

Before Setup.Delete can delete anything, the normal SYSPRO criteria for deleting the item in the core product must be met. For example, to be able to delete a stock code there must be no stock on hand in a warehouse, no sales orders containing this item, no purchase order, etc.

Business objects available to this method can be found in the **Business Object Reference Library** list available on the SYSPRO SupportZone e.net solutions menu.

Use the e.net Diagnostics suite's Harness tool and select `Setup.Delete`. Load the APSSSP business object:



Now click on the **Load XML** button to view the sample XmlIn.

By using the e.net Diagnostics suite's Harness tool you can view and edit the sample XmlIn and process it through the e.net solutions application server, receiving the XmlOut in the **Business Object Output** tab of the *Harness* screen. Using this tool enables you to test and troubleshoot your application's XmlIn and quickly see the results and the XML structures used to convey the returned data. This is possible with all the business objects listed for the `Setup.Delete` method.

Example 5.21. ASP.NET Visual Basic codebehind for Setup.Delete

```
' Logon and trap any exceptions
Dim UserId As String
Dim Obj As New Encore.Utilities()
Try
    UserId = Obj.Logon("ADMIN", " ", "1", " ", 5, 0, 0, " ")
Catch exc As Exception
    Response.Write("Exception - message:" & exc.Message)
    Exit Sub
End Try

Dim Setup As New Encore.Setup()
Dim XmlOut As String

' Build an XML string to pass parameters
Dim XmlParameters As New System.Text.StringBuilder()
XmlParameters.Append("<?xml version='1.0'encoding='Windows- \
     1252'?>")
XmlParameters.Append("SetupArCustomer>")
XmlParameters.Append("<Parameters>")
XmlParameters.Append("<IgnoreWarnings>N</IgnoreWarnings>")
XmlParameters.Append("<ApplyIfEntireDocumentValid>Y \
     </ApplyIfEntireDocumentValid>")
XmlParameters.Append("<ValidateOnly>N</ValidateOnly>")
XmlParameters.Append("</Parameters>")
XmlParameters.Append("</SetupArCustomer>")


' Build an XML string to add a customer
Dim XmlIn As New System.Text.StringBuilder()
XmlIn.Append("<?xml version='1.0'encoding='Windows-1252'?>")
XmlIn.Append("<SetupArCustomer>")
XmlIn.Append("<Item>")
XmlIn.Append("<Key>")
XmlIn.Append("<Customer>0000002</Customer>")
XmlIn.Append("</Key>")
XmlIn.Append("</Item>")
XmlIn.Append("</SetupArCustomer>")


Try
    XmlOut = Setup.Delete(UserId, "ARSSCS", XmlParameters. \
         ToString(), XmlIn.ToString())
Catch exc As Exception
    Response.Write("Unable to run business object ARSSCS -  \
         Exception:" & exc.Message)
    Exit Sub
```

```
End Try
Response.ContentType = "text/xml"
Response.Write(XmlOut)
Response.End()

' Logoff and Cancel your current Session
Dim ReturnCode As Long
ReturnCode = Obj.Logoff(UserId)
Setup = Nothing
Obj = Nothing
```

5.4. Transaction Class

The `Transaction` class has two *Methods* with it's class structure: `Post`, and `Build`.

Use the e.net Diagnostics suite's Harness tool to see the method options displayed when you select the **Transaction** class:

By selecting each different method and clicking on the business object drop down menu you can see which business objects are available for that particular method within the `Setup` class.

5.4.1. Transaction.Post

Syntax:

`Utilities.Transaction(UserID, BusinessObject, XmlParameters, XmlIn)`

The `Post` method enables transactions to be posted to SYSPRO.

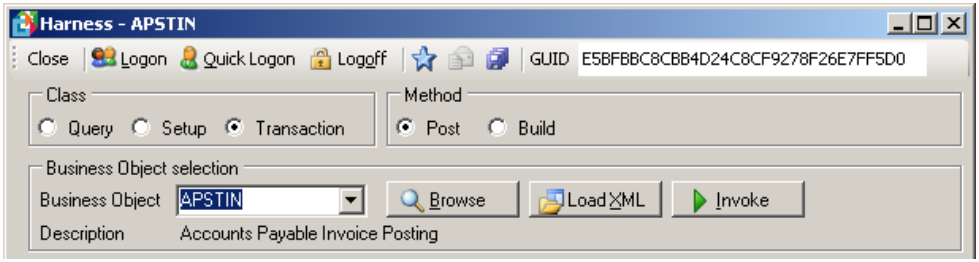
The return XML string will indicate success or failure. More complex Post methods will use the `Build` method to assist with building the XML data.

The `Transaction.Post` method requires two XML input strings. The first, `XmlParameters` is used to pass parameters to the Business Object. The second, `XmlIn` contains the data to be posted to SYSPRO. The Business Object will return an XML string indicating success or failure.

The structure and parameters allowed in `XmlParameters` and `XmlIn` is dependent on the business object being called.

Business objects available to this method can be found in the **Business Object Reference Library** list available on the SYSPRO SupportZone e.net solutions menu.

Use the e.net Diagnostics suite's Harness tool and select `Transaction.Post`. Load the APSTIN business object:



Now click on the **Load XML** button to view the sample XmlIn.

By using the e.net Diagnostics suite's Harness tool you can view and edit the sample XmlIn and process it through the e.net solutions application server, receiving the XmlOut in the **Business Object Output** tab of the *Harness* screen. Using this tool enables you to test and troubleshoot your application's XmlIn and quickly see the results and the XML structures used to convey the returned data. This is possible with all the business objects listed for the `Transaction.Post` method.

Example 5.22. ASP.NET Visual Basic codebehind for Transaction.Post

```
' Sample code to Post a message to the SYSPRO Message Inbox

'Logon and trap any exceptions
Dim UserId As String
Dim Obj As New Encore.Utilities()
Try
    UserId = Obj.Logon("ADMIN", " ", "1", " ", 5, 0, 0, " ")
Catch exc As Exception
    Response.Write("Exception - message:" & exc.Message)
    Exit Sub
End Try

Dim Trn As New Encore.Transaction()
Dim XmlOut As String

' Build an XML string to pass parameters
Dim XmlParameters As New System.Text.StringBuilder()
XmlParameters.Append("<?xml version='1.0'encoding='Windows- \
     1252'?>")
```

```
' Build an XML string to add a customer
Dim XmlIn As New System.Text.StringBuilder()
XmlIn.Append("<?xml version='1.0'encoding='Windows-1252'?>")
XmlIn.Append("<Message>")
XmlIn.Append("<Item>")
XmlIn.Append("<Companyid>A</Companyid>")
XmlIn.Append("<Operator>ADMIN</Operator>")
XmlIn.Append("<Date/>")
XmlIn.Append("<Time/>")
XmlIn.Append("<MessageType>ENET</MessageType>")
XmlIn.Append("<Subject>Stock on hand low for item B100 \
     </Subject>")
XmlIn.Append("<FromOperator/>")
XmlIn.Append("<FromName/>")
XmlIn.Append("<ProgramToRun>INVPEN</ProgramToRun>")
XmlIn.Append("<ProgramParameters>B100</ProgramParameters>")
XmlIn.Append("<PreventDuplicate/>")
XmlIn.Append("</Item>")
XmlIn.Append("</Message>")

Try
    XmlOut = Trn.Post(UserId, "COMTIB", XmlParameters. \
         ToString(), XmlIn.ToString())
Catch exc As Exception
    Response.Write("Unable to run business object COMTIB -  \
         Exception:" & exc.Message)
    Exit Sub
End Try
Response.ContentType = "text/xml"
Response.Write(XmlOut)
Response.End()

' Logoff and Cancel your current Session
Dim ReturnCode As Long
ReturnCode = Obj.Logoff(UserId)
Obj = Nothing
```

Example 5.23. ASP.NET C# Sample Code for Transaction.Post

```
string UserId;
Encore.Utilities Obj = new Encore.Utilities();
try
{
    UserId = Obj.Logon("ADMIN", " ", "1", " ",  \
         Encore.Language.ENGLISH, 0, 0, " ");
```

```
}
catch (Exception exc)
{
    Response.Write(("Exception - message:" + exc.Message));
    return;
}

Encore.Transaction Trn = new Encore.Transaction();
string XmlOut;

string XmlParameters="<?xml version='1.0' encoding='Windows \
     -1252'?>";

System.Text.StringBuilder xmlin = new System.Text. \
     StringBuilder();
xmlin.Append("<?xml version='1.0' encoding='Windows-1252'?>");
xmlin.Append("<Message>");
xmlin.Append("<Item>");
xmlin.Append("<Companyid>A</Companyid>");
xmlin.Append("<Operator>ADMIN</Operator>");
xmlin.Append("<Date/>");
xmlin.Append("<Time/>");
xmlin.Append("<MessageType>ENET</MessageType>");
xmlin.Append("<Subject>Stock on hand low for item B100 \
     </Subject>");
xmlin.Append("<FromOperator/>");
xmlin.Append("<FromName/>");
xmlin.Append("<ProgramToRun>INVPEN</ProgramToRun>");
xmlin.Append("<ProgramParameters>B100</ProgramParameters>");
xmlin.Append("<PreventDuplicate/>");
xmlin.Append("</Item>");
xmlin.Append("</Message>");

try
{
    XmlOut = Trn.Post(UserId, "COMTIB", XmlParameters,  \
         xmlin.ToString());
}
catch (Exception exc)
{
    Response.Write(("Unable to run business object COMTIB  \
         - Exception:" + exc.Message));
    return;
}
Response.ContentType = "text/xml"
Response.Write(XmlOut)
Response.End()
long ReturnCode;
ReturnCode = Obj.Logoff(UserId);
Obj = null;
```

5.4.2. Transaction.Build

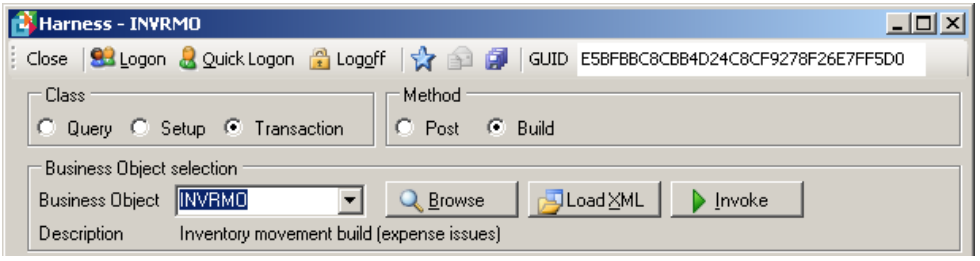
Syntax:

`Transaction.Build(UserID, BusinessObject, XmlIn)`

The `Build` method enables Build business objects to be called, retrieving information that is used during a `Post`. The business object returns an XML string, the elements of which can be added to the input of the `Post` method.

Business objects available to this method can be found in the **Business Object Reference Library** list available on the SYSPRO SupportZone e.net solutions menu.

Use the e.net Diagnostics suite's Harness tool and select `Transaction.Build`. Load the INVRMO business object:



Now click on the **Load XML** button to view the sample XmlIn.

By using the e.net Diagnostics suite's Harness tool you are able to view and edit the sample XmlIn and process it through the e.net solutions application server, receiving the XmlOut in the **Business Object Output** tab of the *Harness* screen. Using this tool enables you to test and troubleshoot your application's XmlIn and quickly see the results and the XML structures used to convey the returned data. This is possible with all the business objects listed for the `Transaction.Build` method.

Example 5.24. ASP.NET Visual Basic codebehind of Transaction.Build

```
' Logon and trap any exceptions
Dim UserId As String
Dim Obj As New Encore.Utilities()
Try
    UserId = Obj.Logon("ADMIN", " ", "1", " ", 5, 0, 0, " ")
Catch exc As Exception
    Response.Write("Exception - message:" & exc.Message)
    Exit Sub
End Try

' Run generic query returning a sales order
Dim Trn As New Encore.Transaction()
Dim XmlOut As String


' Build an XML string for s/o header build
Dim XmlIn As New System.Text.StringBuilder()
XmlIn.Append("<?xml version='1.0'encoding='Windows-1252'?>")
XmlIn.Append("<Build>")
XmlIn.Append("<Parameters>")
XmlIn.Append("<Customer>0000001</Customer>")
XmlIn.Append("</Parameters>")
XmlIn.Append("</Build>")

Try
    XmlOut = Trn.Build(UserId, "SORRSH", XmlIn.ToString())
Catch exc As Exception
    Response.Write("Unable to run business object SORRSH -  \
         Exception:" & exc.Message)
    Exit Sub
End Try
Response.ContentType = "text/xml"
Response.Write(XmlOut)
Response.End()

' Logoff and Cancel your current Session
Dim ReturnCode As Long
ReturnCode = Obj.Logoff(UserId)
Obj = Nothing
```

6

More Advanced Options

Objectives - In this chapter we deal with two concepts that will advance your use of ASP.NET with e.net solutions. We will first tackle XSLT, examining the process of transforming XML output for use in custom applications and by other proprietary applications. By the end of this section you will be familiar with XSLT and the transformation of an XmlOut string to an HTML table. In the second section of this chapter we will deal with the concept of ASP.NET codebehind, separating the programming logic from the presentation logic.

If you are already familiar with XSLT and ASP.NET codebehind usage then please move on to the next chapter.

6.1. Transforming XML

XML is useful for transferring data between applications and between objects within an application. It is, however, not very useful to present an XML file to an accountant or an auditor or a data capture clerk. The benefit of using XML as a data transfer standard is that one can also transform that data into other formats that can then be used to display the information more effectively.

The transformation standards or capabilities for XML were being developed at the same time that the XML standard was being developed. Using these standards, it is possible to transform XML into HTML, SQL scripts, emails, and virtually any other document type. This happens through the use of XSLT (Extensible Style Language Transformation) definition files and an XSLT processor.

6.1.1. What is XSLT

XSLT (Extensible Style Language Transformation) is a standard that was created to transform XML files into other formats or other XML Schemas. An XSL processor reads the XML document and follows the instructions in the XSL stylesheet, then it outputs the data as an HTML page, a SQL script, an email, an XML file governed by a different schema, or any other standardized document type.

XSLT transformations are also useful in situations where the XML document's structure does not match up well with an application that needs access to the data. An XML document may contain the appropriate data to be imported into a database, for example, but may not be structured in the format that the application performing the import expects. The following two examples show how an XML document can be transformed from one

XML format to another:

Example 6.1. Simple XML

```
<?xml version="1.0"?>
<root>
<row id="1" fname="King" lname="Kong"/>
<row id="2" fname="Mary" lname="Stewart"/>
<row id="3" fname="Gerald" lname="Durrel"/>
<row id="4" fname="Jeffery" lname="Shaw"/>
</root>
```

Using XSLT, we can transform this document into a different format, one that is better suited for another application to work with, like this:

Example 6.2. Transformed Simple XML

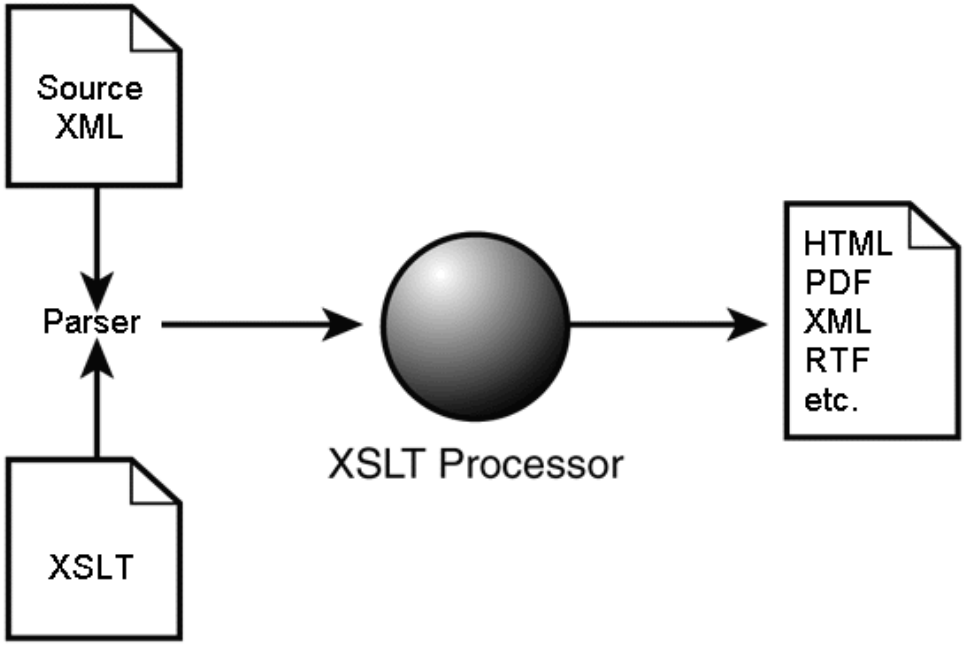
```
<?xml version="1.0"?>
<root>
<row>
<id>1</id>
<fname>King</fname>
<lname>Kong</lname>
</row>
<row>
<id>2</id>
<fname>Mary</fname>
<lname>Stewart</lname>
</row>
<row>
<id>3</id>
<fname>Gerald</fname>
<lname>Durrel</lname>
</row>
<row>
<id>4</id>
<fname>Jeffery</fname>
<lname>Shaw</lname>
</row>
</root>
```

The data is exactly the same in both XML files. The only difference is how the data has been arranged. This is a very simple example of the power of XSLT. Once we have learned more about how to process XML files using an XSLT processor and definition file, we will be using XSLT transformations to present XmlOut data in HTML format.

6.1.2. The Process of Transforming

The process of transforming an XML document into another format, such as HTML, requires two types of processing engines. We first need a parser capable of loading the source XML document into a DOM (Document Object Model) tree structure. The XSLT document is also loaded into the parser and a tree structure created for it. This tree structure will normally be optimized to accommodate XSLT processing and is specific to the processor being used. We then need an XSLT processor to take the XML document structure and match up the nodes within the document against the various &templates" found in the XSLT document structure, and then output the result. The final tree structure (the output) is dynamically created based on information contained within the XSLT document. Here is a simple diagram of the transformation process:

Figure 6.1. The XSLT transformation process.



6.1.2.1. XSLT as a Template

XSLT is important for transforming the XML output of the SYSPRO business objects for use in other applications and settings. In order to gain a better understanding of XSLT, it's important that we define what an XSLT document contains. Although XSLT stands for Extensible Stylesheet Language Transformations, another name for it could be "Extensible **Template** Language Transformations". This is because XSLT relies on templates to process and create the particular output structure. The W3C provides the following statement about XSLT in relation to templates:

“A stylesheet contains a set of template rules. A template rule has two parts: a pattern which is matched against nodes in the source tree and a template which can be instantiated to form part of the result tree. This allows a stylesheet to be applicable to a wide class of documents that have similar source tree structures.”

I'm sure that you have used templates in another application (i.e. MS Word) and so will know that they provide the basic structure that can be reused for specific purposes. Templates function in much the same way in XSLT, except that they are programmed to match up with nodes within an XML document. XSLT templates allow us to process and structure the data contained within the elements and attributes of the source XML document. They provide a template structure that can be processed when a particular node in the source XML document is matched.

Remember that the XSLT processor described earlier is provided with two tree structures to use when transforming. The first is the structure for the source XML document and the second is the XSLT template document. Once these two structures are loaded, the XSLT processor attempts to match the element or attribute names found in the source XML document with templates contained in the XSLT document. The matching process is performed using XPath expressions that are part of the XSLT document. When a node from the source XML document matches a template in the XSLT document, the data contained in that node gets processed though the template.

The use of XSLT definition files as templates offers an effective way to process various XML document structures. Each element, attribute, text node, or whatever, can be matched up with the appropriate template via the XPath expressions. If a given node does not have a matching template, no processing will occur for it, and the next section of the source XML document will be processed. When a matching node is found, the template takes care of creating the proper output structure based on information contained within the node.

The theory of using XSLT to transform XML is very powerful, but let's begin to apply it to transforming XML to HTML so that we can use the XmlOut data returned from the SYSPRO e.net solutions business objects in a web-based application.

6.1.3. Transforming XML to HTML with XSLT

In this section we'll examine a simple XSLT document that transforms XML into HTML for display in a web browser. The section that follows shows how XSLT can transform XML into formats other than HTML. This example shows a simple conversion of an XML document that describes information about a chapter within a book:

Example 6.3. Chapter.xml

```
<?xml version="1.0" ?>
<chapter>
  <name>Sample Applications</name>
  <author>
      <name>John Smith</name>
      <email>jsmith@mailserver.com</email>
      <website>http://www.somesite.com/jsmith/</website>
  </author>
  <examples>
     <example>
        <reference>7</reference>
        <demo>
           <url>logon.aspx</url>
           <link_text>LogonVB.aspx</link_text>
        </demo>
        <source>
           <url>login.txt</url>
           <link_text>LogonVB.aspx</link_text>
        </source>
        <description>SYSPRO Logon using ASP.NET</description>
    </example>
  </examples>
</chapter>
```

The root node of the XML document is <chapter>. The following example shows and XSLT definition file (**`Chapter.xsl`**) that will be used to transform the chapter.xml into web browser viewable HTML:

Example 6.4. Chapter.xsl

```
<?xml version="1.0" ?>
<xsl:transform xmlns:xsl="http://www.w3.org/1999/XSL/ \
 Transform" version="1.0">
<xsl:output method="xml" />
<xsl:template match="/">
<p>
<xsl:apply-templates select="chapter" />
</p>
</xsl:template>
<xsl:template match="/chapter">
<b><xsl:value-of select="name"/></b>
<br/>
by <xsl:apply-templates select="author" />
<br/><br/>
<xsl:apply-templates select="examples" />
</xsl:template>
<xsl:template match="author">
<i><xsl:value-of select="name"/></i>
</xsl:template>
<xsl:template match="examples">
<table bgcolor="#000033">
<tr bgcolor="#CCCCFF">
<th>Reference</th>
<th>Demo</th>
<th>Source</th>
<th>Description</th>
</tr>
<xsl:apply-templates select="example" />
</table>
</xsl:template>
<xsl:template match="example">
<tr bgcolor="#DDDDDD">
<td><xsl:value-of select="reference"/></td>
<td>
<a>
<xsl:attribute name="href">
<xsl:value-of select="demo/url"/>
</xsl:attribute>
<xsl:value-of select="demo/link_text"/>
</a>
</td>
```

```
<td>
<a>
<xsl:attribute name="href">
<xsl:value-of select="source/url"/>
</xsl:attribute>
<xsl:value-of select="source/link_text"/>
</a>
</td>
<td><xsl:value-of select="description"/></td>
</tr>
</xsl:template>
</xsl:transform>
```

In order to transform **`Chapter.xml`** into an HTML document using **`Chapter.xsl`** we need to load both files into an XSLT processor. We can do this using a simple ASP.NET program, as demonstrated using the code shown below:

Example 6.5. ASP.NET C# using the XslTransform Class

```
<%@ Import Namespace="System.Xml" %>
<%@ Import Namespace="System.Xml.Xsl" %>
<%@ Import Namespace="System.Xml.XPath" %>
<script language="C#" runat="server">
public void Page_Load(Object sender, EventArgs E) {
string xmlPath = Server.MapPath("Chapter.xml");
string xslPath = Server.MapPath("Chapter.xsl");

//Instantiate the XPathDocument Class
XPathDocument doc = new XPathDocument(xmlPath);

//Instantiate the XslTransform Class
XslTransform transform = new XslTransform();
transform.Load(xslPath);

//Custom format the indenting of the output document
//by using an XmlTextWriter
XmlTextWriter writer=new XmlTextWriter(Response.Output);
writer.Formatting = Formatting.Indented;
writer.Indentation=4;
transform.Transform(doc, null, writer);
}
</script>
```

On executing the code in Example 6.5, “ASP.NET C# using the XslTransform Class” [6–7], the XML document will be transformed into HTML that can be rendered in a web browser. The result of this transformation is presented below:

Sample Applications

by *John Smith*

Reference	Demo	Source	Description
7	LogonVB.aspx	LogonVB.aspx	SYSPRO Logon using ASP.NET

Your understanding of the code shown in Example 6.4, “Chapter.xsl” [6–6] and Example 6.5, “ASP.NET C# using the XslTransform Class” [6–7] may be limited at this point. Don't let that worry you, though, because a basic understanding of XML coupled with the XSL descriptions contained in Table 6.1, “XSLT Elements” [6–10] will increase your understand of each step of the transformation.

6.1.4. The XSLT Language

We have taken you through a simple transformation process and have demonstrated what an XSLT document looks like. We will now break the different parts used in the **`.xsl`** file into individual pieces and examine them. We will start with the root element, and then briefly look at the other elements available.

6.1.4.1. The Root Element

If you take another look at Example 6.4, “Chapter.xsl” [6–6], you will notice that the XSL document follows all the rules specified in the XML specification. We can see that the case of each opening tag matches the case of the closing tag, that all attributes are quoted, that all tags are closed, etc. XSLT documents are all well-formed XML documents. The first line of each XSLT document should therefore contain the XML declaration. Although this line is optional, it is important that you get into the practice of using it because as new versions of the XML specification are released it will be important to recognize which version is being used.

After the line containing the XML declaration, one of two elements specific to the XSLT language can be used for the document's root node. These elements are:

- <xsl:stylesheet>
- <xsl:transform>

Although it is possible to use either element as the root of an XSLT document, in this book we will use the xsl:stylesheet element. You can substitute the xsl:transform element

instead if you are more experienced in XSLT and are more comfortable using it.

Two more items must be included within an XSLT document that follows the guidelines found in the XSLT specification. These are a local namespace declaration and the "version" attribute. The following stylesheet file shows the xsl:stylesheet element, the namespace declaration, and the version attribute:

Example 6.6. XSL Simple Stylsheet File

```
<?xml version="1.0"?>
<xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/  \
       XSL/Transform" version="1.0">

<!-- Your XSLT template goes here -->

</xsl:stylesheet>
```

The namespace *URI (http://www.w3.org/1999/XSL/Transform)* is always listed exactly as shown, and the version attribute should have a value of 1.0 for the document to conform to the November 1999 XSLT specification (which all XML and XSL used by SYSPRO e.net solutions does). As future versions of the specification are released, this version number can be changed, depending on what features the XSLT document uses.

XSLT version 2.0 was in Candidate Recommendation at the time this chapter was written. All the examples used in this book use XSLT version 1.0.

6.1.4.2. Other XSLT Elements

If you have experience in programming in HTML you will already know how HTML elements are used to perform specific tasks. For example, you know that the <table> element is used with the <tr> and <td> elements to construct a table for display in a browser. You know that the <img> element is used to display an image, and that the element is used as to define different page locations and divisions. In HTML, each of these elements have a specific purpose. Each of the elements of XSLT has a specific purpose as well.

The XSLT version 1.0 specification lists the elements that are used to transform XML documents. The elements can be used in many different ways. They can be used as to perform programming logic, performing if/then statements, looping, and writing out data within a node. They can also be used to determine the output format. An XSLT element is

distinguished from other elements that may be within an XSLT document by its association with a namespace. Declaring this namespace in the XSLT root element (xsl:stylesheet or xsl:transform) was shown in Example 6.6, “XSL Simple Stylsheet File” [6–9].

Table Table 6.1, “XSLT Elements” [6–10] contains a list of the elements defined in version 1.0 of the XSLT specification. Notice that each element contains the *xsl:* prefix. This list contains information from Microsoft's XSLT Elements table [http://msdn2.microsoft.com/en-us/library/ms256058(VS.80).aspx], SAXON's XSLT Elements table [http://saxon.sourceforge.net/saxon6.5.2/xsl-elements.html], and Dan Wahlin's XSLT Elements table (from Chapter 7 of his *XML for ASP.NET Developers*) [http://www.topxml.com/dotnet/articles/xslt/default.asp].

Table 6.1. XSLT Elements

XSLT Element	Description
xsl:apply-imports	This is used in conjunction with imported style sheets to override templates within the source style sheet. Calls to xsl:apply-imports cause an imported template with lower precedence to be invoked instead of the source style sheet template with higher precedence.
xsl:apply -templates	When xsl:apply-templates is used, the XSLT processor finds the appropriate template to apply, based on the type and context of each selected node.
xsl:attribute	This creates an attribute node that is attached to an element that appears in the output structure.
xsl:attribute-set	This is used when a commonly defined set of attributes will be applied to different elements in the style sheet. This is similar to named styles in CSS.
xsl:call-template	This is used when processing is directed to a specific template. The template is identified by name.
xsl:choose	This is used along with the xsl:otherwise and xsl:when elements to provide conditional testing. Similar to using a switch statement in C# or Select Case statement in VB.NET.
xsl:comment	Writes a comment to the output structure.
xsl:copy	Copies the current node from the source document to the result tree. The current node's children are not copied.
xsl:copy-of	This is used to copy a result-tree fragment or node-set into the result tree. This performs a "deep copy," meaning that all descendants of the current node are copied to the result tree.
xsl:decimal -format	Declares a decimal-format that is used when converting numbers into strings with the format-number() function.

XSLT Element	Description
xsl:element	Creates an element with the specified name in the output structure.
xsl:fallback	Provides an alternative (or fallback) template when specific functionality is not supported by the XSLT processor being used for the transformation. This element provides greater flexibility during transformations as new XSLT versions come out in the future.
xsl:for-each	Iterates over nodes in a selected node-set and applies a template repeatedly.
xsl:if	This is used to wrap a template body that will be used only when the if statement test returns a true value.
xsl:import	Allows an external XSLT style sheet to be imported into the current style sheet. The XSLT processor will give a lower precedence to imported templates as compared to templates in the original XSLT style sheet.
xsl:include	Allows for the inclusion of another XSLT style sheet into the current style sheet. The XSLT processor gives the same precedence to the included templates as templates in the original XSLT style sheet.
xsl:key	Declares a named key and is used in conjunction with the key() function in XPath expressions.
xsl:message	This is used to output a text message and optionally terminate style sheet execution.
xsl:namespace -alias	This is used to map a prefix associated with a given namespace to another prefix. This can be useful when a style sheet generates another style sheet.
xsl:number	Used to format a number before adding it to the result tree or to provide a sequential number to the current node.
xsl:otherwise	This is used with the xsl:choose and xsl:when elements to perform conditional testing. Similar to using default in a switch statement.
xsl:output	Specifies options for use in serializing the result tree.
xsl:param	This is used to declare a parameter with a local or global scope. Local parameters are scoped to the template in which they are declared.
xsl:preserve -space	Preserves whitespace in a document. Works in conjunction with the xsl:strip-space element.
xsl:processing -instruction	Writes a processing instruction to the result tree.
xsl:sort	This is used with xsl:for-each or xsl:apply-templates to specify sort criteria for selected node lists.
xsl:strip-space	Causes whitespace to be stripped from a document. Works in conjunction with the xsl:preserve-space element.

XSLT Element	Description
xsl:stylesheet	This element must be the outermost element in an XSLT document and must contain a namespace associated with the XSLT specification and a version attribute.
xsl:template	Defines a reusable template for producing output for nodes that match a particular pattern.
xsl:text	Writes out the specified text to the result tree.
xsl:transform	This is used in the same manner as the xsl:stylesheet element.
xsl:value-of	Writes out the value of the selected node to the result tree.
xsl:variable	This is used to declare and assign variable values that can be either local or global in scope.
xsl:when	This is used as a child element of xsl:choose to perform multiple conditional testing. Similar to using case in a switch or Select statement.
xsl:with-param	This is used in passing a parameter to a template that is called via xsl:call-template.

By using these XSL attributes you will be able to transform and use the XmlOut data generated through the business objects used in your application. There is not enough space in this book to teach you all the in and outs of XSL transformations, so we would recommend that you use the basics that we have introduced in this chapter and supplement them with further reading. There are plenty of good articles and tutorials available on the internet. For example, Chapter 17 of the XML Bible, Second Edition : XSL Transformations http://www.cafeconleche.org/books/bible2/chapters/ch17.html.

6.2. Advanced ASP.NET Notes

If you are already an expert in programming with ASP.NET please skip this section of the book.

In this section of the chapter we deal with the use of codebehind. It may be useful for you to use an integrated development environment (IDE) like Microsoft Visual Studio .NET (or the free *Express* version, Visual Web Developer, which you can download from the Microsoft ASP.NET site [http://msdn.microsoft.com/vstudio/express/vwd/download/]). These programs present a *drag-and-drop* style interface to create the web form (.aspx) page and automatically set up codebehind (.aspx.vb or aspx.cs) controls and event handlers.

6.2.1. Codebehind

The use of ASP.NET allows a programmer to separate presentation (HTML) code from the application logic (in our case the C# or VB code) through the use of *'codebehind'*. The

codebehind class file may be compiled so that it can be used as an object. This allows access to its properties, its methods, and its event handlers. For this to work, the .aspx page must specify where to inherit the codebehind base class. To do this we will use the **Inherits** attribute within the "@Page" directive. The .aspx page inherits from the codebehind class, and the codebehind class inherits from the Page class.

When creating codebehind files, you should define the file extension using the abbreviation of the language used. For example, code written in C# should have the extension ".cs", and code written in VB should have the extension ".vb". Another standard naming convention is to add the .aspx extension to the presentation filename as in "mycodebehind.aspx.vb". A codebehind file or compiled codebehind "dll" can be used to create reusable functions, proprietary application classes and objects, as well as user and server controls.

Every .aspx page (even one with no programming code in it) gets turned into an instance of the System.Web.UI.Page class. An .aspx page is parsed by the ASP.NET engine when it is first requested. Then its JIT (Just-In-Time) compiled version is cached in the temporary ASP.NET Files folder and used as an object. So, since the .aspx page is always instantiated as an object, you can modify its parent class and have it inherit from a class of your choice, provided that your custom made class eventually inherits from System.Web.UI.Page. You can also have different pages set references to the class files of other pages, which then makes possible some very interesting sharing of code objects.

The advantage of using codebehind is the ability to wire up intrinsic and custom events, using ASP.NET server controls, like DataGrids, repeaters, dropdown listboxes and many others. This creates a much richer, more professional and "Windows like" experience for the end users. While this could be done with inline code, it isn't very easy, and it certainly is not fun. You would have to write a lot of custom code to get most of the functionality of the ASP.NET DataGrid control, but why do that if 90% of the time you can get everything you need (and more) from the built in ASP.NET control?

6.2.2. Codebehind in an Non Visual Studio .NET environment

Within the Visual Studio .NET "<@page >" attribute of the .aspx file you will find the entry *Inherits="myCodeBehind" Codebehind="WebForm.aspx.vb"*. This tells Visual Studio to compile the WebForm.aspx.vb code prior to running the .aspx page. In a non Visual Studio .NET environment you simply change the "Codebehind=" entry to "**Src=**". With this entry, the codebehind file will compile on the fly.

6.2.3. Pre-Compilling the Codebehind

Compiling the codebehind code manually is fairly easy. The command will look something like this:

vbc /t:library /out:bin\WebForm.dll /r:System.dll /r:System.Web.dll WebForm.aspx.vb

We are not going to go into all the compiler options in this book, but basically we've taken WebForm.aspx.vb and compiled it into a DLL named WebForm.dll and placed it in the application's /bin directory.

If you need further help on compiling codebehind code please read the online ASP.NET help provided by Microsoft.

In order for .NET to find your classes, make sure your compiled files are stored in the /bin directory off the root of your application. You need to make sure you've set your directory up as an IIS application or else ASP.NET will go up the tree until it finds one and end up at the **`/bin`** directory of the root application if it doesn't find one sooner.

Once you have compiled the codebehind and made sure that the DLL file is located within the **`\bin`** directory within the root directory of your ASP.NET application, modify the page directive on the .aspx presentation page. Change the page directive from

```
<%@ page inherits="myCodeBehind" Src="WebForm.aspx.vb" %>
```

to:

```
<%@ page inherits="myCodeBehind" %>
```

You no longer need the *Src* attribute because the compiled codebehind file is located in the /bin directory. The compiled classes in the /bin directory are automatically available to use in all the ASP.NET pages in the application.

6.2.4. Planning

When planning to create your own custom class codebehind files, even if they are just simple ones, you need to identify the controls and namespaces you will be utilizing so that you can correctly reference them in the *Imports* section of the file. In order to demonstrate this process, let's take a look at a sample codebehind file:

Example 6.7. Simple Codebehind Page

```
Imports System
Imports System.Web
Imports System.Web.UI
Imports Encore

Namespace SimpleControlSamples

Public Class SimpleVB
Inherits Page

Protected Overrides Sub Render(Output As HtmlTextWriter)
Output.Write("<H>Welcome to Simple Codebehind!</H2>")
End Sub

End Class

End Namespace
```

We know that when creating a codebehind file we need to specify any namespaces for other classes that we will be using in the file. In our case we're specifying the System and System.Web.UI namespaces. We need to specify the System namespace because it includes the common classes we need to use in almost every operation. If you were using a Web Server Control in your class, you would need to reference the System.Web.UI.WebControls. We are also including the SYSPRO e.net solutions "Encore" namespace so that we can utilize the e.net solutions classes within our code.

When you define your class you need to specify a class it inherits from. The Page class is associated with all files that have an .aspx extension. These files are compiled at runtime as Page objects and cached, and should be used when creating a Web Forms page with a codebehind file. At the same time we are also specifying the custom namespace (SimpleControlSamples) for the codebehind, which provides a naming scope for our class and is good way to represent a hierarchy of classes.

6.2.5. Coding

Once the planning stage of your custom application has been completed and you know what the end result should be, you will be ready to start the process of coding and debugging. If you are working within a team of developers you should now have a defined role within the team, and a specific portion of the application to work on.

The e.net Diagnostics suite's Harness tool is incredibly useful for programmers. Sample XmlIn, XmlParameters (where needed) and XmlOut for each of the business objects are available through the interface, allowing you to see the options and uses of the business object that is being called within the code. The e.net Diagnostics suite's Harness tool also allows you to customize your XmlIn and process the business object in order to test the outcome.

6.2.6. Testing

No programmer releases code without first testing it. For the purposes of building an e.net solutions application and testing it we would highly recommend that you use a test or development server to run your new applications within a controlled environment. There are few things worse than crashing your enterprises SYSPRO system server because your code needed more debugging. Once your application is in a stable working state, then start testing it on the live SYSPRO system during times when the system is not critically needed (i.e. set up a night time or weekend test time). Always remember to backup!

No matter how much testing you do, there will always be some bugs within an application. Good documentation of the programming task will aid your testing and debugging processes.

7

Processes

Objectives - The objective of this chapter is to show the logical progression possible when planning an e.net solutions application. By using UML diagrams we will show the steps that need to be followed for the creation and processing of a sales order.

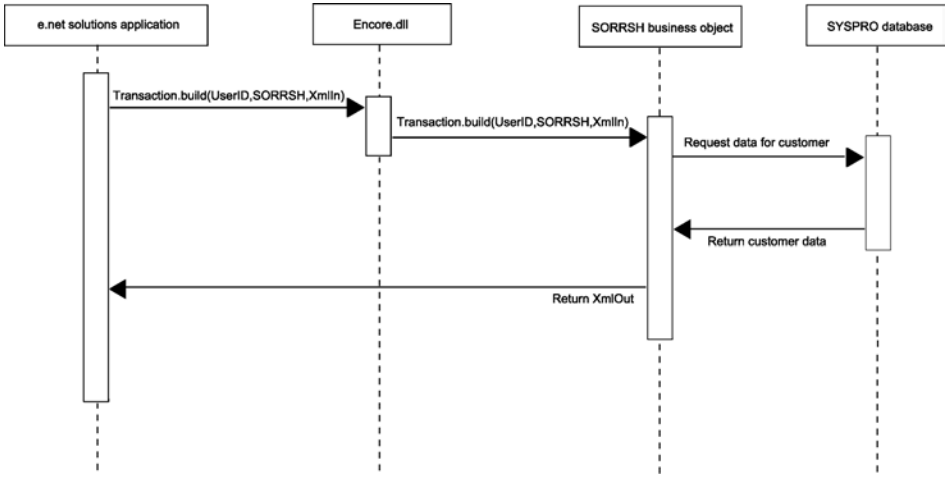
When developing an e.net solutions application it is useful to first define the processes that will be necessary to produce the data and business functions that are required. In this chapter we will briefly present a Sales Order process, with some sample UML diagrams and some sample ASP.NET Visual Basic code that outlines the basics of the process. We will then add a few sub processes to the Sales Order process in order to show how predefining the process can assist in the production of an application.

7.1. Sales Order Processing

The following process demonstrates a simple *Sales Order* (there are no back orders to process). Each step along the process can be defined using UML or another process diagramming system of your choice. As you read through the process and the included UML diagrams please note that the processes are brief and contain no specific XML instructions. In order to define a process such as this you will already need to be familiar with the business objects available on the SYSPRO e.net solutions system.

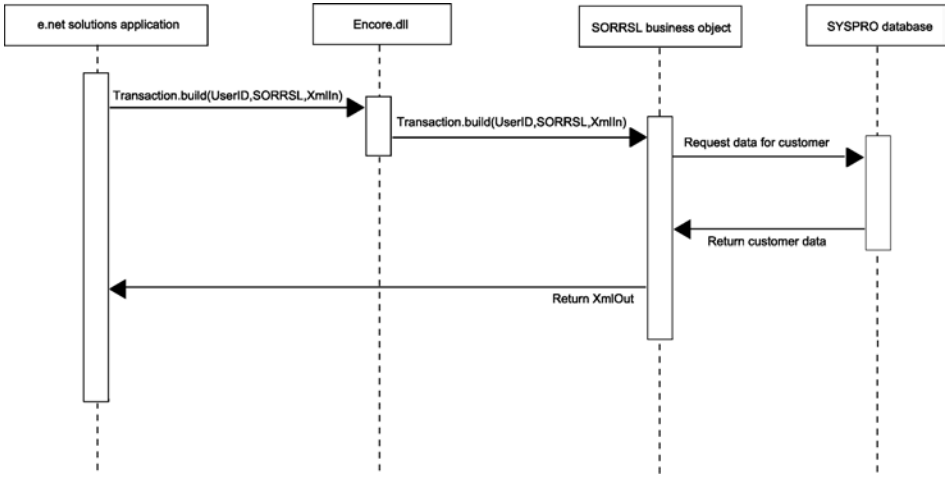
1. Build information for sales order header. SORRSH (Build Sales Order Header)

Figure 7.1. SORRSH UML Sequence



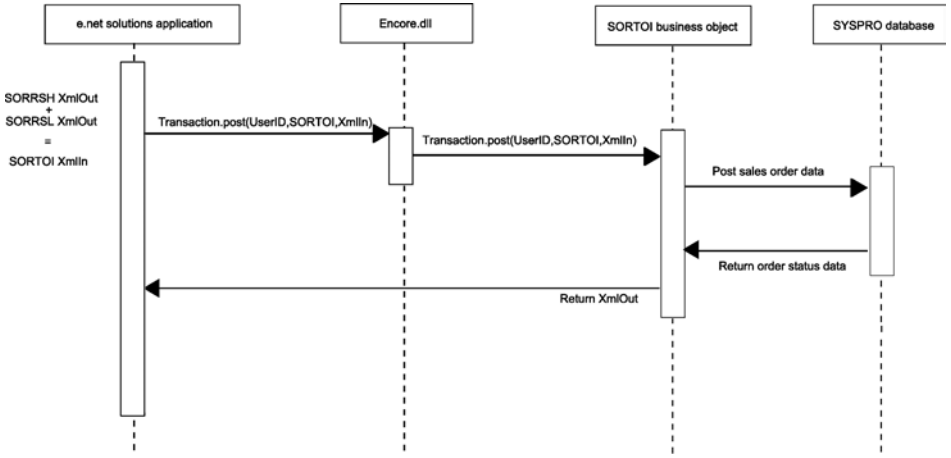
2. Build information for sales order detail line(s). SORRSL (Build Sales Order Line)

Figure 7.2. SORRSL UML Sequence



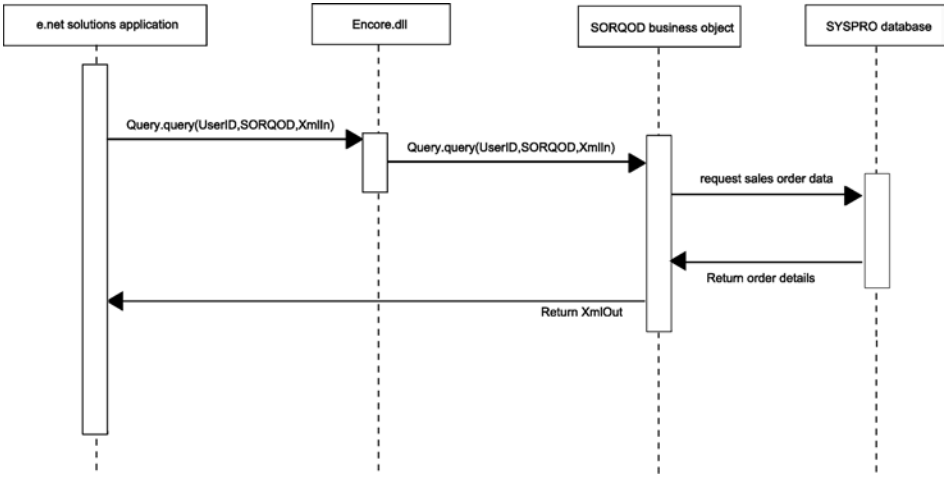
3. Create sales order in status “1 - Open order”. SORTOI (Sales Order Import)

Figure 7.3. SORTOI UML Sequence



4. Retrieve order details to produce own delivery note document. This puts document in to status "4 - In warehouse". SORQOD

Figure 7.4. SORQOD UML Sequence



5. Change order status from "4 - In warehouse" to "8 - Ready to invoice". SORTOS
6. “Invoice” ie update Accounts Receivable and Inventory. Allocate invoice number,

place invoice details in invoice reprint file, order set to status “9 - Complete”. SORTIC

7. Retrieve invoice details and produce own document. SORQID

7.2. Sales Order Processing - Billing

This process defines the steps needed for processing a sales order of type *Billing*. Like the previous process, there are no back order lines included.

1. Build information for sales order header. SORRSH
2. Build information for sales order detail line(s). SORRSL
3. Create sales order in status “8 - Ready to invoice”. SORTOI
4. “Invoice” ie update Accounts Receivable and Inventory. Allocate invoice number, place invoice details in invoice reprint file, set order status to “9 - Complete”. SORTIC
5. Retrieve invoice details and produce own document. SORQID

As you can see, the process is almost identical to the previous one. The first three steps and the final step are the same. This shows us that certain business objects work together and provide data and system functions that other business objects need. For further information about the business objects please visit SYSPRO's Support Zone (http://support.syspro.com/.

A knowledge of business process logic and programming logic is required when formulating e.net solutions processes. For this reason it is quite common that a team of developers work together, some with greater knowledge of business process and others with greater programming expertise.

Both these process have detailed steps of a *Sales Order* without back order lines included. The final process that we will examine in this chapter shows a *Sales Order* process with back orders.

7.3. Sales Order Processing - With Back Orders

By now you should be familiar with the *Sales Order* process and so can concentrate on the differences that occur when one or many lines go into back order.

1. Build information for sales order header. SORRSH
2. Build information for sales order detail lines. SORRSL
3. Create sales order in status “1 - Open order”. SORTOI
4. Retrieve order details to produce own delivery note document for lines not on back order. This puts document in to status "4 - In warehouse". SORQOD
5. Change order status from "4 - In warehouse" to "8 - Ready to invoice". SORTOS

6. “Invoice” ie update Accounts Receivable and Inventory. Allocate invoice number, place invoice details in invoice reprint file, order set to status “2 - Open backorder”. SORTIC
7. Retrieve invoice details and produce own document. SORQID
8. Move back order quantity to ship quantity and put order in status "3 - Released backorder". SORTBO
9. Retrieve order details to produce own delivery note document for lines not on back order. This puts document in to status "4 - In warehouse". SORQOD
10. Change order status from "4 - In warehouse" to "8 - Ready to invoice". SORTOS
11. “Invoice” ie update Accounts Receivable and Inventory. Allocate invoice number, place invoice details in invoice reprint file, order set to status “2 - Open backorder” if there are more detail lines still on back order, or status "9 - Complete" if there are no more lines. SORTIC
12. Retrieve invoice details and produce own document. SORQID

Having seen the basic *Sales Order* process outlined in the first sequence of steps presented in this chapter you can see the simplicity and complexity of creating a process for parts of an application. Each step requires some action from the application or the SYSPRO ERP system, and assumes a level of knowledge and understanding about e.net solutions business objects that is not available in this book. In order to fully utilize e.net solutions and the knowledge of programming with e.net solutions that is presented in this book you will need to study the business objects for yourself and create your own processes.

The next chapter will help you understand the licensing model used by SYSPRO in regard to e.net solutions and the business objects that you will be interacting with through your applications.

8

Licensing

Objectives - In this chapter we will discuss the various issues regarding SYSPRO 6.0 licensing. We will examine the different components of the licensing model used, and discuss some of the ramifications of the model. We will then go through the procedures for installing, updating, importing, and apportioning the licenses.

If you are already aware of the licensing structure that SYSPRO utilizes, please move onto the next chapter. This information is provided so that programmers will have a better understanding of e.net solutions.

8.1. Introduction to SYSPRO Licensing

8.1.1. Licensing Model

The SYSPRO license is a yearly per seat usage license. This means that each installation of the SYSPRO system must be licensed, and that license must be updated on a yearly basis.

8.1.1.1. SYSPRO licensing

With the core SYSPRO products you license the modules that you have by the maximum number of users that you need to be able to log in at any one time. If you need to increase the number of users this has to be done for the all the modules that you have. If you want to add a new module, this has to be done for the number of users that you already have.

8.1.1.2. e.net solutions licensing

The idea of the e.net solutions licensing is that you "only pay for what you use". This means that e.net solutions license is highly configurable and requires you to know what e.net solutions components you will be using. The e.net solutions license needs to be apportioned within your system. We discuss this in Section 8.1.4, “Installing and Configuring License.xml” [8–7].

8.1.1.3. Functional areas

The SYSPRO business logic is provided in components. The SYSPRO modules are broken up in to smaller sections called functional areas, which contain the business objects. SYSPRO operators are licensed to use only the functional areas that they need, in the quantity required, in multiples of 10. For example, you could have 10 users of the

Purchase Order Primary Posting functional area and 250 users of the Requisitions functional area. These licenses are apportioned to specific operator codes, see Section 8.1.2, “License to Named users or Specific Operator Codes” [8–2].

8.1.1.4. Web-based applications

The web-based applications consist of a standard web front-end to the business objects. The licensing of the web-based applications is similar to the functional areas except that they use the web-based functional areas.

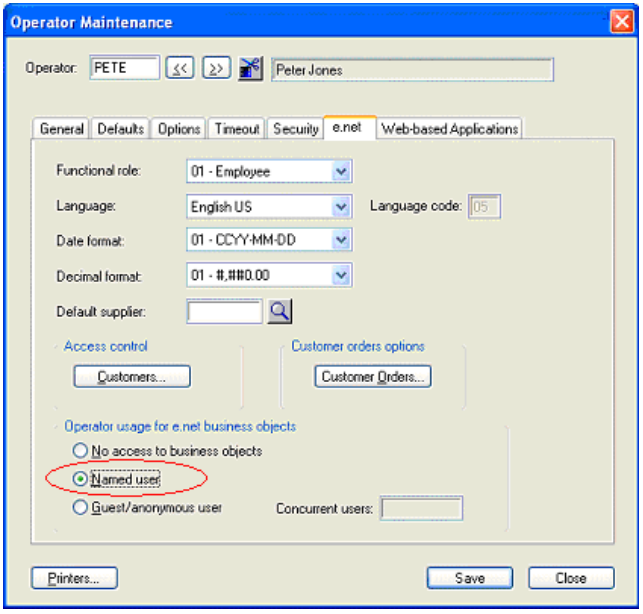
8.1.2. License to Named users or Specific Operator Codes

The default licensing method for business objects and the e.net solutions web-based applications is by "named user". Each functional areas is licensed for the number of named users that will use them.

A named user is a SYSPRO operator code. Against the functional area you specify which named users (SYSPRO operator codes) can use that particular functional area. This allows this named user to have one concurrent logon to e.net solutions. If another user attempts to logon to e.net solutions using this same operator code while this user is still logged on, the existing user will either be logged off and the new user logged on, or the new user will be prevented from logging on, depending on XML parameters passed during the second logon attempt.

Before attempting to apportion the licenses, the SYSPRO license.xml must have already been installed.

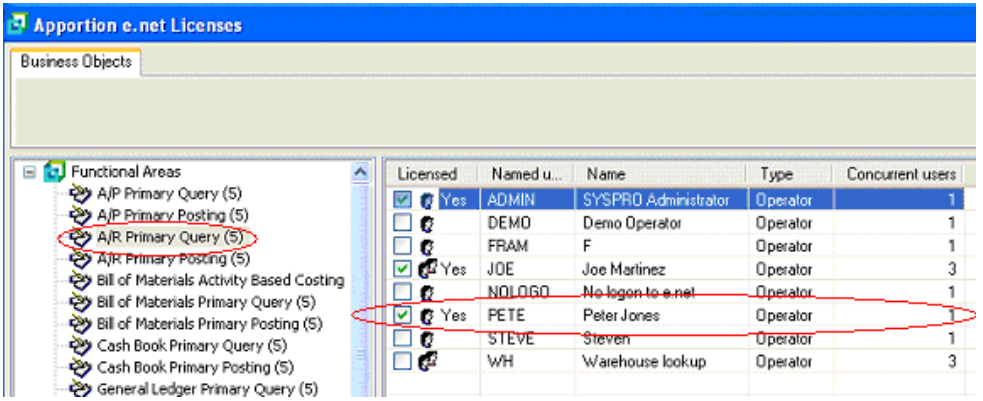
On the e.net tab within the operator maintenance screen you specify that this operator uses the "Named user" licensing for e.net solutions business objects.



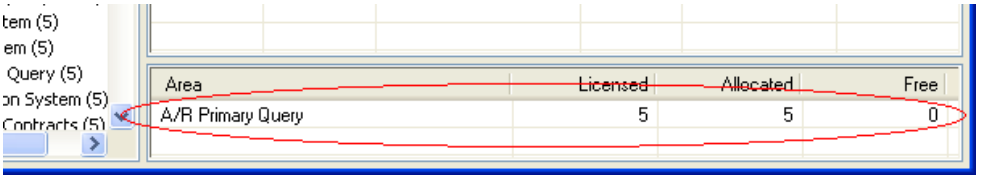
To navigate to where the business object functional area licenses are apportioned from the main menu you need to select **Setup**, **System Setup…**, select the **Configure e.net License…** button, select the **Configure e.net licenses** radio button and then select the **Business Objects…** button. As this is the area for setting up the business object functional areas the tab at the top of the screen contains the name “Business Objects” (as opposed to “Web-based Applications” for the web-based application license apportioning).

The available functional areas are listed down the left-hand side. When you select one, a list of available SYSPRO operator codes is displayed on the right. Only operators that can logon to e.net solutions are listed in the right hand window pane. If an operator is set to "No access to business objects" or has an operator code that begins with underscore underscore (__), which prevents normal logins, they will not be listed here.

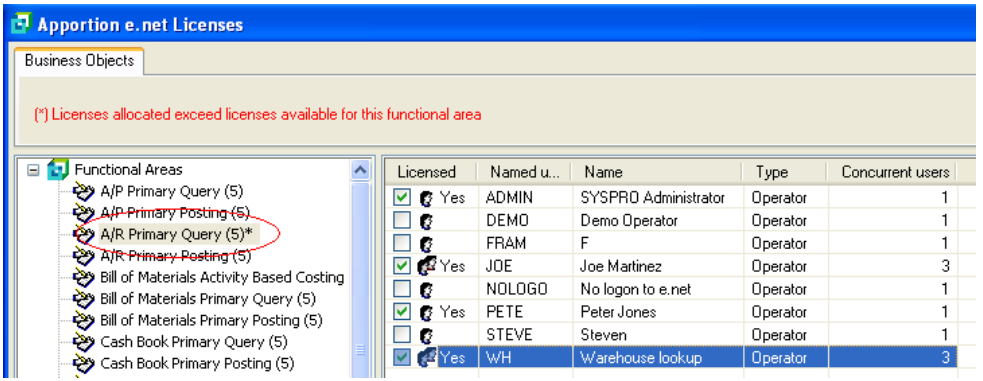
In the following example the Account Receivable Primary Query functional area has been selected. Against this is the number five in brackets, which is the number of available licenses for this functional area. This would normally be in multiples of 10 but this was taken for “The Outdoors Company” test data. The named users ADMIN and PETE have been allocated licenses as well as the Guest / anonymous user called JOE (you can see that these are named users as they have a "Type" of operator and a "Concurrent users" of 1).



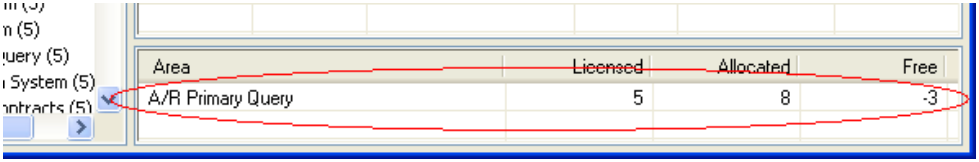
The bottom right pane shows the selected functional area, the number of licenses, the number allocated and how many are still free. In this example there were five and five have been allocated (one to the named user ADMIN, one to the named user PETE and three to the Guest / anonymous user JOE).



If you attempt to allocated more licenses than you have, an asterisk (*) will appear against the functional area and a warning message will appear at the top of the screen.



In addition, the bottom right pane will display that the "Free" amount is negative, and you will not be able to complete the licensing function until the "Free" amount is either zero or a positive number.



As well as all the normal defaults and restrictions, such as default company ID, warehouse and restricted access to inventory costs, etc., there are also e.net solutions specific defaults and restrictions on the "e.net tab" of the operator maintenance. As a named user operator is designed for only one user you can use it to specify these defaults and restrictions such as restricting which customers this operator can access.

When a named user successfully logs on to e.net solutions they are allocated a 33 character UseId which is placed in the COMSTATE file along with their state information. Each time that this user uses a business object, a timestamp is updated against this UserID in the COMSTATE file. When a named user logs off of e.net solutions their UserID and matching state information is removed from the COMSTATE file.

Only one user can logon to e.net solutions using this operator code at a time. If a second logon is attempted it is assumed that the previous UserID is no longer in use, and is removed from the COMSTATE file when this new entry is added (unless the following XML entry is supplied during the logon process, in which case the second user will be prevented from logging on.)

Note that this functionality is only available from SYSPRO 6.0 issue 010

```
<logon>
<FailWhenAlreadyLoggedIn>Y</FailWhenAlreadyLoggedIn>
</logon>
```

The UserID that has been removed can no longer be used.

8.1.3. Concurrency Issues

The core SYSPRO product is licensed on a concurrency basis. If you have a license for 16 users, only 16 can logon to SYSPRO at any one time. It doesn't matter which operator code is using which part of SYSPRO, a total of 16 users can logon. If you want to buy an additional module you have to buy it for 16 users. If you want to upgrade from 16 to 20 users you have to do so for all modules that you have.

As we have seen, the e.net solutions business objects are grouped together in licensable chunks called functional areas. As we have seen, there are two types of functional areas,

those for the raw business objects and those for using the business objects with the SYSPRO web-based applications.

For the first type of functional areas (the "business object only" items) the operator can be either a "Named user" or a "Guest/anonymous user". We've already discussed named users in Section 8.1.2, “License to Named users or Specific Operator Codes” [8–2].

The idea of the Guest / anonymous users is that you do not need to have one SYSPRO operator for each person that needs the same access to e.net solutions. For example, if a SYSPRO company wishes to provide an application to their customers that allows them to remotely capture sales orders and upload them using web services, they may not want to provide a license for each one. They may have 300 customers, of which some order everyday, some only order once a month and some order infrequently. By working out how frequently their customers order, they can work out the maximum number that could logon during any 30 minute time period. They can then create an operator to process these orders and set it to be a Guest / anonymous user. Against this they set the number of concurrent users during a 30 minute time period.

If a user logs on to e.net solutions using the Guest/anonymous operator code, logs off and logs back on again within 30 minutes they have used up two licenses. Therefore it is recommended that this licensing method is only used when it is appropriate, otherwise you could use more licenses than in a named user environment.

When the licenses are apportioned, an operator that is set as a Named user will consume only one license. Only one instance of this operator can logon to e.net solutions at a time. If a second instance of this operator code attempts to logon they will either be prevented from doing so, or will force the first instance to be logged out (depending on an option supplied during the logon process).

For the second type of functional areas (the "web-based application business object" items) the operator can be either a "Named user", a "Guest/anonymous user" (like "business object only") or part of a "Class". A class is a group of people who perform the same or similar tasks, and are licensed together in a true concurrency model. A SYSPRO operator can only be a member of one class but a class can have almost any number of members. When logging on to e.net solutions web-based applications, operators use their own SYSPRO operator code. As they are a member of a class it will use the class license, but they cannot logon using the class code.

When apportioning the access to functional areas for a class, the class consumes the same number of licenses as the class allows concurrent users. It will consume the same number of licenses for all functional areas that this class is licensed to use.

Specifying that this class has four concurrent users means that it will consume four of any web-based functional areas that are apportioned to it. This is different to the core product concurrency in that it is only consuming the four licenses for the functional areas that are apportioned to it and not "using up" four users. Many operator codes can have the same

class against them. For example, if a class allows four concurrent users, there may be ten people in the sales department of an organization, and at any point in time six are always on the road. Specifying this class against all ten operator codes means that whichever four are in the office can logon and use the web-based applications.

When a member of a class attempts to logon to the web-based applications it is detected that they are a member of a class, and instead of checking the licensing for the operator code, all the checking s done for the class. A check is made in the state file to see how many existing members of this class are logged on. If it is less than the number of concurrent users for this class the operator is given their own UserID (which is added to the state file) and they are allowed to logon. Whenever this operator accesses a business object a timestamp is updated against their entry in the state file. When operators that are members of a class logout their UserID and state information is removed from the state file.

When a member of the class attempts to logon and the number of members of this class, already in the state file, is equal to the number of allowed concurrent users, a check is made to see which member of the class has the greatest period of inactivity. If this period of inactivity is greater than the timeout value set against this class, then the existing user is logged out and the new user is logged on. If the period of inactivity was less than the timeout value the new operator is prevented from logging on and a message to this affect is passed back to them.

To manage licensing for SYSPRO e.net solutions web-based applications you implement either "Named User", "Guest/anonymous", or "Class" licensing (or a combination of all three methods).

The advantages of the e.net solutions licensing are three fold:

a. A greater number of users can have access to the system.

b. Licensing is optimized across the system on a per functional area basis.

c. Both the above result in reduced costs and greater customer value.

The number of licenses may therefore be viewed as a limited resource that must be appropriately managed. When managed correctly, all users will receive an adequate level of service from the system.

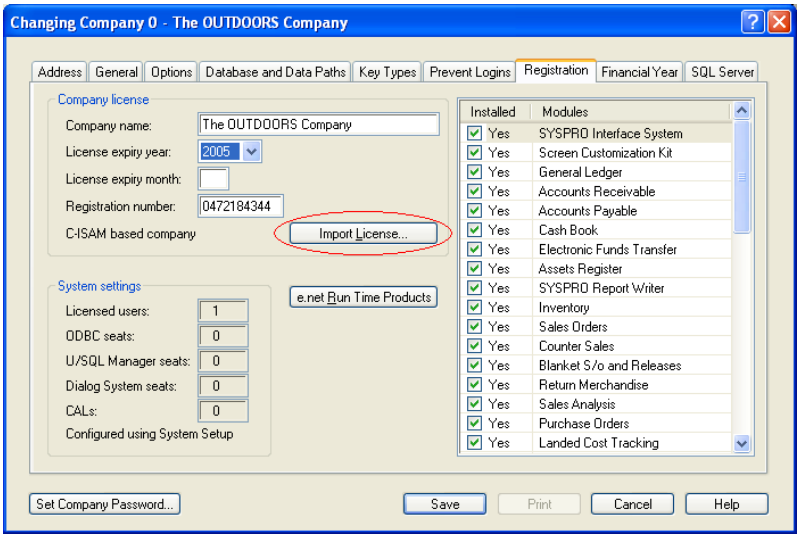
8.1.4. Installing and Configuring License.xml

8.1.4.1. Importing the License.xml file

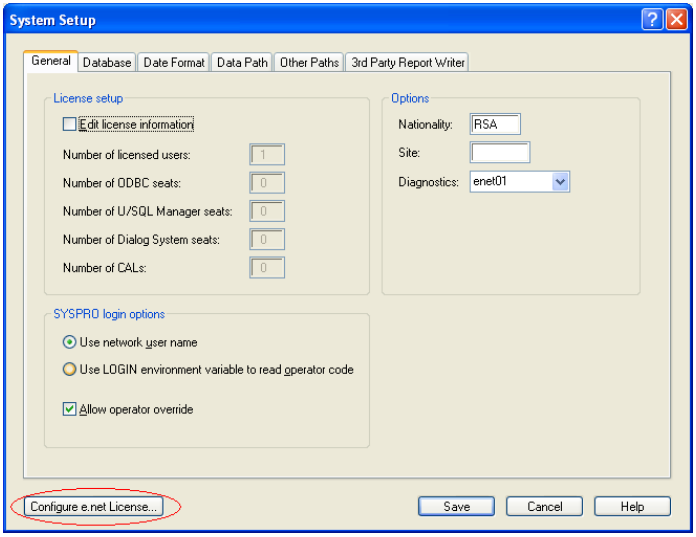
The e.net solutions license is always provided in a file called **`License.xml`**. This has been done to simplify the creation and maintenance of the e.net solutions license. There are many e.net solutions functional areas, and each one could have a different number of licensed users. By providing an import for this license file it is impossible to make a

mistake during the capture of the license.

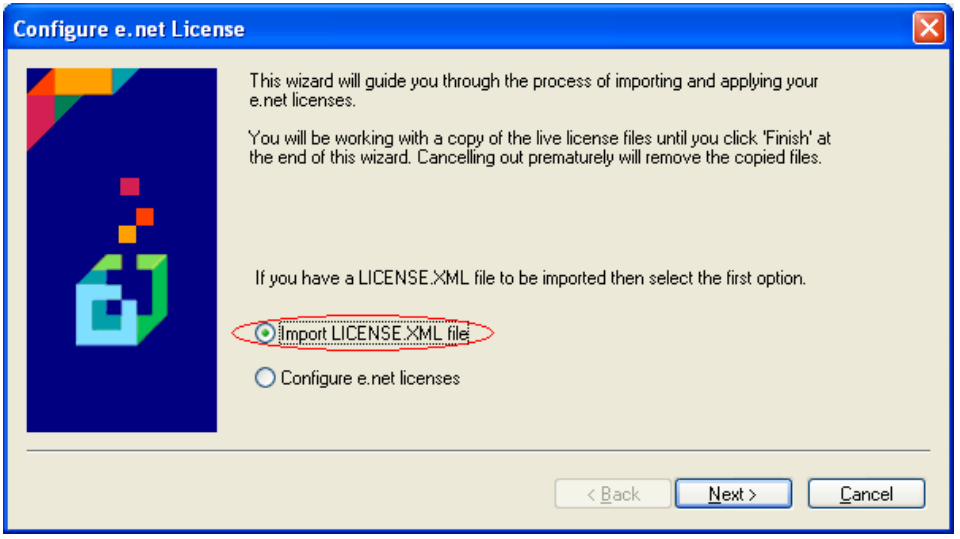
The matching SYSPRO core product license is also included in the license.xml file and must be imported first. This is done via the “Import License” button from the registration tab where you would normally enter the license details manually. The default location for importing the license.xml file is the work folder (in a client / server environment this is the work folder on the server).



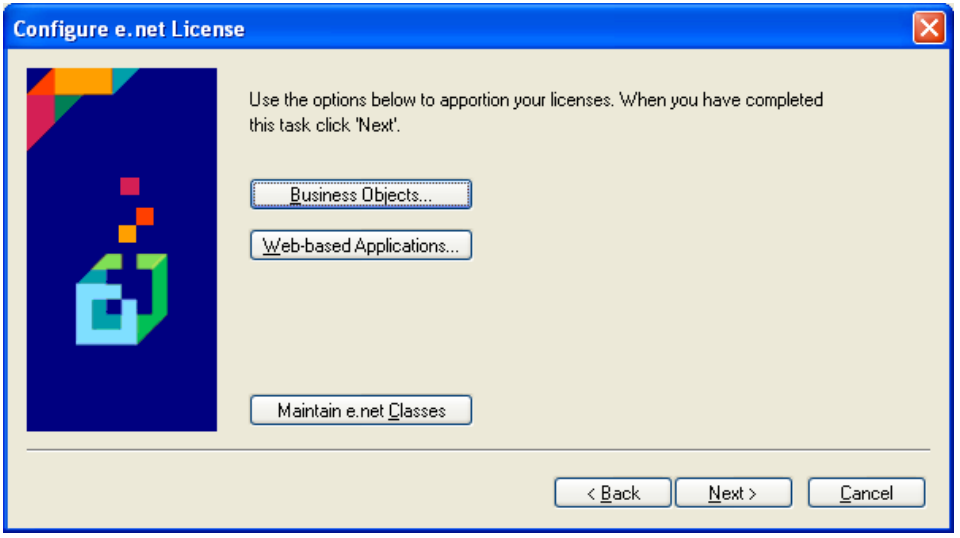
The license can then be imported for e.net solutions. This is done via the "configure e.net license" button against the system setup (Setup, System Setup… from the main menu).



This will display the "Configure e.net License" screen. On this screen make sure that the "Import LICENSE.XML file" option is selected and select the **Next** button.

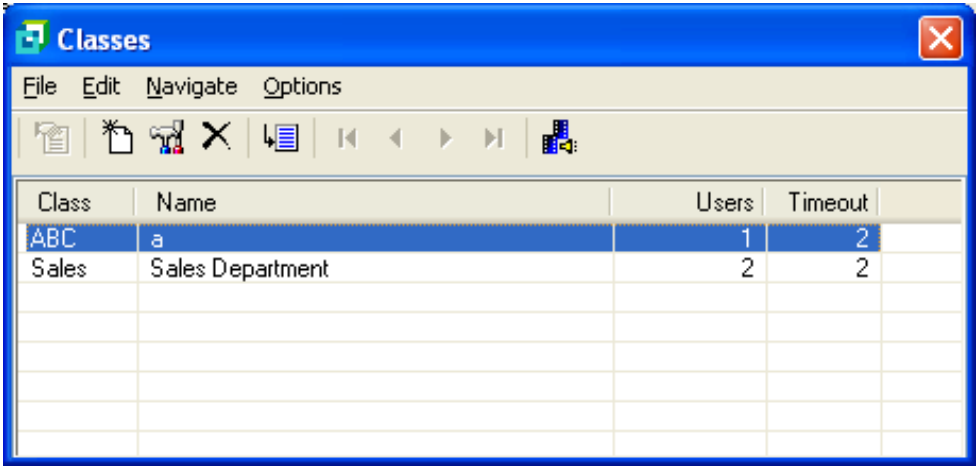


You will be prompted to provide the location of the License.xml file and then to import it. Once the license file has been imported a screen will be displayed that provides three options. These are to apportion the functional area licenses for business object licensing, to apportion the functional area licenses for web-based application licensing and to maintain the e.net solutions web-based application classes.



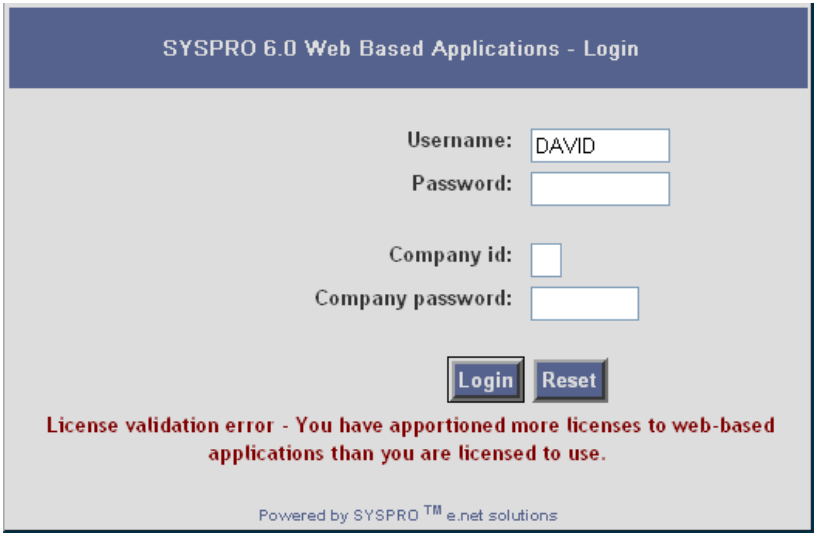
8.1.4.2. Maintaining the web-based application classes

The class maintenance facility allows you to add, maintain and delete a class.



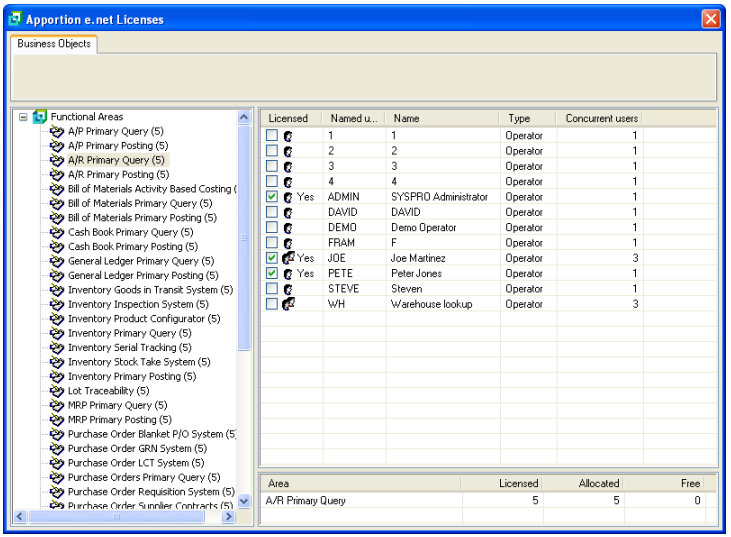
The number of concurrent users is the maximum number of members of this class allowed to use a web-based functional area at any one time.

Note that if you have already apportioned the licenses for a web-based functional area to this class, and you increase the number of concurrent users you may not have sufficient licenses for this functional area. If this happens you will receive the following message:



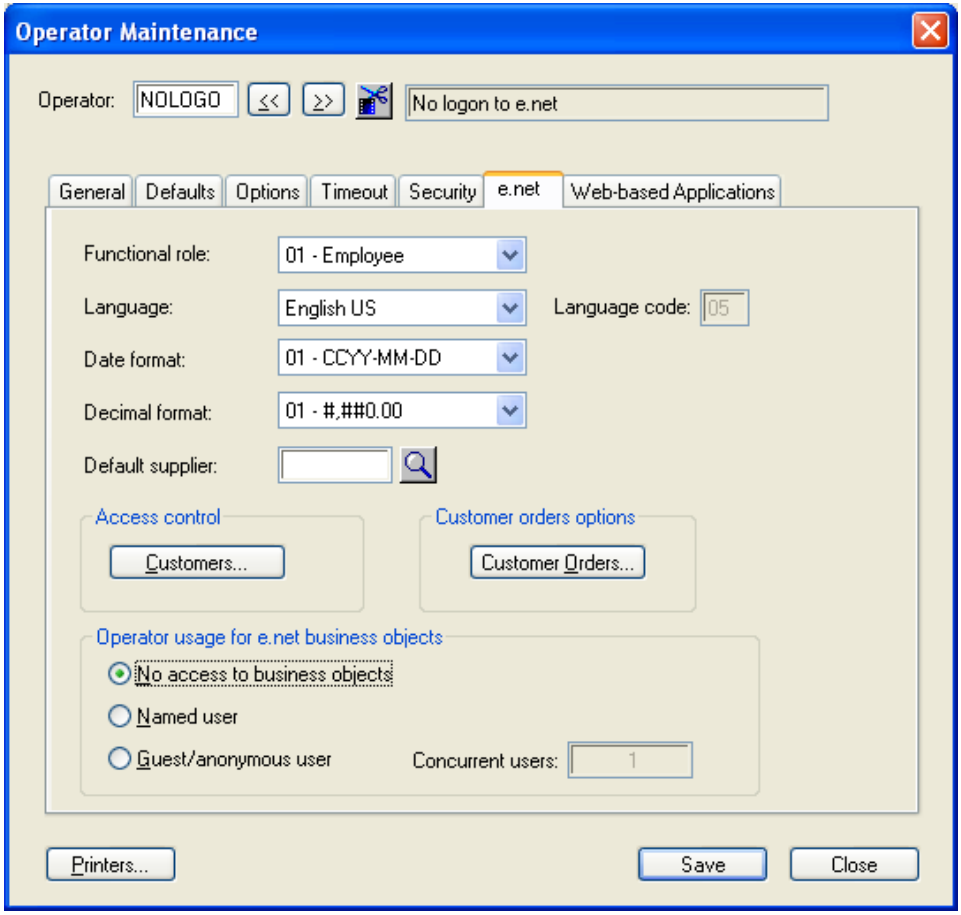
8.1.4.3. Maintaining the Business Object functional areas

When you select the "Business Objects…" button from the "Configure e.net licenses" screen, a screen similar to the one below will be displayed.



The screen has a "Business Objects" tab at the top and consists of three sections. On the left is the list of the functional areas with a number in brackets against them. This is the number of licenses that you have for this functional area. On the right is a list of the available operator codes. This list excludes operator names that begin with two underscore

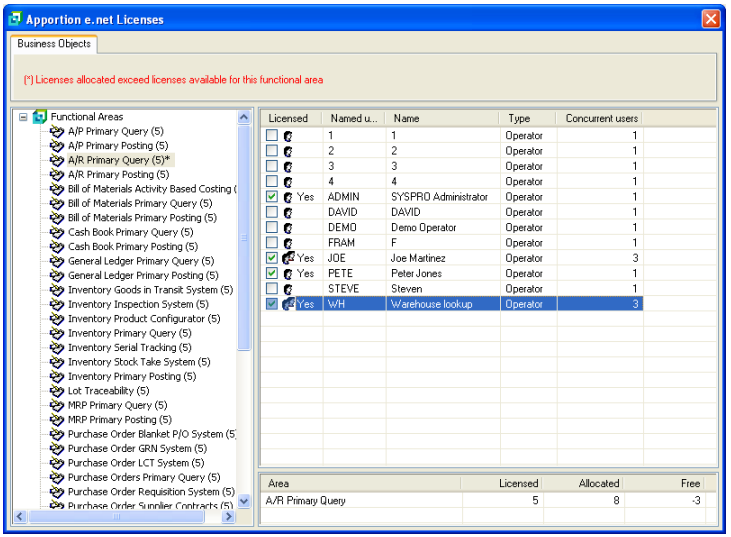
characters as they cannot logon, and also excludes operators who have the option "No access to Business Objects" set against them on the e.net tab of the operator maintenance utility.



Operator codes on this screen that have a number of concurrent users other than 1 are Guest / anonymous user accounts. As you select or deselect the "Licensed" checkbox against the operator code it affects the section at the bottom right pane where it shows the currently selected functional area, the number of available licenses for this area, how many licenses have been allocated and the remainder (Free). The number of licenses allocated / de-allocated for each operator code is the same as the number in the "concurrent users" column.

As you select functional areas on the left pane, the list in the right, and bottom-right panes change to match. If you select to consume more licenses than you have available an asterisk will be placed next to the number of available licenses for the affected functional

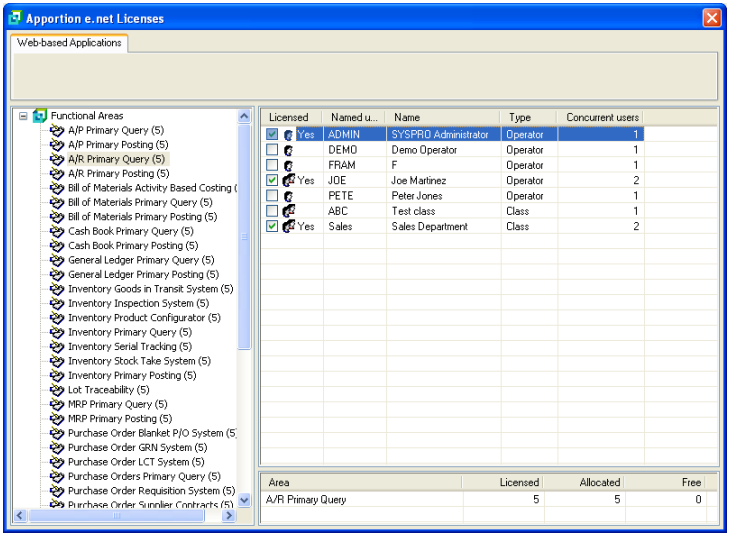
area. When this functional area is displayed, a message will appear directly under the Business Objects tab stating "Licenses allocated exceed licenses available for this functional area". The number of Free licenses in the bottom right pane will also go negative.



If a Guest / anonymous user is already consuming licenses for functional areas and the number of concurrent users against this operator is increased using the operator maintenance utility, it is possible that this will cause the number of licenses to exceed those available. If this occurs, a message similar to that below will be displayed.

8.1.4.4. Maintaining the Business Objects functional areas

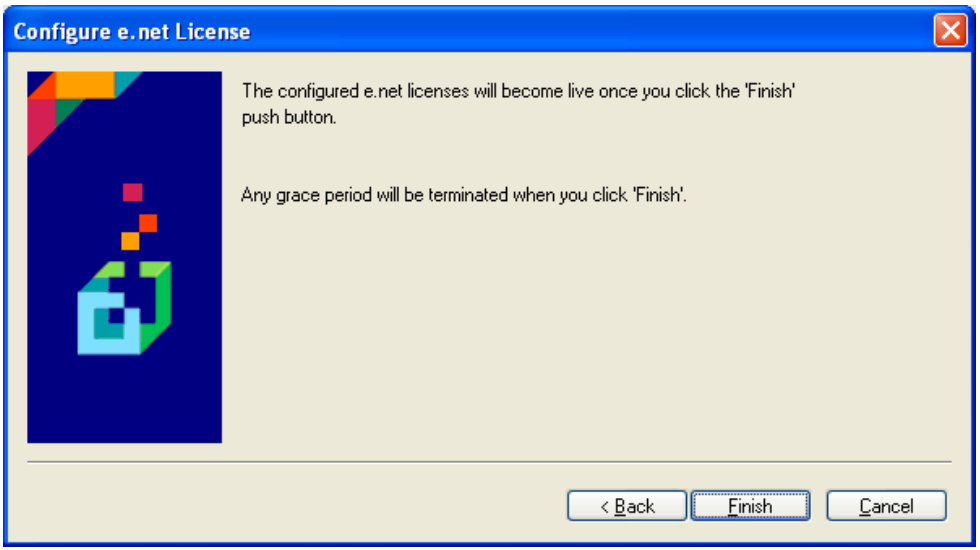
When you select the "Web-based Applications…" button from the "Configure e,net licenses" screen, a screen similar to the one from the "Business Objects…" button will be displayed.



The list of operators displayed in the right-hand pane excludes those operator names that begin with two underscore characters as they cannot logon, operators who have the option "No access to Business Objects" set against them on the e.net tab of the operator maintenance utility and those that are a member of a class. In addition to the operator codes, the list of available classes is also displayed. These have a type of "Class" against them. Entries with a type of "Operator" that have a number of concurrent users other than 1, are Guest / anonymous users. The rest of the utility works in the same way as for Business Objects.

8.1.4.5. Updating the changes

All of the changes to the business object and web-based application functional areas are held in a temporary area until they are either posted (when you select the **Finish** option on the screen below, or you cancel out, in which case they are discarded.



The updated changes will be used when the operators next logon to e.net solutions or the web-based applications.

8.1.5. Evaluation Licensing

Upon request, it is possible to install SYSPRO for purposes of evaluation. Using the SYSPRO Installation CD it is possible to install SYSPRO with a sample company and sample data for such purposes. The sample company, called The Outdoors Company may be used in conjunction with the evaluation license which allows access the sample data. The license is time limited. If you have obtained an older version of the evaluation license it may have expired. In this case please contact SYSPRO and request a newer version of the SYSPRO Installation CDs or a new license file.

The evaluation installation allows the user to install data from a sample company, The Outdoors Company, and the evaluation license allows access the sample data.

8.2. Installing and Apportioning

For information on installing and apportioning licenses please read Appendix C, *Installing and Apportioning Licenses* [C–1].

9

Troubleshooting

Objectives - In this chapter we deal with some of the problems that could be encountered while developing a custom application using e.net solutions. We deal with error handling and some general troubleshooting tips.

Every programmer knows that no matter how hard they try to program correctly, there will always be something that does not work out as planned. In this chapter we present a few issues that have caused problems for past e.net solutions programmers so that you can learn from their experience and be aware of these issues.

9.1. Error Handling

In e.net solutions errors are automatically generated when critical problems are encountered.

There are three instances where an error can occur:

i. **COM:** Errors received by COM will result in an exception being raised. This generally happens when a business object cannot complete its' task, or when it receives an unexpected parameter. The result is the abnormal termination of the process.

Example 9.1. Error: Unexpected Parameter Sent

The XML Schema (**`INVQRY.XSD`**) associated with the Inventory Query object (**INVQRY**) accepts specific elements. If one of the elements received is not supported by the Schema an exception is raised. Therefore, if the spelling of the element `<IncludeBins>` is incorrect an exception will be raised.

The Inventory Query object (**INVQRY**) requires a valid stock code - if the stock code is not valid then the object cannot continue and an exception is raised.

ii. **Business object:** Errors received from the failure of a requested operation are written to the XML string returned by the business object. The error does not raise an exception to COM. Consequently processes are not terminated.

iii. **Internal to custom application using e.net solutions:** When a custom application is programmed to identify and handle errors internally, the application can raise an exception internally.

When an exception is raised an exception number and an exception message are generated. Messages are defined in a set of text files with the extension **`*.IMP`** residing in the **`\programs\`** folder of the SYSPRO 6.0 directory. The message files are organized in a modular manner matching the logical product areas of SYSPRO and are language specific. This logic is reflected in the naming convention used for message files, as follows:

`[MSG] [logical area][language code].IMP`

Where:

[MSG]	An abbreviation of the word "Message".
[logical area]	Is a logical area of the product.
[language code]	A number corresponding to a language selection passed by `Utilities.Logon` method at the start of the session (see Table 9.1, “Language Code Examples” [9–3]).

If a language code is passed but no corresponding message file is found then the system will revert to using "EN", English. If a language code of zero is passed to the `Utilities.Logon` method then the SYSPRO operator's default language code will be used.

Table 9.1, “Language Code Examples” [9–3] provides examples of language codes shipped with SYSPRO. Any ISO 693-1 standard language code can be applied by development.

Table 9.1. Language Code Examples

Code	Language
00	Use operator's default
EN	English
FR	French
ES	Spanish

All message numbers are 6 digits, comprised of:

- a two digit set number
- a four digit sub-message number

Example 9.2. Message Number

The message number 210004 is set 21 (Accounts Receivable), sub-message 0004 returning the message: `Customer '%1' not found`.

The message file can contain parameters, such as %1, so that the messages can be more descriptive. It is important to remember that often a message in e.net solutions is displayed out of context and therefore the messages should be brief but precise. Conversely, in the above example, simply saying `Customer not found` when importing a hundred sales orders makes it difficult to correct the problem.

Double Hash "##" is a place holder for the two digits used to define a language. Substitute the "##" to match the required language. See Table 9.1, “Language Code Examples” [9–3] for a list of available languages and the `LanguageCode` options that can be passed by the `Utilities.Logon` method.

Table 9.2. Error Handling Message Files

Message file	Product area	Set numbers
MSGCOM##.IMP	Core	10 General Messages 11 Security Messages 12 Disk error messages 13 SQL Messages 34 Report Writer Messages 35 Business to Business Messages 36 Archive Messages 38 Document Flow Manager Messages 40 XML Parsing Error Messages 41 Contact Management Messages 42 Reporting Services Messages 4? Reserved for future Core Messages
MSGFIN##.IMP	Financial	20 Accounts Payable Messages 21 Account Receivable Messages 22 Cash Book Messages 23 General Ledger messages 33 Assets Register Messages 5? Reserved for Future Financial Messages
MSGDIS##.IMP	Distribution	24 Inventory Control Messages 25 Purchase Order Messages 26 Sales Analysis Messages 27 Sales Order Messages 32 Lot Traceability Messages 39 Landed Cost Tracking

Message file	Product area	Set numbers
		60 Blanket Sales Orders 61 Serial Tracking 62 Multiple Delivery Notes 63 Trade Promotion Management 64 Load Planning 6? Reserved for Future Distribution Messages
MSGMAN##.IMP	Manufacturing	28 Bill of Material Messages 29 Quotation Messages 30 Work in Progress Messages 31 Requirements Planning Messages 37 Engineering Change Control Messages 70 Projects and Contracts 71 Product Configurator 72 Inventory forecasting 7? Reserved for Future Manufacturing Messages

9.2. General Troubleshooting

To assist with the process of debugging e.net solutions applications the SYSPRO application server provides a diagnostic aid that, when set, causes **`ENCORE.DLL`** to log the sequence and frequency of the calls to a text file named **`enetlog.txt`**. This file is generated in the folder **`\Base\Settings\`** of the SYSPRO 6.0 installation.

The log file provides a trace, identifying the business objects invoked, their frequently and sequence. An example of **`enetlog.txt`** is shown in Figure 9.1, “e.net solutions Log Text” [9–6]. See Table 9.3, “e.net solutions Trace File” [9–7] for a more detailed description.

Figure 9.1. e.net solutions Log Text

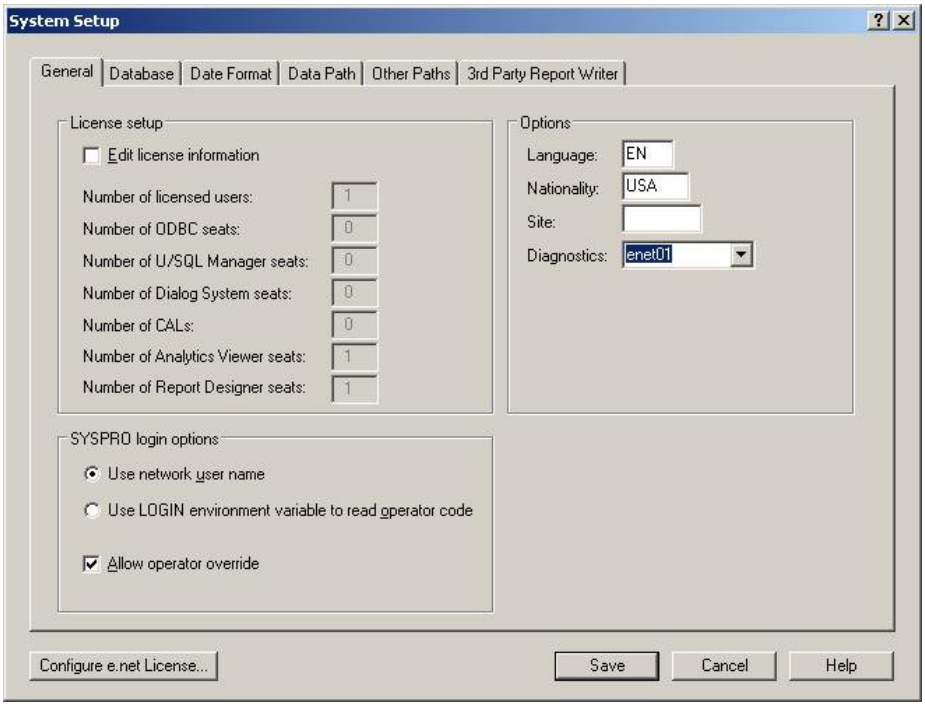
Date	Time	Method			Object	Status	Operator	UserID
2006-09-06	08:28:34:33	Logon	w	A	97	COMLGN 0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:28:34:35	Logon	w	E	97	0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:28:34:38	GetLogonProfile	w	S	93	COMLGN 0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:28:34:38	GetLogonProfile	w	B	93	COMLGN 0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:28:34:39	GetLogonProfile	w	A	94	COMLGN 0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:28:36:60	Query	w	S	95	0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:28:36:60	Query	w	B	95	COMQMN 0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:28:36:64	Query	w	A	96	COMQMN 0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:28:36:64	Query	w	E	96	COMQMN 0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:28:38:81	Query	w	S	95	0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:28:38:81	Query	w	B	95	COMQDS 0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:28:38:86	Query	w	A	96	COMQDS 0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:28:38:86	Query	w	E	96	COMQDS 0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:29:29:06	Post	w	S	96	0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:29:29:06	Post	w	B	96	COMTDS 0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:29:29:19	Post	w	A	97	COMTDS 0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:29:29:19	Post	w	E	97	COMTDS 0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:29:29:20	Query	w	S	95	0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:29:29:20	Query	w	B	95	COMQDS 0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:29:29:22	Query	w	A	96	COMQDS 0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:29:29:22	Query	w	E	96	COMQDS 0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:29:30:80	Query	w	S	95	0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:29:30:80	Query	w	B	95	SORQSO 0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:29:34:99	Query	w	S	94	0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-06	08:29:34:99	Query	w	B	94	SORQSO 0000000000	ADMIN	8EBA2BFCF798F04692FC2194749CC18C0
2006-09-19	16:17:26:92	Logon	w	A	97	COMLGN 0000000000	ADMIN	AEE6B0A68B4EF54985C8D3BB05451CE70

Table 9.3. e.net solutions Trace File

Column	Description
Date	The date, in the format YYYY-MM-DD, on which the action occurred.
Time	The time, in the format HH:MM:SS:NN, at which the action occurred.
Method	The e.net solutions method call used to produce the action.
e.net solutions subsystem	Traces which e.net connection you are using: S = Standard, W = Web Based.
Process Step	The Method step: • S = Start (SYSPRO is aware that a business object has been entered) • B = Before (Before the Business Object processes the data) • A = After (After the Business Object processes the data) • E = Exit (SYSPRO ends the Business Object process) This works in conjunction with the following field.
Processes Running	This tracks the number of objects currently open on the machine at that particular process step. This is primarily used for tracing memory leaks.
Object	The business object invoked by the method call.
Status	The message number as defined in Section 9.1, “Error Handling” [9–1]. A return code of 000000000 means that no error was returned.
Operator	The name of the SYSPRO operator authenticated against the UserID.
UserID	The UserID used to process the business object.

Procedure 9.1. Configuring e.net solutions Trace Logging

1. Logon to SYSPRO.
2. From the main menu select, Setup → System Setup. The System Setup dialog is displayed.



3. From the **Options** group, select Diagnostics → enet01, then click **Save**.
4. When prompted click **OK**, then logout of **SYSPRO** and login again.
5. Open **`enetlog.txt`**. Take note of the current contents.
6. Logon to **SYSPRO** using the **Web Application** (any e.net solutions utility or application).
7. Verify that new entries, caused by the e.net solutions logon have been written to the file.

   Entries should include **COMLGN** and **COMQMN**.

10

Sample Applications

Objectives - This chapter presents code samples that demonstrate the use of e.net solutions to create an application using ASP.NET. We have presented these code sections to help you integrate what you have learned and incorporate it into one programming environment.

One of the difficulties facing us when trying to learn a new system or programming language is being able to comprehend the big picture of what can be done with the limited knowledge that we have of the system or language while we are learning it. As you have read through this book you have learned the basics of the e.net solutions system and how to begin programming with it in VBScript, and ASP.NET C# and VB. In this section we take you one step further by providing some simple applications of the knowledge that you have gained.

10.1. Simple ASP.NET logon

The first step of any application is to provide a way to logon to the SYSRPO application server. The following ASP.NET script does this with four user entry text boxes and a submit button.

Example 10.1. Code Sample for logon.aspx in VB.NET

```
<%@ Page Language="VB" %>
<script runat="server">

Sub btnlogon_Click(sender As Object, e As EventArgs)
Dim Util As New Encore.Utilities()

Dim uid As String
uid = Util.logon(tbUser.Text, tbUserPass.Text, tbComp.Text, \
     tbCompPass.Text, Encore.Language.ENGLISH, 0, 0, "")
lblUid.Text = uid
Util.Logoff(uid)
End Sub

</script>
<html>
<head>
```

```
</head>
<body>
<form runat="server">
<table width="402" border="1">
<tr>
<td width="178">
<div align="right">Operator Name/Code:</div>
</td>
<td width="208">
<asp:TextBox ID="tbUser" runat="server"></asp:TextBox>
</td>
</tr>
<tr>
<td>
<div align="right">Operator Password:</div>
</td>
<td>
<asp:TextBox ID="tbUserPass" runat="server">
</asp:TextBox>
</td>
</tr>
<tr>
<td>
<div align="right">Company ID: </div>
</td>
<td>
<asp:TextBox ID="tbComp" runat="server"></asp:TextBox>
</td>
</tr>
<tr>
<td>
<div align="right">Company Password: </div>
</td>
<td>
<asp:TextBox ID="tbCompPass" runat="server">
</asp:TextBox>
</td>
</tr>
</table>
<p>
<asp:Button id="btnlogon" onclick="btnlogon_Click"
runat="server" Text="logon"></asp:Button>
</p>
<p>
<asp:Label id="lblUid" runat="server" text="">
</asp:Label>
</p>
</form>
</body>
</html>
```

Remember that where ever you see \ at the end of a line of code and the next line indented, this means that the text was too long for the page size of this book but the indented text belongs of the code line above.

The above code demonstrates a simple table with four text box fields and a button. There is obviously a lot more that can be done (like validation rules, password type text boxes, and foreground/background coloring) but it demonstrates the basic variables needed and button click sequence that submits that data to the logon SYSPRO business object.

Save the **`Logon.aspx`** file from the SampleCode download into your IIS localhost directory (usually **`c:\Inetpub\wwwroot\`** or **`c:\Inetpub\wwwroot\Sysproweb`** if you are using the SYSPRO web-based applications). Load the .aspx file in your web browser (usually http://localhost/Logon.aspx) and use your SYSPRO user details to logon and display your UserID.

Most of the other business objects require the formation of an XmlIn string and the translating or presentation of the XmlOut string that is returned by the Object. We have already covered some of the XML and XSL requirements of e.net solutions, and in the next section we will apply that knowledge using the COMFND business object.

10.2. Submitting XmlIn and getting XmlOut

Having successfully logged on through the code presented in the previous section, we must now expand our usage of SYSPRO e.net solutions. We will utilize the Query.Query function by using the business object COMFND to demonstrate the use of XmlIn and XmlOut.

Remember that the e.net Diagnostics suite contains a tool within the **Harness** screen that will wrap the XmlIn string for use in VB or C#. We have used the wrapping tool, but have renamed the "With" variable from `Document` to `XmlIn`.

Example 10.2. ASP.NET code for using COMFND.aspx

```
 <%@ Page Language="VB" %>
<script runat="server">

    Dim uid As String
    Dim Xmlout As String
    Dim Util As New Encore.Utilities()
    Dim Query As New Encore.Query()

    Sub btnlogon_Click(sender As Object, e As EventArgs)
    uid = Util.logon(tbUser.Text, tbUserPass.Text,  \
         tbComp.Text, tbCompPass.Text, Encore.Language. \
         ENGLISH, 0, 0, "")
    lblUid.Text = uid
    Util.Logoff(uid)
    End Sub

    Sub btnTrial_Click(sender As Object, e As EventArgs)
    uid = Util.logon(tbUser.Text, tbUserPass.Text,  \
         tbComp.Text, tbCompPass.Text, Encore.Language. \
         ENGLISH, 0, 0, "")

    Dim XmlIn As New System.Text.StringBuilder

    With Xmlin
          .Append("<?xml version=""1.0"" encoding=""Windows \
                -1252""?>")
          .Append("<!-- Copyright 1994-2006 SYSPRO Ltd.-->")
          .Append("<!--")
          .Append("An example XML instance to demonstrate")
          .Append("use of the Generic find Business Object")
          .Append("-->")
          .Append("<Query xmlns:xsd=""http://www.w3.org/ \
                2001/XMLSchema-instance"" xsd:noNamespace \
                SchemaLocation=""COMFND.XSD"">")
          .Append("<TableName>InvWarehouse</TableName>")
          .Append("<ReturnRows>1000</ReturnRows>")
          .Append("<Columns>")
          .Append("<Column>StockCode</Column>")
          .Append("<Column>Warehouse</Column>")
          .Append("</Columns>")
          .Append("<Where>")
          .Append("<Expression>")
          .Append("<OpenBracket>(</OpenBracket>")
          .Append("<Column>Warehouse</Column>")
          .Append("<Condition>EQ</Condition>")
          .Append("<Value>FG</Value>")
```

```
          .Append("<CloseBracket>)</CloseBracket>")
          .Append("</Expression>")
          .Append("<Expression>")
          .Append("<AndOr>Or</AndOr>")
          .Append("<OpenBracket>(</OpenBracket>")
          .Append("<Column>Warehouse</Column>")
          .Append("<Condition>EQ</Condition>")
          .Append("<Value>E</Value>")
          .Append("<CloseBracket>)</CloseBracket>")
          .Append("</Expression>")
          .Append("</Where>")
          .Append("<OrderBy>")
          .Append("<Column>Warehouse</Column>")
          .Append("</OrderBy>")
          .Append("</Query>")
          .Append("")
    End With

    Xmlout = Query.Query(uid, "COMFND", XmlIn.ToString)
    lblOutput.Text = Xmlout
    Util.Logoff(uid)
    End Sub

</script>
<html>
<head>
</head>
<body>
 <form runat="server">

  <table width="402" border="1">
    <tbody>
      <tr>
        <td width="178">
          <div align="right">Operator Name/Code:
          </div>
        </td>
        <td width="208">
            <asp:TextBox id="tbUser" runat="server"> \
                  </asp:TextBox>
         </td>
      </tr>
      <tr>
         <td>
             <div align="right">Operator Password:
             </div>
         </td>
         <td>
             <asp:TextBox id="tbUserPass" runat="server"> \
                   </asp:TextBox>
          </td>
```

```
      </tr>
       <tr>
          <td>
             <div align="right">Company ID:
             </div>
          </td>
          <td>
              <asp:TextBox id="tbComp" runat="server"> \
                    </asp:TextBox>
           </td>
       </tr>
       <tr>
           <td>
               <div align="right">Company Password:
                </div>
           </td>
           <td>
              <asp:TextBox id="tbCompPass" runat= \
                     "server"></asp:TextBox>
           </td>
      </tr>
    </tbody>
  </table>
  <p>
    <asp:Button id="btnlogon" onclick="btnlogon_Click" \
          runat="server" Text="logon"></asp:Button>
   </p>
   <p>
      <asp:Label id="lblUid" runat="server" text=""> \
            </asp:Label>
   </p>
   <p>
       <asp:Button id="btnTrial" onclick="btnTrial_Click"  \
            runat="server" Text="Trial"></asp:Button>
    </p>
    <p>
       <asp:Label id="lblOutput" runat="server"></asp:Label>
   </p>
</form>
</body>
</html>
```

As you can see from reading through the above code, we took the logon program and added the COMFND function to it. The results of the query are displayed through the *lblTrial* label.

Save the **COMFND.aspx** file from the SampleCode download into your IIS localhost

directory (usually **c:\Inetpub\wwwroot** or **c:\Inetpub\wwwroot\Sysproweb** if you are using the SYSPRO web-based applications). Load the .aspx file in your web browser (usually http://localhost/Logon.aspx) and use your SYSPRO user details to logon and display your UserID. Then click on the "Trial" button.

10.3. Using the Data in XmlOut

There are different ways of utilizing the data returned in the XmlOut string. In this section we will show a few of them, ranging from the simple use of asp:Labels to the use of XSL to format and present the data.

10.3.1. Simple Xml Data Usage

ASP.NET contains the functionality that allows us to assign specific XML nodes to string variables using LoadXML(). The following example pulls the company *name*, *email*, and *address* from the XmlOut and assigns the data values to asp:Labels.

Example 10.3. ASP.NET code for ARSQRY.aspx

```
<%@ Page Language="VB" %>
<%@ import Namespace="System.Data" %>
<%@ import Namespace="System.Xml" %>
<%@ import Namespace="Encore" %>
<script runat="server">

    Dim uid As String
    Dim Xmlout As String
    Dim Util As New Encore.Utilities()
    Dim Query As New Encore.Query()

    Sub btnLogon_Click(sender As Object, e As EventArgs)
    uid = Util.logon(tbUser.Text, tbUserPass.Text, tbComp. \
         Text, tbCompPass.Text, Encore.Language.ENGLISH, \
         0, 0, "")
    lblUid.Text = uid
    End Sub

   Sub btnTrial_Click(sender As Object, e As EventArgs)
   'Define the XmlIn to send to ARSQIP
   Dim Xmlin As New StringBuilder()
   With Xmlin
    .Append("<?xml version=""1.0"" encoding=""UTF-8""?>")
    .Append("<Query xmlns:xsd=""http://www.w3.org/2001/ \
         XMLSchema-instance"" xsd:noNamespace \
         SchemaLocation=""ARSQRY.XSD"">")
    .Append("<Key>")
```

```
    .Append("<Customer>000019</Customer>")
    .Append("</Key>")
    .Append("<Option>")
    .Append("<MultiMediaImageType>GIF</MultiMediaImageType>")
    .Append("<IncludeFutures>N</IncludeFutures>")
    .Append("<IncludeTransactions>Y</IncludeTransactions>")
    .Append("<IncludeCheckPayments>Y</IncludeCheckPayments>")
    .Append("<IncludePostDated>Y</IncludePostDated>")
    .Append("<IncludeZeroBalances>N</IncludeZeroBalances>")
    .Append("<IncludeCustomForms>N</IncludeCustomForms>")
    .Append("<AsOfPeriod>C</AsOfPeriod>")
    .Append("<AgeingOption>S</AgeingOption>")
    .Append("<AgeColumn1>30</AgeColumn1>")
    .Append("<AgeColumn2>60</AgeColumn2>")
    .Append("<AgeColumn3>90</AgeColumn3>")
    .Append("<AgeColumn4>120</AgeColumn4>")
    .Append("<AgeColumn5>150</AgeColumn5>")
    .Append("<AgeColumn6>180</AgeColumn6>")
    .Append("<AgeColumn7>210</AgeColumn7>")
    .Append("<XslStylesheet/>")
    .Append("</Option>")
    .Append("</Query>")
End With

    'Send the XmlIn and assign the results to Xmlout STRING
    Xmlout=Query.Query(lblUid.Text, "ARSQRY", XmlIn.ToString)
    lblOutput.Text = Xmlout

    'Display only part of the Xmlout String
    'Declare a new instance of XmlDocument and load
    'Xmlout STRING
    Dim xmlDoc As New XmlDocument
    xmlDoc.LoadXml(Xmlout)

    'Choose the xml nodes to display
    Dim xmlNode1 As XmlNode
    xmlNode1 = xmlDoc.SelectSingleNode("/ARStatement/Header \
        /Name")
    Dim xmlNode2 As XmlNode
    xmlNode2 = xmlDoc.SelectSingleNode("/ARStatement/Header \
        /Email")
    Dim xmlNode3 As XmlNode
    xmlNode3 = xmlDoc.SelectSingleNode("/ARStatement/Header \
        /ShipToAddr1")
    'Dispaly the nodes in asp Labels
    lblName.Text = xmlNode1.InnerText
    lblEmail.Text = xmlNode2.InnerText
    lblAddress.Text = xmlNode3.InnerText

    End Sub
```

```
    Sub btnLogoff_Click(sender As Object, e As EventArgs)
    'Log off the SYSPRO server
    Util.Logoff(lblUid.Text)
    'Empty Visable Variables
    lblUid.Text = ""
    lblOutput.Text= ""
    lblName.Text = ""
    lblEmail.Text = ""
    lblAddress.Text = ""
    tbUser.Text = ""
    tbUserPass.Text = ""
    tbComp.Text = ""
    tbCompPass.Text = ""
    tbCusNum.Text = ""
    End Sub

</script>
<html>
<head>
</head>
<body>
<form runat="server">
<table width="402" border="1">
 <tbody>
  <tr>
   <td width="178">
    <div align="right">Operator Name/Code:
    </div>
   </td>
   <td width="208">
    <asp:TextBox id="tbUser" runat="server"></asp:TextBox>
   </td>
  </tr>
  <tr>
   <td>
    <div align="right">Operator Password:
    </div>
   </td>
   <td>
   <asp:TextBox id="tbUserPass" runat="server"></asp:TextBox>
   </td>
  </tr>
  <tr>
   <td>
    <div align="right">Company ID:
    </div>
   </td>
   <td>
    <asp:TextBox id="tbComp" runat="server"></asp:TextBox>
   </td>
  </tr>
```

```
  <tr>
   <td>
    <div align="right">Company Password:
    </div>
   </td>
   <td>
   <asp:TextBox id="tbCompPass" runat="server"></asp:TextBox>
   </td>
  </tr>
 </tbody>
</table>
<p>
<asp:Button id="btnLogon" onclick="btnLogon_Click" runat= \
    "server" Text="Logon"></asp:Button>
</p>
<p>
<asp:Label id="lblUid" runat="server" text=""> </asp:Label>
</p>
<p>
Please Enter the Customer Number:
<asp:TextBox id="tbCusNum" runat= \
     "server"></asp:TextBox>
</p>
<p>
(remember - the sample data only has customers 1-19)
</p>
<p>
<asp:Button id="btnTrial" onclick="btnTrial_Click" runat= \
     "server" Text="Display Results"></asp:Button>
</p>
<p>
<asp:Label id="lblOutput" runat="server"> </asp:Label>
</p>
<table width="405" border="1">
 <tbody>
  <tr>
   <td width="118">
    Customer Name:</td>
   <td width="271">
    <asp:Label id="lblName" runat="server"></asp:Label></td>
  </tr>
  <tr>
   <td>
     Email:
   </td>
   <td>
    <asp:Label id="lblEmail" runat="server"></asp:Label></td>
  </tr>
  <tr>
   <td>
   Address:</td>
```

```
   <td>
 <asp:Label id="lblAddress" runat= \
      "server"></asp:Label></td>
  </tr>
 </tbody>
</table>
<p>
<asp:Button id="btnLogoff" onclick="btnLogoff_Click"  \
     runat="server" Text="Log Off"></asp:Button>
</p>
</form>
</body>
</html>
```

Save the **ARSQRY.aspx** file into the webroot directory of your IIS **Inetpub** directory (or whatever IIS directory is configured for localhost) and open the file in your web browser. Logon to e.net solutions using the logon textboxes and button provided in the sample code, then enter a customer number and click the **Display Results** button. You will now see the chosen XmlOut nodes displayed in the asp:Labels.

The above example used the SYSPRO Query.Query method. We can also use this simple XML output method for the XmlOut produced by the Transaction.Build method, as demonstrated within the following code.

Example 10.4. SORRSH.aspx

```
<%@ Page Language="VB" %>
<%@ import Namespace="System.Data" %>
<%@ import Namespace="System.Xml" %>
<script runat="server">

    Dim uid As String
    Dim Xmlout As String
    Dim Util As New Encore.Utilities()
    Dim Transaction As New Encore.Transaction()

    Sub btnLogon_Click(sender As Object, e As EventArgs)
    uid = Util.logon(tbUser.Text, tbUserPass.Text, tbComp. \
        Text, tbCompPass.Text, Encore.Language.ENGLISH, \
        0, 0, "")
    lblUid.Text = uid
    End Sub

    Sub btnTrial_Click(sender As Object, e As EventArgs)
```

```
    'Define the XmlIn to send to SORRSH
    Dim Xmlin As New StringBuilder()
    With Xmlin
    .Append("<?xml version=""1.0"" encoding=""Windows-1252 \
          ""?>")
    .Append("<Build xmlns:xsd=""http://www.w3.org/2001/XML \
          Schema-instance"" xsd:noNamespace \
          SchemaLocation=""SORRSH.XSD"">")
    .Append(" <Parameters>")
    .Append("<Customer>" & tbCusNum.Text & "</Customer>")
    .Append("<AllowCustomerOnHold>N </AllowCustomerOnHold>")
    .Append("</Parameters>")
    .Append("</Build>")
    End With

    'Send the XmlIn and assign the results to Xmlout STRING
    Xmlout = Transaction.Build(lblUid.Text, "SORRSH",  \
          XmlIn.ToString)

    'Display only part of the Xmlout String
    'Declare a new instance of XmlDocument and load the
    'Xmlout STRING
    Dim xmlDoc As New XmlDocument
    xmlDoc.LoadXml(Xmlout)

    'Choose the xml nodes to display
    Dim xmlNode1 As XmlNode
    xmlNode1 = xmlDoc.SelectSingleNode("/SoHeader/OrderDate")
    Dim xmlNode2 As XmlNode
    xmlNode2 = xmlDoc.SelectSingleNode("/SoHeader/Contact")
    Dim xmlNode3 As XmlNode
    xmlNode3 = xmlDoc.SelectSingleNode("/SoHeader/Email")
    'Dispaly the nodes in asp Labels
    lblDate.Text = xmlNode1.InnerText
    lblContact.Text = xmlNode2.InnerText
    lblEmail.Text = xmlNode3.InnerText

    End Sub

    Sub btnLogoff_Click(sender As Object, e As EventArgs)
    'Log off the SYSPRO server
    Util.Logoff(lblUid.Text)
    'Empty Visable Variables
    lblUid.Text = ""
    lblDate.Text = ""
    lblContact.Text = ""
    lblEmail.Text = ""
    tbUser.Text = ""
    tbUserPass.Text = ""
    tbComp.Text = ""
    tbCompPass.Text = ""
```

```
    tbCusNum.Text = ""
    End Sub

</script>
<html>
<head>
</head>
<body>
<form runat="server">
<table width="402" border="1">
<tbody>
<tr>
<td width="178">
<div align="right">Operator Name/Code:
</div>
</td>
<td width="208">
<asp:TextBox id="tbUser" runat="server"></asp:TextBox>
</td>
</tr>
<tr>
<td>
<div align="right">Operator Password:
</div>
</td>
<td>
<asp:TextBox id="tbUserPass" runat="server"></asp:TextBox>
</td>
</tr>
<tr>
<td>
<div align="right">Company ID:
</div>
</td>
<td>
<asp:TextBox id="tbComp" runat="server"></asp:TextBox>
</td>
</tr>
<tr>
<td>
<div align="right">Company Password:
</div>
</td>
<td>
<asp:TextBox id="tbCompPass" runat="server"></asp:TextBox>
</td>
</tr>
</tbody>
</table>
<p>
<asp:Button id="btnLogon" onclick="btnLogon_Click" runat= \
```

```
     "server" Text="Logon"></asp:Button>
</p>
<p>
<asp:Label id="lblUid" runat="server" text=""> </asp:Label>
</p>
<p>
Please Enter the Customer Number:
<asp:TextBox id="tbCusNum" runat="server"></asp:TextBox>
</p>
<p>
(remember - the sample data only has customers 1-19)
</p>
<p>
<asp:Button id="btnTrial" onclick="btnTrial_Click" runat= \
     "server" Text="Display Results"></asp:Button>
</p>
<table width="405" border="1">
<tbody>
<tr>
<td width="118">
Order Date:
</td>
<td width="271">
<asp:Label id="lblDate" runat="server"></asp:Label></td>
</tr>
<tr>
<td>
Contact:
</td>
<td>
<asp:Label id="lblContact" runat="server"></asp:Label></td>
</tr>
<tr>
<td>
E Mail:
</td>
<td>
<asp:Label id="lblEmail" runat="server"></asp:Label></td>
</tr>
</tbody>
</table>
<p>
<asp:Button id="btnLogoff" onclick="btnLogoff_Click" \
     runat="server" Text="Log Off"></asp:Button>
</p>
</form>
</body>
</html>
```

Save the **SORRSH.aspx** file from the SampleCode download file into your IIS localhost directory (usually **c:\Inetpub\wwwroot** or **c:\Inetpub\wwwroot\Sysproweb** if you are using the SYSPRO web-based applications). Load the .aspx file in your web browser (usually http://localhost/Logon.aspx) and use your SYSPRO user details to logon and display your UserID. Enter a Customer number, then click on the "Display Results" button to the results.

10.3.2. Using XSL to Transform XML Data

As we have seen in previous sections of this book, XSL stylesheets are capable of transforming the data returned in the XmlOut into many different formats. For the purposes of this book we will use XSL that outputs to HTML.

The XSL file will take the data within the XML nodes and allow us to apply a predefined HTML template to the data. This will allow us to customize where specific details are displayed, the order in which certain fields appear, and the text formatting, fonts, colors, etc, that will make the data more readable and more useful within the application.

The following **.xsl** file will use the same XmlOut as the previous example, but will format it very differently once incorporated into the sample application.

Example 10.5. SORRSH.xsl

```
<xsl:stylesheet version="1.0" xmlns:xsl="http://www\
   .w3.org/1999/XSL/Transform" xmlns:SALARE="SALARE" \
   xmlns:SALSLS="SALSLS" xmlns:TBLART="TBLART" \
   xmlns:SALBRN="SALBRN" xmlns:ARSMST="ARSMST">
<xsl:template match="SoHeader">
<table border="1">
<tr>
<td>Customer: </td>
<td> <xsl:value-of select="Customer"/> </td>
</tr>
<tr>
<td>Currency: </td>
<td> <xsl:value-of select="Currency"/> </td>
</tr>
<tr>
<td>ShippingInstrs: </td>
<td> <xsl:value-of select="ShippingInstrs"/> </td>
</tr>
<tr>
<td>Area: </td>
<td> <xsl:value-of select="Area"/> </td>
```

```
</tr>
<tr>
<td>SALARE:Description: </td>
<td> <xsl:value-of select="SALARE:Description"/> </td>
</tr>
<tr>
<td>TBLART:Description: </td>
<td> <xsl:value-of select="TBLART:Description"/> </td>
</tr>
<tr>
<td>SALSLS:Name: </td>
<td> <xsl:value-of select="SALSLS:Name"/> </td>
</tr>
<tr>
<td>SALBRN:Description: </td>
<td> <xsl:value-of select="SALBRN:Description"/> </td>
</tr>
<tr>
<td>ARSMST:Name: </td>
<td> <xsl:value-of select="ARSMST:Name"/> </td>
</tr>
<tr>
<td>TaxStatus: </td>
<td> <xsl:value-of select="TaxStatus"/> </td>
</tr>
<tr>
<td>Salesperson: </td>
<td> <xsl:value-of select="Salesperson"/> </td>
</tr>
<tr>
<td>CustomerPoNumber: </td>
<td> <xsl:value-of select="CustomerPoNumber"/> </td>
</tr>
<tr>
<td>OrderDate: </td>
<td> <xsl:value-of select="OrderDate"/> </td>
</tr>
<tr>
<td>SuggestedShipDate: </td>
<td> <xsl:value-of select="SuggestedShipDate"/> </td>
</tr>
<tr>
<td>Branch: </td>
<td> <xsl:value-of select="Branch"/> </td>
</tr>
<tr>
<td>SpecialInstrs: </td>
<td> <xsl:value-of select="SpecialInstrs"/> </td>
</tr>
<tr>
<td>DefaultOrdType: </td>
```

```
<td> <xsl:value-of select="DefaultOrdType"/> </td>
</tr>
<tr>
<td>CompanyTaxNumber: </td>
<td> <xsl:value-of select="CompanyTaxNumber"/> </td>
</tr>
<tr>
<td>SoldToAddr1: </td>
<td> <xsl:value-of select="SoldToAddr1"/> </td>
</tr>
<tr>
<td>SoldToAddr2: </td>
<td> <xsl:value-of select="SoldToAddr2"/> </td>
</tr>
<tr>
<td>SoldToAddr3: </td>
<td> <xsl:value-of select="SoldToAddr3"/> </td>
</tr>
<tr>
<td>SoldToAddr4: </td>
<td> <xsl:value-of select="SoldToAddr4"/> </td>
</tr>
<tr>
<td>SoldToAddr5: </td>
<td> <xsl:value-of select="SoldToAddr5"/> </td>
</tr>
<tr>
<td>SoldPostalCode: </td>
<td> <xsl:value-of select="SoldPostalCode"/> </td>
</tr>
<tr>
<td>Email: </td>
<td> <xsl:value-of select="Email"/> </td>
</tr>
<tr>
<td>Contact: </td>
<td> <xsl:value-of select="Contact"/> </td>
</tr>
<tr>
<td>DateLastSale: </td>
<td> <xsl:value-of select="DateLastSale"/> </td>
</tr>
<tr>
<td>DateLastPay: </td>
<td> <xsl:value-of select="DateLastPay"/> </td>
</tr>
<tr>
<td>Telephone: </td>
<td> <xsl:value-of select="Telephone"/> </td>
</tr>
<tr>
```

```
<td>AddTelephone: </td>
<td> <xsl:value-of select="AddTelephone"/> </td>
</tr>
<tr>
<td>Fax: </td>
<td> <xsl:value-of select="Fax"/> </td>
</tr>
</table>
</xsl:template>
</xsl:stylesheet>
```

The sample code for the Sales Order Process in the previous chapter utilizes this XSL to display the data provided by the business object. Please open and examine **`SalesOrderHeader.aspx`** from the downloaded SampleCode file in order to see how the XSL is called and used.

There is a command line XSL transformation utility that can be downloaded from the msdn.microsoft.com website to assist with testing your XSL files. This can be located by going to microsoft.com [http://msdn.microsoft.com] and entering the two words *msxsl* and *download* in to the search. Within the results will be a page called "Command Line Transformations Using msxsl.exe" that contains both the option to download the MSXSL.exe utility as well as detailed instructions on its use.

You can use this utility to view the output of the SORRSH business object after it has been transformed using the SORRSH.xsl example. In your folder containing MSXSL.exe, save the results of the SORRSH business object as SORRSHOut.xml. Also place the SORRSH.xsl transformation file. From the command line use the following command to process the XML file, using the XSL file, and outputting it as SORRSH.htm.

MSXSL SORRSHOut.xml SORRSH.xsl –o SORRSH.htm

You can now view the file SORRSH.htm in your browser.

10.4. Building the Basic Blocks of an Application

Now that you have seen some of the underlying requirements for building an application with e.net solutions, we will start building the foundation of a fully functional e.net solutions application. We will first look at the namespaces needed to set up the application's .NET environment, then we will discuss and supply sample functions that utilize the SYSPRO class methods. We will then look at calling these method functions, and finally we will present some Business Processes that demonstrate the use of the method functions and XSL output to the application.

10.4.1. Setting up the environment

Example 10.6. Import .NET Namespaces in ASP.NET VB

```
<%@ Import Namespace="System" %>
<%@ Import Namespace="System.Data" %>
<%@ Import Namespace="System.Xml" %>
<%@ Import Namespace="System.Xml.Xsl" %>
<%@ Import Namespace="System.IO" %>
<%@ Import Namespace="System.Text" %>
<%@ Import Namespace="Encore" %>
<%@ Page Language="VB" %>
```

Example 10.7. Import .NET Namespaces in ASP.NET C# codebehind

```
Imports System
Imports System.Web.UI
Imports System.Web.UI.WebControls
Imports System.Data
Imports System.Xml
Imports System.Xml.Xsl
Imports System.Xml.XPath
Imports System.IO
Imports System.Text
Imports Encore
```

As you can see from the sample code presented above, we have declared *Data*, *Xml*, *Xsl*, *IO*, *Text*, and SYSPRO's *Encore* for use within this application.

10.4.2. Creating Method Functions

The following code examples demonstrate functions that can be called from the application to access the various SYSPRO Class Methods. We present an example in ASP.NET VB codebehind and C# codebehind.

The **`methods.aspx.vb`** and **`methods.aspx.cs`** contain these code examples as functions. Save **`methods.aspx.vb`** and **`methods.aspx.cs`** to your IIS localhost directory (usually **`c:\Inetpub\wwwroot\`** or **`c:\Inetpub\wwwroot\Sysproweb`** if you are using the SYSPRO web-based applications). Open both files in your code editor and explore them as you read through this section.

Lets start with the Query method from the Query class:

Example 10.8. Query.Query Method in ASP.NET VB codebehind

```
'*******************************************************
'-- SysproQuery does the actual call to the specified
'   Query business object.
'*******************************************************
'Parameters:
'Uid:- GUID returned by Logon
'BusObject:- business object used to do query
'XmlIn:- The xml to be used in query
'*******************************************************
'Returns:- The XML returned by the business object.
'*******************************************************
Function SysproQuery(ByVal Uid As String, ByVal BusObject  \
As String, ByVal XmlIn As String) As String
Dim xmlOut As String
Dim EncoreQuery As New Encore.Query()

xmlOut = EncoreQuery.Query(Uid, BusObject, XmlIn)
EncoreQuery = Nothing

Return xmlOut
End Function
```

Example 10.9. Query.Query Method in ASP.NET C# codebehind

```
//*********************************************************
//- SysproQuery does the actual call to the specified
//  Query business object.
//*********************************************************
//Parameters:
//Uid:- GUID returned by Logon
//BusObject:- business object used to do query
//XmlIn:- The xml to be used in query
//*********************************************************
//Returns:- The XML returned by the business object.
//*********************************************************
string SysproQuery(string Uid, string BusObject,  \
string XmlIn) {
string xmlOut;
Encore.Query EncoreQuery = new Encore.Query();
xmlOut = EncoreQuery.Query(Uid, BusObject, XmlIn);
EncoreQuery = null;
return xmlOut;
}
```

As you can see, the functions are fairly simple. At this stage of programming we are not worried about building Xml strings or creating or using a UserID. Other parts of the application will create and maintain these variables. The next sample code presents the function using the Transaction.Build method.

Example 10.10. Transaction.Build Method in ASP.NET VB codebehind

```
'*********************************************************
'-- SysproBuild does the actual call to the specified
'   Build business object.
'*********************************************************
'Parameters:
'Uid:- GUID returned by Logon
'BusObject:- business object used to do build
'XmlIn:- The xml to be used in build
'*********************************************************
'Returns:- The XML returned by the business object.
'*********************************************************
Function SysproBuild(ByVal Uid As String, ByVal BusObject  \
As String, ByVal XmlIn As String) As String
Dim xmlOut As String
Dim EncoreBuild As New Encore.Transaction()

xmlOut = EncoreBuild.Build(Uid, BusObject, XmlIn)
EncoreBuild = Nothing

Return xmlOut
End Function
```

Example 10.11. Transaction.Build Method in ASP.NET C# codebehind

```
//*******************************************************
//- SysproBuild does the actual call to the specified
//  Build business object
//*******************************************************
//Parameters:
//Uid:- GUID returned by Logon
//BusObject:- business object used to do build
//XmlIn:- The xml to be used in build
//*******************************************************
//Returns:- The XML returned by the business object.
//*******************************************************
string SysproBuild(string Uid, string BusObject,  \
    string XmlIn) {
string xmlOut;
Encore.Transaction EncoreBuild = new  \
    Encore.Transaction();
xmlOut = EncoreBuild.Build(Uid, BusObject, XmlIn);
EncoreBuild = null;
return xmlOut;
}
```

You will have noticed by now that the functions are very similar to each other. Each requires the input of the UserID, the name of the business object, and the XML input that the business object needs in order to create the required output XML.

Let's continue by looking at a function for Transaction.Post:

Example 10.12. Transaction.Post Method in ASP.NET VB codebehind

```
'*********************************************************
'-- SysproPost does the actual call to the specified
'   Post business object
'*********************************************************
'Parameters:
'Uid:- GUID returned by Logon
'BusObject:- business object used to do post
'XmlParam:- The parameter xml to be used in post
'XmlIn:- The input xml to be used in post
'*********************************************************
'Returns:- The XML returned by the business object.
'*********************************************************
Function SysproPost(ByVal Uid As String, ByVal BusObject  \
As String, ByVal XmlParam As String, ByVal XmlIn As  \
String) As String
Dim xmlOut As String
Dim EncorePost As New Encore.Transaction()

xmlOut = EncorePost.Post(Uid, BusObject, XmlParam, XmlIn)
EncorePost = Nothing

Return xmlOut
End Function
```

Example 10.13. Transaction.Post Method in ASP.NET C# codebehind

```
//*******************************************************
//- SysproPost does the actual call to the specified
//  Post business object
//*******************************************************
//Parameters:
//Uid:- GUID returned by Logon
//BusObject:- business object used to do post
//XmlParam:- The parameter xml to be used in post
//XmlIn:- The input xml to be used in post
//*******************************************************
//Returns:- The XML returned by the business object.
//*******************************************************
string SysproPost(string Uid, string BusObject, string  \
XmlParam, string XmlIn) {
string xmlOut;
Encore.Transaction EncorePost  = new Encore.Transaction();
xmlOut=EncorePost.Post(Uid, BusObject, XmlParam, XmlIn);
EncorePost = null;
return xmlOut;
}
```

The Transaction.Post method also uses the Xml Parameter (XmlParam), but in many cases it is left empty. The following Setup and Transaction functions will also include the XmlParam variable so that it can be used within the application.

We will now look at sample function code for the Setup Class methods - Add, Update, and Delete.

Example 10.14. Setup.Add Method in ASP.NET VB codebehind

```
'*********************************************************
'-- SysproAdd does the actual call to the specified
'   Add business object.
'*********************************************************
'Parameters:
'Uid:- GUID returned by Logon
'BusObject:- business object used to do update
'XmlParam:- The parameter xml to be used in update
'XmlIn:- The input xml to be used in update
'*********************************************************
'Returns:- The XML returned by the business object.
'*********************************************************
Function SysproAdd(ByVal Uid As String, ByVal BusObject  \
As String, ByVal XmlParam As String, ByVal XmlIn As  \
String) As String
Dim xmlOut As String
Dim EncoreAdd As New Encore.Setup()

xmlOut = EncoreAdd.Add(Uid, BusObject, XmlParam, XmlIn)
EncoreAdd = Nothing

Return xmlOut
End Function
```

Example 10.15. Setup.Add Method in ASP.NET C# codebehind

```
//*********************************************************
//- SysproAdd does the actual call to the specified
//  Add business object.
//*********************************************************
//Parameters:
//Uid:- GUID returned by Logon
//BusObject:- business object used to do update
//XmlParam:- The parameter xml to be used in update
//XmlIn:- The input xml to be used in update
//*********************************************************
//Returns:- The XML returned by the business object.
//*********************************************************
string SysproAdd(string Uid, string BusObject, string  \
XmlParam, string XmlIn) {
string xmlOut;
Encore.Setup EncoreAdd = new  Encore.Setup();
xmlOut = EncoreAdd.Add(Uid, BusObject, XmlParam, XmlIn);
EncoreAdd = null;
return xmlOut;
}
```

Example 10.16. Setup.Update Method in ASP.NET VB codebehind

```
'*********************************************************
'-- SysproUpdate does the actual call to the specified
'   Delete business object.
'*********************************************************
'Parameters:
'Uid:- GUID returned by Logon
'BusObject:- business object used to do update
'XmlParam:- The parameter xml to be used in update
'XmlIn:- The input xml to be used in update
'*********************************************************
'Returns:- The XML returned by the business object.
'*********************************************************
Function SysproUpdate(ByVal Uid As String, ByVal BusObject  \
As String, ByVal XmlParam As String, ByVal XmlIn As  \
String) As String
Dim xmlOut As String
Dim EncoreUpdate As New Encore.Setup()

xmlOut=EncoreUpdate.Update(Uid, BusObject, XmlParam, XmlIn)

EncoreUpdate = Nothing

Return xmlOut
End Function
```

Example 10.17. Setup.Update Method in ASP.NET C# codebehind

```
//*********************************************************
//- SysproUpdate does the actual call to the specified
//  Delete business object.
//*********************************************************
//Parameters:
//Uid:- GUID returned by Logon
//BusObject:- business object used to do update
//XmlParam:- The parameter xml to be used in update
//mlIn:- The input xml to be used in update
//*********************************************************
//Returns:- The XML returned by the business object.
//*********************************************************
string SysproUpdate(string Uid, string BusObject, string  \
XmlParam, string XmlIn) {
string xmlOut;
Encore.Setup EncoreUpdate = new  Encore.Setup();
xmlOut=EncoreUpdate.Update(Uid, BusObject, XmlParam, XmlIn);
EncoreUpdate = null;
return xmlOut;
}
```

Example 10.18. Setup.Delete Method in ASP.NET VB codebehind

```
'*********************************************************
'-- SysproDelete does the actual call to the specified
'   Delete business object.
'*********************************************************
'Parameters:
'Uid:- GUID returned by Logon
'BusObject:- business object used to do delete
'XmlParam:- The parameter xml to be used in delete
'XmlIn:- The input xml to be used in delete
'*********************************************************
'Returns:- The XML returned by the business object.
'*********************************************************
Function SysproDelete(ByVal Uid As String, ByVal BusObject  \
As String, ByVal XmlParam As String, ByVal XmlIn As  \
String) As String
Dim xmlOut As String
Dim EncoreDelete As Encore.Setup()

xmlOut = EncoreDelete.Delete(Uid, BusObject, XmlParam, XmlIn)
EncoreDelete = Nothing

Return xmlOut
End Function
```

Example 10.19. Setup.Delete Method in ASP.NET C# codebehind

```
//*******************************************************
//- SysproDelete does the actual call to the specified
//  Delete business object.
//*******************************************************
//Parameters:
//Uid:- GUID returned by Logon
//BusObject:- business object used to do delete
//XmlParam:- The parameter xml to be used in delete
//XmlIn:- The input xml to be used in delete
//*******************************************************
//Returns:- The XML returned by the business object.
//*******************************************************
string SysproDelete(string Uid, string BusObject, string  \
XmlParam, string XmlIn)
{
string xmlOut;
Encore.Setup EncoreDelete = new  Encore.Setup();

xmlOut=EncoreDelete.Delete(Uid, BusObject, XmlParam, XmlIn);

EncoreDelete = null;
return xmlOut;
}
```

All the functions presented here from the Setup class allow the user to submit the additional XML Parameters to the business object should they need to. These functions still follow the simple structure of the earlier ones, taking in the UserID, business object, XmlIn and XmlParameter strings and submitting them to the SYSPRO application server through e.net solutions.

The next portion of sample programming presents the more sample functions from the Query class. We have already seen a function for Query.Query, now lets examine Fetch, Browse, NextKey and PreviousKey. These functions do not require the business object name to be supplied as the business object is predetermined for Fetch, Browse, NextKey and PrevKey.

Example 10.20. Query.Fetch Method in ASP.NET VB codebehind

```
'*********************************************************
'-- SysproFetch does the actual call to the specified
'   Fetch Query.
'*********************************************************
'Parameters:
'[Uid:- GUID returned by Logon
'XmlIn:- The input xml to be used in fetch
'*********************************************************
'Returns:- The XML returned by the business object.
'*********************************************************
Function SysproFetch(ByVal Uid As String, ByVal XmlIn  \
As String) As String
Dim xmlOut As String
Dim EncoreFetch As New Encore.Query()

xmlOut = EncoreFetch.Fetch(Uid, XmlIn)
EncoreFetch = Nothing

Return xmlOut
End Function
```

Example 10.21. Query.Fetch Method in ASP.NET C# codebehind

```
//*******************************************************
//- SysproFetch does the actual call to the specified
//  Fetch Query.
//*******************************************************
//Parameters:
//[Uid:- GUID returned by Logon
//XmlIn:- The input xml to be used in fetch
//*******************************************************
//Returns:- The XML returned by the business object.
//*******************************************************
string SysproFetch(string Uid, string XmlIn) {
string xmlOut;
Encore.Query EncoreFetch = new  Encore.Query();
xmlOut = EncoreFetch.Fetch(Uid, XmlIn);
EncoreFetch = null;
return xmlOut;
}
```

Example 10.22. Query.Browse Method in ASP.NET VB codebehind

```
'*********************************************************
'- SysproBrowse does a browse on a given table.
'*********************************************************
'Parameters:
'Uid:- GUID returned by Logon
'XmlIn:- The input xml to be used in the browse
'*********************************************************
'Returns:- The XML returned by the business object.
'*********************************************************
Function SysproBrowse(ByVal Uid As String, ByVal XmlIn  \
As String) As String
Dim xmlOut As String
Dim EncoreBrowse As New Encore.Query()

xmlOut = EncoreBrowse.Browse(Uid, XmlIn)
EncoreBrowse = Nothing

Return xmlOut

End Function
```

Example 10.23. Query.Browse Method in ASP.NET C# codebehind

```
//*******************************************************
//- SysproBrowse does a browse on a given table.
//*******************************************************
//Parameters:
//Uid:- GUID returned by Logon
//XmlIn:- The input xml to be used in the browse
//*******************************************************
//Returns:- The XML returned by the business object.
//*******************************************************
string SysproBrowse(string Uid, string XmlIn) {
string xmlOut;
Encore.Query EncoreBrowse = new Encore.Query();
xmlOut = EncoreBrowse.Browse(Uid, XmlIn);
EncoreBrowse = null;
return xmlOut;
}
```

Example 10.24. Query.NextKey Method in ASP.NET VB codebehind

```
'*********************************************************
'-- SysproNext does the actual call to the
'    next Query.
'*********************************************************
'Parameters:
'Uid:- GUID returned by Logon
'XmlIn:- The input xml to be used in query
'*********************************************************
'Returns:- The XML returned by the Business Object.
'*********************************************************
Function SysproNext(ByVal Uid As String, ByVal XmlIn As \
    String) As String
Dim xmlOut As String
Dim EncoreNext As New Encore.Query()

xmlOut = EncoreNext.NextKey(Uid, XmlIn)

Return xmlOut
End Function
```

Example 10.25. Query.NextKey Method in ASP.NET C# codebehind

```
//*******************************************************
//- SysproNext does the actual call to the
//   next Query.
//*******************************************************
//Parameters:
//Uid:- GUID returned by Logon
//XmlIn:- The input xml to be used in query
//*******************************************************
//Returns:- The XML returned by the Business Object.
//*******************************************************
string SysproNext(string Uid, string XmlIn) {
string xmlOut;
Encore.Query EncoreNext = new Encore.Query();
xmlOut=EncoreNext.NextKey(Uid, XmlIn);
return xmlOut;
}
```

Example 10.26. Query.PreviousKey Method in ASP.NET VB codebehind

```
'*********************************************************
'-- SysproPrevious does the actual call to the
'   previous Query.
'*********************************************************
'Parameters:
'Uid:- GUID returned by Logon
'XmlIn:- The input xml to be used in query
'*********************************************************
'Returns:- The XML returned by the Business Object.
'*********************************************************
Function SysproPrevious(ByVal Uid As String, ByVal XmlIn \
     As String) As String
Dim xmlOut As String
Dim EncorePrev As New Encore.Query()

xmlOut = EncorePrev.PreviousKey(Uid, XmlIn)

Return xmlOut
End Function
```

Example 10.27. Query.PreviousKey Method in ASP.NET C# codebehind

```
//*******************************************************
//- SysproPrevious does the actual call to the
//  previous Query.
//*******************************************************
//Parameters:
//Uid:- GUID returned by Logon
//XmlIn:- The input xml to be used in query
//*******************************************************
//Returns:- The XML returned by the Business Object.
//*******************************************************
string SysproPrevious(string Uid, string XmlIn) {
string xmlOut;
Encore.Query EncorePrev = new Encore.Query();
xmlOut=EncorePrev.PreviousKey(Uid, XmlIn);
return xmlOut;
}
```

All the method functions that we have shown so far have dealt with the basic submission of the UserID and the XML input to the business object. These functions can now be called from within other functions and subroutines that will define the XML input and the business object to use.

10.4.3. Calling the Method Functions

Now that we have defined the basic functions for the processing data through the various methods of the four SYSPRO e.net solutions classes, we will present some functions that call the method functions. The calling functions will follow the following steps:

- Identify the session Logon Details
- Identify the XmlIn string
- Identify the business object
- Send details to the processing method function
- The processing function calls the business object
- The processing function transforms the XmlOut
- The calling function receives the returned and formated data

Before we show sample code that calls the Class Method functions, we need to define a function that will handle the transformation of XML. This is a preliminary function that will be required by other functions that need to transform an XML string through the use of an XSL file.

Example 10.28. Creating the Transform Function in ASP.NET VB codebehind

```
'*********************************************************
'-- Transform does a server-side transform of an xml
'   string and returns HTML --
'*********************************************************
'Parameters:
'xmlin:- The xml to be transformed - can have a xsl
'        directive
'xslin:- The xsl used to transform the incomming xml
'        preferably as a server path ie. "c:\....mac.xsl"
'*********************************************************
'Returns:- Whatever the transform does with the xml,
'          used mostly to generate HTML.
'*********************************************************
Function Transform(ByVal xmlin As String, ByVal xslin  \
As String) As String
Dim xmlout As String
Dim Navigator As XPath.XPathNavigator
Dim Reader As XmlReader
Dim Xmldoc As New XmlDocument()
Dim Trans As New XslTransform()
Dim Builder As New StringBuilder()
Try
Xmldoc.LoadXml(xmlin)
Trans.Load(xslin)
Navigator = Xmldoc.CreateNavigator()
Reader = Trans.Transform(Navigator, Nothing)
While Reader.Read = True
Builder.Append(Reader.ReadInnerXml)
End While
Return Builder.ToString
Catch Exc As Exception
Return "<table width=""100%""><tr><td style=""color: \
red;font-size:large;font-family:verdana"">" & Exc. \
Message & "</span></td></tr><tr><td><hr/></td> \
</tr><tr><td style=""font-family:verdana;font-size: \
medium""><a href=""#"" onClick=""var frame =  \
parent.document.getElementById('winframe'); \
frame.rows = '*,2px';"" style=""color:#006699; \
font-weight:bold""></a></td></tr></table>"
End Try
End Function
```

Example 10.29. Creating the Transform Function in ASP.NET C# codebehind

```
//*******************************************************
//- Transform does a server-side transform of an xml
//   string and returns HTML --
//*******************************************************
//Parameters:
//xmlin:- The xml to be transformed - can have a xsl
//        directive
//xslin:-The xsl used to transform the incomming xml
//       preferably as a server path ie. "c:\....mac.xsl"
//*******************************************************
//Returns:- Whatever the transform does with the xml,
//          used mostly to generate HTML.
//*******************************************************
string Transform(string xmlin, string xslin)
{
 string xmlout;
 System.Xml.XPath.XPathNavigator Navigator;
 XmlReader Reader;
 XmlDocument Xmldoc = new XmlDocument();
 XslTransform Trans = new XslTransform();
 StringBuilder Builder = new StringBuilder();
 try {
   Xmldoc.LoadXml(xmlin);
   Trans.Load(xslin);
   Navigator = Xmldoc.CreateNavigator();
   Reader = Trans.Transform(Navigator, null);
   while (Reader.Read()) {
     Builder.Append(Reader.ReadInnerXml());
   }
   return Builder.ToString();
 } catch (Exception Exc) {
   return "<table width=\"100%\"><tr><td style=\"color:red; \
font-size:large;font-family:verdana\">" + Exc.Message +  \
"</span></td></tr><tr><td><hr/></td></tr><tr><td  \
style=\"font-family:verdana;font-size:medium\"><a href \
=\"#\" onClick=\"var frame = parent.document. \
getElementById('winframe');frame.rows = '*,2px';\"  \
style=\"color:#006699;font-weight:bold\"></a></td> \
</tr></table>";
 }
}
```

As you can see from the sample code presented above, the functions that call a method function and require XML transformation will also have to provide the XSL string for the actual transformation. These are typically .xsl file stored in a directory on the server that can be loaded by a function and submitted as a string variable. You will need to create your own stylesheet files for the business objects that you will be using.

The following code sample shows how an application would call the Query.Query method already described in the previous section.

Example 10.30. Calling the Query Method in ASP.NET VB codebehind

```
'*********************************************************
'-- Query does a query using the special xml string
'   provided as input and returns xml/html
'*********************************************************
'Parameters:
'Uid:- GUID returned by Logon
'BusObject:- business object used to
'            do query
'XmlIn:- The xml to be used in query - can have a
'         xsl directive
'XmlTransform:- Parameter will specify if
'    server/client side transform is required
'XslIn:- The XLS used to transform the
'  incomming xml preferably as a server
'  path ie. "c:\......mac.xsl"
'ContentType:- ByRef parameter
'  representing the content type to be returned by IIS
'*********************************************************
'Returns:_ Whatever the transform does with
'  the xml, used mostly to generate HTML.
'*********************************************************
Function Query(ByVal Uid As String, ByVal BusObject  \
As String, ByVal XmlIn As String, ByVal XmlTransform  \
As String, ByVal XslIn As String, ByRef ContentType  \
As String, Optional ByVal returnLink As Boolean =  \
True, Optional ByVal BubleExc As Boolean = False) As String
Try
'Case statement to toggle between server/client
'side transform
Select Case XmlTransform
Case "C"    'Prefers a client side transform
Return SysproQuery(Uid, BusObject, XmlIn)
Case "S"    'Prefers a server side transform (Default)
ContentType = "text/html"
Return Transform(SysproQuery(Uid, BusObject, XmlIn), XslIn)
End Select
```

```
Catch Exc As Exception
If BubleExc = False Then
If returnLink = True Then
Return "<table width=""100%""><tr><td style=""color:red; \
font-size:large;font-family:verdana"">" & Exc.Message & " \
</span></td></tr><tr><td><hr/></td></tr><tr><td style= \
""font-family:verdana;font-size:medium""><a href=""#""  \
onClick=""var frame = parent.document.getElementById \
('winframe');frame.rows = '*,2px';"" style=""color:#006699; \
font-weight:bold""></a></td></tr></table>"
Else
Return "<table width=""100%""><tr><td style=""color:red; \
font-size:large;font-family:verdana"">" & Exc.Message & " \
</span></td></tr></table>"
End If
Else
Throw Exc
End If
End Try
End Function
```

Example 10.31. Calling the Query Method in ASP.NET C# codebehind

```
//*******************************************************
//-- Query does a query using the special xml string
//   provided as input and returns xml/html
//*******************************************************
//Parameters:
//id:- GUID returned by Logon
//BusObject:- business object used to
//            do query
//XmlIn:- The xml to be used in query - can have a
//         xsl directive
//XmlTransform:- Parameter will specify if
//'   server/client side transform is required
//'XlIn:- The XLS used to transform the
//' incomming xml preferably as a server
//' path ie. "c:\......mac.xsl"
//ContentType:- ByRef parameter
//  representing the content type to be returned by IIS
//*******************************************************
//Returns:_ Whatever the transform does with
// the xml, used mostly to generate HTML.
//*******************************************************
string Query(string Uid, string BusObject, string XmlIn,  \
```

```
string XmlTransform, string XslIn, ref string ContentType) {
try {
if (XmlTransform == "C") {
return SysproQuery(Uid, BusObject, XmlIn);
} else if (XmlTransform == "S") {
ContentType = "text/html";
return Transform(SysproQuery(Uid, BusObject, XmlIn), \
XslIn);
} else {
return SysproQuery(Uid, BusObject, XmlIn);
}
}
catch (Exception Exc) {
return ("<table width=\"100%\"><tr><td style=\"color:" +
 "red;font-size:large;font-family:verdana\">" +
 Exc.Message + "</span></td></tr><tr><td><hr/>" +
 "</td></tr><tr><td style=\"font-family:verdana;" +
 "font-size:medium\"><a href=" +
 "\"#\" onClick=\"var frame = parent.document." +
 "getElementById(\'winframe\');frame.rows = \'" +
 "*,2px\';\" style=\"color:#006699;font-weight:bold\">" +
"</a></td></tr></table>");
}
}
```

Please note that there are no 'optional' variables in C#, and so the above C# sample code differs from the VB code in it's variable declarations.

Look through the above functions and take note of flow of data within the "try" statement. We can specify whether a server side or client side transformation of the XmlOut string will take place, the default setting not using the transformation function option.

The following code sample demonstrates the use of the Transaction.Build calling function.

Example 10.32. Calling the Build Method in ASP.NET VB codebehind

```
'*********************************************************
'-- Build does a build using the special xml string
'   provided as input and returns xml/html
'*********************************************************
'Parameters:
'Uid:- GUID returned by Logon
'BusObject:- business object used to
'            do query
'XmlIn:- The xml to be used in query - can have a
'         xsl directive
'XmlTransform:- Parameter will specify if
'    server/client side transform is required
'XslIn:- The XLS used to transform the
'  incomming xml preferably as a server
'  path ie. "c:\......mac.xsl"
'ContentType:- ByRef parameter
'  representing the content type to be returned by IIS
'*********************************************************
'Returns:_ Whatever the transform does with
'  the xml, used mostly to generate HTML.
'*********************************************************
Function Build(ByVal Uid As String, ByVal BusObject  \
As String, ByVal XmlIn As String, ByVal XmlTransform  \
As String, ByVal XslIn As String, ByRef ContentType As \
String) As String
Try
'Case statement to toggle between server/client
'side transform
Select Case XmlTransform
Case "C"    'Prefers a client side transform
ContentType = "text/xml"
Return SysproBuild(Uid, BusObject, XmlIn)
Case "S"    'Prefers a server side transform (Default)
ContentType = "text/html"
Return Transform(SysproBuild(Uid, BusObject, XmlIn), XslIn)
End Select
Catch Exc As Exception
Return "<table width=""100%""><tr><td style=""color:red; \
font-size:large;font-family:verdana"">" & Exc.Message & " \
</span></td></tr><tr><td><hr/></td></tr><tr><td style= \
""font-family:verdana;font-size:medium""><a href=""#"" \
onClick=""var frame = parent.document.getElementById \
('winframe');frame.rows = '*,2px';"" style=""color:#006699; \
font-weight:bold""></a></td></tr></table>"
End Try
End Function
```

Example 10.33. Calling the Build Method in ASP.NET C# codebehind

```
//*******************************************************
//- Build does a build using the special xml string
//  provided as input and returns xml/html
//*******************************************************
//Parameters:
//Uid:- GUID returned by Logon
//BusObject:- business object used to
//            do query
//XmlIn:- The xml to be used in query - can have a
//         xsl directive
//'XlTransform:- Parameter will specify if
//    server/client side transform is required
//XslIn:- The XLS used to transform the
//  incomming xml preferably as a server
//  path ie. "c:\......mac.xsl"
//ContentType:- ByRef parameter
//  representing the content type to be returned by IIS
//*******************************************************
//Returns:_ Whatever the transform does with
//  the xml, used mostly to generate HTML.
//*******************************************************
string Build(string Uid, string BusObject, string XmlIn, \
string XmlTransform, string XslIn, ref string ContentType) {
try {
   if (XmlTransform == "C") {
     ContentType = "text/xml";
     return SysproBuild(Uid, BusObject, XmlIn);
   } else if (XmlTransform == "S") {
     ContentType = "text/html";
     return Transform(SysproBuild(Uid, BusObject, XmlIn), \
XslIn);
   }
    else {
     return SysproQuery(Uid, BusObject, XmlIn);
     }
} catch (Exception Exc) {
return "<table width=\"100%\"><tr><td style=\"color:red; \
font-size:large;font-family:verdana\">" + Exc.Message +  \
"</span></td></tr><tr><td><hr/></td></tr><tr><td  \
style=\"font-family:verdana;font-size:medium\"> \
<a href=\"#\" onClick=\"var frame = parent.document. \
```

```
getElementById('winframe');frame.rows = '*,2px';\"  \
style=\"color:#006699;font-weight:bold\"></a></td> \
</tr></table>";
}
}
```

As you can see from the sample code, the basic flow of data is the same as the previous examples.

None of the method or calling functions that we have presented so far have defined the XmlIn/XmlParmater strings or identified specific business objects. The next section will provide sample code that uses the method and calling functions, and will provide this information to the functions.

10.5. Sample Business Logic Subroutines

The foundation of the business application has now been laid by the functions demonstrated so far. We now turn to building subroutines that actually utilize the business logic for specific business processes.

As already indicated, we will use the functions that we have already presented in the previous section for these subroutines. If you are building your own **`.aspx`** file please make sure that all those functions are correctly assembled within the code script section of your file (or the codebehind file if you are using one). The SampleCode download file contains the **`methods.aspx.vb`** and **`methods.aspx.cs`** codebehind files which contain the previous functions as well as the following subroutines. If you are copying code samples from this book please remember to mend broken line [lines ending in " \"] (these were broken to fit onto the printed page, but are whole in the downloadable code).

10.5.1. Prerequisite XSL Formating

The XSL style sheet (format.xsl) performs the basic transformations with the other stylesheets of the application. Please open the SampleCode download file and save the files in the **`\xsl`** subdirectory to an **`\xsl`** subdirectory on your IIS web server root directory. This contains three XSL files used to transform the XmlOut strings in the following examples.

10.5.2. Price Query Subroutine

This section of sample code deals with creating a Price Query option. The ASP.NET .aspx form file containing the asp:Button to be clicked is presented after the subroutine (presented in VB and C#).

Example 10.34. Price Query Code in ASP.NET VB codebehind

```
'*********************************************************
'Price Query Subroutine
'*********************************************************
Public Sub btnPriceQuery_Click(ByVal sender As Object,  \
ByVal e As EventArgs)
 pnlPriceQuery.Visible = True
 Dim xmlin As StringBuilder = New StringBuilder
 xmlin.Append("<?xml version=""1.0"" encoding=""Windows- \
1252""?>")
 xmlin.Append("<Build xmlns:xsd=""http://www.w3.org/2001/ \
XMLSchema-instance"" xsd:noNamespace \
SchemaLocation=""SORRSL.XSD"">")
 xmlin.Append("<Parameters>")
 xmlin.Append("<stockcode>" + txtstockcode.Text +  \
"</stockcode>")
 xmlin.Append("<customer>" + txtcustomer.Text +  \
"</customer>")
 xmlin.Append("<orderquantity>" + txtquantity.Text + \
"</orderquantity>")
 xmlin.Append("<warehouse>" + selwarehouse.Text +  \
"</warehouse>")
 xmlin.Append("</Parameters></Build>")
 Dim content As String = "text/html"
 Response.Write(Build(lblUid.Text, "SORRSL",  \
xmlin.ToString, "S", Server.MapPath("xsl/priceQuery.xsl") \
, content))
 Response.ContentType = content
End Sub
```

Example 10.35. Price Query Code in ASP.NET C# codebehind

```
//*******************************************************
//Price Query Subroutine
//*******************************************************
public void btnPriceQuery_Click(object sender, EventArgs e)
{
pnlPriceQuery.Visible = true;
StringBuilder xmlin = new StringBuilder();

xmlin.Append("<?xml version=\"1.0\" encoding=\"Windows \
-1252\"?>");
xmlin.Append("<Build xmlns:xsd=\"http://www.w3.org/2001/ \
XMLSchema-instance\" xsd:noNamespace \
SchemaLocation=\"SORRSL.XSD\">");
xmlin.Append("<Parameters>");
xmlin.Append("<stockcode>" + txtstockcode.Text + \
"</stockcode>");
xmlin.Append("<customer>" + txtcustomer.Text + \
"</customer>");
xmlin.Append("<orderquantity>" + txtquantity.Text +  \
"</orderquantity>");
xmlin.Append("<warehouse>" + selwarehouse.Text +  \
"</warehouse>");
xmlin.Append("</Parameters></Build>");

string content = "text/html";
Response.Write(Build(lblUid.Text, "SORRSL", xmlin. \
ToString(), "S", Server.MapPath("xsl/priceQuery.xsl"),  \
ref content));
Response.ContentType = content;
}
```

As you can see from the code sample, we have created four textbox data entry points and have built our XmlIn string using the input from those textboxes. We use the `Response.Write` command to display the data returned from the *Build* function described earlier.

Example 10.36. ASP.NET .aspx Form Sample

```
<form runat="server">
asp:Panel id="pnlPriceQuery" runat="server"
 Visible="false">
<table width="402" border="1">
<tr>
<td width="178">
<div align="right">Stock Code:</div>
</td>
<td width="208">
<asp:TextBox ID="txtstockcode" runat="server"
 Text="A100">
</asp:TextBox></td>
</tr>
<tr>
<td>
<div align="right">Customer:</div>
</td>
<td>
<asp:TextBox ID="txtcustomer" runat="server"
 Text="000010">
</asp:TextBox></td>
</tr>
<tr>
<td>
<div align="right">Order Quantity:</div>
</td>
<td>
<asp:TextBox ID="txtquantity" runat="server">
</asp:TextBox></td>
</tr>
<tr>
<td>
<div align="right">Warehouse:</div>
</td>
<td>
<asp:TextBox ID="selwarehouse" runat="server"
 Text="FG">
</asp:TextBox></td>
</tr>
</table>
<p>
<asp:Button id="btnPriceQuery"
 onclick="btnPriceQuery_Click"
runat="server" Text="Submit Price Query"></asp:Button>
</p>
```

```
</asp:Panel>
</form>
```

The SampleCode download contains the **PriceQuery.cs.aspx** and **PriceQuery.vb.aspx** files. These contain the ASP.NET presentation code used by the above functions, and Sales Order Query functions that follow. As we have done before, save the **PriceQuery.cs.aspx** and **PriceQuery.vb.aspx** files to the root directory of your IIS server (usually **C:\Inetpub\wwwroot** or **C:\Inetpub\wwwroot\Sysproweb** if you are using the SYSPRO web-based applications). Load the files into your web browser and logon, then perform a Price Query and a Sales Order Query. If everything is set up properly you will see the data from the Outdoors Company supplied by the SYSPRO 6.0 Issue 010 Evaluation version.

Now take a look at the code of the following Sales Order subroutine.

10.5.3. Sales Order Query Subroutine

The following sample code presents a Sales Order Query. Like the previous sample code, the .aspx file sample follows after the VB and C# subroutines.

Example 10.37. Sales Order Query Code in ASP.NET VB codebehind

```
'*******************************************************
'Sales Order Query Subroutine
'*******************************************************
Public Sub btnSalesOrderQuery_Click(sender As Object, e  \
As EventArgs)
pnlSalesQuery.Visible = True
Dim xmlin As New StringBuilder()

With xmlin
xmlin.Append("<?xml version=""1.0"" encoding= \
""Windows-1252""?><query>")
xmlin.Append("<key><salesorder>" & txtorder.Text &  \
"</salesorder>")
xmlin.Append("<invoice></invoice></key>")
xmlin.Append("<option><xslstylesheet>soquery.xsl \
</xslstylesheet>")
xmlin.Append("<includeserials>N</includeserials>")
xmlin.Append("<includelots>Y</includelots>")
xmlin.Append("<includebins>Y</includebins>")
xmlin.Append("<includecompletedlines>Y \
```

```
</includecompletedlines></option></query>")
End With

Dim content As String = "text/html"
Response.Write(Query(lblUid.Text, "SORQRY", xmlin.ToString, \
"S", Server.MapPath("xsl/salesOrderQuery.xsl"), content))
Response.ContentType = content
End Sub
```

Example 10.38. Sales Order Query Code in ASP.NET C# codebehind

```
//*******************************************************
//Sales Order Query Subroutine
//*******************************************************
public void btnSalesOrderQuery_Click(object sender,  \
EventArgs e)
 {
pnlSalesQuery.Visible = true;
StringBuilder xmlin = new StringBuilder();

xmlin.Append("<?xml version=\"1.0\" encoding=\"Windows- \
1252\"?><query>");
xmlin.Append("<key><salesorder>" + txtorder.Text +  \
"</salesorder>");
xmlin.Append("<invoice></invoice></key>");
xmlin.Append("<option><xslstylesheet>soquery.xsl \
</xslstylesheet>");
xmlin.Append("<includeserials>N</includeserials>");
xmlin.Append("<includelots>Y</includelots>");
xmlin.Append("<includebins>Y</includebins>");
xmlin.Append("<includecompletedlines>Y \
</includecompletedlines></option></query>");

string content = "text/html";
Response.Write(Query(lblUid.Text, "SORQRY", xmlin. \
ToString(), "S", Server.MapPath("xsl/salesOrderQuery.xsl" \
),ref content));
Response.ContentType = content;
}
```

Example 10.39. ASP.NET .aspx Form Sample

```
<form runat="server">
<asp:Panel ID="pnlSalesOrderQuery" runat="server"
 Visible="false">
<table width="402" border="1">
<tr>
<td width="178">
<div align="right">Sales Order:</div>
</td>
<td width="208">
<asp:TextBox ID="txtorder" runat="server" Text="000812">
</asp:TextBox></td>
</tr>
</table>
<p>
<asp:Button id="btnSalesOrderQuery" onclick= \
     "btnSalesOrderQuery_Click" runat="server" Text= \
     "Submit Sales Order Query"></asp:Button>
</p>
</asp:Panel>
</form>
```

You will see that the code is fairly similar between the Price Query and the Sales Order Query. The function builds the required XML input and send it to the calling function along with the name of the business object to use.

Now take some time to examine the **`PriceQuery.cs.aspx`** and **`PriceQuery.vb.aspx`** files along with the **`methods.aspx.cs`** and **`methods.aspx.vb`** files that contain the corresponding codebehind code.

10.5.4. Putting it all together

The **`methods.aspx.cs`** and **`methods.aspx.vb`** files contain the functions that could form the core of an e.net solutions ASP.NET application. You just need to create the subroutines that create the specific business object XmlIn and XmlParameters and stylesheet information, like those contained in the Price Query and Sales Order Query samples presented above. Study them all again and trace the flow of data from the XmlIn string, through the calling functions to the method functions and back.

Now that you have seen and examined the code samples provided in this book, you can

use them (and the knowledge of e.net solutions programming that you have gained from reading this book) to build your own programs and applications using SYSPRO e.net solutions. For further examples of e.net solutions programming please examine the code that is installed with the SYSPRO Web Applications within your **C:\Inetpub\wwwroot\Sysproweb** directory. Examine the **\Sysproweb\main\routines.vb** file to see the core of the SYSPRO web-based applications logic, then look in the **\Sysproweb\content** subdirectories and examine the code and XSL files that are located there.

The SYSPRO web-based applications use the .NET Class Sysprodll.Syspro, which is the SYSPRO Web Applications wrapping of Encore.dll. As you will see, the business object usage is exactly the same regardless of whether one is programming for the COM object's Ecore.dll or the Web Application's Sysprodll.Syspro Class. There are some differences. For instance, the Logon string is different, and the Query NextKey and PreviousKey methods are combined in one method.

11

Building from Here

Objectives - In this final chapter we will briefly summarize what we have presented in the book and challenge you to build your e.net solutions programming skills.

11.1. e.net solutions Classes and Methods

The outline plan of e.net solutions is simple and easy to understand. There are four main class object: Utilities, Query, Setup, and Transaction. Within each of these classes there are methods that control the interaction of the business objects with the SYSPRO application server. The `Utilities` class utilizes the `Logon`, `Logoff`, `GetLogonProfile`, and `Run` methods. The `Query` class utilizes the `Query`, `Browse`, `Fetch`, `Next Key`, and `Previous Key` methods The `Setup` classes utilizes the `Add`, `Update`, and `Delete` methods. The `Transaction` class utilizes the `Post`, and `Build` methods.

When operating together through the SYSPRO COM/DCOM or Web Services interface, these classes and methods expose the core of the SYSPRO ERP system to your programming ability. You can create your own custom interface, your own custom applications, and your own custom web enabled systems.

11.2. Dealing in XML

One of the key elements in programming with e.net solutions is understanding and transforming XML data. As most of the business objects use an XmlIn string to provide data to the SYSPRO system, and receive an XmlOut string from the SYSPRO system, it is vital to build your XML skills to the point where using XML statements and documents is almost second nature to you.

If, after studying and reading through this book, you are still unsure about the XML Input, Output, and Parameter strings used in e.net solutions programming then you will need to speak with someone in your organization (or at your local SYSPRO VAR office) who is more advanced in the use of XML and learn from their experience. There are also many online tutorials and articles that deal with XML, XSL Stylesheets, and transforming of XML to various other types of formats. It is also a good idea to utilize the SYSPRO SupportZone forums.

11.3. Building Your Application

You now have the tools and the knowledge about e.net solutions that will enable you to program your own applications. You have the sample code and the various other examples demonstrated in this book to use as a base. You now need to create your own code in order to build on this knowledge and increase your personal experience of using e.net solutions.

The one area that you still need information and experience involves the function of all the business objects. If you followed our advice and went through the Business Object Library using the e.net Diagnostic Utility's interface or viewed the Business Object Reference Library at the SYSPRO SupportZone, then you will have the basic information required. It is up to you to build, test, and produce your own application using the needs and requirements of your organization's enterprise as your guideline.

SYSPRO produces new business objects on a continuing basis. For an up-to-date listing of all the business objects please visit the online Support Zone site.

A

Installing the SYSPRO Web Services

The SYSPRO Web Services can be setup on the SYSPRO application server or on a separate web server. In this appendix we take you through the installation of the Web Services on the SYSPRO application server. If you set the services up on a separate web server you will need to configure DCOM to connect the web server to the SYSPRO application server.

A.1. Prerequisites

The SYSPRO Web services require the following to be installed on a Windows Server 2000/2003 computer:

- IIS 4.0 or higher needs to be installed on the machine that will act as a web server
- The Microsoft .NET 1.1 Framework is required on the web server
- SYSPRO e.net solutions must be configured on the web server
- All previous versions of the SYSPRO 6.0 Web services have to be un-installed

IIS is the only prerequisite for the installation to succeed.

A.2. Installation

Procedure A.1. Installing Web Services

1. Insert the SYSPRO CD-ROM into the designated computer. The auto-run installation menu is displayed.
2. From the auto-run installation menu select, Install Product.

3. Select, Web Services.

The **SYSPRO Web Services** installshield is invoked.

4. Select **Next** to continue.
5. At the **Select Installation Address** dialog, input the **Virtual directory** id where the SYSPRO Web Services will be located (default SysproWebServices) and the **Port**

number on which the application can be accessed (default: 80). Select Disk Cost if you want to establish the amount of disk space that is required for this installation. Select **Next** to accept the default virtual directory and port.

6. The Confirm Installation window is displayed.

   Click **Next** to install SYSPRO Web Services. The SYSPRO Web Services files will then be copied to your machine.

7. Finally select **Close**.

   SYSPRO 6.0 Web Services have been installed.

B

Installing the SYSPRO Web Based Applications

B.1. Requirements

In order to have a fully functioning installation of the SYSPRO Web Based Applications you will need:

- Microsoft Internet Information Server (IIS) 4.0 or higher
- Internet Explorer 6.0 or higher
- Microsoft .Net Framework Version 1.1.
- SYSPRO e.net DCOM Remote Client (only required when the Web Server is located on a host other than the SYSPRO Server).

Microsoft .Net Framework must be installed *only* after Microsoft Internet Information Server (IIS) has been installed.

B.2. The Installation Procedure

In this section of the appendix we explain how to install the SYSPRO e.net Web Applications.

B.2.1. Installation

The following procedure installs the **SYSPRO e.net Web Applications**.

Before performing the following procedure, please ensure that all the Web Application Dependencies are satisfied as described in Section B.1, “Requirements” [B–1]).

Procedure B.1. Installing Web Applications

1. Insert the SYSPRO CD-ROM into the designated computer. The auto-run installation menu is displayed.

2. From the auto-run installation menu select, Install Product.

3. Select, Web Based Applications.

The **SYSPRO Web Applications** install shield is invoked.

4. Select **Next** to continue.
5. At the **Select Installation Address** dialog, input the **Virtual directory** id where the

SYSPRO Web Apps will be located (default Sysproweb) and the **Port** number on which the application can be accessed (default: 80). Select Disk Cost if you want to establish the amount of disk space that is required for this installation. Select **Next** to accept the default virtual directory and port.

6. The Confirm Installation window is displayed.

   Click **Next** to install SYSPRO Web Services. The SYSPRO Web Services files will then be copied to your machine.

7. Finally select **Close**.

   SYSPRO 6.0 Web Services has been installed, and can be accessed from Internet Explorer.

8. If the Web Application is installed on a host other that the SYSPRO Server, installation of the **SYSPRO e.net DCOM Remote Client** is required. Proceed to the Section B.2.2, “Installing e.net Solutions DCOM Remote Client” [B–3].

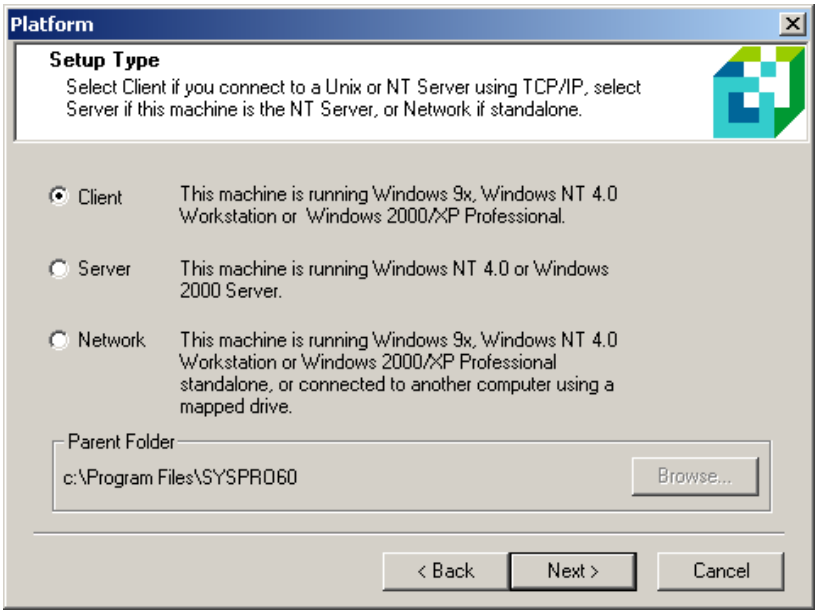
Once you have installed the Web Application please make sure that your IIS is configured to use .Net 1.1. If you have installed the Web Applications on a Windows 2003 Server or on a Windows 2000 server you can check this by opening the IIS manager, navigate to the Sysproweb virtual folder in the default website listing, right click on the directory and select *Properties*, then change the options for the Sysproweb folder under the ASP.NET tab to .Net 1.1.

B.2.2. Installing e.net Solutions DCOM Remote Client

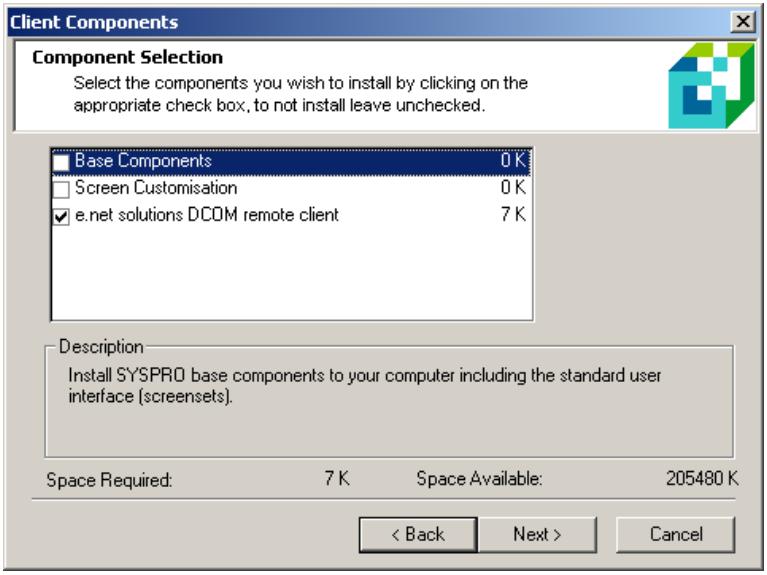
When the Web Server running the **SYSPRO e.net Web Applications** is a host other than the SYSPRO Server, the **SYSPRO e.net solutions DCOM Remote Client** must be installed on the Web Server host. The **SYSPRO e.net DCOM Remote Client** enables the **SYSPRO e.net Web Applications** to communicate with the SYSPRO Server via DCOM.

Do not install **SYSPRO e.net solutions DCOM Remote Client** on a SYSPRO Server that has the **SYSPRO e.net Framework** installed. This is not required and will override Registry entries that instructs COM of the installation path and other information pertaining to **`ENCORE.DLL`**.

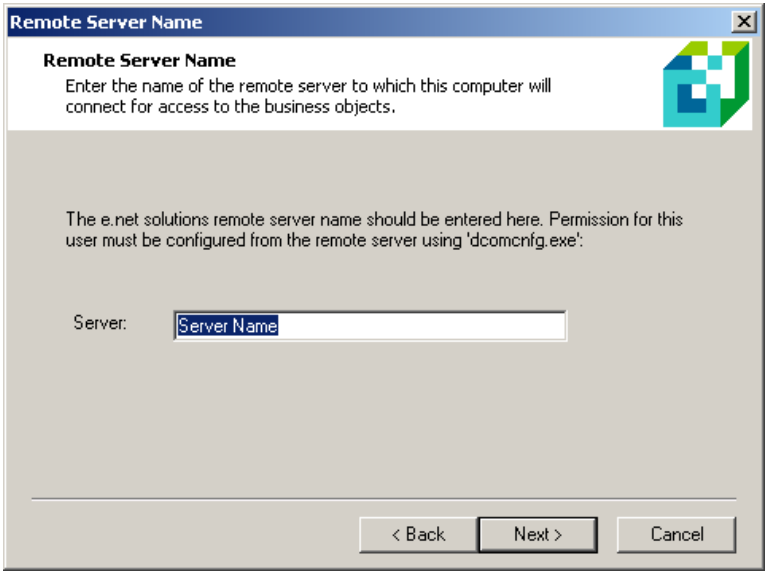
1. Insert the SYSPRO CD-ROM into the designated computer. The auto-run installation menu is displayed.
2. From the installation menu select, Install Product → SYSPRO 6.0 → Core Product.
3. From the **Setup Type** dialog, select the **Client** option, then click **Next**. The **Component Selection** dialog is displayed.



4. Check the e.net solutions DCOM remote client option. Uncheck all other options, then click **Next**. The **Remote Server id** dialog is displayed.



5. Input the TCP/IP Address or NetBIOS name of the SYSPRO Server into the **Server** field.



6. Complete the remaining installation steps, accepting all defaults.

C

Installing and Apportioning Licenses

C.1. Instructions to install License.xml

These instructions should be used to install and apply the License.xml file. The instructions cover the following topics:

- Changing an existing company – either for a new expiry year or for new modules
- Adding a new company
- Adding and apportioning e.net licenses

C.2. Importing the License.xml file

The License.xml file should be saved into the SYSPRO Application server's work folder. Typically use the 'Save as…' function to save this file.

Once the License.xml file has been saved to the work folder you are ready to import it.

C.3. Updating an existing SYSPRO company License

To change a SYSPRO company license perform the following steps:

1. Load SYSPRO and enter your administrator User name and Password.
2. At the Company prompt select the Browse (or press F9)
3. Select a company to be maintained and click 'Change'
4. Select the Registration Tab
5. Click on the 'Import License…"button
6. Choose to import the newly saved License.xml file and click 'Next'
7. Select the company (the current one will be selected by default) and click 'Next'
8. Click 'Finish' to complete the License Import Wizard
9. Back on the Company maintenance 'Registration Tab', click 'Save' to save the company license
10. Repeat from step 3 for each company

Note that if the new license is for a different number of concurrent users, ODBC seats, U/SQL seats, Dialog seats or CAL seats then you should use the System Setup to change the system settings.

C.4. Adding a new SYSPRO company

To add a new SYSPRO company perform the following steps:

1. Load SYSPRO and enter your administrator User name and Password.
2. At the Company prompt select the Browse (or press F9)
3. Click 'Add' and select an unused company id (A-Z, 0-9)
4. Configure your company options
5. Ensure that the correct Company data format is defined on the Database and Data Paths Tab (select either C-ISAM or SQL Server)
6. Select the Registration Tab
7. Click on the 'Import License…' button
8. Choose to import the newly saved License.xml file and click 'Next'
9. Select one of the company names from the list and click 'Next'
10. Click 'Finish' to complete the License Import Wizard
11. Back on the Company maintenance 'Registration Tab', click 'Save' to save the company license

Note that if the License.xml file is for a different number of concurrent users, ODBC seats, U/SQL seats, Dialog seats or CAL seats then you should use the System Setup to change the system settings before adding a new company.

C.5. Importing and apportioning an e.net License

To import and apply the e.net license perform the following steps:

1. Load SYSPRO and logon to the system using your administrator User name
2. Select the System Setup from the main menu
3. Click on the 'Configure e.net Licenses…' button
4. Select the Import XML file radio button and click 'Next' (this saves your current e.net license settings)
5. Choose to import the newly saved License.xml file and click 'Next'
6. Click 'Finish' to complete the License Import Wizard

7. To apportion the newly imported licenses select the Business Objects… and/or Web based Applications… push buttons.
8. When you have completed apportioning the licenses return to the Configure e.net License and click 'Next'. This will verify that all apportioned licenses are valid.
9. Click 'Finish' to complete the e.net license import and apportionment. This will make all the e.net license information live.