



TRANSPORT
.NET MIGRATION SUITE
TECHNOLOGY OVERVIEW

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Overview

The Transport Suite comprised of two products, Visual Expert and Architect, provides a comprehensive migration workbench that simplifies the task of re-engineering existing applications and targeting them for .NET.

Transport uses a model-driven approach for re-engineering efforts and embeds an industry standard UML 1.3 engine as the foundation for capturing existing designs and creating the target application.

Analysis of the existing application and creating the target application's foundation represent a significant portion of the re-engineering effort of these projects.

Functional Summary

Visual Expert

- Automatically generates comprehensive documentation from existing application source code
- Enables visual, hyperlinked navigation of application source code between all application elements
- Makes discovering dispersed business rules in the application source a routine task using the integrated code analyzer
- Automatically discovers and highlights dead code
- Exports the entire application code structure for integration with LeverageIT's Transport Architect and other modeling and diagramming tools

Architect

- Developer-centric design facilitates well-designed applications in a robust object-oriented paradigm
- Constructs a thorough view of existing application architectures as UML models to enable rapid understanding of structures and behavior
- Generates .NET application foundation code direct from models to dramatically reduce development time and increase application quality
- Extensibility and customization features enable you to leverage your existing investment in development environments and development methodologies

Suite Architecture

See Figure 1 for an overview of the Transport suite. See later sections for more detailed descriptions of each Product within the suite.

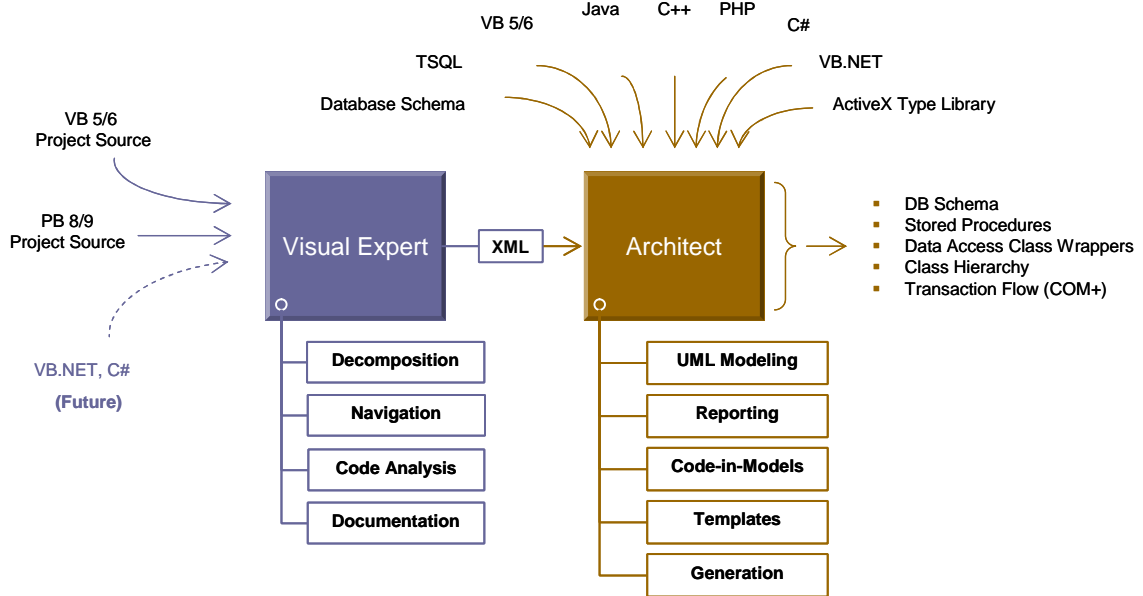


Figure 1

Transport architectural overview

Transport provides deep application source code analysis for Visual Basic 5/6 and PowerBuilder applications. The comprehensive VB 5/6 and PowerBuilder source analyzer extracts every element of the application for easy viewing, navigation, searching and relationship analysis. See Figure 2 for an example of a PowerBuilder application opened in the Transport source analyzer module “Visual Expert.”

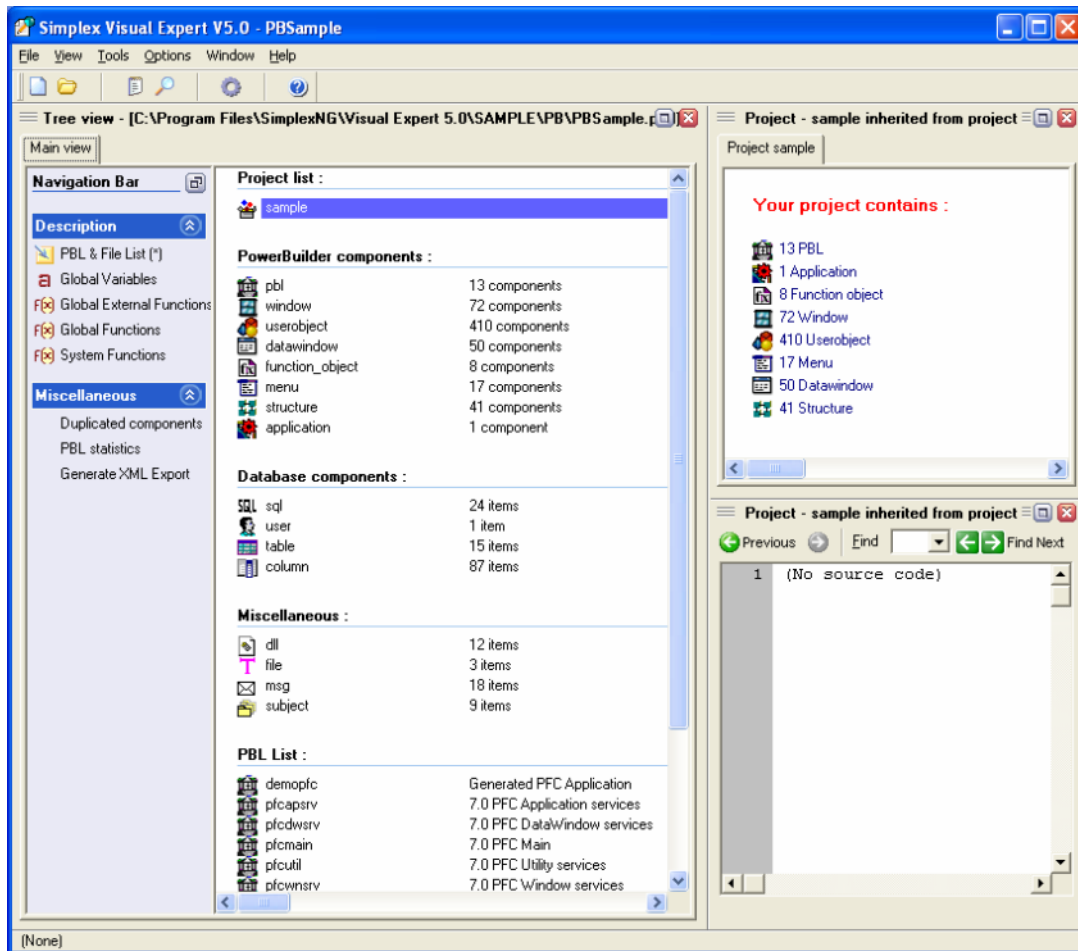


Figure 2

Visual Expert utilizes an intuitive “explorer” style navigation to enable analysis of PowerBuilder and Visual Basic 5/6 application source and related components.

Visual Expert creates quality system documentation directly from the project source files. Documentation generation options are extensive and output options include both RTF and hyperlinked HTML formats. For large or distributed development teams, integrating the HTML documentation within a portal (e.g. Microsoft SharePoint) creates a highly productive environment for disseminating application knowledge. See Figure 3.

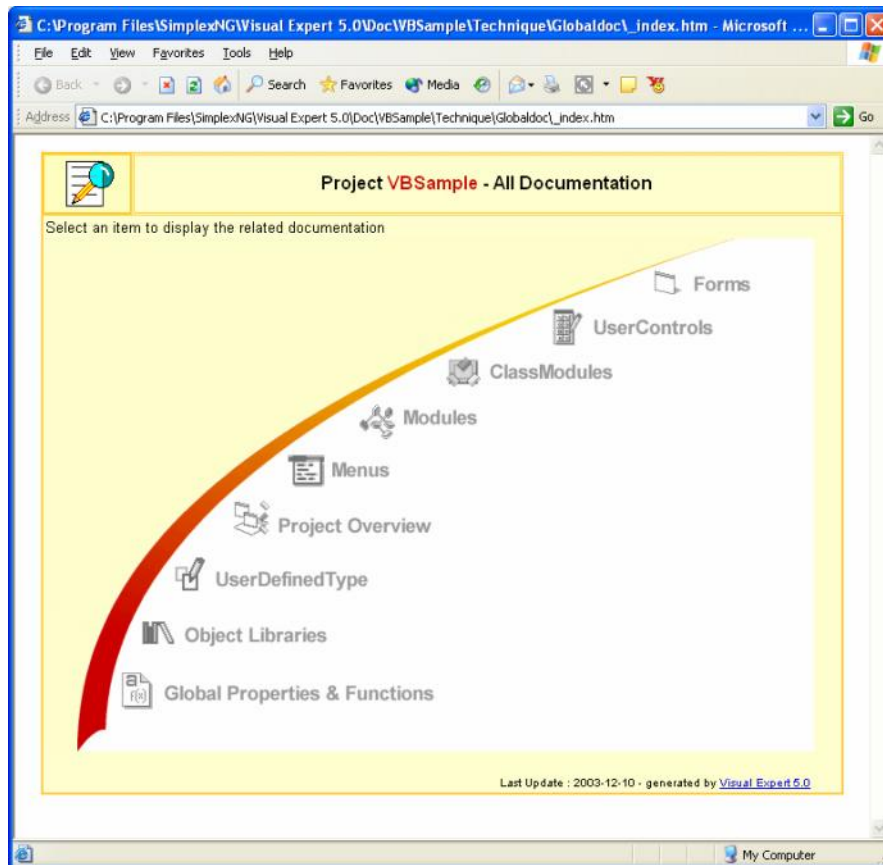


Figure 3

Visual Expert has numerous documentation options including documenting application components such as forms, menus, code structures such as user-defined types, functions, procedures, and SQL constructs.

For VB 5/6 and PowerBuilder applications, the entire application structure is exportable to a portable XML schema. The XML schema is highly readable and is designed to be easily navigated programmatically.

Using model-driven technology, Architect provides an XML-to-UML Bridge for auto-mapping the application structure's XML stream to UML. This UML Bridge creates a detailed view of the application as a UML class diagram and maps all the relevant elements as UML constructs: such as attributes, operations, stereotypes, relations (generalization and aggregation) and packages them as seen in Figure 4. It also maps Java, C/C++, Delphi, Perl and PHP to UML models as well as ActiveX and COM objects, Java class files, and .NET assemblies.

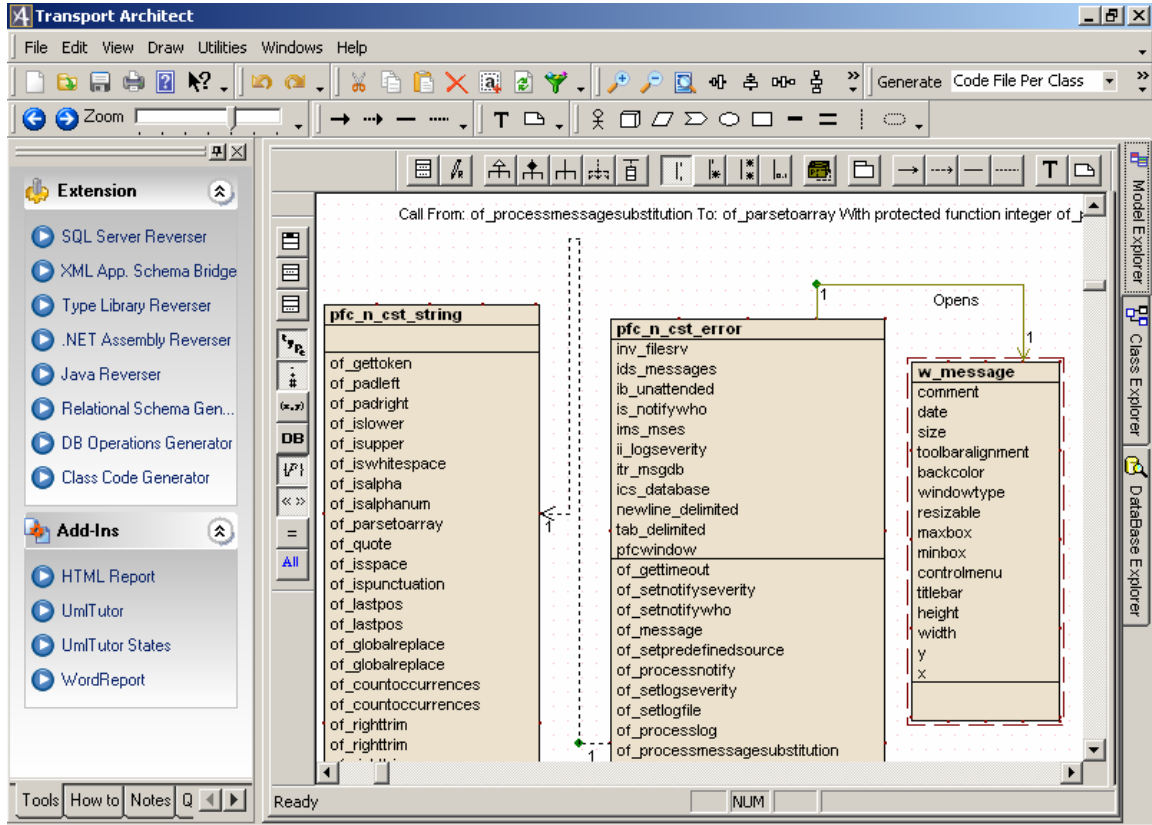


Figure 4

The Transport Architect Application Schema XML-to-UML Bridge can map the structure of existing VB and PowerBuilder application completely to UML class diagrams.



Architect provides additional capabilities for peering into the design of applications through its innovative explorer-style view of class organizations (Figure 5) and by integrating a sophisticated database query facility that provides visual query creation, reporting and charting capabilities.

Consequently, Transport enables both designers and developers to collaborate within a single tool to create their target application design and, if desired, store both the diagrams and key pieces of code within the same UML model.

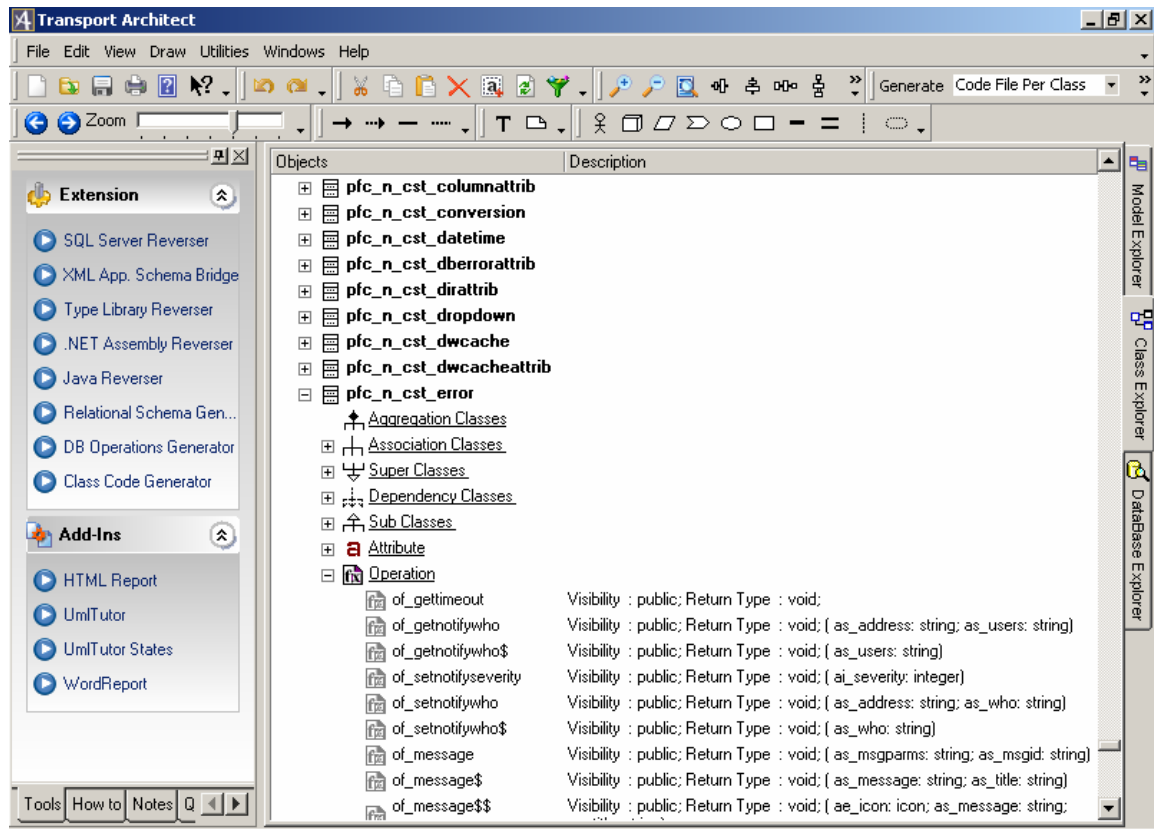


Figure 5

Architect provides alternate views of designs include explorer-style views of UML classes and visual database query construction, reporting and charting.

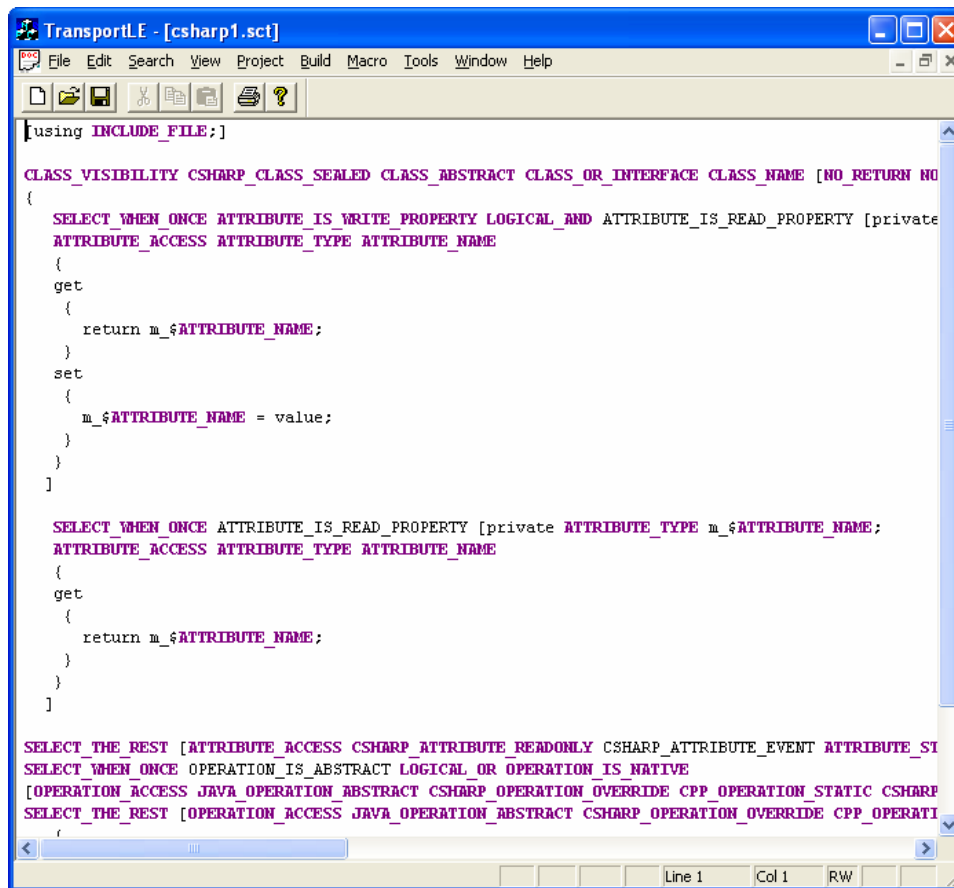
The mapping provides support for generation of classes as well as generalization, aggregation and composition associations. For clarity, the bridge automatically populates descriptions and stereotypes.

The mapping is aware of specific constructs of VB and PowerBuilder applications such as form opening hierarchy, use of external libraries (such as Win32 DLL's) and use of ActiveX properties and methods. The generated class diagram will be a complete reflection of the application in manner consistent with the UML standard.

With the target design in UML, Transport can then generate many components of the final application's foundation including: Relational database schema; basic table maintenance stored procedures; C#/VB.NET stored procedure class wrappers; C# and VB.NET class code and, object-to-object workflow based on UML sequence diagrams.

A highly open and extensible product set, Transport opens much of its core functionality via OLE Automation interfaces (callable from VB, VB.NET, C#, Python, Word, Excel, etc.) It includes Microsoft's VBA core for custom add-in creation, and a highly productive templating mechanism for code generation using a declarative syntax. See Figure 6 for an example.

Transport does not use any proprietary libraries or standards. UML-based code generation uses standard .NET libraries. While Transport does not address generation of the user interface portions of the application, it is however, customizable to create business rules from UML models if so desired.



```
[using INCLUDE_FILE;]

CLASS_VISIBILITY CSHARP_CLASS_SEALED CLASS_ABSTRACT CLASS_OR_INTERFACE CLASS_NAME [NO_RETURN NO
{
  SELECT_WHEN_ONCE ATTRIBUTE_IS_WRITE_PROPERTY LOGICAL_AND ATTRIBUTE_IS_READ_PROPERTY [private
  ATTRIBUTE_ACCESS ATTRIBUTE_TYPE ATTRIBUTE_NAME
  {
    get
    {
      return m_${ATTRIBUTE_NAME};
    }
    set
    {
      m_${ATTRIBUTE_NAME} = value;
    }
  }
}

SELECT_WHEN_ONCE ATTRIBUTE_IS_READ_PROPERTY [private ATTRIBUTE_TYPE m_${ATTRIBUTE_NAME};
ATTRIBUTE_ACCESS ATTRIBUTE_TYPE ATTRIBUTE_NAME
{
  get
  {
    return m_${ATTRIBUTE_NAME};
  }
}

SELECT_THE_REST [ATTRIBUTE_ACCESS CSHARP_ATTRIBUTE_READONLY CSHARP_ATTRIBUTE_EVENT ATTRIBUTE_ST
SELECT_WHEN_ONCE OPERATION_IS_ABSTRACT LOGICAL_OR OPERATION_IS_NATIVE
[OPERATION_ACCESS JAVA_OPERATION_ABSTRACT CSHARP_OPERATION_OVERRIDE CPP_OPERATION_STATIC CSHARP
SELECT_THE_REST [OPERATION_ACCESS JAVA_OPERATION_ABSTRACT CSHARP_OPERATION_OVERRIDE CPP_OPERATI
```

Figure 6

Transport Architect's declarative template generation engine uses a simple syntax that closely mirrors the OLE Automation interface exposed by the product. In this example, the generation will result in C# code representing the UML class diagram.



Visual Expert Product Summary

Description

Visual Expert is a powerful source code analyzer for legacy Visual Basic and PowerBuilder applications.

It enables development teams to rapidly acquire and transfer application knowledge by referencing critical application components, identifying business rules, automatically creating system documentation and exporting the entire application code structure to XML for custom analysis and ready integration using UML.

Functional Summary

- Automatically generates comprehensive documentation from existing application source code
- Enables visual, hyperlinked navigation of application source code between all application elements
- Makes discovering dispersed business rules in the application source a routine task using the integrated code analyzer
- Automatically discovers and highlights dead code
- Exports the entire application code structure for integration with LeverageIT's Transport Architect and other modeling and diagramming tools

Documentation Support

- Produces documentation for Visual Basic 5 & 6, and PowerBuilder to release 9
- Documents Application objects, Menu objects, PBLs content (PowerBuilder), Structure objects, User objects, Window objects, Function objects, Global items (functions and variables)
- Results include event and function source code, screenshots of the visual objects (such as forms), details on the checks carried out on this object, and information on functions and attributes based on their scope (public, private or protected)
- Customizable output for the entire project or selected components
- Output generated in both HTML and Word (RTF)

Code Analysis Support

- Discovers relationships between forms, datawindows, menus, variables, functions, properties, SQL objects, components and external libraries
- Displays inheritance hierarchy and Form open and function call sequences
- Discovers dependencies on external libraries including Windows API
- Identifies ActiveX and COM server usages including references to methods and properties from application source
- Extracts and catalogs SQL statements for PowerBuilder applications
- Provides easy search feature for locating various elements of the application including functions, properties and classes



XML Export Support

- Exports one or more projects in one XML stream
- Produces well-formed XML describing application visual elements, modules, external libraries and components
- Formatted specifically to simplify mapping of VB and PowerBuilder constructs to Object Oriented concepts
- Simplifies integration with Transport Architect and most modern UML technologies

System Requirements

- Windows 2000 Professional or Windows XP
- 500 MHz Pentium class processor
- 512 MB or memory
- At least 100 MB of available disk space



Architect Product Summary

Description

Architect streamlines design and development cycles by providing a complete and accurate reverse engineered view of the application baseline using UML (including database structures). Architect increases developer productivity by automatically generating foundation code for database schema, table maintenance stored procedures, data access class wrappers, inter-application workflow, and class structures directly from the UML design.

Functional Summary

- Developer-centric design facilitates well-designed applications in a robust object-oriented paradigm
- Constructs a thorough view of existing application architectures as UML models to enable rapid understanding of structures and behavior
- Generates .NET application foundation code direct from models to dramatically reduce development time and increase application quality
- Extensibility and customization features enable you to leverage your existing investment in development environments and development methodologies

Modeling Support

- Support for Class, State, Activity, Use Case, Collaboration, Sequence, Deployment and Component diagrams
- Modern user interface for both UML diagrams and “Explorer” style views of models
- Integration with Rose
- Wide range of reporting by exporting models in various graphical formats
- Exporting models to external relational databases
- Exporting to HTML, Ascii, Word, and Excel

Development Support

- Code completion templates
- .NET library intellisense*
- Code File Differencing and Comparison
- File Merging
- Macro Code Completion
- Code Beautifier in most programming languages
- Code spell checking
- Auto code-complete Feature
- Flexible Language Color Syntax configuration
- Source Version Control
- Compilation for .NET, Java, and Visual C++ Projects
- Multiple Editor Emulation (both Windows and Unix)



Reverse Engineering Support

- Major languages including C, C++, C#, VB and VB.NET, IDL, Delphi and Java
- PowerBuilder **
- Internet interpreter languages: PHP, Perl
- Database schemas via ODBC
- SQL Server database schema via SQLDMO
- Microsoft TSQL (SQL Server stored procedures)
- .NET Framework Libraries
- Java class files
- ActiveX, Type Libraries, COM Servers

Code Generation Support

- Complete and thorough relational schema (SQL DDL) generation from UML class models
- Support for multiple Object-Relational mapping strategies
- TSQL stored procedures for all tables maintenance functions
- .NET class wrappers (C# and VB.NET) for table maintenance stored procedures
- Internal method call flow direct from UML sequence diagrams including support for asynchronous calls via COM+ Queued Components
- C# and VB.NET code representations of UML class diagrams
- Extensive custom generation using integrated template language

Extensibility

- Integrated template language for declarative generation from UML models
- Substantial public COM interface for automation clients including C#, VB.NET, VB 6, Visual C++, Delphi, Python, Excel, Access, and Word
- Built-in complete VBA Support
- Application to UML meta-model bridge for generating Application Structure XML Schemas **
- Add-In Wizard for instant Add-In creation

* Microsoft Trademark

** Requires LeverageIT Visual Expert

System Requirements

- Windows 2000 Professional or Windows XP
- .NET Framework 1.1 or better
- 500 MHz Pentium class processor
- 512 MB or memory
- At least 250 MB of available disk space