Innovate2010

The Rational Software Conference

Let's build a smarter planet.

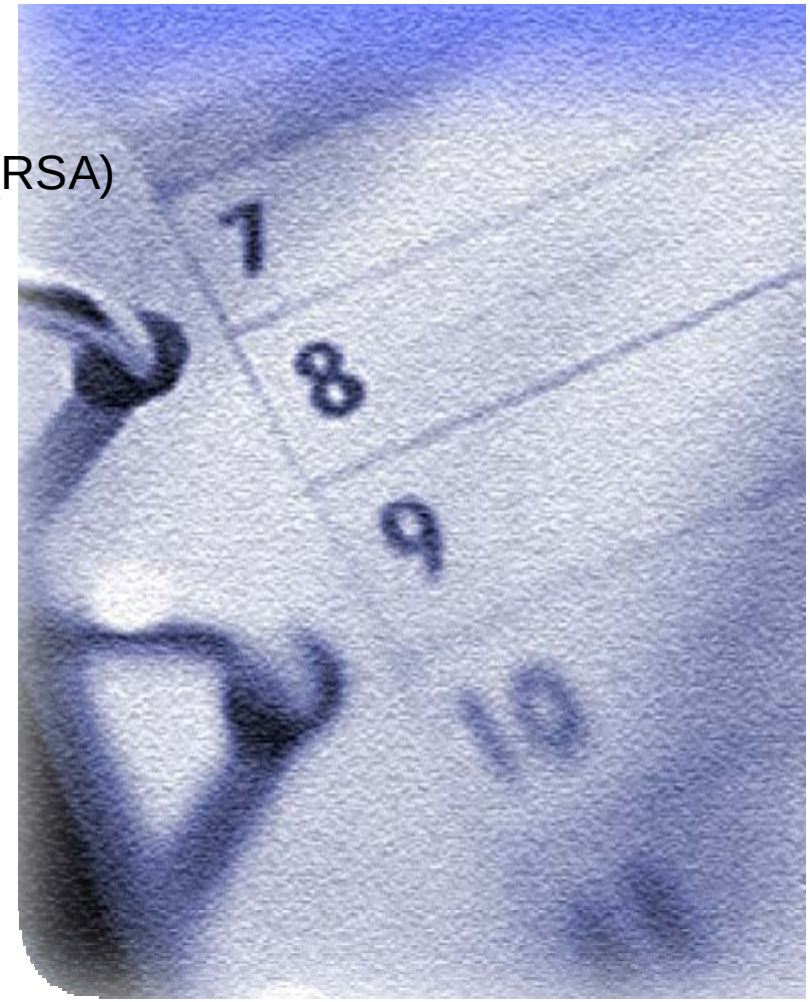
Manish Paul

Introducing Rational Modeling Extension .NET

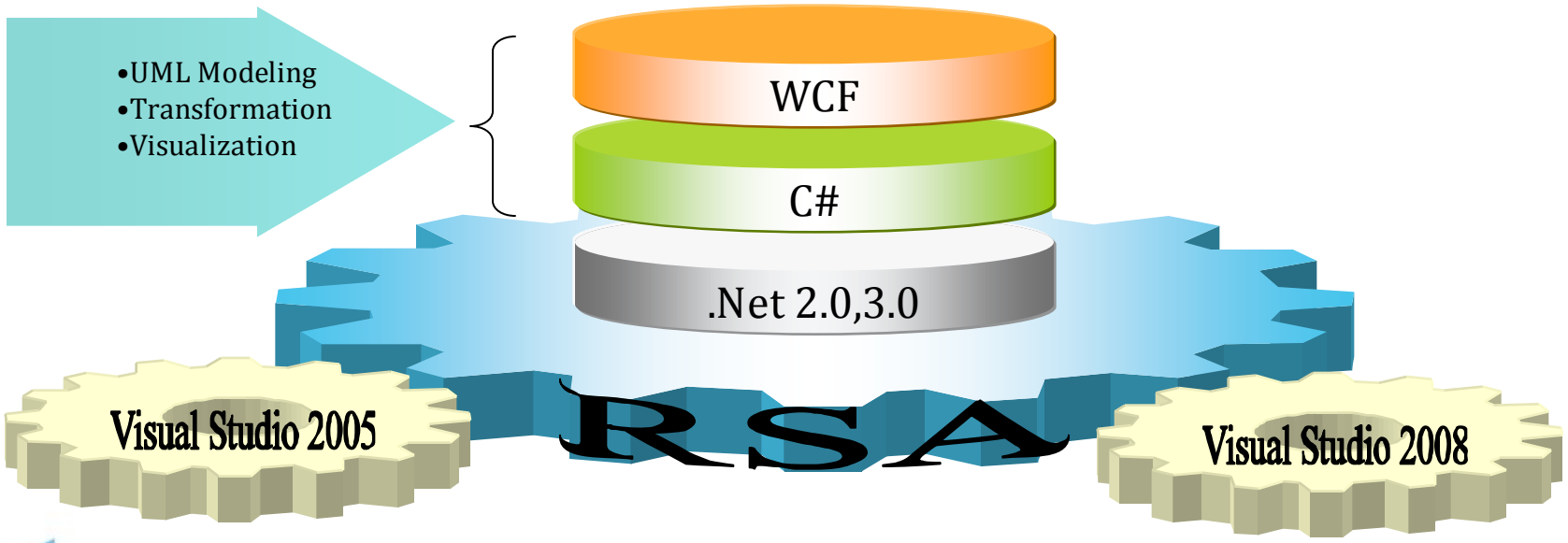
Agenda

Microsoft .Net in Rational Software Architect (RSA)

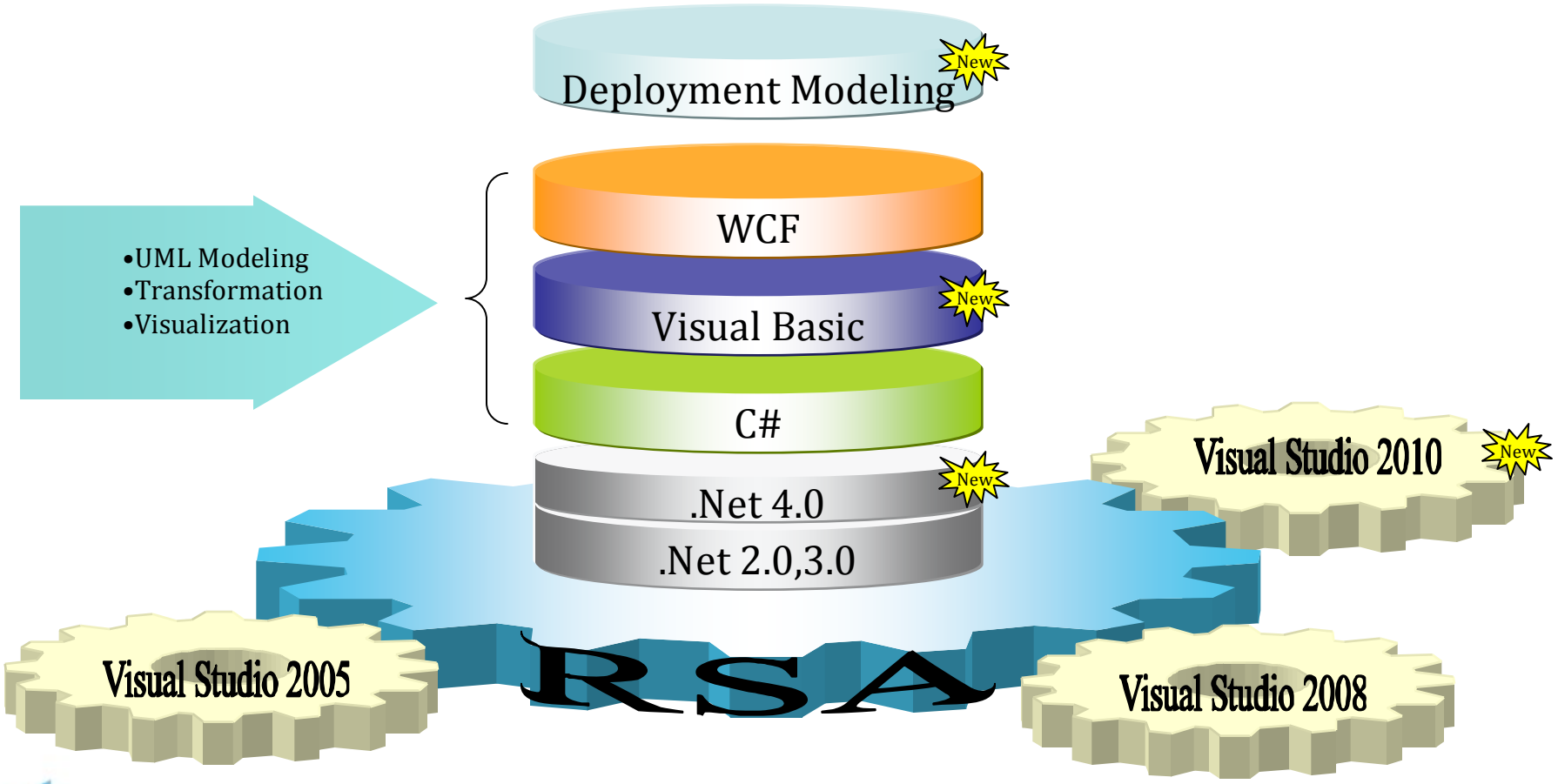
- Microsoft .Net support in RSA
- What's new in RSA 8.0 for .Net developers
- Visual Basic in RSA
- Deployment Modeling



Microsoft .Net Support in Rational Software Architect (RSA)



What's new in RSA 8.0 for .Net developers



Microsoft .Net in Rational Software Architect (RSA)

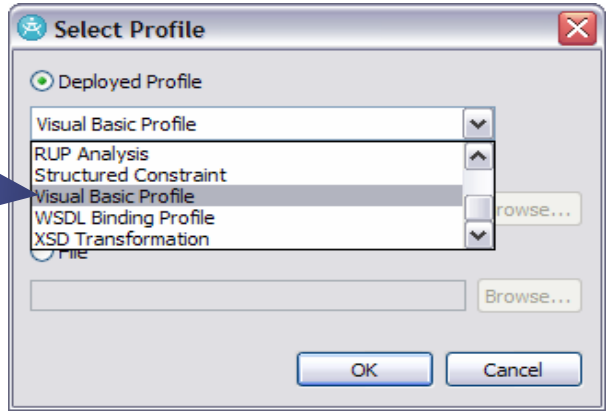
Visual Basic in RSA

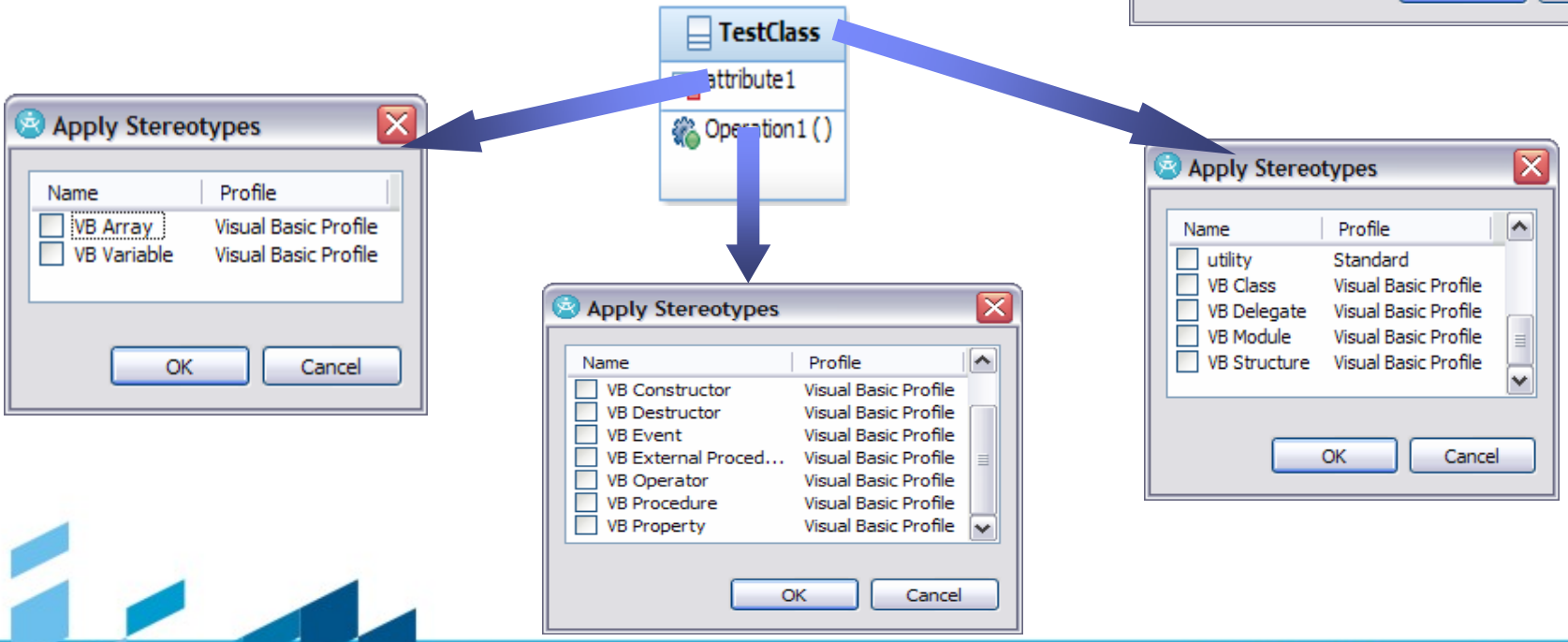
- Visual Basic modeling capabilities.
- Importing Visual Basic projects & types.
- Transformation
  - Generation of Visual Basic code.
  - Reverse engineering of code and architecture reconciliation.
- Visualization of Visual Basic types
- Generation of WCF Service library

Visual Basic in RSA

Visual Basic Modeling capabilities.

- Visual Basic specific modeling in RSA with “Visual Basic Profile”.
- Visual Basic Profile provides comprehensive set of stereotypes which helps in modeling Visual Basic concepts.

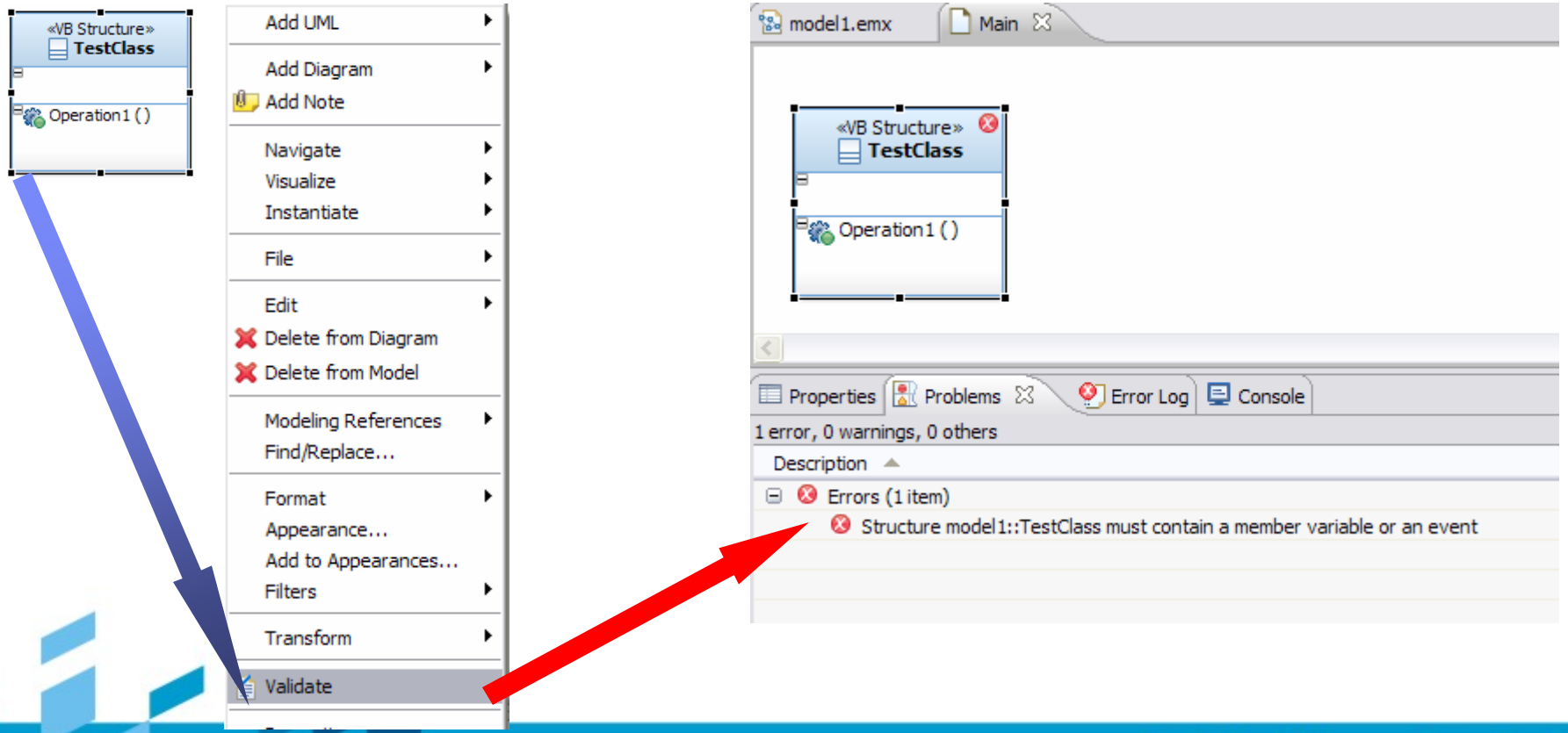




Visual Basic in RSA

Visual Basic Modeling capabilities…

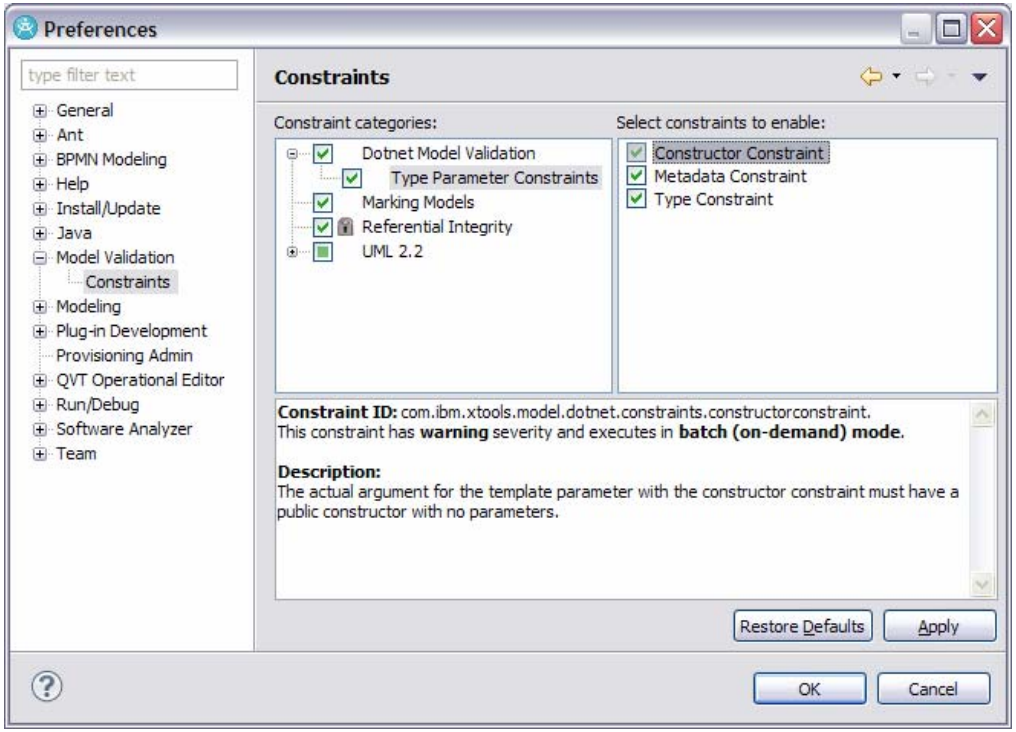
- Stereotype constraints in Visual Basic profile report design level conflicts for Visual Basic domain as warnings OR error on validation.



Visual Basic in RSA

Visual Basic Modeling capabilities

- Model validation constraints based on type parameter constraints to validate generic instantiation



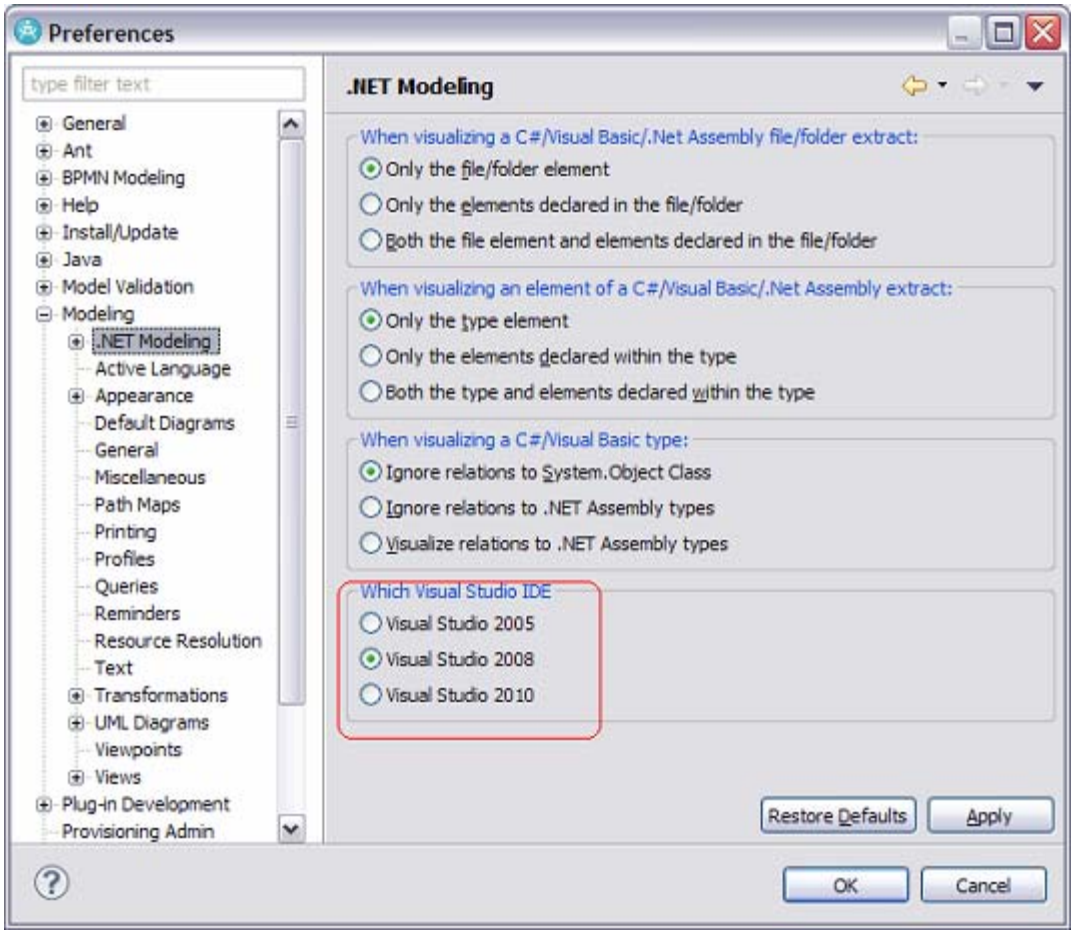
Visual Basic in RSA

Visual Basic Modeling capabilities also includes…

- Explicit interface realization
- Support for modeling event handlers
- Support for XML comments
- Generic and partial types are supported
- Support for generic constraints.

Integration with Visual Studio 2010

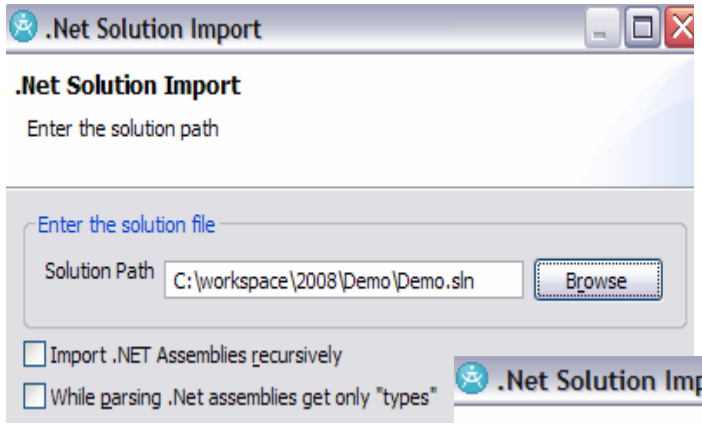
- RSA integrates with:
  - Visual Studio 2005
  - Visual Studio 2008
  - Visual Studio 2010
- Integration with Visual Studio 2010 allows user to import VS 2010 projects into RSx workspace.
- Transformation, Visualization features will work as it is with Visual Studio 2010.

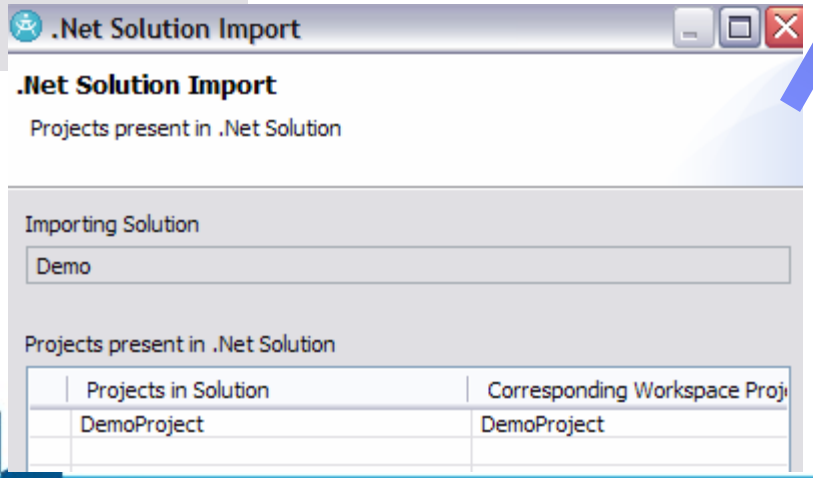


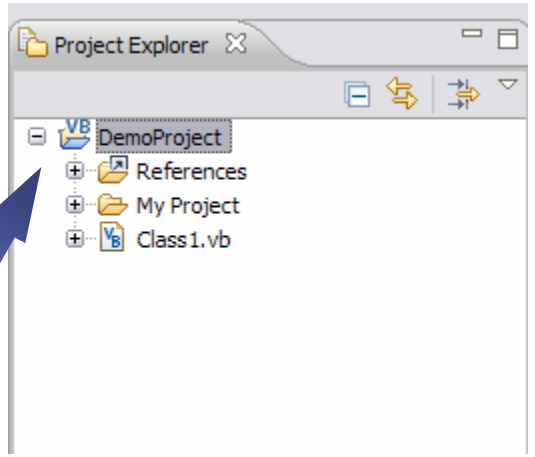
Visual Basic in RSA

Importing Visual Basic projects.

- Visual Basic projects can be imported using .Net solution import wizard : File->Import->Modeling->.Net Solution.



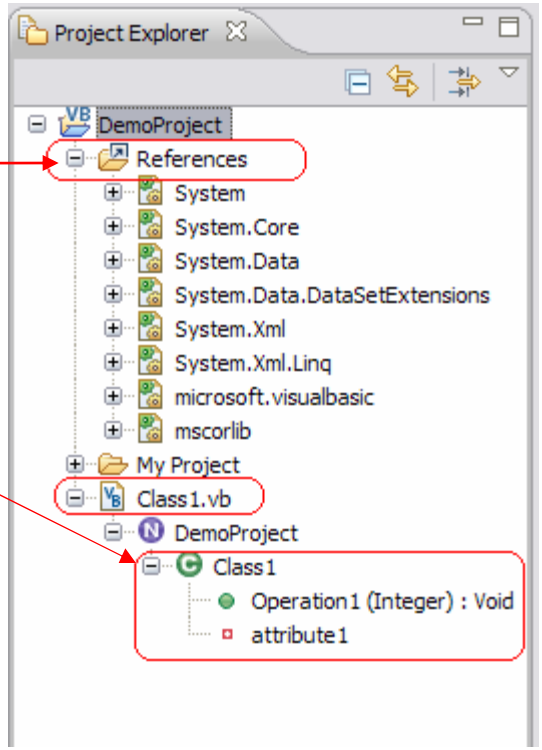




Visual Basic in RSA

Importing Visual Basic projects.

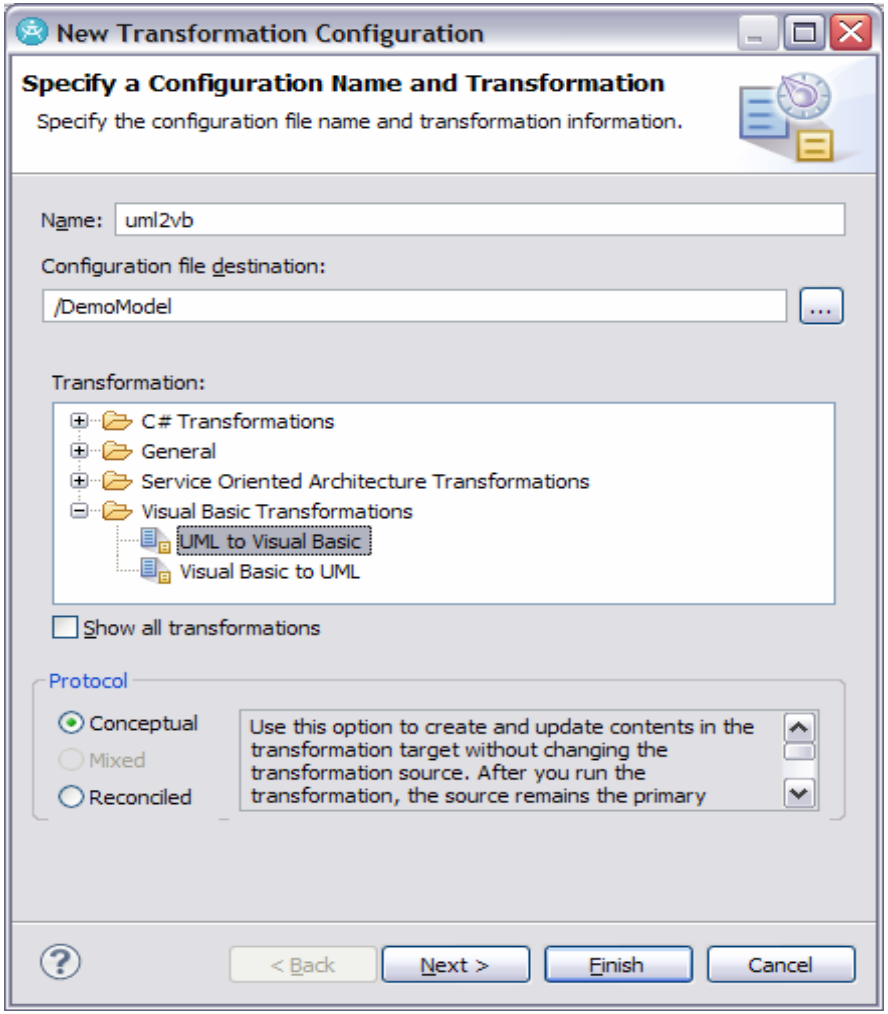
- Expand imported projects in Project Explorer to view:
  - Referenced assemblies
  - Source files
  - Types and type members



Visual Basic in RSA

Transformation

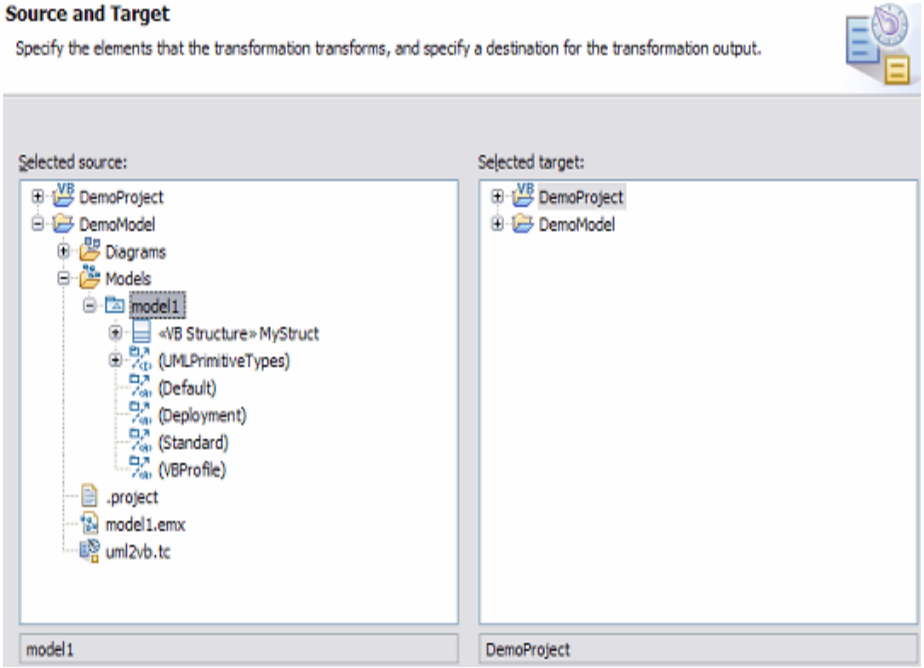
- Two new transformations added for Visual Basic:
  - UML to Visual Basic; for code generation
  - Visual Basic to UML; for reverse engineering and architecture reconciliation

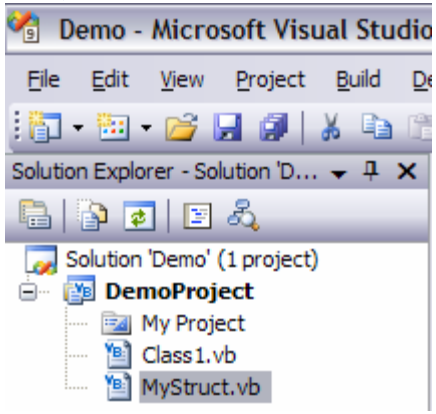


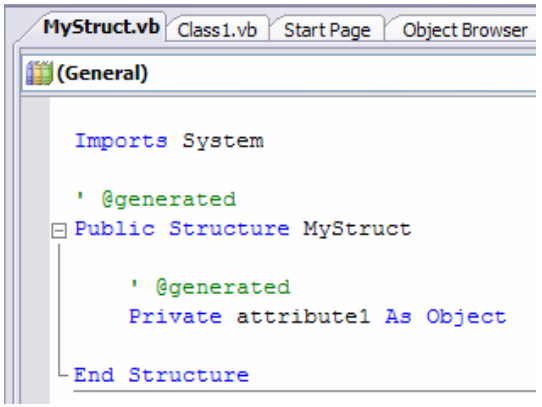
Visual Basic in RSA

UML to Visual Basic transformation

- Create a new transformation configuration using UML to Visual Basic transformation.
- Select the imported Visual Basic project as target and run transformation to generate the code.
- On successful transformation, Visual Basic project in VS IDE will be updated with new **.VB** files generated.
- Code generated from UML model will be annotated by @generated tag.







Visual Basic in RSA

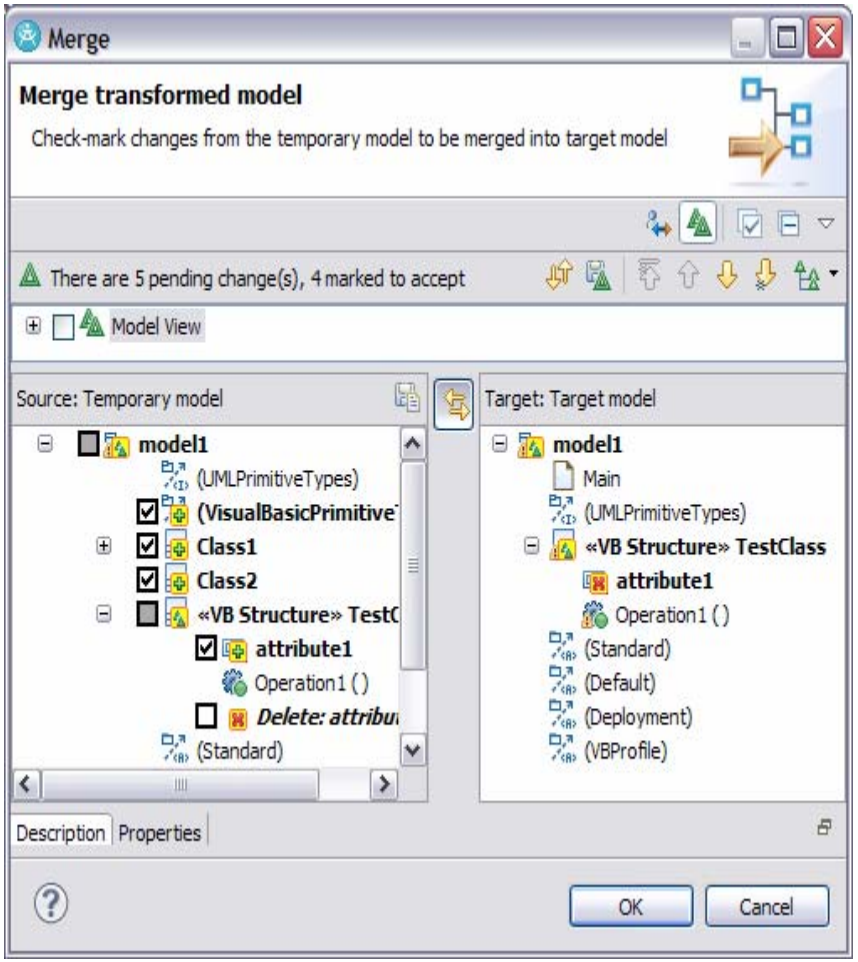
UML to Visual Basic transformation

- **Value Proposition**
  - **Manage Risk early**
    - Early in project, UML models can be modified more quickly and at less cost than code.
    - Avoid the temptation to start coding too soon and fall into the schedule-driven trap of evolving a prototype into the production system
  - **Automates task of translating design to code.**
    - Addresses pain point of repetitive pattern which is translating architecture to actual code with consistency & quality.
  - **Traceability**

Visual Basic in RSA

Visual Basic to UML transformation

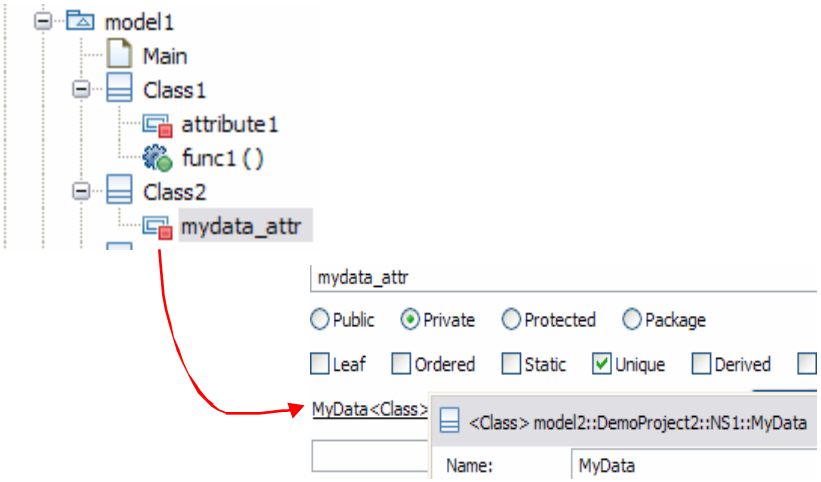
- Use Visual Basic to UML transformation for reverse engineering of code to UML model
- Transformation will capture domain specific information as domain specific model
  - Transformation will apply Visual Basic profile & stereotypes only if the information cannot be captured using UML qualifiers.
- Use Visual Basic to UML transformation for architecture reconciliation

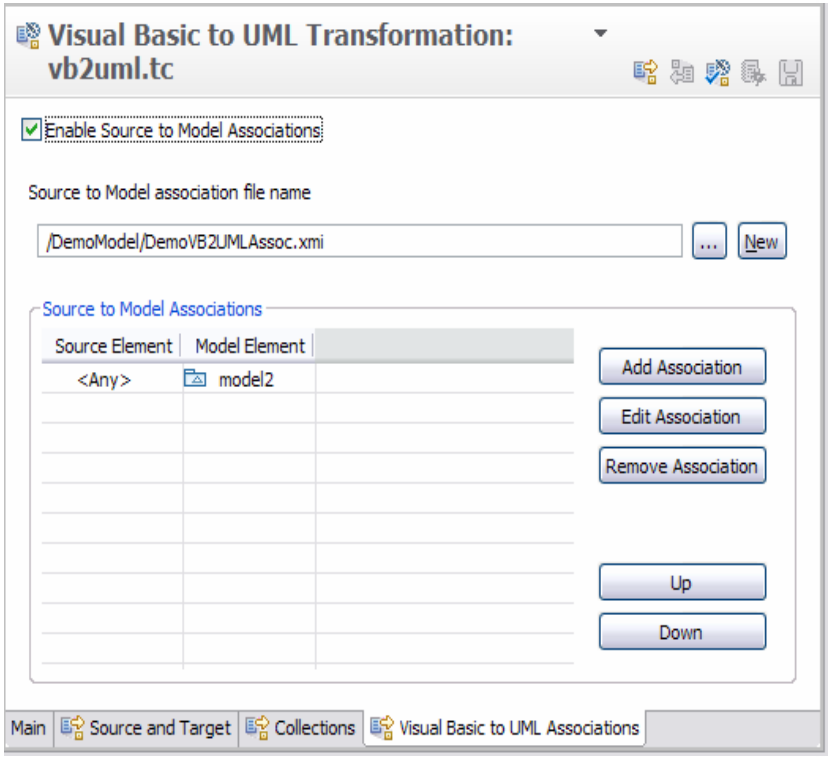


Visual Basic in RSA

Visual Basic to UML transformation

- Use Visual Basic to UML association to resolve cross project references as UML type





- In absence of association, cross project references will be resolved as visualized references

Visual Basic in RSA

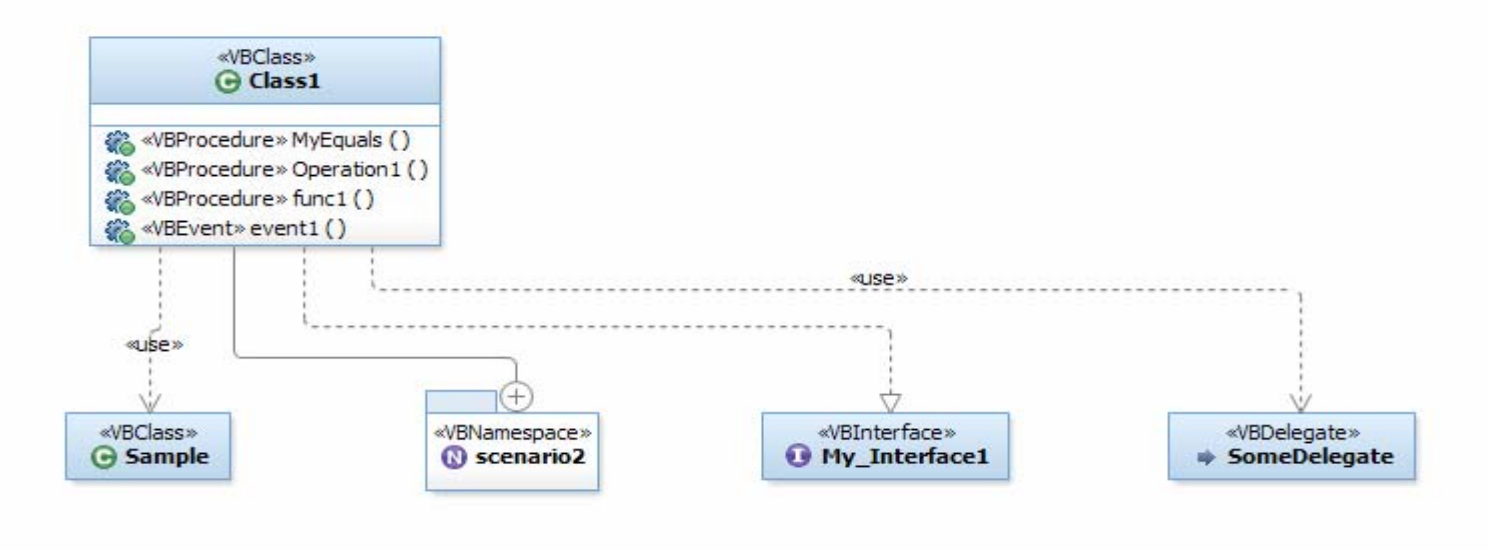
Visual Basic to UML transformation

- **Value Proposition**
  - **Rigorous design contract management**
    - "We have a complete ongoing representation of the evolving design intent that can be periodically compared to the independently evolving state of the implementation. This readily identifies issues that may require corrective action"
  - **Seeding of conceptual model**
  - **Keeps model & code in sync**
    - In round trip engineering keeps model and code in sync with the support of incremental content additions

Visual Basic in RSA

Visualization of Visual Basic types

- Visualization support includes:
  - Class diagrams
  - Sequence diagrams
  - Topic & Browse diagram

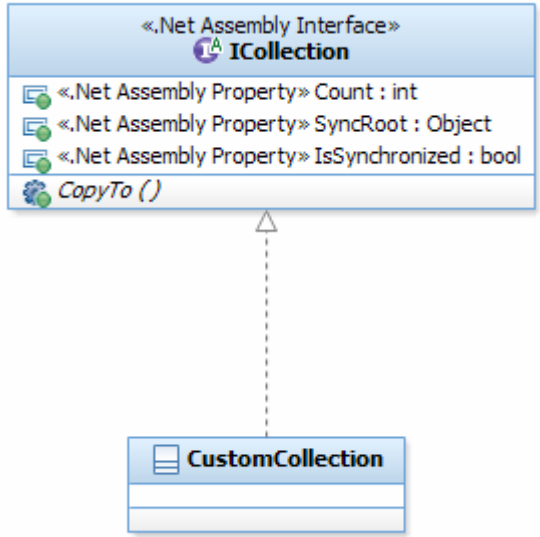


- Double-click visualized element to navigate to the code in Visual Studio …

Visual Basic in RSA

Visualization of Visual Basic types

- Supports mixed modeling:
  - The Mixed modeling combines conceptual and concrete modeling in a unique way
    - Treats the visualized elements as proxy UML elements and use them in designing the conceptual model
    - Allows using the existing code base and extend those further using MDD without capturing them in UML model
  - The Mixed modeling is well suited for an iterative design approach.
  - Allows visualizing custom DLLs or assembly elements
    - Enables extending the CTS type or any User Defined Types in custom DLLs.



Visual Basic in RSA

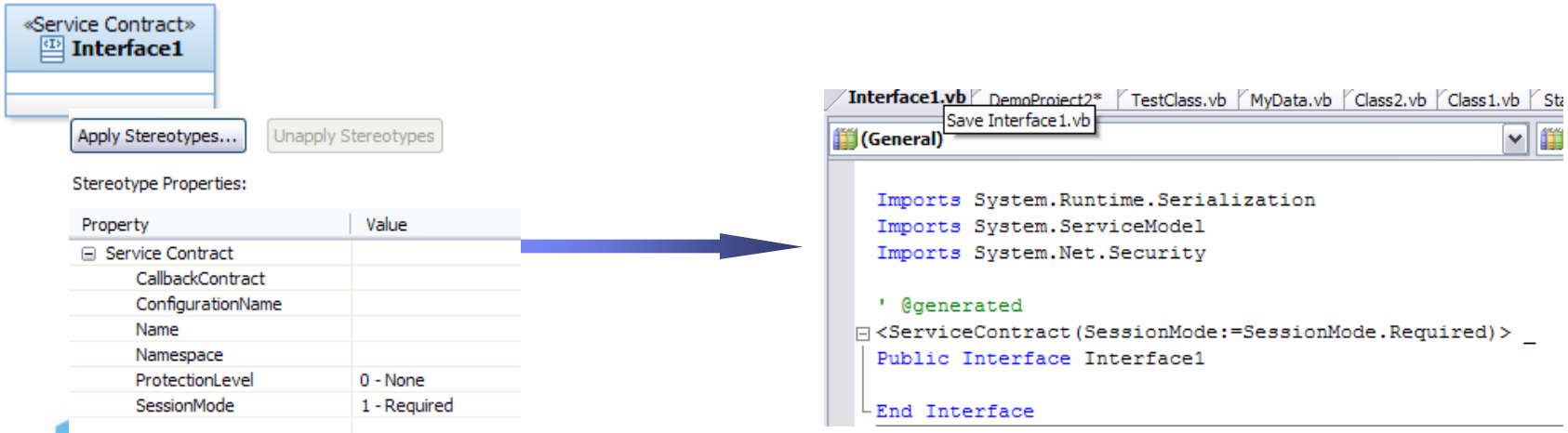
Visualization of Visual Basic types

- Value Proposition
  - **Communication, Documentation, Compliance:**
    - "I can seem to effectively explain the design to the business guys"
    - "My manager/architect wants UML diagrams"
    - "My {customer | general contractor | regulator} requires UML diagrams"
  - **Comprehension, Maintainability**
    - "I don't understand the code that John wrote"
      - Where's John?
  - **Design Support**
    - "I'm a developer, I don't want to learn the details of UML or work with model files, but I like the clarity and rigor that diagrams bring to my design process"

Visual Basic in RSA

Modeling WCF Service library

- The UML to Visual Basic transformation generates WCF Service Library in Visual Basic
  - The Visual Basic code elements get annotated with WCF attribute as per the stereotypes applied on the UML model elements
  - Properties of the stereotype get transformed into the property of the corresponding attribute
- Visual Basic to UML transformation will capture the WCF attributes in the Visual Basic code and apply appropriate stereotype in UML model



.Net 4.0 support

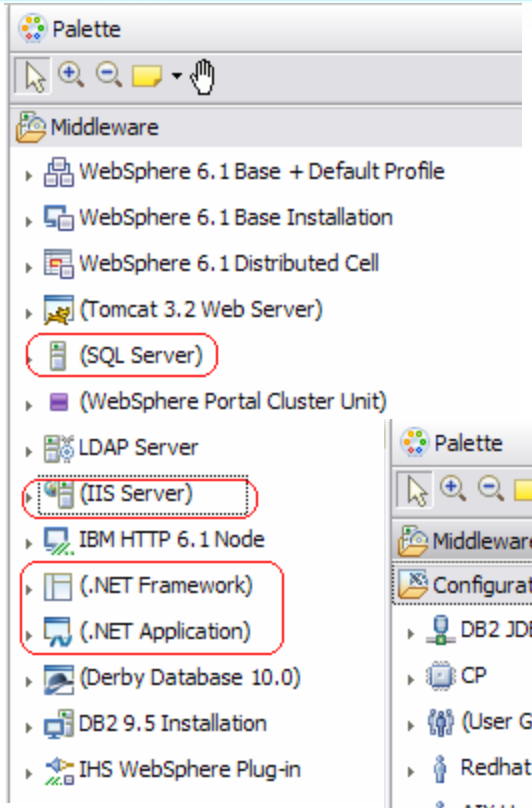
Modeling & Code generation support.

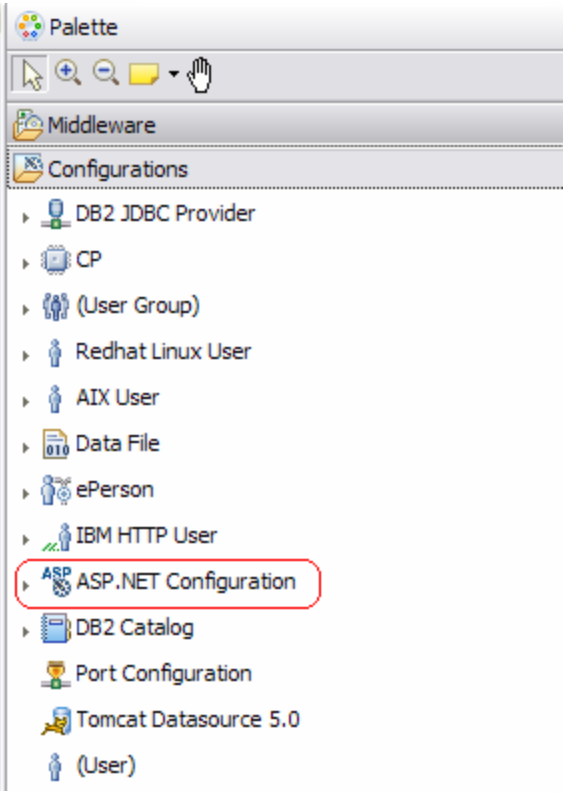
- C#
  - Optional method parameters
  - *dynamic* type support
- Visual Basic
  - Auto-implemented Properties
  - Collection Initializers
  - From keyword in Variable/Field initializers
- Covariance and Contravariance in type parameters
  - Supported for both Visual Basic and C#

Deployment Modeling

Deployment Model Planning support.

- Deployment model planning support is enabled for following .Net components
  - .Net Framework
  - .Net Applications
  - IIS Server
  - SQL Server
  - .Net Configuration

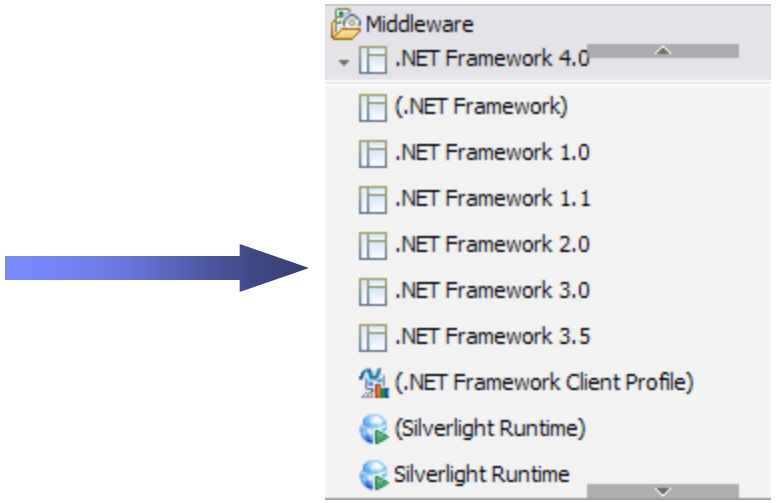


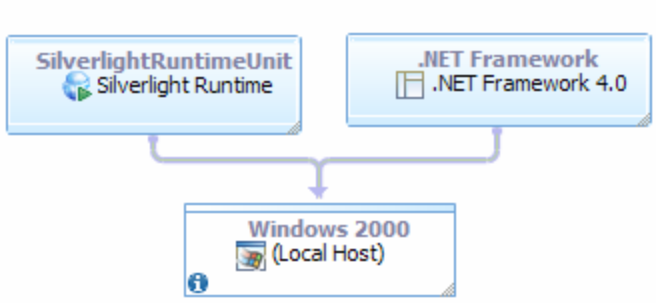


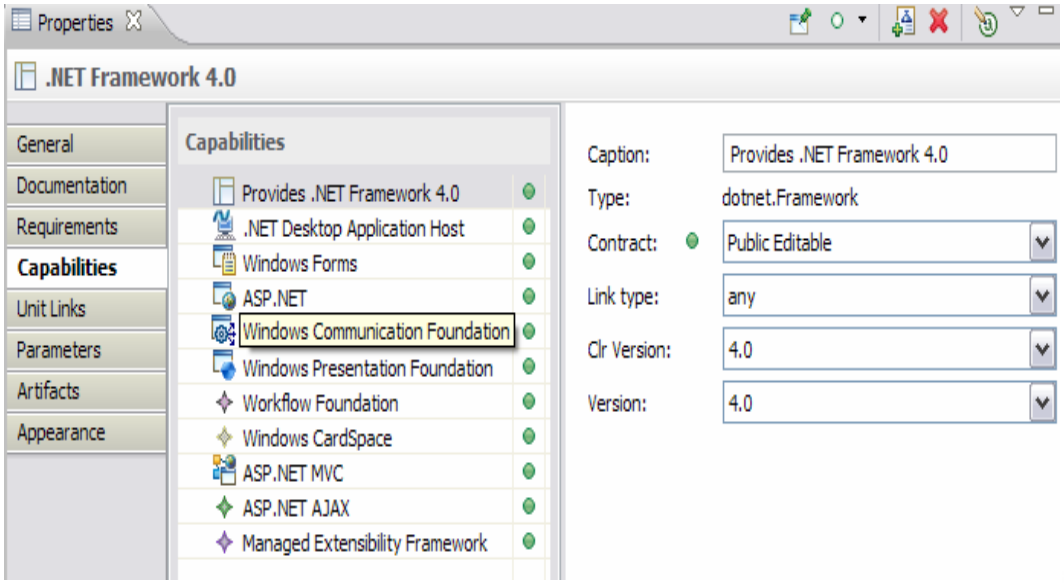
Deployment Modeling

.Net Framework

- Built-in templates for:
  - 1.0, 1.1, 2.0, 3.0, 3.5, 4.0, Client Profile
  - Silverlight Runtime
- Each template comes with capabilities representing libraries bundled with the particular version of the framework
- Additional libraries can be added as required
  - Start from the **dotnet:Library** capability and customize



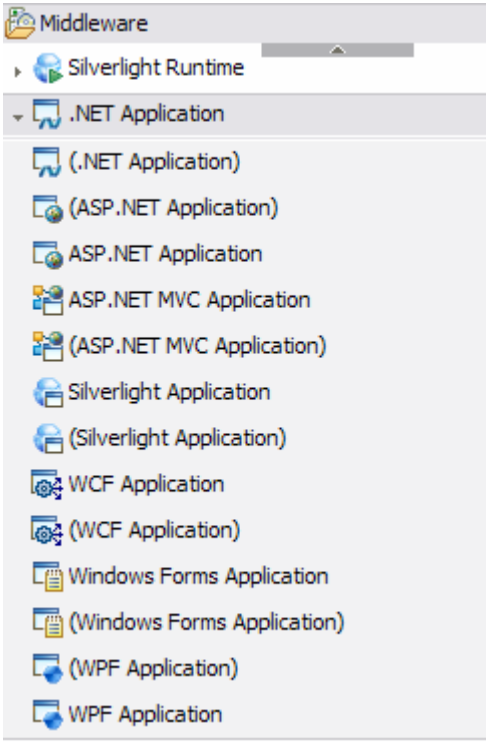


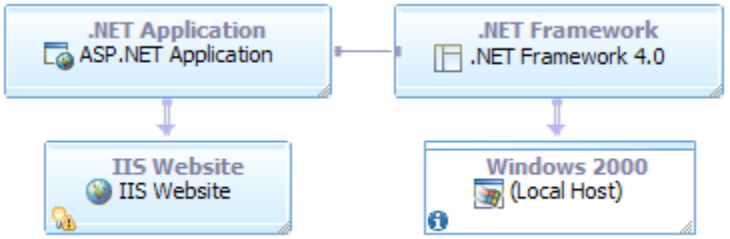


Deployment Modeling

.Net Applications

- Application units
  - An application unit represents .NET Application with its Framework, Framework and Hosting requirements
  - Templates provided for
    - Windows Forms
    - ASP.NET Web Application
    - ASP.NET MVC Application
    - WCF Application
    - WPF Application
    - Silverlight Application
  - Other applications can be modeled by customizing the generic .NET Application unit
- Application hosts
  - Desktop Application host - .NET Framework
  - Web Application host – IIS
  - Silverlight Application host – Silverlight Runtime

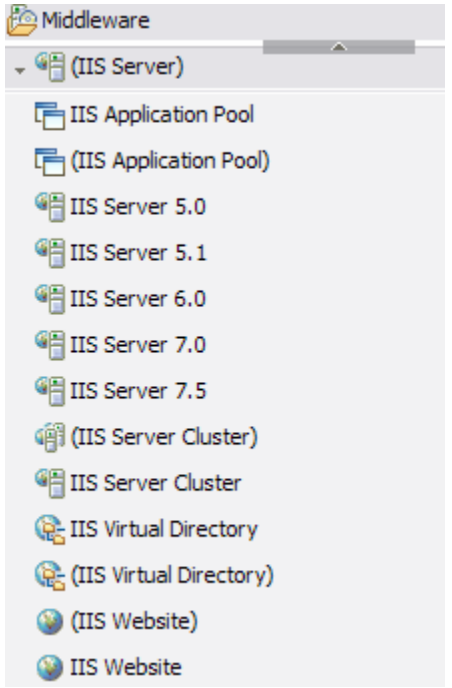


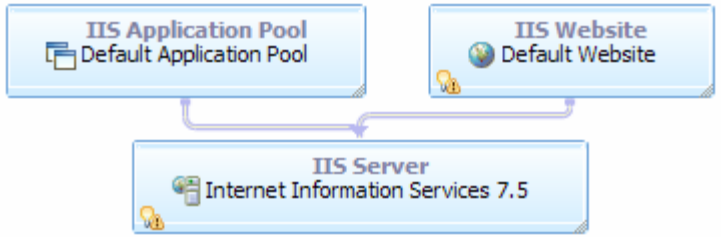


Deployment Modeling

IIS Server

- IIS Server
  - Built-in templates for: 5.0, 5.1, 6.0, 7.0 and 7.5
  - Hosts Websites and Virtual Directories
  - Contains server global configurations (Global handlers and modules for 7.0+)
- Websites
  - Hosts Virtual Directories and .NET Web applications (ASP.NET, ASP.NET MVC)
  - Website configuration – Ports, SSL, Default Documents, MIME Types, HTTP Headers…
- Virtual Directories
  - Hosts .NET Web Applications and nested Virtual Directories
  - Virtual Directory Configuration – Default Documents, MIME Types, HTTP Headers…
- Application Pools
  - Application Pool settings – Recycling, Performance, Health…
- Limited support for modeling IIS Server clusters

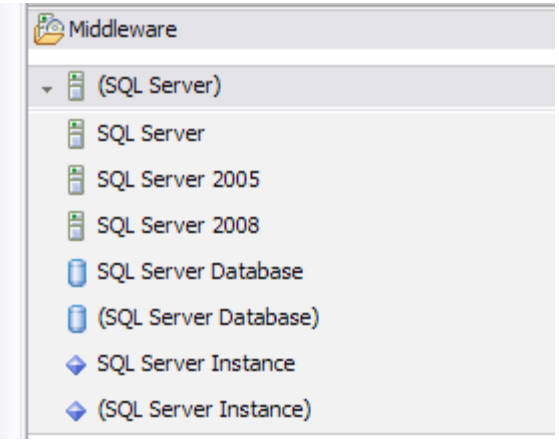


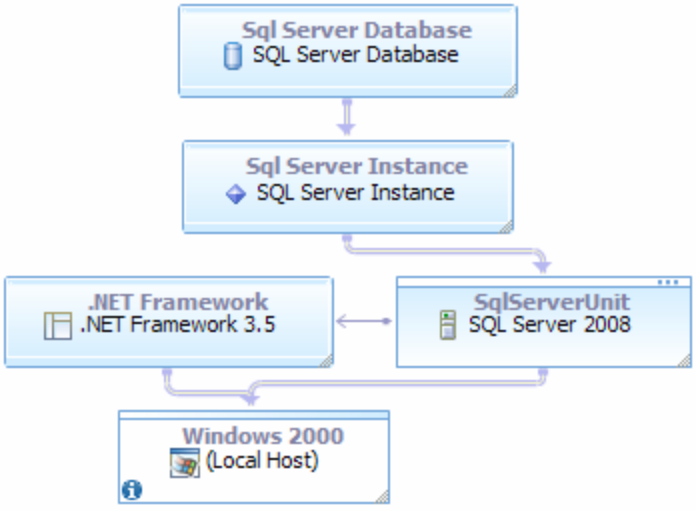


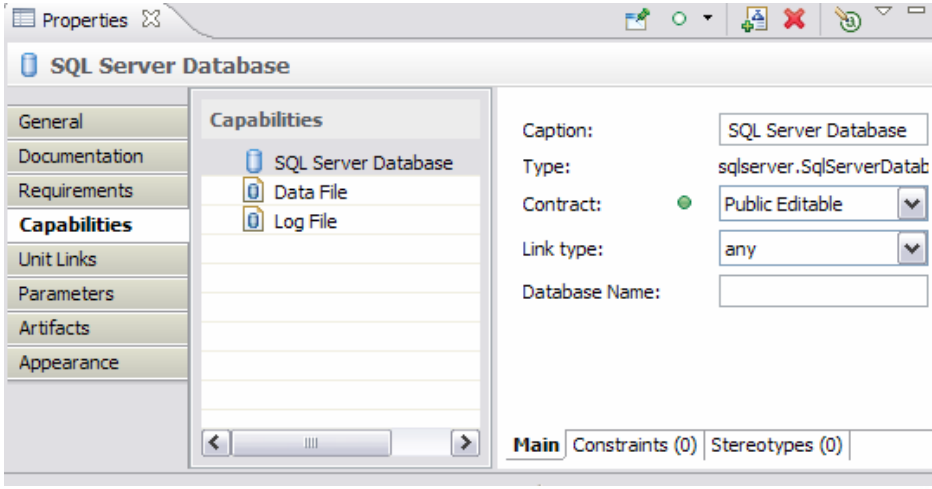
Deployment Modeling

SQL Server

- SQL Server
  - Represents the database engine
  - Hosts one or more SQL Server Instances
- SQL Server Instance
  - Represents a SQL Server Instance (Named or Default)
  - Hosts one or more SQL Sever Databases
- SQL Server Database
  - Models Database properties – Data File (mdf), Log File (ldf)







Demo

Questions

Innovate2010
The Rational Software Conference

THANK YOU