
Microsoft® SQL Server™ 2005

Managed SQL Server 2005 Deployments with CA ERwin® Data Modeler and Microsoft Visual Studio Team Edition for Database Professionals

*Helping to Develop, Model, and Maintain Complex Database
Architectures in a Production Environment*

White Paper

Abstract

CA® has partnered with Microsoft to integrate its CA ERwin® Data Modeler (CA ERwin DM) with the latest version of the Microsoft® Visual Studio® Team Edition for Database Professionals (VSDP) development system. This gives database developers a comprehensive platform for designing and testing Microsoft SQL Server® 2000 and 2005 database software. It provides an industry-leading database modeling and design solution with a development and lifecycle management environment. This collaboration is an example of the CA EITM vision as it maps a clear path to unifying and simplifying the provisioning and management of IT services. The CA approach of “provide, partner, and integrate” can help any organization mitigate risk, reduce cost, improve service, and synchronize its IT services to constantly changing business initiatives.

Contents

- Introduction 1
- The Challenge of IT Administration 1
 - EITM: The CA Comprehensive IT Management Solution 1
 - How Database Management Can Benefit from EITM 2
 - The CA ERwin DM Role in EITM and Database Management 2
 - Advantages of Using Microsoft Visual Studio Team Edition for Database Professionals for Database Management 4
- Examples of How CA ERwin DM and VSDP Make Database Management Tasks Easier 5
 - Scenario 1: Applying Existing Standards to a New Database Application Set 5
 - Scenario 2: Migrating Existing Database Applications to SQL Server 2005 6
 - Scenario 3: Integrating Newly Developed Database Systems and an Existing Analytical Platform 7
 - Scenario 4: Design Visualization and Data Modeling in the VSDP and SQL Server Environments ... 7
- Conclusion 8
- About CA 9

Introduction

As Microsoft® SQL Server® 2005 database software emerges as an important enterprise-class database platform, organizations that use SQL Server also need enterprise-class support to assure reliable performance. The successes of IBM's DB2 relational database product in the mainframe-based database market and Oracle in the distributed database market prove to many CIOs that a company's strategic IT infrastructure relies as much on its supporting processes and tools as it does the horsepower and functionality of the database management system. IT Infrastructure Library (ITIL) best-practice guidelines state that the value of rigorous service management extends to its development and operational processes, and an organization's strategic database architecture is a good example of this.

Fortunately, CA and Microsoft offer a solution that benefits from the cost effectiveness and competitive functionality of SQL Server and offers a robust development and testing platform for database applications.

The purpose of this white paper is to address the need for organizations to adopt best-practice guidelines in building an enterprise-class service architecture, and to briefly describe the tools that CA and Microsoft provide to implement those guidelines.

The Challenge of IT Administration

Many companies are increasingly dependent on complex IT infrastructure to manage their suppliers and partners, organize their internal processes, coordinate with distribution channels, and interact with customers. Especially in today's competitive business environment, business managers need their IT infrastructure to work well and reliably, and to accommodate quickly changing business strategies. This places enormous pressure on IT organizations because the applications and services that comprise the IT infrastructure are often also extremely complex and difficult to develop and manage. It is hard for business managers to make effective business decisions when they cannot understand the technology that enables their business to operate.

Because of this difficulty, IT organizations must find ways to streamline their efforts and work as a cohesive unit with their business counterparts to deliver high-quality services. The multi-tiered and networked applications that deliver business services require a multidisciplinary approach to meet the needs of the business operations. The ITIL framework is a set of best-practice guidelines that promote this goal by linking business perspectives with IT infrastructure management.

A successful implementation of the ITIL service management guidelines cannot be achieved without careful planning in the design of the organization's service architecture. Each business has its own IT requirements, and if IT technology is misapplied, it can increase costs and inefficiency rather than reduce them. The unavoidable complexity of IT infrastructure technologies makes it necessary to use powerful tools and approaches to ensure that the goal of ITIL best-practice guidelines is realized.

EITM: The CA Comprehensive IT Management Solution

The CA approach to enable ITIL and other best-practice guidelines is Enterprise IT Management, or EITM. Its aim is to provide IT staff an integrated framework for managing the entire IT infrastructure according to the principles of "provide, partner, and integrate."

EITM *provides* IT organizations and business-management teams with a comprehensive and cohesive view of the IT operations to help them manage risk and costs, improve service, and align their IT investments to support new and existing business processes. This fulfills the ITIL requirement of *IT*

Governance, which mandates that decisions about IT operations must be governed by all business management, and not just IT management.

Because ITIL guidelines do not advocate a specific vendor's solution, EITM *partners* with and complements the management and security solutions not provided by CA. And EITM *integrates* existing management tools and business processes so that the IT infrastructure can support business transactions in a consistent and automated way.

How Database Management Can Benefit from EITM

An area of IT management where the idea of “provide, partner, and integrate” is particularly useful is the development and management of an organization's database architecture. The database architecture is one of the foundations of an effective IT infrastructure. As such, it is crucial that the architecture be rigorously designed, efficiently implemented, and flexible enough to accommodate expansion and modification as changing business needs dictate. IT management and business management must know how their database resources are configured and how well those resources are meeting their business requirements at all times, and the EITM framework, along with the tools and technologies that support it, provides this knowledge.

Because a company's database architecture develops over many years, it typically relies on several database management applications across its IT infrastructure. For example, a data transaction may take place between an Oracle relational database and several discrete databases managed by Microsoft SQL Server 2005. Integral to the EITM solution is the ability to track and manage the database management solutions of different vendors in an integrated way. EITM can provide business management with an accurate and comprehensive bird's-eye view of the quality of service provided by the database architecture. Business management can then determine whether the architecture needs to be modified if the quality of service is not acceptable.

This ability to monitor and assess database operations is also useful in the lifecycle support of the database architecture. When the entire database structure needs to be changed, it is time-consuming and inefficient to perform these changes piecemeal, using the tools and processes provided by each vendor. EITM makes upgrading heterogeneous database implementations more efficient by partnering with and complementing each vendor's tools and technologies, thereby providing the database modeling and processing capabilities that allow IT managers to design and test the entire database structure as one unit.

The CA ERwin DM Role in EITM and Database Management

CA ERwin DM is a powerful software application that analyzes and models information systems such as data warehouses, enterprise data resource models, and databases. It can display the structure of a distributed database system in an easy-to-understand, graphical format, enabling business and IT managers to easily visualize the state of their data resources and plan optimizations. With CA ERwin DM, design issues can be quickly identified and addressed early in the design process. CA ERwin DM is an integral part of the CA EITM vision and a valuable resource for businesses adopting ITIL best-practice guidelines.

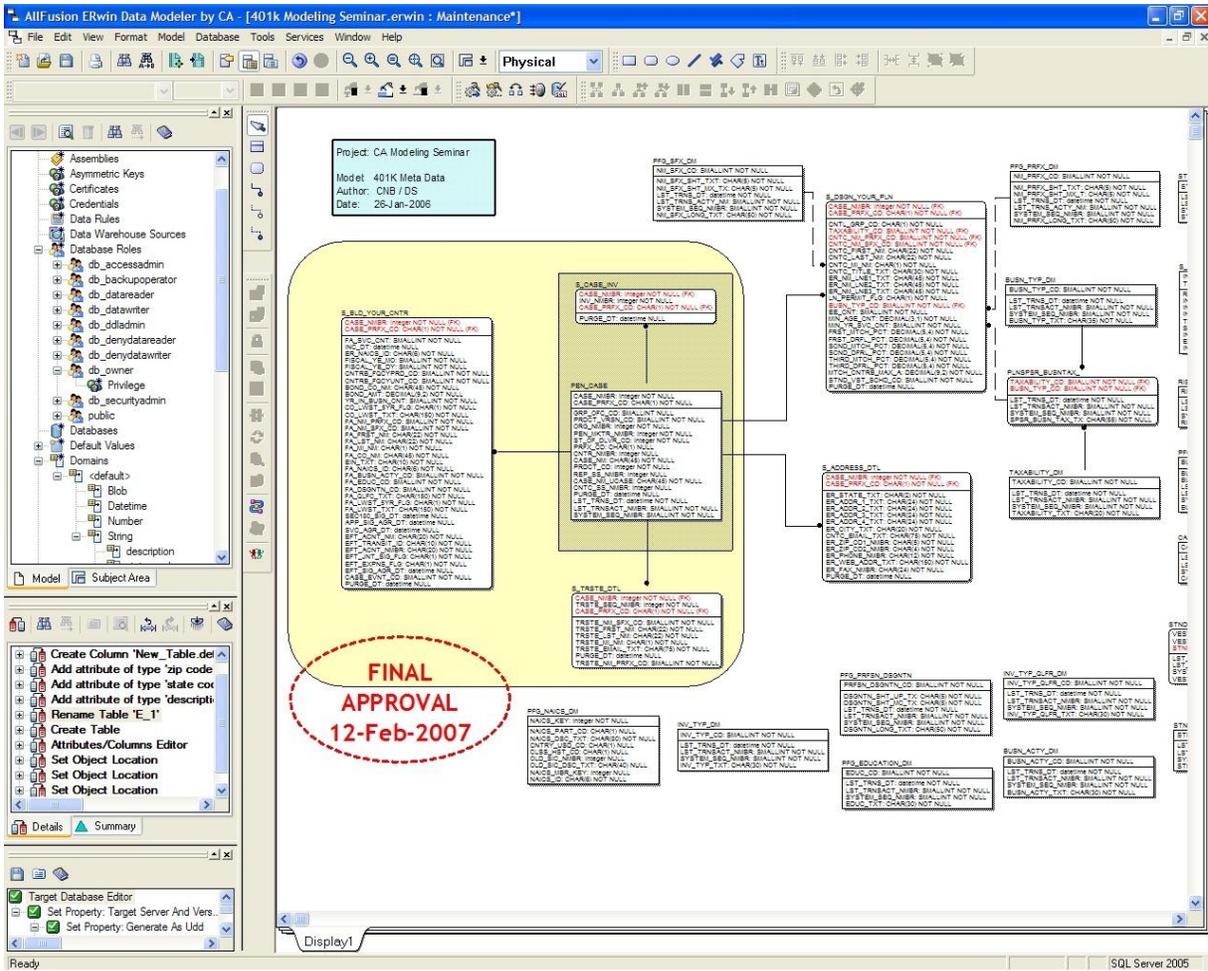


Figure 1. The CA ERwin DM Data Visualization Interface

Specifically, CA ERwin DM capabilities include:

- Logical and Physical Model-Driven Database Development.** CA ERwin DM can create logical models of database structures, which are representations of the structure that can be generalized for all implementations of the database. Logical names and descriptions of entities and descriptions, logical domains, and logical data types are supported.

CA ERwin DM can also create physical models of database structures from the logical models. Physical models are instances of the logical model with the specific attributes particular to an instance. Combinations of logical and physical models are also supported.

There are several advantages to model-driven development: First, it enables database architects to analyze and optimize the design of a database schema before implementing it, saving time and money in the design process. The business rules can be verified, internal and external consistency can be checked, and the maintainability of the design can be ensured while still in the pre-prototype stage. Second, a model can be used to generate a database that can then be modified into a unique implementation, saving time and money by making it unnecessary to create every database from scratch. And last, because the model is a compact and accurate representation of the database schema, it can be easily archived for later reuse, incremental update, or publication in context.

- **Forward and Reverse Engineering.** In forward engineering, CA ERwin DM analyzes the physical model and generates SQL or DDL script that can be run to create the corresponding database schema. In reverse engineering, CA ERwin DM analyzes a database schema and generates the corresponding physical model. Forward and reverse engineering can be performed in one operation—this is referred to as “Complete Compare”—to facilitate seamless round-trip schema engineering.
- **Model-to-Model Comparison.** CA ERwin DM can also compare two model files with “Complete Compare” in order to track model changes as well as share model objects.
- **Integrated Database Analysis and Modeling.** CA ERwin DM can analyze multivendor database architectures and use the results of the analysis to model new architectures.
- **Collaborative Design Task Automation.** The CA ERwin Model Manager enables teams of designers to collectively create, share, and manage their modeling and design processes through rigorous model management.
- **Integration with SQL Server.** SQL Server is becoming a database management solution for enterprise-wide database implementations, and CA ERwin DM provides extensive support for SQL Server 2000 and 2005.

Advantages of Using Microsoft Visual Studio Team Edition for Database Professionals for Database Management

Microsoft Visual Studio® Team Edition for Database Professionals (VSDP) was introduced in 2006 to provide database designers with the tools for collaborative development, schema maintenance, and database deployment. It features extensive support for SQL Server 2005 and earlier versions, taking advantage of the growing prominence of SQL Server as a high-performance, enterprise-level database platform. VSDP is designed to be a comprehensive development and schema management environment with the following capabilities:

- **Integrated Source Control.** VSDP supports all source code control environments offered by Visual Studio 2005, and the combination of VSDP and Team Foundation Server (TFS) offers integrated source control within application lifecycle management features such as work items and bug tracking. Each member of the development team can create a baseline version of the files, compare and shelve versions, branch and merge versions, and check in and check out versions concurrently with other team members in a collaborative environment.
- **Comprehensive Test Environment.** Using VSDP, developers can create full unit tests for database applications and schemas driven by T-SQL scripts or managed Microsoft Visual C#® and Visual Basic® development systems code. These tests can be run privately on the developer’s workstation or as part of the daily or continuous team build, and they provide a mechanism for centrally measuring and reporting quality metrics for the application and database tiers. VSDP can also write test data to the physical database to verify the integrity of the deployment.

When a development database has been tested, you can use VSDP to deploy the tested database to a staging server. During deployment, VSDP automatically creates a change script by comparing the schema of the development database with the schema of the development database. Developers can then run these change scripts to synchronize the two schemas. This saves the organization time and money by making it unnecessary for developers to create these change scripts from scratch, and it eliminates the possibility for mistakes that can occur when change scripts are maintained manually.

- **Effective Team Collaboration.** With VSDP and TFS, members of the development and management teams can communicate and collaborate through the customizable, Web service–based Application Lifecycle Management (ALM) service. VSDP works with the ALM using TFS database–oriented workstreams and work items, bug-tracking capability, and the project management and reporting functionality. All aspects of the application and database tiers are fully visible to developers and management. Project specification documents can also be published on a Web-hosted team portal page.

Developers can use the SQL Server 2005 Reporting Service with TFS to generate detailed reports on any aspect of the development process—for example, the rate of code change over time, lists of unresolved bugs, and the results of regression tests. These reports can be exported to several file formats, including Microsoft Office Excel® spreadsheet software format, XML, PDF, and TIFF. Reports can be accessed by managers and team members using Visual Studio and can also be published on the team portal page.

CA and Microsoft recognized that VSDP and the CA ERwin DM Data Modeling Suite had complementary capabilities. VSDP has the schema change management and lifecycle management functionality that more fully leverages the value of modeling with CA ERwin DM. CA ERwin DM offers the design visualization and standardization capabilities to enhance design and standardization capabilities of the IDE provided by VSDP . Because of this, and because both products have extensive support for SQL Server 2000 and 2005, CA and Microsoft made CA ERwin DM an integral extension of VSDP.

Examples of How CA ERwin DM and VSDP Make Database Management Tasks Easier

The following three examples illustrate how CA ERwin DM and VSDP can be used in an integrated way to solve common database management tasks.

Scenario 1: Applying Existing Standards to a New Database Application Set

An organization is incorporating VSDP and SQL Server 2005 into its database architecture and wants to take advantage of a mature and well-tested set of database and data administration standards. IT personnel must apply these standards—which include naming, standard data types, user-defined data types, and data definitions—to all new database applications within the organization. They must also apply appropriate de-normalizations to these standards.

Approach

1. The standards are defined and captured for reuse by CA ERwin DM.
2. CA ERwin DM is used to identify and establish the appropriate standards, transform them to be SQL Server 2005–compatible, incorporate them in the new design and generate the updated VSDP managed objects.
3. VSDP is used to manage the development/testing/deployment of new/changed schema across the enterprise.

Benefits

From the outset, the new database architecture is in compliance with the established standards and is therefore consistent with the other data assets of the organization. Because the work is based on proven best-practice guidelines, the old standards are integrated into the new applications only once. The user of the new database architecture is not burdened with the task of adapting to new standards, and IT staff is not burdened with the difficulties of developing and maintaining architectures based on new standards.

Scenario 2: Migrating Existing Database Applications to SQL Server 2005

An organization is migrating database applications developed on its legacy platforms (Oracle, DB2, and Sybase) to SQL Server 2005.

Approach

1. The database applications are modeled in CA ERwin DM. (Another option is to reverse-engineer them into a CA ERwin DM model.)
2. SQL Server 2005 is designated a new target DBMS in CA ERwin DM, and the majority of the schema objects are made compatible with SQL Server 2005.
3. The schema objects are analyzed for proper alignment with business requirements before redeployment to SQL Server 2005. They can also be converted to VSDP-managed objects for managed development and deployment. Figure 2 shows VSDP communicating with CA ERwin DM.

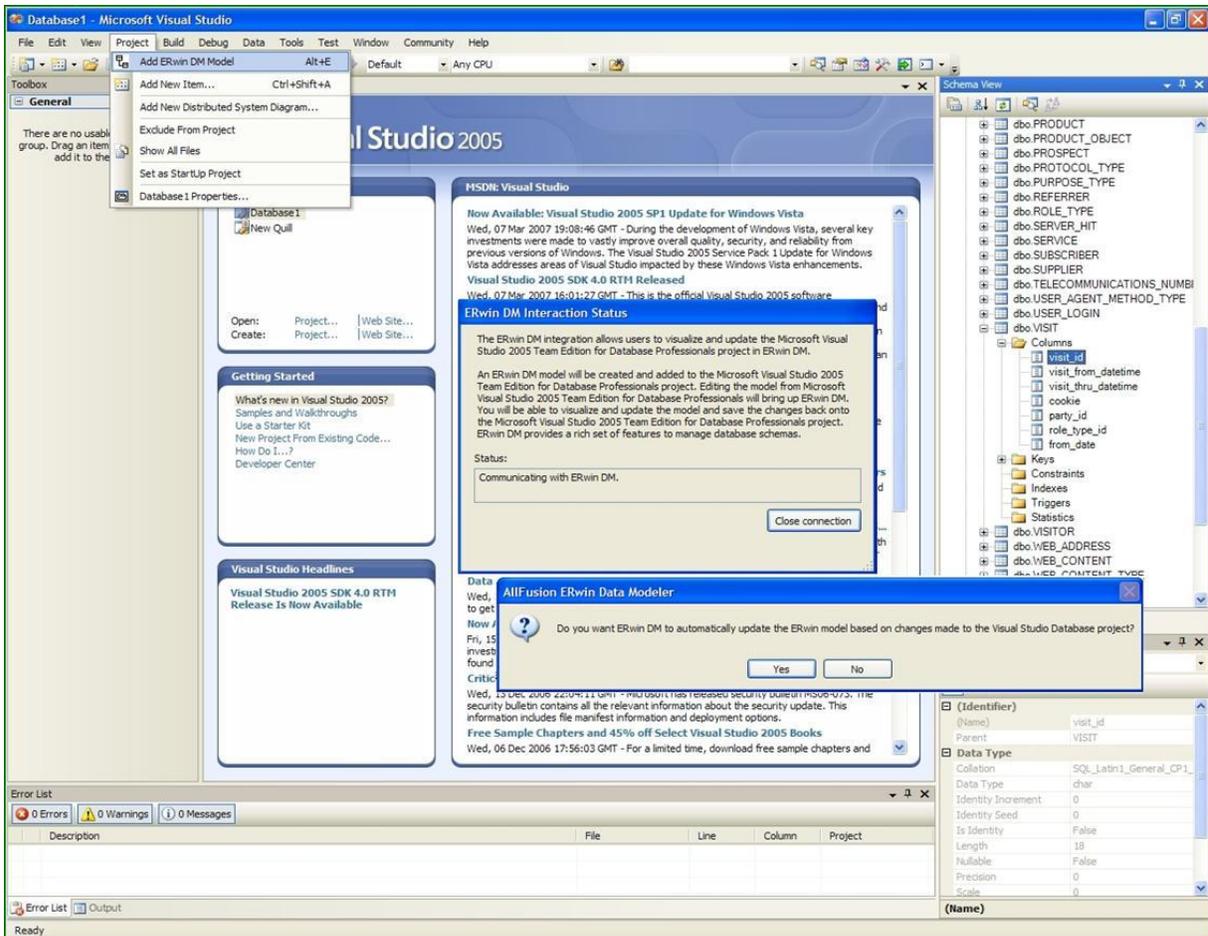


Figure 2. VSDP Reverse-engineering a Database Application

Benefits

The automation and visualization capabilities of CA ERwin DM significantly reduce the costs of migration and redevelopment. They provide developers a foundation to build on, enabling them to

quickly identify changes between the versions and to efficiently analyze, optimize, and augment the design as necessary to comply with the new business requirements before redeployment.

Scenario 3: Integrating Newly Developed Database Systems and an Existing Analytical Platform

An organization operates a data warehouse as an analytical infrastructure where all operational data for business intelligence purposes is kept. The legacy source systems of this data warehouse and all derived data warehouses have been modeled by CA ERwin DM. New systems deployed on SQL Server 2005 and managed by VSDP must be quickly integrated into this analytical infrastructure to help the organization's strategic decision makers.

Approach

1. Reverse-engineer the SQL Server 2005–based applications either natively or as VSDP-managed objects using CA ERwin DM.
2. Forward-engineer the applications into the warehouse environment.
3. The meta data exchange tool in CA ERwin DM transforms and exchanges model metadata. to provide critical source system metadata to the ETL (Extract, Transform, and Load) tool.
4. Use the meta data exchange tool to provide warehouse data definitions as metadata to the business intelligence and reporting tools.
5. Use the RTB (Report Template Builder) tool in CA ERwin DM to publish Web-based reports and definitions to the end-user community so that users can understand, trust, and take better advantage of the new data elements at their disposal.

Benefits

The organization's competitive profile is enhanced by better time-to-market for analytics, better organizational consistency, and better transparency of data assets.

Scenario 4: Design Visualization and Data Modeling in the VSDP and SQL Server Environments

An organization is implementing SQL Server 2005 and VSDP. It wants to accelerate its schema design and analysis efforts through design visualization and well-proven data-modeling techniques. The organization also wants a tool that can work effectively in the native SQL Server environment and visualize and engineer managed schema objects in the VSDP environment.

Approach

1. Provide CA ERwin DM to the organization's users—the database designers, developers, and administrators.
2. Use the CA ERwin DM round-trip engineering in the VSDP and SQL Server environments for iterative visual development and analysis of SQL Server schemas.

Benefits

CA ERwin DM provides superior visualization; large schema management capabilities such as subject areas and stored displays; a productive drag-and-drop environment; and flexible round-trip engineering functionality. All of these capabilities enable the designers, developers, and administrators to work effectively with the VSDP and SQL Server environments. As a result, schema design and analysis are faster because proven visual design practices are followed; the complexity of the design and analysis

processes are reduced; and, for the IT staff developing and maintaining these systems, the processes are much easier to understand and work with.

Conclusion

SQL Server 2005 is both a cost-effective database management platform that can be easy to configure and maintain and an enterprise-class solution that is powerful and flexible enough to be deployed in a variety of production environments. Incorporating SQL Server 2005 into your IT infrastructure requires careful planning, a design approach based on solid best-practice guidelines, and an investment in the right tools. Investing in the time and money up front will result in an IT infrastructure that is fully integrated and congruent with the business practices of the organization. The CA EITM vision is based on industry-standard ITIL best-practices guidelines, and the combination of CA ERwin DM and VSDP is ideally suited to help IT managers develop and maintain an enterprise wide database architecture that achieves the goals of EITM and ITIL.

About CA



Founded in 1976 and headquartered in Islandia, New York, CA is a Microsoft Gold Certified Partner and one of the world's foremost providers of IT management software. With 150 offices in 45 countries, the company's more than 5,300 developers create and deliver solutions that unify and simplify the management of IT, securely, across the entire enterprise. CA calls this approach Enterprise IT Management (EITM). The company serves 98 percent of Fortune 1000 companies, as well as government agencies, educational institutions, and thousands of companies in diverse industries.

This whitepaper is for informational purposes only. MICROSOFT MAKES NO WARRANTIES, EXPRESS OR IMPLIED, IN THIS SUMMARY.

Copyright © 2007 CA. All rights reserved. All trademarks, trade names, service marks and logos referenced herein belong to their respective companies. This document is for your informational purposes only. To the extent permitted by applicable law, CA provides this document "As Is" without warranty of any kind, including, without limitation, any implied warranties of merchantability or fitness for a particular purpose, or non-infringement. In no event will CA be liable for any loss or damage, direct or indirect, from the use of this document including, without limitation, lost profits, business interruption, goodwill or lost data, even if CA is expressly advised of such damages.