.NET DEVELOPMENT WITH ODAC 12C RELEASE 3

Oracle Data Access Components (ODAC) offers four components that simplify .NET development with the Oracle Database: Oracle Data Provider for .NET, Oracle Developer Tools for Visual Studio, Oracle Providers for ASP.NET, and .NET stored procedures. In ODAC 12c Release 3 (12.1.0.2.1), Oracle includes Entity Framework 6 Code First and Code First Migrations; NuGet deployment; .NET Framework 4.5.2; and ODP.NET, Managed Driver XML DB, Kerberos, and enhanced distributed transaction support. ODAC can be downloaded from Oracle Technology Center (OTN) for free and is installable on 32-bit or 64-bit platforms via graphical installer or xcopy.

Oracle Data Provider for .NET

Oracle Data Provider for .NET (ODP.NET) features optimized ADO.NET data access to the Oracle database while providing full accessibility to the latest .NET Framework version 4.5.2 and features, such as Entity Framework 6 Code First. ODP.NET developers can take advantage of Oracle's unique database functionality, including Real Application Clusters, performance optimizations, XML DB, and advanced security features. ODP.NET gives .NET programmers better performance, flexibility, and more feature availability through features, such as self-tuning and faster data retrieval; TimesTen In-Memory Database provider support, and promotable transactions. ODP.NET developers can use the .NET Framework, but not have to sacrifice powerful Oracle data management capabilities.

For more information, visit ODP.NET home page.

Oracle Developer Tools for Visual Studio

The Oracle Developer Tools for Visual Studio (ODT) is a tightly integrated "Add-in" for Microsoft Visual Studio 2013, Visual Studio 2012, and Visual Studio 2010. ODT is free and is available only via ODAC installations.

ODT makes developing .NET code for Oracle easy and fast, allowing developers to stay in Visual Studio for the entire development lifecycle. ODT makes it easy to browse and edit Oracle schema objects using integrated visual designers and can automatically generate .NET code via a simple drag and drop. Developers can easily modify table data, execute Oracle SQL statements, edit and debug PL/SQL code, and generate SQL deployment scripts. The integrated context sensitive online help, including the Oracle SQL and PL/SQL Users Guides, puts the Oracle documentation at their fingertips.

ODT includes a SQL Tuning Advisor tool to help developers tune arbitrary SQL

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statements and an Oracle Performance Analyzer, which analyzes a running .NET application's use of the Oracle database and provides detailed recommendations.

ODT and ODP.NET are seamlessly integrated with Oracle Database 12.1 multitenant container databases (CDBs) allowing developers to easily and quickly create, clone, plug or unplug pluggable databases (PDBs) for use during development and testing. These PDBs can be viewed and managed directly from Server Explorer in Visual Studio. ODP.NET works out of the box with PDBs, requiring no code changes to use them in .NET.

ODT includes Schema Compare tools integrated within Visual Studio. These tools allow developers to detect changes between individual Oracle schema objects or entire schemas. When it comes time for deployment, these tools can be used to generate a deployment ("diff") script to upgrade the target database to include the new schema changes required.

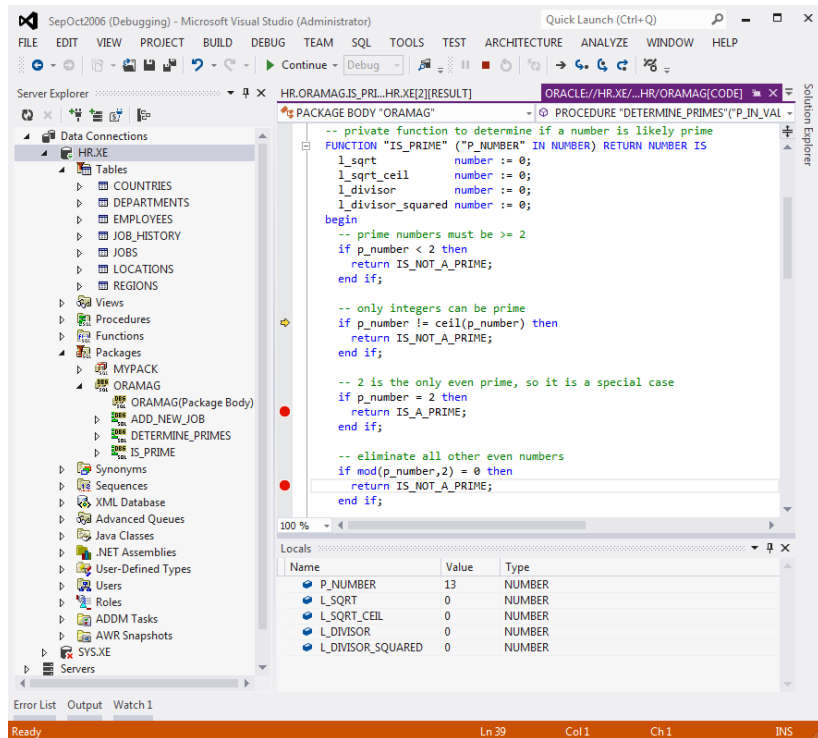For more information, visit Oracle Developer Tools for Visual Studio home page.

Figure1. Browsing the Oracle schema (left) and editing and debugging PL/SQL (right) are just two examples of Oracle's tight Visual Studio integration.

Oracle Providers for ASP.NET

ASP.NET includes service providers that store application state in databases. By storing state in a database, applications ensure web data is highly available and equally accessible among all web servers.

Oracle Providers for ASP.NET support these service providers for use with the Oracle database. For developers already familiar with ASP.NET providers, the Oracle Providers for ASP.NET are easy to learn since they share a common schema

and application programming interface with other existing ASP.NET providers.

Standard ASP.NET controls and services interact with the providers transparently without any Oracle-specific coding required. Oracle offers the following ASP.NET providers: Membership Provider, Role Provider, Site Map Provider, Session State Provider, Profile Provider, Web Events Provider, Web Parts Personalization Provider, and Cache Dependency Provider.

For more information, visit Oracle Providers for ASP.NET home page.

.NET Stored Procedures

The Oracle Database Extensions for .NET is a feature of Oracle Database on Windows that makes it easy to develop, deploy, and run stored procedures and functions written in a .NET managed language, such as C# or VB.NET. .NET stored procedures or functions are developed using Microsoft Visual Studio and deployed using the tightly integrated ODT .NET Deployment Wizard. After deployment, a .NET stored procedure can be called from .NET; from SQL or PL/SQL; from another .NET, PL/SQL, or Java stored procedure; from a trigger; or from anywhere else a stored procedure or function call is allowed.

For more information, visit the Oracle Database Extensions for .NET home page.

New Features

Entity Framework

ODP.NET managed and unmanaged drivers in ODAC 12c Release 3 are certified for Entity Framework 6 (EF 6). EF 6 is the latest version of Microsoft's object-relational mapping (ORM) framework.

ODP.NET developers can use EF 6 Code First and Code First Migrations. Code First provides a code-centric ORM experience for .NET developers, rather than using a designer or XML-based configuration file. The classes defined within the source code become the data model.

Code First Migrations allow ODP.NET developers to evolve the schema at the code level, then to reflect those changes within the Oracle database schema using Package Manager.

NuGet

ODP.NET, Managed Driver is now available in a NuGet installable package. NuGet enables better automated ODP.NET distribution and deployment customization so developers can start programming more quickly, rather than getting bogged down in setup.

NuGet is the package manager for Microsoft .NET. It installs software by copying library files to a .NET solution and automatically updating the project accordingly by adding references and updating configuration files.

The ODP.NET Entity Framework assembly for Code First and Entity Framework 6 is available as a separate NuGet package from the managed driver NuGet package.

ODP.NET, Managed Driver – Added Functionality

ODP.NET in ODAC 12c Release 3 introduces new features to ODP.NET, Managed Driver that bring closer feature parity with ODP.NET, Unmanaged Driver. The new

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features include XML DB APIs, Kerberos, improved distributed transaction support, larger character data types, and returning row counts from array binding.

ODP.NET, Managed Driver supports all ODP.NET XML DB classes supported by ODP.NET, Unmanaged Driver.

Kerberos is a network authentication service for security in distributed environments. ODP.NET, Managed Driver can use Kerberos5 for single sign-on and centralized user authentication.

For distributed transactions, Oracle.ManagedDataAccessDTC.dll assembly is no longer necessary when using .NET Framework 4.5.2 or higher. This eases deployment and setup. For .NET Framework 4.5.1 or earlier, Oracle.ManagedDataAccessDTC.dll still needs to be present, either placed in the application directory or in the GAC.

ODP.NET, Managed Driver supports Oracle Database 12c's larger VARCHAR2, NVARCHAR2, and RAW data types. Each of these ODP.NET data types can store up to 32 KB of data.

When using parameter array binding to execute multiple DML statements, the managed driver now provides an array that lists the number of rows affected for each input value from the bound array, as opposed to just the total number of rows affected. This information provides more detailed feedback to the developer.

Get Started Today

You can quickly start developing .NET applications with Oracle databases. Just download ODAC 12c Release 3 from ODAC OTN download page.

Find getting started tutorials at the OTN .NET Developer Center.

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