.NET DEVELOPMENT WITH ODAC 12C RELEASE 2

OVERVIEW

ORACLE ON .NET

- Easy to use and learn
- No charge
- Supports Visual Studio 2013 and .NET Framework 4.5.1
- 100% managed ODP.NET
- Schema Compare Tools in Visual Studio
- Supports Oracle database 12c features, such as multitenant container databases and Transaction Guard
- Access all database editions, including Express, and database versions 10.2 and later.

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 1 (12.1.0.1.2), Oracle includes fully-managed ODP.NET, multitenant container database support in Oracle Database 12c, and schema compare tools. ODAC can be downloaded from Oracle Technology Center (OTN) for free and is installable via graphical installer or xcopy for 32-bit or 64-bit platforms.

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 4.5.1 and features, such as Entity Framework. 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 statements and an Oracle Performance Analyzer, which analyzes a running .NET

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application's use of the Oracle database and provides detailed recommendations.

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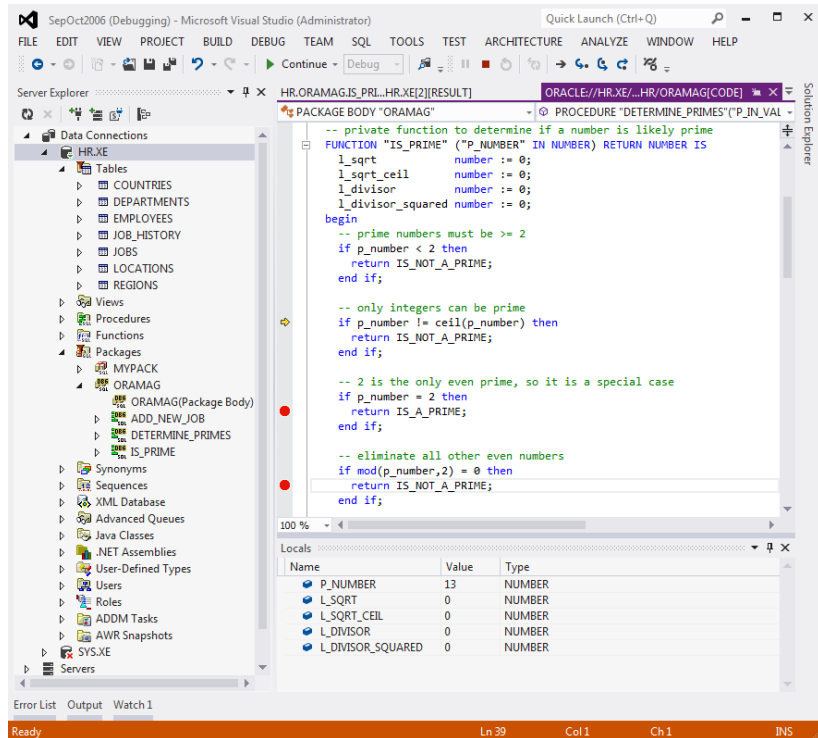

Figure1. Browsing the Oracle schema (left) and editing and debugging PL/SQL (right) are just two examples of Oracle's tight Visual Studio integration.

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 on 32-bit Windows and Windows x64 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

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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

ODP.NET, Managed Driver

ODP.NET 12.1 introduces a new fully managed provider version, containing 100% native .NET code. ODP.NET, Managed Driver includes nearly all the features of ODP.NET, Unmanaged Driver and uses the same application programming interface. This makes migrating existing ODP.NET applications to ODP.NET, Managed Driver simple and easy.

With ODP.NET, Managed Driver, it is easier and faster to deploy ODP.NET. There are fewer assemblies, as few as one. This makes deploying and patching straightforward. The install size is smaller at less than 10 MB. Only one ODP.NET, Managed Driver assembly is necessary whether you are using 32-bit or 64-bit .NET Framework. Side-by-side deployment with other ODP.NET versions won't cause conflicts since there are no unmanaged assemblies to account for. As a fully managed provider, ODP.NET can better integrate with .NET Code Access Security and ClickOnce deployment.

Multitenant Container Database Support

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.

Schema Compare Tools

ODT introduces 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.

Transaction Guard – High Availability

Transaction Guard preserves transaction outcomes during planned and unplanned outages so that every transaction outcome can be made known to the ODP.NET application. This ensures applications use at-most-once execution.

Following an outage, ODP.NET returns the OracleException IsRecoverable property indicating whether the transaction is recoverable. If not recoverable, the application should roll-back, re-execute, and re-submit the current transaction. If recoverable, the application can retrieve a logical transaction identifier to determine the last open transaction's outcome status accurately and determine a plan of action to

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successfully commit the transaction.

Faster and More Robust Planned Database Outages – High Availability

Planned outages are now possible to undertake without disrupting end users. Databases can be brought offline more quickly by communicating its planned outage status to ODP.NET applications. ODP.NET then removes idle pool connections and disallows new connections to these databases. Planned outages can now occur more quickly with fewer end user disruptions than before.

Global Data Services – High Availability and Performance

With Global Data Services, ODP.NET applications can extend RAC's automatic workload management capabilities to their Oracle Data Guard and Oracle GoldenGate instances. .NET applications can utilize all available global database resources to improve performance through run-time connection load balancing and availability through fast connection failover.

Oracle Notification Service – High Availability and Performance

Oracle Notification Service (ONS) is a publish and subscribe service for communicating Fast Application Notification (FAN) events. ODP.NET receives fast connection failover and load balancing messages from the database server through ONS. Previously, ODP.NET used Oracle Advanced Queuing (AQ) as its FAN publish and subscribe service.

Because ONS is a memory-based service, it delivers messages faster than AQ. Using ONS, Oracle consolidates the publish and subscribe service that all Oracle data access drivers use.

Ease of Development

Oracle Database 12c and ODP.NET 12c support new ease of development features:

- Auto Increment Identity Column

    - Simplifies developing with data without a natural primary key.

- Larger VARCHAR2, NVARCHAR2, and RAW Data Types

    - Each data type now stores up to 32 KB in data size.

- Boolean Data Type

    - ODP.NET data type, OracleBoolean, maps to the new database PL/SQL Boolean data type.

- Enhanced Implicit REF Cursor Binding

    - Retrieves stored procedure result sets implicitly without a declared return type, except in the case of Entity Framework and user-defined types.

- Returning Row Counts from Array Binding

    - When executing multiple parameter array-bound DML statements, ODP.NET now returns the number of rows affected for each array input value.

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NETWORK (OTN)

Visit the OTN .NET Developer
Center to learn more about
Oracle database's .NET
support.

Entity Framework and Language Integrated Query – SQL APPLY

ODAC 11.2 Release 4 introduced Entity Framework and Language Integrated Query
(LINQ) integration with ODT and ODP.NET. LINQ is translated into native
database SQL before it can query the database. In some circumstances, LINQ uses
the non-standard APPLY keyword in SQL for retrieving lateral views. Oracle
Database and ODP.NET support the APPLY keyword in Oracle Database 12c to
more fully support LINQ.

Get Started Today

You can quickly start developing .NET applications with Oracle databases. Just
download ODAC 12c Release 2 from ODAC OTN download page.

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

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