



Session: 420219
Agenda Key: 31CU

iSeries. mySeries.

iSeries Access in the .NET World

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iSeries Access Development

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Agenda

- Overview of .NET
- ADO.NET
- iSeries Access in .NET Environment
- iSeries Access .NET Provider Class Notes
- Example programs

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iSeries. mySeries.

What is .NET?

Programming model for building XML Web services and applications

.NET definitions

.NET framework

- Underlying plumbing for .NET applications
- Common Language Runtime (CLR)
- Unified set of class libraries

CLR

- Language integration, security handling, memory/ thread/process management, exception handling, ...

ADO.NET

- .NET classes enabling access to databases

ASP.NET

- .NET classes to support development of Web-based applications and Web services



Applications in .NET

- Typical Windows GUI can still be built
- ASP.NET Web Application
- ASP.NET Web Service
- ...



.NET versus J2EE

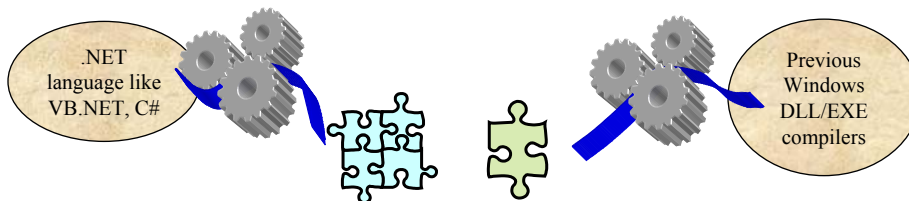
- | | |
|---|--|
| <ul style="list-style-type: none">• Multiple languages(>25?)• 1 IL• 1 platform today (Windows)• Dynamic web: ASP.NET• Database access: ADO.NET | <ul style="list-style-type: none">• 1 language• 1 IL• Multiple platforms (JVM)• Dynamic web: JSPs• Database access: JDBC SQL/J |
|---|--|

.NET versus COM

- Designed to build Internet Applications
- “Managed” by the .NET runtime
- Common Language Runtime (like JVM)
- Can call COM objects through COM Interop bridge
- Modified to work in Internet App world
- “Unmanaged”
- Standard DLLs
- Windows still based on COM

Assemblies versus Binaries

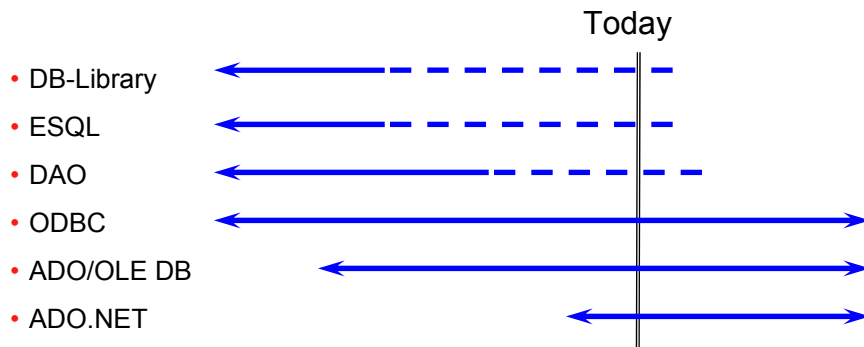
- Intermediate Language (IL) JIT compile
- Self describing metadata
- Referenced by namespace, version, and culture
- Platform specific bytecodes
- Type libraries (IDL)
- Referenced by Registry



Interesting Anecdotes

- Fixing “DLL hell” by allowing multiple versions
- Garbage collection
- Common Type System (CTS) but all the languages do not support all .NET data types
- COM still alive but calling it from .NET means bad performance

Microsoft Technology Roadmap





ADO Options for iSeries

- OLE DB providers
 - iSeries Access OLE DB Provider (IBMDA400, IBMDASQL, IBMDARLA)
 - IBM OLE DB Provider for DB2 (IBMDADB2)
- OLE DB provider for ODBC (MSDASQL)
 - iSeries Access ODBC driver
 - DB2 CLI/ODBC driver



ADO.NET Options for iSeries

- Native managed providers
 - V5R3 iSeries Access .NET provider
 - DB2 V8.2 (Stinger) .NET provider
- OLE DB managed provider (System.Data.OleDb)
 - iSeries Access OLE DB provider
 - IBM OLE DB provider for DB2
- ODBC managed provider (Microsoft.Data.Odbc)
 - iSeries Access ODBC driver
 - DB2 CLI/ODBC driver



What is in the iSeries Access .NET Provider?

Supported

- SQL (INSERT, UPDATE, DELETE, SELECT)
- Commitment Control
- Connection Pooling
- SQL naming
- Unicode
- Threads
- IASPs (multiple databases)
- Stored procedure support

Not supported

- Package support
- Data links
- User Defined Types
- Record Level Access
- CMD/PGM call
- Data Queues

Requiring SI15176 service pack:

- System naming (/)
- Large Objects (LOBs)



What is in the DB2 V8.2 .NET Provider?

Supported

- SQL (INSERT, UPDATE, DELETE, SELECT)
- Commitment Control
- Connection Pooling
- SQL naming
- Unicode
- Threads
- IASPs (multiple databases)
- Stored procedure support
- Large Objects (LOBs)
- Accessing data on other DB2 boxes
- Visual Studio .NET Add-ins

Not supported

- System naming (/)
- Package support
- Data links
- User Defined Types
- Record Level Access
- CMD/PGM call
- Data Queues

For more information...

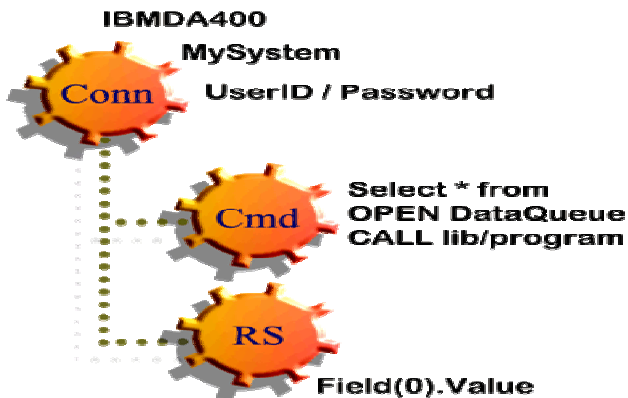
- V5R3 iSeries Access .NET provider
 - <http://www-1.ibm.com/servers/eserver/series/access/>
 - .NET Technical Reference - cwbmptch.hlp (in ..\IBM\Client Access\Mri2924 directory)
- DB2 V8.2 (Stinger) .NET provider
 - <http://www-306.ibm.com/software/data/db2/udb/v82/>
 - <http://www7b.software.ibm.com/dmdd/downloads/dotnetbeta/>
- Using iSeries Access through .NET
 - http://www-919.ibm.com/servers/eserver/series/developer/education/wp/db2_intnet/index.html

Info APAR II13341 Using IBMDA400

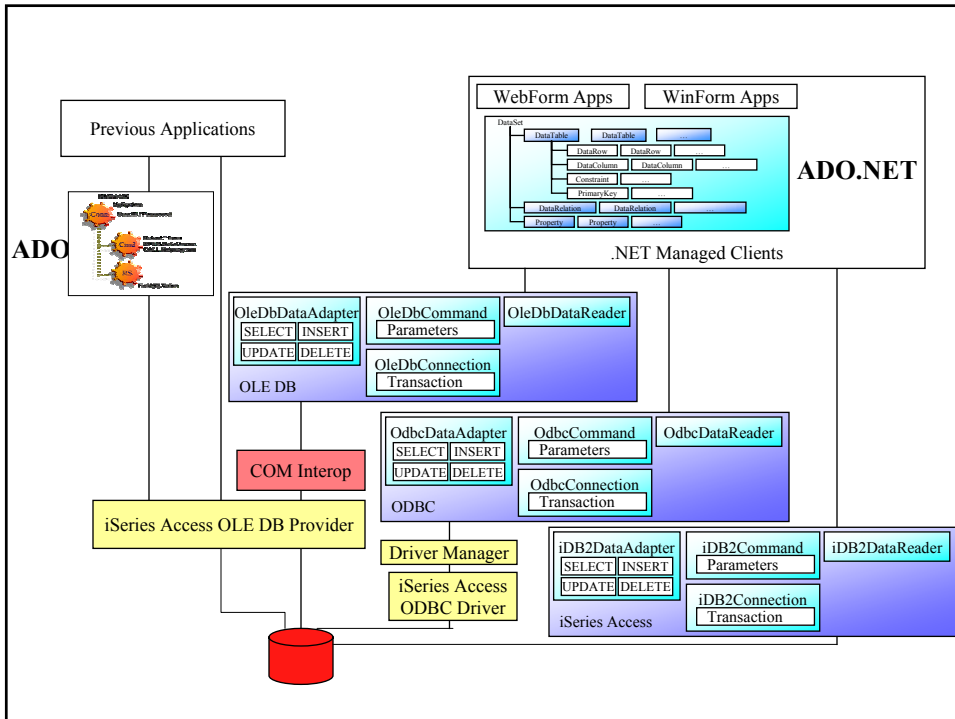
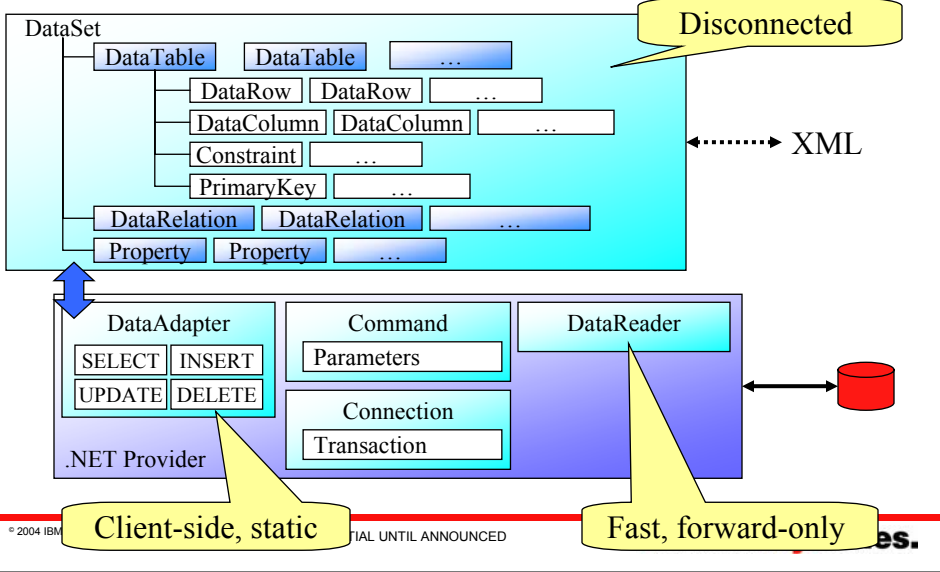
- <http://www.ibm.com/servers/eserver/series/access/caiixe1.htm>

Scroll to the OLE DB section look for "Using managed providers in the .NET framework for accessing DB2 data on AS/400 or iSeries servers"

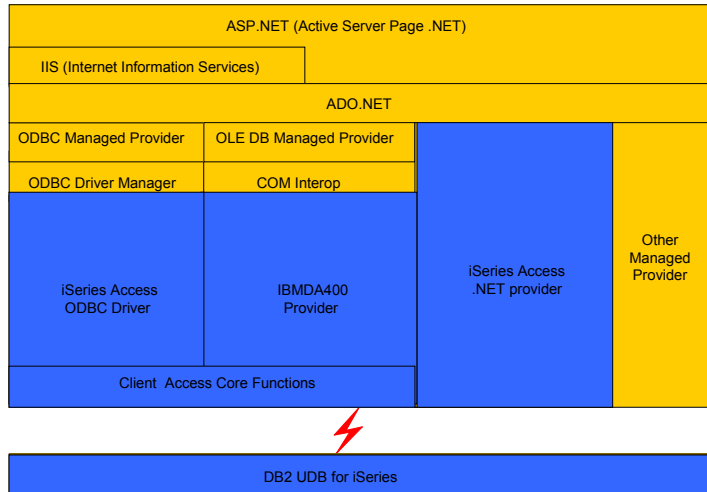
ADO



ADO.NET



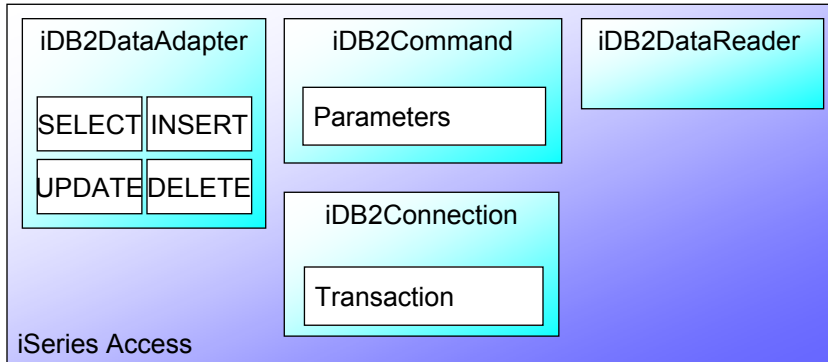
iSeries Access in 3-Tier Environment



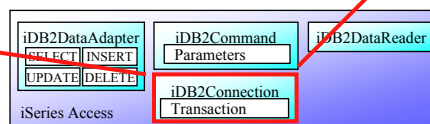
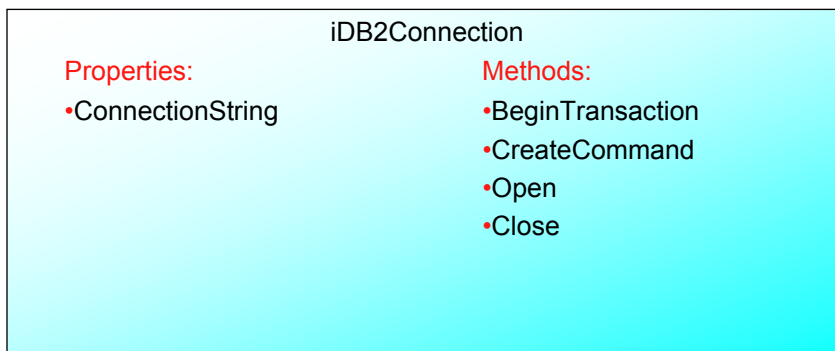
iSeries Access .NET Provider Notes

- Install requires the .NET framework be on PC
 - Windows Server 2003 installs .NET framework by default
- Same requirements as iSeries Access OLE DB / ODBC to use
- Some support limited on pre-V5R2 servers

iSeries Access .NET Provider - Class Notes



Connections



Transactions

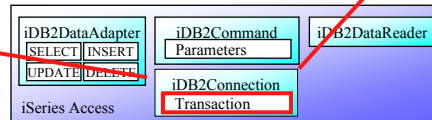
iDB2Transaction

Properties:

- Connection
- IsolationLevel

Methods:

- Commit
- Rollback



Error Handling

iDB2Exception

Properties:

- Errors
- Messages

iDB2ErrorCollection

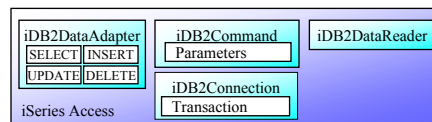
Properties:

- Count
- Item

iDB2Error

Properties:

- Message



Commands

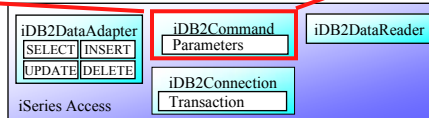
iDB2Command

Properties:

- CommandText
- CommandType
- Parameters
- Connection
- Transaction

Methods:

- Prepare
- CreateParameter
- DeriveParameters
- ExecuteNonQuery
- ExecuteReader



Parameters

iDB2ParameterCollection

Properties:

- Item
- Count

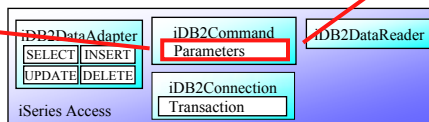
Methods:

- Add
- Clear

iDB2Parameter

Properties:

- iDB2Type
–Enum of iDB2 Data Types
- Direction
- IsNullable
- ParameterName
- Value



DataReader

iDB2DataReader

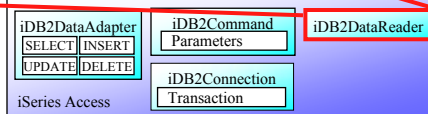
Properties:

- FieldCount
- Item
- RecordsAffected

Methods:

- Close
- NextResult
- Read
- IsDBNull
- GetName
- GetFieldType
- GetAAA 's

–AAA is the Data Type



DataAdapter

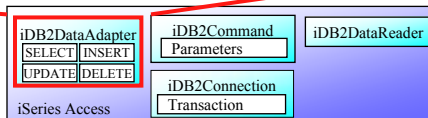
iDB2DataAdapter

Properties:

- SelectCommand
- InsertCommand
- UpdateCommand
- DeleteCommand

Methods:

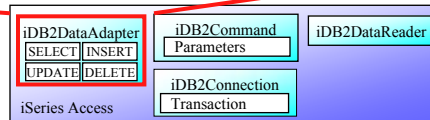
- Fill
- FillSchema
- Update



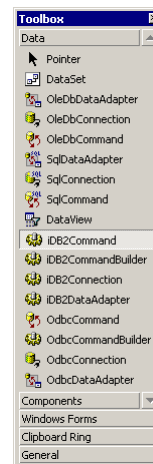
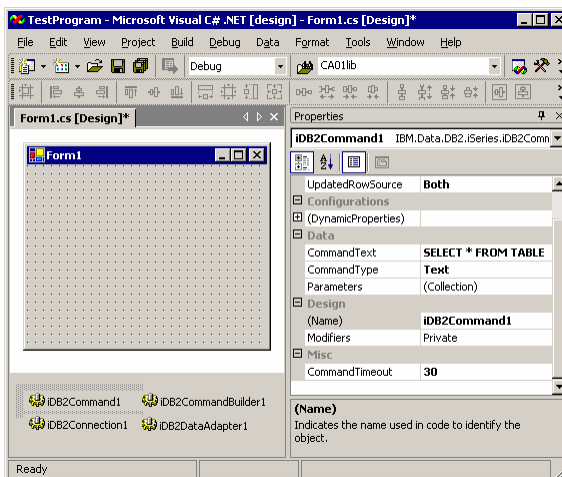
CommandBuilder

iDB2CommandBuilder

<p>Properties:</p> <ul style="list-style-type: none"> •DataAdapter 	<p>Methods:</p> <ul style="list-style-type: none"> •DeriveParameters •GetDeleteCommand •GetInsertCommand •GetUpdateCommand •RefreshSchema
--	---



Visual Studio .NET Integration





C# Example

938472	Henning G K	4859 Elm Ave	Dallas TX	75217	5000	3	37	0
839283	Jones B D	218 NW 135 St	Clay NY	13041	400	1	100	0
392859	Vine S S	PO Box 79	Broton VT	5046	700	1	439	0
938485	Johnson J A	3 Alpine Way	Helen GA	30545	9999	2	3987.5	33.5
397267	Tyron W E	13 Myrtle Dr	Hector NY	14841	1000	1	0	0
389572	Stevens K L	208 Snow Pass	Denver CO	80226	400	1	58.75	1.5
846283	Alison J S	787 Lake Dr	Isle MN	56342	5000	3	10	0
475938	Doe J W	59 Archer Rd	Sutter CA	95685	700	2	250	100
693829	Thomas A N	3 Dove Circle	Casper WY	82509	9999	2	0	0
693029	Williams E D	485 SE 2 Ave	Dallas TX	75218	200	1	25	0
192837	Lee F L	5963 Oak St	Hector NY	14841	700	2	489.5	0.5
583990	Abraham M T	392 Mill St	Isle MN	56342	9999	3	500	0

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C# Example Code

```
private void RunQueryButton_Click(object sender, System.EventArgs e)
{
    ResultsBox.Items.Clear();
    IDB2Connection myConn = new IDB2Connection();
    myConn.ConnectionString = "DataSource=" + SystemBox.Text +
        ";UserID=" + UseridBox.Text +
        ";Password=" + PasswordBox.Text;

    try
    {
        myConn.Open();

        IDB2Command myCmd = new IDB2Command(TableBox.Text, myConn);
        myCmd.CommandType = CommandType.TableDirect;
        IDB2DataReader myDR = myCmd.ExecuteReader();

        bool moredata = true;
        String dataRowString = "";

        moredata = myDR.Read();
        int fieldcount = myDR.FieldCount, counter = 0;
    }
}
```

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C# Example Code (part 2)

```
while( moredata )
{
    while( counter < fieldcount )
    {
        dataRowString += myDR.GetValue(counter).ToString() + " ";
        counter++;
    }

    ResultsBox.Items.Add(dataRowString);
    dataRowString = "";

    moredata = myDR.Read();
    counter = 0;
}

myConn.Close();
}
catch( Exception myException )
{
    ResultsBox.Items.Add(myException.Message);
}
}
```

Summary

- .NET is the next big wave in MS Technology
- Consider iSeries Access when looking at .NET solutions



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