

FoxRockX

Your second Free Issue from Sybase

Dear FoxPro Developer,

Dear FoxRockX Subscriber,

Sybase iAnywhere's Advantage Database Server is the only product today which is actively enhancing how developers can work with Visual FoxPro based data (DBF tables and CDX indexes).

The Prequel to Doug Hennig's April 2008 FoxRockX Article

In April 2008, FoxRockX published a special free edition issue titled Advantage Database Server (ADS) for Visual FoxPro Developers by Doug Hennig. That 20 page ADS Special Issue is online in PDF format for free download from <http://portal.dfpug.de/dfPUG/Dokumente/FoxRockX> (also linked to from www.sybase.com/foxpro).

OK, so technically this article is really a sequel rather than a prequel to Doug Hennig's great in depth technical FoxRockX article from April 2008. I use the term prequel in the spirit of the Hollywood movie trend from the past 5 years or so where they release sequels to popular movies which take place in time before the previously released editions. This article is a combination of overview, scenarios, and an answer to the "why I should care" question related to using Advantage with Visual FoxPro, and primarily in context of using Advantage with existing application DBFs.

VFP developers may want to consider downloading, installing, and using the Local Database version of Advantage, and also installing one or more of the Advantage drivers (ODBC, OLE DB, and .NET Data Provider) to access DBF data from one or more non-VFP clients.

This article describes how using Advantage with VFP allows .NET and other technologies to use DBF based data without requiring any modifications to their existing VFP applications. Advantage will play a key role in modernizing VFP applications with DBF data into the next decade.

January 2010

Number 4

2 ADS Special Issue 2

Sybase iAnywhere

**Sybase Advantage
Database Server with
Visual FoxPro**

Ken Levy

Sybase Advantage Database Server with Visual FoxPro

Ken Levy

The Advantage Database Server product line from Sybase iAnywhere can enhance Visual FoxPro applications into the next decade by bridging VFP DBF data with other technologies and platforms.

Overview of Using Sybase Advantage with Visual FoxPro

The traditional migration path for a VFP application includes: upsizing the DBF data into a client/server database; changing the VFP application to use Remote Views, SQL pass-through, or CursorAdapter for use with remote data; then creating the new .NET application using the new client/server database. But this solution using Advantage as a data container (wrapper) around the existing DBFs allowing shared access opens many doors. Developers can create .NET components for use with an existing VFP application as well as migrate a VFP application to .NET while allowing both applications to work against the same DBF data and never having to update the VFP application's source code.

Advantage Database Server offers:

- Support for large DBF tables (over 2GB)
- A natural migration or integration path for new applications using Visual Studio and .NET
- ODBC access to VFP 9.0 data types
- Internet access to DBF tables
- Direct table access in ADO.NET
- Full Text Search
- Table, index, memo and communication encryption
- The ability to hide DBF tables
- Online backup
- Replication

Figure 1 below compares the two primary alternative ways of using Sybase Advantage with Visual FoxPro.

Left diagram in Figure 1: The scenario depicted on the left shows a VFP application that has been upsized into ADS, thus using ADS as a client/server database with VFP. This scenario is analyzed in great detail in Doug Henning's April 2008 special issue of FoxRockX, Advantage Database Server (ADS) for Visual FoxPro Developers. Scenarios include:

- Access via ODBC, OLE DB, cursor adapters, remote views, and SQL pass-through
- VFP based tools for creating Advantage Data Dictionaries from DBF/DBC data
- Full text search, backup, replication, and data encryption
- Support for large DBF tables (over 2GB), Cross-platform support

Right diagram in Figure 1: The scenario depicted on the right shows Advantage (either the Local Server or Remote Server) with VFP data (DBFs) allowing .NET and other client or web platforms to access and uses the VFP DBF data in a typical client-server model. This is all while keeping the data in DBFs and not requiring any of the VFP application source code to be changed in any way. This article focuses on this architecture. Scenarios include:

- Create .NET apps with Advantage using DBF data, no changes to VFP code
- Retain existing VFP data by using concurrent DBF data access
- Support for VFP data types, existing DBF data, and CDX indexes
- Upsize DBF data to ADS when VFP application becomes inactive

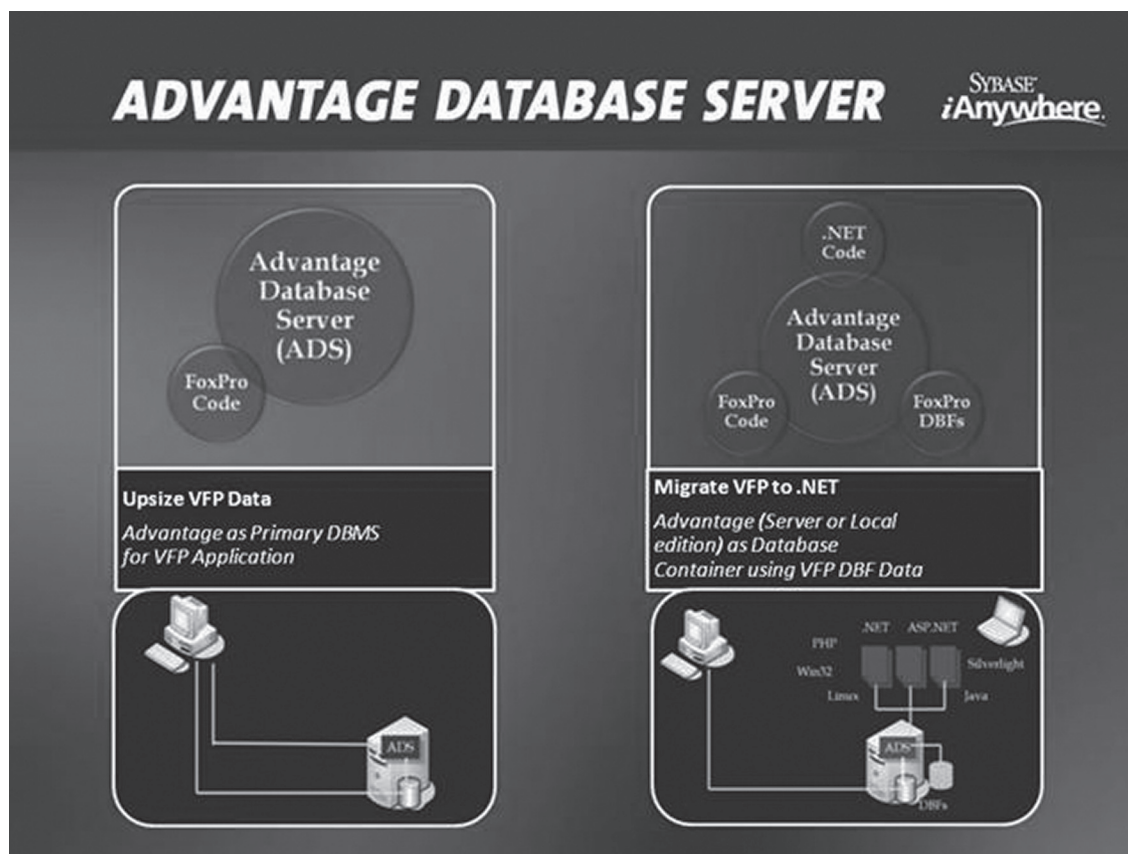


Figure 1. Comparison of using Advantage Database Server as client/server data store vs. database container for concurrent shared VFP DBFs.

It's important to note that the two primary usage scenarios can be mixed. While you may have Advantage sharing existing DBFs with an existing VFP app for use with other clients (such as .NET), you may also have one or more DBF tables in your VFP app upsized to ADS so those tables can take advantage of full client/server features offered by ADS (beyond 2GB limit, rich text search, encryption, replication, backup, and more).

Sybase Advantage Components

The list of Advantage components in [Table 1](#) (below) includes the cost for developers and distribution for each. Essentially they are all

free to develop and distribute, except for Advantage Database Server in deployment. The Advantage Local Server is a fully functioning local database engine, much like the VFP runtime data engine, and can be used for both development and free distribution with VFP applications for scenarios that don't require a full client/server DBMS.

The ServerType setting for any Advantage connection can be changed from local to remote at any time to move from Local Server to Remote Server. This is done without making any changes to the source code or clients accessing the database via one or more of the Advantage drivers.

Table 1. List of various Advantage components including an overview of licensing information and installation file size.

Sybase Advantage Components	Developer Cost	Distribution Cost	Size
Advantage Database Server	Free 2-user developer license	Based on concurrent users	10MB
Advantage Local Server	Free	Royalty Free	2MB
Advantage Data Architect	Free	-	12MB
Advantage OLE DB Provider	Free	Royalty Free	4MB
Advantage ODBC Driver	Free	Royalty Free	4MB
Advantage .NET Data Provider	Free	Royalty Free	4MB

Note that there are other Advantage data access drivers available beyond the ones listed below including those for use with Delphi, Crystal Reports, JDBC, CA Visual Objects, PHP, and Perl, and even Clipper.

Table 1 outlines the various downloads available for VFP specific components of Advantage. Note that the Advantage Local Server is also automatically installed when you install Advantage Data Architect or any of the Advantage drivers, and there is no way (or need) to install the Local Server only. The Local Server component is somewhat analogous to the VFP runtime DLL, a local data engine installed with no UI components. The Clone-DBC utility is installed with the Advantage OLE DB Provider. All downloads are quick and easy to install, generally less than 1 minute total from start of setup to install completion.

Advantage Scenarios with Visual FoxPro

As shown in Figure 2, there are many pillars of useful scenarios in using Advantage with VFP:

Upsize VFP DBFs into ADS

- Give Advantage exclusive DBF control
- Exceed 2GB limit
- Rich Text Search
- Backup
- Replication
- Encryption

.NET Integration with VFP

- ASP.NET, Silverlight
- .NET WinForms and WPF UI
- Windows 7 multi-touch
- .NET SDKs
- LINQ in .NET with VFP data
- DBFs as metadata in .NET

Convert/Migrate VFP Apps

- Convert to .NET with DBFs
- VFP app as-is side-by-side
- C#, VB, Java, etc. with VFP DBF data

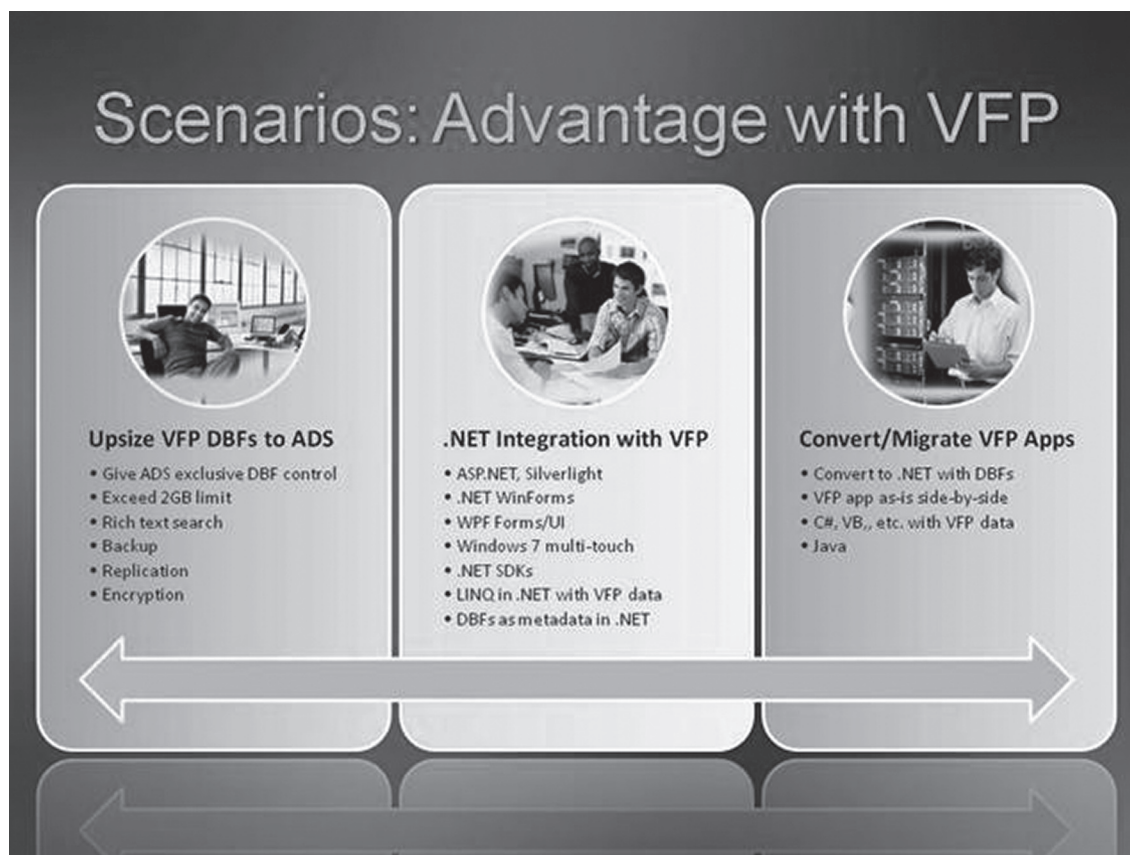


Figure 2. Wide variety of scenarios of using Advantage with existing VFP applications.

Example: Using TestData Non-Exclusive in Visual FoxPro

Figure 3 is a screenshot of Customer.dbf of TestData.dbc (included in the VFP samples folder) opened non-exclusive with the Address field of the first record changed to a new value. The purpose of this screenshot and description is to set the stage for how this same DBF can be changed by any Advantage client, or directly in the Advantage Data Architect.

Example: Accessing TestData DBFs with Advantage

Figure 4 shows Customer.dbf open within Advantage Data Architect (also referred to as ARC) in view mode (a BROWSE window for viewing and editing table data) with the

updated data from within VFP applied in figure 3.

If this (or any) field is changed in Customer.dbf from within ARC, as soon as the next field or record is selected (similar to VFP BROWSE mode), the Customer.dbf table is updated directly. So if you were to go back into VFP and refresh the same BROWSE window, the new updated value would be visible.

This is exactly like having two instances of VFP (on the same machine or remote) accessing the same DBF table open in a non-exclusive shared mode.

The steps to create the TestData connection in ARC are as follows:

Open ARC and select Create New Connection from the Connection menu.

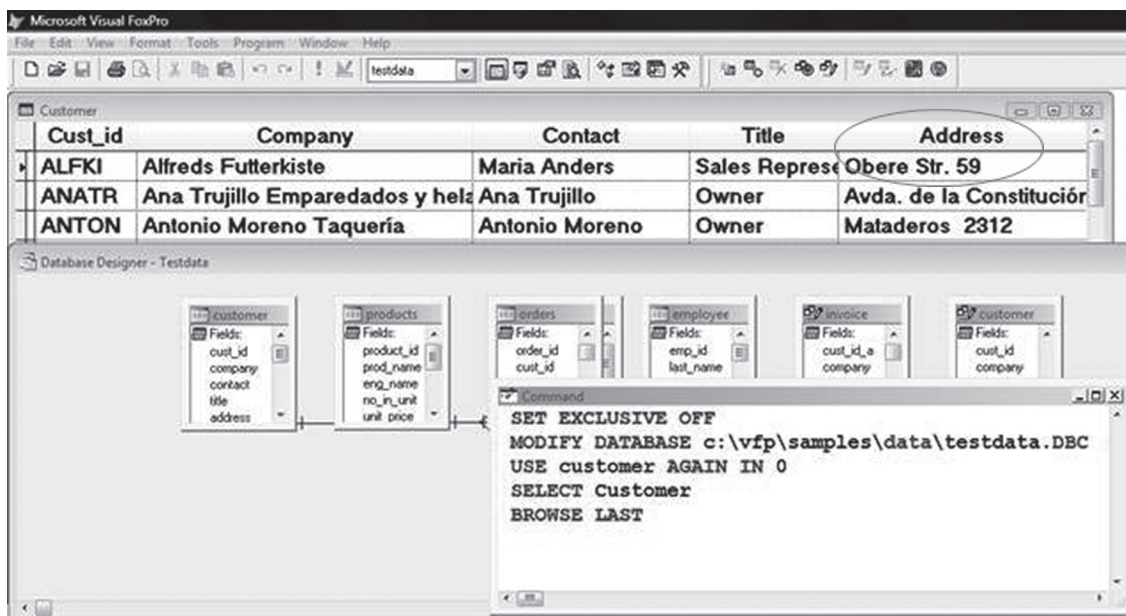


Figure 3. Using TestData non-exclusive in VFP, setting up the example of allowing Advantage to access the same shared DBF data.



Figure 4. Accessing Customer.dbf of TestData directly from the Advantage Data Architect using VFP compatible data access mode.

In `ConnectionString`, enter `c:\vfp\samples\data`, which is the location of `TestData.dbf` (obviously change the `c:\vfp\` path to where VFP is installed on your computer).

For `ConnectionName`, enter `TestData` (although this can be any name you want).

For `TableType`, change the default `adt` (proprietary Advantage table type) to `vfp` which sets the table to be Visual FoxPro DBF (and related CDX) compatible mode.

For `ServerType`, select `Local` (although this can be `Remote` if you have the Advantage Database Server installed).

Press OK and then right click on `TestData` in the `Connections Repository` and select `Connection Properties`.

Change the default `LockingMode` from `proprietary` to `compatible`. You'll notice the same table properties set in the `Create New Connection` dialog can also be changed here.

Click OK, and the tables in `TestData` (all DBFs in that folder) will be accessible and shared from within ARC and from any client that uses one of the Advantage data drivers to add, change, or update that table data.

Example: VFP Sample Invoices Application

Figure 5 is a screenshot of a sample VFP application called `Invoicing`. This is a simple sample app created by EPS Software (also company

who owns `CODE Magazine` and `VFPConversion.com`) as part of their `CODE Training` on .NET targeting VFP developers and teams learning .NET from a VFP knowledge perspective. `VFPConversion.com` is a portal with many resources and links of useful information for VFP developers to reference who are learning .NET, either migrating to .NET or adding .NET functionality (forms, web, components, etc.) to existing VFP based applications.

The `Invoices` sample app is created as a base VFP example application by EPS to show how to create the same app from scratch in .NET (duplicate functionality and data). In this example, rather than upsizing the `Invoicing` DBF tables into a separate client/server database system, the existing DBF data will simply be shared using Advantage. This allows the existing VFP application the ability to continue functioning as is with the same VFP DBF/CDX files. It also allows the new .NET application to use and share the same DBF data but in a full client /server development implementation via the Advantage .NET Data Provider. At any time in the future, the data dictionary could be changed to use Advantage priority data with the Advantage Database Server product for a full client/server database system (instead of DBFs), and none of the code would need to change in the .NET application.

The circle in Figure 5 is a product # field within the `InvLineItem.dbf` table of the `Invoicing` app. The screenshot shows how that field

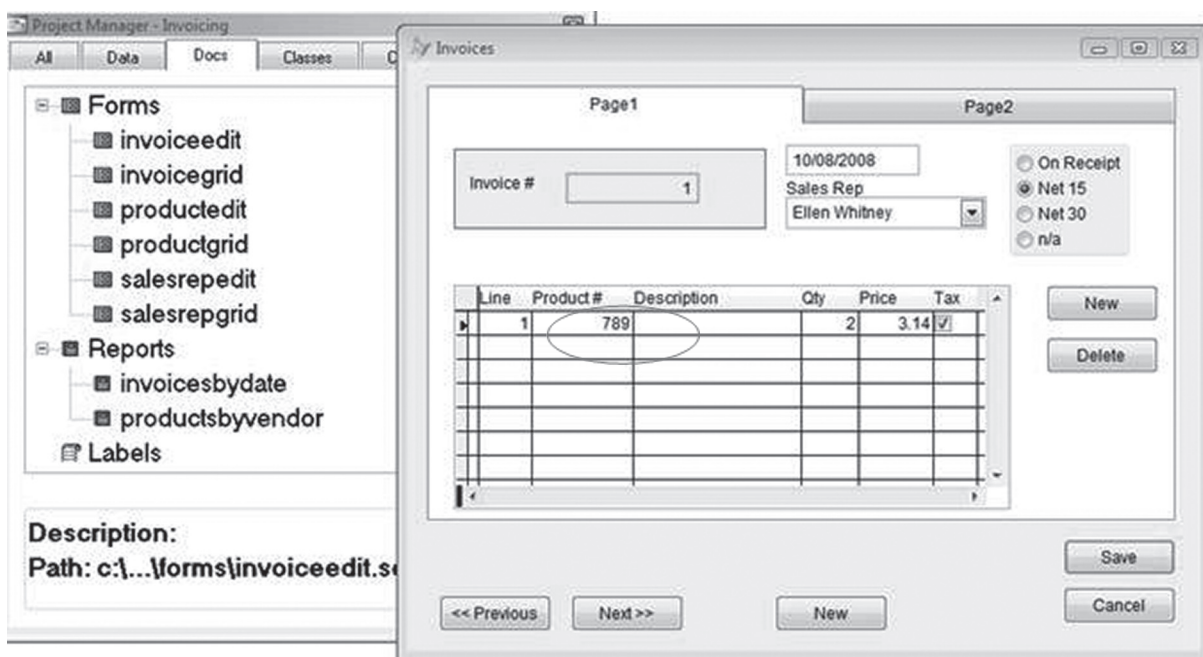


Figure 5. Editing `Invoices` sample application data, in particular, a field in the `InvLineItem.dbf` table.

can be changed, saved to the DBF from within the VFP app, and then viewed or changed from both ARC directly or the new .NET app described in the following sections. Note that when you click Save in the VFP sample app form, it closes the form. The source code for both the VFP and .NET sample Invoices projects can be downloaded from <http://vfp-conversion.com/sybase>.

Advantage Accessing DBFs of VFP Sample Application: Invoices

Figure 6 shows a new data dictionary connection created in ARC for the Invoicing application's DBF tables. The steps to create it are very similar to the steps used in the earlier TestData DBF example.

The steps to create the Invoices connection in ARC are as follows:

Open ARC and select Create New Connection from the Connection menu.

In ConnectionPath, enter C:\Sybase\Samples\VFPCONVERSION\VFP Project\Data, which is the location of TestData.dbf (obviously change the c:\vfp\ path to where VFP is installed on your computer).

For ConnectionName, enter Invoices.

For TableType, change the default adt (proprietary Advantage table type) to vfp which sets the table to be Visual FoxPro DBF (and related CDX) compatible mode.

For ServerType, select Local (although this can be Remote if you have the Advantage Database Server installed).

Press OK and then right click on Invoices in the Connections Repository and select Connection Properties.

Change the default LockingMode from proprietary to compatible. As noted before, you'll notice the same table properties set in the Create New Connection dialog can also be changed here.

Click OK, and the tables in Invoices (all DBFs in that folder) will be accessible and shared from within ARC and from any client that uses one of the Advantage data drivers to add, change, or update that table data.

Now the Invoicing DBFs can be shared between VFP and Advantage. An example is shown in the red highlighted area on Figure 6. This is the same InvLineitm.dbf field changed within the VFP app in Figure 5.

.NET Form Accessing DBFs of VFP Sample Application: Invoices

Now we get to the Invoices application that has been re-written in .NET to duplicate the functionality of the associated Invoices app in VFP, but in this case using the same shared VFP DBF tables simultaneously. This allows the .NET application to function with the existing VFP DBF data while continuing to use the VFP app as-is without changing any of the VFP source code.

To run the .NET application for Invoices, launch the InvoicesUI.exe in the C:\Sybase\Samples\VFPCONVERSION\Invoices\Invoices.UI\bin\Debug folder (with c:\Sybase being the folder you installed the Invoices sample in).

Once the .NET based Invoices app is launched, select Invoices in the top left of the form (no need to double-click) which will open Invoices Grid on the right side of the form.

Advantage Data Architect

File Connection Table Tools Window Help

Active Connection : INVOICES Server Type: LOCAL SERVER

Connection Repository

- Invoices
 - TABLES
 - INVHEADER.DBF
 - invlineitm.dbf
 - Products.dbf
 - salesreps.dbf
 - TestData

C:\SYBASE\SAMPLES\VFPCONVERSION\VFP PROJECT\DATA\INVLINEITM.DBF [VFP, LOCAL] (1)

LINEITEM...	INVOICE...	LINENO	QUANTITY	PRODUC...	PRICE	TAXABLE
1	2	1	2	345	13	True
2	1	1	2	789	3.14	True
3	3	1	99	347	25	True
4	2	2	1	444	3.33	True
5	2	3	1	345	18.5	
6	2	4	3	346	2	

Figure 6. Editing Invoices sample application data, field in the InvLineitm.dbf table, in which any change reflects instantly in the VFP Invoices sample app just to VFP instances accessing the table would.

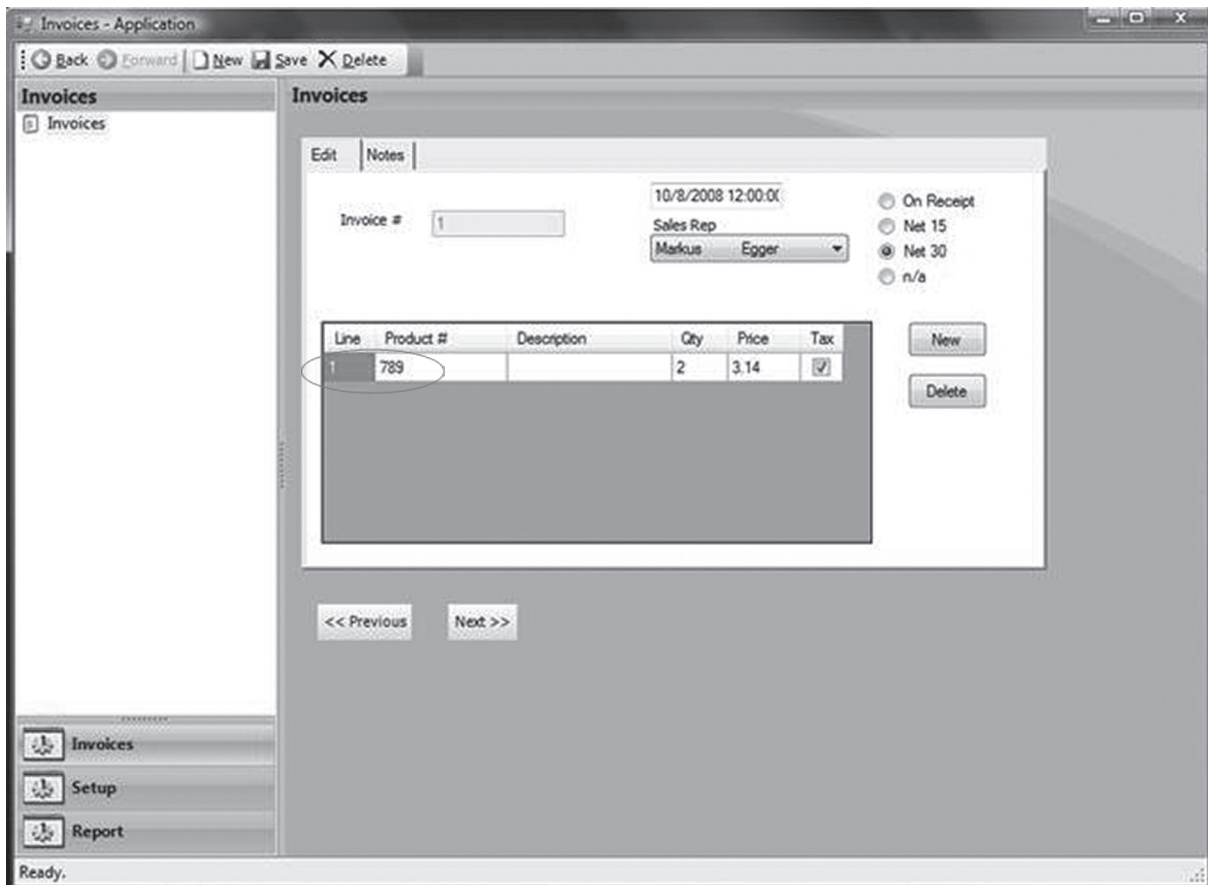


Figure 7. Editing Invoices sample application data directly, field in the InvLineItm.dbf table, using the Advantage .NET Data Provider into the database container within Advantage Local Database (or Advantage Database Server).

Then double-click the first item in the grid to open the edit mode for that record. You will be able to change the data which will actually be updating InvLineItm.dbf directly through the Advantage .NET Data Provider and Advantage local or remote database engine. Note that in order to change a field such as Product # in the .NET application, you must TAB off the field before clicking the Save button at the top of the form.

The circled part of **Figure 7** is a Product # field within the InvLineItm.dbf table of the Invoicing app. The figure shows how that field can be changed and then saved to the DBF from within the VFP app, then viewed or changed from both ARC directly or the new .NET app described in the following sections. The source code for both the VFP and .NET sample Invoices projects can be downloaded from <http://vfpconversion.com/sybase>.

CloneDBC Utility

In older versions of Advantage, a VFP based utility was included called DBCconvert.prg.

That utility has been replaced with a new one (created by Doug Hennig) called CloneDBC. The new name was used to more clearly describe what the utility is used for. The utility copies (or clones) a VFP based DBC meta data dictionary and creates a new Advantage Data Dictionary (ADD) file. Generally the term up-sizing means to copy or move existing DBF data into a client/server database store. Since the original DBC is not modified the upsize reference is no longer used for this utility.

The screenshot in **Figure 8** shows using the CloneDBC utility to clone NewID.dbc (part of the Solutions sample included with VFP) into a new Advantage data dictionary, thus creating a new NewID.add file. Once the newid.add file is created (after clicking the Clone button), it can be opened directly in Advantage Data Architect (or can be opened by double-clicking on the .add file in Windows Explorer, since ARC registered the .add file type to the ARC application).

Important: Once the newid.add file is opened in ARC (by double-clicking on the

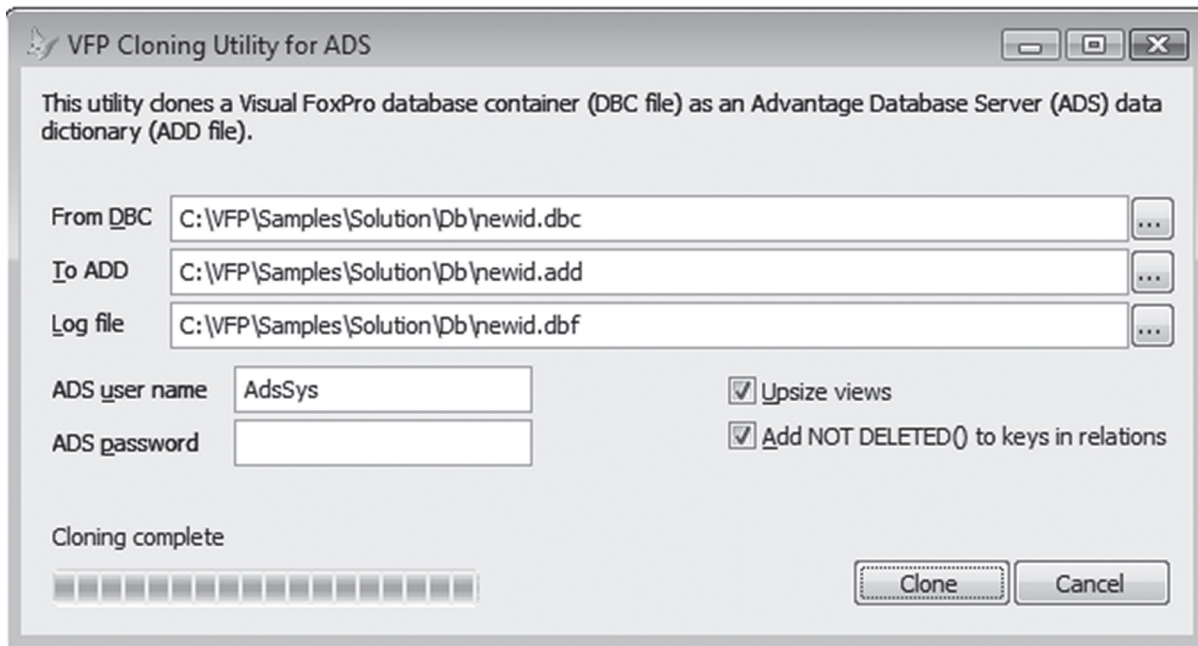


Figure 8. Using the CloneDBC utility (written in VFP) to clone the NewID.dbc metadata into a NewID.add metadata data dictionary for use with Advantage Data Architect.

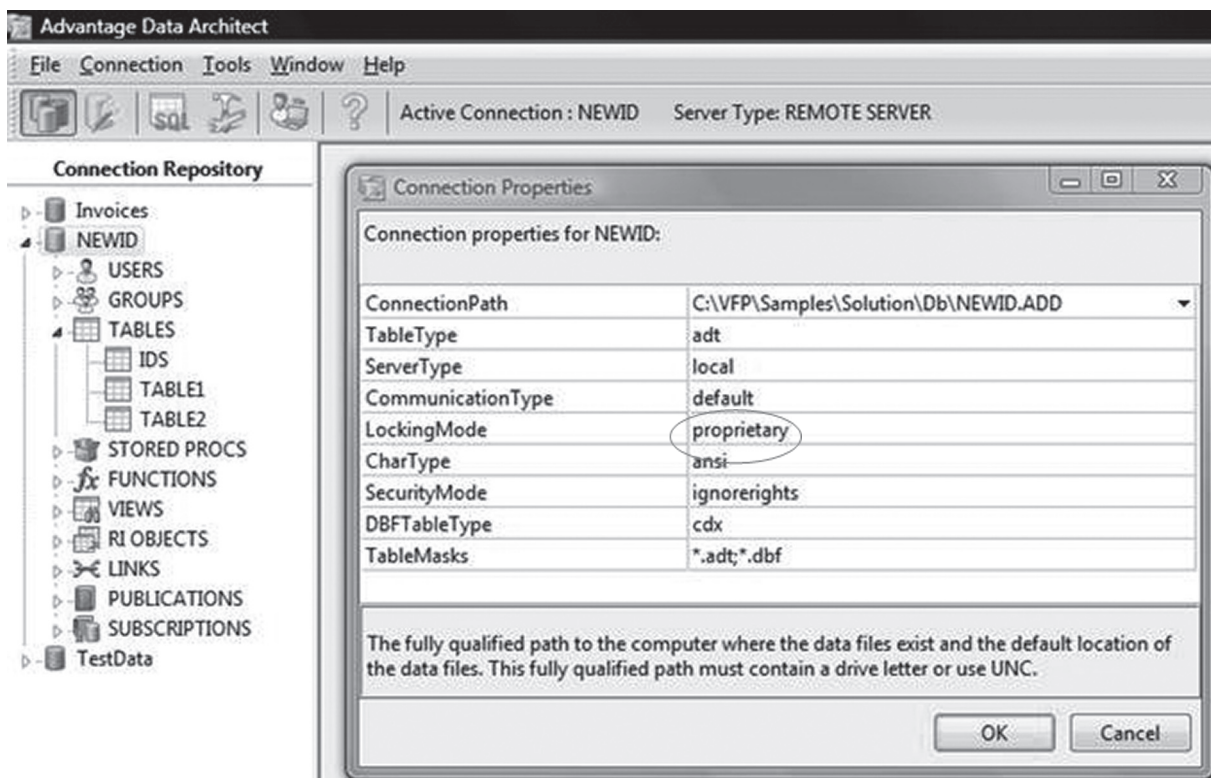


Figure 9. Connection properties of the NewID.add file created with the CloneDBC utility, after NEWID has been added to the Connection Repository in Advantage Data Architect.

newid.add file), the NEWID data dictionary must be added to the ARC repository. To do this, in ARC right-click on NEWID and then select Add To Repository. If you want to use

the NewID DBFs in shared mode with VFP, you will need to change the LockingMode from proprietary to compatible in the Connection Properties for NewID, as shown in [Figure 9](#).

Note there is a way to globally set the default locking mode to either propriety or compatible in ARC, which eliminates the need to set the locking mode for new connections.

Advantage Developer Resources

Advantage Developer Zone

<http://devzone.advantagedatabase.com>

This site is provided by the Advantage Technical Services Team as a service to Advantage customers for technical service and customer support. The site is also a learning and technical reference center for developers using the Advantage products and technologies.

Getting Started for FoxPro Developers

www.sybase.com/foxpro

The primary link for Visual FoxPro developers to access and discover all the relative developer resources for Advantage products and technologies. It includes links to external sources on the subject of ADS with VFP such as Doug Hennig's April 2008 special issue of FoxRockX on ADS, screencasts, whitepapers, samples, documentation, forums, etc.

Free Advantage Database Server 2-User Development Version for Visual FoxPro Developers

www.sybase.com/vfp

While Advantage Local Server is a free database for developers including royalty-free distribution, you can also request a free (with no expiration) 2-user developer version of Advantage Database Server. You can freely download Advantage Clients which include the Advantage Local Server engine at no charge. Combined with an evaluation version of Advantage Database Server, you can start developing with Advantage Database Server.

If you need further information, go to www.advantagedatabase.com or email advantageinfo@sybase.com.

Sybase on VFPCONVERSION.COM

VFPConversion has a new section to view and download any Advantage related samples and content.

Details on using Advantage with VFP as part of the education of migrating from VFP to .NET or using .NET with VFP is now part of the VFPConversion training courses (CODE Training: <http://codemag.com/training>) offered by CODE Magazine (EPS), either in person or remote online via GoToMeeting.

Sybase Advantage Resource Links

see Table 2

VFP Applications with Sybase Advantage: 2010 and Beyond

Advantage products and technologies are evolving and continuing to add new and improved support for VFP 9.0 DBF files and for VFP developers working with Advantage. With the next decade bringing all types of new technologies for applications such as WPF (Windows Presentation Foundation), Silverlight, mobile phone and devices, multi-touch, etc., Advantage can play a key role in helping integrate modern UI and functionality to existing VFP applications that are based on DBF data without having to modify the VFP application source code.

There are a wide range of new opportunities for VFP Developers using Advantage, including:

- Advantage brings new powerful technology to VFP apps and .NET migration
- Usage of Advantage growing within VFP community as value added skill set
- Growing job market for developers with Advantage + VFP experience

Table 2. Sybase Advantage developer resources, including samples referenced in this article.

Sybase Advantage Resources	URL
Sybase Advantage Developer Zone	http://devzone.advantagedatabase.com
Getting Started for FoxPro Developers	http://sybase.com/foxpro
Advantage Developer Edition (free 2-user license)	http://sybase.com/vfp
Demo sample download: Advantage for VFP and .NET	http://vfpcconversion.com/sybase

While Advantage version 9.1 works great with VFP DBF data and with VFP applications, Sybase is activity planning and developing a new Advantage version 10 to be released in the first half of 2010. Sybase is currently requesting feedback from the FoxPro community as to what new feature support and functionality would be great to add to the upcoming version 10, as the FoxPro team did with the VFP community when working on new versions of VFP. You can provide feedback directly (shared online with others) to the Advantage team at <http://feedback.advantagedatabase.com>, much like the VFP Wish List on UniversalThead.com.

With the Advantage Local Server database engine and all the Advantage data drivers free for developers and distribution, it's a great product for all VFP developers to download, try, and possibly use within their VFP applications for developing and evolving VFP applications into the next decade. Advantage will bridge the gap between existing VFP applications and new products and technologies.

The best way to get started using Sybase Advantage with VFP:

- Download and install the free Advantage Data Architect (latest version 9.1 as of December 2009).
- Try out the samples described in this article and then experiment with your own scenarios.
- Get the free 2-user license of Sybase Advantage Database Server to try the full client/server features.

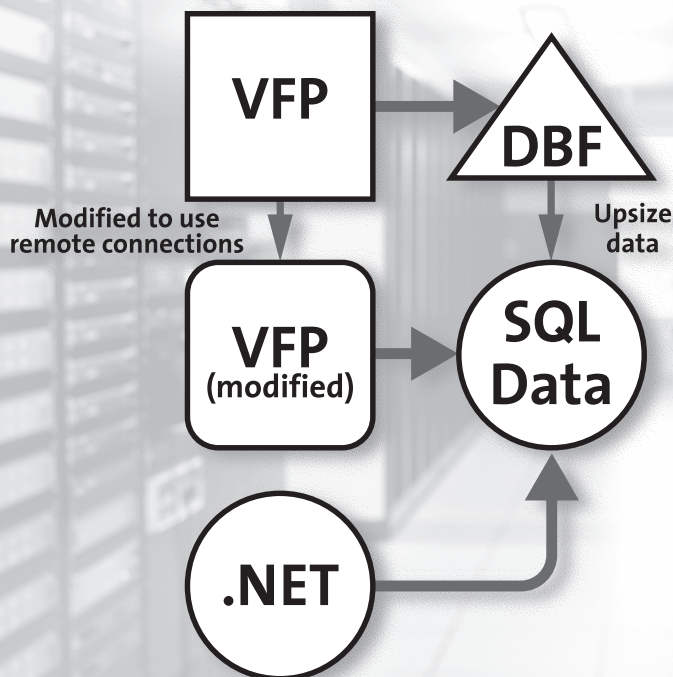
I encourage you to try using Advantage with VFP, and hopefully you will become as enthused as I am about the potential of using the two great products together for enhancing VFP apps and working with VFP DBF data for years to come, enabling all kinds of new types of applications and functionality either difficult or impossible before. Feel free to share your experience, new ideas, and feedback for enhancements with the Advantage team, myself, and others online within the FoxPro community.

About the Author

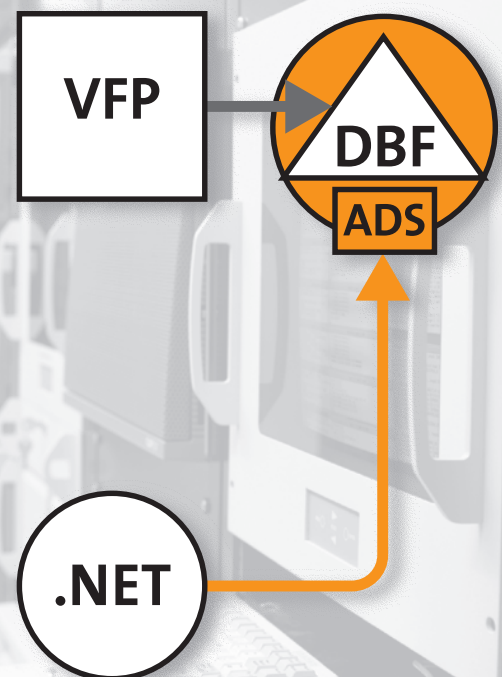
Ken Levy is the president and founder of MashupX, LLC, specializing in consulting for community building around products and services, guerilla marketing techniques, multimedia creation, and software technology. Ken is the co-host of CodeCast, a podcast show associated with CODE Magazine. Prior to starting MashupX, Ken worked at Microsoft as the product manager for Visual FoxPro, a product planner on the Windows Live Platform team, and the community program manager for VSX (Visual Studio Extensibility). Ken is a long time recognized member of the FoxPro community and the developer of GenScrnX for FoxPro 2.x plus many VFP components including the Class Browser. You can find Ken on Twitter @KenLevy, Ken's blog at <http://mashupx.com/blog>, or contact Ken at klevy@mashupx.com.

FoxRockX™(ISSN-1866-4563)	FoxRockX is published bimonthly by ISYS GmbH
dFPUG c/o ISYS GmbH Frankfurter Strasse 21 B 61476 Kronberg, Germany Phone +49-6173-950903 Fax +49-6173-950904 Email: foxrockx@dfpug.de Editor: Rainer Becker	Copyright © 2010 ISYS GmbH. This work is an independently produced publication of ISYS GmbH, Kronberg, the content of which is the property of ISYS GmbH or its affiliates or third-party licensors and which is protected by copyright law in the U.S. and elsewhere. The right to copy and publish the content is reserved, even for content made available for free such as sample articles, tips, and graphics, none of which may be copied in whole or in part or further distributed in any form or medium without the express written permission of ISYS GmbH. Requests for permission to copy or republish any content may be directed to Rainer Becker.
FoxRockX, FoxTalk 2.0, FoxTalk and Visual Extend are trademarks of ISYS GmbH. All product names or services identified throughout this journal are trademarks or registered trademarks of their respective companies.	

Common method without Advantage Database Server



Method with Advantage Database Server



Advantage Database Server

Easiest growth path for Visual FoxPro applications with or to .NET

Migrate to or add .NET to VFP+DBF applications with Advantage Database Server (ADS)

- Create a .NET application side by side with a VFP application directly accessing shared DBF data
- Keep your VFP application unmodified or enhance as needed
- Allows .NET to access DBFs via SQL data client-server functionality
- Supports Xbase type functions accessing DBFs from .NET
- Use ADS to add rich text search, exceed 2GB table size limit, and much more

For more information, visit www.sybase.com/foxpro