IDX Implementation Case Studies

Center for REALTOR® Technology
National Association of REALTORS®

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Stuart White – CEO, RealTracs Solutions/Middle TN

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I. Dispelling the Technical Myths of IDX

Many Multiple Listing Services (MLS) operate web sites that provide searchable listings to consumers as well as downloadable data to both their membership and third-party vendors. Some of the large, regional services invested significant resources in equipment and manpower to provide sophisticated tools and services that extend the scope of IDX policy.

It is important to note that IDX compliance does not require addition of a wide range of costly new services, although it may provide the infrastructure to add these at a later date. The scope of the policy is narrow and very specific about what a MLS must do.

A. What Is Required Under IDX Policy:

1) In its most basic form, IDX requires each MLS to provide downloadable listing data to Participants. The policy is clear that a MLS must provide downloadable data when requested by even a single Participant.

2) The MLS must filter out data from those Participants that do not wish to participate in the sharing of listings. Those Participants that choose to opt out of the program may not download the data shared by other Participants.

3) There are several legal and process related requirements that do not directly relate to technology and are not discussed here.

B. What Is Not Required Under IDX Policy:

1) IDX policy does not require a MLS to build a website or provide any other new services except those described in the above section.

2) The MLS is not required to accept the cost burden for the implementation of IDX.

C. The Spirit of IDX Policy:

Those services that implemented IDX and allow Participants to display reciprocal listings report positive results. In survey responses that NAR received from IDX-compliant MLS’s, close to 100% of available listings were available within a year of implementation. Most services report a proliferation of Participant web sites and positive feedback on reciprocal sharing.

NAR recognizes that the Internet is an exciting advertising and lead-generation medium. Brokers and agents are eager to build web sites that feature property listings and IDX seeks to aid in that process.

It is important to note that providing a data download is not the only solution that adheres to the “spirit” of IDX policy. HAR.COM, operated by the Houston Association of REALTORS®, allows the entire membership to “smart frame” its web site.

* Words highlighted in red can be found in the Glossary of Terms on page 34.
While HAR.COM allows public searches of shared listing data on its own site, individual Brokers can retain presence by enclosing HAR.COM in a small window surrounded by the more prominent Broker web page (Figure 1). HAR.COM and its framing option are extremely popular with MLS Participants and very few Brokers request data downloads (although HARMLS makes a download available).

Figure 1: Coldwell Banker “smart frames” HAR.COM for reciprocal listing searches.

D. Additional Publications:

IDX policy is examined in detail in the NAR Internet Data Exchange Implementation Guide and available from [http://www.onerealtorplace.com/orpframe.nsf](http://www.onerealtorplace.com/orpframe.nsf) with a valid user name and password.

* Items in blue represent links to Internet web sites. These can be clicked in the Microsoft Word version of this document to automatically point a browser to the web site.
II.IDX Implementation Case Studies

A. Case Study Methodology

The Center for REALTOR® Technology (NAR-CRT) sent out an IDX Request for Information survey in September, 2001. From the pool of 40 survey responses, NAR-CRT selected 7 to illustrate several of the numerous available options for IDX implementation. The featured Multiple Listing Services vary in size, region and technologies. The IDX solutions themselves all offer the required download capability and opt-in/opt-out functionality; however, the complexity of implementation strategies differs dramatically.

These case studies are not intended to serve as a step-by-step guide to implementing IDX. Also, technology is only one aspect of a successful IDX launch. NAR-CRT attempted included enough detail to understand a completed IDX system as a whole and the individual steps and technologies required to achieve broker reciprocity. NAR-CRT welcomes any questions or comments about these case studies. Please contact Mark Lesswing at (312) 329-8273 or via email at mlesswing@realtors.org.

Please note NAR in no way advocates any one particular IDX solution or vendor. This is only a small sampling of the systems currently in production and individual MLS’s are entirely responsible for selecting an appropriate IDX method.

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B. Case Study: A Homegrown IDX Solution

Northwest Montana Association of REALTORS®

1. Discussion

The Northwest Montana Association of REALTORS® (NMAR) has implemented IDX using all internal staff and open source software to lower costs (< $10,000 implementation cost). As with many IDX solutions, the key to making listings available on the Internet rests with extracting the raw data from the MLS software archive. In NMAR’s case, the extraction utility was internally developed.

It is not necessary that a MLS use Risco software in order to emulate NMAR’s IDX solution. Many MLS software vendors provide equivalent extraction utilities and several are discussed in Section E. If your particular vendor is not described here, you may contact them directly and ask for the procedures necessary to extract data from the MLS archive. If the vendor provides little or no support, a skilled computer expert may be able to extract the information.

Once the data is extracted from the Risco system, NMAR is able to use any software and hardware configuration it pleases to offer the data to its membership. Diagram 2 shows the process NMAR uses to provide a File Transfer Protocol (FTP) site for members to download listings. Please note that for a successful implementation of IDX using a homegrown strategy, one or more technicians with significant hardware/software/network skills are necessary.

2. Implementation Detail:

<table>
<thead>
<tr>
<th>Development Time:</th>
<th>&gt; 8 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Services:</td>
<td>Listing download, web site with searchable listings and “smart framing”.</td>
</tr>
<tr>
<td>Development Costs:</td>
<td>&lt; $10,000 using internal resources.</td>
</tr>
<tr>
<td>6 Month listing availability:</td>
<td>90% of total listings.</td>
</tr>
<tr>
<td>1 Year listing availability:</td>
<td>N/A</td>
</tr>
<tr>
<td>MLS Participants:</td>
<td>115</td>
</tr>
<tr>
<td>MLS Users:</td>
<td>500</td>
</tr>
<tr>
<td>MLS Listings:</td>
<td>5000</td>
</tr>
</tbody>
</table>

3. Technical Specifications:

<table>
<thead>
<tr>
<th>MLS Software:</th>
<th>RISCO Galaxy and Voyager</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLS Hardware:</td>
<td>Dual 450 MHz processors/Windows 2000</td>
</tr>
<tr>
<td>IDX Software:</td>
<td>MySQL database, Apache web server</td>
</tr>
<tr>
<td>IDX Hardware:</td>
<td>Dual 1.0 GHz processor/Red Hat Linux 7.1</td>
</tr>
</tbody>
</table>
4. Process Detail:

Please refer to the Process Model (Figure 2) on Page 10.

1) Risco MLS archive – Represents the physical archive of the listing data and associated images (pictures) within the Risco MLS software package, in this case a Microsoft SQLServer database. If the software vendor provides an extraction package, the format of the data within the archive is unimportant. However, a detailed knowledge of the archive is required for in-house extraction development to succeed.

2) Extract Listing Data – For NMAR, a locally developed utility that extracts listing data to a comma separated ASCII file.

3) Remove Opt-out broker listings and create output files – In the first version of IDX, NMAR will programmatically filter out those brokers that choose to not participate in reciprocal sharing. Specifically, a program written in Visual Basic scans the Risco MLS archive and compares to a list of non-participating brokers. An ASCII file is produced with the remaining listings. Although NMAR chose to use Visual Basic, virtually any procedural programming language could be used. Filtered data is stored as an FTP file and a MySQL input file.

4A) FTP input files – These ASCII text files contains the complete IDX listing data (only those fields approved for IDX), an agent file, an office file, a keywords file, a class codes file and a geographical area file. The files are copied to the FTP repository and become immediately available for download.

4B) MySQL input file – Although the data is the same as that available in the FTP file (see 4A), it is formatted specifically for upload to the MySQL database.

5) MySQL IDX Database – MySQL is an open-source, relational database available for free download at www.mysql.org. The database resembles many other relational database systems, and a programmer with some knowledge of SQL language and Windows/Linux can configure and use the software on a variety of hardware platforms. The primary benefit to using an open-source database solution is its low cost. The database has some limitations, but is well suited to serve as a repository of listings. Multiple add-on functionality exists for the MySQL database including dynamic web pages and ODBC.

6) IDX Image Repository – The repository is a set of directories that contain individual JPEG images, as stored by the Risco distributed client.

7) Selected Pictures – An ASCII file of daily comparisons of the image repository identifying those images that are to be deleted, along with a list of added or changes images. This file is copied to the FTP repository in a date-stamped file.
8) FTP Repository – The repository is a set of directories designed to be visible to Participants and third-party vendors through FTP. The archive contains the complete listing data and a list of the newest added image files.

9A) Broker accessible, frameable IDX web site – Powered by the Apache Web Server, this is the access point for IDX searches by brokers that wish to frame the site with their own web pages.

9B) Authorized Webmaster FTP access – This is the password protected access point to the set of directories made available for download over the Internet.
Figure 2: NMAR IDX Implementation

1. RISCO MLS Archive
2. Extract Listing Data (RISCO tool)
3. Remove Opt-out broker listings and create output files.
4A. FTP input file (listing data only).
4B. MySQL Input File
5. MySQL IDX Database
6. IDX Image Repository
7. Selected Pictures
8. FTP Repository
9A. Broker-accessible Frameable IDX Website
9B. Authorized Webmaster FTP Access

INTERNET
Consumer access via Broker Web site.

Broker Webmaster

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C. Case Study: Fully Functional IDX Solution

North Texas Real Estate Information Systems, Inc.

1. Discussion

North Texas Real Estate Information Systems (NTREIS) IDX implementation is designed to be highly flexible with frequent refreshes from production MLS data. NTREIS worked closely with its vendor (Fidelity) to create an extraction utility to migrate production Maestro MLS data (Informix database) to a Microsoft SQLServer database. The SQLServer database operates as a mirror of the production system and is refreshed every 6 minutes. NTREIS indicated that this extraction/mirror tool might be available to other Maestro clients through Fidelity.

NTREIS provides its IDX data through SQLServer replication and FTP download. For those Participants and authorized third-party vendors with SQLServer, NTREIS uses replication to “push” a copy of the database mirror on a scheduled basis (IDX approved fields only). Only listing data is contained in the SQLServer database, images are only available through FTP download. Since the SQLServer database contains all MLS data, those Participants using replication are required filter out data fields not approved for IDX.

NTREIS utilized a vendor to create a Visual Basic download utility that migrates only IDX fields from the SQLServer mirror to a MS Access database at a cost of $50,000. The data is ultimately extracted to “pipe” separated files and placed on the FTP site for download. Currently, the files are refreshed in 2-hour intervals. The data extracts contain pointers to image files (JPEG) and these can be downloaded if necessary. NTREIS recently began a program to enable Participants to download image files in real time rather than keeping local copies of the files.

2. Implementation Detail:

<table>
<thead>
<tr>
<th>Development Time:</th>
<th>8 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Services:</td>
<td>Listing download, web site with searchable listings and “smart framing”.</td>
</tr>
<tr>
<td>Development Costs:</td>
<td>Approximately $100,000 using both internal resources and third-party vendors.</td>
</tr>
<tr>
<td>6 Month listing availability:</td>
<td>96% of total listings.</td>
</tr>
<tr>
<td>1 Year listing availability:</td>
<td>96% of total listings</td>
</tr>
<tr>
<td>MLS Participants:</td>
<td>2,100</td>
</tr>
<tr>
<td>MLS Users:</td>
<td>15,000</td>
</tr>
<tr>
<td>MLS Listings:</td>
<td>42,711</td>
</tr>
</tbody>
</table>
3. Technical Specifications:

<table>
<thead>
<tr>
<th>MLS Software:</th>
<th>FNIS Maestro and Rapattoni in parallel</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLS Hardware:</td>
<td>Sun 4500 and networked Microsoft NT servers</td>
</tr>
<tr>
<td>IDX Software:</td>
<td>Microsoft SQLServer, Microsoft Access, Microsoft IIS</td>
</tr>
<tr>
<td>IDX Hardware:</td>
<td>Microsoft NT Server</td>
</tr>
</tbody>
</table>

4. Process Detail:

Please refer to the Process Model (Figure 3) on Page 14.

1) Fidelity Maestro archive – Represents the physical archive of the listing data within the Maestro MLS package, in this case an Informix database.

1A) Listing JPEG images stored within the Maestro MLS system.

2) Visual Basic Full DB Migration – Fidelity worked with NTREIS to provide a utility that extracts listing data from the Maestro Informix database and migrates it directly to an SQLServer database mirror. The SQLServer database is an exact copy of the data and structures in Maestro. Maestro users that may have interest in the extraction utility should contact Fidelity directly.

2A) Maestro uses FTP to transfer images directly to the NTREIS FTP server when Participants upload the files. Maestro then records image location information (metadata) in the Informix database.

3) SQLServer Mirror – The SQLServer database is an exact copy of the Maestro Informix database and refreshed every 6 minutes.

4) Extract IDX data only – NTREIS employed a third party vendor to supply a Visual Basic program to extract data from the SQLServer database. The information is stored in a Microsoft Access database and only those fields identified for IDX are included. MS Access was chosen partly due to its ability to act as an automated scheduling package. The MS Access database automatically starts the refresh process in 2-hour intervals.

4A) SQLServer provides the ability to replicate itself to remote databases. For those Participants and vendors that use SQLServer, NTREIS “pushes” replicas of IDX data to Participants on a schedule.
5) MS Access database – MS Access is used as temporary storage for IDX data only. After the final FTP files are created, this database is not used. NTREIS chose MS Access due to its ability to schedule tasks as well as the its support of simple ASCII data extracts.

6) MS Access Extract tool – MS Access creates three files every 2 hours. This is a standard tool in MS Access.

7) Final FTP files – Refreshed every 2 hours. The full listing file is typically only downloaded once then the incremental files are added (or deleted) from the full listing. Images are individual JPEG files found in a specific directory. Image file locations and names are specified in the listing files.
Figure 3: NTREIS IDX Implementation

- **Sun**
  - (1) Fidelity Maestro
  - (2) Visual Basic Full DB Migration
  - (1A) File photos (JPEG) Stored within Maestro.
  - (2 A) Maestro FTPs Images to Windows FTP Server

- **Windows**
  - (3) SQL Server Mirror
  - (4) Extract IDX Data only
  - (5) MS Access DB
  - (4 A) SQL Server Replication
  - (6) MS Access Extract Tool
  - (7) Incremental Delete File
  - (7) Individual JPEGs FTP site.
  - (7) Listing File (All listings)
  - (7) Listing File (2hr. Incremental Adds/Changes)

- **Internet**

BROKER
D. Case Study: A Fast and Inexpensive IDX Download Solution

RealTracs Solutions/Middle TN

1. Discussion

RealTracs Solutions/Middle TN implemented IDX with a cost- and time-effective solution using internal staff and limiting new hardware purchases. RealTracs leveraged its close association with its vendor (MarketLinx) to extract listing data directly from the MLS Microsoft SQLServer database into a number of extract formats. Currently, Participants can receive the listing data as a comma separated file (csv), a Microsoft Access database or one of a few specialized formats. The listing files are made available from a password protected FTP site. Rather than providing images for download, RealTracs provides the URL for each picture. This approach significantly limits the amount of data that Participants must download while not limiting the functionality of broker web sites since pictures can be easily displayed by linking to the RealTracs web server for images.

RealTracs was in the rare position of knowing the layout of its MarketLinx MLS database before starting the project. Internal developers were able to create scripts to extract only those fields required for IDX with very little difficulty. However, a variant of this approach should be possible with cooperation from most MLS vendors. The option of providing links to image files rather than providing these for download is unique among the respondents to the initial IDX survey. The ability to use this approach will depend on the answers to two important questions:

1) Does the MLS have the bandwidth for a high volume of image requests?
2) Does the MLS understand its vendor software well enough to make image files available over the Internet?

In addition to providing downloads, RealTracs previously provided a public web site with searchable listings that may be framed by Participants.

2. Implementation Detail:

<table>
<thead>
<tr>
<th>Development Time:</th>
<th>&lt; 1 week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Services:</td>
<td>Listing download, web site with searchable listings and framing.</td>
</tr>
<tr>
<td>Development Costs:</td>
<td>$1000 for FTP server</td>
</tr>
<tr>
<td>6 Month listing availability:</td>
<td>100%</td>
</tr>
<tr>
<td>1 Year listing availability:</td>
<td>100% of total listings</td>
</tr>
<tr>
<td>MLS Participants:</td>
<td>813</td>
</tr>
<tr>
<td>MLS Users:</td>
<td>6,000</td>
</tr>
<tr>
<td>MLS Listings:</td>
<td>27,609</td>
</tr>
</tbody>
</table>
3. Technical Specifications:

<table>
<thead>
<tr>
<th>MLS Software:</th>
<th>MarketLinx Tempo</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDX Hardware:</td>
<td>Microsoft NT Server</td>
</tr>
</tbody>
</table>

4. Process Detail:

Please refer to the Process Model (Figure 4) on Page 18.

1) MarketLinx MLS archive – Represents the physical archive of the listing data for the MarketLinx MLS package, in this case a SQLServer database.

1A) MarketLinx associated listing JPEG images stored on disk.

2) Extract Listing Data – RealTracs developed scripts to extract data from the MarketLinx archive based on the fields deemed appropriate for broker reciprocity. Success in creating extraction scripts is determined by the extent of familiarity with the underlying database. As an alternative, MLS vendors may also provide a utility to create an extract file.

3) Listing File – RealTracs created three types of extraction files. The first, an ASCII file, can be read by virtually any software application or the human eye and is often referred to as a text file. For the text file to be useful, each column of the data needs to be defined (i.e. property address, number of bathrooms, etc.). RealTracs alternatively creates several specially formatted files for Participants in unique circumstances. In addition, RealTracs creates a Microsoft Access file since several Participants already use the product.

4) Copy Files to FTP Server – The multiple extract files are moved to an FTP server and made available to Participants. Participants log into the password-protected server and download the files on a daily basis. The data contains links to the listing images rather than the actual JPEG files (see Step 5) and these can be displayed in any custom web site.

5) Image Files migrated to web server – Image files are accessed through links provided the listing download files and served to custom web sites when requested.

5) Web Site

Previous to IDX implementation, RealTracs created a web site with searchable listings. View at [http://www.realtracs.com/](http://www.realtracs.com/).
Figure 4: RealTracs MLS IDX
E. Case Study: Web Site IDX Solution

Houston Association of REALTORS MLS®

1. Discussion

The Houston Association of REALTORS® MLS (HARMLS) operates a large MLS with significant resources and a well-staffed data center. As described in the introduction, HAR operates a searchable and “smart frameable” web site as the preferred method for brokers to share listings. The web site is heavily promoted through aggressive advertising, including daily morning TV ads, three billboards, and newspaper ads, to drive consumers to HAR.COM to find a REALTOR® and all REALTOR® listings. Brokers that represent over 50% of the MLS listing inventory participate in HAR.COM to provide the consumer with searchable listings on their company websites. Each brokerage can customize the look of the framed HAR.COM to its own specifications. Since HAR’s main focus is providing a comprehensive web site, this study will exclude discussion of IDX downloads.

HAR uses a complex array of web servers, load balancing hardware and firewalls to deliver HAR.COM to its large user base. Web content (listings and images) is created using Macromedia’s Coldfusion with the listing data stored in multiple Microsoft SQLServer databases and photos in a proprietary image management system (HAR Photo Manager).

Like many of the other case studies in this publication, HAR starts with its listing data stored in an Interealty MLS archive (Interealty Stellar System). HAR stores and manages associated photos in HAR Photo Manager. Photos are post-populated to the Stellar archive for those Brokers that prefer to use the standard suite of Interealty desktop software.

Listing data is extracted from Stellar using Altaira and imported into the HAR.COM SQLServer database. Multiple servers are required to handle the high volume (over 55 million hits per month) of queries from HAR.COM. The data is currently refreshed every four hours with plans to implement 15-minute refreshes in the near future. All listings are available in English and Spanish with other languages planned.

HAR.COM is the primary entry point for Brokers and customers alike. As stated earlier, the vast majority of Brokers “smart frame” HAR.COM within their own web site. Each individual Broker customizes the look and feel of the framed site by providing HAR.COM with a set of display parameters (i.e. header message, email links, fonts, color, logos, maps, etc.). The Broker maintains the look and feel parameters in a private area of HAR.COM. For Brokers that choose to frame HAR.COM, a link to HAR.COM is included to help Brokers create and maintain relationships with consumers. Listing searches (powered by Coldfusion), combine the listing data from the SQLServer IDX database and the photos from the HAR Photo Manager. None of the 2,500 Brokers have opted out of the HAR IDX Solution.
HAR credits its IDX success to frequent update of listing data, low cost per Broker ($50/month), maintenance free/high performance web infrastructure, and the large volume of consumers driven from HAR.COM to those Broker sites that ”smart frame”.

2. Implementation Detail:

<table>
<thead>
<tr>
<th>Development Time:</th>
<th>2-4 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Services:</td>
<td>Frameable website, download via Altaira</td>
</tr>
<tr>
<td>Development Costs:</td>
<td>$50,000-$75,000</td>
</tr>
<tr>
<td>1 Year listing availability:</td>
<td>100%</td>
</tr>
<tr>
<td>MLS Participants:</td>
<td>2,500</td>
</tr>
<tr>
<td>MLS Users:</td>
<td>10,000</td>
</tr>
<tr>
<td>MLS Listings:</td>
<td>35,000</td>
</tr>
</tbody>
</table>

3. Technical Specifications:

<table>
<thead>
<tr>
<th>MLS Software:</th>
<th>Interealty Stellar System/Altaira</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLS Hardware:</td>
<td>HP 9000</td>
</tr>
<tr>
<td>IDX Software:</td>
<td>Microsoft SQLServer, Macromedia ColdFusion, Microsoft NT Server(s)</td>
</tr>
<tr>
<td>IDX Hardware:</td>
<td>Compaq, Cisco, Alteon, SAN</td>
</tr>
</tbody>
</table>

4. Process Detail:

Please refer to the Process Model (Figure 5) on Page 24.

1) Interealty Stellar archive - Represents the physical archive of the listing data for the Interealty MLS package.

2) Interealty Extract Utility (Altaira) – Performed every 4 hours, this process extracts the complete Interealty database into a .DBF format. Using an automated process developed by HAR the information is then uploaded directly into one of several SQLServers (mirrors).

3) SQLServer IDX database – Multiple SQLServer databases that contain exact duplicates of the Interealty archive (1). Due to high traffic, multiple servers are required to handle the large volume of queries from HAR.COM.

4) File photos – This is a proprietary system developed in-house by HAR previous to the launch of its IDX project. For reasons unassociated with IDX, HAR wanted to provide image functionality that exceeded the specifications in their Interealty MLS package. However, because several Brokers continue to use Interealty desktop software, image files are populated on a daily basis to the Stellar system.
5) HAR.COM – As with any large web site, HAR.COM employs a large number of Web servers, load distribution servers and firewalls to protect its data and allow for a large volume of “hits”. It is beyond the scope of this document to discuss the configuration of the servers. At the heart of HAR.COM is Macromedia’s Coldfusion product that queries, integrates and delivers the content from the SQLServer IDX database and the HAR image archive. HAR.COM contains Broker-only entry points for maintaining frame look and feel as well as a customer-direct search tool.
A. Multiple Web Servers, Load balance hardware and firewall.

B. Coldfusion application server.

Figure 5: HARMLS IDX Implementation

Customer accesses Broker website. Framed HAR.COM

Direct Broker access to maintenance web site

Direct public access to HAR.COM

HAR.COM
F. Case Study: Using MLS vendor-supplied solutions

C.R.I.S. – Akron/Canton OH (Interealty)
Duluth Area Association of REALTORS® (Risco)
Fayetteville Association of REALTORS® (Offutt)

1. Discussion

Many MLS vendors provide IDX solutions for little or no cost to clients. Utilizing a vendor-provided IDX solution can be a low cost and painless method to offer broker reciprocity to membership especially is the MLS data and software is already hosted on the vendor’s hardware. Interealty, Stratus and Risco (and many others) all offer IDX solutions that are in use today. Please note that NAR does not advocate the use of any particular MLS vendor. These case studies represent solutions offered by respondents to the IDX survey.

2. C.R.I.S. – Akron/Canton OH

C.R.I.S. currently uses the Interealty NET-MLS software system and the data is managed on an Oracle database in Vienna, VA. Interealty responded to IDX download requests from C.R.I.S. by providing the MLS with two methods to access the listing data. C.R.I.S. indicated that the data download service was added to their Interealty suite of services and was not a standard part of the product.

Brokers and approved third-party vendors can access the Interealty Oracle database directly using Open Database Connectivity (ODBC). C.R.I.S. provides Participants and third-party vendors with documentation that describes the structure of the database and examples for accessing the data using ODBC. Only information that is approved for IDX is accessible. This method differs from many IDX solutions since the data is available in real-time, meaning that any query against the database results in real-time data. Photos are available from an FTP download site.

For those Participants and third-party vendors that may find the ODBC connectivity solution somewhat intimidating, Interealty provides a user-friendly download tool. DataLink allows members to extract IDX listing data with a simple user interface and does not require knowledge of ODBC or database extraction technologies.

As of this writing, C.R.I.S. had not implemented its IDX solution pending the resolution of state legislative issues expected to be resolved in December 2001. However, C.R.I.S. Participants already use both of the above methods to retrieve and search their own listings.
3. Duluth Area Association of REALTORS®

The Duluth Association (DAAR) currently uses the Risco Voyager MLS system and makes use of a listing download facility provided by its Galaxy desktop software. Galaxy allows approved Participants to download the entire contents of the MLS database to a local flat file.

DAAR allows its Participants to use the downloaded data to create custom Broker websites. Currently, it is the responsibility of individual Participants and third-party vendors to remove opt-out brokers listings and to limit websites to only IDX approved fields. DAAR monitors Participant web sites periodically to ensure that the data conforms to the MLS guidelines.

DAAR contracted with a third-party vendor to create an Association-sponsored website. Like any Participant, the vendor removes opt-outs and maintains the Association’s searchable web site. Brokers are allowed to frame the Association site. DAAR indicated that the web site (not required under IDX) represents the only expense the MLS incurred. A nominal fee for IDX Participants is expected to offset the development cost.

For the future, DAAR expects to make modifications to its opt-out process after Risco offers a solution. Risco is currently in the final stages of providing a software upgrade to specifically target IDX downloads. As of this writing, the details of that solution were not available.

4. Fayetteville Association of REALTORS®

Fayetteville currently uses Innovia from Offutt Systems and was the first to migrate to a new version equipped with IDX extraction utilities. Although Fayetteville hosts its own data and Innovia server, many Offutt clients allow the vendor to host and administer the data.

Offutt Systems’ new software requires no additional hardware and FTP site setup is unnecessary (although an FTP push solution is available). Participants and third-party vendors connect to the Innovia database archive (Oracle) using Offutt’s Smart Link tool. Smart Link enables individual Broker/Agent web sites query the MLS archive in real-time and the pre-formatted listing data is returned to the web site for display.

Although most brokers in Fayetteville chose this method for IDX, Offutt also provides a download option. Each night, a file is pushed to the subscribing Broker or Agent containing only data fields as agreed by the MLS. The file contains the full database of listings and incremental photo files from the previous data push. Full photo archives are also available if required.

Currently, Fayetteville is the first MLS to implement Offutt’s IDX solution. Users of Innovia may contact Offutt Systems President Scott Quinn at 800-334-0831 for more information.
III. Results of NAR IDX Survey

A. Survey Goals

NAR recognizes that IDX policy is implemented in vastly different ways. Some of the most vocal advocates of IDX are Multiple Listing Services that expended tremendous resources to design robust and feature-filled web sites complete with data downloads and extensive broker/agent/consumer tools. However, some MLS’s successfully implemented IDX by providing inexpensive, download-only solutions in a very short time. The survey was developed to gather information on successful IDX solutions that span range of costs and features. Seven of the respondents were asked for additional information and became the case studies in the previous section.

NAR received 40 responses that included detailed information on a number of IDX solutions. Some surveys contained incomplete information; therefore the number of total responses in each of the following graphs varies.
B. Survey Results

Figure 6: Total responses categorized by MLS Software Vendor

Figure 6 shows the vendors that provide the MLS software for each respondent. *The Center for REALTOR Technology and NAR do not advocate the use of any one particular vendor for MLS software.*
Figure 7: Total responses categorized by active MLS listings in each MLS.

Figure 7 shows respondents categorized by active listings available in the MLS database. Of particular interest is dispelling the myth that only the large MLS possesses the resources to implement IDX. As Figure 7 clearly shows, 4 out of 30 respondents* are classified as “small” with less than 1000 listings. In fact, 17 of 30 (57%) contain less than 5000 listings while 13 (43%) have more than 5000.

* Although NAR received 40 responses, not all respondents included MLS participation numbers.
Figure 8: Total responses categorized by MLS user totals.

Figure 8 categorizes response totals by total MLS users. For purposes of this survey, users are defined as any individual who has access to the MLS listing database (not consumers). As noted in Figure 7, IDX implementations are not limited to only large services. Even very small services (those with < 250 users) routinely provide IDX solutions to their membership.
Figure 9: Responses categorized by the percentage of MLS listings shared.

Figure 9 shows the percentage of listings that Participants have chosen to reciprocally share. As Figure 9 clearly shows, only in rare cases are Participants hesitant to join the MLS reciprocity arrangement. An overwhelming majority (88%) of respondents report that 95% or more of listings are available through IDX. NAR believes that these numbers will further improve as more and more Participants embrace reciprocity.
Figure 10: Responses categorized by percentage of Participants using IDX.

Figure 10 indicates the number of MLS Participants that took advantage of the IDX solution (created independent, searchable web sites). After 6 months, 6 of 19 (32%) of respondents indicate their membership is actively using the IDX download solution. However, after one year, 8 of 15 (53%) of respondents report at least partial (>10%) membership interest.
Figure 11: Responses categorized by total IDX development costs (estimated).

Figure 11 categorizes respondents by the estimated cost of IDX implementation. It is important to note that the high costs often attributed to IDX are often the expense of offering a comprehensive web site and tools to Participants and consumers (not required under IDX policy). At the low range of Figure 11, the respondents often cited a vendor-supplied solution included in current maintenance agreements or at low cost. Also, some respondents were able to draw upon internal technical staff to lower development costs. At the high range, the IDX solution was often bundled with a comprehensive package of tools, utilities and web sites.
Figure 12: Responses categorized by development time.

Figure 12 details the development time necessary to design and implement IDX. In most cases, significant time is necessary for the project. Even those respondents that utilized vendor-supplied solutions reported a significant amount of time to install, configure and test the software. It is important to note that some respondents did not separate the technical development time from the regulatory, legal, and other efforts.
Figure 13: Responses categorized by MLS web site type.

Respondents were presented with four categories that best described the functionality of their MLS web site. Dispelling the myth that IDX requires an Internet-savvy MLS, fully 21% percent of respondents provide an IDX solution without offering a web site. For those services that provide a web site, 8 of 27 (30%) do not provide a mechanism to search listings via the Internet although many of these services plan to offer searches in the future.
Appendix A: Original IDX Request for Information (Survey)

Request for Information: IDX Implementation Details
Center for REALTOR® Technology
National Association of REALTORS®

The Center for REALTOR® Technology (CRT) of the National Association is gathering data for a Solutions Guide to showcase successful options for implementing the Internet Data Exchange (IDX) policy. NAR is soliciting detailed information from those Associations and Multiple Listing Services that implemented IDX and wish to share their experiences. The Solutions Guide is intended to provide real world, IDX case studies complete with estimated times and costs as well as associated challenges and successes. The Solutions Guide will not advocate any particular approach. Please take the time to describe in detail your solutions, opinions, unforeseen difficulties and major hurdles. NAR will not publish any information that your organization deems confidential and you may include your privacy policy as part of the response.

Privacy Policy:

Provide any special guidelines for the use of the information that you provide in the space below or as an attachment to your response. NAR will use only that information you authorize. At your request, NAR will omit your Association or Multiple Listing Service as the source of any information you provide.

☐ Yes, NAR may use the information provided in this survey for the Solutions Guide.
☐ No, NAR should not re-publish any of the information provided in this survey.

Specify special additional guidelines or attachment reference.
1. Current Listing Software:

Please provide details on your current Multiple Listing Service software system(s). Provide as much information as possible.

- Vendor:
- Software:
- Version:
- Hardware:
- Additional Notes:

2. IDX Implementation Category:

Please choose the strategy or strategies that most clearly describes your IDX solution.

- Listing software upgrade to IDX compliant version.
- In-house modifications to listing software.
- Third-party vendor solution with existing listing software.
- New listing software purchase.
- Other: Specify details in Section 3 below.

3. IDX Implementation Detail:

We seek specific details regarding your IDX implementation including vendor names, contacts, and software used. If you are using a combination of solutions, please provide detail for each. You may choose to attach documentation to this survey. Please identify the attachment(s) here.

Implementation detail or attachment reference here.
4. Framing

Does your Multiple Listing Service allow its web site to be framed by member web sites?

☐ Our listing service does not have a web site.
☐ Our web site does not display listings.
☐ Our listing service web site provides listings but cannot be framed.
☐ Our listing service web site provides listings and may be framed.

5. Project Cost and Length:

Please detail the time and cost to implement your IDX solution. NAR understands that your Association or Multiple Listing Service may not want to disclose exact financial figures.

Section I: Estimated Costs

Please use the following choices when answering or enter exact figures:

A. Less than $5,000.
B. $5,000 - $10,000
C. $10,000 - $25,000
D. $25,000 - $50,000
E. $50,000 - $100,000
F. $100,000 - $500,000
G. Greater than $500,000

1) Estimated software cost (if upgrade solution):
2) Estimated software cost (if new purchase of listing software):
3) Estimated development cost (if in-house solution):
4) Estimated vendor cost (if third party solution):
5) Other Costs (annual contracts, hosting service, etc.):
6) Estimated hardware costs (if new hardware necessary):
7) Estimated legal costs:

Section II: Project Length

Please use the following choices when answering:

A. Less than 1 week
B. 2 - 4 weeks
C. 4 - 8 weeks
D. More than 8 weeks

8) Approximately how long did it take to implement the technology component of your IDX solution:
6. Usage

Please describe the response from your membership regarding IDX and listings reciprocity.

1) Percent of membership firms that used your IDX solution within 6 months:
2) Percent of membership firms that used your IDX solution within 1 year:
3) What percent of your total listing database is available for download/search:
4) Did you create a new name for your IDX implementation: ☐ Yes ☐ No
5) Did you file for a trademark: ☐ Yes ☐ No

7. Additional Comments:

Please inform us of any details regarding your IDX implementation that might be helpful to others. Specifically, NAR wants to know of the major obstacles and surprises your Association or listing service faced in implementing IDX. Has your solution met expectations? If your IDX solution was easy to implement with no unexpected issues, NAR is interested in this information as well.

Comments here.
8. Contact Information:

<table>
<thead>
<tr>
<th>Name:</th>
<th>Multiple Listing Service/Association name/location:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title:</td>
<td>Number of Multiple Listing Service Participants:</td>
</tr>
<tr>
<td>Business Phone:</td>
<td>Number of Multiple Listing Service Users:</td>
</tr>
<tr>
<td>Email Address:</td>
<td>Active current listings (all classes):</td>
</tr>
</tbody>
</table>

9. Request for Additional Information:

<table>
<thead>
<tr>
<th>Would you be willing to provide additional information to NAR via phone interview or email?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, you may contact me as a follow up to this survey.</td>
</tr>
<tr>
<td>No, I do not wish to be contacted at this time</td>
</tr>
</tbody>
</table>

Please include any additional information you think would be valuable to this project

Comments here.
Appendix B. Glossary of Terms

*Apache Web Server* – The Apache Project is a collaborative software development effort aimed at creating a robust, commercial-grade, featureful, and freely available source code implementation of an HTTP (Web) server. The project is jointly managed by a group of volunteers located around the world, using the Internet and the Web to communicate, plan, and develop the server and its related documentation. These volunteers are known as the Apache Group. In addition, hundreds of users have contributed ideas, code, and documentation to the project (Reprinted from Apache web site).

*American Standard Code for Information Interchange (ASCII)* – The most common format for text files in computers and on the Internet

*File Transfer Protocol (FTP)* - An Internet service used to transfer a data file from the disk of one computer to the disk of another regardless of the operating system type.

*Joint Photographic Experts Group (JPEG)* – A compression technique for reducing the size of electronic color images files.

*Macromedia ColdFusion* – A software product that provides the tools necessary to build and deploy web applications. As an example, ColdFusion can integrate data from multiple database sources and deliver this content to a browser.

*MySQL* – A collaborative software development project that seeks to create a fully functional relational database complete with source code. The database, source code and updates are freely available and continuously improved by a network of volunteers.

*Microsoft Access* – A database management program primarily designed to run on desktop PCs. The program is designed with a simple user interface and is a good tool for novices.

*Microsoft SQLServer* – A full-featured database management system for large organizations and corporations. Installation and maintenance of SQLServer requires experienced database technicians and support staff. *See Oracle.*
Open Source – The Open Source Initiative seeks to promote collaborative projects by eliminating the software industry tendency to protect source code. Not to be confused with “freeware” or “shareware”, the Open Source Initiative offers both the executable files as well as the source code and promotes the improvement of software using a network of tightly knit volunteers. Successful Open Source projects often lead to the creation of corporate enterprises that provide support and services for the software (i.e. Linux and Red Hat).

Open Database Connectivity (ODBC) – A standard method for sharing information between databases and programs. Once the ODBC connection is established with the remote database, standard Structured Query Language (SQL) is often used to access the data.

Oracle - A full-featured database management system for large organizations and corporations. Installation and maintenance of Oracle requires experienced database technicians and support staff. See SQLServer.

Smart Frame – The ability to frame a web site with a border web page. The framed site is made “aware” of the framing page by passing information. This allows the framed page to customize itself in different ways based upon the “identity” of the framing page.

Uniform Resource Locator (URL) – The "address" or location of a Web site or other Internet service and takes on the form http://www.onerealторplace.com/.

Web Server – A generic term that describes the software required to serve pages of content to a browser. The term is sometimes used to describe the physical machine that runs the web server software.