

MIGRATING SOFTWARE, SYSTEMS, AND DATABASES IN A CITRIX ENVIRONMENT

Abstract: Fairfax County, VA has an ESRI user base of over 350 users. Over the past year, the GIS maintained by the county has undergone tremendous change to support this growing user base. An original 3 server Citrix farm that delivers applications was replaced with a 10 server farm. The enterprise SDE database was upgraded and moved. The in-house applications maintained have been upgraded from 3.x to 8.x to 9.x applications. All of these major changes represent major challenges as well. This paper covers the county Citrix implementation, key points to consider when migrating between server farms, in-house applications developed by the county GIS stadd and issue associated with migrating those applications, and also the challenges of migrating from one SDE database to another. One other topic covered will be the tracking of usage metrics in a Citrix Environment. These metrics aid the decision making process in an enterprise GIS.

About Fairfax County GIS

The Fairfax County GIS system has evolved from a small network of a few ArcInfo workstations in the early 1990's to a complete enterprise implementation. In any given month over 350 different users from dozens of locations log on to the system over 3000 times to access over 1 TB of data using all levels of GIS software. The Fairfax County GIS system is set up with a core GIS group that is responsible for maintaining the primary data layers as well as the hardware and software. The central GIS office also provides customer support and custom application development. This office has 19 staff positions to support these functions. Throughout the rest of the county there are various agency GIS coordinators and professionals and a software users. The table below lists the agencies with active users and the average number of users per month in each agency.

Agency	Users
Information Technology	26
Fairfax County Police Department	17
Fairfax County Park Authority	30
Housing and Community Development	7
Public Works & Environmental Services	119
Planning and Zoning	33
Transportation	22
Fire and Rescue	20
Health Department	3
Tax Administration	41
Human Services	4
Board of Supervisors	2
Libraries	1
Northern VA Soil & Water Conservation District	3
Planning Commission	2
Community & Recreation Services	1
Sherrif	1
General Registrar	1
Falls Church Community Services Board	1
Public Safety Communications Center	1

Server Based Computing & Citrix

To support a rapidly growing user base Fairfax County moved to a server based environment in 2000. Even this was a new implementation of an old computing paradigm. The personal computer's Windows environment can be hosted by large server farms, which communicate to "thin" web-distributed clients on the end-user's computer with minimal network bandwidth. Among the many benefits to Server Based computing are:

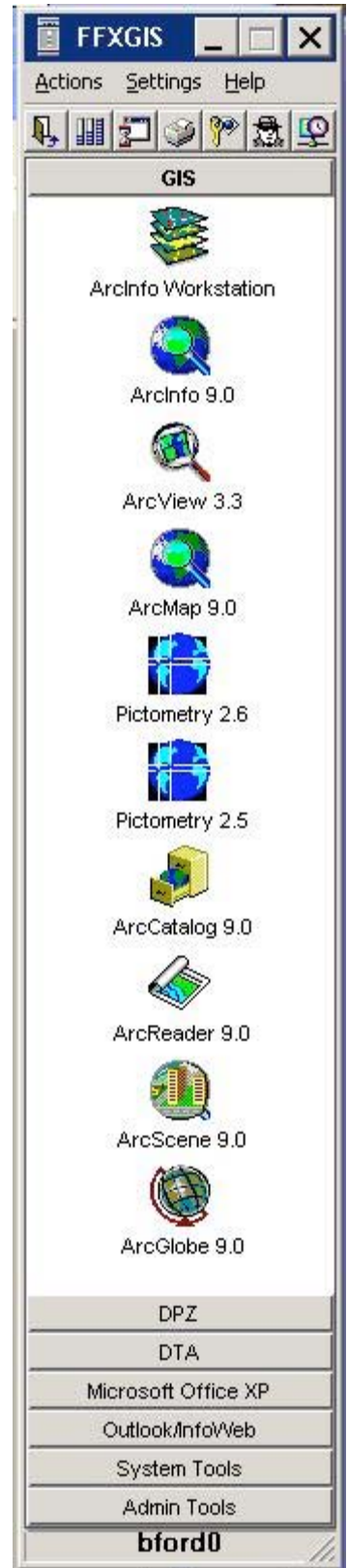
- High performance data access to over 1TB of data in the central GIS database.
- The ability to effectively serve GIS to over 50 remote offices.
- The ability to provide GIS software to 400 different users.
- Efficient hardware, software, and operating system upgrades.
- Excellent application metrics to track system usage.

How Citrix Works

The process of publishing an application on the Citrix application server is a relatively straightforward process. Once software is installed on the Citrix Server, the application can be "published" using the Citrix Application Publishing Tool. In the current Fairfax County implementation, an additional layer called the Application Portal from Emergent On-Line is also used. The screen shot at the right shows the applications available to a high end user. Notice at the bottom of the image there are tabs for custom agency applications. When a user logs in to one of the GIS servers all the applications available to them will appear. By selecting and clicking on one (or more) of the applications the user will check out a license of the product and keep it for the duration of the session. Once the user is finished working and ends the session, the license immediately becomes available for someone else to use. One of the biggest benefits of this system is painfully obvious. A pool of licenses can easily support over 4 times as many users. The table below list the number licenses owned by Fairfax County for some of the major ESRI products:

Software	# licenses
ArcGIS (View)	50
ArcInfo	26
ArcGIS (Editor)	13
ArcView 3.3	13
Spatial Analyst	11

Compare the number of licenses with the usage statistics for the month of May 2005 listed below:



Fairfax County GIS System Usage Stats for May 2005

Process	Dept Count	User Count	Session Count	Average Session time (hours)
Arccatalog	15	90	278	2.80
Arcmap	23	270	2546	3.03
Arcreader	6	12	16	1.86
Arctoolbox	7	10	19	3.47
Arcview	14	73	149	2.46
Pictometry	10	101	528	3.11

Total Unique users of the GIS System	336
Total number of agencies/groups using the GIS System:	23

In May alone 270 users from 23 different agencies ran 2,546 Arcmap sessions on the GIS Citrix farm. One user alone ran 254 sessions in the month of May. Without server based computing these numbers simply would not be possible much less cost effective.

Key Components of the Fairfax County Citrix Implementation

While the Citrix implementation provides obvious benefits, there are other important components to the overall system. They are listed and explained below. A complete system diagram follows the listing.

Active Directory to Manage User Access: Fairfax County uses Microsoft Active Directory (AD) to manage user access to just about all systems. Employees are placed in one or more AD groups that allows administrators to configure file and system level privileges. In the case of GIS, Active Directory is extended and combined with Citrix to configure application level access and printer access. Once an AD group is “imported” into Citrix, any user of the group has access to the GIS Citrix farm and all standard applications.

One of the advantages of Citrix is that it can be configured so any user can see all plotters configured on the Citrix farm. In fact, in our original implementation in 2000, this was the case. This can also be a drawback as multiple agencies have large format plotters that their users must be able to access. Within a couple of years, the list of printers available was excessive and users frequently printed to the wrong plotter. In the current implementation, printers are made available to everyone by Active Directory group, hence everyone in the Transportation AD group can see the HP1055 in the Transportation office and no one else. A standard naming convention has also been adopted for each AD group so they can be easily recognized.

Active Directory is also used to manage testing of new applications and products. A separate testing server is part of the enterprise and access to it is manage through a GIS test group. Once in the group users have access to the test farm and can thoroughly test new applications and extensions before they are moved to the production farm.

Print Appliances to Manage Printers: There are three print appliances used to manage the 56 printers and plotter available to the user community. As discussed in the previous paragraph agency plotters are generally only available to members of the agency. The

lone exception to this are the GIS plotters (5) that are available to the entire county. Some of the advantages of print appliances are that they are cheaper than a server, less likely to have operating system problems, and have interfaces to manage print shares.

Common Storage Area Network (SAN): All Fairfax County GIS users store files on a common storage area network. This space allocated to the GIS users is commonly mapped as "g". This has been a great advantage over the year from a support perspective as all tech support personnel could open user apr's and mxd's from remote desktops. The GIS share of the SAN is divided into agency subdirectories. There is both a public share for each agency where files are visible by any user in the county and a private share where files are only visible by other users in the same agency.

As part of an increased security measure, users on any Fairfax County Citrix application do NOT have access to the local hard drive of the pc they are working from. This allows people to telecommute without endangering the security of the overall enterprise. While users will initially kick and scream about this it is a good policy to enforce. Storing data on a local drive reduces the effectiveness of a Citrix implementation since the data must essentially travel to the server and back just to be viewed. It also makes it extremely difficult to support remote users.

Roaming Profiles: In ArcGIS, the user interface is more customizable than it had been in the 3.x days. ESRI implemented standard Windows features such as remembering your recent projects or how you customized the toolbars. All of this information is stored in the user profile area on a stand-alone installation of ArcGIS. In a Citrix implementation with a substantial number of servers, there is no guarantee you will be on the same server twice in a row. It's a safe bet you will not. Hence the profile information is not going to be correct by default. A further problem is that user profiles can get quite large. In the fall of 2004 the GIS upgraded from a 3 server farm to a 9 server farm. Allowing user profiles to go unmanaged across 9 servers was not an option so originally the profiles were not saved. This meant "Groundhog Day" for the users. Every time they logged in it was the default ArcMap interface. In the Winter of 05, the Administration team implemented a "roaming profile" server to work with all Citrix applications in the county. This was immediately popular among the user community. A roaming profile does exactly what you would expect; it keeps user information from being propagated across multiple servers and stores it in one central location.

GIS Users Group: To coordinate major activities and disseminate and gather information, the GIS staff has managed and run a GIS Users group of county employees. The group meets quarterly to discuss important issues affecting the entire system.

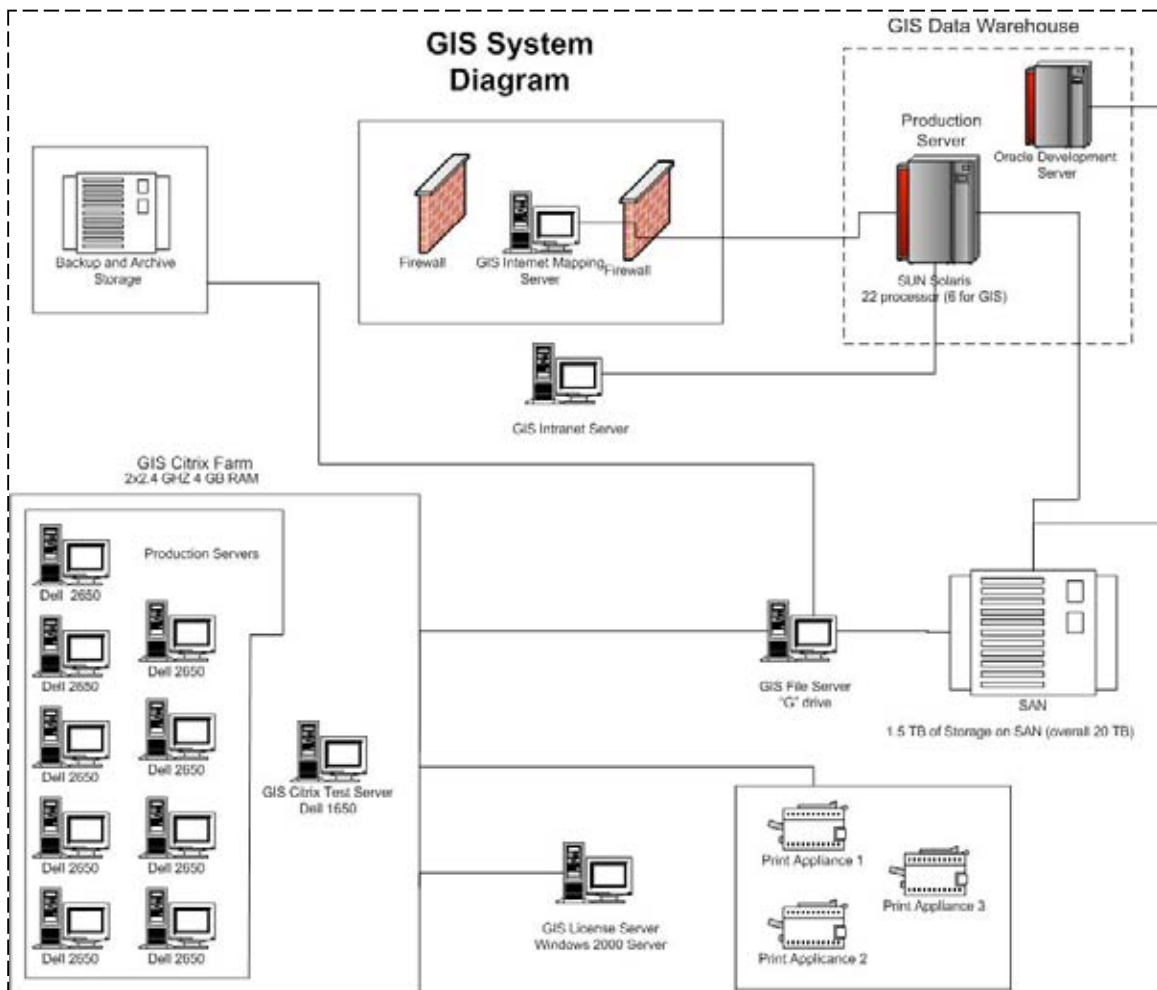
GIS System Administration Group: In the fall of 03 the GIS has also established a GIS System Administrators Group. This group meets 3 or 4 times a year to discuss GIS issues at a system level. This group also has administrator rights to their agency plotters installed on the GIS print appliances and they have administrative rights to their agency AD groups. With this access, an agency System Administrator can provide access to the GIS system for any employee in their agency. GIS groups in agencies that do not have a dedicated System Administrator are managed by the central GIS branch.

Drawbacks to the Current Implementation

Few if any IT solutions do not have a downside and there are a few with server based computing. The most difficult facing the GIS office today are:

Printing: While the issues associated with printing in a Citrix environment are much less than they used to be, there are still times when the print menus do not operate the same way under Citrix as they do in a stand-alone implementation. There is almost always a work around but rarely are they as elegant as “what is suppose to happen”.

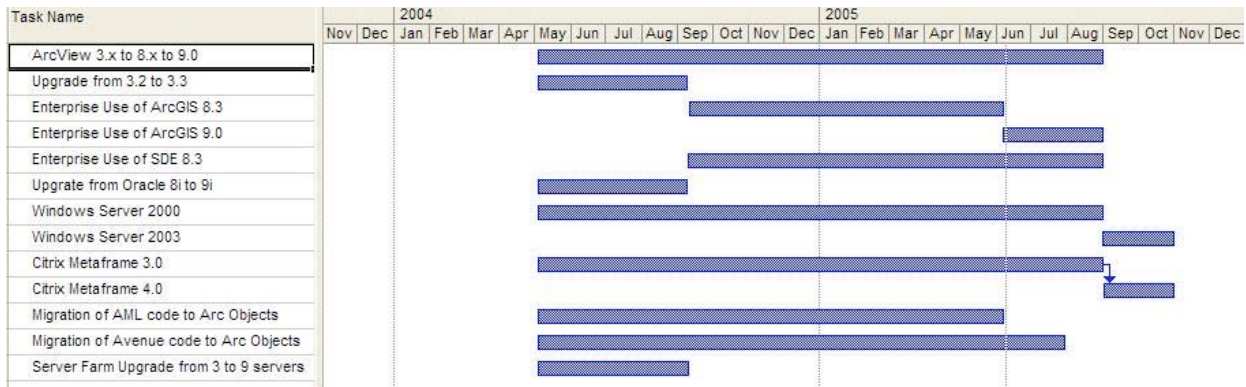
Perception: Like every other new system, implementing a Citrix solution will be a major change for a user base. Not everyone is going to embrace the change immediately. For the most part the software and components function exactly they way they do in a stand-alone implementation. However every platform is unique and there are some differences in the ArcGIS functions.



In a GIS system of this size, every change requires significant planning and effort. There are five major changes that occur in any enterprise GIS system:

- Hardware changes
- Operating System Changes
- Commercial Off The Shelf (COTS) software changes
- Custom application changes
- Enterprise database changes or data format changes

Each of these changes is significant when undertaken independently. More often, one of these changes forces some or all of them to occur. Because of the effort required to make any one of these changes it is preferable to schedule several at the same time. While this can have the drawback that it might be more difficult to troubleshoot problems, it minimized major changes to a system. The chart below shows the major changes to the Fairfax County GIS enterprise that have occurred over the last year or are about to occur.



In the September of 2004 the following enterprise changes took place, an upgrade from a 3 server farm to a 9 server farm, an upgrade of most of the database to from SDE layers to Geodatabase format, an upgrade to ArcGIS 8.3, an upgrade from Oracle 8i to Oracle 9i, a migration to a new database on another server, and a final conversion to Citrix Metaframe 3.0. This effort was started in May and continued through the summer. The transition was kicked off by a user group meeting where all of the major pieces to migration were discussed. A handout dealing with the SDE and Geodatabase issues is included as appendix 1. It was a huge undertaking to make all of these changes and communicating with the users throughout the process was critical. Of the keys to success in this migration was an application called the “Reset Data Source”. This application allowed users to use a custom application to quickly point existing Arcmap documents to the new data layers without having to manually reset the data sources. In 2003 the GIS Office had implemented an application called the “APR Doctor” to assist with database changes when ArcView 3.2 was the main platform.

While the transition in September of 04 went very well, there was lesson learned. Several users were very disappointed that ArcView 3.2 projects would eventually become outdated. The transition to GeoDatabase format would eventually render 3.x a useless

platform. With a database size of 25 gigabytes it isn't practical to freeze every layer so that all projects will work forever. From this perspective, it is always important to remind people that change is imminent.

Migration to 9.0

In May of 2005 the GIS office upgraded the enterprise Citrix Farm from ArcGIS 8.3 to ArcGIS 9. The only other major changes to accompany the ArcGIS 9 migration were the update of custom applications required to run in ArcGIS 9. Many of the applications were developed in ArcGIS 8.3 and ran without any code changes. The table in appendix 2 lists most of the applications which needed testing or updates to work within the new environment. It was with this migration that all legacy AML code, some of which was still used for some data generation applications, was put out to pasture. Most of the applications developed in the 8.3 environment tested fine, and in fact ran fine in the 9.0 environment.

One rule to remember in any software migration is that every environment, no matter how standard it may seem, is a little bit different. Thus, despite any published reports on testing from other sources it is important that all applications, data, and software are tested in as close to the production environment as possible. I have had seen instances where one application works fine on a test server but not on a production server, the only obvious difference being the server type. This is the one area where Citrix can play a major role in making the transition smooth. With every application stored on all 9 production servers, we were able to take one server out of production for one month and use it as an upgrade test server. Doing this allowed us to truly test applications and user projects in a production environment. Because the server farm was built with some growth in mind, users did not see a performance loss as a result of this action. This also allowed us to continue to use the regular test server in its normal function of testing new applications.

When used with ArcGIS there are a couple of implementation strategies for Citrix. One is to have every application on every server. This has the benefits outlined in the paragraph above plus the added failover benefit. It can make it easier to configure the servers if the software installation goes smoothly. Another strategy for deploying ArcGIS in a Citrix environment is to minimize the applications installed on each server. In this vain you would dedicate a certain number of servers as ArcInfo or ArcEditor servers and another number as ArcView boxes. There are a few advantages of this implementation. One is the simplification of the license type dedicated to server. The most difficult problems we have had to solve was making sure users got the proper license of ArcGIS when logging in to the farm. There is a batch file that runs that sets the license type requested. In theory this overrides the default license established by the desktop administrator application. In 8.3 this did not work at all initially and then finally worked after some configuration efforts. In 9 there operation works but not always consistently with the desktop. One other benefit of the dedicated license implementation is that it may reduce the number of troubleshooting issues since the server is configured for a more specific use. Both implementation strategies have merit, choosing the right one depends on the requirements of the organization.

Metrics

One of the beauties of Citrix is metrics. Since the application is server based, Citrix maintains session information for every user and every application. With a little messaging of the data stored in the Citrix database, one can easily paint a picture of software and system usage. The metrics have allowed the GIS office to make informed decisions where before we were just guessing and user activity. Consider the migration away from the 3.x platform. The GIS office invested quite a bit of resources in publicizing and training users to move to the ArcGIS platform. After 4 or 5 months of strong outreach, the session numbers showed that by and large the user community was only using ArcView 3.x for looking at old projects once or twice a month. In January of 05 there were 102 different users who accessed ArcView 3.2 a total of 223 times. In May of 05 there were 73 users who accessed the application a total of 149 times. Some of these users are using some custom applications which have been converted to ArcGIS applications and are now in testing so the real use of the software is even less.

Aside from validating usage for migration purposes, metrics can also indicate which agencies need attention to maximize the user of GIS and which require less attention. That same focus can also be done at a user level by looking at individual logon stats. I would not recommend using Citrix metrics to rate individual performance. Citrix tracks when a user logs on, what applications they use, and how long they were logged on. It does not keep track of what they were doing when they were logged on. Below is a list of the Citrix metrics compiled monthly by the GIS staff and their major uses. Each of these different lists are compiled by agency and sent to agency GIS coordinators and administrators. The usage stats listed on page 3 are published monthly on the intranet and are extremely useful for budget purposes.

Monthly compiled metrics (metrics listed are small samples and not the complete dataset)

Dept_user.xls – Shows unique users by agency. This is used to identify users that are not in the proper AD group. They appear as UNKNOWN in the agency field. It is also used to get a general picture of individual and agency usage.

Agency	User ID	Session Count	Usage(Minute)
DIT	bford0	50	5932
DIT	bjohns	24	8334
DIT	ccrisl	61	2803
DIT	orose0	254	21143

Dept_app.xls – Information is collected by application. This is used to compile the monthly published metrics. This allows the GIS to evaluate the performance of any application and make associated decisions on license purchases, etc. This also will tell the GIS administration team if anyone runs a process on the server that perhaps should not be running.

Process	Dept Count	User Count	Session Count	Usage(Minute)
applockmgr.exe	21	235	1980	364190
arcmap.exe	24	268	2306	392043
arcview.exe	15	102	223	35748
arcreader.exe	4	6	7	1020
electronicfield	12	72	269	46280

Dept.xls – Information is grouped by department. This can also be used when talking with agency administrators to discuss the use of GIS within their agency.

Agency	Process	Session Count	Usage(Minute)
DSMHS	arcmap.exe	51	7455
DSMHS	applockmgr.exe	33	6135
DSMHS	arccatalog.exe	9	2269
DSMHS	arctoolbox.exe	2	348
DSMHS	arcview.exe	1	37

Dept_Unique_user.xls – Gives total users by department. This is used to calculate the overall user count and usage time of the system.

Agency	User Count	Session Count	Usage(Minute)
DIT	26	976	132514
FCPD	17	717	86809
FCPA	28	1254	208887
HCD	7	278	36994
DPWES	116	5406	1148422

Info.xls – Information is grouped by agency, user, and application. This is used to get a unique list of all users using an application. The server number is also included along with the start and end time. This is used to process overall usage minutes and to assist with troubleshooting to find out what server someone may have had problems with.

Agency	User ID	Process	Server	Start Time	End Time
FCPD	aabbot	arcview.exe	XXXXXXXX25	3/28/2005 12:31	3/28/2005 14:32
FCPD	aamin0	arcview.exe	XXXXXXXX23	3/24/2005 9:08	3/24/2005 14:41
DTA	aatkin	arcview.exe	XXXXXXXX28	3/24/2005 14:50	3/24/2005 21:26
FCPD	aaufmu	arcview.exe	XXXXXXXX27	3/1/2005 13:04	3/1/2005 14:22

Perhaps the most important thing to remember with any software migration is that plenty of planning, publicity, and testing are required to make the transition a smooth one. Even with the best of plans problems can arise. During our recent ArcGIS 9 migration the data center which houses all of the servers experienced a power outage on the weekend of the transition. While the servers themselves did not seem affected the network was greatly affected and issue arose during the week that did not surface during the testing phase. During our next migration we will also strive to get more user involvement during the testing phase and not just make sure all applications and systems functions, but are stress tested a fully as possible under normal working conditions.

Appendix 1: User Group Discussion Sheet - Implications of Migrating to ArcSDE8.3 and GeoDatabases

The GIS & Mapping Services office will be migrating the GIS Database from SDE 8.1 to SDE 8.3 over the next six months. This is necessary for several reasons:

1. The current release of SDE (8.1) does not allow us to take full advantage of the geodatabase format or the additional capabilities within ArcGIS 8.2 and ArcGIS 8.3.
2. There are bugs that have been identified by ESRI in ArcSDE 8.1 which will be fixed by upgrading to ArcSDE 8.3.
3. Annotation cannot be stored as a geodatabase in ArcSDE 8.1. ArcGIS 8.3 can store and maintain geodatabase annotation.

A requirement of this migration is to move the SDE data to a new server. This is part of a server consolidation process that is ongoing in DIT. To accomplish this task with as little interruption to the GIS user community as possible, the existing SDE data server will remain available to users until August 2004. While this will allow us to make the necessary changes to the database without interruption to the data currently in use, it will require users to point to the new server once it's ready in July.

The migration to GeoDatabase format will make the data more user friendly, however, we have determined that it does carry significant implications. The items listed below are some anticipated implications that we have determined will affect many users. Please review the following items to determine if any of these changes will impact your use of GIS.

Software Changes:

Upgrade from ArcView 3.2 to ArcView 3.3

- This version change is required to access the newer version of SDE (8.3)
 - *ArcView3.2 cannot connect to SDE8.3 at all*
 - *There are no functionality changes with the migration from 3.2 to 3.3*
- Some layers are not visible with a connection to SDE 8.3
 - *GeoDatabase annotation layers cannot be seen with ArcView3.3, they will come through as line features*
- Applications automatically loading data layers from SDE may need to be revised to correctly point to new layer name or location

Upgrade from ArcGIS 8.2 to ArcGIS 8.3

- This version change is required to access the newer version of SDE (8.3)
 - *There are functionality changes with the migration from 8.2 to 8.3*
- Additional tool bars will be available for tasks
- Functionality of ArcGIS will be greatly enhanced
 - *Editing in ArcGIS will be enhanced with new tools*
- All projects will need to be opened in the same version
 - *There is no backwards compatibility with the versions of ArcGIS. ArcGIS 8.3 projects open in ArcGIS 8.2 but do not load any of the layers*
- There will be no way to directly edit the ArcInfo coverage format in ArcGIS 8.3 desktop. This will still be possible through ArcInfo Workstation command prompt
 - *Editing will be limited to Shapefiles, Personal GeoDatabases and SDE versioned GeoDatabases in ArcGIS8.3*

- Applications automatically loading data layers from SDE may need to be revised to correctly point to new layer name or location

Database Migration:

Layer Names

- All property & zoning layers (all layers under GATE ownership) will be moved to the new server but will not be renamed or converted into GeoDatabase format at this time.
 - *Access to these layers will not change. They will be located on the new server and their format and names will remain the same*
- Other (non-GATE) layer names may be changed for more efficient database management
 - *Users and applications may need to change the source of the layers accessed in map documents (ArcGIS 8.3) and projects (ArcView 3.3)*
 - *All layers will be assigned to an appropriate owner group (i.e. GISMGR for GIS owned layers, PRKMGR for FCPA owned layers)*
 - *A handout detailing the current layer names & locations and their corresponding names & locations on the new server will be distributed*

Layer Locations

- All non-GATE layers will reside in SDE in GeoDatabase format
 - *Additional Feature Data Sets will be created allowing similar data to be grouped*
 - *Layers may be moved into Feature Data Sets for more efficient database management*
 - *Ownership of the data will be more easily determined by the layer name*

Editing

- Layers will be able to be versioned and edited based on permissions
 - *There will no longer be a need to create a shapefile to make any changes to a layer*
 - *Layer changes can be completed by users (with granted permissions) and then posted back to the default database by GIS staff*
 - *Maintenance responsibility of any data layer can now reside with the department that owns it*
 - *Edits can be performed directly on the enterprise database. Data does not have to be extracted, edited, and then reloaded as it has been in the past*
- Users can create Shapefiles and Personal GeoDatabases
 - *This will enable users to utilize all of the functionality of ArcGIS with their own personal data*

Applications

- Any applications that interface with the database directly need to be revised to access the new database
- This migration also includes an upgrade to Oracle 9i from Oracle 8i, some applications will need to ensure that calls to Oracle are still functioning

Appendix 2: Testing spreadsheet of Internal applications to migrate to ArcGIS 9

Application Name	Version	Application Type	Test Results	Remarks	Status
AddressMaster	2/18/2005	Extension/ToolBar/Command	Unable to register the components into categories. Tried to use categories.exe to register the components into GMX Commands, GMX Command Bars, and GMX Extensions, but none of them show up correctly. Loaded the command and tool bar via Tools -> Customize... -> Add from file...	Application should run ok on ArcGIS 9	
FFX Parcel Editor	2.0B4	Extension/ToolBar/Command	Register components into proper categories with .reg file. All components show up properly. Building Ident tool has been tested before and it works properly. The tool for update address point locations in MAR still need to be tested.	Application should run ok on ArcGIS 9	
BOE	1.0B3	Extension/ToolBar/Command	Register components into proper categories with .reg file. All components show up properly. Installed ArcGIS 9.0 SP3 in order to load ArcGIS 8.3 layer files. The application hangs on creating new pagelayout.	To run on ArcGIS9, application needs some updates	Converted to ArcGIS9
CreateAnnoLrg	1.0B1	mxd with VBA	Application runs AML code via ESRI control. It can be run but no new SDE annotation layers are created. Also the process hangs. It seems that the AML scripts are giving some problems.	To run on ArcGIS9, application needs some updates. Also need to convert AML code to VB	Convert this based on new geodatabase annotation feature class in SDE 9.
CreateZoneBuf	1.5	Standalone	Application runs AML code via ESRI arc automation server. It can be run but no new SDE annotation layers are created. Also the process hangs. It seems that the AML scripts are giving some problems.	To run on ArcGIS9, application needs some updates. Also need to convert AML code to VB	Convert this based on new geodatabase annotation feature class in SDE 9.
UpdateSubdivisions	1.4	Standalone	application runs ok and created new SDE layers.	Application should run ok on ArcGIS 9	
CreateCircles	1.5	Standalone	application runs ok and created new SDE layers.	Application should run ok on ArcGIS 9	
UpdateTaxNeighborhoods	1.4	Standalone	application runs ok and created new SDE layers.	Application should run ok on ArcGIS 9	
DataExtractor	3.2B0	mxd with VBA	unable to run application	Application needs to be updated to ArcGIS9	Converted to ArcGIS9
DPZ LDS Mapper	1.0B12	Extension/ToolBar/Command	Register components into proper categories with .reg file. All components show up properly. It needs ArcGIS 9.0 SP3 in order to load ArcGIS 8.3 layer files. The application hangs on creating new pagelayout.	To run on ArcGIS9, application needs some updates	Converted to ArcGIS9
ErrorReporter	2.0B2	Extension/ToolBar/Command	Register components into proper categories with .reg file. All components show up properly. All tools work properly	Application should run ok on ArcGIS 9	
DataLoader	2.5	Extension/ToolBar/Command	Register components into proper categories with .reg file. All components show up properly. All tools work properly	Application should run ok on ArcGIS 9	
FFX Map Maker	1.0B4	Extension/ToolBar/Command	Register components into proper categories with .reg file. All components show up properly. All tools work properly	Application should run ok on ArcGIS 9	
Map Wizard	3/11/2005	mxd with VBA	Application works the same as in ArcGIS 8.3	Maps should work fine on ArcGIS 9 if VBA is not used	
FFX Navigator	8/23/2004	Extension/ToolBar/Command	Register components into proper categories with .reg file. All components show up properly. All tools work properly	Application should run ok on ArcGIS 9	
LoadAddressBacklog	1.2B7	Standalone	Unable to test it since .Net framework 1.1 is not installed.	Application not tested	
PopulateAddressSpatialInfo	1.1B0	Standalone	Unable to test it since .Net framework 1.1 is not installed.	Application not tested	
Stream Assessment GIS Tool	Dec-03	Extension/ToolBar/Command	All tools show up properly, and seem to work.	Application should run ok on ArcGIS 9	