CAGIS HelpDesk System
For the City of Cincinnati's
Cincinnati Area Geographical Information System (CAGIS)

By

Sean K. Winfield

Submitted to
the Faculty of the Information Engineering Technology Program
in Partial Fulfillment of the Requirements for
the Degree of Bachelor of Science
in Information Engineering Technology

University of Cincinnati
College of Applied Science

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Sean K. Winfield Date

Robert Schlemmer, Faculty Advisor Date

Patrick C. Kumpf, Ed.D. Interim Department Head Date

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I would like to thank GOD for giving me the ability to use my mind in a productive, creative and useful capacity. I thank my fiancée, Maya for supporting me all the way while enduring a pregnancy. I thank my children, Ja'nae, Chanee, Briana and Mylan for their support by giving me time to focus on this project. Thanks to Robert Schlemmer and the IT Faculty for giving me the skills to create this application, making sure I met all deadlines, while being as flexible as possible. Thanks to the CAGIS Staff: Jay Erndt, Barbara Quinn, Michael Sullivan, Brian Scholl, Michael Love, Chad Beringhaus and Debbie Shaver for providing me constant feedback, giving me creative ideas and continuous testing throughout my project.

Special thanks to Weifen Luo of www.sourceforge.net for Dock Suite user control.

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ABSTRACT

The Cincinnati Area Geographical Information System (CAGIS) utilized only three administrators to provide support to over 2300 users of their geographical information system and supporting applications. CAGIS had no way of tracking support calls completed by CAGIS administrators.

The CAGIS Helpdesk Application allows CAGIS Administrators to quickly enter the details of a support call and use information within the system to quickly resolve similar support calls. If users need immediate support, this application provides access to a remote connection tool in which an administrator can immediately connect to a user's computer, resolve the issue and document the issue in the system. In addition, the CAGIS Helpdesk Application provides e-mail and reporting functionality. This gives its users a way to communicate and track the status of a problem or generate reports to determine whether problems are numerous in a specific application or area.

Overall, the CAGIS Helpdesk Application is an effective tool for tracking the issues and resolutions to support calls. It provides an efficient way for its users to quickly and easily resolve CAGIS users' issues.

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1. Statement of the Problem

The Cincinnati Area Geographical Information System (CAGIS) was started in 1986 as a City/County "consortium created to share the cost of an automated mapping project."(4) "By 1993, CAGIS had grown to 25 users, in which only half of the population was connected via network lines."(6) There were no plans for maintaining GIS resources and no recorded benefits. "At one point, many top-level managers began doubting the potential of GIS to deliver any benefits. "(4)

Within a 7-year period, CAGIS was restructured and grew into a system that was used enterprise-wide. By the year 2000, CAGIS applications were installed on over 2000 user's computers. (2) In addition, CAGIS technology was being used in virtually all of the City of Cincinnati and Hamilton County agencies, 7 townships and several businesses within Cincinnati. (4) At the time, CAGIS had only one administrator to provide technical support to its user community. (2) In addition, it had no helpdesk application to provide a structured means of providing support.

2. Description of the Solution

Design an issues and resolution tracking system to provide the following functionality:

- display ticket information based on current user's needs;
- utilize Active Directory to authenticate users ;
- display tickets for user currently logged into the application;
- view/modify application data;
- integrate with Microsoft Outlook to provide a generic e-mail template upon ticket creation which contains ticket information and allows the user to add additional recipients;
- generate reports based on various information.

3. Deliverables

In order to effectively define the deliverables for this project, the specific goals for this project are as follows:

- Create an issue and resolution tracking system
- Design an application to utilize Active Directory to authenticate users
- Design a module within the application to view and modify application data
- Integrate the application with Microsoft Outlook to provide a generic e-mail template upon ticket creation which contains ticket information and allows the user to add additional recipients
- Develop at least two reports using Crystal Reports in Visual Basic .NET to be displayed by CAGIS Managers and Secretary
- Design a flexible graphical user interface (GUI) that will allow users to display ticket information for the currently logged on user and save forms layout upon exiting the application.

4. User Profiles

There are four types of users for this application: CAGIS Managers, CAGIS Administrators, CAGIS Specialists, and a secretary. Table 1 outlines the differences between these groups.

CAGIS User Group	Area of Expertise	IT Literacy Level
Administrators	Systems Administration, Technical Support and Networking	Expert
Specialists	Geographical Information Systems (GIS), Permitting, Application Development, Oracle Database Administration, Unix Administration	Intermediate to Expert, depending on application
Managers	IT Support, Unix Administration, IT Management, Budgeting, Organizational Leadership	Intermediate to Expert
Secretary	Clerical tasks	Intermediate

Table 1: User Profiles

The CAGIS Administrators are the primary users of the system. They will use the system all day in order to enter support calls and perform software installations.

The CAGIS Specialists will use the system as “second level support” to the CAGIS Administrators, as necessary. They will take the support calls for which the CAGIS administrators cannot provide support. If a CAGIS Administrator determines that he cannot provide a solution to a particular problem, he will forward the request to the CAGIS Specialist that is best suited to provide a solution for the request. The CAGIS Specialist will be responsible for entering the solution to the problem in the system and closing the ticket.

The CAGIS Managers and Secretary will use the system from time to time, either on a monthly or bi-monthly basis to track the number of support calls and type of calls by application.

The Figure 1 lists the use cases for each user.

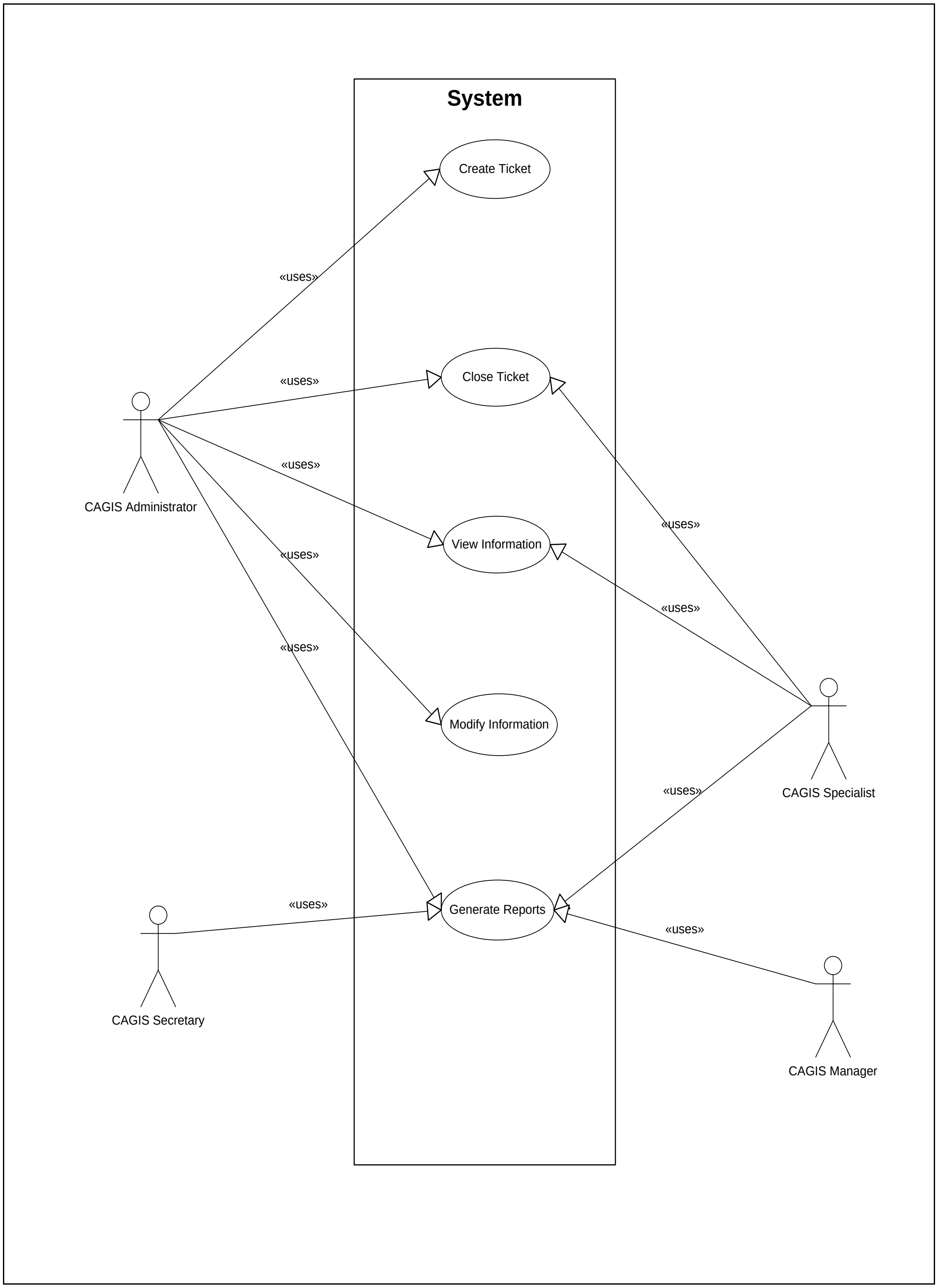


Figure 1: Use Cases for User Profiles

5. Design Protocol

The CAGIS Helpdesk System is multi-user application which was designed using Visual Basic .NET and a C# custom user control written by Weifen Luo from www.sourceforge.net. The application invokes many user utilities such as:

- Radmin: a remote connection tool to simplify and consolidate CAGIS administrator's daily tasks
- Windows command prompt, a utility used to execute shell commands
- Citrix Management Console, a utility used to manage users within Citrix Sessions
- Active Directory Users Computers, a utility used to manage users within an Active Directory domain

The backend database uses Oracle 9i to permanently store its data.   The data is referenced using Oracle packages and stored procedures. The data can be used to view, create similar tickets or view reports.

Forms within the application are instantiated within a combination of a Multiple Document Interface (MDI) and a Tabbed Document Interface (TDI). This format was selected because of the following reasons:

- Many child windows do not fill up the OS task management interface, as they are hierarchically organized. Users simply switch applications.
- With MDI (and also TDI), a single menu bar and/or toolbar is shared between all child windows, reducing clutter and increasing efficient use of screen space.
- All child windows for an application can be hidden/shown/minimized/maximized as a whole.
- Without an MDI frame window, floating toolbars from one application can clutter the workspace of other applications, potentially confusing users with the jumble of interfaces.
- Features such as "Tile" and "Cascade" can be implemented for the child windows. (11)

There are three components to this application: the database, the remote administration interface and the user interface. The user interface is the link to the database. The remote administration interface is the link to the user's computer.

6. Proof of Design

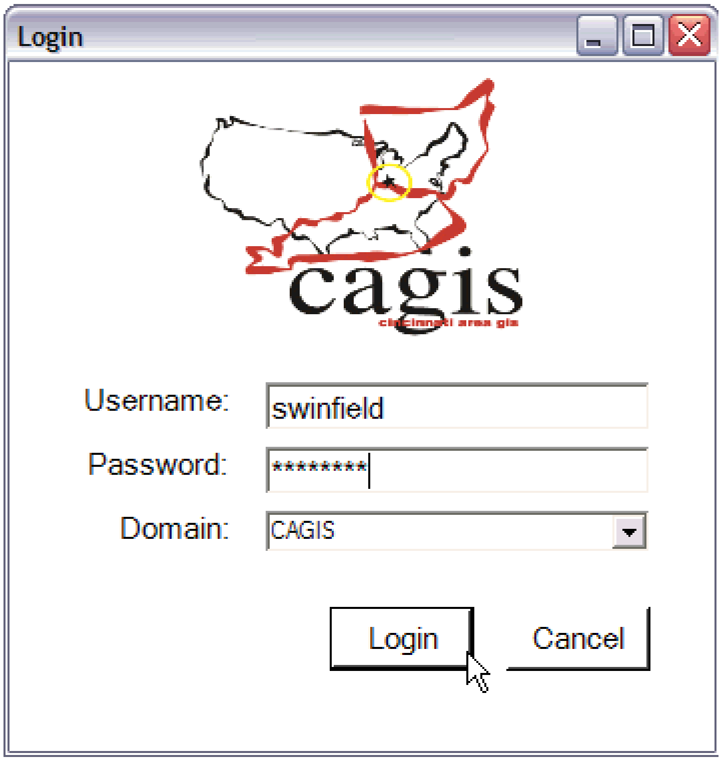
This section explains in detail the design of the system and how the following project deliverables were met.

Project Deliverables

- Create an issue and resolution tracking system which will:
  - utilize Active Directory to authenticate users;
  - contain a module within the application to view and modify application data;
  - integrate with Microsoft Outlook to provide a generic e-mail template upon ticket creation which contains ticket information and allows the user to add additional recipients;
  - contain two reports using Crystal Reports in Visual Basic .NET to be displayed by CAGIS Managers and Secretary;
  - have a flexible graphical user interface (GUI) that will allow users to display ticket information for the currently logged on user and save forms layout upon exiting the application.

6.1 Deliverable #1 – Utilize Active Directory

When users log into the application, they are presented with a login window as displayed in Figure 2.



Username: swinfield

Password: *********

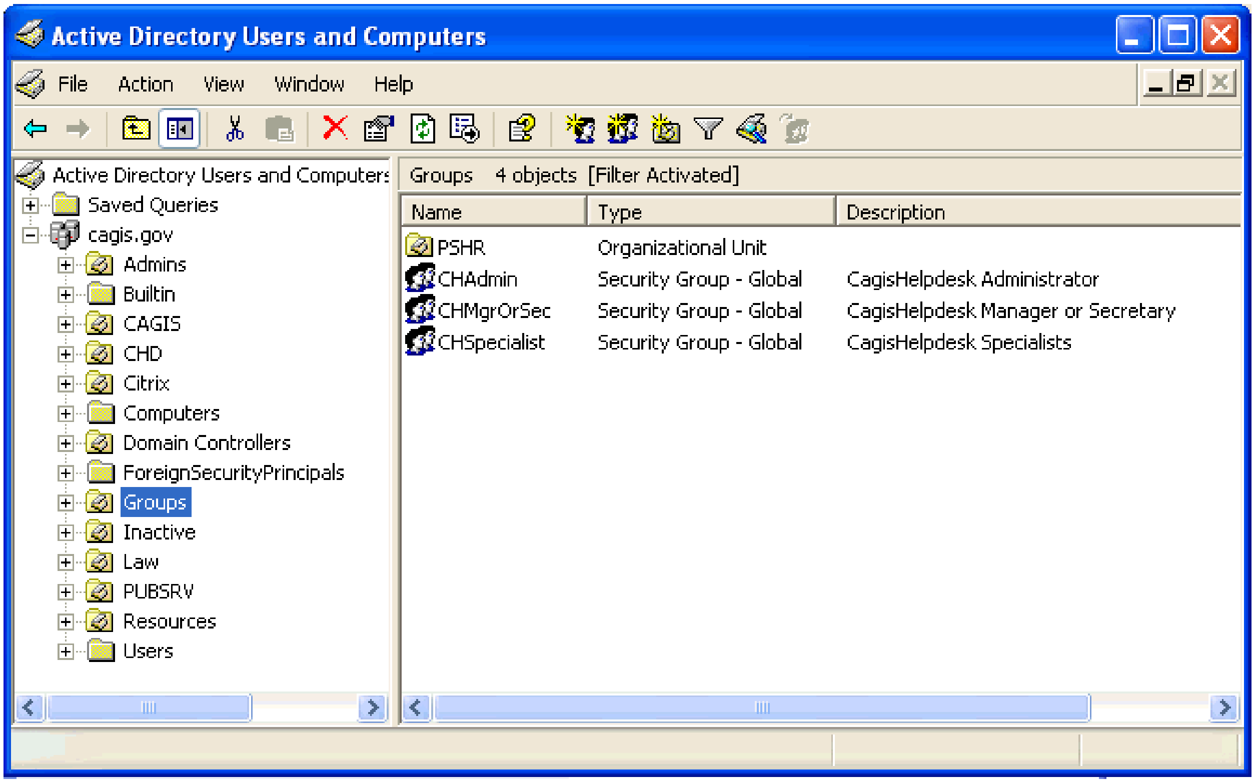
Domain: CAGIS

Figure 2: **Logging into the system**

Users must enter a valid username, password and domain in order to be successfully authenticated. After the user enters this information and clicks the “Login” button, the application will contact active directory, authenticate the user’s username and password and determine if the user is in one of the following groups:

- CHAdmin – represents the group for the administrators of the application. These users have the ability to perform any function within the application.
- CHSpecialist – represents the group for the CAGIS Specialists. Members in this group can only view tickets, close tickets and generate reports.
- CHMgrorSec – represents the group for the CAGIS Secretary and CAGIS Managers. Users within this group can only generate reports.

Figure 3 displays an image of the groups using the Active Directory Users and Groups utility.



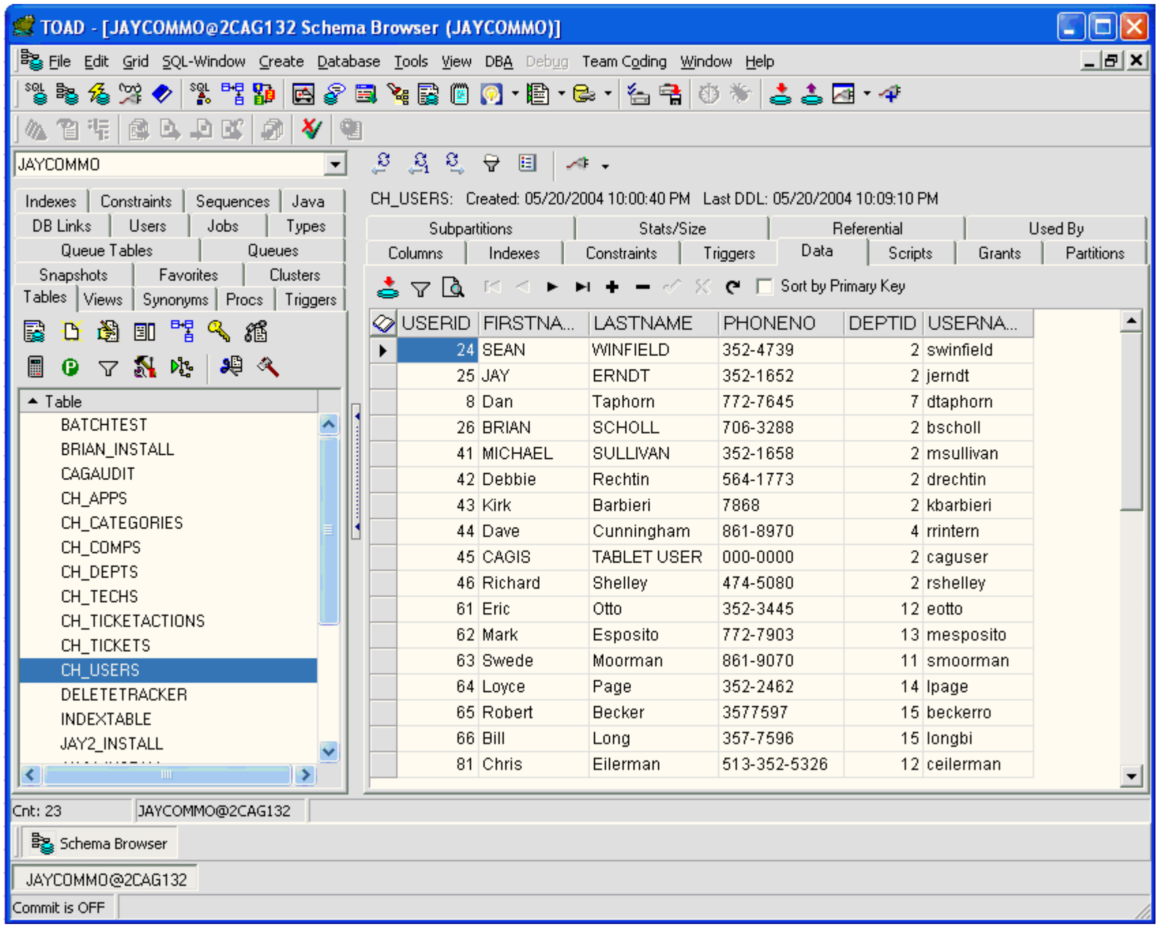
Groups 4 objects [Filter Activated]

Name	Type	Description
PSHR	Organizational Unit	
CHAdmin	Security Group - Global	CagisHelpdesk Administrator
CHMgrOrSec	Security Group - Global	CagisHelpdesk Manager or Secretary
CHSpecialist	Security Group - Global	CagisHelpdesk Specialists

Figure 3: Group Listing for CAGIS Helpdesk System in Active Directory

6.2 Deliverable #2 – Administrator's Interface: View and Modify Data

The Administrator's Interface allows administrators to modify any information in the system. Previously, the administrator needed to login to an application such as TOAD (Figure 4), a database application used to connect to oracle databases and modify data.


TOAD - [JAYCOMMO@2CAG132 Schema Browser (JAYCOMMO)]

Table

BATCHTEST
BRIAN_INSTALL
CAGAUDIT
CH_APPS
CH_CATEGORIES
CH_COMPS
CH_DEPTS
CH_TECHS
CH_TICKETACTIONS
CH_TICKETS
CH_USERS
DELETETRACKER
INDEXTABLE
JAY2_INSTALL

CH_USERS: Created: 05/20/2004 10:00:40 PM Last DDL: 05/20/2004 10:09:10 PM

□ Sort by Primary Key

USERID	FIRSTNA...	LASTNAME	PHONENO	DEPTID	USERNA...
24	SEAN	WINFIELD	352-4739	2	swinfield
25	JAY	ERNDT	352-1652	2	jerndt
8	Dan	Taphorn	772-7645	7	dtaphorn
26	BRIAN	SCHOLL	706-3288	2	bscholl
41	MICHAEL	SULLIVAN	352-1658	2	msullivan
42	Debbie	Rechtin	564-1773	2	drechtin
43	Kirk	Barbieri	7868	2	kbarbieri
44	Dave	Cunningham	861-8970	4	rrintern
45	CAGIS	TABLET USER	000-0000	2	caguser
46	Richard	Shelley	474-5080	2	rshelley
61	Eric	Otto	352-3445	12	eotto
62	Mark	Esposito	772-7903	13	mesposito
63	Swede	Moorman	861-9070	11	smoorman
64	Loyce	Page	352-2462	14	lpage
65	Robert	Becker	3577597	15	beckerro
66	Bill	Long	357-7596	15	longbi
81	Chris	Eilerman	513-352-5326	12	ceilerman

Cnt: 23 JAYCOMMO@2CAG132

JAYCOMMO@2CAG132

Commit is OFF

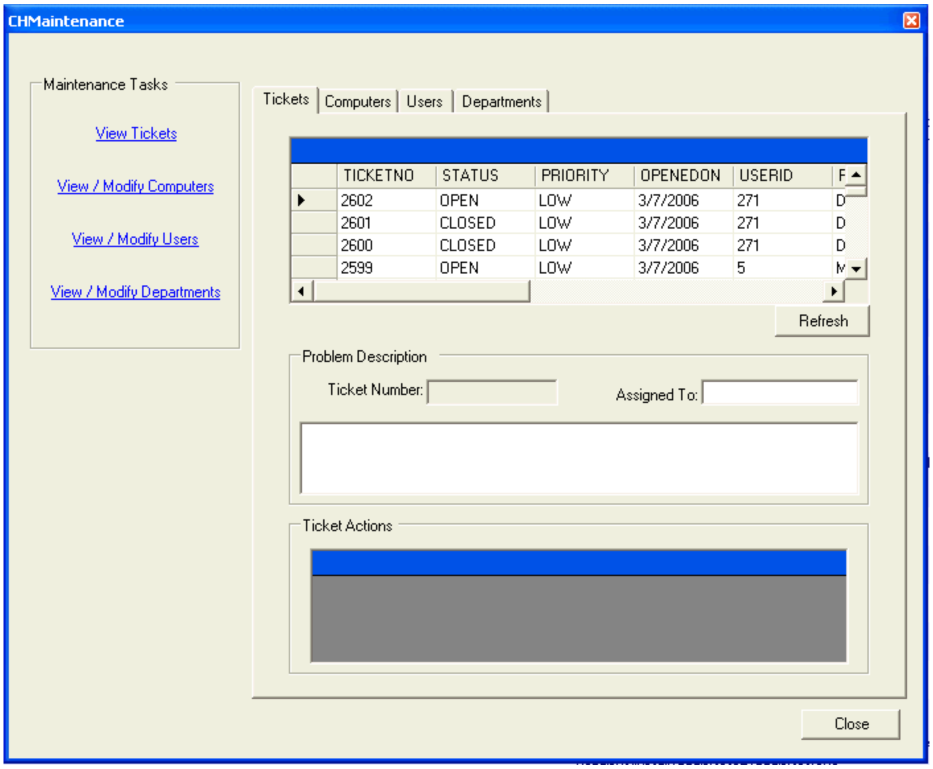
Figure 4: TOAD Interface

The Administrator's Interface eliminates this tedious step and provides a simple, easy way for CAGIS Administrators to modify application data. This interface as displayed in Figure 5, provides the user with four options:

- View Tickets – Provides the user a way to easily view tickets
- View / Modify Computers –Allows the user to modify computer names and IP addresses

- View / Modify Users – Allows the user to view and modify a user's first and last name, phone number or department
- View / Modify Departments – Allows the user to view and add department names and descriptions

The information in the textboxes below each datagrid are populated once a user selects an item within the datagrid. Items listed in the datagrid are displayed by calling an Oracle stored procedure.

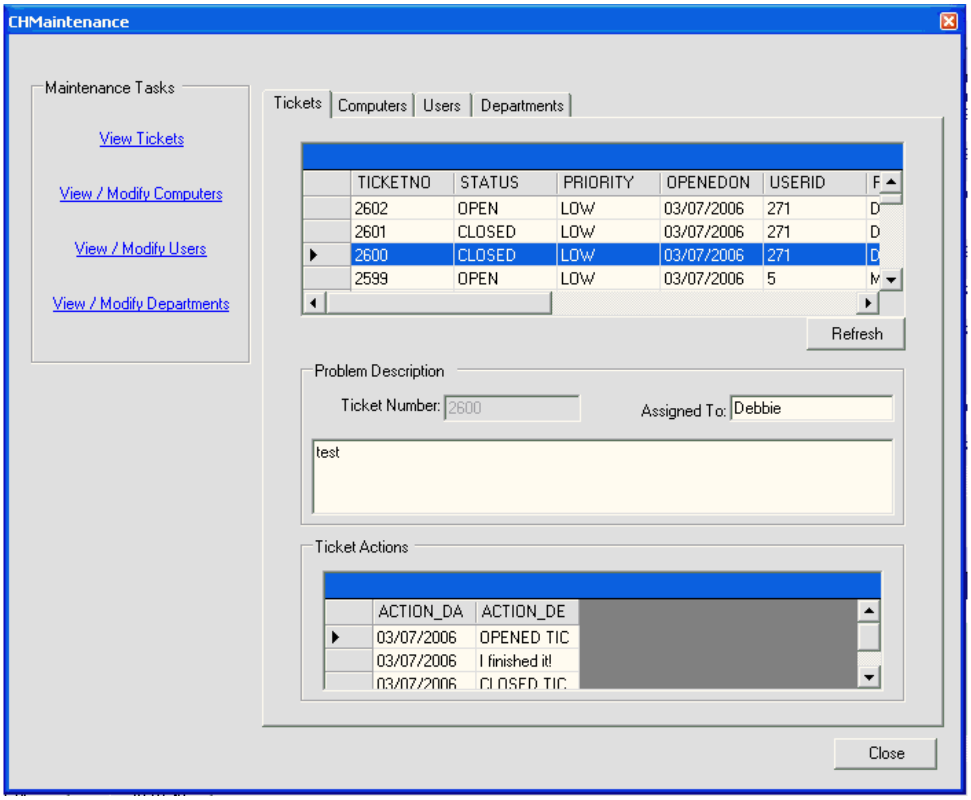


TICKETNO	STATUS	PRIORITY	OPENEDON	USERID	F
2602	OPEN	LOW	3/7/2006	271	D
2601	CLOSED	LOW	3/7/2006	271	D
2600	CLOSED	LOW	3/7/2006	271	D
2599	OPEN	LOW	3/7/2006	5	M

Figure 5: Administrator's Interface

6.2.1 View Tickets

The View Tickets form, displayed in Figure 6, simply displays the tickets in the application. Tickets can only be created by accessing the Add Tickets form through the Main form.



TICKETNO	STATUS	PRIORITY	OPENEDON	USERID	F
2602	OPEN	LOW	03/07/2006	271	D
2601	CLOSED	LOW	03/07/2006	271	D
2600	CLOSED	LOW	03/07/2006	271	D
2599	OPEN	LOW	03/07/2006	5	M

Ticket Number: 2600

Assigned To: Debbie

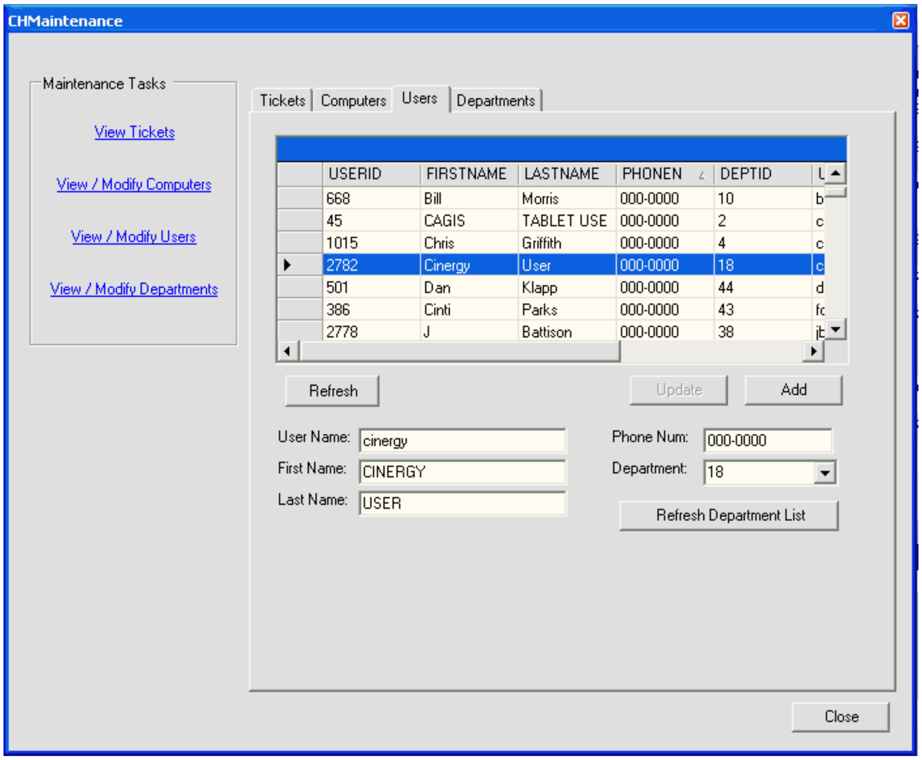
test

ACTION_DA	ACTION_DE
03/07/2006	OPENED TIC
03/07/2006	I finished it!
03/07/2006	CLOSED TIC

Figure 6: View Tickets

6.2.2 View / Modify User Information

The View / Modify Users form, displayed in Figure 7, allows an administrator to change most of a user's information, which includes the user's first name, last name, phone number and department. The user's username cannot be modified because it is linked within the database to ticket information.



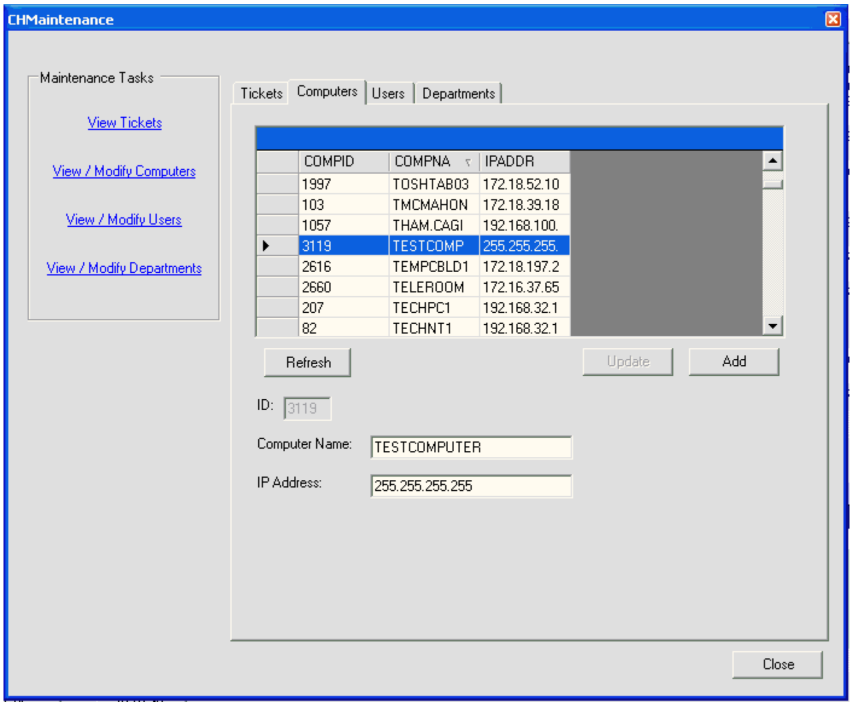
	USERID	FIRSTNAME	LASTNAME	PHONEN	DEPTID	L
	668	Bill	Morris	000-0000	10	b
	45	CAGIS	TABLET USE	000-0000	2	c
	1015	Chris	Griffith	000-0000	4	c
▶	2782	Cinergy	User	000-0000	18	c
	501	Dan	Klapp	000-0000	44	d
	386	Cinti	Parks	000-0000	43	fc
	2778	J	Battison	000-0000	38	jb

User Name: cinergy
First Name: CINERGY
Last Name: USER
Phone Num: 000-0000
Department: 18

Figure 7: View Users

6.2.3 View / Modify Computer Information

The View / Modify Computers form , displayed in Figure 8, allows an administrator change a computer's name or IP address. This is important because the application invokes a third-party remote connection application, Radmin, to connect to a user's computer with this information.



COMPID	COMPNA	IPADDR
1997	TOSHTAB03	172.18.52.10
103	TMCMAHON	172.18.39.18
1057	THAM.CAGI	192.168.100.
3119	TESTCOMP	255.255.255.
2616	TEMPCBLD1	172.18.197.2
2660	TELEROOM	172.16.37.65
207	TECHPC1	192.168.32.1
82	TECHNT1	192.168.32.1

ID: 3119

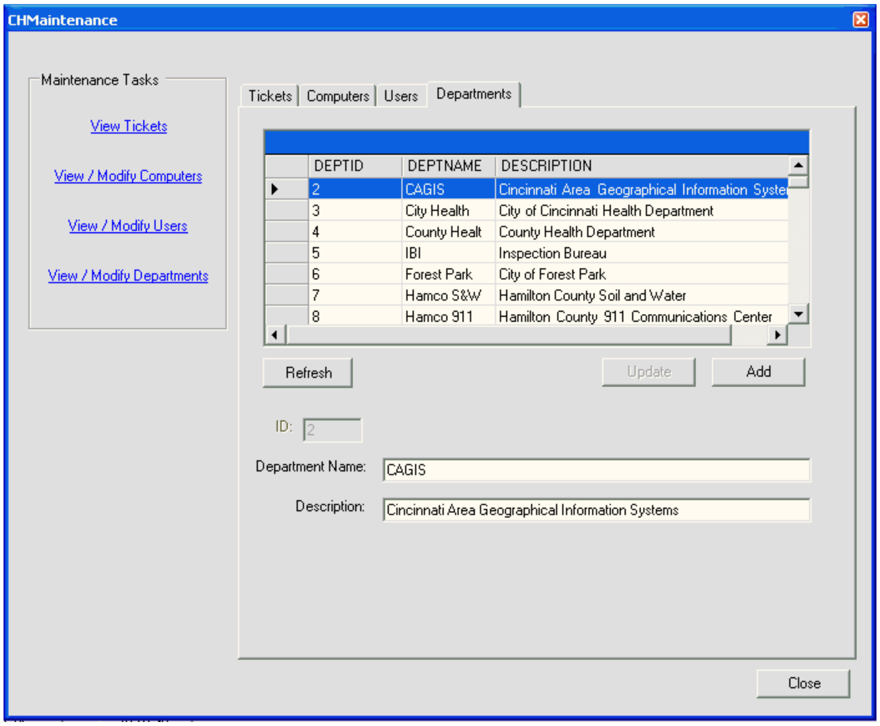
Computer Name: TESTCOMPUTER

IP Address: 255.255.255.255

Figure 8: View Modify Computers

6.2.4 View / Modify Department Information

The View / Modify Department form, displayed in Figure 9, allows administrators to add or update the name or description of a department.



DEPTID	DEPTNAME	DESCRIPTION
2	CAGIS	Cincinnati Area Geographical Information Syste
3	City Health	City of Cincinnati Health Department
4	County Healt	County Health Department
5	IBI	Inspection Bureau
6	Forest Park	City of Forest Park
7	Hamco S&W	Hamilton County Soil and Water
8	Hamco 911	Hamilton County 911 Communications Center

ID: 2

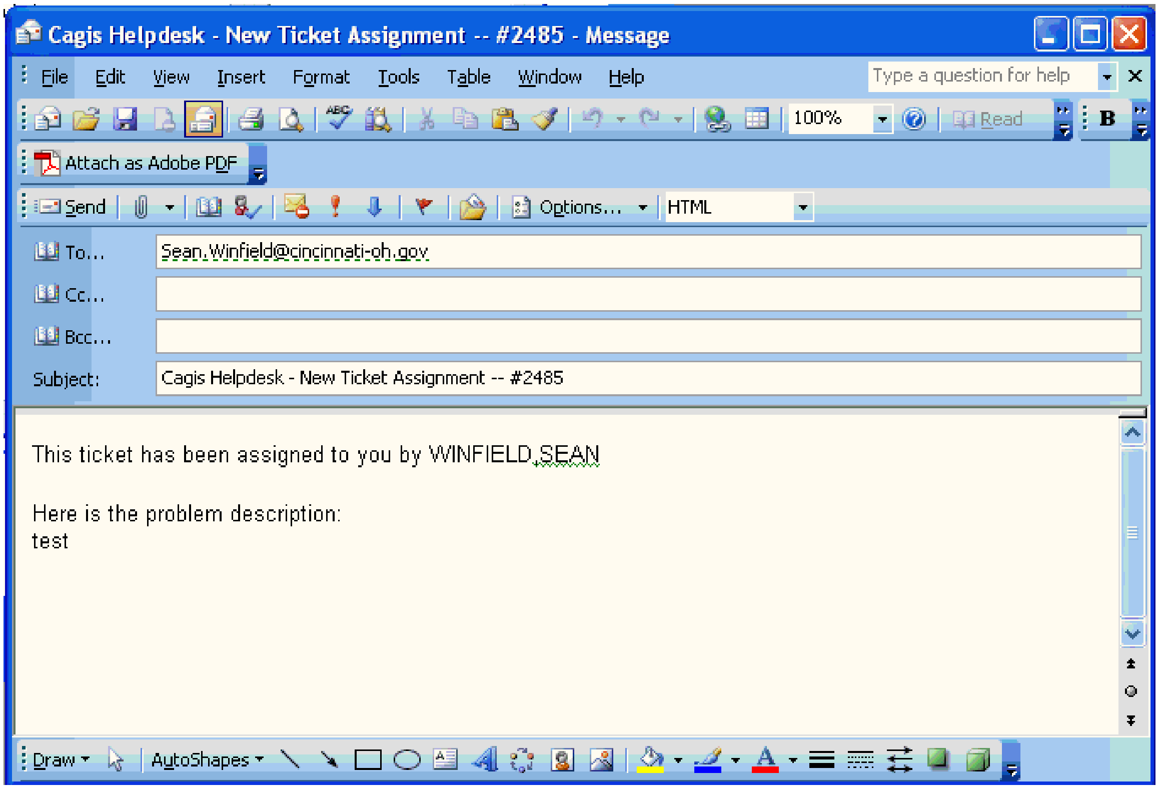
Department Name: CAGIS

Description: Cincinnati Area Geographical Information Systems

Figure 9: View Departments

6.3 Deliverable #3 – Integrate with Microsoft Outlook

This application gives administrators the option of sending an e-mail notification to another administrator, the user for whom the call was taken, or any other interested party for the ticket. If the option is selected after ticket creation, Microsoft Outlook will automatically open with information regarding the ticket, and automatically input the user's name to whom the ticket was assigned in the "To" field as displayed in Figure 10.



To... Sean.Winfield@cincinnati-oh.gov

Cc...

Bcc...

Subject: Cagis Helpdesk - New Ticket Assignment -- #2485

This ticket has been assigned to you by WINFIELD,SEAN

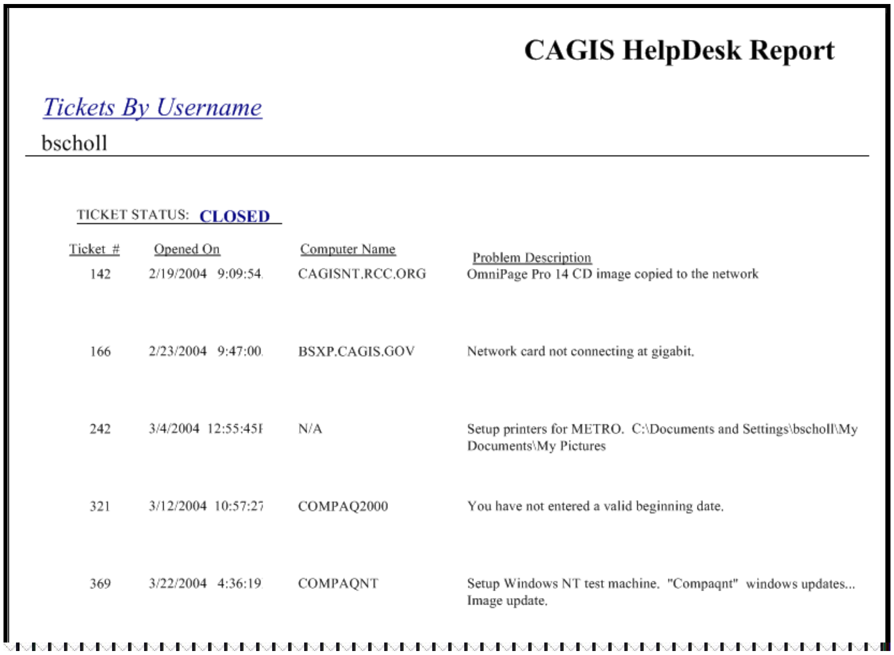
Here is the problem description:
test

Figure 10: E-mail Created via Microsoft Outlook after Ticket Creation

6.4 Deliverable #4 – Helpdesk Reports

This application uses the Crystal Reports for Visual Basic .Net control to create two reports:

- <u>View Tickets by User</u> – This report, displayed in Figure 11 will display all tickets open and closed by a CAGIS Administrator. The information is grouped by ticket status.



CAGIS HelpDesk Report

Tickets By Username

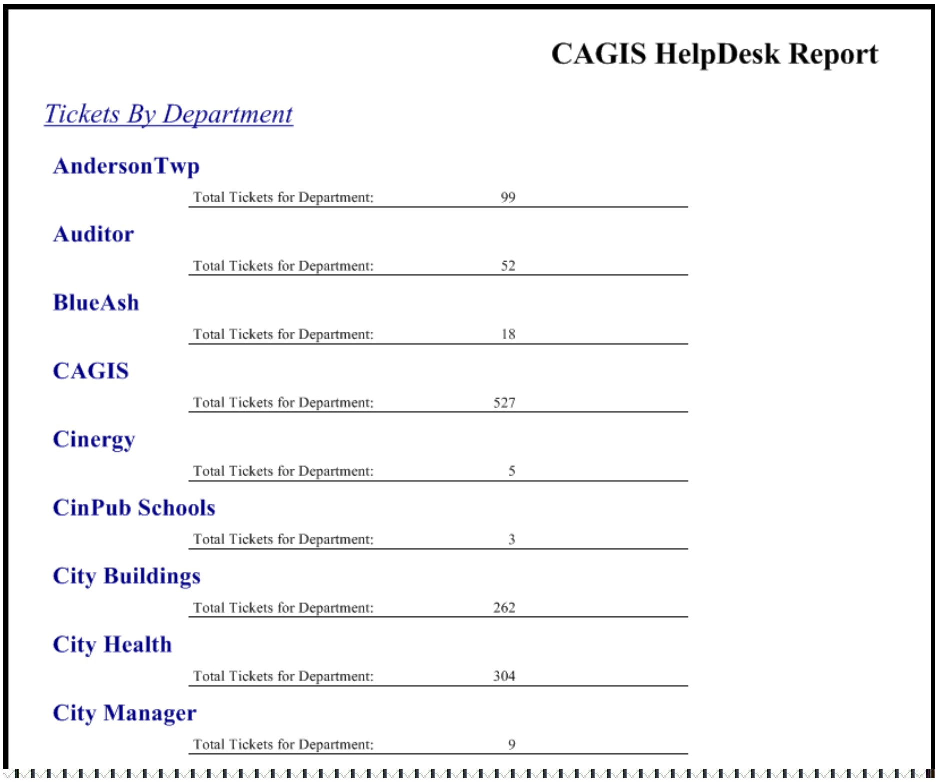
bscholl

TICKET STATUS: **CLOSED**

Ticket #	Opened On	Computer Name	Problem Description
142	2/19/2004 9:09:54.	CAGISNT.RCC.ORG	OmniPage Pro 14 CD image copied to the network
166	2/23/2004 9:47:00.	BSXP.CAGIS.GOV	Network card not connecting at gigabit.
242	3/4/2004 12:55:45I	N/A	Setup printers for METRO. C:\Documents and Settings\bscholl\My Documents\My Pictures
321	3/12/2004 10:57:27	COMPAQ2000	You have not entered a valid beginning date.
369	3/22/2004 4:36:19.	COMPAQNT	Setup Windows NT test machine. "Compaqnt" windows updates... Image update.

Figure 11: View Tickets by User

- View Tickets by Department – This report, displayed in Figure 12 lists the total number of tickets opened and closed for a department. This is report is useful because it help CAGIS Managers determine if a department has a large number of support calls. If so, the Manager can determine if the number is high because the department is large or because the department needs additional training.



CAGIS HelpDesk Report

Tickets By Department

AndersonTwp

Total Tickets for Department: 99

Auditor

Total Tickets for Department: 52

BlueAsh

Total Tickets for Department: 18

CAGIS

Total Tickets for Department: 527

Cinergy

Total Tickets for Department: 5

CinPub Schools

Total Tickets for Department: 3

City Buildings

Total Tickets for Department: 262

City Health

Total Tickets for Department: 304

City Manager

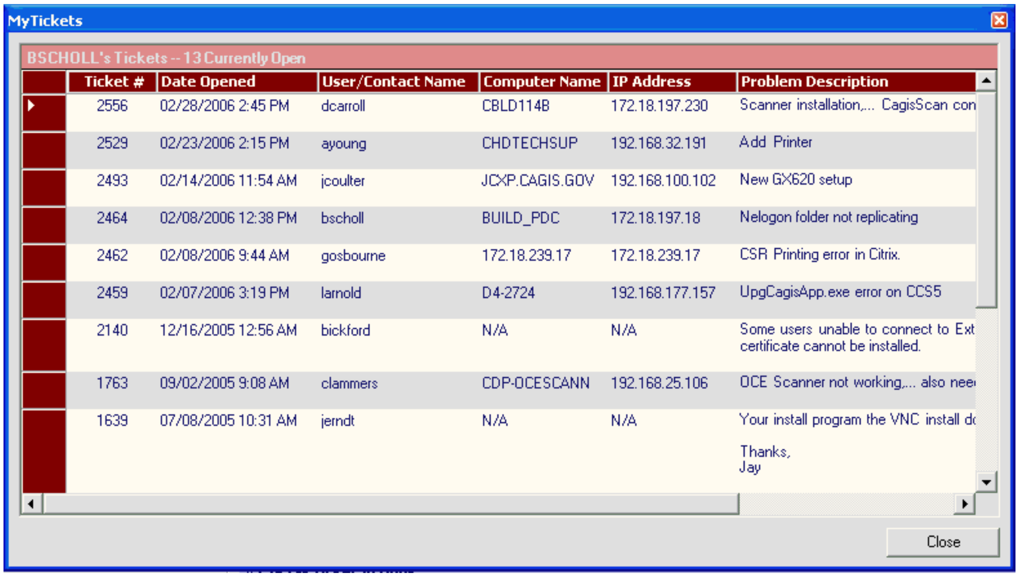
Total Tickets for Department: 9

Figure 12: Tickets by Department

6.5 Deliverable #5 – Design a Flexible GUI

Designing a flexible GUI for the application was quite a challenge. I had to decide how I could display the current user's tickets and more importantly, display information without making the forms look cluttered.

To solve this problem, I created a "My Tickets" form, displayed in Figure 13, which displays all the information for the current user. The user only views this information, therefore it can only be refreshed using the "Refresh" button on the form.

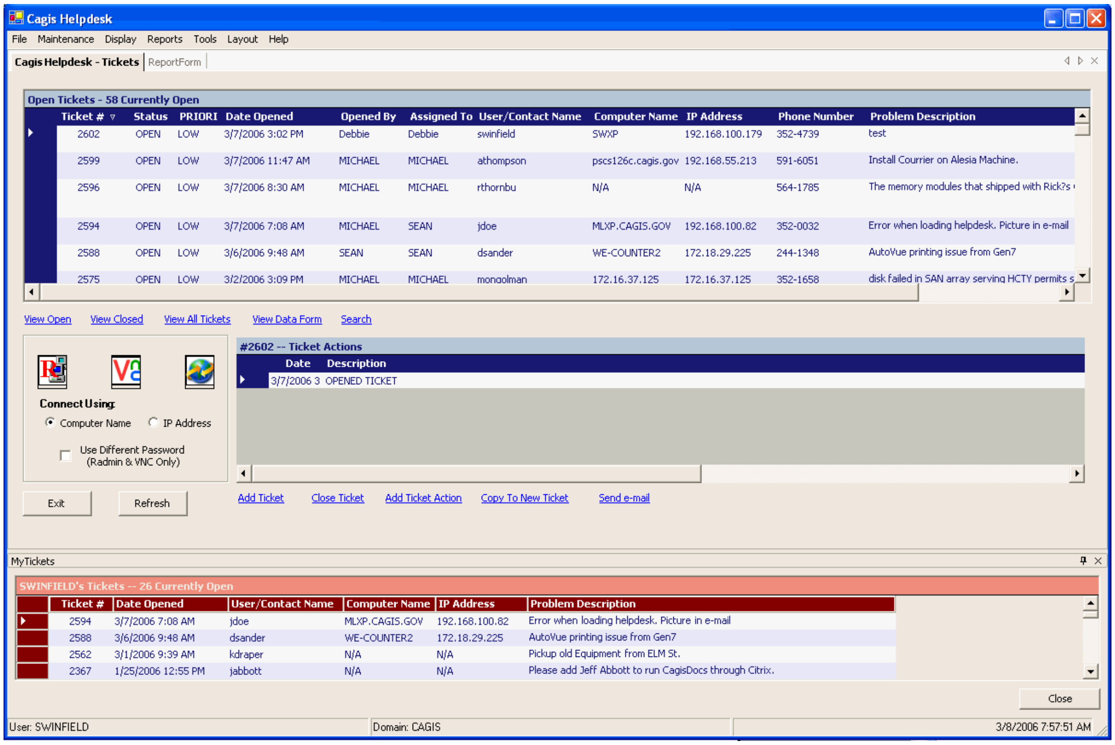


BSCHOLL's Tickets -- 13 Currently Open

Ticket #	Date Opened	User/Contact Name	Computer Name	IP Address	Problem Description
2556	02/28/2006 2:45 PM	dcarroll	CBLD114B	172.18.197.230	Scanner installation,... CagisScan con
2529	02/23/2006 2:15 PM	ayoung	CHDTECHSUP	192.168.32.191	Add Printer
2493	02/14/2006 11:54 AM	jcoulter	JCXP.CAGIS.GOV	192.168.100.102	New GX620 setup
2464	02/08/2006 12:38 PM	bscholl	BUILD_PDC	172.18.197.18	Nelogon folder not replicating
2462	02/08/2006 9:44 AM	gosbourne	172.18.239.17	172.18.239.17	CSR Printing error in Citrix.
2459	02/07/2006 3:19 PM	larnold	D4-2724	192.168.177.157	UpgCagisApp.exe error on CCS5
2140	12/16/2005 12:56 AM	bickford	N/A	N/A	Some users unable to connect to Ext certificate cannot be installed.
1763	09/02/2005 9:08 AM	clammers	CDP-OCESCANN	192.168.25.106	OCE Scanner not working,... also nee
1639	07/08/2005 10:31 AM	jerndt	N/A	N/A	Your install program the VNC install d Thanks, Jay

Figure 13: My Tickets

To solve the problem of managing the information on the user's screen, I found a user control called, "Dock Panel Suite", developed by Weifen Luo at www.sourceforge.net. This user control provided a way for me to implement a form document style similar to Visual Studio .NET which uses a combination of a Tabbed Document Interface and a Multiple Document Interface. The Main form, displayed in Figure 14 – Figure 16, shows the various options for layouts within the application. In addition, the user has the option to save the layout upon exiting the system. If this option is selected, an extensible markup language (XML) file is created and saved that stores the current position of each form within the application. When the user logs back into the system, the XML file is read and the forms are displayed in the same position as the last logged in session for each user.



Open Tickets - 58 Currently Open

Ticket #	Status	PRIORI	Date Opened	Opened By	Assigned To	User/Contact Name	Computer Name	IP Address	Phone Number	Problem Description
2602	OPEN	LOW	3/7/2006 3:02 PM	Debbie	Debbie	swinfield	SWXP	192.168.100.179	352-4739	test
2599	OPEN	LOW	3/7/2006 11:47 AM	MICHAEL	MICHAEL	athompson	pscs126c.cagis.gov	192.168.55.213	591-6051	Install Courrier on Alesia Machine.
2596	OPEN	LOW	3/7/2006 8:30 AM	MICHAEL	MICHAEL	rthornbu	N/A	N/A	564-1785	The memory modules that shipped with Rick?s
2594	OPEN	LOW	3/7/2006 7:08 AM	MICHAEL	SEAN	jdoe	MLXP.CAGIS.GOV	192.168.100.82	352-0032	Error when loading helpdesk. Picture in e-mail
2588	OPEN	LOW	3/6/2006 9:48 AM	SEAN	SEAN	dsander	WE-COUNTER2	172.18.29.225	244-1348	AutoVue printing issue from Gen7
2575	OPEN	LOW	3/2/2006 3:09 PM	MICHAEL	MICHAEL	mongolman	172.16.37.125	172.16.37.125	352-1658	disk failed in SAN array serving HCTY permits s

#2602 -- Ticket Actions

Date	Description
3/7/2006 3	OPENED TICKET

Connect Using:

● Computer Name ○ IP Address

□ Use Different Password (Radmin & VNC Only)

SWINFIELD's Tickets -- 26 Currently Open

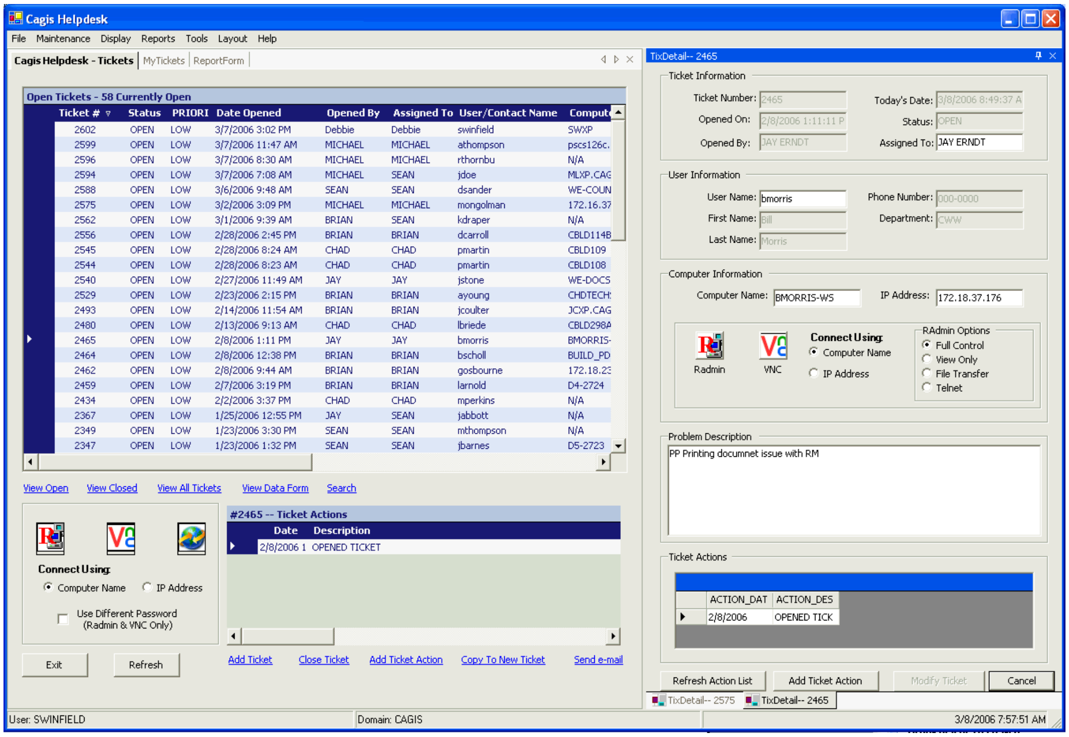
Ticket #	Date Opened	User/Contact Name	Computer Name	IP Address	Problem Description
2594	3/7/2006 7:08 AM	jdoe	MLXP.CAGIS.GOV	192.168.100.82	Error when loading helpdesk. Picture in e-mail
2588	3/6/2006 9:48 AM	dsander	WE-COUNTER2	172.18.29.225	AutoVue printing issue from Gen7
2562	3/1/2006 9:39 AM	kdraper	N/A	N/A	Pickup old Equipment from ELM St.
2367	1/25/2006 12:55 PM	jabbott	N/A	N/A	Please add Jeff Abbott to run CagisDocs through Citrix.

User: SWINFIELD

Domain: CAGIS

3/8/2006 7:57:51 AM

Figure 14: Tabbed Ticket Form and Report Form with My Tickets Docked at Bottom



Open Tickets - 58 Currently Open

	Ticket #	Status	PRIORI	Date Opened	Opened By	Assigned To	User/Contact Name	Comput
	2602	OPEN	LOW	3/7/2006 3:02 PM	Debbie	Debbie	swinfield	SWXP
	2599	OPEN	LOW	3/7/2006 11:47 AM	MICHAEL	MICHAEL	athompson	pscs126c.
	2596	OPEN	LOW	3/7/2006 8:30 AM	MICHAEL	MICHAEL	rthornbu	N/A
	2594	OPEN	LOW	3/7/2006 7:08 AM	MICHAEL	SEAN	jdoe	MLXP.CAG
	2588	OPEN	LOW	3/6/2006 9:48 AM	SEAN	SEAN	dsander	WE-COUN
	2575	OPEN	LOW	3/2/2006 3:09 PM	MICHAEL	MICHAEL	mongolman	172.16.37
	2562	OPEN	LOW	3/1/2006 9:39 AM	BRIAN	SEAN	kdraper	N/A
	2556	OPEN	LOW	2/28/2006 2:45 PM	BRIAN	BRIAN	dcarroll	CBLD114B
	2545	OPEN	LOW	2/28/2006 8:24 AM	CHAD	CHAD	pmartin	CBLD109
	2544	OPEN	LOW	2/28/2006 8:23 AM	CHAD	CHAD	pmartin	CBLD108
	2540	OPEN	LOW	2/27/2006 11:49 AM	JAY	JAY	jstone	WE-DOCS
	2529	OPEN	LOW	2/23/2006 2:15 PM	BRIAN	BRIAN	ayoung	CHDTECH
	2493	OPEN	LOW	2/14/2006 11:54 AM	BRIAN	BRIAN	jcoulter	JCXP.CAG
	2480	OPEN	LOW	2/13/2006 9:13 AM	CHAD	CHAD	lbriede	CBLD298A
▶	2465	OPEN	LOW	2/8/2006 1:11 PM	JAY	JAY	bmorris	BMORRIS-
	2464	OPEN	LOW	2/8/2006 12:38 PM	BRIAN	BRIAN	bscholl	BUILD_PD
	2462	OPEN	LOW	2/8/2006 9:44 AM	BRIAN	BRIAN	gosbourne	172.18.23
	2459	OPEN	LOW	2/7/2006 3:19 PM	BRIAN	BRIAN	larnold	D4-2724
	2434	OPEN	LOW	2/2/2006 3:37 PM	CHAD	CHAD	mperkins	N/A
	2367	OPEN	LOW	1/25/2006 12:55 PM	JAY	SEAN	jabbott	N/A
	2349	OPEN	LOW	1/23/2006 3:30 PM	SEAN	SEAN	mthompson	N/A
	2347	OPEN	LOW	1/23/2006 1:32 PM	SEAN	SEAN	jbarnes	D5-2723

Connect Using:
● Computer Name ○ IP Address

□ Use Different Password (Radmin & VNC Only)

#2465 -- Ticket Actions

	Date	Description
▶	2/8/2006 1	OPENED TICKET

TixDetail-- 2465

Ticket Information

Ticket Number:	2465	Today's Date:	3/8/2006 8:49:37 A
Opened On:	2/8/2006 1:11:11 P	Status:	OPEN
Opened By:	JAY ERNDT	Assigned To:	JAY ERNDT

User Information

User Name:	bmorris	Phone Number:	000-0000
First Name:	Bill	Department:	CWW
Last Name:	Morris		

Computer Information

Computer Name:	BMORRIS-WS	IP Address:	172.18.37.176

Connect Using:
● Computer Name
○ IP Address

RAdmin Options
● Full Control
○ View Only
○ File Transfer
○ Telnet

Problem Description

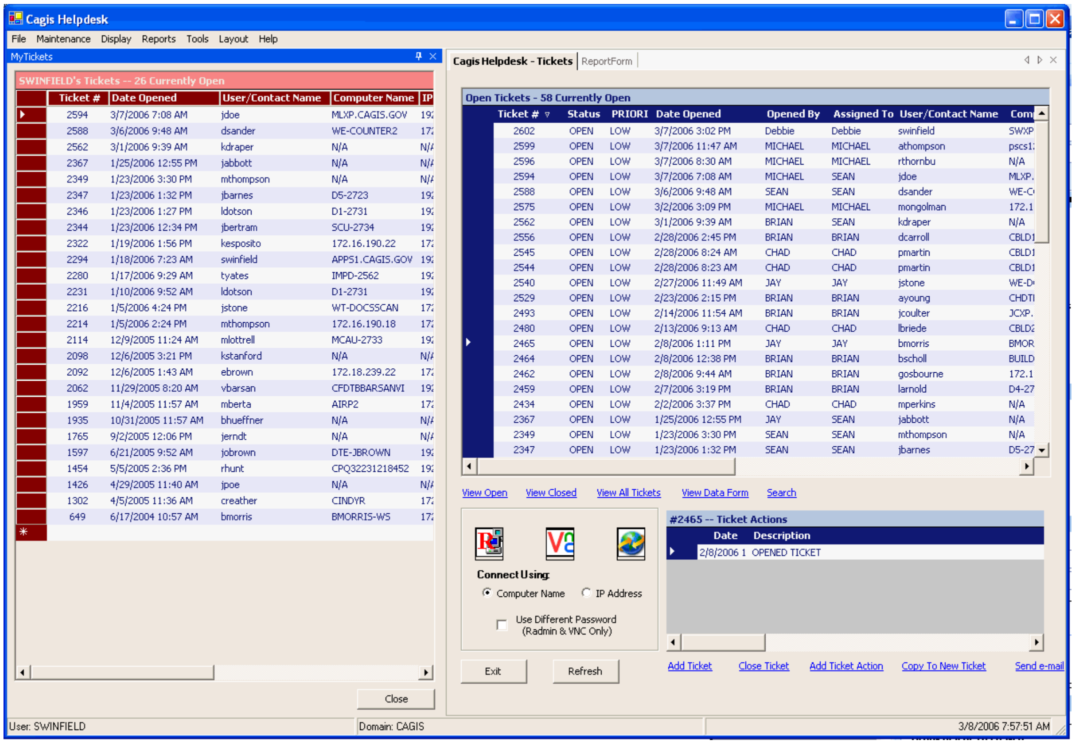
PP Printing documnet issue with RM

Ticket Actions

	ACTION_DAT	ACTION_DES
▶	2/8/2006	OPENED TICK

User: SWINFIELD
Domain: CAGIS
3/8/2006 7:57:51 AM

Figure 15: 3 Tabbed Forms and 2 Ticket Detail Forms Docked Right



SWINFIELD's Tickets -- 26 Currently Open

	Ticket #	Date Opened	User/Contact Name	Computer Name	IP
▶	2594	3/7/2006 7:08 AM	jdoe	MLXP.CAGIS.GOV	19
	2588	3/6/2006 9:48 AM	dsander	WE-COUNTER2	17
	2562	3/1/2006 9:39 AM	kdraper	N/A	N/
	2367	1/25/2006 12:55 PM	jabbott	N/A	N/
	2349	1/23/2006 3:30 PM	mthompson	N/A	N/
	2347	1/23/2006 1:32 PM	jbarnes	D5-2723	19
	2346	1/23/2006 1:27 PM	ldotson	D1-2731	19
	2344	1/23/2006 12:34 PM	jbertram	SCU-2734	19
	2322	1/19/2006 1:56 PM	kesposito	172.16.190.22	17
	2294	1/18/2006 7:23 AM	swinfield	APPS1.CAGIS.GOV	19
	2280	1/17/2006 9:29 AM	tyates	IMPD-2562	19
	2231	1/10/2006 9:52 AM	ldotson	D1-2731	19
	2216	1/5/2006 4:24 PM	jstone	WT-DOCSSCAN	17
	2214	1/5/2006 2:24 PM	mthompson	172.16.190.18	17
	2114	12/9/2005 11:24 AM	mlottrell	MCAU-2733	19
	2098	12/6/2005 3:21 PM	kstanford	N/A	N/
	2092	12/6/2005 1:43 AM	ebrown	172.18.239.22	17
	2062	11/29/2005 8:20 AM	vbarsan	CFDTBBARSANVI	19
	1959	11/4/2005 11:57 AM	mberta	AIRP2	17
	1935	10/31/2005 11:57 AM	bhueffner	N/A	N/
	1765	9/2/2005 12:06 PM	jerndt	N/A	N/
	1597	6/21/2005 9:52 AM	jobrown	DTE-JBROWN	19
	1454	5/5/2005 2:36 PM	rhunt	CPQ32231218452	19
	1426	4/29/2005 11:40 AM	jpoe	N/A	N/
	1302	4/5/2005 11:36 AM	creather	CINDYR	17
	649	6/17/2004 10:57 AM	bmorris	BMORRIS-WS	17
*					

Open Tickets - 58 Currently Open

	Ticket #	Status	PRIORI	Date Opened	Opened By	Assigned To	User/Contact Name	Com
	2602	OPEN	LOW	3/7/2006 3:02 PM	Debbie	Debbie	swinfield	SWXP
	2599	OPEN	LOW	3/7/2006 11:47 AM	MICHAEL	MICHAEL	athompson	pscs1
	2596	OPEN	LOW	3/7/2006 8:30 AM	MICHAEL	MICHAEL	rthornbu	N/A
	2594	OPEN	LOW	3/7/2006 7:08 AM	MICHAEL	SEAN	jdoe	MLXP.
	2588	OPEN	LOW	3/6/2006 9:48 AM	SEAN	SEAN	dsander	WE-C
	2575	OPEN	LOW	3/2/2006 3:09 PM	MICHAEL	MICHAEL	mongolman	172.1
	2562	OPEN	LOW	3/1/2006 9:39 AM	BRIAN	SEAN	kdraper	N/A
	2556	OPEN	LOW	2/28/2006 2:45 PM	BRIAN	BRIAN	dcarroll	CBLD1
	2545	OPEN	LOW	2/28/2006 8:24 AM	CHAD	CHAD	pmartin	CBLD1
	2544	OPEN	LOW	2/28/2006 8:23 AM	CHAD	CHAD	pmartin	CBLD1
	2540	OPEN	LOW	2/27/2006 11:49 AM	JAY	JAY	jstone	WE-D
	2529	OPEN	LOW	2/23/2006 2:15 PM	BRIAN	BRIAN	ayoung	CHDTI
	2493	OPEN	LOW	2/14/2006 11:54 AM	BRIAN	BRIAN	jcoulter	JCXP.
	2480	OPEN	LOW	2/13/2006 9:13 AM	CHAD	CHAD	lbriede	CBLD2
▶	2465	OPEN	LOW	2/8/2006 1:11 PM	JAY	JAY	bmorris	BMOR
	2464	OPEN	LOW	2/8/2006 12:38 PM	BRIAN	BRIAN	bscholl	BUILD
	2462	OPEN	LOW	2/8/2006 9:44 AM	BRIAN	BRIAN	gosbourne	172.1
	2459	OPEN	LOW	2/7/2006 3:19 PM	BRIAN	BRIAN	larnold	D4-27
	2434	OPEN	LOW	2/2/2006 3:37 PM	CHAD	CHAD	mperkins	N/A
	2367	OPEN	LOW	1/25/2006 12:55 PM	JAY	SEAN	jabbott	N/A
	2349	OPEN	LOW	1/23/2006 3:30 PM	SEAN	SEAN	mthompson	N/A
	2347	OPEN	LOW	1/23/2006 1:32 PM	SEAN	SEAN	jbarnes	D5-27

Connect Using:
● Computer Name ○ IP Address

□ Use Different Password (Radmin & VNC Only)

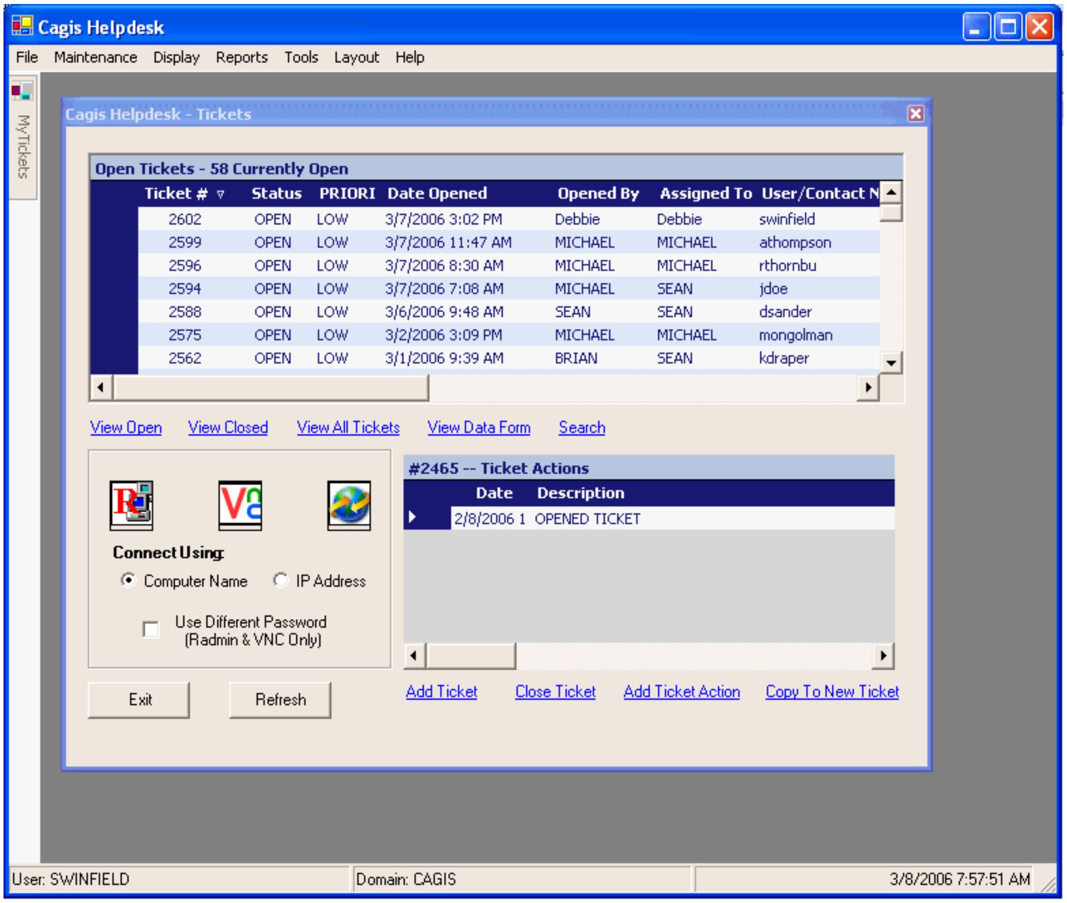
#2465 -- Ticket Actions

	Date	Description
▶	2/8/2006 1	OPENED TICKET

User: SWINFIELD
Domain: CAGIS
3/8/2006 7:57:51 AM

Figure 16: My Tickets Docked Left and 2 Tabbed Forms

The Dock Panel user control allows windows to be docked in five positions with an additional “floating” and “Hidden” window property. The five docked positions are: dock left, dock right, dock bottom, dock top and document. The document property is similar to a docked “fill” property in Visual Studio. Figure 17 displays the floating and hidden windows.



Open Tickets - 58 Currently Open

Ticket #	Status	PRIORI	Date Opened	Opened By	Assigned To	User/Contact N
2602	OPEN	LOW	3/7/2006 3:02 PM	Debbie	Debbie	swinfield
2599	OPEN	LOW	3/7/2006 11:47 AM	MICHAEL	MICHAEL	athompson
2596	OPEN	LOW	3/7/2006 8:30 AM	MICHAEL	MICHAEL	rthornbu
2594	OPEN	LOW	3/7/2006 7:08 AM	MICHAEL	SEAN	jdoe
2588	OPEN	LOW	3/6/2006 9:48 AM	SEAN	SEAN	dsander
2575	OPEN	LOW	3/2/2006 3:09 PM	MICHAEL	MICHAEL	mongolman
2562	OPEN	LOW	3/1/2006 9:39 AM	BRIAN	SEAN	kdraper

Connect Using:
● Computer Name ○ IP Address
□ Use Different Password (Radmin & VNC Only)

#2465 -- Ticket Actions

Date	Description
2/8/2006 1	OPENED TICKET

User: SWINFIELD
Domain: CAGIS
3/8/2006 7:57:51 AM

Figure 17: Ticket Form Floating and My Tickets Hidden

7. Conclusions

The CAGIS Helpdesk Application allows CAGIS Administrators to quickly enter the details of a support call and use information within the system to quickly resolve similar support calls. It give administrators added flexibility by providing them a way to communicate via e-mail and through the system, prioritize tickets so that they can work on the most important issues first and it's new user interface allows administrators to view the information they want to see, when they want to see it.

8. Recommendations

This application was designed with "progressive functionality" in mind so that it can accommodate any future changes. One example of this is a web portal where CAGIS users would be able to submit ticket requests. This add-on would be fairly simple, provided that the programmer has a basic understanding of ASP.NET. The programmer would only need to gather the information about a ticket, add a reference to the business logic dynamic link library, then call the "CreateTicket" function in order to successfully create a ticket via the web.

APPENDIX

9. Design and Development

9.1 Timeline

Senior Design I Accomplishments

- Performed initial research
- Determined requirements for application
- Identified users of the system
- Increased knowledge of Visual Basic .Net
- Created Proposal and Presentation

Senior Design II Accomplishments

- Started development of User Interface, e-mail functionality, administrator profiles
- Restructured database
- Created Test environment on laptop
- Created Design Freeze and Oral Presentation

Senior Design III Accomplishments

- Completed / Tested design
- Presented Final Project
- Submitted Final Report

9.2 Budget

The following table lists the costs to develop the CAGIS Helpdesk System:

Item	Estimated Cost	Actual Cost
Labor	$14644.08	$14644.08
VB.NET Professional*	$548.00	**$0
Oracle DB*	$24,000.00	**$0
Server*	$8,000.00	**$0
Desktop*	$1132.00	**$0
Crystal Reports*	$427.00	**$0
Total Cost	$48751.08	$14644.08

Table 2: Budget

Note: Labor was calculated using a typical Sr. Computer Programmer's hourly salary times the number of hours estimated for the project.

*Server and desktop quotes approximate cost from Dell.com, pricing for software from corporate vendors.

**Software development uses existing licenses and hardware

9.3 Hardware Requirements

The hardware that used for this project was the current hardware within CAGIS. The application was stored on CAGIS' file server and a shortcut to run the application was to the administrator's desktop on their existing computers.

9.4 Software Requirements

Developer Workstation: The application will be written using the coding standard for CAGIS developers, Visual Basic .NET. Since the department distributes reports using Crystal Reports, the application will utilize existing Crystal Reports licenses for its reporting capabilities.

Database: The department stores all of its data on an Oracle 9i database. The application will initially require approximately 50MB space for its data.

Desktop:

- Oracle 9i client
- Microsoft Office 2000 or above
- Meet minimum requirements for running .NET framework applications:
    - Processor:
        - Client (a computer not working in a server capacity): 90-megahertz (MHz) Intel Pentium-class processor, or an AMD Opteron, AMD Athlon64 or AMD Athlon XP processor
        - Server (a computer working in a server capacity): 133-MHz Intel Pentium-class processor, or an AMD Opteron, AMD Athlon64 or AMD Athlon XP processor
    - Operating System(s):
        - Microsoft Windows® Server 2003* (.NET Framework 1.1 is installed as part of the operating system)
        - Windows XP Professional*
        - Windows XP Home Edition
        - Windows 2000*
        - Windows Millennium Edition (Windows Me)
        - Windows 98
        - Microsoft Windows NT® 4.0 Service Pack 6a
    - Memory:
        - Client: 32 megabytes (MB) of RAM, 96 MB recommended
        - Server: 128 MB of RAM, 256 MB recommended

10. Sample Code

10.1 Presentation Layer

10.1.1 Formatting Datagrid for Ticket Form

Begin Code

```
#Region "Configuring Datagrid Tablestyles"
    Private Sub FormatDGTix()
        dgTix.TableStyles.Clear()
        Dim dgtblstyle As New DataGridTableStyle
        Dim textcol As DataGridLabelColumn

        With dgtblstyle
            .AlternatingBackColor = System.Drawing.Color.Lavender
            .BackColor = System.Drawing.Color.WhiteSmoke
            .ForeColor = System.Drawing.Color.MidnightBlue
            .GridLineColor = System.Drawing.Color.Gainsboro
            .GridLineStyle = System.Windows.Forms.DataGridLineStyle.None
            .HeaderBackColor = System.Drawing.Color.MidnightBlue
            .HeaderFont = New System.Drawing.Font("Tahoma", 8.0!,
            System.Drawing.FontStyle.Bold)
            .HeaderForeColor = System.Drawing.Color.WhiteSmoke
            .LinkColor = System.Drawing.Color.Teal
            .SelectionBackColor = System.Drawing.Color.CadetBlue
            .SelectionForeColor = System.Drawing.Color.WhiteSmoke
            .MappingName = "Table" '"Officers"
            .ReadOnly = True
            .AllowSorting = True
            .RowHeadersVisible = True
        End With


        textcol = New DataGridLabelColumn
        textcol.MappingName = "TICKETNO" : textcol.HeaderText = "Ticket #"
        textcol.NullText = "" : textcol.ReadOnly = True : textcol.Width = 70
        textcol.Alignment = HorizontalAlignment.Center 'TextCol.Format=
        dgtblstyle.GridColumnStyles.Add(textcol)

        textcol = New DataGridLabelColumn
        textcol.MappingName = "STATUS" : textcol.HeaderText = "Status"
        textcol.NullText = "" : textcol.ReadOnly = True : textcol.Width = 60
        textcol.Alignment = HorizontalAlignment.Center
        dgtblstyle.GridColumnStyles.Add(textcol)

        textcol = New DataGridLabelColumn
        textcol.MappingName = "priority" : textcol.HeaderText = "PRIORITY"
        textcol.NullText = "" : textcol.ReadOnly = True : textcol.Width = 50
        textcol.Alignment = HorizontalAlignment.Left
        dgtblstyle.GridColumnStyles.Add(textcol)
```

```
textcol = New DataGridLabelColumn
textcol.MappingName = "OPENEDON" : textcol.HeaderText = "Date Opened"
textcol.NullText = "" : textcol.ReadOnly = True : textcol.Width = 125
textcol.Alignment = HorizontalAlignment.Left 'TextCol.Format=
dgtblstyle.GridColumnStyles.Add(textcol)

textcol = New DataGridLabelColumn
textcol.MappingName = "FIRSTNAME1" : textcol.HeaderText = "Opened By"
textcol.NullText = "" : textcol.ReadOnly = True : textcol.Width = 75
textcol.Alignment = HorizontalAlignment.Left 'TextCol.Format=
dgtblstyle.GridColumnStyles.Add(textcol)

textcol = New DataGridLabelColumn
textcol.MappingName = "FIRSTNAME" : textcol.HeaderText = "Assigned
To"
textcol.NullText = "" : textcol.ReadOnly = True : textcol.Width = 75
textcol.Alignment = HorizontalAlignment.Left 'TextCol.Format=
dgtblstyle.GridColumnStyles.Add(textcol)

textcol = New DataGridLabelColumn
textcol.MappingName = "username" : textcol.HeaderText = "User/Contact
Name"
textcol.NullText = "" : textcol.ReadOnly = True : textcol.Width = 125
textcol.Alignment = HorizontalAlignment.Left
dgtblstyle.GridColumnStyles.Add(textcol)

textcol = New DataGridLabelColumn
textcol.MappingName = "compname" : textcol.HeaderText = "Computer
Name"
textcol.NullText = "" : textcol.ReadOnly = True : textcol.Width = 100
textcol.Alignment = HorizontalAlignment.Left
dgtblstyle.GridColumnStyles.Add(textcol)

textcol = New DataGridLabelColumn
textcol.MappingName = "ipaddr" : textcol.HeaderText = "IP Address"
textcol.NullText = "" : textcol.ReadOnly = True : textcol.Width = 100
textcol.Alignment = HorizontalAlignment.Left
dgtblstyle.GridColumnStyles.Add(textcol)

textcol = New DataGridLabelColumn
textcol.MappingName = "phoneno" : textcol.HeaderText = "Phone Number"
textcol.NullText = "" : textcol.ReadOnly = True : textcol.Width = 100
textcol.Alignment = HorizontalAlignment.Left
dgtblstyle.GridColumnStyles.Add(textcol)

Dim txtWrapColumn As New MultiLineColumn
With txtWrapColumn
    .MappingName = "PROBDESC" : .HeaderText = "Problem Description"
    .TextBox.WordWrap = True
    .NullText = "" : .Width = 400 : .ReadOnly = True
    .Alignment = HorizontalAlignment.Left 'TextCol.Format=
End With
dgtblstyle.GridColumnStyles.Add(txtWrapColumn)
dgTix.TableStyles.Add(dgtblstyle)
```

```
        If MainModule.isMgrOrSec = True Or MainModule.isSpecialist = True
        Then
            lblAddTicket.Enabled = False
            lblCopyTix.Enabled = False
        End If
    End Sub
```

End Code

10.2 Business Logic Layer

10.2.1 Ticket class from CH_DLL, the Dynamic Link Library file for the application

Begin Code

```
Imports CagisServices.OracleCall
Imports CagisServices.SqlHelperParameterCache
Imports System.Data
Imports System.Data.OracleClient
Imports Microsoft.Office.Interop
Public Class Tickets

Dim Utility As New DBUtil
Public Function GetTicket(ByVal Ticket As Integer) As DataSet

        Try
            Dim ds As DataSet
            Dim mSTATUS As String

            Dim param1 As New OracleParameter("Vin_Ticket",
            OracleType.Number)
            param1.Value = Ticket

            Dim paramStatus As New OracleParameter("nSTATUS",
            OracleType.VarChar, 4000)
            paramStatus.Direction = ParameterDirection.Output

            Dim paramCursor As New OracleParameter("io_cursor",
            OracleType.Cursor)
            paramCursor.Direction = ParameterDirection.Output

            ds =
            CagisServices.OracleCall.ExecuteDataset(Utility.ConnectionString,
            CommandType.StoredProcedure, _
                 "CH_PKG.CH_TICKET", param1, paramCursor, paramStatus)

            mSTATUS = paramStatus.Value.ToString()
            If mSTATUS <> "SUCCESS" Then
                Throw New ApplicationException(mSTATUS)
            Else
                Return ds
            End If
        Catch ex As Exception
            Throw New ApplicationException(ex.Message, ex)
        End Try

    End Function
```

```
Public Function GetTicketAction(ByVal Ticket As Integer) As DataSet

        Try
            Dim ds As DataSet
            Dim mSTATUS As String

            Dim param1 As New OracleParameter("Vin_Ticket",
            OracleType.Number)
            param1.Value = Ticket

            Dim paramStatus As New OracleParameter("nSTATUS",
            OracleType.VarChar, 4000)
            paramStatus.Direction = ParameterDirection.Output

            Dim paramCursor As New OracleParameter("io_cursor",
            OracleType.Cursor)
            paramCursor.Direction = ParameterDirection.Output

            ds =
            CagisServices.OracleCall.ExecuteDataset(Utility.ConnectionString,
            CommandType.StoredProcedure, _
                 "CH_PKG.CH_TICKETACTION", param1, paramCursor, paramStatus)

            mSTATUS = paramStatus.Value.ToString()
            If mSTATUS <> "SUCCESS" Then
                Throw New ApplicationException(mSTATUS)
            Else
                Return ds
            End If

        Catch ex As Exception
            Throw New ApplicationException(ex.Message, ex)
        End Try

    End Function
```

End Code

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