Network Analysis and Website Design Report

Re/Max Greater Princeton

Term Project

Recommendations on the network infrastructure of Re/Max Greater Princeton and the concept design behind a prototype website.

Term Project for IST 220, Penn State University
April 25, 2001

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INTRODUCTION

This report is a conclusion to four months worth of work analyzing what network would be best for Re/Max Greater Princeton and designing a prototype website that could be implemented at the realty office. The report which follows includes information regarding what type of network design, including hardware and software recommendations and suggestions as to what network topology would be the best to implement in the office.

The analysis team entered this project as outside consultants. Re/Max Greater Princeton was in the process of choosing contractors to install a computer network. The analysis team's job was to develop a set of recommendations for the best type of network for the office, to read the reports from the contractors, and deliver and rating of the contractor's plans to the owners, since none of the five owners had any technical understanding of the proposals they were receiving.

Re/Max Greater Princeton was chosen to be analyzed through a personal connection with the company by one of the analysis team's group members.

ABOUT THE ANALYSIS TEAM

The analysis team is comprised of six students in Dr. C. Lee Giles IST 220 class at Penn State University who were assigned to design a network solution and a website for a local organization.

After receiving the charge from the course instructor and an acceptance from Re/Max Greater Princeton, the team immediately started to form a Gantt Chart and strategy for completing the project in the most effective manner possible. The group divided up roles to work on separately while meeting every Sunday afternoon for 15 weeks to draft this report and code the prototype website.

As Group Coordinator, Ben Eisenberg acted as the team's liaison with Re/Max and centralized all the group's efforts when writing this report or code for the website. Katie Maser took the lead in developing content for the report. Pat Capen led the programming effort for the database and ASP code on the website, while Victoria Raskovich, Maudy Palupi, and Ryan Horne all provided content to the website.

The information provided in this report is in the best interest of Re/Max Greater Princeton. The suggestions included are given by Group Nine as independent consultants. The suggestions provided are supplied as a public service to fulfill the requirements on the class. Re/Max Greater Princeton may implement these recommendations without any reciprocation to the members of Group Nine. Any further recommendations or updates not included in this report may be supplied by Group Nine when requested on a consulting service fee.

COMPANY

The Re/Max Greater Princeton Lobby

What is Re/Max?

Re/Max offices are the worldwide Real Estate Leaders. No one in the world sells more real estate than Re/Max.

Re/Max, which started in Denver, Colorado, in 1973 as "a pad of paper and a dream" is now a global real estate franchise network that spreads across 35 countries and eight territories, on six continents. The revolutionary Re/Max concept of enabling real estate professionals to maximize their business potential has evolved into an organization of more than 62,000 Sales Associates in more than 3,700 offices worldwide. In 1999, Re/Max associates were involved in more than 1 million sales transaction sides within a single year in the United States alone - an industry milestone. In addition, Re/Max is proud to hold the record for the most transaction sides in a single year ever recorded by any real estate network.


Re/Max Greater Princeton Exterior

The Re/Max Concept

Re/Max stands for "real estate maximums." In exchange for paying a management fee and a share of the monthly office overhead, Re/Max associates keep the maximum allowed amount of their commissions and receive the many benefits of Re/Max programs and services. By offering associates maximum commissions and maximum career freedom, Re/Max influenced competitors to re-examine and adjust their own policies toward sales agents, thus dramatically changing the industry. Additionally, Re/Max was one of the first real estate companies to have its own proprietary television network and one of the first in the industry to develop a site on the World Wide Web.

What is Re/Max Greater Princeton?

The Re/Max Greater Princeton Owners

The Re/Max system is a network of franchise offices. In January of 2000, five Realtors: Esther Capotosta, Joan Eisenberg, Claire McNew, Linda November, and Dawn Petrozzini, who share a combine 97 years of experience, joined forces to create a new real estate office, Re/Max Greater Princeton, committed to high-tech professional service for both their clients and the other Realtors in their office.

Originally working in cramped, temporary quarters, Re/Max Greater Princeton accomplished great feats, helping more than 150 families achieve their dreams while selling more than $50 million worth of real estate in only a mere eight months. Now in a spacious, state-of-the-art facility at the Princeton Forrestal Village, across from the Marriott Hotel, Re/Max Greater Princeton officially opened for business at full capacity in March 2001.

Two of Re/Max Greater Princeton's Eight Receptionists

NETWORK ENVIRONMENT

SOFTWARE

Call Trax

A Receptionist Using *Call Trax*

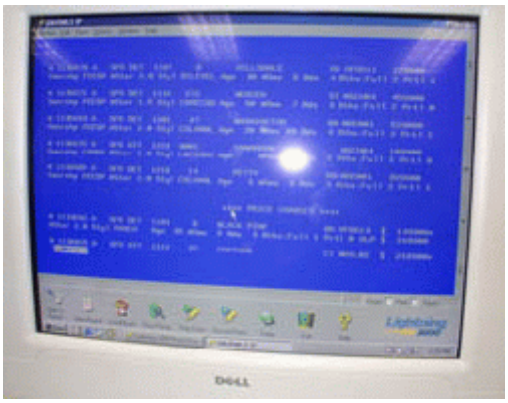
The only way to sell a house is if it is available to be shown by all agents. To coordinate who can show listings at the available times, Re/Max has implemented a program called *Call Trax*. *Call Trax* is a very simple utility which stores a database of the available listings and a database of agents in the region. When an agent calls to show a house, the receptionist will record the time an agent requests. The reports that *Call Trax* can create helps the Realtors better and more efficiently coordinate their efforts.

The *Call Trax* system involves a client program and a server side database. In the Greater Princeton office, the client program is installed only on the receptionists' computers to ensure that only authorized personnel can edit the data. The database itself is stored on the server and accessed by the client computers through a Windows drive share.

Call Trax Main Menu

Listing Information in *Call Trax*

MLS Systems



Lightning 2000 Screen Shot

One of the most important tools for a Realtor is the Multiple Listing Service. The Multiple Listing Service, or MLS, is a county wide database which displays information about houses in the area that are listed for sale. Each Realtor has their own login to this system, and the program used to connect to each counties' database is contingent upon the design implemented by the county's Broad of Realtors.

In Middlesex, Somerset, and Burlington Counties, Iris' *Lighting 2000* is used to access the MLS records. *Lightning 2000*, which replaced a outdated program called *Altera*, works over a direct network connection, or over a dial-up phone connection, to interface with the MLS server. After connecting through this Windows client program, the Realtors can search for the most recent listings, past listings, or add their own to the database.

Until recently, Mercer County also used *Lighting 2000* to connect to their county database. However, they decided to drop support of *Lighting 2000* in November 2000 and opted to use a service called *TReND*. *TReND* is an entirely web based application. It has the same capabilities as *Lightning 2000*, but *TReND* is more portable. All you need to access the Mercer MLS system is an Internet connection and an Internet browser, such as *Internet Explorer*. This is more convenient than the *Lighting 2000* system because it does not involve having to install a program onto each computer and removes the hassle of Realtors being unable to reach the database from the privacy of their own homes.

An Agent Using *Lightning 2000*

Top Producer

Although not used by all Realtors, *Top Producer* is another database productivity tool. *Top Producer*, developed by Top Producer Systems, is a simple program that Realtors can use to store all their clients' contact information. It increases efficiency through the use of it's report tools. For instance, Realtors can get a detailed report with only a few clicks of the mouse that can list such useful information as current clients and past clients. This information is especially useful come the holiday season when most Realtors send cards to clients to thank them for their business and maintain a positive rapport with their clients. Additionally, *Top Producer* has the ability to sync with a Palm Pilot, so Realtors can access this information while they are out at a listing or on the go driving to meet another client.

ERC

In the past, when a Realtor needed to draft a contract of sale for a house, they had pre-made generic forms that they filled in using a typewriter. Now in the digital age, a program called *ERC* was developed to make the process easier. Although the Realtors still are filling out a generic form, it no longer involves the tedious work of manually lining up the blank spaces on the typewriter. Instead, all the information for the contract, including location of house, buyers information, sellers information, and the price can be entered into the computer, edited if necessary, and then automatically added to the appropriate contract in the designated spaces. Not only does the output from *ERC* look more professional, it also takes half the time to draft the contract.

Microsoft Office

In addition to all the Realtor-specific programs that are mentioned above, Re/Max Greater Princeton also needs some of the standard office tools to type reports, make presentations, and check e-mail. To manage these tasks, the Realtors use the Microsoft *Office* Suite of products, including Microsoft *Word*, Microsoft *PowerPoint*, and Microsoft *Outlook*, respectively. These programs were chosen because they are the industry standards and the most familiar to the agents in the office.

Operating Systems

Originally we recommended that Re/Max Greater Princeton use *Windows 2000* as their operating system of choice. It has better security and reliability than its counterpart, *Windows '98*. However, after assessing the requirements made by each of the individual Realtor-specific programs, we learned that *Windows 2000* would not work in this environment because *Lighting* was not compatible with *Windows 2000* at that time. Instead we changed our recommendation to *Windows '98*. We wanted to stay within the *Windows* platform, because as with *Office*, it is simple to use and the most familiar with all of the agents. Recommending a non-GUI (Graphical User Interface)-based operation system, such as *Linux*, would not have been feasible in the locations.

Server Operating Systems

For the file server, we recommended *Windows NT Server* for the operating system. Again, we wanted to use a popular GUI-based operating system so that its maintenance could be handled by the office manager without having to learn any new skills. Although a *UNIX* server may be more robust, it would not be feasible in this application. We also felt that *Windows 2000 Server* was too new and untested to base our recommendation on.

A Receptionist Setting an Appointment Using *Call Trax*, a Microsoft *Windows* Compatible Application

NETWORK ENVIRONMENT

HARDWARE

Computers

A Dell Dimension Office Computer

At the present time, the Re/Max Greater Princeton office does not have the need for a large number of computers. At minimum, the office needs eight computers and a server. Two of the computers would be located in the lobby for the receptionists to use. A third computer would be designated to the office manager's, and the other three would be set up in a lab configuration so that Realtors could access any of their Realtor-specific programs at any time. In addition, the office has two computers divided between the two conference rooms. Although the office only has eight computers now, they do expect to purchase more in the future. Therefore, we designed the network for easy expansion up to 48 nodes.

We recommended that the Re/Max Greater Princeton purchase Dell computers. Dell is consistently rated among the highest in the industry in their service, performance and reliability - three factors crucial to the operation of a Realty office. Two of the computers are of the Dell Optiplex 110 line, which are solid user workstations. One Optiplex was allocated for the office manager; the other to one of the receptionists. The remaining six computers are Dell Dimension L Series, which, although slightly less expensive models, still provide a high level of performance. All of the computers came pre-configured with a Pentium III 733 MHz processor, 128 MB of RAM, a 10 GB hard drive, 3Com 10/100 network card, a 56K modem, 100 MB Zip Drive, and a three year on-sight warranty from Dell. Each computer also came with a 17-inch CRT monitor, except for the receptionists' computers, which instead are 15-inch Phillips flat-screen monitors, chosen for their aesthetic appearance to impress clients as they enter the office.

File Server


Dell PowerEdge 1400 Server

One of the more critical machines in the office is the office file server. Its reliability is crucial to the office's performance. If the machine crashes, the *Call Trax* database would be unavailable. Because of its high reliability, a Dell PowerEdge 1400 was purchased to be the office's server. The server contains a Pentium III 700 MHz processor, 256 MB of RAM, an Intel Pro 100+ highly reliable Ethernet card, and two 18 GB SCSI hard drives. The hard drives are configured using Redundant Array of Independent Disks 1 system (RAID-1), meaning that identical data is written to both drives simultaneously. In case one drive ever goes down, the system will be able to function solely on the redundant disk, similar to a plane flying on only one of its engines. The server also has a built-in tape backup drive, an internal Power Vault 100+ DDS4, to archive the server's files every night. Each day it is the office manager's job to rotate through the seven tapes, one per day, so that at any given point, the office has access to a week's worth of backups. The file server is attached to a 700 volt APS uninterruptible power supply. So should the office suddenly lose power, the office manager has between 30 and 60 minutes to successfully shut down the server without having to worry about any data loss.

Printers


Hewlett Packard LaserJet 4050TN

The Re/Max Greater Princeton office has two printers dedicated to the network. The first printer, an HP LaserJet 4050TN is a fully networkable self-standing node which is used by the entire office. The printer is located across from the copier in the kitchen / break area since that is the center of the office. The laser printer can print 17 pages per minute at 1200 dpi resolution. The printer is networked using an internal DirectJet card which receives its print jobs from the main file server, which also doubles as a print

server.

The second printer, an HP LaserJet 4P is located under the receptionist counter in the lobby. This printer, also a black and white laser, is used only for the small print jobs that the receptionists print out on occasion. This printer is also networked, but not directly to the main server. Rather, it is connected via the parallel port of one of the receptionists' computers, which has printer sharing enabled.


Hewlett Packard LaserJet 4P

Copiers

In addition to the two dedicated printers, Re/Max Greater Princeton also has two copiers which have been networked to double as printers. The first one, a Canon ImageRunner 550, is located in the back office and prints in only black and white. It can act as a stand alone copier for simple copy jobs, or as a node on the network. Its print jobs are spooled by the office's print server and are sent to the copier over standard twisted pair cables.

The second copier, located in the kitchen / break area, is a Canon Color Laser Copier 1120. As with the ImageRunner, the Canon Color Laser Copier 1120 can be used to make color copies. But, it is also is networked so documents can be directly sent from a computer in the office to the copy machine. The color copier needs an additional print spooler, a Canon Color Pass Z60, to handle the complexity and size of the color print jobs. The Color Pass Z60 is essentially a proprietary computer that acts as an intermediary between the copier and the print server.


Canon ImageRunner 550 Copier


Canon Color Laser Copier 1120 (Inset: Canon Color Pass Z60 Print Spooler)

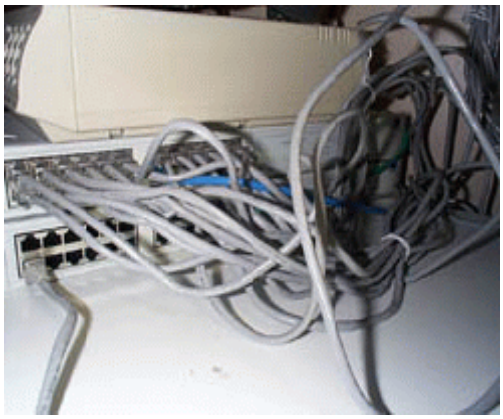
NETWORK TOPOLOGY

Star Topology, Client-Server LAN

Given all the requirements and legacy equipment that the Realtors needed to use, we recommended that the network layout be a star topology in a client-server local area network (LAN). For the highest efficiency and lowest cost, this type of network is the best to implement.

In a star topology, all the nodes on the network should connect to a central hub so all the resources can be shared. This is one of the cheapest methods of network which also provides for easy expansion. Unlike token ring or bus topologies, a star topology has the greatest benefits per user in price.

Since a star topology centralizes how information is distributed, the centerpiece, or hub, needs to be reliable. So Re/Max is using two of the most reliable hubs around, the 3Com Superstack II PS Hub 40. These hubs are cascaded rather than cross-patched to provided faster access and to allow for less interference, should future hubs be added later. Each hub has the capacity for 24 nodes, for a total of 48.



3Com Superstack II PS Hubs

The network has to be client-server in nature because of the demands of the file and print server. Each time a user logs into a client computer, a script is run on the server to gather information about the user, such as their preferences and home directory location. The advantages of client-server computer includes: system expansion, portability, and modular applications (ability of run software on client and retrieve only data from the server). Although the main disadvantage of client-server computing is network congestion, the limited size of this network, combined with the limited distance from the node to the server negates the affects and congestion that would be seen had this design been of a client-server WAN.

LAN vs. WAN

When designing the network, we first ruled out the need for a WAN, or wide area network. The office is located completely within the ground floor of one building, not spread out over cities or even different states. And since each office, by Re/Max Corporate rules must be owned by a different franchise, there is very little chance that the office network will ever have to expand into a wide area capacity or join into other networks at Re/Max locations. The only feasible network for Re/Max Greater Princeton is a local area network, or LAN.

A LAN provides an assortment of benefits to the office. The LAN allows for easy file and printer sharing, as well as access to the Internet. By definition, the LAN is used for communication between multiple devices in a limited geographic area, device and data sharing, high speed data transfer, high reliability, a transparent interface to network resources, low cost, and, ease of management – all features important when comparing which network type best fits the needs of the office.

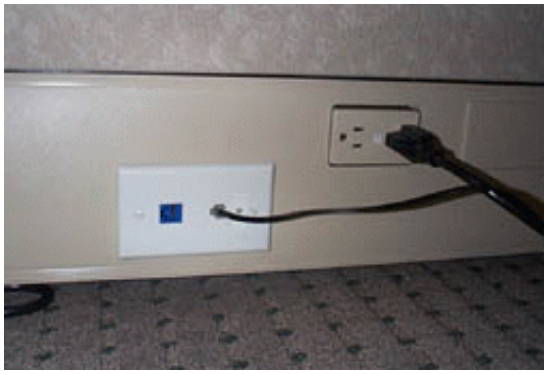
Cabling

48 Port Patch Panel

The local area network uses, as mentioned, two hubs, eight computers, two printers, two copiers, and a server. To connect all these devices, category 5 (CAT-5) cabling was used as the medium. The CAT-5 cable runs from each individual node location to a patch panel in the networking closet. A total of 40 cables were run to the patch panel, 8 shy of its total capacity. At the node end, the wires were punched down into RJ-45 outlets. Small 8 foot cables can be run from the outlet at the baseboard up a desk and plugged into a computer's network interface card with little effort. On the patch panel end, small patch cables were used to connect the panel to the hubs. Again, these patch cables were also CAT-5 with RJ-45 standard connectors.

The primary reason we chose CAT-5 cabling is for its high bandwidth capacity. It is capable

of transferring data up to 1 gigabyte per second, although the hubs and network interface cards limit that transfer to 100 megabyte per second at optimal performance. In addition, the attenuation and cross talk characteristics in CAT-5 twisted pair cabling are better than other wire alternatives. We chose a wired office, as opposed to the new wireless technologies, for many reasons. Primarily, wireless is too expensive for the office's budget and given the lack of portability with the office computers combined with the confined area of the office space would make wireless an overpriced and unjustifiable technology. Running wires that cost about four cents a foot would be a better use of office funds than investing in the new wireless technology. However, should a need for wireless arise in the future (perhaps due to high demand for laptop portability or any other factor), transition to wireless would be simple because the local area network was designed with expansion in msind.


Ethernet (blue) and Telephone (white) Jacks


Network Server Closet

Network Protocols

The local area network we designed operates over TCP/IP protocol, which is represented in the transport and network layers of the OSI model. TCP/IP was originally designed by the U.S. Department of Defense for internetwork file transfers, e-mail transfer, remote logons, and terminal services. To use TCP/IP, each node on the network has been assigned a unique IP address. TCP/IP is composed of two parts, TCP and IP. The Transmission Control Protocol (TCP) operates at the transport layer and has the task of ensuring data integrity. The Internet Protocol (IP) operates the network layer and is used in the addressing and routing of individual packets. TCP/IP was chosen for this network because of its standard nature and necessity when using World Wide Web. The IP addresses the office uses were designated by ATX Telecommunications, which is the service provider for Re/Max Greater Princeton's phone and Internet service. The IP Addresses are dynamically

assigned by the server using DHCP technology.

Internet Service

To get out onto the Internet from a client machine on the network, various hardware is needed before the signal ever leaves the building. Re/Max Greater Princeton did invest in a T1 line for the office. A T1 line is comprised of 24 nodes, each capable of 64 kb of data per second. ATX Telecommunications, the company providing both phone and data services, decided to break the T1 line into two parts. One part, comprised of 20 of the 24 nodes would be used for voice. Each node represents one phone line. The remaining for nodes would be grouped together into a fractional T1 line for data transfer. So at optimal performance, the outgoing Internet traffic for the office can reach as high as 256 kbps.

Ad Tran TSU 120 CSU/DSU
and Cisco 1700 Series Router

In order for the T1 line, which is fiber, to interface with the office network (twisted pair), the signal must be demodulated. The CSU/DSU, which stands for Channel Service Unit / Data Service Unit, connects to the digital line, terminates the signal, and converts it either to analog or digital, dependant on which way the data is being transferred. The CSU/DSU, an AdTran TSU 120 model, was provided by and rented from ATX Telecommunications.

But before the signal ever gets from the client to the CSU/DSU, it first needs to be routed out to the T1 line. Enter, the router. The router works at the network level to distinguish where packets of data should be sent. Routers use the headers of data packets and an intricate routing table to determine the where the packets go. The routing function is provided using TCP/IP. The office's router, which was also provided by ATX Telecommunications, is a Cisco 1700 Series router.

Phone Service

As mentioned earlier, Re/Max Greater Princeton is getting their telephone and data service from ATX Telecommunications. ATX provides only the service. A second company, WireOne, provided the telephone equipment and the cabling, including 20 Panasonic Digital Speakerphones, model HAC VB-44223-B. WireOne was hired based on their affiliation with ATX. WireOne was already contracted by ATX to run the category 3 cable for the telephones. So they simply did double runs, since the CAT-5 and CAT-3 were going to the same locations, to save time and money.

Telephone System Patch Panel
and T1 Fiber Connection Box

Panasonic HAC VB-44223-B
Speakerphone

WEBSITE

Existing Web Presence

Existing Re/Max Greater Princeton Website

Re/Max Greater Princeton already has a presence on the web. Since the creation of the organization, the owners knew how important a well developed, aesthetically pleasing functional website is to a company's marketability. One of the first things Re/Max Greater Princeton did when they formed the company was register the domain *greaterprincetonhomes.com*. Then, after researching a variety of web designers, they chose Fred Rackmill, of Rackmill Associates because of his community involvement and a recommendation from this analysis team's group coordinator. Rackmill is known in town for his community involvement through the website *www.wwptoday.com* which he developed and maintains as a service to the communities of West Windsor and Plainsboro.

Prototype Website Goals

Since Re/Max Greater Princeton already had a high quality website, our group was challenged by finding ways to improve upon their site. So rather than recommend changes, we developed our own Re/Max Greater Princeton website which can be used in two ways. The first way would be to supplement the current site and integrate some of our ideas into the existing site. The second use of the website our group created would be as a alternate redesign of *greaterprincetonhomes.com*, should the company ever decide they need a new web front-end.

Overall Website Layout and Design

The website was designed to be easy to use and visually appealing. The layout is intuitive, with buttons on the left column for the top-level pages, and across the top of the page on second-tier pages. The color scheme: red, blue, and white, was chosen because they are the only colors allowed on Re/Max websites, as designated by the Re/Max Corporate web style rules. And also per web

style rules, the Re/Max hot air balloon, which is the symbol for Re/Max, would be visible on the top left corner of every page.

Design Tools

In developing our version of the website, we used Macromedia *Fireworks* and Macromedia *Dreamweaver*. As one of the top of the line web developing tools, *Dreamweaver* made designing the page content a simple task. *Fireworks*, which is a graphic design tool, was used to develop the pleasing and common template for each page. Additionally, Adobe *Photoshop* was used to edit and crop graphics on the website.

Website Needs

The reasoning behind a Re/Max Greater Princeton website is three-fold. First, it provides Re/Max Greater Princeton with a presence on the web. Second, it is a resource for current clients. And third, it is a tool to attract new clients and allow them to look for a home to purchase.

Target Users

The highest demographics of users that would access the database would be college educated males and females between 35 and 55 and within a combined salary bracket of $50,000 to $250,000 a year. The region Re/Max Greater Princeton serves is primarily a community with families of 0 to 4 kids. The website should serve the same demographics. Although others will access the website, the core population would be the parents of a "typical suburban family."

The website users are probably not too technologically savvy, but have a decent knowledge of the Internet. They are likely to be AOL users, although many clients will probably access their from T1 connections at work in addition to 56K modems at home. The users are likely to utilizing Netscape Navigator, Internet Explorer, and AOL to view the site.

Website Layout - The Homepage

The website has six main sections. The first is the Homepage, which is the first page people

see, and therefore had to be the most visually appealing on the site. The Homepage acts as the initial navigation page, and is the one page on the site that users will keep going back to. The content on the Homepage includes the current Featured Homes, some information off the Re/Max Newswire, and a list of initial contact information so users can quickly find the phone number to call the office and speak to a live representative, rather than deal with the impersonal interaction with a computer.

Website Layout - The Homepage

Realtor Biography of Agent Lisa Brody

Website Layout - "About Us" and "Realtor Bios"

The second section of the website is "About Us." This section tells the story behind Re/Max and Re/Max Greater Princeton. It allows the users who view the page to learn about the company and its philosophy, which is critical when making purchases as large as houses are. Additionally, the "About Us" section contains links to news stories which feature Re/Max Greater Princeton. Another section of the website, similar to "About Us," is the "Realtor Bios" section. In this section, information about each Realtor is provided. Users can click on an agents' picture to learn about their history in Real Estate and ways to contact the agents directly.

Website Layout - "Find A Home"

Website Layout - "Find A Home"

"Find A Home" is yet another department of the website. "Find A Home" is a fully searchable database which allows customers to search for a listed home by the city. A user can select which city in the region they want to search by, and then the results are posted dynamically using ASP code. From that point, users can click on a house for more detailed information. That information is pulled from the Access database and dynamically

Results From A Find Query

displayed on the screen. We chose to use an Access database because the company already owns *Access* (it is included with Microsoft *Office*) and because purchasing another database solution, such as *SQL Server* or Oracle, would have been too pricy and would not increase the results of the office to rationally justify the costs of those packages.

The current *greaterprincetonhomes.com* website does not include any type of database. Instead, when an agent gets a new listing, they send a description of the home to the receptionist to add to the *Call Trax* database, and a second set of descriptions to Fred Rackmill to add to the website. When the house is then sold, Rackmill is notified to remove the page. This system is inefficient, costly, and creates redundant data. We recommend that Re/Max Greater Princeton integrate their *Call Trax* database into their website so that when the receptionist enters or alters any listing information, it is automatically changed or developed for the website.

Website Layout - "Full Service"

A fifth section of the website is titled, "Full Service." It is aptly titled, as that section gives information and tips on how to improve the complete home buying experience, from how to sell your home to how to choose a furniture company to tips on how to make the best use of a moving company. This section was an original idea from the group. We developed it keeping the client in mind. There is more to moving then just searching for a house. This section will help the clients in the entire moving process, and also give them a reason to come back to the website. We hope that this section will be included in the greaterprincetonhomes.com website.

Website Layout - "Contact Us"

Website Layout - "Contact Us"

The final section of the site is "Contact Us". Simply put, it is an online form where potential customers can enter their name, phone number, e-mail address, and a comment about either the website or the office in general. The form is then processed and e-mailed to the receptionist at the office. It is our expectation that this section will be used by people who want to sell their home or want to see one of

the listings. Potential buyers or sellers could request an appointed via the contact form, and the receptionist can then channel the e-mail to the appropriate agent who will then reply back. A similar form made specifically for selling your home is located under the "Click Here to Sell Your Home" link on the Homepage. Additionally, the e-mail addresses collected could be compiled into a monthly mailing list highlighting featured properties or other Re/Max information.

Website Requirements

As per requirements, the site contains Javascript, in the form of a text banner, rolling images, mouse-overs, pull-down menus, and pop up windows. We also added a Flash animation that was given to the office from the Re/Max Corporate Office. Other technical competencies include: HTML, ASP, Visual Basic Script, Access Database Management, and graphic editing.

APPENDIX A:

Network Related Documents

The documents which follow were acquired from Re/Max Greater Princeton for assistance in analzing the network and assessing the contractors. Some of the information contained in this section is confidential, and must be viewed solely in an educational context.

Two proposals from private contractors (ATX Telecommunications and Canon Solutions MCS) were too large to include within this report. Rather they are attached as a separate appendix.

APPENDIX B:

Website Layout

The pages included are sample printouts of a few of the
web pages that Group Nine designed for Re/Max Greater Princeton.
Not all pages from the prototype website are included in this appendix.

APPENDIX C:

Additional Office Pictures

Included are additional photographs of the

Re/Max Greater Princeton office.

The Lobby

The Agents Gather Outside The New Office

One of the Two Conference Rooms

The Back Section of the Office

The Staff Gathers For A Meeting

The Office Manager's Desk

The Copier, Printer, Mailbox, Fax Machine, and Postal Weigh Station Area

An Agent's Desk. Notice the agent's personal computer, which is able to connect to the office network for Internet and e-mail access.

APPENDIX D:

Office Contact Information

To contact the office:

Re/Max Greater Princeton
112 Village Blvd.
P.O. Box 430
Plainsboro, New Jersey 08536

Re/Max Greater Princeton is located off of Route One in Princeton Forrestal Village, across from the Marriott Hotel.

Phone: (609) 951-8600
1-877-9-REMAX-8

Fax: (609) 951-9695

E-mail: info@greaterprincetonhomes.com

On the Web: http://www.greaterprincetonhomes.com

When contacting Re/Max Greater Princeton for research information or materials, our contact was with the owners, primarily Claire McNew, Esther Capotosta, and Joan Eisenberg.

APPENDIX E:
Time Management

Included is a Gantt Chart and minutes from each team meeting, which was used to track our time management and productivity results.

APPENDIX F:
Works Referenced

Although most information included in this report,
some data and research was acquired from outside sources.

Re/Max Greater Princeton's Website. (http://www.greaterprincetonhomes.com)

Stamper, David A. Business Data Communications. Reading, Mass: Addison-Wesley, 1999.

* All photographs included in the report were taken by Ben Eisenberg.