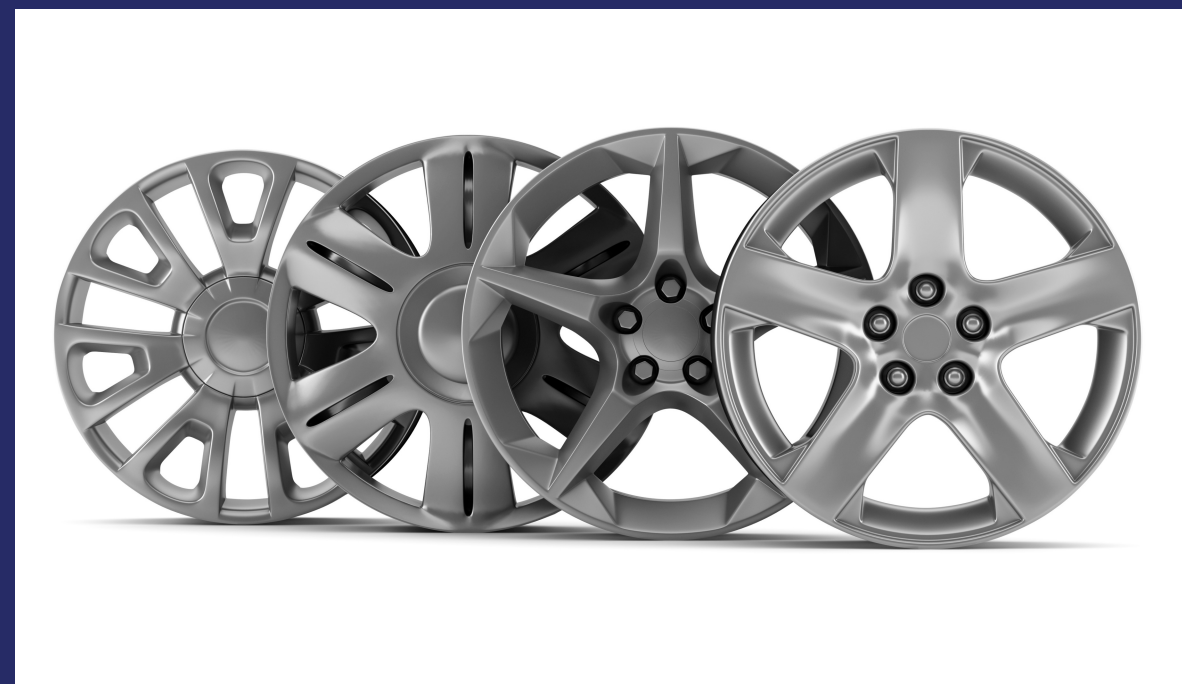
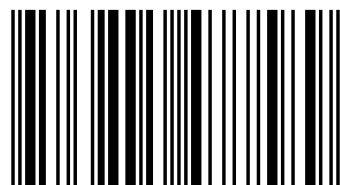


Finding information online may take very long time due to number of designing issues in these websites. Number of these issues have been discussed in the book and have been solved by providing designers with a model called the GOALAPE Model. This model consists of seven steps starting from gathering data until adding-on e-help avatar to the website, and it can be applied on any website to make it comprehensible. Simple website has been built to introduce users to the Microsoft Windows Services as an example of the existing websites with bad designs. Then, the GOALAPE Model has been applied on this website to get a better design. At the end, a survey has been conducted on a group of college students to measure their understanding of the original tool developed by Microsoft and the new website.



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Dr. Daniyal Alghazzawi

Designing a Website for Windows Services

Using the GOALAPE Model



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I would like to thank Dr. Ron Aust from the University of Kansas for his guidance and encouragement and for his advice which was very valuable. Also, I would like to thank from my deep heart my wife for her love and support. I would like to say to my parents that I am indebted to them and I am going to make you proud of me.

Abstract

My major is Computer Science. One day, I had a question about a technical issue which was about hacking. I was looking for the fastest way to find the answer through the Internet. I ended up with tens of questions instead of just one. In addition to these questions, I still did not get the answer for my main question because some websites do not represent the knowledge in a clear way. Therefore, I had to work since that time on these kinds of websites and try to find steps that they need to follow in order to help them present the knowledge in a clear way.

On January 03, 2002, “the FBI’s NIPC (National Infrastructure Protection Center) had strongly recommended that all users should immediately disable windows’ Universal Plug and Play support”. Then, GRC (Gibson Research Corporation) released a small tool to disable this service. "Universal Plug and Play" is one of the Windows’ services that opens a backdoor in your computer. There are more than 100 services that come with Microsoft Windows 7, and these services are under the Administrator Tools, so most people do not like to play with them. Therefore, GRC released a tool just to disable this specific service. Number of companies built number of tools to help you configure these services without the need to do it by yourself because they want to prevent users from playing with this technical complex issue. In my opinion, this technical issue is complex because they made it to be complex for us.

Therefore, I decided to take "Microsoft Windows Services" as an example in my book. I moved all the content from the tool developed by Microsoft to a website. Then, I applied number of steps, called the GOALAPE Model, on the website in order to get a comprehensible website. At the end, a survey has been conducted on a group of college students to measure their understanding of the original tool developed by Microsoft and my new website.

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CHAPTER I: INTRODUCTION

This book is compiled to help website designers to design a website for technical knowledge instructions. Some websites could be understandable only from their designers or only from specific levels of knowledge background. Therefore, I built a model called GOALAPE model that contains of seven steps, which can be applied on any website to make it a comprehensible website.

1.1 Concerns about Websites:

You may have a technical question, such as “What is the role of the Windows Services in computer hacking?” The fastest source to find the answer is the Internet? But this source has number of concerns in the designing. Twelve questions raised in this book about the designing issues of websites:

1. *Does the website have trusted information?*

The Internet is full with junk information. You may go to a website that focuses on protecting your computer, while the website’s designer intends to make your computer more vulnerable, so hackers can access to your computer. For example, many websites ask users to download a file to protect them from a specific virus, while this file is the virus itself. Therefore, we need a way to validate the online knowledge.

2. *Does the answer of the question separated or mixed with other information?*

I found a lot of websites that address a problem, and the answer for this problem is mixed with other problems without any connection between them. This increases the complexity of reading the content.

3. *Does the website use more than one way to present the same information?*

You may find some websites respond to questions using only text version format without any graphic. These websites do not provide a guideline to visualize the knowledge, and readers may get misleading. Presenting the same information in more than one way will confirm that users get the knowledge. The way of the people thinking may change according to their styles, so I am going classify their abilities in understanding according to the following:

1. *Numeric Style:* People with this style interpret everything they read or see in numbers. For example, you find some people like to see numbers in a historical story than words.
2. *Visual Style:* Having too much text or numbers could be confusing for some people. I personally like to see graphs all the time that describe the text with fewer words.
3. *Auditory Style:* Some people get easily disturbed when they listen to the radio, while others may focus more when they listen to the radio than reading newspapers or watching news.
4. *Colored Style:* You find some young people understand the content much better if it is presented in a lot of graphics and colors.
5. *Tactile Style:* They prefer hand-on experience than using their mind to imagine.

4. *Does the source help delivering the knowledge in an efficient way by making the users use the left and right hemispheric of the brain?*

In general, the left and right hemispheres of the brain process information in different ways. We tend to process information using our dominant side. However, the learning and thinking process is enhanced when both sides of the brain participate in a balanced manner. This means strengthening your less dominate hemisphere of the brain. Table 1 shows the characteristics of each side of the brain, so we can organize any content to make both sides work.

Left Hemisphere Style	Right Hemisphere Style
<p><i>Rational</i></p> <ul style="list-style-type: none"> • Responds to verbal instructions • Problem solves by logically and sequentially looking at the parts of things • Looks at differences • Planned and structured • Prefers established, certain information • Prefers talking and writing • Prefers multiple choice tests • Controls feelings • Prefers ranked authority structures 	<p><i>Intuitive</i></p> <ul style="list-style-type: none"> • Responds to demonstrated instructions • Problem solves with hunches, looking for patterns and configurations • Looks at similarities • Is fluid and spontaneous • Prefers elusive, uncertain information • Prefers drawing and manipulating objects • Prefers open ended questions • Free with feelings • Prefers collegial authority structures
<p><i>Sequential</i></p> <ul style="list-style-type: none"> • A splitter: distinction important • Logical, sees cause and effect 	<p><i>Simultaneous</i></p> <ul style="list-style-type: none"> • A lumpner: connectedness important • Analogic, sees correspondences, resemblances
<p>Draws on previously accumulated, organized information</p>	<p>Draws on unbounded qualitative patterns that are not organized into sequences, but that cluster around images</p>

Table 1: The Left and the Right Hemisphere of the Brain¹

5. *Does the website provide the users with a definition for all the terms? If so, does the website separate the definitions from the contexts?*

This is an important issue for the technical instructions. You may read a term, and you think that you know its meaning while you do not know; this makes you build up the wrong knowledge. Also, you may find some websites integrate the definitions with the terms; this considers time-consuming for the readers who already know these terms. The best way to solve this issue is to exclude the definitions of all the terms in separate pages for those who want them.

¹ “Left vs. Right Which Side Are You On?”, <http://intelegen.com>

6. Does the website support the answers with examples?

Having an example is an important way to help users memorize the information and to make sure the content is understandable.

7. Does the website interact with the users?

We are in the 21st century. And there are many ways to make users interact with contents. This is different from the presentation styles referred in the third question. Interacting with the users is achieved by giving them extra content or words directed to them using one of the presentation styles in order to make them feel like that the website is talking to them.

8. Does the website have a clear structure?

Websites sometimes do not provide a clear structure of the pages, so users have to move around these pages to find the answer for their questions, and they may get lost while they move from a link to another. Other people lose their focuses and forget about what they are looking for.

9. Does the website support all the styles of the different ages?

I am going to classify the styles of the different ages in the current century into three categories:

1. *Old Style:* You may have a user who grows up in an environment that the understandable criterion for them is the hard copy. For example, some people prefer the major source to be a book. With these styles, we may present the content in e-book version, so they can download the content and print it to make it look like a book.
2. *Current Style:* You may find the teenagers like to do everything on the computer. The main reason is that computers provide better interaction than the books.
3. *Future Style:* Most of the websites in the future will use high technologies to make the users feel that they are inside the scenes.

10. Does the website help people with different levels of understanding?

You may go to browse websites that have a lot of introduction that you have already known them that make you feel that these websites target the beginners' level, so you may ignore the entire website. On the other hand, some websites do not provide any introduction for complex subjects that make you feel that these websites for experts' level, so you may not be able to understand the concepts until you go over other sources.

11. Does the font style of the website help you to understand the content?

There are some websites that mix the important concepts with others. This may confuse the users who depend on the scanning strategy; they may not notice these important concepts. In order to make these concepts attracting to the users, the designers need to change their font styles.

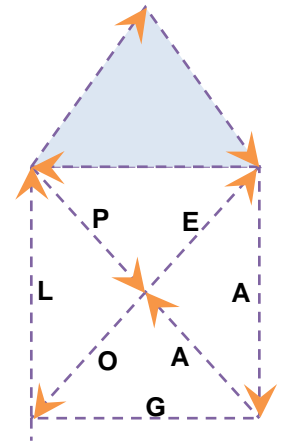
12. Does the website provide consistency for the same level of a topic?

You may find websites that merge the content of a subject into one page without any limitation of the number of the words and without any distinguish between the levels of the topics. This way may waste the time of any user who is looking for a specific answer for a question in the subject.

1.2 The GOALAPE Model

This book tries to provide designers with steps that could be applied on any website to make it comprehensible website. The acronym for these steps is GOALAPE; it means a product dedicated to clearly convey and achieve Instructional Goals on the web. The steps are:

1. **G**ather All Content
2. **O**rganize Topics
3. **A**sk Questions
4. **L**ist Terms
5. **A**udio
6. **P**rintable
7. **e**Help Avatars



1.2.1 Step One: Gathering All Content

- Put all the description for a subject in one page.
- The description may include definitions for some terms.
- Add a title for this subject.

The main idea of this step is to make designers put everything in their minds on one page. Then, they need to pick up a main topic for the content.

1.2.2 Step Two: Organize Topics

- Spilt the content into chunks. Each chunk will be in a separate page with its own sub-title.
- Link all the pages together.
- All the pages have to be in one style, so they appear to be under one main subject.

The main idea of this step is to make designers think about all the sub-topics under the main topic. This may simplify the content and organize it. The website panels can help users to move between the content of the same topic easily.

1.2.3 Step Three: Ask Questions

- Try to spilt each sub-title into more chunks:
 - If the chunks do not have strong relation between them, make further sub-titles which can be a panel in you sub-title.
 - If the chunks have very strong relation, you can distribute them horizontally.

This step will help to limit the number of words in any page, and it helps designers to exclude non-related material into a separate page.

1.2.4 Step Four: List Terms

- Remove the definitions of all the terms into a separate page.
- Ask a non-technical person about the difficult words to understand. Put an underline on all of these words and link them to a separate page that has the definition.

- If you think any term has an important definition, you may include the definition with the description.
- If the term has been repeated again in the same content, you may need to link the first one only.

Moving the definitions of the terms into a separate page will reduce the size of the main content. In addition, this will help the users to ignore reading the definitions of the terms that are already known to them. This step helps people with different level of understanding.

1.2.5 Step Five: Audio

- Present your content in at least one extra different learning style. The most common one other than the text is the audio format.

This will help the content to be presented in more than way. For the user who likes to read, they may read the text on the page. On the other hand, they are some users who prefer listening to reading, so this step is very important because it will introduce another way to present the information.

1.2.6 Step Six: Printable Version

- Serialize the content of all the pages in an electronic printable format.

This will help the old style people who prefer reading from books to read the content. Also, this feature will help the users with the mobility devices.

1.2.7 Step Seven: e-Help Avatars

- Do not forget that we are in the 21 century. You may want your website to interact with the users.

Making the website interacting with the users could be costly with some tools. You can use any of the learning styles to make your website interactive, such as the Audio Style. However, you need to add some words on the content which may get the attention of the users. Otherwise, users will feel that this feature is useless. For example, if you click on the audio button on a page with a table, you may need to describe the content of the table in more detail.

CHAPTER II: BUILDING A SIMPLE WEBSITE

This chapter focuses on building a small website to introduce users to the Windows Services before applying the GOALAPE Model. Also, it will illustrate the procedures used for gathering data and taking notes.

2.1 What is "Windows Services"?

Hackers can attack any remote computer only through the open *ports*. According to IANA (Internet Assigned Numbers Authority), they classify the ports into three categories: well-known ports (from 0 through 1023), registered ports (from 1024 through 49151) and dynamic/private ports (from 49152 through 65535). Finding an open port means one of the following:

1. The first way to open a port is to run a script on your computer. This is going to be your responsibility. You need to be careful before you run any program on your computer. Some of these programs disappear when you run them, or they may run a script while you are listening to the music or watching the clip.
2. Another way is that you ask the operating system to open this port for you. In order to do that, you need to request a service from the operating system that associates with the external world, so the operating system opens this port to facilitate the communication with other devices. This could be risky if you request a service that requires opening a critical port that hackers may use to attack your computer.
3. The last way is that the operating system opens these ports by default. Adding services you do not need could be harmful. The operating system offers to you a lot of services that connects you with the external world, that means the operating system opens a lot of ports for you by default.

The starting of any services is based on the option that has been chosen by the operating system as default unless the user changes them later. The options for the startup each service are:

1. The first option is *automatic*, which means the operating system loads the process for this service in the memory and all the other processes that associate with it when the operating system starts up, and if this service requires opening a specific port, the operating system will do it automatically. This option could be harmful if you do not need this service because it affects the security and the performance of your computer.
2. The second option is *manual*, which means that the operating system is not going to start this service when the operating system starts up. However, you give the permission to the operating system to start this service if any program from your computer requests it.
3. The last option is *disabled*, which means that you do not need to run this service under any circumstance, so you do not give a permission to the operating system to start this service.

Microsoft Windows provides users with number of ways to access to the list of the services in the operating system. Some of the ways to access the Windows Services are:

1. Click on Start -> Settings -> Control Panel -> Administrative Tools -> Services. The Windows Services will appear as shown in Figure 1.

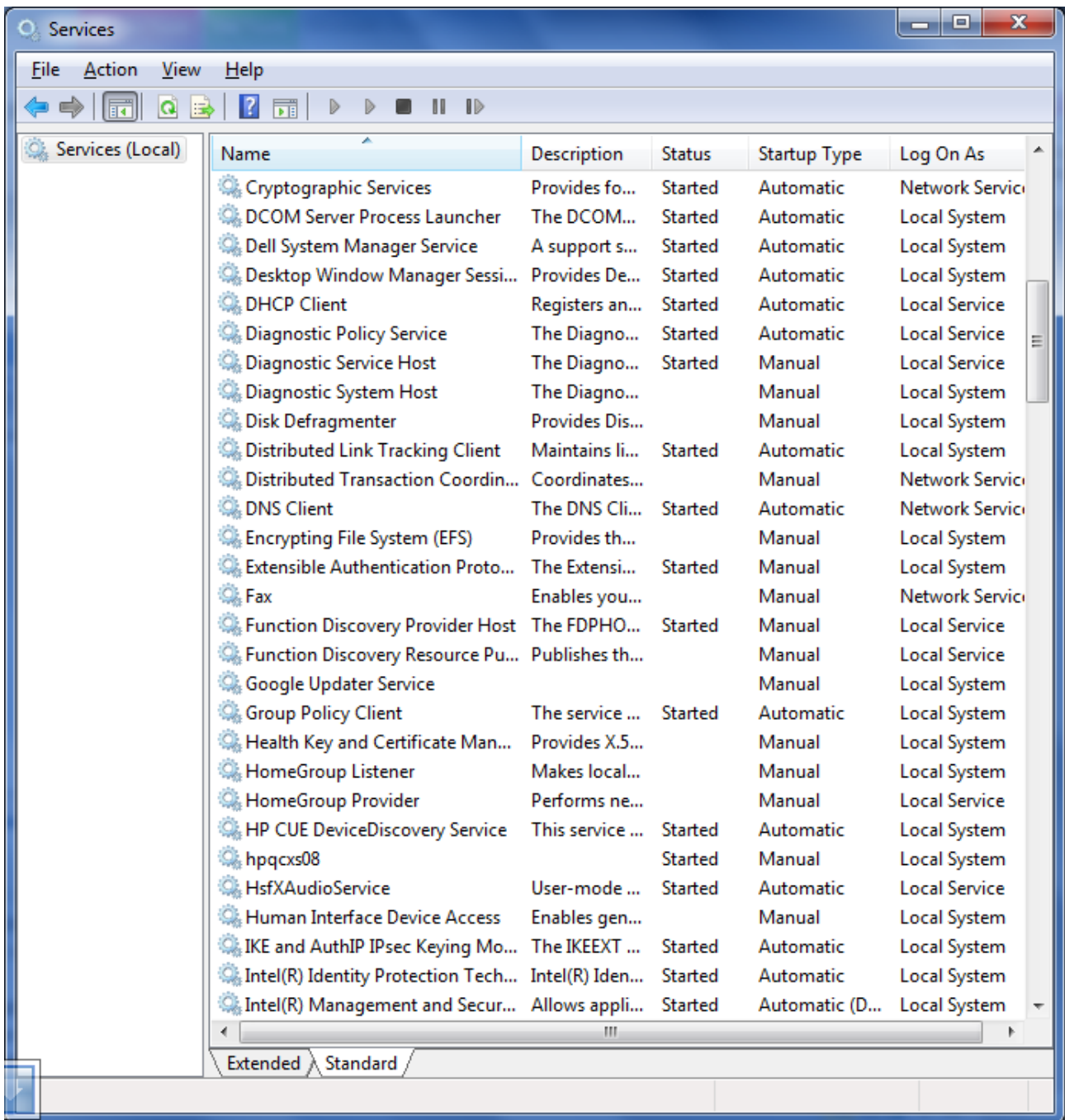


Figure 1: Windows 7 Services Screen

2. Click on Start -> Run, and then type *services.msc*. This will bring up the Windows Services screen as shown in Figure 1.
3. Click on Start -> Run, and then type *Regedit*. Then, go to the following location in the tree: [HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\]. The advantage of using the registry is that you can have a backup of the existing setting before you make any changes. Also, you will see a list of the services shown in Figure 1 in addition to others. This is the way that the hackers use to enable or disable services on a remote machine.

2.2 Gathering Data

Number of steps has been followed to convert the content of the tool developed by Microsoft Windows to a simple website without using the GOALAPE Model. These steps are:

1. Finding more references for each service to understand the objective of each of them.
2. Classifying these services into categories.
3. Bringing up all the information about each service from the operating system.
4. Knowing if this service associates with specific ports.
5. Classifying these services based on the Performance & Security:
 - *Performance*: For the service that opens a new process in the operating system or takes too much from the memory. This service is going to affect the performance on the machine. The same applies for the service that shares with other services in one process or relates to the multimedia application like Windows Media Player. This service is going to affect the performance on the machine but not too much. It may improve the performance if you shut off the entire process by stopping all the services associated with it.
 - *Security*: That means either this service will open a backdoor by opening a port on your computer or will protect your computer. Also, it may make your computer vulnerable by giving other people more privileges on your computer.
 - *Normal*: The service does not take too much from the memory and does not relate to security issue.
6. After reviewing all the previous issues, I want to present some recommendations for the users. Therefore, I have to know my target first, so I classified the users into:
 - *Alone*: The user does not have any connection like Modem, Cable or DSL. Therefore, he should not worry about the security at all. Here, the focus is going to be on the performance only.
 - *Modem*: The user uses a Modem to make outside connection. So the user needs to protect his computer more than thinking about the performance. Here, the focus is going to be on securing the dial-up connection.
 - *Cable/DSL*: The user either has Cable or DSL to connect his computer. So the user needs to protect his computer more than thinking about the performance. Here, the focus is going to be on securing the Cable/DSL connection.
 - *Part of Network*: The user is connected to a network using Hub or Switch. So, there is someone who is going to take care a little bit about the security issue. So, the user needs to protect his computer more than thinking about the performance. Here, the focus is going to be on the Performance more than on the Security.
 - *School*: The user is a student which means that the user is a part of network. However, I am going to expect the administrator does not have enough knowledge to keep the computers in the school secure. Here, the focus is going to be on the Security more than the Performance.
 - *Gaming*: The user has Modem, Cable or DSL. However, he does not care on keeping his computer secure because he may not care whether someone hacks his computer. Here, the focus is going to be on the Performance only.

- *Cisco*: I am going to present the option that Cisco Secure ACS Appliance v3.2 is used to secure Cisco Secure ACS server system.
7. Building a database that has all the above information.
 8. Building a website that shows this information to the users.
 9. Build a program that the users could download from the site. This program will help the users to Disable/Manual/Automatic any service depending on the category that he picks up. In the same time, build a feature in this program that helps the user to download any new update from the internet.

One of the difficulties in this project is gathering data. I focused on 78 services, and I had to understand each of them in detail order to write my notes and the recommendation settings for each service. I used three types of resources: *books*, *conferences*, and *Internet*. I decided just to review Microsoft’s books about the Windows’ Services, and I did not show any of these references to the users on the website. In addition to the books, I used two conferences as shown in Figure 2, which are concerned with this subject. The first one was SANS (SysAdmin, Audit, Network, Security), and the second one was USNIX Security Symposium. These two conferences helped me to find out the vulnerabilities in the Windows’ Services that allow hackers to attack computers. The last resource was the Internet, which is the most difficult one because I have to look after the trusted websites only.

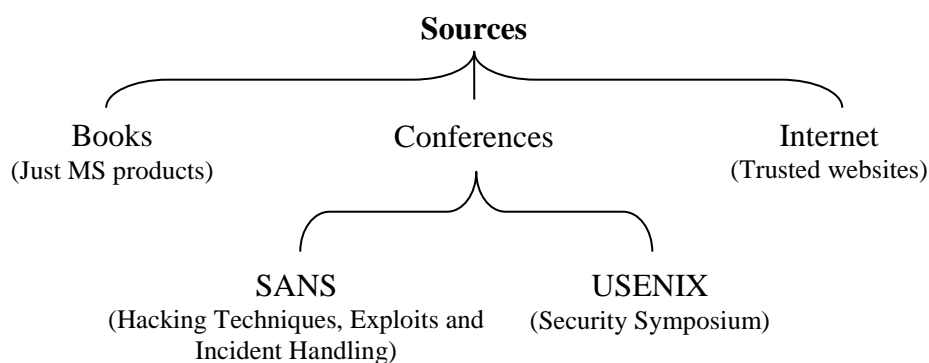


Figure 2: Types of Sources used in Gathering Data

The way by which I built my trust for each website is to have a tree for the trusted websites as shown in Figure 3. The roots for this tree are *Education*, *Government* and *Known Websites*:

- The education websites cover all the websites that their addresses have (.edu), such as <http://kau.edu.sa> and <http://www.ku.edu>.
- The second root is Government websites that cover all the websites that their addresses have (.gov), such as <http://www.fbi.gov>.
- The last root is Known Websites that covers all the known websites, such as <http://www.microsoft.com>.

Each external link in any of these roots will be a node under this root, and it will be trusted node. Appendix 1 shows the references that I used for each service in order to build the content of the website.

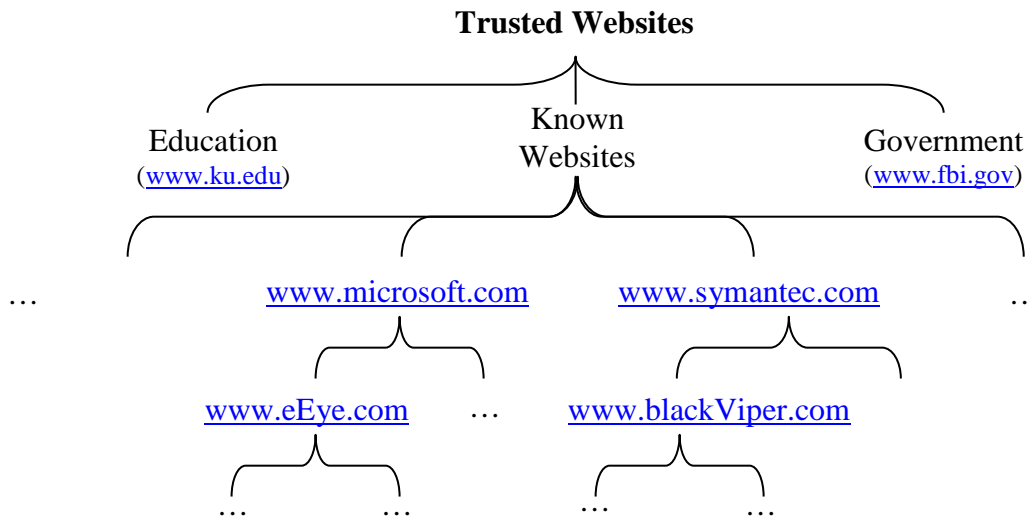


Figure 3: Trusted Website Tree

I found some interesting non-trusted websites, but I had to review them for one of the following reasons:

- It may give *the hackers* ways to attack other computers. For example, some websites give you a script that you need to run on the victim's machine to attack his computer. I put this kind of the websites as references in case someone wants to go deeper, and I have not written anything about them in my notes.
- It has a *personal experience*. For example, someone may recommend disabling or enabling some services to enhance the performance of the operating system. I put this kind of the websites as references, and I have not write anything about them in my notes.
- *Questions and Answers* websites. There are some websites that respond to the users questions from their own experience. In this case, it was very hard to trust such websites. Therefore, I have not added any of them to my references unless I found them interesting.
- Some of them have *recommended settings* for each service depending on their own experience. I put these websites in my considerations when I put the recommended settings, and I have not put any of these websites in the references unless I found interesting information.
- Some websites are very interesting and give an example about *how to use each service*, such as the best way to use a service. In this case, I put these websites in the references. Because I am not sure about the information in those websites, I decided not to mention them in my notes about the service.

2.3 Building the Website

It is the time now to post the conclusion after reading all the references about each service in a website. The following steps used to build a simple website:

2.3.1 Step One: Windows Description

The description of each service provided by MS-Windows is added to the website, but I consider them sometimes useless because:

1. *Technical Descriptions*: Most of the users will have very hard time to understand them. You may need to do research in order to understand them.

2. *Without Pros nor Cons*: You are not sure what happens if you turn such services ON/OFF. Turning on one of the services may cause conflict with other programs, or some programs needs some of these services to be running all the time.
3. *Performance*: You may keep some of unnecessary services running all the time. Some of these services act like a firewall, that means you are going to waste a lot of memory by running them. Windows Description does not tell you whether running a specific service will affect the performance.
4. *Security*: As I mentioned in the introduction that the only way for the hackers to access your computer is through open ports. Some of windows services give the hackers ways to access to your computer by opening backdoors for them like *NetMeeting Remote Desktop Sharing* services.
5. *Recommendation*: What about if you get confused about a specific service that you do not know whether you need this service?. You may not have Internet access, so why should you keep the Firewall running all the time !!!

Windows makes all of their users scared, so they do not want them to play with any default that they made. Therefore, they put the services under Administrator Tools, and in most of the descriptions, they said at the end “*If this service is disabled, any services that explicitly depend on it will fail to start.*” Appendix 2 shows the Windows’ description about each service.

2.3.2 Step Two: My Notes

A conclusion of all the references about each service has been put into the website and I considered the following:

1. *The Concept of the Service*: I described the service in a simple way that helps the users to understand the main concept.
2. *Personal Experience*: I put some of my personal experiences and of other people’s who tried to manipulate with such services.
3. *Vulnerability*: Some of these services are vulnerable. They may allow two kinds of attacks: Denial Of Service attack OR/AND buffer overrun. Some of them can be solved by releasing a patch from Microsoft, and the others are still dangerous. I mentioned this vulnerability in my notes even it has been solved.

The main idea of my notes is to make the users more familiar with each service. Some of these users have no idea about the technical issues, so they need someone to describe them in a simple way. Appendix 3 shows my notes on each service.

2.3.3 Step Three: Categories

I put these services under one of the following categories: (0) Local Service, (1) Clustering and Load Balancing, (2) Remote Access, (3) Collaboration, (4) Remote Administration, (5) Communication, (6) Internet Service, (7) Disk and File Management, (8) Removable and Remote Storage, (9) Event Monitoring, Logging and Alerting, (10) System Administration, (11) Hardware, (12) System Services, (13) Internet Clients, (14) TCP/IP Networking, or (15) Windows Networking. Table 2 shows the category of each service:

Cat	#	Service Name
0	18	Help and Support
	39	Print Spooler
	46	Remote Procedure Call (RPC) Locator
	57	System Event Notification
	61	Telephony
	64	Themes
	68	Utility Manager
	69	Volume Shadow Copy
	71	Windows Audio
1	13	Distributed Transaction Coordinator
2	42	Remote Access Auto Connection Manager
	43	Remote Access Connection Manager
	49	Routing and Remote Access
3	30	NetMeeting Remote Desktop Sharing
4	44	Remote Desktop Help Session Manager
	62	Telnet
	63	Terminal Services
5	6	ClipBook
6	5	Background Intelligent Transfer Service
	10	Cryptographic Services
	56	SSDP Discovery Service
	66	Universal Plug and Play Device Host
	67	Upload Manager
7	12	Distributed Link Tracking Client
	21	Indexing Service
	25	Logical Disk Manager
	26	Logical Disk Manager Admin. Service
	28	MS Software Shadow Copy Provider
8	48	Removable Storage
9	1	Alerter
	4	Automatic Updates
	7	COM Event System
	8	COM System Application
	15	Error Reporting Service
	16	Event Log
	36	Performance Logs and Alerts
	47	Remote Registry
10	3	Application Management
	58	System Restore Service

cat	#	Service Name
	59	Task Scheduler
	73	Windows Installer
	74	Windows Manage. Instrumentation
	75	Windows Time
11	19	Human Interface Device Access
	20	IMAPI CD-Burning COM Service
	37	Plug and Play
	38	Portable Media SN Service
	53	Shell Hardware Detection
	54	Smart Card
	55	Smart Card Helper
	65	Uninterruptable Power Supply
	72	Windows Image Acquisition
12	34	Network Location Awareness
	45	Remote Procedure Call
	51	Security Accounts Manager
	77	WMI Performance Adapter
13	2	Application Layer Gateway Service
	11	DHCP Client
	14	DNS Client
	70	WebClient
	78	Workstation
14	22	Internet Connection Firewall
	23	Internet Connection Sharing
	41	QoS RSVP
	60	TCP/IP NetBIOS Helper
15	9	Computer Browser
	17	Fast User Switching Compatibility
	24	IPSec Services
	27	Messenger
	29	Net Logon
	31	Network Connections
	32	Network DDE
	33	Network DDE DSDM
	35	NT LM Security Support Provider
	40	Protected Storage
	50	Secondary Logon
	52	Server
	76	Wireless Zero Configuration service

Table 2: The Category of each Service

2.3.4 Step Four: Performance and Security

The main idea of putting the performance and the security separate from the notes is to attract the users when they review the services. So, if they found that this service relates to either Security or Performance, they need to review this service carefully. Table 3 shows all the services that relate to the performance, while Table 4 shows all the services that relate to the security issue. The performance and the security for each service can be described as following:

- *Performance*: It was very difficult to decide which service effect the performance higher than the others.
- *Security*: That means either this service will open a backdoor by opening a port in your computer or will protect your computer.

High Performance		Low Performance	
1	Alerter	8	COM System Application
2	Application Layer Gateway Service	16	Event Log
6	ClipBook	24	IPSec Services
7	COM Event System	27	Messenger
9	Computer Browser	28	MS Software Shadow Copy Provider
10	Cryptographic Services	29	Net Logon
12	Distributed Link Tracking Client	33	Network DDE DSDM
13	Distributed Transaction Coordinator	35	NT LM Security Support Provider
14	DNS Client	37	Plug and Play
20	IMAPI CD-Burning COM Service	40	Protected Storage
21	Indexing Service	51	Security Accounts Manager
26	Logical Disk Manager Administrative Service	55	Smart Card Helper
30	NetMeeting Remote Desktop Sharing	60	TCP/IP NetBIOS Helper
32	Network DDE		
36	Performance Logs and Alerts		
39	Print Spooler		
41	QoS RSVP		
44	Remote Desktop Help Session Manager		
46	Remote Procedure Call (RPC) Locator		
54	Smart Card		
56	SSDP Discovery Service		
58	System Restore Service		
62	Telnet		
63	Terminal Services		
65	Uninterruptable Power Supply		
66	Universal Plug and Play Device Host		
69	Volume Shadow Copy		
70	WebClient		
73	Windows Installer		
74	Windows Management Instrumentation		
77	WMI Performance Adapter		

Table 3: The Effective of each Service on the Performance

#	Service Name	Ports
1	Alerter	
2	Application Layer Gateway Service	
4	Automatic Updates	
7	COM Event System	
8	COM System Application	
9	Computer Browser	
13	Distributed Transaction Coordinator	3372, 135
15	Error Reporting Service	
22	Internet Connection Firewall	
23	Internet Connection Sharing	
27	Messenger	TCP [135,139,445], UDP [135,137,138]
30	NetMeeting Remote Desktop Sharing	1720
47	Remote Registry	
52	Server	
56	SSDP Discovery Service	UDP [1900], TCP [5000]
59	Task Scheduler	135
61	Telephony	
62	Telnet	
63	Terminal Services	3389
66	Universal Plug and Play Device Host	
70	WebClient	

Table 4: The Effective of some Service on the Security

2.3.5 Step Five: Recommendations

Now, the users have a clue about each service, and whether each of them is going to improve the performance or the security. Users may still not be able to make a decision whether to keep this service running or stop it. Therefore, the final stage in this project is to give the users a recommendation depending on their environments [Alone, Modem, Cable/DSL, Part of Network, School, Gaming, or Cisco]. Appendix 3 shows the recommendations about each service in each environment.

2.4 The Website before Applying the GOALAPE Model

Two pages were built to carry all the detail discussed in the previous section about the Windows Services including an introduction about these services. These two pages are:

1. The *Introduction Page*, as shown in Figure 4-a, is to give the users general information about Windows Services.
2. The *Service Page*, as shown in Figure 4-b, is to give users the following detail about each service:
 - Service Name.
 - Process Name.
 - Log on as.
 - Windows 7 Default.
 - Windows 7 Pro Default.
 - Category.
 - Antecedent.
 - Dependent
 - Security.
 - Ports.
 - Performance.
 - Services Sharing Process.
 - Windows Description.
 - Recommended Setting.
 - Note.
 - References.

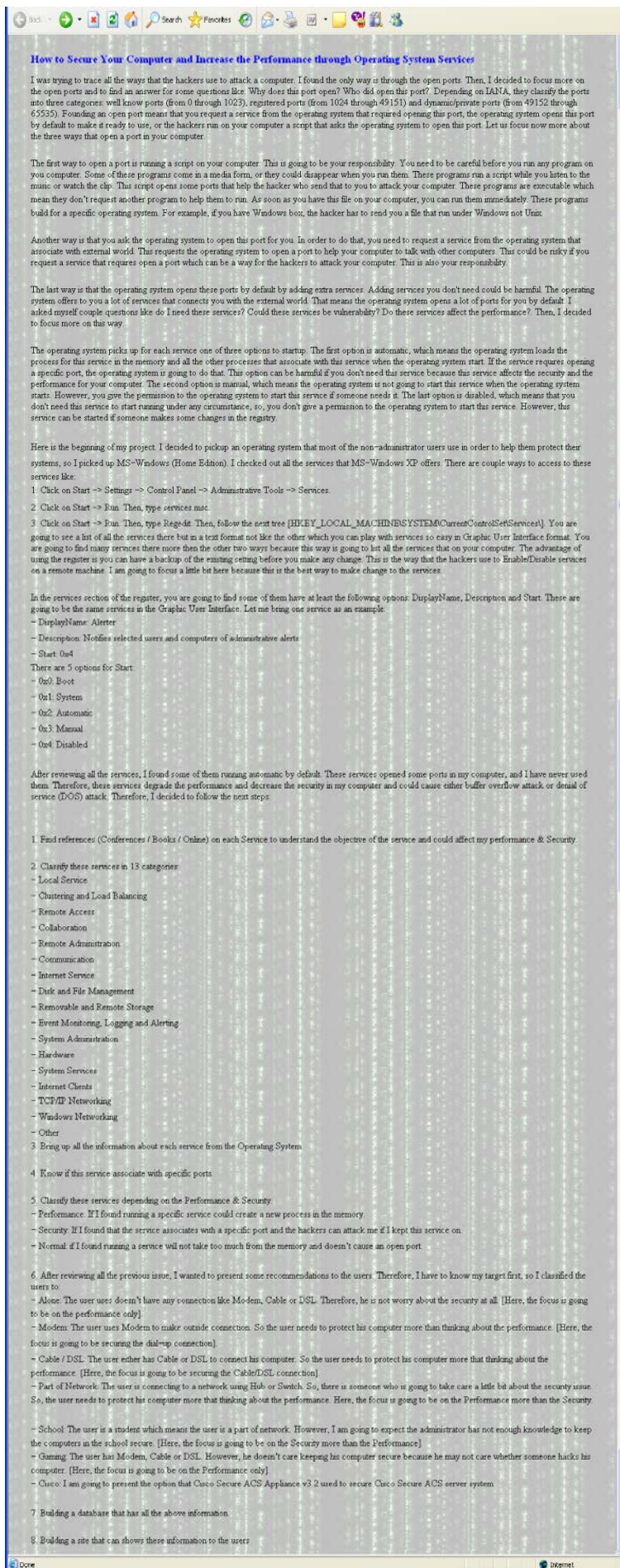


Figure 4-a: The Main Page before the GOALAPE Model

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites

Windows Services Manager

Service Name	1. Alerter		
Process Name	services.exe	Path	Local Service
Startup Type	Manual	Default XP Home	Manual
Category	Event Monitoring, Logging and Alerting		
Antecedent (Parents)	78	Dependent (Children)	None
Security		Ports	No port.
Performance		Services Sharing Process	Alone
Windows Description	Notifies selected users and computers of administrative alerts. If the service is stopped, programs that use administrative alerts will not receive them. If this service is disabled, any services that explicitly depend on it will fail to start.		
Recommend Setting	<input type="checkbox"/> - Alone <input type="checkbox"/> - Modem <input type="checkbox"/> - Cabel/DSL <input type="checkbox"/> - Part of Net <input type="checkbox"/> - School <input type="checkbox"/> - Gaming <input type="checkbox"/> - Cisco		
Note	The Alerter Service uses the Messenger service to send and transmit messages in the form of pop-up alert boxes between Windows computers. The Messenger Service is not related to the Windows Messenger like MSN messenger. With this service enabled, remote hosts, users or attackers are able to generate unsolicited pop-up message boxes on a host as a form of Spam or Denial Of Service attack.		
References:	<ol style="list-style-type: none"> http://hq.mcafeeasap.com/vulnerabilities/vuln_data/30000.asp http://iatservices.missouri.edu/tech-bulletin/windows-file-sharing.html http://ntg.depaul.edu/rd/technotes/m-winxp-msngr.txt http://support.microsoft.com/?kbid=330904 http://support.microsoft.com/default.aspx?scid=KB;EN-US;Q148991& http://www.cezeo.com/solutions/intranet-alerter/ http://www.cisco.com/en/US/products/sw/secursw/ps5338/products_installation_guide_chapter09186a0080193afc.html http://www.cmu.edu/computing/sec/secure.windows.html http://www.hansenonline.net/Networking/winsec.html http://www.intersectalliance.com/projects/WinNTConfig/WinNTConfig-AppendixA.html http://www.microsoft.com/windowsxp/pro/using/howto/communicate/stopsppam.asp http://www.naspa.com/PDF/2001/1101%20PDF/T0111008.pdf http://www.networkscanning.com/details/vulnerability_10457.php http://www.securityspace.com/smysecure/catid.html?id=10457 http://www.systemsbysteve.com/winguides/w2k3services.htm http://www.techtv.com/screensavers/answerstips/story/0,24330,3374542,00.html http://www.theeldergeek.com/alerter.htm http://www.winguides.com/registry/display.php/832/ 		

Notes:

- To know the different between Dependent and Antecedent, [click here](#).
- If you found a picture in the Security field that means the hackers could attack you through this service.
- They are 3 options for the Performance:
 - Normal:** this means this service is not going to improve the performance too much if you disable it.
 - : this means that this service is going to improve the performance if you disable it with all the services that associate with it. (You can see their numbers at *Services Sharing Process* field)
 - : this means this service is really going to affect the performance if you disable it. (Be careful, it could degrade the performance if you have a program that needs it).
- I put the recommendation settings for several categories:
 - I recommend to disable this service.
 - I recommend to make this service manual.
 - I recommend to make this service automatic.
 - I have no recommendation. The decision here is depending on you.

Done Internet

Figure 4-b: The Service Page before the GOALAPE Model

CHAPTER III: APPLYING THE GOALAPE MODEL

3.1 Applying the GOALAPE Model

My main objective in this book is to find out some steps that designers may follow in order to present technical knowledge to non-technical people. This chapter will apply the seven steps in the GOALAPE Model to the website shown in Figure 4-a and Figure 4-b.

3.1.1 Step One: Gathering All Content

- Put all the description for a subject in one page.
- The description may include definitions for some terms.
- Add a title for this subject.

The output of this step will be very similar to Figure 4-a and Figure 4-b except the color of the pages has been changed and a logo of a company has been post it.

3.1.2 Step Two: Organize Topics

- Spilt the content into chunks. Each chunk will be in a separate page with its own sub-title.
- Link all the pages together.
- All the pages have to be in one style, so they appear to be under one main subject.

Figure 5-a shows the Main Page, which will be called the *Introduction Page*, after applying this step, while Figure 5-b shows the Service Page, which will be called the *Site-Side Page*. Figure Figure 5-c called *Program-Side Page* provides users with a small tool developed to help them working with the Windows Services.

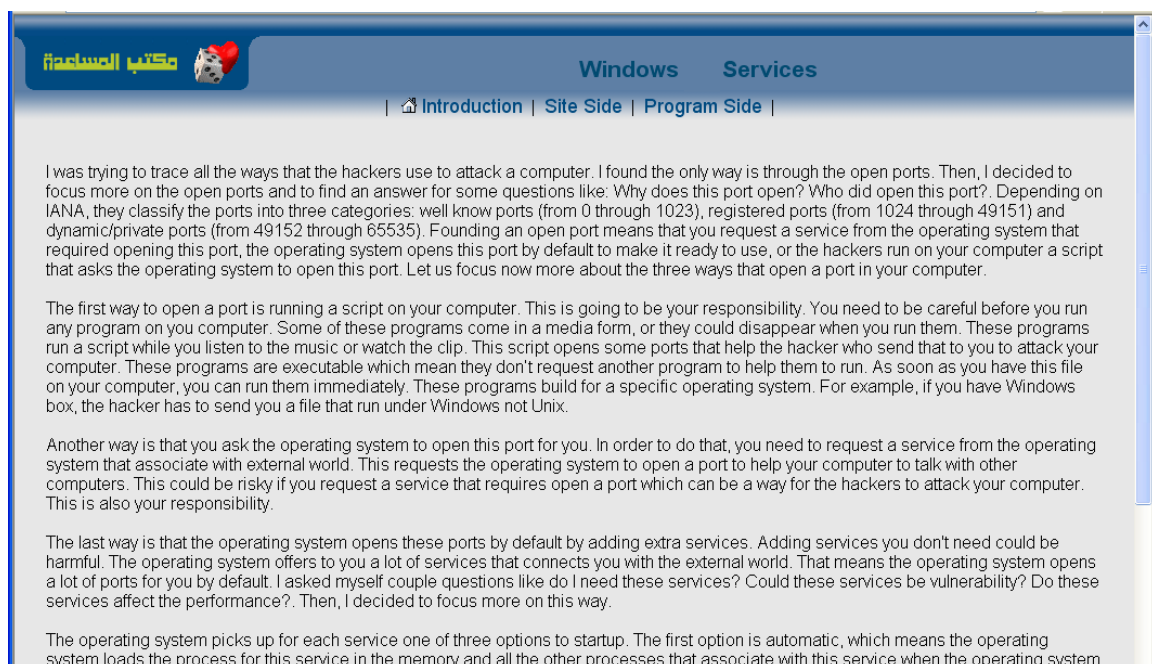


Figure 5-a: The Introduction Page after the Second Step

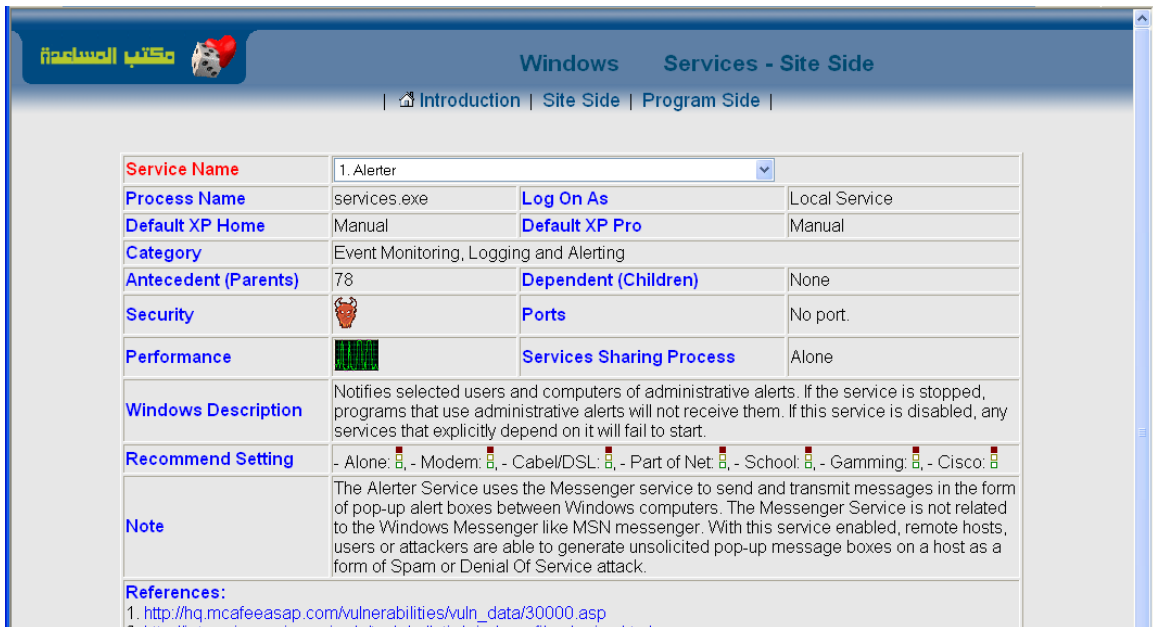


Figure 5-b: The Site-Side Page after the Second Step

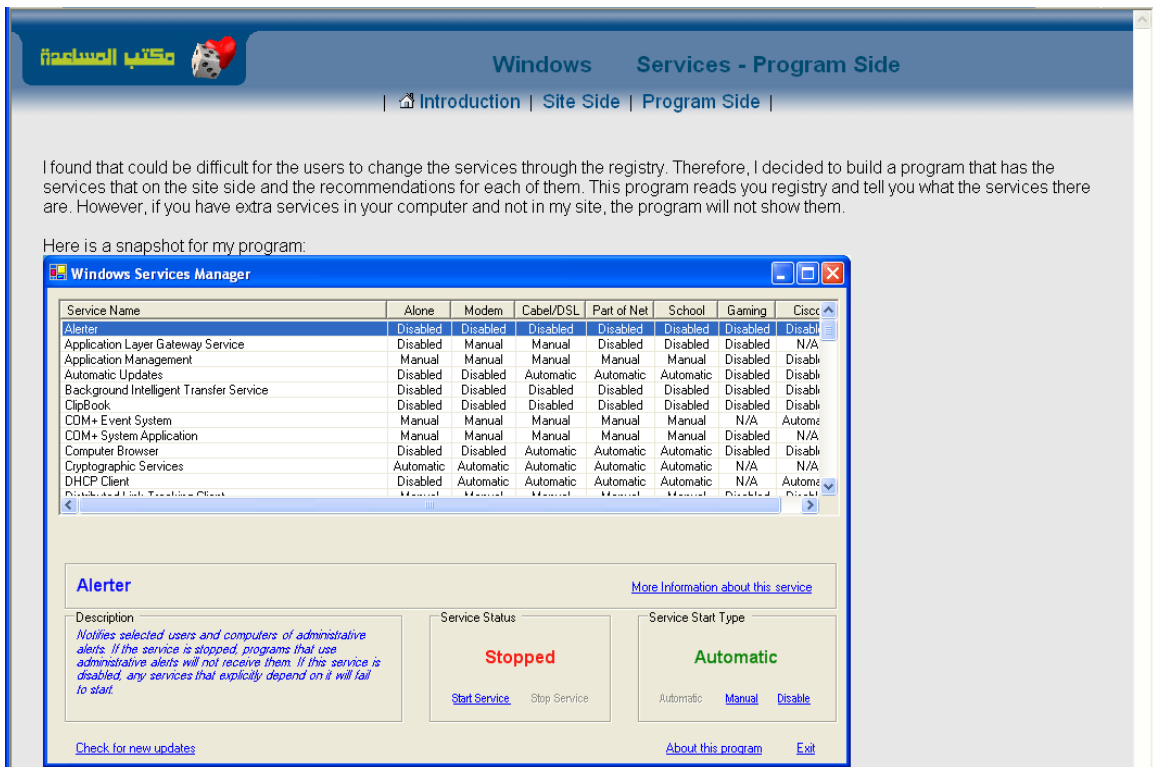


Figure 5-c: The Program-Side Page after the Second Step

3.1.3 Step Three: Ask Questions

- Try to spilt each sub-title into more chunks:
 - If the chunks do not have strong relation between them, make further sub-titles which can be a panel in you sub-title.
 - If the chunks have very strong relation, you can distribute them horizontally.

Figure 6-a shows the first chunk of the Introduction Page after applying this step, while Figure 6-b and Figure 6-c show the other two chunks.

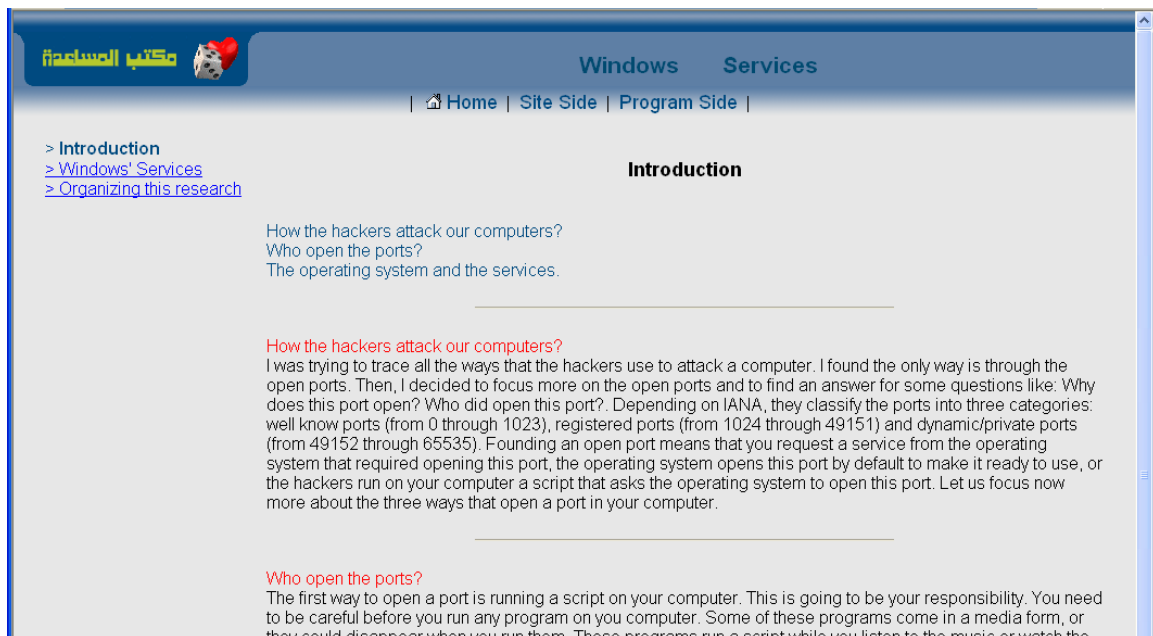


Figure 6-a: The First Chunk in the Introduction Page after the Third Step



Figure 6-b: The Second Chunk in the Introduction Page after the Third Step

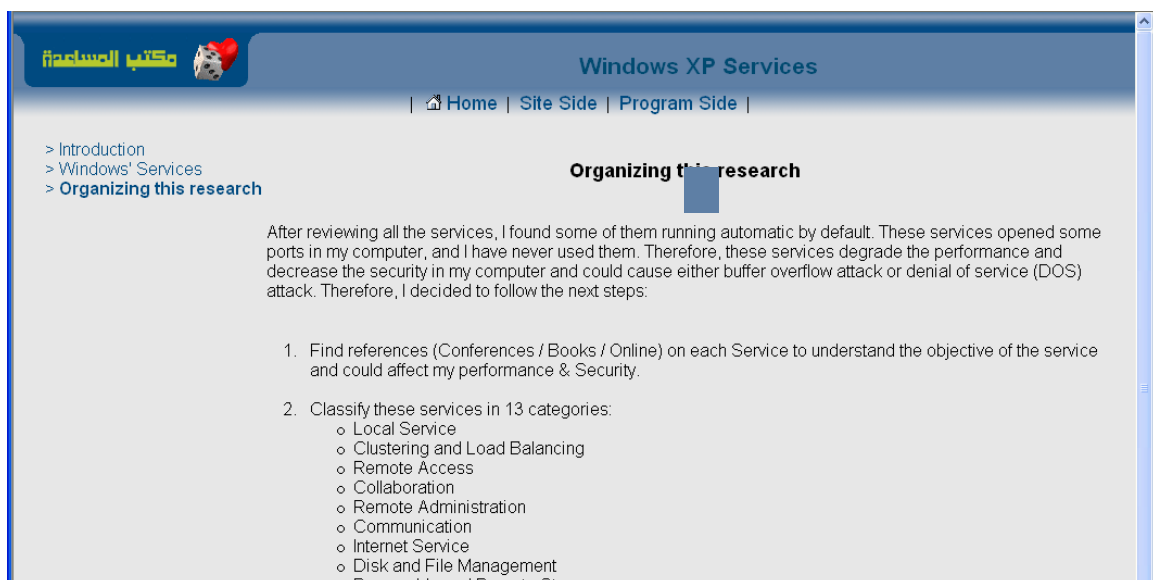


Figure 6-c: The Third Chunk in the Introduction Page after the Third Step

3.1.4 Step Four: List Terms

- Remove the definitions of all the terms into a separate page.
- Ask a non-technical person about the difficult words to understand. Put an underline on all of these words and link them to a separate page that has the definition.
- If you think any term has an important definition, you may include the definition with the description.
- If the term has been repeated again in the same content, you may need to link the first one only.

Figure 7 present the website after applying removing all the definitions of all the terms into a separate page, which results is reducing the size of the page.

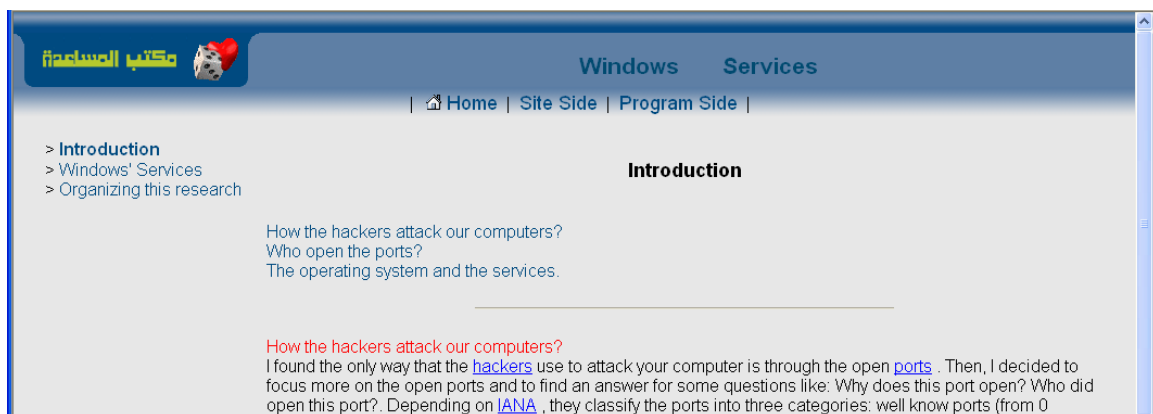


Figure 7: The First Chunk in the Introduction Page after the Fourth Step

3.1.5 Step Five: Audio

- Present your content in at least one extra different learning style. The most common one other than the text is the audio format.

Figure 8 shows a snapshot of the website after applying this step. You will see in the figure that there is a link in the front of each a topic that reads “[\(Please, Read this part for me\).](#)”

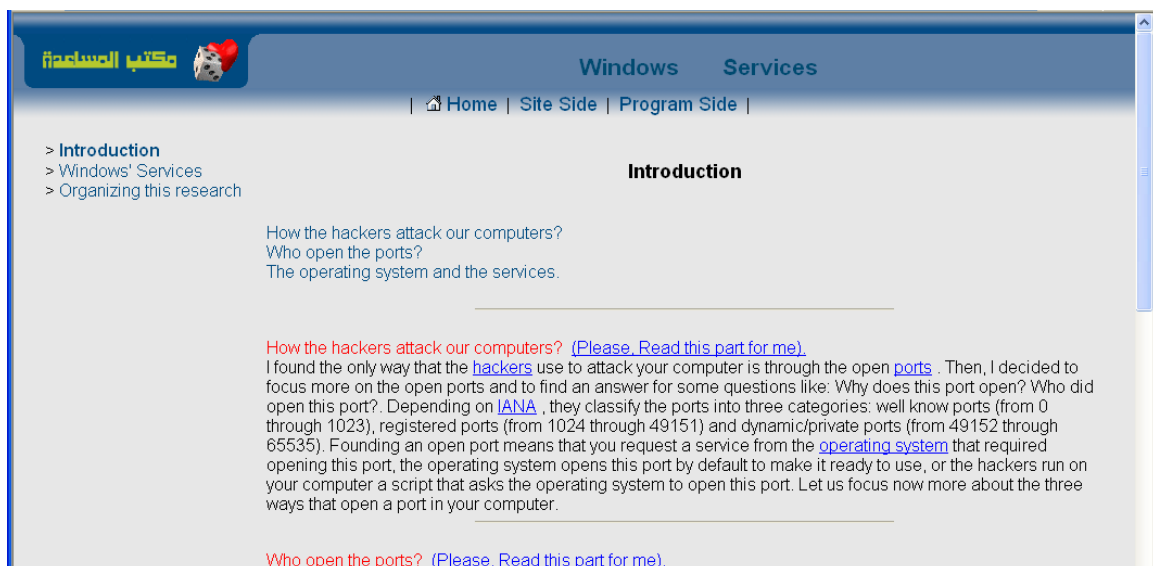


Figure 8: The First Chunk in the Introduction Page after the Fifth Step

3.1.6 Step Six: Printable Version

- Serialize the content of all the pages in an electronic printable format.

Figure 9 shows the main page after putting an icon on the left panel linked to a presentation file. The content of this file is similar to the content of the Introduction Page.

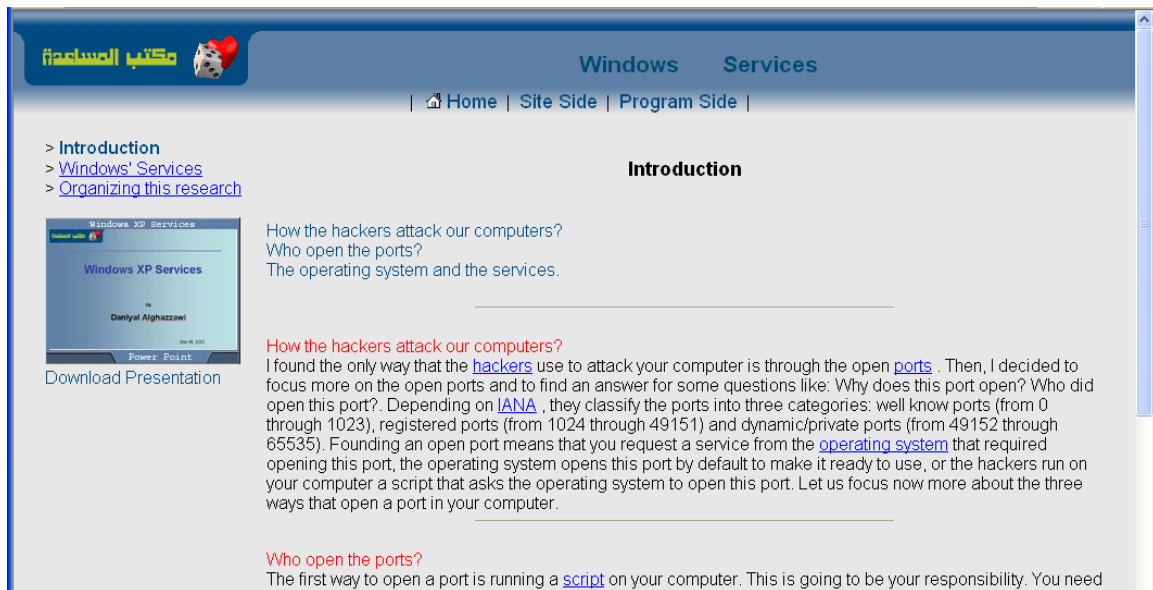


Figure 9: The First Chunk in the Introduction Page after the Sixth Step

3.1.7 Step Seven: e-Help Avatars

- Do not forget that we are in the 21 century. You may want your website to interact with the users.

Figure 10-a, Figure 10-c, and Figure 10-c show the Introduction Page after applying this final step. Figure 10-d shows the Site-Side Page after applying this step, while Figure 10-e shows the Program-Side Page after applying this step.

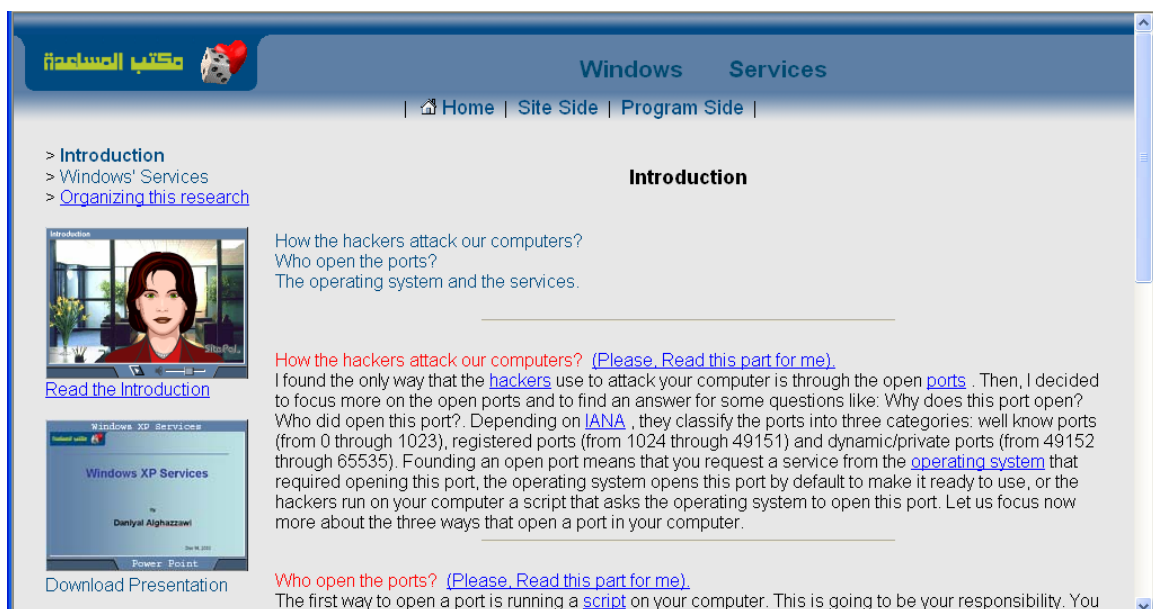


Figure 10-a: The First Chunk in the Introduction Page after the GOALAPE Model

مكتب المساعدة

Windows Services

| Home | Site Side | Program Side |

> Introduction
 > **Windows' Services**
 > Organizing this research

Windows' Services

Here is the beginning of my project. I decided to pickup an operating system that most of the non-administrator users use in order to help them protect their systems, so I picked up MS-Windows (Home Edition). I checked out all the services that MS-Windows XP offers. There are couple ways to access to these services like:

1. Click on Start -> Settings -> Control Panel -> Administrative Tools -> Services.
2. Click on Start -> Run. Then, type services.msc.
3. Click on Start -> Run. Then, type Regedit. Then, follow the next tree [HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\]. You are going to see a list of all the services there but in a text format not like the other which you can play with services so easy in Graphic User Interface format. You are going to find many services there more then the other two ways because this way is going to list all the services that on your computer. The advantage of using the register is you can have a backup of the existing setting before you make any change. This is the way that the hackers use to Enable/Disable services on a remote machine. I am going to focus a little bit here because this is the best way to make change to the services.

Read the entire text

Figure 10-b: The Second Chunk in the Introduction Page after the GOALAPE Model

مكتب المساعدة

Windows Services

| Home | Site Side | Program Side |

> Introduction
 > Windows' Services
 > **Organizing this research**

Organizing this research

After reviewing all the services, I found some of them running automatic by default. These services opened some ports in my computer, and I have never used them. Therefore, these services degrade the performance and decrease the security in my computer and could cause either buffer overflow attack or denial of service (DOS) attack. Therefore, I decided to follow the next steps:

1. Find references (Conferences / Books / Online) on each Service to understand the objective of the service and could affect my performance & Security.
2. Classify these services in 13 categories:
 - o Local Service
 - o Clustering and Load Balancing
 - o Remote Access
 - o Collaboration
 - o Remote Administration
 - o Communication
 - o Internet Service

Read the entire text

Figure 10-c: The Third Chunk in the Introduction Page after the GOALAPE Model

مكتب المساعدة

Windows Services - Site Side

| Home | Site Side | Program Side |

Describe this table

Service Name	1. Alerter		
Process Name	services.exe	Log On As	Local Service
Default XP Home	Manual	Default XP Pro	Manual
Category	Event Monitoring, Logging and Alerting		
Antecedent (Parents)	78	Dependent (Children)	None
Security		Ports	No port.
Performance		Services Sharing Process	Alone
Windows Description	Notifies selected users and computers of administrative alerts. If the service is stopped, programs that use administrative alerts will not receive them. If this service is disabled, any services that explicitly depend on it will fail to start.		

Figure 10-d: The Site-Side Page after the GOALAPE Model



Figure 10-e: The Program-Side Page after the GOALAPE Model

3.2 Answers on the Twelve Questions

This section investigates the twelve questions in the first chapter regarding to the designing issues after applying the GOALAPE Model on the previous example website.

1. *Does the website have trusted information?*

Yes. All the information in the website is supported by references, and users have the option to whether trust them.

2. *Does the answer of the question separated or mixed with other information?*

Yes. You will find in the Introduction Page that the introduction is divided into three questions, and each question is separated from the others. Each of these questions is put for a specific purpose.

3. *Does the website use more than one way to present the same information?*

Yes. You will find that the Site-Side Page supports the content with three styles: numeric, visual and colored styles. So, you will find the *services* put in a numeric order in order to refer to them later in *Antecedent* and *Dependent*. Also, the *Security* and *Performance* have icons (visual) that refer to the value. Also, the colored style is used in the *Recommendation Setting* by the traffic-light icon.

4. *Does the source help delivering the knowledge in an efficient way by making the users use the left and right hemispheric of the brain?*

Yes. If you look at the Introduction Page, you will find that the table supports some of the information spatial, and the others are verbal. The way the source describes the spatial icons is by having a meaningful icon and by describing the meaning of these icons at the end.

5. *Does the website provide the users with a definition for all the terms? If so, does the website separate the definitions from the contexts?*

Yes. You will find that some terms have been linked to a separate page. If a term is repeated again, you will not find it linked because we do not want to distribute the users and make them feel that there is a new term.

6. *Does the website support the answers with examples?*

Yes. If you look at the Site-Side Page, there are some examples for some of the *services*. For example, in *Alerter Service* in the *Note*, there is an example to make the users understand the meaning of this *service* which is the *MSN Messenger*.

7. *Does the website interact with the users?*

Yes. This is so clear if we look at the cartoon person on each page. In order to make the users feel that they interact more with the website, the cartoon person does not read exactly what is on the screen, but it tries to add more onto the content. For example, in the Site-Side Page, you will find the cartoon person describe the table itself. Also, you will find the eye of the cartoon face try to trace the mouse movement.

8. *Does the website have a clear structure?*

The source has a clear structure. Having the same main (top) panel on each page makes the users feel the consistency of the design and makes the user feel more comfortable when they move between them. Also, if any content has more divisions, it is divided to the left panel as happened in the Introduction Page with the three sub-topics. Also, we divided the content of the *Introduction* into three questions. The hierarchical structure for the website is obvious as shown in Figure 11.

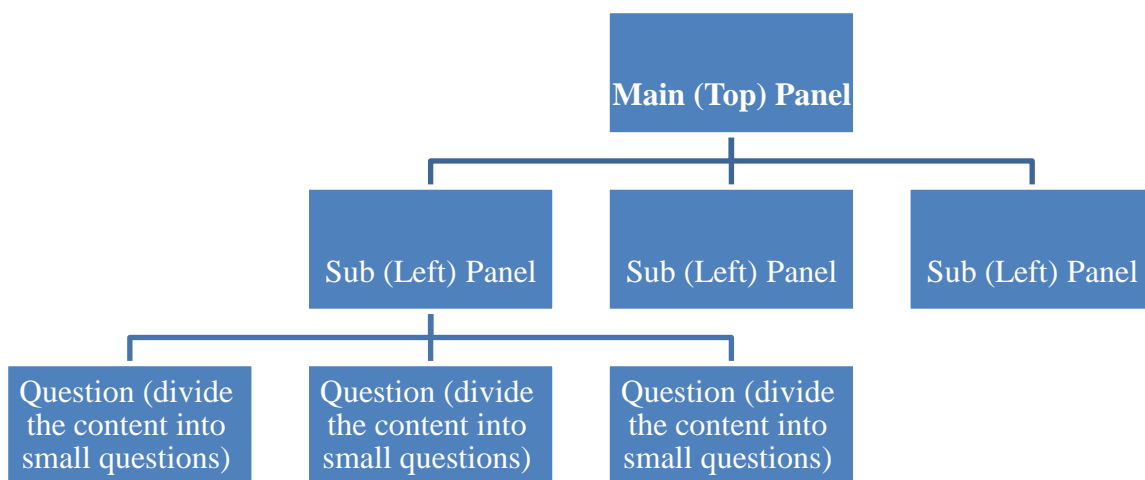


Figure 11: The Hierarchical Structure of the website after the GOALAPE Model

9. *Does the website support all the styles of the different ages?*

Yes. They are three styles that have been mentioned in this project: Old, Current and Future Styles. The website has been designed for the Current Style. Also, the source PPT (MS Power Point) file that can be download and printed on paper to help users with the Old Style to understand the subject. Also, users can download a simulation program on the computer to help people with Future Style.

10. *Does the website help people with different levels of understanding?*

Yes. Having non-tech person to look to the website and understands the content means the source successes to help the users with low experience. Also, taking out all the high level details into separate pages makes the source much more readable for the expert users.

11. Does the font style of the website help you to understand the content?

Yes. A survey has been conducted to a group of people with different level of understanding as will be discussed in Chapter 4.

12. Does the website provide consistency for the same level of a topic?

Yes. The main subject is clear which is “*Windows Services*”, and the layout of any topic is the same for all the pages.

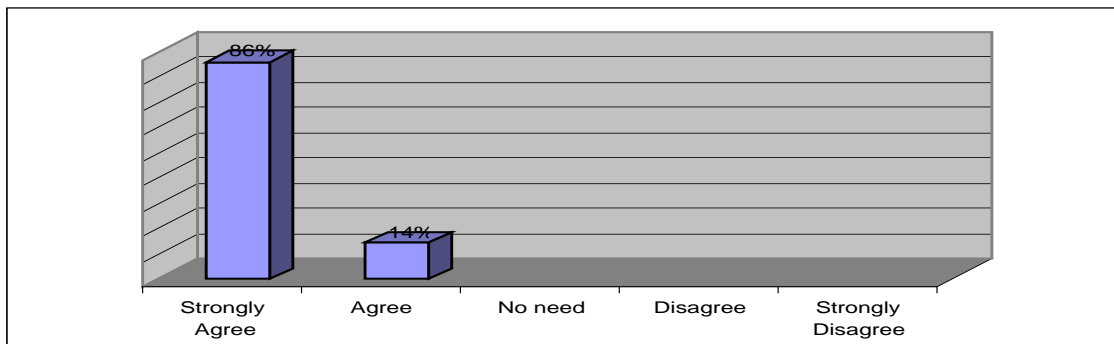
CHAPTER IV: EVALUATION

In order to validate the GOALAPE Model, I built a simple website for “Windows Services” similar to what we have on the Internet, and then I applied the model on this website. The survey shown in Appendix 4 has been conducting to measure the need of each of the seven steps in the Model after showing the participants the website after each step.

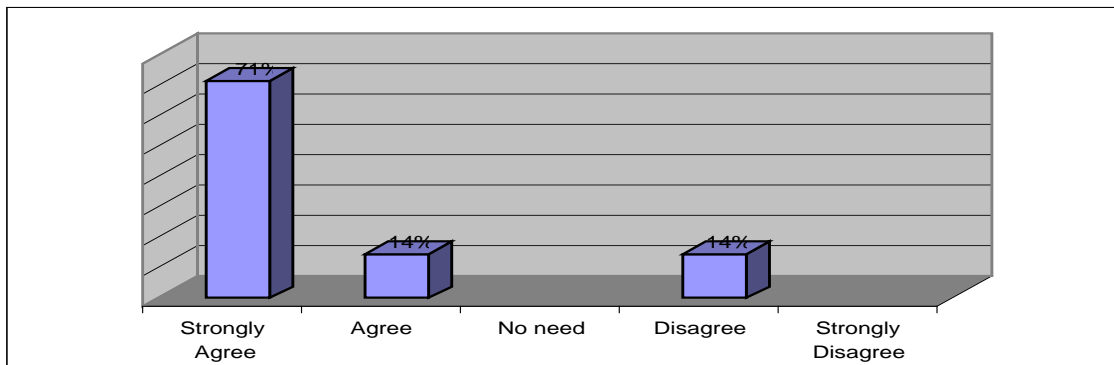
4.1 The Results of the Survey

My sample was random and consists of 30 people whose ages are between 25 and 45 with mixed gender males and females. I put the first two items for further study.

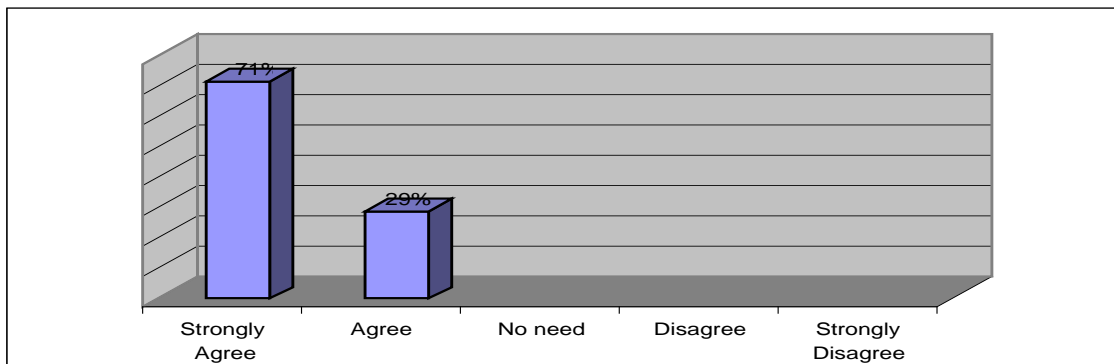
➤ Item 3:



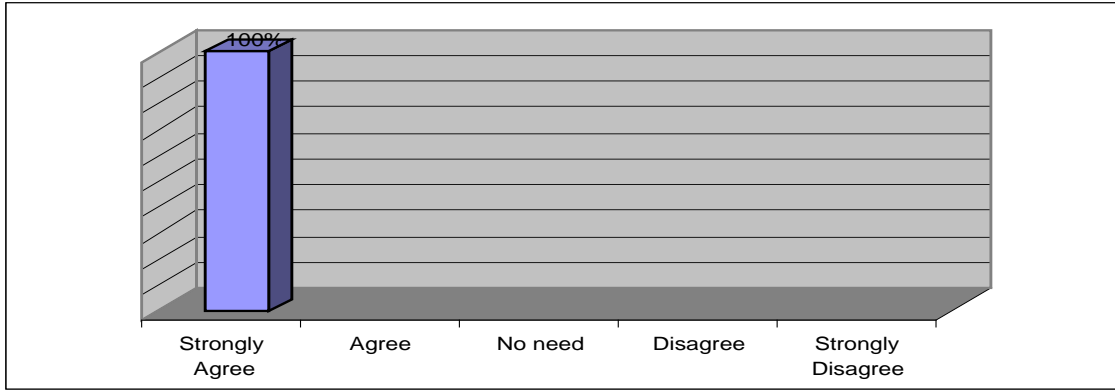
➤ Item 4:



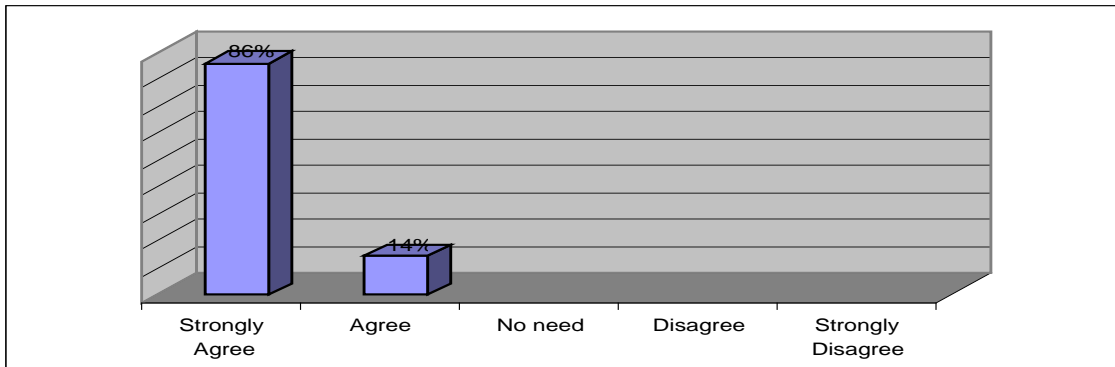
➤ Item 5:



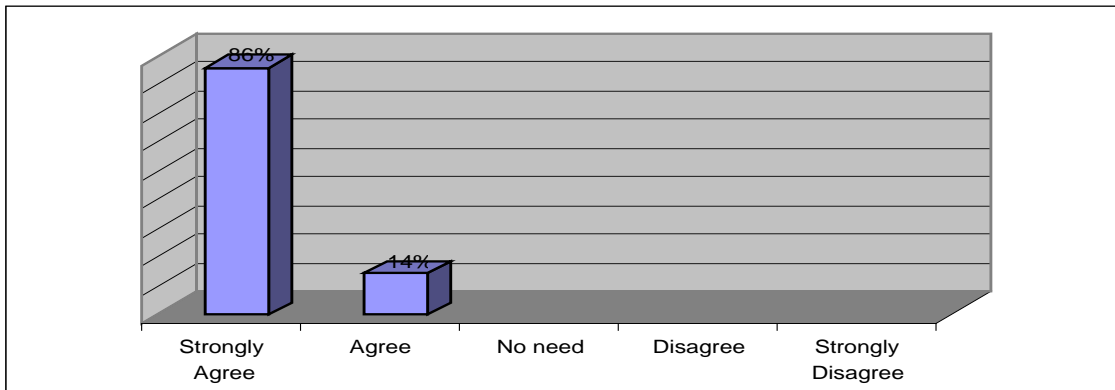
➤ Item 6:



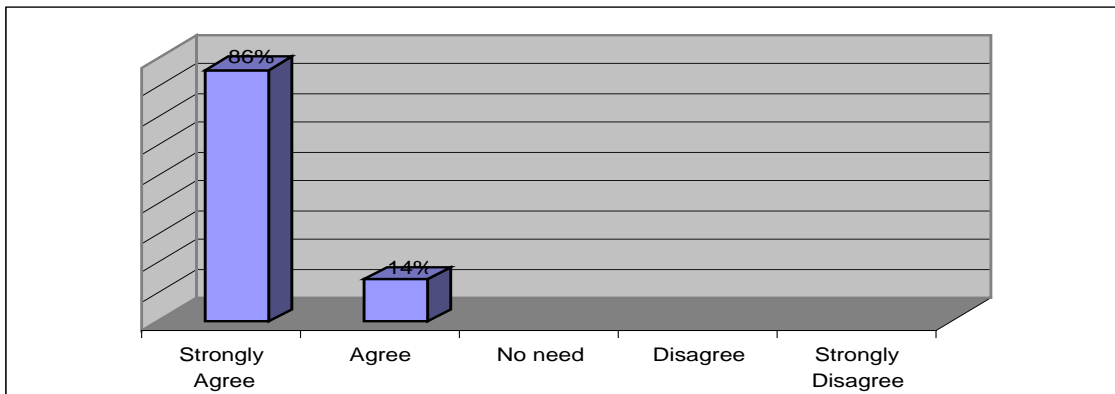
➤ Item 7:



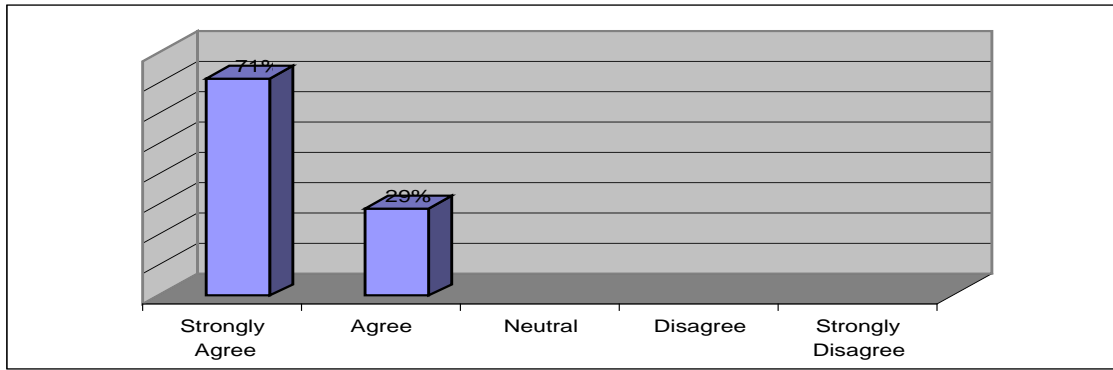
➤ Item 8:



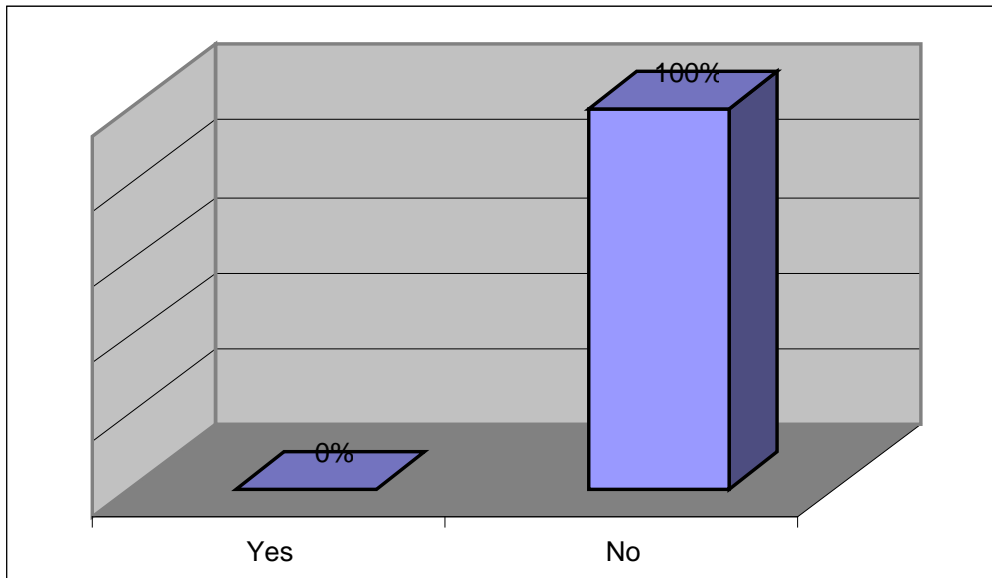
➤ Item 9:



➤ Item 10:



➤ Item 11:



4.2 Recommendations

- Follow all the six steps together in order to get benefit of the model.
- Train the website designers to use the model.
- Apply this model on technical and non-technical subjects.

4.3 Further Study

- Enlarge the sample size.
- Including the gender and the age as independent variables.
- Interview the participants who have difficulties to understand any of the six steps in order to get benefit of the model.

APPENDIX

A-1 The References used for each Service

#	Service Name	Reference
1	Alerter	http://www.techtv.com/screensavers/answerstips/story/0,24330,3374542,00.html
		http://www.winguides.com/registry/display.php/832/
		http://www.theeldergeek.com/alerter.htm
		http://www.cezeo.com/solutions/intranet-alerter/
		http://ntg.depaul.edu/rd/technotes/tn-winxp-msngr.txt
		http://support.microsoft.com/default.aspx?scid=KB;EN-US;Q148991&
		http://iatservices.missouri.edu/tech-bulletin/windows-file-sharing.html
		http://hq.mcafeetasap.com/vulnerabilities/vuln_data/30000.asp
		http://support.microsoft.com/?kbid=330904
		http://www.microsoft.com/windowsxp/pro/using/howto/communicate/stopspam.asp
		http://www.cmu.edu/computing/sec/secure.windows.html
		http://www.naspa.com/PDF/2001/1101%20PDF/T0111008.pdf
		http://www.hansenonline.net/Networking/winsec.html
		http://www.systemsbysteve.com/winguides/w2kservices.htm
		http://www.cisco.com/en/US/products/sw/secursw/ps5338/products_installation_guide_chapter09186a0080193afc.html
		http://www.securityspace.com/smysecure/catid.html?id=10457
		http://www.networkscanning.com/details/vulnerability_10457.php
http://www.intersectalliance.com/projects/WinNTConfig/WinNTConfig-AppendixA.html		
2	Application Layer Gateway Service	http://www.techspot.com/tweaks/winxp_services/services-3.shtml
		http://www.cosc.canterbury.ac.nz/teaching/handouts/afis323/firewall-1.pdf
		http://www.ntsecurity.net/Articles/Index.cfm?ArticleID=7974
		http://archives.tcm.ie/businesspost/2002/11/03/story330575.asp
3	Application Management	http://support.microsoft.com/default.aspx?scid=kb;en-us;Q328213?SD=EE
		http://insight.zdnet.co.uk/software/applications/0,39020466,2133255-2,00.htm
		http://www.microsoft.com/windows2000/techinfo/howitworks/management/installer.asp
		http://www.installsite.org/pages/en/w2k_toc.htm
		http://www.microsoft.com/msj/0998/windowsinstaller.aspx
		http://www.installsite.org/pages/en/msi/books.htm
		http://www.hissoftware.com/windowsinstaller.htm
		http://msdn.microsoft.com/library/default.asp?url=/library/en-us/dnw2kli/html/W2Kcli_chapter2.asp
		http://www.iomega.com/support/documents/11863.html
		http://www.jsiinc.com/SUBM/tip6000/rh6076.htm
http://unattended.sourceforge.net/installers.html		
4	Automatic Updates	http://www.legge40.freeseve.co.uk/WindowsXPAutoDial.htm
		http://www.techtv.com/screensavers/windowstips/story/0,24330,3363639,00.html
5	Background Intelligent Transfer Service	http://msdn.microsoft.com/library/default.asp?url=/library/en-us/dnwxp/html/WinXP_BITS.asp
		http://support.microsoft.com/default.aspx?scid=kb;en-us;Q314862
		http://www.faqshop.com/misc/default.htm?http://www.faqshop.com/misc/bits/2147942403%20error.htm
		http://msdn.microsoft.com/library/default.asp?url=/library/en-us/dncodfun/html/code4fun02282003.asp
6	ClipBook	http://securityresponse.symantec.com/avcenter/venc/data/backdoor.femo.html

		http://support.microsoft.com/default.aspx?scid=kb;en-us;315015
7	COM Event System	http://www.nwfusion.com/columnists/2003/0915drinternet.html
8	COM System Application	http://www.nwfusion.com/columnists/2003/0915drinternet.html
9	Computer Browser	http://support.microsoft.com/?kbid=188001
		http://archives.neohapsis.com/archives/ntbugtraq/2000-q2/0206.html
		http://cert.uni-stuttgart.de/archive/bugtraq/2000/05/msg00343.html
		http://www.winguides.com/registry/display.php/789/
		http://www.securityfocus.com/bid/1262/credit/
		http://www.softheap.com/faq-security/disable_the_ability.html
		http://archives.neohapsis.com/archives/ntbugtraq/2000-q2/0214.html
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/security/bulletin/ms00-036.asp
		http://msdn.microsoft.com/library/default.asp?url=/library/en-us/xpeshelp/html/_component_Network_Browser.asp
		http://www.petri.co.il/hide_computer_from_browser.htm
		http://www.tek-tips.com/gfaqs.cfm/pid/96/fid/3728
10	Cryptographic Services	http://www.tech-pro.co.uk/index.html
		http://www.experts-exchange.com/Operating_Systems/WinXP/Q_20716699.html
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/security/issues/FIPSEval.asp
		http://niap.nist.gov/cc-scheme/ST_VID3010.html
		http://www.techtv.com/screensavers/windowstips/story/0,24330,3363639,00.html
		http://www.computerworld.com/securitytopics/security/holes/story/0,10801,73996,00.html
		http://www.nwfusion.com/news/2002/0905msflaw.html
		http://www.computerworld.co.nz/webhome.nsf/0/5E5363548DD95922CC256C2C000AC8EE?opendocument
		http://www.nwfusion.com/news/2002/0814msflaw.html
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/prodtechnol/windows2000serv/evaluate/featfunc/2000pk.asp
11	DHCP Client	http://www.jsiinc.com/SUBN/tip6600/rh6656.htm
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/prodtechnol/winxppro/proddocs/ipconfig.asp
		http://www.winnetmag.com/Articles/Print.cfm?Action=Print&ArticleID=7187
		http://www.myitforum.com/articles/15/view.asp?id=1786
12	Distributed Link Tracking Client	http://www.cse-cst.gc.ca/en/documents/knowledge_centre/publications/product_reports/ITSPSR-19_e.pdf
13	Distributed Transaction Coordinator	http://support.microsoft.com/default.aspx?scid=http://support.microsoft.com:80/support/kb/articles/Q233/2/97.asp&NoWebContent=1
		http://msdn.microsoft.com/library/default.asp?url=/library/en-us/xpeshelp/html/_MSDTC.asp
		http://www.sap-press.com/ABAPhelp/
		http://www.nwfusion.com/columnists/2003/0915drinternet.html
		http://www.virusbtn.com/resources/viruses/indepth/welchia.xml
		http://www.solinas.com/reports/030913.html
14	DNS Client	http://www.jsiinc.com/SUBN/tip6600/rh6656.htm
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/prodtechnol/winxppro/proddocs/ipconfig.asp
		http://cable-dsl.home.att.net/dns_cache.htm
		http://www.myitforum.com/articles/15/view.asp?id=1786
		http://support.microsoft.com/default.aspx?scid=http://support.microsoft.com:80/support/kb/articles/Q233/2/97.asp&NoWebContent=1
15	Error Reporting Service	http://www.theeldergeek.com/windows_xp_error_reporting.htm

		http://www.windows-help.net/WindowsXP/tune-08.html
		http://www.techtv.com/callforhelp/answerstips/windowstips/story/0,24330,3362242,00.html
		http://www.pcworld.com/howto/article/0,aid,108734,00.asp
		http://www.informit.com/isapi/product_id~%7B77FCFABA-AE80-44F2-9B33-02A6DC6E4F31%7D/element_id~%7B0221BC52-76A0-43E8-AA2B-65F594464C40%7D/st~%7B1128D896-3A1E-422E-B810-A134C0723E3F%7D/content/articlex.asp
		http://www.ciac.org/ciac/bulletins/m-005.shtml
		http://ftp.cerias.purdue.edu/pub/advisories/ciac/m-fy02/m-005.office.xp.error.reporting.sends.sensitive.docs.txt
16	Event Log	http://service1.symantec.com/SUPPORT/tsgeninfo.nsf/docid/2000110615402439
17	Fast User Switching Compatibility	http://support.microsoft.com/?kbid=294855
		http://www.techspot.com/tweaks/winxp_services/services-4.shtml
18	Help and Support	http://home.earthlink.net/~leetutor/ruXP/StrtMenu/fixingxp.htm
		http://www.computing.net/netware/wwwboard/forum/4134.html
		http://www.pclincs.co.uk/Forums/showthread/t-2885.html
		http://www.kellys-korner-xp.com/top10faqs.htm
		http://www.blackviper.com/WinXP/praiseandflames.htm
19	Human Interface Device Access	http://snakefoot.fateback.com/tweak/winnt/service_details/service_details_ghi.html
20	IMAPI CD-Burning COM Service	http://home.triad.rr.com/faq/WNS2003%20FAQ.htm
21	Indexing Service	http://www.1000files.com/Utilities/File_and_Disk_Management/IsSearch_4741_Review.html
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/security/bulletin/MS00-098.asp
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/security/bulletin/MS01-033.asp
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		http://www.xefteri.com/articles/apr192002/default.aspx
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		http://www.microsoft.com/technet/security/bulletin/MS01-033.asp
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		http://www.windowssolutions.com/Articles/Index.cfm?TopicID=1007
		http://msdn.microsoft.com/library/default.asp?url=/library/en-us/indexsrv/html/ixintro_24og.asp
		http://www.safermag.com/html/safer38/alerts/57.html
22	Internet Connection Firewall (ICF)/Internet Connection Sharing	http://www.securityfocus.com/infocus/1620
		http://www.lanarchitect.net/Articles/Windows2003/RRAS/
		http://winservices.web.cern.ch/WinServices/docs/XP-firewall/default.asp
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/prodtechnol/windowsserver2003/proddocs/entserver/hnw_services_add.asp
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/prodtechnol/windowsserver2003/proddocs/entserver/hnw_services_overview.asp
		http://support.microsoft.com/?kbid=297942
		http://www.securityfocus.com/infocus/1620

		http://www.ccse.kfupm.edu.sa/windowsnetwork/winxp.htm
		http://www.sanx.org/tipShow.asp?articleRef=48
		http://www.informit.com/isapi/product_id~%7B4AAF4A51-28A5-4316-BF64-39AE42DB77E8%7D/element_id~%7B709A6587-B8CE-46FC-9B72-E1EF9EBC39FE%7D/st~%7B1128D896-3A1E-422E-B810-A134C0723E3F%7D/content/articlex.asp
		http://www.skypoint.com/bulletins/030815.php
		http://service1.symantec.com/SUPPORT/pca.nsf/docid/2001112711465712?Open&src=w&docid=2001050711552112&nsf=pca.nsf&view=docid&dtype=&prod=&ver=&osv=&osv_lvl=
		http://www.cam.ac.uk/cs/docs/leaflets/m510/
23	Internet Connection Sharing	http://www.securityfocus.com/infocus/1620
		http://www.lanarchitect.net/Articles/Windows2003/RRAS/
		http://winservices.web.cern.ch/WinServices/docs/XP-firewall/default.asp
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/prodtechnol/windowsserver2003/proddocs/entserver/hnw_services_add.asp
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/prodtechnol/windowsserver2003/proddocs/entserver/hnw_services_overview.asp
		http://support.microsoft.com/?kbid=297942
		http://www.securityfocus.com/infocus/1620
		http://www.ccse.kfupm.edu.sa/windowsnetwork/winxp.htm
		http://www.sanx.org/tipShow.asp?articleRef=48
		http://www.informit.com/isapi/product_id~%7B4AAF4A51-28A5-4316-BF64-39AE42DB77E8%7D/element_id~%7B709A6587-B8CE-46FC-9B72-E1EF9EBC39FE%7D/st~%7B1128D896-3A1E-422E-B810-A134C0723E3F%7D/content/articlex.asp
		http://www.skypoint.com/bulletins/030815.php
		http://service1.symantec.com/SUPPORT/pca.nsf/docid/2001112711465712?Open&src=w&docid=2001050711552112&nsf=pca.nsf&view=docid&dtype=&prod=&ver=&osv=&osv_lvl=
		http://www.cam.ac.uk/cs/docs/leaflets/m510/
24	IPSec Services	http://www.microsoft.com/technet/treeview/default.asp?url=/technet/prodtechnol/winxpro/reskit/prcc_tcp_naoc.asp
		http://www.derkeiler.com/Newsgroups/comp.os.ms-windows.nt.admin.security/2003-05/0062.html
		http://www.securityfocus.com/infocus/1519
		http://www.securityfocus.com/infocus/1526
		http://www.securityfocus.com/infocus/1528
		http://support.microsoft.com/default.aspx?scid=http://support.microsoft.com:80/support/kb/articles/q252/7/35.asp&NoWebContent=1
		http://support.microsoft.com/?kbid=823980
		http://www.lokbox.net/SecureXP/
25	Logical Disk Manager	http://service1.symantec.com/SUPPORT/tsgeninfo.nsf/docid/2000110615402439
26	Logical Disk Manager Administrative Service	http://service1.symantec.com/SUPPORT/tsgeninfo.nsf/docid/2000110615402439
27	Messenger	http://www.techtv.com/screensavers/answerstips/story/0,24330,3374542,00.html
		http://www.winguides.com/registry/display.php/832/
		http://www.theeldergeek.com/alerter.htm
		http://www.cezeo.com/solutions/intranet-alerter/
		http://ntg.depaul.edu/rd/technotes/tn-winxp-mngr.txt

		http://support.microsoft.com/default.aspx?scid=KB;EN-US;Q148991&http://iatservices.missouri.edu/tech-bulletin/windows-file-sharing.html
		http://hq.mcafeeasap.com/vulnerabilities/vuln_data/30000.asp
		http://support.microsoft.com/?kbid=330904
		http://www.microsoft.com/windowsxp/pro/using/howto/communicate/stospam.asp
		http://www.cmu.edu/computing/sec/secure.windows.html
		http://www.naspa.com/PDF/2001/1101%20PDF/T0111008.pdf
		http://www.hansenonline.net/Networking/winsec.html
		http://www.systemsbysteve.com/winguides/w2kservices.htm
		http://www.cisco.com/en/US/products/sw/secursw/ps5338/products_installation_guide_chapter09186a0080193afc.html
		http://www.securityspace.com/smysecure/catid.html?id=10457
		http://www.networkscanning.com/details/vulnerability_10457.php
		http://www.intersectalliance.com/projects/WinNTConfig/WinNTConfig-AppendixA.html
28	MS Software Shadow Copy Provider	http://www.microsoft.com/technet/treeview/default.asp?url=/technet/prodtechnol/winxppro/reskit/prdg_dsm_vtrj.asp
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/prodtechnol/winxppro/proddocs/ntbackup_backup_snapshot.asp
		http://www.fawcette.com/special/storage/ruest_10min_1/
		http://www.techexams.net/technotes/70292/shadowcopies.shtml
		http://www.interknowlogy.com/IKCorporate/Services/NetworkServices/Windows.htm
		http://www.swc.com/news/articles/windowsserver2003.htm
		http://www.ntfaq.com/Articles/Index.cfm?ArticleID=39413
		http://www.network-backup.com/graphics/VSS_White_Paper.pdf
		http://www.e3t.net/documents/pdf/ofm_whitepaper_vss.pdf
29	Net Logon	http://support.microsoft.com/default.aspx?kbid=293127
		http://www.jsiinc.com/SUBL/tip5500/rh5592.htm
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/prodtechnol/winxppro/proddocs/net_pause.asp
		http://www.geocities.com/SiliconValley/Monitor/3131/ntserver/nt_core01.html
		http://www.serverwatch.com/tutorials/article.php/1485001
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		http://www.labmice.net/articles/securingwin2000.htm
		http://www.cotse.com/Ntcommands/ntcmdsuntitled00000410.html#c75ffa90
		http://techrepublic.com.com/5100-6268-1032165.html
		http://support.microsoft.com/?kbid=315951
		http://www.faqchest.com/msdn/winnt-l/winnt-99/winnt-9906/winnt-990600/winnt99060820_08847.html
30	NetMeeting Remote Desktop Sharing	http://www.securitytracker.com/alerts/2002/Sep/1005243.html
		http://www-pc.uni-regensburg.de/systemsw/W2KPRO/UPDATE/POSTSP2/q299796.htm
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/security/bulletin/MS00-077.asp
31	Network Connections	http://www.experts-exchange.com/Networking/Q_20638739.html
		http://support.microsoft.com/default.aspx?scid=http://support.microsoft.com:80/su pport/kb/articles/q239/4/73.asp&NoWebContent=1
		http://x220.win2ktest.com/forum/topic.asp?TOPIC_ID=6058
32	Network DDE	http://help.stargate.net/dialup/winxp-no-icon.shtml
		http://www.techspot.com/tweaks/winxp_services/services-3.shtml
		http://www.windows-help.net/features/ms-security020601.html
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/security/bulletin/ms01-007.asp

33	Network DDE DSDM	http://help.stargate.net/dialup/winxp-no-icon.shtml
		http://www.techspot.com/tweaks/winxp_services/services-3.shtml
		http://www.windows-help.net/features/ms-security020601.html
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/security/bulletin/ms01-007.asp
34	Network Location Awareness (NLA)	http://msdn.microsoft.com/library/default.asp?url=/library/en-us/xpehelp/html/NetworkLocationAwarenessService.asp
		http://www.microsoft.com/windowsxp/pro/evaluation/overviews/mobility.asp
		http://www.theeldergeek.com/network_location_awareness_(nla).htm
		http://msdn.microsoft.com/library/default.asp?url=/library/en-us/winsock/winsock/the_role_of_nla_2.asp
		http://www.nwmissouri.edu/compserv/clientcomputing/pc/xppropinstall.pdf
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		http://help.stargate.net/dialup/winxp-no-icon.shtml
		http://accessories.gateway.com/AccessoryStore/Software_316896/Operating+Systems_316946/Desktop_316947/1828291_ProdDetail?moreDetails=1
		http://www.wired.com/news/technology/0,1282,42907,00.html
		http://www.ahinc.com/ingeneral.html
35	NT LM Security Support Provider	
36	Performance Logs and Alerts	http://support.microsoft.com/?kbid=290639
		http://is-it-true.org/nt/xp/atips/atips30.shtml
		http://www.tcsn.experts-exchange.com/Operating_Systems/Q_20737781.html
		http://www.microsoft.com/windows2000/techinfo/reskit/tools/existing/tracelog-o.asp
		http://msdn.microsoft.com/library/default.asp?url=/library/en-us/xpehelp/html/performanceLogsAndAlertsService.asp
37	Plug and Play	http://service1.symantec.com/SUPPORT/tsgeninfo.nsf/docid/2000110615402439
38	Portable Media Serial Number Service	http://www.delymyth.net/en/services/wmdmpmsn.shtml
39	Print Spooler	http://www.microsoft.com/technet/treeview/default.asp?url=/technet/security/bulletin/MS99-047.asp
		http://support.microsoft.com/?kbid=318152
		http://www.jsiinc.com/SUBH/tip3800/rh3851.htm
		http://members.shaw.ca/bsanders/CleanPrinterDrivers.htm
		http://www.eeye.com/html/Research/Advisories/AD19991104.html
40	Protected Storage	http://support.microsoft.com/?kbid=266055
		http://lists.insecure.org/lists/bugtraq/1999/Sep/0193.html
		http://www.jsiinc.com/SUBK/tip5400/rh5443.htm
		http://personal.cfw.com/~tkprit/files/serv.html
		http://www.winnetmag.com/Articles/Index.cfm?ArticleID=8320
		http://searchwin2000.techtarget.com/tip/1,289483,sid1_gci861228,00.html
		http://insideoe.tomsterdam.com/problems/performance.htm
		http://www.jsiinc.com/SUBF/TIP2600/rh2670.htm
		http://www.informationweek.com/834/winsec.htm
41	QoS RSVP	http://www.techspot.com/tweaks/winxp_services/services-5.shtml
		http://www.wininfo.com.ar/pag2.html
42	Remote Access Auto Connection Manager	http://www.jsiinc.com/SUBM/tip6100/rh6135.htm
		http://support.microsoft.com/?kbid=254181
43	Remote Access Connection Manager	http://msdn.microsoft.com/library/default.asp?url=/library/en-us/ras/ras/ras_connection_operations.asp
		http://support.microsoft.com/default.aspx?scid=http://support.microsoft.com:80/support/kb/articles/Q170/0/29.ASP&NoWebContent=1

		http://www.jsiinc.com/SUBM/tip6100/rh6135.htm
		http://www.tech-forums.net/showthread.php?s=&threadid=819
44	Remote Desktop Help Session Manager	http://www.mail-archive.com/libretto@basiclink.com/msg12609.html
		http://www.xptweaks.org/services_2.html
45	Remote Procedure Call (RPC)	http://service1.symantec.com/SUPPORT/tsgeninfo.nsf/docid/2000110615402439
46	Remote Procedure Call (RPC) Locator	http://www.microsoft.com/technet/treeview/default.asp?url=/technet/security/bulletin/MS03-001.asp
		http://www.networkmagazineindia.com/200303/security1.shtml
		http://cert.uni-stuttgart.de/ticker/article.php?mid=1062
		http://www.cert.org/advisories/CA-2003-03.html
47	Remote Registry	http://cert.uni-stuttgart.de/archive/pen-test/2002/12/msg00002.html
		http://www.winguides.com/registry/display.php/1258/
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/security/tools/Tools/MBSAhome.asp
		http://www.sap-press.com/ABAPhelp/
48	Removable Storage	http://www.microsoft.com/technet/treeview/default.asp?url=/technet/prodtechnol/winxpro/reskit/prdg_dsm_fpdt.asp
		http://support.certance.com/support/tape/utils/index_ret.html
		http://www.ipodlounge.com/forums/archive/topic/3791-1.html
		http://blog.thedevins.com/archives/2002_09.php
49	Routing and Remote Access	http://www.computerworld.com/hardwaretopics/hardware/server/story/0,10801,83584,00.html
		http://www.zdnet.com.au/itmanager/technology/story/0,2000029587,20276578,00.htm
		http://www.entmag.com/News/article.asp?EditorialsID=5914
		http://infosecuritymag.techtarget.com/ss/0,295812,sid6_iss61,00.html
50	Secondary Logon	http://www.microsoft.com/windows2000/techinfo/planning/management/seclogon.asp
		http://support.microsoft.com/?kbid=324953
		http://archives.neohapsis.com/archives/vulnwatch/2001-q4/0040.html
		http://www.at.vcu.edu/faq/winsecurity.html
51	Security Accounts Manager	http://service1.symantec.com/SUPPORT/tsgeninfo.nsf/docid/2000110615402439
52	Server	http://support.microsoft.com/?kbid=188001
		http://archives.neohapsis.com/archives/ntbugtraq/2000-q2/0206.html
		http://cert.uni-stuttgart.de/archive/bugtraq/2000/05/msg00343.html
		http://www.winguides.com/registry/display.php/789/
		http://www.securityfocus.com/bid/1262/credit/
		http://www.softheap.com/faq-security/disable_the_ability.html
		http://archives.neohapsis.com/archives/ntbugtraq/2000-q2/0214.html
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/security/bulletin/ms00-036.asp
		http://msdn.microsoft.com/library/default.asp?url=/library/en-us/xpehelp/html/_component_Network_Browser.asp
		http://www.petri.co.il/hide_computer_from_browser.htm
		http://www.tek-tips.com/gfaqs.cfm/pid/96/fid/3728
53	Shell Hardware Detection	http://beta.experts-exchange.com/Operating_Systems/WinXP/Q_20697954.html
		http://msdn.microsoft.com/msdnmag/issues/01/11/Autoplay/default.aspx
54	Smart Card	-
55	Smart Card Helper	-
56	SSDP Discovery	http://www.win2000mag.net/Articles/Index.cfm?ArticleID=26008
		http://www.eeye.com/html/Research/Advisories/AD20011220.html

		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/security/bulletin/MS01-059.asp
		http://www.theregister.co.uk/content/4/23517.html
		http://www.grc.com/unpnp/unpnp.htm
		http://www.nipc.gov/warnings/advisories/2002/01-030-3.htm
57	System Event Notification	http://service1.symantec.com/SUPPORT/tsgeninfo.nsf/docid/2000110615402439
58	System Restore Service	-
59	Task Scheduler	http://www.lanicu.com/whitepapers/tsprpcworm.htm http://grc.com/dcom/ http://packetstorm.widexs.nl/9912-exploits/nt.ie5.scheduler.txt http://www.nwfusion.com/columnists/2003/0915drinternet.html
60	TCP/IP NetBIOS Helper	http://lists.insecure.org/lists/security-basics/2003/Sep/0378.html http://lists.virus.org/security-basics-0309/msg00366.html http://projects.slu.edu/XP/downloads/7/Default_image.doc
61	Telephony	http://www.jsiinc.com/SUBM/tip6100/rh6135.htm http://www.microsoft.com/technet/treeview/default.asp?url=/technet/prodtechnol/windowsserver2003/proddocs/standard/TAPI_service_providers.asp
62	Telnet	http://www.cygwin.com/ml/cygwin/2002-06/msg01381.html http://www.microsoft.com/windows2000/downloads/security/q307298/default.asp http://support.microsoft.com/?kbid=233069 http://cert.uni-stuttgart.de/archive/bugtraq/2001/07/msg00611.html http://msdn.microsoft.com/library/default.asp?url=/library/en-us/tdhelp40/html/nttskSettingUpTelnetServiceAtRunTime.asp http://www.safermag.com/html/safer38/dos/10.html http://www.securityfocus.com/bid/2844 http://www.netadmintools.com/art3.html http://lists.insecure.org/lists/bugtraq/2000/Dec/0011.html http://www.pcworld.com/news/article/0,aid,83283,00.asp http://www.microsoft.com/technet/treeview/default.asp?url=/technet/security/bulletin/MS00-050.asp http://www.securiteam.com/windowsntfocus/5DP0C004KC.html http://www.ks-soft.net/hostmon.eng/telnet-service/ http://www.jsiinc.com/SUBH/tip3800/rh3830.htm http://www.computerworld.com/softwaretopics/os/story/0,10801,61302,00.html
63	Terminal Services	http://www.securiteam.com/windowsntfocus/5QP0D006US.html http://www.securiteam.com/windowsntfocus/6H00B1P35A.html http://cert.uni-stuttgart.de/archive/bugtraq/2001/09/msg00122.html http://www.derkeiler.com/Mailing-Lists/Securiteam/2002-04/0028.html http://www.microsoft.com/technet/treeview/default.asp?url=/technet/security/bulletin/ms01-040.asp http://xforce.iss.net/xforce/xfdb/7538 http://archives.neohapsis.com/archives/vulnwatch/2001-q4/0042.html http://www.ntsecurity.net/Articles/Index.cfm?ArticleID=37947 http://www.infosatellite.com/news/2001/11/a191101xp_2k_bug.html http://www.microsoft.com/windows2000/community/centers/terminal/default.msp x
64	Themes	http://www.msfu.org/win2k3/uxtheme.htm http://pcworld.shopping.yahoo.com/yahoo/article/0,aid,111121,00.asp http://www.blackviper.com/WinXP/supertweaks.htm http://www.webhero.org/System/windowsxp_perf.htm http://www.progamer.50g.com/Library/news.htm
65	Uninterruptable Power Supply	http://www.jsiinc.com/SUBN/tip6800/rh6863.htm
66	Universal Plug and Play Device Host	http://www.win2000mag.net/Articles/Index.cfm?ArticleID=26008

		http://www.eeye.com/html/Research/Advisories/AD20011220.html
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/security/bulletin/MS01-059.asp
		http://www.theregister.co.uk/content/4/23517.html
		http://www.grc.com/unpnp/unpnp.htm
		http://www.nipc.gov/warnings/advisories/2002/01-030-3.htm
67	Upload Manager	http://infosecuritymag.techtarget.com/2003/jul/digest17.shtml#top
		http://support.microsoft.com/default.aspx?scid=KB;en-us;328940&
		http://www.mail-archive.com/samba@lists.samba.org/msg20465.html
		http://computercops.biz/postt5074.html
68	Utility Manager	http://www.jsiinc.com/SUBF/TIP2700/rh2794.htm
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/security/bulletin/MS03-025.asp
		http://archives.neohapsis.com/archives/microsoft/2003-q3/0002.html
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/security/bulletin/MS02-071.asp
		http://archives.neohapsis.com/archives/fulldisclosure/2003-q3/0309.html
69	Volume Shadow Copy	http://www.microsoft.com/technet/treeview/default.asp?url=/technet/prodtechnol/winxpro/reskit/prdg_dsm_vtrj.asp
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/prodtechnol/winxpro/proddocs/ntbackup_backup_snapshot.asp
		http://www.fawcette.com/special/storage/ruest_10min_1/
		http://www.techexams.net/technotes/70292/shadowcopies.shtml
		http://www.interknowlogy.com/IKCorporate/Services/NetworkServices/Windows.htm
		http://www.swc.com/news/articles/windowsserver2003.htm
		http://www.ntfaq.com/Articles/Index.cfm?ArticleID=39413
		http://www.network-backup.com/graphics/VSS_White_Paper.pdf
		http://www.e3t.net/documents/pdf/ofm_whitepaper_vss.pdf
70	WebClient	http://www.theeldergeek.com/webclient.htm
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/prodtechnol/windowsserver2003/proddocs/standard/pub_dav_aboutwebdav.asp
		http://support.microsoft.com/default.aspx?scid=kb;en-us;312181
		http://msdn.microsoft.com/library/default.asp?url=/library/en-us/wcewebsr/html/ceconWebDAVInteroperabilityIssues.asp
		http://www.practicallynetworked.com/sharing/troubleshoot/slowbrowse02.htm
		http://snakefoot.fateback.com/tweak/winnt/service_details/service_details_wxyz.html
		http://www.iisfaq.com/default.aspx?View=A553&P=80
		http://blogs.gotdotnet.com/korbyp/commentview.aspx/e23ff29d-38ea-4cdb-9c54-dfbae9f449ea
		http://www.dotnet247.com/247reference/messages/30/151905.aspx
71	Windows Audio	-
72	Windows Image Acquisition (WIA)	-
73	Windows Installer	http://support.microsoft.com/default.aspx?scid=kb;en-us;Q328213?SD=EE
		http://insight.zdnet.co.uk/software/applications/0,39020466,2133255-2,00.htm
		http://www.microsoft.com/windows2000/techinfo/howitworks/management/installer.asp
		http://www.installsite.org/pages/en/w2k_toc.htm
		http://www.microsoft.com/msj/0998/windowsinstaller.aspx
		http://www.installsite.org/pages/en/msi/books.htm
		http://www.hissoftware.com/windowsinstaller.htm
		http://msdn.microsoft.com/library/default.asp?url=/library/en-us/dnw2kcli/html/W2Kcli_chapter2.asp
		http://www.iomega.com/support/documents/11863.html
		http://www.jsiinc.com/SUBM/tip6000/rh6076.htm

		http://unattended.sourceforge.net/installers.html
74	Windows Manage. Instrumentation	http://service1.symantec.com/SUPPORT/tsgeninfo.nsf/docid/2000110615402439
75	Windows Time	http://www.microsoft.com/windows2000/techinfo/howitworks/security/wintimeserv.asp
		http://www.microsoft.com/windows2000/docs/wintimeserv.doc
		http://support.microsoft.com/default.aspx?scid=http://support.microsoft.com:80/support/kb/articles/Q224/7/99.ASP&NoWebContent=1
		http://www.greyware.com/software/domaintime/product/w32time.asp
		http://www.winnetmag.com/Articles/Index.cfm?ArticleID=8383
		http://www.arbiter.com/ftp/datasheets/w32time.pdf
		http://windows.about.com/library/tips/bltip553.htm
		http://www.windows2000faq.com/Articles/Index.cfm?ArticleID=14943
		http://www.informit.com/isapi/product_id~%7B77FCFABA-AE80-44F2-9B33-02A6DC6E4F31%7D/element_id~%7B66ECDDFF-D794-4F85-9B27-77B3C3A6A52A%7D/st~%7B1128D896-3A1E-422E-B810-A134C0723E3F%7D/content/articlex.asp
		http://www.jsiinc.com/SUBF/tip2600/rh2669.htm
		http://www.jsiinc.com/SUBE/tip2200/rh2273.htm
		http://www.techtutorials.info/w2ktime.html
		http://support.microsoft.com/default.aspx?scid=kb;EN-US;q120944
		http://www.greyware.com/software/domaintime/technical/network/coexistw32time.asp
		http://support.microsoft.com/default.aspx?scid=kb;EN-US;q224799
		http://fox2k.net/2ktweaks/misc_tips.htm#Setting%20Windows%20Time%20from%20a%20Domain%20Server
		http://techrepublic.com.com/5100-6268-1032165.html
76	Wireless Zero Configuration service	http://www.microsoft.com/technet/treeview/default.asp?url=/technet/columns/cableguy/cg1102.asp
77	WMI Performance Adapter	http://www.reger24.de/prozesse/wmiapsrv.exe.php
		http://www.winforums.org/showthread.php?t=1263
78	Workstation	http://support.microsoft.com/?kbid=188001
		http://archives.neohapsis.com/archives/ntbugtraq/2000-q2/0206.html
		http://cert.uni-stuttgart.de/archive/bugtraq/2000/05/msg00343.html
		http://www.winguides.com/registry/display.php/789/
		http://www.securityfocus.com/bid/1262/credit/
		http://www.softheap.com/faq-security/disable_the_ability.html
		http://archives.neohapsis.com/archives/ntbugtraq/2000-q2/0214.html
		http://www.microsoft.com/technet/treeview/default.asp?url=/technet/security/bulletin/ms00-036.asp
		http://msdn.microsoft.com/library/default.asp?url=/library/en-us/xpehelp/html/_component_Network_Browser.asp
		http://www.petri.co.il/hide_computer_from_browser.htm
		http://www.tek-tips.com/gfaqs.cfm/pid/96/fid/3728

A-2 Windows' Description about each Service

#	Service Number	Windows Description
1	Alerter	Notifies selected users and computers of administrative alerts. If the service is stopped, programs that use administrative alerts will not receive them. If this service is disabled, any services that explicitly depend on it will fail to start.
2	Application Layer Gateway Service	Provides support for 3rd party protocol plug-ins for Internet Connection Sharing and the Internet Connection Firewall.
3	Application Management	Provides software installation services such as Assign, Publish, and Remove.

4	Automatic Updates	Enables the download and installation of critical Windows updates. If the service is disabled, the operating system can be manually updated at the Windows Update Web site.
5	Background Intelligent Transfer Service	Uses idel network bandwidth to transfer data.
6	ClipBook	Enables ClipBook Viewer to store information and share it with remote computers. If the service is stopped, ClipBook Viewer will not be able to share information with remote computers. If this service is disabled, any services that explicitly depend on it
7	COM Event System	Supports System Event Notification Service (SENS), which provides automatic distribution of events to subscribing Component Object Model (COM) components. If the service is stopped, SENS will close and will not be able to provide logon and logoff notifica
8	COM System Application	Manages the configuration and tracking of Component Object Model (COM) -based components. If the service is stopped, most COM -based components will not function properly. If this service is disabled, any services that explicitly depend on it will fail to
9	Computer Browser	Maintains an updated list of computers on the network and supplies this list to computers designated as browsers. If this service is stopped, this list will not be updated or maintained. If this service is disabled, any services that explicitly depend on
10	Cryptographic Services	Provides three management services: Catalog Database Service, which confirms the signatures of Windows files; Protected Root Service, which adds and removes Trusted Root Certification Authority certificates from this computer; and Key Service, which helps
11	DHCP Client	Manages network configuration by registering and updating IP addresses and DNS names.
12	Distributed Link Tracking Client	For those that are part of a domain -and- use NTFS it has some value in keeping links across machines up to date, especially in the case of databases updated via the network.
13	Distributed Transaction Coordinator	Coordinates transactions that span multiple resource managers, such as databases, message queues, and file systems. If this service is stopped, these transactions will not occur. If this service is disabled, any services that explicitly depend on it will
14	DNS Client	Resolves and caches Domain Name System (DNS) names for this computer. If this service is stopped, this computer will not be able to resolve DNS names and locate Active Directory domain controllers. If this service is disabled, any services that explicitly
15	Error Reporting Service	Allows error reporting for services and applications running in non-standard environments.
16	Event Log	Enables event log messages issued by Windows-based programs and components to be viewed in Event Viewer. This service cannot be stopped.
17	Fast User Switching Compatibility	Provides management for applications that require assistance in a multiple user environment.
18	Help and Support	Enables Help and Support Center to run on this computer. If this service is stopped, Help and Support Center will be unavailable. If this service is disabled, any services that explicitly depend on it will fail to start.
19	Human Interface Device Access	Enables generic input access to Human Interface Devices (HID), which activates and maintains the use of predefined hot buttons on keyboards, remote controls, and other multimedia devices. If this service is stopped, hot buttons controlled by this service
20	IMAPI CD-Burning COM Service	Manages CD recording using Image Mastering Applications Programming Interface (IMAPI). If this service is stopped, this computer will be unable to record CDs. If this service is disabled, any services that explicitly depend on it will fail to start.
21	Indexing Service	Indexes contents and properties of files on local and remote computers; provides rapid access to files through flexible querying language.
22	Internet Connection Firewall	Provides network address translation, addressing, name resolution and/or intrusion prevention services for a home or small office network.
23	Internet Connection Sharing	...

24	IPSec Services	Manages IP security policy and starts the ISAKMP/Oakley (IKE) and the IP security driver.
25	Logical Disk Manager	Detects and monitors new hard disk drives and sends disk volume information to Logical Disk Manager Administrative Service for configuration. If this service is stopped, dynamic disk status and configuration information may become out of date. If this ser
26	Logical Disk Manager Administrative Service	Configures hard disk drives and volumes. The service only runs for configuration processes and then stops.
27	Messenger	Transmits net send and Alerter service messages between clients and servers. This service is not related to Windows Messenger. If this service is stopped, Alerter messages will not be transmitted. If this service is disabled, any services that explicitly
28	MS Software Shadow Copy Provider	Manages software-based volume shadow copies taken by the Volume Shadow Copy service. If this service is stopped, software-based volume shadow copies cannot be managed. If this service is disabled, any services that explicitly depend on it will fail to sta
29	Net Logon	Supports pass-through authentication of account logon events for computers in a domain.
30	NetMeeting Remote Desktop Sharing	Enables an authorized user to access this computer remotely by using NetMeeting over a corporate intranet. If this service is stopped, remote desktop sharing will be unavailable. If this service is disabled, any services that explicitly depend on it will
31	Network Connections	Manages objects in the Network and Dial-Up Connections folder, in which you can view both local area network and remote connections.
32	Network DDE	Provides network transport and security for Dynamic Data Exchange (DDE) for programs running on the same computer or on different computers. If this service is stopped, DDE transport and security will be unavailable. If this service is disabled, any service.
33	Network DDE DSDM	Manages Dynamic Data Exchange (DDE) network shares. If this service is stopped, DDE network shares will be unavailable. If this service is disabled, any services that explicitly depend on it will fail to start.
34	Network Location Awareness (NLA)	Collects and stores network configuration and location information, and notifies applications when this information changes.
35	NT LM Security Support Provider	Provides security to remote procedure call (RPC) programs that use transports other than named pipes.
36	Performance Logs and Alerts	Collects performance data from local or remote computers based on preconfigured schedule parameters, then writes the data to a log or triggers an alert. If this service is stopped, performance information will not be collected. If this service is disabled
37	Plug and Play	Enables a computer to recognize and adapt to hardware changes with little or no user input. Stopping or disabling this service will result in system instability.
38	Portable Media Serial Number Service	Retrieves the serial number of any portable music player connected to your computer.
39	Print Spooler	Loads files to memory for later printing.
40	Protected Storage	Provides protected storage for sensitive data, such as private keys, to prevent access by unauthorized services, processes, or users.
41	QoS RSVP	Provides network signaling and local traffic control setup functionality for QoS-aware programs and control applets.
42	Remote Access Auto Connection Manager	Creates a connection to a remote network whenever a program references a remote DNS or NetBIOS name or address.
43	Remote Access Connection Manager	Creates a network connection.
44	Remote Desktop Help Session Manager	Manages and controls Remote Assistance. If this service is stopped, Remote Assistance will be unavailable. Before stopping this service, see the Dependencies tab of the Properties dialog box.
45	Remote Procedure Call	Provides the endpoint mapper and other miscellaneous RPC services.
46	Remote Procedure Call (RPC) Locator	Manages the RPC name service database.
47	Remote Registry	Enables remote users to modify registry settings on this computer. If this service is stopped, the registry can be modified only by users on this computer. If this

		service is disabled, any services that explicitly depend on it will fail to start.
48	Removable Storage	No Description Given.
49	Routing and Remote Access	Offers routing services to businesses in local area and wide area network environments.
50	Secondary Logon	Enables starting processes under alternate credentials. If this service is stopped, this type of logon access will be unavailable. If this service is disabled, any services that explicitly depend on it will fail to start.
51	Security Accounts Manager	Stores security information for local user accounts.
52	Server	Supports file, print, and named-pipe sharing over the network for this computer. If this service is stopped, these functions will be unavailable. If this service is disabled, any services that explicitly depend on it will fail to start.
53	Shell Hardware Detection	No Description Given.
54	Smart Card	Manages access to smart cards read by this computer. If this service is stopped, this computer will be unable to read smart cards. If this service is disabled, any services that explicitly depend on it will fail to start.
55	Smart Card Helper	Enables support for legacy non-plug and play smart-card readers used by this computer. If this service is stopped, this computer will not support legacy reader. If this service is disabled, any services that explicitly depend on it will fail to start.
56	SSDP Discovery Service	Enables discovery of UPnP devices on your home network.
57	System Event Notification	Tracks system events such as Windows logon, network, and power events. Notifies COM+ Event System subscribers of these events.
58	System Restore Service	Performs system restore functions. To stop service, turn off System Restore from the System Restore tab in My Computer->Properties
59	Task Scheduler	Enables a user to configure and schedule automated tasks on this computer. If this service is stopped, these tasks will not be run at their scheduled times. If this service is disabled, any services that explicitly depend on it will fail to start.
60	TCP/IP NetBIOS Helper	Enables support for NetBIOS over TCP/IP (NetBT) service and NetBIOS name resolution.
61	Telephony	Provides Telephony API (TAPI) support for programs that control telephony devices and IP based voice connections on the local computer and, through the LAN, on servers that are also running the service.
62	Telnet	Enables a remote user to log on to this computer and run programs, and supports various TCP/IP Telnet clients, including UNIX-based and Windows-based computers. If this service is stopped, remote user access to programs might be unavailable. If this servi
63	Terminal Services	Allows multiple users to be connected interactively to a machine as well as the display of desktops and applications to remote computers. The underpinning of Remote Desktop (including RD for Administrators), Fast User Switching, Remote Assistance, and Ter
64	Themes	Provides user experience theme management.
65	Uninterruptable Power Supply	Just what it says above. How your UPS connects to the computer really determines whether this is needed. Many USB connected UPS's don't need this service.
66	Universal Plug and Play Device Host	Provides support to host Universal Plug and Play devices.
67	Upload Manager	Manages synchronous and asynchronous file transfers between clients and servers on the network. If this service is stopped, synchronous and asynchronous file transfers between clients and servers on the network will not occur. If this service is disabled,
68	Utility Manager	...
69	Volume Shadow Copy	Manages and implements Volume Shadow Copies used for backup and other purposes. If this service is stopped, shadow copies will be unavailable for backup and the backup may fail. If this service is disabled, any services that explicitly depend on it will f

70	WebClient	Enables Windows-based programs to create, access, and modify Internet-based files. If this service is stopped, these functions will not be available. If this service is disabled, any services that explicitly depend on it will fail to start.
71	Windows Audio	Manages audio devices for Windows-based programs. If this service is stopped, audio devices and effects will not function properly. If this service is disabled, any services that explicitly depend on it will fail to start.
72	Windows Image Acquisition (WIA)	Provides image acquisition services for scanners and cameras.
73	Windows Installer	Installs, repairs and removes software according to instructions contained in .MSI files.
74	Windows Management Instrumentation	Provides a common interface and object model to access management information about operating system, devices, applications and services. If this service is stopped, most Windows-based software will not function properly. If this service is disabled, any
75	Windows Time	Maintains date and time synchronization on all clients and servers in the network. If this service is stopped, date and time synchronization will be unavailable. If this service is disabled, any services that explicitly depend on it will fail to start.
76	Wireless Zero Configuration service	Provides automatic configuration for the 802.11 adapters
77	WMI Perform.Adapter	Provides performance library information from WMI HiPerf providers.
78	Workstation	Creates and maintains client network connections to remote servers. If this service is stopped, these connections will be unavailable. If this service is disabled, any services that explicitly depend on it will fail to start.

A-3 My Notes about each Service

#	Service Name	My Note
1	Alerter	The Alerter Service uses the Messenger service to send and transmit messages in the form of pop-up alert boxes between Windows computers. The Messenger Service is not related to the Windows Messenger like MSN messenger. With this service enabled, remote hosts, users or attackers are able to generate unsolicited pop-up message boxes on a host as a form of Spam or Denial Of Service attack.
2	Application Layer Gateway Service	It is like the firewall filters the incoming call. However, this firewall will be in the application layer not in the physical layer. Therefore, it is less secure than the firewall. If you have installed a firewall, you don't need to run this service. Because this service works in the application layer and needs enough memory space to work, this service could degrade the performance of the computer. In the same time, this service offers some good features like: <ul style="list-style-type: none"> - Hiding the name of the internal system, so it'll not known to Internet users. - Authentication and login. - Cost effectiveness because the authentication can be located at application gateway. - Less-complex filtering rules than with packet filter.
3	Application Management	Application Management and Windows Installer services manage Add/Remove applications. Windows installer which is a feature of the Windows 2000 professional operating system manages a standard format for application setup and installation (.mci). It tracks components such as groups of files, registry entries, and shortcuts. Windows installer is a system-resident installation service that provides consistent deployment, enabling administrators and users to manage shared resources, customize installation process, make decisions on application usage, and resolve configuration problems. <p>Disabling these services may generate error when you try to install/uninstall any program. Therefore, disabling these services can be useful in some computers where the administrator doesn't want the users to install/uninstall any program.</p>

4	Automatic Updates	<p>The Automatic Updates service enables bastion hosts to download and install critical Microsoft Windows® updates. This service automatically provides bastion hosts with the latest updates, drivers, and enhancements. You no longer have to manually search for critical updates and information; the operating system delivers them directly to the bastion hosts. The operating system recognizes when you are online and uses your Internet connection to search for applicable updates from the Windows Update service. Depending on your configuration settings, the service will notify you before a download, an installation, or it will automatically install updates for you.</p> <p>Stopping or disabling the Automatic Updates service will prevent critical updates from downloading to the computer automatically. In this case, you will have to go directly to the Windows Update Web site at http://www.windowsupdate.microsoft.com to search for, download, and install any applicable critical fixes.</p>
5	Background Intelligent Transfer Service	<p>The Background Intelligent Transfer service is used by programs (such as Windows AutoUpdate) to download files by using spare bandwidth. The Background Intelligent Transfer service can maintain file transfers through network disconnections and computer restarts. However, the following two problems exist with the Background Intelligent Transfer service: If a file transfer job is pending, and the computer starts without an available network connection, the Background Intelligent Transfer service remains in the "Pending Start" state for two minutes. If a user logs on during this time, some of the system services may not start for the first two minutes. When a computer that is running any of the following operating systems with Internet options set to "Always dial my default connection", the Background Intelligent Transfer service remains in the "Connecting" state when you try to transfer a file: Microsoft Windows Millennium Edition (Me) Microsoft Windows 98 Microsoft Windows 95 To resolve this problem, obtain the latest service pack for Windows.</p> <p>Stopping this service causes features such as Automatic Update to not automatically download programs and other information until the service is running again. This means that the computer will not receive automatic updates from Software Update Services (SUS) if this service has been configured via Group Policy. Disabling this service causes any services that explicitly depend on it to not transfer files, unless a fail – safe mechanism is in place to transfer files directly through other methods such as Internet Explorer.</p>
6	ClipBook	<p>The ClipBook service is an interesting tool that lets you copy and paste the content of your computer's to another. If you want to try out this tool, run ClipBook and look at the Help file. Although this service lets you configure who has remote access to your ClipBook, why enable an open target on your system for attackers?</p>
7	COM Event System	
8	COM System Application	
9	Computer Browser	<p>The primary function of the browser service is to provide a list of computers sharing resources in a client's domain along with a list of other domain and workgroup names across the wide-area network (WAN). This list is provided to clients that view network resources with Network Neighborhood or the NET VIEW command. If you find that My Computer or Network Neighborhood take a very long time to open on client computers, it means the master browser election is being forced on more than one server causing confusion when clients attempt to find network resources.</p> <p>The Microsoft Windows implementation of the browser Protocol contains an undocumented feature that provides for the remote shutdown of the Computer Browser Service on a single computer or multiple computers. This may cause denial of service attack or allow the attacker to browse the Network Neighborhood. Microsoft Security Bulletin (MS00-036) refers about this problem, and they put a patch to fix it.</p>

		<p>Computer Browser Service depends on two other services:</p> <ul style="list-style-type: none"> Server Service: Make you computer as a server which means that you allow sharing on your computer, and you give the other permission to the use the sharing on your computer. Workstation Service: Make you computer as a workstation which means that you give the computer permission to use the sharing on the server. <p>Disabling the Computer Browser service will cause the browser list to not be updated or maintained.</p>
10	Cryptographic Services	<p>Microsoft® Windows 2000 introduces a comprehensive public key infrastructure (PKI) to the Windows platform. This leverages and extends the Windows public key (PK) cryptographic services, introduced over the past few years, providing an integrated set of services and administrative tools for creating, deploying, and managing PK-based applications. This allows application developers to take advantage of Windows NT's shared-secret security mechanisms or PK-based security mechanism as appropriate. At the same time, enterprises gain the advantage of being able to manage the environment and applications based on consistent tools and policy mechanisms.</p>
11	DHCP Client	<p>The DHCP Client service manages network configuration by registering and updating Internet Protocol (IP) addresses and DNS names for your computer. This service prevents you from having to manually change the IP settings when a client, such as when a roaming user wanders throughout the network. The client is automatically given a new IP address regardless of the subnet it reconnects to — as long as a Dynamic Host Configuration Protocol (DHCP) server is accessible from each of those subnets. There is no need to manually configure settings for DNS or Windows Internet Name Service (WINS). The DHCP server enforces these service settings to the client, as long as the DHCP server has been configured to issue such information. To enable this option on the client, simply select the Obtain DNS Server Address Automatically option button. Enabling this option will not cause duplicate IP address conflicts.</p> <p>Stopping the DHCP Client service will cause your computer to not receive dynamic IP addresses and automatic Dynamic DNS updates will not be registered on the DNS server. Disabling this service also causes any services that explicitly depend on it to fail.</p>
12	Distributed Link Tracking Client	<p>Maintains links with NTFS files within your computer or across a domain. For example, you could make a file on "Computer A." You then create a "short cut" or "link" to that file on "Computer B." If you would move the file on Computer A to a different location, this service would tell Computer B to update its information to allow uninterrupted connectivity.</p>
13	Distributed Transaction Coordinator	<p>The Distributed Transaction Coordinator (MSDTC) component is a distributed transaction facility for Microsoft Windows systems, which uses transaction processing technology. MSDTC exploits loosely coupled systems to provide scalable performance.</p> <p>The MSDTC is based on the OLE Transactions interface protocol, which provides a simple, object-oriented interface for initiating and controlling transactions. A consistent transaction object model, it supports a variety of resource managers, including relational databases, object-oriented databases, file systems, document storage systems, and message queues. Applications can use the resource manager with an X/Open-compliant Transaction Processing monitor, such as Encina, TopEnd, and Tuxedo. With MSDTC, applications can update data as shown in the following list:</p> <ul style="list-style-type: none"> Update data residing in one or more XA-compliant resource managers such as Oracle, IBM DB2, Informix, Sybase, or Ingres. Update data residing in two or more OLE Transaction-compliant resource managers such as Microsoft SQL Server™ or Microsoft Message Queue. <p>The client application and the resource managers can reside on a single Windows system. Alternatively, the client application and the resource managers can be distributed across two or more</p>

		Windows systems.
		Microsoft Distributed Transaction Coordinator (MS DTC) loads the Ociw32.dll file without request. This prevents uninstalling Oracle 8. You may receive one of the following error message: PERMISSION_DENIED while removing OCIW32.DLL. -or- PERMISSION_DENIED while removing OCI.DLL
14	DNS Client	DNS is much like the telephone system, real Internet addresses are actually numbers, not names. When you tell your web browser (e.g., Internet Explorer) to go to (say) "www.techtv.com", it first has to convert that name into a numerical Internet address ("64.95.116.134" in the case of "www.techtv.com"). It does that by looking up the address with DNS (Domain Name System), much as you would look up a name in a telephone book to get the proper telephone number to call. Therefore, you need this service if you use the Internet.
15	Error Reporting Service	In an effort to make Windows a better and more stable operating system, Microsoft has included Error Reporting. Whenever an application has to close because of an error, it asks that a report be sent to Microsoft for study and evaluation. Sending the report is optional, but users can benefit from the error log that is generated if they wish to study it or print a hard copy. You can access the error reporting from (Control Panel -> Administrative Tools -> Event Viewer).
16	Event Log	This service may generate an error if you disable it.
17	Fast User Switching Compatibility	Fast User Switching is a feature that allows multiple users to be logged on to the computer at the same time. Many programs were not designed to run in a multiple-user environment, and would normally have problems when multiple users log on to the computer. To make these programs compatible with Fast User Switching, the Fast User Switching Compatibility service will take one of four different actions when a specific problematic program is being used when user sessions are activated and/or disconnected.
18	Help and Support	There is no way to disable this service. I tried to disabled, and then I run Help and Support from the start menu. I found the windows changed the start up type for this service to Automatic.
19	Human Interface Device Access	This service should remain enabled if you use user-defined hot-keys on keyboards, remote controls, etc.
20	IMAPI CD-Burning COM Service	This service should remain enabled if you have/use a CD-Writer.
21	Indexing Service	The Indexing Service on windows allows you to create a search engine for your site. This service has a vulnerability that enables a malicious web site operator to write a web application that could gather information about files on a visiting user's computer. Microsoft Security Bulletin (MS00-098) refers about this problem, and they put a patch to fix it. Also, this service indexes your files presumably to shorten the time needed to search your hard drive if you are looking for a specific file or part of a phrase inside a file. By default, this service is set to manual (so it won't start), but when you do a search on your computer, there's that little question asking you if you want to make future searches faster.... so you could have enabled it (it will tell you that you are going to enable the Indexing service when you choose this). It is working on indexing the files and the folders when the computer is ideal.
22	Internet Connection Firewall (ICF)/Internet Connection Sharing	Windows ICF (Internet Connection Firewall) is the built-in firewall in Windows, both the Home and Professional editions. ICF is an excellent personal firewall and will prevent most attacks from the Internet. However, the lack of granular control makes ICF much too restrictive for power users. Let's discuss the pros and cons of ICF. Pros: ICF is free. You can't argue with free and integrated into the operating system. Well, unless you are Netscape or the Department of Justice. ICF performed robustly under attack as well as under high utilization. ICF will prevent most attacks from the Internet. By default, the firewall ruleset is very restrictive, preventing most attacks. I say most, because it won't prevent against virus and other attacks that initiate from

your computer. ICF is a stateful firewall. Stateful firewalls are generally more secure than packet filters. ICF may already be installed and active. If you've used the Network Setup Wizard, it may have already turned on ICF for you. The ICF programmatic API allows ICF aware applications to open up "holes" in the ICF to allow incoming traffic. This is useful for programs like Windows Messenger and games like Warcraft 3 that require inbound connections. Application proxies allow ICF to work with firewall unfriendly protocols. Cons: ICF breaks a lot of applications. This is arguably a good feature for a firewall, after all, firewalls are designed to stop traffic. However, the inability to create granular access rules and specify "trusted" hosts encourages users to just shut it off. ICF doesn't support RPC, so message notification in Outlook will not function properly. In addition, services such as file sharing won't work. ICF does not perform any outbound filtering. This is by design; however, it makes ICF useless against Trojans and other malicious applications that "phone home". ICF lacks real-time notification of attacks. ICF can be configured to log allowed or denied traffic in a file; however, no real time notification is available. The ability of applications to dynamically open ports requires administrative-level privileges. If you're applying the "Principle of Least Privileges" and your account is only a "limited" account, the applications you run will not be able to take advantage of the ICF programmatic API and open up ports dynamically.

23 Internet Connection Sharing

Windows ICF (Internet Connection Firewall) is the built-in firewall in Windows, both the Home and Professional editions. ICF is an excellent personal firewall and will prevent most attacks from the Internet. However, the lack of granular control makes ICF much too restrictive for power users. Let's discuss the pros and cons of ICF.

Pros: ICF is free. You can't argue with free and integrated into the operating system. Well, unless you are Netscape or the Department of Justice. ICF performed robustly under attack as well as under high utilization. ICF will prevent most attacks from the Internet. By default, the firewall ruleset is very restrictive, preventing most attacks. I say most, because it won't prevent against virus and other attacks that initiate from your computer. ICF is a stateful firewall. Stateful firewalls are generally more secure than packet filters. ICF may already be installed and active. If you've used the Network Setup Wizard, it may have already turned on ICF for you. The ICF programmatic API allows ICF aware applications to open up "holes" in the ICF to allow incoming traffic. This is useful for programs like Windows Messenger and games like Warcraft 3 that require inbound connections. Application proxies allow ICF to work with firewall unfriendly protocols. Cons: ICF breaks a lot of applications. This is arguably a good feature for a firewall, after all, firewalls are designed to stop traffic. However, the inability to create granular access rules and specify "trusted" hosts encourages users to just shut it off. ICF doesn't support RPC, so message notification in Outlook will not function properly. In addition, services such as file sharing won't work. ICF does not perform any outbound filtering. This is by design; however, it makes ICF useless against Trojans and other malicious applications that "phone home". ICF lacks real-time notification of attacks. ICF can be configured to log allowed or denied traffic in a file; however, no real time notification is available. The ability of applications to dynamically open ports requires administrative-level privileges. If you're applying the "Principle of Least Privileges" and your account is only a "limited" account, the applications you run will not be able to take advantage of the ICF programmatic API and open up ports dynamically.

24	IPSec Services	The need for IP-based network security is almost universal in the interconnected business world of the Internet, intranets, branch offices, and remote access. Because sensitive information constantly crosses the networks, the challenge for network administrators and other information service professionals is to ensure that this traffic is: (data integrity) Safe from data modification while in transit. (data confidentiality) Safe from viewing. (data authentication) Safe from being impersonated by unauthenticated parties. (replay protection) Safe from being captured and replayed later to gain access to sensitive resources; typically, an encrypted password can be used in this manner.
25	Logical Disk Manager	This service may generate an error if you disable it.
26	Logical Disk Manager Administrative Service	This service may generate an error if you disable it.
27	Messenger	The Alerter Service uses the Messenger service to send and transmit messages in the form of pop-up alert boxes between Windows computers. The Messenger Service is not related to the Windows Messenger like MSN messenger. With this service enabled, remote hosts, users or attackers are able to generate unsolicited pop-up message boxes on a host as a form of Spam or Denial Of Service attack.
28	MS Software Shadow Copy Provider	<p>Volume shadow copy technology provides an instant copy of the original volume. A shadow copy of the volume is made at the time a backup is initiated. Data is then backed up from the shadow copy instead of from the original volume. The original volume continues to change as the process continues, but the shadow copy of the volume remains constant. This is helpful if users need access to files while a backup is taking place.</p> <p>The main idea is the file server should have at least three different volumes on it. The first, C: drive, should be reserved for the operating system. The second, D: drive, should be your data drive. It should be the biggest volume on the server. The third, E: drive, will be reserved to store the shadow copies.</p>
29	Net Logon	Used for logging onto a Domain Controller. This service is not required on a standalone system, or for a "home" network.
30	NetMeeting Remote Desktop Sharing	<p>NetMeeting is an application included with Windows 2000 (or can be downloaded from http://www.microsoft.com/netmeeting) that enables real-time audio, video, and data communication over the Internet. The feature of NetMeeting at this service is Remote Desktop Sharing.</p> <p>The NetMeeting Remote Desktop service lets users who have proper authorization access you desktop remotely. NetMeeting is compliant with applicable industry standard protocols and represents a significant doorway that you must look and guard if you choose to enable this service,</p> <p>A remote denial of service vulnerability has been discovered in a component of NetMeeting. The denial of service can occur when a malicious client sends a particular malformed string to a port which the NetMeeting service is listening on and with Remote Desktop Sharing enabled. Microsoft has released a patch that eliminates this security vulnerability.</p>
31	Network Connections	Disabling this service may cause: The dial-up network not working. No connections listed in the control panel -> network connections. The connection icon in the system tray.
32	Network DDE	<p>Network Dynamic Data Exchange (DDE) is a technology that enables applications running on different computers to dynamically share information. For instance, using Network DDE, an instance of Word running on Computer A could dynamically link to an instance of Excel running on Computer B, and display a document that's a blend of information from both applications. The service is a type of IPC (InterProcess Communication). One such thing which does is the Clipboard.</p> <p>Microsoft has released a patch that eliminates a security vulnerability in this service. The vulnerability could, under certain conditions, allow an attacker to gain complete control over an affected machine.</p>

33	Network DDE DSDM	<p>Network Dynamic Data Exchange (DDE) is a technology that enables applications running on different computers to dynamically share information. For instance, using Network DDE, an instance of Word running on Computer A could dynamically link to an instance of Excel running on Computer B, and display a document that's a blend of information from both applications. The service is a type of IPC (InterProcess Communication). One such thing which does is the Clipboard.</p> <p>Microsoft has released a patch that eliminates a security vulnerability in this service. The vulnerability could, under certain conditions, allow an attacker to gain complete control over an affected machine.</p>
34	Network Location Awareness (NLA)	<p>The Network Location Awareness Service component supports the Network Location Service. This component provides the infrastructure that informs applications and the operating system of the network connections on a specific computer and to adapt to that computer's connectivity. This component implements the NS_NLA Windows Sockets namespace.</p> <p>This component allows applications to enumerate network connections, obtain information about each connection, and request notification when the connections change. The connection information provides important networking data, such as the connection speed and connection type.</p> <p>If you use your laptop on more than one network, you may have faced the problem of using a static IP address at one location and dynamic IP addressing at another. For example, you may use dynamic addressing (DHCP) at work, but a static IP address at home to connect with a broadband Internet Service Provider. Windows Professional includes Network Location Awareness that allows you to move between wired networks, such as your business network and home network, without reconfiguring your laptop.</p>
35	NT LM Security Support Provider	<p>The NTLM Security Support Provider service provides security to remote procedure call (RPC) programs that use transports other than named pipes, and enables users to log on to the network using the NTLM authentication protocol. The NTLM protocol authenticates clients that do not use Kerberos version 5 authentication.</p> <p>Stopping or disabling the NTLM Security Support Provider service will prevent you from logging on to clients using the NTLM authentication protocol, or accessing network resources. Microsoft Operations Manager (MOM) and Telnet rely on this service.</p>
36	Performance Logs and Alerts	<p>The Performance Logs and Alerts service collects performance data from local or remote computers based on preconfigured schedule parameters, then writes the data to a log or triggers an alert. The Performance Logs and Alerts service starts and stops each named performance data collection based on information contained in the named log collection setting. This service only runs if at least one collection is scheduled.</p> <p>Stopping for disabling the Performance Logs and Alerts service causes performance information to not be collected, currently running data collections will terminate, and future scheduled collections will not occur.</p>
37	Plug and Play	<p>This service may generate an error if you disable it.</p>
38	Portable Media Serial Number Service	<p>The service supports the Secure Digital Music Initiative(SDMI) and enables the WMDM (Windows Media Device Manager) to retrieve the serial number from portable music devices using Pre-Message Security Protocol(PMSP), so media content can be copied securely to the device.</p> <p>If not being able to extract the serial number from the device (If this service is disabled or the device doesn't support it), then copyrighted music will not be allowed to be transfered to the device.</p>

39	Print Spooler	<p>Queues up print jobs for later printing. This service is required if you have printers, even if they are network printers.</p> <p>Microsoft has released a patch that eliminates a security vulnerability in this service. The vulnerability could allow a user to cause the print spooler service to crash, or to run arbitrary code on a Windows NT machine. The patch also eliminates a vulnerability that could allow a user to substitute code of their choosing for a print provider that runs in a privileged state.</p>
40	Protected Storage	<p>The Protected Storage service is used to store certain kinds of privileged information, such as passwords entered into web browser form fields or used to connect to an Internet service provider. Under certain circumstances, the Protected Storage information in the Registry can become corrupt.</p>
41	QoS RSVP	<p>QoS RSVP (Quality of Service Resource ReReservation Protocol) is used to reserve network/internet connection bandwidth when QoS aware processes are active, providing them with more bandwidth as necessary. The amount of bandwidth reserved defaults to 20%, although this can easily be modified (High recommended).</p>
42	Remote Access Auto Connection Manager	<p>The Remote Access Auto Connection Manager service maps and maintains network addresses to connection destinations. This allows a destination to be automatically dialed from a program or from the command prompt. A network address can be an Internet host name, an Internet Protocol (IP) address, or a NetBIOS server name.</p> <p>The Remote Access Auto Connection Manager service does not start automatically. You must manually start the service by using the Services node of the Component Services Microsoft Management Console (MMC) snap-in. The service provides the following autodial functions: If you are not connected to a network and a program cannot reach a remote address, autodial attempts to create the connection. If you are connected to a network and a program cannot reach a remote address, autodial attempts to create a connection but only for those addresses that it has previously obtained. Autodial does not attempt to create a connection for incorrectly typed server or Internet host names. </p>
43	Remote Access Connection Manager	<p>The Remote Access Connection Manager is a service that handles the details of establishing the connection to the remote server. This service also provides the client with status information during the connection operation. The Remote Access Connection Manager starts automatically when an application loads the RASAPI32.DLL.</p>
44	Remote Desktop Help Session Manager	<p>This feature is really cool for new users. If you want to leave this on, set it to Automatic.</p>
45	Remote Procedure Call (RPC)	<p>This service may generate an error if you disable it.</p>
46	Remote Procedure Call (RPC) Locator	<p>Microsoft describes the Windows Locator service as "a name service that maps logical names to network-specific names". A client that is going to make a Remote Procedure Call (RPC) can call the Locator service to resolve a logical name for a network object to a network-specific name for use in the RPC. For example, if a print server has the logical name "laserprinter", an RPC client could call the Locator service to find out the network-specific name that mapped to "laserprinter". The RPC client uses the network-specific name when it makes the RPC call to the service.</p> <p>A buffer overflow in the Windows Locator service may make it possible for a remote attacker to execute arbitrary code on a vulnerable system by sending an overly large request to the Windows Locator service. Microsoft Security Bulletin (MS03-001) refers about this problem, and they put a patch to fix it.</p>

47	Remote Registry	<p>The Remote Registry Service enables remote users to modify registry settings on the domain controller, provided the remote users have the required permissions. Only users in the Administrators and Backup Operators groups by default can access the registry remotely. This service is required for the Microsoft Baseline Security Analyzer (MBSA) utility. MBSA is a tool that allows you to verify which patches are installed on each of the servers in your organization.</p> <p>Stopping the Remote Registry Service allows you to modify the registry only on the local computer. Disabling this service causes any services that explicitly depend on it to fail, but will not affect registry operations on your local computer. Other computers or devices will also no longer connect to your local computer's registry.</p>
48	Removable Storage	<p>Removable Storage provides services to applications and system administrators that facilitate the use, sharing, and management of removable media devices, such as tape drives and robotic storage libraries. The availability of Removable Storage technology eliminates the need for independent software vendors (ISVs) to develop customized solutions and support for these devices on a per-device basis. More importantly, Removable Storage enables multiple storage applications to share expensive removable media storage devices. Thus the focus of storage applications can be directed to customer features rather than hardware issues.</p>
49	Routing and Remote Access	<p>Allows computers to dial in to the local computer through a modem (or other devices) to access the local network using a standard or VPN connection. Upon enabling this service, "Incoming Connections" icon will be available in the "Network Connections" control panel.</p> <p>Microsoft has released a security patch to correct problems on Windows computers running Remote Access Service (RAS) or Routing and Remote Access Service (RRAS). That might cause a denial-of-service vulnerability.</p>
50	Secondary Logon	<p>Enables starting processes under alternate credentials. It allows a "limited user" account to start an application or process with higher privileges, such as the Administrator account or another user. You can also have a privileged user start an application or process with limited privileged account. If you right-click a file, the menu will display "Run As" option. If you disable this service, that function will no longer be available.</p>
51	Security Accounts Manager	<p>This service may generate an error if you disable it.</p>
52	Server	<p>The primary function of the browser service is to provide a list of computers sharing resources in a client's domain along with a list of other domain and workgroup names across the wide-area network (WAN). This list is provided to clients that view network resources with Network Neighborhood or the NET VIEW command. If you find that My Computer or Network Neighborhood take a very long time to open on client computers, it means the master browser election is being forced on more than one server causing confusion when clients attempt to find network resources.</p> <p>The Microsoft Windows implementation of the browser Protocol contains an undocumented feature that provides for the remote shutdown of the Computer Browser Service on a single computer or multiple computers. This may cause denial of service attack or allow the attacker to browse the Network Neighborhood. Microsoft Security Bulletin (MS00-036) refers about this problem, and they put a patch to fix it.</p> <p>Computer Browser Service depends on two other services:</p> <ul style="list-style-type: none"> Server Service: Make you computer as a server which means that you allow sharing on your computer, and you give the other permission to the use the sharing on your computer. Workstation Service: Make you computer as a workstation which means that you give the computer permission to use the sharing on the server. <p>Disabling the Computer Browser service will cause the browser list to not be updated or maintained.</p>

53	Shell Hardware Detection	It automatically detect and react to new devices on a system like memory cards, CD drives, laptop docking stations, etc. If this service is disabled, you will not have an auto play tab displayed or available.
54	Smart Card	This service supports the use of a Smart Card for local or network computer authentication.
55	Smart Card Helper	This service supports the use of a Smart Card for local or network computer authentication.
56	SSDP Discovery Service	<p>Universal Plug and Play (UPnP) is a capability that allows devices on a network to discover other devices and determine how to work with them. UPnP is most easily understood by comparison to plug-and-play (PnP) capability that most Windows users already are familiar with. PnP allows the operating system to detect new hardware when you install it on a system. For instance, if you install a new mouse onto your computer, PnP allows Windows to detect it, load the needed drivers, and begin using it. UPnP extends this concept to devices on a network, rather than on the local system itself. UPnP lets computers learn about other devices on the network, and determine how to use them. For instance, a computer could use UPnP to detect whether there are printers on the network that it can use and learn how to use them.</p> <p>The FBI's NIPC (National Infrastructure Protection Center) Advisory 01-030 regarding what Microsoft refers to as critical vulnerabilities in the Universal Plug and Play (UPnP) service in Windows XP, Millennium Edition (ME), and Windows 98 or Windows 98SE systems. These vulnerabilities could lead to denial of service attacks and separately to system compromises. Since the discovery of these vulnerabilities by eEye Digital Security, Microsoft Corporation has released a software patch and a detailed security bulletin regarding the problem, instructions for installing the patch as well as instructions to disable the UPnP service if patch installation is impracticable.</p>
57	System Event Notification	This service may generate an error if you disable it.
58	System Restore Service	System Restore Service creates system snap shots or restores a point for returning to later. This is the OTHER service that is a massive resource hog. Indexing Service is number one. Every time you install a program or new driver, and on a schedule, this service creates a "restore point" to roll back to if a problem occurs. This service would have been nice in the Windows 95 days due to plenty of problems occurring (new DirectX version every 15 minutes) but not required for the "much" more stable Windows XP.
59	Task Scheduler	You use this service to schedule maintenance, Microsoft Backup sessions, Auto Update, Virus scanner, etc.
60	TCP/IP NetBIOS Helper	<p>The TCP/IP NetBIOS Helper Service provides support for the network basic input/output system (NetBIOS) over TCP/IP (NetBT) service and NetBIOS name resolution for clients on your network; thus, enabling users to share files, print, and log on to the network. The Transmission Control Protocol/Internet Protocol (TCP/IP) NetBIOS Helper service provides support for the NetBT service by performing DNS name resolution.</p> <p>Stopping the TCP/IP NetBIOS Helper Service may prevent NetBT, Redirector (RDR), Server (SRV), Netlogon and Messenger service clients from sharing files, printers, and users from logging on to computers. For example, domain – based Group Policy will no longer function. Disabling this service causes any services that explicitly depend on it to fail.</p>
61	Telephony	This service is required for dial-up modem connectivity. Some DSL/Cable providers require this service. However, if you use a router or gateway, you don't need this service.
62	Telnet	Telnet is a member of the TCP/IP family of protocols, and allows a user to establish a remote session on a server. The protocol supports only alphanumeric terminals – that is, it doesn't support mice and other pointing devices, nor does it support graphical user interfaces. Instead, all commands must be entered via the command line. There are a lot of vulnerable in this service, that could cause a denial of service attack, or even allow attacker access to your PC. Microsoft mentions about most of them, and they posted patches to fix them.

63	Terminal Services	<p>Terminal Services provides a multi – session environment that allows client devices to access a virtual Windows desktop session and Windows – based programs running on the server. Terminal Services allows users to remotely administer a server.</p> <p>There are couple vulnerabilities for this service: The Group Policies (GPO) will not be applied to users if the current number of connections to the GPO hosting server exceeds the number of installed user licenses. If an attacker sent a sufficiently large quantity of such data to an affected machine, he could deplete the machine's memory to the point where response time would be slowed or the machine's ability to respond would be stopped altogether. All system services would be affected, including but not limited to terminal services. Normal operation could be restored by rebooting the machine. If an attacker scan all the open ports on your server, he is going to find port #3389 open unless you add security using IPSec or you change the port number from the registry. Stopping or disabling Terminal Services prevents a computer from being remotely administered making the computer difficult to manage and update.</p>
64	Themes	<p>If you want to have a specific theme (style) for the toolbars on your windows, you may need this service like making all the toolbars blue, silver, or green. Turning this service off will eliminate all these colors. You need to disable this service if you don't care about the appearance, and you just care about freeing the memory and increasing the quality.</p>
65	Uninterruptable Power Supply	<p>This service manage an uninterruptible power supply (UPS) connected to the computer. You may the Windows shut down when you run this service because either you don't have UPS or the UPS signal polarity is set to Negative for Power Fail/On Battery.</p>
66	Universal Plug and Play Device Host	<p>Universal Plug and Play (UPnP) is a capability that allows devices on a network to discover other devices and determine how to work with them. UPnP is most easily understood by comparison to plug-and-play (PnP) capability that most Windows users already are familiar with. PnP allows the operating system to detect new hardware when you install it on a system. For instance, if you install a new mouse onto your computer, PnP allows Windows to detect it, load the needed drivers, and begin using it. UPnP extends this concept to devices on a network, rather than on the local system itself. UPnP lets computers learn about other devices on the network, and determine how to use them. For instance, a computer could use UPnP to detect whether there are printers on the network that it can use and learn how to use them.</p> <p>The FBI's NIPC (National Infrastructure Protection Center) Advisory 01-030 regarding what Microsoft refers to as critical vulnerabilities in the Universal Plug and Play (UPnP) service in Windows XP, Millennium Edition (ME), and Windows 98 or Windows 98SE systems. These vulnerabilities could lead to denial of service attacks and separately to system compromises. Since the discovery of these vulnerabilities by eEye Digital Security, Microsoft Corporation has released a software patch and a detailed security bulletin regarding the problem, instructions for installing the patch as well as instructions to disable the UPnP service if patch installation is impracticable.</p>
67	Upload Manager	<p>The Windows Help and Support center includes a feature that runs when the Found New Hardware Wizard completes. This feature prompts you to send hardware profile information to Microsoft so that you can receive information about how to obtain the appropriate driver, or obtain support for the hardware that you installed. If you agree to send this data to Microsoft, Help and Support uses the Upldrinfo.htm file to send your hardware profile information to the Microsoft Driver Feedback server by using the Upload Manager service.</p> <p>There is a security vulnerability in the JScript code in the Upldrinfo.htm file that might permit an attacker to delete files on your computer by using the hcp:// pluggable protocol to load the Upldrinfo.htm file. Microsoft Security Bulletin (MS02-060) refers about this problem, and they put a patch to fix it.</p>
68	Utility Manager	<p>Utility Manager is an accessibility utility that allows users to check the status of accessibility programs (Microsoft Magnifier, Narrator, On–Screen Keyboard) and to start or stop them.</p>

69	Volume Shadow Copy	<p>Volume shadow copy technology provides an instant copy of the original volume. A shadow copy of the volume is made at the time a backup is initiated. Data is then backed up from the shadow copy instead of from the original volume. The original volume continues to change as the process continues, but the shadow copy of the volume remains constant. This is helpful if users need access to files while a backup is taking place.</p> <p>The main idea is the file server should have at least three different volumes on it. The first, C: drive, should be reserved for the operating system. The second, D: drive, should be your data drive. It should be the biggest volume on the server. The third, E: drive, will be reserved to store the shadow copies.</p>
70	WebClient	<p>WebClient service (on the client machine) work with WebDev service (on the server machine). WebDAV (Web Distributed Authoring and Versioning) extends the HTTP/1.1 protocol to allow clients to publish, lock, and manage resource on the web.</p> <p>When you try to open a file or document that resides on a Distributed File System (DFS) share, it may take a long amount of time to open the resource (from 90 seconds to 15 minutes). However, you may be able to quickly open the same resource by using a UNC path. The problem is caused when the WebClient redirector does not cache information. To resolve this problem, obtain the latest service pack for Windows.</p>
71	Windows Audio	This service is required if you wish to hear any audio at all.
72	Windows Image Acquisition (WIA)	If you disabled this service, your camera and scanner would fail to function properly.
73	Windows Installer	<p>Application Management and Windows Installer services manage Add/Remove applications. Windows installer which is a feature of the Windows 2000 professional operating system manages a standard format for application setup and installation (.mci). It tracks components such as groups of files, registry entries, and shortcuts. Windows installer is a system-resident installation service that provides consistent deployment, enabling administrators and users to manage shared resources, customize installation process, make decisions on application usage, and resolve configuration problems.</p> <p>Disabling these services may generate error when you try to install/uninstall any program. Therefore, disabling these services can be useful in some computers where the administrator doesn't want the users to install/uninstall any program.</p>
74	Windows Management Instrumentation	This service may generate an error if you disable it.
75	Windows Time	Windows uses a time synchronization service to synchronize the date and time of computers running on a Windows 2000-based network. Synchronized time is critical in Window 2000 because the default authentication protocol (MIT Kerberos version 5) uses workstation time as part of the authentication ticket generation process.
76	Wireless Zero Configuration service	802.11 protocols refers to the wireless network protocol. If you don't have a wireless network, you don't need this service. You may require this service for connective with some "hot sync" software for a PDA, laptop, or other portable computers.
77	WMI Performance Adapter	<p>The WMI Performance Adapter service provides performance library information from WMI HiPerf providers. Applications and services that need to provide performance counters today can do so in two ways; by writing a WMI High Performance provider, or by writing a performance library.</p> <p>The WMI Performance Adapter service transforms performance counters supplied by WMI High Performance providers into counters that can be consumed by the Performance Data Helper (PDH) through the Reverse Adapter Performance Library. In this way, PDH clients, for example Sysmon, can consume performance counters surfaced by any WMI High Performance providers on the computer.</p> <p>If the WMI Performance Adapter service is stopped, WMI performance counters are unavailable. Disabling this service causes any services that explicitly depend</p>

on it to fail.

78 Workstation

The primary function of the browser service is to provide a list of computers sharing resources in a client's domain along with a list of other domain and workgroup names across the wide-area network (WAN). This list is provided to clients that view network resources with Network Neighborhood or the NET VIEW command. If you find that My Computer or Network Neighborhood take a very long time to open on client computers, it means the master browser election is being forced on more than one server causing confusion when clients attempt to find network resources.

The Microsoft Windows implementation of the browser Protocol contains an undocumented feature that provides for the remote shutdown of the Computer Browser Service on a single computer or multiple computers. This may cause denial of service attack or allow the attacker to browse the Network Neighborhood. Microsoft Security Bulletin (MS00-036) refers about this problem, and they put a patch to fix it.

Computer Browser Service depends on two other services:

- Server Service: Make you computer as a server which means that you allow sharing on your computer, and you give the other permission to the use the sharing on your computer.
- Workstation Service: Make you computer as a workstation which means that you give the computer permission to use the sharing on the server.

 Disabling the Computer Browser service will cause the browser list to not be updated or maintained.

A-4 Recommendation Settings about each Service

#	Service Name	Windows 7 Default	Windows 7 Pro Default	Alone	Modem	Cable	Part of Net	School	Game	Cisco
1	Alerter	1	1	0	0	0	0	0	0	0
2	Application Layer Gateway Service	1	1	0	1	1	0	0	0	4
3	Application Management	1	1	1	1	1	1	1	0	0
4	Automatic Updates	2	2	0	0	2	2	2	0	0
5	Background Intelligent Transfer Service	2	2	0	0	0	0	0	0	0
6	ClipBook	1	1	0	0	0	0	0	0	0
7	COM Event System	1	1	1	1	1	1	1	4	2
8	COM System Application	1	1	1	1	1	1	1	0	4
9	Computer Browser	2	2	0	0	2	2	2	0	0
10	Cryptographic Services	2	2	2	2	2	2	2	4	4
11	DHCP Client	2	2	0	2	2	2	2	4	2
12	Distributed Link Tracking Client	2	2	1	1	1	1	1	0	0
13	Distributed Transaction Coordinator	1	1	1	1	1	1	1	0	0
14	DNS Client	2	2	0	2	2	2	2	4	2
15	Error Reporting Service	2	2	0	0	0	0	0	0	4
16	Event Log	2	2	0	2	2	2	2	4	2
17	Fast User Switching Compatibility	1	1	1	1	1	1	1	0	4
18	Help and Support	2	2	1	1	1	1	1	0	4
19	Human Interface Device Access	0	0	1	1	1	1	1	4	4
20	IMAPI CD-Burning COM Service	1	1	1	1	1	1	1	0	4
21	Indexing Service	1	1	0	0	0	0	0	0	0
22	Internet Connection Firewall	1	2	0	1	1	1	1	0	4
23	Internet Connection Sharing	1	2	0	1	1	1	1	4	0
24	IPSec Services	2	2	1	1	1	1	1	0	2
25	Logical Disk Manager	1	2	0	1	1	1	1	4	2
26	Logical Disk Manager Administrative Service	1	1	0	1	1	1	1	0	0
27	Messenger	2	2	0	0	0	0	0	4	0
28	MS Software Shadow Copy Provider	1	1	1	1	1	1	1	0	4
29	Net Logon	1	2	1	1	1	1	1	0	0
30	NetMeeting Remote Desktop Sharing	1	1	0	0	0	0	0	0	0
31	Network Connections	1	1	0	1	1	1	1	4	2
32	Network DDE	1	1	0	0	0	0	0	0	0
33	Network DDE DSDM	1	1	0	0	0	0	0	0	0
34	Network Location Awareness (NLA)	1	1	0	1	1	1	1	0	4
35	NT LM Security Support Provider	1	1	0	1	1	1	1	0	0
36	Performance Logs and Alerts	1	1	1	1	1	1	1	0	0
37	Plug and Play	2	2	0	2	2	2	2	4	2
38	Portable Media Serial Number Service	2	2	1	1	1	1	1	0	4
39	Print Spooler	1	1	1	1	1	1	1	0	0
40	Protected Storage	2	2	2	2	2	2	2	0	2
41	QoS RSVP	1	1	1	1	1	1	1	0	0
42	Remote Access Auto Connection Manager	1	1	0	1	0	0	0	4	0
43	Remote Access Connection Manager	1	1	0	1	0	0	0	4	0
44	Remote Desktop Help Session Manager	1	1	0	0	0	0	0	0	4

45	Remote Procedure Call (RPC)	2	2	0	2	2	2	2	4	2
46	Remote Procedure Call (RPC) Locator	1	1	1	1	1	1	1	0	0
47	Remote Registry	4	2	0	0	0	0	0	0	0
48	Removable Storage	1	1	1	1	1	1	1	0	2
49	Routing and Remote Access	0	1	0	0	0	0	0	0	0
50	Secondary Logon	2	2	1	1	1	1	1	0	4
51	Security Accounts Manager	2	2	0	1	1	1	1	0	2
52	Server	2	2	0	1	1	1	1	0	2
53	Shell Hardware Detection	2	2	1	1	1	1	1	4	4
54	Smart Card	1	1	1	1	1	1	1	0	0
55	Smart Card Helper	1	1	1	1	1	1	1	0	0
56	SSDP Discovery Service	1	1	0	0	0	0	0	0	4
57	System Event Notification	2	2	0	2	2	2	2	4	2
58	System Restore Service	2	2	2	2	2	2	2	0	0
59	Task Scheduler	2	2	1	1	1	1	1	0	0
60	TCP/IP NetBIOS Helper	2	2	1	1	1	1	1	0	0
61	Telephony	1	1	1	2	1	1	1	4	0
62	Telnet	0	1	0	0	0	0	0	0	2
63	Terminal Services	1	1	0	0	1	1	1	4	0
64	Themes	2	1	2	2	2	2	2	0	4
65	Uninterruptable Power Supply	1	1	1	1	1	1	1	0	0
66	Universal Plug and Play Device Host	1	1	0	0	1	1	1	0	4
67	Upload Manager	2	2	1	1	1	1	1	0	4
68	Utility Manager	1	1	1	1	1	1	1	4	0
69	Volume Shadow Copy	1	1	1	1	1	1	1	0	4
70	WebClient	2	2	0	0	0	0	0	4	4
71	Windows Audio	2	2	2	2	2	2	2	4	4
72	Windows Image Acquisition (WIA)	1	1	2	2	2	2	2	0	4
73	Windows Installer	1	1	1	1	1	1	1	0	4
74	Windows Management Instrumentation	2	2	0	2	1	1	1	0	2
75	Windows Time	2	2	2	1	1	1	1	0	0
76	Wireless Zero Configuration service	2	2	0	0	0	0	0	0	4
77	WMI Performance Adapter	1	1	1	1	1	1	1	0	4
78	Workstation	2	2	0	2	2	2	2	4	0

A-5 Survey about the GOALAPE Model

1. What is your age?

- < 19
 between 19 and 25
 between 25 and 30
 > 30
-

2. What is your gender?

- Male
 Female
-

3. What is your opinion about the first step? (One Page Topics)

Agree	4	no need for this step	2	Disagree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Note:

4. What is your opinion about the second step? (Main Subtopics)

Agree	4	no need for this step	2	Disagree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Note:

5. What is your opinion about the third step? (Chunks Subtopics into Questions)

Agree	4	no need for this step	2	Disagree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Note:

6. What is your opinion about the fourth step? (Hyperlinks Terminology)

Agree	4	no need for this step	2	Disagree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Note:

7. What is your opinion about the fifth step? (Download Printable Version of Content)

Agree	4	no need for this step	2	Disagree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Note:

8. What is your opinion about the sixth step? (Audio Version of Content)

Agree	4	no need for this step	2	Disagree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Note:

9. What is your opinion about the seventh step? (User Selectable Virtual Aid)

Agree	4	no need for this step	2	Disagree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Note:

10. Do you think that my subject "Windows Services" understandable after these steps? Why?

Yes	4	3	2	No
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Why?

11. Do you think that I need to add more steps to clarify my subject? (if yes, like what?)

Note: