



# Global Information Assurance Certification Paper

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# **Audit of a Corporate Security Systems Domain Controller**

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## ***Abstract***

The following is a technical audit of a Corporate Security Systems Domain Controller. This audit will begin by researching information about the system. It will provide a risk evaluation and review some current states of practice. Following this will be a check list, the audit itself and a report.

The purpose of this audit is to assess the vulnerabilities and risk levels of this security systems server and to provide recommendations and a comprehensive report detailing the findings.

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## **System Research and Risk Evaluation**

### **Company Information and Overview**

The company this audit is focused on develops hardware for the semi-conductor industry. The manufacturing and servicing of this hardware required this company to decentralize its operation. With this organizational model it becomes difficult to monitor and enforce many of the companies policies and procedures. Applying building security systems to this model is an equally challenging task.

Although networked security systems have been around for a few years they are still relatively new. However, it is becoming increasingly more common for mid to large size organizations to rely almost completely on network based technology to secure their physical and (at times) intellectual property. Some organizations

use a single security application that incorporates digital video recorders with access control and security alarm systems. Others use individual applications for each security system. The one key focus they all have in common is their primary form of communication, "The Network." It is true that many security systems have the ability to use a phone dialer as a backup to the network, but often times these connections are slow and unpredictable.

With limited budgets and shared network resources it is not uncommon to find security system servers that have multiple rolls. Such is the case with the security server this audit is focused on.

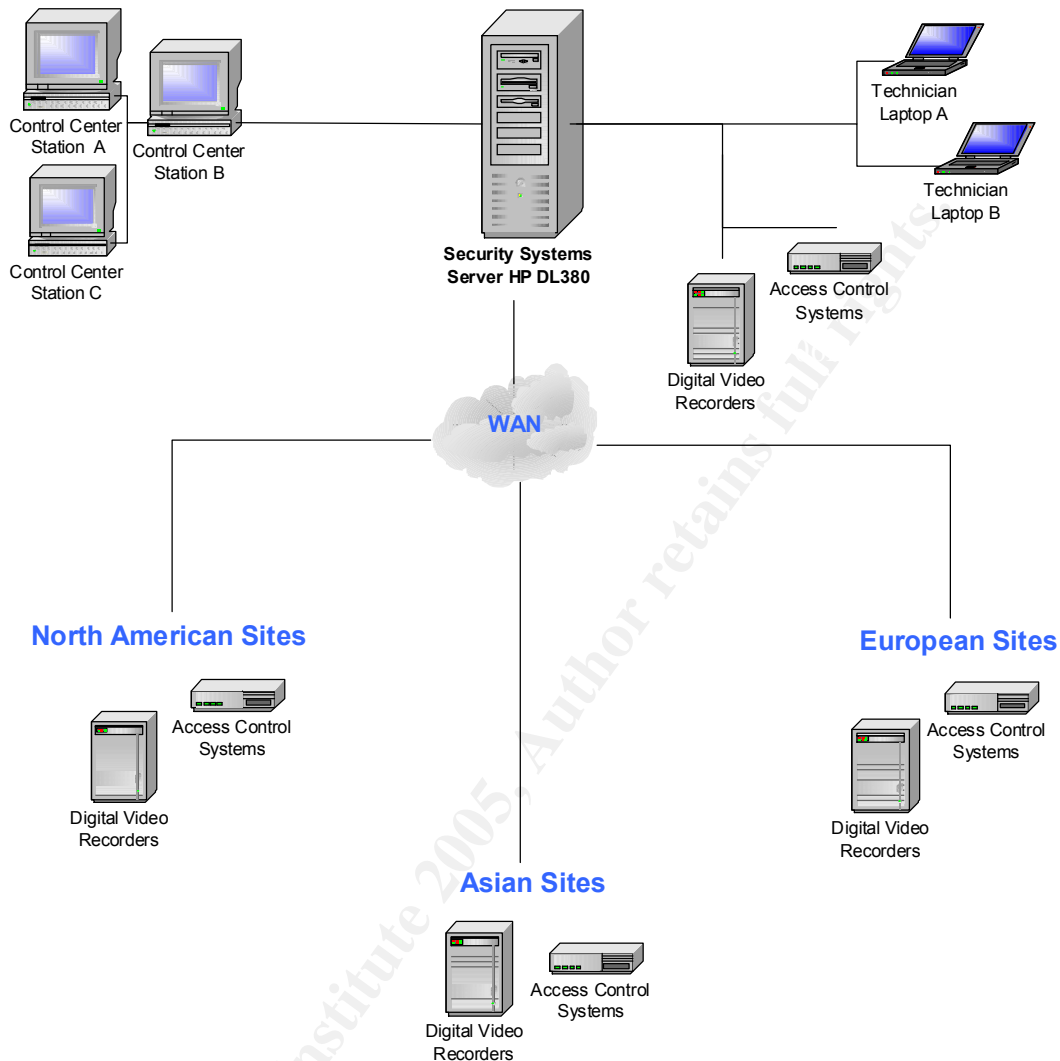
### Target Systems Organizational Role

The target of this audit is a single HP ProLiant DL380 server running Windows 2000 Server with Service Pack 4 (see below):

<u>Item</u>	<u>Value</u>
OS Name	Microsoft Windows 2000 Server
Version	5.0.2195 Service Pack 4 Build 2195
OS Manufacturer	Microsoft Corporation
System Name	-----
System Manufacturer	HP
System Model	ProLiant DL380 G3
System Type	X86-based PC
Processor	x86 Family 15 Model 2 Stepping 7 GenuineIntel ~2389 Mhz
Processor	x86 Family 15 Model 2 Stepping 7 GenuineIntel ~2389 Mhz
Processor	x86 Family 15 Model 2 Stepping 7 GenuineIntel ~2389 Mhz
Processor	x86 Family 15 Model 2 Stepping 7 GenuineIntel ~2389 Mhz
BIOS Version	01/31/03
Windows Directory	C:\WINNT
Locale	United States
Time Zone	Pacific Daylight Time
Total Physical Memory	2,096,660 KB
Available Physical Memory	87,196 KB
Total Virtual Memory	6,132,204 KB
Available Virtual Memory	2,087,604 KB
Page File Space	4,035,544 KB

This machine plays several roles (**see figure 1**). It runs the access control head end application, network monitoring applications and is the Domain Controller for the entire security systems global network. This domain controller is utilized by a 24 hour Security Operations monitoring group including several technicians. It also supports 25 or more Digital Video Recorders and 30 or more access control sites. This server provides services and applications to internal users only.

## Headquarters



**Network Diagram Figure 1**

## Risk Evaluation

Perhaps the main role and certainly one of the most important functions of this Server is its management of the communications for the security domain as the Domain Controller. As the root of the forest for this security domain this stand alone server provides the DNS and WINS service in conjunction with the Global Catalog which makes it versatile yet vulnerable as the only DC (Domain Controller) supporting this security domain. On closer inspection a number of risks are associated with this particular network scenario and certainly apply to the server targeted for this audit.

First we should take a look at what defines a Risk and how it will be identified throughout the remainder of this audit. In basic terms we are creating a Risk when we allow an Exposure to exist. When we add Vulnerability to a Threat we get Exposure:

$$\text{Vulnerability} + \text{Threat} = \text{Exposure}$$

$$\text{Vulnerability} + \text{Threat} = \text{Exposure}$$

Exposure Figure 1.2

With this in mind we will take a look at these elements and how they affect the target of our assessment.

### Threats

Threat	Description	Capacity to Cause Damage
1. Malicious Code	Attack from malicious code such as Add-Ware, Spy-Ware or Computer Virus	<b>High</b> – The introduction of malicious code to this system could allow a virus or some form of malware to gather confidential information and/or completely destroy critical programs, services and databases
2. Unauthorized Access	The ability of an unauthorized person to gain access to the Server	<b>High</b> – The ability to gain access to the system through a network share, remote software or direct access using unauthorized credentials could potentially allow the unauthorized user full control of all security systems
3. Power Outage	Power loss to system and/or redundant power supply failure	<b>High</b> – A power loss to this system would cause the Security Control Center to be blind to potential breaches in the physical security systems of the corporation and for the duration would render Security helpless
4. Damage or Theft	The ability for unauthorized personnel to access the physical system with the	<b>High</b> – Damage or Theft of this system would not only destroy all centralized security support

	intent to steal or damage	for the corporation involving Access Control, Alarm Conditions and Digital Video Surveillance, but would introduce the possibility of a new threat utilizing the newly acquired data and information resident on the system to remotely compromise all security systems
5. Permissions Abuse	Users who are granted permissions above their needs have the ability to compromise the security structure of the server and create vulnerabilities	<b>High</b> – Users with elevated privileges could pose a number of threats from the accidental (Database Corruption) to the malicious (unlocking all card access doors to a highly secured area)

## Vulnerabilities

Vulnerability	Degree of Exposure	Potential Impact
1. Insufficient Patch or Update management Process	<b>High</b>	Systems Services may fail to execute or become corrupt. Data could also become corrupt or acquired through Adware/Spyware. Organization could be severely crippled.
2. No Password Protected screen savers on Server	<b>High</b>	If a user with administrative privileges were to log on to a Server in a multi-user Server Room environment and forget to log off another user with mal-intent could completely compromise the security systems.
3. Easily Guessable Passwords (Server Policy does not enforce Passwords to meet complexity requirements)	<b>High</b>	Once the credentials have been appropriated and a successful logon attempt has been made full authoritative access will be given to the user. The potential impact to the organization could be severe.
4. Minimum UPS standby time	<b>Medium</b>	A prolonged power loss could exhaust the backup power of the UPS causing the server to

		go offline and security controls rendered useless.
5. Unused or Missing Redundant Power Supply	<b>Medium</b>	In the event the primary power supply of the server fails and the secondary power supply is unavailable the server will go offline and security controls will be rendered useless.
6. Server stored in unsecured location	<b>High</b>	If the server becomes damaged or falls victim to theft the organization stands to lose full control of security systems as well as critical data.
7. Elevated Permissions	<b>High</b>	A user with high enough credentials would have the ability to completely compromise the security systems server and all data within.
8. Open Shares	<b>High</b>	Through Open Shares a user can easily gain access to confidential data as well as control the server remotely.
9. Remote Desktop Applications	<b>High</b>	If a user gained access through a Remote Desktop Application they could potentially have as much control of the system as if they were sitting in front of it. If an administrator did not log off or lock the system the remote user could cause sever damage to the organization.

The Security Systems domain controller directly affects several areas of the organization. Some of these areas reach beyond the security group. Some of these groups operations are almost solely dependant on the data and function of this server. Below is a list of the assets this server brings to the Corporation:

### Assets

Asset	Description
1. Control Room Operator (Access Control and Digital Video Data)	Security Control Room Operators rely heavily on the data from this server to Manage building access and Digital Video for the company globally

2. Investigator Data	Investigators use the data from this server as a key tool that provides information from the access control system as well as assisting in the retrieval of archived (time and date stamped) video clips.
3. Badge Office Data	The Badge Office is constantly updating and modifying the Access Control user database located on this server
4. Human Resources Data	Human Resources utilizes this access control server for the formal activation and deactivation of access badges for the company.
5. Building Physical Security	The Security Systems Domain Controller is the nerve center for all electronic security for the company worldwide. Security relies heavily on the functions of this server to extend their reach and enable them to physically secure all business offices around the globe.

### Current State of Practice

In support of this audit you will find a list of sources below that have been or can be used as a reference during this process.

Resource	Comments
<b>1. Securing Windows 2000 Server</b> <a href="http://www.microsoft.com/downloads/details.aspx?FamilyID=9964cf42-e236-4d73-ae4f-7b4fdc0a25f6&amp;DisplayLang=en">http://www.microsoft.com/downloads/details.aspx?FamilyID=9964cf42-e236-4d73-ae4f-7b4fdc0a25f6&amp;DisplayLang=en</a>	Excellent Comprehensive resource and analysis tools from Microsoft itself including a Test, Delivery and Support Readiness Guide.
<b>2. National Security Agency (Security Recommendation Guidelines for Windows 2000)</b> <a href="http://nsa1.www.conxion.com/win2k/download.htm">http://nsa1.www.conxion.com/win2k/download.htm</a>	Good reference and gives you a peak at what the NSA is doing (recommending) to secure Windows 2000

<p><b>3. Securing Windows 2000 Server (Sans)</b>  <a href="http://www.sans.org/rr/whitepapers/win2k/189.php">http://www.sans.org/rr/whitepapers/win2k/189.php</a></p>	<p>Gives you a decent overview on Securing Windows 2000 Server and some good basic guidelines on securing the file system, share permissions, etc.</p>
<p><b>4. Protect Against Weak Authentication Protocols and Passwords</b>  <a href="http://www.windowsecurity.com/articles/Protect-Weak-Authentication-Protocols-Passwords.html">http://www.windowsecurity.com/articles/Protect-Weak-Authentication-Protocols-Passwords.html</a></p>	<p>A great look at Authentication Protocols in depth (from the oldest to the latest)</p>
<p><b>5. Auditing Windows 2000</b>  <a href="http://www.winnetmag.com/Articles/Print.cfm?ArticleID=9633">http://www.winnetmag.com/Articles/Print.cfm?ArticleID=9633</a></p>	<p>This article reviews the Windows 2000 Auditing Categories and the Audit Policy. To see the Figures you must click on the hyperlinks.</p>
<p><b>6. UCB Windows 2000 Server Security Guidelines</b>  <a href="http://www.colorado.edu/its/windows2000/admin/guide/w2ksecguidelines.html">http://www.colorado.edu/its/windows2000/admin/guide/w2ksecguidelines.html</a></p>	<p>These guidelines are primarily set for File and Print Servers, but have been a good source of information.</p>
<p><b>7. Auditing the Corporate Access Control System: An independent Auditor's Perspective</b>  <a href="http://www.giac.org/practical/GSNA/Scott_Steiner_GSNA.pdf">http://www.giac.org/practical/GSNA/Scott_Steiner_GSNA.pdf</a></p>	<p>A very good and thorough Audit of a Corporate Access Control System.</p>
<p><b>8. 5-Minute Security Advisor - Basic Physical Security</b>  <a href="http://www.microsoft.com/technet/community/columns/5min/5min-203.mspix">http://www.microsoft.com/technet/community/columns/5min/5min-203.mspix</a></p>	<p>Good guidelines on Auditing the Physical Security</p>

## The Security Systems Audit Checklist

### Check that the Server is Physically Secured

Item 1	Data/Comments
<b>Reference</b>	<p>Microsoft 5-Minute Security Advisor - Basic Physical Security  <a href="http://www.microsoft.com/technet/community/columns/5min/5min-203.mspix">http://www.microsoft.com/technet/community/columns/5min/5min-203.mspix</a></p>

<b>Risk</b>	<ul style="list-style-type: none"> <li>- Too often companies spend a great deal of time and money securing their Network when their greatest vulnerability could be the theft of the computer itself.</li> <li>- <b>Vulnerability</b> addressed is number <u>6. Server stored in unsecured location</u></li> <li>- <b>Assets</b> affected by a successful exploitation are: <ol style="list-style-type: none"> <li>1. Control Room Operator Access Control and Digital Video Data</li> <li>2. Investigator Data</li> <li>3. Badge Office Data</li> <li>4. Human Resources Data</li> <li>5. Building Physical Security</li> </ol> </li> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <i>High</i></li> </ul>
<b>Testing Procedure</b>	<ul style="list-style-type: none"> <li>- Locate and Visit the facility where the server is housed</li> <li>- Verify that access to the room is controlled and that only required personnel can gain access</li> <li>- Verify that the server is in a locked server cabinet/rack</li> </ul>
<b>Test Nature</b>	<ul style="list-style-type: none"> <li>- Objective</li> </ul>
<b>Evidence</b>	
<b>Findings</b>	

### Check for the existence of Open Shares

Item 2	Data/Comments
<b>Reference</b>	UCB Windows 2000 Server Security Guidelines <a href="http://www.colorado.edu/its/windows2000/adminguide/w2ksecguidelines.html#physical">http://www.colorado.edu/its/windows2000/adminguide/w2ksecguidelines.html#physical</a> Chapter 2.D ii & iii
<b>Risk</b>	<ul style="list-style-type: none"> <li>- One of the most common ways an intruder can gain access to a computer is through an open share.</li> <li>- <b>Vulnerability</b> addressed is number <u>8. Open Shares</u></li> <li>- <b>Assets</b> affected by a successful exploitation are: <ol style="list-style-type: none"> <li>1. Control Room Operator Access Control and Digital Video Data</li> <li>2. Investigator Data</li> <li>3. Badge Office Data</li> <li>4. Human Resources Data</li> </ol> </li> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <i>High</i></li> </ul>
<b>Testing Procedure</b>	<ul style="list-style-type: none"> <li>- Locate server and log on as a domain user</li> <li>- Right click on the My Computer Icon</li> <li>- Left click on Manage</li> <li>- In Computer Management under System tools click on "Shared Folders" then click on Shares</li> <li>- Verify there are no Unauthorized/Open shares</li> </ul>
<b>Test Nature</b>	<ul style="list-style-type: none"> <li>- Objective</li> </ul>
<b>Evidence</b>	
<b>Findings</b>	

### Password Protected Screen Saver Enabled

Item 3	Data/Comments
<b>Reference</b>	I have referenced Personal Experience for this Checklist Item. In my experience you may come across someone remotely logged on to a server by simply traversing through the control console (switchbox)
<b>Risk</b>	<ul style="list-style-type: none"> <li>- If an administrator walked away from a system and did not log off or lock it “and” a Password Protected Screen Saver was not enabled anyone local or remote could take control of that system.</li> <li>- <b>Vulnerability</b> addressed is number <u>2. No Password Protected screen savers on Server</u></li> <li>- <b>Assets</b> affected by a successful exploitation are:               <ol style="list-style-type: none"> <li>1. Control Room Operator Access Control and Digital Video Data</li> <li>2. Investigator Data</li> <li>3. Badge Office Data</li> <li>4. Human Resources Data</li> <li>5. Building Physical Security</li> </ol> <ul style="list-style-type: none"> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <i>High</i></li> </ul> </li> </ul>
<b>Testing Procedure</b>	<ul style="list-style-type: none"> <li>- Locate server and log on as a domain user</li> <li>- Right click on the desktop and select properties</li> <li>- Under display properties select screen saver</li> <li>- Verify that a screen saver is selected and that the Password Protected button is checked</li> <li>- Also verify that the Wait time is set no longer than 15 minutes</li> </ul>
<b>Test Nature</b>	- Objective
<b>Evidence</b>	
<b>Findings</b>	

### Check that “Passwords must meet complexity policy” is enabled

Item 4	Data/Comments
<b>Reference</b>	Protect against weak Authentication Protocols and Passwords <a href="http://www.windowsecurity.com/articles/Protect-Weak-Authentication-Protocols-Passwords.html">http://www.windowsecurity.com/articles/Protect-Weak-Authentication-Protocols-Passwords.html</a>
<b>Risk</b>	<ul style="list-style-type: none"> <li>- An easily guessable password has the potential to allow an intruder full access to that system. Forcing users to create a complex password greatly reduces that risk.</li> <li>- <b>Vulnerability</b> addressed is number <u>3. Easily Guessable Passwords (Server Policy does not enforce Passwords to meet complexity requirements)</u></li> <li>- <b>Assets</b> affected by a successful exploitation are:</li> </ul>

	<ol style="list-style-type: none"> <li>1. <u>Control Room Operator Access Control and Digital Video Data</u></li> <li>2. <u>Investigator Data</u></li> <li>3. <u>Badge Office Data</u></li> <li>4. <u>Human Resources Data</u></li> <li>5. <u>Building Physical Security</u> <ul style="list-style-type: none"> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <i>Medium</i></li> </ul> </li> </ol>
<b>Testing Procedure</b>	<ul style="list-style-type: none"> <li>- Locate server and with a Domain Admin present log on as a domain administrator</li> <li>- Click on Start, Programs, Administrative Tools and Active Directory Users and Computers</li> <li>- Right click on the server you want to administer and select properties</li> <li>- Under the Server Properties select group policy</li> <li>- In the list of Policy Object links Double click "Default Domain Policy"</li> <li>- Under Computer Configuration select Windows Settings, Security Settings, Account Policies and Password Policies</li> <li>- Verify that "Passwords Must Meet Complexity Requirements" is enabled</li> </ul>
<b>Test Nature</b>	- Objective
<b>Evidence</b>	
<b>Findings</b>	

### Verify UPS Configuration

Item 5	Data/Comments
<b>Reference</b>	I have referenced Personal Experience for this Checklist Item. The UPS backup units are often overlooked in the way of maintenance and may be unable to support the devices connected to it for very long if at all.
<b>Risk</b>	<ul style="list-style-type: none"> <li>- Server Up-time is critical to the functionality of several groups. If a server is on a failing UPS and there is a power loss the organization will suffer greatly.</li> <li>- <b>Vulnerability</b> addressed is number <u>4. Minimum UPS standby time</u></li> <li>- <b>Assets</b> affected by a successful exploitation are: <ol style="list-style-type: none"> <li>1. <u>Control Room Operator Access Control and Digital Video Data</u></li> <li>2. <u>Investigator Data</u></li> <li>3. <u>Badge Office Data</u></li> <li>4. <u>Human Resources Data</u></li> <li>5. <u>Building Physical Security</u> <ul style="list-style-type: none"> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <i>Medium</i></li> </ul> </li> </ol> </li> </ul>
<b>Testing</b>	- Locate room where server is housed

<b>Procedure</b>	<ul style="list-style-type: none"> <li>- Identify UPS Power device</li> <li>- Verify at least one of the two power cables are plugged into the UPS</li> <li>- Check the make/model and power capabilities of the UPS</li> <li>- Verify the unit is in good working condition</li> </ul>
<b>Test Nature</b>	- Objective and Subjective
<b>Evidence</b>	
<b>Findings</b>	

### Are both Server power supplies connected and operational

Item 6	Data/Comments
<b>Reference</b>	I have referenced Personal Experience for this Checklist Item. Overcrowded Server Rooms and inadequate power distribution may result in the deployment of a server utilizing only one of its two power supplies.
<b>Risk</b>	<ul style="list-style-type: none"> <li>- Up-time will once again be affected by a failed power supply. For servers with dual power supplies this risk can be greatly reduced and up-time can be retained if the second power supply is connected and operational.</li> <li>- <b>Vulnerability</b> addressed is number <u>5. Unused or Missing Redundant Power Supply</u></li> <li>- <b>Assets</b> affected by a successful exploitation are: <ul style="list-style-type: none"> <li>1. Control Room Operator Access Control and Digital Video Data</li> <li>2. Investigator Data</li> <li>3. Badge Office Data</li> <li>4. Human Resources Data</li> <li>5. Building Physical Security</li> </ul> </li> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <u>Medium</u></li> </ul>
<b>Testing Procedure</b>	<ul style="list-style-type: none"> <li>- Locate Server and power connections (typically on back of unit)</li> <li>- Verify that both power cables are connected to server power supplies</li> <li>- Verify that power indicator lights are lit on both power supplies and their status is "good"</li> </ul>
<b>Test Nature</b>	- Objective
<b>Evidence</b>	
<b>Findings</b>	

### Verify Patch or Update management process

Item 7	Data/Comments
<b>Reference</b>	Securing Windows 2000 Server (Sans) <a href="http://www.sans.org/rr/whitepapers/win2k/189.php">http://www.sans.org/rr/whitepapers/win2k/189.php</a>
<b>Risk</b>	- An un-patched system connected to a network is

	<p>extremely vulnerable to viruses and mal-ware. Insuring there is a good process in place to manage patches and updates will decrease the vulnerability level of the system.</p> <ul style="list-style-type: none"> <li>- <b>Vulnerability</b> addressed is number <u>1. Insufficient Patch or Update management Process</u></li> <li>- <b>Assets</b> affected by a successful exploitation are: <ol style="list-style-type: none"> <li>1. Control Room Operator Access Control and Digital Video Data</li> <li>2. Investigator Data</li> <li>3. Badge Office Data</li> <li>4. Human Resources Data</li> </ol> <ul style="list-style-type: none"> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <u>High</u></li> </ul> </li> </ul>
<b>Testing Procedure</b>	<ul style="list-style-type: none"> <li>- Locate and interview the Administrator for the target system</li> <li>- Verify the existence of policies and procedures outlining the Patching and Updating process</li> <li>- Locate server and with a Domain Admin present log on as a domain administrator</li> <li>- Click on Start, Control Panel and then “Add/Remove programs”</li> <li>- Under “Change or Remove Programs” Identify All Microsoft Updates, Hot Fixes and Service packs</li> <li>- Compare these against the latest versions on the Microsoft Security Updates Bulletins Page <a href="http://www.microsoft.com/security/bulletins/default.msp">http://www.microsoft.com/security/bulletins/default.msp</a></li> <li>- Verify that all applicable patches are installed and current</li> </ul>
<b>Test Nature</b>	- Objective and Subjective
<b>Evidence</b>	
<b>Findings</b>	

### Does the Server have Remote Desktop Applications

Item 8	Data/Comments
<b>Reference</b>	UCB Windows 2000 Server Security Guidelines <a href="http://www.colorado.edu/its/windows2000/adminguide/w2ksecguidelines.html#filesystem">http://www.colorado.edu/its/windows2000/adminguide/w2ksecguidelines.html#filesystem</a> Chapter 4.C

<b>Risk</b>	<ul style="list-style-type: none"> <li>- It is important to check for the presence of remote desktop applications. They are simply another common access point that can be exploited.</li> <li>- <b>Vulnerability</b> addressed is number <u>9. Remote Desktop Applications</u></li> <li>- <b>Assets</b> affected by a successful exploitation are: <ol style="list-style-type: none"> <li>1. <u>Control Room Operator Access Control and Digital Video Data</u></li> <li>2. <u>Investigator Data</u></li> <li>3. <u>Badge Office Data</u></li> <li>4. <u>Human Resources Data</u></li> <li>5. <u>Building Physical Security</u></li> </ol> </li> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <i>High</i></li> </ul>
<b>Testing Procedure</b>	<ul style="list-style-type: none"> <li>- Locate server and with a Domain Admin present log on as a domain administrator</li> <li>- Click on Start, Control Panel and then “Add/Remove programs”</li> <li>- Under “Change or Remove Programs” Identify any Remote Desktop Applications</li> <li>- Under “Add or Remove Windows Components” Identify any Remote Desktop Applications</li> </ul>
<b>Test Nature</b>	- Objective
<b>Evidence Findings</b>	

### Do the Remote Desktop Applications require passwords

Item 9	Data/Comments
<b>Reference</b>	UCB Windows 2000 Server Security Guidelines <a href="http://www.colorado.edu/its/windows2000/adminguide/w2ksecguidelines.html#filesystem">http://www.colorado.edu/its/windows2000/adminguide/w2ksecguidelines.html#filesystem</a> Chapter 4.C
<b>Risk</b>	<ul style="list-style-type: none"> <li>- Many remote desktop applications offer the ability to remotely gain access to another desktop “without” logging onto the application itself. Presenting the password protection on the remote desktop application adds an additional layer of security that may stop an intruder from gaining full access to the remote computer.</li> <li>- <b>Vulnerability</b> Addressed is number <u>9. Remote Desktop Applications</u></li> <li>- <b>Assets</b> affected by a successful exploitation are: <ol style="list-style-type: none"> <li>1. <u>Control Room Operator Access Control and Digital Video Data</u></li> <li>2. <u>Investigator Data</u></li> <li>3. <u>Badge Office Data</u></li> <li>4. <u>Human Resources Data</u></li> <li>5. <u>Building Physical Security</u></li> </ol> </li> </ul>

	- <b>Likelihood</b> that a threat could exploit this vulnerability: <i>High</i>
<b>Testing Procedure</b>	<ul style="list-style-type: none"> <li>- Locate server and with a Domain Admin present log on as a domain administrator</li> <li>- Identify Remote Desktop Applications</li> <li>- Launch the Host program (program on the server that allows remote access) and look for Password Protection Options</li> <li>- Verify that the option is enabled</li> </ul>
<b>Test Nature</b>	- Objective
<b>Evidence</b>	
<b>Findings</b>	

### Check Remote Desktop Application User Administration Process

Item 10	Data/Comments
<b>Reference</b>	UCB Windows 2000 Server Security Guidelines <a href="http://www.colorado.edu/its/windows2000/adminguide/w2ksecguidelines.html#filesystem">http://www.colorado.edu/its/windows2000/adminguide/w2ksecguidelines.html#filesystem</a> Chapter 4.C
<b>Risk</b>	<ul style="list-style-type: none"> <li>- Although a remote desktop application may be password protected it could still fall victim to a free and open administration process. If anyone can give anyone a username and password we greatly reduce the efficiency of this layer of security.</li> <li>- <b>Vulnerability</b> addressed is number <u>9. Remote Desktop Applications</u></li> <li>- <b>Assets</b> affected by a successful exploitation are:               <ol style="list-style-type: none"> <li><u>1. Control Room Operator Access Control and Digital Video Data</u></li> <li><u>2. Investigator Data</u></li> <li><u>3. Badge Office Data</u></li> <li><u>4. Human Resources Data</u></li> <li><u>5. Building Physical Security</u></li> </ol> </li> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <i>High</i></li> </ul>
<b>Testing Procedure</b>	<ul style="list-style-type: none"> <li>- Locate server and with a Domain Admin present log on as a domain administrator</li> <li>- Identify Remote Desktop Applications</li> <li>- Launch the Host program (program on the server that allows remote access) and look for User Account Administration (the ability to create accounts for remote users)</li> <li>- Verify the correct Administrator(s) have the only accounts with the ability to create other accounts and/or modify privileges</li> <li>- Locate and interview the Administrator for the target system</li> <li>- Verify the existence of policies and procedures outlining the</li> </ul>

	Remote Desktop account creation, modification and deletion process
<b>Test Nature</b>	- Objective and Subjective
<b>Evidence</b>	
<b>Findings</b>	

### Check Global Catalog User and Computer Administration Process

Item 11	Data/Comments
<b>Reference</b>	I have referenced Personal Experience for this Checklist Item. Administrators may create additional user accounts for testing or other purposes. Without a strict process and auditing this can create a great vulnerability.
<b>Risk</b>	<ul style="list-style-type: none"> <li>- An open or unrestricted administration process could quite possibly be the weak link in the “security” chain. The network can be secured very well, but if anyone can easily acquire administrative or elevated permissions then the security structure is greatly weakened.</li> <li>- <b>Vulnerability</b> addressed is number <u>7. Elevated Permissions</u></li> <li>- <b>Assets</b> affected by a successful exploitation are:               <ol style="list-style-type: none"> <li>1. Control Room Operator Access Control and Digital Video Data</li> <li>2. Investigator Data</li> <li>3. Badge Office Data</li> <li>4. Human Resources Data</li> <li>5. Building Physical Security</li> </ol> </li> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <u>High</u></li> </ul>
<b>Testing Procedure</b>	<ul style="list-style-type: none"> <li>- Locate and interview the Administrator for the target system</li> <li>- Verify the existence of policies and procedures outlining the user/computer account creation, modification and deletion process</li> </ul>
<b>Test Nature</b>	- Subjective
<b>Evidence</b>	
<b>Findings</b>	

### Verify the existence of Antivirus Software

Item 12	Data/Comments
<b>Reference</b>	Auditing the Corporate Access Control System: An independent Auditor’s Perspective <a href="http://www.giac.org/practical/GSNA/Scott_Steiner_GSNA.pdf">http://www.giac.org/practical/GSNA/Scott_Steiner_GSNA.pdf</a> Item 9

<b>Risk</b>	<ul style="list-style-type: none"> <li>- Antivirus Software is often the main defense against intrusions from computer viruses and other Malware.</li> <li>- <b>Vulnerability</b> addressed is number <u>1. Insufficient Patch or Update management Process</u></li> <li>- <b>Assets</b> affected by a successful exploitation are: <ul style="list-style-type: none"> <li>1. Control Room Operator Access Control and Digital Video Data</li> <li>2. Investigator Data</li> <li>3. Badge Office Data</li> <li>4. Human Resources Data</li> <li>5. Building Physical Security</li> </ul> </li> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <u>High</u></li> </ul>
<b>Testing Procedure</b>	<ul style="list-style-type: none"> <li>- Locate server and with a Domain Admin present log on as a domain administrator</li> <li>- Click on Start, Control Panel and then “Add/Remove programs”</li> <li>- Under “Change or Remove Programs” Identify any Antivirus Software Applications</li> </ul>
<b>Test Nature</b>	- Objective
<b>Evidence</b>	
<b>Findings</b>	

### Check that Antivirus Application is set to Auto Update

Item 13	Data/Comments
<b>Reference</b>	Auditing the Corporate Access Control System: An independent Auditor’s Perspective <a href="http://www.giac.org/practical/GSNA/Scott_Steiner_GSNA.pdf">http://www.giac.org/practical/GSNA/Scott_Steiner_GSNA.pdf</a> Item 9
<b>Risk</b>	<ul style="list-style-type: none"> <li>- An update process must be in place to insure the Antivirus software is being updated often. We are checking to see that the Automatic updates feature is enabled on this system.</li> <li>- <b>Vulnerability</b> addressed is number <u>1. Insufficient Patch or Update management Process</u></li> <li>- <b>Assets</b> affected by a successful exploitation are: <ul style="list-style-type: none"> <li>1. Control Room Operator Access Control and Digital Video Data</li> <li>2. Investigator Data</li> <li>3. Badge Office Data</li> <li>4. Human Resources Data</li> <li>5. Building Physical Security</li> </ul> </li> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <u>High</u></li> </ul>
<b>Testing Procedure</b>	- Locate server and with a Domain Admin present log on as a domain administrator

	<ul style="list-style-type: none"> <li>- Identify Antivirus Software Application(s)</li> <li>- Launch the Antivirus program and search for the option/configuration setting that allows the software to auto-update</li> <li>- Verify this option is enabled</li> </ul>
<b>Test Nature</b>	- Objective
<b>Evidence</b>	
<b>Findings</b>	

### Check that Antivirus Virus Definitions are up to date

Item 14	Data/Comments
<b>Reference</b>	Auditing the Corporate Access Control System: An independent Auditor's Perspective <a href="http://www.giac.org/practical/GSNA/Scott_Steiner_GSNA.pdf">http://www.giac.org/practical/GSNA/Scott_Steiner_GSNA.pdf</a> Item 9
<b>Risk</b>	<ul style="list-style-type: none"> <li>- Although a system may have an Antivirus application installed if the virus definitions are not up to date any number of recently created viruses or malware can still attack a system.</li> <li>- <b>Vulnerability</b> addressed is number <u>1. Insufficient Patch or Update management Process</u></li> <li>- <b>Assets</b> affected by a successful exploitation are:               <ol style="list-style-type: none"> <li>1. Control Room Operator Access Control and Digital Video Data</li> <li>2. Investigator Data</li> <li>3. Badge Office Data</li> <li>4. Human Resources Data</li> <li>5. Building Physical Security</li> </ol> <ul style="list-style-type: none"> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <i>High</i></li> </ul> </li> </ul>
<b>Testing Procedure</b>	<ul style="list-style-type: none"> <li>- Locate server and with a Domain Admin present log on as a domain administrator</li> <li>- Identify Antivirus Software Application(s)</li> <li>- Launch the Antivirus program and search for Virus Definition history</li> <li>- Verify the latest Virus Definitions are up to date</li> </ul>
<b>Test Nature</b>	- Objective
<b>Evidence</b>	
<b>Findings</b>	

## The Audit

In the pages following you will find the results of the physical audit performed on the Corporate Security Domain Controller. A smaller set of items have been chosen to represent the key focus of this Audit. Select items have been taken from the preceding checklist and placed here. The audit results can be found here in the Item's "Evidence" and "Findings" fields.

### Check that the Server is Physically Secured

Item 1	Data/Comments
<b>Reference</b>	Microsoft 5-Minute Security Advisor - Basic Physical Security <a href="http://www.microsoft.com/technet/community/columns/5min/5min-203.msp">http://www.microsoft.com/technet/community/columns/5min/5min-203.msp</a>
<b>Risk</b>	<ul style="list-style-type: none"> <li>- Too often companies spend a great deal of time and money securing their Network when their greatest vulnerability could be the theft of the computer itself.</li> <li>- <b>Vulnerability</b> addressed is number <u>6. Server stored in unsecured location</u></li> <li>- <b>Assets</b> affected by a successful exploitation are:               <ol style="list-style-type: none"> <li>1. Control Room Operator Access Control and Digital Video Data</li> <li>2. Investigator Data</li> <li>3. Badge Office Data</li> <li>4. Human Resources Data</li> <li>5. Building Physical Security</li> </ol> </li> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <i>High</i></li> </ul>
<b>Testing Procedure</b>	<ul style="list-style-type: none"> <li>- Locate and Visit the facility where the server is housed</li> <li>- Verify that access to the room is controlled and that only required personnel can gain access</li> <li>- Verify that the server is in a locked server cabinet/rack</li> </ul>
<b>Test Nature</b>	<ul style="list-style-type: none"> <li>- Objective</li> </ul>
<b>Evidence</b>	<ul style="list-style-type: none"> <li>- The Server is located in a building secured by an Access Control system.</li> <li>- The room that the server is located in is secured by an additional layer of access control utilizing Bio-Metric hand reader technology</li> <li>- Reviewing an access report for this room with the Administrator it was found that only IT personnel with specific requirements have access to this room</li> </ul>
<b>Findings</b>	- Pass

### Check for the existence of Open Shares

Item 2	Data/Comments
<b>Reference</b>	UCB Windows 2000 Server Security Guidelines <a href="http://www.colorado.edu/its/windows2000/adminguide/w2ksecguidelines.html#physical">http://www.colorado.edu/its/windows2000/adminguide/w2ksecguidelines.html#physical</a>

	Chapter 2.D ii & iii
<b>Risk</b>	<ul style="list-style-type: none"> <li>- One of the most common ways an intruder can gain access to a computer is through an open share.</li> <li>- <b>Vulnerability</b> addressed is number <u>8. Open Shares</u></li> <li>- <b>Assets</b> affected by a successful exploitation are: <ul style="list-style-type: none"> <li>1. <u>Control Room Operator Access Control and Digital Video Data</u></li> <li>2. <u>Investigator Data</u></li> <li>3. <u>Badge Office Data</u></li> <li>4. <u>Human Resources Data</u></li> </ul> </li> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <u>High</u></li> </ul>
<b>Testing Procedure</b>	<ul style="list-style-type: none"> <li>- Locate server and log on as a domain user</li> <li>- Right click on the My Computer Icon</li> <li>- Left click on Manage</li> <li>- In Computer Management under System tools click on “Shared Folders” then click on Shares</li> <li>- Verify there are no Unauthorized/Open shares</li> </ul>
<b>Test Nature</b>	<ul style="list-style-type: none"> <li>- Objective</li> </ul>
<b>Evidence</b>	<ul style="list-style-type: none"> <li>- This Screen Shot displays several open shares some of which hold critical information to the access control system running within the server:</li> </ul>

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The screenshot shows the Windows Computer Management console. The 'Shares' folder is expanded, showing a list of shared folders. The 'Pro-Watch Backup' share is selected. A dialog box titled 'Pro-Watch Backup Properties' is open, showing the 'Security' tab. The 'Name' field contains 'Everyone'. The 'Permissions' table is as follows:

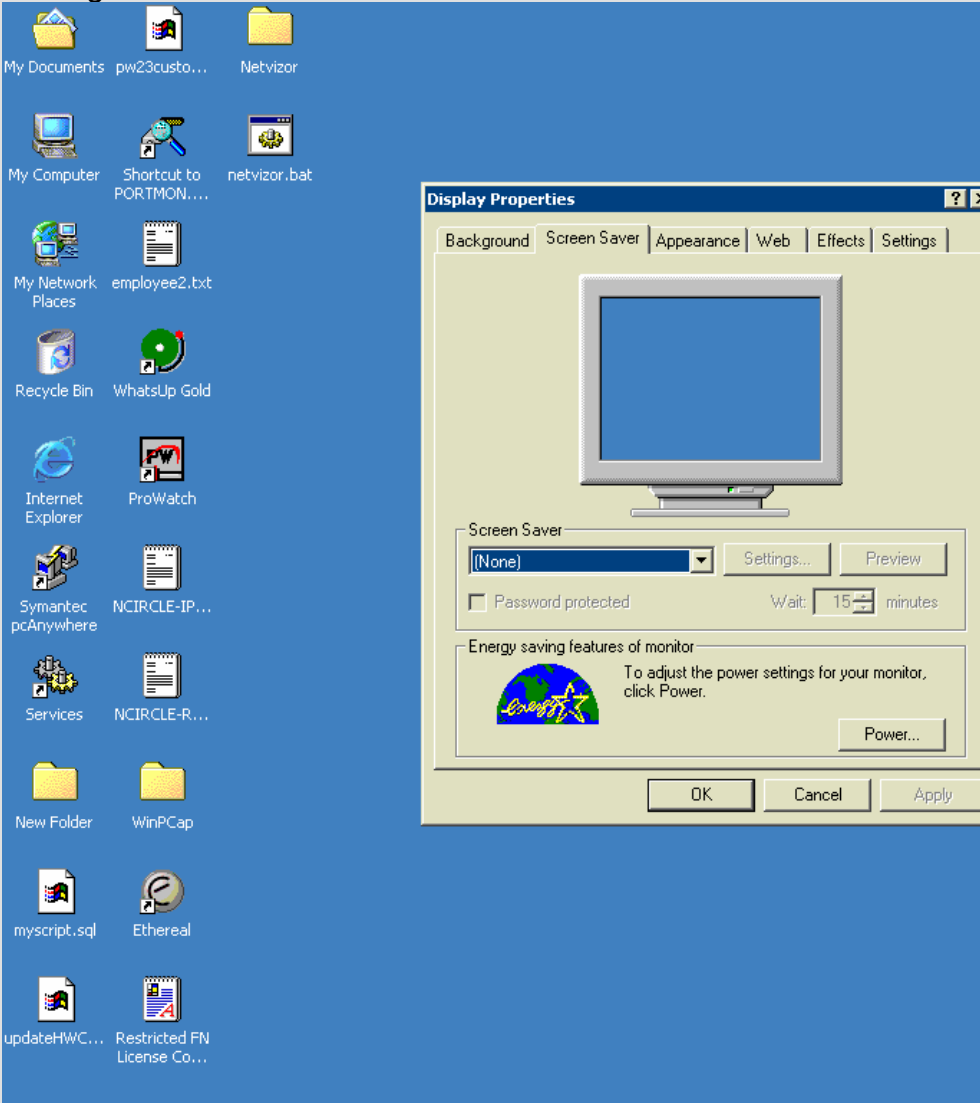
Permissions:	Allow	Deny
Full Control	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Change	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Read	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Below the table are buttons for 'OK', 'Cancel', and 'Apply'.

**Findings** - Fail

### Password Protected Screen Saver Enabled

Item 3	Data/Comments
<b>Reference</b>	I have referenced Personal Experience for this Checklist Item. In my experience you may come across someone remotely logged on to a server by simply traversing through the control console (switchbox)
<b>Risk</b>	<ul style="list-style-type: none"> <li>- If an administrator walked away from a system and did not log off or lock it "and" a Password Protected Screen Saver was not enabled anyone local or remote could take control of that system.</li> <li>- <b>Vulnerability</b> addressed is number <u>2. No Password Protected screen savers on Server</u></li> <li>- <b>Assets</b> affected by a successful exploitation are:               <ol style="list-style-type: none"> <li><u>1. Control Room Operator Access Control and Digital Video Data</u></li> <li><u>2. Investigator Data</u></li> <li><u>3. Badge Office Data</u></li> <li><u>4. Human Resources Data</u></li> </ol> </li> </ul>

	<p><b>5. Building Physical Security</b></p> <ul style="list-style-type: none"> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <i>High</i></li> </ul>
<p><b>Testing Procedure</b></p>	<ul style="list-style-type: none"> <li>- Locate server and log on as a domain user</li> <li>- Right click on the desktop and select properties</li> <li>- Under display properties select screen saver</li> <li>- Verify that a screen saver is selected and that the Password Protected button is checked</li> <li>- Also verify that the Wait time is set no longer than 15 minutes</li> </ul>
<p><b>Test Nature</b></p>	<ul style="list-style-type: none"> <li>- Objective</li> </ul>
<p><b>Evidence</b></p>	<p>- This Screen Shot displays the desktop properties screen saver tab. The Screen Saver is not enabled under the Domain User Logon:</p>  <p>The screenshot shows a Windows XP desktop with a blue background. The 'Display Properties' dialog box is open, showing the 'Screen Saver' tab. The 'Screen Saver' dropdown menu is set to '(None)'. The 'Password protected' checkbox is unchecked. The 'Wait' time is set to 15 minutes. The 'Energy saving features of monitor' section is also visible, with a 'Power...' button. The desktop contains various icons including 'My Documents', 'My Computer', 'My Network Places', 'Recycle Bin', 'Internet Explorer', 'Symantec pcAnywhere', 'Services', 'New Folder', 'myscript.sql', 'updateHWC...', 'Netvizer', 'Shortcut to PORTMON...', 'netvizer.bat', 'employee2.txt', 'WhatsUp Gold', 'ProWatch', 'NCIRCLE-IP...', 'NCIRCLE-R...', 'WinPCap', 'Ethereal', and 'Restricted FN License Co...'.</p>
<p><b>Findings</b></p>	<p>- <b>Fail</b></p>

### Check that “Passwords must meet complexity policy” is enabled

Item 4	Data/Comments
<b>Reference</b>	Protect against weak Authentication Protocols and Passwords <a href="http://www.windowsecurity.com/articles/Protect-Weak-Authentication-Protocols-Passwords.html">http://www.windowsecurity.com/articles/Protect-Weak-Authentication-Protocols-Passwords.html</a>
<b>Risk</b>	<ul style="list-style-type: none"> <li>- An easily guessable password has the potential to allow an intruder full access to that system. Forcing users to create a complex password greatly reduces that risk.</li> <li>- <b>Vulnerability</b> addressed is number <u>3. Easily Guessable Passwords (Server Policy does not enforce Passwords to meet complexity requirements)</u></li> <li>- <b>Assets</b> affected by a successful exploitation are:               <ol style="list-style-type: none"> <li>1. <u>Control Room Operator Access Control and Digital Video Data</u></li> <li>2. <u>Investigator Data</u></li> <li>3. <u>Badge Office Data</u></li> <li>4. <u>Human Resources Data</u></li> <li>5. <u>Building Physical Security</u></li> </ol> </li> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability:  <u>Medium</u></li> </ul>
<b>Testing Procedure</b>	<ul style="list-style-type: none"> <li>- Locate server and with a Domain Admin present log on as a domain administrator</li> <li>- Click on Start, Programs, Administrative Tools and Active Directory Users and Computers</li> <li>- Right click on the server you want to administer and select properties</li> <li>- Under the Server Properties select group policy</li> <li>- In the list of Policy Object links Double click “Default Domain Policy”</li> <li>- Under Computer Configuration select Windows Settings, Security Settings, Account Policies and Password Policies</li> <li>- Verify that “Passwords Must Meet Complexity Requirements” is enabled</li> </ul>
<b>Test Nature</b>	- Objective
<b>Evidence</b>	<ul style="list-style-type: none"> <li>- This Screen Shot displays the Servers Password Policy.</li> <li>- “Passwords Must Meet Complexity Requirements” is enabled for this server:</li> </ul>




The screenshot shows the Active Directory Users and Computers console. The 'VAC Properties' dialog box is open, displaying the 'Group Policy' tab. The 'Group Policy Object Links' section shows 'Default Domain Policy'. The 'Group Policy' dialog box is also open, showing the 'Default: Domain Policy [VAC-NEX]' tree. The 'Policy' list on the right includes 'Enforce password history' (5 passwords), 'Maximum password age' (90 days), 'Minimum password age' (0 days), 'Minimum password length' (8 characters), 'Passwords must meet complexity requirements' (Enabled), and 'Store password using reversible encryption f...' (Disabled).

Policy	Computer Se
Enforce password history	5 passwords
Maximum password age	90 days
Minimum password age	0 days
Minimum password length	8 characters
Passwords must meet complexity requirements	Enabled
Store password using reversible encryption f...	Disabled

**Findings** - Pass

### Verify Patch or Update management process


Item 7	Data/Comments
<b>Reference</b>	Securing Windows 2000 Server (Sans) <a href="http://www.sans.org/rr/whitepapers/win2k/189.php">http://www.sans.org/rr/whitepapers/win2k/189.php</a>
<b>Risk</b>	- An un-patched system connected to a network is extremely vulnerable to viruses and mal-ware. Insuring there is a good process in place to manage patches and updates will

	<p>decrease the vulnerability level of the system.</p> <ul style="list-style-type: none"> <li>- <b>Vulnerability</b> addressed is number <u>1. Insufficient Patch or Update management Process</u></li> <li>- <b>Assets</b> affected by a successful exploitation are: <ol style="list-style-type: none"> <li><u>1. Control Room Operator Access Control and Digital Video Data</u></li> <li><u>2. Investigator Data</u></li> <li><u>3. Badge Office Data</u></li> <li><u>4. Human Resources Data</u></li> </ol> </li> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <i>High</i></li> </ul>										
<b>Testing Procedure</b>	<ul style="list-style-type: none"> <li>- Locate and interview the Administrator for the target system</li> <li>- Verify the existence of policies and procedures outlining the Patching and Updating process</li> <li>- Locate server and with a Domain Admin present log on as a domain administrator</li> <li>- Click on Start, Control Panel and then "Add/Remove programs"</li> <li>- Under "Change or Remove Programs" Identify All Microsoft Updates, Hot Fixes and Service packs</li> <li>- Compare these against the latest versions on the Microsoft Security Updates Bulletins Page <a href="http://www.microsoft.com/security/bulletins/default.msp">http://www.microsoft.com/security/bulletins/default.msp</a></li> <li>- Verify that all applicable patches are installed and current</li> </ul>										
<b>Test Nature</b>	- Objective and Subjective										
<b>Evidence</b>	<ul style="list-style-type: none"> <li>- Interviewed the Security Domain Administrator</li> <li>- Confirmed through interview that there are no Policies and Procedures surrounding the patch and management process.</li> <li>- Administrator patches the Security Domain Controller on an as-needed basis</li> <li>- Below are screen shots displaying the registered patches to this server and a few missed updates from the Microsoft Bulletin page:</li> <li>-</li> </ul> <p><b>Security Bulletin MS04-032</b></p> <table border="1"> <thead> <tr> <th>Severity</th> <th>Software affected</th> <th>Update number</th> </tr> </thead> <tbody> <tr> <td rowspan="5">  </td> <td>• Windows NT Server 4.0 SP6a</td> <td rowspan="5"><b>840987</b></td> </tr> <tr> <td>• Windows NT Server 4.0, Terminal Server Edition SP6</td> </tr> <tr> <td>• Windows 2000 SP3</td> </tr> <tr> <td>• Windows 2000 SP4</td> </tr> <tr> <td>• Windows XP</td> </tr> </tbody> </table>	Severity	Software affected	Update number		• Windows NT Server 4.0 SP6a	<b>840987</b>	• Windows NT Server 4.0, Terminal Server Edition SP6	• Windows 2000 SP3	• Windows 2000 SP4	• Windows XP
Severity	Software affected	Update number									
	• Windows NT Server 4.0 SP6a	<b>840987</b>									
	• Windows NT Server 4.0, Terminal Server Edition SP6										
	• Windows 2000 SP3										
	• Windows 2000 SP4										
	• Windows XP										

- Windows XP SP1
- Windows XP 64-Bit Edition SP1
- Windows XP 64-Bit Edition Version 2003
- Windows Server 2003
- Windows Server 2003 64-Bit Edition

[Get more information in the technical bulletin](#)

**Security Bulletin MS04-036**

Severity	Software affected	Update number
 <p><b>Critical</b></p>	<ul style="list-style-type: none"> <li>• Windows NT Server 4.0 SP6a</li> <li>• Windows 2000 Server SP3</li> <li>• Windows 2000 Server SP4</li> <li>• Windows Server 2003</li> <li>• Windows Server 2003 64-Bit Edition</li> </ul>	<p><b>883935</b></p>

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## Add/Remove Programs



Change or  
Remove  
Programs



Add New  
Programs



Add/Remove  
Windows  
Components

Currently installed programs:

### **Compaq Management Agents**

To change this program or remove it from your computer:

- Ethernet 0.10.3
- Hewlett-Packard Survey Utility
- Internet Explorer Q832894
- Ipswitch WhatsUp Gold
- LiveReg (Symantec Corporation)
- LiveUpdate 1.6 (Symantec Corporation)
- Microsoft English Query
- Microsoft Internet Explorer 6 SP1
- Microsoft SQL Server 2000
- Microsoft SQL Server 2000 Analysis Services
- Norton AntiVirus Corporate Edition
- Pro-Watch 3.5
- Pro-Watch Sentinel Driver
- Symantec pcAnywhere
- Version Control Agent 1.0
- Windows 2000 Administration Tools
- Windows 2000 Hotfix - KB824146
- Windows 2000 Hotfix - KB835732
- WinPcap 3.0 alpha 4
- WinVNC 3.3.3
- WinZip

<b>Findings</b>	<ul style="list-style-type: none"> <li>- <b>Fail</b></li> <li>- There are no policies or procedures and no change control processes in place to insure proper checks and balances in the patching or updating of this domain controller</li> <li>- This server is not at the current patch level</li> </ul>
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### Does the Server have Remote Desktop Applications

Item 8	Data/Comments
<b>Reference</b>	UCB Windows 2000 Server Security Guidelines <a href="http://www.colorado.edu/its/windows2000/adminguide/w2ksecguidelines.html#filesystem">http://www.colorado.edu/its/windows2000/adminguide/w2ksecguidelines.html#filesystem</a> Chapter 4.C
<b>Risk</b>	<ul style="list-style-type: none"> <li>- It is important to check for the presence of remote desktop applications. They are simply another common access point that can be exploited.</li> <li>- <b>Vulnerability</b> addressed is number <u>9. Remote Desktop Applications</u></li> <li>- <b>Assets</b> affected by a successful exploitation are:               <ol style="list-style-type: none"> <li><u>1. Control Room Operator Access Control and Digital Video Data</u></li> <li><u>2. Investigator Data</u></li> <li><u>3. Badge Office Data</u></li> <li><u>4. Human Resources Data</u></li> <li><u>5. Building Physical Security</u></li> </ol> </li> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <i>High</i></li> </ul>
<b>Testing Procedure</b>	<ul style="list-style-type: none"> <li>- Locate server and with a Domain Admin present log on as a domain administrator</li> <li>- Click on Start, Control Panel and then “Add/Remove programs”</li> <li>- Under “Change or Remove Programs” Identify any Remote Desktop Applications</li> <li>- Under “Add or Remove Windows Components” Identify any Remote Desktop Applications</li> </ul>
<b>Test Nature</b>	- Objective
<b>Evidence</b>	<ul style="list-style-type: none"> <li>- This Screen Shot shows a display of the applications loaded onto this server</li> <li>- There are two remote desktop applications installed “PCAnywhere” and “WinVNC”:</li> </ul>

## Add/Remove Programs



Change or  
Remove  
Programs



Add New  
Programs



Add/Remove  
Windows  
Components

Currently installed programs:

### **Compaq Management Agents**

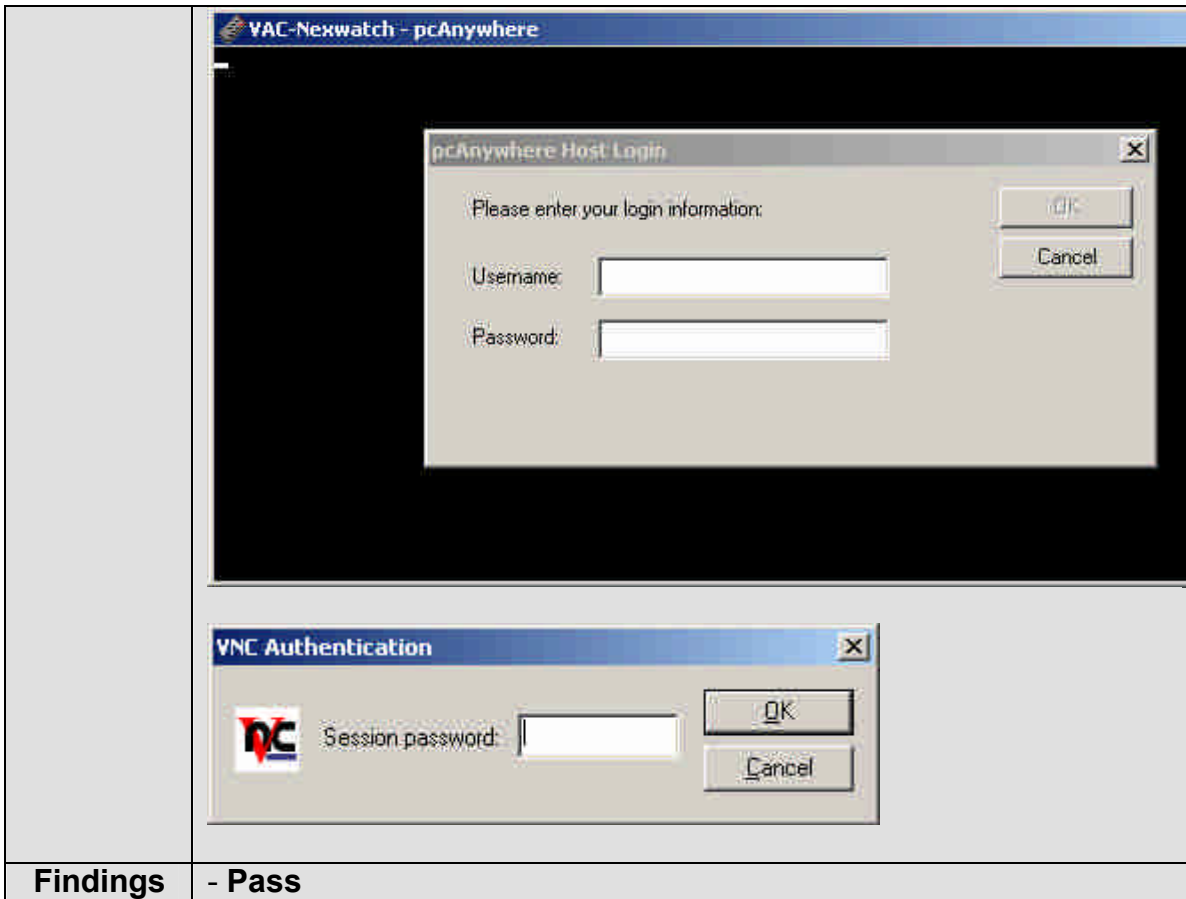
To change this program or remove it from your computer, click

- Ethernet 0.10.3
- Hewlett-Packard Survey Utility
- Internet Explorer Q832894
- Ipswitch WhatsUp Gold
- LiveReg (Symantec Corporation)
- LiveUpdate 1.6 (Symantec Corporation)
- Microsoft English Query
- Microsoft Internet Explorer 6 SP1
- Microsoft SQL Server 2000
- Microsoft SQL Server 2000 Analysis Services
- Norton AntiVirus Corporate Edition
- Pro-Watch 3.5
- Pro-Watch Sentinel Driver
- Symantec pcAnywhere
- Version Control Agent 1.0
- Windows 2000 Administration Tools
- Windows 2000 Hotfix - KB824146
- Windows 2000 Hotfix - KB835732
- WinPcap 3.0 alpha 4
- WinVNC 3.3.3
- WinZip

<b>Findings</b>	- Confirmed 2 Remote Desktop Applications Installed on this Server
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**Do the Remote Desktop Applications require passwords**

Item 9	Data/Comments
<b>Reference</b>	UCB Windows 2000 Server Security Guidelines <a href="http://www.colorado.edu/its/windows2000/adminguide/w2ksecguidelines.html#filesystem">http://www.colorado.edu/its/windows2000/adminguide/w2ksecguidelines.html#filesystem</a> Chapter 4.C
<b>Risk</b>	<ul style="list-style-type: none"> <li>- Many remote desktop applications offer the ability to remotely gain access to another desktop “without” logging onto the application itself. Presenting the password protection on the remote desktop application adds an additional layer of security that may stop an intruder from gaining full access to the remote computer.</li> <li>- <b>Vulnerability</b> Addressed is number <u>9. Remote Desktop Applications</u></li> <li>- <b>Assets</b> affected by a successful exploitation are:               <ol style="list-style-type: none"> <li>1. Control Room Operator Access Control and Digital Video Data</li> <li>2. Investigator Data</li> <li>3. Badge Office Data</li> <li>4. Human Resources Data</li> <li>5. Building Physical Security</li> </ol> </li> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <i>High</i></li> </ul>
<b>Testing Procedure</b>	<ul style="list-style-type: none"> <li>- Locate server and with a Domain Admin present log on as a domain administrator</li> <li>- Identified Remote Desktop Applications</li> <li>- Launch the Host program (program on the server that allows remote access) and look for Password Protection Options</li> <li>- Verify that the option is enabled</li> </ul>
<b>Test Nature</b>	- Objective
<b>Evidence</b>	<ul style="list-style-type: none"> <li>- These Screen Shots are a result of a stimulus/response test for both Remote Desktop Applications</li> <li>- With both application remote programs loaded on a separate client machine within the security domain an attempt to connect to the server was made</li> <li>- PCAnywhere required a username/password</li> <li>- WinVNC required a session password</li> </ul>



**Findings** - Pass

### Check Global Catalog User and Computer Administration Process

Item 11	Data/Comments
<b>Reference</b>	I have referenced Personal Experience for this Checklist Item. Administrators may create additional user accounts for testing or other purposes. Without a strict process and auditing this can create a great vulnerability.
<b>Risk</b>	<ul style="list-style-type: none"> <li>- An open or unrestricted administration process could quite possibly be the weak link in the “security” chain. The network can be secured very well, but if anyone can acquire administrative or elevated permissions then the security structure is greatly weakened.</li> <li>- <b>Vulnerability</b> addressed is number <u>7. Elevated Permissions</u></li> <li>- <b>Assets</b> affected by a successful exploitation are:               <ol style="list-style-type: none"> <li>1. <u>Control Room Operator Access Control and Digital Video Data</u></li> <li>2. <u>Investigator Data</u></li> <li>3. <u>Badge Office Data</u></li> <li>4. <u>Human Resources Data</u></li> <li>5. <u>Building Physical Security</u></li> </ol> </li> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <u>High</u></li> </ul>

<b>Testing Procedure</b>	<ul style="list-style-type: none"> <li>- Locate and interview the Administrator for the target system</li> <li>- Verify the existence of policies and procedures outlining the user/computer account creation, modification and deletion process</li> </ul>
<b>Test Nature</b>	<ul style="list-style-type: none"> <li>- Subjective</li> </ul>
<b>Evidence</b>	<ul style="list-style-type: none"> <li>- Confirmed through interview with Administrator of the Security Domain that there are no Policies and Procedures for the creation, modification and deletion of user or computer accounts.</li> <li>- Administrator updates Active Directory Users and Computers on an as-needed basis</li> </ul>
<b>Findings</b>	<ul style="list-style-type: none"> <li>- <b>Fail</b></li> <li>- There are no policies or procedures and no change control processes in place to insure proper checks and balances in the administration of the user and computer accounts on this domain controller</li> </ul>

### Verify the existence of Antivirus Software

Item 12	Data/Comments
<b>Reference</b>	Auditing the Corporate Access Control System: An independent Auditor's Perspective <a href="http://www.giac.org/practical/GSNA/Scott_Steiner_GSNA.pdf">http://www.giac.org/practical/GSNA/Scott_Steiner_GSNA.pdf</a> Item 9
<b>Risk</b>	<ul style="list-style-type: none"> <li>- Antivirus Software is often the main defense against intrusions from computer viruses and other Malware.</li> <li>- <b>Vulnerability</b> addressed is number <u>1. Insufficient Patch or Update management Process</u></li> <li>- <b>Assets</b> affected by a successful exploitation are:               <ol style="list-style-type: none"> <li><u>1. Control Room Operator Access Control and Digital Video Data</u></li> <li><u>2. Investigator Data</u></li> <li><u>3. Badge Office Data</u></li> <li><u>4. Human Resources Data</u></li> <li><u>5. Building Physical Security</u></li> </ol> </li> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <i>High</i></li> </ul>
<b>Testing Procedure</b>	<ul style="list-style-type: none"> <li>- Locate server and with a Domain Admin present log on as a domain administrator</li> <li>- Click on Start, Control Panel and then "Add/Remove programs"</li> <li>- Under "Change or Remove Programs" Identify any Antivirus Software Applications</li> </ul>
<b>Test Nature</b>	<ul style="list-style-type: none"> <li>- Objective</li> </ul>
<b>Evidence</b>	<ul style="list-style-type: none"> <li>- This Screen Shot shows a display of the applications loaded onto</li> </ul>

	this server - Norton Antivirus Corporate Edition is loaded onto this Server
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## Add/Remove Programs



Change or  
Remove  
Programs



Add New  
Programs



Add/Remove  
Windows  
Components

Currently installed programs:

### **Compaq Management Agents**

To change this program or remove it from your computer, click

- Ethernet 0.10.3
- Hewlett-Packard Survey Utility
- Internet Explorer Q832894
- Ipswitch WhatsUp Gold
- LiveReg (Symantec Corporation)
- LiveUpdate 1.6 (Symantec Corporation)
- Microsoft English Query
- Microsoft Internet Explorer 6 SP1
- Microsoft SQL Server 2000
- Microsoft SQL Server 2000 Analysis Services
- Norton AntiVirus Corporate Edition
- Pro-Watch 3.5
- Pro-Watch Sentinel Driver
- Symantec pcAnywhere
- Version Control Agent 1.0
- Windows 2000 Administration Tools
- Windows 2000 Hotfix - KB824146
- Windows 2000 Hotfix - KB835732
- WinPcap 3.0 alpha 4
- WinVNC 3.3.3
- WinZip

<b>Findings</b>	- Pass
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### Check that Antivirus Virus Definitions are up to date

Item 14	Data/Comments
<b>Reference</b>	Auditing the Corporate Access Control System: An independent Auditor's Perspective <a href="http://www.giac.org/practical/GSNA/Scott_Steiner_GSNA.pdf">http://www.giac.org/practical/GSNA/Scott Steiner GSNA.pdf</a> Item 9
<b>Risk</b>	<ul style="list-style-type: none"> <li>- Although a system may have an Antivirus system installed if the virus definitions are not up to date any number of recently created viruses or malware can still attack a system.</li> <li>- <b>Vulnerability</b> addressed is number <u>1. Insufficient Patch or Update management Process</u></li> <li>- <b>Assets</b> affected by a successful exploitation are:               <ol style="list-style-type: none"> <li><u>1. Control Room Operator Access Control and Digital Video Data</u></li> <li><u>2. Investigator Data</u></li> <li><u>3. Badge Office Data</u></li> <li><u>4. Human Resources Data</u></li> <li><u>5. Building Physical Security</u></li> </ol> </li> <li>- <b>Likelihood</b> that a threat could exploit this vulnerability: <i>High</i></li> </ul>
<b>Testing Procedure</b>	<ul style="list-style-type: none"> <li>- Locate server and with a Domain Admin present log on as a domain administrator</li> <li>- Identify Antivirus Software Application(s)</li> <li>- Launch the Antivirus program and search for Virus Definition history</li> <li>- Verify the latest Virus Definitions are up to date</li> </ul>
<b>Test Nature</b>	- Objective
<b>Evidence</b>	<ul style="list-style-type: none"> <li>- This Screen Shot shows the main application front end of Norton Antivirus</li> <li>- Virus Definition files are up to date:</li> </ul>

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<b>Findings</b>	<b>- Pass</b>

## Report and Recommendations

### Executive Summary

This Audit was performed with the expressed permission of the Security Department and in conjunction with the Security Domain Administrator.

There are several considerations to every technical audit so it was very important that the focus of this audit included only the items that a Security Domain Controller might be vulnerable to. Ultimately 10 Items were used to assess the security of this Server. In general the Server did fairly well outside of a few noted exceptions regarding file shares and screen savers. The other note worthy items had more to do with Policy and Procedure rather than System Security.

The purpose of this audit was to assess the vulnerabilities and risk levels of this security systems server and I believe we have achieved that. Before I get to the recommendations I would like to review some of the findings.

## Audit Findings

### Item 1 (page 22) Check that the Server is Physically Secured

- The Server **passed** the physical security inspection. A site visit was performed and it was found that the building was secured well with access control. Once inside, the server room was protected with BioMetric “Hand Reader” access control technology. The server was secured well inside the Rack in the server room; however, the door to the rack was unlocked and left open.
- The **Recommendation** is to keep the door to the Server Rack closed and locked when not being used. This will mitigate the risk inherent with the physical access of a multi-user server room. The **Cost** should be minimal (less than \$100) to produce additional Rack Door keys and all key-holders should be registered with the security department and human resources in the event of employment termination.
- In the interim or to keep costs down the key to the lockable server cabinet can be given to security where it can be checked out by a user each time it needs to be opened.

### Item 2 (page 22) Check for the existence of Open Shares

- The Server **failed** the check for open shares inspection. While accessing the Computer Management Console and reviewing the Shared Folders a number of “open shares” were discovered. Each share was checked for permissions which may allow it to be accessible by the public. This would create a risk. A few of them were open (see *figure 1.3*). Open Shares can be used to propagate viruses and mal-ware.
- The **Recommendation** is to close all open shares and to conduct a monthly inspection of the Shared Folders under the servers Computer Management Console. A screen shot (much like the one in *figure 1.3*) should be sent to management each month for review. The **Cost** is negligible and only requires a few moments of the Administrators time.

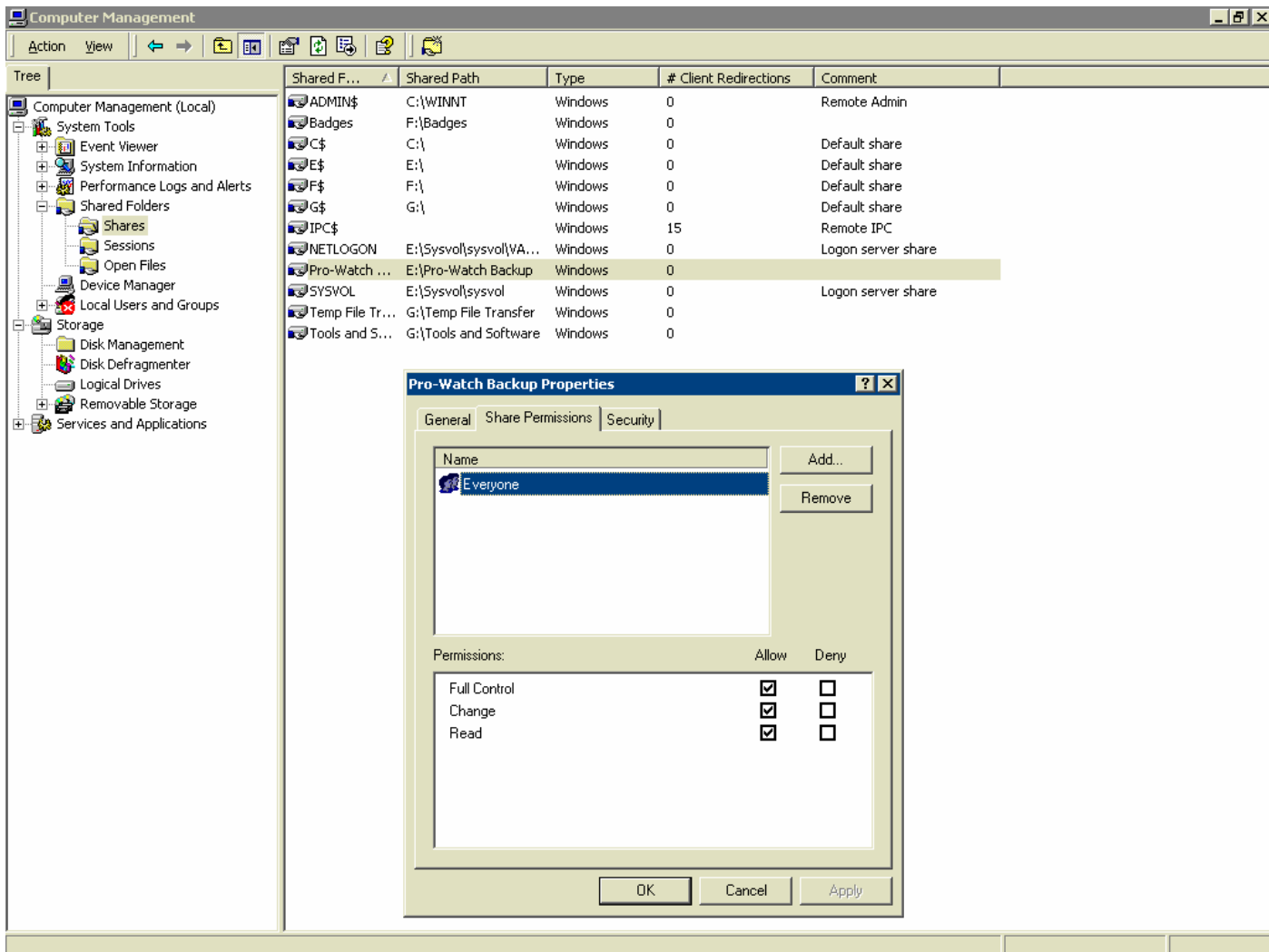


Figure 1.3

### Item 3 (page 24) Password Protected Screen Saver Enabled

- The Server **Failed** the Password Protected Screen Saver inspection (see figure 1.4). I checked to see if the password protected screen savers (under the “Display Properties” on the desktop of the server) option was enabled. As a standard domain user I found the screen saver option was not enabled. If a system does not utilize a password protected screen saver someone can accidentally walk away from a system they’ve logged onto leaving it open for intruders to find even several months later.
- The **Recommendation** is to incorporate the activation and password protection option as part of an administrators check list when assigning a new account. This would be a manual process, but it would accomplish three things. One is the remediation of a potential exposure, the second is the visual verification by the Administrator that the option has been enabled and

lastly the new account holder will gain an initial impression as to the level of importance the management group places on security.

- The **Cost** to achieve this goal should be minimal. To create a checklist for new account holders will take a few hours of an Administrators time, but the management of it should be quite simple.

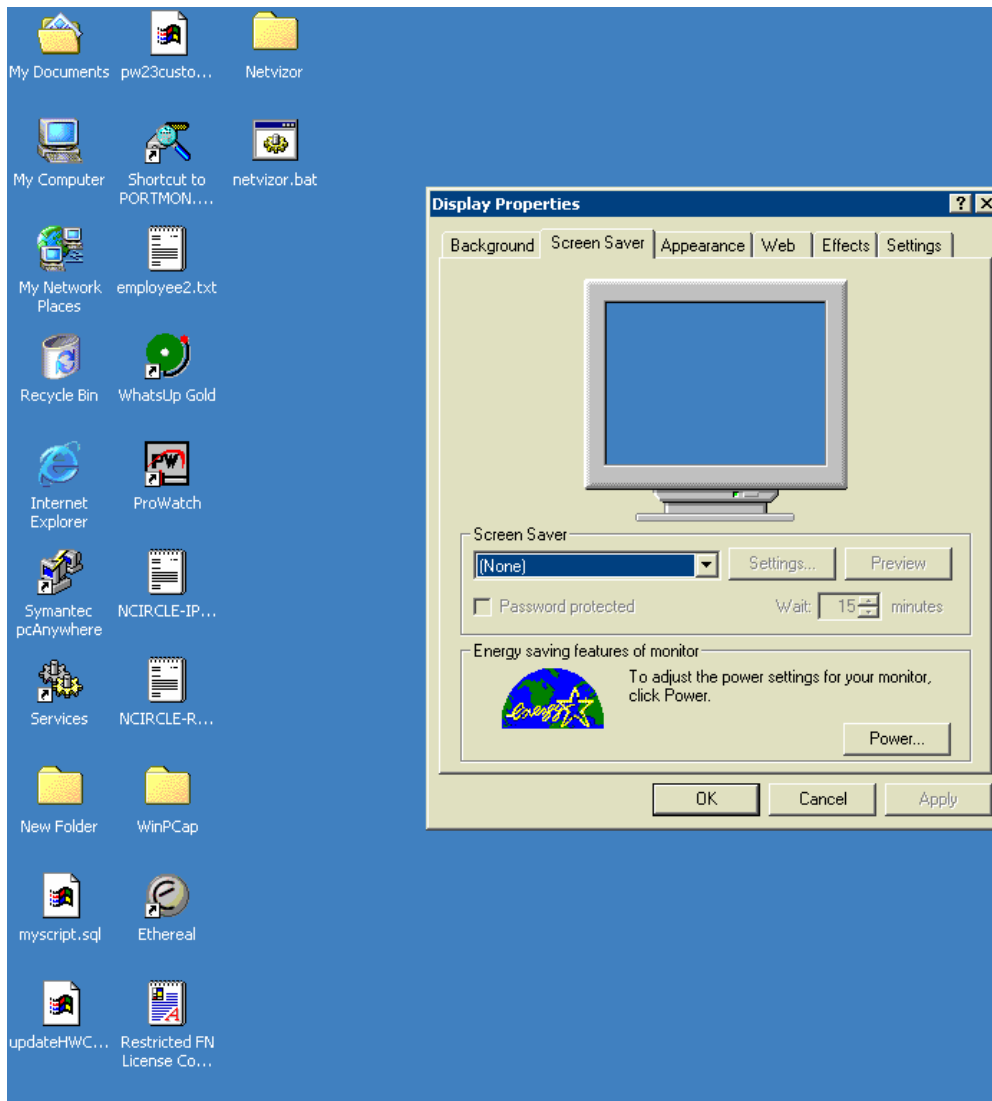


Figure 1.4

**Item 4 (page 26) Check that “Passwords must meet complexity policy” is enabled**

The Server **Passed** the Password Complexity Policy inspection. Under Active Directory Users and Computers I opened up the Password Policies and reviewed the settings (see figure 1.5). This Password must meet complexity policy option was enabled.

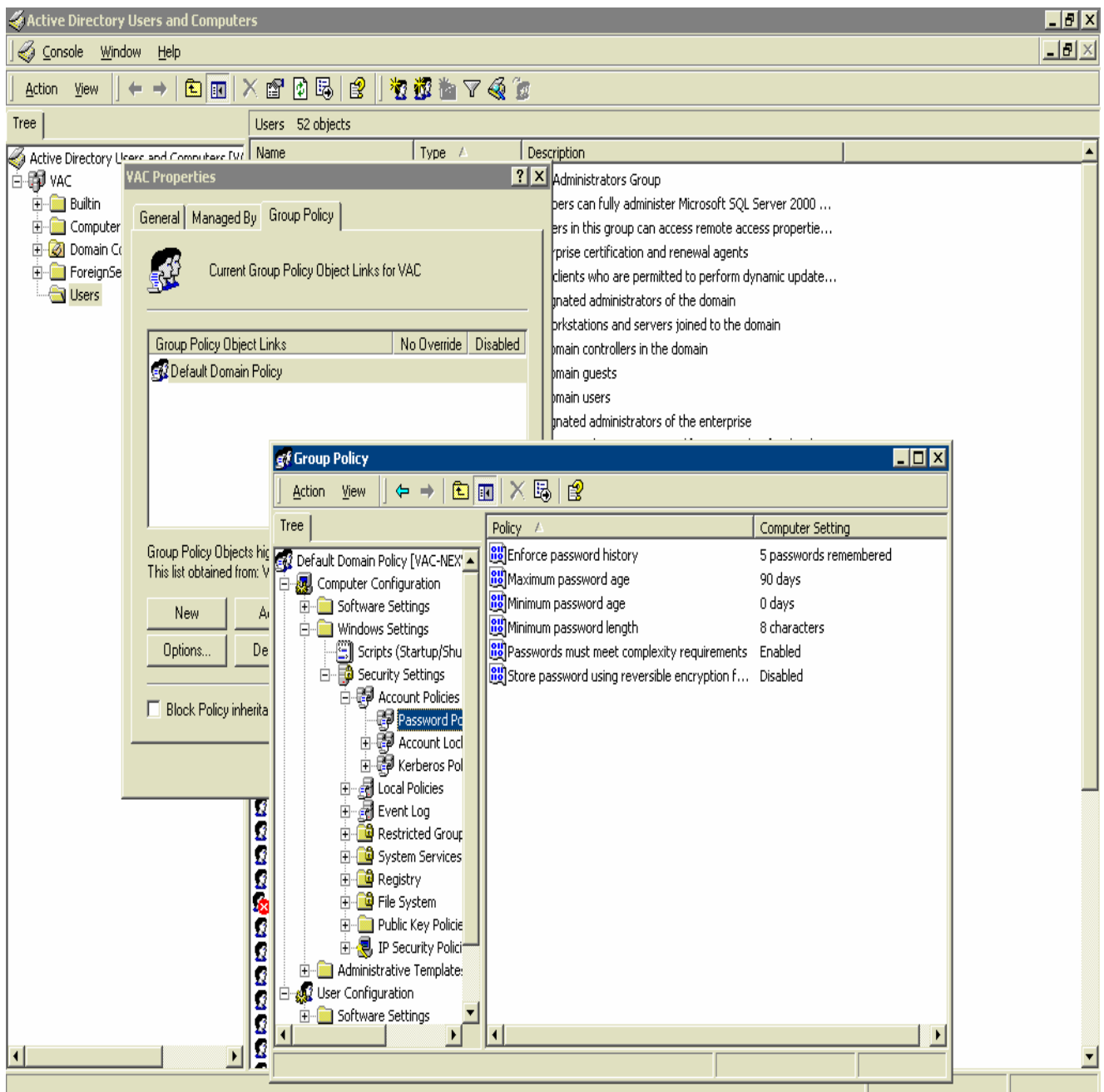


Figure 1.5

**Item 7 (page 27) Verify Patch or Update management processes**

- The Server and the Process **Failed** the Patch/Update management inspection. An interview was conducted with the Security Systems Administrator with regards to Policies and Procedures for patching and updating this server. There are no policies or procedures that govern the Patch or Update process. Additionally the Server is not up to the current patch level and therefore remains vulnerable to intruders (see images on pages 29 and 30). An unpatched system is extremely vulnerable to software

viruses and hackers. Without a process in place this server will have trouble staying at the current patch level.

- The **Recommendation** is to patch the Server as soon as possible. Additionally, a process needs to be put in place that insures this domain controller will remain current with its patches and updates. A simple process could involve a timeline. The administrator would have 24 hours from the time Microsoft releases a patch or update to get it installed and confirm this with a screen shot of the installed patch. There is no **Cost** to support either of these recommendations aside from a few hours of the Administrators time.

#### **Item 8 (page 31) Does the Server have Remote Desktop Applications**

- A **Confirmation** was made that the Server does have remote desktop applications loaded onto it. This was discovered by navigating to the Add/Remove Programs under control panel (see *figure 1.6*). Symantec PCAnywhere and WinVNC 3.3.3 are loaded onto this Server.

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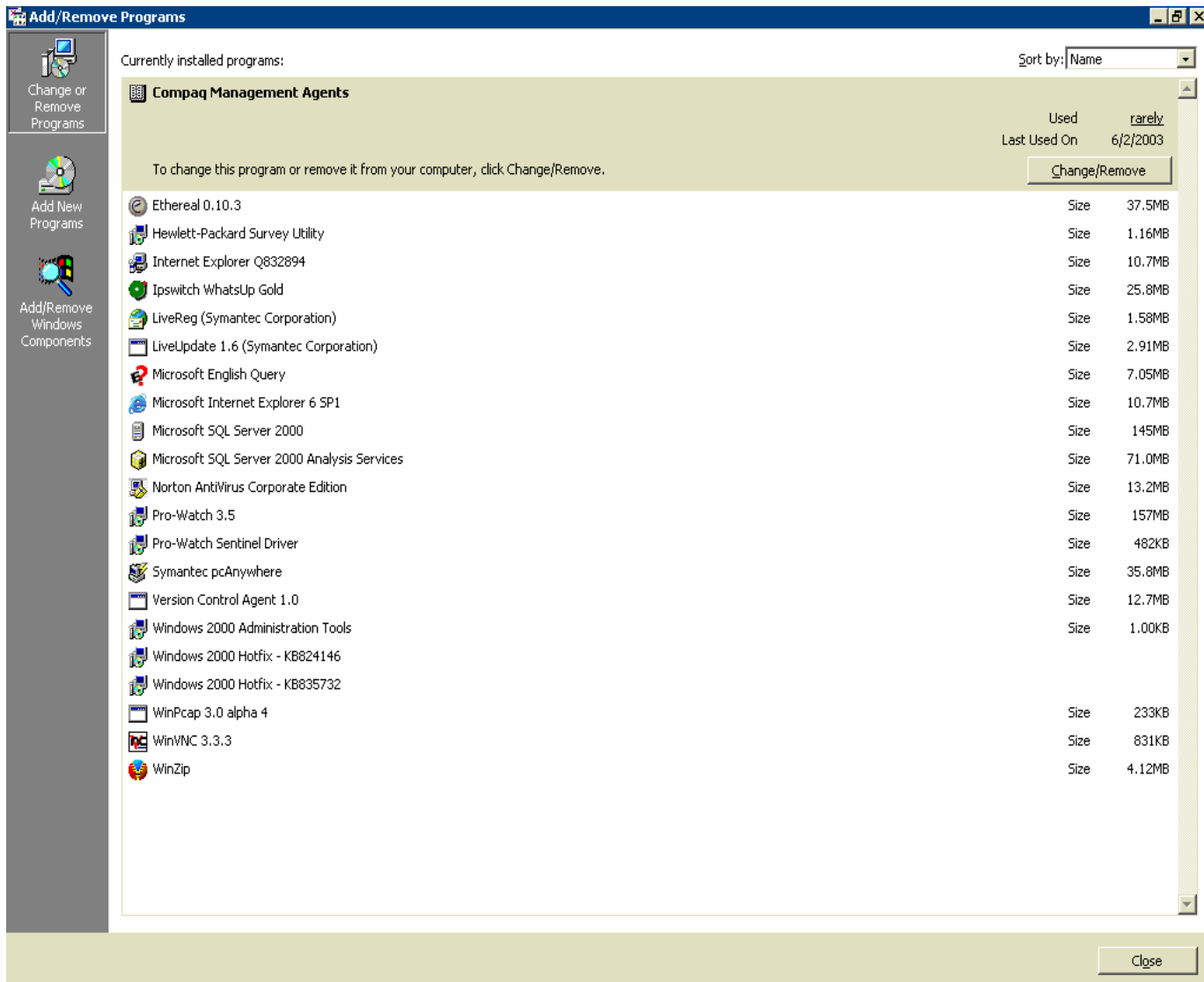


Figure 1.6

**Item 9 (page 33) Do the Remote Desktop Applications require passwords**

- The Server **Passed** the Remote Desktop Application password inspection. If you recall from Item 8, page 31 we discovered the existence of remote desktop applications. Under Item 9 an inspection was made to check whether the Remote Desktop applications are using password protection. To do this I chose a Stimulus/Response test. I logged onto a workstation that had both PCAnywhere and WinVNC remote software running on it. From there I made the attempt to connect to the Security Domain Controller. Please see **Figure 1.7 and 1.8** to review the responses from this test.

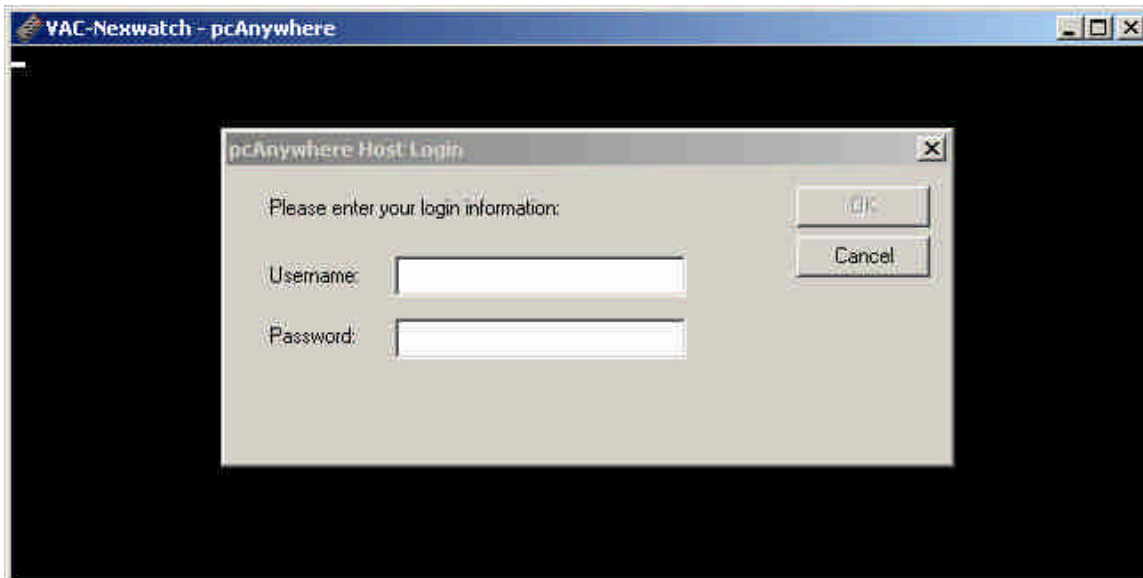


Figure 1.7



Figure 1.8

### Item 11 (page 34) **Check Global Catalog User and Computer Administration Process**

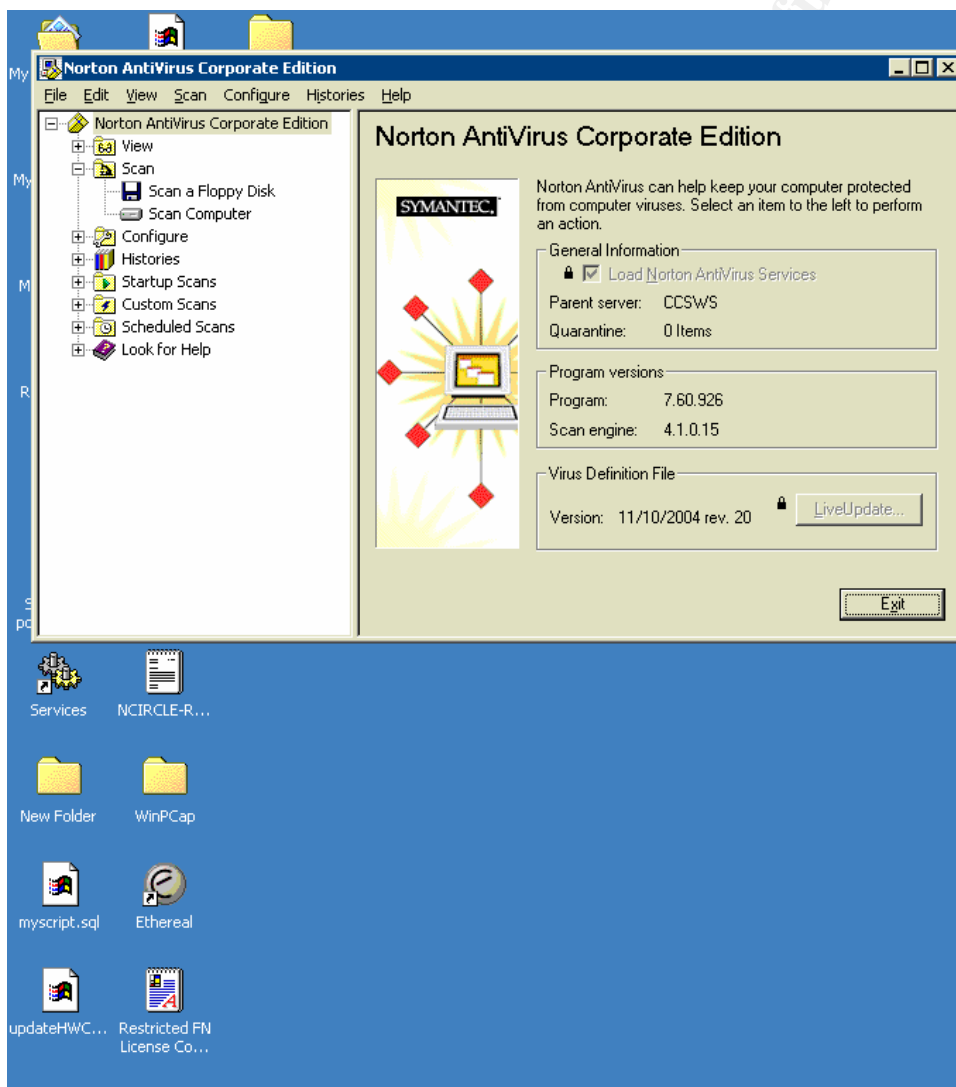
- The Process (in this case) **Failed** the Global Catalog User and Computer Account management inspection. An interview was conducted with the Security Systems Administrator with regards to Policies and Procedures for managing accounts on this server. There are no policies or procedures that govern the account management process. Without a process to manage user and computer accounts users may be able to acquire elevated permissions and accidentally allow exposures to exist.
- I'm **Recommending** a process be put in place that insures accounts on this domain controller will only be updated after acquiring written Management approval to do so. Upon approval the administrator can update the Global Catalog and confirm the new configuration by a screen shot to Management. There is no **Cost** to support this recommendation aside from a few hours of the Administrators time and the time it will take for the Management signature process.

### Item 12 (page 35) **Verify the existence of Antivirus Software**

- A **Confirmation** was made that the Server does have an Antivirus application loaded onto it. This was discovered by navigating to the Add/Remove Programs under control panel (see *figure 1.6*). Norton Antivirus Corporate Edition is loaded onto this Server.

**Item 14 (page 38) Check that Antivirus Virus Definitions are up to date**

- The Server **Passed** the Antivirus Definitions currency inspection. If you recall from Item 12, page 35 we discovered the existence of an antivirus application. Under Item 14 an inspection was made to check whether the Antivirus application is using password protection. To do this I opened the Antivirus Application to the main page/screen. Please see **Figure 1.9** for the results from this test.



**Figure 1.9**

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<http://www.windowsecurity.com/articles/Protect-Weak-Authentication-Protocols-Passwords.html>

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<http://www.winnetmag.com/Articles/Print.cfm?ArticleID=9633>

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|

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**8. 5-Minute Security Advisor - Basic Physical Security**

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