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Introduction

Following a merger Scot-Finance Ltd. and Ecosse-Assets Ltd. have become Scottish Assets and Finance Inc. (SAF). In this document I will be outlining the steps involved to merge the two computer systems by the means of prototyping the new system in a virtual environment. This will take the form of a Windows 2019 server and Windows 10 client virtual machines.

The server machine will be appropriately named "safserver" and the client computer will be "safclient". Usernames will take the format of the first three letters of the user's firstname, the first three letters of their surname and the last two digits of the employees birth year. For example "Adam Gatherer" becomes adagat92.

0.1 - Adding Roles & Features

Server M	anager • Da	shboard	• ③ 🖡	<u>M</u> anage
	WELCOME TO SE	RVER MANAGER		
rage Services ▷	QUICK START WHAT'S NEW LEARN MORE	 Configure this local server Add roles and features Add other servers to manage Create a server group Connect this server to cloud server 	vices	

ROLES AND SERVER GROUPS

From the main dashboard, select "Add roles and features"

	Add Roles and Features Wizard				-		×
	Select destination	server			DESTINA	ATION SERV SAFser	
i	Before You Begin	Select a server or a	a virtual hard disk on which	to install roles and features.			
ī,	Installation Type	Select a server	from the server pool				
7	Server Selection	O Select a virtual	hard disk				
	Server Roles	Server Pool					
	Features	Filter:					-11
		Filter:					
		Name	IP Address	Operating System			
		SAFserver	169.254.249.37	Microsoft Windows Server 2	019 Standard		
		1 Computer(s) fou	nd				_
		and that have bee	n added by using the Add S	lows Server 2012 or a newer re ervers command in Server Mar on is still incomplete are not sh	nager. Offline s		
		y uuucu serve	in a second second confection	and star incomplete are not sit			s
			< Pres	/ious Next >	Install	Cance	el na

In the wizard, select "Role-based or feature-based installation", then choose the server

For this server we will need the following services/features:

- Active Directory Domain Services
- DHCP Server
- DNS Server
- File Server
- File Server Resource Manager
- Windows Deployment Services
- Bitlocker
- Windows Server Backup



Add these features with the wizard and click next through all the windows

	참 Add Roles and Features Wizard			- 🗆 ×
	Select role service	25		DESTINATION SERVER SAFserver
i	Before You Begin	Select the role services to install for V	Vindows Deployment Servic	tes
ī	Installation Type	Role services		Description
6	Server Selection Server Roles Features DHCP Server DNS Server AD DS WDS Role Services Confirmation Results	Deployment Server Transport Server		Deployment Server provides the full functionality of Windows Deployment Services, which you can use to configure and remotely install Windows operating systems. With Windows Deployment Services, you can create and customize images and then use them to reimage computers. Deployment Server is dependent on the core parts of Transport Server.
			< Previous Next >	Install Cancel

Be sure to install both Deployment Server and Transport Server under Windows Deployment Services. Once installed the server is ready to be worked on.

0.2 - Configuring the Active Directory



Click the flag at the t	op right side of t	he server manage	er window a	and click "	Promote this	server to a
do	main controller"	to open the config	guration win	ndow for A	ADDS.	

Deployment Conf	iration Targi	ET SER SAFse
Deployment Configuration Domain Controller Options Additional Options Paths Review Options Prerequisites Check Installation Results	lect the deployment operation Add a <u>d</u> omain controller to an existing domain Add a new domain to an <u>e</u> xisting forest Add a new <u>forest</u> ecify the domain information for this operation not domain name: saf.com core about deployment configurations	

Selecting "Add a new forest", enter saf.com as the root domain name and for the password we'll use the same example password (saf!123)

Additional Option	S		TARGET SERVER SAFserver
Deployment Configuration Domain Controller Options DNS Options	Verify the NetBIOS name assigned The NetBIOS domain name:	to the domain and change it if necessary SAF]
Additional Options			
Paths			
Review Options			

Skip over creating a DNS deloegation, leave the NetBIOS name as the default (SAF in this example), click Next and leave the paths as default.



Review the options and observe the prerequisite checks. There will be a number of yellow triangle exclamation mark symbols but these are not important for our needs just now and can be ignored. Let the server install the ADDS by clicking Install. This will take a few minutes.



The server will now restart.

0.3 - Configuring the Server As A DNS Server

To make things easier for computers joining the domain we can set the server up as a DNS server. This means that computers will be able to connect to saf.com. It is also required for Windows Deployment Services, which we shall see later on.

	– 0 X
_	🕝 🚩 Manage <u>Tools</u> View Help
	Active Directory Administrative Center
	Active Directory Domains and Trusts
	Active Directory Module for Windows PowerShell
	Active Directory Sites and Services
	Active Directory Users and Computers
	ADSI Edit
	Component Services
	Computer Management
	Defragment and Optimize Drives
	DHCP
	Disk Cleanup
	DNS
	Event Viewer
	File Server Resource Manager

In the top right hand side of the Server Manager window is the Tools menu. We will be using this a lot. Click it and select "DNS" from the menu.



-
s all oot
n be vers,
and

In the wizard, click Next then "Create a forward lookup zone" and Next again

	T LINE Manager	
-	Configure a DNS Server Wizard	×
	Primary Server Location You can choose where the DNS data is maintained for your network resources.	
	Which DNS server maintains your primary forward lookup zone?	
	(•) This server maintains the zone The wizard will help you create a primary forward lookup zone.	
	O An ISP maintains the zone, and a read-only secondary copy resides on this server The wizard will help you create a secondary forward lookup zone.	
	$^{\prime}$ Select the "This serever maintains the zone" radio button and click Ne	ext

New	v Zone Wizard	×
Z	Zone Name What is the name of the new zone?	
	The zone name specifies the portion of the DNS namespace for which this se authoritative. It might be your organization's domain name (for example, m or a portion of the domain name (for example, newzone.microsoft.com). Th not the name of the DNS server.	icrosoft.com)
	Zone name:	
	saf.com	

We'll name the zone saf.com, then click next again

ř	DNS Mar	ager							
F	Configure	a DNS Server Wizard			×				
	Forwarders Forwarders are DNS servers to which this server sends queries that it cannot answer.								
	Should this DNS server forward queries?								
	\odot	<u>Y</u> es, it <mark>should f</mark> orward o	queries to DNS servers	with the following IP add	dresses:				
		IP Address	Server FQDN	Validated	<u>D</u> elete				
		<click here="" th="" to<=""><th></th><th></th><th>11-</th></click>			11-				
		8.8.8.8			Up				
					D <u>o</u> wn				
	0	No, it should not forwa	rd <u>q</u> ueries						
		If this server is not con root name servers.	ifigured to use forward	lers, it can still resolve n	ames using				
-			<	Back <u>N</u> ext >	Cancel				

Allow only secure dynamic updates via the radio button, click next and then we'll configure the DNS server to forward queries to an external DNS server (in this demonstration we are using Google's DNS server, 8.8.8.8). Check the summary and click Finish to finish setting up the DNS server.

1 - IP ADDRESSING & DHCP

1.1 - The addressing Scheme

As there will be a need to support 4,000 devices and the DHCP scope is to start at 10.10.10.2 I will be using the 10.10.0.0/19 network. This will allow for 4,000 addresses starting from 10.10.10.2 to all be in the same network.

Subnet Mask	255.255.224.0
First Usable Address	10.10.0.1
Last Usable Address	10.10.31.254
Broadcast Address	10.10.31.255
DHCP Scope Start	10.10.10.2
DHCP Scope End	10.10.26.2

The DHCP scope will acount for

First things first, we statically set the server's IP address to 10.10.10.1.

ion	and subset		
ľ	Internet Protocol Version 4 (TCP/IPv4)	Properties	\times
-	General		
h E	You can get IP settings assigned autor this capability. Otherwise, you need to for the appropriate IP settings.		
	Obtain an IP address automatical	ly	
	• Use the following IP address:		
	IP address:	10 . 10 . 10 . 1	
	Subnet mask:	255.255.224.0	
	Default gateway:	10 . 10 . 10 . 1	
C	Obtain DNS server address auton	natically	
	• Use the following DNS server add	resses:	
	Preferred DNS server:	10 . 10 . 10 . 1	
	Alternate DNS server:	8.8.8.8	
	Ualidate settings upon exit	Advanced	
-		OK Cancel	I

1.2 - Setting up DHCP

To start using DHCP on the network we can initialise a DHCP service on the Windows Server machine. The process to do this is outlined in the steps below.

Server M	anager • DHCP		• 🗭 🍊 Manage	Tools View He
Dashboard Local Server All Servers AD DS DCP	SERVERS All servers 1 total Configuration required for DHCP Server at SAFSER Filter P (E) Server Name IPv4 Address Manageability		Windows Activation	TASKS TASKS
a DNS File and Storage Services ▷ B WDS	Server Name ID Severity Source Log Date and	Add Roles and Features Shut Down Local Server Computer Management Remote Desktop Connection Windows PowerShell Configure NIC Teaming DHCP Manager Manage As Start Performance Counters Refresh Copy	intervention in the second sec	TASKS -

Click the DHCP service from the left hand pane of the Server Manager window then right click the server name from the list of servers and choose "DHCP Manager"

DHCP	Server Name IPv4 Addre	ss Manageability	Last Ui	×
_S File Action V	iew Help			
🗢 🔿 🔂 🗖	🔲 🔍 🚺 📊 🛄			
P DHCP			Actions	
SAFserver	🔰 🚺 Add a S	cope	IPv4	-
	Di <u>s</u> play Statistics	of IP addresses	More Actions	•
	New Sco <u>p</u> e	uters requesting a ss. You must create and		
> 🖥 🖡	New <u>M</u> ulticast Scope	before dynamic IP		
	Assigned. Configure Failover Replica <u>t</u> e Failover Scopes De, on the Action menu,			
	Defi <u>n</u> e User Classes Define Vendor <u>C</u> lasses	tion about setting up a poline Help.		
R	Reconcile <u>A</u> ll Scopes			
S	et Predefined Options			
Create a ner V	/iew >		1	

From the DHCP menu, expand the server and right click on IPv4 and select New Scope

	New Scope Wizard					
2	Scope Name You have to prov a description.	ide an identifying scope name. You also have the option of provid	ding	Ĵ		
P		Type a name and description for this scope. This information helps you quickly identify how the scope is to be used on your network.				
	Name:	SAFDHCP				
	Description:	DHCP Scope for SAF Inc				

In the DHCP Scope wizard, give the new scope an appropriate name and a description that explains what the scope is for and click Next

Nev	w Scope Wizard	I	
, I	P Address Range You define the scope	address range by identifying a set of consecutive IP addresses.	(D)
	Configuration settings	for DHCP Server	
	Enter the range of ad	dresses that the scope distributes.	
	Start IP address:	10 . 10 . 10 . 2	
	End IP address:	10 . 10 . 26 . 2	
	Configuration settings	that propagate to DHCP Client	
	Length:	19 <u>•</u>	
	Subnet mask:	255 . 255 . 224 . 0	
		< Back Next >	Cancel

From here, enter the details for the DHCP Scope from the table at the start of this section. No exclusions will be needed for this situation.

		DH	НСР		renon	nuo			Du.	51160	~
	Fil	e	Action	View	Help						
	() 🖄	•	Q	?	▶ Ξ	<u>.</u>	.		
l	9	DH	ICP								
e	~	Ξ	SAFsen	ver.saf.co	m						
þ		~	🔒 IPv	Ad	ld/Ren	nove B	lindi	ngs			
:F			्राष्ट्र	Au	thorize	e				HC	
;			3	Ba	ckup					hor: Ir ne	

Lastly for DHCP we must right click on the server and select "Authorise" to start the DHCP service.

	New Scope Wizard
2	Lease Duration The lease duration specifies how long a client can use an IP address from this scope.
	Lease durations should typically be equal to the average time the computer is connected to the same physical network. For mobile networks that consist mainly of portable computers or dial-up clients, shorter lease durations can be useful. Likewise, for a stable network that consists mainly of desktop computers at fixed locations, longer lease durations are more appropriate.
P	Set the duration for scope leases when distributed by this server.
	Limited to:
	Days: Hours: Minutes: 7. ↓. ↓. ↓.
	< Back Next > Cancel

The lease will be set to 7 days, chosen to allow users to keep the same IP for the work week. From here click Next again and choose to configure the options now.

New Scope Wizard				
Router (Default Gateway) You can specify the routers	, or default gate	ways, to be distrib	outed by this scope.	(C)
To add an IP address for a I <u>P</u> address: 10 . 10 . 10 . 1	Add	lients, enter the a	ddress below.	
10.10.0.1	<u>R</u> emove Up Down			
		< <u>B</u> ack	<u>N</u> ext >	Cancel

For this example we will tell devices via DHCP to use 10.10.0.1 as the default gateway. Click Next.

Domain Name and DNS Servers The Domain Name System (DNS) maps a on your network.	and translates domain name	s used by clients					
You can specify the parent domain you want the client computers on your network to use for DNS name resolution.							
Parent domain: saf.com							
To configure scope clients to use DNS servers on your network, enter the IP addresses for those servers.							
Server name:	I <u>P</u> address:	Add					
R <u>e</u> solve	10.10.10.1	<u>R</u> emove					
	0.0.0.0	<u>Ш</u> р					
		Down					
	< Back	Next > Cancel					

Set the parent domain name for the DNS server to be saf.com and the check the IP address of the server is in the list of IP addresses. Click Next and then choose to activate the scope now.

DHCP scope has now been configured so any device connecting to the 10.10.0.0/19 network will see the SAFserver as a source of DHCP information and obtain an address within the scope.

2 - PASSWORD POLICY

The password policy for the company should be strong but not so intense that users will forever be forgetting passwords and overloading the IT department with support tickets. Passwords therefore must be:

- 8 characters long
- use a mix of letters, numbers and symbols
- not contain any part of the user's username
- change every month
- not be the same as any password from the past two years

We can apply the password policy to the default domain policy. This can be configured via the steps below.



Select "Group Policy Management" from the Tools menu at the top right hand side of the Server Manager window.



From here expand the saf.com forest and domain and right click on "Default Domain Policy" under "Group Policy Objects". From this menu, select "edit"

	~	– 🗆 X
 Default Domain Policy [SAFSERVER.SAF.COV Computer Configuration Policies Software Settings Windows Settings Name Resolution Policy Scripts (Startup/Shutdown) Event Settings Account Policies Password Policy Account Lockout Polic Kerberos Policy Local Policies Event Log 	Policy Enforce password history Maximum password age Minimum password age Minimum password length Password must meet complexity requirements Store passwords using reversible encryption	Policy Setting 24 passwords remembered 42 days 1 days 7 characters Enabled Disabled

Expand the sections to get to Computer Configuration, Policies, Windows Settings, Security Settings, Account Policies, Password Policy. This is where we can alter the policy settings by right clicking on them and selecting "Properties" to bring up the configuration window.

Policy	Policy Setting
🗓 Enforce password history	24 passwords remembered
📓 Maximum password age	30 days
📓 Minimum password age	1 days
📓 Minimum password length	8 characters
Reassword must meet complexity requirements	Enabled
Store passwords using reversible encryption	Disabled

To meet our specified policy we set it to remember the last 24 passwords (password history), require a password change every 30 days (maximum age), use the mix of letters/numbers/symbols (complexity requirements) and have a minimum length of 8 characters. Leave minimum length and storing using reversible encryption as their default values.

3 - WINDOWS DEPLOYMENT SERVICES

Rather than installing Windows manually onto every desktop computer in the company (some 4,000 odd) we can set up our Windows Server to deploy a Windows 10 image to computers booting into network boot mode. We can install Windows 10 to one desktop computer, configure it to be our ideal install and then upload an image to the Windows Deployment Server. This saves time not just for installation of the operating system, but also for installing applications and software after OS installation.

3.1 - Configuring the WDS Role



We start by clicking the "Tools" menu in the top right hand side of the Server Manager window. Scroll down to find "Windows Deployment Services" and click it to open the WDS window.

	单 w	/indows Deploy	ment Serv	ices	ED		
	File	Action View	/ Help				
	() 🖄 📰 🛛	a 🛛	ÞB			
	Windows Deployment Services SAFserver.saf.com						
		Active Directo		Configure S	Server		dows Deploym
5		A cure bilecto	ly rici	Remove Se	rver		
				View		>	not configured a local administ
				Refresh			
				Help			

In this window, expand the server tree and right click on the SAFserver.saf.com server and click "Configure Server"

	🝨 Windows Deployment Services Configuration Wizard	×
s.	Install Options	
	Select one of the following options:	
	Integrated with Active Directory	
	This server is a member of an Active Directory Domain Services (AD DS) domain, or a domain controller for an AD DS domain.	
	◯ Standalone server	
	Configure the server so that it is standalone, operating independently of Active Directory.	

Choose to integrate the WDS server with the Active Directory and click next

🝨 Windows Deployment Services Configuration Wizard	×
Remote Installation Folder Location	
The remote installation folder will contain boot images, install images, PXE boot files, and the Windows Deployment Services management tools. Choose a partition that is large enough to hold all of the images that you will have. This partition must be an NTFS partition and should not be the system partition.	
Enter the path to the remote installation folder.	
Path: W:\ Browse	
Drowse	

Set the path to the location where we will be putting our boot and install images. In this demonstration we are using an extrenal disk, drive W:

	🝨 Windows Deployment Services Configuration Wizard	×
s.	Proxy DHCP Server	
	If Dynamic Host Configuration Protocol (DHCP) is running on this server, check both of the following check boxes and use DHCP tools to add appropriate PXE options to all DHCP and DHCPv6 scopes.	
	If a non-Microsoft DHCP server is running on this server, then check the first box and manually configure DHCP option 60 and DHCPv6 Vendor Class for Proxy DHCP.	
	The Windows Deployment Services Configuration Wizard detected Microsoft DHCP service running on the server. Please select from the following options:	
	☑ Do not listen on DHCP and DHCPv6 ports	
	Configure DHCP options for Proxy DHCP	

We will want to check both boxes here and click next

Γ	🐐 Windows Deployment Services Configuration Wizard 🛛 🗙 🗙	1
5.		
	PXE Server Initial Settings	
	You can use these settings to define which client computers this server will respond to. Known clients are the clients that have been prestaged. When the physical computer performs a PXE boot, the operating system will be installed based on the settings that you have defined.	
	Select one of the following options:	ŀ
	O Do not respond to any client computers	L
	O Respond only to known client computers	l
	Respond to all client computers (known and unknown)	l
	Require administrator approval for unknown computers. When you select this option, you must approve the computers using the Pending Devices node in the snap-in. Approved computers will be added to the list of prestaged clients.	
	To configure this server, click Next.	ļi
	< Back Next > Cancel	e

Click the radio button to respond to all client computers (this can be changed as per the needs of the server once live in the enterprise scenario) and click Next

	Windows Deployment Services Configuration Wizard	×
5.	Task Progress	
	Configuring Windows Deployment Services	
	Copying files needed by Windows Deployment Services	
	The WDS server is now being set up. Next we will need some images.	

3.2 - Sourcing Boot & Install Images

Now that WDS is active we need some images for it to send to client computers. These can be found in and extracted from the Windows 10 installation disc/image.

📙 🛛 🚽 🔤 🗸 source	s	-	· ·	_	o x
File Home Sh	are View				~ 🕐
← → ~ ↑ <mark>.</mark> ›	This PC > DVD Drive (D:) CCCOMA_X64	4FRE_EN-US_DV9 > sources >	ٽ ~	Search sources	م
	Name	Date modified	Туре	Size	^
🗸 📌 Quick access	🗟 autorun.dll	29/10/2018 23:32	Application extens	171 KB	
📃 Desktop 🛛 🖈	background_cli	29/10/2018 23:44	BMP File	2,305 KB	
🖊 Downloads 🖈	boot.wim	29/10/2018 23:46	WIM File	391,591 KB	
🔮 Documents 🖈	cdplib.mof	29/10/2018 23:32	MOF File	2 KB	
	Continuinstall mof	29/10/2018 23:32	MOF File	1 KB	

Firstly, we'll insert the Windows 10 installation disc image to our virtual server (this can be done with a physical disc as well!). Open the image in Explorer and find the boot.wim image in the sources folder. Also make sure that install.wim is there.

MELCOME TO SERVER MANA	GEP					
🝨 Windows Deployment Services						
File Action View Help						
🗢 🌩 🖄 📰 🗟 🖥						
Windows Deployment Services	SAFserver.saf.com					
✓ III Servers	Name					
> 🚡 SAFserver.saf.com						
> 🔂 Active Directory Prestaged Devices	📔 Install Images					
5	Boot Images					
	Pending I Add Boot Image					
	Multicast Drivers					

Back in the WDS window, right click boot images and select "Add Boot Image ... "

l	🔹 Add Image Wizard 🛛 🗙
ic	Image File
	Enter the location of the Windows image file that contains the images to add.
	<u>F</u> ile location:
	D:\sources\boot.wim Browse
	Note: The default boot and install images (Boot.wim and Install.wim) are located on the installation DVD in the \Sources folder.

Use the boot.wim image we found in the previous step and click next. Then give it an appropriate name and description. Click next again and once more to add the boot image.



We now repeat this step but right clicking on Install Images and then selecting install.wim. We will also have to create an Image Group. Call this "WDS Installs"

🝨 Add Image Wizard	×
Image File	
Enter the location of the Windows image file that contains the images to	add.
File location:	
D:\sources\install.wim	Browse
Note: The default boot and install images (Boot.wim and Install.wim) are installation DVD in the \Sources folder.	located on the

Click next after finding install.wim and then next again, checking all the boxes for the various versions of Windows we wish to install. Then Next once more to add the images.

General	PXE	Response	AD DS	Boot	Client	DHCP
Multicas		Advand		Network		TFTP
Maximum	Block Si	70				
(TFTP) set this, the se	ver shou	Id allow. If a c instead reply v		File Transfer a block size li		
specify the	e next de		size in their A(sion, TFTP cli CK packet.	ents can	

The last thing to do is to change the TFTP block size to 16384. This is done by right clicking on the server in the WDS window and selecting properties. From here we go to the TFTP tab and update the maximum block size.

3.3 - Installing Windows To A Client Via WDS

Now we can test out our WDS server with a demonstration install. Simply done, we put the client in the same network as the virtual server and boot it into network boot mode.

Power on this virtual machine Ip Edit virtual machine settings					
Devices					
📰 Memory	4 GB				
Processors	4				
🖂 Hard Disk (NVMe)	20 GB				
🔁 Network Adapter	LAN Segment				
🚭 USB Controller	Present				
🛄 Display	Auto detect				

Here we have a blank VM ready for network booting. It's in the same LAN segment as our server and does not have any installation media. When it boots, it will receive an IP address from our DHCP server and then start installing Windows 10 from our images.



Pressing F12 as the client boots puts it into PXE network boot mode. Now we wait...

Kind Wind	ows Setup
Windows	Deployment Services
	Enter your user name in the format domain/user or user@domain.com. ✓ Keyboard User name: ✓ Password: ✓ OK Cancel
© 2018 Mic	

Simply enter the administrator username and password, select the version of windows and the empty hard drive to start the installation



The rest of the installation mostly does itself.

4 - FIREFOX AS DEFAULT BROWSER

To conform to SAF's decision to move away from Internet Explorer we can deploy Firefox to all the computers in the domain. This is done via Group Policy Management.

	– 🗆 X
←	desktoj 🕶 🔒 🖒 Search 🔎 🗸 🛱 🍕
Download the Firefox Brow 🗙 📑	
File Edit View Favorites Tools Help	
Choose	Which browser would you like to download?
which	3
	Firefox ~
Firefox	
Browser to	Select your preferred installer ?
BIOWSEI LO	Windows 64-bit MSI
download in	
	Select your preferred language
your	
language	English (British)
language	
F	You are about to download:
Everyone deserves access to the internet — your language should never	Browser: Firefox
be a barrier. That's why — with the	

Firstly we download the latest Firefox msi installer from www.mozila.org and save it to a shared folder on the C:\ drive so computers joining the domain can access it.

-				
l	🔏 Group Policy Mana	gement		
B	File Action View	w Window Help		
	• 🔿 🖄 📶 🗎	🖾 🚺 🖬		
l	Group Policy Manag	gement	saf.co	m
~	 A Forest: saf.com 		Status	Linked Group Policy Objects G
	🗸 📑 Domains			
	✓ iii saf.com			
1	🛒 Defa	Create a GPO in t	his domain,	, and Link it here 🕴 🕻
	🛒 Ma	Link an Existing G	iPO	
	🛒 Upc	Block Inheritance		
	> 道 Dor			

Select "Group Policy Management" from Tools in the main Server Management window. Right click on the saf.com domain and select "Create a GPO in this domain, and Link it here...". From here we give the policy an appropriate name and click OK.

🔣 Group Policy Management						
🖁 File Action View Window Help						
Þ 🔿 🖄 📰 🔯 🕅						
Group Policy Management Group Policy Management Group Policy Modeling Group Policy Results	Status	Linked Group Policy Ob Link Order 0 1 2	GPO 🕡 Default	Domain Policy g Drives for Policy	Enforced No No No Edit Enforce	Link Enabled Yes Yes Yes
Group Policy Management Editor						
File Action View Help						
File Action View Help e <table-cell-rows> 🔿 🖄 📷 🖾 🐼 📝 e 🧾 Firefox Deloyer [SAFSERVER.SAF</table-cell-rows>			Versio	n Deploym	nent st	Source
File Action View Help						Source show in this
File Action View Help e <table-cell-rows> 🔿 🖄 🛐 🖾 🐼 👔 e 🗐 Firefox Deloyer [SAFSERVER.SAF v 褬 Computer Configuration</table-cell-rows>		New		There are no		
File Action View Help File Action View Help Firefox Deloyer [SAFSERVER.SAF Computer Configuration Policies Software Settings		New Paste Refresh		There are no	o items to	

Navigate to Computer Configuration, Policies, Software Settings, Software Installation and right click the empty space in the panel. From the menu choose New, Package...

🗊 Open					
← → × ↑ 🖳 \\safse	erver\SOFTWARE		ジ Search SOFT	WARE	م
Organize 👻 New folde	r			· · ·	•
Desktop ^	Name	Date modified	Туре	Size	
Documents	🐻 Firefox Setup 83.0	14/12/2020 22:47	Windows Installer	56,829 KB	
🕂 Downloads					
👌 Music					
📄 Pictures 🗸 🗸					
File na	me:		✓ Windows In:	staller packages ('	*.r ∨
			Open	Cance	4

Navigate to the shared folder on the network and select the setup msi. Select it as "assigned"

WELCOME TO SERVE	N MANAGEN			
📓 Group Policy Management			-	- 🗆 ×
📓 File Action View Window Help				_ 8 ×
🗢 🔿 🔁 🔜 🙆 🖥				
Group Policy Management A Forest: saf.com C B Domains	Firefox Deloyer Scope Details Settings Delegation			
v 🙀 saf.com	Links			
Default Domain Policy	Display links in this location: saf.com			~
Firefox Deloyer	The following sites, domains, and OUs are linked to this GPC	:		
Update Policy	Location Enfor	ced Link Enabled	Path	
> 📴 Domain Controllers	saf.com No	Yes	saf.com	
 Finance Investments 				
> 📓 Managers				
> 🖸 Operations	Security Filtering			
> Group Policy Objects > G WMI Filters	The settings in this GPO can only apply to the following grou	ps, users, and computers:	:	
> 🛅 Starter GPOs	Name			
> 📑 Sites	Authenticated Users			
Group Policy Modeling				
	Add Remove Prop	erties		
	WMI Filtering			
	This GPO is linked to the following WMI filter:			
< >	<none></none>	✓ Open		
< >	J.			

Returning to the Group Policy Management, double click the "Firefox Deployer" GPO and click "Add..." at the bottom of the Security Filtering section

Select User, Computer, or Group	×
Select this object type:	
User, Group, or Built-in security principal	Object Types
From this location:	
saf.com	Locations
Enter the object name to select (<u>examples</u>):	
Everyone	Check Names
Advanced	OK Cancel

Type "Everyone" in and click OK to target every user in the domain with this policy.

Security Filtering
The settings in this GPO can only a
Name
& Authenticated Users
Section 2018
Now everyone will get Firefox!

5 - ORGANISATIONAL UNITS

Organisational units help keep thins... organised.

5.1 - Creating OUs



From the Tools menu at the top right hand side of the Server Manager window select "Active Directory Users and Computers"



Right click on the domain and select "New" then "Organisational Unit" (spelling corrected as Windows Server 2019 does not have an English UK language option. Typical.)

New Object - Organizational Unit	×
Create in: saf.com/	
N <u>a</u> me:	
Managers	
Protect container from accidental deletion	
-	
r -	
OK Cancel	Help

Type in the name of the Organisational Unit ("Managers" in this example) and click OK. Repeat thrice for "Investments", "Finance" and "Operations".



5.2 - Creating Demo Users

For demonstration purposes we will create some dummy user accounts. Rather than going through the Active Directory Comuters and Users wizard we can do this in the Powershell command line. To optimise/automate this we can use Powershell scripts.

```
# finance
for ($num = 1 ; $num -le 3 ; $num++)
{
$username = ("fUser"+$num)
$userpw = ("fUserPW="+$num)
$userdisp = ("fUser Number "+$num)
$usersam = ("fUserNo"+$num)
New-ADUser `
-Name $username `
-Path "OU=Finance,DC=saf,DC=com" `
-SamAccountName $usersam `
-DisplayName "User One" `
-AccountPassword (ConvertTo-SecureString ($userpw) -AsPlainText -Force) `
-ChangePasswordAtLogon $true
-Enabled $true
}
```

The above script will loop three times. With each loop, \$num increases in value by 1. This variable (\$num) is used in variables such as \$username, to alter them with each run of the loop. This means we will get fUser1, fUser2 and fUser3 as the usernames. The same selection of code is then repeated 4 times per loop (for Management, Investments, Finance and Operations) altering the variables (fUser, mUser, iUser etc.).



Using Powershell, we can navigate to the directory where the script is stored. From here we run the script by typing in its name.

📃 Active Directory Users ar	nd Computers	
pa <u>F</u> ile <u>A</u> ction <u>V</u> iew <u>H</u> el	p	
er 🔶 🔿 🖄 🔝 🗎 🗐) 🗟 🗟 🛛 🖬 🗏 🐮 🗑 🖉	3 8
Active Directory Users an	d Com Name	Туре
Saved Queries	🚰 oUser1	User
✓ i saf.com	🛃 oUser2	User
📔 Builtin	🖲 oUser3	User
Computers		050
d 🕤 🛛 📓 Domain Controlle	rs	
📑 Finance		
ForeignSecurityPr	incipal	
Investments		
Managed Service	Accour	
Managers		
Operations		
Users		

After it has run we now have three demo users in each OU!

6 - SECURITY GROUPS

To manage shared drives and access permissions for individual groups of users we can use Security Groups. Changing group policy objects with these Security Groups allows us to control the shared drives.

6.1 - Creating the Security Groups



Select "Active Directory Users and Computers" from the Tools menu



From here, right click on the domain (saf.com) and select new group

ew Object - Group		3
Create in: saf.c	om/	
Group name:		
Managers		
		-
Group name (pre- <u>W</u> indows 20	000):	-
Managers		
		_
Group scope	Group type]
Group scope	Group type	
◯ D <u>o</u> main local	● Security	
O Domain local	● Security	
◯ D <u>o</u> main local	● Security	
◯ D <u>o</u> main local	● Security	

Type in the name and slect the group type as "Security", repeat for all required groups.



The three Security Groups in the domain

6.2 - Shared Drives

•	Anage Tools View Help Anage Tools View Help Anage Tools View Help Anage Tools View Help Anage Tools View Help Anage Tools View Help Anage Tools View Help View Help
	Active Directory Administrative Center
	Active Directory Domains and Trusts
	Active Directory Module for Windows PowerShell
-	Active Directory Sites and Services
	Active Directory Users and Computers
	ADSI Edit
	Component Services
	Computer Management
	Defragment and Optimize Drives
	DHCP
	Disk Cleanup
	DNS
	Event Viewer
	File Server Resource Manager
	Group Policy Management

Select "Group Policy Management" from Tools

	¥1	LECOME IN	JEILVE		OLIN		
	📓 Group Policy Mana	gement					
	🔣 File Action View	w Window	Help				
	📓 Group Policy Management			Defaul	t Doma	ain Poli	су
	✓ ▲ Forest: saf.com			Scope	Details	Settings	Deleg
	✓ Maine Domains ✓ Maine saf.com			Links			
a		in this dor	main, and	Link it h	ere		
	> 🖬	Link an Existin	ng GPO				:

Right click the saf.com domain and select "Create a GPO in this domain, and Link it here..."

New GPO	×
<u>N</u> ame:	
Mapping Drives for User Groups	
Source Starter GPO:	
(none)	\sim

Give the GPO a name and click OK


Expand the tree as shown above, right click on Drive Maps and select New Mapped Drive

New Drive Properti	ies	×
General Common		
Action:	Update	~
Location:	C: \MANAGERS	
Reconnect:	Label as: ManagerDrive	
Drive Letter		
	ailable starting at:	
_	ailable, starting at:	~
O Use first ava		~
OUse first ava		~
O Use first ava	ional)	~
O Use first ava Connect as (opti User name: Password: Hide/Show this d	ional) Confirm password: Hide/Show all drives No change	
O Use first ava Connect as (opti User name: Password: Hide/Show this d	ional) Confirm password: Hide/Show all drives ve Hide all drives	

Select the location of the folder to set up as the new drive and give it an appropriate letter (M for managers in this case!)

lew Drive Properti	es		×
General Common			
Options common	to all items		
Stop process	ing items in this ext	tension if an error occu	rs
Run in logge	d-on user's security	context (user policy o	ption)
Remove this	item when it is no le	onger applied	
	nd do not reapply		
<u>√</u> <u>I</u> tem-level ta	rgeting	<u>T</u> arg	eting
Description			
			\sim
			~

Click on the "Common" tab and select "Run in logged-on user's security context" and "Item-level targetting". Then click on the Targeting button.

Y	Targeting Editor				×
Ne	w Item 👻 Add Collection	tem Options 👻 🔺 🔻 🕌 🛍 🖛 🗙 Delete	🕜 Help		
23	Battery Present				
	Computer Name	"New Item" button to create a new targeting item			
MHz	CPU Speed				
8	Date Match				
	Disk Space				
6	Domain				
96	Environment Variable				
	File Match				
9	IP Address Range				
0	Language				
A	LDAP Query				
	MAC Address Range				
5	MSI Query				
2	Network Connection				
2	Operating System			~	
	Organizational Unit)K	Canc	ei:

Click "New Item" then select "Security Group" A

	Select Group			×
New Drive F				
Targeting Editor	Group			Object Types
	From this location:			
New Item - Add Collection	sal.com			Locations
👧 the user is a member o	Enter the object name to :	select (<u>examples</u>):		
	ManagersGroup			<u>C</u> heck Names
	<u>A</u> dvanced		OK	Cancel
Group			<u>.</u>	

Click the elipses button to start looking for a group. Type in "managers" and click "Check Names" to select the ManagersGroup, then click OK.

	New Drive Properties			
🝸 Targe	eting Editor	—		×
<u>N</u> ew Iten	m 🗸 🗛 Add Collection 🛛 Item Options 🗸 🔺 🔹 🐇 🗈 🛍 🛪 🗙 Delet	te 🛛 🕜 <u>H</u> elp		
🥂 ti	he user is a member of the security group SAF\ManagersGroup			
				_
<u>G</u> roup	SAF\ManagersGroup	<u>.</u>		^
<u>G</u> roup <u>S</u> ID	SAF\ManagersGroup S-1-5-21-1896614911-873563427-479889181-1130			^
-				^
-	S-1-5-21-1896614911-873563427-479889181-1130			^
-	S-1-5-21-1896614911-873563427-479889181-1130 Primary group Image: User in group		•	^
<u>s</u> id	S-1-5-21-1896614911-873563427-479889181-1130			~
<u>s</u> id	S-1-5-21-1896614911-873563427-479889181-1130 Primary group User in group Computer in group			

Check all the details are correct and click OK to set the mapped drive to be available for the ManagersGroup. Then click Apply on the New Drive Properties window.

🖻 🚍 Drive Maps												
Name Order Action Path Reconnect												
Processing	۲	M:	1	Update	C:\MANAGERS	No						
Stop processing items in	No	30 :	2	Update	C:\OPERATIONS	No						
extension on error: Run in user's context:	Yes	完 F:	3	Update	F:\	No						
Remove if not applied:												
Apply once:	No											
Filtered directly:	Yes											
Filtered by ancestor:	No											
Disabled directly:	No											
Disabled by ancestor:	No											

Repeat the process for the FinanceGroup (using a different volume) and the OperationsGroup (but make the drive available to both OperationsGroup and ManagersGroup, select "OR" for the ManagersGroup by clicking on them and pressing F6). The finished Drive Maps window should look like above.

6.2 - Bitlocker Encryption



Right click on the hard drive in This PC and select "Turn on BitLocker"

🗧 🟘 BitLocker Drive Encryption (F:)

Choose how you want to unlock this drive

Use a password to unlock the drive

Passwords should contain uppercase and lowercase letters, numbers, spaces, and symbols.

Enter your password	•••••
Reenter your password	•••••

Use my smart card to unlock the drive

You'll need to insert your smart card. The smart card PIN will be required when you unlock the drive.

Enter the password you will use for the drive (in this example we are using "saf!123qwe").

×

				V U Se	arch This PC	
÷	🏘 BitLocker Drive Encryption (F:)		×			
	How do you want to back up your recovery key?					
	Rave BitLocker recovery key as					×
	\leftarrow \rightarrow \checkmark \uparrow 🖹 \Rightarrow This PC \Rightarrow Documents \Rightarrow		ڻ ~	Search Doci	uments	Q
	Organize 🔻 New folder					• • • •
	V This PC ^ Name	Date modified	Туре		Size	
	> 🧊 3D Objects	13/12/2020 16:53	File fo	lder		
	> Desktop					
	> 🗄 Documents					
	> 🕂 Downloads					
	> 🁌 Music					
	> E Pictures					
	> 📕 Videos					
	> 🏪 Local Disk (C:)					
	> 📫 DVD Drive (D:) St					
-	> FinanceDrive (E ¹ ♥					
	File name: BitLocker Recovery Key 29B8D4BB-8F7F-4299-B6	C6-9034F87D9B84				~
	Save as type: Text Files (*.txt)					~
	▲ Hide Folders			Save	Ca	ncel

Save the backup recovery key to a file that can use printer or saved elsewhere.

<i>←</i>	Real BitLocker Drive Encryption (F:)
	Choose how much of your drive to encrypt
	If you're setting up BitLocker on a new drive or a new PC, you only need to encrypt the part of the drive that's currently being used. BitLocker encrypts new data automatically as you add it.
i	If you're enabling BitLocker on a PC or drive that's already in use, consider encrypting the entire drive. Encrypting the entire drive ensures that all data is protected—even data that you deleted but that might still contain retrievable info.
÷	
	Encrypt used disk space only (faster and best for new PCs and drives)
	Encrypt entire drive (slower but best for PCs and drives already in use)
	For security we will encrypt the entire drive.

		\times
() 10	←	
	Choose which encryption mode to use	
)	Windows 10 (Version 1511) introduces a new disk encryption mode (XTS-AES). This mode provides additional integrity support, but it is not compatible with older versions of Windows.	
ri	If this is a removable drive that you're going to use on older version of Windows, you should choose Compatible mode.	
a	If this is a fixed drive or if this drive will only be used on devices running at least Windows 10 (Version 1511) or later, you should choose the new encryption mode	1
L.	○ New encryption mode (best for fixed drives on this device)	
	Ompatible mode (best for drives that can be moved from this device)	
Selec	t compatible mode just incase the drive is used in other devices and click next then Ok encrypting the drive with BitLocker.	to start

7 - HARD QUOTAS FOR STORAGE

We can prevent users filling up our available stoage by implementing hard data quotas. For demonstration purposes in this document we will be setting up a 100Mb data limit.

7.1 - Creating the Security Groups

	(2) Manage Tools View Help
	Active Directory Administrative Center
	Active Directory Domains and Trusts
	Active Directory Module for Windows PowerShell
	Active Directory Sites and Services
	Active Directory Users and Computers
	ADSI Edit
	Component Services
	Computer Management
	Defragment and Optimize Drives
	DHCP
	Disk Cleanup
	DNS
	Event Viewer
	File Server Resource Manager
	Group Policy Management

Begin by selecting "File Server Resource Manager" from the Tools menu in Server Manager

🛃 File S	erver l	Resource Manag	ger				-	\times
File Ac	tion	View Help						
🗢 🔿	1	Image: Contract of the second seco						
		lesource Manag	er (Local)	Filter: Show all: 0 items	Action	s		
V Duota Management				Quota Path % Li Quo Source T Match Descr	Quota	s		•
.0	Quo	Create Quota.			🛛 🦉 Ci	reate Quota		
> 💦 Fil R St > 📸 Cl	e	<u>R</u> efresh			Q Re	efresh		
> 📸 Cl	3	View	>		Vi	iew		•
i 🐻 Fil	e				🥐 н	elp		
		<u>H</u> elp						
				1				

In the FSRM window, expand "Quota Management" and right click on Quotas. Select "Create Quota..." to open the Create Quota window.

Create Quota	×
Quota path:	
C:\	Browse
Create guota on path	
\bigcirc <u>A</u> uto apply template and create quotas on existing and new	subfolders
Quota properties	
You can either use properties from a quota template or define quota properties.	custom
How do you want to configure quota properties?	
 Derive properties from this quota <u>t</u>emplate (recommend 	ed):
100 MB Limit \sim	
Define <u>c</u> ustom quota properties	
Custom P <u>r</u> operties	
Summary of quota properties:	
⊡ · Quota: C:\	
Create	Cancel

Select the directory to apply the quota to. In our case it will be the entierity of the C: drive. Whilst there is the option to use the pre-existing 100Mb template we will define a custom quota to demonstrate that the values can be changed as our needs scale.

py properties from quo	ta <u>t</u> emplate (optional)):			
0 MB Limit				\sim	Сору
ettings					
Quota path:					
D:N					
Description (optional):					
Space limit					
Limit:					
100.000	MB ~				
100.000	MD *				
 Hard quota: Do no 		ed limit			
Hard quota: Do no	ot allow users to exce)		
Hard quota: Do no Soft quota: Allow	ot allow users to exce users to exceed limit		ng)		
Hard quota: Do no	ot allow users to exce users to exceed limit		ng)		
Hard quota: Do no Soft quota: Allow	ot allow users to exce users to exceed limit		ng) Command	Report	
Hard quota: Do n Soft quota: Allow Notification threshold:	ot allow users to exce users to exceed limit	(use for monitorir		Report	
Hard quota: Do n Soft quota: Allow Notification threshold:	ot allow users to exce users to exceed limit	(use for monitorir		Report	
Hard quota: Do n Soft quota: Allow Notification threshold:	ot allow users to exce users to exceed limit	(use for monitorir		Report	
Hard quota: Do n Soft quota: Allow Notification threshold:	ot allow users to exce users to exceed limit	(use for monitorir		Report	
Hard q <u>u</u> ota: Do n <u>S</u> oft quota: Allow Notification threshold: Threshold	et allow users to exce users to exceed limit s E-mail	(use for monitorir		Report	
Hard quota: Do n Soft quota: Allow Notification threshold:	et allow users to exce users to exceed limit s E-mail	(use for monitorir		Report	
Hard quota: Do n Soft quota: Allow Notification threshold Threshold <u>A</u> dd	et allow users to exce users to exceed limit s E-mail	(use for monitorir		Report	
Hard q <u>u</u> ota: Do n <u>S</u> oft quota: Allow Notification threshold: Threshold	et allow users to exce users to exceed limit s E-mail	(use for monitorir		Report	

From here enter the quota limit, description, hard/soft setting and then click "Add..." to start adding the threshholds.

Add Threshold	×
Generate notifications when usage reaches (%):	
E-mail Message Event Log Command Report	
Send e-mail to the following administrators: [Admin Email] Format: account@domain. Use semicolons to separate accounts. Send e-mail to the user who exceeded the threshold E-mail message Type the text to use for the Subject line and message. To identify the quota, limit, usage, or other information about the current threshold, you can use Insert Variable to insert a variable in your text. Subject: You have used too much data! Message body: Listen here, [Source to Owner]. You're only allowed [Quota Limit MB] and you're at [Quota Used Percent]% of that. Stop it. [Quota Used MB] MB is a lot. If you go over 1	
will fire you.	
Select <u>v</u> ariable to insert: [Admin Email]	
Inserts the e-mail addresses of the administrators who receive the e-mail.	
Additional <u>E</u> -mail Headers	
OK Cancel	

In this window we set the threshold level for a warning at 85%. We can send an email to the user who has transgressed the threshold to warn them about their usage. The other tabs along the top give other options, such as logging the event, running a command, filing a report etc.

After creating a second threshold for 100% usage we simply click "Create" at the bottom of the Create Quota window and the quota is now applied to the specified drive. We are also given the option to save the quota as a template for future usage.

8 - BACKUP & UPDATE POLICY

We are able to schedule backups and updates to happen with the Windows Server Backup tool and Group Policy Objects. The details below will show the steps taken to schedule these at a time when the office will be empty.

8.1 - Scheduling Backups

	🚋 wbadmin - [Windows Server Backup (Local)\Local Backup]											
	File	Action	View	l elp								
) 🖄										
	w ملاح	indows S) Local B	erver Ba	^{ckup (I} Local Backup								
		,		Backup Schedule								
2		Backup Once				ngle backup or schedule a r	egular backup using this application.					
		Recover Configure Performance Settings				ured for this computer. Use the Back	up Schedule Wizard or the Backup Once Wizard to p					
	View				>	, double click on the message to s	ee details)					
				Help		Message	Description					

Start by selecting "Windows Server Backup" from the Tools menu in Server Manager. In this new window right click "Local Backup" and select "Backup Schedule..."



Click Next to start the wizard. For this demonstration we are choosing to do a full server backup, though smaller backups of individual volumes or files can be configured via the same method. Click Next at the bottom of the window to continue



Here we can choose the time for the backup. As no users will be in the office at 3am and the on-call junior admin will be awake, this will be our chosen time.



Again for demonstration purposes we will be chosing to backup to a dedicated backup drive.

Backup Schedule Wizard	nation D	lisk				>	×
Getting Started Select Backup Configurat Specify Backup Time		to store disks of		backups. You c	an use multiple bac	kup disks if	
Specify Destination Type	Disk	Name	Size	Used Space	Volumes in D		
Select Destination Disk	1	VMware Vi	15.00 GB	0 KB			
Confirmation							
Summary							
					<u>S</u> how All Avail	able Disks	

We select the disk we want and click next. A warning will pop up to remind us that the disk used will be formatted, all data on it erased and then used as a dedicated backup disk.

Backup Schedule Wizard		
Summary		1
Getting Started Select Backup Configurat	Status: You have successfully created the backup schedule. Your first scheduled backup will happen at 15/12/2020 03:00.	
Specify Backup Time Specify Destination Type Select Destination Disk Confirmation	Make sure that the disks you are using to store scheduled backups are attached to this computer and are available.	-
Summary		

After checking the summary, click Next to schedule the backups. The screen above will confirm that we have backups scheduled and will show the upcoming back up.

8.2 - Scheduling Updates



Open the Group Policy Manager via the Tools menu again. Right clck on the domain, select "Create a GPO in this domain, and Link it here..." and name it. Then right click on the new GPO and select edit.

Group Policy Management Editor					- 0	×
File Action View Help						
🔶 🧼 🖄 📰 🗟 🔜 🖉 👘						
Update Policy [SAFSERVER.SAF.COM	📋 Windows Update		-			
Gomputer Configuration Policies	Configure Automatic Updates		Setting	State	Comment	
> Software Settings	updates.	~	Windows Update for Business			
> 📔 Windows Settings	When Windows finds updates		🗄 Do not display 'Install Updates and Shut Down' option in Sh	Not configured	No	
✓ ² Administrative Templates:	that apply to this computer, users		Do not adjust default option to 'Install Updates and Shut Do	Not configured	No	
> Control Panel	will be notified that updates are		Enabling Windows Update Power Management to automati	Not configured	No	
> 🧮 Network	ready to be downloaded. After going to Windows Update, users		E Turn off auto-restart for updates during active hours	Not configured	No	
Printers	can download and install any		Specify active hours range for auto-restarts	Not configured	No	
Server	available updates.		Allow updates to be downloaded automatically over metere	Not configured	No	
> 📔 Start Menu and Taskba			Always automatically restart at the scheduled time	Not configured	No	
> 🧮 System	3 = (Default setting)		Specify deadline before auto-restart for update installation	Not configured	No	
Windows Component:	Download the updates automatically and notify when		Configure auto-restart reminder notifications for updates	Not configured	No	
ActiveX Installer Se	they are ready to be installed		Turn off auto-restart notifications for update installations	Not configured	No	
Add features to Wi			Configure auto-restart required notification for updates	Not configured	No	
🧮 App Package Deple	Windows finds updates that		Configure Automatic Updates		No	
App Privacy	apply to the computer and			Edit	No	
App runtime	downloads them in the background (the user is not		Specify intranet Microsoft update service location Automatic Updates detection frequency	Filter On	No	

Expand the trees on the left to navigate to Computer Configuration, Policies, Administrative Templates, Windows Components, Windows Updates and left click on it to open the policies in the right hand pane. In here, we right click on "Configure Automatic Updates" and select Edit

	Configure Automatic Updates		— 🗆 X	:
	📆 Configure Automatic Updates		Previous Setting <u>N</u> ext Setting	
	○ Not <u>C</u> onfigured Comment:		^	
•	O <u>D</u> isabled Supported on: Win	dows XP Pro	ofessional Service Pack 1 or At least Windows 2000 Service Pack 3	
	Options:		Help:	
	Configure automatic updating: 4 - Auto download and schedule the install The following settings are only required and applicable if 4 is selected. Install during automatic maintenance Scheduled install day: 2 - Every Monday Scheduled install time: 05:00 If you have selected "4 – Auto download an schedule the install" for your scheduled insta and specified a schedule, you also have the of to limit updating to a weekly, bi-weekly or maintenance 1 - Auto download and schedule install of the schedule of the sched	II day option	Specifies whether this computer will receive security updates and other important downloads through the Windows automatic updating service. Note: This policy does not apply to Windows RT. This setting lets you specify whether automatic updates are enabled on this computer. If the service is enabled, you must select one of the four options in the Group Policy Setting: 2 = Notify before downloading and installing any updates. When Windows finds updates that apply to this computer, users will be notified that updates are ready to be downloaded. After going to Windows Update, users can download and install any available updates. 3 = (Default setting) Download the updates automatically and notify when they are ready to be installed	*
	<	>	Windows finds updates that apply to the computer and OK Cancel	•

In this window, we first enable the policy by clicking the Enabled radio button, then select "4 - Auto download and schedule the install" from the drop down menu, then schedule it to happen every Monday at 0500 after the backup. To apply these changes we simply click "Apply" then "OK" to close the window.

8.3 - Storage Reports

		<u> </u>							
	🛃 File Server Resource Manager								
	File Action View Help								
	🗢 🔿 🙍 📰 👔								
:e	File Server Resource Manager (Local)	Rep	Report	Scope	Fold	Sche	S., Last	La	Ac
	> 🖨 Quota Management								Ste
	> 🔊 File Screening Management								
	Classification Management								11~
	👸 File Management Tasks		Sch	edule a N	lew Repo	rt Task			
			Add	l or Remo	ove Repor	ts for a Re	port Task		
			Gen	erate Rep	ports Nov	v			Q
			Refr	resh					1
			Viev	M				>	?
			Hel	р					

Open up File Server Resource Manager from the Tools menu again. Click "Storage Reports Manager" and then right click in the empty pane and select "Schedule a New Report Task..."

Neu	NEDUIL.			JUIC		J L03	L L.a		Netion:
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Settings	Scope	Delivery	Schedule						
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Set the report name, and select the specific reports to generate.

Kep	Report	. ⊢Scope	Fold	che	S. Last	La		ction
orage R	eports Ta	sk Propei	ties			_		Х
Settings	Scope	Delivery	Schedule					
Includ	e all folde	rs that stor	re the following	kinds of a	lata:			
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In the Scope tab we'll select all file types and add the two drives to the report. This is just for this demonstration. More articulated scopes can be determined as needed.

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Storage Reports Task Properties 🛛 🗌	\times
Settings Scope Delivery Schedule	20
Send reports to the following <u>a</u> dministrators:	C
[Admin Email]	e
Format: account@domain. Use a semicolon to separate multiple accounts.	e
Reports will be saved in C:\StorageReports\Scheduled.	
To change the locations where storage reports are saved, use the Configure Options task, Report Locations tab.	
	Settings Scope Delivery Schedule ✓ Send reports to the following administrators: [Admin Email]

Likewise, the email address in the Delivery tab can be altered as needed.

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Storage Reports Task Prope	rties	—		\times
Settings Scope Delivery	Schedule			20
Run at: 09:00:00	-			e
Weekly	O Monthly			e
Sunday	Monday	Tuesday		1
U Wednesday	Thursday	Friday		
Saturday				
Limit (în hours):	1			

The Schedule tab allows us to have the report sent first thing on Monday morning! Click OK to save

9 - SSH ACCESS FOR OPERATIONS GROUP

The users in the Operations Group will want to be able to access the server remotely via the command line. This is simply done by enabling SSH and configuring it so it will only allow logins from the members of that group. The Managers also wish to have remote access, but they wish to use remote desktop. SSH will not suffice for their needs so we must set up RDP.

9.1 - Setting up SSH Access



Add-WindowsCapability -online -name OpenSSH.Servervvv0.0.1.0







When it has finished installing we will see the above message letting us know SSH is now online and no restart is required at this time.

Skills Integration Project Adam Gatherer

```
PS C:\Users\Administrator> Add-WindowsCapability -online -name OpenSSH.Client~~~~0.0.1.0
Path :
Online : True
RestartNeeded : False
PS C:\Users\Administrator> set-service -name ssh-agent -startuptype 'automatic'
PS C:\Users\Administrator> set-service -name sshd -startuptype 'automatic'
PS C:\Users\Administrator> start-service sshd -startuptype 'automatic'
PS C:\Users\Administrator> start-service ssh-agent
PS C:\Users\Administrator> start-service sshd
PS C:\Users\Administrator> start-service sshd
PS C:\Users\Administrator> a
Now we enter the following commands one at a time:
```



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File Edit Format View Help					
# ForceCommand cvs server					^
Match Group administrators AuthorizedKeysFilePROGR	AMDATA/ss	h/admini	strator	s_ai	
AllowGroups OperationsGroup					¥
<				>	
	Windows (CRI	Ln 73, Col 1	3 100%		:
×					

The next step is to edit the sshd_config file, located at C:\ProgramData\ssh. Open with a text editor and add the following line to the end: "AllowGroups OperationsGroup". This can be any previously created group, but for the demonstration we will use OperationsGroup.

PS C:\Users\Administrator> Restart-Service sshd
PS C:\Users\Administrator> Restart-Service ssh-agent
PS C:\Users\Administrator>

From here we run "start-service ssh-agent" and "start-service sshd" to restart ssh

9.2 - Setting up RDP Access

RDP can be enabled for groups via the use of a Group Policy Object. By now we should be fairly familiar with creating GPOs. This section will assume previous experience and summarise various aspects without showing all steps.



For RDP we once again go to Group Policy Mangement via the Tools menu. From here, right click on the domain and select "Create a GPO in this domain, and Link it here...", name the GPO, right click on it and select "Edit"

Group Policy Management Editor		- 🗆	×
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 Location and Sensors Maintenance Scheduler Maps MDM Messaging Microsoft account Microsoft Secondary Auther Online Assistance OOBE Portable Operating System Presentation Settings Push To Install Remote Desktop Services Remote Desktop Sessior Application Compat Connections 	its description. Setting State O if Aluow users to connect remotely by using Remote Desktop S Not configured if Deny logoff of an administrator logged in to the console ses Not configured if Configure keep-alive connection interval Not configured if Limit number of connection interval Not configured if Suspend user sign-in to complete app registration Not configured if Set rules for remote control of Remote Desktop Services use Not configured if Set rules for remote control of Remote Desktop Services use Not configured if Select RDP transport protocols Not configured if Allow remote start of unlisted programs Not configured if Allow remote start of unlisted programs Not configured if Turn off Fair Share CPU Scheduling Not configured	Comment No No No No No No No No No	
 Licensing Printer Redirection 			
Extended Standard	/		
setting(s)			

Expand the tree on the left hand panel to Computer Configuration, Adminstrative Templates, Windows Components, Remote Desktop Services, Remote Desktop Session Host, Connections and then right click on "Allow users to connect remotely using Remote Desktop Services".

l	Allow users to cor	nect remotely by	using Remote Desktop Services				×
	Allow users to cor	nnect remotely by	using Remote Desktop Services	Previous Setting	<u>N</u> ext Setting		
þ	○ Not <u>C</u> onfigured	Comment:					^
	Enabled						
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1		Supported on:	At least Windows Server 2003 ope	rating systems or Wind	ows XP Profess	ional	^
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e	0-1		11-1				

In this window, simply click the "Enabled" radio button followed by "Apply" and OK

WELCOWE TO SERVE	N WANAGEN		
🛃 Group Policy Management			$ \Box$ \times
Image: Sile Action View Window Help Image: Image: Sile Action View Window View		Select User, Computer, or Group	×
Group Policy Management ✓ ▲ Forest: saf.com ✓ ➡ Domains ✓ ➡ Domains ✓ ➡ Default Domain Policy ➡ Firefox Deloyer ➡ Mapping Drives for User Grout ➡ RDP for Managers ➡ Update Policy > ➡ Domain Controllers > ➡ Investments > ➡ Managers > ■ Operations	Location	Select this object type: User, Group, or Built-in security principal From this location: saf.com Enter the object name to select (examples): ManagersGroup Advanced OK	Object Types Locations Check Names
 > Group Policy Objects > WMI Filters > Starter GPOs > Sites W Group Policy Modeling Group Policy Results 	The settings in this GPO can only apply to the Name Authenticated Users		
< >>	Add Remove WMI Filtering This GPO is linked to the following WMI filter: <	Properties V Open	

Returning to the Group Policy Management window, click on the "RDP for Managers" policy and click the "Add..." button in the Seucrity Filtering section. Enter "ManagersGroup" and click "Check Names" to ensure it is spelled correctly. Then click "OK" to apply the policy to the group.

10 - MONITORING FOR PERFORMANCE

Monitoring performance is very important for running large scale servers such as SAFserver. Fortunatley for us this is made easy through the use of a program in Windows Server 2019 called Performance Monitor. It can be configured to send out reports as shown below.

10.1 - Generating Performance Reports

) () () () () () () () () () () () () ()	 Performance Monitor File Action View Windo → 2 (1) (1) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2	ow Help 🗟 👔 📷 🕨 🔳 📸 💷		
	 Performance Monitoring Tools Performance Monitor Data Collector Sets User Defined Server Manag System Event Trace Sessi Startup Event Tra Reports User Defined System System Startup Event Tra 	Name Performance Counters Start Stop Save Template Data Manager Latest Report	Type Performance Counter	Output
	/ System	New >	Data Collector	
		View >		

Open Performance Monitor and expand the tree to find Server Manager under User Defined in Data Collector Sets. Right click on "Server Manger" and select New, Data Collector.

What type of data collector would you like to create?

Na<u>m</u>e:

Monitor1

- Performance counter data collector
- O Event trace data collector
- Configuration data collector
- O Performance counter alert

We give the collector a name and select the type with the radio buttons.

Select counters from computer:	× Browse	Counter	Parent	Inst	Computer	
(BAFSERVER	✓ Browse	Processor				^
POWEISHEIL WORKHOW		*		*	\\SAFSERVER	
Print Queue	• •					
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From the next window we click "Add" and this opens the available counters. Here we add the various counters for the things we wish to monitor. For demonstration purposes we will add all Processor, Network Adaptor and RAM data collectors available and click OK.

←	🔊 Create new Data Collector	×
	Which performance counters would you	like to log?
	Performance counters:	
	\\SAFSERVER\Memory* \\SAFSERVER\Network Adapter(*)* \\SAFSERVER\Processor(*)*	Add Remove
	Sample interval: Units:	
	15 Seconds V	
		Next Finish Cancel

The Sample Interval can be set in this window. For demonstration purposes we will leave it at 15 seconds and click Finish to create the data collector.

lame		Туре	Output	
Performance C	Counters	Performance C	ounter	
Monitor1	Monitor1 Pr	operties		×
	Performance	e Counters File		
	Log file <u>n</u> a	me:		
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	-Log mod	2		
		rwrite		
		en <u>d</u>		
	Ci <u>r</u> cu	ılar (requires a non-zero	maximum file size)	
	Example fi	e name:		
		s\Admin\ServerManage	r Monitor 1.blg	
			OK Cancel	Apply

Right click the new Data Collector and select properties. Open the File tab to have a look at the details for the log file that will be created by the collector. Changes can be made here should we need any. The collector is now collecting data.