# Lesson 19: Configuring Group Policy Processing

MOAC 70-411: Administering Windows Server 2012



WILEY

## Overview

- Exam Objective 4.2: Configure Group Policy
   Processing
- Understanding Group Policy Processing

## Understanding Group Policy Processing

Lesson 19: Configuring Group Policy Processing

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# Group Policies and GPOs

- Group policies are defined using group policy objects (GPOs).
- GPOs are the collection of configuration instructions that the computer processes.
- To assign a group policy, it is linked to an Active Directory container (site, domain, or organizational unit).

# Scoping a GPO

Mechanisms for scoping a GPO:

- A GPO link to a site, domain, or organizational unit (OU)
- The GPO link enabled or disabled
- Enforced option of the GPO
- The Block Inheritance option of an OU
- Security group filtering
- WMI filtering
- Loopback policy processing
- Preferences targeting (discussed in Lesson 22)

## Configuring Processor Order and Precedence

- 1. When a computer first starts up, it establishes a secure link between the computer and a domain controller.
- 2. The computer obtains a list of GPOs that are applied to the computer.
- 3. Computer configuration settings are applied synchronously (one by one) during computer startup before the Logon dialog box is presented to the user.
- 4. When the computer configuration settings have been applied and the startup scripts have been applied, users have the Ctrl+Alt+Del option to log on.

## Configuring Processor Order and Precedence

- 5. A user is authenticated and the user profile is loaded.
- 6. The computer obtains a list of GPOs that are applied to the user. Again, GPO processing is hidden from the user.
- 7. After the user policies run, any logon scripts defined by GPOs run. Scripts are executed asynchronously.
- 8. The login script defined for the user in Active Directory user properties is executed.
- 9. The user's desktop is displayed.

# Understanding Group Policy Inheritance

A computer and user can be affected by multiple GPOs. GPOs are processed in the following order:

- 1. Local group policy
- 2. Site
- 3. Domain
- 4. OU

A Group Policy uses **inheritance** in which settings are inherited from the container above.

# Understanding Group Policy Inheritance

When Active Directory is installed, two domain GPOs are created by default:

- **Default Domain Policy**: Linked to the domain. It affects all users and computers in the domain including domain controllers. It specifies the password, account lockout, and Kerberos policies.
- **Default Domain Controller Policy**: Linked to the Domain Controllers organization unit, which then affects the domain controllers. It contains the default user rights assignments.

## Understanding Group Policy Inheritance

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#### Displaying GPOs for a domain

#### Change the Precedence of a GPO

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Changing the precedence

## Managing Group Policy Links

To disable a group policy for a container, you right-click the GPO for the container and click the Link Enabled link.

### Managing Group Policy Links

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Toggle the Link Enabled :	Refresh								
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Showing a link is enabled for a GPO

## Managing Group Policy Links

After a GPO is created, you can:

- View the containers that a GPO is linked to by clicking the GPO in Group Policy Management and viewing the Scope tab.
- Delete a link to a container for a GPO without deleting the GPO by right-clicking the GPO for a container and clicking Delete. When it asks whether to delete the link, click OK.
- Disable the link or delete a link for a container by right-clicking the container in the Scope tab and clicking the Link Enabled option or the Delete Link(s) option.

## Managing Group Policy Links

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Showing the containers a GPO is linked to

## Managing Group Policy Links

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#### Configuring the GPO status

# Using Filtering with Group Policies

The exceptions to the processing of group policies can be modified with these options:

- Block inheritance
- Enforced

## Configuring Blocking of Inheritance

- By default, group policies flow down to the lower containers and objects.
- To prevent the inheritance of policy settings, block all Group Policy settings from the GPOs linked to parent containers in the Group Policy hierarchy.
- GPOs linked directly to the container and GPOs linked to lower containers are unaffected.

#### Block the Inheritance of GPOs

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#### Selecting the Block Inheritance option

#### Block the Inheritance of GPOs

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A GPO with the Block Inheritance option enabled

## Configuring Enforced Policies

- By enforcing a GPO link, the GPO takes the highest precedence, which will prevail over any conflicting policy settings in other GPOs.
- An enforced link applies to child containers even when those containers are set to Block Inheritance.

#### Enforce a GPO

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#### Enforcing a GPO

### Enforce a GPO

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#### Showing the effect of enforcing a GPO

# Configuring Security Filtering/WMI Filtering

For granular control over who or what receives a group policy, use these filters:

- Security group filtering: Uses a security access list (ACL) to determine who can modify or read a policy and who or what a GPO is applied to.
- WMI filtering: Uses the WMI Query Language (WQL) to control who or what a GPO is applied to.

# **Using Security Filtering**

**Security group filtering** specifies which users, computers, or groups based on ACL receive a GPO.

# Filtering GPO Scopes

Here are the ways to filter GPO scopes:

- Remove the Allow Apply group policy permission from a group such as Authenticated Users.
- Remove the Authenticated Users group access control entry (ACE), add other groups or users, and assign the Allow Apply group policy permission.
- Add ACE for another group, user, or computer and assign the Deny Apply group policy permission. Like NTFS permissions, the Deny settings always supersede any Allow settings granted to a user through membership in another group or to the user directly.

### Configure a Security Group Filtering

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<ul> <li>A Forest: contoso.com</li> <li>B Domains</li> <li>A A contoso.com</li> <li>Contoso.com</li> <li>Default Domain Policy</li> </ul>	Scope         Details         Settings         Delegation           These groups and users have the specified permission for Groups and users:         Provide the specified permission for specified permission for the specified permission for specifie	this GPO	
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Group Policy Modeling	Add Remove Pr	roperties 4	Advanced

Showing current groups and users that have permissions to a GPO

### Configure a Security Group Filtering

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Create all child objects		
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For special permissions or advance click Advanced.	ed settings,	Advanced
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Showing the ACL for a GPO

## Configure a Security Group Filtering

WESTGPO1 Sec	urity Setting	js 🗙
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Permissions for Administrators	Allow	Deny
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Delete all child objects		
Apply group policy		<ul> <li></li> </ul>
For special permissions or advanced click Advanced.	d settings,	Advanced
Learn about access control and per	missions	
OK	Cancel	Apply

Clicking the Deny Apply group policy permission

# WMI Filtering

- Windows Management Instrumentation (WMI): A component that extends the Windows Driver Model through an operating system interface that provides information and notification on hardware, software, operating systems, and services.
- **WMI filtering**: Configures a GPO to be applied to certain users or computers based on specific hardware, software, operating systems, and services.

Using WMI Filtering

- You need to have one domain controller running Windows Server 2003 or higher.
- WMI filters will be applied only to computers running Windows XP Professional or newer, or Windows Server 2003 or newer.
- All filter criteria must have an outcome of true for the GPO to be applied.
- Only one WMI filter can be configured per GPO. After a WMI filter has been created, it can be linked to multiple GPOs.

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Opening the WMI Filters node

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Opening the New WMI Filter dialog box

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Opening the WMI Query dialog box

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Default Domain Policy     GPO1     GPO2     GPOSales1     GPOSales2		Add Remove Properties	
New Group Policy Object  Site1GPO  WESTGPO1  WFSTGPO2   III	~	WMI Filtering       This GPD is linked to the following WMI filter: <none> <none>       New WMI Filter</none></none>	

Selecting the name of the WMI filter on the Scope tab

# Configuring Loopback Processing

- Group Policy loopback processing is used to assign user policies to computer objects.
- No matter who logs on to a computer, the user policies are applied to the computer.

# Configuring Loopback Processing

- The loopback policy is enabled using the Group Policy Management Editor, specifically the Computer Configuration\Administrative Templates\System\Group Policy\Configure user Group Policy Loopback processing mode.
- After you enable the setting, you have two modes to choose from that specify the loopback processing mode:
  - Replace mode
  - Merge mode

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## **Configuring Loopback Processing**

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Mode: Replace	~		This policy setting directs the Policy objects for the com- computer affected by this computers, such as those i- classrooms, where you mu- the computer that is being By default, the user's Grou settings apply. If this settin on to this computer, the co- determine which set of Grou- lf you enable this setting, y modes from the Mode box "Replace" indicates that th computer's Group Policy Co- normally applied to the us "Merge" indicates that the computer's Group Policy Co-	the system to apply puter to any user w setting. It is intend n public places, lai used. p Policy Objects du g is enabled, then, omputer's Group P sup Policy Objects rou can select one c e user settings defi Dbjects replace the er. user settings defir Dbjects and the uss	y the set of who logs or led for spec boratories, r setting ba etermine w when a us Policy Obje s applies. of the follo "ined in the e user settings	Group 1 to a :ial-use and sed on trich use er logs cts wing gs normall <u>:</u>	er =
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Configuring the Group Policy loopback processing mode

- Client-side extensions (CSEs) are processes that interrupt the settings in a GPO and make the changes to the local computer or the currently logged-on user.
- CSEs are triggered when a Group Policy client pulls the GPOs from the domain.
- Each major category of policy setting has CSEs.

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Windows Settings		E Configure IP security policy processing	Not configured				
Administrative Templates: Policy definitions (ADMX files) retrie	≡	E Configure Local Users and Groups preference extension policy processing	Not configured				
Control Panel		E Configure Network Options preference extension policy processing	Not configured				
Network		E Configure Network Shares preference extension policy processing	Not configured				
Printers		E Configure Power Options preference extension policy processing	Not configured				
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Distributed COM		E Configure scripts policy processing	Not configured				
Ciper Installation		Configure security policy processing	Not configured				
Early Launch Antimalware		Configure Services preference extension policy processing	Not configured				
Enhanced Storage Access		Configure Shortcuts preference extension policy processing	Not configured				
File Classification Infrastructure		Configure software Installation policy processing	– Not configured				
🧮 File Share Shadow Copy Provider		Configure Start Menu preference extension policy processing	Not configured				
Filesystem		Configure user Group Policy loopback processing mode	Not configured	~			
🦰 Folder Redirection	$\overline{}$			>			
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50 setting(s)							

#### Displaying some of the available client-side extensions

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You can configure the behavior of CSEs by using Group Policy, specifically \Computer Configuration\Policies\Administrative Template\System\Group Policy\.

<b>9</b>	Configure scripts policy processing	x
Configure scripts policy processing	Previous Setting Next Setting	
<ul> <li>Not Configured Comment:</li> <li>Enabled</li> <li>Disabled</li> <li>Supported on:</li> </ul>	At least Windows 2000	
Options:	Help:	
Allow processing across a slow network connection Do not apply during periodic backgip processing Process even if the Group Policy object not changed	ork         This policy setting determines when policies that assign shared scripts are updated.           ound         This policy setting affects all policies that use the scripts component of Group Policy, such as those in WindowsSettings \Scripts. It overrides customized settings that the program implementing the scripts policy set when it was installed.           If you enable this policy setting, you can use the check boxes provided to change the options. If you disable or do not configure this setting, it has no effect on the system.           The "Allow processing across a slow network connection" option updates the policies even when the update is being transmitted across a slow network connections, such as a telephone line.           Updates across slow connections can cause significant delays.           The "Do not apply during periodic background processing" option prevents the system from updating affected policies in the background while the computer is in use. When background updates are disabled, policy changes will not take effect until the	
	OK Cancel Apply	

#### Configuring scripts policy processing

# Configuring/Managing Slow-Link Processing

- Group policies executed over slow network links can affect the performance of the client computer, between a site and the corporate office of a site, or the computer being configured via a GPO.
- A link is considered slow if the link is less than 500 kilobits per second (kbps).
- The Configure Group Policy slow-link detection is used to define what is considered a slow-link connection.

### **Configuring/Managing Slow-Link Processing**

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<ul> <li>Not Configured Comment:</li> <li>Enabled</li> <li>Disabled</li> <li>Supported on:</li> </ul>	At least Windows	2000				
Options:		Help:				~
Connection speed (Kbps): 500 Enter 0 to disable slow link detection.	v link	This policy setting d applying and updati If the rate at which o providing a policy u slower than the rate considers the conne The system's respon policies. The progra response to a slow li this folder lets you o slow links. If you enable this set box, type a decimal indicating a transfer slower than this rate connections are con If you disable this se	lefines a slow ing Group Pc data is transfu pdate to the specified by action to be s use to a slow m implemen ink. Also, the override the p tting, you ca number betw tting, you ca number betw tting or do n tting or do n	v connection for pro- plicy. erred from the don computers in this this setting, the sy low. policy connection ting the policy car policy processing programs' specified n, in the "Connect ween 0 and 4,294,9 its per second. Any d to be slow. If you e fast.	urposes of nain contr group is sstem varies am specify ti settings in settings in d response ion speed' 67,200, v connecti u type 0, a e system u	roller = nong he n ss to lian lian lises $\checkmark$
			ОК	Cancel	A	pply

#### Defining the maximum speed of a slow link

# **Troubleshooting GPOs**

Windows Server 2012 provides the following tools for performing Result Set of Policy (RSoP) analysis:

- The Group Policy Results Wizard
- The GPResult.exe command
- The Group Policy Modeling Wizard

# **Troubleshooting GPOs**

The **Group Policy Results Wizard** helps you analyze the cumulative effect of GPOs and policy settings on a user or computer.

To run the Group Policy Results Wizard, the following must be true:

- The target computer must be online.
- You must have administrative credentials on the target computer.
- The target computer must run Windows XP or newer.
- WMI must be running on the target computer and ports 135 and 445 must be available to access WMI on the target computer.

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Group Policy Results Wizard	x		
Computer Selection You can view policy settings for this computer or for another computer on this network.			
Select the computer for which you want to display policy settings.  This computer			
O Another computer:			
Browse			
Do not display policy settings for the selected computer in the results (display user policy settings only)			
< Back Next > Car	ncel		

Viewing the Computer Selection page

Group Policy Results Wizard
User Selection You can view policy settings for users of the selected computer.
<ul> <li>Display policy settings for:</li> <li>Current user</li> </ul>
Select a specific user:      CONTOSO \Administrator     CONTOSO \user1      This list only shows users that have logged on to the computer, and for whom you have permission to read Group Policy Results data.      Do not display user policy settings in the results (display computer policy settings only)
< Back Next > Cancel

Viewing the User Selection page

1	Gro	up Policy Manag	ement			
File Action View Window Help						- 6
• • 🖄 🖬 🧟 🖥 🖬						
Group Policy Management	user1 on win2012srv2					
A 🔬 Forest: contoso.com	Summaru Details Policu Event					
⊿ 🙀 Domains	i constanti constanti constanti i constanti i constanti i constanti i constant	~	Group Policy Posult	e		
⊿ mi contoso.com	001/70001 1	0011700011		5		
GPO1	CONTOSO(userT on Data collected on: 10/14/2012	CONTOSO(WI	N2012SRV2			abow all
GPO2	Computer Details	0.02.44114				hide
DirectAccessClients	General					hide
Domain Controllers	Computer name		CONTOS	SOLW/IN2012SR\/2		
⊿ sales ☐ GPOSales1	Domain		contoso.	com		
GPOSales2	Site		Default-F	irst-Site-Name		
🛛 📸 West	Organizational Ur Block Inheritance	urt	contoso.	com/Sales/West		
WESTGP01	Security Group M	embership	show			
Mesigeoz Signature Policy Objects	Component Status					hide
∠ is with a standard of the standard of th	Component Name	Status	Time Taken	Last Process Time	Event Log	
😽 New WMI Filter	Group Policy	Success	6 Second(s) 381	10/ 14/ 2012 8:28:38	View Log	
b i Starter GPOs	Infrastructure		Millisecond(s)	PM		
P Roun Policy Modeling	Registry	Success	16 Millisecond(s)	10/14/2012 2:10:48 PM	View Log	
A 📴 Group Policy Results	Security	Success	266 Millisecond(s)	10/ 14/ 2012 12:38:54	View Log	
Administrator on WIN2012SRV				PM		
🖆 user1 on win2012srv2	Settings					hide
	Policies					hide
	Administrative Templat	tes				<u>hide</u>
	Policy definitions	(ADMX files) retrieved	from the local computer.			
	Control Panel/Pers	sonalization				hide
	Policy		Setting	Winning GF	0	
	Prevent changin	g lock screen image	Enabled	GP01		
	Group Policy Objects					<u>hide</u>
	Applied GPOs					hide
	GP01					show
	Local Group Policy					show
	WESTGP02					show
	Denied GPOs					hide
	Default Domain Polic	.v				show
	GPO2					hide
	Link Location		contor	0.000		
	Extensions Co	onfigured	Regist	N.Com		
	Enforced		No			
	Disabled	_	None			·
	Security Filter	•	NI AI	Concern to autoenticated II	artini.	

Viewing the Details tab for Group Policy Results

Prevent changing lock screen image Pro	perties ? X
Setting Explain Precedence	
Prevent changing lock screen image	
GPO Name	Setting
GP01	Enabled
Site1GPD	Enabled
GPOs higher in the list have the highest priority	
Previous Setting Next Setting	
OK	ncel Apply

Using the Resultant Set of Policy console

Group Policy M	Nodeling Wizard
<b>Domain Controller Selection</b> You must specify a domain controller to use I	for performing the simulation.
The simulation performed by Group Policy Modeli Windows Server 2003 or later. Show domain controllers in this domain:	ng must be processed on a domain controller running
contoso.com	~
Process the simulation on this domain controller: <ul> <li>Any available domain controller running W</li> <li>This domain controller:</li> </ul>	indows Server 2003 or later
Name 🔶	Site
VSERVER1.contoso.com	Default-First-Site-Name
WIN2012SRV.contoso.com	Default-First-Site-Name
Win2UT25rv2.contoso.com	Default-First-Site-Name
	< Back Next > Cancel

Selecting the domain controller

Group Policy Modeling Wizard	x
User and Computer Selection You can view simulated policy settings for a selected user (or a container with us information) and computer (or a container with computer information).	er
Example container name: CN=Users,DC=contoso,DC=com Example user or computer: CONTOSO\Administrator Simulate policy settings for the following: User information <ul> <li>Container:</li> <li>User:</li> </ul>	Browse
Computer information         O Container:         O Computer:         Skip to the final page of this wizard without collecting additional data	Browse Browse
< Back Next >	Cancel

#### Selecting the user and computer to model

Group Policy Modeling Wizard	x
Advanced Simulation Options You can select additional options for your simulation.	
Simulate policy implementation for the following:  Slow network connection (for example, a dial-up connection)  Loopback processing  Replace  Merge	
Site: (None)	<b>v</b>
Skip to the final page of this wizard without collecting additional data	
< Back Next >	Cancel

#### Selecting advanced simulation options

Group Policy Modeling Wizard	x
<b>User Security Groups</b> You can simulate changes to the selected user's security groups.	
The selected user is a member of the following security groups. To simulate changes to the security group membership, use the Add and Remove buttons.	
Security groups:	
Authenticated Users	
Everyone	
Add Remove Restore D	efaults
Skip to the final page of this wizard without collecting additional data	
< Back Next > 0	Cancel

#### Changing the user security groups

Group Policy Modeling Wizard	x
<b>Computer Security Groups</b> You can simulate changes to the selected computer's security groups.	ļ
The selected computer is a member of the following security groups. To simulate changes to the security group membership, use the Add and Remove buttons.	
Security groups: Authenticated Users Everyone	
Add Remove Restore Defau	ults
< Back Next > Cano	cel

#### Changing the computer security groups

Group Policy Modeling Wizard	x
WMI Filters for Users You can include Windows Management Instrumentation (WMI) filters in your simulation.	
WMI filters can be linked to Group Policy objects (GPO). If a filter is linked to a GPO, then that GPO applies only to those users who meet the criteria specified in the filter. Assume that the selected user meets the criteria for the following filters: All linked filters Only these filters:	
List Filters Remove Skip to the final page of this wizard without collecting additional data	
< Back Next > C	ancel

#### Changing WMI Filters for Users

# Lesson Summary

- Group policies are defined using group policy objects (GPOs), which are the collection of configuration instructions that are processed by the computer.
- To assign a group policy, it is linked to an Active Directory container (site, domain, or organizational unit).
- GPOs are processed in the following order: local group policy, site, domain, and OU.
- By default, a group policy uses inheritance, whereas settings are inherited from the container above.
- When Active Directory is installed, there are two domain GPOs created by default: Default Domain Policy and Default Domain Controller Policy.
- The exceptions to the processing of group policies can be modified with the Block inheritance and Enforced options.

# Lesson Summary

- Windows Management Instrumentation (WMI) filtering configures a GPO to be applied to certain users or computers based on specific hardware, software, operating systems, and services.
- Loopback processing allows the Group Policy processing order to circle back and reapply the computer policies after all user policies and logon scripts run.
- Client-side extensions (CSEs) are processes that interrupt the settings in a GPO and make the changes to the local computer or the currently logged-on user.
- Windows Server 2012 provides the following tools for performing RSoP analysis: the Group Policy Results Wizard, the GPResult.exe command, and the Group Policy Modeling Wizard.

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