
Active Directory GPO client

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ADSys is the Active Directory Group Policy client for Ubuntu.

ADSys enables system administrators to manage Ubuntu Desktop clients centrally via Microsoft Active Directory. It includes ADMX and ADML templates and allows policies to be applied at boot and login, then refreshed periodically.

It simplifies the task of configuring Ubuntu systems in a Microsoft Active Directory environment. However, it doesn't handle user authentication or initial security policy, which are managed by SSSD/Winbind and PAM.

ADSys is valuable for system administrators who wish to manage Ubuntu Desktop clients in a centralized manner through Microsoft Active Directory.

TUTORIALS

This section contains step-by-step tutorials to help you get started with ADSys. We hope our tutorials make as few assumptions as possible and are accessible to anyone with an interest in ADSys. They should be a great place to start learning about ADSys, how it works, and what it's capable of.

1.1 Certificates Auto-Enrollment

Certificate Auto-Enrollment is a key component of Ubuntu's Active Directory GPO support. This feature enables clients to seamlessly enroll for certificates from Active Directory Certificate Services. In this demonstration, we'll guide you through the entire process, starting from the initial setup requirements to configuring the Active Directory policy. This demonstration is designed to provide you with a hands-on understanding of how to efficiently implement and manage certificate auto-enrollment, ensuring your systems remain secure and compliant with organizational policies.



1.2 Certificates Auto-Enrollment

Explore the essentials of Ubuntu's Certificate Auto-Enrollment Feature, a crucial tool for seamless certificate management with Active Directory Certificate Services.

- *Certificates auto-enrollment demo*

HOW-TO GUIDES

These guides accompany you through the complete ADSys operations lifecycle.

2.1 Installation

2.1.1 Windows Domain Controller

This is the configuration needed on Windows Domain Controller.

How to set up the Active Directory Server

Active Directory needs policy files (**.admx** and **.adml**) to know which settings can be changed on given clients and actions to be performed on users of the domain.

As a rule of thumb, we generally separate the Ubuntu configuration from the Windows one to avoid incompatibilities:

- namespace conflicts
- forward vs backward slashes
- let the administrator know exactly what settings are supported on which client version.

Ubuntu administrative template generations

ADSys ships with pre-built Active Directory administrative templates that you can install on your Active Directory server. You will find two flavors of them:

- One listing only Long Term Supported (LTS) Ubuntu versions.
- One listing all currently supported Ubuntu versions, including non LTS.

To get them, run `adsysctl policy admx lts-only`. It will create 2 files `Ubuntu.adml` and `Ubuntu.admx` in the current directory. As described, those will list only LTS versions of Ubuntu. To get all supported releases, replace `lts-only` with `all`.

Those are the 2 files that must be copied on your Active Directory server.

You can find the latest version of those files in a [dedicated directory of the upstream repository](#). Note though that not all the keys may be supported by our local ADSys installation. Only the templates generated by `adsysctl` match the version of your client.

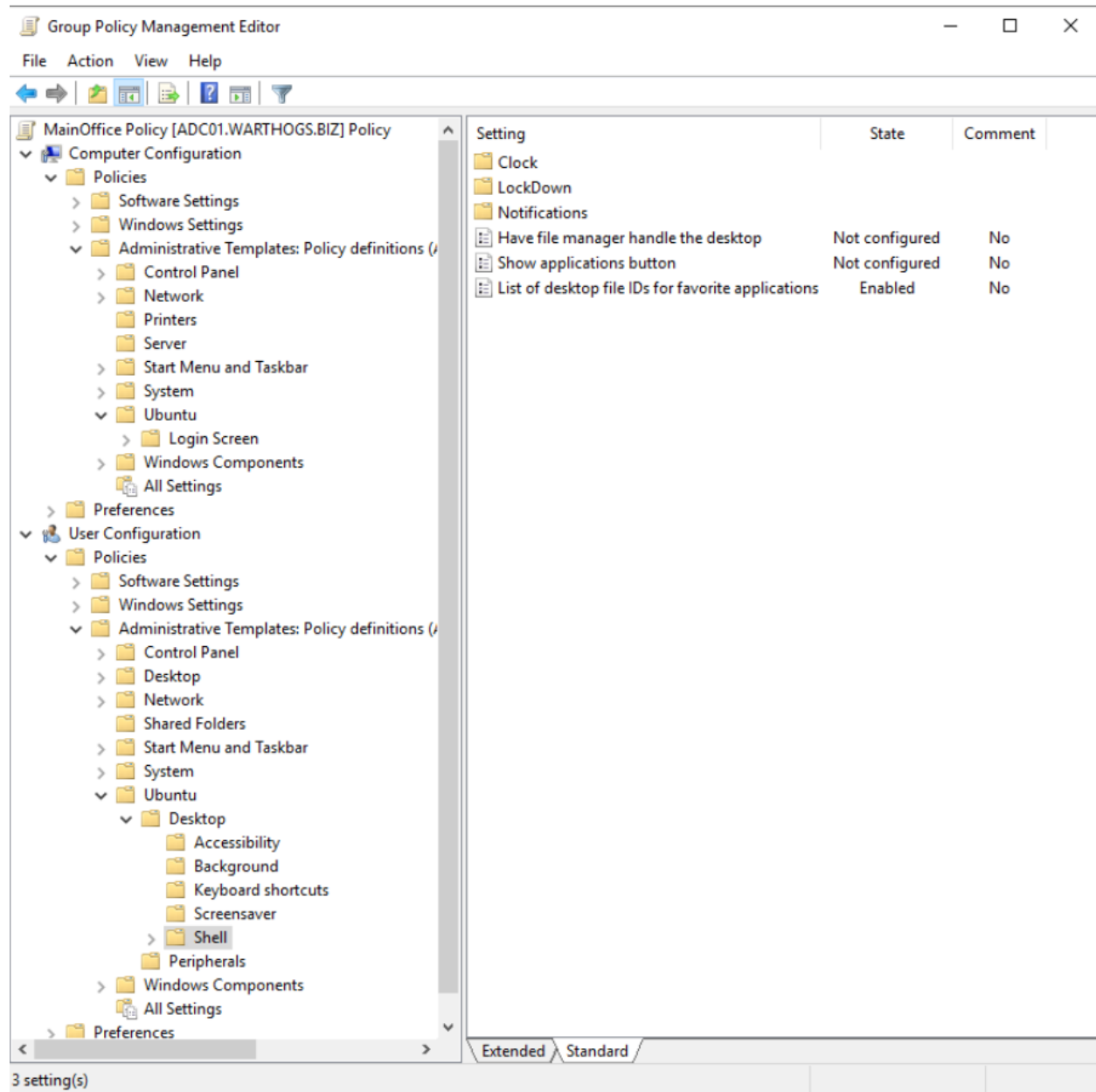
The policy files are also shipped as part of the `adsys-windows` package, together with the *Active Directory Watch Daemon*.

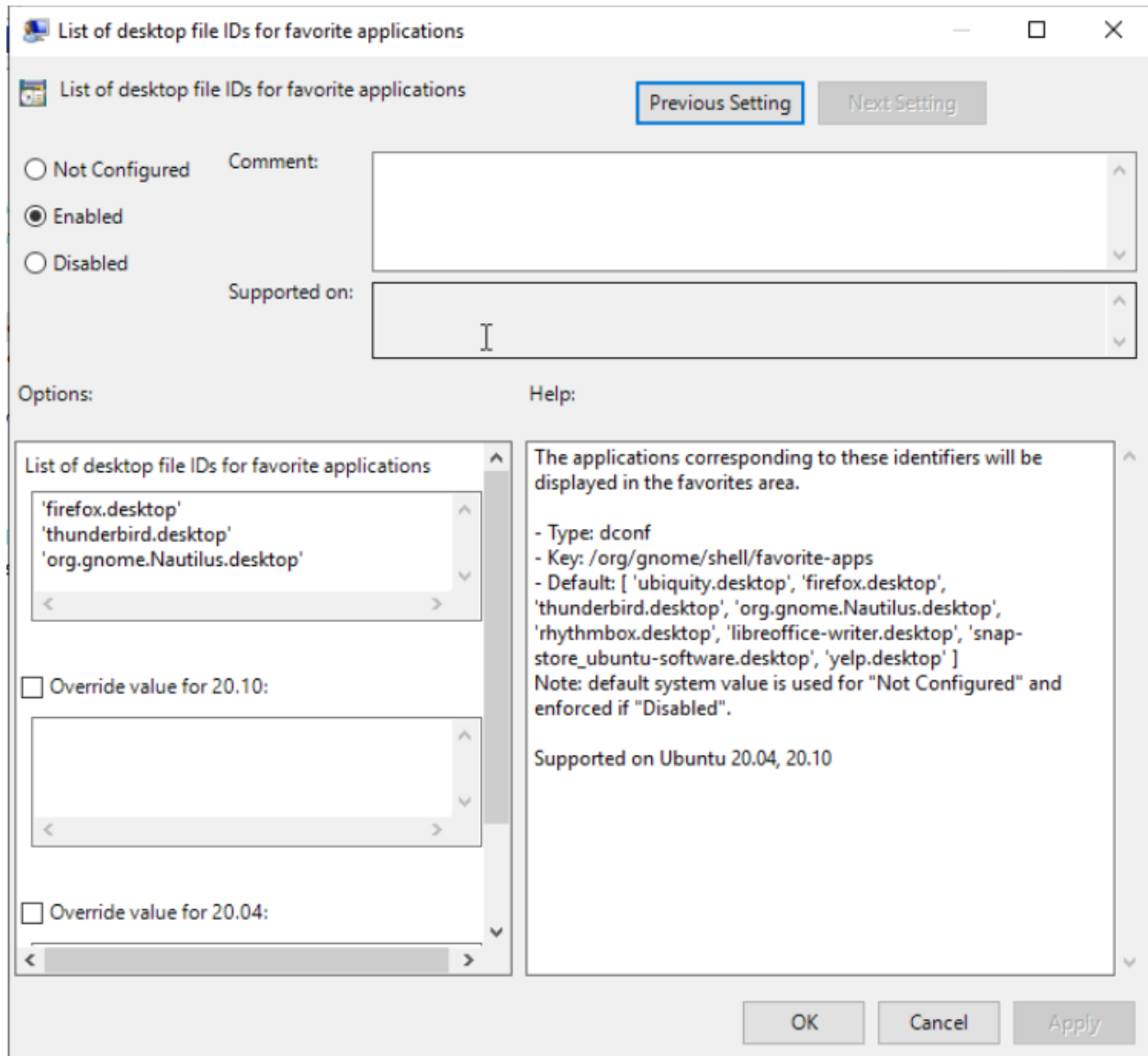
Deployment of ADM files on the Active Directory server

The administrative templates for Ubuntu must be deployed on your Active Directory server in the policy definition directory corresponding to your forest root. For instance `\\example.com\sysvol\example.com\Policies\PolicyDefinitions` for the .admx file and `\\example.com\sysvol\example.com\Policies\PolicyDefinitions\en-US` for the .adml file. These directories can be created manually if they do not exist.

For more information read the Microsoft documentation “[create and manage the Central Store](#)”.

Once loaded successfully in Active Directory, the Ubuntu specific settings are available in the **Group Policy Management Editor** under [Policy Name] > Computer Configuration > Policies > Administrative Templates > Ubuntu for the machine policies and [Policy Name] > User Configuration > Policies > Administrative Templates > Ubuntu for the user policies.





Recommended readings

- `adsysctl help policy admx` or `man adsysctl-policy-admx`.
- Create and manage the Central Store.

Active Directory Watch Daemon

The **Active Directory Watch Daemon** (or `adwatchd`) is a Windows application geared towards automating the manual process of incrementing the version stanza of a `GPT.ini` file.

At its core, the program can be simplified to the following steps:

- watch a list of user-configured directories for changes – subdirectories are also watched, but only the root directory will have a `GPT.ini` file
- when a change is detected, attempt to locate a `GPT.ini` file at the root of the watched directory, or create one if absent
- if a `GPT.ini` file is found, increment the version stanza of the file by 1, thus signaling clients that a new version of the assets (including scripts) are available to download during the next client refresh

Installation

The `adwatchd` executable is available as a standalone Windows executable file, distributed as part of the `adsys-windows` Ubuntu package, or packaged as an installer available on the [GitHub repository](#).

Installing via the Ubuntu package

To source the `adwatchd` executable from the `adsys-windows` Ubuntu package, we must run the following (on Ubuntu):

```
sudo apt install adsys-windows
```

After a successful installation, the `adwatchd.exe` executable will be available in the `/usr/share/adsys/windows` directory. We suggest you deploy this executable to a persistent directory of your choosing on the AD Domain Controller, such as `%SystemDrive%\Program Files\Ubuntu\adsys\`.

Installing via the bespoke installer

Download the [latest release](#) of the `adwatchd_setup.exe` file (or a specific version if you wish), and run it.

Follow the installation steps, paying attention to the prompts, optionally specifying a different installation directory for the application.

Configuring and starting the daemon

Regardless of how the application is installed, the configuration steps are the same:

- locate and run the `adwatchd.exe` executable to start the application's interactive configuration tool
- specify a path for the configuration file, or leave it blank to use the default location (the directory where the executable is located)
- specify a list of directories to watch, one per line (the program will block installation if any of the directories do not exist)
- hit the [Install] button to finish the installation, this will:
 - create the configuration file if it does not exist
 - install and start the `adwatchd` Windows service

For a better understanding on what directories should be configured for watching, please refer to the **Installing scripts on sysvol** section of the [Scripts execution](../explanation/scripts#Installing scripts on sysvol) document.

Note that the interactive configuration tool can only be run if the `adwatchd` service is not already installed on the machine. Please refer to the [CLI usage](#CLI usage) section for instructions on how to finely manage the service.

We recommend making use of the interactive configuration tool to install the application, as it provides a level of error handling, taking care of path normalization and the creation of the configuration file.

The configuration file is stored as a YAML file, and can be freely edited after the application has been installed. The following keys are configurable:

```
verbose: 0      # 0 = warning, 1 = info, 2 = debug, 3 = debug with caller output
dirs:         # list of directories to watch
- C:\Windows\sysvol\testdomain.com\Ubuntu      # traditional path
- \\testdomain.com\sysvol\testdomain.com\Ubuntu # UNC path
```

Configuring the service using a pre-filled configuration file

For convenience, the `adwatchd` application can be configured with a pre-filled configuration file. Start a Command Prompt or PowerShell window and run one of the following:

```
REM Run the interactive configuration tool with a predefined configuration file
REM
REM This will start the interactive configuration tool with pre-filled entries for the
REM config path and directories to watch, leaving the user to press the [ Install ]
↪button
C:\path\to\adwatchd.exe -c path\to\config.yaml

REM Run the service installation command with a predefined configuration file
REM
REM This will install the service with the given configuration file and start it
C:\path\to\adwatchd.exe service install -c path\to\config.yaml
```

Upgrading

The upgrade process differs based on the installation method used. If you decide to switch to a different installation method, you will need to uninstall the existing service beforehand.

Upgrading via the Ubuntu package

1. Source the new `adwatchd` executable from the `adsys-windows` Ubuntu package
2. Stop the `adwatchd` service (via the Services GUI or the `adwatchd service stop` command)
3. (Optional) Remove the existing `adwatchd` service from the system (through the `adwatchd service uninstall` command)
4. Replace the existing `adwatchd.exe` executable with the new one
5. (Optional) Install the `adwatchd` service (through the `adwatchd service install` command)
6. Start the `adwatchd` service (via the Services GUI or the `adwatchd service start` command)

The optional steps are only necessary if the intent is to do a complete upgrade of the application and are not usually needed. Always refer to the changelog for information on the latest version of the application.

Upgrading via the bespoke installer

1. Source the latest release of the `adwatchd_setup.exe` file
2. Run the installer, following the prompts

The installer will automatically take care of the upgrade process, and will offer to stop the service if it is running prior to the upgrade, and start it afterwards.

2.1.2 Linux client machine

This section outlines how to join your client machine to the domain, install ADSys, and verify that the setup is correct.

How to join an Active Directory domain during installation

In order to use Group Policies on an Ubuntu client, the first thing to do is, of course, to join the computer to an Active Directory domain.

A machine can join an AD domain at installation time with the Ubuntu Desktop installer, or after installation, by manually setting up the connection to AD.

Join at installation time

Joining during installation is only supported by the Ubuntu Desktop graphical installer Ubiquity. So, start an installation of Ubuntu Desktop as you would usually do and proceed to the page “**Who are you?**”. Enter user and computer name information.

Install

Who are you?

Your name: ✓

Your computer's name: ✓
The name it uses when it talks to other computers.

Pick a username: ✓

Choose a password: Good password

Confirm your password: ✓

Log in automatically
 Require my password to log in
 Use Active Directory
You'll enter domain and other details in the next step.

Note about the host name:

*In order to set and resolve the host name properly, you must enter the **Fully Qualified Domain Name (FQDN)** of the machine in the field “Your computer’s name”. For example, `host01.example.com` instead of only the host name `host01`.*

After installation you can check if it is correct with the command `hostname` and `hostname -f` which must return the name of the machine (`host01`) and the full name of the machine with the domain (`host01.example.com`) respectively.

Check the box “**Use Active Directory**” and click “**Continue**” to proceed with next step “**Configure Active Directory**”.

On this page you can enter the address of the Active Directory controller and credentials of the user allowed to add machines to the domain.

Install

Configure Active Directory

Domain: ✓

Domain Administrator: ✓

Password:

● ● ● ● ● ● ●

You can verify that the server is reachable by pressing **“Test Connection”**.

Once all the information has been entered and is valid, press **“Continue”** to proceed with the remaining usual steps of the installation.

At the end of the installation you can reboot the machine and you are ready to log in as a user of the domain on first boot.

If anything goes wrong with the join process during installation, you will be notified by a dialog box. You can still reboot the machine, log in as the administrator user of the machine (i.e. the user you entered in the page **“Who are you?”**) and troubleshoot the issue. The [Ubuntu Server Guide](#) provides instructions to perform such troubleshooting.

How to join an Active Directory domain manually

ADSys supports two Active Directory backends:

1. **SSSD**, or System Security Services Daemon, provides access to centralized identity management systems like Microsoft Active Directory, OpenLDAP, and various other directory servers. This client component retrieves and caches data from remote directory servers, delivering identity, authentication, and authorization services to the host machine.
2. **Winbind** is a component of the Samba suite that provides seamless integration and authentication services between UNIX or Linux systems and Windows-based networks, allowing the former to appear as members in a Windows Active Directory domain.

Join manually using SSSD

The aim of this documentation is to describe how to operate ADSys. So we won't do an in depth description of the operations to manually configure a connection to Active Directory from an Ubuntu Client.

Authentication of Ubuntu against the Active Directory server requires to configure SSSD and Kerberos. SSSD will then retrieve the credentials and the initial security policy of the `Default Domain Policy`.

All these operations are described in details in the [Ubuntu Server Guide "Service - SSSD"](#) and the [White Paper How to integrate Ubuntu Desktop with Active Directory](#).

Join manually using Winbind

In addition to SSSD, ADSys supports Winbind as a backend. The easiest way to join a domain using Winbind is to use the `realmd` utility, as described in the [Samba - Active Directory](#) guide.

ADSys uses SSSD as a default backend, so Winbind has to be opted into explicitly via the following configuration option in `adsys.yaml`:

```
ad_backend: winbind
```

In addition, Winbind requires additional dependencies to be installed. On Ubuntu-based systems they can be installed by executing the following command, prior to ADSys:

```
sudo apt update
sudo apt install winbind krb5-user
```

How to set-up ADSys

ADSys is not currently installed by default on Ubuntu desktop. This must be done manually by the local administrator of the machine.

To do so, log in on first boot, update the repositories and install **ADSys**. On Ubuntu-based systems this can be accomplished with the following commands:

```
sudo apt update
sudo apt install adsys
```

Reboot then to allow the machine to do its policy refresh.

Logging in as a user of the domain

To log in as a user of the domain, press the link **"Not listed?"** in the greeter. Then enter the username followed by the password.

SSSD

By default, there is no default domain configured in SSSD. You have to enter the full user name with one of the forms: `USER@DOMAIN.COM`, `USER@DOMAIN` or `DOMAIN/USER`.

On the first log in the user's home directory is created.

All of this (default domain, default path for home directories, default shell, etc.) is configurable in `/etc/sss/sss.conf`.

Winbind

If Winbind is used as a backend, the account can be specified in one of the following forms: `USER@DOMAIN.COM`, `USER@DOMAIN` or `DOMAIN\USER`.

For the home directory to be created automatically on login, the `pam_mkhomedir` module can be enabled:

```
sudo pam-auth-update --enable mkhomedir
```

Options such as the home directory path template, shell and others can be tweaked in `/etc/samba/smb.conf` and are documented in the `smb.conf(5)` man page.

Kerberos

ADSys relies on the configured AD backend (e.g. SSSD) to export the `KRB5CCNAME` environment variable pointing to a valid Kerberos ticket cache when a domain user performs authentication.

If for any reason the backend doesn't export the variable but *does* initialize a ticket cache in the `default path`, ADSys can be configured to infer the path to the ticket cache (via the `libkrb5` API) and export it as the `KRB5CCNAME` variable during both authentication and runs of `adsysctl update` for the current domain user.

To opt into this functionality, the following must be added to `/etc/adsys.yaml`:

```
detect_cached_ticket: true
```

With this setting active, ADSys attempts to determine and export the path to the ticket cache. To avoid unexpected behaviors like rejecting authentication for non-domain users, no action is taken if the path returned by the `libkrb5` API does not exist on disk.

2.2 Operations

2.2.1 How to use GPO with Ubuntu

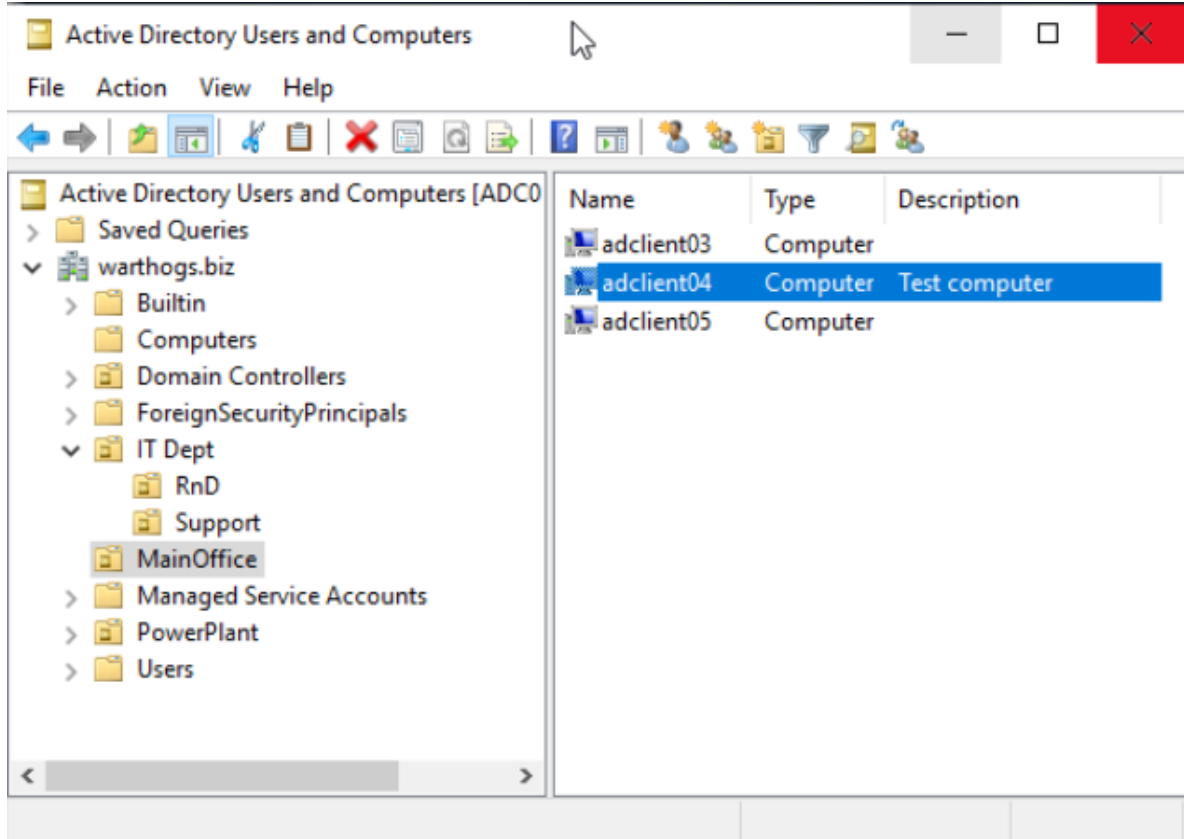
As explained in previous chapter, there are 2 sets of Ubuntu specific settings in the **Group Policy Management Editor**:

- [Policy Name] > Computer Configuration > Policies > Administrative Templates > Ubuntu for the machine policies.
- [Policy Name] > User Configuration > Policies > Administrative Templates > Ubuntu for the user policies.

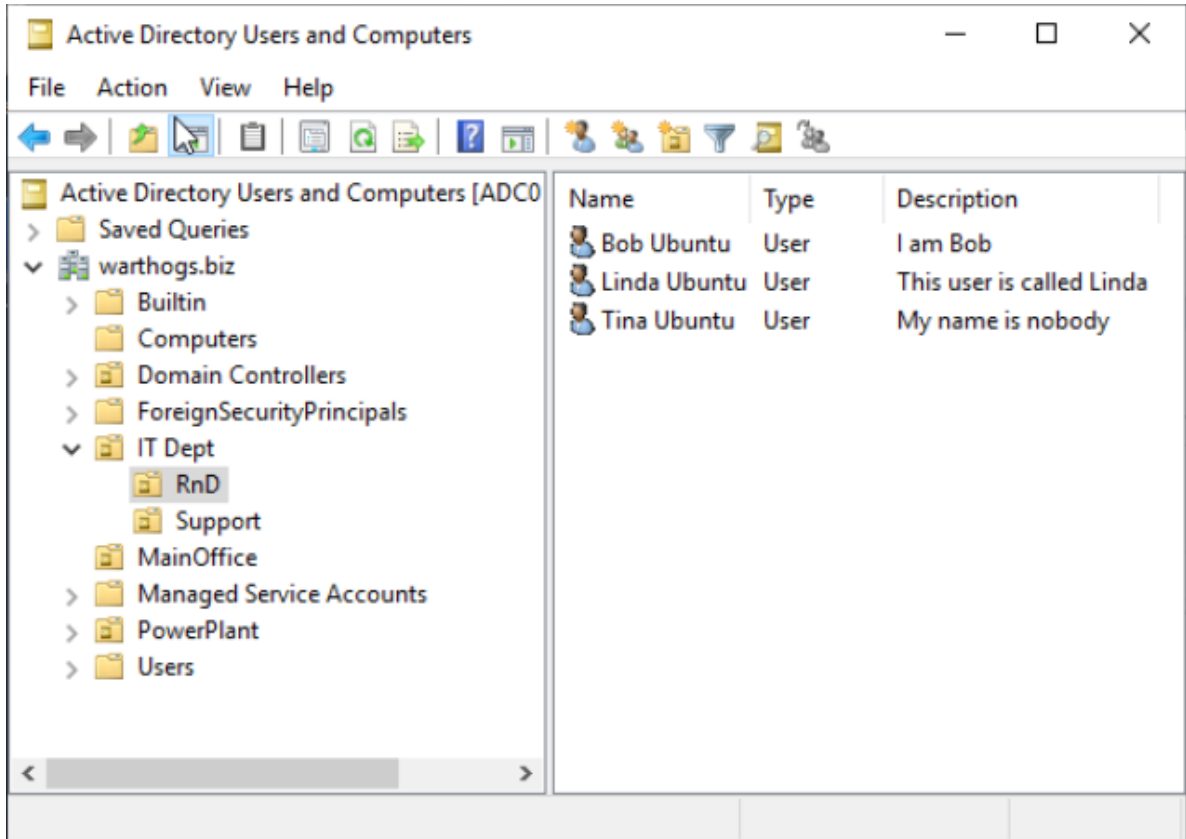
Your first Ubuntu GPO rule

For this example we will use a test domain called warthogs.biz with 2 separate OUs.

- The machine is called adclient04 and belongs to warthogs.biz > MainOffice



- The user is called bob and belongs to warthogs.biz > IT Dept > RnD

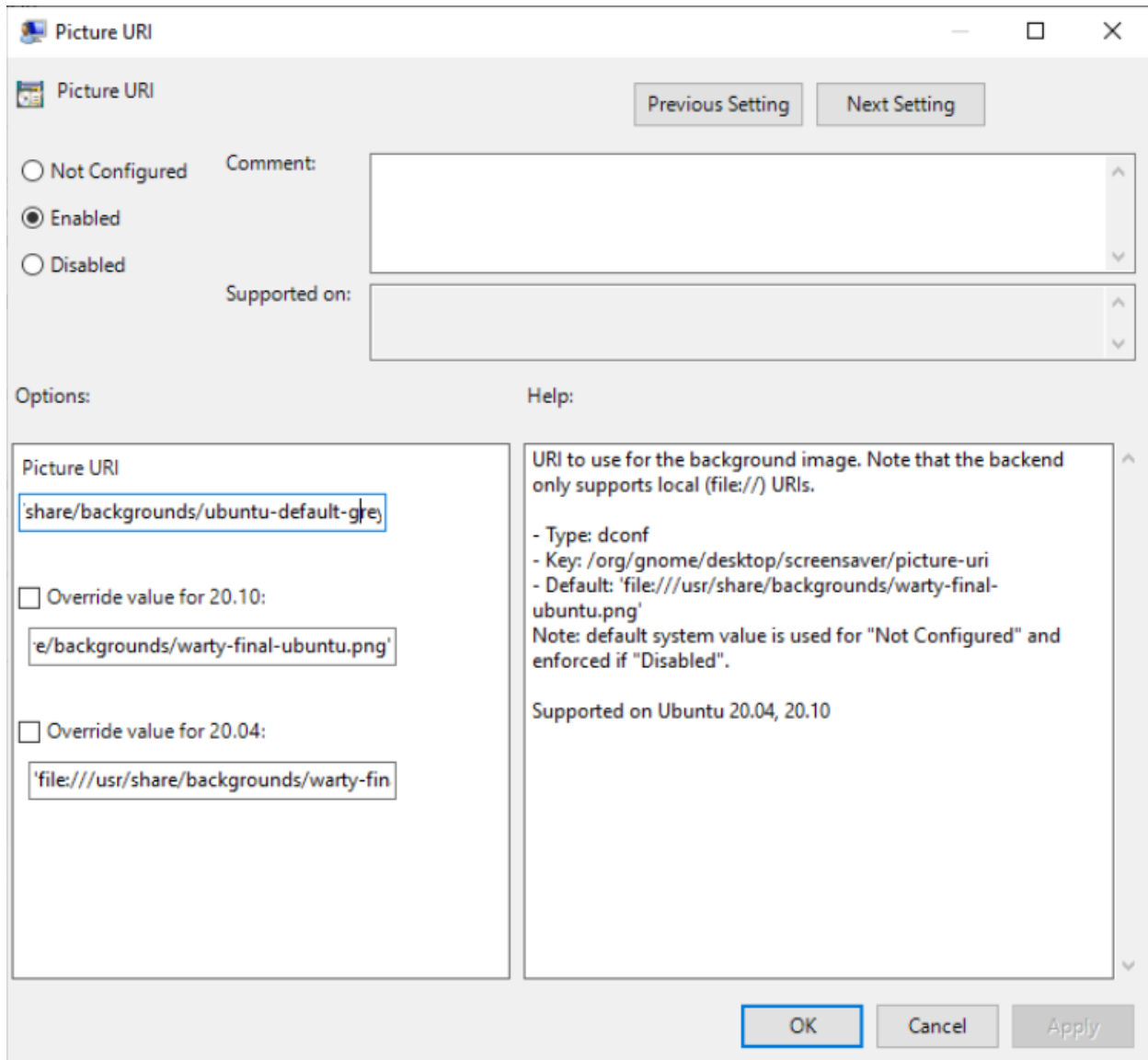


In this example, we will demonstrate how to change dconf settings. We will first modify the greeter background image to illustrate how to enforce a computer setting and the list of preferred applications in the launcher for the user settings.

Modifying a computer setting

Launch the GPO Management editor and create a GPO in `warthogs.biz > MainOffice`

1. Select GDM background picture setting in `Computer Configuration > Policies > Administrative Templates > Ubuntu > Login Screen > Interface > Picture URI`.
2. Select `Enabled` to enable the modification of the `Picture URI` field.
3. Enter a valid absolute path to a `.png` image on the client machine, e.g. `/usr/share/backgrounds/ubuntu-default-greyscale-wallpaper.png`.
4. Refresh the GPO rule on the client by rebooting the machine or running `adsysctl update -m` (You may be prompted to enter your password to check if have enough privileges to run the command)



The change is now visible on the greeter.

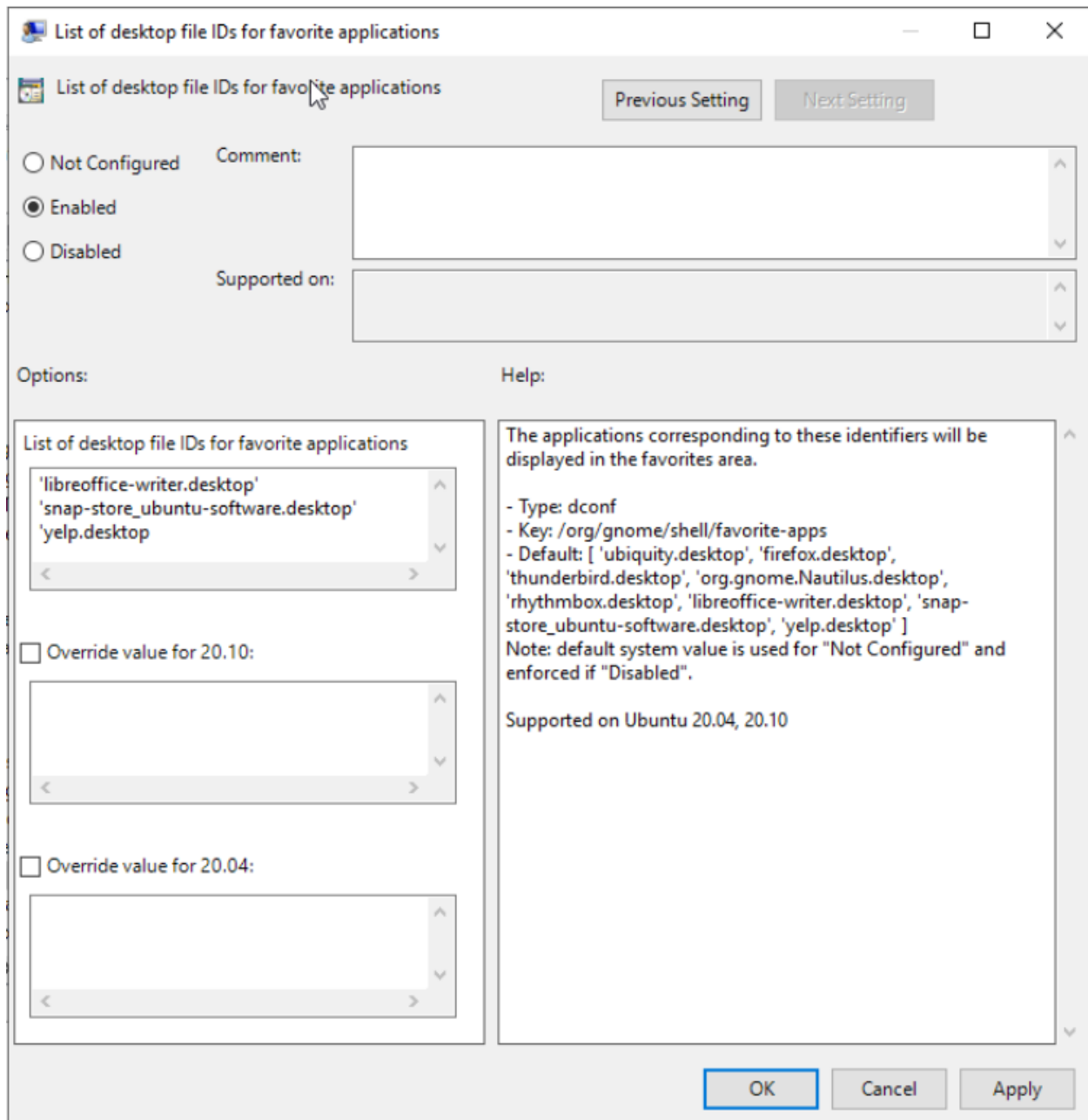


Files are not copied by the Active Directory client and must already exist on the target system at this given path.

Modifying an user setting

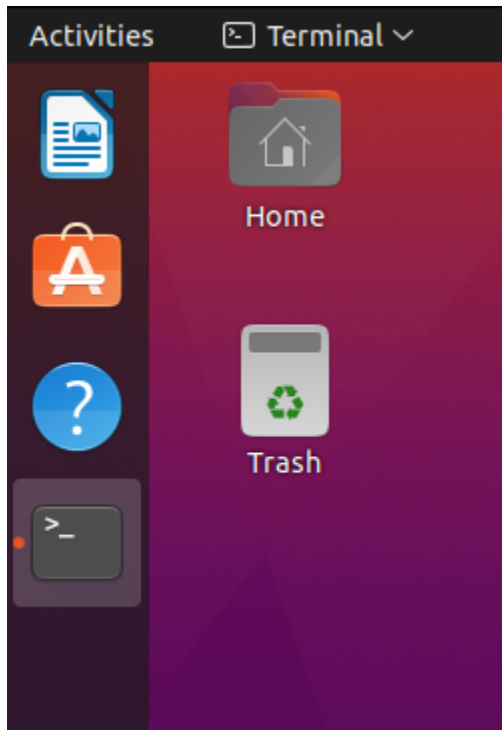
1. Let's create another GPO in warthogs.biz > IT Dept > RnD.
2. Select the list of favorite desktop applications setting in User Configuration > Policies > Administrative Templates > Ubuntu > Desktop > Shell > List of desktop file IDs for favorite applications.
3. Enter a list of valid .desktop file IDs, one per line, like the following:

```
libreoffice-writer.desktop  
snap-store_ubuntu-software.desktop  
yelp.desktop
```



4. Refresh the GPO rule applied to the user by logging in or running `adsysctl update` as your current user or `adsysctl update --all` to refresh the computer and all active users.

The list of applications showing up on the left side for your current Active Directory user should be updated.



There are other ways of defining a list in ADSys / Active Directory integration. Check the **“Different types of widgets”** section below.

General principles

There are multiple **policy managers** for different types of settings. As of now, only a **dconf** manager is available.

When settings are common to a machine and users, the machine settings will always take precedence over the user ones.

The workflow to update a setting in the **GPO Management editor** and to apply the setting to a target user or machine is similar to Windows clients. However, we will see below that there are slight differences when the GPO are applied and refreshed between Windows and Ubuntu.

When are GPO applied?

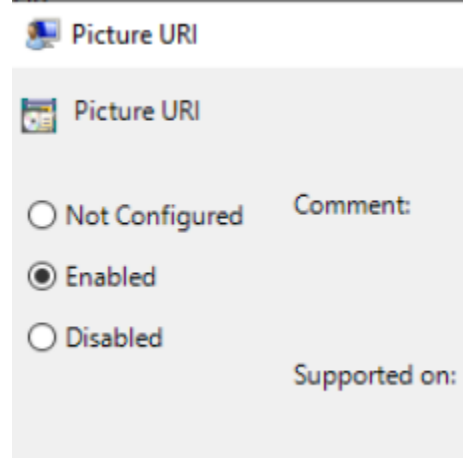
Any change to a GPO is applied:

- On boot for the machine settings
- On login for the user settings
- A periodic refresh timer will update the GPOs of the machine and all active users.

Next section will detail how to configure this and what happens when the Active Directory controller is unreachable.

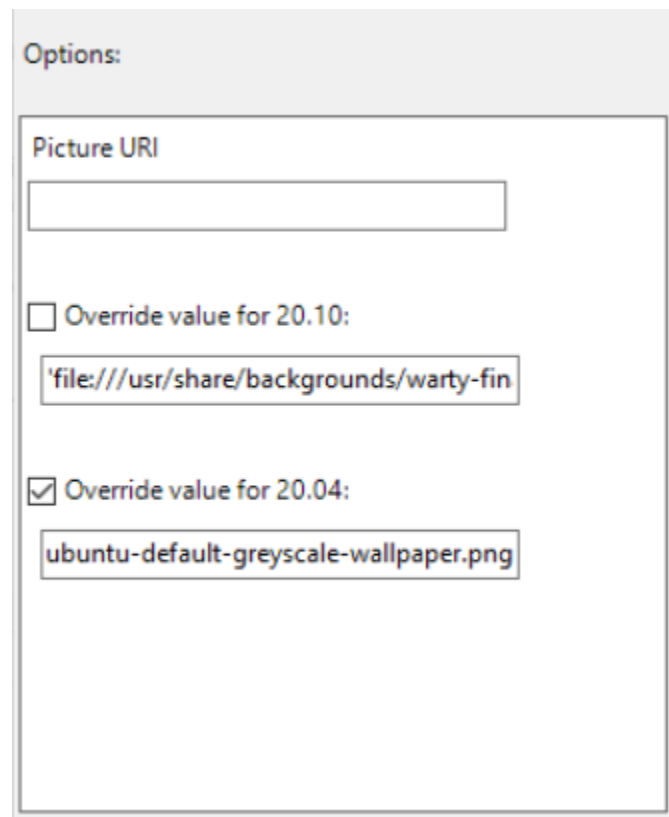
State of GPO settings

Most GPO rules can have 3 states: enabled, disabled, not configured. These states may have different meanings depending on the manager.



General information of a setting

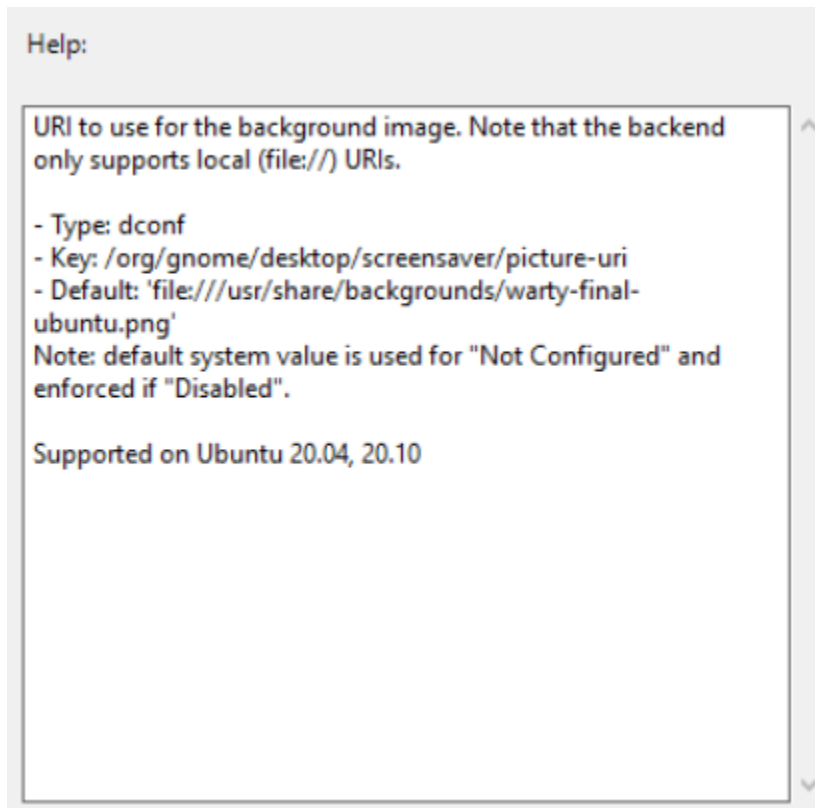
The **left pane** of the GPO Management Editor contains the options that can be edited when a setting is enabled.



There is a default value for all the releases and an override for each supported release of Ubuntu. More about multiple releases in the next section.

The **right pane** of the GPO Management editor contains the general information about the GPO including:

- The description of the setting
- The type of settings (e.g. dconf)
- The path of the key in our schema
- The default value of the key that is used if nothing is set on the left pane. Note that if defaults differ between releases, this will be a list per release.
- The list of releases that support this setting.



Different types of widgets

Text entry

The type Text represents a single line of text. If you don't enclose a string with single quotes ' and the value is not a decimal, it will be done automatically and the entry will be sanitized (e.g. space, '...'). If you want to force a decimal to be treated as a string, enclose the value with single quotes.

The default value will be already set.

Options:	Help:
<p>Picture URI</p> <input type="text"/> <p><input type="checkbox"/> Override value for 20.10:</p> <input type="text" value="'file:///usr/share/backgrounds/warty-fin'"/> <p><input type="checkbox"/> Override value for 20.04:</p> <input type="text" value="'file:///usr/share/backgrounds/warty-fin'"/>	<p>URI to use for the background image. Note that the backend only supports local (file://) URIs.</p> <p>- Type: dconf - Key: /org/gnome/desktop/background/picture-uri - Default: 'file:///usr/share/backgrounds/warty-final-ubuntu.png' Note: default system value is used for "Not Configured" and enforced if "Disabled".</p> <p>Supported on Ubuntu 20.04, 20.10</p>

Text list

A multiline text field is used for this case. A list can be:

Options:	Help:
<p>List of desktop file IDs for favorite applications</p> <input type="text" value="firefox.desktop
thunderbird.desktop
org.gnome.Nautilus.desktop"/> <p><input type="checkbox"/> Override value for 20.10:</p> <input type="text"/> <p><input type="checkbox"/> Override value for 20.04:</p> <input type="text"/>	<p>The applications corresponding to these identifiers will be displayed in the favorites area.</p> <p>- Type: dconf - Key: /org/gnome/shell/favorite-apps - Default: ['ubiquity.desktop', 'firefox.desktop', 'thunderbird.desktop', 'org.gnome.Nautilus.desktop', 'rhythmbox.desktop', 'libreoffice-writer.desktop', 'snap-store_ubuntu-software.desktop', 'yelp.desktop'] Note: default system value is used for "Not Configured" and enforced if "Disabled".</p> <p>Supported on Ubuntu 20.04, 20.10</p>

- One item per line: any end of line will be considered as a delimiter Example:

```
libreoffice.desktop  
firefox.desktop  
nautilus.desktop
```

- Multiple items on one line: a coma , is the item delimiter:

```
libreoffice.desktop, firefox.desktop, nautilus.desktop
```

Note that spaces will be stripped automatically.

- Both syntaxes can be combined:

```
libreoffice.desktop, firefox.desktop  
nautilus.desktop
```

The type can be either text or numeric:

- Text list:

```
libreoffice.desktop  
firefox.desktop  
nautilus.desktop
```

- Decimal list:

```
42  
300  
10
```

Ensure that you enter the valid type of list, as expected by dconf setting. ADSys will do its best to try to match the entry with the right and expected dconf type.

String or decimal field ?

The type of the value will be detected automatically and interpreted as a number if it contains only digits and no quotes, everything else is considered a string. If you want to enforce a list to have string entries, enclose each entry with single quotes.

Text list:

```
'42'  
'300'  
'10'
```

Dropdown list

A list field is a limited list of values to choose from. It is represented by a drop down list.

Options:	Help:
<p>Picture Options none ▾</p> <p><input type="checkbox"/> Override value</p> <p>none</p> <p><input type="checkbox"/> Override value for 20.04:</p> <p>none ▾</p>	<p>Determines how the image set by wallpaper_filename is rendered. Possible values are "none", "wallpaper", "centered", "scaled", "stretched", "zoom", "spanned".</p> <ul style="list-style-type: none"> - Type: dconf - Key: /org/gnome/desktop/background/picture-options - Default: 'zoom' <p>Note: default system value is used for "Not Configured" and enforced if "Disabled".</p> <p>Supported on Ubuntu 20.04, 20.10</p>

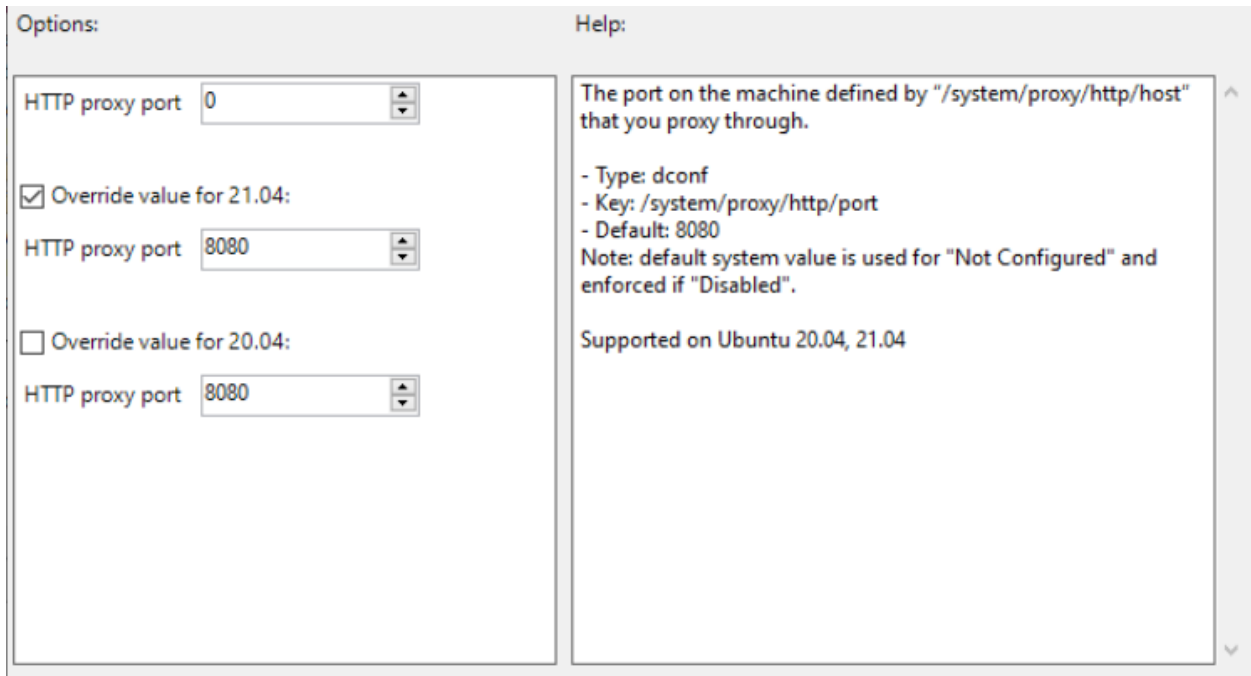
Checkbox

A checkbox will correspond to set to true or false values for the corresponding setting. The default value will be already selected.

Options:	Help:
<p><input type="checkbox"/> Whether to automatically mount media</p> <p><input type="checkbox"/> Override value for 20.10:</p> <p><input checked="" type="checkbox"/> Whether to automatically mount media</p> <p><input type="checkbox"/> Override value for 20.04:</p> <p><input checked="" type="checkbox"/> Whether to automatically mount media</p>	<p>If set to true, then Nautilus will automatically mount media such as user-visible hard disks and removable media on start-up and media insertion.</p> <ul style="list-style-type: none"> - Type: dconf - Key: /org/gnome/desktop/media-handling/automount - Default: true <p>Note: default system value is used for "Not Configured" and enforced if "Disabled".</p> <p>Supported on Ubuntu 20.04, 20.10</p>

Decimal

Decimal values are fields that allow only digits with optional upper and lower bounds. A spinner helps the user to increase or decrease the value.



The screenshot shows a configuration window with two main panels: 'Options' on the left and 'Help' on the right. The 'Options' panel contains three 'HTTP proxy port' spinner controls. The first is set to '0'. Below it is a checked checkbox labeled 'Override value for 21.04:' followed by a spinner set to '8080'. Below that is an unchecked checkbox labeled 'Override value for 20.04:' followed by a spinner set to '8080'. The 'Help' panel contains text explaining the setting: 'The port on the machine defined by "/system/proxy/http/host" that you proxy through.' It lists '- Type: dconf', '- Key: /system/proxy/http/port', and '- Default: 8080'. A note states: 'Note: default system value is used for "Not Configured" and enforced if "Disabled".' At the bottom, it says 'Supported on Ubuntu 20.04, 21.04'.

The limits, if any, will be specified in the right section, per release.

Multi-release support

ADSys supports setting different values for different releases of Ubuntu.

The top entry will set a common value between all clients, independently of the release it's running on.

If you need to specify a per-release value for a set of clients, select the **Override** checkbox for the corresponding release and enter a value in the associated field. If the **Override** is checked, but no value is specified, the default value for this release will be used.

By definition, override takes precedence over the default value defined at the top for all the releases.

Finally, note that the help text on the right panel will list each default per release if they differ between themselves. In addition, it will list the supported releases for this setting.

Picture URI

Picture URI

Previous Setting Next Setting

Not Configured
 Enabled
 Disabled

Comment:

Supported on:

Options:

Picture URI

share/backgrounds/ubuntu-default-gre...

Override value for 20.10:

/e/backgrounds/warty-final-ubuntu.png

Override value for 20.04:

file:///usr/share/backgrounds/warty-fin...

Help:

URI to use for the background image. Note that the backend only supports local (file://) URIs.

- Type: dconf
- Key: /org/gnome/desktop/screensaver/picture-uri
- Default: 'file:///usr/share/backgrounds/warty-final-ubuntu.png'

Note: default system value is used for "Not Configured" and enforced if "Disabled".

Supported on Ubuntu 20.04, 20.10

OK Cancel Apply

Multi-release overrides are only available when your Active Directory administrative templates defines more than one release. If this is not the case, you will only see the top entry to define your policy.

TECHNICAL REFERENCE

This section consolidates technical details on ADSys, including specifications, APIs, and architecture.

On the Linux side, ADSys is composed of a daemon and a command line interface:

- The daemon - `adsysd` - implements the Group Policy protocol. It relies on Kerberos, Samba and LDAP for authentication and policy retrieval.
- The command line interface - `adsysctl` - controls the daemon and reports its status.

A Windows daemon, `adwat chd` can be installed on the domain controller to automatically refresh assets without system administrator interventions.

Reference

3.1 The `adsysctl` command

`adsysctl` is a command line utility to request actions from the daemon and query its current status. You can get more verbose output with the `-v` accumulative flags, which will stream all logs from the service corresponding to your specific request.

As a general rule, favor shell completion and the help command for discovering various parts of the `adsysctl` user interface. It will help you by completing subcommands, flags, users and even chapters of the offline documentation!

3.1.1 Which policies are applied

- You can check with policies are currently applied to your current AD user with the `adsysctl policy applied` command:

```
$ adsysctl policy applied
Policies from machine configuration:
- MainOffice Policy 2 ({B8D10A86-0B78-4899-91AF-6F0124ECEB48})
- MainOffice Policy ({C4F393CA-AD9A-4595-AEBC-3FA6EE484285})
- Default Domain Policy ({31B2F340-016D-11D2-945F-00C04FB984F9})

Policies from user configuration:
- RnD Policy 3 ({073AA7FC-5C1A-4A12-9AFC-42EC9C5CAF04})
- RnD Policy 2 ({83A5BD5B-1D5D-472D-827F-DE0E6F714300})
- RnD Policy ({5EC4DF8F-FF4E-41DE-846B-52AA6FFAF242})
- IT Policy ({75545F76-DEC2-4ADA-B7B8-D5209FD48727})
- Default Domain Policy ({31B2F340-016D-11D2-945F-00C04FB984F9})
```

The order of policies are top-down, higher GPOs have priorities over lower ones on the stack (respecting OU order, GPO enforcement, GPO block instructions on your AD setup...).

- If you have the right permission, you can request other users as well:

```
$ adsysctl policy applied tina
Policies from machine configuration:
- MainOffice Policy ({A2F393CA-AD9A-4595-AEBC-3FA6EE484285})
- Default Domain Policy ({31B2F340-016D-11D2-945F-00C04FB984F9})

Policies from user configuration:
- RnD Policy 4 ({25A5BD5B-1D5D-472D-827F-DE0E6F714300})
- IT Policy ({75545F76-DEC2-4ADA-B7B8-D5209FD48727})
- Default Domain Policy ({31B2F340-016D-11D2-945F-00C04FB984F9})
```

Pro tip! Use shell completion to get the list of active users you can request which policies are applied on.

- To get which policy are set to a given value or disabled by which key, use the `--details` flags:

```
$ adsysctl policy applied --details
Policies from machine configuration:
- MainOffice Policy 2 ({B8D10A86-0B78-4899-91AF-6F0124ECEB48})
  - gdm:
    - dconf/org/gnome/desktop/notifications/show-banners: Locked to system default
- MainOffice Policy ({C4F393CA-AD9A-4595-AEBC-3FA6EE484285})
  - gdm:
    - dconf/org/gnome/desktop/interface/clock-format: 24h
    - dconf/org/gnome/desktop/interface/clock-show-date: false
    - dconf/org/gnome/desktop/interface/clock-show-weekday: true
    - dconf/org/gnome/desktop/screensaver/picture-uri: 'file:///usr/share/
↳backgrounds/ubuntu-default-greyscale-wallpaper.png'
- Default Domain Policy ({31B2F340-016D-11D2-945F-00C04FB984F9})

Policies from user configuration:
- RnD Policy 3 ({073AA7FC-5C1A-4A12-9AFC-42EC9C5CAF04})
  - dconf:
    - org/gnome/desktop/media-handling/automount: Locked to system default
- RnD Policy 2 ({83A5BD5B-1D5D-472D-827F-DE0E6F714300})
- RnD Policy ({5EC4DF8F-FF4E-41DE-846B-52AA6FFAF242})
  - dconf:
    - org/gnome/shell/favorite-apps: libreoffice-writer.desktop\nsnap-store_ubuntu-
↳software.desktop\nyelp.desktop
- IT Policy ({75545F76-DEC2-4ADA-B7B8-D5209FD48727})
  - dconf:
    - org/gnome/desktop/background/picture-options: stretched
    - org/gnome/desktop/background/picture-uri: file:///usr/share/backgrounds/
↳canonical.png
- Default Domain Policy ({31B2F340-016D-11D2-945F-00C04FB984F9})
```

- The `--all` flag will list every key set by a given GPO, including the ones that are redefined by another GPO with a higher priority. This is traditionally helpful for debugging your GPO stack and discover where a given value is defined:

```
$ adsysctl policy applied --all
Policies from machine configuration:
```

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```

- MainOffice Policy 2 ({B8D10A86-0B78-4899-91AF-6F0124ECEB48})
  - gdm:
    - dconf/org/gnome/desktop/notifications/show-banners: Locked to system default
- MainOffice Policy ({C4F393CA-AD9A-4595-AEBC-3FA6EE484285})
  - gdm:
    - dconf/org/gnome/desktop/interface/clock-format: 24h
    - dconf/org/gnome/desktop/interface/clock-show-date: false
    - dconf/org/gnome/desktop/interface/clock-show-weekday: true
    - dconf/org/gnome/desktop/screensaver/picture-uri: 'file:///usr/share/
↳backgrounds/ubuntu-default-greyscale-wallpaper.png'
- Default Domain Policy ({31B2F340-016D-11D2-945F-00C04FB984F9})

Policies from user configuration:
- RnD Policy 3 ({073AA7FC-5C1A-4A12-9AFC-42EC9C5CAF04})
  - dconf:
    - org/gnome/desktop/media-handling/automount: Locked to system default
- RnD Policy 2 ({83A5BD5B-1D5D-472D-827F-DE0E6F714300})
- RnD Policy ({5EC4DF8F-FF4E-41DE-846B-52AA6FFAF242})
  - dconf:
    - org/gnome/shell/favorite-apps: libreoffice-writer.desktop\nsnap-store_ubuntu-
↳software.desktop\nyelp.desktop
- IT Policy ({75545F76-DEC2-4ADA-B7B8-D5209FD48727})
  - dconf:
    - org/gnome/desktop/background/picture-options: stretched
    - org/gnome/desktop/background/picture-uri: file:///usr/share/backgrounds/
↳canonical.png
    - org/gnome/shell/favorite-apps: 'firefox.desktop'\n'thunderbird.desktop'\n'org.
↳gnome.Nautilus.desktop'
- Default Domain Policy ({31B2F340-016D-11D2-945F-00C04FB984F9})

```

3.1.2 Refreshing the policies

The command `adsysctl policy update` is used to refresh the policies. By default only the policy of the current user is updated. It can also refresh only the policy of the machine with the flag `-m`, or the machine and all the active users with the flag `-a`. On success nothing is displayed.

For example, refreshing the policy for all the objects:

```

$ adsysctl policy update --all -v
INFO No configuration file: Config File "adsys" Not Found in "[/home/warthogs.biz/b/bob /
↳etc]".
We will only use the defaults, env variables or flags.
INFO Apply policy for adclient04 (machine: true)
INFO Apply policy for bob@warthogs.biz (machine: false)

```

You can provide the name of a user and the path to its Kerberos ticket to refresh a given user.

For example for user `bob@warthogs.biz`

```

$ adsysctl update bob@warthogs.biz /tmp/krb5cc_1899001102_wBlbck -vv
INFO No configuration file: Config File "adsys" Not Found in "[/home/warthogs.biz/b/bob /
↳etc]".

```

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```
We will only use the defaults, env variables or flags.
DEBUG Connecting as [[26812:519495]]
DEBUG New request /service/UpdatePolicy
DEBUG Requesting with parameters: IsComputer: false, All: false, Target: bob@warthogs.
↳biz, Krb5Cc: /tmp/krb5cc_1899001102_wBlbck
DEBUG Check if grpc request peer is authorized
DEBUG Polkit call result, authorized: true
DEBUG GetPolicies for "bob@warthogs.biz", type "user"
DEBUG GPO "RnD Policy 3" for "bob@warthogs.biz" available at "smb://warthogs.biz/SysVol/
↳warthogs.biz/Policies/{073AA7FC-5C1A-4A12-9AFC-42EC9C5CAF04}"
DEBUG GPO "RnD Policy 2" for "bob@warthogs.biz" available at "smb://warthogs.biz/SysVol/
↳warthogs.biz/Policies/{83A5BD5B-1D5D-472D-827F-DE0E6F714300}"
DEBUG GPO "RnD Policy" for "bob@warthogs.biz" available at "smb://warthogs.biz/SysVol/
↳warthogs.biz/Policies/{5EC4DF8F-FF4E-41DE-846B-52AA6FFAF242}"
DEBUG GPO "IT Policy" for "bob@warthogs.biz" available at "smb://warthogs.biz/SysVol/
↳warthogs.biz/Policies/{75545F76-DEC2-4ADA-B7B8-D5209FD48727}"
DEBUG GPO "Default Domain Policy" for "bob@warthogs.biz" available at "smb://warthogs.
↳biz/sysvol/warthogs.biz/Policies/{31B2F340-016D-11D2-945F-00C04FB984F9}"
DEBUG Analyzing GPO "Default Domain Policy"
DEBUG Analyzing GPO "IT Policy"
DEBUG Analyzing GPO "RnD Policy 2"
DEBUG Analyzing GPO "RnD Policy 3"
DEBUG Analyzing GPO "RnD Policy"
DEBUG Policy "RnD Policy 2" doesn't have any policy for class "user" open /var/cache/
↳adsys/gpo_cache/{83A5BD5B-1D5D-472D-827F-DE0E6F714300}/User/Registry.pol: no such file,
↳or directory
DEBUG Policy "Default Domain Policy" doesn't have any policy for class "user" open /var/
↳cache/adsys/gpo_cache/{31B2F340-016D-11D2-945F-00C04FB984F9}/User/Registry.pol: no
↳such file or directory
INFO Apply policy for bob@warthogs.biz (machine: false)
DEBUG ApplyPolicy dconf policy to bob@warthogs.biz
DEBUG Update user profile /etc/dconf/profile/bob@warthogs.biz
DEBUG Analyzing entry {Key:org/gnome/desktop/background/picture-options Value:stretched,
↳Disabled:false Meta:s}
DEBUG Analyzing entry {Key:org/gnome/desktop/background/picture-uri Value:file:///usr/
↳share/backgrounds/canonical.png Disabled:false Meta:s}
DEBUG Analyzing entry {Key:org/gnome/desktop/media-handling/automount Value:,
↳Disabled:true Meta:}
DEBUG Analyzing entry {Key:org/gnome/shell/favorite-apps Value:libreoffice-writer.desktop
snap-store_ubuntu-software.desktop
yelp.desktop
Disabled:false Meta:as}
```

3.1.3 Getting the status

The status of the service is provided by the command `adsysctl service status`

```
$ adsysctl service status
Machine, updated on Tue May 18 12:15
Connected users:
  bob@warthogs.biz, updated on Tue May 18 12:15

Active Directory:
  Server: ldap://adc01.warthogs.biz
  Domain: warthogs.biz

SSS:
  Configuration: /etc/sss/sss.conf
  Cache directory: /var/lib/sss/db

Daemon:
  Timeout after 2m0s
  Listening on: /run/adsysd.sock
  Cache path: /var/cache/adsys
  Run path: /run/adsys
  Dconf path: /etc/dconf
```

You can get the list of connected users, when they were last refreshed, when the next refresh is scheduled and various service configuration options (static or dynamically configured).

3.1.4 Debugging

The `cat` command has already been described in *the previous chapter*. You can display logs with debugging levels independent of daemon and clients debugging levels. Local printing will also be forwarded.

For example, running `cat` while the command version and applied are executed:

```
# adsysctl service cat -vv
INFO No configuration file: Config File "adsys" Not Found in "[/root /etc]".
We will only use the defaults, env variables or flags.
DEBUG Connecting as [[29220:823925]]
DEBUG New request /service/Cat
DEBUG Requesting with parameters:
DEBUG Check if grpc request peer is authorized
DEBUG Authorized as being administrator
INFO New connection from client [[29302:462445]]
DEBUG [[29302:462445]] New request /service/Version
DEBUG [[29302:462445]] Requesting with parameters:
DEBUG [[29302:462445]] Check if grpc request peer is authorized
DEBUG [[29302:462445]] Any user always authorized
DEBUG Request /service/Version done
INFO New connection from client [[29455:217212]]
DEBUG [[29455:217212]] New request /service/DumpPolicies
DEBUG [[29455:217212]] Requesting with parameters: Target: bob@warthogs.biz, Details:
↪false, All: false
DEBUG [[29455:217212]] Check if grpc request peer is authorized
```

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```
DEBUG [[29455:217212]] Polkit call result, authorized: true
INFO [[29455:217212]] Dumping policies for bob@warthogs.biz
DEBUG Request /service/DumpPolicies done
```

3.1.5 Other commands

Versions

You can get the current service and client versions with the `version` command to check you are running with latest version on both sides:

```
$ adsysctl version
adsysctl      0.5
adsysd        0.5
```

Documentation

An offline version of this documentation is available in the daemon. It will render the documentation on the command line.

You can get a list of all chapters with their titles:

```
$ adsysctl doc

  Table of content

  1. [Welcome] ADSys: Active Directory Group Policy integration
  2. [Prerequisites] Prerequisites and installation
  [...]

```

And render a given chapter by requesting it:

```
$ adsysctl doc Welcome
↔
↔
  ADSys: Active Directory Group Policy integration
↔
↔
  ADSys is the Active Directory Group Policy client for Ubuntu. It allows
  [...]

```

Finally, there are different rendering modes to dump documentation in html for instance with the `--format` flag.

Admx generation

The `policy admx` commands dumps pre-built Active Directory administrative templates that can be deployed on the Active Directory server. For more information, check the [AD setup documentation](#)

Stopping the service

If you do not wish to wait for the idling timeout to stop the server, you can request graceful shutdown with `adsysctl service stop`. This will first wait for all active connections to ends before shutting down.

The `-force` flag will end the service immediately.

3.2 The adsys daemon

3.2.1 Policy enforcement

When are the policies refreshed

On the client the policies are refreshed in 3 situations:

- At boot time for the policy of the machine.
- At login time for the policy of the user.
- Periodically by a timer for the machine and the user policy.

What happens when a policy refresh fails

When the client is offline, e.g. a laptop, or the Active Directory server is unreachable, you still want to use the machine and be able to log in. For this purpose, ADSys uses a cache located in `/var/cache/adsys`.

There are 2 types of cache:

- A cache for the GPO downloaded from the server in directory `gpo_cache`
- A cache for the rules as applied by ADSys in `policies`

The enforcement of the policy will fail when the cache is empty or the client fails to retrieve the policy from the server.

If the enforcement of the policy fails:

- At boot time, ADSys stops the boot process.
- At login time, login is denied.
- During periodic refresh, the policy currently applied on the client remains.

How to change refresh rate

Periodic refresh of the policies (machine and active users) is handled by the systemd timer unit `adsys-gpo-refresh.timer`.

You can list the timers with the command `systemctl list-timers`.

```
$ systemctl list-timers
NEXT                                LEFT                                LAST                                PASSED                                ──┘
→ UNIT                                ACTIVATES
Tue 2021-05-18 10:05:49 CEST 11min left    Tue 2021-05-18 09:35:49 CEST 18min ago ──┘
→ adsys-gpo-refresh.timer            adsys-gpo-refresh.service
Tue 2021-05-18 10:31:34 CEST 36min left    Tue 2021-05-18 09:31:09 CEST 23min ago ──┘
→ anacron.timer                      anacron.service
[...]
```

The default refresh rate is **30 minutes**.

You can override the refresh rate with the configuration variables `OnBootSec` and `OnUnitActiveSec` in a configuration file as follow:

`/etc/systemd/system/adsys-gpo-refresh.timer.d/refresh-rate.conf`:

```
# Refresh ADSys GPO every 2 hours
[Timer]
OnBootSec=
OnBootSec=120min
OnUnitActiveSec=
OnUnitActiveSec=120min
```

The changes will be effective after a reload of the daemon with `systemctl daemon-reload` or after a reboot.

```
$ sudo systemctl daemon-reload
$ sudo systemctl list-timers
NEXT                                LEFT                                LAST                                PASSED                                ──┘
→ UNIT                                ACTIVATES
Tue 2021-05-18 10:35:45 CEST 16min left    Tue 2021-05-18 10:05:50 CEST 1h43min ago ──┘
→ adsys-gpo-refresh.timer            adsys-gpo-refresh.service
[...]
```

The empty `OnBootSec=` and `OnUnitActiveSec=` statements are used to reset the system-wide timer unit time instead of adding new timers. `man systemd.timer` for more information.

You can get more details about the timer status itself as an administrator:

```
$ sudo systemctl status adsys-gpo-refresh.timer
adsys-gpo-refresh.timer - Refresh ADSys GPO for machine and users
  Loaded: loaded (/lib/systemd/system/adsys-gpo-refresh.timer; enabled; vendor┘
  →preset: enabled)
  Active: active (waiting) since Tue 2021-05-18 08:35:48 CEST; 1h 23min ago
  Trigger: Tue 2021-05-18 10:05:49 CEST; 6min left
  Triggers: adsys-gpo-refresh.service

may 18 08:35:48 adclient04 systemd[1]: Started Refresh ADSys GPO for machine and users.
```

TODO: `adsysctl service status` to get next scheduled refresh

3.2.2 Socket activation

The ADSys daemon is started on demand by systemd's socket activation and only runs when it's required. It will gracefully shutdown after idling for a short period of time (by default 120 seconds).

3.2.3 Configuration

ADSys doesn't ship a configuration file by default. However, such a file can be created to modify the behavior of the daemon and the client.

The configuration file can be system-wide in `/etc/adsys.yaml`. This will thus apply to both daemon and client. You can have per-user configuration by creating `$HOME/adsys.yaml`. It will then affect only the client for this user.

The current directory is also searched for an `adsys.yaml` file.

Finally, each `adsysd` and `adsysctl` commands accept a `--config|-c <configuration_file_path>` flag to set the path to a configuration file at run time. It can be used for testing purpose for instance.

An example of configuration file with all the options can be found in the [ADSys repository](#):

```
# Service and client configuration
verbose: 2
socket: /tmp/adsysd/socket

# Service only configuration
service_timeout: 3600
cache_dir: /tmp/adsysd/cache
run_dir: /tmp/adsysd/run

# Backend selection: sssd (default) or winbind
ad_backend: sssd

# SSSD configuration
sssd:
  config: /etc/sss.conf
  cache_dir: /var/lib/sss/db

# Winbind configuration
# (if ad_backend is set to winbind)
winbind:
  ad_domain: domain.com
  ad_server: adc.domain.com

# Client only configuration
client_timeout: 60
```

Configuration common between service and client

- **verbose** Increase the verbosity of the daemon or client. By default, only warnings and error logs are printed. This value is set between 0 and 3. This has the same effect as the `-v` and `-vv` flags.
- **socket** Path the Unix socket for communication between clients and daemon. This can be overridden by the `--socket` option. Defaults to `/run/adsysd.sock` (monitored by `systemd` for socket activation).

Service only configuration

- **service_timeout** Time in seconds without any active request before the service exits. This can be overridden by the `--timeout` option. Defaults to 120 seconds.
- **backend** Backend to use to integrate with Active Directory. It is responsible for providing valid kerberos tickets. Available selection is `sssd` or `winbind`. Default is `sssd`. This can be overridden by the `--backend` option.
- **sss_cache_dir** The directory that stores Kerberos tickets used by SSSD. By default `/var/lib/sss/db/`.
- **run_dir** The run directory contains the links to the kerberos tickets for the machine and the active users. This can be overridden by the `--run-dir` option. Defaults to `/run/adsys/`.

Backend specific options

SSSD

- **config**

Path `sssd.conf`. This is the source of selected sss domain (first entry in `domains:`), to find corresponding active directory domain section.

The option `ad_domain` in that section is used for the list of domains list of the host. `ad_server` (optional) is used as the Active directory LDAP server to contact. If it is missing, then the “Active Server” detected by `sssd` will be used.

Finally `default_domain_suffix` is used too, and falls back to the domain name if missing.

Default lookup path is `/etc/sss/sssd.conf`. This can be overridden by the `--sssd.config` option.

- **cache_dir**

Path to the sss database to find the HOST kerberos ticket. Default path is `/var/lib/sss/db`. This can be overridden by the `--sssd.cache-dir` option.

Winbind

- **ad_domain**

A custom domain can be used to override the C API call that ADSys executes to determine the active domain – which is returned by the `wbinfo --own-domain` (e.g. `example.com`)

- **ad_server**

A custom domain controller can be used to override the C API call that ADSys executes to determine the AD controller FQDN – which is returned by `wbinfo --dsgetdcname domain.com` (e.g. `adc.example.com`).

Client only configuration:**

- **client_timeout** Maximum time in seconds between 2 server activities before the client returns and aborts the request. This can be overridden by the `--timeout` option. Defaults to 30 seconds.

3.2.4 Debugging with logs (cat command)

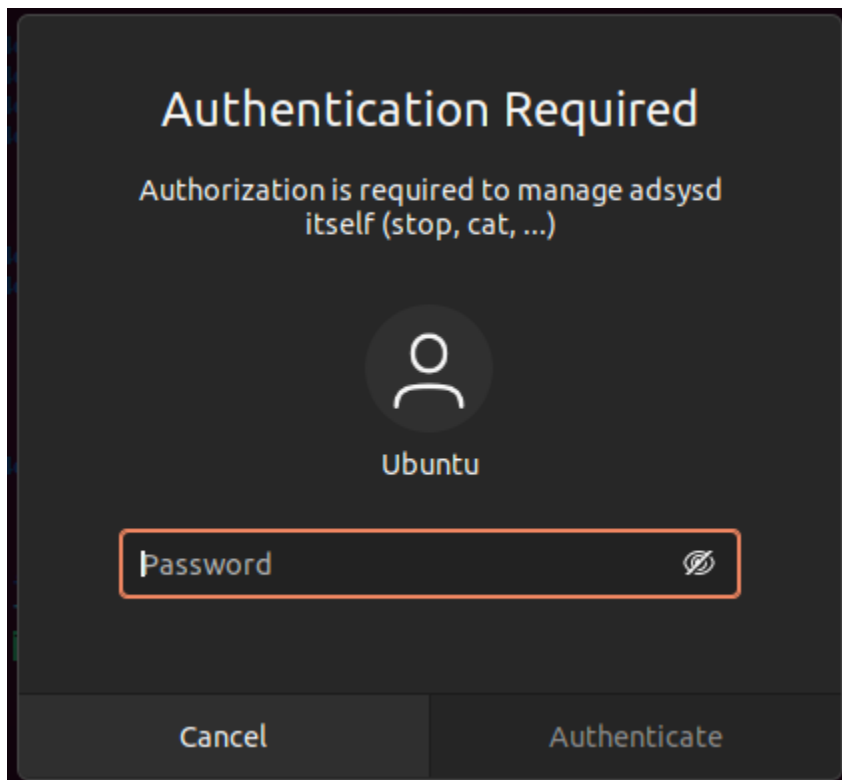
It is possible to follow the exchanges between all clients and the daemon with the `cat` command. It forwards all logs and message printing from the daemon alone.

Only privileged users have access to this information. As with any other command, the verbosity can be increased with `-v` flags (it's independent of the daemon or client current verbosity). More flags increases the verbosity further up to 3.

More information is available in the *next chapter* covering `adsysctl cat` command.

3.2.5 Authorizations

ADSys uses a privilege mechanism based on `polkit` to manage authorizations. Many commands require elevated privileges to be executed. If the `adsys` client is executed with insufficient privileges to execute a command, the user will be prompted to enter its password. If allowed then the command will be executed and denied otherwise.



This is configurable by the administrator as any service controlled by `polkit`. For more information man `polkit`.

3.2.6 Additional notes

There are additional configuration options matching the `adsysd` command line options. Those are used to define things like `dconf`, `apparmor`, `polkit`, `sudo` directories... Even though they exist mostly for integration tests purposes, they can be tweaked the same way as other configuration options for the service.

3.2.7 Reference guide

Do not hesitate to use the shell completion and the `help` subcommands to get more information about the subcommands.

3.3 Active Directory Watch Daemon

3.3.1 Monitoring the application

`adwatchd` is configured to log to the Windows Event Log, and can be monitored using the [Event Viewer](#). By default, the application will only log events when it starts or stops, but the verbose level can be increased via the configuration file to log more information such as files being watched, or the `GPT.ini` file being updated.

3.3.2 CLI usage

For more advanced usage, the application can be managed from the command line. If the application was installed via the bespoke installer, a helpful shortcut is available in the Start Menu: `Start Command Prompt with adwatchd`. This will start a Command Prompt window with the `adwatchd` executable in the `PATH`.

There are two commands available:

- The `run` command starts the directory watch loop in foreground mode. This is useful for debugging purposes, as it can be called with the same arguments as the service.
- The `service` provides a set of subcommands to manage the service.

For detailed descriptions and configuration options of `adwatchd`, refer to the [Command line reference](#) section.

Command line

3.4 adsysctl command line

3.4.1 User commands

`adsysctl`

AD integration client

Synopsis

Active Directory integration bridging toolset command line tool.

```
adsysctl COMMAND [flags]
```

Options

```

-c, --config string  use a specific configuration file
-h, --help           help for adsysctl
-s, --socket string  socket path to use between daemon and client. Can be overridden
↳by systemd socket activation. (default "/run/adsysd.sock")
-t, --timeout int    time in seconds before cancelling the client request when the
↳server gives no result. 0 for no timeout. (default 30)
-v, --verbose count  issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output

```

adsysctl applied

Print last applied GPOs for current or given user/machine

Synopsis

Alias of “policy applied”

```
adsysctl applied [USER_NAME] [flags]
```

Options

```

-a, --all           show overridden rules in each GPOs.
--details          show applied rules in addition to GPOs.
-h, --help         help for applied
-m, --machine      show applied rules to the machine.
--no-color         don't display colored version.

```

Options inherited from parent commands

```

-c, --config string  use a specific configuration file
-s, --socket string  socket path to use between daemon and client. Can be overridden
↳by systemd socket activation. (default "/run/adsysd.sock")
-t, --timeout int    time in seconds before cancelling the client request when the
↳server gives no result. 0 for no timeout. (default 30)
-v, --verbose count  issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output

```

adsysctl completion

Generate the autocompletion script for the specified shell

Synopsis

Generate the autocompletion script for adsysctl for the specified shell. See each sub-command's help for details on how to use the generated script.

Options

```
-h, --help    help for completion
```

Options inherited from parent commands

```
-c, --config string    use a specific configuration file
-s, --socket string    socket path to use between daemon and client. Can be overridden
↳by systemd socket activation. (default "/run/adsysd.sock")
-t, --timeout int      time in seconds before cancelling the client request when the
↳server gives no result. 0 for no timeout. (default 30)
-v, --verbose count    issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adsysctl completion bash

Generate the autocompletion script for bash

Synopsis

Generate the autocompletion script for the bash shell.

This script depends on the 'bash-completion' package. If it is not installed already, you can install it via your OS's package manager.

To load completions in your current shell session:

```
source <(adsysctl completion bash)
```

To load completions for every new session, execute once:

Linux:

```
adsysctl completion bash > /etc/bash_completion.d/adsysctl
```

macOS:

```
adsysctl completion bash > $(brew --prefix)/etc/bash_completion.d/adsysctl
```

You will need to start a new shell for this setup to take effect.

```
adsysctl completion bash
```

Options

```
-h, --help          help for bash
--no-descriptions  disable completion descriptions
```

Options inherited from parent commands

```
-c, --config string  use a specific configuration file
-s, --socket string  socket path to use between daemon and client. Can be overridden
↳by systemd socket activation. (default "/run/adsysd.sock")
-t, --timeout int    time in seconds before cancelling the client request when the
↳server gives no result. 0 for no timeout. (default 30)
-v, --verbose count  issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adsysctl completion fish

Generate the autocompletion script for fish

Synopsis

Generate the autocompletion script for the fish shell.

To load completions in your current shell session:

```
adsysctl completion fish | source
```

To load completions for every new session, execute once:

```
adsysctl completion fish > ~/.config/fish/completions/adsysctl.fish
```

You will need to start a new shell for this setup to take effect.

```
adsysctl completion fish [flags]
```

Options

```
-h, --help          help for fish
--no-descriptions  disable completion descriptions
```

Options inherited from parent commands

```
-c, --config string  use a specific configuration file
-s, --socket string  socket path to use between daemon and client. Can be overridden
↳by systemd socket activation. (default "/run/adsysd.sock")
-t, --timeout int    time in seconds before cancelling the client request when the
↳server gives no result. 0 for no timeout. (default 30)
-v, --verbose count  issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adsysctl completion powershell

Generate the autocompletion script for powershell

Synopsis

Generate the autocompletion script for powershell.

To load completions in your current shell session:

```
adsysctl completion powershell | Out-String | Invoke-Expression
```

To load completions for every new session, add the output of the above command to your powershell profile.

```
adsysctl completion powershell [flags]
```

Options

```
-h, --help          help for powershell
--no-descriptions  disable completion descriptions
```

Options inherited from parent commands

```
-c, --config string  use a specific configuration file
-s, --socket string  socket path to use between daemon and client. Can be overridden
↳by systemd socket activation. (default "/run/adsysd.sock")
-t, --timeout int    time in seconds before cancelling the client request when the
↳server gives no result. 0 for no timeout. (default 30)
-v, --verbose count  issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```


adsysctl completion zsh

Generate the autocompletion script for zsh

Synopsis

Generate the autocompletion script for the zsh shell.

If shell completion is not already enabled in your environment you will need to enable it. You can execute the following once:

```
echo "autoload -U compinit; compinit" >> ~/.zshrc
```

To load completions in your current shell session:

```
source <(adsysctl completion zsh)
```

To load completions for every new session, execute once:

Linux:

```
adsysctl completion zsh > "${fpath[1]}/_adsysctl"
```

macOS:

```
adsysctl completion zsh > $(brew --prefix)/share/zsh/site-functions/_adsysctl
```

You will need to start a new shell for this setup to take effect.

```
adsysctl completion zsh [flags]
```

Options

```
-h, --help          help for zsh
--no-descriptions  disable completion descriptions
```

Options inherited from parent commands

```
-c, --config string  use a specific configuration file
-s, --socket string  socket path to use between daemon and client. Can be overridden.
↳ by systemd socket activation. (default "/run/adsysd.sock")
-t, --timeout int    time in seconds before cancelling the client request when the
↳ server gives no result. 0 for no timeout. (default 30)
-v, --verbose count  issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adsysctl doc

Documentation

```
adsysctl doc [CHAPTER] [flags]
```

Options

```
-h, --help    help for doc
```

Options inherited from parent commands

```
-c, --config string    use a specific configuration file
-s, --socket string    socket path to use between daemon and client. Can be overridden
↳ by systemd socket activation. (default "/run/adsysd.sock")
-t, --timeout int      time in seconds before cancelling the client request when the
↳ server gives no result. 0 for no timeout. (default 30)
-v, --verbose count    issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adsysctl policy

Policy management

```
adsysctl policy COMMAND [flags]
```

Options

```
-h, --help    help for policy
```

Options inherited from parent commands

```
-c, --config string    use a specific configuration file
-s, --socket string    socket path to use between daemon and client. Can be overridden
↳ by systemd socket activation. (default "/run/adsysd.sock")
-t, --timeout int      time in seconds before cancelling the client request when the
↳ server gives no result. 0 for no timeout. (default 30)
-v, --verbose count    issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adsysctl policy admx

Dump windows policy definitions

```
adsysctl policy admx lts-only|all [flags]
```

Options

```
--distro string  distro for which to retrieve policy definition. (default "Ubuntu")
-h, --help      help for admx
```

Options inherited from parent commands

```
-c, --config string  use a specific configuration file
-s, --socket string  socket path to use between daemon and client. Can be overridden by systemd socket activation. (default "/run/adsysd.sock")
-t, --timeout int    time in seconds before cancelling the client request when the server gives no result. 0 for no timeout. (default 30)
-v, --verbose count  issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adsysctl policy applied

Print last applied GPOs for current or given user/machine

```
adsysctl policy applied [USER_NAME] [flags]
```

Options

```
-a, --all          show overridden rules in each GPOs.
--details         show applied rules in addition to GPOs.
-h, --help        help for applied
-m, --machine     show applied rules to the machine.
--no-color       don't display colored version.
```

Options inherited from parent commands

```
-c, --config string  use a specific configuration file
-s, --socket string  socket path to use between daemon and client. Can be overridden by systemd socket activation. (default "/run/adsysd.sock")
-t, --timeout int    time in seconds before cancelling the client request when the server gives no result. 0 for no timeout. (default 30)
-v, --verbose count  issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adsysctl policy purge

Purges policies for the current user or a specified one

```
adsysctl policy purge [USER_NAME] [flags]
```

Options

```
-a, --all      all purges the policy of the computer and all the logged in users. -m  
↳ or USER_NAME cannot be used with this option.  
-h, --help    help for purge  
-m, --machine machine purges the policy of the computer.
```

Options inherited from parent commands

```
-c, --config string use a specific configuration file  
-s, --socket string socket path to use between daemon and client. Can be overridden.  
↳ by systemd socket activation. (default "/run/adsysd.sock")  
-t, --timeout int   time in seconds before cancelling the client request when the  
↳ server gives no result. 0 for no timeout. (default 30)  
-v, --verbose count issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adsysctl policy update

Updates/Create a policy for current user or given user with its kerberos ticket

```
adsysctl policy update [USER_NAME KERBEROS_TICKET_PATH] [flags]
```

Options

```
-a, --all      all updates the policy of the computer and all the logged in users. -m  
↳ or USER_NAME/TICKET cannot be used with this option.  
-h, --help    help for update  
-m, --machine machine updates the policy of the computer.
```

Options inherited from parent commands

```
-c, --config string use a specific configuration file  
-s, --socket string socket path to use between daemon and client. Can be overridden.  
↳ by systemd socket activation. (default "/run/adsysd.sock")  
-t, --timeout int   time in seconds before cancelling the client request when the  
↳ server gives no result. 0 for no timeout. (default 30)  
-v, --verbose count issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adsysctl service

Service management

```
adsysctl service COMMAND [flags]
```

Options

```
-h, --help    help for service
```

Options inherited from parent commands

```

-c, --config string    use a specific configuration file
-s, --socket string    socket path to use between daemon and client. Can be overridden
↳ by systemd socket activation. (default "/run/adsysd.sock")
-t, --timeout int      time in seconds before cancelling the client request when the
↳ server gives no result. 0 for no timeout. (default 30)
-v, --verbose count    issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output

```

adsysctl service cat

Print service logs

```
adsysctl service cat [flags]
```

Options

```
-h, --help    help for cat
```

Options inherited from parent commands

```

-c, --config string    use a specific configuration file
-s, --socket string    socket path to use between daemon and client. Can be overridden
↳ by systemd socket activation. (default "/run/adsysd.sock")
-t, --timeout int      time in seconds before cancelling the client request when the
↳ server gives no result. 0 for no timeout. (default 30)
-v, --verbose count    issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output

```

adsysctl service status

Print service status

```
adsysctl service status [flags]
```

Options

```
-h, --help    help for status
```

Options inherited from parent commands

```
-c, --config string    use a specific configuration file
-s, --socket string    socket path to use between daemon and client. Can be overridden
↳ by systemd socket activation. (default "/run/adsysd.sock")
-t, --timeout int      time in seconds before cancelling the client request when the
↳ server gives no result. 0 for no timeout. (default 30)
-v, --verbose count    issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adsysctl service stop

Requests to stop the service once all connections are done

```
adsysctl service stop [flags]
```

Options

```
-f, --force    force will shut it down immediately and drop existing connections.
-h, --help    help for stop
```

Options inherited from parent commands

```
-c, --config string    use a specific configuration file
-s, --socket string    socket path to use between daemon and client. Can be overridden
↳ by systemd socket activation. (default "/run/adsysd.sock")
-t, --timeout int      time in seconds before cancelling the client request when the
↳ server gives no result. 0 for no timeout. (default 30)
-v, --verbose count    issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adsysctl update

Updates/Create a policy for current user or given user with its kerberos ticket

Synopsis

Alias of “policy update”

```
adsysctl update [USER_NAME KERBEROS_TICKET_PATH] [flags]
```

Options

```
-a, --all          all updates the policy of the computer and all the logged in users. -m,
↳ or USER_NAME/TICKET cannot be used with this option.
-h, --help        help for update
-m, --machine     machine updates the policy of the computer.
```

Options inherited from parent commands

```
-c, --config string use a specific configuration file
-s, --socket string  socket path to use between daemon and client. Can be overridden.
↳ by systemd socket activation. (default "/run/adsysd.sock")
-t, --timeout int    time in seconds before cancelling the client request when the
↳ server gives no result. 0 for no timeout. (default 30)
-v, --verbose count  issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adsysctl version

Returns version of client and service

```
adsysctl version [flags]
```

Options

```
-h, --help  help for version
```

Options inherited from parent commands

```
-c, --config string use a specific configuration file
-s, --socket string  socket path to use between daemon and client. Can be overridden.
↳ by systemd socket activation. (default "/run/adsysd.sock")
-t, --timeout int    time in seconds before cancelling the client request when the
↳ server gives no result. 0 for no timeout. (default 30)
-v, --verbose count  issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

3.4.2 Hidden commands

Those commands are hidden from help and should primarily be used by the system or for debugging.

adsysctl policy debug

Debug various policy infos

```
adsysctl policy debug [flags]
```

Options

```
-h, --help    help for debug
```

Options inherited from parent commands

```
-c, --config string    use a specific configuration file
-s, --socket string    socket path to use between daemon and client. Can be overridden
↳ by systemd socket activation. (default "/run/adsysd.sock")
-t, --timeout int      time in seconds before cancelling the client request when the
↳ server gives no result. 0 for no timeout. (default 30)
-v, --verbose count    issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adsysctl policy debug cert-autoenroll-script

Write certificate autoenrollment python embedded script in current directory

```
adsysctl policy debug cert-autoenroll-script [flags]
```

Options

```
-h, --help    help for cert-autoenroll-script
```

Options inherited from parent commands

```
-c, --config string    use a specific configuration file
-s, --socket string    socket path to use between daemon and client. Can be overridden
↳ by systemd socket activation. (default "/run/adsysd.sock")
-t, --timeout int      time in seconds before cancelling the client request when the
↳ server gives no result. 0 for no timeout. (default 30)
-v, --verbose count    issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```


adsysctl policy debug gpolist-script

Write GPO list python embedded script in current directory

```
adsysctl policy debug gpolist-script [flags]
```

Options

```
-h, --help help for gpolist-script
```

Options inherited from parent commands

```

-c, --config string use a specific configuration file
-s, --socket string socket path to use between daemon and client. Can be overridden
↳ by systemd socket activation. (default "/run/adsysd.sock")
-t, --timeout int time in seconds before cancelling the client request when the
↳ server gives no result. 0 for no timeout. (default 30)
-v, --verbose count issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output

```

3.5 adsysd command line

3.5.1 User commands

adsysd

AD integration daemon

Synopsis

Active Directory integration bridging toolset daemon.

```
adsysd COMMAND [flags]
```

Options

```

--ad-backend string Active Directory authentication backend (default "sssd")
--cache-dir string directory where ADSys caches GPOs downloads and policies.
↳ (default "/var/cache/adsys")
-c, --config string use a specific configuration file
-h, --help help for adsysd
--run-dir string directory where ADSys stores transient information
↳ erased on reboot. (default "/run/adsys")
-s, --socket string socket path to use between daemon and client. Can be
↳ overridden by systemd socket activation. (default "/run/adsysd.sock")
--sssd.cache-dir string SSSd cache directory (default "/var/lib/sss/db")

```

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```
--sssd.config string      SSSd config file path (default "/etc/sss/sssd.conf")
-t, --timeout int        time in seconds without activity before the service
↳exists. 0 for no timeout. (default 120)
-v, --verbose count      issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv)
↳output
```

adsysd completion

Generate the autocompletion script for the specified shell

Synopsis

Generate the autocompletion script for adsysd for the specified shell. See each sub-command's help for details on how to use the generated script.

Options

```
-h, --help help for completion
```

Options inherited from parent commands

```
--ad-backend string      Active Directory authentication backend (default "sss")
--cache-dir string       directory where ADSys caches GPOs downloads and policies.
↳ (default "/var/cache/adsys")
-c, --config string      use a specific configuration file
--run-dir string         directory where ADSys stores transient information
↳erased on reboot. (default "/run/adsys")
-s, --socket string      socket path to use between daemon and client. Can be
↳overridden by systemd socket activation. (default "/run/adsysd.sock")
--sss.cache-dir string   SSSd cache directory (default "/var/lib/sss/db")
--sss.config string     SSSd config file path (default "/etc/sss/sssd.conf")
-t, --timeout int        time in seconds without activity before the service
↳exists. 0 for no timeout. (default 120)
-v, --verbose count      issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv)
↳output
```

adsysd completion bash

Generate the autocompletion script for bash

Synopsis

Generate the auto completion script for the bash shell.

This script depends on the ‘bash-completion’ package. If it is not installed already, you can install it via your OS’s package manager.

To load completions in your current shell session:

```
source <(adsysd completion bash)
```

To load completions for every new session, execute once:

Linux:

```
adsysd completion bash > /etc/bash_completion.d/adsysd
```

macOS:

```
adsysd completion bash > $(brew --prefix)/etc/bash_completion.d/adsysd
```

You will need to start a new shell for this setup to take effect.

```
adsysd completion bash
```

Options

```
-h, --help          help for bash
--no-descriptions  disable completion descriptions
```

Options inherited from parent commands

```
--ad-backend string      Active Directory authentication backend (default "sssd")
--cache-dir string       directory where ADSys caches GPOs downloads and policies.
↳ (default "/var/cache/adsys")
-c, --config string      use a specific configuration file
--run-dir string         directory where ADSys stores transient information.
↳ erased on reboot. (default "/run/adsys")
-s, --socket string      socket path to use between daemon and client. Can be
↳ overridden by systemd socket activation. (default "/run/adsysd.sock")
--sssd.cache-dir string  SSSd cache directory (default "/var/lib/sss/db")
--sssd.config string     SSSd config file path (default "/etc/sss/sss.conf")
-t, --timeout int        time in seconds without activity before the service
↳ exists. 0 for no timeout. (default 120)
-v, --verbose count      issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv)
↳ output
```

adsysd completion fish

Generate the autocompletion script for fish

Synopsis

Generate the autocompletion script for the fish shell.

To load completions in your current shell session:

```
adsysd completion fish | source
```

To load completions for every new session, execute once:

```
adsysd completion fish > ~/.config/fish/completions/adsysd.fish
```

You will need to start a new shell for this setup to take effect.

```
adsysd completion fish [flags]
```

Options

```
-h, --help          help for fish
--no-descriptions  disable completion descriptions
```

Options inherited from parent commands

```
--ad-backend string      Active Directory authentication backend (default "sssd")
--cache-dir string       directory where ADSys caches GPOs downloads and policies.
↳ (default "/var/cache/adsys")
-c, --config string      use a specific configuration file
--run-dir string         directory where ADSys stores transient information.
↳ erased on reboot. (default "/run/adsys")
-s, --socket string      socket path to use between daemon and client. Can be
↳ overridden by systemd socket activation. (default "/run/adsysd.sock")
--sssd.cache-dir string  SSSd cache directory (default "/var/lib/sss/db")
--sssd.config string     SSSd config file path (default "/etc/sss/sssd.conf")
-t, --timeout int        time in seconds without activity before the service
↳ exists. 0 for no timeout. (default 120)
-v, --verbose count      issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv)
↳ output
```

adsysd completion powershell

Generate the autocompletion script for powershell

Synopsis

Generate the autocompletion script for powershell.

To load completions in your current shell session:

```
adsysd completion powershell | Out-String | Invoke-Expression
```

To load completions for every new session, add the output of the above command to your powershell profile.

```
adsysd completion powershell [flags]
```

Options

```
-h, --help          help for powershell
--no-descriptions  disable completion descriptions
```

Options inherited from parent commands

```
--ad-backend string      Active Directory authentication backend (default "sssd")
--cache-dir string       directory where ADSys caches GPOs downloads and policies.
↳ (default "/var/cache/adsys")
-c, --config string      use a specific configuration file
--run-dir string         directory where ADSys stores transient information.
↳ erased on reboot. (default "/run/adsys")
-s, --socket string      socket path to use between daemon and client. Can be
↳ overridden by systemd socket activation. (default "/run/adsysd.sock")
--sssd.cache-dir string  SSSd cache directory (default "/var/lib/sss/db")
--sssd.config string     SSSd config file path (default "/etc/sss/sss.conf")
-t, --timeout int        time in seconds without activity before the service
↳ exists. 0 for no timeout. (default 120)
-v, --verbose count      issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv)
↳ output
```

adsysd completion zsh

Generate the autocompletion script for zsh

Synopsis

Generate the auto completion script for the zsh shell.

If shell completion is not already enabled in your environment you will need to enable it. You can execute the following once:

```
echo "autoload -U compinit; compinit" >> ~/.zshrc
```

To load completions in your current shell session:

```
source <(adsysd completion zsh)
```

To load completions for every new session, execute once:

Linux:

```
adsysd completion zsh > "${fpath[1]}/_adsysd"
```

macOS:

```
adsysd completion zsh > $(brew --prefix)/share/zsh/site-functions/_adsysd
```

You will need to start a new shell for this setup to take effect.

```
adsysd completion zsh [flags]
```

Options

```
-h, --help          help for zsh
--no-descriptions  disable completion descriptions
```

Options inherited from parent commands

```
--ad-backend string      Active Directory authentication backend (default "sssd")
--cache-dir string       directory where ADSys caches GPOs downloads and policies.
↳ (default "/var/cache/adsys")
-c, --config string      use a specific configuration file
--run-dir string         directory where ADSys stores transient information.
↳ erased on reboot. (default "/run/adsys")
-s, --socket string      socket path to use between daemon and client. Can be
↳ overridden by systemd socket activation. (default "/run/adsysd.sock")
--sssd.cache-dir string  SSSd cache directory (default "/var/lib/sss/db")
--sssd.config string     SSSd config file path (default "/etc/sss/sss.conf")
-t, --timeout int        time in seconds without activity before the service
↳ exists. 0 for no timeout. (default 120)
-v, --verbose count      issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv)
↳ output
```

adsysd version

Returns version of service and exits

```
adsysd version [flags]
```

Options

```
-h, --help help for version
```

Options inherited from parent commands

```

--ad-backend string      Active Directory authentication backend (default "sssd")
--cache-dir string       directory where ADSys caches GPOs downloads and policies.
↳ (default "/var/cache/adsys")
-c, --config string      use a specific configuration file
--run-dir string         directory where ADSys stores transient information.
↳ erased on reboot. (default "/run/adsys")
-s, --socket string      socket path to use between daemon and client. Can be
↳ overridden by systemd socket activation. (default "/run/adsysd.sock")
--sssd.cache-dir string  SSSd cache directory (default "/var/lib/sss/db")
--sssd.config string     SSSd config file path (default "/etc/sss/sss.conf")
-t, --timeout int        time in seconds without activity before the service
↳ exists. 0 for no timeout. (default 120)
-v, --verbose count      issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv)
↳ output

```

3.5.2 Hidden commands

Those commands are hidden from help and should primarily be used by the system or for debugging.

adsysd mount

Mount the locations listed in the specified file for the current user

```
adsysd mount MOUNTS_FILE [flags]
```

Options

```
-h, --help help for mount
```

Options inherited from parent commands

```
--ad-backend string      Active Directory authentication backend (default "sssd")
--cache-dir string       directory where ADSys caches GPOs downloads and policies.
↳ (default "/var/cache/adsys")
-c, --config string      use a specific configuration file
--run-dir string         directory where ADSys stores transient information.
↳ erased on reboot. (default "/run/adsys")
-s, --socket string      socket path to use between daemon and client. Can be
↳ overridden by systemd socket activation. (default "/run/adsysd.sock")
--sssd.cache-dir string  SSSd cache directory (default "/var/lib/sss/db")
--sssd.config string     SSSd config file path (default "/etc/sss/sss.conf")
-t, --timeout int        time in seconds without activity before the service
↳ exists. 0 for no timeout. (default 120)
-v, --verbose count      issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv)
↳ output
```

adsysd runscripts

Runs scripts in the given subdirectory

```
adsysd runscripts ORDER_FILE [flags]
```

Options

```
--allow-order-missing  allow ORDER_FILE to be missing once the scripts are ready.
-h, --help             help for runscripts
```

Options inherited from parent commands

```
--ad-backend string      Active Directory authentication backend (default "sssd")
--cache-dir string       directory where ADSys caches GPOs downloads and policies.
↳ (default "/var/cache/adsys")
-c, --config string      use a specific configuration file
--run-dir string         directory where ADSys stores transient information.
↳ erased on reboot. (default "/run/adsys")
-s, --socket string      socket path to use between daemon and client. Can be
↳ overridden by systemd socket activation. (default "/run/adsysd.sock")
--sssd.cache-dir string  SSSd cache directory (default "/var/lib/sss/db")
--sssd.config string     SSSd config file path (default "/etc/sss/sss.conf")
-t, --timeout int        time in seconds without activity before the service
↳ exists. 0 for no timeout. (default 120)
-v, --verbose count      issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv)
↳ output
```


3.6 adwatchd command line

3.6.1 User commands

adwatchd

AD watch daemon

Synopsis

Watch directories for changes and bump the relevant GPT.ini versions.

```
adwatchd [COMMAND] [flags]
```

Options

```
-c, --config string  use a specific configuration file
-h, --help           help for adwatchd
-v, --verbose count  issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adwatchd completion

Generate the autocompletion script for the specified shell

Synopsis

Generate the autocompletion script for adwatchd for the specified shell. See each sub-command's help for details on how to use the generated script.

Options

```
-h, --help  help for completion
```

Options inherited from parent commands

```
-v, --verbose count  issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adwatchd completion bash

Generate the autocompletion script for bash

Synopsis

Generate the autocompletion script for the bash shell.

This script depends on the ‘bash-completion’ package. If it is not installed already, you can install it via your OS’s package manager.

To load completions in your current shell session:

```
source <(adwatchd completion bash)
```

To load completions for every new session, execute once:

Linux:

```
adwatchd completion bash > /etc/bash_completion.d/adwatchd
```

macOS:

```
adwatchd completion bash > $(brew --prefix)/etc/bash_completion.d/adwatchd
```

You will need to start a new shell for this setup to take effect.

```
adwatchd completion bash
```

Options

```
-h, --help          help for bash  
--no-descriptions  disable completion descriptions
```

Options inherited from parent commands

```
-v, --verbose count  issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adwatchd completion fish

Generate the autocompletion script for fish

Synopsis

Generate the autocompletion script for the fish shell.

To load completions in your current shell session:

```
adwatchd completion fish | source
```

To load completions for every new session, execute once:

```
adwatchd completion fish > ~/.config/fish/completions/adwatchd.fish
```

You will need to start a new shell for this setup to take effect.

```
adwatchd completion fish [flags]
```

Options

```
-h, --help          help for fish  
--no-descriptions  disable completion descriptions
```

Options inherited from parent commands

```
-v, --verbose count  issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adwatchd completion powershell

Generate the autocompletion script for powershell

Synopsis

Generate the autocompletion script for powershell.

To load completions in your current shell session:

```
adwatchd completion powershell | Out-String | Invoke-Expression
```

To load completions for every new session, add the output of the above command to your powershell profile.

```
adwatchd completion powershell [flags]
```

Options

```
-h, --help          help for powershell
--no-descriptions  disable completion descriptions
```

Options inherited from parent commands

```
-v, --verbose count  issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adwatchd completion zsh

Generate the autocompletion script for zsh

Synopsis

Generate the autocompletion script for the zsh shell.

If shell completion is not already enabled in your environment you will need to enable it. You can execute the following once:

```
echo "autoload -U compinit; compinit" >> ~/.zshrc
```

To load completions in your current shell session:

```
source <(adwatchd completion zsh)
```

To load completions for every new session, execute once:

Linux:

```
adwatchd completion zsh > "${fpath[1]}/_adwatchd"
```

macOS:

```
adwatchd completion zsh > $(brew --prefix)/share/zsh/site-functions/_adwatchd
```

You will need to start a new shell for this setup to take effect.

```
adwatchd completion zsh [flags]
```

Options

```
-h, --help          help for zsh
--no-descriptions  disable completion descriptions
```

Options inherited from parent commands

```
-v, --verbose count  issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adwatchd run

Starts the directory watch loop

Synopsis

Can run as a service through the service manager or interactively as a standalone application.

The program will monitor the configured directories for changes and bump the appropriate GPT.ini versions anytime a change is detected. If a GPT.ini file does not exist for a directory, a warning will be issued and the file will be created. If the GPT.ini file is incompatible or malformed, the program will report an error.

```
adwatchd run [flags]
```

Options

```
-c, --config string  use a specific configuration file
-d, --dirs directory a directory to check for changes (can be specified multiple
↳times)
-f, --force          force the program to run even if another instance is already
↳running
-h, --help          help for run
```

Options inherited from parent commands

```
-v, --verbose count  issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adwatchd service

Manages the adwatchd service

Synopsis

The service command allows the user to interact with the adwatchd service. It can manage and query the service status, and also install and uninstall the service.

```
adwatchd service COMMAND [flags]
```

Options

```
-h, --help    help for service
```

Options inherited from parent commands

```
-v, --verbose count    issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adwatchd service install

Installs the service

Synopsis

Installs the adwatchd service.

The service will be installed as a Windows service.

```
adwatchd service install [flags]
```

Options

```
-c, --config string    use a specific configuration file  
-h, --help             help for install
```

Options inherited from parent commands

```
-v, --verbose count    issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adwatchd service restart

Restarts the service

Synopsis

Restarts the adwatchd service.

```
adwatchd service restart [flags]
```

Options

```
-h, --help help for restart
```

Options inherited from parent commands

```
-v, --verbose count issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adwatchd service start

Starts the service

Synopsis

Starts the adwatchd service.

```
adwatchd service start [flags]
```

Options

```
-h, --help help for start
```

Options inherited from parent commands

```
-v, --verbose count issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adwatchd service status

Returns service status

Synopsis

Returns the status of the adwatchd service.

```
adwatchd service status [flags]
```

Options

```
-h, --help help for status
```

Options inherited from parent commands

```
-v, --verbose count issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adwatchd service stop

Stops the service

Synopsis

Stops the adwatchd service.

```
adwatchd service stop [flags]
```

Options

```
-h, --help help for stop
```

Options inherited from parent commands

```
-v, --verbose count issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```


adwatchd service uninstall

Uninstalls the service

Synopsis

Uninstalls the adwatchd service.

```
adwatchd service uninstall [flags]
```

Options

```
-h, --help help for uninstall
```

Options inherited from parent commands

```
-v, --verbose count issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

adwatchd version

Returns version of service and exits

```
adwatchd version [flags]
```

Options

```
-h, --help help for version
```

Options inherited from parent commands

```
-v, --verbose count issue INFO (-v), DEBUG (-vv) or DEBUG with caller (-vvv) output
```

3.6.2 Hidden commands

Those commands are hidden from help and should primarily be used by the system or for debugging.

Supported policies

3.7 Policies reference list

Here is the list of each supported policies by ADSys. The categories and elements are under the same hierarchy you will find on your Active Directory controller.

3.7.1 Computer Policies

Ubuntu

Client management

Computer Scripts

Shutdown scripts

Define scripts that are executed on machine power off. Those scripts are ordered, one by line, and relative to SYSVOL/ubuntu/scripts/ directory. Scripts from this GPO will be appended to the list of scripts referenced higher in the GPO hierarchy.

- Type: scripts
- Key: /shutdown

Note: -

- Enabled: The scripts in the text entry are executed at shutdown time.
- Disabled: The scripts will be skipped. The set of scripts are per boot, and refreshed only on new boot of the machine.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

An Ubuntu Pro subscription on the client is required to apply this policy.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> Computer Scripts -> Shutdown scripts
Registry Key	Software\Policies\Ubuntu\scripts\shutdown
Element type	multiText
Class:	Machine

Startup scripts

Define scripts that are executed on machine boot, once the GPO is downloaded. Those scripts are ordered, one by line, and relative to SYSVOL/ubuntu/scripts/ directory. Scripts from this GPO will be appended to the list of scripts referenced higher in the GPO hierarchy.

- Type: scripts
- Key: /startup

Note: -

- Enabled: The scripts in the text entry are executed at startup time.
- Disabled: The scripts will be skipped. The set of scripts are per boot, and refreshed only on new boot of the machine.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

An Ubuntu Pro subscription on the client is required to apply this policy.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> Computer Scripts -> Startup scripts
Registry Key	Software\Policies\Ubuntu\scripts\startup
Element type	multiText
Class:	Machine

Power Management

Enable the ALS sensor

If the ambient light sensor functionality is enabled.

- Type: dconf
- Key: /org/gnome/settings-daemon/plugins/power/ambient-enabled
- Default: true

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> Power Management -> Enable the ALS sensor
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\settings-daemon\plugins\power\ambient-enabled
Element type	boolean
Class:	Machine

The brightness of the screen when idle

This is the laptop panel screen brightness used when the session is idle.

- Type: dconf
- Key: /org/gnome/settings-daemon/plugins/power/idle-brightness
- Default: 30

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> Power Management -> The brightness of the screen when idle
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\settings-daemon\plugins\power\idle-brightness
Element type	decimal
Class:	Machine

Dim the screen after a period of inactivity

If the screen should be dimmed to save power when the computer is idle.

- Type: dconf
- Key: /org/gnome/settings-daemon/plugins/power/idle-dim
- Default: true

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> Power Management -> Dim the screen after a period of inactivity
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\settings-daemon\plugins\power\idle-dim
Element type	boolean
Class:	Machine

Laptop lid close action when on AC

The action to take when the laptop lid is closed and the laptop is on AC power.

- Type: dconf
- Key: /org/gnome/settings-daemon/plugins/power/lid-close-ac-action
- Default: 'suspend'

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Valid values

- blank
- suspend
- shutdown
- hibernate
- interactive
- nothing
- logout

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> Power Management -> Laptop lid close action when on AC
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\settings-daemon\plugins\power\lid-close-ac-action
Element type	dropdownList
Class:	Machine

Laptop lid close action on battery

The action to take when the laptop lid is closed and the laptop is on battery power.

- Type: dconf
- Key: /org/gnome/settings-daemon/plugins/power/lid-close-battery-action
- Default: 'suspend'

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Valid values

- blank
- suspend
- shutdown

- hibernate
- interactive
- nothing
- logout

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> Power Management -> Laptop lid close action on battery
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\settings-daemon\plugins\power\lid-close-battery-action
Element type	dropdownList
Class:	Machine

Laptop lid, when closed, will suspend even if there is an external monitor plugged in

With no external monitors plugged in, closing a laptop's lid will suspend the machine (as set by the lid-close-battery-action and lid-close-ac-action keys). By default, however, closing the lid when an external monitor is present will not suspend the machine, so that one can keep working on that monitor (e.g. for docking stations or media viewers). Set this key to False to keep the default behavior, or to True to suspend the laptop whenever the lid is closed and regardless of external monitors.

- Type: dconf
- Key: /org/gnome/settings-daemon/plugins/power/lid-close-suspend-with-external-monitor
- Default: false

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> Power Management -> Laptop lid, when closed, will suspend even if there is an external monitor plugged in
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\settings-daemon\plugins\power\lid-close-suspend-with-external-monitor
Element type	boolean
Class:	Machine

Power button action

The action to take when the system power button is pressed. Virtual machines only honor the ‘nothing’ action, and will shutdown otherwise. Tablets always suspend, ignoring all the other action options.

- Type: dconf
- Key: /org/gnome/settings-daemon/plugins/power/power-button-action
- Default: ‘interactive’

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Valid values

- nothing
- suspend
- hibernate
- interactive

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> Power Management -> Power button action
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\settings-daemon\plugins\power\power-button-action
Element type	dropdownList
Class:	Machine

Enable power-saver profile when battery is low

Automatically enable the “power-saver” profile using power-profiles-daemon if the battery is low.

- Type: dconf
- Key: /org/gnome/settings-daemon/plugins/power/power-saver-profile-on-low-battery
- Default: true

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> Power Management -> Enable power-saver profile when battery is low
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\settings-daemon\plugins\power\power-saver-profile-on-low-battery
Element type	boolean
Class:	Machine

Sleep timeout computer when on AC

The amount of time in seconds the computer on AC power needs to be inactive before it goes to sleep. A value of 0 means never.

- Type: dconf
- Key: `/org/gnome/settings-daemon/plugins/power/sleep-inactive-ac-timeout`
- Default: 0

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> Power Management -> Sleep timeout computer when on AC
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\settings-daemon\plugins\power\sleep-inactive-ac-timeout
Element type	decimal
Class:	Machine

Whether to hibernate, suspend or do nothing when inactive

The type of sleeping that should be performed when the computer is inactive.

- Type: dconf
- Key: `/org/gnome/settings-daemon/plugins/power/sleep-inactive-ac-type`
- Default: ‘suspend’

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Valid values

- blank
- suspend
- shutdown
- hibernate
- interactive
- nothing
- logout

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> Power Management -> Whether to hibernate, suspend or do nothing when inactive
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\settings-daemon\plugins\power\sleep-inactive-ac-type
Element type	dropdownList
Class:	Machine

Sleep timeout computer when on battery

The amount of time in seconds the computer on battery power needs to be inactive before it goes to sleep. A value of 0 means never.

- Type: dconf
- Key: /org/gnome/settings-daemon/plugins/power/sleep-inactive-battery-timeout
- Default for 20.04: 1200
- Default for 22.04: 1200
- Default for 24.04: 900
- Default for 24.10: 900

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> Power Management -> Sleep timeout computer when on battery
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\settings-daemon\plugins\power\sleep-inactive-battery-timeout
Element type	decimal
Class:	Machine

Whether to hibernate, suspend or do nothing when inactive

The type of sleeping that should be performed when the computer is inactive.

- Type: dconf
- Key: /org/gnome/settings-daemon/plugins/power/sleep-inactive-battery-type
- Default: ‘suspend’

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Valid values

- blank
- suspend
- shutdown
- hibernate
- interactive
- nothing
- logout

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> Power Management -> Whether to hibernate, suspend or do nothing when inactive
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\settings-daemon\plugins\power\sleep-inactive-battery-type
Element type	dropdownList
Class:	Machine

Privilege Authorization

Allow local administrators

This allows or prevents client machine to have local users gaining administrators privilege on the machine.

- Type: privilege
- Key: /allow-local-admins

Note: -

- Enabled: This leaves the default rules for the “sudo” and “admin” rule intact.
- Disabled: This denies root privileges to the predefined administrator groups (sudo and admin).

An Ubuntu Pro subscription on the client is required to apply this policy.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> Privilege Authorization -> Allow local administrators
Registry Key	Software\Policies\Ubuntu\privilege\allow-local-admins
Element type	
Class:	Machine

Client administrators

Define users and groups from AD allowed to administer client machines. It must be of the form user@domain or %group@domain. One per line.

- Type: privilege
- Key: /client-admins

Note: -

- Enabled: This allows defining Active Directory groups and users with administrative privileges in the box entry.
- Disabled: This disallows any Active Directory group or user to become an administrator of the client even if it is defined in a parent GPO of the hierarchy tree.

An Ubuntu Pro subscription on the client is required to apply this policy.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> Privilege Authorization -> Client administrators
Registry Key	Software\Policies\Ubuntu\privilege\client-admins
Element type	multiText
Class:	Machine

System Drive Mapping

System mounts

Define network shares that will be mounted for the system. If more shares are defined higher in the GPO hierarchy, the entries listed here will be appended to the list and duplicates will be removed.

Values should be in the format: `://` e.g. `nfs://example_nfs.com/nfs_shared_dir`
`smb://example_smb.com/smb_shared_dir` `ftp://ftp_share_server.com`

This pattern must be followed, otherwise the policy will not be applied.

By default, the mounts will be done in anonymous mode. In case of authentication needed, a krb5 tag can be added to the value, e.g. `[krb5]://`

If the tag is added, the mount will require Kerberos authentication in order to occur.

The supported protocols / file systems are the same as the ones supported by the mount command. They are listed on the mount man page on <https://man7.org/linux/man-pages/man8/mount.8.html> It's up to the user to ensure that the requested protocols are valid and supported and that the shared directories have the correct configuration for the requested connection.

- Type: mount
- Key: /system-mounts

Note:

- Enabled: The value(s) referenced in the entry are applied on the client machine.

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- Disabled: The value(s) are removed from the target machine.
- Not configured: Value(s) declared higher in the GPO hierarchy will be used if available.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

An Ubuntu Pro subscription on the client is required to apply this policy.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> System Drive Mapping -> System mounts
Registry Key	Software\Policies\Ubuntu\mount\system-mounts
Element type	multiText
Class:	Machine

System proxy configuration

Auto-configuration URL

Declare system-wide proxy auto-configuration URL.

Auto-configuration URLs are always prioritized over manual proxy settings, meaning that if all proxy options are set, the GPO client will enable automatic proxy configuration for supported backends. An empty value will remove previously set settings of the same type.

- Type: proxy
- Key: /proxy/auto

Note: -

- Enabled: The setting in the text entry is applied on the client machine.
- Disabled: The setting is removed from the target machine.
- Not configured: A setting declared higher in the GPO hierarchy will be used if available.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

An Ubuntu Pro subscription on the client is required to apply this policy.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> System proxy configuration -> Auto-configuration URL
Registry Key	Software\Policies\Ubuntu\proxy\proxy\auto
Element type	text
Class:	Machine

FTP Proxy

Declare system-wide HTTPS proxy setting. The value must be in the form of:

protocol://username:password@host:port

It is not mandatory to escape special characters in the username or password. The GPO client will escape any unescaped special character before applying the proxy settings, and will take care not to double-escape already escaped characters. An empty value will remove previously set settings of the same type.

- Type: proxy
- Key: /proxy/ftp

Note: -

- Enabled: The setting in the text entry is applied on the client machine.
- Disabled: The setting is removed from the target machine.
- Not configured: A setting declared higher in the GPO hierarchy will be used if available.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

An Ubuntu Pro subscription on the client is required to apply this policy.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> System proxy configuration -> FTP Proxy
Registry Key	Software\Policies\Ubuntu\proxy\proxy\ftp
Element type	text
Class:	Machine

HTTP Proxy

Declare system-wide HTTP proxy setting. The value must be in the form of:

protocol://username:password@host:port

It is not mandatory to escape special characters in the username or password. The GPO client will escape any unescaped special character before applying the proxy settings, and will take care not to double-escape already escaped characters. An empty value will remove previously set settings of the same type.

- Type: proxy
- Key: /proxy/http

Note: -

- Enabled: The setting in the text entry is applied on the client machine.
- Disabled: The setting is removed from the target machine.
- Not configured: A setting declared higher in the GPO hierarchy will be used if available.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

An Ubuntu Pro subscription on the client is required to apply this policy.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> System proxy configuration -> HTTP Proxy
Registry Key	Software\Policies\Ubuntu\proxy\proxy\http
Element type	text
Class:	Machine

HTTPS Proxy

Declare system-wide HTTPS proxy setting. The value must be in the form of:

protocol://username:password@host:port

It is not mandatory to escape special characters in the username or password. The GPO client will escape any unescaped special character before applying the proxy settings, and will take care not to double-escape already escaped characters. An empty value will remove previously set settings of the same type.

- Type: proxy
- Key: /proxy/https

Note: -

- Enabled: The setting in the text entry is applied on the client machine.
- Disabled: The setting is removed from the target machine.
- Not configured: A setting declared higher in the GPO hierarchy will be used if available.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

An Ubuntu Pro subscription on the client is required to apply this policy.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> System proxy configuration -> HTTPS Proxy
Registry Key	Software\Policies\Ubuntu\proxy\proxy\https
Element type	text
Class:	Machine

Ignored hosts

An array of hosts allowed to bypass the proxy settings. The host exclusion setting must be in the form of:

localhost,127.0.0.1,::1

Hosts can be individually wrapped in single (') or double quotes ("), or separated by spaces. An empty value will remove previously set settings of the same type.

- Type: proxy
- Key: /proxy/no-proxy

Note: -

- Enabled: The setting in the text entry is applied on the client machine.

- Disabled: The setting is removed from the target machine.
- Not configured: A setting declared higher in the GPO hierarchy will be used if available.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

An Ubuntu Pro subscription on the client is required to apply this policy.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> System proxy configuration -> Ignored hosts
Registry Key	Software\Policies\Ubuntu\proxy\proxy\no-proxy
Element type	text
Class:	Machine

SOCKS Proxy

Declare system-wide HTTPS proxy setting. The value must be in the form of:

protocol://username:password@host:port

It is not mandatory to escape special characters in the username or password. The GPO client will escape any unescaped special character before applying the proxy settings, and will take care not to double-escape already escaped characters. An empty value will remove previously set settings of the same type.

- Type: proxy
- Key: /proxy/socks

Note: -

- Enabled: The setting in the text entry is applied on the client machine.
- Disabled: The setting is removed from the target machine.
- Not configured: A setting declared higher in the GPO hierarchy will be used if available.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

An Ubuntu Pro subscription on the client is required to apply this policy.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> System proxy configuration -> SOCKS Proxy
Registry Key	Software\Policies\Ubuntu\proxy\proxy\socks
Element type	text
Class:	Machine

System-wide application confinement

AppArmor

Define AppArmor profiles to be parsed and loaded on client machines. These profiles are ordered, one by line, and relative to the `SYSVOL/ubuntu/apparmor/` directory. On the client machine, computer profiles are stored in `/etc/apparmor.d/adsys/machine`, thus the administrator can reference abstractions and tunables shipped with the client distribution of AppArmor. Files can be included in each other either using a path relative to the current directory of the profile (include “path/to/profile”), or relying on the include path of AppArmor (include `<adsys/machine/path/to/profile>`).

Profiles from this GPO will be appended to the list of profiles referenced higher in the GPO hierarchy.

- Type: apparmor
- Key: /apparmor-machine

Note: -

- Enabled: The profiles in the text entry are applied on the client machine.
- Disabled: The profiles are removed from the target machine, and any related rules are unloaded.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

An Ubuntu Pro subscription on the client is required to apply this policy.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Client management -> System-wide application confinement -> AppArmor
Registry Key	Software\Policies\Ubuntu\apparmor\apparmor-machine
Element type	multiText
Class:	Machine

Login Screen

Authentication

Number of allowed authentication failures

The number of times a user is allowed to attempt authentication, before giving up and going back to user selection.

- Type: dconf
- Key: /org/gnome/login-screen/allowed-failures
- Default: 3

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Login Screen -> Authentication -> Number of allowed authentication failures
Registry Key	Software\Policies\Ubuntu\gdm\dnconf\org\gnome\login-screen\allowed-failures
Element type	decimal
Class:	Machine

Whether or not to allow fingerprint readers for login

The login screen can optionally allow users who have enrolled their fingerprints to log in using those prints.

- Type: dconf
- Key: /org/gnome/login-screen/enable-fingerprint-authentication
- Default: true

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Login Screen -> Authentication -> Whether or not to allow fingerprint readers for login
Registry Key	Software\Policies\Ubuntu\gdm\dnconf\org\gnome\login-screen\enable-fingerprint-authentication
Element type	boolean
Class:	Machine

Whether or not to allow passwords for login

The login screen can be configured to disallow password authentication, forcing the user to use smartcard or fingerprint authentication.

- Type: dconf
- Key: /org/gnome/login-screen/enable-password-authentication
- Default: true

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Login Screen -> Authentication -> Whether or not to allow passwords for login
Registry Key	Software\Policies\Ubuntu\gdm\dconf\org\gnome\login-screen\enable-password-authentication
Element type	boolean
Class:	Machine

Whether or not to allow smartcard readers for login

The login screen can optionally allow users who have smartcards to log in using those smartcards.

- Type: dconf
- Key: /org/gnome/login-screen/enable-smartcard-authentication
- Default: true

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Login Screen -> Authentication -> Whether or not to allow smartcard readers for login
Registry Key	Software\Policies\Ubuntu\gdm\dconf\org\gnome\login-screen\enable-smartcard-authentication
Element type	boolean
Class:	Machine

Interface

The background-color property sets the background color.

The background-color property sets the background color to use when the background picture URI is missing or when it doesn't cover the whole background. It overrides the value defined in the default style sheet.

- Type: dconf
- Key: /com/ubuntu/login-screen/background-color
- Default: ‘

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Login Screen -> Interface -> The background-color property sets the background color.
Registry Key	Software\Policies\Ubuntu\gdm\dmconf\com\ubuntu\login-screen\background-color
Element type	text
Class:	Machine

Sets the background image for the login screen.

URI to use for the background image. Note that the backend only supports local (file://) URIs. It overrides the value defined in the default style sheet.

- Type: dconf
- Key: /com/ubuntu/login-screen/background-picture-uri
- Default: ''

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Login Screen -> Interface -> Sets the background image for the login screen.
Registry Key	Software\Policies\Ubuntu\gdm\dmconf\com\ubuntu\login-screen\background-picture-uri
Element type	text
Class:	Machine

The background-repeat property sets if/how the background image will be repeated.

The background-repeat property sets if/how a background image will be repeated. By default, a background-image is repeated both vertically and horizontally. It overrides the value defined in the default style sheet.

- Type: dconf
- Key: /com/ubuntu/login-screen/background-repeat
- Default: 'default'

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Valid values

- default
- repeat

- repeat-x
- repeat-y
- no-repeat
- space
- round

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Login Screen -> Interface -> how the background image will be repeated.
Registry Key	Software\Policies\Ubuntu\gdm\dconf\com\ubuntu\login-screen\background-repeat
Element type	dropdownList
Class:	Machine

The background-size property specifies the size of the background image.

The background-size property specifies the size of the background images. There are three keywords you can use with this property: auto: The background image is displayed in its original size; cover: Resize the background image to cover the entire container, even if it has to stretch the image or cut a little bit off one of the edges; contain: Resize the background image to make sure the image is fully visible. It overrides the value defined in the default style sheet.

- Type: dconf
- Key: /com/ubuntu/login-screen/background-size
- Default: 'default'

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Valid values

- default
- auto
- cover
- contain

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Login Screen -> Interface -> The background-size property specifies the size of the background image.
Registry Key	Software\Policies\Ubuntu\gdm\dconf\com\ubuntu\login-screen\background-size
Element type	dropdownList
Class:	Machine

Enable showing the banner message

Set to true to show the banner message text.

- Type: dconf
- Key: /org/gnome/login-screen/banner-message-enable
- Default: false

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Login Screen -> Interface -> Enable showing the banner message
Registry Key	Software\Policies\Ubuntu\gdm\dconf\org\gnome\login-screen\banner-message-enable
Element type	boolean
Class:	Machine

Banner message text

Text banner message to show in the login window.

- Type: dconf
- Key: /org/gnome/login-screen/banner-message-text
- Default: ‘

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Login Screen -> Interface -> Banner message text
Registry Key	Software\Policies\Ubuntu\gdm\dconf\org\gnome\login-screen\banner-message-text
Element type	text
Class:	Machine

Whether the clock displays in 24h or 12h format

Whether the clock displays in 24h or 12h format

- Type: dconf
- Key: /org/gnome/desktop/interface/clock-format
- Default: ‘24h’

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Valid values

- 24h
- 12h

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Login Screen -> Interface -> Whether the clock displays in 24h or 12h format
Registry Key	Software\Policies\Ubuntu\gdm\conf\org\gnome\desktop\interface\clock-format
Element type	dropdownList
Class:	Machine

Show date in clock

If true, display date in the clock, in addition to time.

- Type: dconf
- Key: /org/gnome/desktop/interface/clock-show-date
- Default: true

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Login Screen -> Interface -> Show date in clock
Registry Key	Software\Policies\Ubuntu\gdm\conf\org\gnome\desktop\interface\clock-show-date
Element type	boolean
Class:	Machine

Show weekday in clock

If true, display weekday in the clock, in addition to time.

- Type: dconf
- Key: /org/gnome/desktop/interface/clock-show-weekday
- Default: false

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Login Screen -> Interface -> Show weekday in clock
Registry Key	Software\Policies\Ubuntu\gdm\dconf\org\gnome\desktop\interface\clock-show-weekday
Element type	boolean
Class:	Machine

Path to small image at top of user list

The login screen can optionally show a small image to provide site administrators and distributions a way to display branding.

- Type: dconf
- Key: /org/gnome/login-screen/logo
- Default: '/usr/share/plymouth/ubuntu-logo.png'

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Login Screen -> Interface -> Path to small image at top of user list
Registry Key	Software\Policies\Ubuntu\gdm\dconf\org\gnome\login-screen\logo
Element type	text
Class:	Machine

Disable showing the restart buttons

Set to true to disable showing the restart buttons in the login window.

- Type: dconf
- Key: /org/gnome/login-screen/disable-restart-buttons
- Default: false

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Login Screen -> Disable showing the restart buttons
Registry Key	Software\Policies\Ubuntu\gdm\dconf\org\gnome\login-screen\disable-restart-buttons
Element type	boolean
Class:	Machine

Avoid showing user list

The login screen normally shows a list of available users to log in as. This setting can be toggled to disable showing the user list.

- Type: dconf
- Key: /org/gnome/login-screen/disable-user-list
- Default: false

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Login Screen -> Avoid showing user list
Registry Key	Software\Policies\Ubuntu\gdm\dconf\org\gnome\login-screen\disable-user-list
Element type	boolean
Class:	Machine

Show notification banners

Whether notification banners are visible for application notifications.

- Type: dconf
- Key: /org/gnome/desktop/notifications/show-banners
- Default: true

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Login Screen -> Show notification banners
Registry Key	Software\Policies\Ubuntu\gdm\dconf\org\gnome\desktop\notifications\show-banners
Element type	boolean
Class:	Machine

Show notifications in the lock screen

Whether notifications are shown in the lock screen or not.

- Type: dconf
- Key: /org/gnome/desktop/notifications/show-in-lock-screen
- Default: true

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Login Screen -> Show notifications in the lock screen
Registry Key	Software\Policies\Ubuntu\gdm\dmconf\org\gnome\desktop\notifications\show-in-lock-screen
Element type	boolean
Class:	Machine

Enable Toolkit Accessibility

Whether toolkits should load accessibility related modules.

- Type: dconf
- Key: /org/gnome/desktop/interface/toolkit-accessibility
- Default: false

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	Computer Policies -> Ubuntu -> Login Screen -> Enable Toolkit Accessibility
Registry Key	Software\Policies\Ubuntu\gdm\dmconf\org\gnome\desktop\interface\toolkit-accessibility
Element type	boolean
Class:	Machine

3.7.2 User Policies

Ubuntu

Desktop

Accessibility

On-screen keyboard

Whether the on-screen keyboard is turned on.

- Type: dconf
- Key: /org/gnome/desktop/a11y/applications/screen-keyboard-enabled
- Default: false

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Accessibility -> On-screen keyboard
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\all\applications\screen-keyboard-enabled
Element type	boolean
Class:	User

Screen magnifier

Whether the screen magnifier is turned on.

- Type: dconf
- Key: /org/gnome/desktop/all\applications/screen-magnifier-enabled
- Default: false

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Accessibility -> Screen magnifier
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\all\applications\screen-magnifier-enabled
Element type	boolean
Class:	User

Screen reader

Whether the screen reader is turned on.

- Type: dconf
- Key: /org/gnome/desktop/all\applications/screen-reader-enabled
- Default: false

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Accessibility -> Screen reader
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\all\applications\screen-reader-enabled
Element type	boolean
Class:	User

Enable Toolkit Accessibility

Whether toolkits should load accessibility related modules.

- Type: dconf
- Key: /org/gnome/desktop/interface/toolkit-accessibility
- Default: false

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Accessibility -> Enable Toolkit Accessibility
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\interface\toolkit-accessibility
Element type	boolean
Class:	User

Background

Picture Options

Determines how the image set by wallpaper_filename is rendered. Possible values are “none”, “wallpaper”, “centered”, “scaled”, “stretched”, “zoom”, “spanned”.

- Type: dconf
- Key: /org/gnome/desktop/background/picture-options
- Default: ‘zoom’

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Valid values

- none
- wallpaper
- centered
- scaled
- stretched
- zoom
- spanned

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Background -> Picture Options
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\background\picture-options
Element type	dropdownList
Class:	User

Picture URI (dark)

URI to use for the background image. Note that the backend only supports local (file://) URIs.

- Type: dconf
- Key: /org/gnome/desktop/background/picture-uri-dark
- Default for 22.04: 'file:///usr/share/backgrounds/warty-final-ubuntu.png'
- Default for 24.04: 'file:///usr/share/backgrounds/ubuntu-wallpaper-d.png'
- Default for 24.10: 'file:///usr/share/backgrounds/ubuntu-wallpaper-d.png'

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Background -> Picture URI (dark)
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\background\picture-uri-dark
Element type	text
Class:	User

Picture URI

URI to use for the background image. Note that the backend only supports local (file://) URIs.

- Type: dconf
- Key: /org/gnome/desktop/background/picture-uri
- Default: 'file:///usr/share/backgrounds/warty-final-ubuntu.png'

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Background -> Picture URI
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\background\picture-uri
Element type	text
Class:	User

Keyboard shortcuts

Launch settings

Binding to launch GNOME Settings.

- Type: dconf
- Key: `/org/gnome/settings-daemon/plugins/media-keys/control-center`
- Default: [' ']

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Keyboard shortcuts -> Launch settings
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\settings-daemon\plugins\media-keys\control-center
Element type	multiText
Class:	User

Modifier to use for extended window management operations

This key will initiate the “overlay”, which is a combination window overview and application launching system. The default is intended to be the “Windows key” on PC hardware. It’s expected that this binding either the default or set to the empty string.

- Type: dconf
- Key: `/org/gnome/mutter/overlay-key`
- Default: ‘Super_L’

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Keyboard shortcuts -> Modifier to use for extended window management operations
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\mutter\overlay-key
Element type	text
Class:	User

Show the activities overview

- Type: dconf
- Key: /org/gnome/desktop/wm/keybindings/panel-main-menu
- Default: ['<Alt>F1']

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Keyboard shortcuts -> Show the activities overview
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\wm\keybindings\panel-main-menu
Element type	multiText
Class:	User

Launch terminal

Binding to launch the terminal.

- Type: dconf
- Key: /org/gnome/settings-daemon/plugins/media-keys/terminal
- Default: ['<Primary><Alt>t']

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Keyboard shortcuts -> Launch terminal
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\settings-daemon\plugins\media-keys\terminal
Element type	multiText
Class:	User

Keybinding to open the “Show Applications” view

Keybinding to open the “Show Applications” view of the Activities Overview.

- Type: dconf
- Key: /org/gnome/shell/keybindings/toggle-application-view
- Default: [“<Super>a”]

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Keyboard shortcuts -> Keybinding to open the “Show Applications” view
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\shell\keybindings\toggle-application-view
Element type	multiText
Class:	User

Keybinding to open the overview

Keybinding to open the Activities Overview.

- Type: dconf
- Key: /org/gnome/shell/keybindings/toggle-overview
- Default for 20.04: ["<Super>s"]
- Default for 22.04: ["<Super>s"]
- Default for 24.04: []
- Default for 24.10: []

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Keyboard shortcuts -> Keybinding to open the overview
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\shell\keybindings\toggle-overview
Element type	multiText
Class:	User

Screensaver

Disable lock screen

Prevent the user to lock his screen.

- Type: dconf
- Key: /org/gnome/desktop/lockdown/disable-lock-screen
- Default: false

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Screensaver -> Disable lock screen
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\lockdown\disable-lock-screen
Element type	boolean
Class:	User

Picture Options

Determines how the image set by `wallpaper_filename` is rendered. Possible values are “none”, “wallpaper”, “centered”, “scaled”, “stretched”, “zoom”, “spanned”.

- Type: dconf
- Key: `/org/gnome/desktop/screensaver/picture-options`
- Default: ‘zoom’

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Valid values

- none
- wallpaper
- centered
- scaled
- stretched
- zoom
- spanned

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Screensaver -> Picture Options
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\screensaver\picture-options
Element type	dropdownList
Class:	User

Picture URI

URI to use for the background image. Note that the backend only supports local (`file://`) URIs.

- Type: dconf
- Key: `/org/gnome/desktop/screensaver/picture-uri`
- Default: ‘`file:///usr/share/backgrounds/warty-final-ubuntu.png`’

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Screensaver -> Picture URI
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\screensaver\picture-uri
Element type	text
Class:	User

Show notifications in the lock screen

Whether notifications are shown in the lock screen or not.

- Type: dconf
- Key: /org/gnome/desktop/notifications/show-in-lock-screen
- Default: true

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Screensaver -> Show notifications in the lock screen
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\notifications\show-in-lock-screen
Element type	boolean
Class:	User

Shell**Clock****Whether the clock displays in 24h or 12h format**

Whether the clock displays in 24h or 12h format

- Type: dconf
- Key: /org/gnome/desktop/interface/clock-format
- Default: ‘24h’

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Valid values

- 24h
- 12h

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Shell -> Clock -> Whether the clock displays in 24h or 12h format
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\interface\clock-format
Element type	dropdownList
Class:	User

Show date in clock

If true, display date in the clock, in addition to time.

- Type: dconf
- Key: /org/gnome/desktop/interface/clock-show-date
- Default: true

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Shell -> Clock -> Show date in clock
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\interface\clock-show-date
Element type	boolean
Class:	User

Show weekday in clock

If true, display weekday in the clock, in addition to time.

- Type: dconf
- Key: /org/gnome/desktop/interface/clock-show-weekday
- Default: false

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Shell -> Clock -> Show weekday in clock
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\interface\clock-show-weekday
Element type	boolean
Class:	User

LockDown

Disable command line

Prevent the user from accessing the terminal or specifying a command line to be executed. For example, this would disable access to the panel's "Run Application" dialog.

- Type: dconf
- Key: /org/gnome/desktop/lockdown/disable-command-line
- Default: false

Note: default system value is used for "Not Configured" and enforced if "Disabled".

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Shell -> LockDown -> Disable command line
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\lockdown\disable-command-line
Element type	boolean
Class:	User

Disable log out

Prevent the user from logging out.

- Type: dconf
- Key: /org/gnome/desktop/lockdown/disable-log-out
- Default: false

Note: default system value is used for "Not Configured" and enforced if "Disabled".

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Shell -> LockDown -> Disable log out
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\lockdown\disable-log-out
Element type	boolean
Class:	User

Disable print setup

Prevent the user from modifying print settings. For example, this would disable access to all applications' "Print Setup" dialogs.

- Type: dconf
- Key: /org/gnome/desktop/lockdown/disable-print-setup
- Default: false

Note: default system value is used for "Not Configured" and enforced if "Disabled".

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Shell -> LockDown -> Disable print setup
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\lockdown\disable-print-setup
Element type	boolean
Class:	User

Disable printing

Prevent the user from printing. For example, this would disable access to all applications' "Print" dialogs.

- Type: dconf
- Key: /org/gnome/desktop/lockdown/disable-printing
- Default: false

Note: default system value is used for "Not Configured" and enforced if "Disabled".

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Shell -> LockDown -> Disable printing
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\lockdown\disable-printing
Element type	boolean
Class:	User

Disable saving files to disk

Prevent the user from saving files to disk. For example, this would disable access to all applications' "Save as" dialogs.

- Type: dconf
- Key: /org/gnome/desktop/lockdown/disable-save-to-disk
- Default: false

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Shell -> LockDown -> Disable saving files to disk
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\lockdown\disable-save-to-disk
Element type	boolean
Class:	User

Disable user switching

Prevent the user from switching to another account while his session is active.

- Type: dconf
- Key: /org/gnome/desktop/lockdown/disable-user-switching
- Default: false

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Shell -> LockDown -> Disable user switching
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\lockdown\disable-user-switching
Element type	boolean
Class:	User

Disable user administration

Stop the user from modifying user accounts. By default, we allow adding and removing users, as well as changing other users settings.

- Type: dconf
- Key: /org/gnome/desktop/lockdown/user-administration-disabled
- Default: false

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Shell -> LockDown -> Disable user administration
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\lockdown\user-administration-disabled
Element type	boolean
Class:	User

Notifications

Show notification banners

Whether notification banners are visible for application notifications.

- Type: dconf
- Key: /org/gnome/desktop/notifications/show-banners
- Default: true

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Shell -> Notifications -> Show notification banners
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\notifications\show-banners
Element type	boolean
Class:	User

List of desktop file IDs for favorite applications

The applications corresponding to these identifiers will be displayed in the favorites area.

- Type: dconf
- Key: /org/gnome/shell/favorite-apps
- Default for 20.04: ['ubiquity.desktop', 'firefox.desktop', 'thunderbird.desktop', 'org.gnome.Nautilus.desktop', 'rhythmbox.desktop', 'libreoffice-writer.desktop', 'snap-store_ubuntu-software.desktop', 'yelp.desktop']
- Default for 22.04: ['ubuntu-desktop-installer_ubuntu-desktop-installer.desktop', 'ubiquity.desktop', 'firefox_firefox.desktop', 'thunderbird.desktop', 'org.gnome.Nautilus.desktop', 'rhythmbox.desktop', 'libreoffice-writer.desktop', 'snap-store_ubuntu-software.desktop', 'yelp.desktop']
- Default for 24.04: ['ubuntu-desktop-bootstrap_ubuntu-desktop-bootstrap.desktop', 'firefox_firefox.desktop', 'thunderbird_thunderbird.desktop', 'org.gnome.Nautilus.desktop', 'org.gnome.Rhythmbox3.desktop', 'libreoffice-writer.desktop', 'snap-store_snap-store.desktop', 'yelp.desktop']

- Default for 24.10: ['ubuntu-desktop-bootstrap_ubuntu-desktop-bootstrap.desktop', 'firefox_firefox.desktop', 'thunderbird_thunderbird.desktop', 'org.gnome.Nautilus.desktop', 'org.gnome.Rhythmbox3.desktop', 'libreoffice-writer.desktop', 'snap-store_snap-store.desktop', 'yelp.desktop']

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Shell -> List of desktop file IDs for favorite applications
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\shell\favorite-apps
Element type	multiText
Class:	User

Have file manager handle the desktop

If set to true, then file manager will draw the icons on the desktop.

- Type: dconf
- Key: /org/gnome/desktop/background/show-desktop-icons
- Default: true

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Shell -> Have file manager handle the desktop
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\background\show-desktop-icons
Element type	boolean
Class:	User

Show applications button

Show applications button in the dash

- Type: dconf
- Key: /org/gnome/shell/extensions/dash-to-dock/show-show-apps-button
- Default: true

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Desktop -> Shell -> Show applications button
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\shell\extensions\dash-to-dock\show-show-apps-button
Element type	boolean
Class:	User

Peripherals

Whether to automatically mount media

If set to true, then Nautilus will automatically mount media such as user-visible hard disks and removable media on start-up and media insertion.

- Type: dconf
- Key: /org/gnome/desktop/media-handling/automount
- Default: true

Note: default system value is used for “Not Configured” and enforced if “Disabled”.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Peripherals -> Whether to automatically mount media
Registry Key	Software\Policies\Ubuntu\dconf\org\gnome\desktop\media-handling\automount
Element type	boolean
Class:	User

Session management

User Drive Mapping

User mounts

Define network shares that will be mounted for the client. If more shares are defined higher the GPO hierarchy, the entries listed here will be appended to the list and duplicates will be removed.

Values should be in the format: `://` e.g. `nfs://example_nfs.com/nfs_shared_dir`
`smb://example_smb.com/smb_shared_dir` `ftp://ftp_share_server.com`

This pattern must be followed, otherwise the policy will not be applied.

By the default, the mounts will be done in anonymous mode. In case of authentication needed, a krb5 tag can be added to the value, e.g. `[krb5]://`

If the tag is added, the mount will require Kerberos authentication in order to occur.

The supported protocols are the same as the ones supported by gvfs. They are listed on the man page of gvfs, under the gvfs-backends section: <https://manpages.ubuntu.com/manpages/jammy/en/man7/gvfs.7.html> It's up to the user to

ensure that the requested protocols are valid and supported and that the shared directories have the correct configuration for the requested connection.

- Type: mount
- Key: /user-mounts

Note:

- Enabled: The value(s) referenced in the entry are applied on the client machine.
- Disabled: The value(s) are removed from the target machine.
- Not configured: Value(s) declared higher in the GPO hierarchy will be used if available.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

An Ubuntu Pro subscription on the client is required to apply this policy.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Session management -> User Drive Mapping -> User mounts
Registry Key	Software\Policies\Ubuntu\mount\user-mounts
Element type	multiText
Class:	User

User Scripts

Logoff scripts

Define scripts that are executed when the user exits from last session. Those scripts are ordered, one by line, and relative to SYSVOL/ubuntu/scripts/ directory. Scripts from this GPO will be appended to the list of scripts referenced higher in the GPO hierarchy.

- Type: scripts
- Key: /logoff

Note: -

- Enabled: The scripts in the text entry are executed at user logoff time.
- Disabled: The scripts will be skipped. The set of scripts are per session, and refreshed only on new session creation.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

An Ubuntu Pro subscription on the client is required to apply this policy.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Session management -> User Scripts -> Logoff scripts
Registry Key	Software\Policies\Ubuntu\scripts\logoff
Element type	multiText
Class:	User

Logon scripts

Define scripts that are executed the first time an user logon until it exits from all sessions. Those scripts are ordered, one by line, and relative to SYSVOL/ubuntu/scripts/ directory. Scripts from this GPO will be appended to the list of scripts referenced higher in the GPO hierarchy.

- Type: scripts
- Key: /logon

Note: -

- Enabled: The scripts in the text entry are executed at user logon time.
- Disabled: The scripts will be skipped. The set of scripts are per session, and refreshed only on new session creation.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

An Ubuntu Pro subscription on the client is required to apply this policy.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Session management -> User Scripts -> Logon scripts
Registry Key	Software\Policies\Ubuntu\scripts\logon
Element type	multiText
Class:	User

User application confinement

AppArmor

Define an AppArmor user profile to be parsed and loaded on client machines. The profile is specified as a file path relative to the SYSVOL/ubuntu/apparmor/ directory. On the client machine, user profiles are stored in /etc/apparmor.d/adsys/users/, thus the administrator can reference abstractions and tunables shipped with the client distribution of AppArmor.

The profile will ideally contain a mapping between a user and a role. Roles must be configured beforehand in the System-wide application confinement section. Below is an example of a user profile declaration:

```
include <abstractions/authentication> include <abstractions/namespace>
```

```
capability dac_override, capability setgid, capability setuid, /etc/default/su r, /etc/environment r, @{HOME-  
DIRS}/.xauth* w, /usr/bin/{,b,d,rb}ash Px -> default_user, /usr/bin/{c,k,tc}sh Px -> default_user,
```

The GPO client will wrap this into an apparmor block declaration containing the client username. The default_user role must be declared beforehand in the Machine section. More details and examples can be found in the apparmor section of the adsys documentation.

The configured profile will override any profile referenced higher in the GPO hierarchy.

- Type: apparmor
- Key: /apparmor-users

Note: -

- Enabled: The profile in the text entry is applied on the client machine.

- Disabled: The profile is removed from the target machine, and any related rules are unloaded.
- Not configured: A profile declared higher in the GPO hierarchy will be used if available.

Supported on Ubuntu 20.04, 22.04, 24.04, 24.10.

An Ubuntu Pro subscription on the client is required to apply this policy.

Metadata

Element	Value
Location	User Policies -> Ubuntu -> Session management -> User application confinement -> AppArmor
Registry Key	Software\Policies\Ubuntu\apparmor\apparmor-users
Element type	text
Class:	User

3.8 Supported releases

ADSys is supported on Ubuntu starting from **20.04.2 LTS**, and tested with Windows Server 2019.

Only Active Directory on-premise is supported.

3.9 Recommended readings

- `adsysd help` or `man adsysd`.
- `adsysctl help` or `man adsysctl`.

EXPLANATION

Discussion and clarification of key topics.

4.1 Managers

ADSys supports a wide variety of managers to configure and control various aspects of the client systems.

Managers available with ADSys are

4.1.1 Dconf manager

The dconf manager allows to enforce default or custom [dconf settings](#) on the client.

Some settings are globally enforced on the machine while other are per-user specific settings.

Example of settings

- Change the login screen layout and background color.
- Set and lock the default applications in the launcher.
- Set and lock the user wallpaper.
- Set the date and time format of the clock.

Rules precedence

Any settings will override the same settings in less specific GPO.

Settings UI

Widgets

Depending on the type of settings, appropriate widgets are displayed to the AD system administrator. Those can be different per release if the type of settings changed.

States

Enabled

Setting a key to enabled will apply a value to any machines or user targeted by the GPO. It allows the Active Directory administrator to enter a value that will be applied to the target object (user or machine). This setting will be enforced on the client. Only an administrator of the client system can override it, but it will be reset to the Active Directory setting on next refresh.

The screenshot shows the 'Picture URI' configuration window. At the top, there are 'Previous Setting' and 'Next Setting' buttons. Below them are three radio buttons: 'Not Configured', 'Enabled' (which is selected), and 'Disabled'. To the right of these is a 'Comment:' text area. Below the radio buttons is a 'Supported on:' text area. The 'Options:' section contains three checkboxes for overriding values for different Ubuntu versions: 'Override value for 20.10:' with a text input field containing '/e/backgrounds/warty-final-ubuntu.png', 'Override value for 20.04:' with a text input field containing 'file:///usr/share/backgrounds/warty-fin', and a third checkbox that is not checked. The 'Help:' section contains the following text: 'URI to use for the background image. Note that the backend only supports local (file://) URIs.', '- Type: dconf', '- Key: /org/gnome/desktop/screensaver/picture-uri', '- Default: 'file:///usr/share/backgrounds/warty-final-ubuntu.png'', 'Note: default system value is used for "Not Configured" and enforced if "Disabled".', and 'Supported on Ubuntu 20.04, 20.10'. At the bottom right, there are 'OK', 'Cancel', and 'Apply' buttons.

Disabled

Setting a key to disabled will prevent user updates. However, no value can be explicitly entered by the Active Directory administrator. The default value of the client system will then be used (which may differ between machines).

Picture URI

Previous Setting Next Setting

Not Configured Comment:

Enabled

Disabled Supported on:

Options: Help:

Picture URI

Override value for 20.10:

Override value for 20.04:

URI to use for the background image. Note that the backend only supports local (file://) URIs.

- Type: dconf
- Key: /org/gnome/desktop/screensaver/picture-uri
- Default: 'file:///usr/share/backgrounds/warty-final-ubuntu.png'

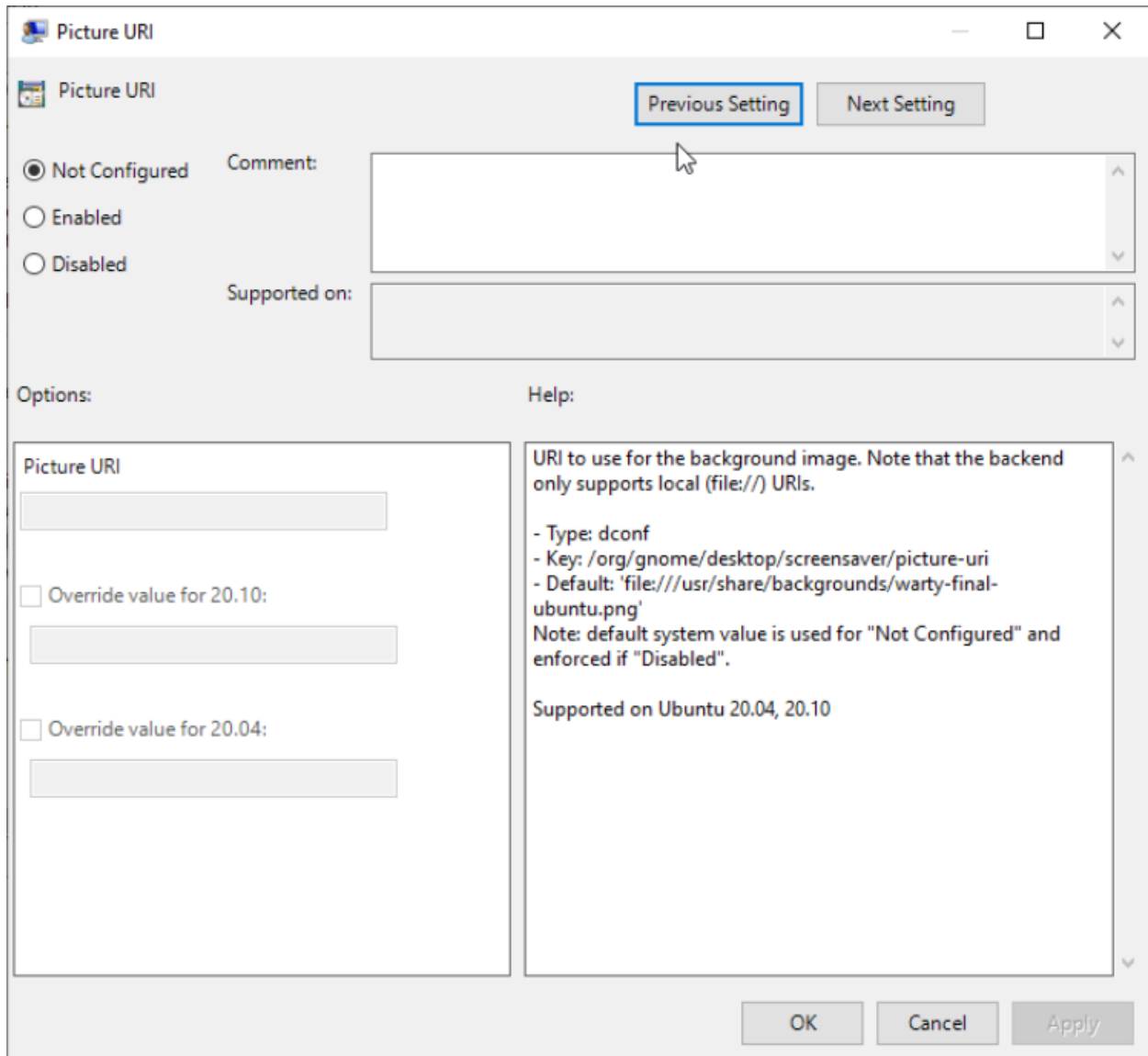
Note: default system value is used for "Not Configured" and enforced if "Disabled".

Supported on Ubuntu 20.04, 20.10

OK Cancel Apply

Not configured

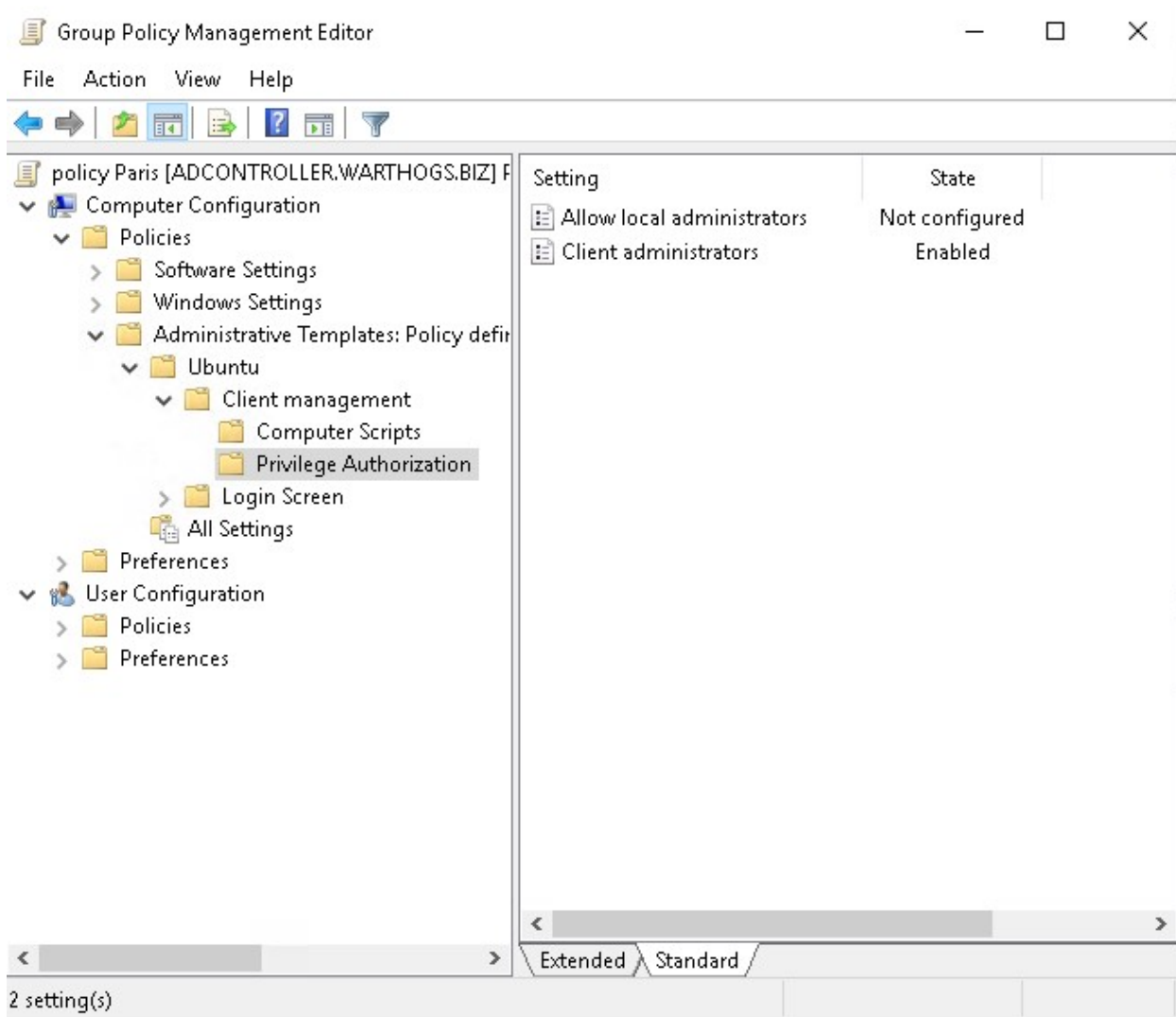
Finally, not configured is the default state. The setting is managed as usual directly on the client and without Active Directory.



4.1.2 Admin privileges management

The Admin privilege manager allows to grant or revoke superuser privileges for the default local user, and Active Directory users and groups.

All those settings are globally enforced on the machine and are available at `Computer Configuration > Policies > Administrative Templates > Ubuntu > Client management > Privilege Authorization`.



Feature availability

This feature is available only for subscribers of **Ubuntu Pro**.

Rules precedence

Any settings will override the same settings in less specific GPO.

What does administrator means?

Administrators:

- Can get administrators privileges and ran commands as such with `sudo`.
- Are considered **admin** for all `polkit` actions. If the current user is not an admin and a particular daemon require `polkit` administrator privilege, a prompt will allow you to choose an existing administrators to authenticate before performing the action.

Local user

Members of the local `sudo` group are administrators by default on the machine.

Not Configured or enabled

This status keep the default for the system: `sudo` group members are considered administrators on the client.

Disabled

`sudo` group members are not considered administrators on the client.

Note: you can grant specific users not necessarily in the `sudo` group administrator privileges with the “Client administrator option”.

Active Directory users and groups

Users and groups in the directory can be granted administrator privileges of the local machine with `sudo`.

Several users or groups or a set of both can be assigned.

The form is a list of users and group, one per line, `user@domain` for a user and `%group@domain` for a group.

Not Configured or disabled

There is no AD user or group configured with admin privileges for the machine.

Enabled

There is one or several AD user or group configured with admin privileges for the machine via the list under it.

Note: you can use this list to grant non-default local users matching the name on the client.

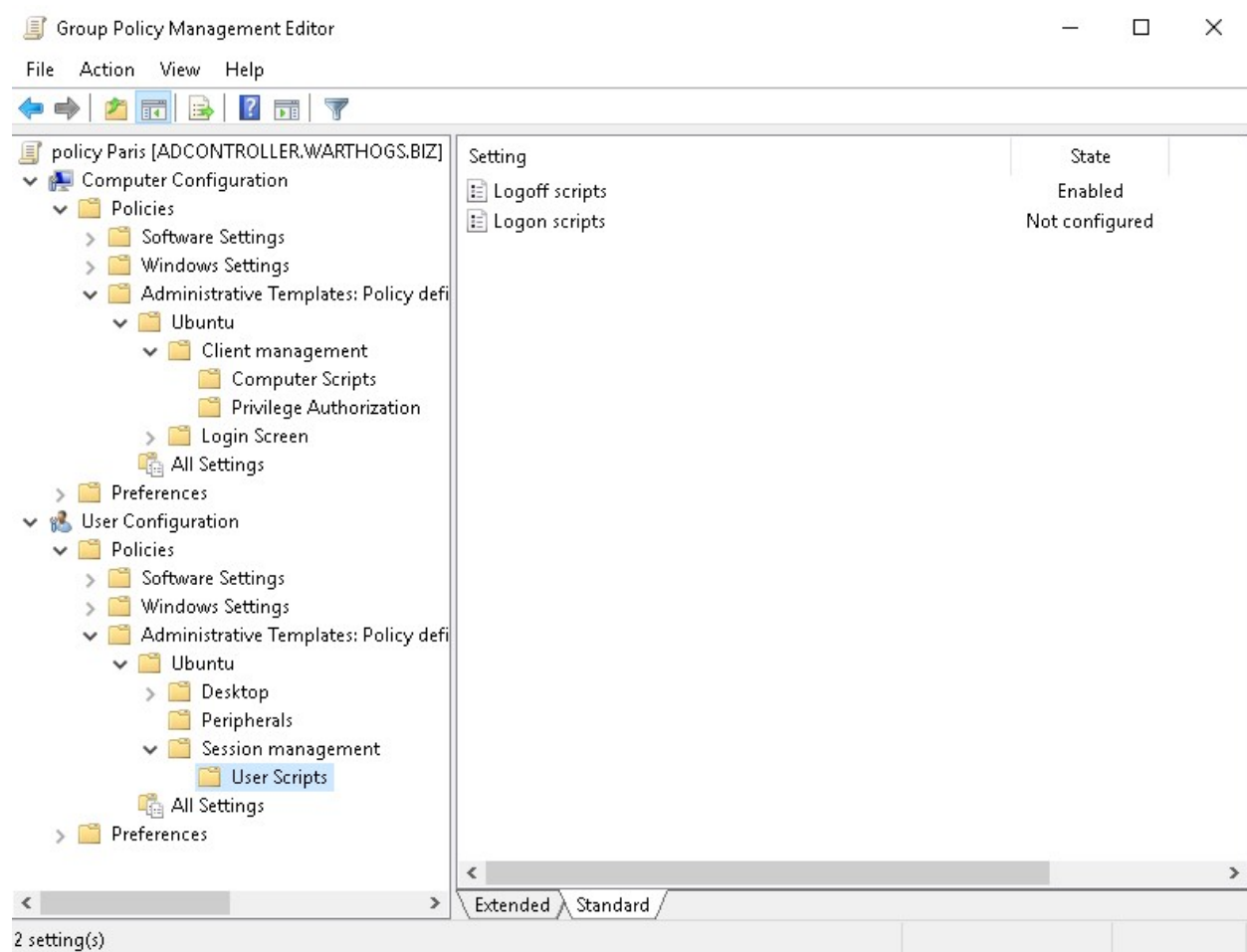
4.1.3 Scripts execution

The scripts managers allows AD administrators to target scripts to be executed on behalf of the client, or by users.

Those scripts, can be triggered on:

- Computer startup and shutdown. They are located in Computer Configuration > Policies > Administrative Templates > Ubuntu > Client management > Computer Scripts.
- User log on and log off. They are located in User Configuration > Policies > Administrative Templates > Ubuntu > Session management > User Scripts.

Scripts can be shell scripts, or any binary that can be executed on Linux.



Feature availability

This feature is available only for subscribers of **Ubuntu Pro**.

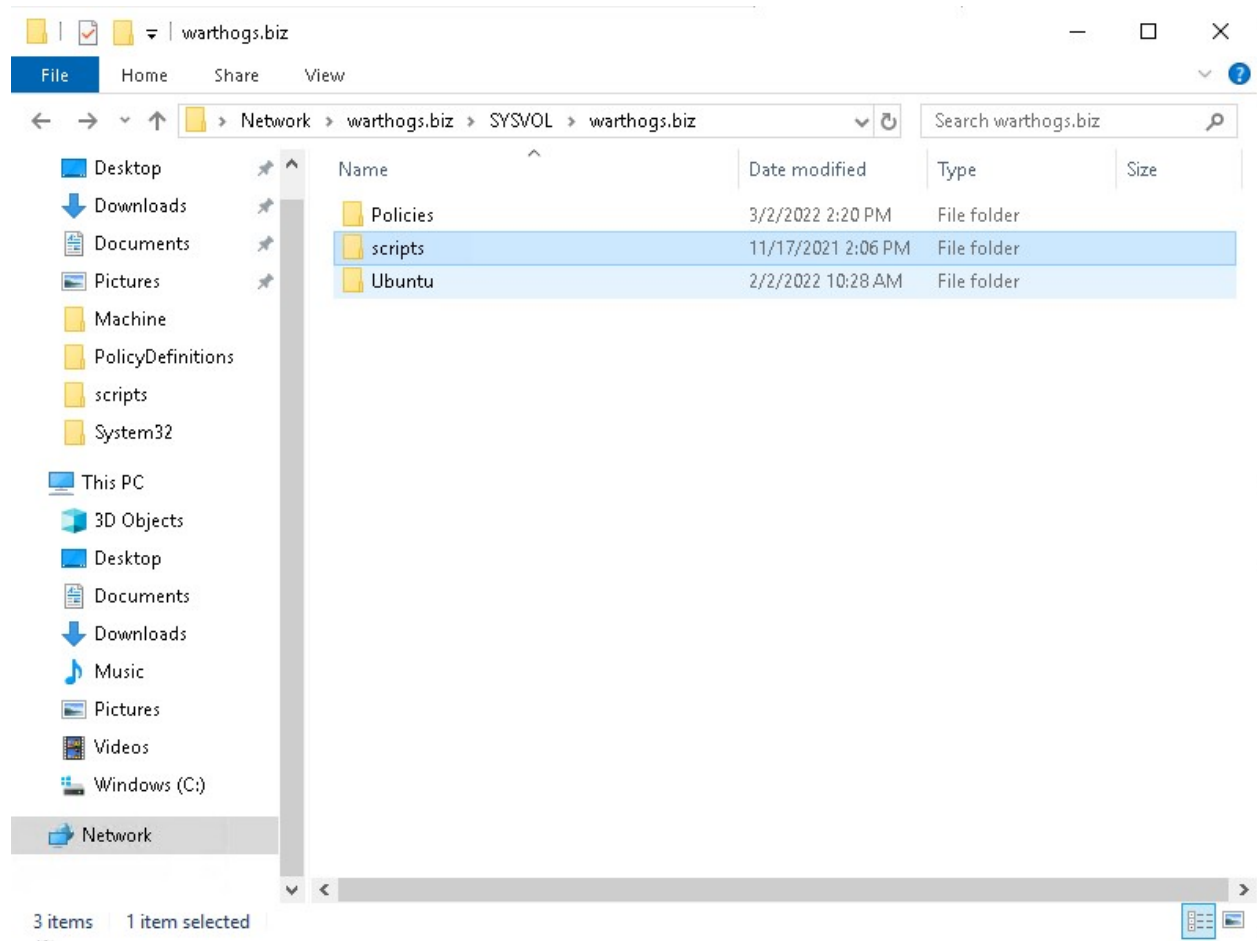
Rules precedence

Any settings will be additive to the same settings in less specific GPO. It means that scripts in the less specific GPO will be executed first.

Installing scripts on sysvol

Scripts must be available in the assets sharing directory on your Active Directory `sysvol/` samba share.

In this directory, next to `Policies` in your domain folder, create a directory matching your distribution name. For instance `Ubuntu`, which will be the assets sharing directory.



It must also contain a `GPT.ini` file of the form:

```
[General]
Version=22
displayName=Ubuntu Assets Directory
```

Every time you change the scripts, you need to increase the version stanza in the `GPT.ini` file (similarly to how Active Directory is doing automatically when you change any field). This will signal clients that a new version of assets (including scripts) are available and should be downloaded.

Then, place any scripts you need under the `scripts/` directory (subdirectories are allowed).

Automating the incrementation of the GPT.ini version stanza

Making manual changes to a file every time scripts are changed can be unproductive and tedious. For your convenience, we developed a tool to automate this process. For detailed usage and installation instructions please refer to the *Active Directory Watch Daemon* documentation.

Active directory UI

Enabled

The form is a list of scripts path, relative to the `scripts/` subdirectory of your assets sharing file system, one per line.

Startup scripts

Previous Setting Next Setting

Not Configured Comment:
 Enabled
 Disabled

Supported on:

Options: Help:

Startup scripts

script01.sh
script02
directory/script03.py

Override value for 23.04:

Override value for 22.10:

Define scripts that are executed on machine boot, once the GPO is downloaded. Those scripts are ordered, one by line, and relative to `SYSDVOL/ubuntu/scripts/` directory. Scripts from this GPO will be appended to the list of scripts referenced higher in the GPO hierarchy.

- Type: scripts
- Key: /startup

Note: -
* Enabled: The scripts in the text entry are executed at startup time.
* Disabled: The scripts will be skipped.
The set of scripts are per boot, and refreshed only on new boot of the machine.

Supported on Ubuntu 20.04, 22.04, 22.10, 23.04.

OK Cancel Apply

Not configured or Disabled

This GPO won't refer any scripts for execution.

Scripts behaviors

Scripts erroring out

If a script errors out on execution, it will not fail the session startup or the machine boot. However, some errors details will be available in systemd journal.

Incorrect script path reference

If a script referenced by a GPO doesn't exist or that the path is incorrect, then the policy will fail to be applied and any client startup or user log on will fail.

Transactional sessions

Scripts sessions are transitional: if you installed V1 of some scripts, and starts a session (computer startup or user log on), then you can be ensured that whatever version is updated on the Active Directory, you will exit the session with the same V1 version of the scripts you initially provided (computer log off or user log off).

However, even if **user1** has logged on with version V1 of the scripts and V2 is available, then any log on for **user2** will use the V2 of the scripts. **user1** though, is ensured to continue using the V1 version of the scripts.

4.1.4 Managing AppArmor profiles

The AppArmor manager allows to enforce custom [AppArmor](#) profiles on the client.

Custom AppArmor profiles can be enforced on a:

- System-wide level, located in `Computer Configuration > Policies > Administrative Templates > Ubuntu > Client management > System-wide application confinement > AppArmor`
- User level, located in `Computer Configuration > Policies > Administrative Templates > Ubuntu > Session management > User application confinement > AppArmor`

Feature availability

This feature is available only for subscribers of **Ubuntu Pro**.

Rules precedence

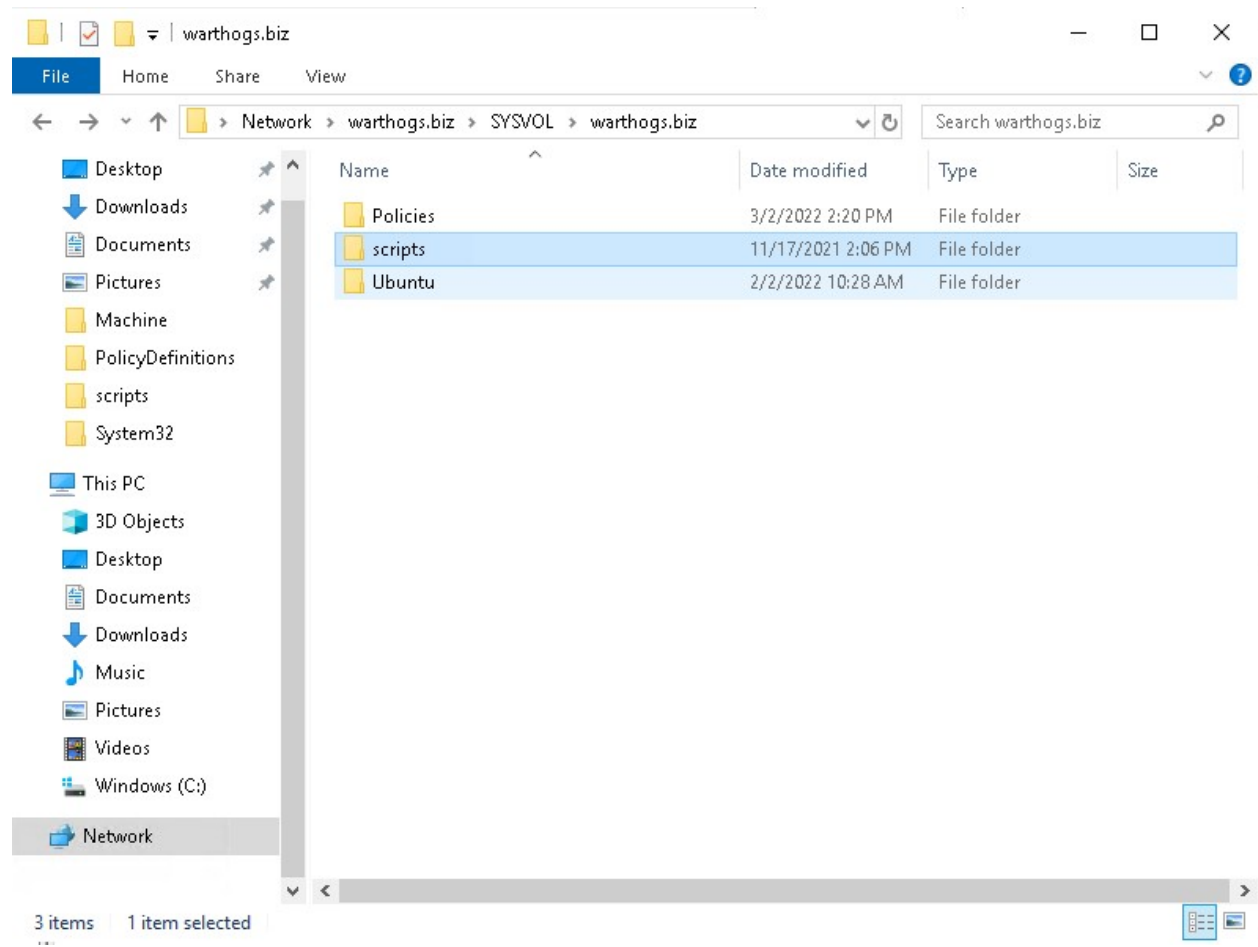
On a system-wide level, files in the entry are appended to the list of profiles referenced higher in the GPO hierarchy.

On a user level, the configured profile will override any profile referenced higher in the GPO hierarchy.

Installing AppArmor profiles on sysvol

AppArmor profiles must be available in the assets sharing directory on your Active Directory sysvol/ samba share.

In this directory, next to Policies in your domain folder, create a directory matching your distribution name. For instance Ubuntu, which will be the assets sharing directory.



It must also contain a GPT.ini file of the form:

```
[General]
Version=22
displayName=Ubuntu Assets Directory
```

Every time you change the contents of AppArmor profiles, you need to increase the version stanza in the GPT.ini file (similarly to how Active Directory is doing automatically when you change any field). This will signal clients that a new version of assets (including AppArmor profiles) are available and should be downloaded.

Then, place any AppArmor profiles you need under the apparmor/ directory (subdirectories are allowed).

Automating the incrementation of the GPT.ini version stanza

Making manual changes to a file every time AppArmor profiles are changed can be unproductive and tedious. For your convenience, we developed a tool to automate this process. For detailed usage and installation instructions please refer to the *Active Directory Watch Daemon* documentation.

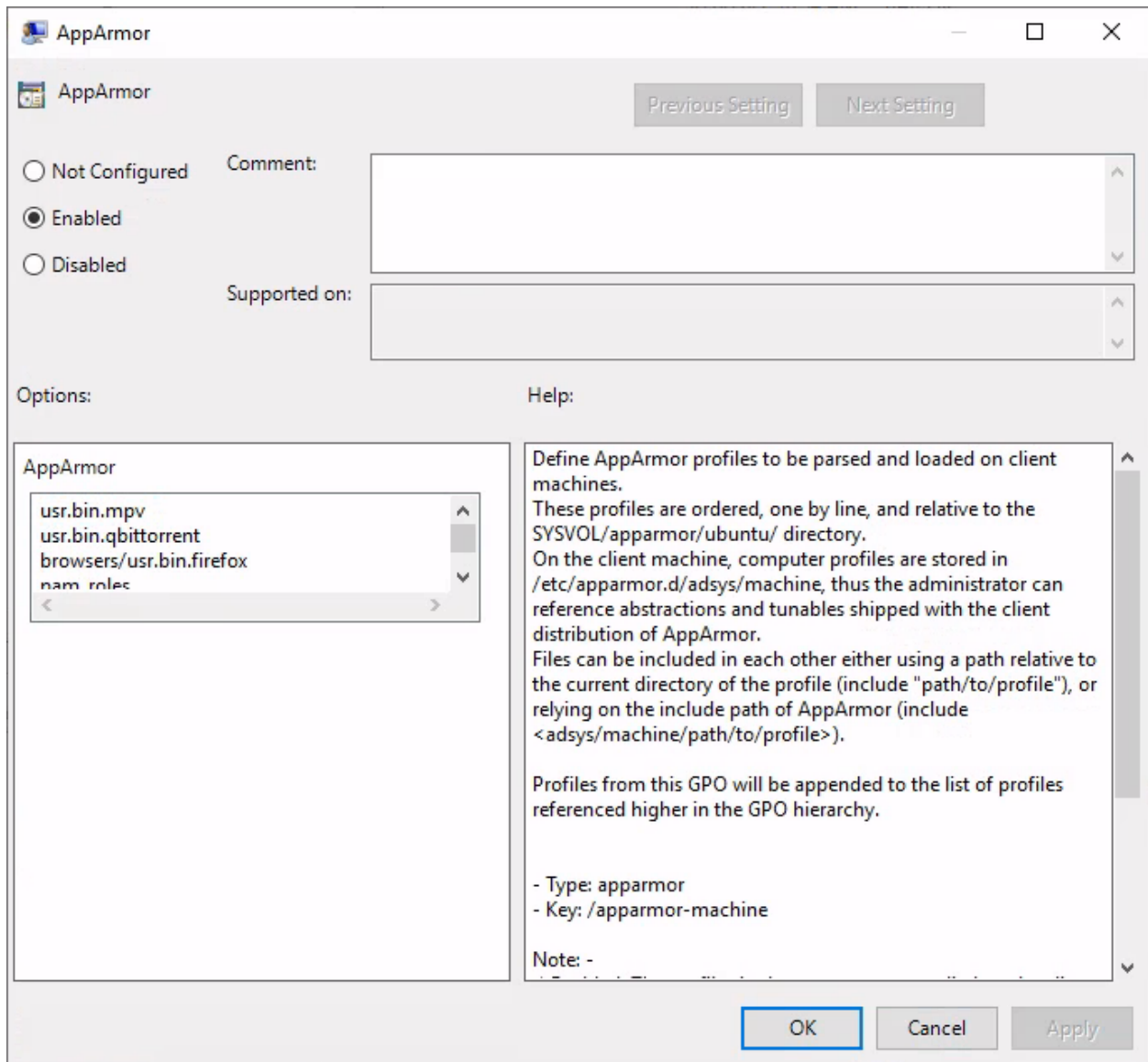
Developing AppArmor profiles

We highly recommend developing AppArmor profiles separately from ADSys, testing them, and only then integrating them with ADSys. Here are some resources to get you started:

- [How to create AppArmor Profile](#)
- [AppArmor Documentation](#)
- [The Comprehensive Guide To AppArmor](#)

System-wide profiles

The form is a list of AppArmor profile paths, relative to the `apparmor/` subdirectory of your assets sharing file system, one per line.



When set to enabled, adsys will load the configured AppArmor profiles on refresh. AppArmor's caching functionality is leveraged to ensure redundant reloads are kept to a minimum, i.e. a loaded profile will be parsed again only if a change occurred in the profile definition.

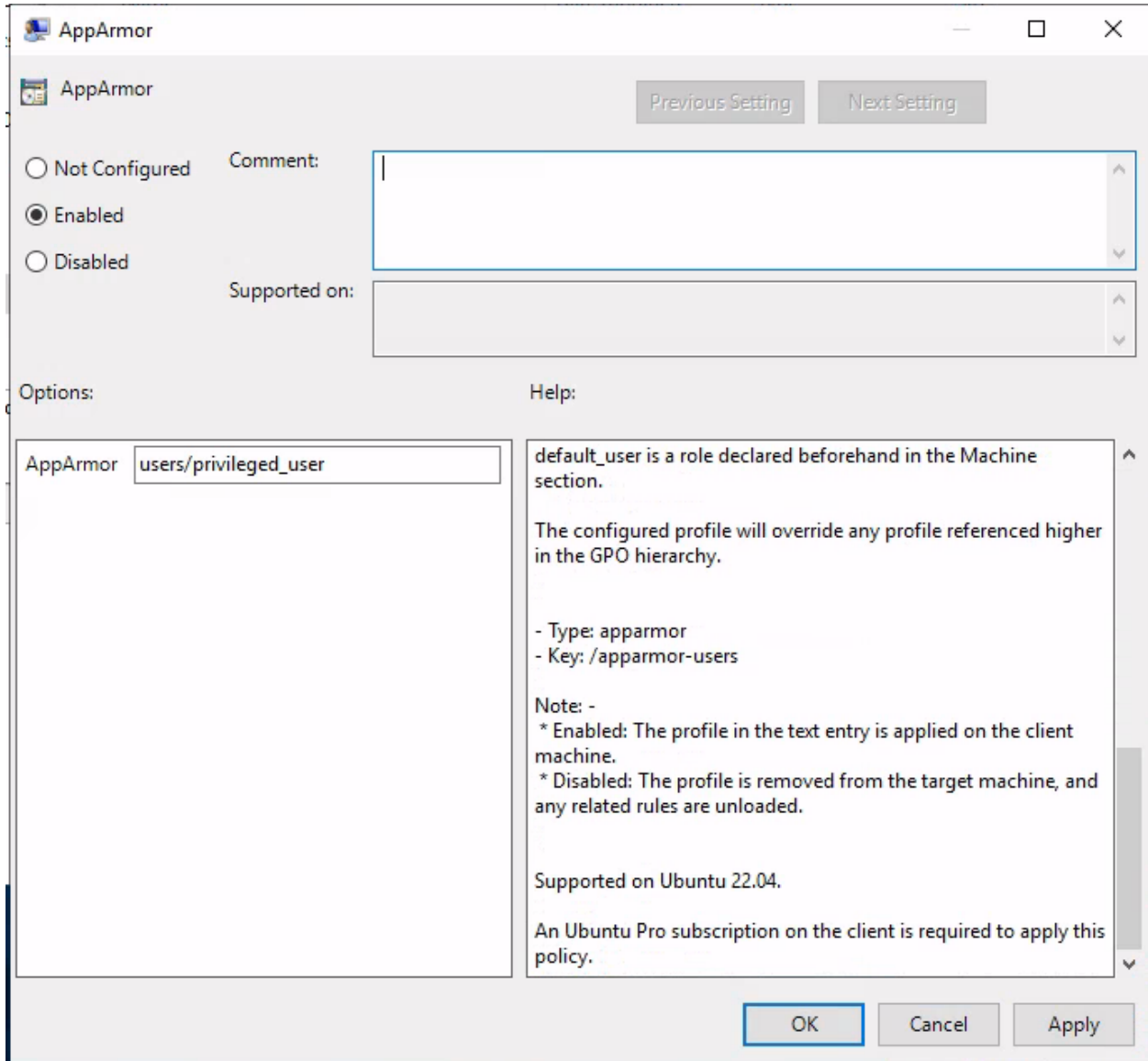
On the client machine, system-wide profiles are located under `/etc/apparmor.d/adsys/machine` by default.

When set disabled / not configured, ADSys will unload any previously loaded profiles (that were managed by ADSys) from the client machine.

User profiles

AppArmor supports confining executables on a user-by-user basis via the `pam_apparmor` PAM module. The module allows applications to confine authenticated users into subprofiles based on group names, user names, or a default profile. To accomplish this, `pam_apparmor` needs to be registered as a PAM session module. A [working example](#) can be found on the official AppArmor repository wiki.

The form accepts a path to a single file, relative to the `apparmor/` directory of your assets sharing file system.



Installing the AppArmor PAM module

The PAM module can be installed on Ubuntu using the following command:

```
sudo apt install libpam-apparmor
```

The module must then be configured manually for any desired executables. To enable it for the su command, append the following to the `/etc/pam.d/su` file:

```
session optional pam_apparmor.so order=user,default
```

Warning Even though GPOs can be applied to AD groups, the AppArmor policy manager currently only supports confining AD users, so we've omitted `group` from the PAM order.

User profile declaration syntax

As per the example linked above, the user profile is essentially a subprofile (also known as a *hat*) which needs to be included in the actual executable profile definition. The PAM module will then attempt to change *hats* into a subprofile containing the target user's name.

If a regular subprofile looks like the following (assuming `admin@domain.com` is the user we want to confine):

```
^admin@domain.com {
  #include <abstractions/authentication>
  #include <abstractions/nameservice>
  capability dac_override,
  capability setgid,
  capability setuid,
  /etc/default/su r,
  /etc/environment r,
  @{HOMEDIRS}/.xauth* w,
  /bin/{b,d,rb}ash Ux,
  /bin/{c,k,tc}sh Ux,
}
```

Its ADSys counterpart will omit the first and last lines which will be inferred automatically when policies are applied on the client machine. Thus, the subprofile declaration becomes:

```
#include <abstractions/authentication>
#include <abstractions/nameservice>
capability dac_override,
capability setgid,
capability setuid,
/etc/default/su r,
/etc/environment r,
@{HOMEDIRS}/.xauth* w,
/bin/{b,d,rb}ash Ux,
/bin/{c,k,tc}sh Ux,
```

When the policy is applied on the target machine, the user profile will be created in `/etc/apparmor.d/adsys/users/admin@domain.com`.

The user profile doesn't accomplish anything on its own until it is included in a system-wide profile definition. We recommend including the entire users directory in the profile declaration, as evidenced by the official `pam_apparmor` documentation.

It is also recommended to define a DEFAULT subprofile as part of the system-wide profiles to ensure `pam_apparmor` has a profile to switch to as a last resort if it cannot find a profile for the user.

```
/usr/bin/su {
  ...
  include "users"

  ^DEFAULT {
    capability dac_override,
    capability setgid,
    capability setuid,
    /etc/default/su r,
    /etc/environment r,
    @{HOMEDIRS}/.xauth* w,
    /usr/bin/{b,d,rb}ash Px -> default_user,
    /usr/bin/{c,k,tc}sh Px -> default_user,
  }
}
```

Profile parsing behaviors

Troubleshooting misbehaving user profiles

If you encounter issues with user profiles, it's always helpful to check the kernel buffer (`dmesg`) and the authentication logs at `/var/log/auth.log`. Additionally, appending `debug` to the PAM module declaration stanzas at `/etc/pam.d/` will log additional debug information, such as the profile that the module tries to switch to.

```
Nov 18 13:55:48 ubuntu2204 su: pam_unix(su:session): session opened for user_
↳ administrator@warthogs.biz(uid=1130200500) by root(uid=0)
Nov 18 13:55:48 ubuntu2204 su: pam_apparmor(su:session): Using username
↳ 'administrator@warthogs.biz'
```

In contrast, switching to a user with no declared profile and no default profile will print the following and restrict access entirely:

```
Nov 18 14:00:22 ubuntu2204 su: pam_unix(su:session): session opened for user_
↳ fry@warthogs.biz(uid=1130201105) by root(uid=0)
Nov 18 14:00:22 ubuntu2204 su: pam_apparmor(su:session): Using username 'fry@warthogs.biz
↳ '
Nov 18 14:00:22 ubuntu2204 su: pam_apparmor(su:session): Using DEFAULT
Nov 18 14:00:22 ubuntu2204 su: pam_apparmor(su:session): Can't change to any hat
Nov 18 14:00:22 ubuntu2204 su: pam_unix(su:session): session closed for user_
↳ fry@warthogs.biz
```

The PAM module goes through the order specified in the configuration (user, default), ultimately bailing and denying access if it cannot find any hat to switch to.

Error on loading profiles

ADSys relies on the `apparmor_parser` executable to parse, load, and unload profiles. If the command fails for any reason (e.g. syntax errors in profile declaration), loading profiles will be aborted and the output of the `apparmor_parser` command will be logged.

```
ERROR Error from server: error while updating policy: failed to apply policy to
↳ "ubuntu2204": can't apply apparmor policy to ubuntu2204: can't apply machine policy:␣
↳ failed to get apparmor policies: exit status 1
AppArmor parser error for /etc/apparmor.d/adsys/machine/pam_roles in profile /etc/
↳ apparmor.d/adsys/machine/pam_roles at line 9: Lexer found unexpected character: '<'␣
↳ (0x3c) in state: INITIAL
```

Invalid profile path reference

If an AppArmor profile referenced by a GPO doesn't exist or the path is incorrect, then the policy will fail to be applied and any client startup or user log on will fail.

4.1.5 Network shares

The mount managers allow AD administrators to specify network shares that must be mounted in the file system when a client logs in.

Feature Availability

This feature is available only for subscribers of **Ubuntu Pro**.

System mounts

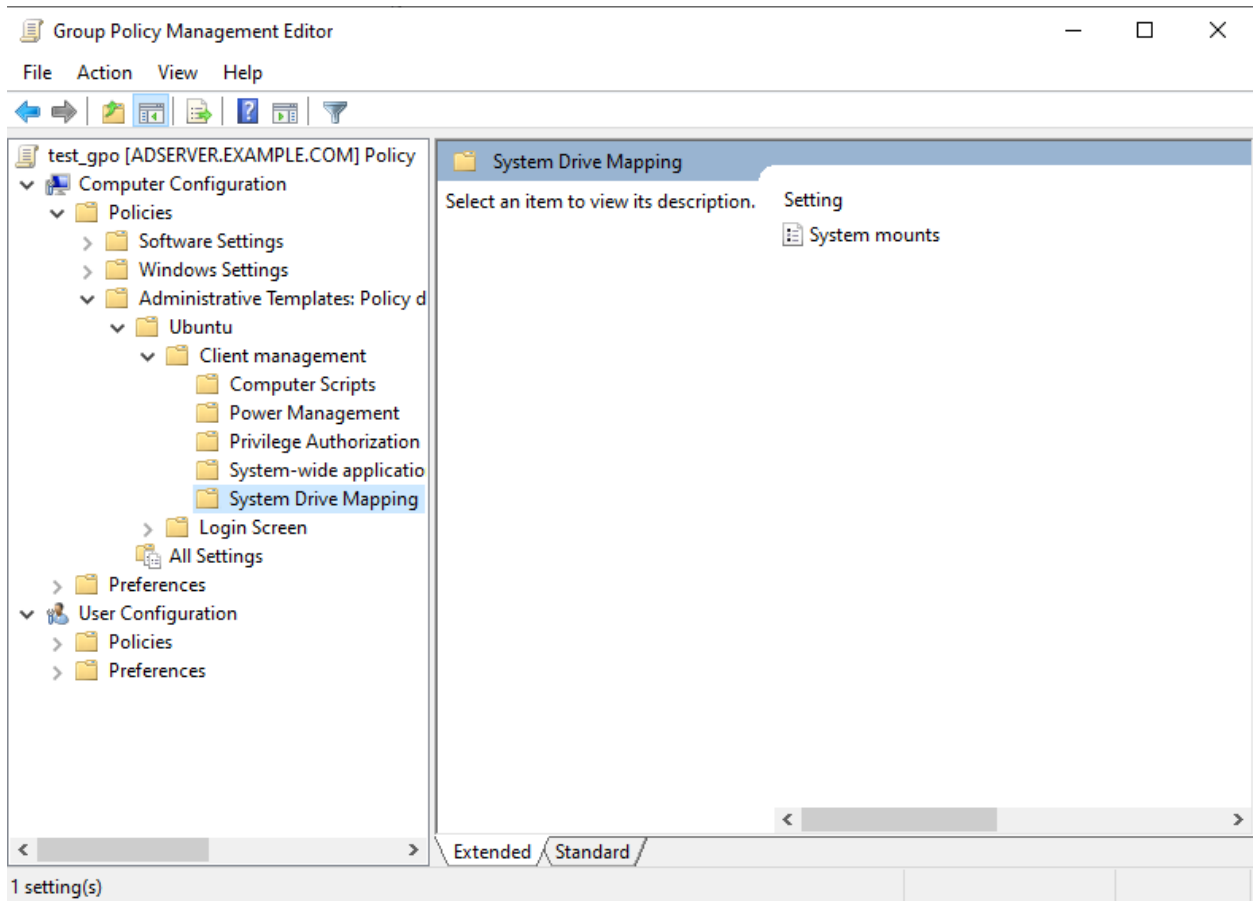
The mount process for these mounts is triggered at the moment a client logs in. System mounts are handled by `systemd` through unit files and happen at root level. Therefore, users do not have control over the mounting / unmounting process.

All protocols supported by the `mount` command should work out of the box. However, the only tested ones are `smb`, `ftp` and `nfs`.

The backends for the protocols `smb` and `nfs` are automatically enabled when installing the `adsys` package. In order to enable the backend for `ftp` mounts, the user must install the recommended `curlftpfs` package. This behavior is tested on Ubuntu and might differ on other Linux distributions.

Access control and file permissions should be configured on the shared location.

User mount policies are located under `Computer Configuration > Policies > Administrative Templates > Ubuntu > Client management > System Drive Mapping`, as shown in the following picture.



Setting up the policy

The form is a list of shared drives that should be mounted for the client machine. They must follow the structure `{protocol}://{host name or ip address}/{shared location}`.

The default mount behavior is to mount the listed shares anonymously. In order to require kerberos authentication for the mount process, the tag `[krb5]` can be added as a prefix to the listed share, i.e. `[krb5]{protocol}://{host name or ip address}/{shared location}`.

Additional mount options are not supported yet.

All entries must be separated by a line break.

System mounts

System mounts

Previous Setting Next Setting

Not Configured
 Enabled
 Disabled

Comment:

Supported on:

Options:

Help:

System mounts

protocol://hostname/anon_share
[krb5]protocol://hostname/krb_share

Override value for 23.04:

Override value for 22.10:

Define network shares that will be mounted for the system. If more shares are defined higher in the GPO hierarchy, the entries listed here will be appended to the list and duplicates will be removed.

Values should be in the format:
<protocol>://<hostname-or-ip>/<shared-dir>
e.g.
nfs://example_nfs.com/nfs_shared_dir
smb://example_smb.com/smb_shared_dir
ftp://ftp_share_server.com

This pattern must be followed, otherwise the policy will not be applied.

By default, the mounts will be done in anonymous mode. In case of authentication needed, a krb5 tag can be added to the value, e.g.
[krb5]<protocol>://<hostname-or-ip>/<shared-dir>

If the tag is added, the mount will require Kerberos

OK Cancel Apply

Rules precedence

The policy strategy is “append”. Therefore, if multiple policies defining network shares are to be applied to a client, all of the listed shares will be mounted.

Duplicated shares will be handled. Anonymous and authenticated shares of the same location are treated as duplicates and the first one listed will take precedence over the others.

Invalid mounts

ADSys will block client authentication only if the policy cannot be applied, meaning that the listed shares could not be set up. Any issues that arise after the setup process, such as an unreachable domain or a non-existent share, will be reported as an error. Refer to the system logs for more details about the failures.

Unmounting

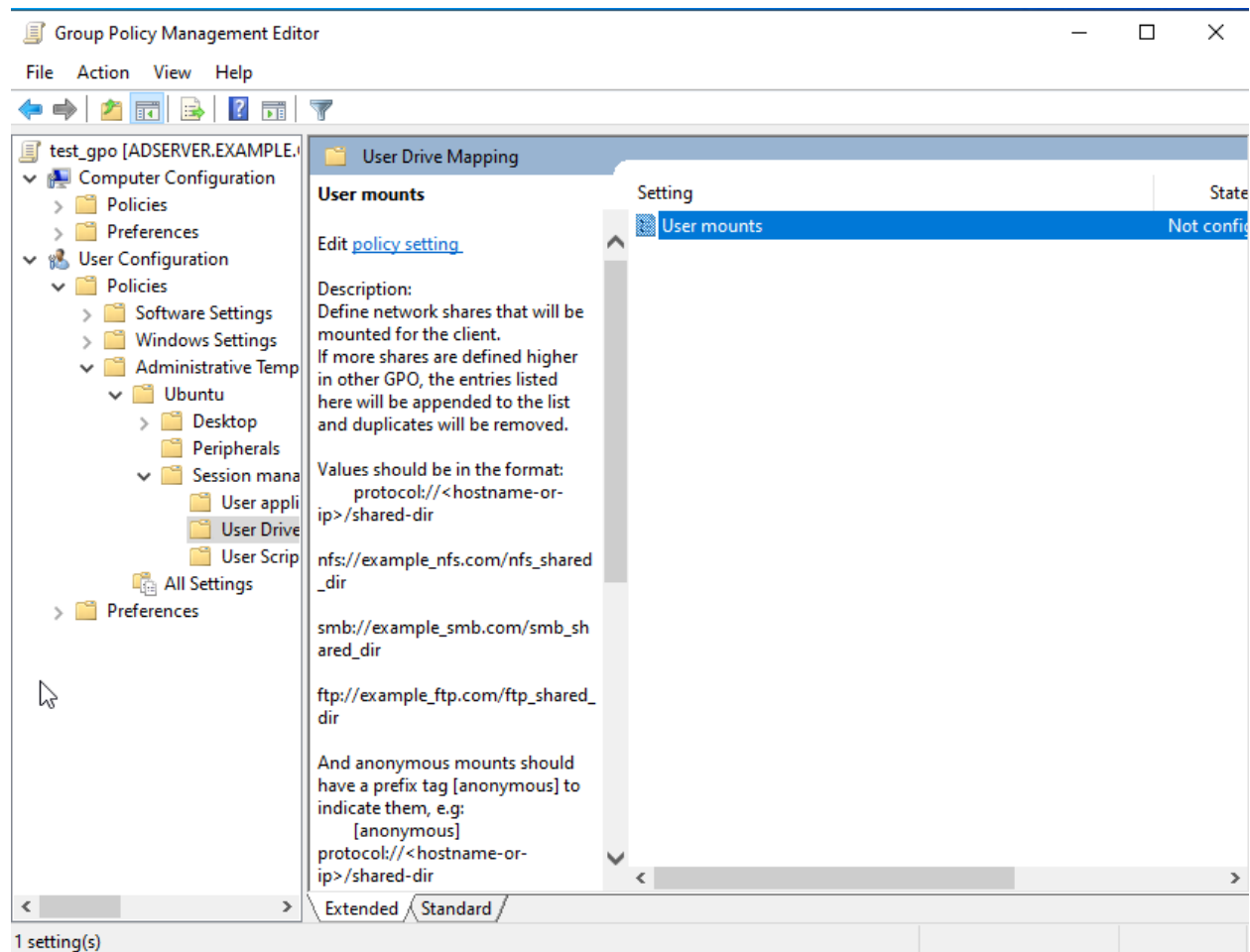
The unmounting process is handled by systemd on shutdown.

User mounts

The mount process for these mounts is triggered at the moment a user logs in. User mounts are accessible in the file manager and the user has the ability to unmount them manually.

Credentials authentication for mounts are disabled on ADSys. Instead, authentication is done with the Kerberos ticket present on the machine. If the mount is set to anonymous, then the administrator must ensure that the shared drive supports anonymous access and that the permissions for the directory are set accordingly.

User mount policies are located under **User Configuration > Policies > Administrative Templates > Ubuntu > Session management > User Drive Mapping**, as shown in the following picture.



Setting up the policy

The format is a list of shared drives that should be mounted for the user. They must follow the structure {protocol}://{host name or ip address}/{shared location}. If the drive is to be mounted anonymously, the tag [anonymous] should be added as a prefix to the listed entry, i.e. [anonymous]{protocol}://{host name or ip address}/{shared location}.

All entries must be separated by a line break.

The screenshot shows the 'User mounts' configuration window. It includes a title bar, window controls, and a 'Previous Setting' / 'Next Setting' navigation bar. The main area has radio buttons for 'Not Configured' (selected), 'Enabled', and 'Disabled'. To the right is a 'Comment:' text area and a 'Supported on:' dropdown. Below are 'Options:' and 'Help:' sections. The 'Options:' section contains a list box for 'User mounts'. The 'Help:' section contains a text area with instructions: 'Define network shares that will be mounted for the client. If more shares are defined higher in other GPO, the entries listed here will be appended to the list and duplicates will be removed. Values should be in the format: protocol://<hostname-or-ip>/shared-dir, nfs://example_nfs.com/nfs_shared_dir, smb://example_smb.com/smb_shared_dir, ftp://example_ftp.com/ftp_shared_dir. And anonymous mounts should have a prefix tag [anonymous] to indicate them, e.g: [anonymous]protocol://<hostname-or-ip>/shared-dir. The supported protocols are the same as the ones supported by gvfs. They are listed on the man page of gvfs, under the gvfs-backends section: https://manpages.ubuntu.com/manpages/jammy/en/man7/gvfs.7.html. If an entry is not formatted accordingly, it will be ignored or an error may occur.' At the bottom right are 'OK', 'Cancel', and 'Apply' buttons.

The mount process is handled with GVfs and it defines in which directory the shared drive will be mounted into. Usually, it's mounted under `/run/user/%U/gvfs/`.

Rules precedence

The policy strategy is “append”. Therefore, if multiple policies defining mount locations are to be applied to a user, all of the listed entries will be mounted.

Invalid mounts

If the mounting of an entry listed in the policy fails, ADSys will proceed with the other entries in the policy, mounting those it can and logging those that cannot be mounted.

Unmounting

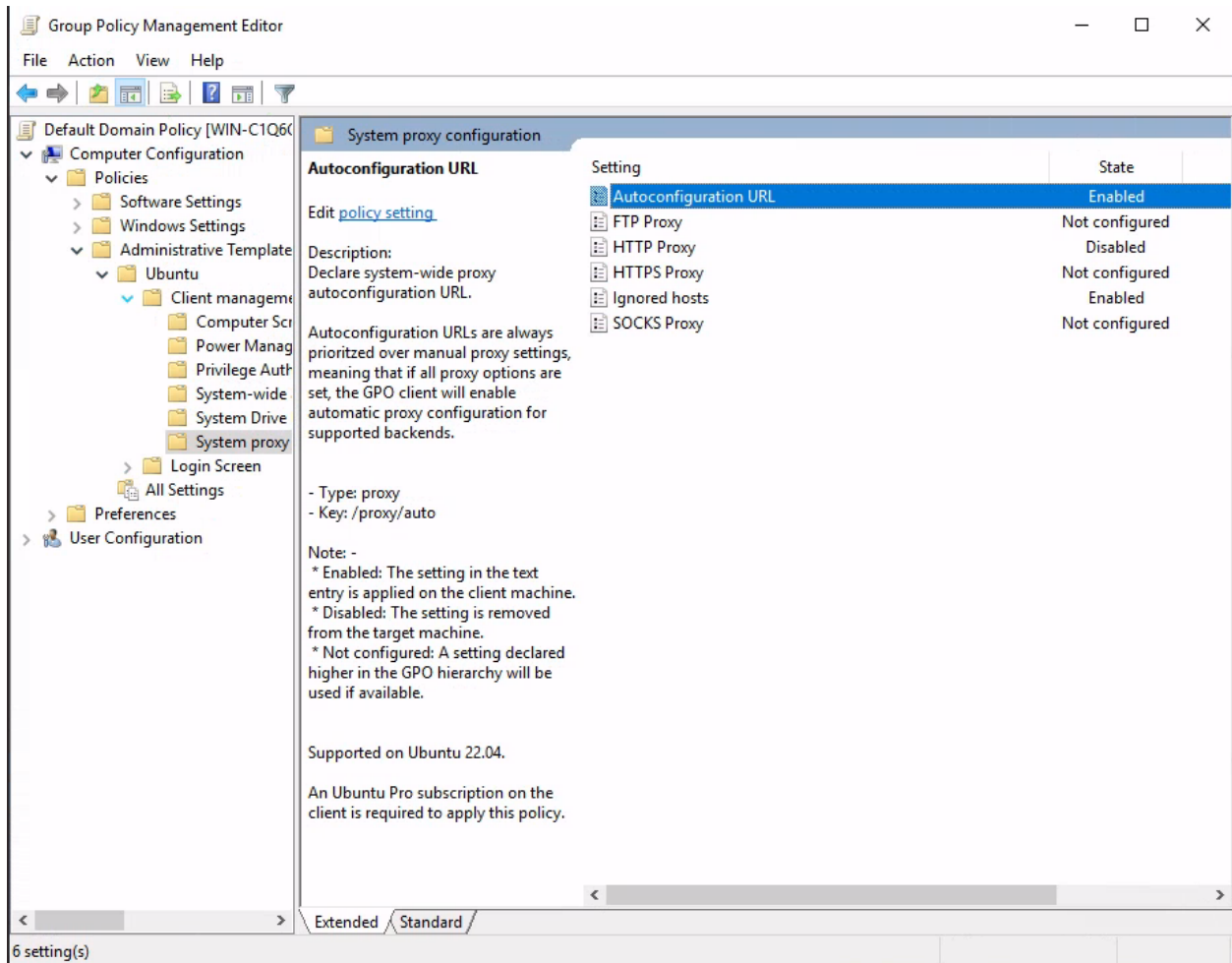
The unmounting process is handled by systemd at the end of the session.

4.1.6 Network Proxy

The proxy manager allows AD administrators to apply proxy settings on the clients. Currently, only system-wide proxy settings are supported.

Proxy settings are configurable under the following GPO path:

- System-wide level, located in `Computer Configuration > Policies > Administrative Templates > Ubuntu > Client management > System proxy configuration`



Feature availability

This feature is available only for subscribers of **Ubuntu Pro**.

Additionally, the `ubuntu-proxy-manager` package must be installed in order for proxy settings to be applied on the client system. On Ubuntu systems, run the following to install the package:

```
sudo apt install ubuntu-proxy-manager
```

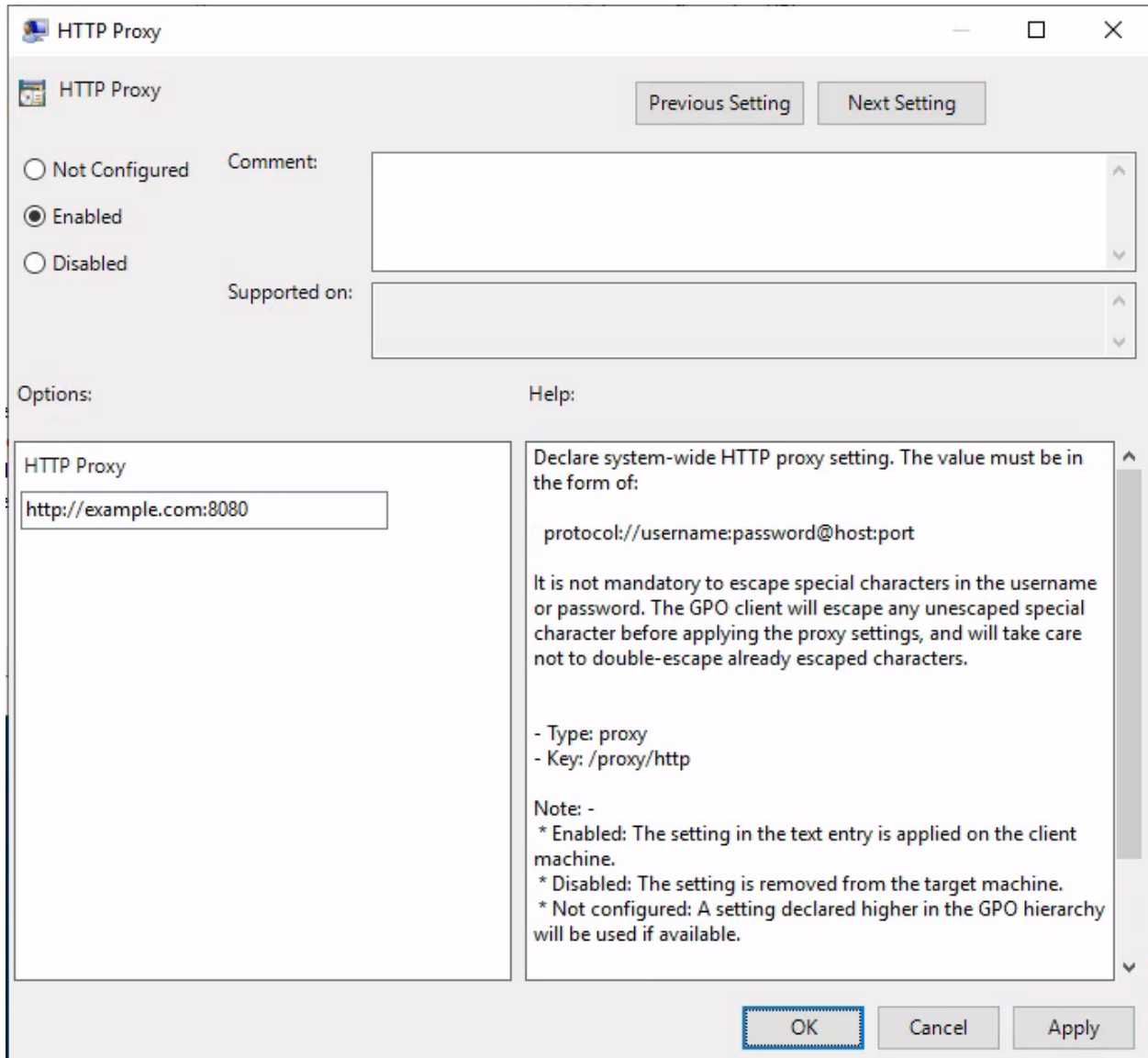
Rules precedence

Configured proxy settings will override any settings referenced higher in the GPO hierarchy.

Setting up the policy

The System proxy configuration category provides a list of configurable proxy settings:

- HTTP Proxy
- HTTPS Proxy
- FTP Proxy
- SOCKS Proxy
- Ignored hosts
- Auto configuration URL



Configured settings will then be forwarded to `ubuntu-proxy-manager` which will apply them on all supported backends (e.g. environment variables, APT, GSettings). For an up-to-date list of supported backends, proxy formats and behaviors, refer to the `ubuntu-proxy-manager` [documentation](#).

Disabling proxy settings

To disable or remove proxy settings, either set the required values to an empty value (""), or mark the setting as `Disabled`.

Note that if none of the proxy settings in the category are set (all settings are `Not Configured`), the proxy manager won't take any action.

Troubleshooting manager errors

If any proxy GPOs are configured and the `ubuntu-proxy-manager` package is not installed (specifically, no response is received from the D-Bus call on the object exported by the proxy manager service), the manager will fail hard. The package doesn't need to be installed if no proxy entries are configured.

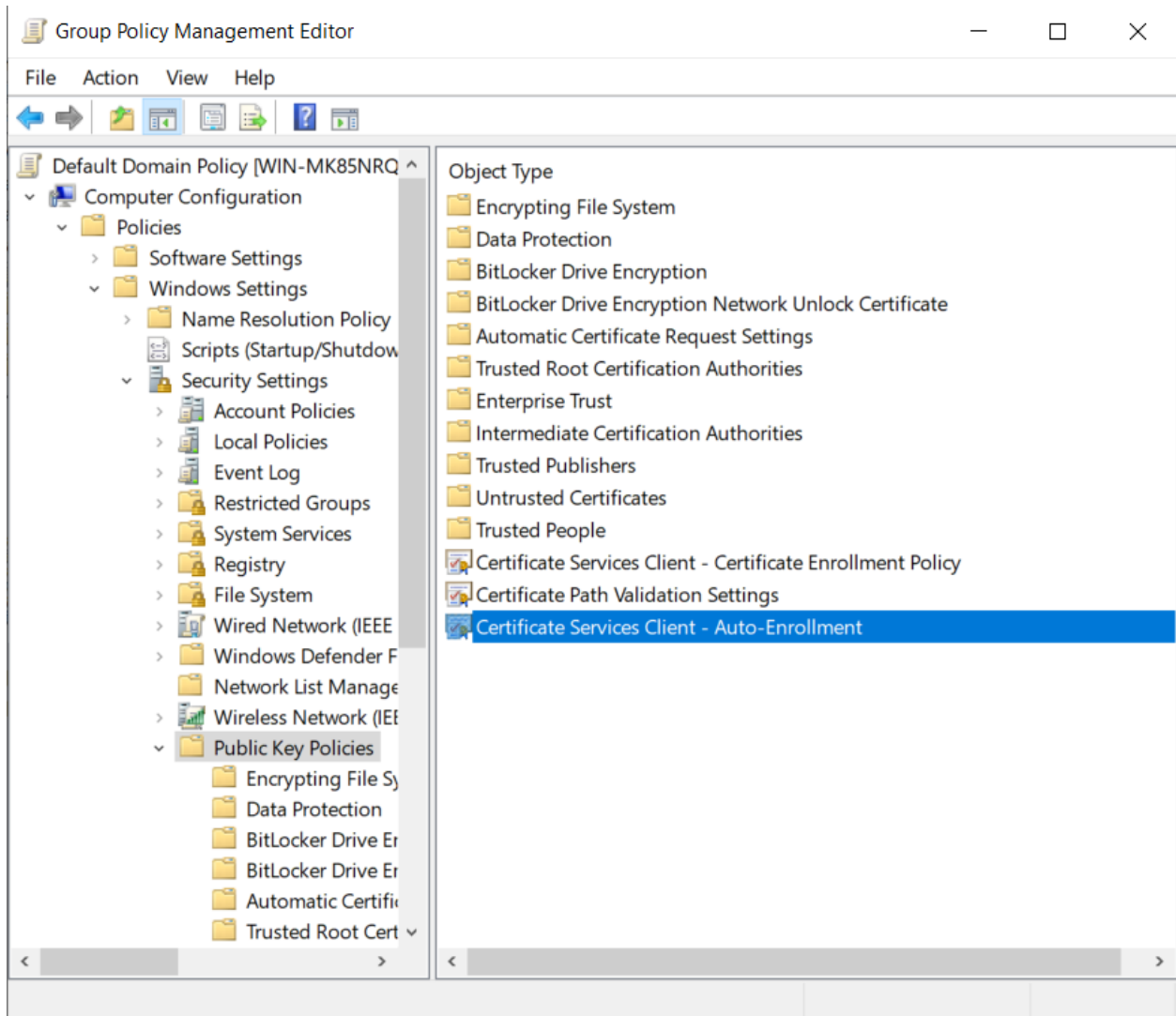
If proxy application fails for other reasons, refer to the [Troubleshooting](#) section of the `ubuntu-proxy-manager` documentation for details on how to debug the D-Bus service.

4.1.7 Certificate auto-enrollment

The certificate policy manager allows clients to enroll for certificates from **Active Directory Certificate Services**. Certificates are then continuously monitored and refreshed by the `certmonger` daemon. Currently, only machine certificates are supported.

Unlike the other ADSys policy managers which are configured in the special Ubuntu section provided by the ADMX files (Administrative Templates), settings for certificate auto-enrollment are configured in the Microsoft GPO tree:

- Computer Configuration > Policies > Windows Settings > Security Settings > Public Key Policies > Certificate Services Client - Auto-Enrollment



Feature availability

This feature is available only for subscribers of **Ubuntu Pro** and has been tested and known to work on all Ubuntu versions starting with 22.04 (Jammy).

Additionally, the following packages must be installed on the client in order for auto-enrollment to work:

- `certmonger` - daemon that monitors and updates certificates
- `cepces` - `certmonger` extension that can communicate with **Active Directory Certificate Services**

On Ubuntu systems, run the following to install them:

```
sudo apt install certmonger python3-cepces
```

On the Windows side, the following roles must be installed and configured:

- Certification Authority
- Certificate Enrollment Policy Web Service
- Certificate Enrollment Web Service

Rules precedence

Auto-enrollment configuration will override any settings referenced higher in the GPO hierarchy.

Policy configuration

Certificate auto-enrollment is configured by setting the **Configuration Model** to **Enabled** and ticking the following checkbox: **Update certificates that use certificate templates**.

Certificate Services Client - Auto-Enrollment Properties ? X

Enrollment Policy Configuration

Enroll user and computer certificates automatically

Configuration Model: Enabled

Renew expired certificates, update pending certificates, and remove revoked certificates

Update certificates that use certificate templates

Log expiry events and show expiry notifications when the percentage of remaining certificate lifetime is

10 %

Additional stores. Use "," to separate multiple stores. For example: "Store1, Store2, Store3"

OK Cancel Apply

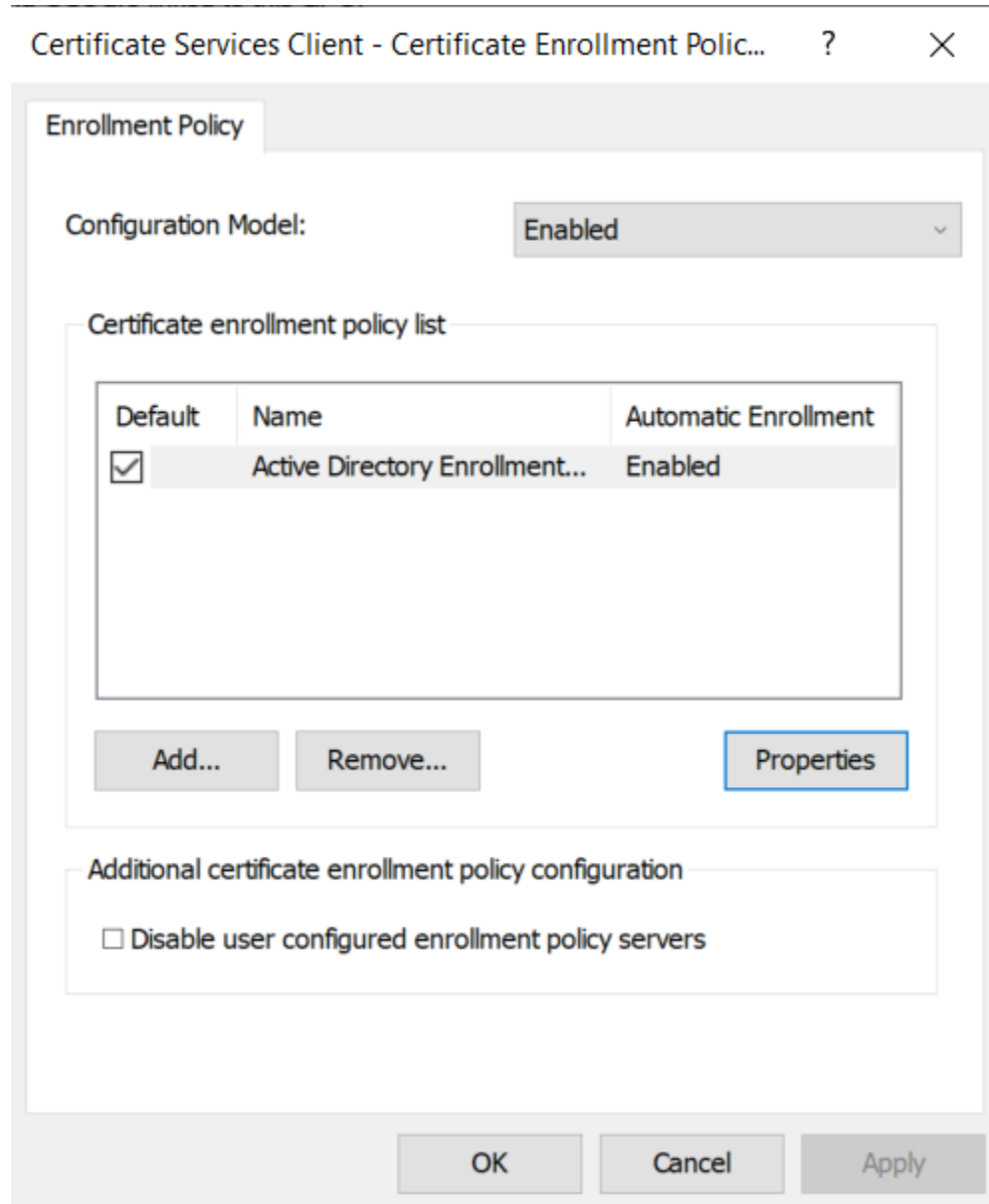
The policy can be disabled by performing *any* of the following:

- unticking the **Update certificates that use certificate templates** checkbox
- setting the **Configuration Model** to **Disabled** or **Not configured**

The other settings in this GPO entry do not affect ADSys in any way.

For more advanced configuration, a list of policy servers can be specified in the following GPO entry:

- Computer Configuration > Policies > Windows Settings > Security Settings > Public Key Policies > Certificate Services Client - Certificate Enrollment Policy



Applying the policy

On the client system, a successful auto-enrollment will place certificate data in the following paths:

- /var/lib/adsys/certs - certificate data
- /var/lib/adsys/private/certs - private key data
- /usr/local/share/ca-certificates - root certificate data (symbolic link pointing to /var/lib/adsys/certs)

For detailed information on the tracked certificates, certmonger can be directly interacted with:

```
# Query monitored certificates
> getcert list
Number of certificates and requests being tracked: 1.
Request ID 'galacticcafe-CA.Machine':
  status: MONITORING
  stuck: no
  key pair storage: type=FILE,location='/var/lib/adsys/private/certs/galacticcafe-CA.
↳Machine.key'
  certificate: type=FILE,location='/var/lib/adsys/certs/galacticcafe-CA.Machine.crt'
  CA: galacticcafe-CA
  issuer: CN=galacticcafe-CA,DC=galacticcafe,DC=com
  subject: CN=keypress.galacticcafe.com
  issued: 2023-08-18 18:44:27 EEST
  expires: 2024-08-17 18:44:27 EEST
  dns: keypress.galacticcafe.com
  key usage: digitalSignature,keyEncipherment
  eku: id-kp-clientAuth,id-kp-serverAuth
  certificate template/profile: Machine
  profile: Machine
  pre-save command:
  post-save command:
  track: yes
  auto-renew: yes

# Query known CAs
> getcert list-cas
(...)
CA 'galacticcafe-CA':
  is-default: no
  ca-type: EXTERNAL
  helper-location: /usr/libexec/certmonger/cepces-submit --server=win-mk85nrq26nu.
↳galacticcafe.com --auth=Kerberos
```

Policy implementation

With the exception of policy parsing, ADSys leverages the Samba implementation of certificate auto-enrollment. As this feature is only available in newer versions of Samba, we have taken the liberty of vendoring the required Samba files to allow this policy to work on Ubuntu versions that ship an older Samba version. These files are shipped in `/usr/share/adsys/python/vendor_samba`.

To ensure idempotency when applying the policy, we set up a Samba [TDB cache file](#) at `/var/lib/adsys/samba/cert_gpo_state_$(hostname).tdb` which contains various information pertaining to the enrolled certificate(s).

Here is an overview of what happens during policy application:

- GPO parsing (ADSys)
- execute Python helper script (ADSys)
- fetch root CA and policy servers (Samba)
- start monitoring certificate using `certmonger` and `cepces` (Samba)

Troubleshooting

Some dependencies are not available in the client Ubuntu installation

While `certmonger` has been available for a while in Ubuntu, `python3-cepces` is a new package, available starting with Ubuntu 23.10. If unavailable on the client version, it can also be manually installed from the [source repository](#). The certificate policy manager only checks for the existence of the `cepces-submit` and `getcert` binaries, not their respective packages, in order to allow some wiggle room for this.

Manipulating certificates with `getcert`

While not encouraged, certificates can be manipulated with the same tool. This could be helpful for debugging purposes.

```
# Regenerate a certificate
> getcert rekey -i galacticcafe-CA.Machine
Resubmitting "galacticcafe-CA.Machine" to "galacticcafe-CA".

# Unmonitor a certificate
> getcert stop-tracking -i galacticcafe-CA.Machine
Request "galacticcafe-CA.Machine" removed.

# Remove CA
> getcert remove-ca -c galacticcafe-CA
CA "galacticcafe-CA" removed.
```

Note that tampering with certificate data outside of ADSys (e.g. manually unmonitoring using `getcert`) will render the GPO cache obsolete as it will cause a drift between the actual state and the “known” cached state. In this case, it’s best to remove the cache file at `/var/lib/adsys/samba/*.tdb` together with any enrolled certificates and CAs to ensure a clean slate.

Debugging auto-enroll script

While certificate parsing happens in ADSys itself, enrollment is done via an embedded Python helper script. For debugging purposes, it can be dumped to the current directory and made executable by executing the following commands:

```
> adsysctl policy debug cert-autoenroll-script
> chmod +x ./cert-autoenroll
```

Before executing the script manually, the following environment variables have to be set:

```
export PYTHONPATH=/usr/share/adsys/python
export KRB5CCNAME=/var/run/adsys/krb5cc/$(hostname)
```

Then, run the script passing the required arguments (the argument list is also printed in the ADSys debug logs during policy application):

```
# Un-enroll machine
> ./cert-autoenroll unenroll keypress galacticcafe.com --state_dir /var/lib/adsys --debug
```

Errors communicating with the CEP/CES servers

If ADSys successfully applies the policy but `getcert list` does not list the certificates or they are in an unexpected state, check the `certmonger` logs for details (`journalctl -u certmonger`). Additionally, debug logging for `cepces` can be enabled by editing the logging configuration at `/etc/cepces/logging.conf`.

The `cepces` configuration itself is batteries-included, meaning it should work out of the box for most setups. All configuration options are documented and configurable at `/etc/cepces/cepces.conf`.

Additional information

While configuring Active Directory Certificate Services is outside the scope of the policy manager documentation, we have found the following resources to be useful:

- [How to setup Microsoft Active Directory Certificate Services](#)
- [How to increase your CSR key size on Microsoft IIS without removing the production certificate?](#)

Acknowledgements

We would like to thank the Samba team for making great strides in the research and implementation of certificate auto-enrollment via Active Directory Certificate Services.

4.1.8 Case of the security policy

Certain group policies are directly managed by **SSSD**. In such instances, **ADSys** is not involved at all. This is applicable to **Security Settings**.

In Windows Group Policy Management Editor, you can locate these keys at `[FOREST.ROOT] > Computer Configuration > Windows Settings > Security Settings`

Below is a table providing a non-comprehensive list of Security Settings defined in Windows, which are not managed by ADSys but receive partial support through SSSD.

Windows Setting
Account Policies > Password Policy
Enforce password history
Maximum password age
Minimum password age
Minimum password length
Password must meet complexity requirements
Account Policies > Account Lockout Policy
Account lockout duration
Account lockout threshold
Reset account lockout counter after
Local Policies > User Rights Assignment
Access this computer from the network
Allow log on locally
Allow log on through Remote Desktop Services
Change the system time
Change the timezone
Deny access to this computer from the network
Deny log on as a batch job
Deny log on as a service
Deny log on locally
Deny log on through Remote Desktop Services
Log on as a batch job
Log on as a service
Shutdown the system
Local Policies / Security Options
Administrator account status
Shutdown: Allow system to be shut down without having to log on

Get more information on [SSSD](#).

IN THIS DOCUMENTATION

Tutorials

Start here: a hands-on introduction to ADSys for new users

How-to guides

Step-by-step guides covering key operations and common tasks

Explanation

Discussion and clarification of key topics

Reference

Technical information - specifications, APIs, architecture

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