Centrify Infrastructure Services

Samba Integration Guide

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Centrify Corporation

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About this guide

Centrify Infrastructure Services centrally secures cross-platform data centers through Active Directory-based identity and access management for a wide range of heterogeneous systems, hypervisors and applications.

Built on an integrated architecture that leverages patented technology, the Centrify Infrastructure Services of solutions help centralize ID, access privilege delegation and policy management to reduce the organization's IT expense and complexity, improve end-user productivity, strengthen security and enhance regulatory compliance initiatives. Key components of Centrify Infrastructure Services include integrated authentication, access control, role-based privilege management, user-level auditing and server protection solutions.

This book describes how to integrate the Samba open source file and print sharing program on a Linux or UNIX computer that has the DirectControl agent already installed.

Note Beginning in calendar year 2016, Centrify no longer supports the Centrify-enabled version of Samba that was available for use with earlier Centrify Server Suite releases. If you are currently using Centrify-enabled Samba with Centrify Server Suite 2013.3 or later, you must uninstall Centrify-enabled Samba, install open-source Samba, and install the latest version of the `adbindproxy` package. Those steps are described in Chapter 2, "Installing the Centrify Samba integration components". After you perform those steps, Centrify Server Suite (2013.3 or later) is integrated with open-source Samba.

Intended audience

This book is written for an experienced system administrator familiar with the unpacking and installation of programs on Linux or UNIX computers. In addition, the instructions assume that you have a working knowledge of Samba and how to perform common administrative tasks for creating and maintaining Samba shares.

This book also requires you to have a working knowledge of Centrify Infrastructure Services and how to perform common administrative tasks using the Access Manager console and the Active Directory Users and Computers administration tool. If you are unfamiliar with infrastructure services, see the *Administrator's Guide for Linux and UNIX* and other documentation.

Using this guide

The book guides you through the installation and configuration of the components necessary to integrate infrastructure services and Samba. It is organized as follows:

- Chapter 1, "Using infrastructure services technology with Samba," provides a brief overview of Samba, and how Samba, Centrify DirectControl, and Active Directory work together to provide a secure, integrated environment.
- Chapter 2, "Installing the Centrify Samba integration components" describes how to unpack and install the Centrify `adbindproxy` package.
- Chapter 3, "Migrating existing Samba users to Centrify," describes how to migrate your existing Samba users to Active Directory for use with infrastructure services.
- Chapter 4, "Configuring the Samba integration," describes how to use the Samba configuration file and test your integration of Samba, Centrify DirectControl, and Active Directory.
- Chapter 5, "Using adbindproxy.pl," describes the `adbindproxy.pl` utility, which enables you to configure Samba for interoperability with Centrify DirectControl.

Conventions used in this guide

The following conventions are used in this guide:

- `Fixed-width` font is used for sample code, program names, program output, file names, and commands that you type at the command line. When *`italicized`*, this font is used to indicate variables. In addition, in command line reference information, square brackets (`[ ]`) indicate optional arguments.
- **Bold** text is used to emphasize commands, buttons, or user interface text, and to introduce new terms.
- *Italics* are used for book titles and to emphasize specific words or terms.

- The variable *release* is used in place of a specific release number in the file names for individual Centrify DirectControl software packages. For example, centrifydc-*release*-sol8-sparc-local.tgz in this guide refers to the specific release of the DirectControl agent for Solaris on SPARC available in a Centrify DirectControl download package. In the download package, the file name indicates the Centrify DirectControl version number. For example, if the software package installs Centrify DirectControl version number 4.4.2, the full file name is centrifydc-4.4.2-sol8-sparc-local.tgz.

Finding more information

Before you start, be sure to read through the *Release Notes* included with the software package. This file provides the most up-to-date information about the package, including system requirements and supported platforms, and any additional information that may not be included in other documentation.

For information about how to set up and use Samba, you should review the guides included in the Samba distribution or the documentation available at http://samba.org.

Centrify provides extensive documentation targeted for specific audiences, functional roles, or topics of interest. If you want to learn more about Centrify and Centrify products and features, start by visiting the Centrify website. From the Centrify website, you can download data sheets and evaluation software, view video demonstrations and technical presentations about Centrify products, and get the latest news about upcoming events and webinars.

For access to documentation for all Centrify products and services, visit the Centrify documentation portal. From the Centrify documentation portal, you can always view or download the most up-to-date version of this guide and all other product documentation.

To get to the documentation portal, go to docs.centrify.com.

Contacting Centrify

If you have a problem during Server Suite software installation or configuration, need help with Active Directory configuration, or want clarification on best practices contact your Centrify System Engineer or Technical Support. Go to www.centrify.com/support and log in for the Technical Support contact information.

Using infrastructure services technology with Samba

This chapter describes how Samba integrates with infrastructure services, and highlights some integration issues that you might encounter. Here are the topics in this chapter:

- What is Samba?
- What is Centrify-enabled Samba?
- “Centrify-enabled Samba architecture” on page 12

What is Samba?

Samba is an open source file and printer sharing program that allows a Linux or UNIX host to participate as an Active Directory services domain member. When Samba is installed, Windows users can share files and printers on the Linux or UNIX computers.

Samba.org distributes the Samba files and expects users to download and build their own packages. All major Linux and free UNIX distributions have Samba as a native package. For a native install of Samba on your system, see your distributor’s package or port system.

Also, the https://samba.plus/samba/ web site offers Samba packages for Red Hat Enterprise Linux (RHEL), SuSE Linux Enterprise Server (SLES), and Debian systems. The http://en.opensuse.org/Samba web site offers Samba packages for all SuSE Linux products, including SLES.

What is Centrify-enabled Samba?

Centrify-enabled Samba is an adbindproxy module and PERL configuration script that enables infrastructure services and Samba to work together without UID, GID, or Active Directory conflicts.

In previous releases, Centrify would modify the Samba package and provide a unique, Centrify version of Samba for different operating

systems. In this release, Centrify provides a couple of components that work with the stock Samba packages.

Centrify Infrastructure Services is an integrated set of commercial identity management products that enable a Linux, UNIX, or Mac host to participate as an Active Directory domain member. When you install Centrify Infrastructure Services products, you can manage the Centrify-managed computer's user and group accounts and privileges entirely through Active Directory.

When open-source Samba is configured as an Active Directory domain member and the DirectControl agent is installed together with Samba on the same Linux or UNIX host, two problems can arise:

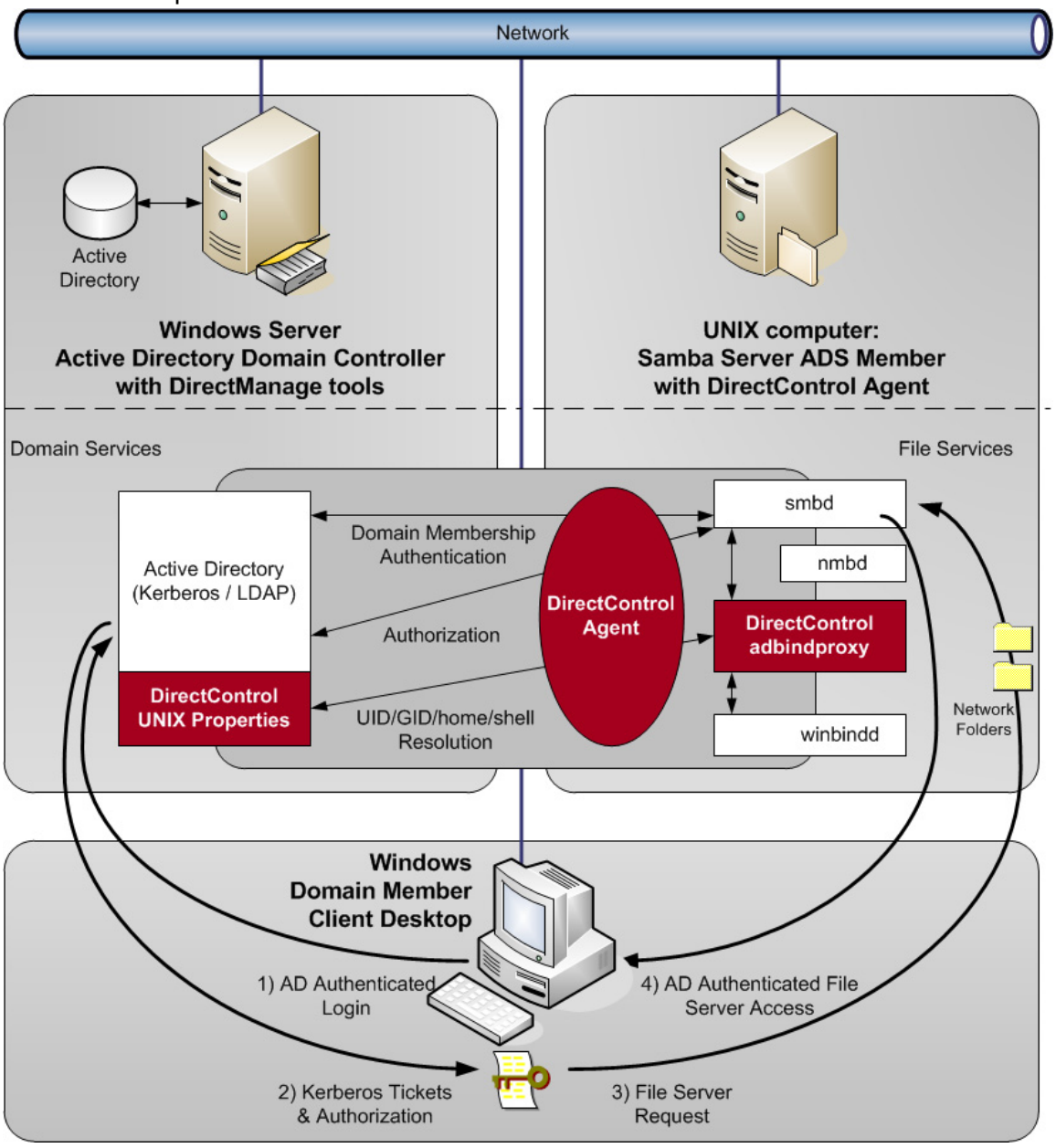
- Samba and the DirectControl agent both attempt to create and manage the same Active Directory computer account object, causing one of the products to stop working.
- Conflicting UIDs and GIDs are generated by Samba and the Centrify Management Services tools for the same Active Directory users and groups. However, the two programs use different algorithms for generating these values. The result is file ownership conflicts and access control problems.

To resolve these issues, Centrify provides the following components:

- **`adbindproxy` (`adbindd`) module:** The `adbindproxy` module uses the `adbindd` daemon. Unless otherwise noted, "adbindproxy" and "adbindd" are used interchangeably in the documentation. The `adbindproxy` (`adbindd`) module intercepts Samba UNIX ID mapping requests and reroutes them to the DirectControl agent for processing. This module ensures that Samba and DirectControl agent agree on the UNIX attribute values.
- **`adbindproxy.pl` PERL configuration script:** Automates most of the setup process and designates the DirectControl agent as the manager of the shared computer object.

Centrify-enabled Samba architecture

The following figure provides a conceptual view of the complete solution architecture using Active Directory, Samba, and Server Suite components.



If you have not been using Samba up to this point, or if you have been using an older Samba security method (such as user or server), the integration process makes it easy to configure Samba as an Active Directory member.

On the other hand, if you have already been using Samba as an Active Directory domain member and have assigned UIDs and GIDs to Active Directory users and groups, the PERL configuration script helps to resolve conflicts when Samba and infrastructure services are integrated.

The integrated solution, composed of the DirectControl agent (installed separately), open-source Samba, and `adbindproxy`, provides the following:

- Samba and the DirectControl agent use the same Active Directory computer object without conflicts.
- Consistent user and group attributes are applied on files across Windows, Linux and UNIX computers.
- All UNIX user identity attributes, including the UID, GID, home directory, and login shell in UNIX profiles, are centrally stored and managed in Active Directory.
- Both Kerberos and NTLM Samba authentication methods are supported.
- Standard Samba access-control features are implemented and augmented by the Centrify zones technology.

Installing the Centrify Samba integration components

This chapter explains how to install the Centrify adbindproxy package. You install the adbindproxy package on your Linux and UNIX computers so that the DirectControl agent works with Samba.

This chapter includes the following topics:

- Installation process overview
- "What's in the adbindproxy package" on page 18
- "Installing the adbindproxy components" on page 18

Installation process overview

Your Linux or UNIX computer can be in one of three main states regarding Samba and infrastructure services:

- **New to both Centrify Infrastructure Services and Samba:**

  Samba is not in use and the computer does not have the DirectControl agent installed. The Samba packages might already be installed but you haven't configured Samba yet. For details, see "Installation overview for computers new to both infrastructure services and Samba" on page 15.

- **Using Samba, new to Centrify Infrastructure Services:**

  Samba is in use but the computer doesn't have the DirectControl agent installed. For details, see "Installation overview for computers new to Centrify Infrastructure Services" on page 16.

- **Using the previous Centrify-enabled version of Samba:**

  Samba is in use and the DirectControl agent is installed, and you're using the previous release of Centrify-enabled Samba. For details, see "Upgrade overview for computers with Centrify-enabled Samba" on page 16.

The installation process varies slightly depending on what kind of environment you're currently using.

Installation overview for computers new to both infrastructure services and Samba

If you're configuring a computer that does not yet have either Samba working nor the DirectControl agent, here's an overview of what you need to do.

1 Make sure that you have the software you need.	Make sure that you have the latest version of the DirectControl agent, the Centrify adbindproxy package, and the open source Samba files.
2 Install the DirectControl agent.	Refer to the Centrify Infrastructure Services documentation for instructions.
3 Install open source Samba.	All major UNIX and Linux distributions have Samba as a native package. See your distributor's package or port system for a native install of Samba on your system. You can also visit http://enterprisesamba.com/ which offers Samba packages for Red Hat Linux, SUSE Linux Enterprise Server, and Debian.
4 Install the Centrify adbindproxy package.	See "Installing the adbindproxy components" on page 18
5 Run the adbindproxy.pl script.	See Chapter 4, "Configuring the Samba integration."
6 Modify the Samba configuration file, as needed.	See "Modifying the Samba smb.conf configuration file" on page 36.
7 Test and verify the configuration.	See "Verifying the Samba integration" on page 33

Installation overview for computers new to Centrify Infrastructure Services

If you're configuring a computer that has Samba configured but that does not yet have the DirectControl agent installed, here's an overview of what you need to do.

1 Make sure that you have the software you need.	Make sure that you have the latest version of the DirectControl agent, the Centrify adbindproxy package, and the open source Samba files.
2 Install the DirectControl agent.	Refer to the Centrify Infrastructure Services documentation for instructions.
3 Make a backup copy of your smb.conf file.	
4 Install the Centrify adbindproxy package.	See "Installing the adbindproxy components" on page 18
5 Migrate Samba users to Active Directory.	See Chapter 3, "Migrating existing Samba users to Centrify." **Note**: If you're using Auto Zone or Centrify Express, user migration is not supported.
6 Run the adbindproxy.pl script.	See Chapter 4, "Configuring the Samba integration."
7 Modify the Samba configuration file, as needed.	See "Modifying the Samba smb.conf configuration file" on page 36
8 Test and verify the configuration.	See "Verifying the Samba integration" on page 33

Upgrade overview for computers with Centrify-enabled Samba

Beginning in calendar year 2016, Centrify neither provides nor supports the Centrify-enabled version of Samba that was available earlier. Instead, Centrify now provides a standalone `adbindproxy`

package containing the components that are necessary for Centrify Infrastructure Services to integrate with open-source Samba.

If you are currently using Centrify-enabled Samba with Centrify Server Suite 2013.3 or later (Centrify Infrastructure Services), not only do you need to upgrade to the latest DirectControl agent but there are some additional steps to migrate your users and settings. Below is an overview of what you need to do on each agent-controlled Linux and UNIX computer that was integrated with Samba.

1 Make sure that you have the software you need.	Make sure that you have the latest version of the DirectControl agent, the Centrify adbindproxy package, and the open source Samba files.
2 Make a backup copy of your smb.conf file.	
3 Uninstall Centrify-enabled Samba.	For example, on most Linux variants you would issue the following command: `rpm -e CentrifyDC-samba`
4 Upgrade the DirectControl agent so that it's either the latest version or a version later than 2013.3.	Refer to the Centrify Infrastructure Services documentation for instructions.
5 Install open source Samba.	All major UNIX and Linux distributions have Samba as a native package. See your distributor's package or port system for a native install of Samba on your system. You can also visit http://enterprisesamba.com/ which offers Samba packages for Red Hat Linux, SUSE Linux Enterprise Server, and Debian.
6 Install the Centrify adbindproxy package.	See "Installing the adbindproxy components" on page 18.
7 Migrate Samba users to Active Directory.	See Chapter 3, "Migrating existing Samba users to Centrify." **Note**: If you're using Auto Zone or Centrify Express, user migration is not supported.

8 Run the adbindproxy.pl script.	See Chapter 4, "Configuring the Samba integration."
9 Modify the Samba configuration file, as needed.	See "Modifying the Samba smb.conf configuration file" on page 36
10 Test and verify the configuration.	See "Verifying the Samba integration" on page 33

What's in the adbindproxy package

After you download and extract the Centrify adbindproxy package, you'll see the following files:

```
./Centrify-Adbindproxy-Release-Notes.html
./centrifydc-adbindproxy-release-rhel4-x86_64.rpm
```

The software bundle has a name in this format: `centrify-adbindproxy-release-rhel4-x86_64.rpm` and contains these components:

- **`adbindproxy` (`adbindd`) module:** The `adbindproxy` module uses the `adbindd` daemon. Unless otherwise noted, "adbindproxy" and "adbindd" are used interchangeably in the documentation. The `adbindproxy` (`adbindd`) module intercepts Samba UNIX ID mapping requests and reroutes them to the DirectControl agent for processing. This module ensures that Samba and the DirectControl agent agree on the UNIX attribute values.
- **`adbindproxy.pl` PERL configuration script**: This script automates most of the setup process and designates the DirectControl agent as the manager of the shared computer object.

Installing the adbindproxy components

Perform the following steps to install the integration components from the `adbindproxy` package. In these steps, the file name `centrifydc-adbindproxy-*.rpm` is used in place of the full file name. You can use the wildcard symbol (`*`) to substitute for a portion of the file name if there are no conflicting files in the directory.

Note If you are upgrading from a previous version of Centrify-enabled Samba, see "Upgrade overview for computers with Centrify-enabled Samba" on page 16 before proceeding.

Be sure to enter the full path name in the command line if multiple versions of the same file exist in the same directory.

To install the Centrify Samba integration components:

1 Run the appropriate command for your platform to install the `centrifydc-adbindproxy` package.

The following table shows sample commands using the common package installers for each platforms.

For this platform	You can run

• Linux-based computers
• Red Hat Enterprise Linux
	For 32-bit systems:
	`rpm -Uvh centrifydc-adbindproxy-`*`release`*`-rhel4-i386.rpm`
	For 64-bit systems:
	`rpm -Uvh centrifydc-adbindproxy-`*`release`*`-rhel4-x86_64.rpm`
	For PowerPC systems:
	`rpm -Uvh centrifydc-adbindproxy-`*`release`*`-rhel4-ppc.rpm`

Sun Solaris	On SPARC systems, for example:
	`gunzip centrifydc-adbindproxy-`*`release`*`-sol10-sparc-local.tgz`
	`pkgadd -d centrifydc-adbindproxy-*`
	There are two Solaris packages. Select the package that matches your Solaris version and processor type. Furthermore, the x86 version can be installed on 32- and 64-bit architectures.
	`centrifydc-adbindproxy-`*`release`*`-sol10-sparc-local`
	`centrifydc-adbindproxy-`*`release`*`-sol10-x86-local`

For this platform	You can run

HP-UX	For HP-UX 11.23 on PA-RISC:
	`gunzip centrifydc-adbindproxy-`*`release`*`-hp11.23-pa.tgz`
	`swinstall -s /path/centrifydc-adbindproxy-`*`release`*`-hp11.23-pa.depot CentrifyDC-adbindproxy`
	For other HP-UX versions and platforms the commands are the same but the file names are different. For example on HP-UX 11.23 Itanium 64-bit systems:
	`centrifydc-adbindproxy-*-hp11.23-ia64.depot.tgz`

IBM AIX	For AIX 6.1 or later:
	`gunzip centrifydc-adbindproxy-*-aix6.1-ppc.tgz`
	`inutoc .`
	`installp -aY -d centrifydc-adbindproxy-*-aix6.1-ppc.bff CentrifyDC.adbindproxy`

Debian Linux Ubuntu Linux	Check that you have `libcupsys2-gnutls10` (1.1.23-1 or later) installed If you have the required libraries, run the following command to install: • 32-bit processor: `dpkg –i centrifydc-adbindproxy-*-deb6-i386.deb` • 64-bit processor: `dpkg –i centrifydc-adbindproxy-*-deb6-x86_64.deb`

SuSE Linux
OpenSuSE Linux
	For 32-bit systems:
	`rpm -ivh centrifydc-adbindproxy-*-suse10-i386.rpm`
	For 64-bit systems:
	`rpm -ivh centrifydc-adbindproxy-*-suse10-x86_64.rpm`

2 (Optional) Join the computer to a zone using the `adjoin` command.

This concludes the installation of the `adbindproxy` package.

If you have existing Samba users to migrate, go to Chapter 3, Migrating existing Samba users to Centrify. Otherwise, go to Chapter 4, Configuring the Samba integration to continue.

Migrating existing Samba users to Centrify

This chapter describes how to migrate an existing user population from Samba servers to the integrated Centrify Infrastructure Services.

Note The information in this chapter is relevant to computers with the core infrastructure services components installed and for which you created a Centrify zone. These instructions do not apply to computers with Centrify Express installed or computers that are joined through Auto Zone. If you are using Centrify Express or if you have joined a computer using workstation mode, it is not possible to migrate existing Samba UID and GID settings.

The following topics are covered:

- Migrating UNIX profiles to Active Directory
- Migrating Samba servers to Centrify Zones

Migrating UNIX profiles to Active Directory

If your current environment includes Samba servers that are joined to the Active Directory domain as member servers and existing Windows users access the data on those servers, you may want to migrate those existing users to infrastructure services to rationalize UIDs and GIDs and manage all of your network's conflicting identities in a single, centralized ID repository.

Note Migrate your Samba users to Active Directory, as explained in this section, **before** integrating Samba and Server Suite as explained in "Running the adbindproxy.pl script" on page 26.

There are two ways to migrate your UNIX profiles to Active Directory:

- If `winbind` is currently configured in your `/etc/nsswitch.conf` file, you need to run the `getent` command to retrieve the user information.
- If you do not have `winbind` configured in your `/etc/nsswitch.conf` file, then run the `adbindproxy` perl script to migrate the users. See the instructions below.

Migrating users if winbind is configured in /etc/nsswitch.conf

To save the winbind information to a file:

1 If `winbind` is currently configured in your `/etc/nsswitch.conf` file, run the following commands to save the information to a file before installing the `adbindproxy` package:

```
getent passwd | grep -e -f /etc/passwd > /tmp/passwd.winbind
getent group | grep -e -f /etc/group > /tmp/group.winbind
```

2 Move the exported files to a computer where you have installed the Access Manager console.

3 In the Access Manager console, use the **Import from UNIX** wizard to import the users and groups (with their existing UID and GID mappings) into the zone.

For more information on importing existing user and group information and mapping information to Active Directory, see the "Importing existing users and groups" chapter in the *Administrator's Guide for Linux and UNIX*.

Migrating users with the adbindproxy perl script

If `winbind` is not currently configured in your `/etc/nsswitch.conf` file, follow the steps below after you've installed the adbindproxy package.

This script gets the UID andGID files from Samba. You then import them into Active Directory.

To migrate UNIX user profiles to Active Directory using the adbindproxy.pl script:

1 Identify the Samba servers you want to update to integrate with infrastructure services.

2 On each of the Samba servers to be updated, locate the `winbindd_idmap.tdb` file and create a backup copy of the file.

a To locate the `winbindd_idmap.tdb` file, you can run a command similar to the following to view details about the Samba build:

```
/CurrentSambaBInaryPath/smbd -b |grep -i lockdir
```

b In the output, you should see a line similar to the following that indicates the location of the `winbind_idmap.tdb` file:

```
LOCKDIR: /var/lib/samba
```

3 Make a backup copy of the `winbindd_idmap.tdb` file.

For example:

```
cp /var/lib/samba/winbind_idmap.tdb /tmp/
winbind_idmap.tdb.pre_adbindproxybackup
```

4 Run the `adbindproxy.pl` script with the following options to generate the export files.

```
perl /usr/share/centrifydc/bin/adbindproxy.pl --exports --groupFile
filename --userFile filename --tdbFile filename
```

See Chapter 5, "Using adbindproxy.pl," for details about the command-line parameters for `adbindproxy.pl`.

When you run these `adbindproxy.pl` options it generates export files for the users and the groups that are currently known by the Samba server. By default, these files are created as:

```
/var/centrifydc/samba/passwd
/var/centrifydc/samba/group
```

5 Move the exported files to a computer where you have installed the Access Manager console.

6 In the Access Manager console, use the **Import from UNIX** wizard to import the users and groups (with their existing UID and GID mappings) into the zone.

For more information on importing existing user and group information and mapping information to Active Directory, see the "Importing existing users and groups" chapter in the *Administrator's Guide for Linux and UNIX*.

Migrating Samba servers to Centrify Zones

Samba generates UIDs and GIDs based on a range of values that have been defined for a specific server. In most cases, a user who has accessed two different Samba servers is likely to have two different UIDs: for example, a user could have UID `6003` on the server `mission` and UID `9778` on the server `dolores`.

Therefore, in an initial migration of existing users, each Samba server must join the Active Directory domain in separate Centrify Zones to accommodate the different UIDs and GIDs users and groups may have.

If you want users to have consistent GIDs and UIDs, then you need to put the Samba servers in the same zone.

Configuring the Samba integration

This chapter describes how to configure the DirectControl agent and Samba to work together properly after you have installed the integration components from the Centrify `adbindproxy` package and joined agent-controlled computers to a zone.

The following topics are covered:

- Running the adbindproxy.pl script
- Verifying the Samba integration
- Modifying the Samba smb.conf configuration file

Running the adbindproxy.pl script

This section describes how to configure Samba using the `adbindproxy.pl` script.

Note If your current environment has Windows users accessing data on Samba member servers that are joined to the Active Directory domain, you may want to migrate those users to infrastructure services. This way, you can use Centrify Zones to manage conflicting identities and rationalize UIDs and GIDs. For details on how to migrate those users, see Chapter 3, “Migrating existing Samba users to Centrify.” Complete the migration **before** integrating Samba and Server Suite.

The `adbindproxy.pl` script performs the following tasks:

- Determines the computer’s operating system and adjusts accordingly.
- Confirms that the DirectControl agent is installed.
- Confirms that open-source Samba has been installed.
- Determines if you are joined to an Active Directory domain and, if you are, displays the domain name and Centrify Zone.

- Asks if you want to join Samba to the current Active Directory domain or another. If you choose another, the script guides you through the current domain leave and new domain join processes.

  Note If you want to modify or set advanced join settings (for example, update PAM or NSS config, use DES for encryption, or use a computer alias), either run `adleave` before you run `adbindproxy.pl` or select a different domain when prompted in the script. Otherwise, the script does NOT prompt you to enter advanced join settings.

- If you have a previous Samba installation, asks if you want to keep the `smb.conf` settings or use new ones. `adbindproxy.pl` automatically saves the existing copy.

  Note The script automatically looks for an existing `smb.conf` file using the `smbd -b` command. If your current version of `smbd` does not support the `-b` option or you have `smb.conf` in a custom directory the script will not find it. If you want to use your existing `smb.conf`, move it to `/etc/samba` before you run the script.

- Removes old state files from previous instances of Samba, including any existing `winbind` entries from the `/etc/nsswitch.conf` file.

- Restarts the necessary clients (`nmbd, winbindd, adbindd and smbd`).

- Installs scripts to automatically start the correct Samba and Centrify services each time the computer boots.

Before you run `adbindproxy.pl`, read through the prompts described below to make sure you're prepared with the answers. For example, before you run the script be sure you know the path where Samba is installed.

To begin, log on and switch to the root user and proceed with the following steps:

To run the adbindproxy.pl script:

1. To start the script, from `root` enter the following:

   ```
   perl /usr/share/centrifydc/bin/adbindproxy.pl
   ```

2. Specify the path to the Samba installation:

   a. If Samba is not installed in the default location (/usr), enter the Samba path.

b If Samba is installed in /usr, press **Enter** to accept the default. Otherwise, enter your path.

3 Next, specify the domain to join.

You proceed based on whether the computer is already joined to a domain or not:

- If you **are already joined** to a domain when you initiated the script, the script displays the domain name and zone and asks you the following:

```
Do you want to leave or join to another domain? [N]
```

  To continue to join the current joined Active Directory domain press **Enter** and skip ahead to Step 6 on page 29.

  If you want to leave the current domain and join another OR change any advanced options (see list below) in your current domain enter **Y** and then continue to Step 4.

- If you **are not joined** to a domain, the script displays the following message:

```
Not joined to any domain. Make sure you enter the correct domain and zone
information in the next steps
```

  This initiates a set of prompts that ask you for the Active Directory domain name, the Centrify Zone and advanced options.

  Continue to Step 4.

4 In this step, you join the new Active Directory domain.

Note You arrive at this step if you are not joined to an Active Directory Domain when you started `adbindproxy.pl` or if you decided to leave that domain OR you decided to change advanced options in your current join. If none of these conditions apply to you, skip to Step 6.

a At this prompt, enter the domain name:

```
Enter the Active Directory domain to join:
```

b At the DNS health prompt, press **Enter** to verify that the domain exists.

```
Check DNS health for [domain]? Note: this may take several minutes [Y]:
```

c At the next prompt, enter the following domain properties:

Note If you are running infrastructure services in Express Mode or need to join the domain through Auto Zone, enter NULL_AUTO for the zone name.

- Centrify zone on the target Active Directory domain
- Computer name on which the `adbindproxy` package is installed
- Active Directory authorized user (default is Administrator)

5 (Optional) In this next step, you can specify advanced join options.

The script prompts you with the following message:

```
Do you wish to specifyadvanced join options? [N]:
```

The options are listed below. The defaults are in brackets.

a If do not need any advanced join options, enter **N**. Otherwise, enter **Y** and make your selections.

```
Canonical name of Active Directory Computer Container
Preferred Domain Server to use (press Enter for none)
Update PAM and NSS Config [Y]
Trust computer for delegation? [N]
Use DES encryption only? [N]
Run adjoin in verbose mode? [N]
Addition computer alias (press Enter for none)
```

The script then displays the selections you made and asks if you want to proceed.

b Enter **Y** to proceed or **N** to abort `adbindproxy.pl`.

If you were not joined to an Active Directory domain when you started the script, you are prompted to enter your password once.

c Enter the password for the Active Directory Domain, computer and authorized user specified in the prompts.

Note If you choose to proceed **AND** you are leaving the current Active Directory domain to join another, the script prompts you **twice** to enter your password.

d In response to the first prompt, enter the current Active Directory domain account password to leave that domain.

e In response to the second prompt, enter the password for the Active Directory Domain, computer and authorized user specified in the prompts to join the new domain.

6 At the next prompt, if the samba winbindd listen path is not in `/run/samba/winbindd`, enter the path or press **Enter** to accept the default.

7 If there is an existing `smb.conf` file, continue to Step 8.

Otherwise, if there is no existing smb.conf file (which is true for new installations of Samba), the adbindproxy script searches for existing `smb.conf` files. If it **does not** find an existing smb.conf file, it automatically creates a new one, stores it in `/etc/samba`, and displays the following message:

```
Updating smb.conf with Centrify recommended settings ...
```

and finishes the script.

This new smb.conf file has minimal global settings and a samba-test share. Go to "Finishing Up" on page 31 for the messages.

Note Regardless of whether you update an existing `smb.conf` or create a new one, you will need to modify the `/etc/samba/smb.conf` file to have the `[global]` section settings and the appropriate shares for your environment. See "Modifying the Samba smb.conf configuration file" on page 35 for instructions. The file created by `adbindproxy.pl` should be used for verifying the Samba integration only.

If you do have at least one existing smb.conf file, continue to Step 8.

8 If you have an existing smb.conf file, you next specify whether to update the settings in the existing smb.conf file or create a new, skeletal smb.conf file. If you choose to use the existing settings, you can also choose to do a backup of the existing smb.conf file.

If the script **does** find an existing smb.conf file, the script copies the smb.conf file to `/etc/samba` and asks the following question:

```
Do you want to keep the original samba settings? [Y]:
```

Note If the script finds more than one `smb.conf`, it displays the list and asks you to select one. After you make the selection, it copies that one to `/etc/samba` and continues.

Note Regardless of whether you update an existing `smb.conf` or create a new one, you will need to modify the `/etc/samba/smb.conf` file to have the `[global]` section settings and the appropriate shares for your environment. See "Modifying the Samba smb.conf configuration file" on page 35 for instructions. The

file created by `adbindproxy.pl` should be used for verifying the Samba integration only.

- **Don't keep the original Samba settings**: Enter **N** to not keep the original Samba settings and instead create the new, basic `smb.conf`.

The script creates a backup copy of your `smb.conf` in `/etc/samba`. The backup filename is in this format: `smb.conf.`*`yyyy-mm-dd-hh-mm`*. This new smb.conf file has minimal global settings and a samba-test share, if no shares exist.

Continue to "Finishing Up" on page 31.

- **Keep the original Samba settings**: Enter **Y** to modify the existing file and continue to Step 9.

9 If you've chosen to keep the original Samba settings, the script displays the following prompt about backing up the existing settings:

```
Backup existing /etc/samba/smb.conf and add Centrify recommended settings?
[Y]
```

- Enter **Y** to create a backup in the form, `smb.conf.`*`yyyy-mm-dd-hh-mm`*.
- Enter **N** to use the existing `smb.conf` **without** making a backup.

Note If the existing smb.conf has Security = ADS and the workgroup and realm are set, the script does NOT modify the existing file; the original is left unchanged.

10 If you've chosen to keep the original Samba settings, the script displays the following prompt about resetting the Samba cache for user and group IDs.

```
Reset the Samba User/Group ID Cache (Centrify Samba may create
conflicting mappings) [Y]
```

Unless you have created custom mappings, use the default [Y]. This flushes the cache and displays the following message:

```
This prompt is only pertinent to the small set of Samba administrators who
created custom user and group ID mappings. If you do have custom mappings,
use the default to flush the cache and prevent potential conflicts. After
```

```
adbindproxy.pl completes, re-add your mappings as necessary.
```

If you entered Y, the script creates new mappings in the Samba User/Group ID cache, which may result in conflicts if there are any mappings in place already.

Finishing Up

To complete the configuration, `adbindproxy.pl` stops any running versions of `smbd`, `adbindd`, `winbindd` and `nmbd`, starts the required Centrify processes, and displays a set of progress and configuration messages. You should see the following messages:

```
Init Samba start script ...
Restarting Samba daemons ...
Reloading systemd:                                         [
OK  ]
Restarting centrifydc-samba (via systemctl):               [
OK  ]
Current DirectControl Configuration:
...
Current Samba Configuration:
...
```

The adbindproxy script displays the following:

```
Press ENTER to continue ...
Notes: If you need to join other domain, please re-run this
script and enter a different domain name !
Done.
```

Note If any service fails to start, you should run one of the following after the `adbindproxy.pl` script completes its execution.

On Linux or Solaris computers, run:

```
/etc/init.d/centrifydc-samba restart
```

On HP-UX computers, run:

```
/sbin/init.d/centrifydc-samba restart
```

On AIX computers, run:

```
stopsrc -g samba  && startsrc -g samba
```

As a quick test, log off as the `root` user and log on with an Active Directory user account that has been granted access to the local

computer's zone. If this is the first time that you are logging on with this user account, check that the user's home directory is created, which is created automatically by Server Suite the first time you log on.

Verifying the Samba integration

To verify that Samba and infrastructure services are working together correctly, you test if you can access Samba shares. If you upgraded existing shares, then you can test those; otherwise, you can verify the connection using the test share.

There are two key scenarios for testing whether Samba is configured properly for integration with Server Suite and Active Directory:

- "Accessing Samba from a UNIX client session"
- "Accessing Samba shares from a Windows desktop" on page 34

Accessing Samba from a UNIX client session

To test access to Samba shares on a Linux or UNIX computer, users should do the following:

To access Samba from a UNIX client session:

1 Log on to the Linux or UNIX computer using the Active Directory account that has been granted access to the local computer's zone.

- Run the following command:

  ```
  smbclient -k -L host_name
  ```

  The `smbclient` program displays information about Samba and the SMB shares that are available on the local computer. For example, you should see a listing similar to the following (where `s.s.s` is the Samba version):

```
OS=[Unix] Server=[Samba s.s.s]

      Sharename      Type      Comment
      ---------      ----      -------
      samba-test     Disk
      IPC$           IPC       IPC Service (Samba-CDC)
      sara           Disk      Home directories

OS=[Unix] Server=[Samba s.s.s]

        Server               Comment
        ---------            -------
        Workgroup            Master
        --------             -------
        ARCADE               MAGNOLIA
```

If you are able to see the Samba shares as an Active Directory user logged on to the Linux or UNIX computer that is acting as the Samba server, you should next test accessing the Samba shares from a Windows desktop. For information about performing this test, see "Accessing Samba shares from a Windows desktop" on page 34.

Purging and reissuing Kerberos tickets on UNIX computers

If you see an error such as `NT_STATUS_LOGIN_FAILURE` instead of the expected results when you run the `smbclient` program, you may need to purge your existing Kerberos tickets and have them reissued. Try running the following command to remove all of your Kerberos tickets:

```
/usr/share/centrifydc/kerberos/bin/kdestroy
```

Then run the following command to reissue tickets after you provide your Active Directory password:

```
/usr/share/centrifydc/kerberos/bin/kinit
```

You can then run the following command to list the Kerberos tickets that have been issued to you:

```
/usr/share/centrifydc/kerberos/bin/klist
```

After verifying the Kerberos tickets you have been issued, try running the `smbclient` program again.

Verifying the version of Samba you are using

If purging and reissuing tickets does not resolve the problem, confirm the version of the `smbstatus` that is currently running using the following command:

```
smbstatus | grep version
```

The command should display the Samba version you have installed. For example:

```
Samba version s.s.s
```

(where `s.s.s` is the installed Samba version)

If the correct version of Samba is installed, run `smbstatus` again and note the names of any `*.tdb` files that do not exist, and try restoring them from your backup, then try running the `smbclient` program again.

If you don't see the correct Samba shares

If the `smbclient` program does not display the Samba shares you have defined in the configuration file, you should review the settings in the `smb.conf` file and then restart the DirectControl agent and run the `adflush` command.

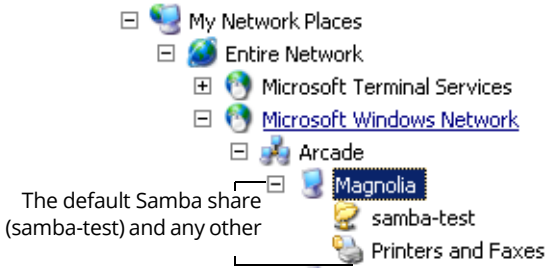
Accessing Samba shares from a Windows desktop

To test access to Samba shares on a Linux or UNIX computer from a Windows desktop:

1. Log on to a Windows computer that is joined to the domain with an Active Directory user account.
2. Click **Start > Windows Explorer**, then navigate to the domain.

   For example, open **My Network Places > Entire Network > Microsoft Windows Network > Arcade** to view the `Arcade.net` domain.

3 Select the Linux or UNIX computer that is integrated with Samba to view its Samba shares. For example:



4 Click `samba-test` or browse other available Samba shares to verify that you can open existing files and create new files.

5 Confirm from both Windows and the managed computer that the files in the share directories are owned by the correct users.

If you cannot browse the shares on the Linux or UNIX computer from the Windows desktop, you should:

- Verify that there is network connectivity between the two systems.
- Confirm that you do not have a firewall running on the managed computer that is blocking access to the SMB ports.
- Make sure there are no stale Kerberos tickets on your Windows system. The tools to remove stale Kerberos tickets may already be installed on your system—see this site for more information about `klist` and `kerbtray` programs.

Modifying the Samba smb.conf configuration file

The Samba configuration file, `/etc/samba/smb.conf`, defines important parameters for Samba-based file sharing. After you have verified the Samba integration with Server Suite and Active Directory using a sample configuration file and the test share, you need to modify the `smb.conf` file so that it accurately represents your environment.

This `smb.conf` file must include the `[global]` section that defines the Active Directory domain, authentication methods, and other

parameters. The file should also include a section for each directory you are making accessible as a SMB share.

At the beginning of a line, both the hash symbol (#) and the semi-colon (;) indicate lines to ignore. By convention, in this file, the hash indicates a comment and the semi-colon indicates a parameter you may wish to enable.

If you specify multiple users in `valid users`, user names can be separated by a comma or by white space.

The settings in the `[global]` section are required whether you use the sample configuration file or create your own `smb.conf` file. The settings in the `[homes]` section indicate that you want to share home directories, and the `[samba-test]` section describes the `samba-test` share as a publicly-writable share mapped to the `/samba-test` directory. For more information about editing the Samba configuration file and the supported parameters, see the Samba documentation.

A sample Samba smb.conf configuration file

The adbindproxy script tests to determine what operating system is running on the host and generates an `smb.conf` file appropriate to that platform.

In the following sample file, it runs on a CentOS computer in the arcade.net domain and the Samba share is called MyShare.

```
#
# This file was generated by Centrify ADBindProxy Utility
#
[global]
    security = ADS
    realm = ARCADE.NET
    workgroup = ARCADE
    netbios name = centos-6

    auth methods = guest, sam, winbind, ntdomain
    machine password timeout = 0
    passdb backend = tdbsam:/var/lib/samba/private/
passdb.tdb
```

```
    #
    # Samba versions 3.4.0 and newer have replaced "use
kerberos keytab"
    # with "kerberos method".  The directive "kerberos
method = secrets and keytab"
   # enables Samba to honor service tickets that are still
valid but were
    # created before the Samba server's password was
changed.
    #
    kerberos method = secrets and keytab


    #
    # Setting "client use spnego principal" to true
instructs SMB client to
   # trust the service principal name returned by the SMB
server. Otherwise,
    # client cannot be authenticated via Kerberos by the
server in a different
    # domain even though the two domains are mutually
trusted.
    #
  #  client use spnego principal = true

    #
    # Setting send spnego principal to yes .
    # Otherwise, it will not send this principal between
Samba and Windows 2008
    #
  #  send spnego principal = Yes

   # If your Samba server only serves to Windows systems,
try server signing = mandatory.
    server signing = auto

    client ntlmv2 auth = yes
    client use spnego = yes


    template shell = /bin/bash
```

```
    winbind use default domain = Yes

    winbind enum users = No
    winbind enum groups = No
    winbind nested groups = Yes

    idmap cache time = 0

  #  ignore syssetgroups error = No
    idmap config * : backend  = tdb
    idmap config * : range = 1000 - 200000000
    idmap config * : base_tdb = 0
    enable core files = false
    #  Disable Logging to syslog, and only write log to
Samba standard log files.
    #syslog = 0

[samba-test]
    path = /samba-test
    public = yes

    #  if set  public = No, we should  set parameter valid
users .
    #  and when the user or group is in AD , the setting
syntaxes is:
    #  valid users = CPUBS\username +CPUBS\group

    writable = yes

[MyShare]
  path = /samba-test
  browsable = yes
  writable = yes
 guest ok = yes
 read only = no
[homes]
    comment = Home directories
    read only = No
    browseable = No
```

SMB.conf file variations for different platforms

Some platforms will have slight variations in the `smb.conf` file, as follows:

- On HP-UX computers, the following line is added:

```
guest account = smbnull
```

- On SuSE computers, the following lines are added:

```
# Suse 11 CUPS printing appears to crash at start up
# So we disable printing on this platform for now
printing = BSD
```

- On AIX computers, the following comments are added:

```
#
# On AIX, the service NMBD may fail to start because Samba
# cannot determine the correct IP subnet mask.
# In this case, you can manually specify the correct subnet
mask.
# For example if you have the following configuration:
#
# Interface     = eth0
# IP Address    = 192.168.97.199
# Subnet mask   = 255.255.252.0
#
# then set the interfaces keyword as follows:
#
# interfaces = eth0 192.168.97.199/255.255.252.0
#
```

Testing changes to the smb.conf file

When you make changes to the `smb.conf` file, you should run the Samba utility `testparm` to make sure there are no errors in your `smb.conf` file before putting it into production use. When you run the `testparm` utility, you should see output similar to the following:

```
Load smb config files from /etc/samba/smb.conf
Processing section "[homes]"
Processing section "[printers]"
Processing section "[samba-test]"
Loaded services file OK.
Server role: ROLE_DOMAIN_MEMBER
Press enter to see a dump of your service definitions
```

```
[global]
  workgroup = ARCADE
  realm = ARCADE.NET
    security = ADS
  auth methods = guest, sam, winbind, ntdomain
  passdb backend = tdbsam:/etc/samba/private/passdb.tdb
  syslog = 0
  enable core files = No
  server signing = auto
  machine password timeout = 0
  adbindproxy backend = cdc:/usr/share/centrifydc/lib/
libcapi.so
  adbindproxy standard mappers = No
  template shell = /bin/bash
  winbind use default domain = Yes

[homes]
  comment = Home Directories
  read only = No
  browseable = No

[printers]
  comment = All Printers
  path = /usr/spool/samba
  printable = Yes
  browseable = No

[samba-test]
  path = /samba-test
  read only = No
  guest ok = Yes
```

Using adbindproxy.pl

This appendix describes the options available for the `adbindproxy` command-line tool. The `adbindproxy.pl` utility is used to configure Samba and Server Suite to work together and provides specific functions, such as exporting UIDs and GIDs, creating symbolic links to Samba binaries and libraries, and restoring backed-up Samba files.

Note For step-by-step instructions about running `adbindproxy.pl` to configure Samba and Server Suite to work together, see "Running the adbindproxy.pl script" on page 25.

Synopsis

```
adbindproxy.pl [--help] [--info] [--restore] [--verbose]
[--version]

adbindproxy.pl --exports [--gidfile filename] [--uidfile
filename] [--tdbfile filename]
```

adbindroxy.pl options

You can use the following options with this command:

Use this option	To do this
`-E, --exports`	Export user IDs (UIDs) and group IDs (GIDs) that are stored in Samba's winbindd_idmap.tdb file. Use the `--groupFile` and `--userFile` options to specify the export files for the GIDs and UIDs. Use the `--tdbfile` option to specify the .tdb file that contains the GIDs and UIDs. After export, you can use the Server Suite Administrator Console to import the users and groups with their existing UID and GID mappings into a zone.

Use this option	To do this
`-g, --groupFile` *`filename`*	Specify the file in which to write the Samba-created Active Directory group to GID mappings. Use this option with the `--export` option. By default, the file is: `/etc/group`
`-h, --help`	Display the `adbindproxy.pl` usage information.
`-i, --info`	Display Samba interoperability information.
`-r, --restore`	Restore files backed up from the first time you configured Samba for interoperability with Server Suite. Typically, you run `adbindproxy.pl` with the `--restore` option to restore Samba files before uninstalling the integration components that were provided in adbindproxy.
`-t, --tdbFile` *`filename`*	Specify the location of the `winbindd_idmap.tdb` file that contains Samba UID and GID information. This option is used during the UID and GID export process. If you omit this option, the default file to export from is: `/var/lib/samba/winbindd_idmap.tdb`
`-u, --userFile` *`filename`*	Specify the file in which to write Samba-created Active Directory user to UID mappings. Use this option with the `--exports` option. By default, the file is `/etc/passwd`.
`-v, --version`	Display version information for the installed software.
`-V, --verbose`	Display detailed information for each operation.

Examples

To display basic information about the configuration of the Samba integration and interoperability with Server Suite and Active Directory, you could type a command line similar to the following:

```
adbindproxy.pl --info
```

This command displays information similar to the following (where `v.v.v` is the Centrify version number and `s.s.s` is the Samba number):

```
The Samba base path is:       /usr
CentrifyDC Realm                = ARCADE.NET
CentrifyDC NTLM Domain          = ARCADE
CentrifyDC Host                 = magnolia.arcade.net
CentrifyDC Short Host           = magnolia
CentrifyDC version              = CentrifyDC v.v.v

Samba Version                   = s.s.s
Samba Realm                     = ARCADE.NET
Samba NetBIOS Name              = MAGNOLIA

Samba Version Supported         = yes
Samba and CDC in same Realm     = yes
Samba and CDC share machine account = yes
```

To export existing Samba GID and UID information that you want to import into a Centrify Zone, and to show details about the operation performed, type a command line similar to the following:

```
adbindproxy.pl --exports --verbose
```

This command displays information similar to the following:

```
The existing uid mappings have been exported to
/var/centrifydc/samba/passwd.
The existing gid mappings have been exported to
/var/centrifydc/samba/group.
```

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