

HP CIFS For OpenVMS V1.0

Cluster Installation, Configuration, and Removal

Document Abstract

This document describes how to install, configure, and remove HP CIFS for OpenVMS v1.0 on an OpenVMS cluster. This document also describes how to establish the cluster as a Member server in an existing domain.

Terms

- **CIFS Cluster** - A group of OpenVMS cluster members sharing a common SAMBA\$ROOT directory tree.
- **DNS Cluster** - TCP/IP Services defines a "DNS cluster" as multiple A resource records for a single host name. See the documentation for the TCP/IP product installed on the cluster for more information regarding establishing DNS clusters.
- **Installation Node** - The cluster member on which the \$ PRODUCT INSTALL SAMBA command is executed.

Pre-Installation Considerations

- Ensure the OpenVMS systems have the latest C RTL (Run-Time Library) ECO installed. There are changes that directly affect CIFS behavior and reliability. One source (there are others) for obtaining OpenVMS ECOs is:

ftp://ftp.itrc.hp.com/openvms_patches
- A CIFS cluster is supported only on OpenVMS systems running OpenVMS v8.3 or higher. The C RTL for versions of OpenVMS prior to v8.3 lack support for byte range locking in the FCNTL function and, thus, files accessed by two or more cluster members simultaneously cannot coordinate byte range locking activity which **can result in file corruption**. The information in this document assumes all cluster members are running OpenVMS v8.3 or later.
- CIFS may be installed on cluster members running OpenVMS Alpha 8.2 or OpenVMS Integrity v8.2-1, but these systems must use separate SAMBA\$ROOT: directory trees and care must be taken to prevent users from accessing the same files simultaneously on multiple cluster members (i.e., offer a share only from one cluster member).
- A common SYSUAF and RIGHTSLIST database is required.

- If desired, establish a DNS cluster name for the CIFS cluster nodes. This cluster name will also be used as the CIFS cluster name; therefore, it cannot exceed 15 characters (to comply with the NetBIOS specification). CIFS relies on TCP/IP and DNS load balancing mechanisms to spread the client sessions across the CIFS cluster members. To gain the benefits of load balancing and failover, clients should connect to CIFS using the CIFS cluster name.
- If any previous version of HP CIFS for OpenVMS is currently installed, including field test versions, it must be completely removed prior to installing the v1.0 kit. If desired, retain a copy of the configuration files in the existing samba\$root:[lib] (or samba_root:[lib]) directory, such as smb.conf, lmhosts, and username map files. See the **Removing CIFS** section at the end of this document for detailed instructions.
- The CIFS cluster should not be configured to use a WINS server because each CIFS cluster node attempts to register the CIFS cluster name as a Unique (NetBIOS) name rather than a Group name, which is not allowed. WINS will prevent the second and subsequent cluster members that start CIFS from associating their IP address with the cluster name in WINS. This restriction will be addressed by engineering in a future release.

The WINS server restriction shouldn't present a problem for clients as they (typically) resolve names using DNS queries. But the inability to use a WINS server may present problems for the CIFS servers if there are no domain controllers on the same IP subnet as the CIFS cluster members. In this case, use the SAMBA\$ROOT:[LIB]LMHOSTS. file to map the IP address of remote domain controllers to their respective names (including the special names that only domain controllers register). For more information, see the MAN page for the lmhosts file at:

<http://www.samba.org/samba/docs/man/manpages-3/smb.conf.5.html>

- Download the latest set of patches for HP CIFS for OpenVMS v1.0. Install these patches after installing the CIFS v1.0 kit (see the **Post-Installation Tasks** section).

The file naming convention for these self-extracting ZIP files is:

CIFSV10-<arch>-V<ver>-PS<nnn>.EXE, where:

<arch> = System architecture, either AXP or I64

<ver> = OpenVMS version, i.e., 821 represents version 8.2-1

<nnn> = 3-digit patch set number, i.e., 003

The patches may be downloaded from the following site:

\$ ftp hprc.external.hp.com

Username: ionet

Password: ionet-pw ! Case-sensitive

```
ftp> ls CIFSv10*      ! Find the right kit(s), based on OpenVMS version
ftp> bin
ftp> get <filename>   ! Case-sensitive
ftp> quit
```

Installation

All CIFS cluster nodes must share a common SAMBA\$ROOT: directory tree. By default, CIFS will be installed to SYS\$COMMON:[SAMBA]. Use the /DESTINATION qualifier of the \$ PRODUCT INSTALL command to install CIFS on a disk (accessible to all CIFS cluster nodes) other than the system disk. For example:

\$ PRODUCT INSTALL SAMBA /DESTINATION=DISK\$COMMON:[000000]

Post-Installation Tasks

1. On the installation node, execute the CIFS configuration procedure to define logical names and add the SMBD and SWAT services (and set connection limits):

\$ @DISK\$COMMON:[SAMBA.BIN]SAMBA\$CONFIG

When prompted for the client capacity, enter a value that is at least twice more than the expected number of concurrent client sessions.

When prompted for the SWAT client capacity, specify a value of at least 15 (more if multiple users use SWAT) to avoid problems using SWAT.

2. On the installation node, unzip and install the CIFS v1.0 patch set and run the command procedure included in the kit. For example:

\$ RUN CIFSv10-AXP-V83-PS003.EXE ! Run the self-extracting ZIP file

\$ @SAMBA\$CIFSv10-PS003_INSTALL ! Install the patched files

3. If the CIFS cluster nodes use separate systems disks the installation does not accommodate such environments; thus, the following actions must be accomplished to update any other applicable system disks:

- o The following files must be copied from the installation node system disk to SYS\$COMMON:[SYS\$STARTUP] on the other applicable system disk(s):

SAMBA\$DEFINE_ROOT.COM
SAMBA\$STARTUP.COM
SAMBA\$SHUTDOWN.COM

- The TCP/IP service definitions for the SMBD and SWAT services must be added to the service database. The best way to accomplish this is to run the CIFS configuration procedure on any one CIFS cluster member that boots from that system disk:

\$ @DISK\$COMMON:[SAMBA.BIN]SAMBA\$CONFIG

4. The SAMBA\$ROOT: logical name will initially be defined only on the cluster members that have executed the SAMBA\$CONFIG procedure. To define the logical on remaining CIFS cluster members, execute the following procedure:

\$ @SYS\$STARTUP:SAMBA\$DEFINE_ROOT

5. If the CIFS cluster members include both Alpha and Integrity systems, the installation procedure only installs the files for the system architecture on which the kit was installed. For example, if the \$ PRODUCT INSTALL command is executed on an Alpha system, only the Alpha images are installed. To install the files for the other system architecture execute the following procedure from a system of that architecture:

\$ @SAMBA\$ROOT:[BIN]SAMBA\$MIXED_CLUSTER_SETUP

NOTE: The current version of SAMBA\$MIXED_CLUSTER_SETUP.COM has several problems. To avoid most of these problems, first set your current directory to the location of the CIFS PCSI installation file.

6. Define the commands for the CIFS utilities (and consider adding to your LOGIN.COM):

\$ @SAMBA\$ROOT:[BIN]SAMBA\$DEFINE_COMMANDS

7. If you plan to use SWAT, restore the SWAT backup saveset (from any CIFS cluster member). However, do not modify the server configuration using SWAT due to a known issue (INCLUDE files are not handled appropriately).

**\$ BACKUP SAMBA\$ROOT:[UTILS]SAMBA\$SWAT_FILES.BCK/SAVE –
SAMBA\$ROOT:[*...]*.*;*/LOG**

8. To ensure CIFS starts when a system starts, add the following commands to the site-specific startup procedures (i.e., SYS\$MANAGER:SYSTARTUP_VMS.COM on each applicable system disk):

**\$ @SYS\$STARTUP:SAMBA\$DEFINE_ROOT
\$ @SYS\$STARTUP:SAMBA\$STARTUP**

NOTE: If CIFS should not be started on all cluster members that boot from a system disk, include the necessary DCL commands to prevent this.

9. To ensure CIFS shuts down gracefully during system shutdown, add the following command to the site-specific shutdown procedures (i.e., SYS\$MANAGER:SYSHUTDOWN.COM on each applicable system disk):

```
$ @SYS$STARTUP:SAMBA$SHUTDOWN
```

CIFS Cluster Configuration

1. Edit SAMBA\$ROOT:[LIB]SMB.CONF and make the following changes (in the [global] section) to configure the CIFS cluster as a Member server in the domain:

- Set the “netbios name” parameter to the CIFS cluster name. For example:

```
netbios name = cifscluster
```

- Add or modify the “workgroup” parameter, setting the value to the NetBIOS name of the domain to be joined. For example:

```
workgroup = DomainName
```

- Add or modify the following parameters and set them to the values indicated:

```
security = domain  
domain master = no  
domain logons = no
```

- Optionally add the following lines:

```
case sensitive = yes      ; Improve file system performance  
host msdfs = no         ; Avoid DFS pathname errors
```

For further information, refer to the MAN page for the smb.conf file available at:

<http://www.samba.org/samba/docs/man/manpages-3/smb.conf.5.html>

2. The CIFS cluster must be joined to the domain. To create a computer account for the CIFS cluster either:
 - a. Use a tool such as Active Directory Users and Computers, with the following in mind:
 - Name the account the same as the “netbios name” SMB.CONF parameter.

- If using Active Directory Users and Computers, ensure the check box next to "Assign this computer account as a pre-Windows 2000 computer" is selected.
- Do not add a machine account for the individual cluster members (they aren't needed and could confuse matters).

Then, from any ONE (and only one) CIFS cluster member, enter:

```
$ net rpc join [--server <PDC-Emulator>] [--ipaddress <PDCs-IP-Addr>]
```

NOTE: Do not use a fully qualified domain name with the --server option; specify the NetBIOS name of the PDC emulator

- b. Create the computer account from the CIFS cluster. From any ONE (and only one) CIFS cluster member, execute the following command and specify the credentials of a domain user with administrator privileges:

```
$ net rpc join --user <admin-acct>%<password> [--server <PDC-Emulator>] --  
 [--ipaddress <PDCs-IP-Addr>]
```

NOTE: Do not use a fully qualified domain name with the --server option; specify the NetBIOS name of the PDC emulator.

3. To confirm (at any time) the CIFS cluster joined the domain successfully, execute:

```
$ net rpc testjoin
```

4. At this stage, CIFS should successfully start on each CIFS cluster member. However, since the "netbios name" parameter is being used to define the CIFS cluster name, the only name each CIFS cluster member will accept connections to is the CIFS cluster name. To also have each cluster member accept connections to its host name, use the "netbios aliases" SMB.CONF parameter in a separate INCLUDE file for each cluster member.

For example, if the CIFS cluster node names are IA64-1, IA64-2, & IA64-3:

- First, in the main SMB.CONF file, add the following line to the [global] section:

```
include = /samba$root/lib/smb.conf_%h
```

- Second, create the INCLUDE file for each CIFS cluster member:

```
$ create samba$root:[lib]smb.conf_ia64-1  
netbios aliases = ia64-1  
; plus any other node-specific parameters you prefer
```

```
$ create samba$root:[lib]smb.conf_ia64-2
netbios aliases = ia64-2
; plus any other node-specific parameters you prefer
```

```
$ create samba$root:[lib]smb.conf_ia64-3
netbios aliases = ia64-3
; plus any other node-specific parameters you prefer
```

Sample SMB.CONF [GLOBAL] Section

```
[global]
netbios name = cifscluster
workgroup = domain-name      ; NOT the fully qualified domain name
server string = SAMBA %v running on %h (OpenVMS)
include = /samba$root/lib/smb.conf_%h
security = domain
passdb backend = tdbsam
log level = 0
log file = /samba$root/var/log_%h.%m
name resolve order = lmhosts bcast      ; To ensure WINS is not used
username map = /samba$root/lib/username.map
idmap uid = 6000 - 7000      ; See the CIFS documentation
idmap gid = 6000 - 7000      ; See the CIFS documentation
printcap name = nl:
load printers = no
case sensitive = yes
host msdfs = no
```

5. Run the TESTPARM utility after any changes to smb.conf or INCLUDE files and correct any errors before starting CIFS.

```
$ testparm
```

Starting & Stopping CIFS

- To start CIFS execute:

```
$ @SYS$STARTUP:SAMBA$STARTUP
```

- To shutdown CIFS, terminating all SMBD processes (client sessions) and the NMBD process, as well as disabling the SMBD and SWAT services, execute:

```
$ @SYS$STARTUP:SAMBA$SHUTDOWN
```

- To shutdown the NMBD process only, obtain the process ID (PID) from the \$ SHOW SYSTEM (or \$ SMBSHOW) display and execute:

\$ STOP/ID=<pid> ! Specify PID of NMBD process

- To start the NMBD process, execute the CIFS startup procedure:

\$ @SYS\$STARTUP:SAMBA\$STARTUP

Removing CIFS

1. To remove CIFS from any single cluster member, while retaining the CIFS configuration on other cluster members, execute the following procedures on the cluster member(s) from which CIFS should be removed:

\$ @SYS\$STARTUP:SAMBA\$SHUTDOWN

\$ @SAMBA\$ROOT:[BIN]SAMBA\$REMOVE_CONFIG.COM

NOTE: If CIFS is removed on all cluster members that boot from a particular system disk, execute the following command on any one of those cluster members to remove CIFS files from that system disk:

\$ DELETE SYS\$STARTUP:SAMBA*.COM*;*

2. To remove CIFS completely from the cluster:
 - a. Execute the procedures in item 1 above to remove CIFS on all but one CIFS cluster member.
 - b. On the one remaining CIFS cluster member:
 - 1) Make note of the current location (device and directory path) of the SAMBA\$ROOT directory for use later. If CIFS has been started since the system last booted, execute:

\$ SHOW LOGICAL SAMBA\$ROOT ! Without a colon

Otherwise, execute:

\$ @SYS\$STARTUP:SAMBA\$DEFINE_ROOT:

\$ SHOW LOGICAL SAMBA\$ROOT ! Without a colon

- 2) Remove the product :

\$ @SYS\$STARTUP:SAMBA\$SHUTDOWN

\$ PRODUCT REMOVE SAMBA

- 3) Using the device and directory assigned to the SAMBA\$ROOT logical name (obtained above), delete all remaining files in the SAMBA\$ROOT: directory tree (not deleted by the \$ PRODUCT REMOVE procedure). For example, if SAMBA\$ROOT was defined as DISK\$COMMON:[000000.SAMBA.], execute the following command repeatedly until the command completes with no “directory file is not empty” errors:

\$ DELETE DISK\$COMMON:[SAMBA...]*. ! Repeat as necessary**

- 4) Delete the SAMBA\$ROOT directory:

\$ DELETE DISK\$COMMON:[000000]SAMBA.DIR;

- 5) If the CIFS cluster employed the WINBIND functionality, CIFS may have created OpenVMS accounts and/or identifiers that you may wish to remove.

NOTE: Before removing any such accounts and/or identifiers, files owned by such identifiers should be changed to another existing identifier (such as SYSTEM). Also, any ACL referencing the CIFS identifiers may need to be updated or removed.

The account and identifier names all begin with the string CIFS\$, so they are easily identifiable. To determine if any CIFS accounts and/or identifiers exist and remove them, use the AUTHORIZE utility. For example:

UAF> **SHOW /BRIEF CIFS*** ! CIFS accounts created by WINBIND

UAF> **REMOVE <username>** ! Remove a CIFS user account

UAF> **SHOW/PAGE/IDENT IFIER** ! Make note of CIFS\$GRP* names

UAF> **REMOVE/IDENTIFIER <identname>** ! Remove a CIFS identifier