StorageWorks™

Command Console Agent
Version 1.0 for Digital UNIX®

User Guide

digital™

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Revision History		
Revision	**Date**	**Content**
A	8/96	Version 1.0 release
B	8/96	Minor corrections

Contents

Command Console Agent for Digital UNIX®

This guide describes Command Console Agent for Digital UNIX. It includes a product description, minimum system requirements, and installation and configuration instructions.

Product Description

Command Console Agent for Digital UNIX is a companion application to the Command Console Client graphical user interface (GUI) program. Agent serves as Client's assistant in configuring, operating, and monitoring your host's storage subsystems. Agent runs on your host system as a server application. It connects to Command Console Client sessions via the TCP/IP network protocol, as shown in Figure 1.

Figure 1   Command Console Client/Agent Connection

CXO-5415A-MC
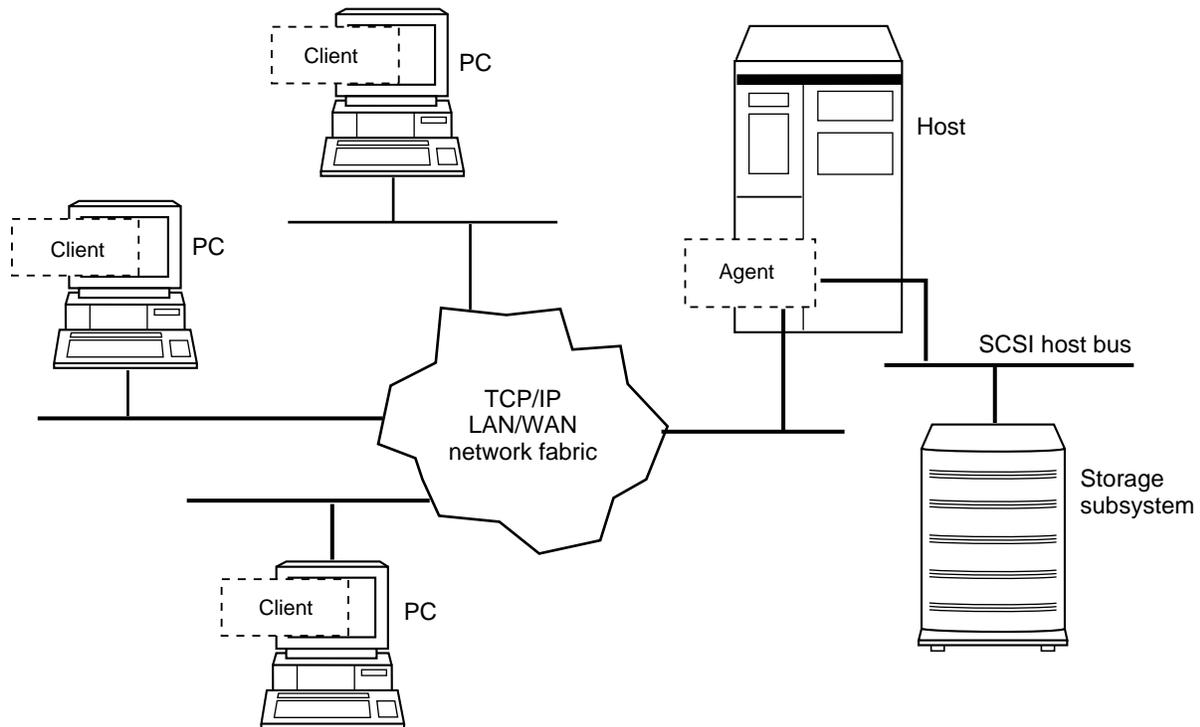
Command Console Agent provides a network connection between a host storage subsystem and any number of Command Console Client sessions running on either the host or other remote systems. Agent provides access protection on a network address-by-network address basis. You can configure Agent to allow, for instance, one Client session complete configuration access to the storage subsystem, while another Client session might only be allowed monitoring capability.

You can also use Agent for asynchronous fault notification. The program monitors your host's storage subsystems and sends notification messages to all Client sessions connected to it the moment a fault occurs. You can configure Agent to use TCP notification to Client and SNMP notification to an SNMP-compatible monitoring application.

Minimum System Requirements

Agent requires the minimum host system resources shown in Table 1. The program is designed to operate with Command Console Client Version 1.0 for Windows NT® and Windows 95®.

Table 1   Minimum System Requirements

Host Feature	Requirement
Architecture	Digital Equipment Corporation Digital UNIX-compatible platform, 2 MB free space in /tmp directory, 4 MB free space for Agent installation directory
Operating System	Digital UNIX version 3.2 C, D, or F
Controller Compatibility	StorageWorks 2 or 6-port controller running operating firmware Version 3.0 or higher.

Installing Command Console Agent

Agent is Client's network assistant. You'll need one Agent program running on each host system you wish to connect to Client over the network. The Agent installation program installs the Agent program of your choice at the host system of your choice.

The following installation instructions cover Agents for all operating systems. Ignore any information that does not apply to the Agent you wish to install.

> **NOTES**
>
> You can install a Windows NT Agent only on a host system on which you can run the CD-ROM.
>
> You can install an Agent for any other operating system only from a Windows NT system with a CD-ROM. Further, you can only install this Agent over a network connection to a remote host.
>
> You can run the Agent installation program on either Intel® or Digital Equipment Corporation Alpha® Windows NT platforms.

Installing an Agent

Here's how to install an Agent in one of your host systems:

1. Your host's system resources must meet the minimum requirements to run the Agent program you wish to install. The minimum system requirements for each Agent type are listed in its user guide on the accompanying CD–ROM. Before going on, verify that each of your host systems will support the Agent you wish to install.

2. Before you can install an Agent, at least one logical volume must exist on each storage subsystem you wish to connect to. If your subsystems do not each contain at least one volume, use your operating system utilities to connect to your controller's command line interpreter (CLI) interface to create one. Subsystems without at least one logical volume are invisible to Agent and the host operating system.

3. Place the Command Console CD–ROM in your local system's CD–ROM drive.

4. Open the *\AGENTS* subdirectory in File Manager.

5. Double click the *INSTALL.BAT* file.

   The installation program begins, displaying a series of windows in which you must enter configuration information for your Agent.

6. Enter the appropriate information in each window, until you have completed the installation of your Agent.

   Click the *Info* button on any window for helpful information on its use.

   If you are installing an Agent on a host system running Windows NT, be sure to read the "Special Windows NT Agent Installation Instructions" below for more information.

   If you are installing an Agent on a host system running a type of UNIX be sure to read the special instructions included in some *Info* windows. See "Special UNIX Agent Installation Instructions" below for more information.

Special Windows NT Installation Instructions

If you installed an Agent with a *Service Startup Type* of *Manual*, you'll need to restart Agent manually each time you boot its host system. If you selected the *Automatic* type, your agent starts automatically when you boot the host system.

In either case, you must manually start Agent after you first install it.

To manually restart Agent, perform the following actions:

1. Click on the Control Panel icon to open it.
2. Click the *Services* icon.
3. Click *Steam.*
4. Click *Start.*

Your Windows NT Agent starts and executes as a background task.

Special UNIX Agent Installation Instructions

When you run the Agent installation program from Windows NT, and you select a UNIX-based Agent type, the program performs the installation over the network. You must have access to the superuser (root) account on the remote host, and your local system must have network access to the remote system.

The installation program prompts you for the remote host's name, along with your personal user name and password. It then uses the file transfer protocol (FTP) to transfer the Agent files to the remote host's */tmp* directory. When the files are transferred, the program opens a separate Telnet window on your local system. You must use the Telnet window to complete the remaining steps of the Agent installation.

Perform the following actions in the Telnet window to complete your Agent installation. Use the special instructions included with the text-based prompts for assistance as you go along.

1. Log on to the remote host system using your personal user name and password.
2. Enter "su" and the superuser password to become superuser.
3. Enter "cd /tmp" to change your working directory to the */tmp* directory containing the Agent software.
4. Enter "sh install.sh" to start the UNIX, Bourne-shell installation script.
5. Follow the text-based prompts to complete your UNIX Agent installation.

Your UNIX-based Agent is installed as a background task, and it automatically runs at all times once it is installed.

Installing Additional Agents

You may want to install Agents on your other host systems. To install more Agent programs, simply repeat the procedure above, using the appropriate host system name and Agent type for each session.

Agent Documentation for Alpha® Platforms

If you're running the Agent programs on a Digital Equipment Corporation Alpha® Windows NT platform, you cannot install the Acrobat Reader. The *\DOCS* subdirectory on the CD–ROM contains Agent user guides in Word for Windows format for use in this situation.

Running Command Console Agent

Your Agent program was automatically started when you installed it, and it was installed to restart automatically if it stops for any reason.

The installation script places an entry in the */etc/inittab* file to implement automatic execution of the Agent when the host system is started. The tag field in the file is *steam*.

The installation script also places an entry in the *crontab* file for root. This entry runs on the quarter hour and restarts the Agent automatically should it prematurely stop running.

Reconfiguring Command Console Agent

You can reconfigure previously-installed Agents using the configuration program. To reconfigure an Agent, execute the *config.sh* Bourne-shell script in the */installation_directory/steam/bin* subdirectory and follow the prompts.

You can also use this script to manually start and stop the daemon.

Uninstalling Command Console Agent

You can remove any Agent program using the uninstall program. You have two options to remove an Agent:

- Run the Agent configuration script on the host and Select Option 5. Run the *config.sh* script in the */installation_directory/steam/bin* subdirectory.

- Run the Agent uninstall script on the host. Run the */installation_directory/steam/bin/uninstal.sh* script, where *installation_directory* is the directory into which you installed Agent.

  Run the script with the string */installation_directory/steam/bin/uninstal.sh installation_directory*, to point the program to the proper location of the Agent files. If you do not know what the location is, examine the file */etc/.STEAMDIR*.

For Advanced Users

The fastest and most user-friendly method of configuring an Agent is to use the configuration script. Use of the script is the recommended method for Agent configuration.

If you wish, however, you can manually configure any Agent by editing the Agent's configuration files with a text editor on the Agent's host system. To configure Command Console Agent for access protection and proper connection with your subsystems, you must edit four, ASCII files.

Editing the Services File

Agent uses sockets (sometimes called "network ports") to communicate with its Clients. Agent uses an even/odd number pair for the port numbers. The socket numbers at the Client and Agent ends must match for network communication to occur.

In UNIX-based systems, the socket numbers are assigned in the *services* file in the */etc* subdirectory. In the unlikely event that you experience a conflict with the socket numbers, you may edit the *services* file manually.

The default socket numbers for Command Console are 4998 and 4999. If you are installing Agent and these numbers are already taken by another application, the installation program prompts to warn you that you must choose another 4-digit, even/odd pair.

To select another pair for Agent, open the *services* file in an ASCII editor. Pick two numbers above 1023 that are not already used in the file, and add the following two lines:

```
spgui               even_number/tcp # StorageWorks® Command Console
spagent             odd_number/tcp # StorageWorks® Command Console
```

Note that the port numbers that you select must match the port numbers used by all of the Clients to which you wish to connect your Agent.

Network Port Assignments for UNIX-Client/Server Systems

A UNIX host may use Network Information Services (NIS) to serve the *services* file containing its network port assignments.

Agent must use the *services* file to determine which network ports to use. Because of this requirement, you may need to configure your system so that Agent can access the proper *services* file.

You have two options to prevent a conflict between the two possible locations of the *services* file:

- You can manually edit the local *services* file and, in addition, force the host to use this file. Be sure the system uses the correct search order for the *services* file by running the utility */usr/sbin/svcsetup*. The search order in this case should be: "local,yp" or simply "local".

- You can manually edit the *services* file on the NIS server to set up the proper network ports for Agent and potentially for the other Agents in the NIS domain. Be sure the system uses the correct search order for the *services* file by running the utility */usr/sbin/svcsetup*. The search order in this case should be: "yp,local".

Editing the Agent Configuration File

The agent configuration file, *steam.cfg*, configures Command Console Agent within its operating system. The file contains five lines of ASCII text, formatted as follows:

device_special_file_path

In Digital UNIX, this line must contain the device special file path, */dev.*

agent_executable_file_path

The full path to the steam.exe, client.ini, and storage.ini files.

encrypted_password

The encrypted password from the password generation program.

manufacturer_name

Your manufacturer name. The default is "Digital Equipment Corporation" You can use up to 80 characters.

snmp_enterprise_assignment

Your SNMP enterprise assignment number. The default is "36.2.15.21.". (Note that this parameter is *not* your numerical TCP/IP address.) If you are unsure about this parameter, use the default or contact your network administrator.

Editing the File

Edit the */installation_directory/steam/bin/steam.cfg* file by performing the following actions:

1. Run the password generation program by changing to the directory that the *steamd, client.ini,* and *storage.ini* files are installed in and entering the following at a command prompt:

   ```
   sp_passwd "yourpassword"
   ```

   where "*yourpassword*" is a 4 to 16-character text string of your choosing.

   The program generates an encrypted password string and displays it on the screen.

2. Use an ASCII editor to modify the *steam.cfg* file you copied during the installation process. Use the encrypted password from Step 1 as line 3 in the file.

Following is a sample *steam.cfg* file:

```
/dev
/opt
Ql</Sn_k
Digital Equipment Corporation
36.2.15.21.
```

Editing the Client Access File

The client access file, *client.ini*, configures Command Console Agent for proper operation with its Command Console Client companions. The file is located in the directory */installation_directory/steam/etc.*

Use an ASCII editor to modify the *client.ini* file you copied during the installation process. Add a separate line in the file for each system that you wish to grant access to this host system. Use vertical bars (sometimes called the "pipe" character) to delimit the three fields. You may add comment lines as long as they start in very first position and begin with the exclamation point character, "!".

NOTE

Blank lines are not allowed in the *client.ini* file. A blank line may interfere with Agent execution.

The line for each client system must be in the following format:

system_network_address|notification _method|access_allowed

where:

system_network_address
The network name, including the domain information if appropriate, of the remote system to which you wish to grant access. The address must be alphanumeric and not a numeric IP address. The address can be up to 128 characters long, including periods. If you are unsure of this address, consult your network administrator.

notification_method
The mechanism you wish Agent to use to notify Client sessions of a fault, where:

> 0 = no notification
> 1 = notify via TCP
> 2 = notify via SNMP
> 3 = notify via both TCP and SNMP
> If you are unsure of which mechanism to use, use "1" for this parameter.

access_allowed
You can configure Agent for three levels of subsystem access:

- High-level monitoring—Good/Bad indication at the host and storage subsystem levels. Good/Bad indication of Client/Agent communication link. Client notified of subsystem faults as they occur.

- Low-level monitoring—All detailed information about the status of the storage subsystem available, in addition to high-level monitoring capabilities.

- Configuration—Capability of changing the configuration of the storage subsystem, in addition to high and low-level monitoring capability.

The *access_allowed* parameter sets the level of access you are granting to this remote system, where:

0 = High-level monitoring only. No low-level monitoring or configuration changes allowed.

1 = High and low-level monitoring. No storage subsystem configuration changes allowed.

2 = High and low level storage subsystem monitoring and configuration access.

Following is a sample *client.ini* file. This file enables full access for the remote Client system at network address *dreamon.your.company.com,* and sends fault notifications to Client using the TCP mechanism. It also disables any monitoring or configuration access by Client running on the system at network address *wanderlust.your.company.com*, but still enables asynchronous fault notification via the TCP mechanism.

```
!  Access list for system HOST123:
dreamon.your.company.com|1|2
wanderlust.your.company.com|1|1
```

Editing the Subsystem Identification File

The subsystem identification file, *storage.ini*, configures Agent to communicate with the storage subsystems on the host on which Agent is running. The file is located in the directory */installation_directory/steam/etc.*

Use an ASCII editor to modify the *storage.ini* file you copied during the installation process. Add a separate line in the file for each system that you wish to grant access to this host system. Use vertical bars (sometimes called the "pipe" character) to delimit the three fields. You may add comment lines as long as they start in very first position and begin with the exclamation point character, "!".

NOTE

Blank lines are not allowed in the *client.ini* file. A blank line may interfere with Agent execution.

The line for each system must have the following format:

subsystem_name|driveID|monitor_interval

where:

> *subsystem_name*
> The name you wish to refer to the subsystem by when using the Client GUI. The name must be alphanumeric and can consist of up to 32 characters.

> *driveID*
> The name that identifies this storage subsystem in Digital UNIX. The name has the format *rrzlnp*, where:

> *rrz* is a fixed string that identifies the subsystem as a Digital UNIX character device.
> *l* is the LUN identifier on the Digital UNIX character device.
> *n* is an integer defined as: (8 * *subsystem_bus_number*) + *controller_target_ID*.
> *p* is the partition identifier on the Digital UNIX character device.

> *monitor_interval*
> The time interval, in seconds, between Agent's periodic status checks on this subsystem. The range of intervals is from 1 to 99,999 seconds. If you set this parameter to 0, Agent does not perform periodic status checks on the subsystem.

Following is a sample *storage.ini* file. This file configures Agent to communicate with and to periodically monitor subsystems *sw300* on drive *rrza16c*, and *mini_b* on drive *rrzb12b*. Agent will check *sw300* at 20-second intervals, and *mini_b* at 300-second intervals (that is, every 5 minutes).

```
! Storage subsystems for HOST123
sw300|rrza16c|20
mini_b|rrzb12b|300
```

Miscellaneous Support Files

Agent uses several files in cooperation with the operating system. Do not delete these files. Most are in the */installation_directory/steam/{bin,etc,data}* subdirectories.

In particular, do not delete these two files:

- */etc/.STEAMDIR—*This file is used to indicate the current directory location of the *steamd* program and support files.

- */etc/inittab—*This file is modified during installation to start *steamd* when the system is started. If you change this file, make sure to issue the command *init q* to cause the operating system to read the file and to recognize the changes.

- */var/spool/cron/crontabs/root—*This file contains an entry that causes the system to monitor the *steamd* process at 15-minute intervals and to restart the process if necessary.