



C120-E275-10ENZ0(A)

Tape Driver Configuration Tool 1.2 Update2

User's Guide



FUJITSU



Preface

Purpose of This Manual

This manual explains the workings of the Tape Driver Configuration Tool which defines parameters of a tape driver on Oracle Solaris.

Intended Readers

This document is intended for system administrators who introduce systems into their organization and maintain them.

Organization of This Manual

The document is organized as follows.

- "Chapter 1 Product Overview" explains the function of the Tape Driver Configuration Tool.
- "Chapter 2 Command Reference" explains how to use the commands supplied by this tool.
- "Chapter 3 Messages" explains what output messages mean and what action should be taken to go ahead.
- "Chapter 4 Appendix" explains configuration detail of each tape device.

Notation

Oracle Solaris might be described as Solaris, Solaris Operating System, or Solaris OS in this manual.

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Revision History

Version Number	Date	Description
1	Februry/2005	Created newly
2	December/2005	Modified /deleted product name of tape devices Added messages
3	November/2006	Added new target tape devices Added messages
4	January/2007	Added new target tape devices
5	December/2007	Added new target tape devices
6	October/2008	Added new target tape devices
7	July/2009	Added new target tape devices
8	December/2009	Added target tape device which needs manual modification of /kernel/drv/st.conf.
9	November/2010	Modified Preface, 1.1 and 1.2
10	August/2011	Modified Preface, 1.2 and 1.3

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Chapter1 Product Overview

1.1 Overview

The Tape Driver Configuration Tool is a component that gives the definition of parameters of a tape driver (`/kernel/drv/st.conf`) automatically. This tool sets definitions of a tape device in the `/kernel/drv/st.conf` by itself when you use the tape device that requires to be given the definitions of parameters.

The Tape Driver Configuration Tool supplies the following commands.

- `fjcnfset(1M)` – This command gives the definitions of parameters of target tape devices automatically.
- `fjcnfchk(1M)` – This command diagnoses the definitions of parameters of target tape devices.

For more information about the commands, see “Chapter 2 Command Reference”.

In addition, the above commands the ‘`fjcnfset(1M)`’ and the ‘`fjcnfchk(1M)`’ run automatically during package installation of this tool.

If any target tape device is detected, it is checked whether the definitions of parameters of the device have been given in the `/kernel/drv/st.conf` or not and the following process is performed according to a setting status.

- If the definitions have not been given, necessary definitions will be given automatically.
- If the definitions have been given, the definitions detail will be checked.

Definitions given by this tool automatically will be valid at the following point.

- If your platform is Solaris 7 or older, or Solaris 8 111804-02 or older, after reboot of your system.
- If your platform is Solaris 8 111804-03 or newer, or Solaris 9 or newer, after normal termination of the ‘`fjcnfset(1M)`’.

Regarding the target tape devices of this tool, see “1.3 Target Tape Devices”.

1.2 Operating Environment

The Tape Driver Configuration Tool works in the following environments.

1. Hardware
 - SPARC Enterprise, PRIMEPOWER, GP7000F
2. Software
 - Solaris 2.6
 - Solaris 7
 - Solaris 8
 - Solaris 9
 - Solaris 10
 - Solaris 11

1.3 Target Tape Devices

The Tape Driver Configuration Tool supports the following tape devices.

No.	device name	Model	connection
1	DDS-4 Tape Drive	PW0G3DT1	Build-in (Note1)
2	DAT-72 Tape Drives	PW023DT5U, PW023DT6U, PW0R3DT3U, PW0G3DT2U, PW0R3DT4U,PW0G3DT4U SELX9DT1X, SEMX9DT1X	Build-in (Note1)
3	ETERNUS LT Series Tape Libraries	LT130, LT160, LT270, LT220, LT210, LT230, LT250	External (Note2)

(Note1) means a tape device is connected as an internal device.

(Note2) means a tape device is connected via PCI card.

In addition, there are two ways in which this tool is supplied.

- Bundled software of Enhanced Support Facility 2.5 or later
- Tape Driver Configuration Tool 1.2 Update2 CD-ROM (attached to a target external tape device)

The conditions under which this tool adds definitions to the `/kernel/drv/st.conf` by itself as part of package installation differ as follows according to how this tool is supplied.

How this tool is supplied.	When definitions are given automatically as part of installation.
Bundled software of Enhanced Support Facility 2.5 or later	If a target internal tape device is detected.
Tape Driver Configuration Tool 1.2 Update2 CD-ROM	If a target external tape device is detected. If a target internal tape device is detected.

However, you need to run the `'fjcnfset(1M)'` manually in the following case.

How this tool is supplied.	When you need to run the <code>'fjcnfset(1M)'</code> manually.
Bundled software of Enhanced Support Facility 2.5 or later	If you connected a target external tape device. If you connected a new target tape device after installed this tool. If a target tape device has been connected to a destination system into which you installed this tool remotely.
Tape Driver Configuration Tool 1.2 Update2 CD-ROM	If you connected a new target tape device after installed this tool. If a target tape device has been connected to a destination system into which you installed this tool remotely.

Chapter2 Command Reference

2.1 fcnfset(1M)

[NAME]

fcnfnset – This command gives the definitions of parameters of a tape driver by itself.

[SYNOPSIS]

```
/opt/FJSVdcnf/bin/fcnfnset st
```

[DESCRIPTION]

The ‘fcnfnset’ sets the configuration of SCSI tape driver (st(7D)) automatically.

This command performs mainly the two processing as follows.

- 1) Settings of environments of the FUJITSU PCI Fibre Channel (the fjpfc driver)

This command gives the fjpfc driver's definitions to the /kernel/drv/fjpfc.conf automatically by an interactive processing when you connected a tape device using FUJITSU fibre channel card and fibre channel switch.
- 2) Setting of definitions of the st driver

This command checks whether the definitions for a target tape device have been given in the /kernel/drv/st.conf, or not, and executes necessary processing according to the following setting status when it detects the target tape device.

 - If no definitions have been given, it gives all necessary definitions automatically.
 - If any definitions have been given, it diagnoses the definitions detail.

Definitions the ‘fcnfnset’ created will be valid at the following point.

- If your platform is Solaris 7 or older, or Solaris 8 111804-02 or older, after reboot of your system.

In this case, the ‘fcnfnset’ command outputs the following message prompting you to reboot your system, so run ‘shutdown(1M)’.

```
The message to prompt you to reboot the system before Solaris 7 or
Solaris 8 111804-02
```

```
Executing "/bin/touch /reconfigure".
```

```
***** IMPORTANT NOTICE *****
```

```
This machine must now be rebooted to reconfigure system.
```

```
Ensure the following operation.
```

```
    /usr/sbin/shutdown -y -i6 -g0
```

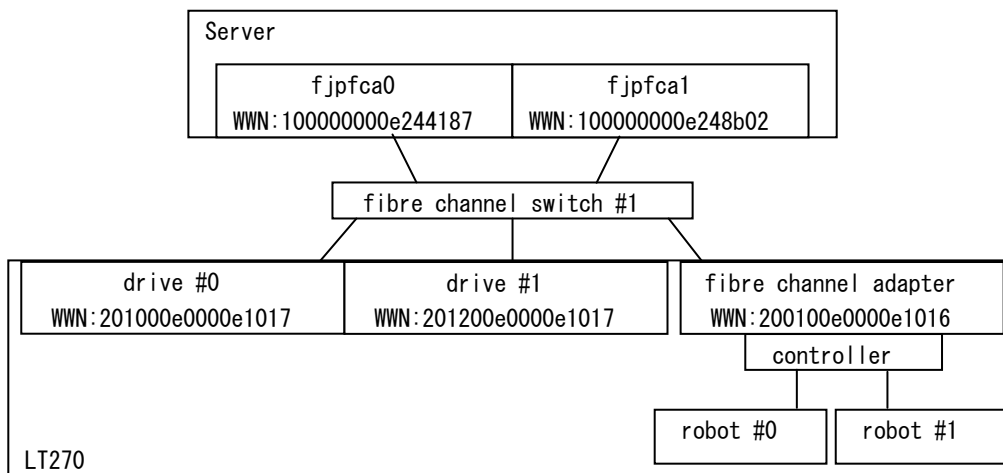
Please note the system may reboot automatically again because the ‘shutdown(1M)’ command recognizes a tape device as part of its processing.

- If your platform is Solaris 8 111804-03 or newer, or Solaris 9 or newer, after normal termination of the ‘fcnfnset’.

The following gives you an explanation of details of the processing of 1) and 2).

1) Settings of environments of the fjpfa driver

As the example of the following configuration, we explain the processing when you connected a tape device using the FUJITSU fibre channel card.



1-1) Confirmation of the tape devices

The 'fcnfset' displays a complete list of all fibre channel cards mounted on the server, and all tape devices connected to those cards.

An example of a complete list of the fibre channel cards and the connected tape devices.

Searching target tape devices of the fjpfa driver...

switch	WWN	device	slot
1	10000000e244187	fjpfca0	Cabinet#0-SB#00-PCI#05
1	10000000e248b02	fjpfca1	Cabinet#0-SB#00-PCI#02
1	200100e0000e1016	LT160/LT270	-
1	201000e0000e1017	LT160/LT270	-
1	201200e0000e1017	LT160/LT270	-

Adapter instance	Adapter WWN	Switch	Tape Device WWN	Tape Device product	Status
[] 1	fjpfca0 10000000e244187	1	200100e0000e1016	LT160/LT270	New
[] 2	fjpfca0 10000000e244187	1	201000e0000e1017	LT160/LT270	New
[] 3	fjpfca0 10000000e244187	1	201200e0000e1017	LT160/LT270	New
[] 4	fjpfca1 10000000e248b02	1	200100e0000e1016	LT160/LT270	New
[] 5	fjpfca1 10000000e248b02	1	201000e0000e1017	LT160/LT270	New
[] 6	fjpfca1 10000000e248b02	1	201200e0000e1017	LT160/LT270	New

The following describes what the upper part of the above example says.

switch :

The number (domain ID) of the fibre channel switch connected to the tape device.

A dash (-) indicates an AL connection.

WWN :

The device's WWN (World Wide Name).

device :

The model name of the tape device, and the instance name of the fibre channel card connected to the server.

slot :

PCI slot name of the server is shown when the Enhanced Support Facility is installed.

A dash (-) is shown when it isn't installed.

The following describes what the lower part of the above example says.

Adapter :

The instance number and WWN of the fibre channel card.

Switch :

The domain ID of the fibre channel switch connected to the fibre channel card and the tape device. A hyphenated pair of domain IDs shows that the fibre channel card and the tape device are connected to different switches.

For example, a "1-2" switch number indicates the fibre channel card is connected to the fibre channel switch that has "1" as domain ID and the tape device is cascade-connected to the fibre channel switch that has "2" as domain ID.

Tape Device :

WWN and the model (product) name of a tape device.

Status :

Displays "New" for a new device added to the fibre channel switch, "Exist" for a previously existing device, and "AL" for an AL connection.

If a set of the tape device consists of existing status ("Exist") and AL connection ("AL"), it is unnecessary to set the environment of the fjpfc driver.

So, only the list of 1-1) is displayed, and the procedures of 1-2) and 1-3) are skipped in this case.

1-2) Selection of the access paths

You select the access paths from the server to the tape devices.

You need to choose either "manual selection" or "automatic selection" to create the access paths interactively.

[Automatically selecting access paths]

Select the "automatic selection", when the setup of the tape devices and the fiber channel switches is appropriately done and your server can not recognize any other access paths than necessary paths.

All access paths of new addition ("New") displayed in 1-1) are defined in the server, when the "automatic selection" is selected.

[Manually selecting access paths]

All you have to do to select necessary access paths is a setting on the server using manual selection, when the setup of the tape devices and the fibre channel switches is not done.

However, the setup of the tape devices and the fiber channel switches is recommended for safety.

Select the "manual selection", when the setting of the tape devices and the fibre channel switches is not done.

And select the necessary access paths from the tape devices list which is displayed like in the case of 1-1) when you select "manual selection".

The following example shows the procedure of "manual selection"

An example of the interactive processing of "automatic selection" and "manual selection".

```

:
Do you want to select access paths automatically or manually?
** If you select automatic selection, all paths whose status is "New"
are set as the object of the fjpfca driver's configuration.
** Please choose Auto Select when the access path has been appropriately
selected by setting Tape Device and Switch.

automatic selection ---> hit the 'a' key.
manual selection    ---> hit the 'm' key.
quit                ---> hit the 'q' key.

Please input  [a, m, q] m <Return>

```

Input the underlined part in the above example. The details of each choice are as follows.

automatic selection :

Select access paths automatically. Please input "a" in this case.

manual selection :

Select access paths manually. Please input "m" in this case.

quit :

Interrupt this process. Please input "q" in this case.

An example of the interactive processing of access paths when you select "manual selection".

```

:

```

	Adapter instance	WWN	Switch	WWN	Tape Device	Status product
[]	1	fjpfca0 10000000e244187	1	200100e0000e1016	LT160/LT270	New
[]	2	fjpfca0 10000000e244187	1	201000e0000e1017	LT160/LT270	New
[]	3	fjpfca0 10000000e244187	1	201200e0000e1017	LT160/LT270	New
[]	4	fjpfca1 10000000e248b02	1	200100e0000e1016	LT160/LT270	New
[]	5	fjpfca1 10000000e248b02	1	201000e0000e1017	LT160/LT270	New
[]	6	fjpfca1 10000000e248b02	1	201200e0000e1017	LT160/LT270	New

```

Select Numbers of "New" device to which you want to add the fjpfca driver's
configuration.
** Display access paths list once again after your input.
** Selected paths appear as asterisks on the screen.
** In case of inputting incorrect number, input the incorrect number again.

select ---> hit Number ( Number Number ...)

```

```

complete ---> hit 'x' key
quit      ---> hit 'q' key

Please input  [PathNumber, x, q] 1 2 6 <Return>

```

Input the access path numbers which you need as the above underlined part. The details of each choice are as follows.

select :

Select the necessary access path numbers from the numbers (from 1 to 6 in the above example) shown in the access path list.

You cannot select the number which doesn't have "[]" at the head of each line.

Input numbers with delimiter of blank when two or more numbers are selected.

complete :

Complete manual selecting of the access paths. Please input "x" in this case.

quit :

Interrupt this process. Please input "q" in this case

The list of the server and the access path is displayed again as follows, when the number of the access path is input.

An example of confirmation of the access paths of "manual selection".

```

:
          Adapter          Switch          Tape Device          Status
          instance        WWN              WWN              product
-----+-----+-----+-----+-----+-----+
[*] 1  fjpfca0 100000000e244187  1 200100e0000e1016  LT160/LT270  New
[*] 2  fjpfca0 100000000e244187  1 201000e0000e1017  LT160/LT270  New
[ ] 3  fjpfca0 100000000e244187  1 201200e0000e1017  LT160/LT270  New
[ ] 4  fjpfca1 100000000e248b02  1 200100e0000e1016  LT160/LT270  New
[ ] 5  fjpfca1 100000000e248b02  1 201000e0000e1017  LT160/LT270  New
[*] 6  fjpfca1 100000000e248b02  1 201200e0000e1017  LT160/LT270  New

Select Numbers of "New" device to which you want to add the fjpfca driver's
configuration.
** Display access paths list once again after your input.
** Selected paths appear as asterisks on the screen.
** In case of inputting incorrect number, input the incorrect number again.

select ---> hit Number ( Number Number ...)
complete ---> hit 'x' key
quit    ---> hit 'q' key

Please input  [PathNumber, x, q] x <Return>

```

Check the selected access paths were marked with '*', and repeat the following operation until all desired access paths have been selected.

- If an incorrect access path number has been selected, reenter the correct access path number.

- If you have forgotten to select an access path, enter its access path number now.

Check the specified access paths finally. If there are no errors, press the "x" key (complete) as the above underlined part.

1-3) Setting of environment definitions of the /kernel/drv/fjpfca.conf

The 'fcnfset' gives the fjpfca driver's definitions to the /kernel/drv/fjpfca.conf automatically.

The 'fcnfset' allocates a target ID automatically when you connected the tape device with server via the fibre channel switch.

The following messages are shown when the processing of 1-3) finished.

An example of output messages after setting definitions of the /kernel/drv/fjpfca.conf automatically.

```

:
Please wait for update of the fjpfca driver's configuration.

/tmp/pfca_conf_set/fjpfca.conf seems to be correct.

*****

*port definition*

instance      status  options
-----
fjpfca0       found  nport
fjpfca1       found  nport

*target definition*

instance      t-id   wwn                status  throt  alias
-----
fjpfca0       0      0x200100e0000e1016  detect UNDEF  UNDEF
fjpfca0       1      0x201000e0000e1017  detect UNDEF  UNDEF
fjpfca1       0      0x201200e0000e1017  detect UNDEF  UNDEF

check new target definition
-----
New target binding find(fjpfca0t0, wwn=0x200100e0000e1016).
New target binding find(fjpfca0t1, wwn=0x201000e0000e1017).
New target binding find(fjpfca1t0, wwn=0x201200e0000e1017).

check new max throttle setting
-----

check new port definition
-----
fjpfca0:change nport mode
fjpfca1:change nport mode

```

2) Setting of definitions of the st driver

The 'fjcnfset' gives all necessary definitions automatically when it detects the target tape device and no definitions for the target tape device have been given in the /kernel/drv/st.conf.

2-1) The contents of the /kernel/drv/st.conf edited automatically

The following is an example of definitions the 'fjcnfset' gives in the /kernel/drv/st.conf without manual operation when you installed internal DAT device into PRIMEPOWER250/450. Comment lines will be shown at the back/in front of the body edited by the 'fjcnfset'.

An example of additional definitions when you connected PRIMEPOWER internal DAT device.

```
### FJSVdcnf Auto Edit Start (05/01/04) #####
tape-config-list=
"SEAGATE DAT 9SP40-000", "SEAGATE_DAT___9SP40-000", "SEAGATE_DAT___9SP40-000";
### FJSVdcnf Auto Edit END (05/01/04) #####

### FJSVdcnf Auto Edit Start (05/01/04) #####
SEAGATE_DAT___9SP40_000=1, 0x34, 0, 0x9639, 4, 0x00, 0x8c, 0x8c, 0x8c, 3;
### FJSVdcnf Auto Edit END (05/01/04) #####
```

Additional definitions will be given automatically as follows besides above definitions when you connected a tape device that has undefined lun number in the /kernel/drv/st.conf. In this case, the following comments lines are added.

An example of an additional definition when you connected a device that has undefined lun-1 in the /kernel/drv/st.conf.

```
### FJSVdcnf Auto Edit(lun) Start (06/05/15) #####
name="st" class="scsi" target=1 lun=1;
### FJSVdcnf Auto Edit(lun) END (06/05/15) #####
```

2-2) Interactive processing of tape devices which cannot be distinguished automatically

An interactive processing for a tape device you connected is needed when the 'fjcnfset' detects the following tape devices which cannot be distinguished automatically.

- ETERNUS LT130 Tape Libraries
- ETERNUS LT20 Tape Libraries (Ultrium3 drive)
- Storage Tek/Sun StorEdge LTO (*)
- Sun StorEdge L8 (*)

(*) This product is shipped to Japan only.

The following is an example of the interactive processing when you connected ETERNUS LT130 tape library (Ultrium 3 drive).

```
An example of a prompt screen when you connected ETERNUS LT130 tape
library (Ultrium 3 drive).

Please select your tape device and input the following number.

1 : "ETERNUS LT130 tape library (Ultrium3)"
2 : "Sun StorEdge LTO (Generation3) and others"
q : quit

Select number [1, 2, q] : 1 <Return>
```

As the above underlined part, you input a relevant number of the tape device you connected.

Please select "q" when you want to quit the processing.

2-3) When you need to edit the /kernel/drv/st.conf manually

You need to edit the definitions for ETERNUS LT130 Library (the 'fcnfset' set in the /kernel/drv/st.conf automatically) from the beginning to the place where the target number of that tape device-ETERNUS LT130 is defined if you connected multiple tape devices that have an "o" mark on the following table to one processing device.

ETERNUS \ Storage Tek/ Sun StorEdge/ ETERNUS	XSLLT118R(*)	XSTLT22A(*)/ XSTLT22B(*)/ XSLL2118R(*)	XSTLT23A(*)/ XSTLT23B(*)/ LT20 (Ultrium3 drive)
LT130 (Ultrium1 drive)	o	x	x
LT130 (Ultrium2 drive)	x	o	x
LT130 (Ultrium3 drive)	x	x	o

o : means that you need to edit st.conf manually.

x : means that you don't have to edit st.conf manually.

(*) This product is shipped to Japan only.

You need to run the following commands in order to make values you edited valid when you edited the file - /kernel/drv/st.conf.

- If your platform is Solaris 7 or older, or Solaris 8 111804-02 or older, reboot your system.

```
# /usr/sbin/shutdown -y -i6 -g0
```

- If your platform is Solaris 8 111804-03 or newer, or Solaris 9 or newer, run 'update_drv(1M)'.

```
# /usr/sbin/update_drv -f st
```

For example, in Solaris 10 environment, if you run the 'fcnfset' when you connected ETERNUS LT130 Tape Library(Ultrium 3 drive) to target=1, lun=0, Storage Tek/Sun StorEdge LTO Generation 3(XSTLT23A/B) to target=2,lun=0, then the definitions detail of the /kernel/drv/st.conf is as follows.

An example of definitions detail of the `/kernel/drv/st.conf` after running the 'fjcnfset'.

```

:
name="st" class="scsi"
  target=1 lun=0;

name="st" class="scsi"
  target=2 lun=0;      A definition that the 'fjcnfset' added automatically.
:
-----
### FJSVdcnf Auto Edit Start (06/05/19) #####
tape-config-list =
"HP      Ultrium 3", "HP Ultrium LTO 3", "HP____Ultrium_3";
### FJSVdcnf Auto Edit END   (06/05/19) #####

### FJSVdcnf Auto Edit Start (06/05/19) #####
HP____Ultrium_3=2, 0x3b, 0, 0x29679, 4, 0x00, 0x00, 0x00, 0x44, 3, 60, 300, 600, 1200, 600
, 600, 18000;
### FJSVdcnf Auto Edit END   (06/05/19) #####
-----
:

```

In this case, you need to edit the file - `/kernel/drv/st.conf` manually as follows and to run 'update_drv(1M)'.

An example of manual operation after running the 'fjcnfset'

```

# vi /kernel/drv/st.conf
:
name="st" class="scsi"
  target=1 lun=0      ← You need to delete ":" that is the last character
                       in this line.

-----
### FJSVdcnf Auto Edit Start (06/05/19) #####
tape-config-list =
"HP      Ultrium 3", "HP Ultrium LTO 3", "HP____Ultrium_3";
### FJSVdcnf Auto Edit END   (06/05/19) #####

name="st" class="scsi"
  target=2 lun=0;    ↑ You need to move a block of definitions of
                       "tape-config-list" created automatically to
                       the space under "target=1" as the definitions
                       of the "target=1".

-----

### FJSVdcnf Auto Edit Start (06/05/19) #####
HP____Ultrium_3=2, 0x3b, 0, 0x29679, 4, 0x00, 0x00, 0x00, 0x44, 3, 60, 300, 600, 1200, 600, 60
0, 18000;
### FJSVdcnf Auto Edit END   (06/05/19) #####
:

# update_drv -f st
:

```

[OPERANDS]

You need to specify 'st' as the name of driver.

[EXIT STATUS]

You will get the following exit status.

0 Configuration of /kernel/drv/st.conf finished successfully.

>0 An error occurred.

For more information, see "Chapter 3 Messages".

[FILES]

/kernel/drv/st.conf

[SEE ALSO]

fjcfnchk(1M)

st(7D)

driver.conf(4)

[NOTE]

none

2.2 fcnfchk(1M)

[NAME]

fcnfchk – This command diagnoses the definitions of parameters of a driver.

[SYNOPSIS]

/opt/FJSVdcnf/bin/fcnfchk st

[DESCRIPTION]

The ‘fcnfchk’ command checks the definitions detail for SCSI tape driver (st(7D)).

If any definitions for a target tape device have been given in the /kernel/drv/st.conf, it checks those definitions against Fujitsu’s recommendation.

As a result of the check, if it finds any differences, it displays current definitions and definitions recommended by Fujitsu.

[OPERANDS]

You need to specify ‘st’ as the name of driver.

[EXIT STATUS]

You will get the following the name of driver.

0 All definitions of the /kernel/drv/st.conf are correct.

>0 There is an error in the definitions of the /kernel/drv/st.conf.

For more information, see “Chapter 3 Messages”.

[FILES]

/kernel/drv/st.conf

[SEE ALSO]

fcnfset(1M)

st(7D)

driver.conf(4)

[NOTE]

none

Chapter3 Messages

This document explains the messages that the Tape Driver Configuration Tool produces the following messages when it configures or checks the file `/kernel/drv/st.conf`.

For more information about the contents and format of each parameter defined in the `/kernel/drv/st.conf`, see man pages of `st(7D)`.

3. 1 Notice Messages

This section explains the notice messages of the Tape Driver Configuration Tool.

[MESSAGES]

```
FJSVdcnf: st: notice: ***** /kernel/drv/st.conf auto edit *****
FJSVdcnf: st: target device = <device name>.
FJSVdcnf: st: config value  = <config value>
```

[MEANING]

The 'fjcnfset(1M)' command has detected a tape device and set the value of <config value> in the file - /kernel/drv/st.conf .

[RESOLUTION]

Nothing.

[MESSAGES]

```
FJSVdcnf: st: notice: ***** current setting recommend for (<product-name 1>) *****
FJSVdcnf: st: target device   = <device name>
FJSVdcnf: st: current    value = <value 1>
FJSVdcnf: st: recommend value = <value 2> (for <product-name 2>)
                               :
FJSVdcnf: st: recommend value = <value N> (for <product-name N>)
```

[MEANING]

The 'fjcnfset(1M)' or the 'fjcnfchk(1M)' command has found that the current value <value1> for a device specified by <device name> is the recommended value for a tape device <product-name 1>.

When multi tape devices have the same <device name> and each recommended value is different, this message is output.

The values between <value 2> and <value N> show the recommended values for other products.

[RESOLUTION]

When using the <product-name 1>, you don't have to take any action.

When using the products except <product-name 1>, we recommend that you change the current value to the recommended value (between <value2> and <value N>) but you don't have to take any action if you have no problems with operations.

[MESSAGES]

```
FJSVdcnf: st: notice: There is no fibre channel card.
```

[MEANING]

The fjpfc driver is installed. However, the fibre channel card of FUJITSU is not installed.

[RESOLUTION]

If the fibre channel card of FUJITSU is installed, check to see if there is a problem with this fibre channel card.

[MESSAGES]

FJSVdcnf: st: notice: There is no fibre channel tape device.

[MEANING]

The tape device may not be properly connected.

[RESOLUTION]

Confirm that the tape device is connected to the fibre channel cable, the fibre channel switch, and the fibre channel card correctly.

3.2 Warning Messages

This section explains the warning messages of the Tape Driver Configuration Tool.

[MESSAGES]

```
FJSVdcnf: st: warning: ***** current setting not recommend *****
FJSVdcnf: st: target device    = <device name>
FJSVdcnf: st: current    value = <value 1>
FJSVdcnf: st: recommend value = <value 2>
      or
FJSVdcnf: st: warning: ***** current setting not recommend *****
FJSVdcnf: st: target device    = <device name>
FJSVdcnf: st: current    value = <value 1>
FJSVdcnf: st: recommend value = <value 2> (for <product-name 2>)
      :
FJSVdcnf: st: recommend value = <value N> (for <product-name N>)
```

[MEANING]

The 'fjcnfset(1M)' or the 'fjcnfchk(1M)' command has found a difference as a result of comparing current value <value1> with recommended value <value2> for a device specified by <device name>.

Each recommended value may be different when multi tape devices have the same <device name>.

In this case, this command compares the current value <value 1> with the recommended value (between <value 2> and <value N>) of each tape device.

[RESOLUTION]

We recommend that you change the current value to the recommended value (between <value2> and <value N>) for your tape device but you don't have to take any action if you have no problems with operations.

When the multi-recommended values are output, the recommended value <value X> is applied to the <product-name X> of your tape device.

[MESSAGES]

```
FJSVdcnf: st: warning: **** target tape device is busy. try again. ****
FJSVdcnf: st: target device= <device name>
```

[MEANING]

The 'fjcnfset(1M)' command failed in getting information about a tape device because the tape device specified by <device name> is in use.

[RESOLUTION]

Make sure that the tape device specified by <device name> is not in use and run the command again.

[MESSAGES]

```
FJSVdcnf: st: warning: Another fjcnfset or fjcnfchk process is executing.
```

[MEANING]

The 'fjcnfset(1M)' command or the 'fjcnfchk(1M)' command has been run doubly.

[RESOLUTION]

Make sure that another process of each command is not running when you try to run the 'fjcnfset(1M)' command or the 'fjcnfchk(1M)' command.

3.3 Error Messages

This section explains the error messages of the Tape Driver Configuration Tool.

[MESSAGES]

```
FJSVdcnf: st: error: ***** /kernel/drv/st.conf *****
```

```
FJSVdcnf: st: ungrammatical
```

[MEANING]

The 'fjcnfchk(1M)' command has detected a format error of the /kernel/drv/st.conf.

[RESOLUTION]

Check the format of the /kernel/drv/st.conf, and correct it.

[MESSAGES]

```
FJSVdcnf: st: error: ***** /kernel/drv/st.conf tape-config-list *****
```

```
FJSVdcnf: st: duplicate configuration
```

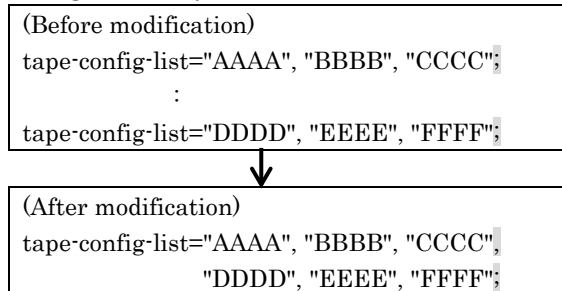
[MEANING]

The 'fjcnfchk(1M)' command has detected the duplicate definitions of the tape-config-list line of the /kernel/drv/st.conf.

[RESOLUTION]

Please correct to avoid the duplicate definitions of the tape-config-list line of the /kernel/drv/st.conf.

Delimit each parameter of the tape-config-list line by "," and terminate the tape-config-list line by ";" as follows.



[MESSAGES]

```
FJSVdcnf: st: error: ***** /kernel/drv/st.conf tape-config-list *****
```

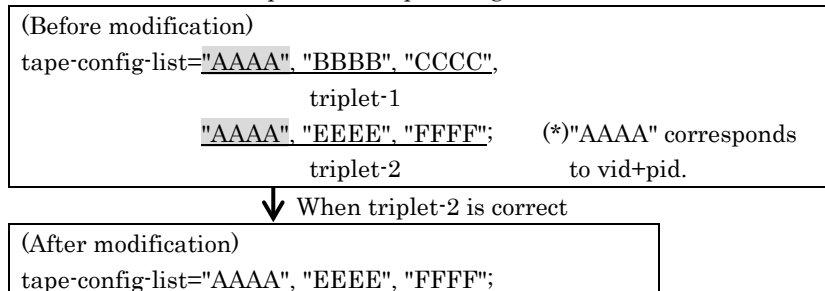
```
FJSVdcnf: st: duplicate triplet configuration
```

[MEANING]

When the multi-triplets are described in the tape-config-list line of the /kernel/drv/st.conf, the 'fjcnfchk(1M)' command has detected the duplicate definitions of the same vid+pid between the different triplets.

[RESOLUTION]

Modify to select the correct triplet from the triplets which have the duplicate definitions of the same vid+pid in the tape-config-list line of the /kernel/drv/st.conf.



[MESSAGES]

```
FJSVdcnf: st: error: ***** /kernel/drv/st.conf tape-config-list *****
FJSVdcnf: st: miss configuration -> tape-config-list=...
```

[MEANING]

The 'fjcnfchk(1M)' has detected an error in the parameter of tape-config-list line defined in the /kernel/drv/st.conf.

[RESOLUTION]

Make sure what parameter is set to the tape-config-list line of the /kernel/drv/st.conf, and rectify the error.

[MESSAGES]

```
FJSVdcnf: st: error: ***** /kernel/drv/st.conf data-property *****
FJSVdcnf: st: duplicate configuration
FJSVdcnf: st: <property-name> -> <data-property-name>
```

[MEANING]

When the definition of the target tape device of this tool is manually edited in the tape-config-list line of the /kernel/drv/st.conf, the 'fjcnfchk(1M)' command has detected the duplicate definitions of its <data-property-name> line.

[RESOLUTION]

Delete the duplicate <data-property-name> line when all parameter values are the same in the duplicate <data-property-name> lines.

Change the duplicate <data-property-name> into the correct variable name as follows, when different parameter values are defined in the duplicate <data-property-name> lines.

(Before modification)

```
tape-config-list="AAAA", "BBBB", "CCCC",
                "DDDD", "EEEE", "FFFF";
CCCC= p1, p2, ..., pN;
CCCC= q1, q2, ..., qM;
```



When "q1, q2, ..., qM" are parameter values for "FFFF" correctly

(After modification)

```
tape-config-list="AAAA", "BBBB", "CCCC",
                "DDDD", "EEEE", "FFFF";
CCCC= p1, p2, ..., pN;
FFFF= q1, q2, ..., qM;
```

[MESSAGES]

```
FJSVdcnf: st: error: ***** /kernel/drv/st.conf data-property *****
FJSVdcnf: st: miss configuration -> <data-property-name>= <value1>, ..<value n>
FJSVdcnf: st: <property-name> -> <data-property-name>
```

[MEANING]

The 'fjcnfchk(1M)' has detected an error in the value of <data-property-name> line defined in the /kernel/drv/st.conf.

This command displays "miss configuration->" followed by information on that values until reaches a wrong value <value n> i.e. information between <value 1> and <value n>.

[RESOLUTION]

Make sure what value is set to the <data-property-name> line, and rectify the error.

[MESSAGES]

```
FJSVdcnf: st: error: ***** /kernel/drv/st.conf data-property *****  
FJSVdcnf: st: no configuration  
FJSVdcnf: st: <property-name> -> <data-property-name>
```

[MEANING]

When the definition of the target tape device of this tool is manually edited in the tape-config-list line of the /kernel/drv/st.conf, the 'fjcnfchk(1M)' command has detected no definitions of its <data-property-name> line.

[RESOLUTION]

Add the <data-property-name> line as follows, and define the appropriate parameters referring to "Chapter 4 Appendix".

```
(Before modification)  
tape-config-list="AAAA", "BBBB", "CCCC";
```



```
(After modification)  
tape-config-list="AAAA", "BBBB", "CCCC";  
CCCC= p1, p2, .., pN;
```

[MESSAGES]

```
FJSVdcnf: st: error: An operation of fjpgca driver is failed(chk_conf -v).  
FJSVdcnf: st: error: An operation of fjpgca driver is failed(fc_config -v).
```

[MEANING]

The fjpgca driver command (chk_conf, fc_config) failed.
There is a problem with the definition file of the fjpgca driver.

[RESOLUTION]

Refer to the fjpgca driver manual to correct the definition file.

[MESSAGES]

```
FJSVdcnf: st: error: An operation of fjpgca driver is failed(fc_info -p).  
FJSVdcnf: st: error: An operation of fjpgca driver is failed(alpa).
```

[MEANING]

The fjpgca driver command (fc_info, alpa) failed.

[RESOLUTION]

Refer to the fjpgca driver manual to know what action to be taken.

[MESSAGES]

```
FJSVdcnf: st: error: An allocation of target ID is failed.
```

[MEANING]

A new target ID cannot be allocated, because the target IDs between 0 and 255 are already used.

[RESOLUTION]

Configure manually because the 'fjcnfset(1M)' cannot work automatically.

[MESSAGES]

FJSVdcnf: st: error: Invalid fjpca.conf.

[MEANING]

The existing fjpca driver's definition that has been defined has a problem.

[RESOLUTION]

Refer to the fjpca driver manual to correct the definition file.

Chapter4 Appendix

4.1 The Contents of a Definition File

This section explains each value of parameters of a tape device that the Tape Driver Configuration Tool supports.

The formal syntax of the configuration of the `/kernel/drv/st.conf` is as follows. :

```
tape-config-list="<AAAA>", "<BBBB>", "<CCCC>";  
<CCCC>= param1, param2, ..., paramN;
```

<AAAA> is a character string i.e. Vendor ID and Product ID.

<BBBB> is a character string that is outputted to console when this tool recognizes a tape device.

<CCCC> is a variable name that is used to define parameters (between param1 and paramN).

(*) In `st(7D)` man-pages, each field name of "AAAA", "BBBB", and "CCCC" is called <vid+pid>, <pretty print> and <data-property-name> in this order.

It is possible to set any character string to above BBBB,CCCC.

For example, as follows, if each parameter between param1 and paramN has the same value, the difference between BBBB fields or CCCC fields in each 'tape-config-list' doesn't affect the operation of a tape driver.

```
tape-config-list="SEAGATE DAT    9SP40-0000", "SEAGATE_DAT", "SEAGATE_DAT";  
SEAGATE_DAT=1, 0x34, 0, 0x9639, 4, 0x00, 0x8c, 0x8c, 0x8c, 3;
```

```
tape-config-list="SEAGATE DAT    9SP40-0000", "SEAGATE_DDS4", "SEAGATE_DDS4";  
SEAGATE_DDS4=1, 0x34, 0, 0x9639, 4, 0x00, 0x8c, 0x8c, 0x8c, 3;
```

For details of each value of parameters, see `st(7D)` man-pages.

4.1.1 DDS-4 Tape Drive (PW0G3DT1)

```
tape-config-list=  
"SEAGATE DAT    9SP40-000", "SEAGATE_DAT___9SP40-000", "SEAGATE_DAT___9SP40-000";  
SEAGATE_DAT___9SP40-000=1,0x34,0,0x9639,4,0x00,0x8c,0x8c,0x8c,3;
```

4.1.2 DAT-72 Tape Drives(PW023DT5U,PW023DT6U,PW0R3DT3U, PW0G3DT2U,PW0R3DT4U,PW0G3DT4U,SELX9DT1X,SEMX9DT1X)

```
tape-config-list=  
"SEAGATE DAT    DAT72-000", "SEAGATE_DAT___DAT72-000", "SEAGATE_DAT___DAT72-000";  
SEAGATE_DAT___DAT72-000=1,0x34,0,0x9639,4,0x00,0x8c,0x8c,0x8c,3;
```

4.1.3 ETERNUS LT Series Tape Libraries

- LT130(Ultrium1 drive)


```
tape-config-list =
"HP      Ultrium 1","HP Ultrium","HP____Ultrium_1";
HP____Ultrium_1=1,0x36,0,0x29679,4,0x00,0x00,0x00,0x40,3;
```
- LT130(Ultrium2 drive)


```
tape-config-list =
"HP      Ultrium 2","HP Ultrium2","HP____Ultrium_2";
HP____Ultrium_2=1,0x36,0,0x29679,4,0x00,0x00,0x00,0x42,3;
```
- LT130(Ultrium3 full height drive)


```
tape-config-list =
"HP      Ultrium 3","HP Ultrium LTO 3","HP____Ultrium_3";
HP____Ultrium_3=2,0x3b,0,0x29679,4,0x00,0x00,0x00,0x44,3,60,300,600,1200,600,600,18000;
```
- LT160(Ultrium1 drive)


```
tape-config-list =
"IBM      ULTRIUM-TD1","IBM Ultrium1","IBM____ULTRIUM-TD1";
IBM____ULTRIUM-TD1=1,0x36,0,0x9679,4,0x00,0x00,0x00,0x40,3;
```
- LT160,LT270,LT210(Ultrium2 drive)


```
tape-config-list =
"IBM      ULTRIUM-TD2","IBM Ultrium2","IBM____ULTRIUM-TD2";
IBM____ULTRIUM-TD2=1,0x36,0,0x9679,4,0x00,0x00,0x00,0x42,3;
```
- LT270,LT220,LT230,LT250(Ultrium3 full height drive)


```
tape-config-list =
"IBM      ULTRIUM-TD3","IBM Ultrium3","IBM____ULTRIUM-TD3";
IBM____ULTRIUM-TD3=2,0x3B,0,0x18659,4,0x44,0x44,0x44,0x44,3,60,300,600,1200,600,600,18000;
```
- LT270,LT230,LT250,LT220(Ultrium4 full height drive[FC/SCSI])


```
[914644-02 or older]
tape-config-list =
"IBM      ULTRIUM-TD4","IBM Ultrium4","IBM____ULTRIUM-TD4";
IBM____ULTRIUM-TD4 =2,0x3b,0,0x18659,4,0x46,0x46,0x46,0x46,3,60,300,600,1200,600,600,18000;
[914644-03 or newer]
tape-config-list =
"IBM      ULTRIUM-TD4","IBM Ultrium4","IBM____ULTRIUM-TD4____SCSI";
IBM____ULTRIUM-TD4____SCSI =2,0x3b,0,0x18659,4,0x46,0x46,0x46,0x46,3,60,300,600,1200,600,
600,18000;
```

(*) It is unnecessary to set this definitions when you connect both the Ultrium4 full height drive[SAS] and the Ultrium4 full height drive[FC/SCSI].

- LT210,LT220(Ultrium3 half height drive)
[914644-02 or older]
tape-config-list =
"IBM ULTRIUM-HH3","IBM Ultrium3","IBM____ULTRIUM-HH3 ";
IBM____ULTRIUM-HH3 =2,0x3b,0,0x18659,4,0x44,0x44,0x44,3,60,300,600,1200,600,600,18000;
[914644-03 or newer]
tape-config-list =
"IBM ULTRIUM-HH3","IBM Ultrium3","IBM____ULTRIUM-HH3____SCSI ";
IBM____ULTRIUM-HH3____SCSI =2,0x3b,0,0x18659,4,0x44,0x44,0x44,3,60,300,600,1200,600,
600,18000;
- LT220(Ultrium4 half height drive[SAS])
tape-config-list =
"IBM ULTRIUM-HH4","IBM Ultrium4","IBM____ULTRIUM-HH4";
IBM____ULTRIUM-HH4=2,0x3B,0,0x41861d,4,0x00,0x42,0x44,0x46,3,60,1080,780,13020,780,960,13980;

4.2 Notes

4.2.1 When you edit the /kernel/drv/st.conf manually

This section explains the note about editing the tape-config-list line of the /kernel/drv/st.conf.

There are the following two ways to define the tape-config-list line.

- Common definition

```

:
name="st" class="scsi"
  target=6 lun=0; ← The definition preceding that of the tape-config-list
                    terminates in ";".
:
tape-config-list = "AAAA", "BBBB", "CCCC";
:

```

- Definition of each target/lun number

```

:
name="st" class="scsi"
  target=6 lun=0 ← The definition preceding that of the tape-config-list
                  does not terminate in ";".
:
tape-config-list = "AAAA", "BBBB", "CCCC";
:

```

Edit as follows when you add any definitions to the tape-config-list line of the above common definition manually.

(Before modification)

```

:
name="st" class="scsi"
  target=6 lun=0;
:
tape-config-list = "AAAA", "BBBB", "CCCC";
:

```



(After modification)

```

:
name="st" class="scsi"
  target=6 lun=0;
:
tape-config-list = "AAAA", "BBBB", "CCCC", ← Replace the last ";" with ", ".
                  "DDDD", "EEEE", "FFFF"; ← Add the definitions and type ";" to
                                           terminate the addition.
:

```

4.2.2 When you add different interface drive to the environment of ETERNUS LT Series Tape Libraries

When the existing drive is combined with the additional drive as the following table, run the `fjcnfset(1M)` command after commenting out the definition for the existing drive.

Existing drive		Additional drive		Result of <code>fjcnfset(1M)</code>
LT230	Ultrium4 full height drive [FC]	LT230	Ultrium4 full height drive [SAS]	No definition
LT250				
LT270				
LT220	Ultrium4 full height drive [SCSI]			

For example, an definition of `/kernel/drv/st.conf` when you connected the Ultrium4 full height drive[SCSI] is as follows.

```
An definition example of /kernel/drv/st.conf when you connected the Ultrium4 full height drive[SCSI].
```

```

:
name="st" class="scsi"
  target=1 lun=0;
:

```

The definition for Ultrium4 full height drive[SCSI]

```

### FJSVdcnf Auto Edit Start (xx/xx/xx) #####
tape-config-list=
"IBM ULTRIUM-TD4","IBM Ultrium4","IBM____ULTRIUM-TD4";
### FJSVdcnf Auto Edit END (xx/xx/xx) #####
### FJSVdcnf Auto Edit Start (xx/xx/xx) #####
IBM____ULTRIUM-TD4=2, 0x3b, 0, 0x18659, 4, 0x46, 0x46, 0x46, 0x46, 3, 60, 300, 600, 1200, 600, 600, 18000;
### FJSVdcnf Auto Edit END (xx/xx/xx) #####
:

```

When you add the Ultrium4 full height drive[SAS] to this environment, connect this drive, comment out the definition for Ultrium4 full height drive[SCSI] of /kernel/drv/st.conf by manual edit and run the fjcncfset(1M) command as follows.

```

An example of manual operation
# vi /kernel/drv/st.conf
:
name="st" class="scsi"
target=1 lun=0;
:
height drive[SCSI].
### FJSVdcnf Auto Edit Start (xx/xx/xx) #####
# tape-config-list=
# IBM ULTRIUM-TD4", "IBM Ultrium4", "IBM____ULTRIUM-TD4";
### FJSVdcnf Auto Edit END (xx/xx/xx) #####
### FJSVdcnf Auto Edit Start (xx/xx/xx) #####
# IBM____ULTRIUM-TD4=2, 0x3b, 0, 0x18659, 4, 0x46, 0x46, 0x46, 0x46, 3, 60, 300, 600, 1200, 600, 600, 18000;
### FJSVdcnf Auto Edit END (xx/xx/xx) #####
:
# /opt/FJSVdcnf/bin/fjcncfset st
:

```

At this time, there are no output messages of the fjcncfset(1M) command because it does not add the definition.

If you run the fjcncfset(1M) command without commenting out the definition for existing drive, the following messages are shown.

```

:
FJSVdcnf: st: notice: **** current setting recommend for (IBM Ultrium4 SCSI) ****
FJSVdcnf: st: target device = "IBM ULTRIUM-TD4"
FJSVdcnf: st: current value = 2, 0x3b, 0, 0x18659, 4, 0x46, 0x46, 0x46, 0x46, 3, 60, 300, 600,
1200, 600, 600, 18000;
FJSVdcnf: st: recommend value = *** definition is not necessary *** (for IBM Ultrium4
Full Height SAS)
:

```

If the above messages are shown, run the fjcncfset(1M) command again after commenting out the definition for existing drive according to the procedure of this section.

