Sun Enterprise 10000 Dynamic Reconfiguration Reference Manual

Sun Microsystems, Inc.

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Contents

Maintenance Commands

NAME | Intro – Sun(tm) Enterprise(tm) 10000 DR administration

AVAILABILITY | Sun Enterprise 10000 servers only.

DESCRIPTION | This section describes commands, scripts, and programs executed in the Enterprise 10000 Dynamic Reconfiguration (DR) environment.

Note - Execute commands shown here only in the SSP environment. One exception, dr_daemon(1M), must be executed in the host environment of the Sun Enterprise 10000 server.

LIST OF COMMANDS

abort_attach(1M)	abort DR attach operation
abort_detach(1M)	abort DR detach operation
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dr(1M)	initiate dynamic reconfiguration shell
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dr_cmd_dev_info(1M)	show devices on a system board in Tcl encoding

dr_cmd_drain(1M)   start memory drain on a system board

dr_cmd_drain_status(1M) show state of in-progress memory drain

dr_cmd_eligible_attach(1M) a system board is eligible for DR attach

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dr_cmd_init_attach(1M) initiate DR attach system board operation

dr_cmd_mem_info(1M)   show memory configuration on a system board in
                            Tcl encoding

dr_cmd_obp_info(1M)   show complete config on a system board in Tcl
                            encoding

dr_cmd_print_brd_info(1M) show board resource in tabular format

dr_cmd_print_obp_info(1M) show system board info per OpenBoot(tm) Prom
                            in tabular format

dr_cmd_print_unsafe_info(1M) show domain's open, unsafe devices in tabular
                            format

dr_cmd_unsafe_dev_info(1M) show a domain's open, unsafe devices in Tcl
                            encoding

drain(1M)   start memory drain

drshow(1M)   display DR and board resource info

drview(1M)   DR Graphical User Interface

init_attach(1M)   initiate DR Attach operation

reconfig(1M)   initiate auto-configuration sequence

NAME	abort_attach – abort a DR Attach operation
SYNOPSIS	**abort_attach** *sb*
AVAILABILITY	Sun Enterprise 10000 servers only.
DESCRIPTION	Execute this command at the dr(1M) shell prompt to return the specified board to its original condition after completion of an init_attach(1M) operation. abort_attach leaves the board present, powered-on, and in no domain. It instructs the operating system running on the target domain specified by the SUNW_HOSTNAME environment variable to abandon the in-progress attach operation, then removes the board from the domain_config file and resets the Enterprise 10000 centerplane cluster mask registers and board domain mask registers. See domain_config(4) in the *Sun Enterprise 10000 SSP Reference Manual*.
	You should run abort_attach after init_attach(1M) has successfully completed, and instead of the complete_attach(1M) command.
	If executing abort_attach fails to abort the operation, try repeating the attempt at a later time, or contact your service provider.
OPTIONS	The following options are supported.
	sb The board number (0 to 15) of the system board not to be attached.
EXIT STATUS	If successful, abort_attach returns a 0 in the dr_return global variable; if not, it returns a 1, along with one or more diagnostic messages.
EXAMPLES	**EXAMPLE 1** Using abort_attach(1M)

dr> **abort_attach 5**

Aborting attach board 5 to domain ts4.

Processors on board 5 reset.

Removing board 5 from domain_config file.

Board 5 placed into loopback.

Abort attach board successful.

dr>

DIAGNOSTICS   The following diagnostics are supported:

```
Failed to abort board attachment
```

Repeat the `abort_attach` command at a later time, or contact your service
provider.

NOTES   If DR detects a usage syntax error, it immediately aborts the `dr(1M)`
command, displays the `dr(1M)` shell prompt, and leaves `dr_return`
unmodified. See `dr(1M)`.

SEE ALSO   dr(1M), init_attach(1M)

NAME	abort_detach – abort a DR Detach operation

SYNOPSIS   **abort_detach** *sb*

AVAILABILITY   Sun Enterprise 10000 servers only.

DESCRIPTION   Execute this command at the `dr(1M)` shell prompt to abort an attempt to DR
Detach a board. You can execute `abort_detach` after the board has been
successfully executed, resources on the designated system board are once
again available to the operating system.

OPTIONS   The following options are supported.
sb   The board number (0 to 15) of the system board not to be
                    detached.

EXIT STATUS   If successful, `abort_detach` returns a 0 in the `dr_return` global variable; if
not, it returns a 1, along with one or more diagnostic messages.

EXAMPLES   **EXAMPLE 1**   Using `abort_detach(1M)`

dr> **abort_detach 4**

Aborting detach board 4

Returning board to domain_config.

Adding board 4 to domain_config file.

Abort board detach completed successfully.

DIAGNOSTICS   The following diagnostics are supported:

```
FAILED to restore domain_config file

Retry the ABORT board detach at a later time
```

The attempt to restore the board number to the target domain board list in the `domain_config(4)` file (in the *Sun Enterprise 10000 SSP Reference Manual*) has failed. This may be a temporary condition, so try the `abort_detach` again at a later time.

```
Failed to abort board detach
```

The operating system on the target domain was unable to restore the board to full operation. This may be a temporary condition, so try the `abort_detach` again at a later time.

NOTES   If DR detects a usage syntax error, it immediately aborts the `dr(1M)` command, displays the `dr(1M)` shell prompt, and leaves `dr_return` unmodified. See `dr(1M)`.

SEE ALSO   complete_attach(1M), dr(1M), drain(1M)

NAME | complete_attach – complete a DR Attach operation

SYNOPSIS | **complete_attach** *sb*

AVAILABILITY | Sun Enterprise 10000 servers only.

DESCRIPTION | Execute this command at the dr(1M) shell prompt to complete an attempt to DR Attach a board after successful execution of the of the init_attach(1M) command. complete_attach causes the operating system running on the target domain to dynamically add the resources (processors, memory, and I/O devices) from the specified board to the running system. If a problem that prevents attachment of any device present on the board occurs, that problem is logged in the system message buffer of the target domain. To display a list of the devices that were successfully attached, execute the drshow(1M) command to display the current system configuration for the board.

OPTIONS | The following options are supported.
sb   The board number (0 to 15) of the system board to be attached to the target domain.

EXIT STATUS | If successful, complete_attach returns a 0 in the dr_return global variable; if not, it returns a 1, along with one or more diagnostic messages.

EXAMPLES | **EXAMPLE 1**   Using complete_detach(1M)

dr> **complete_attach 5**

Completing attach for board 5

Board attachment completed successfully.

DIAGNOSTICS | The following diagnostics are supported:

Failed during final state transition

The operation failed during the final stage of attachment. Check that the DR daemon is still running on the target domain, and that the network is operational. To recover from the failure, repeat the `complete_attach` operation or execute an `abort_attach(1M)`.

```
Failed to complete attach board
```

The operating system on the target domain was unable to attach the board. Repeat the `complete_attach` operation at a later time or execute the `abort_attach(1M)` command.

NOTES   If DR detects a usage syntax error, it immediately aborts the `dr(1M)` command, displays the `dr(1M)` shell prompt, and leaves `dr_return` unmodified. See `dr(1M)`.

SEE ALSO   dr(1M), drshow(1M), init_attach(1M)

NAME	complete_detach – complete a DR detach operation
SYNOPSIS	**complete_detach** *sb* [force]
AVAILABILITY	Sun Enterprise 10000 servers only.
DESCRIPTION	Execute this command at the dr(1M) shell prompt to complete an attempt to DR Detach a board. The drain(1M) must have been previously executed and the drain operation must have completed before complete_detach can proceed. You can use the drshow(1M) command to check the status of the domain operation.
	A board can be detached only after all use of its devices has ceased. DR automatically terminates the use of memory and network devices and, in almost all cases, processors; but you must terminate use of the board's I/O devices. You can use the drshow(1M) command to list the devices in use on the board.
	If the detaching board contains non-pageable kernel or OBP memory, the domain is quiesced during the complete_detach operation. The quiesce operation may fail due to *forcible* conditions. See the *Sun Enterprise 10000 Dynamic Reconfiguration User's Guide* for a description of such conditions. You can use the force argument to force the quiesce in such situations.
OPTIONS	The following options are supported.
	sb The board number (0 to 15) of the system board to be detached.
	force Force the domain quiesce operation. See the *Sun Enterprise 10000 Dynamic Reconfiguration User's Guide* for a description of such conditions. You can use the force argument to force the quiesce in such situations.
EXIT STATUS	If successful, complete_detach returns a 0 in the dr_return global variable; if not, it returns a 1, along with one or more diagnostic messages.
EXAMPLES	**EXAMPLE 1** Using complete_detach(1M)
	dr> **complete_detach 5**

Completing detach of board 5.

Operating System has detached the board.

Processors on board 5 reset.

Board 5 placed into loopback.

Board detachment completed successfully.

DIAGNOSTICS   The following diagnostics are supported:

`Cannot COMPLETE detach until drain completes`

The drain operation is still in-progress. Use `drshow(1M)` to monitor the drain. After it has completed, repeat the `complete_detach` command.

`Board detachment failed`

`Retry the COMPLETE or ABORT the operation`

A condition on the target domain's operating system has prevented the detach from completing. Retry the operation at a later time, or use `abort_detach(1M)` to abort the detach.

NOTES   If DR detects a usage syntax error, it immediately aborts the `dr(1M)` command, displays the `dr(1M)` shell prompt, and leaves `dr_return` unmodified. See `dr(1M)`.

SEE ALSO   abort_detach(1M), dr(1M), drain(1M), drshow(1M)

NAME	dr – initiate dynamic reconfiguration shell
SYNOPSIS	**dr**
AVAILABILITY	Sun Enterprise 10000 servers only.
DESCRIPTION	The dr command initiates the Dynamic Reconfiguration (DR) shell, a Tcl application (see NOTES, below) with DR command extensions. You can use the dr shell to logically attach or detach a system board to or from an Enterprise 10000 domain from the command line or via a script.

Note - Whenever possible, use the DR GUI via Hostview to execute Dynamic Reconfiguration operations. Use the dr shell when you cannot run Hostview; for example, if you need to run DR over a dial-up connection. For more information, see the *Sun Enterprise 10000 Dynamic Reconfiguration User's Guide* and hostview(1M) in the *Sun Enterprise 10000 SSP Reference Manual*.

When executed on the command line, dr connects to the domain specified by the SUNW_HOSTNAME environment variable. After this connection is established, dr displays the dr> prompt, which accepts the DR commands.

Note - To see the list of DR commands while not using AnswerBook, execute man Intro on the SSP while logged in as user ssp.

You can quit the dr shell at any time by typing exit or Control-d.

⚠ **Caution -** Do not execute any of the DR commands that begin with dr_cmd_; these are low-level commands that are for use only by authorized service personnel under special circumstances, as described in dr.service(1M).

To minimize the risk of unintended DR operations, start this shell only when you are ready to execute DR commands and exit it as soon as you are done.

The DR commands return error status in the global Tcl variable dr_return. Normally, Tcl commands return both output and status together, which can be confusing and difficult to parse from within scripts. You can, however, execute the DR command set dr_return to display dr_return after executing each DR command, to determine command success or failure. Though, under most circumstances, the diagnostic messages output by the dr shell clearly indicate success or failure.

Note - Type help at the dr shell prompt
(dr>) to access DR's quick-reference help guide.

EXAMPLES   **EXAMPLE 1**   Using dr(1M)

The following example performs a DR Attach of Board 2 to the domain named
"e100001". After complete_attach(1M) has successfully completed dr
displays the result code stored in dr_return

e100001-ssp% **domain_switch e100001**

e100001-ssp% **dr**

Checking environment...

Initializing SSP SNMP MIB...

Establishing communication with DR daemon...

e100001: System Status - Summary

BOARD #: 2 3 5 6 physically present.

BOARD #: 0 1 4 being used by the system.

dr> **init_attach 2**

Initiate attaching board 2

phase init_reset: Initial system resets...

phase jtag_integ: JTAG probe and integrity test...

phase mem_probe: Memory dimm probe...

phase jtag_bbsram: JTAG basic test of bootbus sram...

phase procl: Initial processor module tests...

phase pc/cic_reg: PC and CIC register tests...

phase dtag: CIC DTAG tests...

phase mem: MC register and memory tests...

phase procmem: Processor vs. memory tests...

phase xcall: Interprocessor interrupt tests...

phase io: I/O controller tests...

Skipping phase ecc: Proc ecc vs. memory tests...

phase final_config: Final configuration...

Creating OBP handoff structures...

Configured in 3F with 3 processors, 0 SBus cards, 1024 MBytes
memory.

Boot processor is 4.0 = 8

POST execution time 1:23

hpost is complete.

/opt/SUNWssp/bin/obp_helper

Master cpu is 8

Slave cpus initialization:

Slave cpus initialization OK

board debut utility complete.

Board attachment initiated successfully.

Ready to COMPLETE board attachment.

```
dr> complete_attach 2


Completing attach for board 2


Board attachment completed successfully.


dr> set dr_return



0



dr> exit
```

e100001-ssp%

NOTES

Tcl (Tool command language) is a simple scripting language forr controlling and extending applications. You do not need Tcl knowledge to use the `dr` shell. However, if you wish to write Tcl scripts or just want more information about Tcl, a good reference is *Tcl and the Tk Toolkit* by John K. Ousterhout, published by Addison-Wesley Publishing Company.

As a Tcl application, `dr` checks for certain types of syntax errors and, if it finds one, aborts without executing the `dr` shell command. For example, if you specify an argument with a command that does not require one, `dr` prints a usage error message and aborts. `dr` updates `dr_return` only upon completion of a `dr` command. If the command does not complete, as in our example above, `dr` does not update `dr_return`.

SEE ALSO

Sun Enterprise 10000 Dynamic Reconfiguration User's Guide

Sun Enterprise Server Alternate Pathing User's Guide

Sun Enterprise 10000 SSP User's Guide

domain_switch(1M), hostview(1M) in the *Sun Enterprise 10000 SSP Reference Manual*

dr(7) in the *Solaris Reference for SMCC-Specific Software*

add_drv(1M), drvconfig(1M), devlinks(1M), disks(1M), inetd(1M), ports(1M), prtconf(1M), tapes(1M) in *man Pages(1M): System Administration Commands* of the *SunOS Reference Manual*

syslog(3) in *man Pages(3): Library Routines* of the *SunOS Reference Manual*

NAME	dr.service – low-level DR commands for service providers
AVAILABILITY	Sun Enterprise 10000 servers only.
DESCRIPTION	The low-level commands described here, which begin with `dr_cmd`, are available only in the DR shell, and are for use by service providers only. Service providers should use them only when they need a finer level of control to debug failing DR operations, or when they cannot access the DR GUI.
	The DR shell provides commands that directly map to `libdr.so` function calls. Executing this command set gives the caller a finer level of control over DR operations, but introduces additional risk of error due to fewer safeguards.
	Note that DR operations can fail to be denied by the operating system for numerous reasons. Often, specific user action is required to complete a DR sequence. For this reason, Sun cautions against the use of automated DR scripts. The Hostview interface (see `hostview(1M)` in *Sun Enterprise 10000 SSP Reference Manual*) is the preferred method of performing DR operations. Use the `dr(1M)` shell when the GUI-based Hostview application is unavailable.
CAUTION	Customers should not use these low-level commands, but should access DR through the DR GUI, as described in the *Sun Enterprise 10000 Dynamic Reconfiguration User's Guide*, or via the high-level DR commands (those without the `dr_cmd` prefix) described in this reference manual.
SHELL COMMANDS	The low-level shell commands are those that begin with `dr_cmd`. See `Intro(1M)`.
EXIT STATUS	The DR shell low-level command set generally returns an exit code in the `dr_return` global variable. Upon return from each of the DR commands, this variable can be tested for success or failure.

Note - Tcl parsing errors prevent DR commands from running which, in turn, leaves `dr_return` uninitialized. In such cases, the `dr_return` error code is meaningless. See `dr(1M)` for more information concerning return codes.

NAME	dr_cmd_a_attach – abort DR attach system board operation
SYNOPSIS	**dr_cmd_a_attach** *sb*
AVAILABILITY	Sun Enterprise 10000 servers only.
CAUTION	Do not use this command, which runs in the DR shell; it is included here only for completeness. Instead, use abort_attach(1M), which performs the same functions, but with the added security of safeguards and checks.
DESCRIPTION	If abort_attach(1M) were unavailable for some reason, you could run dr_cmd_init_attach(1M) and before the board has been completely attached via the dr_cmd_c_attach(1M). dr_cmd_a_attach returns the board to the state it was in prior to the dr_cmd_init_attach(1M) operation; that is, present, powered-on, and in no domain.
	dr_cmd_a_attach instructs the operating system running on the target domain to abandon the in-progress attach operation, removes the system board from the domain_config file, and resets the Enterprise 10000 server's centerplane shared memory mask registers and board domain mask registers.
	Some conditions that are transparent to the user may cause an abort failure. Therefore, if dr_cmd_a_attach fails to complete the abort successfully, try executing it again at a later time.
OPTIONS	The following options are supported:
	sb The system board number (0 to 15) for the abort attach operation.
EXIT STATUS	If abort_attach(1M) succeeds it returns a 0 result code in the dr_return global variable. If it fails, it returns a 1 and displays diagnostic messages.

Note - Tcl parsing errors prevent DR commands from running which, in turn, leaves dr_return uninitialized. In such cases, the dr_return error code is meaningless. See dr(1M) for more information concerning return codes.

DIAGNOSTICS	See DIAGNOSTICS on abort_attach(1M).
SEE ALSO	dr(1M), dr_cmd_init_attach(1M), dr_cmd_c_attach(1M)

NAME	dr_cmd_a_detach – abort DR detach system board operation
SYNOPSIS	**dr_cmd_a_detach** *sb*
AVAILABILITY	Sun Enterprise 10000 servers only.
CAUTION	Do not use this command, which runs in the DR shell; it is included here only for completeness. Instead, use abort_attach(1M), which performs the same functions, but with the added security of safeguards and checks.
DESCRIPTION	You can run dr_cmd_a_detach after draining a system board via dr_cmd_drain(1M) but before that board has been completely detached.
OPTIONS	The following options are supported:
	sb The board number (0 to 15) of the system board whose detach is being aborted.
EXIT STATUS	If dr_cmd_a_detach succeeds it returns a 0 result code in the dr_return global variable. If it fails, it returns a 1 and displays diagnostic messages.
	Note - Tcl parsing errors prevent DR commands from running which, in turn, leaves dr_return uninitialized. In such cases, the dr_return error code is meaningless. See dr(1M) for more information concerning return codes.
DIAGNOSTICS	See DIAGNOSTICS in abort_detach(1M).
SEE ALSO	dr(1M), dr_cmd_drain(1M)

NAME	dr_cmd_auto_config – run Solaris reconfig sequence on target domain
SYNOPSIS	**dr_cmd_auto_config**
AVAILABILITY	Sun Enterprise 10000 servers only.
CAUTION	Do not use this command, use `reconfig(1M)` instead. Only authorized service providers should use `dr_cmd_auto_config`, which runs in the DR shell, and only when they cannot use `reconfig(1M)`. Performing this operation may cause device files to be remapped and known devices to be renamed.
DESCRIPTION	The system administrator would normally run `dr_cmd_auto_config` after a new system board has been attached to a running domain to make the devices on the boards available immediately. The automatic configuration on Solaris consists of the following SunOS commands, in the order shown: `drvconfig(1M)`, `devlinks(1M)`, `disks(1M)`, and `tapes(1M)`.
EXIT STATUS	If `dr_cmd_auto_config` succeeds it returns a 0 result code in the `dr_return` global variable. If it fails, it returns a 1. **Note -** Tcl parsing errors prevent DR commands from running which, in turn, leaves `dr_return` uninitialized. In such cases, the `dr_return` error code is meaningless. See `dr(1M)` for more information concerning return codes.
DIAGNOSTICS	See DIAGNOSTICS in the `reconfig(1M)` man page.
SEE ALSO	reconfig(1M) in this Reference Manual dr_daemon(1M) in the *Solaris Reference for SMCC-Specific Software* drvconfig(1M), devlinks(1M), disks(1M), ports(1M), tapes(1M) in *man Pages(1M): System Administration Commands* of the *SunOS Reference Manual*

NAME	dr_cmd_c_attach – complete DR attach system board operation
SYNOPSIS	**dr_cmd_c_attach** *sb*
AVAILABILITY	Sun Enterprise 10000 servers only.
CAUTION	Do not use this command, which runs in the DR shell; it is included here only for completeness, and is dangerous. Instead, use complete_attach(1M), which performs the same functions, but with the added security of safeguards and checks.
DESCRIPTION	dr_cmd_c_attach completes the DR attach board operation started by dr_cmd_init_attach(1M). The designated system board should already have been successfully Init Attached via dr_cmd_init_attach(1M). The complete attach operation causes the operating system on the target domain to dynamically add the resources from this system board (processors, memory, and I/O devices) to the running system. If a problem occurs, preventing attachment of any device present on the board, the problem is logged in the system message buffer of the target domain.
OPTIONS	The following options are supported:
	sb The board number (0 to 15) of the system board being attached.
EXIT STATUS	If dr_cmd_c_attach succeeds it returns a 0 result code in the dr_return global variable. If it fails, it returns a 1 and displays diagnostic messages.

Note - Tcl parsing errors prevent DR commands from running which, in turn, leaves dr_return uninitialized. In such cases, the dr_return error code is meaningless. See dr(1M) for more information concerning return codes.

DIAGNOSTICS	See DIAGNOSTICS on complete_attach(1M).
SEE ALSO	dr(1M), dr_cmd_init_attach(1M)

NAME	dr_cmd_c_detach – complete DR detach system board operation
SYNOPSIS	**dr_cmd_c_detach** *sb*
AVAILABILITY	Sun Enterprise 10000 servers only.
CAUTION	Do not use this command, which runs in the DR shell; it is included here only for completeness, and is dangerous. Instead, use complete_detach(1M), which performs the same functions, but with the added security of safeguards and checks.
DESCRIPTION	dr_cmd_c_detach completes a DR detach board operation. The designated system board should already have been drained via dr_cmd_drain(1M).
	You can detach a system board only when none of its devices is in use. DR automatically terminates the use of memory, processors (in almost all cases), and network devices on the board. But the administrator must make certain that all use of the board's I/O devices has ceased. You can use drshow(1M) to list the devices in use on a given system board.
OPTIONS	The following options are supported:
	sb　　　　　　　　The board number (0 to 15) of the system board being detached.
EXIT STATUS	If dr_cmd_c_attach succeeds it returns a 0 result code in the dr_return global variable. If it fails, it returns a 1 and displays diagnostic messages.

Note - Tcl parsing errors prevent DR commands from running which, in turn, leaves dr_return uninitialized. In such cases, the dr_return error code is meaningless. See dr(1M) for more information concerning return codes.

DIAGNOSTICS	See DIAGNOSTICS on complete_detach(1M).
SEE ALSO	dr(1M), dr_cmd_drain(1M)
	Sun Enterprise 10000 SSP User's Guide

NAME	dr_cmd_c_f_detach – force completion of DR detach system board operation
SYNOPSIS	**dr_cmd_c_f_detach** *sb*
AVAILABILITY	Sun Enterprise 10000 servers only.
CAUTION	Do not use this command, which runs in the DR shell; it is included here only for completeness, and is dangerous. Instead, use complete_detach(1M), which performs the same functions, but with the added security of safeguards and checks.
DESCRIPTION	dr_cmd_c_f_detach completes a DR detach board operation, using a forcible domain quiesce. See the CAUTION, above. Use this command when you need to force the system to complete a detach operation, when the system board to be detached contains unsafe devices that are open, but not in use. See the *Sun Enterprise 10000 Dynamic Reconfiguration User's Guide* for more information on system quiesce, and ways to increase the safety of this dangerous command.
OPTIONS	The following options are supported:
	sb The board number (0 to 15) of the system board to be detached.
EXIT STATUS	If dr_cmd_c_f_detach succeeds it returns a 0 result code in the dr_return global variable. If it fails, it returns a 1 and displays diagnostic messages.
	Note - Tcl parsing errors prevent DR commands from running which, in turn, leaves dr_return uninitialized. In such cases, the dr_return error code is meaningless. See dr(1M) for more information concerning return codes.
DIAGNOSTICS	See DIAGNOSTICS on complete_detach(1M).
SEE ALSO	dr(1M), dr_cmd_drain(1M)
	Sun Enterprise 10000 SSP User's Guide

NAME	dr_cmd_cpu_info – show processors on a system board in Tcl encoding
SYNOPSIS	**dr_cmd_cpu_info** *sb*
AVAILABILITY	Sun Enterprise 10000 servers only.
CAUTION	This command, which runs in the DR shell, produces output in a form suitable for the drview(1M) application, not the interactive user.
DESCRIPTION	dr_cmd_cpu_info queries the target domain and produces a list of the processors attached to the specified system board. This list is returned in a Tcl format, and is used by the drview(1M) application.
	Since the Tcl list is not readily accessible to an interactive user, you should use drshow(1M) instead to acquire processor information.
OPTIONS	The following options are supported:
	sb The board number (0 to 15) of the target system board.
EXIT STATUS	If dr_cmd_cpu_info succeeds it returns a 0 result code in the dr_return global variable. If it fails, it returns a 1 and displays diagnostic messages.

Note - Tcl parsing errors prevent DR commands from running which, in turn, leaves dr_return uninitialized. In such cases, the dr_return error code is meaningless. See dr(1M) for more information concerning return codes.

SEE ALSO	dr(1M), dr_cmd_mem_info(1M), dr_cmd_dev_info(1M)

NAME	dr_cmd_debug – toggle DR library-level debugging
SYNOPSIS	**dr_cmd_debug**
AVAILABILITY	Sun Enterprise 10000 servers only.
CAUTION	Only authorized service providers should use this command, which runs in the DR shell.
DESCRIPTION	When switched on, `dr_cmd_debug` provides significantly more detailed information about DR operations performed via `dr(1M)`. `dr_cmd_debug` is set up as a toggle; execute it once to turn it on, and again to turn it off. Initially, it is set to 0, or off.
	The service provider may find `dr_cmd_debug` very useful when diagnosing a DR-related failure. Activate debugging prior to executing any commands related to DR Attach or DR Detach.
EXIT STATUS	`dr_cmd_debug` always returns a 0 character in the `dr_return` global Tcl variable.
SEE ALSO	dr(1M)

NAME	dr_cmd_detach_allow – verify a system board can support DR detach
SYNOPSIS	**dr_cmd_detach_allow** *sb*
AVAILABILITY	Sun Enterprise 10000 servers only.
CAUTION	Only authorized service providers should use this command, which runs in the DR shell.
DESCRIPTION	dr_cmd_detach_allow queries the operating system running on the target domain about any conditions that may prevent the system board from being successfully detach. If the board is not detachable, dr_cmd_detach_allow displays one or more diagnostic messages.
OPTIONS	The following options are supported:
	sb The board number (0 to 15) of the system board to be queried.
EXIT STATUS	If dr_cmd_detach_allow succeeds it returns a 0 result code in the dr_return global variable. If it fails, it returns a 1.
SEE ALSO	dr(1M)
	Sun Enterprise 10000 SSP User's Guide

NAME	dr_cmd_dev_info – show devices on a system board in Tcl list encoding
SYNOPSIS	**dr_cmd_dev_info** *sb*
AVAILABILITY	Sun Enterprise 10000 servers only.

DESCRIPTION

> **Note -** This command, which runs in the DR shell, produces output in a form suitable for the drview(1M) application, not the interactive user. Use drshow(1M) instead to view device information.

dr_cmd_dev_info checks the target domain for peripheral devices attached to the specified system board and returns the information in a Tcl list encoding, which is used by the drview(1M) application.

OPTIONS

The following options are supported:

sb   The board number (0 to 15) of the target system board.

EXIT STATUS

If dr_cmd_dev_info succeeds it returns a 0 result code in the dr_return global variable. If it fails, it returns a 1 and displays diagnosic messages.

> **Note -** Tcl parsing errors prevent DR commands from running which, in turn, leaves dr_return uninitialized. In such cases, the dr_return error code is meaningless. See dr(1M) for more information concerning return codes.

SEE ALSO

dr(1M), dr_cmd_cpu_info(1M), dr_cmd_mem_info(1M)

NAME	dr_cmd_drain – start memory drain on a system board.
SYNOPSIS	**dr_cmd_drain** *sb*
AVAILABILITY	Sun Enterprise 10000 servers only.
CAUTION	This command, which runs in the DR shell, is dangerous; do not use it. It is included here only for completeness. Instead, use the drain(1M) command, which performs the same functions, but with the added security of safeguards and checks.
DESCRIPTION	dr_cmd_drain determines the best way to vacate memory physically located on the designated system board. It may simply flush the memory, or copy it to memory available on another system board in the same domain. If a suitable target memory for the memory copy is not available when the dr_cmd_drain command is invoked, the request is denied. If the unavailability is due to run-time conditions and system load, you should retry the dr_cmd_drain operation at a later time.
	The dr_cmd_drain operation also removes the system board from the target domain's board list in the domain_config(4) file on the SSP. (See domain_config(4) in the *Ultra Enterprise 10000 SSP Reference Manual*.
	dr_cmd_drain begins execution, then quickly exits. Use drshow(1M) to monitor its progress.
OPTIONS	The following options are supported:
	sb　　　　　The board number (0 to 15) of the system board to be drained.
EXIT STATUS	If dr_cmd_drain succeeds it returns a 0 result code in the dr_return global variable. If it fails, it returns a 1 and displays diagnosic messages.

Note - Tcl parsing errors prevent DR commands from running which, in turn, leaves dr_return uninitialized. In such cases, the dr_return error code is meaningless. See dr(1M) for more information concerning return codes.

DIAGNOSTICS	See DIAGNOSTICS on drain(1M).
SEE ALSO	dr_cmd_mem_info(1M)
	Sun Enterprise 10000 SSP User's Guide

NAME	dr_cmd_drain_status – show state of in-progress memory drain.
SYNOPSIS	**dr_cmd_drain_status** *sb*
AVAILABILITY	Sun Enterprise 10000 servers only.
CAUTION	Only authorized service providers should use this command, which runs in the DR shell.
DESCRIPTION	Use dr_cmd_drain_status to monitor a drain-in-progress. It displays a table of current information about the drain. DR cannot complete a detach until all the memory on a system board has been successfully drained.
OPTIONS	The following options are supported:
	sb The board number (0 to 15) of the system board being drained.
EXIT STATUS	If dr_cmd_drain_status succeeds it returns a 0 result code in the dr_return global variable. If it fails, it returns a 1.

Note - Tcl parsing errors prevent DR commands from running which, in turn, leaves dr_return uninitialized. In such cases, the dr_return error code is meaningless. See dr(1M) for more information concerning return codes.

SEE ALSO	dr(1M)

NAME	dr_cmd_eligible_attach – verify a system board is eligible for DR attach
SYNOPSIS	**dr_cmd_eligible_attach** *sb*
AVAILABILITY	Sun Enterprise 10000 servers only.
CAUTION	Only authorized service providers should use this command, which runs in the DR shell. Service providers: Be sure to run this eligibility check prior to initiating any DR attach activity when using the low-level DR shell command set. Initiating an attach operation on an ineligible board may cause a system failure.
DESCRIPTION	Use dr_cmd_eligible_attach to verify that a system board is eligible for an attach operation before using dr_cmd_init_attach(1M) to begin the Init Attach.
OPTIONS	The following options are supported:

board   The board number (0 to 15) of the system board to be checked.

EXIT STATUS dr_cmd_eligible_attach returns one of the following result codes to the dr_return global Tcl variable:

y   The specified system board is eligible to be attached.

n   The specified system board is not eligible to be attached. dr_cmd_eligible_attach sends additional information to stdout.

sb   The specified system board is not eligible to be attached because system board *sb* (0 to 15), a different system board in the target domain, is in an intermediate DR Attach state. That DR Attach operation must be completed before you can initiate a DR operation on another board (such as the one specified).

Note - Tcl parsing errors prevent DR commands from running which, in turn, leaves dr_return uninitialized. In such cases, the dr_return error code is meaningless. See dr(1M) for more information concerning return codes.

SEE ALSO   dr(1M)

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NAME	dr_cmd_eligible_detach – verify a system board is eligible for DR detach
SYNOPSIS	**dr_cmd_eligible_detach** *sb*
AVAILABILITY	Sun Enterprise 10000 servers only.
CAUTION	Only authorized service providers should use this command, which runs in the DR shell. Service providers: Be sure to run this eligibility check prior to initiating any DR attach activity when using the low-level DR shell command set. Initiating an attach operation on an ineligible board may cause a system failure.
DESCRIPTION	Use dr_cmd_eligible_detach to verify that a system board is eligible for a detach operation before using dr_cmd_drain(1M) to begin a DR drain operation.

OPTIONS

The following options are supported:

board   The board number (0 to 15) of the system board to be checked.

EXIT STATUS

dr_cmd_eligible_detach returns one of the following result codes to the dr_return global Tcl variable:

y   The specified system board is eligible to be detached.

n   The specified system board is not eligible to be detached. dr_cmd_eligible_detach sends additional information to stdout.

sb   The specified system board is not eligible to be detached because system board *sb* (0 to 15), a different system board in the target domain, is in an intermediate DR Detach state. That DR Detach operation must be completed before you can initiate a DR operation on another board (such as the one specified).

Note - Tcl parsing errors prevent DR commands from running which, in turn, leaves dr_return uninitialized. In such cases, the dr_return error code is meaningless. See dr(1M) for more information concerning return codes.

SEE ALSO

dr(1M)

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NAME	dr_cmd_init_attach – initiate DR attach system board operation
SYNOPSIS	**dr_cmd_init_attach** *sb*
AVAILABILITY	Sun Enterprise 10000 servers only.
CAUTION	Do not use this command, which runs in the DR shell; it is dangerous, and is included here only for completeness. Instead, use init_attach(1M), which performs the same functions, but with the added security of safeguards and checks.
DESCRIPTION	dr_cmd_init_attach begins a DR attach board operation. DR does not screen the target domain for intermediate system boards as it does with the init_attach(1M) command and through Hostview.
	dr_cmd_init_attach is a low-level command for use only by trained service personnel for diagnosing DR-related system problems. The designated system board should be present, powered-on, and currently in no domain. dr_cmd_init_attach diagnoses, then debuts the system board to the Enterprise 10000 target domain specified in the SUNW_HOSTNAME environment variable.
	dr_cmd_init_attach adds the system board to the system board list in the SSP's domain_config file. (See domain_config(4) in *Sun Enterprise 10000 SSP Reference Manual*.) DR then prepares the board's resources (processors, memory, and I/O controllers) for attachment by the operating system, and the Enterprise 10000 server's centerplane is reconfigured such that the board is visible to the target domain.
	After dr_cmd_init_attach completes successfully, you can execute dr_cmd_c_attach(1M) to complete the attach operation, or dr_cmd_a_attach(1M) to abort it.
OPTIONS	The following options are supported:
	board The board number (0 to 15) of the system board to be attached.
EXIT STATUS	If dr_cmd_init_attach succeeds it returns a 0 result code in the dr_return global variable. If it fails, it returns a 1 and displays diagnostic messages.

Note - Tcl parsing errors prevent DR commands from running which, in turn, leaves dr_return uninitialized. In such cases, the dr_return error code is meaningless. See dr(1M) for more information concerning return codes.

DIAGNOSTICS	See DIAGNOSTICS on init_attach(1M).

SEE ALSO | *Sun Enterprise 10000 SSP User's Guide*

NAME	dr_cmd_mem_info – show memory config on a system board in Tcl encoding
SYNOPSIS	**dr_cmd_mem_info** *sb*
AVAILABILITY	Sun Enterprise 10000 servers only.
CAUTION	Do not use this command. It returns information in Tcl encoding, which is understood by the drview(1M) application, but is not intended for direct viewing by users. Instead, use the drshow(1M) command.
DESCRIPTION	dr_cmd_mem_info queries the target domain for memory attached to this system board, returning the information in a Tcl list encoding, which then is used by the drview(1M) application.
OPTIONS	The following options are supported:

board   The board number (0 to 15) of the system board to be
                     checked.

EXIT STATUS If dr_cmd_mem_info succeeds it returns a 0 result code in the dr_return
global variable. If it fails, it returns a 1 and displays diagnostic messages.

Note - Tcl parsing errors prevent DR commands from running which, in turn,
leaves dr_return uninitialized. In such cases, the dr_return error code is
meaningless. See dr(1M) for more information concerning return codes.

SEE ALSO dr(1M)

NAME	dr_cmd_obp_info – show complete config of a system board in Tcl encoding
SYNOPSIS	**dr_cmd_obp_info** *sb*
AVAILABILITY	Sun Enterprise 10000 servers only.
CAUTION	Do not use this command, which runs in the DR shell; it displays information in Tcl encoding, which is understood by the drview(1M) application, but is not intended for direct viewing by the interactive user. Instead, use drshow(1M) to view this information.
DESCRIPTION	dr_cmd_obp_info displays the complete board configuration, including processors, memory and I/O devices, of a system board that has been Init Attached to a domain (that is, probed by OBP), but is not yet completely attached. See the CAUTION, above.
OPTIONS	The following options are supported: *board* The board number (0 to 15) of the target system board.
EXIT STATUS	If dr_cmd_obp_info succeeds it returns a 0 result code in the dr_return global variable. If it fails, it returns a 1 and displays diagnostic messages.

Note - Tcl parsing errors prevent DR commands from running which, in turn, leaves dr_return uninitialized. In such cases, the dr_return error code is meaningless. See dr(1M) for more information concerning return codes.

NAME   dr_cmd_print_brd_info – show board resource in tabular format

SYNOPSIS   **dr_cmd_print_brd_info** *sb flags*

AVAILABILITY Sun Enterprise 10000 servers only.

CAUTION   Do not use this command, which runs in the DR shell; it is included here only
                  for completeness. Instead, use drshow(1M), which presents the information in
                  a more reabable format.

DESCRIPTION   dr_cmd_print_brd_info obtains configuration information about the
                  specified attached system board. The *flags* option specifies the information this
                  command is to display, in the form of a bitstring, as follows:

                  Flag Value   Display

                  ————–   ——-

                  1   Processor information

                  2   Controller and peripheral information

                  4   Memory configuration

8   Memory cost information

16   Memory drain status

You can obtain multiple displays by OR'ing (summing) the above decimal values. All displays are in a readable, tabular format.

EXAMPLES   **EXAMPLE 1**   Displaying the Processor and Memory Configuration

To display the processor and memory configuration, use the following command:

dr> **dr_cmd_print_brd_info 5**

To display all configuration information, use the following command:

dr> **dr_cmd_print_brd_info 31**

OPTIONS   The following options are supported:

sb   The board number (0 to 15) of the target system board.

flags   A bitstring in decimal that represents the desired information.

EXIT STATUS If dr_cmd_print_brd_info succeeds it returns a 0 result code in the dr_return global variable. If it fails, it returns a 1 and displays diagnostic messages.

Note - Tcl parsing errors prevent DR commands from running which, in turn, leaves dr_return uninitialized. In such cases, the dr_return error code is meaningless. See dr(1M) for more information concerning return codes.

NAME | dr_cmd_print_obp_info – show system board info per OpenBoot(tm) Prom in tabular format

SYNOPSIS | **dr_cmd_print_obp_info** *sb*

AVAILABILITY | Sun Enterprise 10000 servers only.

CAUTION | Do not use this command, which runs in the DR shell; it is included here only for completeness. Instead, use drshow(1M), which presents the information in a more reabable format.

DESCRIPTION | dr_cmd_print_obp_info obtains configuration information from OpenBoot, then displays that information in a tabular format. Use this command to interrogate a system board that has been Init Attached, but not yet Complete Attached.

OPTIONS | The following options are supported:
sb   The board number (0 to 15) of the target system board.

EXIT STATUS | If dr_cmd_print_obp_info succeeds it returns a 0 result code in the dr_return global variable. If it fails, it returns a 1 and displays diagnostic messages.

Note - Tcl parsing errors prevent DR commands from running which, in turn, leaves dr_return uninitialized. In such cases, the dr_return error code is meaningless. See dr(1M) for more information concerning return codes.

NAME	dr_cmd_print_unsafe_info – show a domain's open, devices in tabular format
SYNOPSIS	**dr_cmd_print_unsafe_info**
AVAILABILITY	Sun Enterprise 10000 servers only.
CAUTION	Do not use this command, which runs in the DR shell; it is included here only for completeness. Instead, use drshow(1M), which presents the information in a more reabable format.
DESCRIPTION	dr_cmd_print_unsafe_info queries the target domain to determine if any unsafe peripheral devices are open. (See the *Sun Enterprise 10000 Dynamic Reconfiguration User's Guide* for more information concerning DR unsafe devices.) If it finds that any such devices are open, it sends that information to stout.

If dr_cmd_print_unsafe_info succeeds it returns a 0 result code in the dr_return global variable. If it fails, it returns a 1 and displays diagnostic messages.

Note - Tcl parsing errors prevent DR commands from running which, in turn, leaves dr_return uninitialized. In such cases, the dr_return error code is meaningless. See dr(1M) for more information concerning return codes.

NAME | dr_cmd_unsafe_dev_info – show a domain's open, unsafe devices in TCL encoding

SYNOPSIS | **dr_cmd_unsafe_dev_info**

AVAILABILITY | Sun Enterprise 10000 servers only.

CAUTION | Do not use this command, which runs in the DR shell; it is included here only for completeness. Instead, use drshow(1M), which presents the information in a more reabable format.

DESCRIPTION | dr_cmd_unsafe_dev_info queries the target domain to determine if any unsafe peripheral devices are open. (See the *Sun Enterprise 10000 Dynamic Reconfiguration User's Guide* for more information concerning DR unsafe devices.) If it finds that any such devices are open, it returns that information in a Tcl list encoding, which is used by the drview(1M) application.

If dr_cmd_unsafe_dev_info succeeds it returns a 0 result code in the dr_return global variable. If it fails, it returns a 1 and displays diagnostic messages.

Note - Tcl parsing errors prevent DR commands from running which, in turn, leaves dr_return uninitialized. In such cases, the dr_return error code is meaningless. See dr(1M) for more information concerning return codes.

NAME	dr_daemon – Sun Enterprise 10000 DR daemon
SYNOPSIS	**dr_daemon** [−a]
AVAILABILITY	Sun Enterprise 10000 servers only. Execute this command only in the host - not SSP - environment.
DESCRIPTION	The dr_daemon is an RPC program that provides the interface to the Sun Enterprise 10000 Dynamic Reconfiguration (DR) driver, dr(7). The Hostview and DR applications provide the user interface to DR. See hostview(1M) in the *Sun Enterprise 10000 SSP Reference Manual* and dr(1M) in the *Sun Enterprise 10000 Dynamic Reconfiguration Reference Manual*.
OPTIONS	−a Disable communications with the Alternate Pathing daemon. See ap_daemon(1M) in the *Sun Enterprise Server Alternate Pathing Reference Manual*.
Configuration Information	The /platform/SUNW,Ultra-Enterprise-10000/lib/dr_daemon RPC program name is DRPROG, its RPC program number is 300326, and its underlying protocol is TCP. It is invoked as an inetd server using the TCP transport. The UID required for access to the daemon is ssp. This UID can be a non-login UID.

The entry for the daemon in the /etc/inetd.conf

file is:

300326/4 tli rpc/tcp wait root /platform/SUNW,Ultra-Enterprise-10000/lib/dr_daemon

The daemon's only clients are Hostview and DR. Hostview provides a GUI interface; dr(1M) is a command-line interface for non-windowing environments. The DR daemon uses syslog(3) to report status and error messages, which are logged with the LOG_DAEMON facility and the LOG_ERR and LOG_NOTICE priorities.

The dr_daemon communicates via RPC with the Alternate Pathing (AP) daemon to notify the AP software when controllers are attached to and detached from the system, or to gather information about the system configuration. See ap_daemon(1M) in the *Sun Enterprise Server Alternate Pathing Reference Manual*.

SEE ALSO	*Sun Enterprise 10000 Dynamic Reconfiguration User's Guide*
	Sun Enterprise Server Alternate Pathing User's Guide
	dr(7) in this reference manual

ap(1M), ap_daemon(1M) in the *Sun Enterprise Server Alternate Pathing Reference Manual.*

dr(1M) in the *Sun Enterprise 10000 Dynamic Reconfiguration Reference Manual*

hostview(1M), hpost(1M) in the *Sun Enterprise 10000 SSP Reference Manual*

add_drv(1M), drvconfig(1M), devlinks(1M), disks(1M), inetd(1M), ports(1M), tapes(1M), prtconf(1M), syslog(3) **in this reference manual**

NAME	drain – start memory drain
SYNOPSIS	**drain** *sb* [*wait*]
AVAILABILITY	Sun Enterprise 10000 servers only.

DESCRIPTION

The drain command, which you execute from the dr(1M) prompt, is the first of a two-step procedure for DR detaching a system board. The primary function of the drain command is to determine how the memory physically located on the designated board should be vacated. This memory may be simply flushed, or it may be copied to memory available on another system board in the same domain.

If a suitable target memory for the memory copy is not available when the drain command is invoked, the request is denied. If the unavailability is due to run-time conditions and system load, you can retry the drain operation at a later time.

The drain command starts the drain operation, and then returns. The drain may take several minutes to complete. You can execute drshow *sb* DRAIN< to monitor its progress; see drshow(1M). Or, you can specify the wait option, and the drain returns only after the board has been fully drained, or drain detects an error. drain automatically displays the board status once before returning.

OPTIONS

The following options are supported:

sb	The board number (0 to 15) of the system board to be drained.
wait	Poll the DR daemon every 5 seconds and return to the caller only after the drain completes. This option is useful when the drain is performed by a script. This option is case-insensitive.

EXIT STATUS

Upon successful initiation of the drain, drain returns a 0 in the dr_return global variable; if the initiation fails, it returns a 1. If wait is specified, a 0 in the dr_return indicates that the drain (not just initiation of it) has completed successfully, and a 1 indicates that the drain has failed.

EXAMPLES

EXAMPLE 1   Using drain(1M)

```
ts4-ssp% domain_switch ts4
ts4-ssp% dr
Checking environment...
Establishing Control Board Server connection...
Initializing SSP SNMP MIB...
Establishing communication with DR daemon...
```

```
                      ts4: System Status - Summary

      BOARD #: 1 3 4 5 being used by the system.


      dr> drain 5
      Removing board 5 from domain_config file.
      Start draining board 5.
      Board drain started. Retrieving System Info...

                   Bound Processes for Board 5

      cpu  user  sys  procs
      ---  ----  ---  -----
       20    0    1
       21    0    1
       22    0    1
       23    0    1

      No active IO devices.

                Memory Drain for Board 5 - IN PROGRESS

      Reduction          = 1024 Mbytes
      Remaining in System   = 2048 MBytes
      Percent Complete      = 0% (1048576 KBytes remaining)

      Drain operation started at Sun Sep 15 22:50:57 1996
      Current time           Sun Sep 15 22:50:57 1996
      Memory Drain is in progress. When Drain has finished,
      you may COMPLETE the board detach.
```

NOTES   If DR detects a usage syntax error, it immediately aborts the dr(1M) command, displays the dr(1M) shell prompt, and leaves dr_return unmodified. See dr(1M).

SEE ALSO   dr(1M) in this reference manual

domain_switch(1M) in the *Sun Enterprise 10000 SSP Reference Manual*

NAME	drshow – display DR and board resource information
SYNOPSIS	**drshow** UNSAFE [*interval* | [*count*]]
	drshow *sb* [*report_type*][*interval* | [*count*]]
	drshow ALL [*report_type*][*interval* | [*count*]]
AVAILABILITY	Sun Enterprise 10000 servers only.

DESCRIPTION

drshow displays board-level and system-level resources and information about DR. It presents the displays in a tabular format.

drshow can sample at a specified interval (in seconds), for a given number of times. This polling capability is especially useful to monitor an in-progress drain operation.

OPTIONS

The following options are supported:

UNSAFE Display all unsafe devices that are open throughout the domain.

sb The board number (0 to 15) of the target domain.

ALL Report the requested information for all active system boards in the domain. You can specify this keyword with one (and only one) on the following keywords. Note that all keyword arguments are case-insensitive.

CPU – Show processor information for the board (default)

DRAIN – Show the progress of any active drain operation

IO – Show the devices attached to this board

OBP – Display tthe board configuration as OBP sees it. The OBP display can be used on a board that has been init-attached, and not yet complete-attach'ed. The OBP display may not be as accurate as the CPU/MEM/IO displays for boards in use.

MEM – Show the memory configuration of this board

interval The frequency, in seconds, with which drshow is to repeat the display.

count   The number of times drshow is to repeat the
                                     display.

NOTES   Exercise caution when using repeating displays. The only way to prematurely
                 stop one is by hitting Control-C, which terminates the DR shell.

EXIT STATUS drshow returns a character 0 result code in dr_return.

EXAMPLES   **EXAMPLE 1**   Using drshow(1M)

```
 dr> drshow 1 IO

                             I/O Bus Controllers and Devices for Board 1

 ------------------------------ I/O Bus 1 : Slot 0 : esp0 ----------------------

 device     opens   name                        usage
 ------     -----   ----                        -----
 sd0          0     /dev/dsk/c0t0d0s0
 sd1         26     /dev/dsk/c0t1d0s0           /
              0     /dev/dsk/c0t1d0s1           swap, /tmp
              9     /dev/dsk/c0t1d0s3           /var
              1     /dev/dsk/c0t1d0s5           /opt
             18     /dev/dsk/c0t1d0s6           /usr
              1     /dev/dsk/c0t1d0s7           /export
 sd2          0     /dev/dsk/c0t2d0s0
 sd3          0     /dev/dsk/c0t3d0s1           swap, /tmp
              0     /dev/dsk/c0t3d0s7           /xfer

 ------------------------------ I/O Bus 1 : Slot 1 : qec0 ----------------------

 device     opens   name                        usage
 ------     -----   ----                        -----
 qe0                qe0                         ts4 (129:153:49:118)
 qe1                qe1
 qe2                qe2
 qe3                qe3
```

SEE ALSO   dr(1M)

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NAME	drview – DR Graphical User Interface
SYNOPSIS	**drview**
AVAILABILITY	Sun Enterprise 10000 servers only.
DESCRIPTION	`drview` is the Graphical User Interface (GUI) for Dynamic Reconfiguration (DR). Do not invoke it directly; it is automatically initiated by Hostview. See `hostview(1M)` in the *Sun Enterprise 10000 SSP Reference Manual.*
	For more information about Hostview see the *Sun Enterprise 10000 SSP User's Guide* and for more information about drview see the *Sun Enterprise 10000 Dynamic Reconfiguration User's Guide.*
SEE ALSO	hostview(1M) in the *Sun Enterprise 10000 SSP Reference Manual.*
	Sun Enterprise 10000 SSP User's Guide

NAME	init_attach – initiate a DR attach operation

SYNOPSIS　**init_attach** *sb*

AVAILABILITY　Sun Enterprise 10000 servers only.

DESCRIPTION　Execute this command at the `dr(1M)` shell prompt to begin a DR Attach operation. The system board to be attached must be present, powered-on, and currently in no domain. It is diagnosed and debuted to the Enterprise 10000 target domain specified by the SUNW_HOSTNAME environment variable. Upon completion of the `init_attach`, the board's resources — processors, memory, and I/O controllers — are prepared for attachment by the operating system. The board is added to the board list in the SSP's `domain_config(4)` file, and the Enterprise 10000 centerplane is reconfigured such that the board is visible to the target domain.

Upon successful completion of `init_attach` you can use `complete_attach(1M)` to complete the attach operation or `abort_attach(1M)` to abort it.

OPTIONS　The following options are supported:

sb　　　　　　　　　　　　　The board number (0 to 15) of the system board to be attached.

EXIT STATUS　If successful, `init_attach` returns a 0 in the `dr_return` global variable; if not, it returns a 1, along with one or more diagnostic messages.

EXAMPLES　**EXAMPLE 1**　Using `init_attach(1M)`

```
ts4-ssp% domain_switch ts4
ts4-ssp% dr
Checking environment...
Establishing Control Board Server connection...
Initializing SSP SNMP MIB...
Establishing communication with DR daemon...


        ts4: System Status - Summary


BOARD #: 5 physically present.
BOARD #: 1 3 4 being used by the system.


dr> init_attach 5
Initiate attaching board 5 to domain ts4..
Adding board 5 to domain_config file.
/opt/SUNWssp/bin/hpost -H20,4
Opening SNMP server library...
```

```
    Reading centerplane asics to obtain bus configuration...
    Bus configuration established as 3F.
    phase cplane_isolate: CP domain cluster mask clear...
    phase init_reset: Initial system resets...
    phase jtab_integ: JTAG probe and integrity test...
    phase mem_probe: Memory dimm probe...
    phase iom_probe: I/O module type probe...
    phase jtag_bbsram: JTAG basic test of bootbus sram...
    phase procl: Initial processor module tests...
    phase pc/cic_reg: PC and CIC register tests...
    phase dtag: CIC DTAG tests...
    phase mem: MC register and memory tests...
    phase io: I/O controller tests...
    phase procmem2: Processor vs. memory II tests...
    phase ibexit: Centerplane connection tests...
    phase final_config: Final configuration...
    Configuring in 3F with 4 processors, 2 SBus cards, 1024 MBytes memory.
    Interconnect frequency is  83.273 MHz, from SNMP MIB.
    Processor   frequency is 166.589 MHz, from SNMP MIB.
    Boot processor is 5.0 = 20
    POST (level=16, verbose=20, -H4,0020) execution time 3:50
    hpost is complete.
    obp_helper -H -m20
    Board debut complete.
    Reconfiguring domain mask registers.
    Probing board resources.
    Board attachment initiated successfully.


    Ready to COMPLETE board attachment.


    dr>
```

DIAGNOSTICS   The following diagnostics are supported:

add_board_to_domain returns entry not found

  The target domain specified by the SUNW_HOSTNAME environment
  variable is not properly listed in the domain_config(4) file. Check the
  domain_config(4) file, then try the operation again at a later time.

add_board_to_domain returns entry not found
Unable to locate domain *target domain* in domain_config file.

  DR was unable to locate an entry for the current target domain. Use the
  domain_status(1M) command to verify the contents of the
  domain_config(4) file. See the *Sun Enterprise 10000 SSP Reference
  Manual.*

Board debut failed - return = *value*

The debut utility has failed (see `obp_helper(1M)` in *Sun Enterprise 10000 SSP Reference Manual*). Consult the SSP message files for information regarding the failure.

`Board` *brd* **is a member of a foreign hardware domain.**

The board you are trying to attach has been identified as a member of another domain on this platform, which prevents it from being attached to the designated target domain. You must remove this board from the other domain before initiating an attach.

`Board` *brd* `is not  eligible for attach`

One or more conditions is preventing this board from being attached to the target domain. The board must be physically present, powered on, and not a member of any domain to be eligible for attachment.

`Board may be Black or Red listed.`

If this board is blacklisted or redlisted, it cannot be attached. Check the `postrc(4)` file for the location of the `blacklist(4)` and `redlist(4)` files.

`DR Error: State for board` *brd* `can't be determined.`

During initial domain contact an unexpected board condition was detected by `dr_daemon(1M)`. (See `dr_daemon(1M)` in the *Solaris Reference for SMCC-Specific Software*.) Check the system log on the host for more information.

`Error executing` *command*

`dr(1M)` executed the indicated command, but it returned a failure indication. If the error message specifies a specific action you must take, do so, then retry the command. Otherwise, simply retry the `init_attach` operation at a later time. If that attempt fails, call your service provider.

`FAD error detected, retrying...`

A transient failure occurred during updating of the `domain_config(4)` file has been. `init_attach` will retry the operation. If all retries fail, consult the SSP messages files for more information.

`Failed to initiate board attachment`

The init_attach operation on the target domain has failed.

Unable to execute *command*

dr(1M) could not execute the indicated command. Check that the program
file exists and is assigned the appropriate modes.

NOTES   If DR detects a usage syntax error, it immediately aborts the dr(1M)
command, displays the dr(1M) shell prompt, and leaves dr_return
unmodified. See dr(1M).

SEE ALSO   dr(1M) in this Reference Manual

blacklist(4), domain_config(4), domain_status(1M), domain_switch(1M),
postrc(4), redlist(4) in Section 4 of the *Sun Enterprise 10000 SSP Reference
Manual*

dr_daemon(1M) in the *Solaris Reference for SMCC-Specific Software*

NAME	reconfig – initiate auto-configuration sequence
SYNOPSIS	**reconfig**
AVAILABILITY	Sun Enterprise 10000 servers only.
WARNING	This command can remap device files and cause the renaming of known devices. Use it with extreme caution.
DESCRIPTION	Execute this command at the dr(1M) shell prompt after a new board has been attached to a running domain to make the board's devices immediately available for use.
	reconfig executes the standard Solaris configuration sequence in the target domain. This sequence consists of the following commands, shown here in the proper order: drvconfig(1M), devlinks, disks(1M), ports(1M), and tapes(1M).
EXIT STATUS	reconfig returns a 0 in the dr_return global variable upon success, or a 1 upon failure.
EXAMPLES	**EXAMPLE 1** Using reconfig(1M)

```
 dr> reconfig
 Reconfiguration of devices in progress...
 Reconfiguration completed successfully.
```

DIAGNOSTICS	

```
Reconfiguration failed
```

> One or more of the Enterprise 10000 domain's reconfiguration commands has failed. Check the /var/adm/messages file on the Enterprise 10000 domain.

NOTES	If DR detects a usage syntax error, it immediately aborts the dr(1M) command, displays the dr(1M) shell prompt, and leaves dr_return unmodified. See dr(1M).
SEE ALSO	dr(1M) in this Reference Manual
	drvconfig(1M), devlinks(1M), disks(1M), ports(1M), tapes(1M) in *man Pages(1M): System Administration Commands* of the *SunOS Reference Manual*.

Device and Network Interfaces

NAME | Intro – DR special files

DESCRIPTION | This section describes DR files for your Sun Enterprise server.

LIST OF FUNCTIONS | `dr(7)`   dynamic reconfiguration driver

NAME   dr – Sun Enterprise 10000 Dynamic Reconfiguration driver

DESCRIPTION   The DR driver provides a pseudo-driver interface to sequencing dynamic
                  attach and detach of Sun Enterprise 10000 system boards. This interface is
                  provided via file system entry points referred to as *Attachment Points*. An
                  attachment point exist for each possible system board slot in the Sun
                  Enterprise 10000 server and takes the form of:

                  ```
                  /devices/pseudo/dr@0:slot X
                  ```

                  where *X* represents the physical slot number (0 to 15) for a particular system
                  board.

                  The `dr` driver is actually designed as a general module for sequencing DR
                  operations for different platforms, but it is currently supported only on the
                  Sun Enterprise 10000. The `dr` driver works in conjunction with the
                  `drmach(7)` "misc" module, which provides the platform-specific (Sun
                  Enterprise 10000) DR sequencing and attributes.

                  Execution of DR operations on the Enterprise 10000 are actually performed by
                  the `dr_daemon(1M)`. When performing either a DR Attach or DR Detach
                  operation, `dr_daemon(1M)` makes the appropriate `ioctl(2)` system calls
                  into the respective attachment point for that particular board. The general
                  sequence of the `ioctl(2)` calls are as follows:

                  For DR Attach:
                  CONNECT   OBP probes for the devices on the incoming board.

                  CONFIGURE   Convert the device nodes into CF2 and make the respective
                                   resources available to the OS.
                  For DR Detach:
                  RELEASE   Release usage of certain devices on the respective board.

                  UNCONFIGURE Remove respective devices from the operating system
                                   resource pool.

                  DISCONNECT   Remove devices from the (OBP) device tree.

SEE ALSO   *Sun Enterprise 10000 Dynamic Reconfiguration User's Guide*

                  `add_drv(1M)`, `drvconfig(1M)`, `devlinks(1M)`, `disks(1M)`, `ports(1M)`,
                  `tapes(1M)` in the *SunOS Reference Manual*