

Tape Configuration [2]

This chapter provides information on UNICOS and UNICOS/mk configuration.

2.1 UNICOS configuration

In order for users to access tapes through the tape daemon-assisted interface or through the character-special tape interface, the `roptions` file must contain a tape entry. The following entry is required to activate the tape software:

```
RC-TAPE="YES"
```

Tape configuration is usually maintained through the UNICOS installation and configuration menu system, which uses the `text_tapeconfig` file. You should set the parameters in the file to values that suit your system. This section contains information on configuration settings and the system boot parameter file.

2.1.1 Configuration settings

Tape configuration on a UNICOS system is determined at the following four levels. The higher levels override the lower levels if the settings differ.

1. Kernel generation. Kernel parameters that relate to tapes are located in `config.h`, a Cray Research systems source file. It provides defaults for the `TAPE_MAX_CONF_UP` and `TAPE_MAX_PER_DEV` parameters in the system boot parameter file.
2. System boot. The system boot parameter file specifies tape parameters in `~cri/os/uts/param`, an operator work station (OWS) file, in the `/sys/param` file for the CRAY J90 series systems with IOS-V, or in `/opt/CYRIOS/systemname/param`, a system workstation (SWS) file.
3. Tape system initialization. The `tpinit(8)` command reads and processes the parameters you have specified in `/etc/config/text_tapeconfig`. For parameter descriptions, see the `text_tapeconfig(5)` man page. This page also contains tape configuration file examples for GigaRing based systems and for systems with I/O subsystems Model E (IOS-E) and Model V (IOS-V).

4. Administration commands. You may specify particular settings and options by using tape administration commands such as `tpset(8)` to make run-time changes. For more information, see Chapter 1, page 1.

Tape configuration parameters that you can modify are defined in the system boot parameter file and in the tape configuration file on Cray Research systems.

Note: For Trusted UNICOS systems, specific configuration values must be observed. See "Configure the UNICOS 9.0 System" section in the *UNICOS Installation Guide*, Cray Research publication SG-2112, for more information.

2.1.2 System boot parameter file

The system boot parameter file specifies parameters that define the kernel. The following three parameters are tape-related:

<code>TAPE_MAX_CONF_UP</code>	This parameter defines the maximum number of tape devices that can be configured up. The tape configuration file may specify more devices than are specified in this parameter. The default value is 4.				
<code>TAPE_MAX_PER_DEV</code>	This parameter defines the maximum number of bytes that a device can have for buffers. This number is rounded up to the next multiple of 4096 bytes by the tape driver. The default value is 65536 bytes.				
<code>TAPE_MAX_DEV</code>	This parameter specifies the maximum number of tape devices in the system. The following define the types of tape devices: <table border="0" style="margin-left: 20px; width: 100%;"> <tr> <td style="padding-right: 20px;">Real devices</td> <td>Tape devices upon which you can mount a tape.</td> </tr> <tr> <td>Pseudo devices</td> <td>These devices are not real devices. They are used by the tape daemon and tape users as handles to gain access to the tape driver. A pseudo device may be opened and the</td> </tr> </table>	Real devices	Tape devices upon which you can mount a tape.	Pseudo devices	These devices are not real devices. They are used by the tape daemon and tape users as handles to gain access to the tape driver. A pseudo device may be opened and the
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resulting file descriptor used to issue `ioctl(2)` system calls to the tape driver.

The value specified by this parameter is the sum of all of the following:

- The number of real tape devices
- The number of tape I/O processors (IOPs)
- The total number of channels for tapes

The default value is 32.

The following example shows the section of the system boot parameter file that specifies a maximum of 40 tape devices for the IOS-E:

```
unicos {
  3536 NBUF;
  0 LDCHCORE;
  32 TAPE_MAX_CONF_UP; /* Maximum of 32 tapes configured up */
  196608 TAPE_MAX_PER_DEV; /* Maximum size of buffer per device */
                          /* (in bytes) */
  40 TAPE_MAX_DEV /* Maximum of 40 tape devices */
  500 NLDCH;
  24 PDDMAX;
  256 LDDMAX;
  256 PDDSLMAX;
  256 MDDSLMAX;
  256 SSDDSLMAX;
  256 SDDSLMAX;
}
```

2.2 UNICOS/mk configuration

Tape configuration is usually maintained through the UNICOS/mk configuration tool, which uses the `text_tapeconfig` file. You should set the parameters in the file to values that suit your system. This section contains information on configuration settings and the parameter file.

2.2.1 Configuration settings

The following settings affect tape usage on a UNICOS/mk system:

1. Kernel generation. The system administrator should make sure that the tape flag in the CRAY T3E `/etc/config/config.mh` file is set to 1. This flag controls whether or not a site will have the online tape capability in the kernel:

```
/*  
 * If set to one (1), the CONFIG_TAPE variable turns on the online tape  
 * capability in the kernel. If set to zero (0), the code is turned  
 * off. Its default is one (1), or ON.  
 */  
  
#ifndef CONFIG_TAPE  
#define CONFIG_TAPE 1  
#endif
```

2. `rcoptions` file set-up. The system administrator should also make sure that the CRAY T3E `rcoptions` file contains the following tape entry:

```
RC_TAPE="YES"
```

This entry is required to activate tape software so that users can access tapes. It is needed for either the tape daemon-assisted interface or the character-special tape interface.

For information on startup and shutdown, see *UNICOS/mk Configuration Reference Manual*, Cray Research publication SG-2603.

3. System startup. The system administrator can specify tape parameters in the SWS `/opt/CYRIOs/<mainframe_name>/param` file.
4. Multiuser initialization. The `tpinit(8)` command reads and processes the parameters specified in the `/etc/config/text_tapeconfig` file. For a description of these parameters, see the `text_tapeconfig(5)` man page.

The tape daemon uses these values to decide what to do in various situations. The tape configuration file must be updated to configure the tape daemon before the daemon is started.

The tape configuration file defines all tape hardware used by the system. The diagnostic devices are implicitly defined when the nodes and the channels are defined. You must not define them again.

5. Administration commands. Once the system is in multiuser mode, the system administrator may specify particular settings and options by using tape administration commands such as `tpset(8)` to make run-time changes. For a brief description of the commands, see Chapter 1, page 1.

2.2.2 Parameter file

The parameters in the parameter file define the kernel. The following three parameters are tape-related:

<code>tpd_max_bufz</code>	Specifies the maximum tape buffer size in bytes for each tape device configured up. Accepts 0 to 999999999. This value is rounded up to the next multiple of 4096 bytes.	
<code>tpd_max_conf_up</code>	Specifies the maximum number of tape devices that may be configured up. Accepts 0 to 9999.	
<code>tpd_maxdev</code>	Specifies the maximum number of tape devices that may be configured in the tape subsystem. Accepts 0 to 9999. The following define the types of tape devices:	
	Real devices	Tape devices upon which you can mount a tape.
	Pseudo devices	These devices are not real devices. They are used by the tape daemon and tape users as handles to gain access to the tape driver. A pseudo device may be opened and the resulting file descriptor used to issue <code>ioctl(2)</code> system calls to the tape driver.

The value specified by this parameter is the sum of all of the following:

- The number of real tape devices
- The number of tape nodes
- The total number of channels for tapes

The default value is 32.

For more information, see *SWS-ION Administration and Operations Guide*, Cray Research publication SG-2204.

The following example shows the section of the parameter file that specifies a maximum of 32 tape devices.

```
tapedriver.tpd_maxdev           = 32;  
tapedriver.tpd_max_conf_up      = 32;  
tapedriver.tpd_max_bufz         = 262144;
```