

NAME

hexdump, **hd** - ASCII, decimal, hexadecimal, octal dump

SYNOPSIS

hexdump [-bcCdovx] [-e *format_string*] [-f *format_file*] [-n *length*] [-s *offset*] *file* ...

hd [-bcdovx] [-e *format_string*] [-f *format_file*] [-n *length*] [-s *offset*] *file* ...

DESCRIPTION

The **hexdump** utility is a filter which displays the specified files, or the standard input, if no files are specified, in a user specified format.

The options are as follows:

- b** *One-byte octal display.* Display the input offset in hexadecimal, followed by sixteen space-separated, three column, zero-filled, bytes of input data, in octal, per line.
- c** *One-byte character display.* Display the input offset in hexadecimal, followed by sixteen space-separated, three column, space-filled, characters of input data per line.
- C** *Canonical hex+ASCII display.* Display the input offset in hexadecimal, followed by sixteen space-separated, two column, hexadecimal bytes, followed by the same sixteen bytes in %_p format enclosed in “|” characters.

Calling the command **hd** implies this option.

- d** *Two-byte decimal display.* Display the input offset in hexadecimal, followed by eight space-separated, five column, zero-filled, two-byte units of input data, in unsigned decimal, per line.
- e *format_string***
Specify a format string to be used for displaying data.

- f *format_file***
Specify a file that contains one or more newline separated format strings. Empty lines and lines whose first non-blank character is a hash mark (#) are ignored.

- n *length***
Interpret only *length* bytes of input.

- o** *Two-byte octal display.* Display the input offset in hexadecimal, followed by eight space-separated, six column, zero-filled, two byte quantities of input data, in octal, per line.

-s *offset*

Skip *offset* bytes from the beginning of the input. By default, *offset* is interpreted as a decimal number. With a leading **0x** or **0X**, *offset* is interpreted as a hexadecimal number, otherwise, with a leading **0**, *offset* is interpreted as an octal number. Appending the character **b**, **k**, or **m** to *offset* causes it to be interpreted as a multiple of 512, 1024, or 1048576, respectively.

-v Cause **hexdump** to display all input data. Without the **-v** option, any number of groups of output lines, which would be identical to the immediately preceding group of output lines (except for the input offsets), are replaced with a line comprised of a single asterisk.

-x *Two-byte hexadecimal display.* Display the input offset in hexadecimal, followed by eight, space separated, four column, zero-filled, two-byte quantities of input data, in hexadecimal, per line.

For each input file, **hexdump** sequentially copies the input to standard output, transforming the data according to the format strings specified by the **-e** and **-f** options, in the order that they were specified.

Formats

A format string contains any number of format units, separated by whitespace. A format unit contains up to three items: an iteration count, a byte count, and a format.

The iteration count is an optional positive integer, which defaults to one. Each format is applied iteration count times.

The byte count is an optional positive integer. If specified it defines the number of bytes to be interpreted by each iteration of the format.

If an iteration count and/or a byte count is specified, a single slash must be placed after the iteration count and/or before the byte count to disambiguate them. Any whitespace before or after the slash is ignored.

The format is required and must be surrounded by double quote (") marks. It is interpreted as a `fprintf`-style format string (see `fprintf(3)`), with the following exceptions:

- An asterisk (*) may not be used as a field width or precision.
- A byte count or field precision is required for each 's' conversion character (unlike the `fprintf(3)` default which prints the entire string if the precision is unspecified).
- The conversion characters 'h', 'l', 'n', 'p' and 'q' are not supported.

- The single character escape sequences described in the C standard are supported:

NUL	\0
<alert character>	\a
<backspace>	\b
<form-feed>	\f
<newline>	\n
<carriage return>	\r
<tab>	\t
<vertical tab>	\v

The **hexdump** utility also supports the following additional conversion strings:

- _a[dox]** Display the input offset, cumulative across input files, of the next byte to be displayed. The appended characters **d**, **o**, and **x** specify the display base as decimal, octal or hexadecimal respectively.
- _A[dox]** Identical to the **_a** conversion string except that it is only performed once, when all of the input data has been processed.
- _c** Output characters in the default character set. Nonprinting characters are displayed in three character, zero-padded octal, except for those representable by standard escape notation (see above), which are displayed as two character strings.
- _p** Output characters in the default character set. Nonprinting characters are displayed as a single ".".
- _u** Output US ASCII characters, with the exception that control characters are displayed using the following, lower-case, names. Characters greater than 0xff, hexadecimal, are displayed as hexadecimal strings.

```

000 NUL
      001 SOH
        002 STX
          003 ETX
            004 EOT
              005 ENQ
006 ACK
      007 BEL
        008 BS 009 HT 00A LF 00B VT

```

```

00C FF  00D CR 00E SO 00F SI  010 DLE
                                011 DC1
012 DC2
      013 DC3
        014 DC4
          015 NAK
            016 SYN
              017 ETB
018 CAN
      019 EM 01A SUB
        01B ESC
          01C FS  01D GS
01E RS  01F US  07F DEL

```

The default and supported byte counts for the conversion characters are as follows:

%_c, %_p, %_u, %c One byte counts only.

%d, %i, %o, %u, %X, %x Four byte default, one, two and four byte counts supported.

%E, %e, %f, %G, %g Eight byte default, four and twelve byte counts supported.

The amount of data interpreted by each format string is the sum of the data required by each format unit, which is the iteration count times the byte count, or the iteration count times the number of bytes required by the format if the byte count is not specified.

The input is manipulated in “blocks”, where a block is defined as the largest amount of data specified by any format string. Format strings interpreting less than an input block’s worth of data, whose last format unit both interprets some number of bytes and does not have a specified iteration count, have the iteration count incremented until the entire input block has been processed or there is not enough data remaining in the block to satisfy the format string.

If, either as a result of user specification or **hexdump** modifying the iteration count as described above, an iteration count is greater than one, no trailing whitespace characters are output during the last iteration.

It is an error to specify a byte count as well as multiple conversion characters or strings unless all but one of the conversion characters or strings is **_a** or **_A**.

If, as a result of the specification of the **-n** option or end-of-file being reached, input data only partially satisfies a format string, the input block is zero-padded sufficiently to display all available data (i.e., any format units overlapping the end of data will display some number of the zero bytes).

Further output by such format strings is replaced by an equivalent number of spaces. An equivalent number of spaces is defined as the number of spaces output by an **s** conversion character with the same field width and precision as the original conversion character or conversion string but with any "+", " ", "#" conversion flag characters removed, and referencing a NULL string.

If no format strings are specified, the default display is equivalent to specifying the **-x** option.

EXIT STATUS

The **hexdump** and **hd** utilities exit 0 on success, and >0 if an error occurs.

EXAMPLES

Dump input in canonical (hex+ASCII) form:

```
$ echo "FreeBSD: The power to serve" | hexdump -C
00000000 46 72 65 65 42 53 44 3a 20 54 68 65 20 70 6f 77 |FreeBSD: The pow|
00000010 65 72 20 74 6f 20 73 65 72 76 65 0a             |er to serve.|
0000001c
```

Same as above but skipping the first 4 bytes of stdin and interpreting only 3 bytes of input:

```
$ echo "FreeBSD: The power to serve" | hexdump -C -s 4 -n 3
00000004 42 53 44                                     |BSD|
00000007
```

Assuming a format file named *format.txt* with the following contents that specify a perusal format:

```
"%06.6_ao " 12/1 "%3_u "
"\t\t" "%_p "
"\n"
```

Dump input in canonical form using the format in *format.txt*:

```
$ echo "FreeBSD" | hexdump -f format.txt -C
000000 F r e e B S D lf                          F r e e B S D .
00000000 46 72 65 65 42 53 44 0a                     |FreeBSD.|
00000008
```

Assuming a format file named *format.txt* with the following contents that simulate the **-x** option:

```
"%07.7_Ax\n"  
"%07.7_ax " 8/2 "%04x " "\n"
```

Dump input in canonical form using the format in *format.txt*:

```
$ echo "FreeBSD: The power to serve" | hexdump -f format.txt -C  
00000000 7246 6565 5342 3a44 5420 6568 7020 776f  
00000000 46 72 65 65 42 53 44 3a 20 54 68 65 20 70 6f 77 |FreeBSD: The pow|  
00000010 7265 7420 206f 6573 7672 0a65  
00000010 65 72 20 74 6f 20 73 65 72 76 65 0a          |er to serve.|  
0000001c
```

SEE ALSO

od(1)