

NAME

dwarf_get_ranges - retrieve non-contiguous address ranges

LIBRARY

DWARF Access Library (libdwarf, -ldwarf)

SYNOPSIS

```
#include <libdwarf.h>
```

int

```
dwarf_get_ranges(Dwarf_Debug dbg, Dwarf_Off offset, Dwarf_Ranges **ranges, Dwarf_Signed *cnt,  
  Dwarf_Unsigned *byte_cnt, Dwarf_Error *err);
```

int

```
dwarf_get_ranges_a(Dwarf_Debug dbg, Dwarf_Off offset, Dwarf_Die die, Dwarf_Ranges **ranges,  
  Dwarf_Signed *cnt, Dwarf_Unsigned *byte_cnt, Dwarf_Error *err);
```

DESCRIPTION

Function **dwarf_get_ranges**() retrieves information about the non-contiguous address ranges associated with a DWARF debugging information entry. Information about address ranges is returned as an array of descriptors of type *Dwarf_Ranges*, with each *Dwarf_Ranges* descriptor describing one address range entry.

Argument *dbg* should reference a DWARF debug context allocated using **dwarf_init**(3).

Argument *offset* is an offset, relative to the ".debug_ranges" section, to the start of the desired list of address ranges. The offset of an address ranges list is indicated by the DW_AT_ranges attribute of a debugging information entry.

Argument *die* (function **dwarf_get_ranges_a**() only) is ignored in this implementation; see the section *Compatibility Notes* below.

Argument *ranges* should point to a location that will be set to a pointer to an array of *Dwarf_Ranges* descriptors.

Argument *cnt* should point to a location that will be set to the number of entries returned. If argument *byte_cnt* is not NULL, it will be set to the number of bytes occupied by the returned entries in the ".debug_ranges" section.

If argument *err* is not NULL, it will be used to store error information in case of an error.

Dwarf_Ranges descriptors are defined in the header file `<libdwarf.h>`, and consists of the following fields:

dwr_addr1 The first address offset, whose meaning depends on the type of the entry.

dwr_addr2 The second address offset, whose meaning depends on the type of the entry.

dwr_type The type of this address range entry:

DW_RANGES_ENTRY A range list entry. For this type of entry, the fields *dwr_addr1* and *dwr_addr2* hold the beginning and ending offsets of the address range, respectively.

DW_RANGES_ADDRESS_SELECTION

A base address selection entry. For this type of entry, the field *dwr_addr1* is the value of the largest representable address offset, and *dwr_addr2* is a base address for the beginning and ending address offsets of subsequent address range entries in the list.

DW_RANGES_END An end of list mark. Both *dwr_addr1* and *dwr_addr2* are set to 0.

Memory Management

The memory area used for the array of *Dwarf_Ranges* descriptors returned in argument *ranges* is owned by the DWARF Access Library (`libdwarf`, `-ldwarf`). The application should not attempt to directly free this pointer. Portable code should instead use **`dwarf_ranges_dealloc()`** to indicate that the memory may be freed.

RETURN VALUES

These functions return `DW_DLX_OK` when they succeed. They return `DW_DLX_NO_ENTRY` if there is no address range list at the specified offset *offset*. In case of an error, they return `DW_DLX_ERROR` and set the argument *err*.

EXAMPLES

To retrieve the address range list associated with a debugging information entry, use:

```
Dwarf_Debug dbg;
Dwarf_Die die;
Dwarf_Error de;
Dwarf_Addr base;
Dwarf_Attribute *attr_list;
Dwarf_Ranges *ranges;
Dwarf_Signed cnt;
Dwarf_Unsigned off, attr_count, bytecnt;
```

```

int i, j;

if ((ret = dwarf_attrlist(die, &attr_list, &attr_count, &de)) !=
    DW_DLV_OK)
    errx(EXIT_FAILURE, "dwarf_attrlist failed: %s",
        dwarf_errmsg(de));

for (i = 0; (Dwarf_Unsigned) i < attr_count; i++) {
    if (dwarf_whatattr(attr_list[i], &attr, &de) != DW_DLV_OK) {
        warnx("dwarf_whatattr failed: %s",
            dwarf_errmsg(de));
        continue;
    }
    if (attr != DW_AT_ranges)
        continue;
    if (dwarf_formudata(attr_list[i], &off, &de) != DW_DLV_OK) {
        warnx("dwarf_formudata failed: %s",
            dwarf_errmsg(de));
        continue;
    }
    if (dwarf_get_ranges(dbg, (Dwarf_Off) off, &ranges, &cnt,
        &bytecnt, &de) != DW_DLV_OK)
        continue;
    for (j = 0; j < cnt; j++) {
        if (ranges[j].dwr_type == DW_RANGES_END)
            break;
        else if (ranges[j].dwr_type ==
            DW_RANGES_ADDRESS_SELECTION)
            base = ranges[j].dwr_addr2;
        else {
            /*
             * DW_RANGES_ENTRY entry.
             * .. Use dwr_addr1 and dwr_addr2 ..
             */
        }
    }
}

```

COMPATIBILITY

Function **dwarf_get_ranges_a()** is identical to **dwarf_get_ranges()**, except that it requires one additional

argument *die* denoting the debugging information entry associated with the address range list. In this implementation of the DWARF Access Library (libdwarf, -ldwarf), the argument *die* is ignored, and function **dwarf_get_ranges_a()** is only provided for compatibility with other implementations of the DWARF(3) API.

ERRORS

These function can fail with:

[DW_DLE_ARGUMENT] One of the arguments *dbg*, *ranges* or *cnt* was NULL.

[DW_DLE_NO_ENTRY] There is no address range list at the specified offset *offset*.

SEE ALSO

dwarf(3), dwarf_ranges_dealloc(3)