Bit Field (1A)

Young Won Lim
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Please send corrections (or suggestions) to youngwlim@hotmail.com.

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Padding

Padding: aligned with a natural address boundary

32-bit platforms

```
struct aaa {
        short     s;
        int       i;
        char      c;
};
```

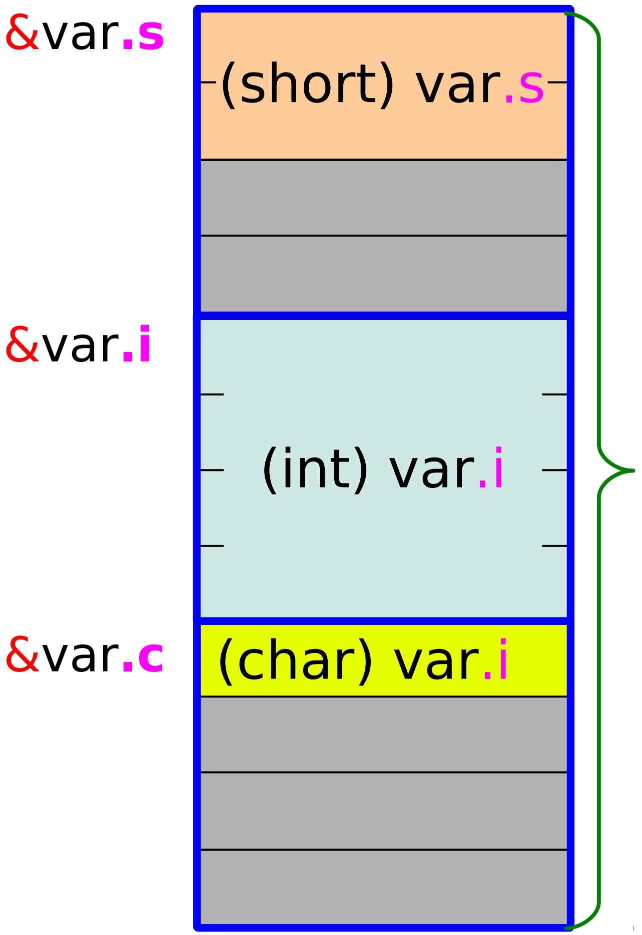
definition

```
struct aaa   var;
```

var declaration

address data

address	data
&var.s	var.s
&var.i	var.i
&var.c	var.c



&var.s

(short) var.s

&var.i

(int) var.i

&var.c

(char) var.i

sizeof (var) = 12 bytes

Packing Structure

structure type

```
struct __attribute__((__packed__)) aaa {
        short     s;
        int       i;
        char      c;
} ;
```

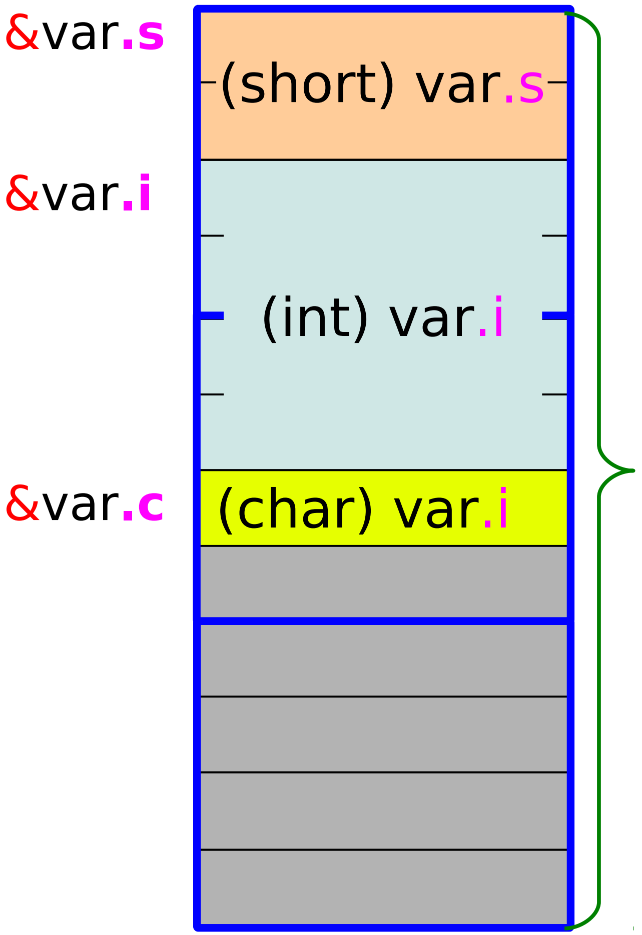
definition

```
struct __attribute__((__packed__)) aaa   var;
```

var declaration

address data

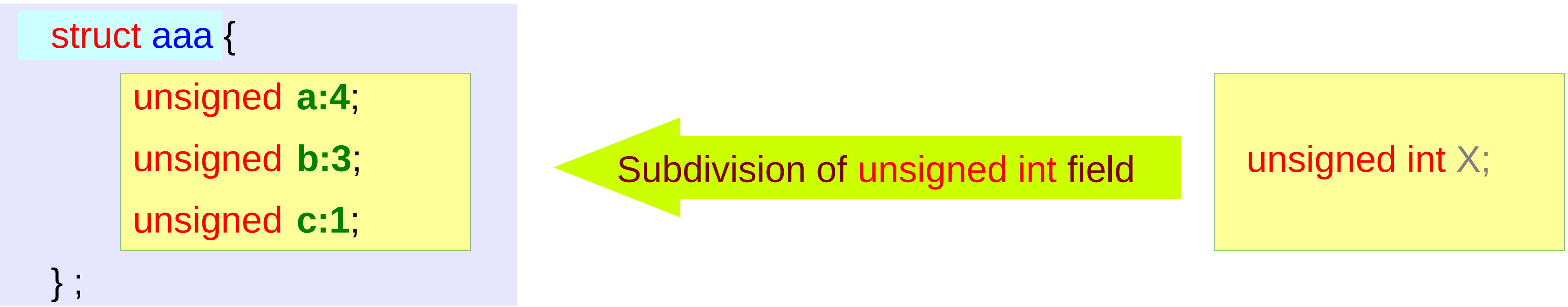
address	data
&var.s	var.s
&var.i	var.i
&var.c	var.c



sizeof (var) = 7 bytes

Bit Field

structure type definition



```
struct aaa {
        unsigned a:4;
        unsigned b:3;
        unsigned c:1;
};
```

Subdivision of unsigned int field

```
unsigned int X;
```

```
struct aaa  var;
```

var declaration

Accessing bit fields

```
var.a
var.b
var.c
```

types for subdivision

- **unsigned int**
- **(signed) int**
- **unsigned char**

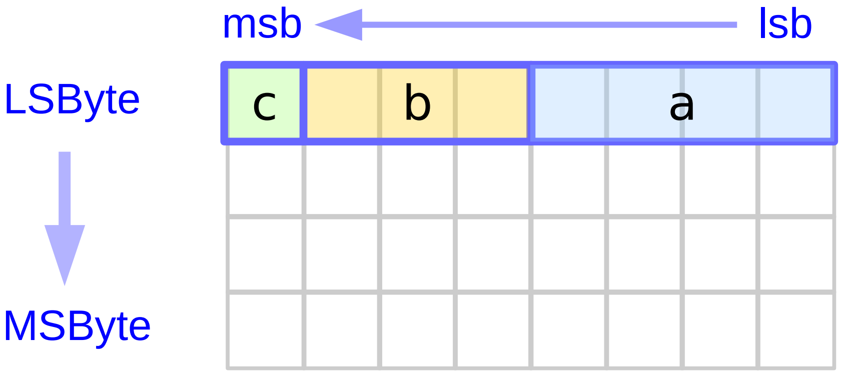
Bit Field Width – Little Endian Examples

structure type definition

```
struct aaa {
        unsigned a:4;
        unsigned b:3;
        unsigned c:1;
} ;
```

```
struct aaa var;
```

var declaration



a:4 bits;

b:3 bits;

c:1 bit;

sizeof(unsigned) = 4 bytes (32-bits)

Little Endian: LSB first

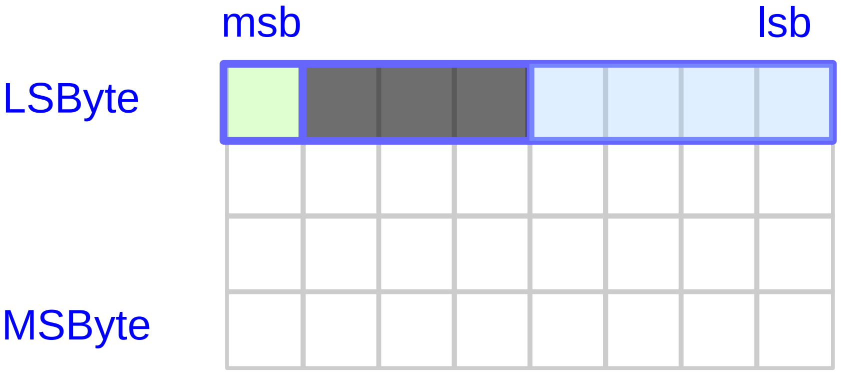
Unnamed Bit Field - Padding

structure type definition

```
struct aaa {
        unsigned int    a:4;
        signed int       :3;
        int             c:1;
} ;
```

```
struct aaa   var;
```

var declaration



Bit Field & Endians

structure type

```
struct aaa {
        unsigned int    a:4;
        unsigned int    b:3;
        unsigned int    c:1;
} ;
```

lsb

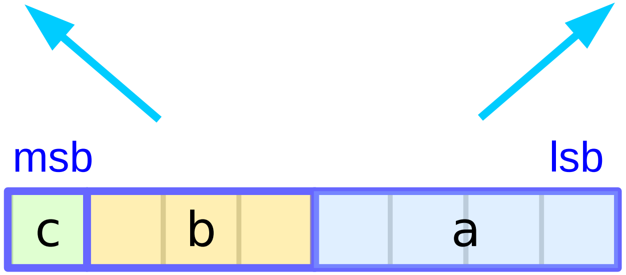
structure type

```
struct aaa {
        unsigned int    c:1;
        unsigned int    b:3;
        unsigned int    a:4;
} ;
```

msb

Little Endian

Big Endian



References

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