

Slay Some Earthly Demons XVI

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Undefined Behavior:

- (19) A non-array lvalue with an incomplete type is used in a context that requires the value of the designated object (6.3.2.1).

Example:

```
struct f *p;
void g(void)
{
    *p;
}
```

Godbolt Link

Analysis:

This is an unused extension point.

This was part of Demons I, but it turned out that this requires more work because the proposed solution to change the definition of lvalue to require a complete type had unintended consequences. This version follows the alternative proposed in reflector message 25600 to only add a specific constraint without changing the definition of lvalue.

Recommendation: Make it a constraint violation. Using the opportunity to improve readability of the standard, we also suggest to add a syntax part to 6.5 Expressions (the syntax production is useless, but makes the structure a bit more coherent and easier to follow).

Wording (rel. to N3299)

6.3.3 Other operands

6.3.3.1 Lvalues, arrays, and function designator

Except when it is the operand of the sizeof operator, or the typeof operators, the unary & operator, the ++ operator, the -- operator, or the left operand of the . operator or an assignment operator, an lvalue that does not have array type is converted to the value stored in the designated object (and is no longer an lvalue); this is called lvalue conversion. If the lvalue has qualified type, the value has the unqualified version of the type of the lvalue; additionally, if the lvalue has atomic type, the value has the non-atomic version of the type of the lvalue; otherwise, the value has the type of the lvalue. ~~If the lvalue has an incomplete type and does not have array type, the behavior is undefined.~~ If the lvalue designates an object of automatic storage duration that could have been declared with the register storage class (never had its address taken), and that object is uninitialized (not declared with an initializer and no assignment to it has been performed prior to use), the behavior is undefined.

6.5 Expressions

6.5.1 General

Syntax

1

```
expression:  
    comma-expression
```

Constraints

2 During lvalue conversion, the lvalue shall not have an incomplete type.

Semantics

3 ...

6.5.18 Comma operator

Syntax

1

```
comma-expression:  
    assignment-expression  
    comma-expression , assignment-expression
```