

Earthly Demon XV: Definition of Main (Updates n3562)

Document: n3623

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Changes since n3562: Revise wording (“compatible with”, remove “permitted”). Add explanation about multiple declarations to discussion. Better handle free-standing.

Changes since n3480: Revise wording and address the possibility of free-standing implementations in the new constraint. Add size expression to second prototype.

Changes since n3419: Rephrase and change to external linkage (SC22WG14.28267), also allow multiple definition to still be UB (this will be addressed later)

Undefined Behavior: Non-supported definition of main (or no definition).

Example:

```
int main(int argc, char *argv[], int *p)
{
// ...
}
```

Analysis:

POSIX defines an extension, but we explicitly allow implementation-defined forms, so this does not fall under this UB in this case. It is UB if there is no corresponding implementation-defined extension.

Note that this does not address the possibility of multiple definitions, which causes UB for any external definition (6.9p5).

Recommendation: Make this a constraint violation.

Wording on next page.

Wording (n3550) (note to editor: addition of size expression to second prototype)

5.2.2.3.2 Program startup

The function called at program startup is named `main`. The implementation declares no prototype for this function. It ~~shall be defined~~ **is defined** with a return type of `int` and with no parameters:

```
int main(void) { /* ... */ }
```

or with two parameters (referred to here as `argc` and `argv`, though any names can be used, as they are local to the function in which they are declared):

```
int main(int argc, char *argv[static argc + 1]) { /* ... */ }
```

~~or equivalent;6) or in some other implementation-defined manner.~~ **using another type that is compatible with one of these two function types, or using some other implementation-defined type.**

6.9.1. General

Constraints

1 The function called at program startup shall have one of the function types specified in 5.2.2. There shall be a definition of this function with external linkage. **XX)**

XX) For a hosted implementation, this function is called ‘main’ (5.2.2.3.2)