

预先检查版本如下：

```
D:\UNIX_VC6++\Unix V6++\oos\tools>gcc -v
Reading specs from D:/UNIX_VC6++/Unix V6++/MinGW old/bin/./lib/gcc/mingw32/3.4.5/specs
Configured with: ../gcc-3.4.5-20060117-3/configure --with-gcc --with-gnu-ld --with-gnu-as --host=mingw32 --target=mingw32 --prefix=/mingw --enable-threads --disable-nls --enable-languages=c,c++,f77,ada,objc,java --disable-win32-registry --disable-shared --enable-sjlj-exceptions --enable-libgcj --disable-java-awt --without-x --enable-java-gc=boehm --disable-libgcj-debug --enable-interpreter --enable-hash-synchronization --enable-libstdcxx-debug
Thread model: win32
gcc version 3.4.5 (mingw-vista special r3)

D:\UNIX_VC6++\Unix V6++\oos\tools>nasm -v
NASM version 2.07 compiled on Jul 19 2009

D:\UNIX_VC6++\Unix V6++\oos\tools>make -v
GNU Make 3.81
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This program built for i686-pc-mingw32
```

## 1 No such file or directory

实验过程中可能出现如下问题，分析得知是找不到 .OBJ\$xxx.o 文件导致的，显然，OBJ\$ 是父级目录，xxx.o 文件在其目录下，推断是将 \ 识别为转义字符遂改为 / 重新编译运行。

```
gcc.exe: .OBJ$commandtree.o: No such file or directory
gcc.exe: .OBJ$executecommand.o: No such file or directory
gcc.exe: .OBJ$preexecute.o: No such file or directory
gcc.exe: .OBJ$main.o: No such file or directory
make[1]: *** [all] Error 1
make[1]: Leaving directory `D:/UNIX_VC6++/64/oos/src/shell'
make: *** [shell] Error 2
```

Makefile 文件修改如下。

```
LIB_INCLUDE = ../lib/include

MAKEIMAGEPATH = ../tools/MakeImage/bin/Debug/programs

.PHONY : all

SHELL_OBJ$ =$(TARGET)/commandtree.o \
            $(TARGET)/executecommand.o \
            $(TARGET)/preexecute.o \
            $(TARGET)/main.o
...
```

## 2 undefined reference

此操作可能对于添加 getpid 调用后执行为 -1 的情况也有效。

```
[/]\#cd bin
[/bin]\#showStack.exe
result=3
This is Process 2# speaking...
My parent process ID is: -1
```

如果执行过 clean.bat 或 clean 操作，再次 build Unix V6++ 可能会出现如下问题：

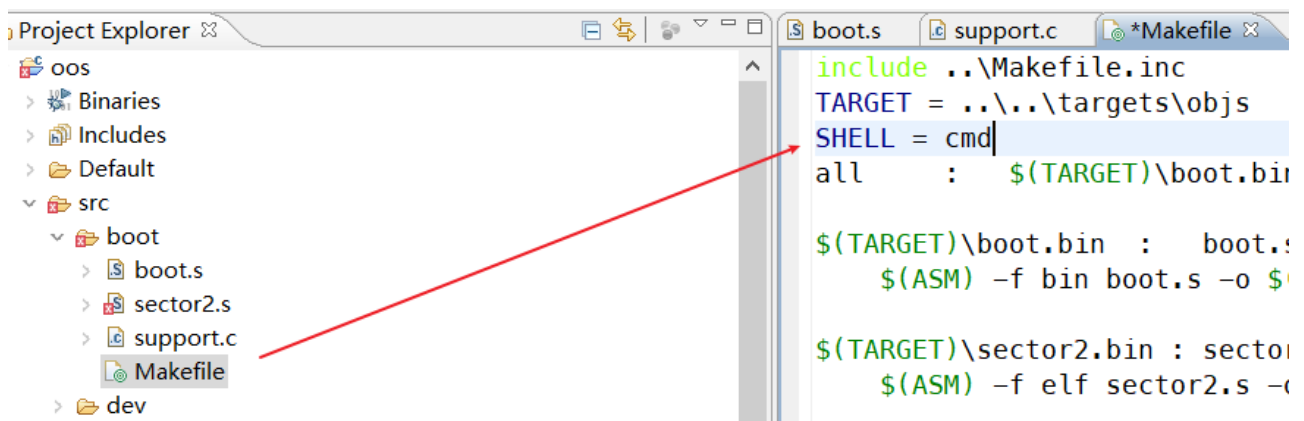
```
D:\UNIX_V6++\64\oos\tools>clean.bat
del ..\targets\objs\*.o
del ..\targets\objs\*.exe
del ..\targets\objs\*.bin
del ..\targets\objs\*.sym
del ..\targets\objs\*.asm
del ..\targets\img\*.bin
del ..\targets\img\*.sym
del ..\targets\img\*.asm
del ..\targets\UNIXV6++\c.img
```

```
sector2.s:(.text+0x10): undefined reference to `__main'
sector2.s:(.text+0x15): undefined reference to `main0'
sector2.s:(.text+0x1a): undefined reference to `__atexit'
make: *** [build] Error 1
```

错误路径位于 src/boot/sector2.s 。然而同级目录下存在 \_\_main 和 \_\_atexit，因此可能是路径问题。

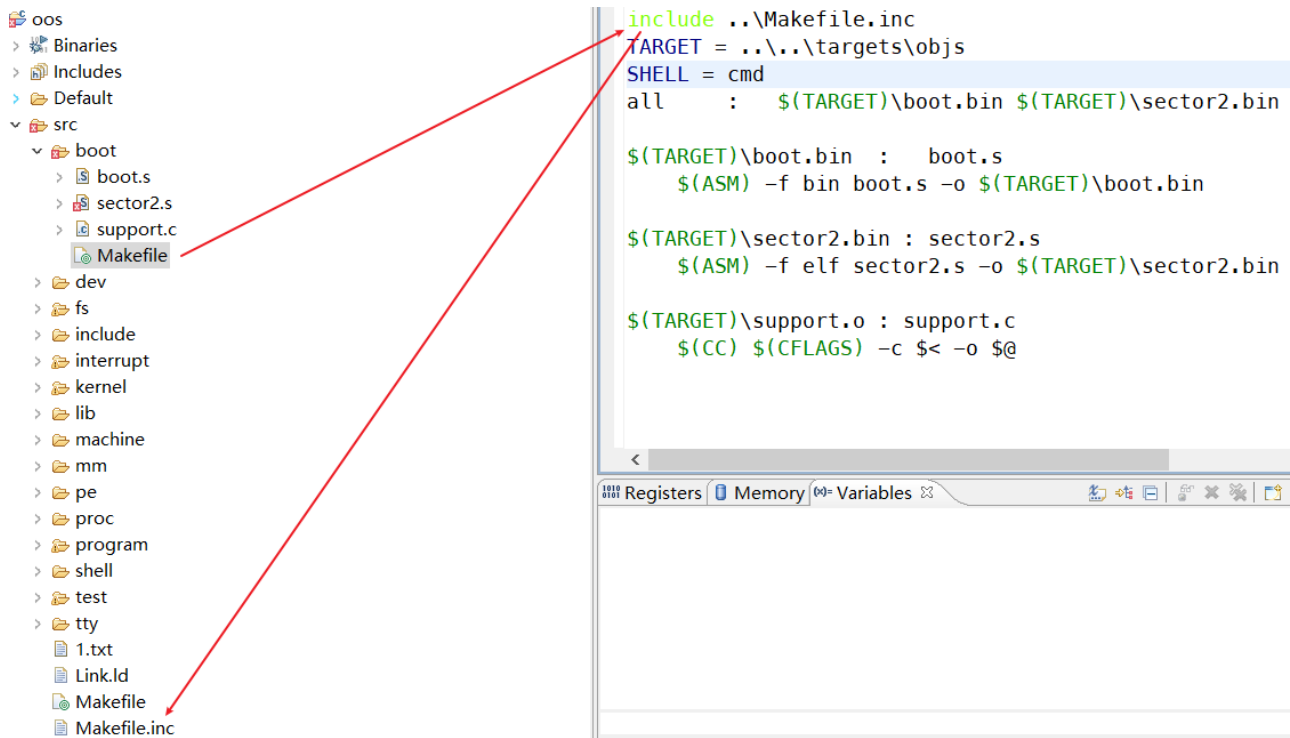
```
support.c  *Makefile  Mal
extern "C" void __main()
extern "C" void __atexit()
```

首先修改同级目录 Makefile 文件如下。



```
..\targets\objs\sector2.bin: In function `greatstart':
sector2.s:(.text+0x15): undefined reference to `main0'
make: *** [build] Error 1
```

仅仅剩余 main0 问题，此时问题只能来源于外部文件。即



打开 Makefile.inc，修改如下：

```
Makefile.inc • support.c x
1  #命令定义
2  CC = g++
3  LD = ld
4  OBJCOPY = objcopy
5  OBJDUMP = objdump
6  ASM = nasm
7  NM = nm
8  MAKE = make
9  SHELL = cmd
10 #参数定义
```

重新 build 成功。

```
cd ../tools/MakeImage/bin/Debug && build.exe c.img boot.bin
kernel.bin programs
copy ../tools/MakeImage/bin/Debug/c.img "../targets/UNIXV6+
+"c.img
已复制    1 个文件。
```

\*\*\*\* Build Finished \*\*\*\*

修改 showStack.c 验证是否 build 正常。

```
int pid, ppid;
pid = getpid();
ppid = getppid(pid);
printf("This is Process %d# speaking...\n",pid);
printf("My parent process ID is: %d\n", ppid);
printf("Modify\n");|
```

```
\tools>run
\tools>pushd .
\tools>cd "D:\UNIX_VC6++\64\o
\targets\UNIXV6++>popd
C:\Bochs for Window
\tools>
D:\UNIX_VC6++\64
=====
Buil
```

Bochs for Windows - Display

A: B: CD USER Copy Paste

```
[/]#cd bin
[/bin]#showStack.exe
result=3
This is Process 2# speaking...
My parent process ID is: 1
Modify
[/bin]#_
```