

Lab 7-2

Troubleshooting a Boot Failure

Booting Windows 2000/XP

1. First, the POST
2. BIOS locates Master Boot Record
3. MBR looks for System partition
4. MBR passes control to NTLDR
5. NTLDR reads BOOT.INI
6. BOOT.INI points to the Boot menu or to the location of the OS

POST and BIOS

System Reset

Check for major hardware problems

Test basic system components

Look for a boot device

Finding the MBR

BIOS follow the boot sequence configured in Setup

A, C, CD-ROM

C Only

CD-ROM, A, C

Search for *active* partitions which contain the MBR

MBR

Points to *system* partitions

System partitions contain the OS loaders.

IO.SYS

NTLDR

NTLDR Takes Over

Looks for BOOT.INI


Startup Menu

Any Microsoft OS can be
launched from here

BOOT.INI

Where is the OS?

What are the options?



```
[boot loader]
timeout=30
```

```
default=multi(0)disk(0)rdisk(0)partition(2)\WINNT
```

```
[operating systems]
```

```
multi(0)disk(0)rdisk(0)partition(2)\WINNT="Microsoft Windows 2000 Professional" /fastdetect
```

```
C:\="Microsoft Windows 98"
```

```
C:\CMDCONS\BOOTSECT.DAT="Microsoft Windows 2000 Recovery Console" /cmdcons
```

Where is the OS?

```
[boot loader]
```

```
timeout=30
```

```
default=multi(0)disk(0)rdisk(0)partition(2)\WINNT
```



```
[operating systems]
```

```
multi(0)disk(0)rdisk(0)partition(2)\WINNT="Microsoft Wind
```

```
C:\="Microsoft Windows 98"
```

```
C:\CMDCONS\BOOTSECT.DAT="Microsoft Windows 2000 Recovery
```

BOOT.INI (con't.)

```
[boot loader]
timeout=30
```

```
default=multi(0)disk(0)rdisk(0)partition(2)\WINNT
```

```
[operating systems]
```

```
multi(0)disk(0)rdisk(0)partition(2)\WINNT="Microsoft Windows 2000 Professional" /
```

```
C:\="Microsoft Windows 98"
```

```
C:\CMDCONS\BOOTSECT.DAT="Microsoft Windows 2000 Recovery Console" /cmdcons
```

NTDETECT.COM

Detecting System Component ...

Reading BIOS date ...

Done reading BIOS date (5/18/2000)

Detecting PCI Bus Component ...

PCI: Calling PCI_BIOS_PRESENT PCI BUS FOUND

Calling PCI BIOS to get IRQ Routing table...

PCI BIOS returned 0x0050 as the size of IRQ routing options buffer...

*** Real-mode PCI BIOS IRQ Routing Table - BEGIN ***

Exclusive PCI IRQ mask = 0x0000

Bus	Device	LnkA	Mask	LnkB	Mask	LnkC	Mask	LnkD	Mask	Slot
0x0000		0x000F	0x0001	0xDEF8	0x0002	0xDEF8	0x0003	0xDEF8	0x0000	
0x0000		0x0010	0x0002	0xDEF8	0x0003	0xDEF8	0x0004	0xDEF8	0x0000	
0x0000		0x0011	0x0003	0xDEF8	0x0004	0xDEF8	0x0001	0xDEF8	0x0000	
0x0000		0x0012	0x0004	0xDEF8	0x0001	0xDEF8	0x0002	0xDEF8	0x0000	
0x0000		0x0007	0x0001	0xDEF8	0x0002	0xDEF8	0x0003	0xDEF8	0x0000	
4	0xDEF8	0x0000								

*** Real-mode PCI BIOS IRQ Routing Table - END ***

press any key to continue...

The Kernel Loads

`\SYSTEM32\NTOSKRNL.EXE`

Missing or corrupt?

Check `BOOT.INI`

Starting Windows...



NTLDR Error

```
Windows 2000 could not start because the following file is missing or corrupt:  
<windows 2000 root>\system32\ntoskrnl.exe.  
Please re-install a copy of the above file.
```

Boot Error

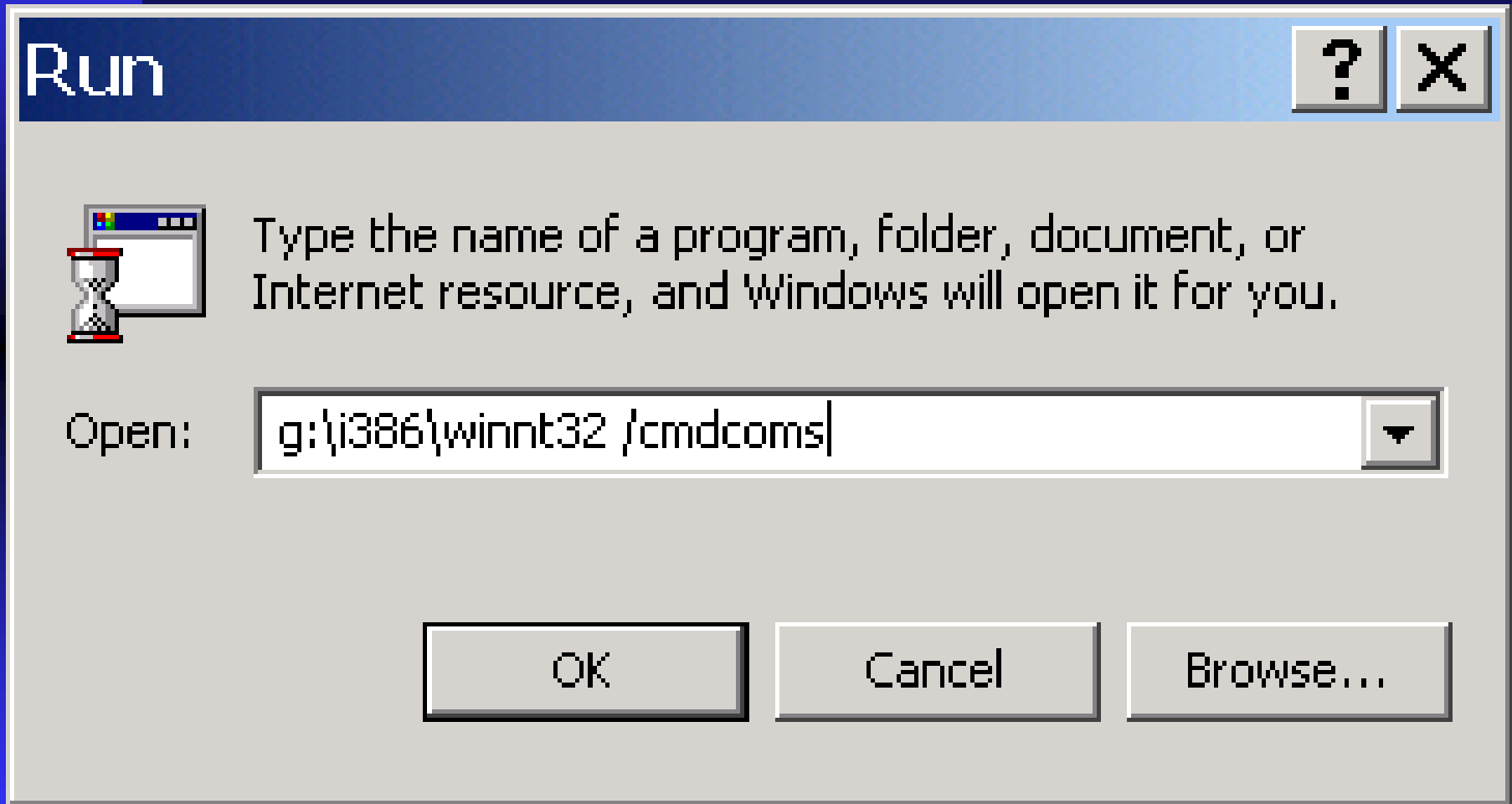
NTLDR is missing
Press any key to restart

The Recovery Console

It's a "Windows 2000 command prompt"

It's *very* limited

Recovery Console



Please select the operating system to start:

Microsoft Windows 2000 Professional
Microsoft Windows 2000 Recovery Console



Use ↑ and ↓ to move the highlight to your choice.

Press Enter to choose.

Seconds until highlighted choice will be started automatically: 27

For troubleshooting and advanced startup options for Windows 2000, press F8.

Microsoft Windows 2000(TM) Recovery Console.

The Recovery Console provides system repair and recovery functionality.

Type EXIT to quit the Recovery Console and restart the computer.

1: C:\WINNT

Which Windows 2000 installation would you like to log onto
(To cancel, press ENTER)? 1

Type the Administrator password:

C:\WINNT>■

TTRIB
BATCH
CD
CHDIR
CHKDSK
CLS
COPY
DEL
DELETE
DIR
DISABLE
DISKPART
ENABLE
EXIT
EXPAND
FIXBOOT
FIXMBR
FORMAT
HELP
LISTSUC
LOGON
MAP
MD
MKDIR
MORE
RD
REN
RENAME
RMDIR
SYSTEMROOT
TYPE

C:\WINNT>■

C:\WINNT>copy /?

Copies a single file to another location.

COPY source [destination]

source Specifies the file to be copied

destination Specifies the directory and/or file name for the new file

The source may be removable media, any directory within the system directories of the current Windows installation, the root of any drive, the local installation sources, or the Cmdcons directory.

The destination may be any directory within the system directories of the current Windows installation, the root of any drive, the local installation sources, or the cmdcons directory.

The destination cannot be removable media.

If a destination is not specified, it defaults to the current directory.

COPY does not support replaceable parameters (wildcards).

COPY prompts if the destination file already exists.

A compressed file from the Windows installation CD is automatically decompressed as it is copied.

C:\WINNT>■

```
C:\WINNT>del /?  
Deletes one file.
```

```
DEL      [drive:][path]filename  
DELETE  [drive:][path]filename
```

```
    [drive:][path]filename  
                Specifies the file to delete.
```

DELETE only operates within the system directories of the current Windows installation, removable media, the root directory of any hard disk partition, or the local installation sources.

```
C:\WINNT>■
```

```
C:\WINNT>fixboot /?
```

Writes a new bootsector onto the system partition.

```
FIXBOOT [drive:]
```

```
    [drive:]
```

Specifies the drive to which a boot sector will be written, overriding the default choice of the system boot partition.

FIXBOOT is only supported on x86-based computers.

```
C:\WINNT>fixmbr /?
```

Repairs the master boot record of the boot partition.

```
FIXMBR [device-name]
```

```
    device-name    Optional name that specifies the device
                   that needs a new MBR.  If this is left blank then
                   the boot device is used
```

If FIXMBR detects an invalid or non-standard partition table signature, it prompts you before rewriting the master boot record (MBR).

FIXMBR is only supported on x86-based computers.

```
C:\WINNT>■
```

Now, it's your turn.