IESoc 2005: Windows Command Prompt

Tutorial by Adrian (IE99, swtam9@ie)

1. BACKGROUND

- PC-DOS = MS-DOS, released around 1981, as a successor to CP/M (used in Apple II, but Adrian is not sure)

- MS-DOS 6.22 is the last version (in 1994-1995)

- No more DOS afterwards, but the DOS command still exists in Windows, called the "command prompt" in Windows NT/2000/XP or "MS-DOS prompt" in Windows 95/98

- If you know DOS, you can play with it already (find a book in LCSD Public Libraries, they got tons!)

- PS: In DOS 5.0/6.0 age, we even got QBASIC and some games in DOS

2. BASICS

2.1   Start up

- Win95/98: Start Menu ▷ Program Files ▷ MS-DOS Prompt

- WinNT/2k/XP: Start Menu ▷ Program Files ▷ (Somewhere) ▷ Command Prompt

- Any: In Start Menu ▷ Run, call "cmd" (WinNT/2k/XP) or "command" (all)

2.2   DOS commands chart

- Source: `http://www.computerhope.com/msdos.htm`

A	ANSI.SYS | APPEND | ARP | ASSIGN | ASSOC | AT | ATMADM | ATTRIB
B	BATCH | BOOTCFG | BREAK
C	CACLS | CALL | CD | CHCP | CHDIR | CHKDSK | CHKNTFS | CHOICE | CLS | CMD | COLOR | COMMAND | COMP | COMPACT | CONTROL | CONVERT | COPY | CTTY
D	DATE | DEBUG | DEFRAG | DEL | DELETE | DELTREE | DIR | DISABLE | DISKCOMP | DISKCOPY | DISKPART | DOSKEY | DOSSHELL | DRIVPARM
E	ECHO | EDIT | EDLIN | EMM386 | ENABLE | ENDLOCAL | ERASE | EXIT | EXPAND | EXTRACT
F	FASTHELP | FC | FDISK | FIND | FINDSTR | FIXBOOT | FIXMBR | FOR | FORMAT | FTP | FTYPE
G	GOTO | GRAFTABL
H	HELP | HOSTNAME
I	IF | IFSHLP.SYS | IPCONFIG
K	KEYB
L	LABEL | LH | LISTSVC | LOADFIX | LOADHIGH | LOCK | LOGON
M	MAP | MD | MEM | MKDIR | MODE | MORE | MOVE | MSAV | MSD | MSCDEX
N	NBTSTAT | NET | NETSH | NETSTAT | NLSFUNC | NSLOOKUP
P	PATH | PATHPING | PAUSE | PING | POPD | POWER | PRINT | PROMPT | PUSHD
Q	QBASIC
R	RD | REN | RENAME | RMDIR | ROUTE | RUNAS
S	SCANDISK | SCANREG | SET | SETLOCAL | SETVER | SFC | SHARE | SHIFT | SHUTDOWN | SMARTDRV | SORT | START | SUBST | SWITCHES | SYS | SYSTEMROOT
T	TELNET | TIME | TITLE | TRACERT | TREE | TYPE
U	UNDELETE | UNFORMAT | UNLOCK
V	VER | VERIFY | VOL
X	XCOPY

2.3   DOS External Commands Chart (with version)

- Source: `http://www.computerhope.com/dosapp.htm`

- DOS commands are either in COM extension (no longer use in Windows) or EXE extension (used in Windows), but you can forget about the difference unless you play with Intel 80x86 real mode assembly (not even required in ELE3230)

	2.0x	2.1x	3.00	3.1x / 3.2x	3.3x	4.0x	5.0 / 5.00a	6.0	6.2	6.21 / 6.22
APPEND	N/A	N/A	N/A	EXE	EXE	EXE	EXE	EXE	EXE	EXE
ASSIGN	COM	COM	COM	COM	COM	COM	COM	N/A	N/A	N/A
ATTRIB	N/A	N/A	EXE	EXE	EXE	EXE	EXE	EXE	EXE	EXE
BACKUP	COM	COM	COM	COM	COM	COM	EXE	N/A	N/A	N/A
BASIC	COM	COM	COM	COM	N/A	N/A	N/A	N/A	N/A	N/A
BASICA	COM	COM	COM	COM	N/A	N/A	N/A	N/A	N/A	N/A
CHKDSK	COM	COM	COM	COM	COM	COM	EXE	EXE	EXE	EXE
CHOICE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	COM	COM	COM
COMMAND	COM	COM	COM	COM	COM	COM	COM	COM	COM	COM
COMP	COM	COM	COM	COM	COM	COM	EXE	N/A	N/A	N/A
DBLSPACE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	N/A
DEBUG	COM	COM	COM	COM	COM	COM	EXE	EXE	EXE	EXE
DEFRAG	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE
DELTREE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE
DISKCOMP	COM	COM	COM	COM	COM	COM	COM	COM	COM	COM
DISKCOPY	COM	COM	COM	COM	COM	COM	COM	COM	COM	COM
DOSKEY	N/A	N/A	N/A	N/A	N/A	N/A	COM	COM	COM	COM
DOSSHELL	N/A	N/A	N/A	N/A	N/A	COM	COM	EXE	N/A	N/A
DOSSWAP	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	N/A	N/A
DRVSPACE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE
EDIT	N/A	N/A	N/A	N/A	N/A	N/A	COM	COM	COM	COM
EDLIN	COM	COM	COM	COM	COM	COM	EXE	N/A	N/A	N/A
EMM386	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE	EXE
EXE2BIN	N/A	EXE	EXE	EXE	EXE	EXE	EXE	N/A	N/A	N/A
EXPAND	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE
FASTHELP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE
FASTOPEN	N/A	N/A	N/A	N/A	EXE	EXE	EXE	EXE	EXE	EXE
FC	N/A	N/A	N/A	N/A	EXE	EXE	EXE	EXE	EXE	EXE
FDISK	COM	COM	COM	COM	COM	EXE	EXE	EXE	EXE	EXE
FILESYS	N/A	N/A	N/A	N/A	N/A	EXE	N/A	N/A	N/A	N/A
FIND	EXE	EXE	EXE	EXE	EXE	EXE	EXE	EXE	EXE	EXE
FORMAT	COM	COM	COM	COM	COM	COM	COM	COM	COM	COM
GRAFTABL	N/A	N/A	COM	COM	COM	COM	COM	N/A	N/A	N/A
GRAPHICS	COM	COM	COM	COM	COM	COM	COM	COM	COM	COM
GWBASIC	N/A	N/A	N/A	N/A	EXE	EXE	N/A	N/A	N/A	N/A
HELP	N/A	N/A	N/A	N/A	N/A	N/A	EXE	COM	COM	COM
IFSFUNC	N/A	N/A	N/A	N/A	N/A	EXE	N/A	N/A	N/A	N/A
INTERLNK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE
INTERSVR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE
JOIN	N/A	N/A	N/A	EXE	EXE	EXE	EXE	N/A	N/A	N/A
KEYB	N/A	N/A	N/A	N/A	COM	COM	COM	COM	COM	COM
KEYBFR	N/A	N/A	COM	COM	N/A	N/A	N/A	N/A	N/A	N/A
KEYBGR	N/A	N/A	COM	COM	N/A	N/A	N/A	N/A	N/A	N/A
KEYBIT	N/A	N/A	COM	COM	N/A	N/A	N/A	N/A	N/A	N/A
KEYBSP	N/A	N/A	COM	COM	N/A	N/A	N/A	N/A	N/A	N/A
KEYBUK	N/A	N/A	COM	COM	N/A	N/A	N/A	N/A	N/A	N/A
LABEL	N/A	N/A	COM	COM	COM	COM	EXE	EXE	EXE	EXE
LINK	EXE	EXE	EXE	EXE	EXE	EXE	N/A	N/A	N/A	N/A
LOADFIX	N/A	N/A	N/A	N/A	N/A	N/A	COM	COM	COM	COM
MEM	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE	EXE	EXE
MEMMAKER	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE
MIRROR	N/A	N/A	N/A	N/A	N/A	N/A	COM	N/A	N/A	N/A
MODE	COM	COM	COM	COM	COM	COM	COM	COM	COM	COM
MORE	COM	COM	COM	COM	COM	COM	COM	COM	COM	COM
MOVE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE
MSBACKUP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE
MSCDEX	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE
MSD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE
MWAV	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE
MWAVTSR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE
MWBACKUP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE
MWUNDEL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE
NLSFUNC	N/A	N/A	N/A	N/A	EXE	EXE	EXE	EXE	EXE	EXE
POWER	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE

PRINT	COM	COM	COM	COM	COM	COM	EXE	EXE	EXE	EXE
QBASIC	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE	EXE
RECOVER	COM	COM	COM	COM	COM	COM	EXE	N/A	N/A	N/A
REPLACE	N/A	N/A	EXE	N/A	EXE	EXE	EXE	EXE	EXE	EXE
RESTORE	COM	COM	COM	COM	COM	COM	EXE	EXE	EXE	EXE
SCANDISK	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE
SELECT	N/A	N/A	COM	COM	COM	COM	N/A	N/A	N/A	N/A
SETVER	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE	EXE
SHARE	N/A	N/A	EXE	EXE	EXE	EXE	EXE	EXE	EXE	EXE
SIZER	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE
SMARTDRV	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE
SMARTMON	N/A	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	N/A
SORT	EXE	EXE	EXE	EXE	EXE	EXE	EXE	EXE	EXE	EXE
SUBST	N/A	N/A	N/A	EXE	EXE	EXE	EXE	EXE	EXE	EXE
SYS	COM	COM	COM	COM	COM	COM	COM	COM	COM	COM
TREE	COM	COM	COM	COM	COM	COM	COM	COM	COM	COM
UNDELETE	N/A	N/A	N/A	N/A	N/A	N/A	EXE	EXE	EXE	EXE
UNFORMAT	N/A	N/A	N/A	N/A	N/A	N/A	COM	COM	COM	COM
VSAFE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	COM	COM	COM
XCOPY	N/A	N/A	N/A	N/A	EXE	EXE	EXE	EXE	EXE	EXE

2.4 Manipulating files using command prompt

- Change drive: `C:`

- Change directory (folder): `cd "\Program Files\Microsoft Office"`

- Browse folder
  ```
  dir                          dir /o:a
  dir /w                       dir /a:d
  dir /p                       dir /a
  dir /s /p
  ```

- Copy, move and delete file
  ```
  copy m:\source\assg1.doc u:\ieg2345\
  copy /b c:\part1.mpg + c:\part2.mpg + c:\part3.mpg m:\whole.mpg
  copy m:\source\*.* u:\ieg2345
  move m:\source\*.* u:\ieg2345
  del m:\source\*.*
  del m:\source\ /s
  ```

- Create and remove directories (folders)
  ```
  mkdir hello
  md m:\source\cyanide
  rmdir u:\ieg2345\temp
  rd m:\source\cyanide
  ```

- Rename files or directories
  ```
  ren m:\source\cynaide m:\source\no_problem
  ```

- Clear the screen: `cls`

- Format: `format c:`

2.5 Asking for help

- Google

- `dir /?`

3. BATCH FILE

- Programming script, but use DOS command only

- Support loops, etc.

- Example:
  ```
  @ECHO OFF
  notepad c:\hello.txt
  ```

  – Save as `openhello.bat` (must end with BAT)

- – whenever run, run the whole set of commands in the file just as you typed
- – `@ECHO OFF` is to prevent showing commands on the screen while it is running (default is to show)

- Commands can help:

  - – Parameters to batch file: `%1`, `%2`, ...
    - ∗ In C, it is `argv[1]`, `argv[2]`, ...
  - – If statements:
    ```
    if [not] string1 == string2 ( command )
    if [not] exist filename ( command )
    if [not] errorlevel n ( command )
    ```
    - ∗ errorlevel is the code returned by a command, you can check the errorlevel of your just finished command by `echo %ERRORLEVEL%`
    - ∗ you can compare for a truth value, then run a command if that's true
    - ∗ "else" can be used, for example:
      `if exist doc1.tmp ( del doc1.tmp ) else ( echo no temp file found )`
    - ∗ You can line break at suitable positions
  - – `for %var in ( item1 item2 item3 ) do command`
    - ∗ `%var` should be `%%var` if used in batch file
    - ∗ during command, you can use `%var` wherever you like
    - ∗ example:
      ```
      for %v in ( 1 3 5 7 9 ) do del assg%v.doc
      for %v in ( *.doc ) do ren %v %v.bak
      ```
  - – for /L %var in (start , step , end) do command
    - ∗ Loop like those in C
    - ∗ example:
      `for /L %v in (1,2,13) do echo %v is an odd number`
  - – Label like this
    `:THIS_LABEL`
  - – "Go to" statement like this
    `goto THIS_LABEL`
  - – Environment variables (variables that you can use in batch file)
    - ∗ Define like this
      `set MYROOM=SHB725a`
    - ∗ Use like this
      `echo %MYROOM%`
    - ∗ Show all environment variables: just `set`
  - – More information:
    ```
    if /?
    for /?
    help
    ...
    ```
  - – More information: `http://www.computerhope.com/batch.htm`

4. MORE KNOWLEDGE

4.1 Environment variables

- `%PATH%` is the environment variable controls where to find a command EXE file to run, if you just type the name

  - – My way: put putty and others in U:\apps, then set
    `set PATH=%PATH%;u:\apps`
    whenever I log-in

- Windows XP checks `%PATHEXT%` for the filename extensions to treat as commands, default are COM, EXE, BAT, CMD, VBS, VBE, JS, JSE, WSF, WSH

- View your default environment variable list from:
  My Computer (right click) ▷ System Properties ▷ Advanced ▷ Environment Variables

4.2 Networking

- Most network-related jobs can be done by `net` command

- Example 1: add a user to your system (hehe....)
  `net user adrian letadrianin /add`

- Example 2: delete a user
  `net user administrator /delete`

- Example 3: add and delete a group
  `net group goodguy /add`
  `net group goodguy /delete`

- Example 4: change password
  `net user adrian newpassword`

- Example 5: map a drive
  `net use v:  \\adrianhall.no-ip.com\shared`

- Example 6: delete the mapped drive
  `net use v:  /delete`

- Example 7: send a pop-up message
  `net send ieugp32 "Finished your source?"`
  `net send * "Anyone got source?"`

- Example 8: Kill print job
  `net print \\printserver\printer1 13 /delete`

- Example 9: Share out my folder (and delete)
  `net share mysoftware=d:\download`
  `net share mysoftware /delete`

- Show which IP connected to me, and which port I am listening:
  `netstat -a` (show domain names)
  `netstat -an` (numerical IP)

- Manage more networking matters:
  `netsh`

    - You go into another shell to manage your network, even turning off your firewall

- ping is `ping`

- trace-route is `tracert` or `pathping`

- check your IP setting with `ipconfig /all`

4.3 More commands

- `shutdown` - Shutdown, logoff or reboot your computer (even a remote computer)

    - Abort a shutdown: `shutdown -a`

- `tasklist` - Show which program is running

- `taskkill` - Kill one of them

- `exporer /e,/root,d:\download` - Open Windows Explorer, but lock to folders under d:\download only

5. RUNDLL32

- RUNDLL32 is a command in Windows that allows you to access many Windows API directly from command line

- For detail, read MSDN web site for the API and usage

5.1 Shutdown related

- `rundll32 user.exe,exitwindows` - exit Windows

- `rundll32 user.exe,ExitWindowsExec` - restart Windows

- `rundll32 shell32.dll,SHExitWindowsEx 2` - reboot the computer

- `rundll32 shell32.dll,SHExitWindowsEx` - log off the current user without the confirmation question

- `rundll32 user32.dll,LockWorkStation` - Lock workstation

5.2   Control panel related

- `control main.cpl` - Keyboard and mouse

- `control main.cpl,@1` - Just the first page of "Keyboard and mouse"

- `rundll32 shell32.dll,Control_RunDLL main.cpl,@1` - Another way to do this

- Look for other control panel tools in C:\Windows\System32*.cpl

Accessibility Options: access.cpl	Microsoft Mail Post Office: wgpocpl.cpl
Add New Hardware: sysdm.cpl	Modem Properties: modem.cpl
Add/Remove Programs: appwiz.cpl	Multimedia Properties: mmsys.cpl
Date/Time Properties: timedate.cpl	Network Properties: netcpl.cpl (WinNT 4.0 is ncpa.cpl)
Display Properties: desk.cpl	Password Properties: password.cpl
FindFast: findfast.cpl	Power Management: powercfg.cpl
Fonts Folder: fonts.cpl	Printers Folder: printers.cpl
Internet Properties: inetcpl.cpl	Regional Settings: intl.cpl
Joystick Properties: joy.cpl	Scanners and Cameras: sticpl.cpl
Keyboard/Mouse Properties: main.cpl	Sound Properties: mmsys.cpl
Microsoft Exchange: mlcfg32.cpl	Sounds System Properties: sysdm.cpl

- For syntax on playing with control panel through RUNDLL32, see: `http://www.robvanderwoude.com/rundll.html`

5.3   Printer related

- `rundll32 printui.dll,PrintUIEntry /?` - Help for printer related command

- Add printer:
  ```
  rundll32 printui.dll,PrintUIEntry /ia /c\\server /m "AGFA-AccuSet v52.3" /h "Intel" /v "Windows 2000"
      /f %windir%\inf\ntprint.inf
  rundll32 printui.dll,PrintUIEntry /if /b "Test Printer" /c\\SERVER /f "%windir%\inf\ntprint.inf"
      /r "lpt1:" /m "AGFA-AccuSet v52.3"
  ```

- Delete printer (remote):
  ```
  rundll32 printui.dll,PrintUIEntry /dl /n "Test Printer" /c\\SERVER
  ```

5.4   Networking related

- `rundll32 rnaui.dll,RnaDial ''CUHK VPN''` - Dial a connection

- `rundll32 shdocvw.dll,OpenURL http://www.ie.cuhk.edu.hk` - Open a link

5.5   Multimedia related

- `rundll32 C:\WINDOWS\SYSTEM\amovie.ocx,RunDll /play /close movie.mpg` - Play a MPG/AVI

6.   LINKS

DOS

- `http://www.computerhope.com/msdos.htm`

Command list

- Microsoft Windows XP Home Command-line Reference A-Z
  `http://www.microsoft.com/WINDOWSXP/home/using/productdoc/en/ntcmds_o.asp`

- Microsoft Windows 2000 Server Command Reference
  `http://www.microsoft.com/windows2000/en/server/help/ntcmds.htm`

- Windows XP commands (online version of `command /?`)
  `http://www.ss64.com/nt/`

Windows tools list

- More XP utilities (non-DOS command, specific to Windows XP operation)
  `http://www.g4tv.com/techtvvault/features/35054/Windows_XP_Command_Line_Utilities.html`

Windows Tweaking

- 104 Performance Tips for Windows XP (not related to command prompt, but quite useful)
  `http://www.pcstats.com/articleview.cfm?articleID=1681`

- Registry hacks
  `http://www.easydesksoftware.com/regtrick.htm`

RUNDLL32

- Eric Helps: RUNDLL32 commands
  `http://www.ericphelps.com/batch/rundll/`

- RUNDLL32 Reference (a lot)
  `http://www.dx21.com/SCRIPTING/RUNDLL32/REFGUIDE.ASP?ISF=0&P=A`