Chapter 17
TELNET and Rlogin

- Concept
- NVT
- Option and Option Negotiation
- Controlling the Server
- Out-of-Band Signaling
- Escape Character
- Mode of Operation

Figure 17-1
Local login
Application programs
Terminal driver
Terminal
Operating system
Remote login

Figure 17-2

Application programs

TELNET server

TCP/IP

Data link

Physical

Operating system

Terminal

TELNET client

Operating system

Terminal driver

TCP/IP

Data link

Physical

Internet

Figure 17-3

Concept of NVT

TELNET client

TELNET server

Pseudoterminal driver

Local computer character set

Internet

NVT character set

Remote computer character set

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Forouzan Notes 17-4
Figure 17-4  Format of data characters

Figure 17-5  Format of control characters
**Figure 17-6**

An example of embedding

```
cat file
```

**Figure 17-7**

Offer to enable an option

**WILL**

I will enable the option

**DO or DON’T**

Do (or don’t) enable the option
Figure 17-8  Request to enable an option

```
DO
Do enable the option
```

```
WILL or WONT
I will (won’t) enable the option
```

Sender  Receiver

Figure 17-9  Offer to disable an option

```
WON’T
I won’t use the option any more
```

```
DON’T
Don’t use it
```

Sender  Receiver
**Request to disable an option**

- **Sender**
  - DON’T
  - Don’t use the option any more

- **Receiver**
  - WON’T
  - I won't

**Echo option example**

- **Client**
  - Do enable the echo option
  - ECHO  DO  IAC

- **Server**
  - I will enable the echo option
  - IAC  WILL  ECHO
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Client Server Application

Forouzan Notes 17-14

Figure 17-12
Example of suboption negotiation

I will enable the terminal option

Terminal type WILL IAC

Do enable terminal option

IAC DO Terminal type

Set the terminal type to "VT"

SE IAC 'V' 'T' SE

Figure 17-13
Example of interrupting an application program

Interrupt

*C

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Figure 17-13
Example of interrupting an application program
Out-of-band signaling

Two different interruptions

a. Interrupting the application program

b. Interrupting the client
Example 1

Figure 17-16

Client

GO AHEAD
WILL TERMINAL TYPE
DO TERMINAL TYPE
GO AHEAD
WILL TERMINAL SPEED
DON'T TERMINAL SPEED
Login:
GO AHEAD
forouzan
Password
GO AHEAD
XXXXX
GO AHEAD
cp file1 file2

Server

Example 2

Figure 17-17

Client

GO AHEAD
DO SUPPRESS GO AHEAD
WILL SUPPRESS GO AHEAD
DO ECHO
WILL ECHO
Login:
f
o
r
f
o
r
o

Server
Figure 17-18  
**Connection establishment**

Client

Server

0

forouzan

0

barf3652

0

vt100/9600

0

0

Figure 17-19  
**Sending ss command from the client to the server**

Client

Server

0x08

0xFFFF

"ss"

24

80

600

600