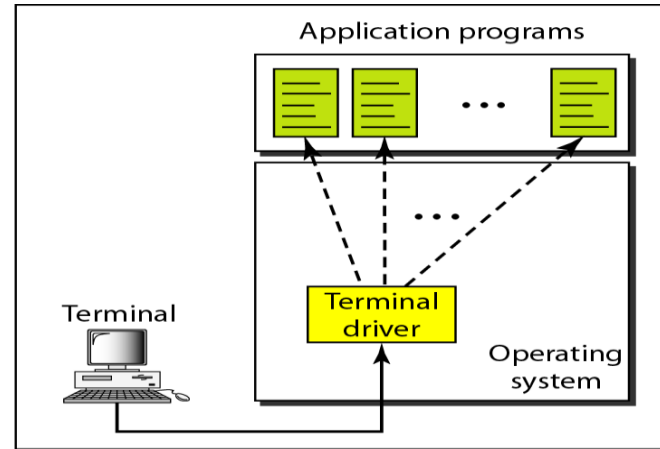


Application Layer Remote Login

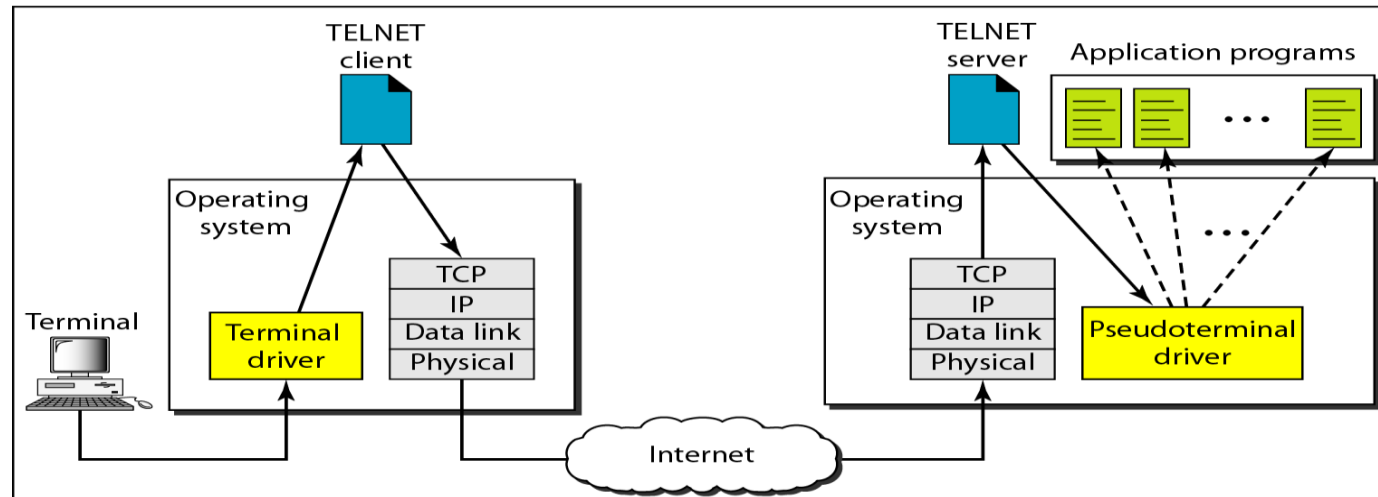
Remote Logging

- It would be impossible to write a specific client/server program for each demand. The better solution is a general-purpose client/server program that lets a user access any application program on a remote computer.
- TELNET is a general-purpose client/server application program.

Local and remote log-in

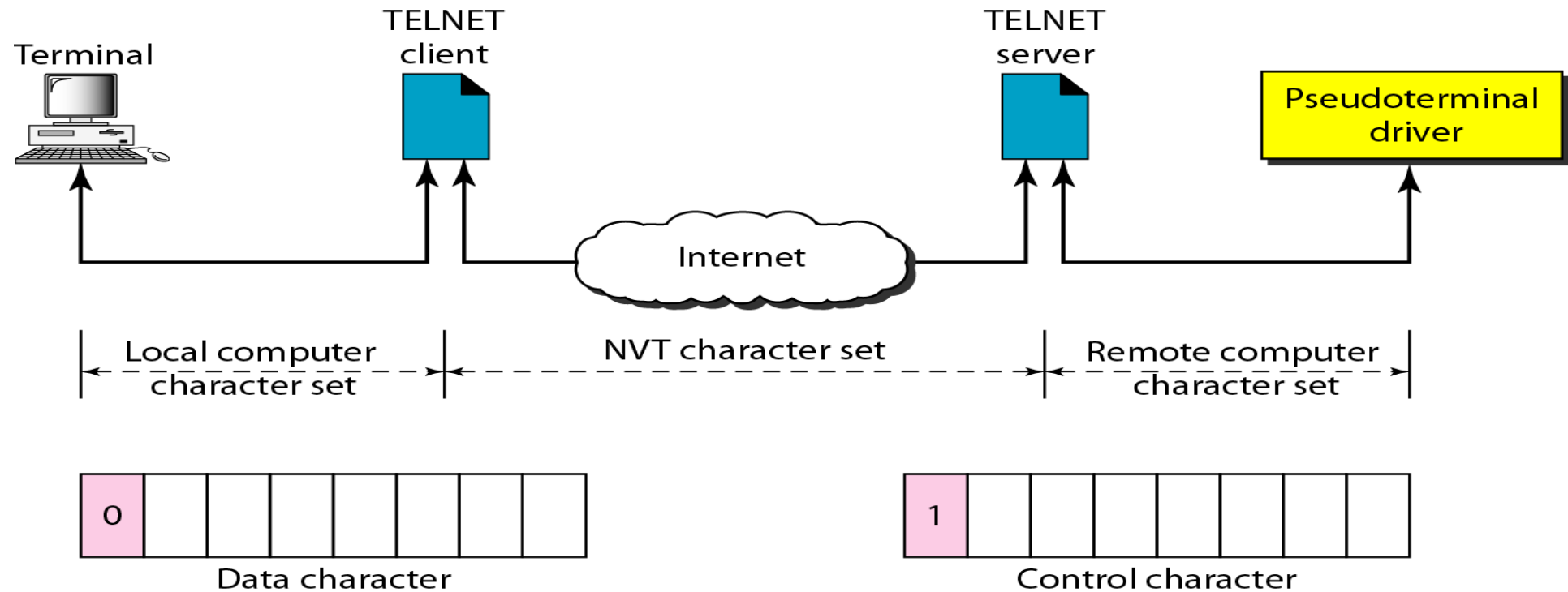


a. Local log-in



b. Remote log-in

Concept of NVT



Some NVT control characters

<i>Character</i>	<i>Decimal</i>	<i>Binary</i>	<i>Meaning</i>
EOF	236	11101100	End of file
EOR	239	11101111	End of record
SE	240	11110000	Suboption end
NOP	241	11110001	No operation
DM	242	11110010	Data mark
BRK	243	11110011	Break
IP	244	11110100	Interrupt process
AO	245	11110101	Abort output
AYT	246	11110110	Are you there?
EC	247	11110111	Erase character
EL	248	11111000	Erase line
GA	249	11111001	Go ahead
SB	250	11111010	Suboption begin
WILL	251	11111011	Agreement to enable option
WONT	252	11111100	Refusal to enable option
DO	253	11111101	Approval to option request
DONT	254	11111110	Denial of option request
IAC	255	11111111	Interpret (the next character) as control

Options

<i>Code</i>	<i>Option</i>	<i>Meaning</i>
0	Binary	Interpret as 8-bit binary transmission.
1	Echo	Echo the data received on one side to the other.
3	Suppress go ahead	Suppress go-ahead signals after data.
5	Status	Request the status of TELNET.
6	Timing mark	Define the timing marks.
24	Terminal type	Set the terminal type.
32	Terminal speed	Set the terminal speed.
34	Line mode	Change to line mode.

NVT character set for option negotiation

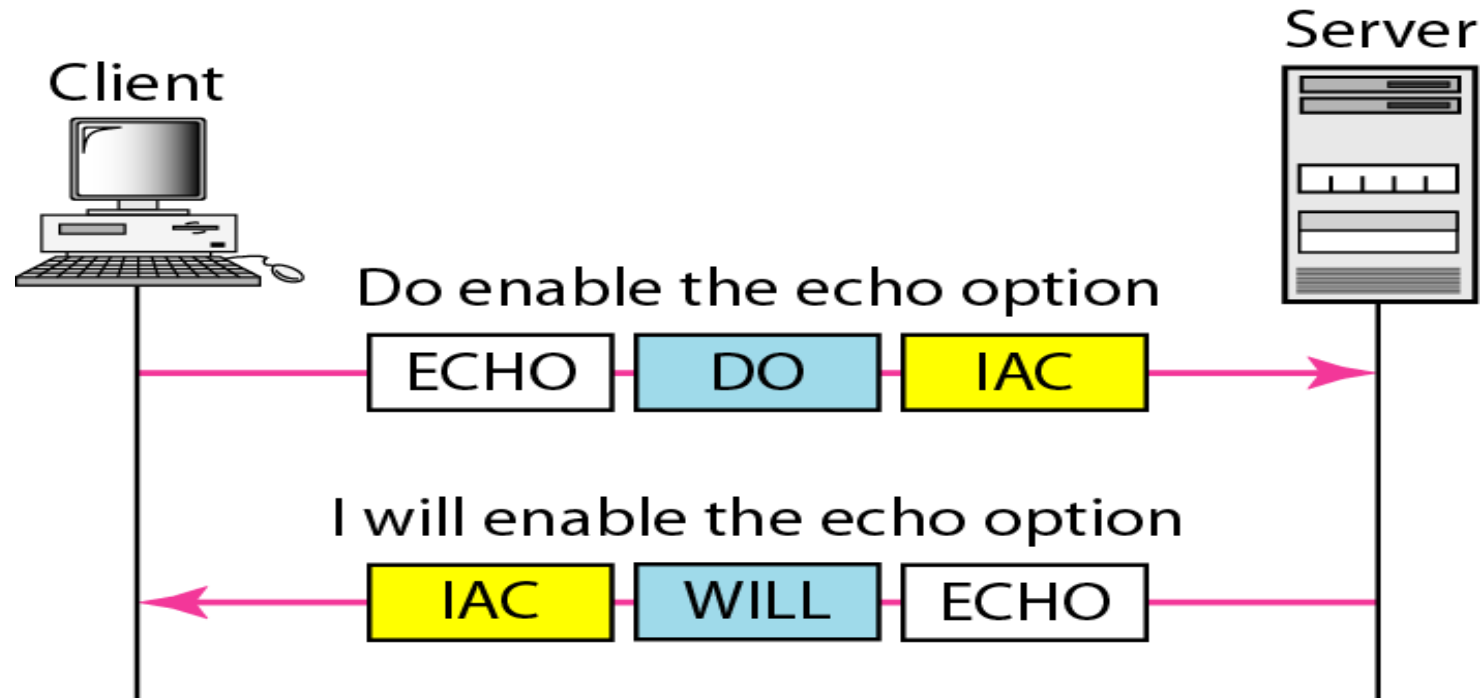
<i>Character</i>	<i>Decimal</i>	<i>Binary</i>	<i>Meaning</i>
WILL	251	11111011	<ol style="list-style-type: none">1. Offering to enable2. Accepting a request to enable
WONT	252	11111100	<ol style="list-style-type: none">1. Rejecting a request to enable2. Offering to disable3. Accepting a request to disable
DO	253	11111101	<ol style="list-style-type: none">1. Approving an offer to enable2. Requesting to enable
DONT	254	11111110	<ol style="list-style-type: none">1. Disapproving an offer to enable2. Approving an offer to disable3. Requesting to disable



Example 26.1

Figure 26.4 shows an example of option negotiation. In this example, the client wants the server to echo each character sent to the server. The echo option is enabled by the server because it is the server that sends the characters back to the user terminal. Therefore, the client should request from the server the enabling of the option using DO. The request consists of three characters: IAC, DO, and ECHO. The server accepts the request and enables the option. It informs the client by sending the three-character approval: IAC, WILL, and ECHO.

Example 26.1: Echo option



Character set for sub options

<i>Character</i>	<i>Decimal</i>	<i>Binary</i>	<i>Meaning</i>
SE	240	11110000	Suboption end
SB	250	11111010	Suboption begin