

# Unit 9: Windows 2000 Networking

## 9.4. Winsock 2.0 – additional Features

# Winsock 2.0 Features

- Windows NT 4.0 was the first operating system with native support of the Winsock 2.0 specification:
  - access to protocols other than TCP/IP,
  - overlapped I/O,
  - ability to query and request specific qualities of service
- New header file and libraries:
  - WS2\_32.LIB / WS2\_32.DLL
  - winsock2.h
- Microsoft extensions to Winsock have been moved out into their own separate DLL
  - WINSOCK.DLL contains forwarders to these routines

# Internet Support

- WININET.DLL supports HTTP, FTP, Gopher protocols
- General-purpose WinInet Functions
  - InternetOpen
  - InternetConnect
  - InternetOpenUrl
  - InternetReadFile
  - InternetCloseHandle
  - InternetSetStatusCallback
  - InternetQueryOption
  - InternetSetOption
  - InternetFindNextFile (FTP and Gopher)

# Internet Support (http/gopher protocols)

- WinInet HTTP Functions
  - HttpOpenRequest
  - HttpAddRequestHeaders
  - HttpSendRequest
  - HttpQueryInfo
- WinInet Gopher Functions
  - GopherFindFirstFile
  - GopherOpenFile
  - GopherCreateLocator
  - GopherGetAttribute

# Internet Support (ftp protocol)

- WinInet FTP Functions
  - FtpFindFirstFile
  - FtpGetFile
  - FtpPutFile
  - FtpDeleteFile
  - FtpRenameFile
  - FtpOpenFile
  - InternetWriteFile
  - FtpCreateDirectory
  - FtpRemoveDirectory
  - FtpSetCurrentDirectory
  - FtpGetCurrentDirectory
  - FtpCommand
  - InternetGetLastResponseInfo

Most of the WinInet functions work with or return HINTERNETs (handles to Internet). While your code sees all HINTERNETs as the same type, one HINTERNET can mean something completely different from another.

The first type of HINTERNET that you obtain comes when you initialize WININET.DLL by calling InternetOpen. This is the first of 13 possible subtypes of HINTERNETs.

# HINTERNET subtypes

INTERNET_HANDLE_TYPE_INTERNET	1
INTERNET_HANDLE_TYPE_CONNECT_FTP	2
INTERNET_HANDLE_TYPE_CONNECT_GOPHER	3
INTERNET_HANDLE_TYPE_CONNECT_HTTP	4
INTERNET_HANDLE_TYPE_FTP_FIND	5
INTERNET_HANDLE_TYPE_FTP_FIND_HTML	6
INTERNET_HANDLE_TYPE_FTP_FILE	7
INTERNET_HANDLE_TYPE_FTP_FILE_HTML	8
INTERNET_HANDLE_TYPE_GOPHER_FIND	9
INTERNET_HANDLE_TYPE_GOPHER_FIND_HTML	10
INTERNET_HANDLE_TYPE_GOPHER_FILE	11
INTERNET_HANDLE_TYPE_GOPHER_FILE_HTML	12
INTERNET_HANDLE_TYPE_HTTP_REQUEST	13

Query the subtype of a particular handle by calling:

## **InternetQueryOption**

and sending it the HINTERNET with the INTERNET\_OPTION\_HANDLE\_TYPE parameter

# Using Internet Functions

- After setting up WININET.DLL, the initial HINTERNET is usually passed to InternetConnect,
  - parameter indicates the type of connecting server (HTTP, FTP, or Gopher).
  - InternetConnect returns another subtype of HINTERNET, which is then passed to the appropriate HTTP, FTP, or Gopher functions.
  - Alternatively call InternetOpenUrl (parses the URL; connects to the appropriate type of server automatically)
- After connecting to the desired server:
  - turn to the protocol-specific functions
  - read data from the server via InternetReadFile (works with HINTERNETs for any of the three supported protocols)
- Before exiting the program:
  - all of the HINTERNETs should be closed by calling InternetCloseHandle.