Distributed Network & TCP/IP Programming Using .NET Framework 3.5

For Software, Communications & Network Engineers
60-80 Hours

Objectives:

In This course you will learn the most Network Programming skills that managed under Microsoft .Net Platform, and unmanaged using Windows API, including TCP/IP & Socket Programming, Streaming connection oriented and Datagram Connectionless Programming, Advanced Socket & Network Layer Programming, Multicasting & Video/Voice Conferencing Programming, VOIP & TAPI 3 Telephony Programming, working with SIP and H.323 Protocols on .Net, Raw Socket & Packet Sniffing Programming, DNS, HTTP, FTP, SMPT, POP3 Protocols Programming, Serialization & Distributed Systems Programming, Socket Permissions & Network Security Programming, after this course you will be able to create and analysis any Advanced Network Programming Project such as Remote Control Applications, Remote Access Systems, Remote Administration Systems, Advanced Messenger Systems that including (Text, Video, Voice & data Transmission) , understanding the concept of Distributed Systems, VOIP – Voice Over Internet Protocol more and more topics…

Module 1 Introduction to Enterprise Networking Environment:
- Introduction to Communication Systems
- TCP/IP Encapsulation Overview
- Addressing (Classful & Classless)
- Routing (RIP, OSPF)
- ATM, Frame Relay, Ethernet, Serial Communication Overview
- PPP & HDLC
- Voice over IP, PBX Concept Overview
- How to Secure your Business Environment

Module 2 C# Framework 3.5 Programming Skills:
- Introduction to Microsoft .Net 3.5 Platform
- The Concept of OOP (Object Oriented Programming) in DOT NET:
    - Classes
    - Inheritance
    - Polymorphisms
    - Encapsulation
    - Related Topics (Events, Interfaces, Indexers , Delegates)
- Environment:
    - Framework
    - Controls
    - CLR - DLL Files & COM Components
- Introduction to ADO.NET 3.5 & LINQ
- Introduction WCF – Windows Communication Foundation

Module 3 Network & TCP/IP Programming Overview:

Topic 1: TCP/IP Layers Programming Overview
- TCP / UDP Connection Establishment
- TCP & UDP Header Encapsulation
- Using TCP Connection Oriented in Dot Net to Send Unicast Messages
- Introduction to Binary Streaming in Dot Net
- Using UDP Connectionless in Dot Net to Send Uni & Broadcast Messages

Topic 2: IPv4 & IPv6 Architecture
- IPv4 Architecture
- Classful IP Address & CIDR Nation
- Unicast IP
- Broadcast IP
- Multicast IP
- IPv6 Architecture

Topic 3: IP Multicasting
- IP Multicasting
- Using IP Multicasting in Dot Net to Create Multicast Groups

Topic 4 Multithreading Using & Managing
- Introduction to Threading in Dot Net
- Threading Classes & Members
- Multithreading & Network Applications

Topic 5: Streaming (Classes & Members)
- Stream Classes
- Stream Members
- Stream Manipulation

Topic 6: Applied Streaming in Dot Net
- Create a Simple Remote Control Application Using StreamReader & StreamWriter
- Create a Remote Desktop Application By Using TCP Streaming Connection With Remote Control
- Create an Advanced Remote Web Camera Monitoring System By Using TCP Streaming Connection & Image Processing.
- Create a Simple Application to Store & Read Images (Binary Data) in Microsoft Access & Microsoft SQL Server Database Management System By Using Streams Library & ADO.NET

Module 4 Transport & Network Layer Programming:

Topic 7: Transport TCP & UDP (Classes & Members)
- TCP Classes Members
- UDP Classes Members

Topic 8: Synchronous Sockets Programming
- Introduction to Socket Programming
- Synchronous Socket Programming
- Synchronous Socket Classes & Members

Topic 9: Asynchronous Sockets Programming
- Asynchronous Socket Class and its members
- Applied Asynchronous Socket in Dot Net

Topic 10: Advanced Multicasting Systems
- Architecture of Multicast Sockets
- Using Multicast Sockets with .NET
- Multicast Conferencing Systems:
    - Full/Half Duplex Multicast Video Conferencing System.
    - Full/Half Duplex Multicast Desktop Conferencing System.
    - Full/Half Duplex Multicast Text Conferencing System

Topic 11: VOIP - Voice Over IP Programming
- The Concept & Requirements of Voice Communication Systems
- How to Create a Voice Chat Throw Dot Net Using Unmanaged API's Functions
- Testing UDP Multicasting, TCP and Thinking in SCTP to Transfer Voice Throw Networks
- How to Create a Voice Conference System Using Microsoft Direct Play 9
- RTP, H323 & SIP Protocol Concept
- Working With API TAPI Telephony and H323 Protocols on .Net

Topic 12: Raw Socket & Packet Sniffing Programming
-Introduction to Raw Socket & Raw Protocols
-Raw Socket Programming
  -ICMP – Internet Control Message Protocol Programming (Ping & Tracing)
  -Using ARP Protocol to Get The MAC of a Remote Machine in Dot Net
-Introduction to Packet Sniffing Applications

Module 5 Application Layer Programming:

Topic 13 DNS Programming
- Synchronous DNS Members
- Asynchronous DNS Members

Topic 14 HTTP Programming
- The Concept of HTTP Protocol
- Using HTTP in Dot Net
- Advanced HTTP Programming
- Using HttpWebRequest
- Using HttpWebResponse

Topic 15 Web/Windows Services & XML Programming
- Introduction to Web services & XML
- Create A Simple Web Service Application
- Advanced Remoting & Web Services Programming
- Windows Services Programming

Topic 16 Remoting & Distributed Systems Programming & Design
- The Distributed Systems Concept & Design
-Design a Distributed eCommerce System by Using ASP.NET and Web Services.
- Serialization Programming
  -The Serialization (Classes & Members)
  -Using BinaryFormatter & SoapFormatter to Serialize Objects & Images Throw Network
- Remoting Programming
  -Remoting (Classes & Members)
  -Using Remoting Applications in Dot Net
  -Create an Advanced Distributed eLearning System (Remote Class Room)
  -Create an Advanced Remote Desktop Application With Remote (Mouse/Keyboard) Control

Topic 17 SMTP & POP3 Programming
- SMTP Protocol
- SMTP Concept
- Using SMTP in Dot Net
- Advanced SMTP Programming
- POP3 Protocol
- POP3 Concept
- Using POP3 in Dot Net

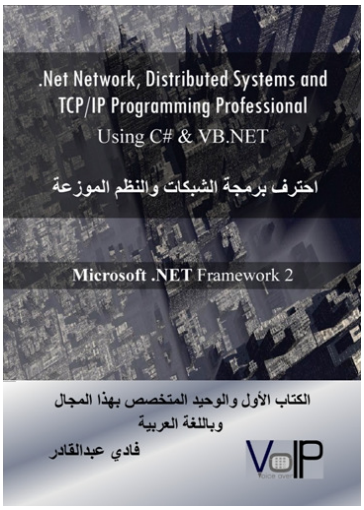
Topic 18 FTP Programming
- Introduction to FTP – File Transfer Protocol
- Create a Simple Application to Transfer Files By Using COM Components
- Create a Simple Application to Transfer Files By Using Web Classes Components
- Create a Simple Application to Transfer Files By Using Socket Programming & Streaming

Module 6 Network Security Programming:

Topic 19 Cryptography
• Symmetric Encryption
  - DES (Data Encryption Standard)
• Asymmetric Encryption
  - RSA (Rivest Shamir Adleman)
  - Digital Signature Algorithms
  - Hashing Algorithms
•Using Security Encryption Standards With Network Applications
  - Create an Advanced RSA Client Server Chat System.
  - SSL Programming

Topic 20 Socket Permissions
- Permission Namespace Overview
- Security Action
- Socket Access property

Text Book: FADI Abdel-qader - . Net Network, Distributed Systems Programming and some other outside books and articles



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