

Course ID

**ATM**

Course Duration

**3 days**

Course Title

**ATM: A Survival Course**

**Related Courses**

- ATM: An Advanced Tutorial (ATM-ADV, 2 days)
- SONET/SDH: Principles and Design (SONET-SDH, 2 days)
- DWDM: An Introductory Tutorial (DWDM101, 2 days)
- DWDM Principles and Design: An Advanced Tutorial (DWDM, 2-3 days)
- SNMP Essentials: A Fast-Track Tutorial (SNMP-ESSENT, 3 days)
- SNMPv3: Secure SNMP (SNMPV3, 1 day)
- SNMP: Agent Development (SNMP-AGENT, 1 day)
- IP-Based Systems: TCP/IP and Mobile IP (IPSYS, 2-3 days)
- Multimedia Applications: IMS, SIP, and VoIP (MULTIMEDIA, 2 days)
- VoIP: Protocols, Design, and Implementation (VOIP, 2-3 days)
- State-of-the-art of VoIP Technology for Professionals, Managers, and Executives (VOIP-EXEC, 1 day)
- VoIP Security (VOIPSEC, 2 days)
- MPLS: Integrated Routing with End-to-End QoS for the Next Generation Networks (MPLS, 2-3 days)

**Aimed At**

- Anyone who deals with client-server data, voice, video or facsimile networking or uses client-server LANs and WANs
- Users, providers, and designers of ATM technology
- LAN/WAN networking professionals and administrators
- Communications engineers and product designers
- Communications and technical marketing and sales support
- Client-server programmers, analysts, and planners
- IT managers and consultants

**Group Size**

5-25

**Prerequisites**

While there are no specific prerequisites, prior exposure to telecommunications and data networks will be helpful.

**Course in a Nutshell**

Asynchronous Transfer Mode (ATM) is a widely deployed technology known for its flexibility and support of multimedia data traffic. ATM is a key component of broadband ISDN (B-ISDN) and for some people it still holds promise as the single integrating network technology. However, it's also a very complex technology to learn and manage.

This course, designed as a practical survival guide, deals with all of the key ATM issues including architecture, user-network interface, LAN and WAN

implementation, enhanced functionality, network management using SNMP, traffic engineering, and more. You will go away from this course with a solid set of skills to help deal with your ATM network.

### **Customize It!**

Let us know your background and reason for studying ATM so we can customize the course to your specific needs. If you need to learn SONET/SDH, SNMP, or other technologies in conjunction with ATM, we can also structure combination courses for you. Most customization is performed at little to no added charge.

### **Learn How To**

- Define and use the important ATM terms
- Become a confident user of ATM
- Name the ATM suppliers, products, carriers, and users
- Summarize the most promising ATM business goals, structures, applications, and services
- Name the factors critical to the assessment, deployment, and management of ATM
- Use the selection criteria for determining where ATM can be safely applied
- Minimize your risk for selecting and using ATM and new vendors
- Identify what's missing from ATM capabilities and the migration obstacles
- Employ proper products and strategies for migrating your office LANs and WANs to ATM
- Determine if you should first use ATM on your LANs, WANs, voice, or video
- Integrate your LAN/WAN networks with voice, video, and facsimile networks
- Utilize SNMP's ATM MIBs to help manage your ATM products
- Leverage ATM enhancements such as ABR, P-NNI, LAN Emulation, MPOA
- Describe Cisco's Tag Switching and Multi-Protocol Label Switching (MPLS) technologies
- Identify and pursue key ATM issues and ask more penetrating questions
- Anticipate and minimize network management and reliability problems
- Budget and evaluate costs and cost savings more effectively
- Describe ATM Classes of Service and Traffic Management
- Avoid being disappointed by management products and performance
- Identify what ATM test equipment is available and what you need
- Evaluate job applicants and vendors better

## Course Outline

- Introductory Overview of ATM
  - What is ATM? Its chief characteristics and uses?
  - Why is ATM Asynchronous if it is synchronous?
  - Positioning ATM in public networking technology
  - Vital and valid business reasons for using ATM
  - Why not just use Fast Ethernet, MPLS, SONET or Frame Relay?
  - The ATM Forum, the ITU-T, ETSI, ECMA
- The ATM Architecture
  - The rationale behind ATM's design : 5+48 bytes, etc
  - B-ISDN Architectural Model. Versus OSI?
  - ATM Adaptation Layer (AAL) and sublayers
    - ATM Service classes and QoS: A, B, C, D
    - The AAL sublayers: Convergence and SAR
    - AAL 1, AAL 2, AAL 3/4: Purpose and structure
    - Type 5 : MPLS and Multi-Protocol Encapsulation
    - What is missing or is undefined now?
  - ATM Layer: Purpose, definitions, and vagueness
    - Virtual Connections, Paths and Channels
    - The ATM cell header: Fields and function
    - ATM OAM cells, Signaling cells and channels
  - ATM Physical Layer: Purpose and structure
    - Transmission Convergence Sublayer
    - Formats at STS-1 (51.84 Mbps), at SDH-1 (155.52 Mbps), at OC-1, at SDH-4 (622.08 Mbps), OC-48, OC-192, etc.
    - Formats at 155.52, 100, 51 Mbps & T1 / E1
    - Physical Medium Dependent Sublayer
  - Three different technologies used in ATM switches
- ATM Forum's User-Network Interface
  - Its scope, purpose, bearer service attributes and QoS
  - Setting up an SVC: Parameters, protocols, elements
    - Q.2931, UPC, CAC, NPC, QoS, CLP
  - UNI vers. 3.1/4.0/4.1, Spec'd and Unspec'd QoSs
  - Specs for SONET and 44.736 Mbps at public UNI
  - Specs for 100, 155.52 and 51 Mbps at private UNI
- Managing ATM Using SNMP
  - Quick review of SNMP, MIB, ASN.1, BER, scope
  - ATM Integrated Local Management Interface (ILMI)
    - The UNI Management Entity (UME)
  - ATM MIB (Management Information Base)
  - Can you manage ATM today with ILMI and UMEs?
- Being Realistic about ATM
  - Politics of merging your voice, data and video
  - AAL incompatibilities and interoperability

- Adequate compliance tests available today?
- Capability and availability of ATM test equipment
- Admission control and security
- Applying ATM in Campus LANs
  - Objectives, target applications, obstacles
  - Dangers: Vendor performance specs, surprises
  - Campus LAN configurations and ATM
- Applying ATM in the WAN
  - Objectives for implementing the ATM WAN
    - Cost justification, strategies
  - Obstacles that carriers and users face
  - Descriptions of some operational ATM WANs
- ATM Enhancements
  - Procedures for Switched Virtual Connections
    - States, messages, multipoints, parameters
  - For T1/E1, E3/T3 25.6, 51 and SONET/SDH
  - Network Management: M1 to M5 specs
  - P-NNI : Purpose, procedures, scope
  - B-ICI, UNI 4.0, DXI, Frame Relay over ATM
  - LAN Emulation, Classical IP over ATM, MPOA
  - IP Switching, Cisco's Tag Switching, MPLS
- ATM Traffic Management
  - Six different Classes of Service: Parameters, QoS
  - Available Bit Rate (ABR): Issues, techniques
  - Congestion Control: Issues, technology
    - Rate-based versus Credit-based
    - UPC, EPD, Shaping, PPD
  - ATM traffic shaping: Objectives, tools, status
- Course Wrap-up
  - • Quick summary review
  - • Issues and concerns
  - • Final discussions

**How You Will  
Learn**

- A seasoned ATM expert who is also a good teacher will present this course in interactive lecture format.
- Along with lecture, he/she will use exercises to enrich the instruction and drive home the important points.
- If you already know something about ATM or related topics, we will build on that. We'll compare and contrast what you know with what's new, making the new information easier to assimilate as well as more relevant.
- If your background is less technical, we will use suitable examples and analogies to get the point across.
- You will receive a comprehensive Participant Handbook which will minimize the need to take notes and provide an excellent reference when you are back on your job.

*Revised*

*May 1, 2007f*