

z/OS Communications Server Part 1 - Implementing an APPN Network using SNA/VTAM

Course Summary

Description

This newly revised four-day course is the first part of the definitive z/OS Communications Server training program. It is an essential requirement for all personnel working in or with an SNA (APPN and SubArea) network. This in-depth course introduces and explains the concepts, terminology and configuration of SNA, VTAM and APPN. Emphasis is placed upon, but is not limited to, VTAM implementations of SNA in both an APPN and SubArea Network. Additionally, APPC is explained in detail. The course also teaches how to define the network in order to optimize response time and throughput, especially in a Parallel Sysplex.

Please note that this is a highly practical course where each student will have their own VTAM/APPN Network.

Objectives

At the end of this course, students will be able to:

- Define startup and session establishment procedures to the z/OS Communications Server (VTAM) using parameters and logmodes
- Reinforce understanding of SNA architecture implementation
- Define network resources (major/minor nodes) to VTAM
- Avoid the most common mistakes made by new users
- Identify and code routing requirements for an APPN and subarea network
- Code the definitions to support cross-domain communication in an APPN Network
- Understand uses of VTAM console commands
- Diagnose SENSE code information
- Code USS and LOGMODE tables
- Explain how APPN uses HPR
- Describe the Message structure
- Understand Enterprise Extender and how to code it in an APPN Network
- Recognize the parameters needed for APPC applications
- Understand why VTAM Generics and Multi Node Persistent Session is needed in an APPN network for continuous availability in a Parallel Sysplex.
- Perform a VTAM/APPN trace.

Topics

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| <ul style="list-style-type: none"> • SNA - Introduction • Console Commands • Network Addressable Units • SNA Sessions • APPN/HPR Concepts • APPN/HPR Topology • Network Installation and Definition • VTAM and APPN Resources | <ul style="list-style-type: none"> • User-Coded Tables • APPN and VTAM Data Flow • APPN Message Structures • VTAM/APPN Trace • Enterprise Extender • Using VTAM Generics and Multi Node Persistent Sessions |
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Audience

This course is ideal for all personnel working in operations, systems programming, and networking departments.

Prerequisites

A knowledge of z/OS concepts. A basic understanding of network concepts would be helpful but is not mandatory.

Duration

Four days

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Course Outline

I. SNA - Introduction

- A. What is SNA?
- B. Pre-SNA networks
- C. SNA hardware and software
- D. SNA elements
- E. Sessions
- F. SNA layers
- G. SNA message units
- H. Session establishment sequence
- I. Why APPN?
- J. APPN node types
- K. Resource registration
- L. Resource location
- M. LU-LU session activation
- N. Locating resources.

II. Console Commands

- A. The START command
- B. The DISPLAY command
- C. The VARY command
- D. The MODIFY command
- E. The HALT command.

III. Network Addressable Units

- A. SNA Network Addressable Units (NAUs)
- B. SSCP/CP functions
- C. PU types
- D. Message flow
- E. Address awareness
- F. Subarea network addresses
- G. APPN network address
- H. Local addresses
- I. Address conversion.

IV. SNA Sessions

- A. Sessions and half-sessions
- B. half session layers
- C. session types
- D. setup flows
- E. initiation sequences
- F. logon request processing
- G. LU-LU session types.

V. APPN/HPR Concepts

- A. Introduction to APPN
- B. APPN protocol
- C. Base and Towers

- D. SNA layer model
- E. Why APPC?
- F. APPC LU differences
- G. Route calculation
- H. APPN Class Of Service
- I. APPN COS definition in VTAM
- J. Transmission groups
- K. Channel to Channel Adapters
- L. Cross domain logon processing
- M. PU Type 2.1
- N. The Address Space Manager
- O. APPN and the Boundary Function
- P. Link Stations
- Q. APPN Node Services.

VI. APPN/HPR Topology

- A. Topology Database - Part One
- B. Learning of Topology
- C. Topology Database - Part Two
- D. Topology Database - Part Three
- E. Garbage Collection; HPR overview
- F. The High Performance routing principle
- G. Rapid Transport Protocol
- H. RTP Route Recovery
- I. APPN/HPR options
- J. Adaptive rate based pacing
- K. ISTRTPNM
- L. HPR only links

VII. Network Installation and Definition

- A. Network planning
- B. Network installation
- C. MVS installation considerations
- D. VM installation considerations
- E. Network related datasets
- F. VTAM start procedure
- G. Structure of SYS1.VTAMLST
- H. The ATCSTR00 member of SYS1.VTAMLST
- I. The ATCCON00 member of SYS1.VTAMLST
- J. Network definition - major & minor nodes

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Course Outline (cont'd)

VIII. VTAM and APPN Resources

- A. Applications and local terminals
- B. Application programs
- C. Local terminals
- D. VTAM and application programs
- E. The Application Major Node
- F. TSO session establishment
- G. VTAM and Local SNA terminals
- H. The Local SNA Major Node
- I. VTAM and Local non-SNA terminals
- J. The Local non-SNA Major Node
- K. VTAM and TCP/IP
- L. The Application Major Node for TCP/IP
- M. OSAs, Hipersockets and Channel Attached Routes
- N. OSA diagnostic device
- O. QDIO and non-QDIO
- P. OSA Express CHPID definitions
- Q. Adding an OSA Control Unit and device
- R. Adding OSAD device
- S. Hipersockets; Hipersockets definition
- T. CHPID Type IQD
- U. MTU sizes
- V. Channel Attached Routers and Servers
- W. Defining MPCPTP devices
- X. Defining MPCIPA devices
- Y. Available TCP/IP commands
- Z. The START and STOP commands
- AA. The MODIFY command
- BB. The DISPLAY command
- CC. The VARY command
- DD. The OBEYFILE command
- EE. The NETSTAT and onetstat command
- FF. NETSTAT command options
- GG. Defining model major nodes for EE connections and RTP pipes
- HH. Defining switched PUs for EE connections.

IX. User-Coded Tables

- A. Assembled Tables
- B. Unformatted System Services (USS) logon procedure
- C. Mode Tables
- D. USS Tables
- E. USSCMD macro format
- F. USSPARM macro format

- G. SNA/SCS message 10 example
- H. SNA character set
- I. Non-SNA/3270 message 10 example.

X. APPN and VTAM Data Flow

- A. The Session Control Layers
- B. Session profiles
- C. Session level pacing (TC)
- D. Session level pacing example
- E. Adaptive session level pacing
- F. Request chaining (DFC)
- G. Bracketing (DFC)
- H. Send/Receive modes (DFC)
- I. Function Management Headers (PS)
- J. BIND request format
- K. LU6.2 negotiable BIND
- L. Negotiable BIND parameters
- M. Conversations and sessions
- N. Types of conversation
- O. Starting a conversation
- P. APPC Function Management Headers
- Q. FMH-5 contents
- R. FMH-7 contents
- S. FMH-12 contents
- T. Generalized Data Stream
- U. Service Transaction Program GDS IDs
- V. Conversation message flows
- W. Major architectural verbs
- X. Implementation differences
- Y. Sample APPC application.

XI. APPN Message Structures

- A. Message format and flow
- B. RU categories
- C. BIU structures
- D. request header format
- E. response header format
- F. transmission header formats
- G. additional TH fields
- H. FID conversion.

XII. VTAM/APPN Trace

- A. Introduction to VTAM trace
- B. Starting a trace
- C. Trace details.

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Course Outline (cont'd)

XIII. Enterprise Extender

- A. z/OS services for SNA traffic
- B. APPN parameters in startup options
- C. Implementation considerations
- D. TCP/IP implementation
- E. IUTSAMEH
- F. DYNAMICXCF
- G. DYNAMICXCF & HiperSockets
- H. Modifications to TCP/IP profile
- I. Modifications to OSPF interface
- J. Proof of initialization of IUTSAMEH
- K. VTAM implementation
- L. Defining the XCA HPRIP major node
- M. Defining model Major Nodes for EE connections and RTP pipes
- N. Defining switched PUs for EE connections.

XIV. Using VTAM Generics and Multi Node Persistent Sessions

- A. What is sysplex?
- B. Not a new concept
- C. So what's new?
- D. 'Before' and 'after' sysplex
- E. XCF sysplex requirements
- F. Components of the XCF sysplex
- G. Server Time Protocol
- H. Clock synchronization techniques
- I. XCF sysplex definitions
- J. XCF sysplex services
- K. Signaling and Status Monitoring services
- L. Group services
- M. The parallel sysplex
- N. The parallel sysplex concept
- O. Couple Data Sets
- P. Planning CFRM - identification and structure size
- Q. VTAM generic resources
- R. TSO generic resources.