

CompTIA Convergence+ 2006 Examination Objectives

Introduction

The CompTIA Convergence+ examination covering the 2006 objectives certifies that the successful candidate has the necessary knowledge to perform basic requirements analysis, and specify, implement and manage basic components of data, voice and multimedia convergence applications and understand basic problem analysis and resolution for converged technologies. It is recommended that a typical candidate have CompTIA Network+ certification or equivalent knowledge, though CompTIA Network+ certification is not a prerequisite in order to take the CompTIA Convergence+ certification exam. In addition, candidates are encouraged to have 18 to 24 months of work experience in areas that include data networking, VoIP, and other convergence related technologies.

The skills and knowledge measured by this examination are derived from an industry-wide Job Task Analysis (JTA) and were validated through an industry wide, global survey in Q1 2006. The results of this survey were used in weighing the domains and ensuring that the weighting is representative of the relative importance of the content.

The table below lists the domains measured by this examination and the extent to which they are represented.

Domain	% of Examination
1.0 Telephony	22%
2.0 Network Engineering	20%
3.0 Applications	16%
4.0 Hardware & Architecture	17%
5.0 Management	12%
6.0 Security	13%
Total	100%

1.0 Telephony

1.1 Demonstrate application of traffic engineering concepts

- Prioritization of voice traffic
- Trunking requirements
- Traffic Shaping

1.2 Describe fundamentals of voice systems

- Types of systems
 - Legacy Hybrid and IP Telephony
- Voice transmission fundamentals
 - Transport
 - Encoding / decoding
 - Signaling

1.3 Describe the components of number and dialing plans

- Prefixes
- Formats
- Number blocking
- Digit translation
- Toll fraud
- ENUM
- LNP (Local Number Portability)
- Emergency Services

1.4 Identify the various endpoints used in a converged environment

- Voice Terminals
 - IP phones
 - TDM phones
 - Analog phones
- PC based softphones
 - Headsets, microphones, speakers
- SIP phones
- PDA softphone
- WiFi phone

2.0 Network Engineering

2.1 Define QoS (Quality of Service), describe implementation techniques and show the importance of QoS.

- Types of QoS (TOS, diffserv, IP precedence, 802.1p/Q)
- Application of QoS types
- Levels of traffic prioritization

2.2 Analyze network performance

- Jitter, latency, loss, port settings and bandwidth on a converged network
- Network capacity baselining
- Network throughput
- Determine bottlenecks
- Impact to the network when adding/modifying converged applications

2.3 Describe networking technologies used in a converged network

- Switching
- Physical / Logical port settings
- Network topologies

- LAN, WAN, MAN, GAN
- Routing
 - NAT/PAT
- Protocols
 - TCP/IP, RTP, RTCP, UDP
- Transmission medium
 - Cable, DSL, Satellite, Wireless, Ethernet, EVDO, Fiber
 - Limitations and capacity of each transmission medium
 - VPN
- Signaling

2.4 Identify methods of encoding, decoding and compression

- Analog to Digital Conversion (A to D)
- Standards (e.g: H.261 & 264 G.711, 729a, 722)
- μ -LAW and a-LAW
- MPEG.x

3.0 Applications

3.1 Identify different types of messaging applications

- Voice mail
- Text messaging
- Video messaging
- Unified messaging (e.g: integration of email, fax and voice mail)

3.2 Identify different types of collaboration applications

- Audio conferencing
- Video conferencing
- Data sharing

3.3 Identify different components of a contact center

- CTI (Computer Telephony Integration)
- Call center management
- Customer interaction
- Call routing
- Queuing
- Web chats
- Call recording
- Interactive voice response

3.4 Identify components of mobility

- Softphone
- Presence
- SIP (Session Initiation Protocol)
- Cellular integration services
- Find me Follow me feature

3.5 Identify methods used for rich media transmission

- Webcasting
- Audio and video streaming
- Multicasting (audio and video)
- Unicasting (audio and video)

3.6 Identify benefits of using different video standards and the impact on the performance of the network.

- H.323, H.320
- H.261, H.263, H.263+, H.264
- MPEG (MPEG-1, MPEG-2, MPEG-4)
- CIF, SIF, QCIF, FCIF, HD
- G.711, G.722, G.724, G.729a
- T.120
- NTSC, PAL, SECAM

4.0 Hardware and Architecture

4.1 Identify the layers of the OSI model and know it's relevance to converged networks

- Application
- Presentation
- Session
- Transport
- Network
- Data Link
- Physical

4.2 Recognize network models and how they affect the converged network

- Centralized network vs. Decentralized network
 - Configuration of converged application resources
- Branch – Edge network solutions
- Network flattening vs. tier network

4.3 Identify the functions of hardware components as used on a converged network

- Routers (multimedia routers)
- Switches (managed – unmanaged)
- Servers
- Gateways
 - TDM / IP gateway
 - SIP gateway
- Gatekeepers
- PBX (TDM, IP only & Hybrid)
- MCU (Multipoint Conferencing Unit)
- Firewall
- CSU/DSU (Channel Service Unit / Data Service Unit)
- NT1
- Traffic shapers
- Session border controller
- In-line power components (Power over Ethernet)
- Wireless access points
- Modems (e.g: Cable, DSL, etc)

5.0 Management

5.1 Identify and execute problem solving and analysis process

- Log the problem
- Confirm the problem

- Troubleshoot the problem
- Escalate it required
- Close the log

5.2 Identify common symptoms and problems on a converged network

- Symptoms
 - E.g: Poor voice quality, clipping, echo, delay, no dial tone, loss of feature set, cross talk, dropped calls, blocked calls, poor video quality, frame loss
- Problems
 - E.g: Media errors, data loss, packet loss, protocol mismatch, jitter, port settings, configuration settings, packet re-ordering, bandwidth restrictions, hardware failure, routing misconfigurations, MTU issues, QoS tags being dropped, IP loss, impact of backup over the network

5.3 Describe and use tools and commands to monitor network performance in a converged environment

- LAN monitoring tools (e.g: SNMP, RMON, ping, pathping, Traceroute)
- QoS monitoring tools
- Bandwidth monitoring tools
- Data analyzers & protocol analyzers
- WAN monitoring tools
- Voice/Video quality monitoring tools
- Traffic Management
- QoS parameters, router parameters, load balancing
- Traffic shaping
- MOS (Mean Opinion Score)

5.4 Identify and describe proper administration tasks and procedures

- Monitoring log files
- Reporting
- Managing configuration changes
- Policy management (e.g. QoS, admission controls, registration)
- Patching, upgrades and backups
- MAC (Moves, Adds, Changes)
 - (e.g: move, add or change: users, hunt groups, agents and stations)
- CDR (call detailed records)

6.0 Security

6.1 Explain concepts and components of security design and how they affect the converged network

- Firewalls
- Authentication
- Proxies
- VPN (Virtual Private Network)
- NAT/PAT (Network Address Translation / Port Address Translation)
- Encryption
- IDS (Intrusion Detection System)
- IPS (Intrusion Prevention System)
- Antivirus
- VLAN (separation of voice, video and data)
- DMZ (Demilitarized zone)

Convergence+ Examination Acronym List

ACL (Access Control List)
ATM (Asynchronous Transfer Mode)
BRI (Basic Rate Interface)
CDR (Call Detail Record)
CIF (Common Intermediate Format)
CIR (Committed Information Rate)
CODEC (Coder-decoder)
COS (Class of Service)
CSU (Channel Service Unit)
D/A (Digital to Analog Conversion)
Diffserv (Differentiated Services)
DMZ (Demilitarized Zone)
DSCP (Differentiated Services Code Points)
DSL (Digital Subscriber Line)
DSLAM (DSL access multiplexer)
DSU (Data Service Unit)
ENUM (E.164 Number Mapping)
Erlang – Unit of measure for voice traffic capacity in a PBX environment.
EVDO (Evolution Data Only)
GAN (Global Area Network)
IDS (Intrusion Detection System)
IMUX (Inverse Multiplexer)
IP (Internet Protocol)
IPS (Intrusion Prevention System)
ISDN (Integrated Services Digital Network)
IVR (Interactive Voice Response)
LAN (Local Area Network)
LNP (Local Number Portability)
MAC (Media Access Control)
MAC (Moves, Adds and Changes)
MAN (Metropolitan Area Network)
MCU (Multipoint Control Unit)
MOS (Mean Opinion Score)
MPEG (Motion Picture Experts Group)
MSS (Maximum Segment Size)
MTU (Maximum Transmission Unit)
NANP (North American Number Plan)
NAT (Network Address Translation)
NT1 (Network Termination 1)
NTSC (National Television Standards Committee)
OSI (Open Systems Interconnection)
PAL (Phase Alternate Line)
PAT (Port Address Translation)
PBX (Private Branch eXchange)
PDA (Personal Digital Assistant)
POE (Power over Ethernet)
PRI (Primary Rate Interface)
QoS (Quality of Service)

RMON (Remote Monitoring)
RSVP (ReserVation Protocol)
RTCP (Real Time Control Protocol)
RTP (Real Time Protocol)
SIF (Standard Image Format)
SIP (Session Initiation Protocol)
SNMP (Simple Network Management Protocol)
SS7 (Signaling System 7)
TCP (Transmission Control Protocol)
TDM (Time Division Multiplexing)
TLS (Transport Layer Security)
TOS (Type of Service)
UDP (User Datagram Protocol)
VLAN (Virtual Local Area Network)
VPN (Virtual Private Network)
VRU (Voice Response Unit)
WAN (Wide Area Network)
WiFi (Wireless Fidelity)