The Certified Network Expert Program

The CNX™ (Certified Network Expert™) program provides a way for experienced network engineers, managers, administrators, and technicians to gain recognition through a comprehensive examination process. Certification is granted in specific technology areas. Initially, testing will be for the Ethernet data link and the token-ring data link. Future plans include certification for Novell NetWare, NetBIOS, TCP/IP, AppleTalk, Banyan VINES, and other areas of technical focus as the program evolves.

The Test Structure

Each test consists of 60 multiple choice questions. Of the 60 questions, 40 are focused on general technology and 20 are practical in nature, involving the interpretation of trace file printouts obtained from the network analyzer of the candidate's choice. Initially, only the Sniffer Analyzer from Network General and the Network Advisor from Hewlett-Packard will be offered as choices. Other products will be considered for inclusion in the practical test in the future.

The questions are chosen, at random, from a set of over 300 questions for each technology. The selection is computer generated by a third-party test administration organization. Candidates not familiar with computer-aided testing may choose to use an on-line tutorial with sample tests prior to starting the actual CNX exam. There is no charge for the tutorial session. The registration fee for the test is $395 per technology.

The Certification Process

Successful completion requires a minimum score of 85 percent. In the event that the test is not completed successfully the first time, the candidate may retake the test one time (within 6 months) without additional charge. The successful candidate will receive a wall plaque, as well as a joint letter of certification from Network General and Hewlett-Packard. Successful candidates may choose to be listed in the NGC/HP Directory of Experts, a quarterly publication that will be made available to the major players in the computer industry and which will be available, on request, to any interested party. In addition, service/support discounts are available to the Certified Network Expert.

Preparing for the Test

To help the candidate gain insight into the scope and depth of material that must be understood, a reading list will be provided. An experienced professional network engineer should be familiar with the concepts and engineering models described throughout these texts. A detailed study guide is being prepared and will be available soon.

The Ethernet Data Link Certification Examination

To be certified as an expert in the Ethernet data link, candidates should have at least two years of field experience troubleshooting Ethernet networks using a network analyzer. The successful candidate will be well versed in the following areas of Ethernet data link technology:

- **General system architectures and topologies,** including bus and star networks with client/server and host/terminal communications. Candidates are assumed to possess a general understanding of computer system internals (i.e., CPU, permanent storage, temporary storage, and I/O issues and concerns).

- **Repeater, bridge, and router technology,** including specific similarities and differences between them and appropriate implementation strategies using each. A general understanding of common bridge and routing strategies is also assumed (i.e., spanning tree algorithm as it applies to transparent and to source-route bridges; distance vector versus link state routing algorithms including poison reverse, hold-down, and split horizon schemes; filtering; protocol conversion; and blocking).

- **Ethernet signal transmission technology:** Manchester encoding, propagation delay, attenuation and distance limitations as per the applicable Version II or 802.3 specification. In general, the candidate should be well versed in the current Version II and IEEE specifications relating to Ethernet/802.3 engineering, CSMA/CD including the operation of the Ethernet transceiver, implications of SQE heartbeat, exponential backoff algorithm, bit jam, preamble generation, jabbering, and the bit patterns typically associated with common frame corruption (propagation delay problems, reflection problems, environmental noise, and faulty hardware). Candidates should be able to evaluate trace files containing corrupted frames and make a valid observation regarding possible causes.

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The successful candidate will understand and be able to identify the similarities, differences, and areas of incompatibility between Ethernet implementations using the DIX Version II Ethernet spec, the 802.3 spec, and the SNAP frame type.

The Token-Ring Data Link Certification Examination

To be certified as an expert in the token-ring data link, candidates should have at least two years of field experience troubleshooting token-ring networks using a network analyzer. The successful candidate will be well versed in the following areas of token-ring data link technology:

- **General system architectures and topologies,** including star and ring networks with client/server and host/terminal communications. Candidates are assumed to possess a general understanding of computer system internals (i.e., CPU, permanent storage, temporary storage, and I/O issues and concerns).

- **Repeater, bridge, and router technology** including the specific similarities and differences between them and appropriate implementation strategies using each. An in-depth understanding of source route bridging. A general understanding of common bridge and routing strategies is also assumed (i.e., spanning tree algorithm as it applies to transparent and to source-route bridges; distance vector versus link state routing algorithms including Poisson reverse, hold-down, and split horizon schemes; filtering, protocol conversion, and blocking).

- **Token-ring signal transmission technology:** differential Manchester encoding, propagation delay, attenuation and distance limitations as per the applicable 802.5 specification. In general, the candidate should be well versed in the current and draft IEEE specifications relating to 802.5 engineering.

Candidates will be tested on specific details of all aspects of ring operation including ring poll/neighbor notification, station insertion and removal, soft error reporting, contention, and beaconing (with fault domain isolation). The use of the control bits in a token-ring frame should be understood completely (i.e., priority, monitor count, ARI/FCI, error-detected, functional address, source-routing-present, etc.) A firm grounding in the IBM (or equivalent) Architectural Reference Guide is essential.

Commonly Asked Questions

How is the CNX certification different from other programs already in existence?

The Certified Network Expert program is a joint effort among major computer industry vendors to establish a standard for excellence in the analysis and troubleshooting of multiprotocol networks. As such, it differs from many current vendor-sponsored certification programs' focus on a specific hardware or software product line.

What classes must I attend before I can take the CNX exam?

There are no prerequisite courses for the CNX exam. Many academic and vendor-sponsored courses are available to help you attain the level of knowledge that is consistent with an "expert" in a particular technology. It should, however, be noted that simply completing a series of classes, regardless of the source, is not a substitute for the practical, field experience that is necessary to fully understand and complete the questions in the test.

The Next Step

For details on registration, classes which may help you prepare for the **CNX** examination, the suggested reading list, and any other questions you may have, please call **(800) 851-7898 in U.S. and Canada.**

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