Open Transport 1.1: Key Features and Benefits Q & A (3/96)

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TOPIC --

This article is the Reference Q & A (questions and answers) on key features and benefits for Open Transport 1.1.

DISCUSSION --

Question: How can Open Transport benefit users?

Answer: Open Transport provides individual computer users with many benefits. Two of the most immediately visible and important benefits relate to making networking more accessible - that is, easier to configure and easier to use.

For example, Open Transport makes it easy to switch from one network configuration to another. A computer user "on the go" might want to hook up to the Internet in various locations, each requiring a different network configuration. With Open Transport settings for each network location can be stored for easy access and use. Changed settings are available immediately - no reboot of the computer is required to use the new configuration.

Open Transport also integrates on-line help, based on Apple Guide technology, to make it easier for an individual to hook up to an network, with fewer demands on network manager and support resources.

Question: How can Open Transport benefit network managers and organizations?

Answer: Open Transport provides significant new flexibility in setting up network configurations; with Open Transport, the network manager can recommend or require configuration settings for users on the network, or allow users to determine their own settings.

Open Transport also improves support for centralized configuration management.

For example, Open Transport/TCP supports the Dynamic Host Configuration Protocol (DHCP), allowing network managers to administer addressing and other TCP/IP configuration information from a central server.

Question: How can Open Transport benefit developers?

Answer: Open Transport is designed to make it easier and more cost-effective to develop Mac OS-applications for a wide variety of customers and markets. With Open Transport, Mac OS has built-in networking and communications based on cross-platform industry standards including the POSIX compliant X/Open Transport Interface (XTI), UNIX STREAMs and Data Link Provider Interface (DLPI).

Applications written to support Open Transport can directly support a wide range of networking environments (serial, dial-up network, LAN, and WAN), and multiple protocols (AppleTalk, TCP/IP, serial, and others) from a common code base. This capability is sometimes referred to as transport independence.

Question: What is transport independence? Why is it important?

Answer: Different people judge networking in different ways. End-users focus on what they can do using the network, and tend to select applications based on functionality and ease of use. Network managers are interested in delivering reliable network services in a cost efficient manner. Developers want to create compelling functionality for users, but are strongly influenced by the availability of networking infrastructure.

Unfortunately, with current networking tools and systems developers are forced to tie their applications to specific network infrastructure requirements - driven by their API choices. This creates a potential conflict between individual and organizational needs. If network managers restrict protocols to control support costs, users may not have access to the applications they need. If user require specific applications they may increase support costs for the network manager by "dragging along" specific network infrastructure requirements. Developer are stuck in the middle, making decisions for both users and network managers by selection of an API at compile time.

Transport independence is a concept that breaks this undesirable linkage. When implemented, it allows developers to write to a uniform set of APIs, users to focus on selecting the best applications, and network managers to make independent decisions about network infrastructure, all on an ongoing basis.

Question: What benefits can be realized from transport independent applications?

Answer: For end-users, transport independence brings an increased freedom to select applications that meet their needs, without being concerned with the bits and bytes of networking protocols. For network managers, transport independence allows increased flexibility in designing and controlling infrastructure demands arising from support of end-user applications, that is, the freedom to manage the bits and bytes of networking protocols.

Developers who create transport independent applications will find access to broader markets with incremental resources; code written for the AppleTalk market, for example, can be delivered to TCP/IP markets as well.

Question: How does Open Transport enable transport independence?

Answer: Open Transport brings together four technologies to support the development and deployment of transport independent applications on Mac OS:

• a set of look-and-feel guidelines that promote consistency for configuration of network services across protocols,

• a unified set of cross-platform, standards based APIs for all networking and communications protocols; for example, applications can send and receive data over an AppleTalk LAN or the TCP/IP based Internet using the same programming interfaces,

• a dynamic link-and-load architecture and set of protocols; protocols are loaded and unloaded on demand, conserving system resources, and making it possible to substitute TCP for ADSP at application launch time (for example),

• an addressing and naming support tool box; for example, applications can open a communications end-point by name (that is, "seeding.apple.com" or "printer16:LaserWriter@sales"; Open Transport will automatically provide the appropriate name-to-address mapping services (that is, DNR, NBP, and so on).

Together these support the creation of transport independent applications on Mac OS.

Question: Are all Open Transport applications transport independent?

Answer: No. While Open Transport provides the necessary foundation, there are certain guidelines and programming practices required for developers to create transport independent applications. For example, most protocols have many features in common - but also some features that are protocol-specific. If an application depends on a protocol-specific feature, then it will depend upon that protocol as well.

In some cases it may be appropriate or desirable to develop a transport-specific application. For example, an MBone client is currently only useful when communicating using TCP/IP.

Question: Does transport independence imply that an organization can offer "AppleTalk services" without supporting AppleTalk protocols?

Answer: For each service and network environment, protocol and services choices will be determined by a combination of factors; transport independence is only one of them.

This begins with both the client and the server implementations of the particular service of interest (file, print, e-mail, directory, security, back-up, calendar, and so on) supporting the Open Transport APIs. Next, both the client and server must have the protocol stack(s) of choice installed. Finally, the server application must include some administration utility to allow the network manager to specify the protocol(s) over which application and/or presentation layer services are to be provided.

The user experience for selecting the server (that is, "Choosing", or "name-binding") may vary depending on the underlying protocol. For example, AppleTalk offers a distinctive user experience through the "Chooser" and the underlying NBP/ZIP protocols. TCP/IP offers a substantially different model for name-to-address translation (DNS); NetWare/IPX still another (NDS).

Question: In addition to providing for transport independence, how is the Open Transport standards based architecture important?

Answer: Although it might seem that the use and support of standards based APIs is of direct interest only to developers writing applications code, Apple's adoption of a fully standards based architecture for networking also has important benefits for individual users, network managers, and organizations. Some of these include:

• Porting of network protocols, drivers, and applications from other platforms (especially UNIX) to Mac OS becomes easier, resulting in an even wider selection of networking software for the Mac OS,

• A larger developer community is focused on STREAMs than would be focused solely on the Mac OS, making it possible to leverage development efforts underway outside Apple - for example, Apple's demonstration of IPv6 (next generation TCP/IP) on the Macintosh platform in cooperation with Mentat Inc.,

• Developers experienced in writing high-performance, high-reliability networking hardware and software for UNIX systems can apply their expertise directly to the Mac OS, accelerating the availability of similar solutions for Mac OS customers.

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