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System 7.5: Technical Overview Of QuickDraw GX (2/95)

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TOPIC -----

This article provides a technical overview of QuickDraw GX.

DISCUSSION -----

Introduction

QuickDraw GX provides a robust graphics environment, high-quality typography, worldwide text services, and an extensible print architecture that enables easy driver development. It is composed of three major technologies: new graphics capabilities, expanded and easier-to-use print architecture, and very sophisticated typography. QuickDraw GX is not intended to replace QuickDraw.

They coexist, ensuring compatibility with all existing applications. By supporting high-resolution graphics with its Macintosh systems and LaserWriter printers, Apple started the desktop publishing revolution. With QuickDraw GX, Apple is setting the stage for the next generation in graphics. QuickDraw GX greatly extends and expands the graphics capabilities of the Macintosh, creating a new standard for desktop graphics computing and reaffirming the place of Macintosh as the premier publishing platform in the personal computer industry.

QuickDraw GX offers greater efficiency and power to Macintosh users by providing:

- Device- and resolution-independent graphics. Unlike QuickDraw, QuickDraw GX supports multiple resolutions and a much larger coordinate system for precise and resolution-independent imaging.
- Greatly enhanced graphic capabilities. Because QuickDraw GX is an object-based model (shapes are the basic building block for everything) all graphic primitives can be distorted, or transformed in many ways. Rotation, perspective, skewing, and scaling are a few of the transforms offered by the system. Colors can also be transformed to allow for transparent overlapping shapes and realistic shading effects. In addition, all of the primitives can have various styles applied to create framed, dashed, patterned, and filled shapes.

- Simplified printing and print management via a new, customizable print architecture and user interface.
- The capability to create "portable" documents from any application, letting other users print and view documents without having the original application or fonts.
- Consistent color between scanners, displays, and printers via ColorSync color management technology.
- Powerful type and text capabilities that, in conjunction with updated or new applications, enable the display and printing of any typeface in any of the world's myriad script systems.
- Tools for developers that result in new applications that offer greater sophistication in graphics, type, and printing.

Simplified and More Powerful Printing

QuickDraw GX makes Macintosh print functions even more powerful and convenient—with no software upgrades required.

QuickDraw GX lets you to display and control selected printers via printer icons on the Macintosh desktop. To print a document, you can simply drag the file to the desired printer icon. Because multiple printer icons can appear on the desktop, you can choose to send a document to any of a number of printers. An improved print dialog box appears in QuickDraw GX-compatible applications to let you select among multiple desktop printers without having to access the Chooser.

A desktop printer icon behaves much like a file server or other network device icon. Double-click on a printer icon, and a print queue status window appears. You can decide to reorder the print queue or postpone a print job simply by dragging document icons to a new location. You can also transfer print jobs to other printers by dragging document icons to another printer icon. These print management functions replace today's Print Monitor.

Further benefits come from new printer extensions that can be used with existing applications. These extensions let you customize print output with watermarks and print multiple pages on a single sheet.

Portable Documents

QuickDraw GX supports a new type of document file format, known as a "print and view" document, that facilitates the exchange of documents in electronic form. With this technology, you can create a file, called a portable digital document, that can be opened, viewed, and printed from any other Macintosh with QuickDraw GX installed.

Even if the other Macintosh doesn't have the same application or typefaces that were used to create the document, the file retains all of the graphics and typographic information of the original document. No new software is required; portable documents can be created using any of today's applications.

More Sophisticated Typography

Macintosh gave many users their first opportunity to work with high-quality type. This helped make their written work more readable and effective. Many Macintosh users are now demanding even better typography from their applications, and they want it to be even easier to work with type. Applications that work with QuickDraw GX satisfy both of these demands.

QuickDraw GX raises the standards of type and document composition, making typographic excellence the standard, not the exception. This is because QuickDraw GX automates much of the typographic process. Users who work extensively with type no longer have to determine the proper kerning and justification for a particular block of type, or remember to select special characters (such as ligatures) when typing. These settings and capabilities are built into QuickDraw GX fonts and are handled automatically within applications that support QuickDraw GX.

TrueType GX has an extended set of glyphs that support typographic features such as ligatures, swash characters, fractions, old style numerals, and small caps. Extended sets have been available previously on the Macintosh in collections called "expert sets," but they required multiple fonts and tedious mixing of font selection in order to achieve desired effects. QuickDraw GX provides support for context-sensitive substitution of the glyph used to represent a character, or characters, based on its position within a word or line of text.

The capabilities listed above require extended fonts, with extra glyphs, kerning information, ligature tables, and so on. New fonts can also support an expanded notion of Macintosh "styles." Similar in capability to Adobe's Multiple Master technology, these new fonts can support many degrees of boldness, condensing, or other features from one typeface.

Installation, screen display, and printing of fonts is simplified with QuickDraw GX, which includes support for Apple's TrueType standard as well as a new version of Adobe Type Manager, ATM GX. This lets users select the typefaces they want, whether in TrueType or Type 1 format.

QuickDraw GX also provides extensive, system-level capabilities for the display and printing of any international text system, such as Arabic or Kanji. It doesn't matter whether the text reads right to left, left to right, vertically, or some combination of the three. QuickDraw GX can even display text that combines different reading directions within the same line.

In addition, QuickDraw GX and WorldScript, Apple's system technology for international software localization, provide Macintosh developers with a powerful set of tools for the creation and release of equivalent software versions worldwide. Specifically, QuickDraw GX provides support for the display and graphical manipulation of international fonts and text systems on Macintosh computers. QuickDraw GX fully supports worldwide character sets based on international standards.

Consistent and Predictable Color Matching

It's easy to create documents that contain color information - most Macintosh computers have color displays and most Macintosh applications are color-capable. The difficulty has been in trying to get the onscreen colors to match the colors produced on a variety of color output devices.

For example, a businessperson might have to redesign an entire presentation when she sees that the contrast between the text and the background color is not nearly as great on the transparencies as it is on the screen. Or a graphic designer might have to rework a design when the colors in a corporate logo come out differently in print than they looked on the screen.

To create better color matching, QuickDraw GX incorporates Apple's ColorSync color management technology to let color devices and applications input, display, exchange, and output color information consistently and predictably. It matches colors between scanners, displays, printers, and even between Macintosh systems. You can send a color file from one Macintosh with QuickDraw GX installed to another, and the same color matching processes help maintain accurate color display and printout on the second machine.

Compatibility

Apple is committed to protecting customers' investment in fonts, applications, and hardware while creating a foundation for extensive new features and product development possibilities. Current Macintosh applications and fonts work alongside QuickDraw GX and can take advantage of many of the printing enhancements it provides. Revised and newly-designed applications take full advantage of QuickDraw GX color, type, and graphics.

QuickDraw GX runs on 68020, 68030, or 68040 Macintosh systems and is also optimized for the PowerPC chip, letting applications access the greater speed and performance of the PowerPC technology.

Many of the features of QuickDraw GX, such as improved printing and portable document technology, are available to users immediately. Other features, such as advanced type and graphics, require developers to build these features into new QuickDraw GX-compatible applications.

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