

GRAPHIC EXCHANGE

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BY BOB CONNOLLY



-COMMERCE — IT'S FUELING THE FIRES OF BROADBAND INTERNET WEB SITES AS TELEPHONE AND CABLE TELEVISION companies battle to supply you with fast Internet connections capable of delivering video and data at speeds that were once only possible from a CD-ROM.

Soon Web designers will have to deliver this “rich media” content as customers start to demand video, sound, virtual reality tours and interactive product brochures. This emerging trend will create a demand for photographers who can capture virtual reality images — not just panoramic scenery but object movies too. Imagine an Internet clothing store where you pick up a dress, put it on a model, rotate it to see the front, side and back — then place your order.

But the nightmares that come along with the use of this rich media are sometimes daunting. The dreaded browser “plug-in” monster is always lurking, waiting to scare surfers away from your site. Their greatest fear? System incompatibility.

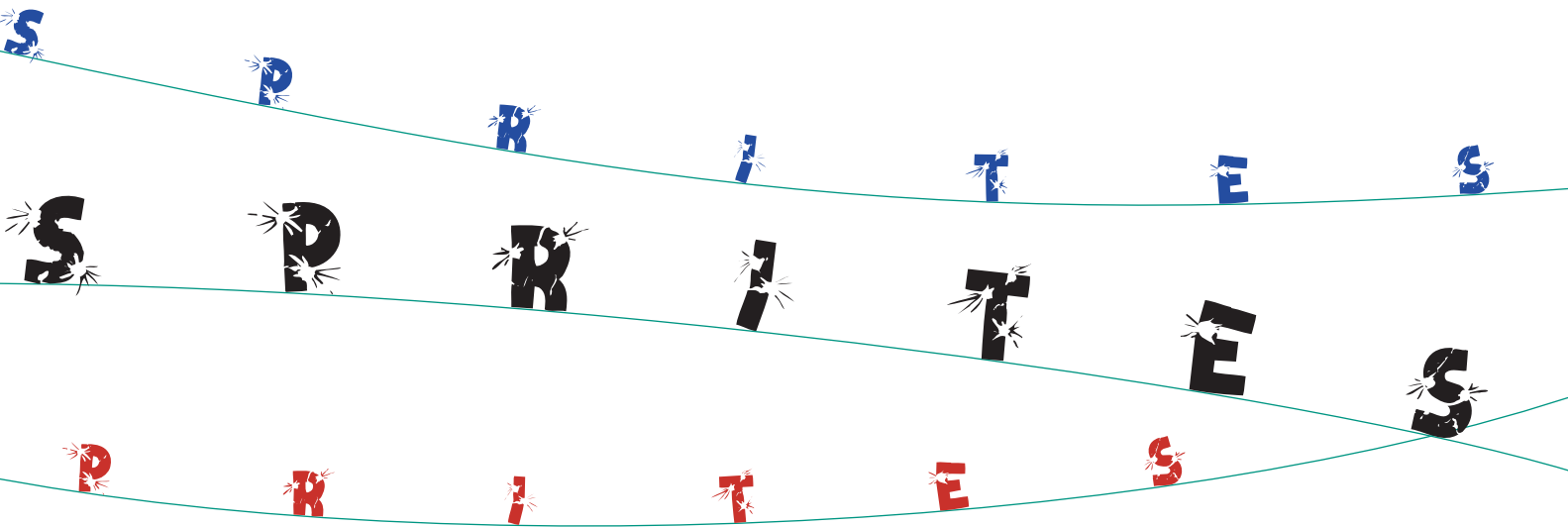
Apple's recent release of QuickTime 4 solves almost all these problems of system incompatibility. Apple has morphed QT 4 into a sort of Swiss army knife for creating and delivering rich media content, giving it the potential to even replace HTML. You can now create an entire Web site out of QuickTime, using HTML only to position a single QuickTime movie on the page.

THE QUICKTIME EVOLUTION: FROM DIGITAL VIDEO TO RICH MEDIA

Originally QuickTime was used to create digital video that would play on both Mac and Windows platforms. But the QuickTime that we have today has evolved well beyond that. It has become a universal interactive cross-platform “rich media” operating system which might even outlive the Macintosh. If Bill Gates ever purchased Apple's assets, QuickTime would be a treasured jewel in his silicon kingdom.

Windows enthusiasts proudly proclaim that Real Networks could stream video long before Apple's QT 4 Streaming Media addition. Macromedia's ShockWave brought interactive graphic streaming media and Flash brought tiny vector-based animated graphics, but with them also came browser plug-ins.

In the meantime, Apple's QuickTime software developers have been busy creating, licensing, acquiring and co-developing rich media applications such as:



- virtual reality software for panoramas and object movies
- video and audio compression codecs
- third party software architecture such as Flash
- MIDI sound generators from Rolland
- Java script
- QuickTime text tracks

It seems as if Apple wants to deliver *everything* you see on the Internet via QuickTime using just one plug-in. They want QuickTime to be your digital media system software. They want it to work well with Windows and Mac. And it does — most of the time...

QuickTime Digital Operating System software is so advanced that even most people working at Apple aren't aware of the possibilities. Several vendors of third party QuickTime software products often relate how difficult it is to get information from Apple's QuickTime developers, and this is a major problem.

THE GUTS OF QUICKTIME

QuickTime 3 reflected a complete overhaul of QuickTime, becoming a container for "tracks": audio, video, text, virtual reality, sprites, etc.

These interactive tracks were also known as "wired sprites" and you could control them through a sort of "lingo" code known only to programmers. Effects such as fades, wipes and 3D effects were included inside QuickTime. You could fade between one video track and the next. Still JPEG images could be transitioned with wipes for a great slide show. If you understood Macintosh Programmers Workshop (MPW) and C code, you could manipulate these tracks interactively using a mouse. But most of us mere mortals know English, not MPW, so this ability sat largely unused.

When Apple released the Mac OS operating system, it relied on the developer community to write application software. *PhotoShop*, *QuarkXPress*, *Word*, and other standard apps were all born to help us paint, publish and write. We didn't need to write the code that allowed us to use the computer as a graphics tool.

This same scenario was followed with the release of the QuickTime 3 digital media operating system; Apple left it up

It seems as if Apple wants to deliver everything you see on the Internet via QuickTime using just one plug-in.

to the developer community to write applications that would manipulate the wired sprite tracks inside QuickTime. But this time it was a disaster. So far, only two applications — *Electrifier Pro* and *Live Stage* — have attempted to harness the "big" interactive ability of QuickTime and for these first attempts it has been a brutal undertaking. Adobe recently released *GoLive 4* which has given us some interactivity with QuickTime wired sprites, but it is far from a true QT interactive authoring program.

When Apple first released QuickTime VR, people were amazed at its ability to allow the user to move about in buildings, picking up virtual objects. It was all there for the programmer that knew MPW C code — so no one jumped on. It wasn't until Apple released an application called QuickTime VR Authoring Studio that VR finally made its way to the Web. That was a dangerous move for Apple because it meant Apple was competing with its own developer community.

QuickTime 4 faces a similar obstacle. Quicktime 4 needs

a *QuarkXPress*- or *Director*-like interface. Most of us can produce some of the individual raw materials for the QuickTime tracks — still images, video, audio, *Flash* animations, etc. But to package them up for use on the Internet effectively, we are still dealing with separate QuickTime .mov files, GIFs and JPEG images.

Apple needs to produce an application that controls all the functions of QuickTime assets, a sort of drag-and-drop Web page tool that allows you to:

- import a compressed JPEG file to use as a background
- place QTVR movies on top of that JPEG file
- place digital videos on top of QTVR movies and on JPEG backgrounds

- place *Flash* animations beside the digital movies
- add sound to the production
- add MIDI sound data
- create hot spots for user-controlled interactivity
- link to other Web pages within the same page
- produce Java applets for database, cgi, etc.
- allow for transitions between VR objects, panoramas and videos

Finally, and most important, it should allow you to export a hinted, self-contained QuickTime 4 movie, ready for uploading to an Apple Streaming Media Server.

Imagine a Web page made entirely of one streaming QuickTime movie. HTML would only be used to download



A Frank (Casanova) Conversation about Apple's QuickTime 4

When Frank Casanova, Apple Computer's Director of Product Marketing for QuickTime, talks about his favorite subject, he exudes tremendous exuberance for his product. Casanova has been with Apple on and off for about ten years, first with the CPU group, then the research group. Bob Connolly caught up with Frank at the June newMedia 99 show in Toronto, just days before the official launch of QuickTime 4.0. It was a perfect opportunity to go into some depth about what QuickTime is, what it can do and how to use it.

Bob: Let's start with the differences between QuickTime 3 and QuickTime 4. Can you sum that up for us?

Frank: The big difference between QuickTime 3 and 4 is real-time streaming. It's important to understand the differences between http streaming—which is in essence a file download—and real-time streaming, which is audio and video coming real-time to your desktop. QuickTime 3 supported streaming but it was called http streaming, which was basically where you click on a file server and those bits are transferred from the server to your local hard disk. The cool thing was that you could watch as you downloaded. If your connection

speed was faster than the playback, you had a great experience. If not, sometimes you had to wait for more information to download, and hit Play again, and watch that bit that downloaded. By the end of the download, you ended up with a file on your hard disk. That's cool, because then you could play around with it, play it back, and do whatever you want—except what if the content provider doesn't want you to do that? As we know, a lot of people in the industry are very, very strict with what you can do with their content. Then we come to QuickTime 4, which allows real-time streaming of audio and video over the Internet. A real-time stream sends you nothing more than audio and video, but at the end of the session, you are left with nothing but a good feeling. You don't have the bits, you can't repurpose any of the content; so intellectual property people—content providers—are really excited about real-time streaming, because it doesn't leave anything there at the end. The essence of QuickTime 4 is real-time streaming and a whole bunch of other stuff that goes with that.

Bob: What changes will we see with material that's used? What if it's not put over a streaming server? What are we going to see in per-

formance?

Frank: You'll see differences in quality and performance. QuickTime 3 came out about a year and a month ago. Since then we've been working directly with our codec (compressor-decompressor) vendors — companies such as Sorenson Video, Q-Design, a Vancouver company for our music audio, and Qualcomm for our speech audio. We've worked with these guys aggressively, with our engineering group and their engineering groups, to evolve state-of-the-art codecs over the course of a whole year—and you can do an awful lot in a year. Understand, too, that the performance of Apple's hardware has gone from 233 MHz for an iMac up to 333 MHz; 100 new MHz can do an awful lot of goodness to a codec. Compressing and decompressing video is incredibly performance-oriented, so that the more performance you can throw at it, the better things look. And our codecs have evolved to go with that performance—and QuickTime scales! QuickTime is incredibly scalable—the faster your connection, the faster your computer, regardless of format, QuickTime will scale to fill up as much performance as you can possibly have.

Bob: I noticed that the procedures to download

the page into your browser. The QuickTime plug-in streams the data from the server to your computer, and instead of tiled images, full page JPEG background graphics in millions of colors are transitioned by QuickTime effect generators as animated slide shows. Virtual Reality Panoramas, Object Movies and Digital Videos play in position on top of the background. Interactive hot spots allow for Internet links and navigation of virtual tours. The touch of a button over live video triggers animations, video and sound. Tiny MIDI data files play music that is generated by your computer. Java applets provide database fields for ordering products.

Sound far fetched?

All these capabilities are built into QuickTime 4. But at this point they remain untapped because there are no sim-

ple (key word — *simple*) authoring applications that can get into the guts of QuickTime and present it to us with a friendly user interface.

Apple has just recently ventured into the world of digital video editing software with *Final Cut Pro* and Adobe is screaming murder — *Premiere* is a goner!

Apple must move away from its Apple Media Tool CD-ROM interactive software and release a QuickTime Wired Sprite Authoring tool.

There are, however, several small developers who have seen this opportunity and have built helper applications using wired sprite QuickTime technology. Since we have been promoting our GRAPHIC EXCHANGE QTVR contest, I'd like to introduce you to some third party tools that will come in



QuickTime 4 or the upgrade to QuickTime 4 have been drastically altered. Could you explain that?

Frank: The install process is very different for QuickTime 4 than it was for Quick-

Time 3. There are a couple of reasons why. QuickTime 3 was about seven megabytes in size. We noticed that a lot of people started the download and then stopped. It could be for a lot of reasons—maybe call waiting clicked and they lost their modem connection, or maybe they were using a 28.8 modem and they got tired of waiting for a 7MB file to download. Regardless of which, we had millions of downloads of QuickTime 3. In QuickTime 4, we decided to break it up into three different sections. The final version that ships will have three different types of installs. There will be a minimum install, which is about 2.5MB, there is a full install, which is about 5.7MB, and then there is a custom install, where if you take it all together is upwards of 8MB. Basically you can pick and choose how much stuff you need, versus how much time you have to wait right in the installer. So, if you pick the 2.5MB install, you get full support for audio and video using our best codecs—MP3 support, Flash, wired sprites, and QuickTime VR support are all right in the minimum install. If you're surfing on the Web, and you've bumped into a piece of media that your QuickTime doesn't know, we're not gonna leave you hanging. We're gonna pop up a message that says we've found some media that your current installation doesn't understand—would you like us to go get it? You click 'yes', and your installer will connect with our servers

in Cupertino and download the pieces of software that you need, install it on the fly and let you interact with that media.

Bob: What type of media would that be?

Frank: 3D would be an example. If you want to look at some 3D in a QuickTime movie, the minimum install does not install the 3D graphics viewers.

Bob: How will QuickTime know you need 3D?

Frank: Because it's QuickTime. It found something it didn't understand. The QuickTime movie will ask your player to look at it and your player will recognize that it doesn't have this necessary piece of software and it will signal your installer to flag you that 3D is required.

Bob: How does it accomplish that? By looking at the extensions?

Frank: Yes, it knows what you have, and it sees what it's being asked for. It's all QuickTime!

Bob: So, it analyzes your whole computer?

Frank: Well, it knows what version of QuickTime you had installed and it knows at all times where you are, what you have and what you want to have with this piece of media you just ran into. In addition, every week or so, when you connect to the Internet, your QuickTime application will go back to Cupertino, and it will compare your bits to our bits, and if there are some new ones on our site, we'll ask you, do you want to get them right now? Yes or no? As a matter of fact, there's also a way to force the installer to go check your bits against our bits. We can add updates all the time now. We don't have to wait for big monolithic, huge introductions. With QuickTime 4 and its intelligent installer, if we find something we want to fix, or if there's a new piece of software we want to have qualified, or if there's a new button for the channel drawer, we can just put that on our site, and it will change the revision of the player on

our site. The next time your player goes to check and see, it will find something new there and it will ask you if you'd like to get the newest update.

Bob: Does it have to go to the Apple site to check and see, or is it doing this automatically?

Frank: The checking is automatic, it's transparent, you won't even know it's happening. We want everyone to have the latest possible software that we have. If we have it on our servers, you deserve to have it on your computer and we want to give you that option. So, every other week or so, it will go back and check for you. We aren't going to go and change it every day, because that would be revision control madness. It may happen every month, every couple of months, when it is worth signalling people that there is an update. If we find something nasty, and someone on the field reports it and we're going, 'Son of a gun, we missed that one,' we can usually fix these bugs in a day, once we find them. We can then post that to our servers, so that people can be signalled, once they go online. So it's a good mechanism for us to get in touch with people. It's not a marketing tool, it's nothing more than an installer update.

Bob: So I launch my PPP and it's going to happen then? Or it's going to happen when I launch my browser?

Frank: Once your system knows you have an Internet connection.

Bob: If I have a connection and I go to any other site, part of it will go to the Apple site?

Frank: Yes, if QuickTime is running, and you are actually looking at some streaming media. It's not just when you are surfing around, it's when you are surfing and looking at some streaming

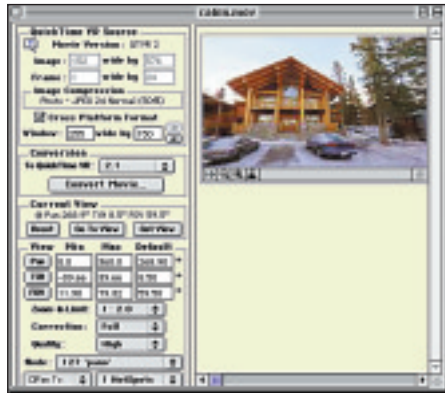
handy for producing Web-ready, interactive QTVR content.

By using Apple's QTVR Authoring Studio and the following additional VR helper applications, you'll be able to produce professional quality QTVR movies that contain:

- hot areas for links to the Internet
- wired preview sprite tracks for fast downloads
- stereo sound
- interactive still background graphics with QTVR overlays
- automation for a hands-free end user experience

THE FIRST PRIORITY — SPEED

ConVRter — speed up Web downloads by 800%. QTVR movies are made up of image tiles that load into Web pages one tile at a time. When downloading a QTVR movie, you'll



ConVRter makes a wired JPEG preview image track that loads into the browser right away.

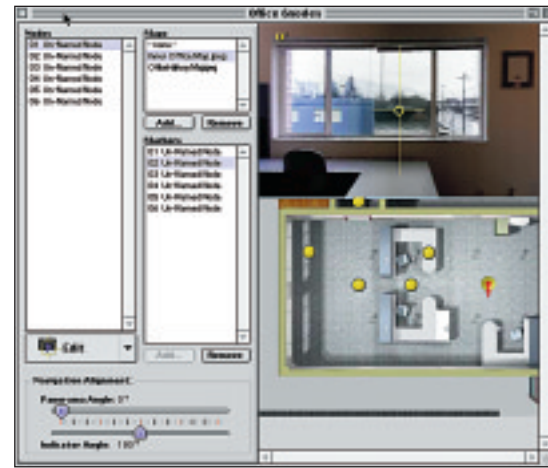
first notice that the image is a black wire frame that updates using sections of the movie as the movie downloads. These tiles, or panels of data, are sometimes out of view at the beginning and the user thinks there is something wrong with the movie. ConVRter takes the entire panoramic image

and makes a wired JPEG preview image track that loads into the browser right away. This is usually a low resolution image that updates as the high resolution tiles are loaded, but at least the user sees some feedback right away.

SoundsaVR — Add sound to panoramas. Virtual reality panoramas are nice to look at but, alas, it's like viewing a silent movie. *SoundsaVR*, from Vancouver-based Squamish Media Group (and now distributed by Kaidan), allows you to take a stereo QuickTime audio file and wire or "attach" it to a VR panorama. Some use it to add ambient sound effects, others use narration for guided tours that might describe the setting and scenery.

MapsaVR — Add floor plans to panoramas. Have you ever been lost inside a VR panorama? A multinode VR tour with several rooms can become an experience that resembles a funhouse arcade. Using *MapsaVR*, another Squamish software product, you wire, or "attach", a JPEG graphic, usually a map or floor plan to the panorama. Every node or location in the panorama is assigned a hot spot which can be positioned on the graphic image. If you click on the map's hot spot, the VR panorama jumps to that location. If you navigate inside the VR, markers which are placed on

the map highlight to show you where you are located relative to all the other panoramic locations. Rotating directional arrows on the markers also help you get your bearings.



Using MapsaVR, you wire, or "attach", a JPEG graphic, usually a map or floor plan to the panorama.

RevolVR — Add automatic movement to your VR movies. Panorama movies are often confused with still JPEG or GIF pictures. Unless you make it clear to the user that the picture is interactive, they may overlook the fact that the picture has a 360 degree view inside. *RevolVR* allows you to add an automatic revolving motion to the image, so that when the movie is finally loaded into the Web browser, it will begin to rotate by itself. This movement can be overridden by your mouse for manual control.

VR MAKES TRAVEL PLANS EASIER

Internet travel bookings are becoming a hot topic as hotels and cruise lines fight for your attention. A virtual Internet tour of a vacation destination is an ideal way to see a hotel's property before you book.

Go shopping in virtual clothing stores. Check out the finest restaurants. It's all coming faster than you might think.

We want to connect Web designers to VR photographers, and to help with this we are creating a database of people who already are or want to become experienced with the ever-evolving virtual reality industry.

Delivrator, *Map SaVR*, *Sound SaVR* and *RevolVR* are just some of the thousands of dollars worth of prizes to be won in the GRAPHIC EXCHANGE Virtual Reality Contest — visit www.canada2000dvd.com to learn more. Digital cameras are everywhere. Grab a Kaidan tripod VR head. Capture your favorite panoramic place and get wired! *

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