

# Intercom



Product Documentation's Third Dimension

## VRML:

IS THERE A DIGITAL CAMERA IN YOUR FUTURE?  
AN APTITUDE FOR TECHNICAL COMMUNICATION  
SEVEN LESSONS I NEVER LEARNED IN EDITING SCHOOL

# RAM



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The World Wide Web is quickly moving from a two-dimensional medium to one filled with 3-D graphics and multi-user interactivity. One area in particular that is garnering considerable attention is 3-D modeling, better known as Virtual Reality Modeling Language, or VRML (pronounced *ver-mil*).

VRML is an evolving standard for creating 3-D graphics for distribution on the Internet or on CD-ROM. VRML technology allows you to present ideas through Web browsers like Netscape Navigator and Microsoft Internet Explorer (as long as they have the necessary VRML plug-ins).

How can technical communicators use this new technology? An ever-increasing number of tools and techniques are available to technical communicators, thanks in part to the rapid development and acceptance of the Internet and, believe it or not, to the proliferation of the personal computer game industry. The push to create more realistic scenarios—like the creature-filled tunnels in popular games such as Doom—has led to realistic interactive product images that can be used in online tutorials, overviews, and user guides. If you deliver documentation through a Web browser, you can use VRML files to enhance your documentation. Let's examine a scenario in which you could use existing VRML technology.

Picture an office cube nestled in the center of the XYZ Corporation. Within that office cube is the network systems manager, carefully examining the online documentation for a network node recently purchased and installed in XYZ's corporate network. But no books are present—just a computer with a colorful animated display screen.

Upon closer inspection we see that the manager is reading text, aesthetically placed within the frames of an HTML page. A VRML image takes up the right half of the display and illustrates the front of a seven-foot-tall, card-filled cabinet, which is an exact image of the recently installed network node (see Figure 1). This same type of node was recently installed some thirty miles from her office. The manager isn't certain which card in the shelf is the packet-processing card, but by moving her cursor over the cards' images, she can see their card types (embedded within the VRML image) and hypertext links to additional descriptive text.

Pushing forward on the mouse moves her past the card's front plate to the interior of the cabinet. Since her VRML-enabled browser has the "collision detection" feature disabled, she can move to the interior of the product as easily as if she

were Casper the Friendly Ghost moving through a living room wall. A double-click later, a screen describing the functions of that specific card's Light-Emitting Diode (LED) display appears in her browser's window. The manager is comfortable with the principles of hypertext and surfing the Web, so using the product documentation is almost second nature.

#### Where Did VRML Originate?

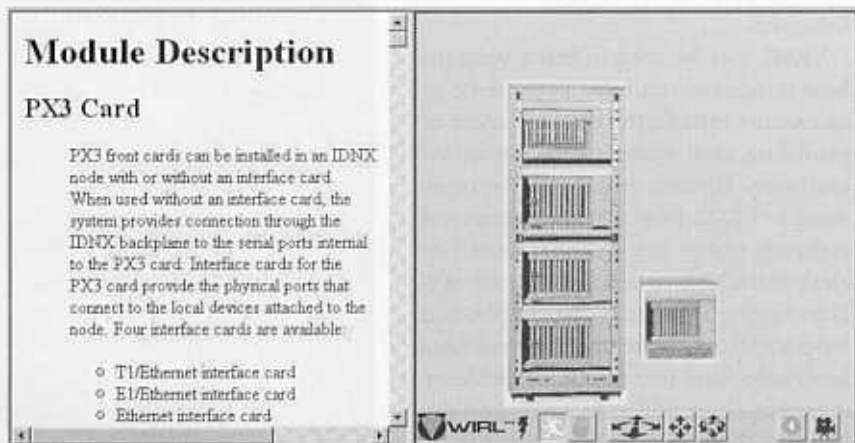
VRML technology first appeared on the Internet in the spring of 1994 at the First International Conference on the World Wide Web in Geneva, Switzerland. Many had a hand in the development of VRML, but three people in particular stood out: Mark Pesce, who developed the "big picture"; Gavin Bell, a Silicon Graphics Inc. (SGI) employee, who was a key player in the development of the OpenGL graphics language on which VRML is based; and Anthony Parisi, who later founded Intervista Software.

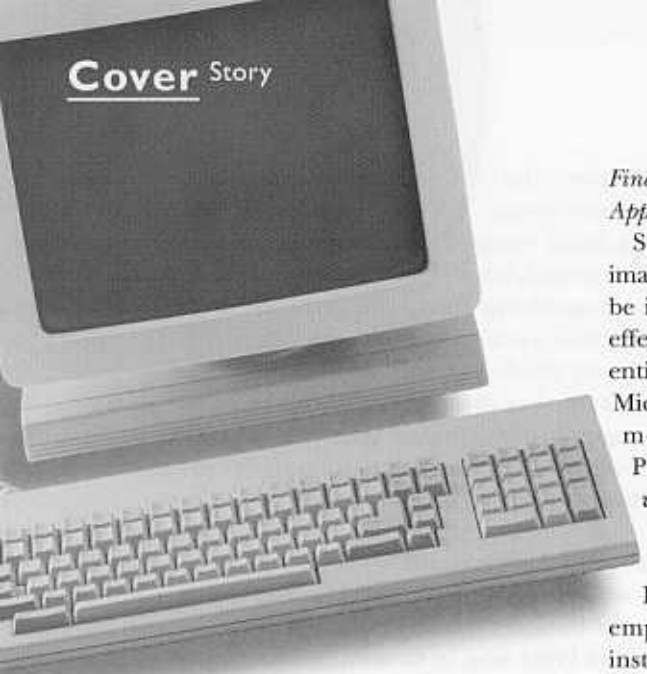
VRML was created in an open forum in which a few thousand people from a variety of disciplines provided input into the VRML 1.0 design specification. The VRML standard was designed to be platform-independent and to work at modem speeds of 14.4 kbps or faster. The standard has drawn the support of major vendors, including Adobe Systems, AutoDesk, Computer Associates, EDS, IBM, Informix, and Oracle. An ISO standard is already being developed (ISO/IEC 14772) for VRML, which should help it gain worldwide acceptance.

#### Current Uses of VRML

As with any new technology, it may take a while for the masses to become accustomed to what VRML can pro-

Figure 1. Accessing documentation using a VRML-enabled Web browser (the control interface shown is here that of WIRL, a VRML plug-in from VREAM, Inc.)





vide and for existing content to be moved into this new format. However, VRML's potential should eventually overcome people's inertia. Several uses for VRML and virtual reality (VR) in general are described below.

#### Entertainment

Most of the work being done with VRML is in the area of game design. VRML allows a participant to enter many virtual worlds that are linked together through the limitless expanse of the Internet. A participant can use the mouse to grab an object in a VRML world and move it.

In VRML, objects have gravity and, in some cases, a life of their own. For instance, the sound of a waterfall becomes clearer and louder as you approach. If you click on an object it may say hello, give you directions, or take a swing at you! Avatars, or on-screen representations of participants in the virtual world, are becoming increasingly popular.

#### Education

VRML can be used to teach students how to operate an expensive piece of machinery without the cost and space of providing each student with the actual hardware. Historic scenes can be replicated in VRML from a vast warehouse of artifacts, which are either scanned or electronically recreated with the aid of 3-D authoring software. For example, SGI has a VRML site (<http://vrml.sgi.com/handbook/index.html>) that replicates the Aztec capital of Tenochtitlan as it stood on the island in the Valley of Mexico in 1519.

#### Financial/Scientific/Medical Visualization Applications

Stock prices, mutual funds, medical imagery, and databases of all types can be infused with interactivity and sound effects to clarify trends and highlight scientific anomalies. This summer, the Sun Microsystems Web site included VRML models and animations of the Pathfinder mission to Mars (<http://www.sun.com/mars/vrml/vrml.html>).

#### Product Training

Instead of sending large groups of employees out for training or paying instructors to visit your company, you can simply copy VRML-based training courses to the company intranet. Northern Telecom (<http://www.nortel.com>) is going one step further and posting its VR courses (using a proprietary product from Superscape, <http://www.superscape.com>) on the Internet to allow qualified customers to download the VR files to their intranets to begin the training process.

**As with any new technology, it may take a while for the masses to become accustomed to what VRML can provide and for existing content to be moved into this new format.**

Nortel places its courses on CD-ROM, using virtual reality to duplicate the hands-on experience of installing and troubleshooting hardware switches. Since Nortel's switches are updated every six months, using the Internet to distribute the training modules seemed to be the next natural choice. "We investigated [many other] opportunities, including distance learning, video, and plain old computer-based training. None of these really fit the bill," said Brad Kuhne, senior manager of business development for Nortel's VR group, in an article in the November 1996 *WebMaster* (page 37). "We need to be able to demonstrate [working with the product] hands-on. We need the knowledge retention that studies have shown VR provides. And we need something that is exciting and new to keep students interested so [customers] get their dollar value."

Another use for VRML is in creating mock-ups of actual devices to train personnel. For example, according to an article in *InformationWeek Online* (<http://techweb.cmp.com/iw/598/98iover.htm>), Randy Stiles, head of the Virtual Environments Training Project at Lockheed Martin Advanced Technology Center in Palo Alto, California, builds 3-D mock-ups of the interior of a battleship to train U.S. Navy seamen.

#### Is VRML Just Like HTML?

Yes and no. HTML resembles SGML code (or, for those not familiar with SGML, typesetting code), whereas the VRML code resembles standard object-oriented programming (OOP). Both types of code can be generated with a simple word processor or text editor (but the file must be saved as a plain text file). HTML and VRML are similar in that neither type of file has to be compiled. Simply create your file, save it as a text file with a \*.url extension, exit the file, and start your favorite Internet browser. Next, select Open File, locate the file, and view your virtual world.

I like working with VRML files, because you can type several lines of code, save the file, call up your browser, and instantly see your results in all their glory—or gore. Instant gratification.

The two file types differ with regard

to errors. If there's a typographical error in one of your lines in the \*.html file, you still see your page, mistake and all. In fact, if the file resides on an Internet service provider's server, the whole world sees your error! But if you have an error in a line of VRML code, the VRML browser is not so forgiving. The file may continue to load and display the contents in its entirety, or you may see the following message: "Syntax error: File could not be loaded!"

Also, VRML is case-sensitive, which means that "Shape" is not the same as "shape."

#### How Can We Use VRML in Documentation?

VRML can enhance your online documentation by letting your customer not only read about your product, but also install it, remove it, or even troubleshoot it in three dimensions. But why? Aren't two dimensions good enough? No—to reinforce and accelerate the learning process in an increasingly complex and hectic workplace, new techniques should be used that are proven to enhance learning and retention.

The use of VRML files embedded in HTML documents engages the following senses:

- **Visual**—embedded animated GIF files, MPEG movies, etc.
- **Auditory**—sound varies as you move within the 3-D VRML space
- **Kinesthetic**—manipulating a mouse or space ball for navigation and interaction

Navigation in a VRML world almost parallels the experience of playing a video game. Exactly how you navigate within a VRML file depends on which VRML plug-in you install in your browser. Figure 1 shows the control interface for WIRL, a VRML plug-in from VREAM. Compare it with Figures 2 and 3, which highlight two other popular VRML plug-ins and their interface controls: WorldView from Intervista Software, Inc. (Figure 2), and V-Realm from Integrated Data Systems (Figure 3).

If you have a chance to test-drive all three, look for the following differences:

- Navigation toolbars (move forward, backward, up, down, rotate objects, etc.)

- Mouse input (for adjusting light settings, speed of movement, etc.)
- Keyboard strokes

VRML can also aid in navigating through a large Web site of documentation. A VRML-based system might be better suited to a novice audience (users who do not have experience with the product). More experienced users, who want to go directly to the information they need, might prefer simple HTML links.

#### How Do You Create VRML Files?

Anyone can create files using a VRML authoring program. These authoring packages also export the files to the VRML format. The VRML files I have created for use on my Web site (<http://www.geocities.com/~courageon>) were produced with Virtus 3-D Website Builder 1.1 on my Windows 95 PC. This

program cost \$99, and its interface is shown in Figure 4. I recently purchased V-Realm Builder 1.1, which allows me to edit and refine features in my VRML worlds much more efficiently.

Point your Web browser (VRML-enabled, of course) to my Web site (<http://www.geocities.com/~courageon/demo.html>) to view the progress of my VRML prototypes.

Several of the better known authoring packages are listed below:

- ParaGraph International's Internet3D Space Builder (<http://www.paragraph.com>)
- Caligari Corporation's Pioneer and Pioneer Pro (<http://www.caligari.com>)
- Virtus Corporation's 3-D Website Builder (<http://www.virtus.com>)

#### When Do We Have Time to Do This?

Most of the work for your VRML files will probably be in the form of Computer

Figure 2. Interface for WorldView from Intervista Software

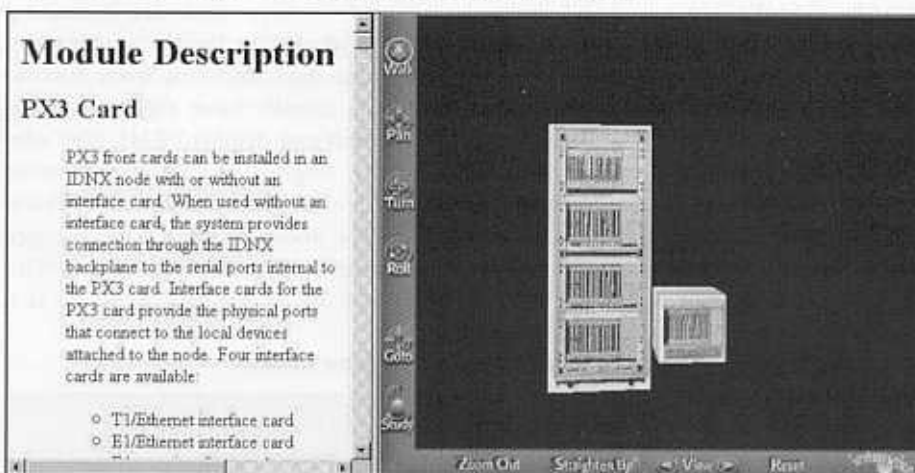
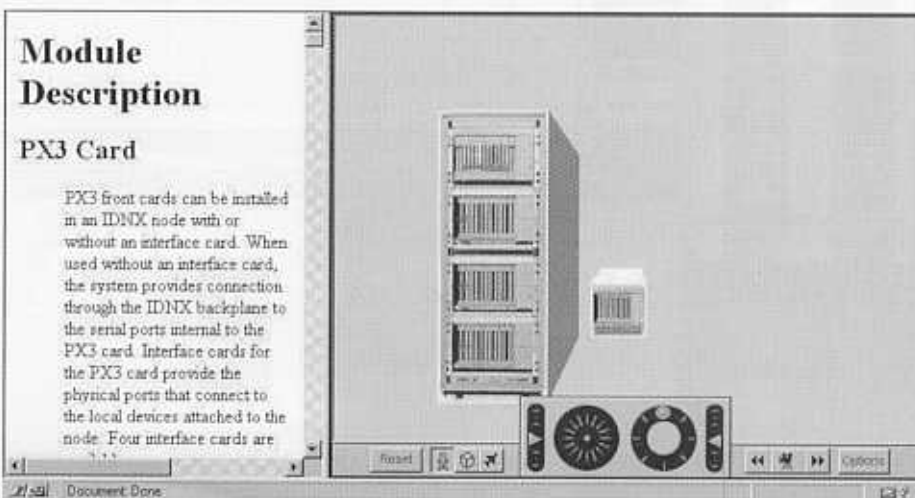


Figure 3. Interface for V-Realm from Integrated Data Systems



Aided Design (CAD) or Computer Aided Engineering (CAE) files. If your product exists in one digital format (the DXF file format, for instance), then you can import that file into a VRML authoring package and export it to VRML. Many CAD programs now have the ability to export their drawing files to the VRML format. Check with your company's engineering department to see whether you can acquire some DXF files representing your product. Next, download a free DXF-to-VRML conversion program off the Internet.

The most popular Web site concerning VRML topics is that of the San Diego Supercomputing Laboratory (<http://www.sdsc.edu>). That may sound familiar if you've heard of Andrea Ames, a senior member of STC. She is also coauthor of *The VRML 2.0 Sourcebook*, the updated book covering the latest multimedia features of VRML along with page after page of tutorials on how to create VRML 2.0 files. The Supercomputing Laboratory site is one of the largest repositories of VRML application reviews, tutorials, and software. You can get up to speed on VRML after only a couple of hours at this site. The site also provides information on the differences between VRML 1.0 and 2.0—version 2.0 being the more interactive and most current of the two. Version 3.0 is not expected until 1998.

#### In the Future...

Currently there are restrictions to the size of VRML files and how elaborate the file can be without inducing a long download time for the end user. VRML designers suggest using textures only when absolutely necessary.

Will you need to hand-code VRML files in the future? Again, the answer is yes and no. If you want to know how the interactivity works within the files, it never hurts to peek inside the code to see how a texture relates to an object. New software applications are appearing that allow you to establish interactivity in your VRML world with the point and click of your mouse. As with any new element thrust into the sequence for documentation production, time must be allotted for the design, creation, and testing of VRML content, especially if these files are to be embedded into online help files.

New 3-D video cards are becoming the standard for family multimedia PCs these days, and Sun Sparc 5 workstations usually have eight-bit video cards that can display VRML files adequately. Higher end, twenty-four-bit cards are available for Sparc workstations for about \$1,000. The average price for a 3-D video card for a Windows 95 PC is around \$150. It is a

good idea to ask your customers what type of video display they use to view your online documentation.

Research indicates that audiences' reading and communication skill levels will continue to decline and that various visual formats for presenting information will be increasingly common. It is imperative that technical communicators search out and use new tools that help users retain information. This search should result in fewer technical support calls, thereby reducing the overall cost to support a product. It may also produce a satisfied customer who finds using the "manuals" a pleasure instead of a hassle.

#### Web Sites

VRML Repository  
<http://www.sdsc.edu/vrml/>

VRML Consortium  
<http://www.vrml.org>

Superscape VR PLC  
<http://www.superscape.com>

Virtus Corporation  
<http://www.virtus.com>

Silicon Graphics, Inc.  
<http://www.sgi.com>

ParaGraph International  
<http://www.paragraph.com> ■

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Adhikari, Richard. "Virtual Reality: A Corporate Reality." *InformationWeek Online*. <http://techweb.cmp.com/iw/598/98iover.htm>, 1996

Radosevich, Lynda. "Sizzle and Steak: Multimedia Morphs From a Pointless Frill Into a Serious Business Tool." *WebMaster*, November 1996, page 37.

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Figure 4. Creating a VRML file using Virtus 3-D Website Builder

