

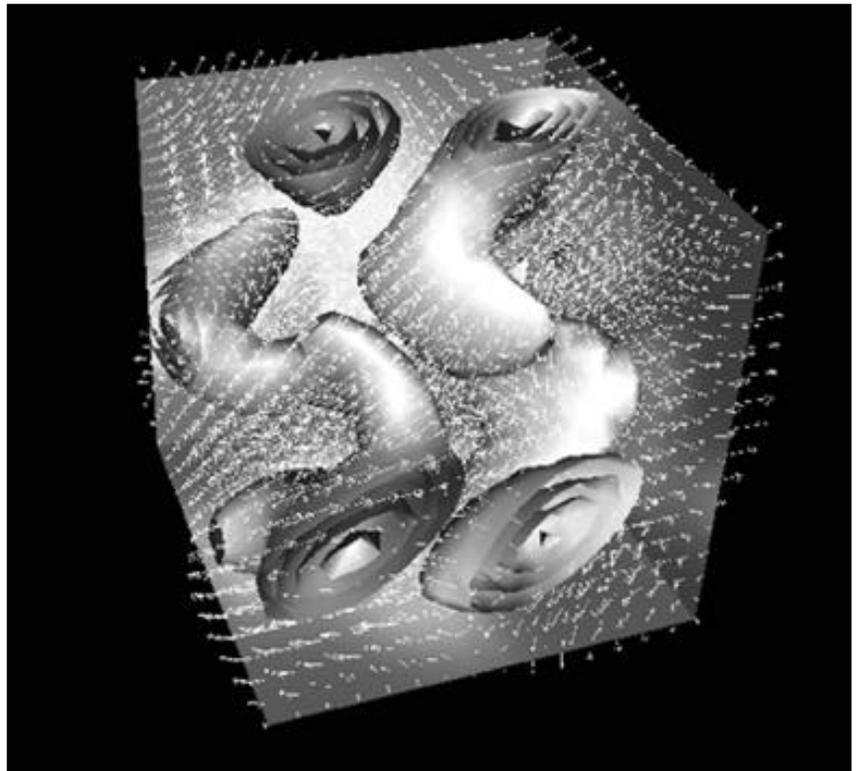
BITS

computing & communications news

October 1997

COMPUTING, INFORMATION, AND COMMUNICATIONS (CIC) DIVISION • LOS ALAMOS NATIONAL LABORATORY

This illustration depicts the visualization of a three-dimensional fluid turbulence. Surfaces of constant vorticity magnitude are displayed with fluid velocity vectors in an attempt to gain insight into complex flows. The flow data was generated by a 3-D pseudo-spectral turbulence code written by Stephen Smith (CIC-ACL) using the POOMA (Parallel Object-Oriented Methods and Applications) framework. Insight into the nature of turbulent flows has applications in diverse fields such as aerodynamics, oceanography, and combustion. The graphics were produced with the ACLVIS run-time visualization tool created by James Ahrens and David Thompson (CIC-8). The ACLVIS tool leverages the capabilities of the Visualization Tool Kit (freely distributed software from General Electric Research) and has been connected into the POOMA framework by William Humphrey (CIC-ACL). The tool is currently being restructured and extended for future flexibility and functionality.



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Customer Service Center(505) 665-4444 or cichelp@lanl.gov

Because of the wide variety of CIC computing services, numerous facilities are available to address your questions. If you are uncertain whom to call, you can always call the Customer Service Center (CSC). CSC consultants are trained to either answer your question or locate someone who can. To reach the appropriate consultant, dial 665-4444 and make your selection from the following choices:

Option 1: New user topics including e-mail, passwords, registration, and World Wide Web.

Option 2: Labwide Systems such as Travel, Time and Effort, and Purchase Cards.

Option 3: Scientific computing, storage systems, and networking.

Option 4: Classroom instruction and training.

Option 5: Desktop Consulting for PC and Macintosh software and network configurations.

Consulting Via E-Mail

Customer Service Center.....	cichelp@lanl.gov
Scientific and engineering computing.....	consult@lanl.gov
Administrative and business computing.....	labwide@lanl.gov
Passwords and registration.....	validate@lanl.gov
Macintosh computing.....	Mac-help@lanl.gov
PC computing.....	PC-help@lanl.gov
UNIX computing.....	UNIX-help@lanl.gov

Other Useful Numbers

Advanced Computing Laboratory.....	665-4530
Central Computing Facility.....	667-4584
Network Operations Center.....	noc@lanl.gov or 667-7423
Telephone Services Center.....	667-3400

CIC-8 Visualization Team

The Visualization Team, which is part of the Distributed Computing Group (CIC-8) in CIC Division, provides a variety of tools and services to help Laboratory customers create visual representations of their data. The team is located at TA-3, in the east side of Building 132 on the second floor. The team home page is located at

<http://www.lanl.gov/divisions/cic/cic8/gvizteam>

Scientific Visualization

Scientific visualization uses computer-based presentation techniques to help customers gain an in-depth understanding of their data. The techniques used depend upon the customer's needs. Traditional presentation techniques include x-y plots, 2-D and 3-D images, and stereo images.

Computer simulations often generate large amounts of complex data. Preprocessing reduces the quantity of data and permits the visualization of specific characteristics. This allows customers to get an overview of the entire data set and to "zoom in" on areas of interest. If the data is extremely complex, innovative visualization techniques may be required. These techniques include standard visualization methods as well as customized algorithms that provide non-standard visualization capabilities.

Participation in Projects

The Visualization team has worked on a wide variety of projects at the Laboratory. Many of these projects have required specialized hardware and software that some Laboratory research groups do not have. A few of these projects are described as follows.

Accelerated Strategic Computing Initiative (ASCI): The ASCI project requires visualization of very large data sets that are produced by weapons simulation codes. The Visualization Team is working on two aspects of this project: (1) providing or developing visualization tools that will be used to analyze data from the tera-scale codes and (2) analyzing and resolving input/output efficiency and sharability issues.

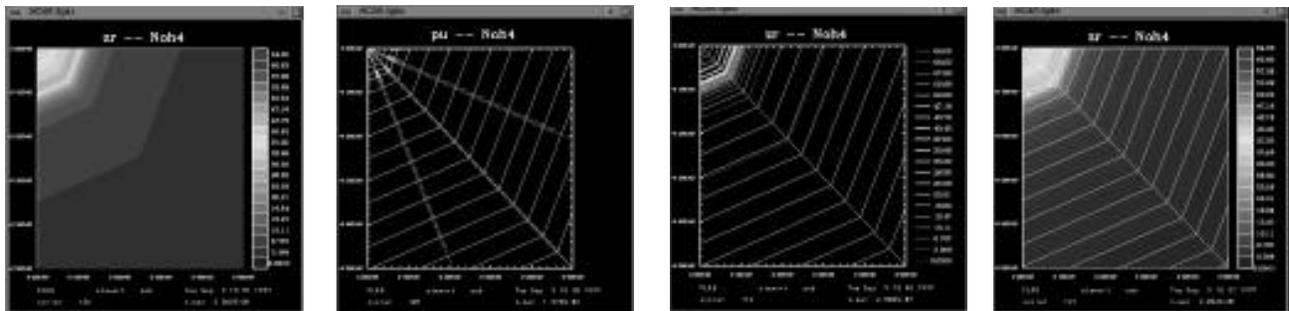
Grand Challenge Problems: The Visualization Team is helping to create visualization of the earth's oceanic characteristics. This project is one of several Grand Challenge Problems currently being addressed by Laboratory researchers. These problems are characterized by their computational magnitude and complexity, and continuously push the envelope of current computational power and models.

General Support: The Visualization Team provides graphics solutions for 2-D and 3-D data through the use of commercial software, freeware, and shareware.

The Visualization Laboratory (Vizlab)

The newly remodeled Vizlab is divided into two functional workspaces: (1) presentation area and (2) production workspace. The presentation area is used for demonstrations and meetings, while the production workspace accommodates open and classified visualization production work, color printing, and color scanning.

Customers can use any of the hardware or software available to create visualization output. When customers require assistance with their visualization projects, Visualization Team



These 2D images, created with the NCAR library, are used for diagnostics during runtime of the FLAG code. Stephany Bouchier of the Visualization Team has been working with Don Burton of X-CI (7-8746 or burton@lanl.gov) to allow for simultaneous display of these diagnostic images. The images can be characterized as follows (left to right): colored contours of the variable zr at time step 126, vector plot of the variable pu at time step 101, contours of the variable zr at time step 116, and gouraud plot of zr at time step 131.

members work with them from start to finish to create the required output. Team members can also assist customers by helping them choose the appropriate software tools and animation production techniques.

Initial consultation on visualization packages and techniques is free. The cost for services beyond general consultation is \$100 per hour. This fee applies when customers have a particular project for which Vizlab personnel can help to implement a solution. Such help includes preparing data for different software packages, writing project-specific graphics modules, and customizing a video. Rates for weekly or longer periods can be accommodated.

Vizlab Software

CEI Insight: Insight has been chosen by the ASCI program to be its turn-key visualization tool for the tri-laboratory effort. Insight provides engineers and scientists with an easy-to-use graphics post processing package. CEI's goal is to supply powerful tools through a user-friendly Motif/X-Window based user interface.

IBM Data Explorer: The IBM Visualization Data Explorer (IBM DX) is a general-purpose software package for data

visualization and analysis. It employs a data-flow driven, client-server execution model, and it provides a graphical program editor that allows the user to create visualizations using a point and click interface.

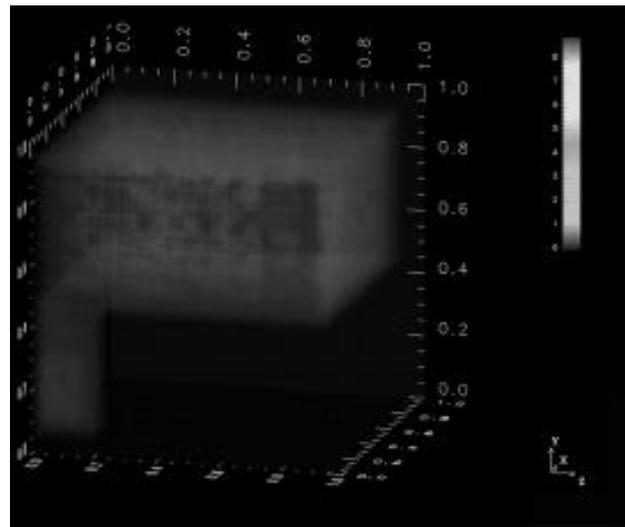
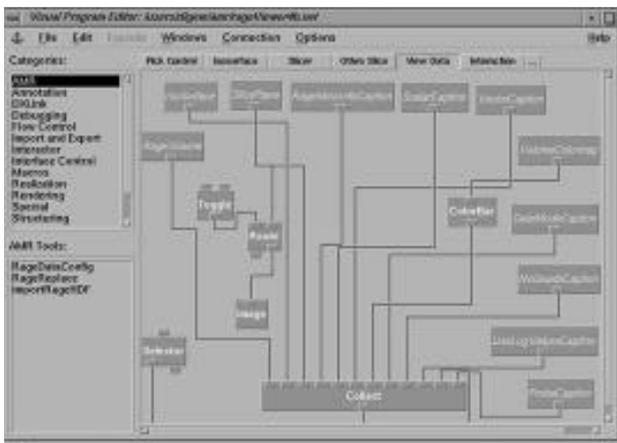
DX runs on seven major UNIX platforms and is designed to take full advantage of multi-processor systems from IBM, SGI, and Sun. DX is an extensible system that allows savvy users to add their favorite algorithms to the system as new visual components.

Vizlab Hardware

The Visualization Team supports scientific visualization on many different platforms including Macintosh, NT, UNIX, and high-end SGI hardware.

Public Domain Software

NCAR Graphics: The National Center for Atmospheric Research (NCAR) has built a very powerful and flexible computer graphics package. The Visualization Team adopted the NCAR graphics package as the in-house graphics standard for 2-D graphics. LANL currently has a site license for this package and any group within the Laboratory may use this package free of charge. NCAR Graphics produces output

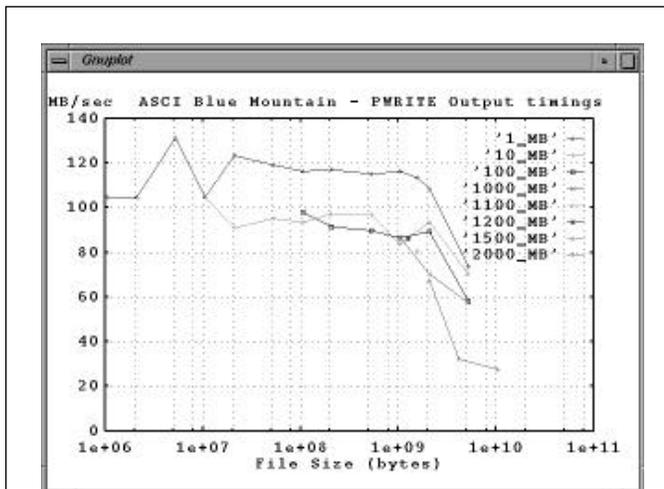


The illustration on the left depicts a portion of an image processing network from IBM Data Explorer (DX) while the illustration on the right depicts the 3-D image produced when the network is executed with a data set from X Division's Rage code as input. DX allows for rapid prototyping of visualization techniques for arbitrary data sets which allows analysts to examine the results more quickly. This DX network was assembled by David Modl, CIC-8 Visualization Team.

files based on popular industry standards, such as PostScript and Computer Graphics Metafile (CGM). This allows customers to import NCAR Graphics plots into non-NCAR visualization tools that run on Macintoshes, PCs, and UNIX systems. Additional features of this package are as follows:

Prototype Graphical User Interface—allows creation and editing of visualizations from a workstation in a truly interactive way.

NCAR Command Language—provides strong data handling and data manipulation facilities, and it supports a variety of data formats including Network Common Data Form (NETCDF), Hierarchical Data Format (HDF), binary, and ASCII.



This simple plot shows the output rates using the C function "pwrite" on the ASCII Blue Mountain machine dixiebutte. The test program that generated the data for this plot was developed by Genevieve Fox and Jim Holten and includes tests for the functions write, writv, fwrite, and pwrite. There are also tests for the HDF and NetCDF libraries and for the input/output library being developed by the ASCII Data Models and Formats group. The purpose of this tool is to provide benchmark I/O rate data on a wide variety of machines so that software developers can use it for comparison. In this plot, the "pwrite" rate (Megabyte/second) was measured for different sizes of arrays from 1 MB to 2000 MB. When the array sizes get larger than 1000 MB (1 Gigabyte), the rate of output starts to drop off dramatically. This is most likely the result of system buffering.

High-Level Utility Library—provides an easy to use collection of graphical objects to generate custom visualizations.

CGS to NCAR Bridge Library: The Visualization Team strongly encourages customers to use NCAR graphics for newly developed software projects that require 2-D graphics. To accommodate existing software applications that make calls to the Common Graphics System (CGS), the team is implementing a bridge library. The bridge library preserves the calling interface of CGS, which means users will not have to change their code. The principal objectives of the reimplementation are (1) to shift most of the costs for maintaining CGS functionality away from LANL to the NCAR graphics subscriber group as a whole, and (2) to provide an easy migration path for CGS users to the NCAR graphics resources.

Future Developments

The Visualization Team is developing software and hardware to fully explore new human-computer interaction paradigms. The team is researching new techniques for computer-human interfaces, information presentation analysis, and distributed collaborative environments. The navigation through data and the manipulation of that data is a first step toward presenting the customer with an interactive immersive environment. Stereo viewing of data and the use of sound increases the sense of presence. A "touch metaphor," through the use of tactile and force feedback devices, extends this sense of presence. Hand and head tracking devices can be used to allow the customer to maneuver within and manipulate the environment more naturally. These techniques, taken one at a time or in combination, are often referred to as Virtual Reality. Virtual Reality is being explored as a means of improving customers' ability to analyze and understand their simulation or modeling data. Customers with unique and complex data are encouraged to consider discussing some of these new exploration techniques with the team.

Visualization Team Members

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Visualization Team Leader

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Parallel and distributed rendering, OpenGL, and VTK toolkit

Stephany Bouchier, scb@lanl.gov, (505) 667-8266
CEI Ensignt, AVS Express, and NCAR Graphics

Genevieve Fox, genevieve@lanl.gov, (505) 667-6880
Vizlab, video production, image processing, and CEI Ensignt

Jim Holten, holten@lanl.gov, (505) 667-431
3-D rendering, X11, Motif, parallel I/O Data Models and Formats



Visualization Team (L to R): David Thompson, Stephany Bouchier, Jack Horner, Genevieve Fox, Steve Smith, Robert Gurule, Pat McCormick, Ted Reed, Dave Modl, Andy Martinez, Jim Holten, and Jim Ahrens (not shown).

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CGS Bridge Library and NCAR Graphics

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NCAR Graphics, PC Graphics, and Macintosh Graphics

Pat McCormick, pat@lanl.gov, (505) 665-0201
Parallel and distributed rendering, OpenGL, and IBM BX

Dave Modl, digem@lanl.gov, (505) 665-8123
IBM Data Explorer, Khoros, and alternative user interfaces

Ted Reed, tnr@lanl.gov, (505) 667-0935
Device level graphics and ASCII Data Models and Formats

Steve Smith, sas@lanl.gov, (505) 665-3377
Collaborative environments and alternative user interfaces

David Thompson, davidt@lanl.gov, (505) 665-1973
OpenGL, VTK, and non-linear dynamics

Vizlab Open House

There will be an open house for the Visualization Laboratory on October 29 from 9:00 a.m. to 4:00 p.m. The Vizlab is located at TA-3, Building 132, Room 248.

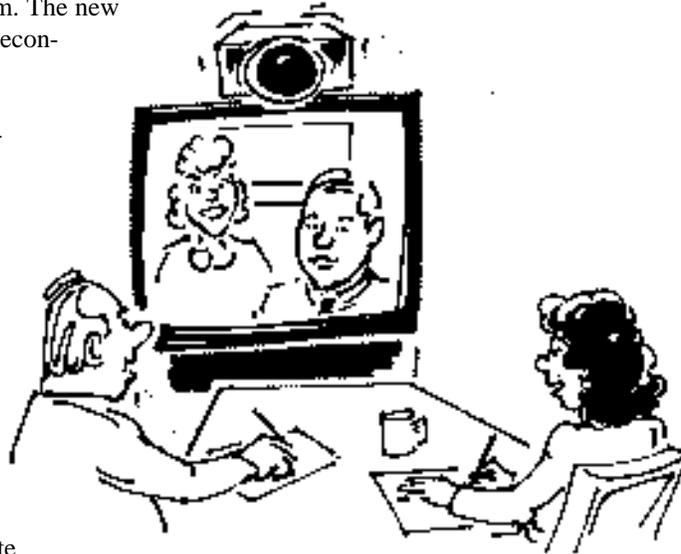
Computer Graphics Contest

Watch for details in the November BITS.

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Distributed Computing Group (CIC-8)*

Video Teleconference Center Offers New Capabilities

The Video Teleconference Center (VTC) announces the availability of a new capability at its auxiliary teleconference facility which is located in an open area at TA-3, SM-200, Room 108. This facility now has a new dial-up, ISDN-based Picturetel, Concord 4500 System. The new system is available for unclassified teleconferences. (The main VTC facility located in the secure area is available for classified and unclassified teleconferences.) This system greatly expands the number of sites available for teleconferences. Previously, we could access only those sites that were connected to the FTS-2000 Compressed Video Transmission Services network. With the new Picturetel system, however, we can provide access to virtually any other teleconferencing facility worldwide. The Picturetel system provides site-to-site conferences as well as multiple-site conferences. And the system is certified on FTS-2000/AT&T, Sprint, and other DOE bridges. We have already used the Picturetel system for teleconferences with numerous sites around the U.S. as well as with sites in Japan and Spain.



OR



The auxiliary teleconference facility offers graphics capabilities including high-resolution graphics with real-time interaction and image manipulation as well as standard-resolution graphics for color transparencies, view graphs, photographs, and videotape recording.

The cost for a teleconference is \$325 per hour, regardless of how many sites are connected. For reservations, please call us at (505) 665-3000 or contact us by e-mail at djr@lanl.gov or vina@lanl.gov. You can also drop by our main VTC facility located at TA-3, SM-132, Room 331 and we will be glad to schedule your conferences.

Remember to watch for our open house of the auxiliary teleconference facility, which will be held in October. Details will be announced in Update.

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Hackers Sniff LANL Passwords

A “sniffer” is a network analyzer. It’s an effective diagnostic tool for maintaining and troubleshooting networks because it captures, analyzes, and stores data frames. However, the sniffer is a double-edged sword. In the hands of the wrong person, this same instrument can be used to capture clear text passwords as they traverse a network. But this is something that only happens once in a blue moon and to other people. Right? Well, tell that to the LANL users whose passwords were picked off by sniffers in recent weeks.

Sniffing Incidents

The first incident happened to Terry Ladwig while he was using an Internet Service Provider (ISP) Account. Terry recounts his experience:

“My e-mail account was hacked into while I was on paternity leave. I was keeping up on my e-mail while at home. I have a personal ISP, Santa Fe Trail, and routinely use this account to get onto the Internet. While on leave, I logged onto sfttrail and established a telnet session to cic-mail.lanl.gov. To log onto cic-mail.lanl.gov, I enter my Z number and pop password.

Meanwhile, sfttrail had been hacked into. The hacker was able to sniff my password. The hacker caused considerable damage to sfttrail. The hacker used my information to cause further damage by attempting to bring down cic-mail.lanl.gov. Fortunately our mail staff was more experienced than sfttrail’s people and we narrowly escaped disaster. I contacted sfttrail and learned that this is the third time they’ve been hacked into. I believe they have some good clues as to who the perpetrator is.

I will strongly advocate using our smartcards for all remote access in the future. It feels very odd and scary to be the one picked out for this attack.”



Chuck Wilder (CIC-5) uses a Sniffer to maintain and troubleshoot LANL networks.

Several other LANL users also had their passwords sniffed as a result of the Santa Fe Trail break-in.

Another sniffing incident happened to a LANL employee while using an off-site training network. It was reported as follows:

A hacker was apparently using a packet sniffer on the open network outside of LANL. A LANL user on the UNM-LA system was using a password that was common to his local system as well as the UNM-LA system. The hacker picked off the password, used it to log into the LANL system, and then proceeded to use the LANL user’s account to attack the UNM-LA system.

Lessons Learned

What can you do to protect yourself from sniffers if you're accessing the ICN from an off-site location?

- Use a smartcard. Smartcards create one-time "passcodes" which are useless to the hacker. Because the sniffer can still view the contents of your mail or other information you are processing, do not enter your ICN password at any time during the session.
- Use the direct dial-up numbers to get to the ICN: 667-9020 (for local calls) or 800-443-1461 (for long distance).
- Use different passwords for your ISP or other special accounts so that if that password is captured, your LANL account is unaffected.
- Watch for upcoming recommendations on how to encrypt your off-site sessions so that the entire content of your session is protected from sniffers.

If you have questions, please contact LANL SIRT (see sidebar, right).

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Advanced Database & Information Technology (CIC-15)*

CIC Division Annual Report Available On Line

The 1996-97 edition of the CIC Division annual report is now available on line at

www.lanl.gov/Internal/divisions/cic/publications.html

This report includes a division highlights section as well as summaries of CIC groups and projects.

*Jeannette Mortensen, jjmortensen@lanl.gov, (505) 665-9399
Communications Arts and Services (CIC-1)*

LANL Security Incident Response Team (SIRT)

Charter: To respond to security incidents, i.e., receive reports about suspected incidents, investigate, evaluate, and report findings.

Contact Information

E-Mail: lanl-sirt@lanl.gov

Phone: 505-667-7423 (business hours)
505-667-4585 (after hours)

Pager: 104-7097

Fax: 505-667-7793 (business hours)

Postal Address: Security Incident Response Team
Mail Stop B255
Los Alamos National Laboratory
Los Alamos, NM 87545

URL: <http://www.noc.lanl.gov/nic/Security/Incidents>

Retirement of Machine RHO Postponed

The retirement of machine RHO that was scheduled for October 1, 1997, has been postponed. RHO will continue to be available after October 1, 1997.

Unfortunately, we do not have a definite date for the removal of RHO at this time. We will continue to keep you informed in as timely a manner as possible.

*Manuel Vigil, Group Leader, (505) 667-5243
Computing Group (CIC-7)*

*Cheryl Wampler, SCR Team Leader, (505) 667-0147
Computing Group (CIC-7)*

Maintaining Effective Web Pages: More Tips and Tricks

Puerto Vallarta again, and it was a muy bonito evening for a swim. Sky was clear, stars bright, water buoyant and warm. Across Mismaloya Bay with a backstroke, I watched the stars and listened to the movements of ocean below. (Nearer the shore, what you hear is sand moving; farther out, it's a deeper, more distant sound.) Comfortable and relaxed (and probably a bit too full of myself), I decided to rest for a while on some rocks. And as my reward...something over thirty sea urchin spines scattered across both hands and both feet, which distracted me and led to various other scrapes and bruises as I lost my grip and was washed up onto the rock.

Even in the most beautiful of settings, people like me still seem to find a way to be, well, "not yet adequately informed."

"Not yet adequately informed" can, of course, be applied to more than just the way we swim. By virtue of the fact that I've been working the Web since the Stone Age (i.e., before in-line graphical images), I've had ample opportunities to be "not yet adequately informed" in what I've done, and to observe similar behavior in others. The easier and more powerful our authoring tools become, the more often it seems we encounter pages that are unnecessarily slow, don't work, and/or crash our browsers.

For this month, I'd like to review a variety of things I repeatedly encounter on the Web that can easily be done better. Some of this will be repetition from earlier BITS articles, some will be new, but hopefully most of it can be useful.

JPEG Is Under Used

There is still an over reliance on GIF-format images, and an under use of the JPEG format. Several years ago, the hesitation to use JPEG was understandable since few browsers supported it. That hesitation is no longer valid, though; in-line JPEG has been supported by all the major browsers for years now (since at least Netscape 0.94 beta and NCSA Mosaic 2).

There have also apparently been concerns about the way JPEG images can be dithered (made spotty) when viewed on 256-color monitors, but (a) that dithering will also occur if the image is made into a 256-color GIF and (b) JPEG is frequently noticeably better on higher-color monitors with smaller file sizes as an added benefit.

In general, JPEG is the better choice for photorealistic images (scanned photographs, etc.), while GIF is the better choice for line-art, lettering, and other images with sharp edges. In the Information Architecture White Paper IA-6801: Electronic Image Formats and Compression Algorithms, we include

example image formats that show both good JPEG and good GIF. A wolf photo, for example, at 25% JPEG compression is 5,832 bytes, while a lower quality GIF version of the same photograph is 10,885 bytes. On the other hand, a 1,488 byte GIF of line art becomes 13,131 bytes under JPEG before it begins to approach comparable quality to the GIF.

Which format to use depends on the particular image. When in doubt, try both and see which yields the best result and smallest file size. When working with JPEG, also try various compression levels to see how small the file can be made while still retaining acceptable quality. Also, Macintosh users should be sure to use JPEG/JFIF when exporting or converting images, since the JPEG/TIFF that Macs frequently default to is not widely supported in line by Web browsers.

On a related subject, in-line support for the W3C's PNG (Portable Network Graphics) format is continuing to gain momentum and can be expected to displace GIF within a few years. (PNG is supported in line by Microsoft Internet Explorer 4.0, which is scheduled for production release for Windows 95/NT prior to the publication of this article, and is expected in Netscape Navigator 4.1 or 5.0.)

Compress Animated GIFs

Although animations are easily overused, there are places where they are appropriate, and there have been occasions when I have used them. The simplest of these to create are animated GIFs, and a common problem with these is that they haven't been compressed. (An easy way to tell whether an animated GIF has been compressed is to watch how it loads in the browser: an uncompressed animated GIF will load slowly, one image at a time, and then speed up after the entire sequence has been loaded, while a compressed version will load more quickly and will immediately start off at full speed.)

What compression does is to store a complete version of the first image in a sequence and then record only the pixels that change from one image to the next. This can significantly reduce the file size and download time. For example, a nine-image hourglass I recently built compressed from 49,398 bytes down to 6,554, a reduction of more than 85%. Compression (sometimes called "optimization") is available from a variety of shareware products, so if your current product doesn't support it, it might be a good time for an upgrade.

Cache Control via HTTP Headers

Most Web authors have probably encountered this before. We update a page, only to receive a phone call from a user who is

still seeing the old page because it has been cached by the browser. While this is easy for the user to fix (simply reload the page), it can be a nuisance, particularly if the changes are important.

When we have a page that we know will be updated on a regular basis, one thing we can do is to take advantage of the HTTP "Expires" command to tell modern browsers how long to hold the page in cache. This is inserted into the <HEAD> section of a document with a <META> tag as follows:

```
<META HTTP-EQUIV="Expires" CONTENT="Wed, 30 Jul 1997 12:00:00 GMT">
```

The date and time will vary depending on when the browser should automatically delete the page from its cache.

Note that a date in the past (such as in the example) will prevent the page from being cached, so that it will need to be reloaded every time the user looks at it. This can be useful when we want to make sure that it's always an up-to-date version that the user sees (or if we don't want information cached for security reasons), but it also slows down performance and increases the load on the server and the network, so it should only be used when it is really needed. (Out of several thousand pages in the Information Architecture Web space, there are only two that have the expiration date set to the past.)

Because of the above effect, it is important to keep expiration dates up to date. If we set the expiration date to the end of today (or the end of this week), then we need to extend it before the end of today (or this week), or else users who arrive after the expiration will be stuck waiting for the page to continually reload from scratch. To avoid needing to always directly edit a page, expiration dates can be automatically set for pages created on-the-fly from a Perl script or other program, or a server-side include can be used in parsed pages to

include an external file that is updated via a cron or other periodic program. Because the line needs to be in the <HEAD> section, though, I don't know of any way that JavaScript can be used to set it.

Auto-Forward to New Locations

As all of us are familiar, page locations are continually changing on the Web, causing us to continually update our own links and bookmarks. Frequently we'll see messages such as "This page has moved to a new location. Please follow this link and update your bookmark." While this is a helpful improvement over a "404 Not Found" message, there are several ways to do it better.



As described in the October 1996 BITS article "Mariachis Weave Beethoven? More Tips and Tricks," my own preference is to use a "Redirect" line in the access configuration file. Under NCSA or Apache, this file is typically named ".htaccess" and the line to add to the file uses the following syntax:

```
Redirect /old-path/old-name.html http://server/new-path/new-name.html
```

Note that not all servers require the "http://server" portion.

With the Redirect, whenever somebody attempts to reach the old location, they are automatically forwarded to the new location. The advantage to this approach is that other people's links and bookmarks continue to work without their needing to do any maintenance work. The disadvantages are that the server needs to be properly configured and that the load on the server is increased when it needs to read through sometimes lengthy ".htaccess" files before it can serve a page. (A tip for decreasing the server load: Put the ".htaccess" redirects as far down in the directory structure as possible so that the server only needs to read the redirects that apply to the current directory.)

Another approach is to use an HTTP "Refresh" command in the <HEAD> section of the update notice. This is done similarly to the cache control described above, and uses the following syntax:

```
<META HTTP-EQUIV="Refresh" CONTENT="4; URL=http://server/new-path/new-name.html">
```

When modern browsers load a page with the above command in its <HEAD>, they will wait a certain number of seconds ("4" in the example, though it can be changed to whatever you prefer) and then automatically load the specified URL. The update message itself will then typically read something like "This page has moved to a new location. Please follow this link or wait to be automatically forwarded." (The link is still included because not all browsers support the automatic refresh.)

The advantages to this approach are that it reduces server load, makes the change more explicit for users (in case they choose to update their bookmarks), and can be used even if the server is not configured for redirects. I personally continue to prefer the automatic redirect (when possible), but the HTTP Refresh is still better than a static page with a link.

For Additional Information

For additional information about Web authoring, please see the Information Architecture's General Internet/WWW Activity Area page (<http://www.lanl.gov/projects/ia-lanl/area/web/>, Laboratory IP addresses only). For additional information about the Information Architecture Project in general, please see our home page at <http://www.lanl.gov/projects/ia/>. If you would like printed or e-mail copies of any of our materials, please contact me at the address below.

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Information Architecture Standards Editor
Communications Arts and Services (CIC-1)*



Research Library Training

The LANL Research Library provides training for using its specialized databases. Training sessions begin and end at times indicated below. Classes are free but you must preregister by calling the Research Desk at 7-5809 or sending e-mail to library@lanl.gov. Special classes and orientations can also be arranged.

Date	Time	Subject Matter
10/7/97	1:00 - 1:30 p.m.	Research Library Catalog via the WWW
10/8/97	11:00 - 11:30 a.m.	MELVYL (U of CA specialized databases)
10/9/97	1:00 - 1:30 p.m.	Finding Addresses and Phone Numbers on the WWW
10/9/97	1:00 - 1:30 p.m.	Environmental Resources on the WWW
10/15/97	2:00 - 4:00 p.m.	InfoSurfing: Basic Web Searching Strategies
10/21/97	1:00 - 1:30 p.m.	SciSearch at LANL—at your desktop!
10/22/97	1:00 - 1:30 p.m.	Grants and Funding on the WWW
10/29/97	11:00 - 11:30 a.m.	MELVYL (U of CA specialized databases)
10/29/97	1:00 - 1:30 p.m.	Finding Addresses and Phone Numbers on the WWW
11/4/97	2:00 - 4:00 p.m.	InfoSurfing: Basic Web Searching Strategies
11/5/97	1:00 - 1:30 p.m.	Research Library Catalog via the WWW
11/5/97	1:00 - 1:30 p.m.	Introduction to Electronic Library Resources
11/11/97	1:00 - 1:30 p.m.	SciSearch Alerting Service
11/12/97	1:00 - 1:30 p.m.	Grants and Funding on the WWW
11/12/97	1:00 - 1:30 p.m.	Finding Addresses and Phone Numbers on the WWW
11/18/97	2:00 - 4:00 p.m.	InfoSurfing: Basic Web Searching Strategies
11/19/97	1:00 - 1:30 p.m.	Environmental Resources on the WWW
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Labwide Systems Training

The Customer Service Group (CIC-6) offers training for users of Laboratory information systems. The CIC-6 courses offer training for a variety of personnel including property administrators, group secretaries, training coordinators, budget analysts, group leaders, or anyone needing to access training records, property records, costs, employee information, travel, chemical inventories, etc. Refer to the table below for specific information about courses currently offered.

You must have a valid ICN password before taking any of the courses shown in the table. To register for a course, call the CIC-6 Training, Development, and Coordination section at 667-9559 or access our Web page. From the LANL home page, look under "Services/Computing at LANL/Training" or enter the URL: <http://www.lanl.gov:8010/computer-information/cic6/teampage.html>.

Course Title	Date	Time	Cost	Course Number
Employee Development System - Basic Training (EDS I)	10/8/97 & 11/5/97	8:30–12:00	\$375	Course #5289
The course provides hands-on instruction to request course enrollment, use the on-line course catalog, retrieve training transcripts, and assign EDS authorities. The student will learn to create courses, add students to the courses, and generate several training reports.				
Employee Development System - Training Plans (EDS II)	10/22/97 & 11/9/97	8:30–12:00	\$375	Course #7155
Participants receive hands-on instruction to create and maintain training plans, assign assignment codes, and generate training plan reports. Attendees must have prior training in the Employee Development System.				
Eudora Electronic Mail	TBA	1:30–3:30	\$200	Course #9762
This class is a hands-on class that teaches the participant how to use Eudora software to create, send, receive, and edit electronic mail messages. In addition to these procedures, the participant will learn what related settings mean and how to configure the system to meet his or her individual needs.				
Data Warehouse Basics	10/21/97 & 11/7/97	8:30–10:30	\$200	Course #11961
Students will receive hands-on training to generate standard reports and make quick queries from information in the data warehouse, a real-time collection of data tables from Laboratory financial, time-reporting, and personnel systems.				
Data Warehouse/ Financial Reporting	10/21/97 & 11/7/97	8:30–12:00	\$375	Course #11960
Students will receive hands-on training to generate standard financial reports and make on-line queries from information in the "data warehouse," a collection of data from Laboratory budgeting, accounting, and time-keeping systems.				
HTML Basics	10/8/97 & 11/6/97	1:00–4:30	\$375	Course #11605
Students will gain a basic understanding of HTML (Hypertext Markup Language), the language for the World Wide Web. Topics covered will be commands and standards, creating and editing documents, and authoring programs.				
HTML Tables	10/15/97	1:00–4:30	\$375	Course #11959
Students gain basic understanding of how to create various tables in HTML and new tags in HTML 3.0. Netscape-specific tags are also identified for clarity. Prerequisite: HTML Basics or permission of the instructor.				

Course Title	Date	Time	Cost	Course Number
Utilizing Netscape	TBA	8:30–10:30	\$200	Course #10961
Students gain basic understanding of the Internet, the World Wide Web, and Netscape as a browser to surf the Net. Topics covered are both Laboratory sites and open sites, along with practical uses of the Internet.				
Notes Basics 4.5	10/30/97 & 11/20/97	8:30–12:00	\$375	Course #9917
Participants receive hands-on computer instruction to learn to create and send Notes e-mail memos, fax documents, search on one or multiple databases, use views and folders, create nicknames and distribution lists, set defaults, create doclinks, send attachments, and replicate databases.				
Meeting Maker	10/7/97 & 11/4/97	1:30–3:30	\$200	Course #12395
Students learn how to create an address book, create personal groups, utilize the Auto-Pick feature, utilize e-mail integration with non-Meeting Maker users, and customize various Meeting Maker features.				
Reporting with Infomaker	10/27/97 & 10/28/97	8:30–5:00	\$650	Course #11054
Hands-on training to query data and develop ad hoc, or non-standard, reports from the LANL data warehouse using Infomaker software.				
Time and Effort System (GUI)	10/29/97 & 11/25/97	8:30–10:30	\$200	Course #11018
The student will learn how to enter attendance, amend attendance, approve attendance, and submit exception and approval reports. Time codes and associated policies will be discussed. The student will also learn how to use the Information Manager utility to view and print reports.				
Travel	10/23/97 & 11/17/97	1:00–4:30	\$375	Course #12091
Hands-on training to submit and approve travel requests and expenses in the new Travel System which replaces the TRIPS on-line system and the post-travel expense worksheets.				

Advanced Technical Computer Training

The Customer Service Group (CIC-6) supports advanced technical training in computing areas such as programming languages, system administration, networking, and World Wide Web development tools. The support provided by CIC-6 can be as limited as providing the appropriate facilities for a specific group or as extensive as coordinating training functions such as system administration, vendor acquisition, EDS administration, and class facilitation. The table below lists classes that are either currently being offered or are available on request. An expanded list of classes that are potentially available can be viewed on the Internet at <http://www.lanl.gov:8010/computer-information/ComputerTraining/Vendor.html>. To request registration in any course or for general assistance, please contact the CIC-Division Advanced Technical Computer Training Coordinator at (505) 667-9399 or send e-mail to cic6-train@lanl.gov. *Cost per student will vary depending on the total number of students enrolled in the class.

Course Title	Date	Time	Cost	Course Number
C Programming (Beginning)	12/1-5/97		\$1600-\$2000*	3996
Prerequisite(s): Knowledge of another high-level Programming Language. Topics Include: Fundamentals; History and Uses of C; Current State of Standard; Elements of C; Concepts and Terminology; Basic Structure of Program; Good and Bad Aspects of C; Data Types, Arrays, Structures, Pointers, Unions, and Bitfields; Operators and Expressions; Storage Classes; Library Functions; File I/O; Math, String, Database Operations; Modular Programming; Preprocessors, Macros, Conditional Inclusions/Expressions, Types, and Prototype; Additional Tools; Control Flow Constructs; Debuggers; and Additional Libraries.				
C++ for Experienced C Programmers	3/2-6/98		\$1600-\$2000*	9050
Prerequisite(s): Excellent C Language programming skills. Topics Include: Major Differences and Additions to ANSI C; Building C++ Classes; Introduction to Text I/O with C++; Function Overloading; Single Inheritance; Virtual Functions; Multiple Inheritance; Operator Overloading; Creating, Initializing and Assigning Objects; Passing and Returning Objects; Templates, Parameterized Functions and Classes; C++Stream I/O with the File System; and C++ Course Summary.				
FrameMaker (Basic)	Available on Request (3 days)		\$1000-\$1300*	8962
Prerequisite(s): Familiarity with use of a mouse. Topics Include: Editing and Formatting Text; Applying, Modifying, and Creating Paragraph and Character Formats; Searching for and Changing Text and Formats; Using the Thesaurus and Spelling Checker; Creating and Editing Graphics Using Drawing Tools; Using Text Run-Around; Applying Side Heads, Run-In Heads, and Straddles; Using FrameMaker Templates and Clip Art Files; Using Tables and Basic Table Formatting; Adding Illustrations to a Document (Anchored Frames); Using and Formatting Footnotes in Text and Tables; Changing the Basic Layout of a Document (on Master Pages); and reference Pages and Referenced Art.				
FrameMaker (Advanced)	Available on Request (2 days)		\$700-\$1000*	8964
Prerequisite(s): FrameMaker Basic course or equivalent knowledge and experience. Topics Include: Complex Auto-Numbering; Table Formats, Row Formats, and Table Variables; Formatting Text in Table Cells; Customizing Table Formats; Designing Custom Pages; Creating Templates for Documents, TOCs, and Indexes; Multiple Flows, Multiple Columns, and Connecting columns; Using Hypertext; Generating a Table of Contents and an Index; Creating a Book with Multiple Files; Using Cross-References and Text Insets; Creating Documents that Contain Conditional Text and Graphics; and Using Color.				

Course Title	Date	Time	Cost	Course Number
Perl Programming	11/18–21/97		\$1600–\$2000*	8095
<p>Prerequisite(s): Knowledge of Unix, the ability to edit text files (using vi or the OpenWindows Text Editor), and the ability to use basic programming constructs (variables, loops) to write simple programs in at least one programming language. Topics Include: Use Perl's Scalar Variables, Arrays, and Associative Arrays, Including Built-In Functions; Use Perl's Various Operators (Arithmetic, Conditional, String, Etc.); Use Regular Expression Metacharacters and Statement Modifiers; Open Files, Directories, and Input/Output Filters via Filehandlers; Use the Unix System Interface Functions; Create Subroutines and Use the Perl Standard Library; Use Packages for Encapsulation; Handle Signals and Errors; and Write Nawk-Like Reports.</p>				
SGI Network Administration	4/20–24/98		\$1800–\$2300*	11690
<p>Prerequisite(s): Completion of Silicon Graphics System Administration (Beginning) course or equivalent knowledge and experience. Topics Include: Networking Fundamentals; Network Configuration; Network Troubleshooting; Resource Management with Network; Information Services; Domain Management with Domain Name System; Electronic Mail with Sendmail; Remote File Sharing with Network File System & Automounter; Network Performance Monitoring; and Network Security.</p>				
SGI Origin 2000 for ASCII/ACL Programmers	Available on Request (4 hours)		\$250	14059
<p>This course is for programmers who need training in the Silicon Graphics programmer environments on the Los Alamos ASCII Origin 2000 systems. Prerequisites: Experience writing and debugging programs in C, C++, or Fortran and experience using appropriate Irix, UNICOS, or UNIX commands. Topics Include: Using the Load Share Facility at Los Alamos; Silicon Graphics Fortran, C, and C++ Compiler Command-Line; Using the Build Manager Tools to Compile Programs; Using the Source View, File Browser, Silicon Graphics Help, and Graphical View; Using the Static Analyzer to Create Filesets and Databases, and to Make Queries; Setting Traps (Breakpoints) and Looking at Data Using the Debugger; Setting Fast Watchpoints; Using the Fix+Continue Feature to Debug and Prototype Changes; Utilizing the Authentication Process (Kerberos, Ssh, DCE/DFS); and Utilizing HPSS.</p>				
SGI ProDev C++ Workshop	Available on Request (4 days)		\$1400–\$1800	12895
<p>Prerequisite(s): C Programming experience. Topics Include: Silicon Graphics C and C++ Compiler Environment Including Compiler Use and Compiler Flow; Customizing the ProDev Environment Including Changing Color Schemes, Using the Source View, and File Browser; Silicon Graphics Help and Graphical View; Using UNIX Regular Expressions; Writing Simple Make(1) Files; Using the Build Manager Tools to Compile Programs; Using the Static Analyzer to Create Filesets and Databases, and to Make Queries; Setting Traps (Breakpoints) and Looking at Data Using the Debugger; Setting Fast Watchpoints; Using the Fix+Continue Feature to Debug and Prototype Changes; Profiling Your Code and Determining Resource Usage Using the Performance Analyzer; Doing Heap and Memory Fragmentation Analysis Using Heap View; Determining the Coverage of Your Software Tests with Tester; Tuning Your C and C++ Code for Silicon Graphics; and Tuning Your Code for Memory and I/O Bottlenecks.</p>				
SGI System Administration (Beginning)	1/26–30/98		\$1800–\$2300*	11688
<p>Prerequisite(s): Familiarity with using Silicon Graphics IRIS workstations and system administration procedures on other open system platforms. Topics Include: The Role of the System Administrator; Set Up and Configuration of an IRIS Workstation or Server; Supporting a Group of Silicon Graphics Users; System Security Maintenance; Backups and Recoveries; Configuration of Disk Drives; System Installation and Application Software; Attaching Terminals and Printers; Modifying the system Start Up and Shut Down Sequences; Automating Administrative Procedures; and Performing Basic System Troubleshooting.</p>				

Course Title	Date	Time	Cost	Course Number
SGI System Administration (Advanced)	2/23-27/98		\$1800-\$2300*	11689
	Prerequisite(s): Completion of Silicon Graphics System Administration (Beginning) course or equivalent knowledge and experience. Topics Include: System Error Monitoring; Kernel Reconfiguration and Debugging; System Monitoring Tools; Process Management; MultiProcessor CPU Management; Memory Management and Tuning; Swap Management and Tuning; Disk Management and Tuning; XPS Filesystem Management; and System Security Concepts.			
Solaris 2.X System Administration (Beginning)	Available on Request (5 days)		\$1600-\$2000*	7477
	Prerequisite(s): Knowledge of Unix commands and an editor. Topics Include: Custom Install a Solaris 2.X Server; Use the Solaris 2.X Device Naming Conventions; Use the Format Utility to Display Partition Information; Change System Run Levels; Add Startup Files for Additional Services; Add and Remove Software Packages; Add Peripheral Devices, Configure Terminals and Modems; Administer Disks and File Systems; Configure NFS to Support the Client-Server Environment; Use the Automounter; Add and Remove Diskless Clients; Back Up and Restore File Systems; Perform Basic Recovery and Troubleshooting Procedures; and Use Scripts to Configure and Administer the NIS+ Environment.			
Solaris 2.X Network Administration	Available on Request (5 days)		\$1600-\$2000*	8107
	Prerequisite(s): Completion of Solaris 2.X System Administration (Beginning) class or equivalent knowledge and experience. Topics Include: TCP/IP Networking Model's Major Protocols; Monitor Network Traffic; Monitor and Control the Address Resolution Protocol Cache; Set Up, Configure, and Manage a Sun Internet Router with Subnets; Identify the Differences Between TCP and UDP; Manage Client-Server Transport Layer Communications; Configure and Maintain RPC-Based Applications Support; Describe Common Applications, Systems, and Network Bottlenecks; Test and Monitor System, Disk, and Network Loads; Use Monitoring Commands to Find Performance Bottlenecks; Set Up and Maintain a Simple Domain Naming Service (DNS) Environment; Set Up a Jumpstart Automated Network Installation Server; Identify Sendmail Functionality and Configuration; Install a Mail Server; and Install UUCP Between Existing Solaris 2.X Systems.			
Solaris 2.X Server Administration	Available on Request (4 days)		\$1600-\$2000*	
	Prerequisite(s): Solaris 2.X Beginning System Administration class and six months of experience OR two years of Solaris 2.X system administration experience. Topics Include: Install and Use Solstice Backup; Install and Use Solstice DiskSuite; Configure a Sun X-Terminal; List the Different Accounting Types and Set Up Accounting; List the Different License Configurations and Install a License Server Using FLEXlm; and List Reasons to Distribute Data and Use rdist for Data Distribution.			
UNIX (Basic)	Available on Request (4 mornings)		\$400	5267
	Prerequisites: Basic computer literacy (knowledge of the keyboard and mouse) are helpful. Topics: Getting Started; UNIX File System; Editing with VI; Manipulating Files; Using C-Shell Features; Customizing Your Environment; Navigating the Network; Job Control; Generic UNIX E-mail; and Electronic Mail Registration (EMR).			
UNIX (Advanced)	Available on Request (4 mornings)		\$400	12972
	Prerequisites: The Basic Unix class or equivalent knowledge. Topics: File Manipulation; File Reorganization; Network File System Concepts; Introduction to C-Shell Scripts; Conditional Execution; Shell Programming; The Korn Shell; Korn Shell Script Features; and SED Filtering Tool.			

Special Requirements

Administrative Partition Lab-Wide Systems (e.g., Travel, Data Warehouse, IA [BUCS, Stores], IB [EIS, FMIS, PAIRS])	
<input type="checkbox"/> Under 18 years of age	If you need to access Administrative systems, your Group Leader must provide a memo accepting responsibility for your actions and justifying your need for access. This memo is to accompany all forms taken to the security briefing (see "Contractor or Non-Cleared") section below. You may not access the Secure Partition.
<input type="checkbox"/> Contractor or Non-Cleared	Phone (505) 665-4444 (option #2) to obtain Access Authorization packet. Phone (505) 667-9153 to schedule a security briefing. Bring all forms including this ICN Validation Request to the security briefing for approval.
CIC-6 Security Briefing Approval Signature	Date

<input type="checkbox"/> Foreign National	Attach a copy of Form 982 (REQUEST FOR UNCLASSIFIED VISIT OR ASSIGNMENT BY A FOREIGN NATIONAL) with all approval signatures. Be sure Box #11 of Form 982 is completed. If you are not a visitor/assignee under a LANL/DOE approved Visit / Assignment Request, attach written justification from your host Group Leader or Division Director describing your need to access the ICN.
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Authorization (required)			
Print Manager Name (Group Leader or above)	Manager Z-Number	Group	
Manager Signature (Group Leader or above)	Mail Stop	Date	
If you are NOT a LANL employee you must have a LANL contact and obtain the contact's signature in addition to the contact's manager's signature.			
LANL contact: Read the following and sign below.			
By signing this form I affirm that I understand and accept the following:			
a. I am a regular Laboratory employee.			
b. I am responsible for forwarding password reauthorizations and verifying annual account reauthorizations for this user.			
c. I am responsible for notifying the Password Office within 10 days of changes in my status.			
d. I am responsible for notifying the Password Office immediately of changes in this user's status (termination, end of contract, etc.).			
Print LANL Contact Name	Contact Z-Number	Phone Number	Group
LANL Contact Signature	Mail Stop	Date	

NOTE: All Laboratory computers, computing systems, and their associated communication systems are for official business only. By completing this validation request and signing for a password and/or smartcard, you agree not to misuse the ICN. The Laboratory has the responsibility and authority to periodically audit user files.

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