

# BITS

## computing & communications news

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

### IT WORKS!



*Parallel Virtual Machine (PVM) is a software package that allows programmers to configure multiple, UNIX-based workstations into a single computational resource for scientific computing. Recent local modifications to PVM make it easier to write and execute applications. This enhanced version of PVM is now available throughout the Open computing network at Los Alamos. Support for PVM is provided by the Parallel-Distributed Computing Team of CIC-8. The illustration was developed by Genevieve Fox of CIC-8. For details see the article "PVM: Easier to Use" on page 8 in this issue.*

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# Laboratory Desktop Software Standards

The Information Architecture (IA) Project led the initiative to establish an initial set of Laboratory standards for desktop computer software. The IA Desktop Standards Team laid the groundwork for this initiative by analyzing Laboratory software procurement trends, hundreds of responses to an IA Desktop Software Standards Request-For-Help, and comments received on preliminary recommendations in a Lab-wide IA Request-For-Comment. The team based its software recommendations on the Lab-wide input and on the following criteria:

1. The software has widespread use throughout the Lab, making it a Laboratory de facto standard.
2. The product enhances or enables Lab-wide information sharing.
3. The software has technical capabilities that meet the needs of most Laboratory users.
4. The software supplier provides dependable service, quality, and documentation.

The team considered almost 40 software categories for PC, Macintosh, and UNIX desktop computers and selected a subset of these categories for initial standardization. Software packages within this subset of categories are partitioned into the following two groups.

1. Basic—software that should be on all Laboratory desktop computer systems.
2. General—software that is widely used and is either crucial or becoming crucial to Laboratory operations.

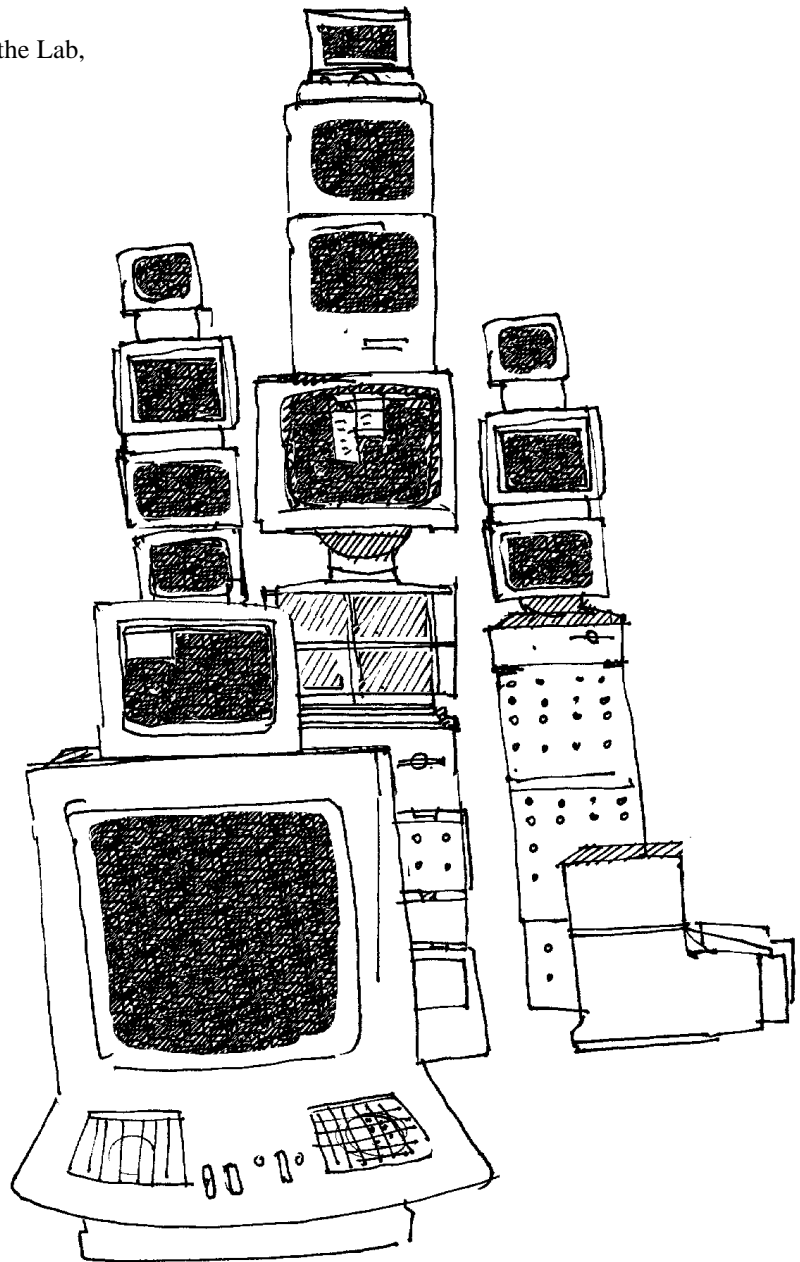
Tables 1 and 2 (see pages 2-4) list the products that have been adopted as Laboratory standards for basic and general desktop computer software.

To respond to changing technologies and evolving Laboratory needs, the Desktop Standards Team will review software standards at 6-month intervals. The first revision is scheduled for May 1996. The team welcomes your input. Please contact the IA Desktop Standards Team, [ia-desk@lanl.gov](mailto:ia-desk@lanl.gov), with your questions and comments.

Additional details about desktop computer standards and other IA activities are available at

<http://www.lanl.gov/projects/ia/stds/>

Marcia Hunsberger (CIC-1)  
and the IA Desktop Standards Team



**Table 1. Basic Desktop Software**

Category	Platform		
	PC	Mac	UNIX
A. Communications			
1. E-mail	Eudora (commercial version)	Eudora (commercial version)	Use the software that comes with the machine.
2. Internet Browser	Netscape or Mosaic <sup>1</sup>	Netscape or Mosaic <sup>1</sup>	Netscape or Mosaic <sup>1</sup>
3. Terminal Emulation (via TCP/IP) <sup>2</sup>	PC/TCP version 2.3 or higher (FTP Software, Inc.):  Use Telnet Wtnvt for VT/ASCII emulation.  Use Wtn3270 for 3270/EBCDIC emulation.	Use Versaterm or NCSA Telnet for VT/ASCII emulation.  Use TN-3270 for 3270/EBCDIC emulation.	Use the software that comes with the machine for VT/ASCII emulation.  Use x3270 for 3270/EBCDIC emulation.
4. File Transfer (ftp client)	WS_FTP  For PC/TCP, use the FTP client included in the PC/TCP package.	Fetch 2.1.2 or higher  For Versaterm, use the FTP client included in the Versaterm package.	Use the software that comes with the machine.
B. Electronic Document Distribution and Viewing <sup>3</sup>	Adobe Acrobat	Adobe Acrobat	Adobe Acrobat
C. Operating System <sup>4</sup>	Use DOS 6.0 or higher for Windows 3.1 or higher or use Windows NT.	MacOS System 7.5	Use the software that comes with the machine.

**Table 1. Basic Desktop Software**

Category	Platform		
	PC	Mac	UNIX
D. Protection			
1. Virus detection	Virex or Data Physician <sup>1</sup>	Virex or Disinfectant <sup>1</sup>	N/A
2. Password and Screen Lock Protection	Use the software that comes with Windows.	For simple passworded screenlock, use Darkside of the Mac.  For startup and file protection, use Norton Disklock.	Use the software that comes with the machine.
E. Utilities			
1. Diagnostic	Norton Utilities	Norton Utilities	Use the software that comes with the machine.
2. File Decompression	PKUnzip	Stufft Expander	Use the software that comes with the machine.

Note: Products are placed in the category for which they were designed rather than for which they might be used.

<sup>1</sup>When more than one product is listed as a standard for a given computer, the list is preferentially ordered; the first item is the standard for new acquisitions.

<sup>2</sup>The 3270/EBCDIC emulation is needed only for IBM mainframe access.

<sup>3</sup>Use Adobe Acrobat Reader to view pdf formatted document files. Use Adobe Acrobat Exchange to generate and view such files. A pdf format is recommended for institutional electronic document distribution and viewing.

<sup>4</sup>Windows 95 will be addressed in a forthcoming RFC (3/96).

**Table 2. General Desktop Software**

Category	Platform		
	PC	Mac	UNIX
A. Basic Business Applications			
1. Word Processor <sup>1</sup>	Microsoft Word or WordPerfect <sup>2</sup>	Microsoft Word or WordPerfect <sup>2</sup>	FrameMaker <sup>3</sup>
2. Spreadsheet	Microsoft Excel or Lotus 123 <sup>2</sup>	Microsoft Excel or Lotus 123 <sup>2</sup>	Lotus 123
3. Presentation Graphics	Microsoft Powerpoint	Microsoft Powerpoint	FrameMaker <sup>3</sup>
B. Calendar/Scheduling <sup>4</sup>	MeetingMaker	MeetingMaker	MeetingMaker (via Solaris server)
C. Groupware <sup>5</sup>	LotusNotes	LotusNotes	LotusNotes
D. On-line Forms	For passive forms, use Jetform Filler.  For interactive forms, use Web-based Forms (HTML).	For passive forms, use Jetform Filler.  For interactive forms, use Web-based Forms (HTML).	Web-based Forms (HTML)

Note: Products are placed in the category for which they were designed rather than for which they might be used (except for FrameMaker as noted below).

<sup>1</sup>Procurement of the Word, Excel, and Powerpoint suite should be made via the Microsoft Office package. For PCs, Microsoft Office Professional also includes the Microsoft Access database application.

<sup>2</sup>When more than one product is listed as a standard for a given computer, the list is preferentially ordered; the first item is the standard for new acquisitions.

<sup>3</sup>Although FrameMaker is a desktop publishing application, it is used for word processing and creating presentation graphics by many UNIX users.

<sup>4</sup>For scheduling facilities, meetings, and group activities; not necessarily for personal information management.

<sup>5</sup>Groupware is a relatively new applications area still under active development. Organizations need to assess their own cost/benefits associated with using Groupware.

## The CIC-6 Vendor Training Program

While the Customer Service Group (CIC-6) continues to offer support for vendor computer training, there have been some changes in the way this support is provided. Leslie Linke is now the Vendor Training Coordinator for CIC Division; she has been in this position since January 1996. Leslie assisted the vendor training program from 1989 to 1994 and she served as Training Generalist for CIC Division from 1994 until January 1996.

Vendor training is provided in many areas such as programming languages, system administration, networking, and World Wide Web development tools. The Vendor Training Coordinator provides a variety of services that include course scheduling, vendor acquisition, system administration, EDS administration, and class facilitation.

BITS publishes a list of the vendor classes currently being offered and the classes that can be arranged by request (see the "In the Classroom" section in this issue). Information about vendor classes is also available via the Internet at

<http://www.lanl.gov:8010/computer-information/ComputerTraining/Vendor.html>

Another change within the vendor training program is that the registration form used to solicit registration from students is no longer required. (This form will no longer be published in BITS.) To request registration in a course, please contact the CIC-Division Vendor Training Coordinator at (505) 667-9399 or send e-mail to [comp-train@lanl.gov](mailto:comp-train@lanl.gov). Once you are

on the registration list for a scheduled course, you will be notified via memorandum about course specifics; an authorizing signature will be requested at this time. However, registration does not guarantee that the course will be scheduled. A course cannot be scheduled until a minimum number of people have registered. Therefore, it's important that potential students don't necessarily wait for a course to be advertised before indicating an interest.

Several state-of-the-art facilities are available for on-site computer classes. The Computational Testbed for Industry (CTI) Classroom is located in an Open area and has 16 SGI computers, each with 32 MB RAM, a local hard disk, and access to a 380 VGX server. The CTI classroom is being upgraded with 8 PCs (Pentiums and 486s) connected to a Novell server. It also has a video projection system and other audio/video equipment available. The CIC-Division Classroom (Secure area) is home to 8 Sun SPARC workstations served by a SPARC workstation server. This classroom is also equipped with a video projection system. Our PC/Macintosh classroom is in the Otowi Building (Room P180) and houses 6 PCs and 9 Power Macintoshes; this classroom is primarily used for Lab-wide systems training but can be used for vendor training as needed.

Please contact the Vendor Training Coordinator, Leslie Linke, with questions regarding vendor computer training.

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Customer Service Group (CIC-6)

## On-Line Semiannual Passwords for Secure Users

The next time your secure-classified or secure-unclassified ICN password comes up for renewal, you'll notice two changes in the renewal procedure:

- (1) Your new password can be obtained from the convenience of your office simply by logging onto the Secure Register machine and following the prompts.
- (2) The password will be valid for 6 months. Like your Open password, Secure passwords now expire semiannually to comply with DOE orders.

If you have questions, please contact the ICN Password Office at (505) 665-1805 or [validate@lanl.gov](mailto:validate@lanl.gov). You may also contact the CIC Customer Service Center at (505) 665-5444 or [cichelp@lanl.gov](mailto:cichelp@lanl.gov).

Sharon Wilhelmy  
Customer Service Group (CIC-6)

# Cray CF90 Programming Environment 2.0 for PVP and SPARC Systems

In the February 1996 issue of BITS, we announced the Cray Programming Environment 2.0. This product was released on February 15. As stated in the February article, Programming Environment 2.0 contains new products as well as significant upgrades to existing products. The CF90 Programming Environment 2.0 for PVP and SPARC systems includes the CF90 compiler, run-time libraries, and the following supporting tools: ATExpert, program browser xbrowse, cflist, cflint, libcif, and the TotalView debugger. The CF90 compiler also contains CF77 features, providing functionality and performance that were not available in the CF90 Programming Environment 1.0 release. A criterion for the 2.0 release is to provide the same performance level as the CF77 6.0.4 compiling system as well as equivalent functionality. The CF90 Programming Environment 2.0 for SPARC systems contains performance enhancements along with CF77 features and functionality that were not available in the CF90 Programming Environment 1.0 release.

As stated in previous articles, more information about CF90 2.0 is available in the appropriate Cray publications and on the Web at

[http://www-cic8.lanl.gov/dist\\_comp2/MATH/prog\\_env\\_2.0.html](http://www-cic8.lanl.gov/dist_comp2/MATH/prog_env_2.0.html)

## Compatibilities and Differences

Users should carefully consider the topics discussed in the paragraphs below before writing new code or porting code written for programming environments released prior to the 2.0 programming environment releases. Some of the features listed in these paragraphs bring the CF90 2.0 compiler into conformance with the Fortran 90 standard.

**Manifest intermediate format (MIF).** The CF90 2.0 compiler for both the SPARC and PVP platforms introduces the MIF interface between the compiler “front end” and the optimizer and code generator (optcg). This new interface was developed to provide a textual representation that can be used for interprocedural analysis. The benefits of using this MIF interface are the ability to “inline” and the decrease in memory usage. Inlining capability is required to provide equivalency of functionality and performance between the CF90 2.0 compiler and the CF77 6.0.4 compiling system. Performance testing shows that maximum memory usage could decrease by as much as 20% for some codes.

**List-directed output of character/noncharacter mixture.** The output format for a list-directed statement that contains a

mixture of character and noncharacter items is being changed to conform to the Fortran 90 standard. This change only affects programs compiled with CF90. The change causes the format of the output to differ between CF77 and CF90.

**Behavior of list-directed output is changed.** The behavior of a “list-directed write” after a nonadvancing formatted write statement has changed in CrayLibs 2.0. In previous releases, output from the list-directed write statement began on a new record after flushing the partial record from the previous non-advancing write statement. This change allows list-directed writes to continue on the current record begun by a prior non-advancing formatted, write statement.

**Equivalence of CF90 programming environment with CF77 6.0.4 compiling system.** Below are the areas of functionality required to ensure the functional equivalency of CF90 2.0 with the CF77 6.0.4 compiling system.

- Enhanced CF90 unformatted I/O performance
- Inlining array intrinsics
- Bit matrix multiply support
- Conditional compilation preprocessing support
- Runtime checking
- Vector search and update loops
- Enhancements of optimization messages
- FPP directives for equivalency
- Automatic scoping when tasking
- Improved pattern matching
- New Inliner (IPO)
- Automatic scoping with user-directed tasking
- No reassociation
- Vectorized pack and unpack operations
- Regioning of data flow
- Debug symbol tables availability with autotasking
- Addition of STACK directive

**CF90 2.0 performance improvements.** Listed below are the performance optimizations required to ensure that CF90 2.0 provides performance equivalent to the CF77 6.0.4 compiling system.

- Tasking of singly nested and innermost loops
- Tasking threshold checks
- Invariant reciprocal hoisting
- Multiple vector reductions
- User interface changes
- Elimination of redundant vector loads/stores



- Support for 132 columns in fixed source form
- Enhanced -x disable directives option
- Enhanced PVM support
- Option to allow full word size

### CF90 Programming Environment 2.0 for SPARC Systems

Described in the paragraphs below are the specific features and functionality of the SPARC CF90 system that are included in the Programming Environment 2.0 releases. These features are in addition to those previously mentioned in this article. The SPARC-specific features provide enhanced performance and further compatibility with Cray PVP systems, providing more capabilities than are commonly found in workstation environments.

**Equivalence of SPARC CF90 2.0 to Cray PVP.** Listed below are the features and functionality needed to further the equivalence between CF90 on SPARC systems and CF90 on Cray PVP systems.

- 128-bit floating point support
- 64-bit integer support
- 64-bit logicals support
- Complex\*32 support
- Generation of position independent code (PIC)
- Installation time compiler configuration
- POSIX Fortran routines
- ASSIGN command added for CF90 SPARC
- Implement MP\_DEDICATED and MP\_HOLDTIME

Below is a list of the features and functionality needed to further the compatibility of Cray software on SPARC systems with other vendor's software currently running on workstations.

- Support for Sun format hex constants
- Profiling support
- Enable default types to be undefined

**SPARC CF90 2.0 new features and functionalities.** The following reflect features that were not in CF90 Programming Environment 1.0 for SPARC systems.

- Add %val intrinsic to CF90
- Directive to map external names outside Fortran name space
- Support for 8 character or larger Hollerith
- Data initialization of blank common

**SPARC CF90 performance enhancements.** The SPARC-specific features that provide compile time and runtime

performance enhancements are listed below. These enhancements are in addition to those performance features pertaining to SPARC systems that were described earlier.

- Clarification of optimizations at all opt levels in CF90
- Change iteration scheduling technique
- Selected LIBM entries for SPARC systems

### Performance Enhancements

The features listed below are performance enhancements in addition to those that satisfied the CF90 2.0 commitment of ensuring performance equivalence to the CF77 6.0.4 compiling system. These performance improvements target the PVP and SPARC platforms, with some features able to improve the performance for more than one platform. In addition, some of the performance features noted here address the C++ 2.0 release as well.

- Hierarchical memory optimizations of loops
- Strength reduction of floats
- Loop fusion enhancements
- Smaller executable stack size requirements
- Temporal locality optimization
- Vector conditionals with gather/scatter
- Conditionals at vector length of 128
- Improved vector merge conditionals
- Improved vector temporary memory analysis
- Full loop vector length for vector merge
- Two loop reduction invariant IF hoisting
- Array syntax vectorization at all optimization levels
- Expression compression after linearization
- Vectorization of complex product reductions
- Eliminate duplicate subscripted loads
- SIN/COS to COSS
- Improved vector common sub-expression elimination
- Denormalize loops
- Improved code hoisting
- Pattern matching
- Improve I/O performance
- Extraction of constants from data statements
- Tail recursion support
- Memory dependence analysis of loops

Next month we will wrap-up this series of articles on the Cray 2.0 Programming Environment with an overview of the tools and a status report.

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## PVM: Easier to Use

PVM (Parallel Virtual Machines), a software library for writing and executing parallel programs based on message passing, is installed throughout the Open LANL computing network via a shared server. (For details on accessing this server, see your system administrator or the Web page at <http://storage.lanl.gov/usrlanl.html>.) Plans are being made for a similar distribution system in the Secure computing environment. Installation on the Open network allowed us to make certain modifications to the PVM source that have made PVM easier to use. This article discusses these changes as well as other local modifications and sources for further information.

### Don't Worry about Environment Variables

The vanilla version of PVM requires the user to set various environment variables (PVM\_ROOT, PVM\_ARCH, etc.). These variables are necessary so that the software can access various executables based on where PVM is installed, which allows for the possibility of using PVM in various locations. However, the LANL "icn-tools" repository has given us the capability to install software in a common location (`/usr/lanl/pvm3`) so we can "softcode" the environment variables for you. (By softcode we mean that if the user chooses to set the environment variables, they will not be overwritten.)

To access the PVM library in this environment, simply add `/usr/lanl/pvm3/lib` to your path in your `.cshrc` file (not your `.login` file). This gives you all PVM binaries, including XPVM.

### Easier Program Startup

There are two steps to running a PVM-based program: configuring the virtual parallel machine and executing your program across it. We've combined both requirements into a single user "callable" function named `pvm_initialize`. Advantages for using this initialization function are as follows:

- 1. Code reuse.** Programs written in the same style (e.g., SPMD, Master-worker) often begin with the same 20 lines of code. These 20 lines form the basis of this function.
- 2. Automatic machine configuration.** This function reads in a list of machine names from a user-supplied file; PVM uses this file to initiate startup on the machines listed.

Notes on automatic machine configuration:

- Automatic machine configuration does not startup PVM on the parent host. Instead, PVM should be started up on the parent host manually. From your UNIX prompt, type "pvm". This will turn windows into the PVM console.

- The virtual machine is not dismantled upon termination of your program. This feature is necessary so that more than one job can run across your machine. To dismantle the virtual machine, enter "halt" from the PVM console or run "pvm\_cleanup.prl" as discussed below.
- It is not an error if PVM is already running on a machine listed in the hostfile.

**3. Use of process ids instead of PVM tids.** PVM sets up an addressing scheme between executing processes using a 32-bit integer. A more understandable scheme is to assign process identifiers to tasks from 0 to `ntasks-1`, in which the parent process `my_task_id` is 0. The `pvm_initialize` function makes these assignments and returns the appropriate value to the calling process. With these assignments, other processes can be addressed relative to `my_task_id`. For example, processes can be addressed as `my_task_id+1`, `my_task_id-1`, etc. Of course, PVM still requires the use of the `tid`, so ultimately your call to `pvm_send` must use it. However, your code will be more readable. For example:

```
pvm_send( tids[my_pe+1], msg_tag );
```

Note that if you are using the dynamic group capability, processes are also assigned a group identifier. If you want the group instance number to match up with the group identifier, you must enforce this in your programming scheme (for example, a token ring algorithm).

**4. Runtime determination of a homogeneous computing environment.** PVM lets your program execute across a virtual machine consisting of different architectures such as Suns and DECs. (For a discussion of heterogeneity and homogeneity, see the June 1995 BITS article "Getting the Most out of PVM.") However, you must "hardcode" this capability into your code (`pvm_initsend`). We've developed functionality that lets you avoid this hardcoding by recognizing heterogeneity at runtime and setting appropriate parameters. To take advantage of this functionality, use `DataEncodingNonContiguous` and `DataEncodingContiguous` (noncontiguous data and contiguous data, respectively) instead of hardcoding `PvmDataDefault` (heterogeneous environment), `PvmDataRow` (noncontiguous data in a homogeneous environment), or `PvmDataInPlace` (contiguous data in a homogeneous environment). Then upon startup, `pvm_initialize` will set these parameters to the appropriate values.

In the contiguous case, the code would look like

```
pvm_initsend( DataEncodingContiguous );
```

```
pvm_pkint( a, m, 1 );
pvm_pkfloat( x, n, 1 );
pvm_send( tids[target_pe], msg_tag );
```

In the noncontiguous case, the code would look like

```
pvm_initsend( DataEncodingNonContiguous );
pvm_pkfloat( x, n, 2 ); /* Stride length 2 through data */
pvm_pkfloat( x, p, 1 );
pvm_send( tids[target_pe], msg_tag );
```

Note: The next four options are invoked by editing a simple text file which will be read in by `pvm_initialize`.

### 5. Easier control over the distribution of the user program to specific machines.

**6. Option to execute your program under debugger control.** Each spawned process will be brought up in a separate window under debugger control. To debug the parent task, it must be started up directly using your local debugger.

Another local modification is to allow the user to set an environment variable in order to use a debugger other than the default located on the participating machine. For example, `dbx` is the default on Sun workstations. However, if you want to use the Sun debugger named “`debugger`” execute the following:

```
% setenv PVM_DEBUGGER debugger
```

A warning is necessary for this particular debugger. The start-up script for the PVM debugging shell is named “`debugger`.” Therefore, in this case you must ensure that the location of your Sun debugger is inserted in your path before `/usr/lanl/pvm3/lib`. Otherwise, the PVM debugger script will get in an infinite loop bringing up `xterms` (until your workstation runs out of memory).

Defaults for some workstations are given below (for machines not listed, see `/usr/lanl/pvm3/lib/debugger2`).

- Sun OS, IBM RS6K, and DEC alpha: `dbx`
- HP/UX: `xbd`
- Next: `gdb`
- SP2: `pdbx`

An additional note concerning the PVM debugger is that you must ensure that the display variable of the participating machines is set to your local machine (`setenv $DISPLAY localhost:0`) and that your local machine allows display from the remote hosts (`xhost + remotename`).

**7. Option to force child task output (stdout/stderr) to the stdout of the parent.** This is accomplished with a call to `pvm_catchout`, which is documented in the man pages and Users’ Guide. Note that there is no assurance of any output ordering among tasks. Without this option, child task output is written to a log file (`/tmp/pvml.<uid>`) on the machine on which the task is running.

**8. Option to startup XPVM on a specified machine.** (For a discussion of XPVM, a program execution tracing tool, see the December 1994 BITS article “PVM 3.3 and XPVM Installed and Supported on the Open Cluster.”) This functionality is available separate from `pvm_initialize` via the function `xpvm_initialize`, which your program can call directly when not using `pvm_initialize`. Additionally, if you want to configure XPVM separate from `xpvm_initialize`, you can call the function `join_xpvm`, which will set the connection between your program and XPVM to capture trace files. (Man pages are available for each of these functions.)

**9. Verbose error reporting.** If relevant, PVM functions return an integer status code (the “`info`” parameter), which is printed to the screen if an error occurs. Unfortunately, the error code is not very descriptive. Therefore, we’ve added verbose error reporting to the library. The locally developed functions (`pvm_initialize`, `xpvm_initialize`, etc.) described above utilize this error reporting. For example, instead of seeing “-7” printed to your computer screen, you will see the following:

```
“Specified executable cannot be found. Ensure that your host-
file contains the correct location and that your executable is
located there with the correct permissions. Beyond a visual
check, you can see what PVM thinks the location is by
starting up PVM under a debug option as follows:
```

```
pvm_d -d8 hostfile
```

For each machine listed in the hostfile, find the ‘`ep`’ option. The value will be in double quotes. If the quotes are empty, your hostfile option was not interpreted by PVM. See the PVM User Guide for assistance or contact your local PVM administrator.”

When not using our functions, you can get a basic error message using the `pvm_error.prl` function. From a UNIX

command line, type `pvm_error.prl <error number>` (this function simply parses the message from `pvm3.k`, where all pvm errors are parameterized).

*Include file:* You must include `pvm3_lanl.h` instead of `pvm3.h` (`pvm3.h` is included in `pvm3_lanl.h`) to use the functionality of `pvm_initialize`. In addition to listing the prototypes for the functions described above, it defines and sets certain global variables such as `my_task_id` and the number of tasks running. This file is found in `/usr/lanl/pvm3/include`. It also lists the prototype for the functions described above.

*Program execution:* C Programs compiled using this function expect command line input of the number of processes to be executed and, optionally, the location of the user executable. For example:

```
% a.out -npes 4 -cwd $pwd
```

Future plans include a graphical user interface for startup as well as execution monitoring.

### Kerberos

To startup daemons on remote machines, PVM by default executes a remote shell (`rsh`) that executes `/usr/lanl/pvm3/lib/pvmd`. (When passwords are required, `rexec()` is used in place of `rsh`.) However, kerberos startup is often required or preferable. In this case, we require the user to set the environment variable as follows:

```
% setenv PVM_RSH ksh
```

If this environment variable is not set, `rsh` is assumed.

Note that kerberos tickets have a limited lifetime. Therefore, `pvm_addhost` will fail if the ticket has expired.

### Don't Worry about Group Server Startup

For a variety of reasons, it is a common error for PVM to fail to find the group server daemon. Again, because PVM is located in `/usr/lanl` throughout the Lab, we simply hardcoded this location into the group startup process. Therefore, users need not be concerned with setting a "soft link" to the daemon as before.

Although the dynamic group capability of PVM is often a major bonus of this particular software (e.g., fault tolerance), performance of group operations can be unsatisfactory, particularly when your program is executing across a network of workstations (as opposed to an MPP, for example). This is because all message passing involving groups are routed

through a coordinating program (group server daemon `pvmgs`) that is executing on a machine in your configuration, which of course adds overhead. However, it is common that once a group is formed, members are not added or they are added infrequently, and thus the dynamic capability is not needed. In this case, a call to `pvm_freezgroup` will allow for intergroup communication without handling by the group server, which can significantly improve performance. If a new member is to be added, all group members must exit the group (`pvm_lvgroup`) and then reform (`pvm_joygroup`).

### pvm\_cleanup

A major feature of PVM is its ability to create parallel machines using collections of loosely coupled workstations found throughout the work environment. However, for a variety of reasons, connections between the participating machines can be disrupted or permanently lost. When this happens, control of the processes on remote machines is also lost. These problems are of two types: (1) loss of control over the PVM daemon, preventing reconfiguration of the virtual machine and (2) processes formally running under the control of the PVM daemon may continue, wasting CPU cycles.

Cleanup of these processes can be accomplished using the locally developed perl script `pvm_cleanup.prl`, which is found in `/usr/lanl/pvm3/lib`. A man page describes its usage (`man pvm_cleanup`). This script has been customized for the LANL Network Compute Servers (NCS). It may be used as above or, in the absence of the "hostfile" argument, it automatically performs the cleanup operations on each machine within the ONCS or SNCS. (We can provide this customization for LANL users for their particular collection of workstations upon request.)

### Documentation

Man pages are available for each of the functions described above and for an overall description of the local modifications (`man pvm3_lanl_mods`). All man pages for these functions as well as all PVM functions are located in `/usr/lanl/pvm3/man`.

### Drawback

The drawback in using the above described features is that they are local modifications developed specifically for use in the LANL computing environment. However, we can provide you with the source code if you want to run your program in other environments.

### XPVM

The latest version of XPVM (see the December 1994 BITS article) has also been installed. It is accessible via `/usr/lanl/pvm3/lib`.

Much of the graphics functionality has been converted from Tcl/Tk into C, which has increased its efficiency and therefore reduced its intrusion into the performance of your code.

A new feature is a fuzzy view of actual bandwidth realized between machines. The network view connections thicken as average bandwidth increases.

### **LANL Support**

The Parallel-Distributed Computing Team in CIC-8 provides support not only for explicit message passing paradigms (PVM, MPI) but also for object oriented methods (POOMA) and HPF (High Performance Fortran). For details, see our team Web page at

[http://www.cic-8.lanl.gov/dist\\_comp2](http://www.cic-8.lanl.gov/dist_comp2)

For additional information, see the following BITS articles regarding parallel computing:

- “Introduction to PVM Support,” November 1994.
- “PVM 3.3 and XPVM Installed and Supported on the Open Cluster,” December 1994.
- “Getting the Most Out of PVM,” June 1995.

Announcements are also made through a mailing list, [ptools@lanl.gov](mailto:ptools@lanl.gov). You may join this list by sending e-mail to [listmanager@lanl.gov](mailto:listmanager@lanl.gov), with the text message “subscribe [ptools@lanl.gov](mailto:ptools@lanl.gov)” (no subject entry).

### **PVM User Group Proceedings**

Proceedings from the recent PVM User Group Meeting held in Santa Fe are available via the World Wide Web at

<http://www.cic-8.lanl.gov/pvmug96>

Presentations covered applications such as protein folding, seismology, earth mantle convection modeling, algorithms (such as load balancing for finite element modeling), program development tools (such as the locally developing Heterogeneous Parallel Debugger), program execution management, performance experiences, and resource management.

### **MPI Information**

The formal standard, MPI (Message Passing Interface), continues to gain momentum, both in the user community and by vendors. Therefore, we plan to provide the functionality for MPI implementation as appropriate. As these plans are implemented, announcements will be made in BITS and through other channels.

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## CIC-17 Offers Highlight Color Printing

Customers who utilize the network printing services provided by PAGES (Media Group/CIC-17) now have the ability to print in highlight color within the OPEN and ADMIN environments.

### What Is Highlight Color Printing?

Highlight color printing is not full color printing. Highlight color printing is essentially black and white printing with the addition of one color—the highlight color. The customer may choose one of three highlight colors: red, green, or blue. The chosen color serves as the designated highlighter for the entire document. Only one highlight color is allowed per document; that is, the document is printed using only one highlight color at a time. Think of highlight color printing as a way of highlighting particular segments of your document, just as you might manually highlight important passages in a text book. The highlighted segments stand out because they are printed in the requested highlight color while the rest of the document is printed in black and white.

### What File Formats Can Print In Highlight Color?

To print in highlight color, the file format must be capable of specifying color. Any file format that PAGES can print in color can also be printed in highlight color. This rules out simple ASCII text files since ASCII format has no mechanism for specifying color. The file formats for which highlight color printing is possible are PostScript, CGS, CGM (raster subset), TIFF, SUN, and IRIS. CGM, TIFF, SUN, and IRIS are raster file formats and although you can highlight color print full color raster images, this is not a useful application of the highlight color printer. Highlight color printing is primarily intended to highlight passages of text. PostScript and, to a lesser extent, CGS are the principle file formats that can fully utilize the advantages of highlight color printing.

### What Effect Will Highlight Color Have On My Document?

Highlight color printing doesn't just happen. The document must be properly prepared before it can be highlight color printed. An unprepared black and white document sent to PAGES for highlight color printing will come out as, well, black and white. The document must specify with color commands what text and/or images are to be highlighted and in what color (red, green, or blue).

### What Happens When a Multicolored Document (such as a full color raster image) Is Highlight Color Printed?

Results from printing multicolored documents depend on the highlight color requested and the particular colors used in the image. PAGES maps the three-dimensional RGB (red green blue) color space of the image to a two-dimensional color

space of K (black) plus R, G, or B. For example, if green is selected as the highlight color, the printer will map from RGB to G&K. This mapping is not one-to-one and as such some information is lost. The mapping attempts to maintain the overall color quality of the image by using the following rules:

- (1) Colors with a hue matching the highlight color are not changed.
- (2) Colors with a hue close to the highlight color are rendered with color but with a saturation level that decreases as the hue shifts away from the highlight color.
- (3) Colors with a hue complementary to the highlight color are reproduced in shades of gray.

### A Picture Is Worth a Thousand Words

On display in the PAGES concourse display case is an example of a full color image rendered three ways to show the effect highlight color printing has on a full color image. The nature of mapping is visibly apparent in these examples.

### What Documents Can Best Benefit From Highlight Color?

Simply put, any document in which highlighting with a single color makes sense is a good candidate. Examples include output from spreadsheet, forms builder, and word-processing applications. Just keep in mind that a highlight color printer is not a color printer and therefore should not be used to print what would normally be printed on a color printer.

### Sending A Highlight Color Document

To print a document in highlight color from a UNIX platform, use the shipping utility `ppages` with the following command line syntax:

```
ppages -ft <filetype> -format ltr -bw -hc <highlightcolor> filename
```

Note that `<filetype>` equals `ps`, `cgs`, `cgm`, `sun`, `iris`, or `tiff` and that `<highlightcolor>` equals `r`, `g`, or `b`. Format is set to `ltr`, designating 8.5 x 11 inch letter size paper. The black and white option, `-bw`, is specified because the highlight color printer is really a black and white printer with the added capability of highlighting.

Suppose we wish to print a PostScript file called "mydocument" with highlight color blue. The appropriate `ppages` syntax would be as follows:

```
ppages -ft ps -format ltr -bw -hc b mydocument
```

From a Macintosh, highlight color can be selected on the 8.5 x 11 bw printer. When you print, click the Options button and select the color you want. Note that this assumes you have installed the PAGES for Macintosh software, which is available at

[http://pages-sv.lanl.gov/pages/software/Mac/PAGES\\_For\\_Mac\\_Installer.hqx](http://pages-sv.lanl.gov/pages/software/Mac/PAGES_For_Mac_Installer.hqx)

From MS Windows, click the Features button in the Print Setup dialog box and choose the desired highlight color. This assumes you have installed the PAGES for Windows Software, which is available at

<http://pages-sv.lanl.gov/pages/software/Windows/page-win.exe>

For more information on highlight color printing, call the PAGES Customer Assistance Desk at 667-2905 or the author cited below.

For more information on ppages, call Gerald Morris at 665-6547.

For more information on sending files from Macintosh or MS Windows, call Lee Ankeny at 665-0195.

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## PAGES Hardware Status Now Available on the Web

A World Wide Web page is now available for checking the status of the hardware devices used by PAGES (Print And Graphics Express Station). When a PAGES device breaks down, we will use this Web page to keep you informed about what broke and when it might be available again.

To access the hardware status page, point your Web browser at

[http://pages-sv.lanl.gov/pages/hardware\\_status.html](http://pages-sv.lanl.gov/pages/hardware_status.html)

And don't forget that we have a job status Web page if you want to check on your PAGES jobs.

[http://pages-sv.lanl.gov/pages\\_status.html](http://pages-sv.lanl.gov/pages_status.html)

You might also want to visit our recently expanded PAGES status help page. This Web page provides detailed explanations of the queue names and other status-related minutiae.

[http://pages-sv.lanl.gov/pages\\_status\\_help.html](http://pages-sv.lanl.gov/pages_status_help.html)

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Software Design and Development Group (CIC-12)

## Questions and Answers for Lab-Wide Systems Users

This article is intended for those who use Lab-wide Business Information Systems on the IB machine. What follows are frequently asked questions and corresponding answers regarding the assigned authorities within the Electronic Authorization System (EAS) and the Signature Authority System (SAS).

**Question**—I received notification via e-mail that my EAS authorities are about to expire. How do I know which ones are about to expire?

**Answer**—You can view your EAS authorities by logging onto IB and typing EALAU in the menu option field. Enter your z-number and then press return. A list of your EAS authorities will be displayed showing the expiration dates.

**Question**—I received notification that my SAS authorities are about to expire. Who updates these authorities?

**Answer**—The authority to update, add, or delete signature authorities has been assigned to all deputy-group leaders and above. Group leaders can delegate this authority to another individual by assigning that individual SAADM (SAS Administrator) authority. Updates are made in the SAMZN screen.

**Question**—My SAMGR authority is about to expire, but my manager can't update it on the EAAUS screen. How do I get it updated?

**Answer**—The SAMGR authority cannot be updated on the EAAUS screen. SAMGR authority is an EAS authority and therefore is automatically updated when you update the SAADM (SAS Administrator) authority on the SAMZN screen in SAS.

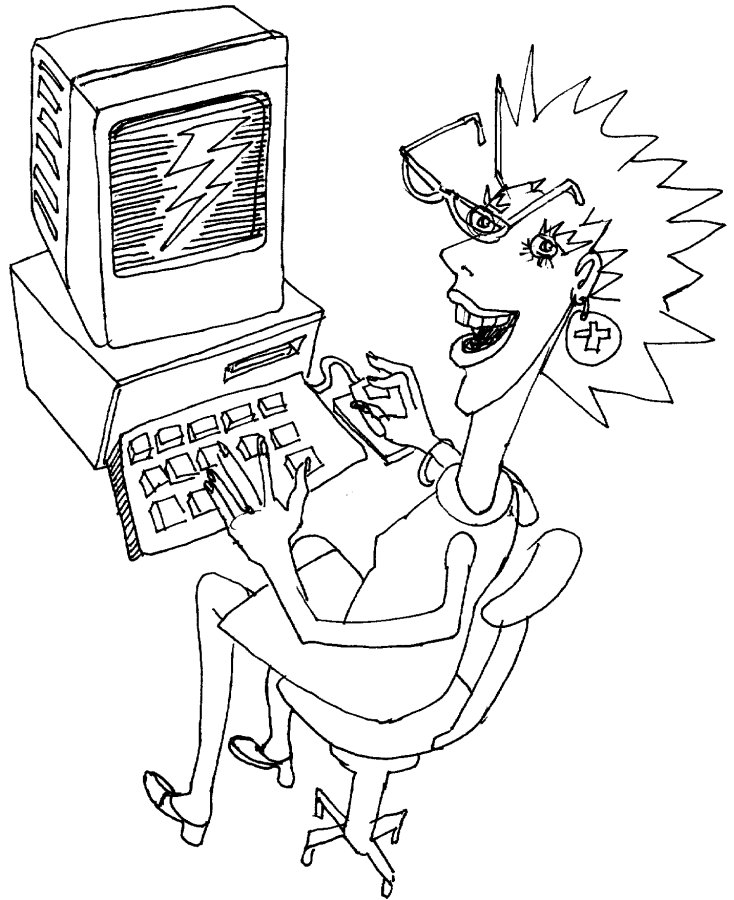
**Question**—My Sigma 14 and 15 authorities were deleted. How do I get them reassigned?

**Answer**—Sigma 14 authority can only be assigned by Roger Taylor or Yolanda Garcia in the Engineering Science and Applications (ESA) division. You can call Yolanda at 7-4113 or Roger at 7-3867.

Sigma 15 authority is only assigned to certain organizations. The line managers of these organizations can assign Sigma 15 authority to those who need it. To view a list of these organizations, enter SASGF on screen SAUOD in SAS. If you need Sigma 15 authority and your organization is not on this list, call Larry Freestone at 5-1802.

If you would like hands-on training to use SAS, call 5-4444, ext. 4.

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Customer Support Group (CIC-6)





# Creating Effective Web Page Backgrounds

When we stop to realize how common the various colors and patterns of page backgrounds have become on the World Wide Web, it's easy to forget how new they are. It was barely a year ago, March 1995, when Netscape released its first browser that supported backgrounds (Navigator 1.1 beta); NCSA Mosaic was several months behind. Since then, backgrounds have rapidly become ubiquitous.

As with any new capability, the results have been mixed. Sometimes the background works well, complementing the subject matter, other graphics, and overall layout of the page. Other times the colors clash or jar, or the texture of the background makes the text unreadable.

During a period of widespread experimentation, these types of results are predictable and to a point justifiable. We've had more than enough experience by this point, though, to work out a few basic tips for making backgrounds effective.

## Determine the Background's Purpose

Before creating a page background, the first thing to determine is why you want it at all. It's not necessarily going to make anything easier to read, the results will not be completely predictable, and it's not going to take the place of good content. Having said that, several legitimate purposes for backgrounds can be identified:

- A subtle logo can be embedded in the background to reinforce the corporate or group identity. For example, see the "ENERGY" logo in the background of the DOE Lessons Learned Information Services home page (<http://www.hyperk.com/trl/ll/ll.html>).
- A recognized motif can be similarly used to reinforce identity. See the clouds used on the Windows95 applications page (not Microsoft) (<http://www.windows95.com/>).
- A forced-white background can be used to ensure that type is readable and other graphics work correctly. See the Microsoft home page (<http://www.microsoft.com/>); its images have shadow effects that require a white background.
- A background can be used as an integrated part of the overall graphic design. See the Lotus home page (<http://www.lotus.com/>), which uses a vertical band in its background to separate parts of the page.
- A consistent background can be used throughout a Web space in order to foster the sense of a unified "place." See the U.S. Fusion Energy Sciences Program Web site

(<http://wwwofe.er.doe.gov/>), which has a consistent background throughout most, though not all, of its HTML Web space.

The purpose should come first. If the purpose can't be identified, the use of a background probably isn't justified.

## Do Not Rely on the Background

Even cases in which the background is used to reinforce content (e.g., with a logo), it should never be relied on as the only means of communicating content. Not all browsers support backgrounds, and even those that do will not show backgrounds if in-line images are turned off.

Any content that is carried in the background should also be expressed in the text. The more important the content, the more this point is true. Copyright notices, for example, should never be shown by graphics only (though I've seen this done).

## The HTML "Standard"

The Information Architecture guideline, IA-5815: Laboratory Standard HyperText Markup Language, seeks to balance the pressure to adopt new HTML with the need to use a stable HTML that is widely supported and likely to remain so throughout a document's life cycle. To do this the guideline calls for HTML that

- Is part of the IETF HTML 2.0 specification or has been proposed by the IETF HTML working group,
- Is supported by multiple browsers, and
- Does not cause older browsers to crash.

The following HTML construction meets these criteria:

```
<BODY BACKGROUND="filename.jpg">
```

or

```
<BODY BACKGROUND="filename.gif">
```

With this construction, the graphics file is read by the browser and tiled across the display underneath any text and other graphics.

The following HTML constructions, although widely used, do not meet the IA-5815 tests:

```
<BODY BGCOLOR=?> and <BODY TEXTCOLOR=?>
```

Even though these constructions are supported by several browsers, they have not been endorsed by the IETF HTML Working Group (which is currently debating several alternatives).

Hence, the “standard” way to construct backgrounds is through the use of graphics files, which also provide for textures and are generally more consistently rendered by browsers.

### Stylistic Considerations

Backgrounds are one of those issues that everybody seems to have an opinion about. Personally, for example, I like to gray scale the graphics file because (a) it creates a smaller file, (b) near-white gray patterns are less likely to interfere with text and other graphics, and especially (c) whites and grays are more consistently rendered across browsers and platforms than colors. As soon as I say that, though, someone else is likely to complain that pale grays are dull and too widely used. Having said this, there seems to be consensus on a few points:

- The background should operate in support of the content, not in conflict or rivalry with it.
- Pale, subtle patterns are less likely to interfere with the readability of the text.
- The pattern should tile seamlessly both horizontally and vertically.
- The background should be tested with multiple browsers on multiple platforms at various screen settings.

The final point is especially important. Different browsers display backgrounds differently, as do different platforms and monitors.

As an example, I had personally used a pale blue pattern for a while that seemed to work well on the various machines I tested. What I hadn't tested, though, was what happened when you move from a 256-color screen to a 16-color screen. It wasn't until a colleague mentioned it to me that I realized the whole thing went purple—not at all the effect I'd been looking for (and part of what drove me toward gray scales).

### Technical Considerations

As graphic images, backgrounds need to be transferred to and interpreted by the browser, which can lead to significant delays in displaying the page.

One way of speeding up the page's performance is to keep the file size of the image small. The sample background files

from NCSA, for example, are 60 x 60 pixels, or roughly 3/4-inch square on a 1280 x 1024 display. Their file sizes range from about 500 to 1,000 bytes. By contrast, many of the sample background files from Netscape are 160 x 160 pixels, which pushes their file sizes up to the 10- to 20-kilobyte range. A file that is 20 times larger will take 20 times longer to transfer (which is only partially made up for by the fact that the browser doesn't have to lay as many tiles).

Another method of keeping file sizes small is to consider using the JPEG image format instead of GIF. JPEG isn't always better, but it frequently compresses better with background-type images, generally works better with the subtle continuous-tone images frequently seen in backgrounds, and is just as widely supported by backgrounds-capable browsers as GIF.

Performance can also be improved by taking advantage of the browser's cache. (Any major browser that doesn't support a cache doesn't support backgrounds anyway.) To do this, put the background file in a specific place (typically a directory dedicated to graphics) and then call the same file from all your HTML files by a full path or URL (which allows you to move the HTML file without needing to rewrite the background path). With this arrangement, once the browser has read the image the first time, it can call it from the local cache for the other pages. The tiles will still need to be laid, but the file will no longer need to be transferred from the server.

### Additional Information

Additional information about HTML authoring can be found in the Information Architecture's Internet/WWW Subject Area Web space:

<http://www.lanl.gov/projects/ia-lanl/areas/int-web/>

IA-5815: Laboratory Standard HTML is available on-line at

<http://www.lanl.gov/projects/ia/stds/welcome.html#5815>

For further information about the Information Architecture project itself, see

<http://www.lanl.gov/projects/ia/>

Or look under “What's New” from the Laboratory home page.

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

## ICN Host Status Now Available on the Web

For those of you who miss the gone but not forgotten INFORM utility (and for those of you who don't), a replacement has been provided. ICN host status may now easily be monitored via the World Wide Web. No longer is this information being hoarded jealously by the ICN Consultants.

The ICN host checker currently displays whether or not a host is responding to queries on the network. When a host stops responding, the time and reason (if known) that the host went down will be displayed.

In addition to current host status information, more general bulletins such as Dedicated System Time and other scheduled down time will be posted.

If you're using Netscape 1.1 or later as your WWW browser, the information on the host status page will update automatically every 60 seconds for as long as you continue to view the status page. Users of other WWW browsers will need to reload the page periodically for updated information.

Information other than host status will be updated during working hours, Monday through Friday.

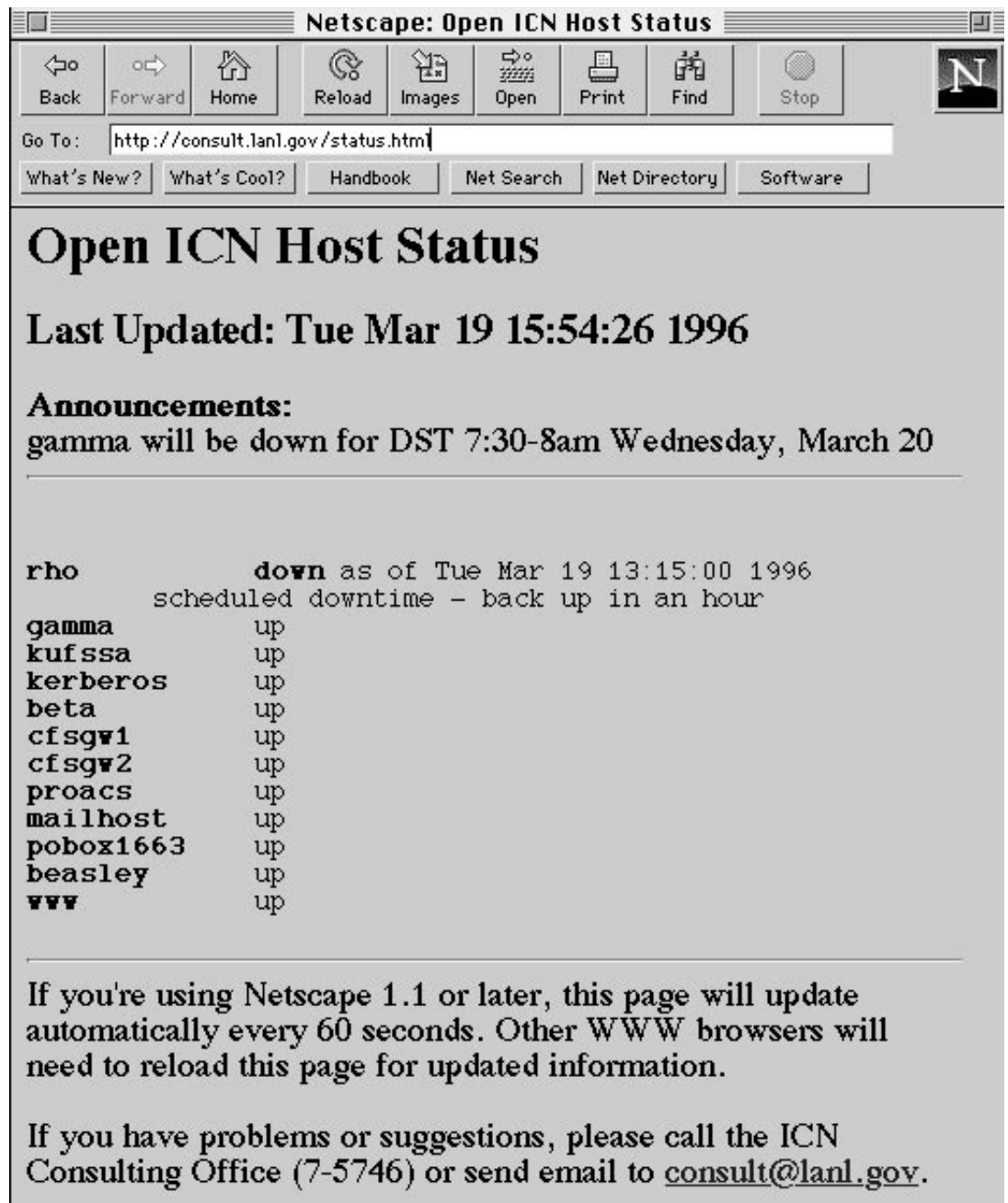
If you have questions or suggestions about the host status pages, please call or write to the CIC-6 ICN Consulting Office at 7-5746 or [consult@lanl.gov](mailto:consult@lanl.gov).

Host checker locations:

Open partition: <http://consult.lanl.gov/status.html>

Secure partition: <http://roswell.lanl.gov/cic/status.html>

Jeff Johnson, ICN Consultant  
Customer Service Group (CIC-6)



**Netscape: Open ICN Host Status**

Go To: <http://consult.lanl.gov/status.html>

What's New? What's Cool? Handbook Net Search Net Directory Software

### Open ICN Host Status

**Last Updated: Tue Mar 19 15:54:26 1996**

**Announcements:**  
gamma will be down for DST 7:30-8am Wednesday, March 20

<b>rho</b>	<b>down</b>	as of Tue Mar 19 13:15:00 1996
		scheduled downtime - back up in an hour
<b>gamma</b>	up	
<b>kufssa</b>	up	
<b>kerberos</b>	up	
<b>beta</b>	up	
<b>cfsqv1</b>	up	
<b>cfsqv2</b>	up	
<b>proacs</b>	up	
<b>mailhost</b>	up	
<b>pobox1663</b>	up	
<b>beasley</b>	up	
<b>www</b>	up	

**If you're using Netscape 1.1 or later, this page will update automatically every 60 seconds. Other WWW browsers will need to reload this page for updated information.**

**If you have problems or suggestions, please call the ICN Consulting Office (7-5746) or send email to [consult@lanl.gov](mailto:consult@lanl.gov).**

# Windows 95 SLIP/PPP Installation

This article describes how to install SLIP (Serial Line Internet Protocol) software and PPP (Point To Point) software with scripting for use at LANL. We assume that you already have a modem installed and configured, and that you are not connected to any network (i.e., through a docking bay).

Note: If you have the floppy disk version of Windows 95, you will not have all the files you need to run SLIP or PPP via a script. The scripting software is on the CD version of Windows 95. You can also download the scripting software from the Microsoft Web server at

<http://www.microsoft.com/windows/software/admintools.htm>.

The costs of SLIP/PPP access are currently 2¢ a minute or \$1.20 per hour. If you are using the 800 number, there is an additional charge of 12¢ a minute or \$7.20 per hour.

There are four basic steps to install SLIP/PPP support and scripting in Windows 95. These steps must be done in order.

## I. Installation of SLIP/PPP Software and Scripting Support

### II. Setting Up Properties for SLIP/PPP Connection

### III. SLIP/PPP Connection Configuration

### IV. Setting up the TIG Login Script

#### I. Installation of SLIP/PPP Software and Scripting Support

1. Open up the Add/Remove Programs icon in the Control Panel.

2. Click on the Windows Setup Tab.

3. Select Have Disk.

4. Select Browse and choose your CD drive letter.

5. Choose `\Admin\apptools\dscript`.

6. Highlight the `rnaplus.inf` file.

7. Hit OK until you see Components: SLIP and Scripting for Dial-Up Networking.

8. Check the box that reads Components: SLIP and Scripting for Dial-Up Networking and hit install.

9. Hit OK to return to the control panel.

#### II. Setting Up Properties for SLIP/PPP Connection

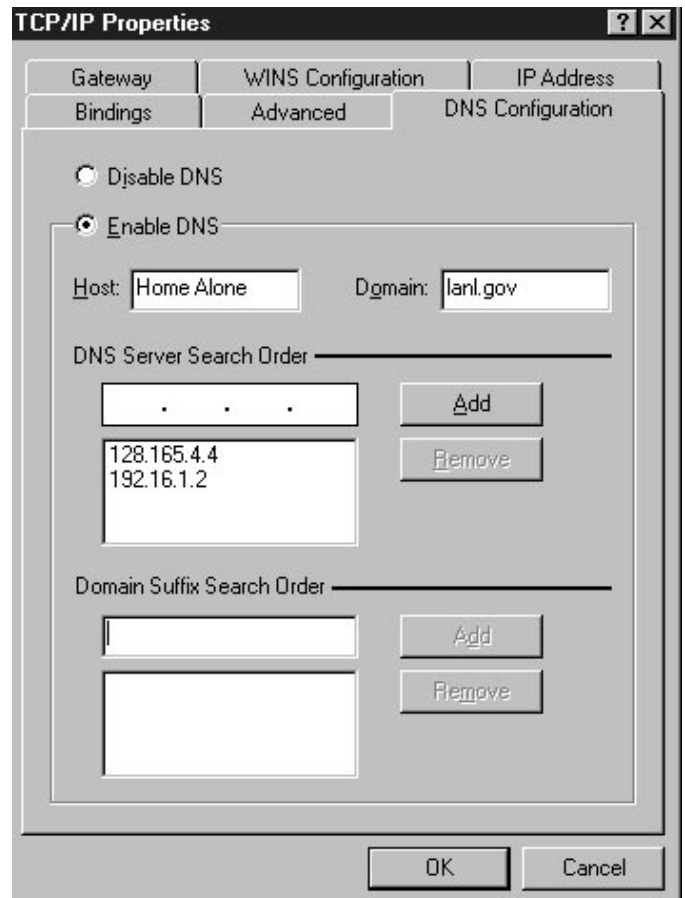
1. Open up the Network icon in the Control Panel.

2. Click on the Configuration Tab. (See Figure 1.)



Figure 1. Network Control Panel

3. Click in succession: Add, Client, Add, Microsoft, Client for Microsoft Networks, and OK.
4. Click in succession: Add, Adapter, Add, Microsoft, Dial-Up Adapter, and OK.
5. Click in succession: Add, Protocol, Add, Microsoft, TCP/IP, and OK.
6. Remove any other Clients, Adapters, and Protocols; they are not needed for TCP/IP Dial-Up Networking. (Click on each name in the Network Control Panel and then click on Remove.)
7. Under Primary Network Logon, select Windows Logon.
8. Click on File and Print Sharing.
9. Highlight Client for Microsoft Networks in the Network Control Panel and hit Properties.
10. Under Log-on validation, uncheck Log-on to Windows NT Domain.
11. Under Network Logon options, select Quick Logon.
12. Hit OK.
13. Highlight Microsoft Dial-Up Adapter and hit Properties.
14. Under Driver Type, select Enhanced Mode.
15. Under Bindings, select TCP/IP.
16. Under Advanced, leave it alone and hit OK.
17. Highlight TCP/IP and hit Properties.
18. Under Bindings, select Client for Microsoft Networks.
19. Under WINS Configuration, select Disable.
20. Under IP Address, select Obtain an IP address automatically.
21. Select DNS Configurations.
22. Click on the radio button to enable DNS. (See Figure 2.)
23. In the space for Host, enter your System Name (can be anything).
24. In Domain, enter lanl.gov.
25. In DNS Server Search Order enter 128.165.4.4 and hit the Add button.
26. In DNS Server Search Order, enter 192.16.1.2 and hit the Add button.
27. In Gateway, click on New Gateway, enter 128.165.7.241, and hit the Add button.
28. Click on the Advanced Tab and hit OK.
29. Click on the Identification Page Tab and fill in the proper information for your system.
30. Click on the Access Control Page Tab and choose Share-Level Access Control.



**Figure 2. DNS Configuration**

31. And finally, close the Network Pop-up. If you're installing for the first time, setup will copy more files to your hard drive. It will prompt you to re-boot. You must do that at this time.

### III. SLIP/PPP Connection Configuration

Note: If you don't have an icon for Dial-Up Networking in your accessories, hit the start button, choose settings, control panel, and Add/Remove Programs. Under the Windows Setup tab, double click on Communications Tools and then put a check in the Dial-Up Networking item.

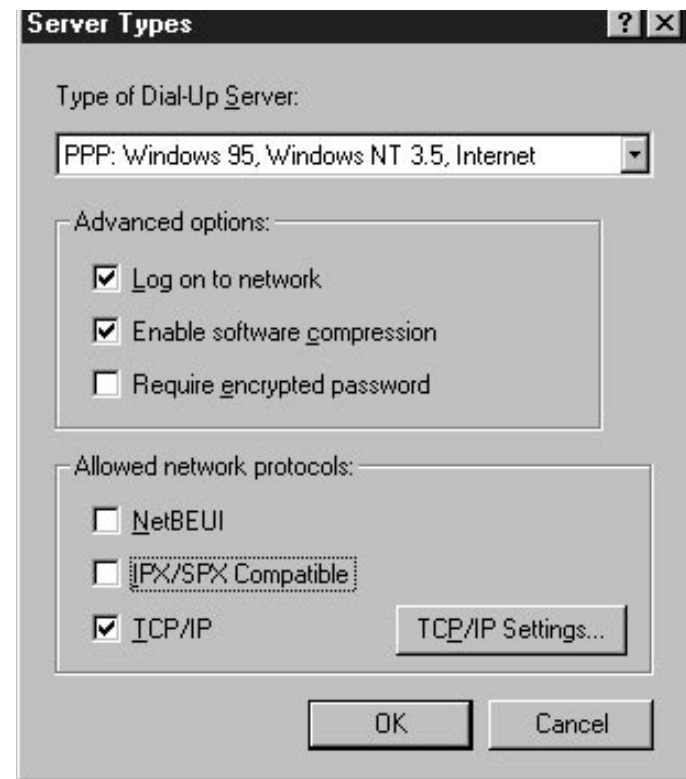
1. Select Dial Up Networking under Start/Programs/Accessories.
2. Double-click on Make New Connection.
3. Enter a definitive name for the connection (e.g., LANL tig) and select a modem.
4. Configure your modem now if it has not already been done.
5. Hit Next.
6. Enter one of the following telephone numbers: 667-9020 through 667-9025. The area code is not necessary for a local connection. (800-443-1461 is also available when calling long distance.)
7. Hit Next. The display will state that you have successfully created a new Dial-Up Networking connection. (Not really, but you're close.)
8. Hit Finish. Your connection will now appear as an icon in the Dial-Up Networking box.
9. Click on the icon you just created with your right mouse button.
10. Select Properties from the pop-up.
11. Hit Configure.
12. Under General, select the desired modem properties. For Maximum Speed, I select 38400 for a 14.4 modem and 115200 for a 28.8. Or you can select default speed.
13. Under Connection, connection preferences should be Data bits: 8; Parity: None; Stop bits: 1; Port Settings should be OK.

14. Under Advanced, check Use error control, Compress data, Use flow control, Hardware (RTS/CTS), and then hit OK.

15. Under Options, check only Display modem status and then hit OK.

16. Hit the button that reads Server Type.

17. Under Type of Server (See Figure 3.), Select PPP: Windows 95, Windows NT 3.5, and Internet.



**Figure 3. Server Types Window in the Dial-Up Networking Set-up**

Note: If the item "SLIP: UNIX Connection" is not in this list of options, then something went wrong when you performed the first step in these instructions. Go back up to "Installation of SLIP Software and Scripting Support" and repeat those steps. We don't know why, but it sometimes takes two or three tries for this to work properly. You don't want to pick the SLIP option, but it needs to be there for the TIG connection to work.

18. Under Advanced, check log-on to network and enable software compression.

19. Under allowed Network protocols, check only TCP/IP.
20. Click on TCP/IP Settings.
21. Click on Server assigned IP address.
22. Click on Server assigned name server addresses.
23. Check: Use IP header compression.
24. Check: Use default gateway on remote network.
25. Hit OK.

26. Hit OK again to exit Properties. You can “Click-and-Drag” the connection’s icon to your desktop to create an easily accessible shortcut to access your connection.

#### IV. Setting up the TIG Login Script

1. Copy lanlppp.scp to the c:\Program Files\Accessories directory.
2. Select Dial-Up Scripting Tool under Start/Programs/Accessories. This will open up the Dial-Up Scripting Tool window.
3. Attach your newly created Dial-Up Connection to the lanlppp.scp script.

That’s it! All you have to do now is double click your connection’s icon to initiate login. Fill in your ICN user name and password and then click connect. (See Figure 4.) For security reasons, it’s not a good idea for you to check the “remember password” box. If you really want to check this box, talk to your OCSR first.

#### Script Available on the CIC-2 Web Page

You can get a copy of this article and the lanlppp.scp script from the CIC-2 Web page at <http://atomboy.lanl.gov>. Once you’re there, click on the Technical Support Documents hot link, then click on Telecommunications Assistance.

If you have questions, call the CIC-2 PC software support line at 7-help. To find out the status of LANL modem lines, etc., call the CIC-5 Network Operations Desk at 667-7423. This article was originally written by Weldon Scoggins; HTMLized by Andrew Collins; screen shots, extra verbiage, and formatting by John Layne.

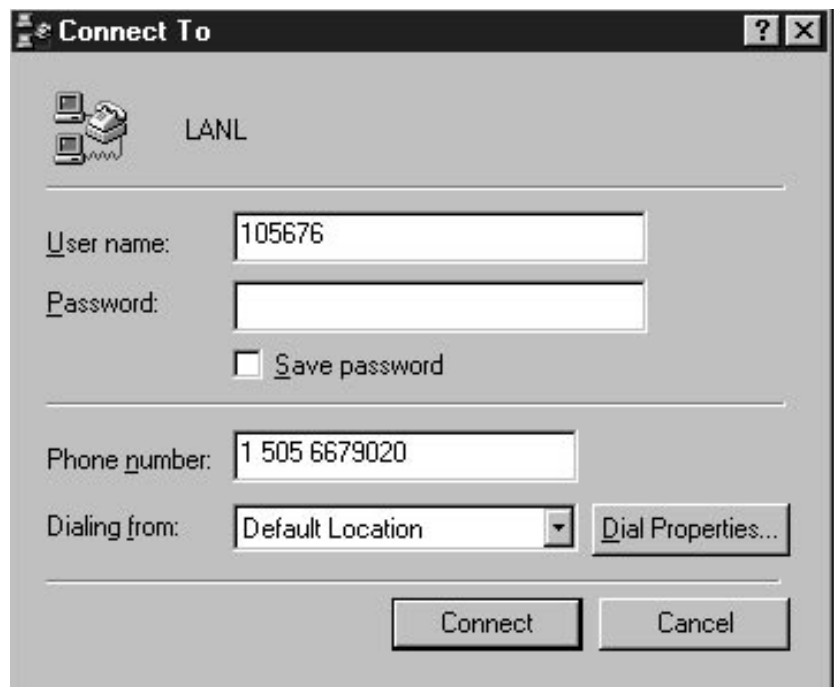


Figure 4. LANL Conect To Window

# Vendor Computer Training

The Customer Service Group (CIC-6) supports vendor training in technical 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 by 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 vendor course or for general assistance with vendor training, please contact the CIC-Division Vendor Training Coordinator at (505) 667-9399 or send e-mail to [comp-train@lanl.gov](mailto:comp-train@lanl.gov).

Course Title	Date	Time	Cost	Course Number
<b>C Programming (Beginning)</b>	TBA (5 days)	8:30-5:00	\$1000-\$1500	3996
Prerequisite(s): An understanding of and useful skills in a high-level programming language. A current ICN password is required. Topics Include: Introduction and Fundamentals; Basic Semantic Constructs - Getting; Base Level I/O With C; The Preprocess-Compilation Environment; Operators, Data Types, and Storage Classes; Control Flow Constructs; Conditional Constructs; Higher-Level Data Constructs in C; File I/O; UNIX Software Tools and POSIX System Calls.				
<b>C Programming (Advanced)</b>	TBA (5 days)	8:30-5:00	\$1000-\$1500	4777
Prerequisite(s): Useful skills and experience with the C Programming. A current ICN password is required. Topics Include: Data Structures, Algorithms, and OOP; An Advanced Clinic for C ; The ANSI C Recommendation X3.159; C and ANSI C War Stories; The Data Structure and the Assessment of Algorithms; Arrays; Structures; Unions; Stacks; Queues; Linked Lists; Recursive Functions; Binary Trees; Hashing; File Organizations Using the C Runtime Library; Standard Interprocess Communication Mechanisms; and An Introduction and Overview of AT&T's C++ 3.0.				
<b>C++ for Experienced Programmers</b>	TBA (5 days)	8:30-5:00	\$1000-\$1500	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.				
<b>C++ Visual Windows Programming</b>	TBA (5 days)	8:30-5:00	\$1600-\$2000	
Prerequisite(s): C programming experience. Topics Include: Introduction to Visual C++; A Working Introduction to Windows Programming; Concepts of Object-Oriented Programming; Classes; Memory Management; Scope and Access Control; Functions in C++; References and Argument Passing; Operators; Class Design, Single Inheritance; Polymorphism and Virtual Functions; Microsoft				



Course Title	Date	Time	Cost	Course Number
<b>C++ Visual Windows Programming (continued)</b>	Foundation Class Library; Windows Event Handling; The Mouse; The Keyboard; Graphics Device Interface; Dialog Boxes; Windows Memory Management; Menus and Accelerators; Document/View Architecture; MDI and Multiple Views; and Visual C++ and NT.			
<b>Java Programming (Basic)</b>	5/20-22/96	8:30-5:00	\$1000-\$1200	11686
	Prerequisite(s): Students must have the ability to create compiled programs using an advanced language (such as C or C++) and the knowledge to use basic Solaris commands and a World Wide Web browser (such as Mosaic or Netscape). Topics Include: Overview of the Java Programming Language, the HotJava WWW Browser, Applets, Audio and Animation, Importing Java Classes, Attaching Applets to HTML, Object-Oriented Programming Methodology, and Identification of Main Features of Java (including classes, servers, and security) .			
<b>Java Programming (Advanced)</b>	5/23-24/96	8:30-5:00	\$800-\$1000	11687
	Prerequisite(s): Completion of Beginning Java Programming course or equivalent knowledge. Topics Include: Developing Java Applications; Point-of-Sale Interfaces; Writing Java Code (demonstrating Java security, interactivity, graphics, audio, and animation); Java Class Packages and Subclasses; Memory Allocation and Garbage Collection Work; Interfaces, Exceptions, and Access Modifiers; Multithreading; and Extending Java.			
<b>Perl Programming</b>	TBA (1-3 days)	8:30-5:00	\$400-\$600 per day	8095/8093
	Topics Include: Describes the programming language that occupies the niche between shell and C Programming; syntax and semantics; data types; operators, control flow, regular expressions, and I/O facilities; the Perl debugger.			
<b>Perl Programming for the WWW</b>	TBA (2-3 days)	8:30-5:00	\$400-\$600 per day	
	Prerequisite(s): Programming skills with a light background in Perl and HTML. Topics Include: On-line Resources; Server Configuration; Permissions; Setuid Issues; Tainting; Safe Perl; Data Security; OO Programming; Web Modules; CGI Programs; CGI.pm; What Went Wrong?; CGI Template; Using Forms; Form Template; Input Widgets; Submit Widgets; Reset Widgets; Sample Form; Password Fields; Textareas; Hidden Fields; Checkboxes; Radio Boxes; Popup Menus; Lisboxes; Image Maps; Random Links; libwww Modules; Sending Mail; Shopping Carts; Database Access; and Advanced Topics.			
<b>SGI Network Administration</b>	6/17-21/96	8:30-5:00	\$1700-\$2200	11690
	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.			
<b>SGI System Administration (Beginning)</b>	5/6-10/96	8:30-5:00	\$1700-\$2200	11688
	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			

Course Title	Date	Time	Cost	Course Number
<b>SGI System Administration (continued)</b>				
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.				
<b>SGI System Administration (Advanced)</b>	6/10-14/96	8:30-5:00	\$1700-\$2200	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.				
<b>Solaris 2.X Network Administration</b>	5/13-17/96	8:30-5:00	\$1300-\$1700	8107
Prerequisite(s): Completion of Solaris 2.X System Administration (Beginning) class or equivalent knowledge and experience. Topics Include: Network Configuration; Remote Installation Procedures; Advanced Security Techniques; Troubleshooting Techniques; Customizing Sendmail; network Application Tools; and Name Service Configuration.				
<b>Solaris 2.X System Administration (Beginning)</b>	TBA (5 days)	8:30-5:00	\$1300-\$1700	7477
Prerequisite(s): Familiarity with a UNIX workstation and UNIX commands. Topics Include: Custom Installation of Solaris 2.X Server; Add Peripheral Devices; Use Format Utility to Display Partition Information; Compress and Send Binary Files; Change System Run Levels; Add Startup Files for Additional Services; Add and Remove Software Packages; Configure Terminals and Modems; Administer Disks and File Systems; Discuss Basic Networking Concepts; 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; Configure and Administer the NIS+ Environment.				
<b>UNIX (Beginning)</b>	3/25-29/96	8:15-12:00	\$738	5267
Prerequisite(s): Familiarity with a UNIX workstation. Topics Include: Overview of the Workstation Environment; Getting Started; The UNIX File System; Manipulating Files; Customizing Your Environment; The C-Shell; Editing and Writing with vi; Using the Network; Discussing NFS and NIS; Using Basic System Status Commands; Startup and Shutdown Procedures; Using tar.				
<b>World Wide Web Development (Advanced)</b>	5/28-31/96	8:30-5:00	\$1200-\$1600	11526
Prerequisite(s): Prior knowledge of basic HTML, WWW servers, and browsers. Topics Include: Introduction; Advanced HTML; Netscape Advanced Features; Perl Programming; Common Gateway Interface (CGI); Quality Assurance Testing; Image Maps; Filters and Data Conversion Programs; Security; Graphical Tools; Internet Resources; Registration on the WWW; Statistics; Database Integration; Searching; Graphics; and Extended Data Types.				

## 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 pre-register by calling the Research Desk at 7-5809 or sending e-mail to library@lanl.gov. Special classes and orientations can also be arranged.

<b>Date</b>	<b>Time</b>	<b>Subject Matter</b>
4-4-96	10:00 - 12:00 a.m.	Information Sources on the Internet via WWW
4-9-96	1:00 - 1:30 p.m.	Patent Office Database
4-10-96	11:00 -11:30 a.m.	MELVYL (U of CA Specialized Databases)
4-11-96	1:00 - 1:30 p.m.	SciSearch—at your desktop!
4-11-96	2:00 - 4:00 p.m.	Information Sources on the Internet via WWW
4-16-96	1:00 - 1:30 p.m.	Energy Database—at your desktop!
4-18-96	10:00 - 12:00 a.m.	Information Sources on the Internet via WWW
4-23-96	1:00 - 1:45 p.m.	New Employee Orientation/Research Library Overview
4-24-96	11:00 -11:30 p.m.	Automatic alerting/updates on MELVYL (basic searching knowledge required)
4-25-96	1:00 - 1:30 p.m.	Finding Unclassified and Classified Report Literature
4-25-96	2:00 - 4:00 p.m.	Information Sources on the Internet via WWW
4-30-96	1:00 - 1:30 p.m.	NTIS (US Govt-sponsored research)—at your desktop!

# Lab-Wide 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 and on the following pages for specific information about courses currently offered.

## Course Registration

You must have a valid ICN password before taking any of the courses shown in the table. To register for a course, call CIC-6 Training, Development, and Coordination section at 667-9444. You will be sent a registration form to be completed and returned.

Course Title	Date	Time	Cost	Course Number
<b>Administrative ToolKit</b>	<b>Scheduled on Request</b>		<b>\$260</b>	<b>Course #11395</b>
	A combination of the Directory Information, Signature Authority, TRIPS, and STORES system classes. The student will learn how to update directory information, assign signature authorities (purchase, SIGMA, etc.), submit travel requests, and purchase materials on-line. Reporting and printing for each system will also be covered.			
<b>Automated Chemical Inventory System (ACIS):</b>	<b>Scheduled on Request</b>		<b>\$260</b>	<b>Course #7480</b>
	Participants receive hands-on instruction to update the status (end-user, location, quantity) of chemical containers. Participants will also learn to generate chemical inventory reports by chemical name, end-user, location, and organization.			
<b>Budget Computing System (BUCS):</b>	<b>Scheduled on Request</b>		<b>\$260</b>	<b>Course #3527</b>
	This training is an introduction to the Budget Computing System (BUCS). Students practice generating "quick reports" and reports requiring parameter files. An introduction and demonstration of (no "hands-on") allocating procedures are given during the three-hour session.			
<b>Employee Development System - Basic Training (EDS I):</b>	<b>4/17/96</b>	<b>8:30 – 12:00</b>	<b>\$260</b>	<b>Course #5289</b>
	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.			
<b>Employee Development System - Training Plans (EDS II):</b>	<b>4/30/96</b>	<b>8:30 – 12:00</b>	<b>\$260</b>	<b>Course #7155</b>
	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 (course #5289).			
<b>Eudora Electronic Mail</b>	<b>4/15/96</b>	<b>8:30 – 10:30</b>	<b>\$130</b>	<b>Course #9762</b>
	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.			

Course Title	Date	Time	Cost	Course Number
<b>Financial Reporting System</b>	<b>4/16/96</b>	<b>8:30 – 11:30</b>	<b>\$260</b>	<b>Course #11050</b>
	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.			
<b>Financial Management Information System (FMIS):</b>	<b>Scheduled on Request</b>		<b>\$260</b>	<b>Course #8338</b>
	Participants receive hands-on instruction to “explode” and “transfer” through the costs, allocations, and outstanding commitments screens. In addition, participants will create/review reports, access the Information Manager Utility for printing reports, and learn how to assign authorities in the system.			
<b>HTML Basics</b>	<b>4/10/96</b>	<b>8:30 – 12:00</b>	<b>\$260</b>	<b>Course #11605</b>
	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.			
<b>Introduction to the Internet: Beginning Netscape</b>	<b>4/23/96</b>	<b>8:30 – 10:30</b>	<b>\$130</b>	<b>Course #10961</b>
	Students gain basic understanding of the Internet and the World Wide Web and the use of Netscape as a browser to surf the Net. Topics covered are both Laboratory sites and open sites, along with practical uses of the Internet.			
<b>Key/Core System</b>	<b>Scheduled on Request</b>		<b>\$130</b>	<b>Course #10179</b>
	Key custodians and alternate key custodians receive hands-on instruction to add, update, and delete key and padlock information, and view assignment information and request reports. Students will also learn how to request key inventory notifications. Students must be a key custodian or alternate and have an ICN password.			
<b>Lotus Notes Basic Concepts</b>	<b>Scheduled on Request</b>		<b>\$260</b>	<b>Course #9917</b>
	This class provides hands-on instruction for Mac and PC users to use Lotus Notes software to create and send E-mail memos; fax documents; search databases; create filters, nicknames, banners, and doclinks; set defaults; and use multiple address books. In addition, participants learn how to use the memo, meetings, and discussion databases.			

Course Title	Date	Time	Cost	Course Number
On-Line Forms	4/23/96	10:30 – 12:00	\$130	Course #9756
	Participants will learn to use Netscape software to access Lab-wide information and forms. Using Jetform Filler software, participants will access, complete, and print forms such as the “ICN Validation Request,” “Visitor Request for Unclassified Visits to Security Areas,” and “Request for Quotation.”			
Property Accounting, Inventory, and Reporting System (Advanced)	Scheduled on request		\$260	Course #9918
	This course will include a refresher of PAIRS, advanced techniques and tips, explanation of the notification system, and report capabilities. Swap Shop, Loan Out information, and support tables will be discussed. Participants should already have a basic understanding of and know how to use PAIRS.			
Reporting with Infomaker	4/11/96 - 4/12/96	8:30 – 5:00	\$560	Course #11054
	Hands-on training to query data and develop ad hoc, or non-standard, reports from the LANL data warehouse using Infomaker software.			
Secretarial/Contract Services (SE):	Scheduled on request		\$260	Course #7481
	This class provides hands-on instruction for creating secretarial requests for temporary services, entering time for technical and nontechnical contract employees, and creating reports using the Information Manager Utility. The students will also learn how to review notifications and approve attendance. A training database will be used for the class.			
Time and Effort System	Scheduled on request		\$260	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 also be discussed. In addition, the student will learn how to use the Information Manager utility to view and print reports.			

# INTEGRATED COMPUTING NETWORK (ICN) VALIDATION REQUEST

To access ICN Computing resources, please complete all parts of this form that apply to you, including "Special Requirements."

Mail your completed application to:  
ICN Password Office (PWO)  
Mail Stop: B271  
Los Alamos National Laboratory  
Los Alamos, NM 87545

If you have questions: Call: (505) 665-1805  
E-mail: validate@lanl.gov

All Laboratory computers, computing systems, and their associated communication systems are for official business only. By completing this request, users agree not to misuse the ICN. The Laboratory has the responsibility and authority to periodically audit user files.

## Owner Information

Z-Number (if you have one)	PWO Use Only	Name (last, first, middle initial)
LANL Group	LANL Mail Stop	Citizenship (Foreign National see "Special Requirements-Foreign National")
Phone Number	Cost Center	Program Code

<p>Check LANL affiliation:</p> <p><input type="checkbox"/> LANL employee</p> <p><input type="checkbox"/> Contractor _____ (specify contract company)</p> <p><input type="checkbox"/> Consultant, VSM, associate</p> <p><input type="checkbox"/> External user _____ (specify employer)</p> <p><input type="checkbox"/> Other (specify) _____</p>	<p>Send password / smartcard to:</p> <p><input type="checkbox"/> Mail Stop or <input type="checkbox"/> Mail to address indicated below</p> <p>Name / Organization _____</p> <p>Address _____</p> <p>_____</p> <p>City, State, Zip Code _____</p>
--	--

## Access Check access method and needed partitions:

<p><b>Access method:</b>    <input type="checkbox"/> ICN Password    <input type="checkbox"/> Smartcard    <input type="checkbox"/> Both</p> <p><input type="checkbox"/> Open partition (e.g., email systems, open machines)</p> <p><input type="checkbox"/> <b>Administrative</b> partition (e.g., IA [BUCS, Stores, Travel], IB [EIS, FMIS, PAIRS]) If you are not a Q-cleared LANL employee, see required steps in section "Special Requirements-Administrative Partition," unless you already have Administrative access with an ICN password.</p> <p><input type="checkbox"/> <b>Secure</b> partition (i.e., secure machines) Indicate level(s) of data to be processed:</p> <p><input type="checkbox"/> Unclassified</p> <p><input type="checkbox"/> Secret</p>	<p>I certify this person does require secure access:</p> <p>_____</p> <p>Manager Signature (Group Leader or above)      Date</p>
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NOTE: A Q-clearance is required. All classified computing must be performed within the Secure environment.

## PWO Use Only

<p>New <input type="checkbox"/>    Change <input type="checkbox"/></p>	Clearance Status	Processed	Lv	Smartcard Serial #
Comments:				

CUT ALONG DASHED LINE

## Special Requirements

<b>Administrative Partition</b>	
(U.S. Citizens Only)	Lab-Wide Systems (e.g., IA [BUCS, Stores, Travel], 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-Q-Cleared") section below. You may not access the Secure Partition.
<input type="checkbox"/> Contractor or Non-Q-Cleared	Phone (505) 667-9444 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.
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 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, obtain your LANL contact's signature in addition to the contact's manager's signature.  
NOTE: LANL contacts are regular Laboratory employees. Contacts are responsible for obtaining annual re-authorizations, forwarding renewals, and notifying the ICN Password Office of changes in user or contact status.

Print LANL Contact Name	Contact Z-Number	Phone Number	Group
LANL Contact Signature	Mail Stop	Date	



# Reader Feedback

Feedback helps us to provide a document that responds to the changing needs of its readership. If you have comments or questions about this publication, please let us hear from you. We have reserved the back of this form for that purpose. We also accept articles for publication that are of interest to our readers. Contact the managing editor for more information. This form is also used for new subscriptions, deletions, or changes. Instructions are on the back. If you prefer to contact us by E-mail, send your comments and/or subscription request to [finney@lanl.gov](mailto:finney@lanl.gov).

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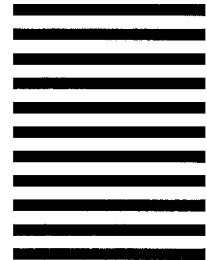


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LOS ALAMOS NATIONAL LABORATORY  
PO BOX 1663  
LOS ALAMOS NM 87544-9916



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