NorthWestNet

User Services Internet Resource Guide (NUSIRG)

Third Edition

March,1992

Introduction: About NorthWestNet

On-Line PostScript Version 1.0, March 24, 1992

Author: Jonathan Kochmer

Executive Editor: Dr. Eric S. Hood

Technical Editor: Dan L. Jordt

Production Manager: Schele Gislason

Copyright (c) 1991 by the NorthWestNet Academic Computing Consortium, Inc.

A product of NorthWestNet and the Northwest Academic Computing Consortium, Inc.

All rights reserved. NWACC permits the copying of NUSIRG or parts of NUSIRG for research and educational purposes only, provided that appropriate attribution is given to both NWACC and NorthWestNet. The requirement for appropriate attribution will be satisfied by the inclusion of this copyright page with every copy. Resale of NUSIRG is expressly prohibited without written permission from NWACC, Inc. NWACC, Inc. makes no warranty of any kind, expressed or implied, with regard to the contents of this Guide, nor shall be liable in any event for incidental or consequential damages, direct or indirect, resulting from the use of this document.

TABLE OF CONTENTS

How To Get NUSIRG i
About NorthWestNet iii
NorthWestNet Acceptable Use Policy v
NSFNET Backbone Services Acceptable Use Policy vi
NorthWestNet Network Operations Center (NOC) vii

How To Get NUSIRG

THE NORTHWESTNET USER SERVICES INTERNET RESOURCE GUIDE

You can either get NUSIRG at no charge by the Internet "File Transfer Protocol" (FTP), or you can purchase a bound copy from NorthWestNet. If you have a connection to the Internet, you are encouraged to follow these instructions for using FTP to obtain NUSIRG. If you can't use FTP (or don't know how yet!), instructions on how to order a printed and bound copy from NorthWestNet are included on the next page.

Free Copies of NUSIRG By File Transfer Protocol (FTP)

NUSIRG is available at no charge, by FTP, as text-only or PostScript files. The text-only files are in a simple format which can be printed by most kinds of printers or viewed on-screen with most text editors. The PostScript files produce output which is essentially identical to the bound version of NUSIRG.

If you have access to a computer connected to the Internet, all you have to do is follow the simple instructions below.

Note: commands you type are shown in the left hand column in lower case (don't type the #'s!); UPPER CASE and ">" indicates prompts from the computer that will appear on your screen.

What you type (or what you'll see)	Explanation
1) ftp ftphost.nwnet.net	Connect to the NorthWestNet FTP host.
2) LOGIN: anonymous	At the "LOGIN:" prompt enter "anonymous".
3) PASSWORD: your-user-id@address	At the "PASSWORD:" prompt, please enter your user-id@your.full.internet.address (e.g., robessin@uwvvd.derrg.edu).
4) FTP> cd nic/nwnet/user-guide	Change directories (cd) to the directory containing FTP copies of NUSIRG.
5) FTP> get README.nusirg	Use the "get" command followed by a filename from the list on the next page to copy a file; get "README.nusirg" first, which contains the most up-to-date information about NUSIRG files.
6) FTP> ls	The "ls" command will produce a listing of the names of the files in the NUSIRG directory (see below).
7) FTP> quit	The "quit" command will end your FTP session.

The file "README.nusirg" contains more detailed information about the files in the NUSIRG directory.

Files in the NUSIRG directory	Description of file's contents
README.nusirg	A detailed description of NUSIRG files.
nusirg,Index.ps	Index for all of NUSIRG
nusirg.Index.txt	
nusirg.about.nwnet.and.aup.ps	NWNET & NSFNET backbone information and policies
nusirg.about.nwnet.and.aup.txt	
nusirg.beginner.overview.ps	Overview of NUSIRG and the Internet.
nusirg.beginner.overview.txt	
nusirg.email.ftp.telnet.ps	Basic Internet tools: e-mail, FTP, TELNET and Archie
nusirg.email.ftp.telnet.txt	
nusirg.listserv.usenet.ps	Using USENET and LISTSERV.
nusirg.listserv.usenet.txt	
nusirg.online.info.resources.ps	On-line books, libraries, databases, WAIS, and directory services
nusirg.online.info.resources.txt	
nusirg.supercomputers.ps	Supercomputer use and access information.
nusirg.supercomputers.txt	
nusirg.teach.k-12.ps	The Internet and K-12 education.
nusirg.teach.k-12.txt	
nusirg.whole-guide.ps.tar.Z	All of NUSIRG in compressed and archived format.
nusirg.whole-guide.txt.tar.Z	

Notice that the file names above occur in pairs differing only in the last parts of their names. Files ending with "ps" are in PostScript format and cannot be printed unless you have access to a PostScript printer. You should not copy the files whose names end with "tar.Z" unless you know how to handle compressed and archived files, which is explained in the file "README.nusirg".

Printed Copies From NorthWestNet

If you would prefer to purchase an already printed and bound copy (or if you are unable to use FTP), NUSIRG is available for $20.00 per copy from NorthWestNet.

postal mail:	NorthWestNet NUSIRG Orders 15400 SE 30th Place, Suite 202 Bellevue, WA 98007
e-mail:	nusirg-orders@nwnet.net
phone:	(206) 562-3000
fax:	(206) 562-4822

Please make your check or money order payable to NorthWestNet.

If you have questions, comments, or suggestions about NUSIRG, please send e-mail to nusirg@nwnet.net

About NorthWestNet

NorthWestNet is a regional computing and digital communications network founded in 1987 by the Directors of the Northwest Academic Computing Consortium, Inc. (NWACC). The NWACC mission is to promote research, education and economic development by providing access to network communications, computing and electronic information systems and services throughout the Northwest. In 1988 NWACC was incorporated in the state of Oregon as a not-for-profit corporation. NorthWestNet is wholly owned, operated and managed by NWACC. NorthWestNet is an independent, regional sub-unit of the Interim National Research and Education Network (NREN) currently managed and operated by the National Science Foundation (NSF).

A national movement is growing to build a permanent National Research and Education Network (NREN) to enhance the nation's and each state's educational, research, and economic competitiveness and productivity. NREN is designed to provide the primary information linkage among the nation's knowledge-based organizations including higher education institutions, scientific laboratories, and industrial research units. The general architecture of NREN has three levels: a federally-sponsored interstate foundation (backbone) network; midlevel networks providing broad, regional connectivity and expected to be partially self-supporting; and self-sponsored individual campus, government agency, industrial and federal laboratory networks distributing information to their end users.

NorthWestNet is a regional (midlevel) network which is cooperatively addressing the high-performance computing and networking needs of the Northwest within the scope of the NREN policies. NorthWestNet serves higher education institutions, government agencies, not-for-profit organizations and industry in six states (Alaska, Idaho, Montana, North Dakota, Oregon and Washington). Since NorthWestNet was established in 1987, our network connectivity has expanded from 11 originator members to over 60 sites. Similar growth is expected over the next five years as NorthWestNet expands and enhances network services offerings and marketing efforts.

NorthWestNet is financially supported by a grant from the National Science Foundation (NSF), institutional membership dues and network service fees. In April 1991 the NSF confirmed renewal of NorthWestNet's core grant, first approved in 1988. Under the terms of the grant renewal, NSF has committed funds totaling nearly two million dollars distributed over the next three-year contract period. NWACC revenues and annual operating budgets for the next three fiscal years are expected to exceed one million dollars annually.

In 1989 NWACC initiated a strategic planning process to chart the future course for NWACC and NorthWestNet. The resultant plan recognizes the special needs of the northwestern United States, a geographically large, yet sparsely populated area. Current markets for NorthWestNet services are rapidly expanding and broadening, extending past the conventional education and research communities to industry, government agencies and health care organizations. Technical and operational implementation of the NorthWestNet Strategic Plan are now in progress. NorthWestNet is already upgrading network equipment, operations, and user services offerings. The NorthWestNet Network Operations Center (NOC) facilities management agreement with the University of Washington was formalized in June 1991. NorthWestNet currently offers a variety of information and user support services.

For the past three years, NorthWestNet has published for its membership an Internet Users Training Manual. This new "NorthWestNet User Services Internet Resource Guide" (NUSIRG) is another step in our user services support. NUSIRG is available in both hardcopy and electronic formats to anyone using the Internet.

Technical seminars and training courses are presented each autumn at our NorthWestNet Annual Meeting. Seminars and workshops on a variety of topics are presented by regionally and nationally recognized network engineers, communications technicians and user services specialists. A special training track for new NorthWestNet member institutions will also be offered beginning October 1991.

Workshops for researchers and scholars providing training in the use of high-performance computing systems and networked information resources are offered periodically and are also held in conjunction with our Annual Meeting.

To facilitate communication among participants in our numerous committees and working groups, NorthWestNet operates and maintains electronic mail exploders for the NWACC Board of Directors and Executive Committee, the NorthWestNet Technical Committee and Configuration Subcommittee, the User Services Committee and the Editorial Review Board.

NorthWestNet maintains and offers via anonymous FTP a modest collection of regional and national networking policies, working papers and operational documents on our network information server.

We are also vigorously pursuing the development of new programs focusing on high performance computing and parallel processing, electronic library resources and networked information services, K-12 educational networking, and health care information and delivery systems.

Over the next five years, NorthWestNet is committed to servicing the needs of its expanding membership by:

- ❏ Providing its members from education, government, not-for-profits and industry with the ability to access and to share advanced computing and information systems (especially data bases and electronic library resources) using high-speed telecommunications facilities;
- ❏ Seeking, promoting, and supporting methods and tools for assisting users to access and to share information in an interactive, convenient, integrated and easy-to-learn manner;
- ❏ Expanding NREN access to K-12 schools and education districts, health care organizations and economic development groups;
- ❏ Encouraging and enhancing education, research, and development by providing value-added network services in support of northwestern interests;
- ❏ Promoting affordable and, if possible, subsidized national, and international electronic access for all regional education and research organizations;
- ❏ Encouraging and facilitating collaboration among educational institutions, government, not-for-profit agencies and industry. Opportunities include (1) sharing computing and information resources, (2) sharing procurement and (3) transferring technology;
- ❏ Being a leader, both regionally and nationally, in the efforts to establish a regional electronic sharing of resources; and
- ❏ Being recognized by its membership and funding agencies as a provider of excellent quality services and support.

The NWACC Executive Director, on board since June 1991, has established a home office for the NorthWestNet staff in the principal market city of Seattle. The Executive Director provides leadership and manages the network under the general direction of the Executive Committee and the Board of Directors. The Executive Director's staff coordinates network operations, technical planning and management activities, network information service delivery, network user training and educational services, and marketing and general network administration.

The futures of NWACC and NorthWestNet are truly bright. In the Northwest's rapidly growing, technology-based and -driven economy, the demand for computing, electronic communications, and information services is ever increasing. With our expanded and enhanced network and computing service offerings, NorthWestNet membership and revenues are both projected to continue increasing rapidly through the mid-1990s.

Dr. Eric S. Hood
NWACC Executive Director
September 1991

NorthWestNet Acceptable Use Policy

NorthWestNet is a regional data communications network serving a consortium of universities and research groups in the northwestern United States. Its goals are summarized in the Articles of Incorporation for the Northwest Academic Computing Consortium, Inc.. All use of NorthWestNet facilities must be consistent with the goals and purposes of NorthWestNet. The intent of this statement is to describe certain uses which are consistent with the purposes of NorthWestNet, not to exhaustively enumerate all such possible uses.

Some acceptable uses of NorthWestNet facilities include:

- Use for scientific research or instruction at member and associate member institutions through the provision of high-speed data communications;
- Use as a vehicle for scholarly communications;
- Use as a means for NorthWestNet members to access remote computing resources for the purpose of scientific research or instruction. Notable examples of such resources are the NSF supercomputing facilities;
- Use necessary to support other acceptable uses. For example, administrative communications which are part of the support infrastructure needed for research and instruction are acceptable. Similarly, communications directly between non-member institutions in support of research or instruction at member institutions is acceptable;
- Use required by agreements with NSF, the primary funding agency for NorthWestNet;
- Use by member institutions as a laboratory for research and experimentation in computer communications, where such use does not interfere with production usage. However, any experimental use requiring modification to router software or protocol layers below ISO layer 4 requires prior review by the Technical Committee.

In general, commercial and general administrative use are prohibited. Use for scientific research or instruction at non-member institutions and at for-profit institutions may or may not be consistent with the purposes of NorthWestNet, and will be reviewed on a case by case basis.

Use of NorthWestNet for any illegal purpose, or to achieve unauthorized access to systems, software, or data is prohibited.

NorthWestNet is a production communications network on which many researchers depend. Uses that significantly interfere with the ability of other users to make effective use of the network are not acceptable.

Version 2.0
May 12, 1988

NSFNET Backbone Services Acceptable Use Policy

GENERAL PRINCIPLE:

(1) NSFNET Backbone services are provided to support open research and education in and among US research and instructional institutions, plus research arms of for-profit firms when engaged in open scholarly communication and research. Use for other purposes is not acceptable.

SPECIFICALLY ACCEPTABLE USES:

(2) Communication with foreign researchers and education in connection with research or instruction, as long as any network that the foreign user employs for such communication provides reciprocal access to US researchers and educators.

(3) Communication and exchange for professional development, to maintain currency, or to debate issues in a field or subfield of knowledge.

(4) Use for disciplinary-society, university-association, government-advisory, or standards activities related to the user's research and instructional activities.

(5) Use in applying for or administering grants or contracts for research or instruction, but not for other fundraising or public relations activities.

(6) Any other administrative communications or activities in direct support of research and instruction.

(7) Announcements of new products or services for use in research or instruction, but not advertising of any kind.

(8) Any traffic originating from a network of another member agency of the Federal Networking Council if the traffic meets the acceptable use policy of that agency.

(9) Communication incidental to otherwise acceptable use, except for illegal or specifically unacceptable use.

UNACCEPTABLE USES:

(10) Use for for-profit activities (consulting for pay, sales or administration of campus stores, sale of tickets to sports events, and so on), or use by for-profit institutions unless covered by the General Principle or as a specifically acceptable use.

(11) Extensive use for private or personal business.

This statement applies to use of the NSFNET Backbone only. NSF expects that connecting networks will formulate their own use policies. The NSF Division of Networking and Communications Research and Infrastructure will resolve any questions about this Policy or its interpretation.

NorthWestNet Network Operations Center (NOC)

Much recent national attention has focused on improving the quality of Internet connectivity services by enhancing "end-to-end" network management. In the three tiered hierarchy of the Internet, high priority has been placed upon the critical role of the midlevel networks in delivering quality connectivity services. "Hardening the regionals" has emerged as the phrase most often used to describe the portion of this new national initiative. Given the recent consensus regarding the importance of "end-to-end" network connectivity focused on mid-level networks, this brief summary of NorthWestNet's Network Operations Center (NOC) has been included in this Guide.

INTRODUCTION

The purpose of this document is to identify the functions that the Network Operations Center (NOC) will provide to maintain the operational integrity of the network. This document is available via anonymous ftp on ftphost.nwnet.net in local/nwnet/doc/uw-nwnet.noc.

NETWORK MONITORING, REPAIR, AND TROUBLE TRACKING

The NOC will provide real-time network monitoring and repair at the layers one (1) through four (4) in the OSI model. The link state of each NorthWestNet circuit will be queried periodically (approximately once a minute) by a Network Management Station (NMS). The NMS will be monitored 24 hours a day, 7 days a week. This NMS is expected to provide a real-time view of the entire network, and to have some rudimentary network diagnosis tools available to operators to identify common or general problems with link layer connectivity.

The level of staffing is expected to vary between primary shifts (approximately 8:00 a.m. to 6:00 p.m. Monday through Friday), and the secondary shifts (the complement of the primary shift hours). The primary shift will have skilled network analysts available and trained in more complex network diagnostic tools. These analysts will be able to assist in problem diagnosis and resolution at the Network and Transport Layers. The secondary shift operators will be expected to recognize simple circuit outages (at the Physical and Link Layers), and initiate work orders with telecommunications providers. Once an outage or problem is identified, it will be tracked with a trouble ticket system to help provide consistency across multiple shifts and to identify reoccurring problems.

CIRCUIT COMMISSIONING AND EQUIPMENT INSTALLATION

The NorthWestNet NOC will configure the equipment necessary to facilitate member connections to the network and deliver it to the member site. If the technical representative of the member institution requires additional support to complete the installation, the NOC will endeavor to assist. The NOC will also assist the public telecommunications providers in specifying and commissioning the required data circuits.

EQUIPMENT MAINTENANCE AND UPGRADE

The NOC will reconfigure and coordinate upgrades of the NorthWestNet managed equipment as necessary. In case of a hardware failure, the NOC will ship a spare to the member institution's technical representative, not later than the next business day following discovery of the problem.

DIAGNOSTIC TOOLS REPOSITORY

The NMS will act as a repository for network management tools. Tools in the public domain, developed locally by programming staff or available to the NOC through licensing agreements, will be stored on and available from the NMS.

NMS DATA COLLECTION AND ANALYSIS

The NMS periodically (approximately every 15 minutes) will query each router to retrieve a set of Management Information Base (MIB) variables that can be considered useful for diagnosis and analysis. This data will be stored on the NMS and made available for report generation or post-processing analysis. Rudimentary programs will be available to query this database and generate graphs as aids to problem diagnosis and reporting. Simple monthly reports on outages and circuit usage will also be derivable from this data.

INVENTORY AND REVISION CONTROL

The NOC will keep a database of NorthWestNet owned equipment, including serial numbers, revision levels, component types, equipment locations, etc..

DOMAIN NAME SERVICE

Upon the request of a member, the NOC will provide interim primary or continuing secondary Domain Name Service. Members may request interim primary DNS from the NOC, which implies that all host name additions, changes, or deletions be done by NOC staff. When a member site is able to provide its own primary DNS, the NOC will, if requested, continue to provide secondary DNS.

AGENCY INTERACTION

The NOC will interact with national, regional, and member network agencies, as well as telecommunications providers and equipment vendors to facilitate transitions in network topology, resolve outages, or provide other operational assistance as required.

SUPPORT FOR HUB SITES

The NOC will assist technical staff at NorthWestNet hub sites in resolving connectivity problems. This assistance will be mainly in the form of consulting by phone and e-mail.

NETWORK ENGINEERING

With consultation from and review by the NorthWestNet Technical Committee, the NOC will provide network engineering services to define and implement a network topology and architecture that will achieve NorthWestNet's connectivity and cost objectives as set forth by the NorthWestNet Management Committee.

Version 2.1, June 1991