

# Using Electronic Mail (EMAIL) for Database Communications

Lorry Scura\*  
John C. Klensin+

If you haven't used *EMAIL* it may be hard to imagine why you would *want to*. You may use *EMAIL* at your local work site and not realize what else is possible or it may seem too difficult. In this presentation I will show you what is possible with computer networking and *EMAIL*. My experiences with *EMAIL* have been very positive, I find it to be fast, easy, and efficient. It can also be fun. More and more of us find ourselves spending part of each day on the computer. Whether you are calculating diets, word processing documents, analyzing data, or doing something else, you're on a computer that either is already connected to a communications network, or could be connected. If you're not yet on a computer, this may be the reason to use one.

In the past twenty years communications technology has evolved from switchboard telephone systems to VoiceMail; from teletype and TWX to what is now an international communications network. In this presentation I will share with you some of my background using electronic communications and hopefully convey to you some of the benefits of these technologies.

My first work experience was as a switchboard operator. This switchboard had ten incoming lines, long black wires with plugs on the end, an incoming call would have a blinking light, you would put a plug in and finally transfer the call by physically moving the plug to the appropriate extension. Later, I worked as a TWX operator for the home office of a manufacturing company. (The TWX machine is sort of a primitive cross between *EMAIL* and a FAX - it's a typewriter, a printer, a paper-tape producer, and a telephone combined.)

The TWX served as a communications tool for receiving international orders and informal and formal communication between the branch offices. The TWX

fostered daily communication across time zones in a such a way that the concept of my *working environment* expanded. I began to think of each of these branch contacts as co-workers and would look forward to their correspondence. After a while, I no longer needed to read who the message was from, because I learned to recognize each individual's writing, typing, and "talking" styles. In my mind, I could hear a southern accent from the Baltimore office, a British accent from the London correspondent - although I had never actually spoken with either of them.

For the daily communication required for this organization the TWX was essential. Had we relied on postal mail the response time would have been too slow, had we tried to communicate internationally by telephone, one of us would have had to work a different shift.

Currently, as I work in research and database management, *EMAIL* quite naturally serves this same function. At the HNRC at Tufts, our group uses *EMAIL* regularly for all types of communication. Last year, for the first time, we were cabled to receive Internet access. This capability has expanded our concept of working environment in much the same way as the TWX did twenty years earlier, except that *EMAIL* is a lot easier to use and provides opportunities for interactive communication.

As we rely on the Grand Forks HNRC staff for nutrient database updates and support, prior to the Internet connection we used postal mail and telephones for communication. We can now communicate with Grand Forks staff through *EMAIL* quickly, easily, and more effectively. We no longer need to consider time zone differences or play phone-tag with one another. More importantly, we can now receive immediate database updates through the net, rather than postal mail on computer tape.

#### SLIDE 1: List of Major Interconnected Networks

The Internet, the net, the network, is actually a group of linked area-networks (Quartermain, 1990). BITNET, which may be the best known network in this community, links academic and research institutions and provides access to the worldwide communications networks. BITNET and the Internet are the most common networks in the United States. Some institutions are connected to one, some to the other, and a growing number to both. For *EMAIL* purposes and access to most types of services, the two networks are identical and highly interconnected. Software can make the differences nearly invisible, and may leave users unaware of which network they are actually using. John Klensin could likely tell you what each of these acronyms stand for and how they are connected to one another (if anyone is interested).

There are a wide range of users on the network. Scientific researchers, political communities, social groups, public interest groups, and others all use the electronic communication facilities of the net.

#### SLIDE 2: NSFNET T1/T3 Networks 4/91 Map

This map gives a visual representation of the connections that exist for one of the U.S. networks. Each of the world-wide area networks could be mapped out like this and if they were all put on a single map many areas of the world, the U.S. in particular, would be a solid mass of black lines. Each of these networks are connected through gateways of one sort or another, but this is invisible to the user. You need to know as much about how the net works as you do about the U.S. Mail. (It just gets there!)

#### SLIDE 3: Electronic Mail(*EMAIL*) Services

There are various services available to network users. *EMAIL* can be used to communicate with individuals in the next office or world-wide, or networks can be used to reach many individuals simultaneously through special interest mailing lists. Transfer of data files and machine readable documents can be as easy as copying a file.

*EMAIL* communication is very much like postal mail, without the stamps, delays (usually), or paper copies. It differs from FAX in that the mail is queued until you read it, and printed only if you want a printout. It is further differentiated from these other communication models in that it allows you to *edit* the document and send it back. It mimics a conversation in ways that can't be accomplished as spontaneously in other forms of written communication.

#### SLIDE 4: Sample *EMAIL* Correspondence

In our day-to-day work environment *EMAIL* can be quite efficient. Messages can be sent to individuals or to multiple recipients. The "Does anyone know what this is?" question is a common one in the coding of food intake. Sometimes contacting the subject is not feasible, so the coders ask each other, ask dietitians, ask the resident vegetarians, check the resource library, or visit the supermarket or health food store to better identify products. *EMAIL* is used to efficiently ask questions of a number of people at one time, without the effort of calling or visiting each of them. In our environment where we need to interact with people who spend little time at their desks this can be an invaluable communications tool. Sometimes everyone has a different idea, sometimes someone has the product in their refrigerator and can bring in the label.

*EMAIL* correspondence is different - it takes some getting used to for new users. Use of a simple editor is recommended - as it allows the user to "pull in" a message being replied to (as in this example). The first part of this posting, with the *greater than* sign (>) leading the text is an excerpt of the "question" that was asked. A real advantage of this medium is that the respondent can easily *include portions of the original message in the REPLY*, thus reminding the sender of what was asked, and *eliminating the need to reiterate the question*. In this form, the mail message also makes for excellent documentation - it can be filed for future reference.

#### SLIDE 5: Conversational "Language" of *EMAIL* Communications

As *EMAIL* often takes on conversational tones, but the printed word seems more formal - many users make use of various mood clues in their text. This slide details some of the *EMAIL* conventions that are used. Any graphic designer will tell you that ALL CAPS are very unfriendly to the eye, they also seem to take on the appearance of SHOUTING in *EMAIL* conversation. The *flame* is basically a warning that someone is about to vent frustration or anger (offered by the sender so that the context is known *before* the text, the reader then may choose to read it, or skip it altogether).

Because in written communication body language is missing, various symbols are used to indicate mood. Grin, smile, just kidding may be seen in brackets leading or following a sentence to lighten the tone. Faces can also be used (turn your head to the side to look at them) to serve the same purpose.

#### **SLIDE 6: Mail File Systems**

Many mail utilities have organizing capabilities where messages can be filed by topic. These utilities are similar to conventional paper filing systems. The user can select folders, search for keywords, or look at a list of messages which shows the date and the subject of each message in a folder. This slide indicates how mail messages can be filed into folders, the user can see the available folders, and a folder's contents can be reviewed. Mail utilities differ in the naming conventions and commands, but whether they are called folders, notebooks, or files the concept is the same as a manual system.

#### **SLIDE 7: Examples of Electronic Mail Lists Available for Subscription**

Joining a topic-specific list can be a way of sharing ideas, expertise, and support with others interested in the same issues. Lists can be of any topic, and reviewing some of the list server sites, I discovered these existing electronic mail lists. The info lists for IBMPC, Vax, and Mac users are heavily subscribed, with members helping each other with problems and generally talking about issues related to these computers. Info-nets is a list for discussion of all concerns relating to computer networking and communications. The hobby lists, SF-LOVERS (Science Fiction Lovers) for example, is a discussion list for people who love fantasy and science fiction in books, movies, and television; FELINE-L (Cat Lovers List) is a discussion list devoted to the problems and pleasures associated with cat companionship. Members refer each other to books, journal articles, other people, share information, and problem-solve for each other. The kinds of activities on these lists could easily be transferred to nutrition-related subjects.

I looked for a nutrition-related list that conference participants might find interesting as an example. I found one - NUTEPI - a new list for the discussion of nutritional epidemiology issues, but there hasn't been any activity yet. This list will be announced this afternoon during the international sessions and I hope some of you will become members.

#### **SLIDE 8: Interest Group Mailing Lists/Mail Distribution Lists**

Joining a list is not difficult to do and allows for a number of possible interactions, illustrated in this diagram. An individual sends a command to a list server address. The server responds back that you are now a member. Any member of the list can send mail to the list which is automatically distributed to each of

the members on the distribution list. Individuals can also passively read the conversations on a list. Further, list membership provides individuals with the opportunity to meet others with similar interests and ideas and communicate directly with other members with mail directed to their individual network addresses.

#### **SLIDE 9: Subscribing to a List**

Joining a list can be as easy as one mail message. A message is sent to the list site, either a LISTSERV or LIST-NAME-REQUEST address, and the text of your message contains the command SUBSCRIBE, the list name, and your full name, or in the case of the Internet variety, your request actually goes to a person, so you might add please and thank you. New subscribers might want to identify any archive files of list activity with the INDEX command. The GET command can deliver those files to you.

I can imagine a list that serves the same function as this morning's 7:30 A.M. session with U.S.D.A. database developers. The kinds of questions, comments, and interactions at that meeting (and at each year's conference in general) could happen on a daily basis on the Internet with distribution lists.

One of the most valuable benefits of list communications is the ability to selectively read contributions to a list (for example, users can read each posting's subject field and decide whether to read it, delete it, save it, or go on to the next message depending on its relevance to your work). I do this all the time on the infonets list, as I'm not interested in the very technical discussions of the workings of network communication. On the other hand, I have found other uses of the list - like problem-solving with network addresses or How to' lessons, "Where do I find ...?" questions are often quite helpful to me as a network user.

The diversity of the nutrient database conference community is this year's theme for the conference. List conferences are particularly useful for bringing groups of diverse interests and expertise together. To give an example that relevant to nutrient databases - imagine a list for food composition data. Extensive discussion might take place on a single nutrient - vitamin K, for example. Discussion of sources of data, analytic methods, problems with the estimation of vitamin K in foods, studies or journal articles that are relevant, etc. might be brought to this list, with contributors world-wide.

I may not be at all interested in vitamin K data at this time and could skip over these entries. Later, when a researcher comes to me and wants a dataset of vitamin

KI could easily search the list archives for all messages containing vitamin K. Additionally, I could communicate directly with the individual list members who had been involved in the discussion earlier. In this way, the list serves as an informational database, an excellent communications tool, and a way of networking and meeting people you might otherwise not come in contact with.

#### SLIDE 10: Examples of Network Addresses

Both for illustration and contact purposes I've listed some of the network addresses that work for John Klensin at MIT, and me at Tufts. For various reasons, multiple addresses do exist. John and I offer our addresses to help you get started and will refer you to others, as needed.

#### SLIDE 11: Example of Posting to Info-nets List

As an example of list communication, I've taken an excerpt of a conversation from the info-nets list. In this example, one user is trying to make sense of a port problem and another is trying to help. The question asked here was in fact answered by several info-nets subscribers and others went on to discuss John's response to the question, as well. This posting is pretty typical of the list, in that the conversation can be similar to a foreign language unless you know the inner workings and protocols of networks. John is a frequent contributor to info-nets and is an invaluable resource when it comes to problem-resolution. Luckily, we don't need to understand what they are talking about on info-nets to be network users. They take care of the problems so that we can use the net.

#### SLIDE 12: File Transfer Protocol (FTP) of the Internet

This slide illustrate how to transfer files using the File Transfer Protocol(FTP) of the net. In this example, I am actually logging onto this computer, on an account specifically set up for this purpose(called ANONYMOUS), and copying the file that contains the map of a U.S. network that I showed you earlier. This is basically how the programmer in Grand Forks transfers database updates to us. He uses FTP to log onto an account on our computer and simply copies the file.

In summary, I'd like to say that reading the various lists and using FTP has made me realize how valuable this kind of service could be to the nutrient database community. I can imagine international bulletins, lists, and individual communications that would reduce some of the current barriers to sharing resources, data, and ideas.

It's very difficult to generalize what it means to use the network, as each site, each computer, may have a different interface. That's the hard part - this presentation can't really serve as a how-to because the environments you all work in are different. What I do hope I've provided is an incentive for some of you to try electronic communications. You will have to overcome the barriers of something new, something unfamiliar, and something that won't work just right in the beginning. But I think the payoff can be great.

#### References

LaQuey, T.L., ed. Users' directory of computer networks. Bedford, MA: Digital Press; 1990. 630 p.

Quarterman, J.S. Matrix: Computer networks and conferencing systems worldwide. Bedford, MA: Digital Press; 1989. 719 p.

- \* Lorry Scura  
Tufts HNRCA  
Boston, Massachusetts
- + John C. Klensin  
INFOODS Secretariat, MIT  
Cambridge, Massachusetts

#### SLIDE 1:

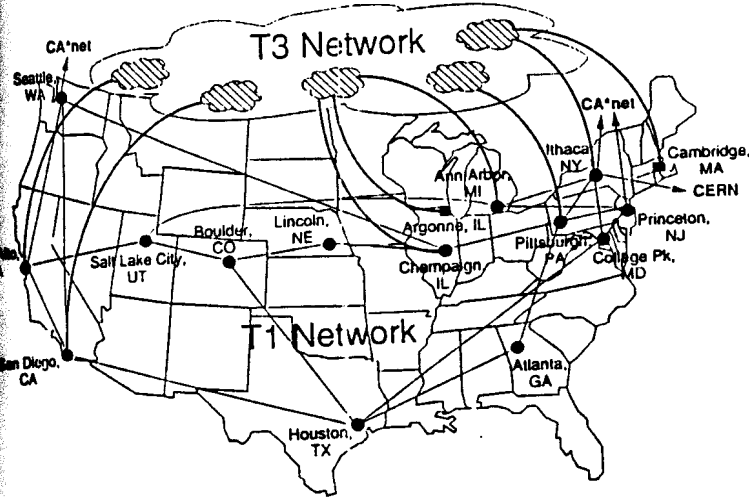
#### List of Major Interconnected Networks

<u>Networks</u>		
BITNET	DASnet	SPAN
Internet	HEPnet	MFEnet
EAN	UUCP	EUnet
XeroX	EASYnet	VNET
JANET	CDNnet	ACSnet
INFNET	JUNET	PeaceNet
BITNET/EARN/NetNorth/Gulfnet		

#### Communities & Users

Scientific Researchers  
Political Communities  
Computer Centers  
Operating Systems  
Network Researchers  
Social Groups  
Public Interest Groups  
Technical Groups

SLIDE 2: NSFNET T1/T3 Networks 4/91



SLIDE 5:

Conversational "Language" of EMAIL Communications

- ALL CAPS IS EXTREMELY UNFRIENDLY AND IS THE EQUIVALENT OF *SHOUTING*.
- Sometimes you will see text preceded by cues, such as:  
 .....FLAME..... (which usually precedes a very angry note)
- As EMAIL often takes on conversational tones, but the typed word can be misconstrued - mood clues have been used to precede, or follow text :  
 <grin> <smile> <just kidding> <ha! ha!>  
 :- ) ^ (happy faces)  
 (^; (-: (winking, smiling faces, backwards)  
 }-: ]-: (frowns, mad faces)

SLIDE 3:

Electronic Mail(EMAIL) Services

- One-to-one communication with rapid response and opportunities for interactive editing of documents
- One-to-many communication with Interest-Group Mailing Lists
- LISTSERV functions that automatically send back documents or data files when the appropriate GET commands are sent
- Accessibility to computers all over the world via FTP and easy transfer of data files and machine-readable documents

SLIDE 4:

Sample EMAIL Correspondence

Original Message:

- > A subject reports eating "peperoncini" - Does anyone know what that *is* ?
- > Could it be packaged tiny sausages - like little pepperoni?

Reply:

I have some in my refrigerator - they're bottled, tiny hot green peppers called peppercini or something like that? I'll bring in the label.

SLIDE 6:

Mail File Systems

Most mail utilities have some capability which allows users to organize their mail. In the VAX/VMS environment, there are MAIL FOLDERS and the user would read the message and type:



MAIL> FILE FOLDER\_NAME

Another mail system utilizes 'notebooks' but it is basically the same principle. A directory of folders can be called up, and specific searches in these files can be accomplished:



MAIL> DIRECTORY/FOLDERS

BITNET	DIARY_STUDIES	EMAILSESSION
EPI	FELINE-L	GRANDFORKS
MAIL	NUTRNET	SYSTEMS_DOCS

MAIL> DIRECTORY EMAILSESSION

EMAILSESSION:

#	From	Date	Subject
1	SAUL_SY	May-22-91	Outline of presentation
2	SANDY	May-23-91	Outline looks OK



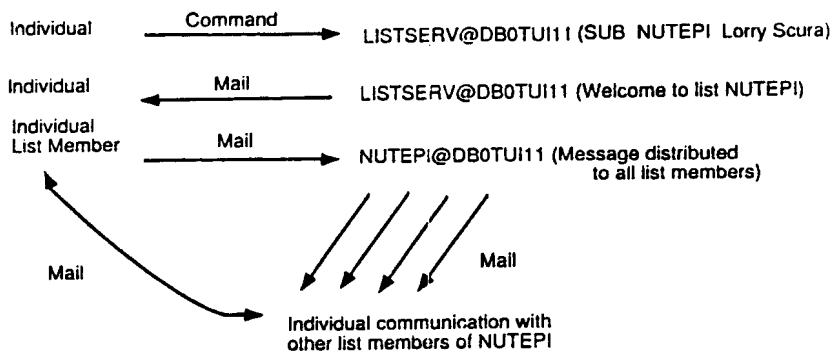
SLIDE 7:

Examples of Electronic Mail Lists Available for Subscription

High Activity:	Moderate Activity:	No Activity:
INFO-IBMPC	SPSSX-L	NUTEPI
INFO-NETS	SAS-L	EPID-L
INFO-VAX	KIDS-ACT	
RISKS		
SF-LOVERS		
INFO-MAC		
FELINE-L		

SLIDE 8:

Interest Group Mailing Lists/ Mail Distribution Lists



SLIDE 9:

Subscribing to a List

```

MAIL> SEND
TO:  LISTSERV@DB0TUI11.BITNET
SUBJ:

Subscribe NUTEPI "Lorry A. Scura"

Index NUTEPI

-----
Get NUTEPI archives.list
  
```

SLIDE 10:

Examples of Network Addresses

```

Internet: Klensin@INFOODS.MIT.EDU
BITNET:  JCK@MITVMA

Internet: LScura@HNRC.TUFTS.EDU
BITNET:  LScura@TUFTS
  
```

Note: For properly configured BITNET hosts - Internet addresses *should* work as BITNET addresses.

SLIDE 11:

Example of Posting to Info-nets List

[Mail header and list header deleted]

```

< But there is no port #5555 specified in the RFC1060.
< Is it a private one? An experimental? The original
< question dealt with "nslookup". How could you use
< "te:net" on another port to transport a non-text protocol,
< as DNS?
  
```

[deleted]... Let's assume that I was trying to run a conceptual TCP/IP network in which I had some fully-competent Internet hosts and several incompetent or only partially connected ones(whether those hosts are part of the same subnet, or part of the same domain, or are blocked by security gateways from accessing the DNS servers makes no difference). I decide that the only thing to do is to run host tables on those hosts(perhaps the software does not support anything else) and to provide users on each of them with a utility for updating the local host table, one host name at a time...[deleted]

```

--:ohn
Klensin@INFOODS.MIT.EDU
-----
  
```

SLIDE 12:

File Transfer Protocol(FTP)

```

$ FTP NIS.NSF.NET
GINGER.HNRC.TUFTS.EDU MultiNet FTP user process
Connection opened
< FTP Serve at MERIT, 15:42:02 EDT Tuesday 6/11/91
< Connection will close if idle for more than 5 minutes.

NIS.NSF.NET> LOGIN ANONYMOUS
<Send 'guest' as password, please
Password:
<ANONYMOU logged in: Working directory is ...

NIS.NSF.NET> CD MAPS
< Working directory is MAPS 191 (ReadOnly)

NIS.NSF.NET> GET BACKBONE.T1T3-PS
To local file: NETMAP.PS
<Sencing file 'backbone.t1t3-ps'
<Transfer completed successfully

NIS.NSF.NET> EXIT
<Quit command received. Goodbye
  
```