The First Network Email

A History from Ray Tomlinson

During the summer and autumn of 1971, I was part of a small group of programmers who were developing a time-sharing system called "TENEX" that ran on Digital PDP-10 computers. We were supporting a larger group working on natural language. Earlier, I had worked on the Network Control Protocol (NCP) for TENEX and network programs such as an experimental file transfer program called CPYNET.

I was making improvements to the local inter-user mail program called SNDMSG. Single-computer electronic mail had existed since at least the early 1960's and SNDMSG was an example of that. SNDMSG allowed a user to compose, address, and send a message to other users' mailboxes.

A mailbox was simply a file with a particular name. Its only special property was its protection, which only allowed other users to append to the file. That is, they could write more material onto the end of the mailbox, but they couldn't read or overwrite what was already there. The idea occurred to me that CPYNET could append material to a mailbox file just as readily as SNDMSG could. SNDMSG could easily incorporate the code from CPYNET and direct messages through a network connection to remote mailboxes in addition to appending messages to local mailbox files.

The missing piece was that the experimental CPYNET protocol had no provision for appending to a file; it could just send and receive files. Adding the missing piece was a no-brainer -- just a minor addition to the protocol. I don't recall the protocol details, but appending to a file was the same as writing to a file except for the mode in which the file was opened.

Next, the CPYNET code was incorporated into SNDMSG. It remained to provide a way to distinguish local mail from network mail. I chose to append an @ sign and the host name to the user's (login) name. The @ sign seemed to make sense. The purpose of the @ sign (in English) was to indicate a unit price (for example, 10 items @ $1.95). I used the @ sign to indicate that the user was "at" some other host rather than being local.

The first message was sent between two machines that were literally side-by-side. The only physical connection they had (aside from the floor they sat on) was through the ARPANET. I sent a number of test messages to myself from one machine to the other. The test messages were entirely forgettable and I have, therefore, forgotten them. Most likely the first message was QUERTYIOP or something similar. When I was satisfied that the program seemed to work, I sent a message to the rest of my group explaining how to send messages over the network. The first use of network e-mail announced its own existence.

These first messages were sent in late 1971. The next release of TENEX went out in early 1972 and included the version of SNDMSG with network mail capabilities. The CPYNET protocol was soon replaced with a real file transfer protocol having specific mail handling features. Later, a number of more general mail protocols were developed.

Email FAQs

Did you send the first network email?

As far as I know, yes. However, there are a few qualifications. The word "network" should be included because there were many earlier instances of email within a single machine. Computer networks, in any real sense, didn't exist until the ARPANET was built in 1969. Dick Watson proposed a form of email in July 1971 (RFC 196). I don't think that was ever implemented and it differed in that the mail was directed to numeric mailboxes. RFC 196 also suggests that the final product would be a printer output (i.e. ink on paper).

Why did you do it?

Mostly because it seemed like a neat idea. There was no directive to "go forth and invent email". The ARPANET was a solution looking for a problem. A colleague suggested that I not tell my boss what I had done because email wasn't in our statement of work. That was really said in jest because we were, after all, investigating ways in which to use the ARPANET.

Ray

Ray Tomlinson

Why did you choose the @ sign?
The primary reason was that it made sense. The @ sign didn't appear in names so there would be no ambiguity about where the separation between login name and host name occurred. (Of course, this last notion is now refuted by the proliferation of products, services, slogans, etc. incorporating the @ sign.) The @ sign also had no significance in any editors that ran on TENEX. I was later reminded that the Multics time-sharing system used the @ sign as its line-erase character. This caused a fair amount of grief in that community of users.

What was the first message?
As I mentioned above, the first message of any substance was a message announcing the availability of network email. The exact content is unknown, but it gave instructions about using the @ sign to separate the user's name from his host computer name.

Did you receive any rewards, patents, etc.?
Not unless you consider the current interest in the origins of email a reward.

What were the early uses of email?
The early uses were not terribly different from the current uses. The exceptions are that there was only plain text in the messages and there was none of that disgusting SPAM.

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