MLTNET - A "MULTI-TELNET" SUBSYSTEM FOR TENEX

INTRODUCTION

MLTNET is a TELNET-like facility for TENEX which enables a user to
control a number of jobs, running on different ARPANET hosts. It
multiplexes the user's local console among the remote jobs. MLTNET is
useful in applications which require coordinated behavior of several
network hosts. In particular, we have found it helpful in debugging
programs which make use of the network. The MLTNET program is designed
to be easy to use and, while used in remote mode, to be as transparent
as possible to the user. It is somewhat less sophisticated than the
TENEX user-TELNET program. MLTNET is currently a subsystem on the BBN-
TENEX host.

USING MLTNET

MLTNET operates in two modes:

1.   Local Mode Operation:
        When in local mode MLTNET interprets input types by the
        user as commands to it. Commands consist of a mnemonic
        command name followed by zero or more parameters.
        Included in the commands recognized by MLTNET are ones
        which enable the user to associate a name of his choice
        with a connection to an ARPANET site, to establish a
        connection with a named site, to list the network status
        as seen from the user's TENEX etc.

2.   Remote Mode Operation
        When operating in remote mode MLTNET makes the user's
        console appear to be directly connected to a remote
        site. It transmits input typed by the user to the
        remote site and prints output recieved from the remote
        site. Output received from a remote site while the user
        is in local mode or is interacting with another remote
        site is buffered for the user by MLTNET.

        MLTNET has been designed to be transparent to the user
        while operating in remote mode. In particular, when in
        remote mode it transmits user-types ^C (CONTROL-C, the
        TENEX "attention" character) and ^T (CONTROL-T, the
        TENEX "time used query" character) to the remote site.

When in local mode ^C and ^T have their usual TENEX
effect.

Occasinally a user may find it necessary to modify the
characteristics of a connection to a particular remote
site. For example, he may want to have MLTNET echo
typed input as it is transmitted. Or, he may be using a
remote host which requires both upper and lower case
characters from a local terminal which has only upper
case; in such a case he would want MLTNET to transmit
upper and lower case as appropriate. In remote mode
operation MLTNET recognizes "!" as an escape character
and interprets the character following it as a command
to change the characterristics of the connection currently
in use. Commands recognized by MLTNET in remote mode
are summerized in the next section. To have MLTNET
transmit "!" to the remote site the user types "!!".

MLTNET Command Summary

Local Mode Commands

MLTNET uses the character "<" to signal the user that it is in local
mode ready to accept input. Commands and command parameters may be
editted as they are input.The character ^A (CONTROL-A) deletes the last
character input. In response to a ^A MLTNET types " deleted. The
character ^R (CONTROL-R) causes the input string as collected so far to
be retyped (with all editing carried out). MLTNET responds to the
character RUBOUT (octal 177) by aborting the current input collecting
operation and typeing the ready character "<". The ALTMODE character
(octal 175) may be used to invoke command recognition and completion. If
insufficient information is availble to recognize an input string as a
command MLTNET responds to ALTMODE by ringing the terminal bell. Any
prefix which uniquely identifies a command is recognized as that command
by MLTNET.

In the following, <name> and <site> denote command parameters. They are
strings terminated by a space or carriage return. <name> is a user
chosen string of 14 characters or less; site is either the name of an
ARPANET host or the string "LOCAL".

The commands recognized by MLTNET in local mode are:

ASSIGN:
        syntax: ASSIGN <name> <site>
        effect: Associates the user chosen string <name> with a
                connection to the ARPANET site <site>.

TALK:
>   syntax: TALK <name>
>   effect: Switches from command mode to remote mode
>   directing subsequent console input to the site
>   associated with <name>. If no ARPANET site is
>   currently associated with <name>, the user is
>   asked to spesify a site. The first time the
>   user "talks" to a particular named site MLTNET
>   goes through the ARPANET initial connection
>   protocol with the remote site in order to
>   establish a duplex connection with it.

NAMES:
>   syntax: NAMES
>   effect: Prints on the console the <name>/<site>
>   associatins currently known to MLTNET.

QUIT:
>   syntax: QUIT
>   effect: Returns control to the TENEX EXEC breaking all
>   connections with remote hosts. It is good
>   practice to log out of each remote host before
>   using the QUIT command.

NETSTAT:
>   syntax: NETSTAT
>   effect: Prints on the console the network status as seen
>   from the local TENEX.

RENAME:
>   syntax: RENAME <name>1 <name>2
>   effect: Associates <name>2 with the ARPANET site
>   previously associated with <name>1.

FLUSH:
>   syntax: FLUSH <name>
>   effect: Breaks the network connection with the ARPANET
>   site associated with <name> and, in addition,
>   breaks the association between <name> and that
>   site.

HOSTS:
>   syntax: HOSTS
>   effect: Prints on the console the list of hosts
>   currently known to the MLTNET subsystem.

HELP:
>   syntax: HELP

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               effect: Prints on the console a breif summary of how to
                       use MLTNET.


Remote Mode Commands


In remote mode MLTNET recognizes the escape character "!" as a signal to
interpret the following character as a command.  Currently MLTNET
recognizes the following characters as commands to it:


Q:        (quit) Causes MLTNET to switch from remote mode to local
          mode.


L:        (local echo) Causes MLTNET to echo characters as it
          transmits them to the remote site. ;L is the inverse of
          R. The default case.


R:        (remote echo) Causes MLTNET to transmit characters typed
          to it without echoing them; invers of L.


U:        (upper case) Causes MLTNET to transmit upper case letters
          as typed; the inverse of S. The default case.


S:        (small letters - lower case): Causes MLTNET to transmit
          upper case letters typed to it as lower case letters.
          In this mode of operation "^" acts as a shift key; "^"
          may be transmitted by typing "!^". S is the inverse of
          U.


X:        (where X is any character other than Q, L, R, U or S):
          Causes MLTNET to transmit X.


The following is an annotated scenario which illustrates the use of
MLTNET; in it characters typed by  the users are underlined.


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