MASSACHUSETTS INSTITUTE OF TECHNOLOGY
INFORMATION PROCESSING CENTER

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BACKUP AND RETRIEVAL OF USER FILES ON MULTICS

The Center will endeavor to provide adequate backup on magnetic
tape of the user files stored on secondary storage devices for
Multics. Although the Center will take the utmost care in storing
the tapes, it cannot be held responsible for nonreadability of a
particular tape or for the destruction of a tape by mechanical
failure or other means.

The intent is to provide sufficient redundancy of information
storage so that users can retrieve files created over an 18-month
period.

The following points indicate the types of backup performed and
the period of time for which magnetic tapes will be saved for the
user to retrieve.

1. Incremental dump tapes of user files (i.e., dumps of files
    modified since the last incremental dump) will be saved for
    four weeks. Any file residing on the system for at least two
    hours will have been written on an incremental dump tape and
    therefore is retrievable for four weeks.

2. Complete dump tapes of user files (i.e., all files currently
    on secondary storage devices) will be taken on Mondays and
    Thursdays and saved for six months except for the tapes written
    on the first Monday of each month (refer to (3) below). Any
    file residing on the system Monday or Thursday between midnight
    and 4 a.m. will be written on a complete dump tape and will be
    available for retrieval for six months.

3. Complete dumps taken on the first Monday of each month will be
    written in duplicate, and the tapes will be saved for 18 months.
    Any file residing on the system the first Monday of the month
    between midnight and 4 a.m. will be written on the complete
    dump.

Users wishing to retrieve Multics files must complete a Multics
File Retrieval Request (sample attached) and submit the form at
the dispatching counter on the second floor of building 39 or
to the operations staff on the ninth floor of 545 Technology
Square. Retrieval requests normally will be performed late at
night when the system is lightly loaded. Overnight service is
the norm, although faster service may be requested under special
circumstances (see the Manager of Operations).

Both individual files and the entire contents of directories may
be retrieved. (Links will not be retrieved.) If the name of a
file is specified, that file will be retrieved; if the name of
a directory is specified, all the entries in that directory, in-
cluding all subordinate directories and their contents, will be
retrieved. Existing files in one of these directories will not
be deleted unless a file of the same name is found on the re-
trieval tape(s).

Files and directories are referred to unambiguously in Multics
by use of an "absolute" pathname, which is a concatenation of
entry names, separated by ">", starting at the root directory
and leading to the desired segment or directory. In the case of
multiply-named entries, the backup retrieval system makes the
restriction that each name in the absolute pathname be a "first"
name, as typed by list or status. Note the pathnames of most
user files begin with ">user_dir_dir>PROJ>PERS" where PROJ
specifies the user's project and PERS specifies the user's
(personal) name.

Users can request file retrieval from complete dump tapes, in-
cremental dump tapes or a combination of complete and incremental
dump tapes. Complete dump tapes, containing all user files in
the Multics file system at the time of the complete dump, are
prepared twice a week. Incremental dump tapes, containing all
files modified since the last incremental dump, are written on
a relatively continuous basis during normal Multics operation.
The current schedule of incremental and complete dumps is listed
on the preceding page.

If a file (or directory) has been in existence long enough to have
been written on a complete dump tape, it may be retrieved merely
by specifying the date of the appropriate complete dump. This
technique can be used to retrieve older copies of files when the
current copy is found to have been damaged or lost.

If a file has been created or modified since the last complete
dump was taken, the file must be retrieved from the incremental
dump tapes. In this case, the user specifies a time period (from
date/time to date/time) in which the file was created or last
modified. The last copy of the file dumped within the specified
time period will be retrieved. This technique also can be used
to retrieve an entire directory if the directory is known to have
been created since the last complete dump.

If a great number of files, a directory or even a sub-tree of
the file hierarchy is lost, retrieval can be accomplished by a
combination retrieval request specifying retrieval from the most
recent complete dump tape and from all the incremental dump tapes
taken since the complete dump up to the time that the loss was
discovered. This type of retrieval is requested merely by
specifying retrieval from both complete and incremental dump
tapes on a single request form. In this case, the starting date
and time of the incremental portion of the retrieval is left
blank.

MULTICS FILE RETRIEVAL REQUEST

User's Name:_____ Project:_____

Date/Time Submitted:_____ Phone:_____

Dump Type:

(__) Complete Dump   Date:_____

(__) Incremental Dump   From (Date/Time):_____

                               To (Date/Time):_____

Absolute path names of Files or Directories to be retrieved:

1._____

2._____

3._____

4._____

5._____

6._____

7._____

8._____

9._____

10._____

User's Signature:_____

FOR OPERATIONS USE ONLY

Reel Numbers:_____

_____

Date/Time Retrieved:_____

CPU Time:_____

Operator:_____

Comments:_____

_____