

A CHECKLIST OF MULTICS FEATURES

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Following is a checklist of currently available features and facilities of Multics. Although many of the features are described in cryptic and untranslated local jargon, one can at least obtain a feel for the range of facilities now provided. Further information on most of these features may be found in the Multics Programmers' Manual.

Interactive Time-Sharing Facilities

- 40 average users per central processor
- file editors (2) (or build your own)
- file manipulation (rename/list/delete)
- personal command abbreviations
- recursive command language
- source language debugging with breakpoints
- subroutine call tracer
- can stop any running command or program

Programming Languages

- PL/I
- FORTRAN
- BASIC
- (APL)*
- LISP
- BCPL
- ALM (assembly language/Multics)

Information Storage System

- configuration independent
- accessed through virtual memory (segments)
- access control lists by user or project
- links to segments of other users
- hierarchical directory (catalog) arrangement
- public library facilities
- sharing at all levels
- multiple segment names (synonyms)
- separate control of read, write, append, and execute

Programming Environment

- segmented virtual memory
- dynamic linking of procedures and data, or prelinking
- interprocess communication
- independent of configuration
- uniform error handling mechanism
- user definable protection rings
- microsecond calendar clock with interrupt
- program interrupt signal from console

Input and Output

- standard typewriter interface for device independence
- ANSII character set used throughout
- input characters converted to canonical form
- erase and kill editing on typed input
- I/O streams switchable during execution
- magnetic tape, printer, card punch, card reader
- typewriter terminals: IBM 2741, 1050
 - Teletype 37 (33, 35 usable)
 - Dura, Datel, Execuport
- graphic support library (devices: ARDS, IMLAC, DEC 338)
(ARPA network)*
- interfaces at three levels:
 - formatted conversion
 - bit stream control
 - full device control

Management Facilities

- passwords required for login
- project may interpose authentication procedure
- decentralized projects
- accounting, billing, and quotas
- on-line probing and account adjustment
- operator or system initiated logout of users
- unlisted users
- limited service system
- dynamic reconfiguration of memories and cpus
- system performance metering for parameter adjustment

Communication Facilities

- interuser mail
- help command; help files
- message of the day
- on-line error reporting
- on-line user graffiti board
- operations message broadcast to logged-in users

Absentee facilities

priority/defer queues for printer, card punch
queued translator facility
(GECOS environment)*
(General absentee user facility)*

Reliability measures

weekly file copies onto tape
daily disk/drum copy onto tape
incremental file copies onto tape, 1/2 hour behind use
salvager to clean up files after system crash
emergency shutdown entry to system

Maintenance Features

on-line library change, no disruption of current users
entire system source on-line, maintenance tools
system checkout on small hardware configuration
on-line performance monitoring of multiprogramming
paging traffic
disk/drum usage
typewriter traffic
user performance feedback:
cpu time and paging load on each command
page trace always operating
subroutine call counters

Limited subsystems

user providable command interface
Dartmouth environment
PAL environment
SIPB environment

Miscellaneous Facilities

desk calculators
sort command
memorandum formatting and typing subsystem
user-provided list of programs to be automatically
executed when user logs in.

* These items are currently under development. Availability is expected sometime in 1971.