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Introduction

Summary of Initial I/O System for Initial Multics.
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Purpose

This section summarizes the degree of implementation of I/O System calls, features, and modules to be achieved by the time of Initial Multics. This partial I/O System (IOS) implementation is called the Initial IOS.

Devices Supported

The input/output devices supported by the Initial IOS are listed in Table 1.

User Calls

Table 2 contains a complete list of user calls and shows the degree of implementation for each call. "Delayed" indicates that the call is not implemented in the Initial IOS; the call will be rejected by the I/O switch. "Full" indicates essentially complete implementation from the user's vantage point. Partial implementation of certain IOS features may affect use of these calls. "Partial" indicates an implemented call having some nonimplemented minor aspect. "Faked" indicates calls which while accepted by the Initial IOS have a faked or dummied implementation. Discussion later below of certain calls and features will clarify these meanings.

Mode Handling

The Initial IOS is committed only to the implementation of default modes (see Section BF.1.02, Table 3). The synchronization modes are discussed separately below. Outer modules will accept mode arguments in calls and pass them to a Mode Handler and get back a mode bit string, bmode, (see Section BF.2.27). The Mode Handler may either: (1) be fully implemented and function normally; or (2) be dummied and return a fixed (but tailored to the outer module) bmode. In either case, outer modules are coded to test and branch on the mode states in bmode. However, program branches corresponding to nondefault modes are committed only to return an error condition.

The tape DSM implements "sequential-backspaceable" as the default access mode in the Initial IOS (see Section BF.1.02).

Synchronization Modes

The read and write synchronization modes concern read-ahead and write-behind respectively and are the sole responsibility of the Device Strategy Module (DSM) (see Section BF.1.04). These modes

are implemented in Initial IOS DSMs. The readsync and writesync calls are implemented except that the limit argument is ignored, and some built-in limit is used instead. Inasmuch as these modes are represented in bmode, the use of a dummy Mode Handler will prevent these modes from being changed (default is asynchronous). The Initial IOS implements only the synchronous workspace synchronization mode (except for DCMs which are always asynchronous). Related calls, worksync, and iowait are accepted. The worksync call propagates normally but otherwise has no effect. Since the workspace mode is held synchronous, immediate return from the iowait call occurs. The abort call functions normally.

Element Size

The element size is fixed at 9 bits for the typewriter modules; a setsize call is accepted provided it specifies this size. The getsize call is implemented for all modules. Both calls are fully implemented for the tape modules. The element size is fixed at 6 bits for the PRT202 DCM and at 9 bits at the DSM.

Delimiters

The setdelim and getdelim calls are not implemented in the Initial IOS. The "new line" character is the fixed read- and break-delimiter in the typewriter modules.

Status Reporting

Status returned by inner modules (e.g. TBM) and standard subroutines (e.g. request queuer) is essentially complete in the Initial IOS. The status bit string returned for outer calls is expected to be incompletely but adequately implemented; the primary bits are fully implemented and many bits in the status subfields are implemented.

The Monocaster and Synonyms

The Monocaster is classed non-critical in Initial Multics. Indirect-frame attachment (using a typename equal to "ioname") requires the Monocaster. The ioname synonym function (using a typename equal to "syn") is provided by the switching complex. See Section BF.1.01.

Modules and Data Bases

Table 3 shows the degree of implementation of various data bases and their maintainers, and of various inner and outer modules. Modules not listed are not implemented in the Initial IOS.

Request Queuer and Driver

The request queuer and driver are fully implemented in the Initial IOS, except the list of queuable calls is restricted (see

BF.2.24) to:

```
localattach
detach
restart
changemode
abort
order
read
write
writerec
```

Registry Files

The I/O Registry Files and the I/O Registry File Maintainer are implemented in the initial IOS. However, the extent to which unique Registry Files will be used for individual tape reels, typewriters, etc. is not yet determined. The automatic creation of temporary Registry Files for such devices is implemented. See Section BF.2.22.

Table 1.

Input/output devices supported by the initial IOS.

1. Typewriters
   Teletype M37

2. Data sets
   103A on typewriter channels

3. Magnetic Tape
   Standard Multics Tape

4. Printers
   PRT202

Table 2.

Initial IOS implementation of user calls.

Degree	Call
Full	attach(ioname1,type,ioname2,mode,status)
Full	detach(ioname1,ioname2,disposal,status)
Full	changemode(ioname,mode,status)
Full	getmode(ioname,bmode,status)
Delayed	noattach(ioname1,type,ioname2,status)
Full	localattach(ioname1,type,ioname2,mode,status)
Delayed	localnoattach(ioname1,type,ioname2,status)
Full	divert(ioname,newioname,mode,status)
Full	revert(ioname,mode,status)
Full	restart(ioname,status)
Full	invert(ioname,status)
Delayed	trace(ioname,modname,nextlist,status)
Partial	readsync(ioname,rsmode,limit,status)
Partial	writesync(ioname,wsmode,limit,status)
Full	resetread(ioname,status)
Full	resetwrite(ioname,status)
Faked	worksync(ioname,wkmode,status)
Faked	iowait(ioname,oldstatus,status)
Full	abort(ioname,oldstatus,status)
Delayed	format(ioname,epl,epw,tsl,tsw,down,indent,status)
Delayed	tabs(ioname,tmode,hv,ntabs,tablist,status)
Full	order(ioname,request,argptr1,argptr2,status)
Full	getsize(ioname,elsize,status)
See text	setsize(ioname,elsize,status)
Full	read(ioname,workspace,nelem,nelemt,status)
Full	write(ioname,workspace,nelem,nelemt,status)
Delayed	setdelim(ioname,nbreaks,breaklist,nreads,readlist,status)
Delayed	getdelim(ioname,nbreaks,breaklist,nreads,readlist,status)
Delayed	seek(ioname,ptrname1,ptrname2,offset,status)
Delayed	tell(ioname,ptrname1,ptrname2,offset,status)
Delayed	readrec(ioname,reccount,workspace,nelem,nelemt,status)
PRT202	writerec(ioname,reccount,workspace,nelem,nelemt,status)
Full	getstatus(oldstatus,cstatus)
Full	upstate(ioname,status)
Full	hold(oldstatus,cstatus)
Full	release(oldstatus,cstatus)

Table 3.

Degree of implementation of various modules and data bases.

Degree	Module and/or Data Base
Full	Attach Table and Maintainer
Full	Type Table and Maintainer
Full	Not Founder
Full	I/O Switch
Full	Transaction Block Maintainer
Dummied*	Mode Handler
Almost full*	I/O Registry Files and Maintainer
Full	Attachment Module
Full	Dispatcher
Full*	Request Queuer and Driver
Full#	Code Conversion Module (CCM)
PRT202, typewriter#	CCM Driving Tables
Full#	Typewriter DSM
Full (M37)#	Typewriter DCM
Full#	PRT202 DSM and DCM
Full#	Tape DCM
Full (Std. tape)#	Tape DSM
Noncritical	Monocaster
Delayed	Broadcaster

"*" = see text.
"#" = uses default modes.