<u>Identification</u>

The Traffic Controller Data Block

Robert L. Rappaport, Michael J. Spier

<u>Purpose</u>

The Traffic Controller Data Block (TCDB) is a collection   of miscellaneous
items in segment <tc_data>; some of those items are internal to the Traffic
Controller, others are of general interest. This section lists all these
items and explains their function. No table-declaration is furnished as
this is a pre-assembled table and the items are independent of one another;
rather, the EPL attributes of each of these items are stated seperately.

<u>Itemization</u>

Following are the TCDB items listed by their symbols; to access any of
them, say apt_lock, reference should be made to <tc_data>|[apt_lock];
"internal" means internal to the Traffic Controller.

apt_lock	*global* lock word used to restrict access into the traffic controller	
aet_lock	the AET is the only table that is sometimes accessed without using the global traffic controller interlock; the AET lock is then used	
apt_ptr	pointer to the base of the APT (ptr)	internal
apt_size	number of words in the APT (fixed)	internal
aet_ptr	pointer to the base of the AET (ptr)	internal
aet_size	number of words in the AET (fixed)	internal
aht_ptr	pointer to the base of APTHSH (ptr)	internal
aht_size	number of words in the APTHSH	internal
act_tbl_ptr	pointer to the base of the Activator Table	internal
act_tble_size	humber of words in the Activator Table (fixed)	internal
lowest_level	is the lowest-priority (highest-*numbered*) level number in the ready-list; it is assigned to the idle processes exclusively. (fixed)	

number of

lowest_loaded   lowest-priority *ready-list queue* ~~level number~~ in which a loaded process may be found. Subroutine unload-test uses this variable to determine which process to unload. (fixed)

nloaded   number of processes currently loaded, this variable is maintained by the loader-daemon. (fixed)

nloaded_ready   number of ready & loaded processes   (fixed)

max_loaded   maximum number of loaded processes the system can accomodate (fixed)

loaded_depth   the number of processes that must be kept loaded at the head of the ready-list. (fixed)

nprocessors   number of processors currently used (fixed)

mini_time   a constant minimal time-allotment given a newly-created process; *this allows* ~~it is sufficient for~~ the process to get out of the Traffic Controller before it gets a timer runout interrupt and properly reschedules itself (fixed)

activation_level   a constant level-number given a newly created process; when rescheduling itself, it will give itself an appropriate level number.

wait_enable   a system_flag, initially set to zero and which is set to "1"b after Traffic Controller initialization. It is further discussed below. (bit(1))

loader_daemon_sw   a state variable exclusively used by the Traffic Controller Daemon Process (bit(1))

loader   pointer to the TC Daemon Process' APT entry (ptr)

loader_id   TC Daemon Process' ID (bit(36))

initializer_id   initializer process' ID (bit(36))

(the term "sentinel" used below is explained in BJ.1.2)

empty_q   the first of two contiguous empty-list sentinels   internal

block_q   the first of three contiguous blocked-list sentinels interna

ready_q   the first of an array of ((lowest_*level* +1))sentinels

                            of the ready-list.   internal

                 (while empty_q and block_q mxm have pre-assembled values,

                 the ready-q array is initialized by subroutine apt_init

                 together with the four tables)

aet   pre-initialization AET   internal

Initialization

The pre-assembled segment <tc_data> is loaded into core from a Multics

System Tape as one of the very first items in the system, and is wired down.

At this point, most of the above-mentioned items are pre-set to either

zero (for fixed variables) or null (for pointer variables) values.

The exceptions are the two empty_q and the three block_q sentinels which

already have their definite values, and the items associated with the AET.

As it is, the Basic File System is engaged in PWN activity xxfxmxxxthxx

long before Traffic Controller initialization; this is recognized by

wait_enable's zero-value. However, rather then encumber all four PWN

subroutines with conditional statements it was found more elegant to provide

a dummy AET during initialization time, and thus execute most of the

actual PWN code (stopping short of giving the processor away, in wait.)

Consequently, aet_size is pre-set to 1, and aet_ptr points to symbol aet,

thus providing a temporary one-word-long AET.

Subroutine tc_data_init allocates areas in <tc_data> for the four tables,

copies system parameters from the Software Parameter Table (SWPT) into

appropriate TCDB items, and initializes all pointers to tables.