Essential Kernel Procedures

These KPs represent the most-used functions. They are arranged by the following areas of functionality:

- **Attribute Access**
- **Distributions**
- **Dynamic Processes**
- **Events and Time**
- **Identification and Discovery**
- **Interface Control Information (ICIs)**
- **Interrupt Processing**
- **Packet Generation and Processing**
- **Statistic Recording**

Click on a KP name to see a complete description of the KP.

Attribute Access

Get or set attribute values. (Simulation attributes are “global” to the simulation model.)

op_ima_obj_attr_get (objid, attr_name, value_ptr) ➔ completion code

op_ima_obj_attr_set (objid, attr_name, value) ➔ completion code

op_ima_sim_attr_get (attr_type, attr_name, value_ptr) ➔ completion code

Distributions

Load distributions by name; Obtain outcomes from loaded distributions.

op_dist_load (dist_name, dist_arg0, dist_arg1) ➔ distribution handle

op_dist_outcome (dist_ptr) ➔ outcome

op_dist_uniform (limit) ➔ outcome (between 0.0 and limit)

Dynamic Processes

Create a new “child” process of a given type; Destroy a process.

op_pro_create (model_name, ptc_mem_ptr) ➔ process handle

op_pro_destroy_options (pro_handle, options) ➔ completion code

Identify the current process.

op_pro_self () ➔ handle for this process

Invoke another process (cause it to execute now). **As an invoked process, get optional state that is passed.**

op_pro_invoke (pro_handle, argmem_ptr) ➔ completion code

op_pro_argmem_access() ➔ argument pointer

Events and Time

Cancel an event.

op_ev_cancel (evhandle) ➔ completion code

Obtain current simulation time.

op_sim_time () ➔ current simulation time in seconds

Terminate simulation.

op_sim_end (line0, line1, line2, line3) ➔ (no return value)

Identification and Discovery

Find the containing object.

op_id_self () ➔ object ID of containing object

Find the parent of an object.

op_topo_parent (child_objid) ➔ object ID of parent

Find an object's descendants in the hierarchy.

op_topo_child_count (parent_objid, child_type) ➔ number of children of specified type

op_topo_child (parent_objid, child_type, child_index) ➔ object ID of the i'th child meeting criteria

Find an object's peers.

"objmtype" is one of an enumerated set; "direction" is IN or OUT.
Possible use: how many links am I connected to; then, give me the i'th link.

op_topo_assoc_count (objid, direction, objmtype) ➔ number of associations of given direction and type

op_topo_assoc (objid, direction, objmtype, index) ➔ object ID of the i'th association meeting the direction and type criteria

Interface Control Information (ICIs)

Create or destroy an ICI.

op_ici_create (fmt_name) ➔ ICI

op_ici_destroy (iciptr)➔ (no return value)

Get or set ICI attribute values.

op_ici_attr_get (iciptr, attr_name, value_ptr) ➔ completion code

op_ici_attr_set (iciptr, attr_name, value ➔ completion code

Associate an ICI with a particular interrupt.

op_ici_install (iciptr) ➔ (no return value)

Interrupt Processing

Schedule an interrupt for this object or another at a given time. Optionally pass a “code”.

op_intrpt_schedule_self (time, code) ➔ event handle for interrupt

op_intrpt_schedule_remote (time, code, mod_objid) ➔ event handle for interrupt

Obtain various attributes of the current interrupt.

op_intrpt_type () ➔ type (such as packet arrival, statistic change, self interrupt)

op_intrpt_strm () ➔ stream for packet arrivals

op_intrpt_ici () ➔ control information passed with an interrupt (arbitrary structure)

op_intrpt_code () ➔ numeric code associated with the current interrupt of the invoking process

Packet Generation and Processing

Create, copy, or destroy a packet.

op_pk_create_fmt (format_name) ➔ pointer to new packet

op_pk_copy (pkptr) ➔ pointer to new copy of packet

op_pk_destroy (pkptr) ➔ (no return value)

Get or send a packet. (with optional delay)

op_pk_get (instrm_index) ➔ pointer to packet from input stream

op_pk_send (pkptr, outstrm_index) ➔ (no return value)

op_pk_send_delayed (pkptr, outstrm_index, delay) ➔ (no return value)

Get and set named fields of a packet.

op_pk_nfd_set (pkptr, fd_name, value) ➔ completion code (arguments vary for information and structure fields)

op_pk_nfd_get (pkptr, fd_name, value_ptr) ➔ completion code

Get certain properties of a packet.

op_pk_creation_time_get (pkptr) ➔ simulation time at which packet was created

op_pk_total_size_get (pkptr) ➔ size of packet in bits (sum of field sizes)

Insert or remove a packet from a specified subqueue.

op_subq_pk_insert (subq_index, pkptr, pos_index) ➔ completion code

op_subq_pk_remove (subq_index, pos_index) ➔ pointer to packet removed from the specified subqueue

Statistic Recording

Obtain a handle for a statistic, given its name.

Type is Global or Local. Optionally specify an index when a single statistic name encompasses multiple independent time series.

op_stat_reg (stat_name, stat_index, type) ➔ statistic handle

Write a new value to a particular statistic. (new value is assumed to be recorded at the current time)

op_stat_write (stat_handle, value) ➔ statistic handle