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NSW Transaction Protocol (NSWTP)

The interprocess communication facility in NSW is called MSG. NSW
processes communicate with each other by sending and responing to
messages transmitted via MSG. The content of NSW messages conform to
the following structural outline called NSW Transaction Protocol
(NSWTP).

  LIST(type,tid,parameter,args)

    type: INDEX.

      Value of one means invoke an operation.

      Value of two means that this message is a reply.

      Value of three means that this message is a response to an
      alarm.

      Other values may be defined as needed.

    tid: INDEX

      This is a transaction identifier.

        INDEX indicates acknowledgement required if type=1, or
        indicates which invocation request it is acknowledging if
        type=2.

      If type=1 (invoke message):

        tid=0 means no acknowledgement required.

        tid NOT=0, acknowledgement required.

      If type=2 (acknowledgement message):

        tid is the tid of the invocation request.

      If type=3 (alarm response) :

        tid contains the alarm code.

That is, when an operation is invoked the tid specifies whether a acknowledgement is required or not. If required, the same tid must be present in the reply.

For response to an alarm, type=3, this is the alarm code transmitted as an INDEX.

parameter:

if type=1 (invoke request):

CHARSTR which is the name of the operation or procedure to be performed. This string will be interpreted in an upper/lower case independent manner.

if type=2 (acknowledgement) or type=3 (response to alarm):

LIST() (i.e. zero length list), to indicate success, or

LIST (errclass,errnumber,errstring) to indicate an error

errclass: INDEX.

=1: partial results returned.

This error class is used when several steps are performed by one operation and some of them fail.

=2: failure, resources unavailable.

=3: failure, user error.

=4: failure, NSW error. Recoverable.

=5: failure, NSW error. Fatal.

This indicates that the instance of the NSW component in question is out of business.

=6: User abort request

errnumber: INDEX.

This is a code for the particular error that ocurred. When possible, these codes should be uniform across different implementations of the same NSW component.

errstring: CHARSTR.

This is a human readable character string describing the error.

args: LIST.

If type=1 (invoke operation)

This is a LIST of arguments.

If type=2 (acknowledgement) or type=3 (response to alarm)

This is a list of results.

The first byte of the message will be the first byte of the above LIST.

Another way to view these format conventions is:

Request Message:

LIST(

 type: INDEX [= 1],

 transaction-id: INDEX   % zero if no reply is
 required %

 operation-name: CHARSTR, %operation to be performed %

 arguments: LIST(...)
)

Reply Message:

LIST(

 type: INDEX [=2 or 3],

 transaction-id: INDEX:

 errorcode: LIST(errclass,errnumber,errstring) or LIST()

 results: LIST(...)
)

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MSG Process Names

> MSG process names are transmitted as one unit of type BITSTR. The
> MSG documentation specifies that a process name is composed of
> several fields (host, incarnation, ...), but this internal structure
> is not identified at the NSWB8 protocol level.

NSW Procedure Names

> In the NSW all externally callable procedures shall be named such
> that the first two letters of the procedure name identify the NSW
> component of which that procedure is a part.

> The two letter codes are:

FE	Frontend
FM	Foreman
FP	File Package
WM	Works Manager
WO	Works Manager Operator