Title:

RC8000 Host Process

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Abstract:

This manual describes the host process complex seen from an internal process. It also describes the formats of the messages and answers for creation, removal and inspection of links.

(24 printed pages)

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1.   HOST   1.

This manual describes the host process complex seen from a job
host. The protocol is used for creation and removal of links be-
tween a job host and a device host.

A link is a logical connection between a device on a device host
and a job host. When a link has been created, it is described in
an external process in the job host.

The host process complex is always included in the monitor when
RC8000/RC4000 is to work as a job host in a network, i.e. when it
has one or more SCC's or FPA's as peripheral devices. The complex
consists of a number of external processes: a main process, al-
ways by the name of 'host', and one subhost process for each SCC/
FPA connected.

The processes are used for operator communication and for control
tasks in the network.

All communication with these processes takes place via the main
process, which has to find out which subhost should handle the
operation. Messages are only accepted from internal processes
which are users of the subhost in question.

All hosts have a unique identification, the host-id. Normally
when a link is created the device is identified by its name at
the device host and the identification of the device host (dh.
host-id). It is, however, also possible only to specify some de-
mands to the device without specifying a specific device, e.g.
the kind of device, number and size of data buffers and operation
mode.

1.1   General Message/Answer Formats   1.1

As all host functions involve addressing of either a device host
or a device connected to a device host a common format for all
messages and answers has been introduced.

Operation < 12 + function mode < 1 + address mode

first (data)

last (data)

identification field

where

- operation and function mode are specific for the function to be executed,
- address mode defines the contents of the identification field as described below,
- first (data) and last (data) define a data block, if the operation is odd (or else insignificant),
- identification field defines a device or a device host either by addressing the device (device host) directly or by stating the address of a process description which is linked to the device (or which is linked to a device on the device host).

address mode = 0

identification field specifies a device link or a device host:

identification (device link):

dh.linkno < 12 + hostno

dh. host-id

dh. home-reg < 12 + dh. net-id

jh. host-id

jh. linkno < 12 + jh net-id

identification (device host):

unused < 12 + hostno

dh. host-id

dh. home-reg < 12 + dh. net-id

where

dh. linkno (8)   indicates the link number in the device host

hostno (12)	states the logical device number for the external process, representative subhost which is to handle the operation,
dh. host-id(16)	and
dh. net-id (8)	address the device host,
dh. home-reg(ion)(8)	is a utility parameter stating in which area of the network the device host in question should be found,
jh. linkno(8)	defines a link number in a jobhost (if the jobhost is RC8000/4000 the link number is equal to the logical device number for the external process representing the device),
jh. host-id(16)	and
jh. net-id (8)	define the job host. The value 0 in the jh. host-id field causes the host process to set the jh. host-id and net-id, to the equivalent values for the sender host.

Figures in parenthesis indicate the maximum size of the parameter (in bits). If this is exceeded the operation will return immediately with result 3.

address mode = 1

identification-field contains the address of an external process, which - in case a device link is to be defined - has to be linked to the device or - if the addressing defines a device host - has to be linked to a device on the device host in question.

identification (device link):

process description address of the external process linked to the device

identification (device host):

process description address of the external process linked to a device on the device host

If the process description address does not point out a process linked to a device on the device host, the operation immediately returns with result 3.

1.1.2   Answer   1.1.2

    Return value
    number of halfwords received
    number of chars received
    dh. linkno < 12 + hostno
    dh. host-id
    dh. home-reg < 12 + dh. net-id

where
-   return value = device status < 16 + link desc. < 12 + funct.
    result

Function result:
    -1   SENDER STOPPED
     0   FUNCTION EXECUTED
     1   DEVICE TROUBLES (SPECIFIED IN DEVICE STATUS)
     2   DEVICE RESERVED BY OTHER HOST
     3   NO RESOURCES AT JOBHOST
     4   NO RESOURCES AT DEVICEHOST
     5   TIMEOUT
     6   DEVICE REQUESTED WITH HIGHER PRIORITY
         (examples of this may be that another LOOKUP LINK LOCAL has
         already been received)
     8   dh. unknown

Linkdescriptor: (relevant only for function result <> -1)
    Specifies the interpretation of the fields JOBHOST ID and
    JOBHOST LINKNO in the datablock
    0   No linked present
    1   Remote linked subprocess present
    2   Local linked subprocess present

<u>Device Status</u> (Relevant only when function result = 1):

    Bit 0 Device unknown

    −   1 Device closed

    −   2

    −   3

    −   4

    −   5 Device driver not loaded

    −   6 Device reserved by another process

    −   7 Reservation rejected from AP (only GAC − interfacing)

- number of halfwords received and

- number of chars received indicate the size of the data block received in the data buffer at sender's process. The fields will be 0, if the operation executed does not involve input of data or if sender was stopped when data were received from the device host.

- the remaining parameters are described later on, however, it should be mentioned that dh. linkno is only significant if a device link has been addressed in the message.

2.   NETWORK SUPERVISOR FUNCTIONS   2.

The network supervisor functions are a group of operations used
for supervising and controlling the network.

These functions are usually performed as output-input operations,
i.e. a databuffer is sent to the device host and then, when the
device host has handled the operation, the data containing
answers are received in the original output area.

The data area contains parameters as kind, buffer specification
and device name. The general format is described below.

The network supervisor functions are lookup, lookup reserve, can-
cel reservation, link up remote, lookup link local and release
link.

The format of the data areas used in network supervisor oper-
ations is:

output	input
mode < 12 + kind	kind
timeout < 12 + buffers	max. no. of buffers
buffersize	max. buffersize
devicename (0:1)	devicename (0:1)
− (2:3)	− (2:3)
− (4:5)	− (4:5)
− (6:7)	− (6:7)
jh. linkno	jh. linkno
jh. host-id	jh. host-id
jh. home-reg < 12 + jh. net-id	jh. home-reg < 12 + jh. net-id
(unused)	process description

The format of the individual operation is described later on. If
a field is described as unused the value is of no importance. A
field can be set to 'dummy' value, and is then regarded as irrel-
evant.

```
dummy value =  0 for buffers, buffersize, devicename
                  (first char (name) = 0),
dummy value = -1 for mode, kind.
```

Below the meaning of the individual fiels is described. The figures in parenthesis indicate the size of the important part of the field. If this is exceeded the operation will - apart from dummy value - return with result 3.

mode (8)	specifies that the device should be able to operate in this mode;
kind (8)	defines the type of the device,
timeout (8)	states the time out value for the operation
buffers (8)	specifies the wanted number of operations, which at the same time should be able to be sent out from the job host to the device host,
bufferzise (16)	indicates the data block size wanted (in characters), which one at a time can be sent to the device,
devicename (12 chars)	fixes the name of the device in the device host (is unrelated to the process name in the job host),
max buffers (8)	states the greatest number of operations which at the same time can be sent out to the device,
max bufsize (16)	states the size of the greatest data block, which can be transferred at a time to the device (in characters). The size is not necessarily the greatest buffer which can be sent from an internal process,
jh. linkno (10)	specifices linkno for the external process in job host. If the job host is RC8000/ RC4000 then the linkno is equal to the logical device number,
jh. host-id (16),	define the job host. Host-id is a number,
jh. net-id (8)	uniquely defining the host inside a network determined by net-id,

jh. home-reg (8)   is a utility parameter stating where the
                       host in question is to be found in the net-
                       work,

proc desc (24)   indicates the process description address
                       for the external process, which is defined
                       by jh. linkno in case the job host is
                       sender host.

2.1   Lookup Process   2.1

The lookup process operation is used for retrieving the par-
ameters from an external process possibly linked to a device.

The data format is the standard data format except for device
name, which is the name of the external process in the job host.

message:
    1 < 12 + 2 < 1 + 1
    first (data)
    last (data)
    proc desc (external process)

answer:
    return value
    number of halfwords
    number of chars
    dh. linkno < 12 + hostno
    dh. host-id
    dh. home-reg < 12 + dh. net-id

data:
    output: none
    input: kind (sub)
            max. buffers
            max. buffersize
            name of external process
            -         -
            -         -
            -         -

jh. linkno

jh. host-id

jh. home-reg < 12 + jh. net-id

process description of external process

2.2 Lookup 2.2

The lookup function examines the parameters for a peripheral,
e.g. when all parameters of a peripheral given by a device name
are to be known, or if it is desirable to examine whether a pe-
ripheral exists fulfilling one or more demands on the parameters'
mode, kind, buffers and/or buffer size. Irrelevant parameters are
given dummy value.

Formats

message:

    1 < 12 + 3 < 1 + address mode

    first (data)

    last (data)

    identification (device host)

answer:

    return value

    number of halfwords received

    number of chars received

    dh. linkno < 12 + hostno

    dh. host-id

    dh. home-reg < 12 + dh. net-id

data

    output

    +0 mode < 12 + kind

    +2 buffers

    +4 buffer size

    +6 device name (0:1)

    +8 -   (2:3)

    +10 -   (4:5)

    +12 -   (6:7)

+14 unused

+16 unused

+18 unused

+20 unused

input:

+0 kind

+2 max buffers

+4 max buffer size

+6 device name (0:1)

+8 -   (2:3)

+10 -   (4:5)

+12 -   (6:7)

+14 unused

+16 unused

+18 unused

2.3   Lookup Reserve   2.3

This function performs a lookup as described earlier. If the device exists it is reserved, which means that links to the device can only be established on initiative of the sender host (called reserver host).

Formats

message:

   1 < 12 + 4 < 1 + address mode

   first (data)

   last (data)

   identification (device host)

answer:

   as in lookup.

data:

   as in lookup.

2.4   Cancel Reservation   2.4

A reservation made by lookup reserve is removed by cancel
reservation. The reservation can only be removed from reserver
host.

Formats

message:

     1 < 12 + 5 < 1 + address mode

     first (data)

     last (data)

     identification (device host)

answer:

     return value

     0

     0

data:

     output as by lookup.

     input does not take place.

2.5   Linkup Remote   2.5

The operation linkup remote is used to establish a temporary link
to a device specified by parameter conditions in data (as by
lookup). The link can be established for either the sender job
host or another job host. If the device is occupied it is indi-
cated by timeout how long the operation can wait before it is re-
turned.

If the operation results in the establishment of a link to
RC8000/RC4000 the external process representing the peripheral
will get the work name 'subxxx', where xxx is a number between
000 and 999. At the establishment it is controlled that there is
not already a process (external, internal or area) of the same
name. If the link is established to sender host then only the
sender of the linkup operation will become user of the external
process. On the other hand if the job host is another RC8000/

RC4000 than the sender host then all internal processes on that
job host which are users of the subhost 'facing' the device host
will be included as users of the newly established process.

Formats

message:

    1 < 12 + 6 < 1 + address mode

    first (data)

    last (data)

    identification (device host)

answer:

    return value

    number of halfwords received

    number of chars received

    dh. linkno < 12 + hostno.

    dh. host-id

    dh. home-reg < 12 + dh. net-id

data

    output:

    +0 mode < 12 + kind

    +2 timeout < 12 + buffers

    +4 buffer size

    +6 device name (0:1)

    +8 -   (2:3)

    +10 -   (4:5)

    +12 -   (6:7)

    +14 unused

    +16 jh. host-id

    +18 jh. home-reg < 12 + jh. net-id

    +20 unused

values of timeout can be interpreted as follows:

    timeout =   0 do not wait

                 < 128 wait for up to 'timeout' minutes for the device
                       to be unoccupied

                 ≥ 128 wait until the device is set free.

If jh. host has the value 0 then sender host is set in as job host.

input:
+0   kind
+2   max. buffers
+4   max. buffersize (chars)
+6   devicename (0:1)
+8   -   (2:3)
+10 -   (4:5)
+12 -   (6:7)
+14 jh. linkno
+16 jh. hostid
+18 jh. home-reg < 12 + jh. net-id
+20 process description

2.6   Linkup Local   2.6

This function establishes a local link to a device. The specification of the device takes place as by lookup, however, an external process description should also be pointed out in the job host (which can only be sender host). If the device is already connected to the sender host - whether as local or remote device - this link will be cancelled first. When establishing the external process the sender of the 'linkup local' operation and all the ancestors of sender are included as users. Furthermore the process is named as described in 'linkup remote'.

The external process to which the link is to be connected must be unused. This is defined by jh. linkno (= logical device number).

Formats
message:
   1 < 12 + 7 < 1 + address mode
   first (data)
   last (data)
   identification (device host)

answer:

    as for linkup remote

data

    output:

    +0 mode < 12 + kind

    +2 buffers

    +4 buffersize

    +6 devicename (0:1)

    +8 -   (2:3)

    +10 -   (4:5)

    +12 -   (6:7)

    +14 jh. linkno (= logical deviceno)

    +16 unused

    +18 unused

    +20 unused

    input:

    +0 kind

    +2 max buffers

    +4 max buffersize

    +6 device name (0:1)

    +8 -   (2:3)

    +10 -   (4:5)

    +12 -   (6:7)

    +14 jh. linkno

    +16 jh. host-id

    +18 jh. home-reg < 12 + jh. net-id

    +20 process description addr

jobhost in input data is the same as sender host.

2.7   Lookup Link   2.7

Lookup link is used for examination of the parameters for an existing link. The operation can be executed on both links to sender host and other job hosts.

Formats

message:

   1 < 12 + 8 < 1 + address mode

   first (data)

   last (data)

   identification (device link)

answer:

   as by linkup remote.

data

  output:

    no datablock is sent.

  input:

    as by linkup remote.

2.8   Release Link   2.8

This operation makes it possible to cancel links. The removal of the link does not wait for the device to complete commenced operations if any. Answer to release link can be handed over before the external process is removed, as the device host answers the release operation immediately.

Links can only be cancelled from hosts which are job host or re-server host to the link. The operation involves no data transport.

Formats

message:

   2 < 12 + address mode

   unused

   unused

   identification (device link)

answer:

   as by linkup remote.

3.   OPERATOR COMMUNICATION   3.

The two operator operations 'operator output' and 'operator out-
put-input' are introduced to make it easier to communicate with
the operator of a device (or of a device host), as it is possible
to write messages and to return the answer from the operation
without having to establish a link to the operator terminal. The
communication device – the operator terminal – is specified by
stating the device name in the 12 first characters of the output
block. If the value of this field is set to dummy (first charac-
ter = 0), the communication will take place on a terminal defined
by the device host.

The communication can be of either a general kind or concern a
specific device (e.g. an error message), which is stated in func-
tion mode. In the last case the device host will add a specifica-
tion of the device, which might consist of the device name.

3.1   Operator Output   3.1

This operation writes out 'outtext' from data until the data buf-
fer is emptied or until it has met and printed an 'nl' character.

3.2   Operator Output-Input   3.2

Output is written out as mentioned above. When the output is ter-
minated it switches to input. After this the operator can key in
an answer line. If the length of the answer exceeds the buffer
size the input operation is terminated.

message:

    operation < 12 + function mode < 1 + address mode

    first (data)

    last (data)

    identification field

where

    operation: 9   operator output

                  11   operator output-input

    function mode: 0   specific mode: The operation concerns a
                              specific device, and the identification
                              field addresses a device link,
                   1   generel mode: The operation is of a gen-
                              eral kind and the identification field
                              addresses a device host.

answer:

    return value

    number of halfwords received

    number of chars received

    dh. linkno < 12 + hostno

    dh. host-id

    dh. home-reg < 12 + dh. net-id

where

    dh. linkno is dummy for function mode = 1.

    return value: -1   operation rejected (sender stopped)
                  0   operation performed without troubles
                  1   operation rejected by device host
                  2   operator terminal malfunctioning

data

  output:

  +0   device name of operator terminal (0:1)

  +2   -   -   - -   -   (2:3)

  +4   -   -   - -   -   (4:5)

  +6   -   -   - -   -   (6:7)

  +8   start of outtext

  ....

  last of buffer

  input:

  +0   start of intext

  ....

  ....

  last of buffer

RETURN LETTER

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