MSHEAR Binary Patch 0531-01

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An archive file msbp990926.slip.lzh is available to correct an error in SLIP communication links that can render the link inoperable. This patch applies to MSHEAR 36/09-0531. It is also backwards compatible to all previous versions of MSHEAR. It is the first patch of this release.

Description of the problem

The datalogger enters a condition whereby all SLIP communication is disabled. The system sends IP packets out the serial port but no packets are accepted in return. The serial port of the datalogger is not polled for input and hence no incoming slip packets are received. The ifslip process transmitting packets monopolizes the serial port and does not allow the ifslip process receiving packets access.

In our case, the trigger for entering the problem state was the onset of acknowledges to the SEC comlink during a period when the PRI comlink was still retransmitting frequently but receiving no acknowledgments. An error in the configuration parameters exacerbated the situation by configuring the comlink resend packet window size to be six packets instead of two, when used with a very short resend timeout of 2 seconds.   (See configuration details below) In lab simulations, we used ws=16, resendpkts=6 and resend=10 for normal operations and could trigger the problem state by changing resend=2 via the option K of the aqshell menu.   In our case, killing the dacommo process could reactivate the link.

The flooding option of a comlink does not cause the slip driver to hang. It seems gross overload of packets to the driver causes it to discard packets and it does not hang. There appear to be only certain conditions in which the driver attempts to keep up transmission at the expense of reception.

Clear indication of the problem is identified through the slipstat reports. A view of this status at 5 minute intervals revealed the outbound packets increased while the inbound packets do not. Also, the number of polls of the serial port do not increase. See example diagnostic output in the diagnostic details below.

Solution to the Problem

A revised slip driver (ifslip) works in combination with a revised serial port descriptor (5x8530) to correctly arbitrate for the serial port. The serial port driver is available for Q4120 and Q730. A version for Q680 systems is not yet available. The new slip driver will work with older versions of the serial port descriptor (including the Q680 version) to avoid the error, though better performance is achieved with the new combination. The revised files as offered as a binary lharc archive at;
ftp://quake.geo.berkeley.edu/pub/quanterra/mshear/release/msbp990926.slip.lzh
This archive includes a copy of the old version and the new version of each module, as well as update the file actually used by the system to the new version.

To install the archive, transfer the binary file to the datalogger (to /h0/HOLDING). Extract the file by entering;
chd /h0
lharc –xf holding/msbp990926.slip.lzh

The version of these modules released with MSHEAR 36/09-0531 were;
/h0/isp98/cmds/ifslip   version 11   crc $2686D0   edition #21
/h0/overlays/4120/5x8530 version 23   crc $A391B3   edition #22

The new versions are;
/h0/isp98/cmds/ifslip   version 12   crc $1D0880   edition #21
/h0/overlays/4120/5x8530 version 26   crc $DD5D03   edition #26

Use the crc to uniquely identify the module. The determine what version is loaded in memory, enter;
sysop: ident -m ifslip
Header for: ifslip
Module size: $26EC   #9964
Owner: 0.0
Module CRC: $1D0880   Good CRC   <<==== look at this value
Header parity: $2564   Good parity
Edition: $15   #21
Ty/La At/Rev $E01 $A001
Permission: $555   -----e-r-e-r-e-r
Dev Drv, 68000 obj, Sharable, System State Process

For more details of the versions and the filesystem organization see Version Details below.

Additional Details Section

Diagnostic Details
VSP) date
August 19, 1999 Thursday 10:00:06 pm

VSP) slipstat /sl2

==

IFSLIP Device Information Statistics:

Device   = sl2   Driver = ifslip
MTU   = 1006 bytes
Flags   = 0x0132 [BROADCAST PT_TO_PT NO-TRAILERS NO-ARP]

if_this = 0x00e38190   if_next = 0x00eb5290   if_prev = 0x00e30010
if_static = 0x00e31990   if_size = 0x000000d0

Socket Address (Internet Style):

Address Family = 2   IP Port = 0   IP Address = 131.215.58.9

IFSLIP Driver Static Storage:

                   Input   Output
                 ---------------   ---------------

Serial Device: /x2   /x2
Process ID's: 19   20
Compression: OFF   OFF
Mbuf Queue Head: 0x00000000   0x00e0ca10
Bytes In/Out: 68908970   1438618817
IP Packets In/Out: 1823507   2844113
Compressed Packets: 187430   0
Uncompressed Packets: 23299   0
Biggest IP Packet: 414   552
Smallest IP Packet: 3   40
Errors: 409832   0

```
Reopens:              0            0
System path:          20           21
Death Flag:           0            0

Mbuf Size:            4096
Failed InMbuf Alloc:      0
Runts:            6896
GS_READY Polls:           9621394
SS_SIG Waits:             9621394

IFSLIP Device Descriptor Options:
---------------------------------------------------------------------
Serial Device - Input:      /x2
Serial Device - Output:       /x2
Process Priority - Input:     128
Process Priority - Output:    128
Receive Buffer Size:       4096
Compression:               OFF
Parity-Stop Bits-Bits/Char:   0x00
Baud Rate Code:            0x0f


=================================================================

VSP) ifcontrol /sl2
mbuf control module revision: 1
total mbuf size: 393216
total allocated: 15552
minimum reserve: 49152
failed attempts: 0
allocation mode: NO WAIT
looking for if control module ifi.83D73A09
if control module revision: 1
ip address: 83D73A09
if device name: sl2
total queued on xmit: 13700
xmit queue limit: 15000
discarded xmit bytes: 257912912
discarded xmit packets: 470644
total queued on recv: 0
discarded recv packets: 0
queued bytes in serial xmit buffer: 1024
total input packets: 1406780
total output packets: 2844169

A second report is obtained five minutes later.

VSP) date
August 19, 1999 Thursday 10:06:12 pm

VSP) slipstat /sl2


=================================================================

IFSLIP Device Information Statistics:
---------------------------------------------------------------------
```

```
Device   = sl2          Driver = ifslip
MTU      = 1006 bytes
Flags    = 0x0132 [ BROADCAST  PT_TO_PT  NO-TRAILERS  NO-ARP ]

if_this  = 0x00e38190  if_next = 0x00eb5290  if_prev = 0x00e30010
if_static = 0x00e31990  if_size = 0x000000d0

Socket Address (Internet Style):
----------------------------------------------------------------------
Address Family = 2      IP Port = 0       IP Address = 131.215.58.9

IFSLIP Driver Static Storage:
----------------------------------------------------------------------
                   Input          Output
                 --------------   --------------

Serial Device:          /x2            /x2
Process ID's:           19             20
Compression:          OFF            OFF
Mbuf Queue Head:      0x00000000       0x00e27350
Bytes In/Out:         68908970         1439210109
IP Packets In/Out:    1823507          2845192
Compressed Packets:   187430           0
Uncompressed Packets: 23299            0
Biggest IP Packet:    414              552
Smallest IP Packet:   3                40
Errors:               409832           0
Reopens:              0                0
System path:          20               21
Death Flag:           0                0

Mbuf Size:          4096
Failed InMbuf Alloc:     0
Runts:              6896
GS_READY Polls:        9621394
SS_SIG Waits:          9621394

IFSLIP Device Descriptor Options:
----------------------------------------------------------------------
Serial Device - Input:     /x2
Serial Device - Output:    /x2
Process Priority - Input:    128
Process Priority - Output:   128
Receive Buffer Size:      4096
Compression:            OFF
Parity-Stop Bits-Bits/Char:  0x00
Baud Rate Code:         0x0f


======================================================================


VSP) infcontrol /sl2
mbuf control module revision: 1
total mbuf size: 393216
total allocated: 13248
minimum reserve: 49152
```

failed attempts: 0
allocation mode: NO WAIT
looking for if control module ifi.83D73A09
if control module revision: 1
ip address: 83D73A09
if device name: sl2
total queued on xmit: 12056
xmit queue limit: 15000
discarded xmit bytes: 258174308
discarded xmit packets: 471121
total queued on recv: 0
discarded recv packets: 0
queued bytes in serial xmit buffer: 604
total input packets: 1406780
total output packets: 2845252

Module Version Details

The slip driver is located in /h0/isp98/cmds as ifslip.11 for the old version and ifslip.12 as the new version. The module used by the system is /h0/isp98/cmds/ifslip and is a copy of ifslip.12.

sysop: ident ifslip.11
Header for: ifslip
Module size: $264A   #9802
Owner: 0.0
Module CRC: $2686D0   Good CRC
Header parity: $25C2   Good parity
Edition: $15   #21
Ty/La At/Rev $E01 $A001
Permission: $555   -----e-r-e-r-e-r
Dev Drv, 68000 obj, Sharable, System State Process

sysop: ident ifslip.12
Header for: ifslip
Module size: $26EC   #9964
Owner: 0.0
Module CRC: $1D0880   Good CRC
Header parity: $2564   Good parity
Edition: $15   #21
Ty/La At/Rev $E01 $A001
Permission: $555   -----e-r-e-r-e-r
Dev Drv, 68000 obj, Sharable, System State Process

The serial port descriptor for Q4120 and Q730 systems is located in /h0/overlays/4120. The old version is located in a subdirectory 23/5x8530 while the new version is in another subdirectory 26/5x8530. The module used by the system is /h0/overlays/4120/5x8530 and is a copy of 26/5x8530. The module used by Q680 systems is /h0/overlays/147/5x8530 or /h0/overlays/00/5x8530 depending on the CPU type. Installing the lharc file will not update these Q680 serial port descriptors but the slip driver will avoid the error.

Module released with MSHEAR 36/09-0531

sysop: ident 23/5x8530
Header for: 5x8530
Module size: $1120   #4384
Owner: 0.0
Module CRC: $A391B3   Good CRC
Header parity: $1E75   Good parity
Edition: $16   #22
Ty/La At/Rev $E01 $A001
Permission: $555   -----e-r-e-r-e-r
Dev Drv, 68000 obj, Sharable, System State Process

Revised Module:
sysop: ident 26/5x8530
Header for: 5x8530
Module size: $1160   #4448
Owner: 0.0
Module CRC: $DD5D03   Good CRC
Header parity: $1E79   Good parity
Edition: $1A   #26
Ty/La At/Rev $E01 $A001
Permission: $555   -----e-r-e-r-e-r
Dev Drv, 68000 obj, Sharable, System State Process

Configuration Details

Portion of desired Key file for a SLIP link:
ws1 6
ws2 6
resend1 2
resend2 2
rspkt1 3
rspkt2 3

This produces the desired comlink configuration section of aqcfg:
* comlink section for IP mode on pri
*
[pri]
levels=32 mprio=20 port=35145 ipaddr=131.215.63.5 pkts=2500
fmt=QSL rce=y
resend=2 maxresends=15 synctime=20 ws=6
resendpkts=3 netdly=120 netto=60 delay=5
grpsize=1 grpto=0 detprio=14 timeprio=24
notify=y station=GOR udp=y keepnew=y
*
*
* comlink section for IP mode on sec
*
[sec]
levels=32 mprio=20 port=37145 ipaddr=131.215.63.6 pkts=2500
fmt=QSL rce=y
resend=2 maxresends=15 synctime=20 ws=6
resendpkts=3 netdly=120 netto=60 delay=5
grpsize=1 grpto=0 detprio=14 timeprio=24
notify=y station=GOR udp=y keepnew=y

*

Portion of the key file which caused the error when both comlinks became active. Note that the correct key
is resendpkts=%rspkt1%.

ws1 6
ws2 6
resend1 2
resend2 2
rspkts1 3
rspkts2 3

That produces the desired comlink configuration section of aqcfg, the default
keyvalue of 6 is used for resendpkt, rather than 2:

* comlink section for IP mode on pri
*
[pri]
levels=32 mprio=20 port=35145 ipaddr=131.215.63.5 pkts=2500
fmt=QSL rce=y
resend=2 maxresends=15 synctime=20 ws=6
resendpkts=6 netdly=120 netto=60 delay=5
grpsize=1 grpto=0 detprio=14 timeprio=24
notify=y station=GOR udp=y keepnew=y
*
*
* comlink section for IP mode on sec
*
[sec]
levels=32 mprio=20 port=37145 ipaddr=131.215.63.6 pkts=2500
fmt=QSL rce=y
resend=2 maxresends=15 synctime=20 ws=6
resendpkts=6 netdly=120 netto=60 delay=5
grpsize=1 grpto=0 detprio=14 timeprio=24
notify=y station=GOR udp=y keepnew=y
*