# Contents

# Introduction

This document describes how to use the hidden libfc debugs to gain low level visibility into the port login (PLOGI) process used in Fibre Channel (FC) communication within ESXi.  By enabling debug_logging we are able to see the Converged Network Adapter's (CNA) information about the Extended Link Service (ELS) frames such as Fabric Login (FLOGI), Port Login (PLOGI), that we normally would not be able to see.  This can be useful if there isn't a Finisar handy or a SPAN and you want to ensure what the host is/isn't completing in the FC stack.

Contributed by Brian Hopkins, Cisco TAC Engineer.

# Supported Configuration

Currently this is only supported on ESX with a Cisco Virtual Interface Card (VIC), other adapters as far as I know do not support this feature.

# Identifying Current Setting

You can use the following command on the ESXi host to ensure this value isn't already set:

The output should look like the following, notice how the value isn't configured for **debug_logging**, which is the value we will be changing in the next steps.

```
~ # tail /var/log/vmkernel.log | grep <0>
~ # esxcli system module parameters list -m libfc_92
Name                  Type  Value  Description
-----------------     ----  -----  -----------------------------------------------------------------------
debug_logging         int          a bit mask of logging levels
heap_initial          int          Initial heap size allocated for the driver.
heap_max              int          Maximum attainable heap size for the driver.
min_exch_pool_elem    int          Miminum number of elements guaranteed to be allocated for exchange pool.
rec_tov               int          REC timeout value
skb_mpool_initial     int          Driver's minimum private socket buffer memory pool size.
skb_mpool_max         int          Maximum attainable private socket buffer memory pool size for the driver.
~ # esxcli system module parameters list -m libfcoe_92
Name                  Type  Value  Description
-----------------     ----  -----  -----------------------------------------------------------------------
debug_logging         int          a bit mask of logging levels
heap_initial          int          Initial heap size allocated for the driver.
heap_max              int          Maximum attainable heap size for the driver.
skb_mpool_initial     int          Driver's minimum private socket buffer memory pool size.
skb_mpool_max         int          Maximum attainable private socket buffer memory pool size for the driver.
~ # _
```

# Change LIBfc debug_logging Setting

In order to get the additional information to show up in the /var/log/vmkernel.log file on ESXi we need to enable the debug_logging and will have to restart the host:

After you enter this commands you can check again to ensure the value is now set to 0xf:

```
~ # esxcli system module parameters set -p debug_logging=0xf -m libfc_92
~ # esxcli system module parameters set -p debug_logging=0xf -m libfcoe_92
~ # esxcli system module parameters list -m libfcoe_92
Name                Type  Value  Description
----------------    ----  -----  ------------------------------------------------------------------
debug_logging       int   0xf    a bit mask of logging levels
heap_initial        int          Initial heap size allocated for the driver.
heap_max            int          Maximum attainable heap size for the driver.
skb_mpool_initial   int          Driver's minimum private socket buffer memory pool size.
skb_mpool_max       int          Maximum attainable private socket buffer memory pool size for the driver.
~ # esxcli system module parameters list -m libfc_92
Name                Type  Value  Description
----------------    ----  -----  ------------------------------------------------------------------
debug_logging       int   0xf    a bit mask of logging levels
heap_initial        int          Initial heap size allocated for the driver.
heap_max            int          Maximum attainable heap size for the driver.
min_exch_pool_elem  int          Miminum number of elements guaranteed to be allocated for exchange pool.
rec_tov             int          REC timeout value
skb_mpool_initial   int          Driver's minimum private socket buffer memory pool size.
skb_mpool_max       int          Maximum attainable private socket buffer memory pool size for the driver.
```

We are still not finished, you will not see the new logs show up until you **restart the ESXi host**. After you have rebooted the ESXi host you can verify you see this new updated data in the vmkernel.log file by running the following command:

Since all the commands have this <6> header it makes them easy to find, I have included a snip below of this new useful information showing the FLOGI and PLOGI states:

```
2016-04-01T16:12:39.672Z cpu21:8803)<6>fnic : 3 :: vNIC flags 0x8 luns per tgt 256
2016-04-01T16:12:39.672Z cpu21:8803)<6>fnic : 3 :: vNIC flogi_retries 8 flogi timeout 4000
2016-04-01T16:12:39.672Z cpu21:8803)<6>fnic : 3 :: vNIC plogi retries 8 plogi timeout 20000
2016-04-01T16:12:39.672Z cpu21:8803)<6>fnic : 3 :: vNIC io throttle count 16 link dn timeout 30000
2016-04-01T16:12:39.672Z cpu21:8803)<6>fnic : 3 :: vNIC port dn io retries 30 port dn timeout 30000
2016-04-01T16:12:39.673Z cpu21:8803)<6>fnic : 3 :: vNIC interrupt mode: MSI-X
2016-04-01T16:12:39.673Z cpu21:8803)<6>fnic : 3 :: vNIC resources avail: wq 2 cp_wq 1 raw_wq 1 rq 1 cq 3 intr 4
2016-04-01T16:12:39.673Z cpu21:8803)<6>fnic : 3 :: firmware uses non-FIP mode
2016-04-01T16:12:39.680Z cpu21:8803)<6>host3: lport ffffffff: Entered RESET state from reset state
<6>Broadcom NetXtreme II CNIC Driver cnic v1.74.04.v50.1 (September 11, 2012)
<6>bnx2fc: Broadcom NetXtreme II FCoE Driver bnx2fc v1.74.02.v50.2 (Aug 28, 2012)
2016-04-01T16:12:40.341Z cpu1:8761)<6>host2: libfc: Link up on port (    0)
2016-04-01T16:12:40.341Z cpu1:8761)<6>host2: lport     0: Entered FLOGI state from reset state
2016-04-01T16:12:40.354Z cpu2:8763)<6>host2: lport     0: Received a FLOGI accept
2016-04-01T16:12:40.354Z cpu2:8763)<6>host2: Assigned Port ID  10003
2016-04-01T16:12:40.354Z cpu2:8763)<6>host2: fip: received FLOGI LS_ACC using non-FIP mode
2016-04-01T16:12:40.354Z cpu2:8763)<6>host2: lport  10003: Entered DNS state from FLOGI state
2016-04-01T16:12:40.354Z cpu2:8763)<6>host2: rport fffffc: Login to port
2016-04-01T16:12:40.354Z cpu2:8763)<6>host2: rport fffffc: Port entered PLOGI state from Init state
2016-04-01T16:12:40.356Z cpu18:8733)<6>host2: rport fffffc: Received a PLOGI accept
2016-04-01T16:12:40.357Z cpu18:8733)<6>host2: rport fffffc: Port is Ready
2016-04-01T16:12:40.357Z cpu18:8733)<6>host2: rport fffffc: work event 1
2016-04-01T16:12:40.357Z cpu18:8733)<6>host2: rport fffffc: callback ev 1
2016-04-01T16:12:40.357Z cpu18:8733)<6>host2: lport  10003: Received a 1 event for port (fffffc)
```

# Change LIBfc debug_logging back to original setting:

You can change this back to the default by inserting the 2 commands below and restarting the ESXi host. We are basically just zeroing out the change from before to set this back to the default:

You can run the same commands again to ensure the change is successful:

They should both look like the following:

After rebooting the ESX host you can ensure the debugging is gone in the log by checking with this command: