LS2085 iNIC FEARURE TEST GUIDE

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LS2085 iNIC functionality reproducibility procedures

Revision History:

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19-Nov-2015	A0_01	LS2085 iNIC functionality Implementation and Reproducibility Procedures.	VVDN Technologies

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1. Introduction

This document describes the setup and the steps required to validate the Freescale LS2085 card iNIC functionality.

The Freescale LS2085 Based Intelligent Network Interface Card (iNIC) Framework provides a base level of functionality on which a flexible network solution can be built. It can support the growing demands in the intelligent network acceleration and application offload for converged data center applications, such as storage.

The Freescale iNIC framework includes three components.
- iNIC card: LS2085 board with PCIe Endpoint interface
- iNIC endpoint NIC driver which is deployed on iNIC card.
- iNIC X86 kernel driver which is deployed on X86 host to provide Ethernet interfaces.

2. Features Summary

- Basic Network Interface Card (NIC) functionality that facilitates network traffic flow to/from Ethernet interfaces to X86 host .
- Layerscape LS2085 processor is used as PCIe Endpoint.
- Four working 10G Ethernet interfaces.
- PCIe x4, Gen3.
- X86 host kernel driver.
- Endpoint NIC driver.

2.1 LS2085 iNIC Endpoint Driver

- LS2085 card is used as Endpoint
- NIC Card driver works on DPAA2 Architecture.

Endpoint Network Driver: This Driver will be running at the iNIC side and will be responsible for communication with the ethernet interface created by the host driver. We need to enable the Inbound and Outbound from NIC so that buffer automatically updates when a new packet arrives. Each time the Frame descriptors get updated when new packet is arrived from iNIC network interface, Buffer of X86 DDR would be updated with the new value (Packet).

2.2 X86 Kernel Driver

- X86 Based Ethernet host driver for LS2085.

PCI Network Driver: This driver will be running on host side in order to control and configure the

physical properties of the iNIC Card detection, configuration will be supported by this driver. This driver will also be responsible for making the Ethernet virtual ports on the host side.

3. Hardware Setup

This section describes the hardware setup with X86 machine as host and LS2085 card as iNIC card.
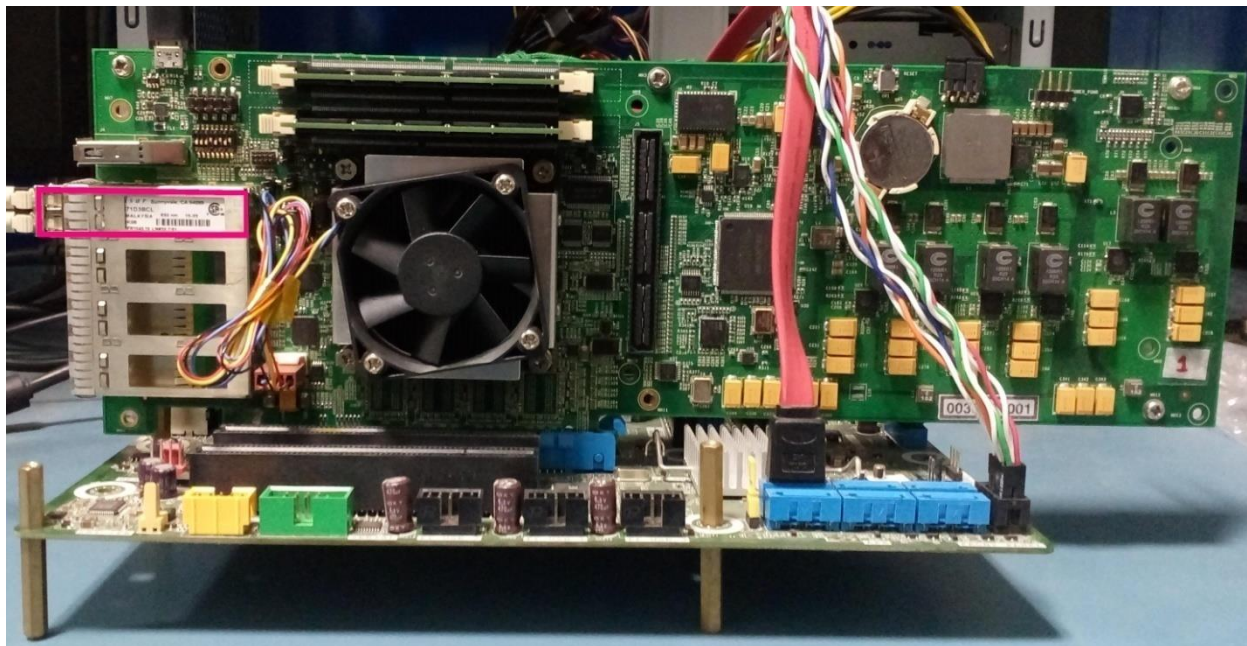

Figure 1: iNIC Hardware Setup

Follow the below procedure to make the hardware setup,
1. Do not power up the x86.
2. Insert the LS2085 iNIC card properly in PCIe x16 slot of X86 Machines.
3. Connect USB mini console cable to your laptop for LS2085 iNIC card console access.
4. Insert SFP in the proper 10G port as shown in the figure.
5. Connect 10G interface to some other 10G interface(x86) to do the ping test.
6. Make sure Card is inserted properly.

3.1 X86 Host Setup

Intel i7 Machine is running as host with the following configuration

- **i7 @3.50GHZ**
- **OS Type**: 64-bit
- **Kernel Version**: 3.13.0-24-generic.
- **Memory**: 8GB RAM(exact).

- **Guest OS**: Ubuntu 14.04 LTS

System Configuration details shown in figure below,

Figure 2: System Configuration details

3.2 LS2085 Endpoint Setup

The iNIC endpoint software is built on top of the Freescale Hardware LS2085 processor and Layerscape Software Development Kit (SDK) environment. The processors combine several arm cores, four 10G interfaces, Layerscape Data Path Acceleration (LDPAA2) logic.

The iNIC endpoint software is developed and compiled based on the released Freescale SDK V1.6.

- **OS Type**: 64-bit
- **Kernel Version**: 3.19.3-Layerscape2

- **Memory**: 16GB RAM.

4. Software setup

This section describes the software setup with X86 machine as host and LS2085 card as iNIC card.

4.1 X86 Host Setup

The following steps to be done before testing the iNIC functionality at x86 host side,
1. Boot the X86 system.
2. Open terminal on X86 Machine.
3. Go to the path where we copied the host driver file x86_host_driver.tar.gz, Extract the host driver in x86 machine.

```
# cd <host driver path>
# tar -xf  x86_host_driver.tar.gz
```

4. Go to the host driver and compile the driver.

```
# cd <host driver path>/x86_host_driver/host/
#  make
```

5. The above steps will create the **fsl_host.ko**, make sure it is present in *<host driver path>*/x86_host_driver/host/ path.

4.2 LS2085 Endpoint Setup

LS2085 card contains the in build kernel driver to configure it has an endpoint, It will wait for the host driver to be inserted on x86 side once the LS2085 kernel boots.

5. Test Procedure

The following steps describes the iNIC functionality testing procedure,
1. Setup the Hardware as per section 5 and Power on the X86 host.
2. Both LS2085 and X86 will start booting.
3. LS2085 will wait for X86 host driver configuration.
4. Open terminal on X86 Machine.
6. Go to the X86 host driver path (Previously compiled ref. section 6.1) and Insert the host driver fsl_host.ko.

```
# cd  <host driver path>/x86_host_driver/host/
# sudo insmod fsl_host.ko
```

7. The above driver will create one virtual Ethernet interface (ethx) at X86 side which is used to communicate with LS2085 Ethernet interface.
8. After X86 host driver is loaded LS2085 continue to boot.
9. Both X86 and LS2085 are up and ready.
10. Make the interface up at X86 host side.

```
# sudo ifconfig eth1 192.168.1.10 up

Note: Replace eth1 with proper interface name according to your setup.
```

11. Make the interface up at test system which is connected with LS2085 card via Ethernet interface.

```
# sudo ifconfig eth0 192.168.1.20 up

Note: Replace eth0 with proper interface name according to your setup.
```

12. Ping the test system IP from X86, you should get the ping response from test system

```
X86 Side
# ping 192.168.1.20
```

13. Ping the X86 host IP from test system, you should get the ping response from X86 system.

```
X86 Side
# ping 192.168.1.20
```

14. From the above steps and results we can validate the NIC functionality of the LS2085.

15. Follow the same steps for remaining 3 SFP ports checking also.