This document provides the instructions to install and run the Fast Path UTM application on a simulated p4080 platform running on a X86 Host. The P4080 in this demo is configured to run the control plane in one partition (core 0) and the data plane code in three partitions (cores 1, 2 and 3). The remaining four partitions are unused.

This document does not cover the SIMICS and LTIB installation instructions.
Table 1. System Requirements

<table>
<thead>
<tr>
<th>Recommended Host Platform</th>
<th>Intel® Core™ Q9300 @ 2.50GHz, Minimum memory 4 GB, Minimum three 1 Gb NIC interfaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System</td>
<td>UbuntuVersion 8.04 (64 bit)</td>
</tr>
<tr>
<td>SIMICS</td>
<td>Simics Base 4.0.23 ,P4080-R1 4.0.pre8</td>
</tr>
<tr>
<td>LTIB</td>
<td>8.1.2(1.393.2.3)</td>
</tr>
<tr>
<td>Test Equipment</td>
<td>3 to 4 Vlan tag capable switches, Minimum 4 High End PCs, Minimum two large size monitors.</td>
</tr>
<tr>
<td>SDK</td>
<td>1.0 B</td>
</tr>
</tbody>
</table>

1 Terminology

- **Target Linux**
  The Linux that runs on P4080 platform. iGateway Fast Path UTM control plane applications runs on this Linux and data plane applications are started through this Linux.
- **LWE application**
  Application that runs on the Light weight Executive, the dataplane part of the FPUTM runs on the LWE partitions.
- **Simics Host**
  PC running ubuntu 8.04 (64 Bit). The p4080 simulator tool Simics, runs on this host machine. This machine should be capable of connecting to a FlexLm server that maintains and serves SIMICS licenses.
- **Ltib Install path**
  Path where the ltib.iso was installed on the Simics host.
  Generally ltib install Path is /home/b2XXXX/ltib/ltib-e500mc-20080924.

2 Prerequisites

- SIMICS and LTIB should have been already installed on the Simics host.
- Bridge Utilities

The test setup requires bridging capabilities on the Simics Host. Therefore the Bridge control utility, ‘brctl’ has to be available on the simics host.

To check if the bridge utilities are available type,

```
sudo brctl show
```

on the Simics Host. If the utility has been already installed the display is as below

```
b22174@intoto-desktop:~$ sudo brctl show
bridge name   bridge id  STP enabled  interfaces
```
If this utility is not present you will see an error that says
‘command not found’.

In such a case, install the package by typing
’sudo apt-get install bridge-utils’
on the shell of the Simics Host.

3 Installation of the Demo Package

Copy IgwDemoPkg_1.00.00D_MM-DD-YYYY.tgz into ltib install path. (Generally ltib install Path is
/home/b2XXXX/ltib/ltib-e500mc-20080924.)

CAUTION

This tar archive overwrites the list of files mentioned below.

```
rootfs/boot/vmlinux.stripped     Target linux image
rootfs/boot/hv-8p-lnx-lwe.dtb    device tree image
rootfs.ext2.gz rootfs/boot/u-boot.bin   u-boot image
rootfs/boot/hv.uImage    hypervisor image
bin/s4_hv-8p-lnx-lwe.simics    simics script
bin/s4_boot.simics     simics script
bin/xtel.sh      terminal server image
rootfs/igateway-FPUTM/    igateway binaries
startup.sh     Simics host demo start script
igwstart.sh Script to start Simics. This is executed with in

Backup the above files if required.
• Untar IgwDemoPkg_1.00.00D_MM-DD-YYYY.tgz. This package contains the files to start
FPUTM application and the scripts to configure Firewall and VPN.

    sudo tar --xzvf IgwDemoPkg_1.00.00D_MM-DD-YYYY.tgz

4 Quick Guide to Start the Application

The following two steps are the only ones required to bring up the iGateway FPUTM application:

Step 1: Start the Simics application
• cd /home/b2XXXX/ltib/ltib-e500mc-20080924
• ./startup.sh

Step 2: Start iGateway –FPUTM Application start
• At the login prompt of the target Linux shell, enter ‘root’ as user name and ‘root’ as password.
• cd /igateway-FPUTM
• ./load.sh 7 00:11:22:33:44:55

The following subsection provides a detailed explanation.

4.1 Running the igateway–FPUTM Application

Open a terminal window on the Simics Host.

Change the directory ltit install path

\[ cd /home/b2XXXX/ltib/ltib-e500mc-20080924 \]

run

\[ startup.sh \]

This script creates 10 TUN/TAP interfaces, fman0_eth0 thru fman0_eth4 and fman1_eth0 thru fman1_eth4.

The script also creates three bridges br0, br1, and br2. These bridge interfaces connect the Target application to the real world, as follows:

• Bridge ‘br0’ bridges ports fman0_eth1 and eth1
• Bridge ‘br1’ bridges ports fman0_eth2 and eth2
• Bridge ‘br2’ bridges ports fman0_eth3 and eth3 physical ports.

**NOTE**

As eth1, eth2 and eth3 ports of the Simics host are bridged, applications other than simics that might be running on the host and using these interfaces will lose connectivity.

• 7 xterm windows are spawned one for each LWE partition.
• Two serial consoles appear on UART0 and UART2.
• The Hypervisor image running on all cores uses UART0 for its console.
• The control plane Target Linux image uses UART2 for its console.

The two UART consoles overlap each other; you can drag these windows apart and away from the xterm windows to have a good view of all of the windows simultaneously. The following is a sample screen shot after the \[ startup.sh \] is executed.
The terminal on which the startup script was executed becomes the simics console.

To verify if the script executed correctly and to examine if all of the interfaces required are available.

```
ifconfig -s
```

Among other interfaces on the system you should see 10 tun/tap interfaces with names fman0_eth0 to fman0_eth4 and fman1_eth0 to fman1_eth4. and both bridges br0 and br1

<table>
<thead>
<tr>
<th>Interface</th>
<th>MTU</th>
<th>RX-OK</th>
<th>RX-ERR</th>
<th>RX-DRP</th>
<th>RX-OVR</th>
<th>TX-OK</th>
<th>TX-ERR</th>
<th>TX-DRP</th>
<th>TX-OVR</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>br0</td>
<td>1500</td>
<td>0</td>
<td>27</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>BMRU</td>
</tr>
<tr>
<td>br1</td>
<td>1500</td>
<td>0</td>
<td>273</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>BMRU br2 1500 0</td>
</tr>
<tr>
<td></td>
<td>273</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>BMRU</td>
<td></td>
</tr>
<tr>
<td>ethernet0</td>
<td>1500</td>
<td>0</td>
<td>153</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>154</td>
<td>0</td>
<td>0</td>
<td>BMRU</td>
</tr>
<tr>
<td>ethernet1</td>
<td>1500</td>
<td>0</td>
<td>160</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>161</td>
<td>0</td>
<td>0</td>
<td>BMRU</td>
</tr>
<tr>
<td>ethernet2</td>
<td>1500</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>BMU</td>
</tr>
<tr>
<td>ethernet3</td>
<td>1500</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>BMU</td>
</tr>
<tr>
<td>ethernet4</td>
<td>1500</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>BMU</td>
</tr>
<tr>
<td>ethernet5</td>
<td>1500</td>
<td>0</td>
<td>3050</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1464</td>
<td>0</td>
<td>0</td>
<td>BMRU</td>
</tr>
<tr>
<td>ethernet6</td>
<td>1500</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>BMU</td>
</tr>
<tr>
<td>ethernet7</td>
<td>1500</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>BMU</td>
</tr>
<tr>
<td>fman0_eth0</td>
<td>1500</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>BMU</td>
</tr>
</tbody>
</table>
4.2 Stopping the Simics Application

On the Simics console type <Ctrl> C .

You will be at the simics prompt; type exit to exit the demo.

4.3 Starting the FPUTM Application

Login on the target Linux window with user name as ‘root’ and password as ‘root’.

Change dir to igateway-FPUTM.

    cd /igateway-FPUTM

From the target Linux prompt type

    ./load.sh 7 00:11:22:33:44:55

This script starts the FPUTM DP and CP Applications.

    load.sh scripts accepts two parameters.
    The first is the core mask which is a bitmap of data plane cores that are to be included for the DP application.

For example, if cores 1 and 2 are to be used the coremask value will be 6 and for 0 thru 2 coremask would be 7.

The second parameter takes the Base MAC address of the pseudo Ethernet interfaces created by iGateway CP application. This Mac address is assigned to the first pseudo Ethernet interface on the target Linux and the remaining interfaces get the incremented value of the last octet.

This value should be different for each iGateway-FPUTM application in order to avoid MAC address conflicts with in the test network.
After you see the line ‘Initial loading completed’ message on the target Linux window start iGateway’s command line interface by typing

`.cli`
If you intend to build your own version of Target Linux, the following changes have to be made for Target Linux. This Step is not required if you plan to install and run the demo binary.

The following modules from the Target Linux kernel should be disabled
- Freescale Datapath(Qman/Bman) support
- Freescale Datapath Frame Manager Ethernet.
- Module Versioning support.

How to check and disable these modules from the Target Linux?
- ./ltib --configure

This will display a screen as shown below.
• Now from the above wizard, grep for ‘configure the kernel’ and press space bar and <EXIT>
• Select ‘yes’

• After the above step lot of messages appear on the terminal and one more screen appears as
• Scroll down and select ‘Device Drivers’

![Image of Linux Kernel Configuration]

• Find ‘hardware Queue support’ and press ‘select’

![Image of Linux Kernel Configuration]
• Unselect the ‘Freescale datapath (Qman/Bman) support’ and <EXIT>
• Then Find the ‘Network Device support’ under ‘Device Drivers’
• Find the ‘Ethernet (10000 Mbit)’
• Find ‘Freescale Data path Frame manager Ethernet’ and unselect

![Configuration menu with Freescale Data path Frame manager Ethernet option highlighted]

• <EXIT> <EXIT> <EXIT>
4.3.1 Removing Versioning Support

- Under kernel configuration find ‘Enable loadable module support’
• Unselect ‘Module versioning support’

• <EXIT> <EXIT  doubt need to be clarified >>
Now kernel configuration has changed, so after the above step kernel starts preparing a build with new configuration and at the end it as shown below.

```
Your ramdisk exceeds the old default size of 4096k, you may need to
set the command line argument for ramdisk_size in your bootloader
allowing 10% free this gives 58775k. For instance, for u-boot:

seleny booleurs root=/dev/ram rw ramdisk_size=58775

creating an ext2 compressed filesystem image: rootfs.ext2.gz

genext2fs: running in LlIB backwards compatibility mode: -i -> -N

creating a u-boot ramdisk image: rootfs.ext2.gz.uboot

Image Name: uboot ext2 ramdisk rootfs
Created: Sat Feb 14 17:00:41 2009
Image Type: Power PC Linux RAMDisk Image (gzip compressed)
Data Size: 13127917 Bytes = 12020.23 kB = 12.52 MB
Load Address: 0xe0000000
Entry Point: 0xe0000000

Ended: Sat Feb 14 20:00:42 2009
Elapsed: 244 seconds

Build Succeeded
```

Build, install and deploy the kernel

```
#cd /home/b2XXXX/ltib/ltib-e500mc-20080924
./ltib –m scbuild –p kernel
./ltib –m scdeploy –p kernel
```

### 4.4 Demo Scripts

Firewall and VPN scripts are provided in the binary package under two directories named “fw-scripts” and “vpn-scripts” to verify the functionality. These scripts are available on the p4080 target. On the UART2 console, typing the following takes to these script directories.

```
#/cd /igateway-FPUTM/demo-scripts
/igateway-FPUTM/demo-scripts#ls
fw-scripts vpn-scripts
```

Various use cases defined in the FPUTM_On_P4080_Demo_Use_Cases vX.doc, are mapped to these scripts.
5 Revision History

Table 2 summarizes revisions to this document.

<table>
<thead>
<tr>
<th>Revision</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Initial release</td>
</tr>
</tbody>
</table>