Using CHARON-AXP with Linux virtual Network Interfaces

CHARON-AXP v1.1 b12901 allows usage of the Linux virtual Network Interfaces (TUN/TAP) and mapping them to Ethernet adapters' emulations of individual CHARON-AXP instances. This document describes configuration specifics of this approach.

1. Prerequisites

The following packages need to be installed at a first step:
- bridge-utils
- tunctl

Providing that the host operating system is FC14 the following versions of those packages can be installed for example:
- bridge-utils-1.2-9.fc13.x86_64
- tunctl-1.5-4.fc12.x86_64 or openvpn-2.1.1-2.fc13.x86_64

The installation is performed with a help of standard RPM procedure or with "yum install".

The second step is setting a physical network interface to be dedicated to the whole network bridge (to be created later) to the promiscuous mode with the following command:

```
> /sbin/ifconfig eth<N> 0.0.0.0 promisc up
```

The promiscuous mode allows the physical network interface (as well as the virtual one) to accept the entire volume of the incoming packets. This mode is essential for consistence of the whole information transfer.

2. Starting virtual network interfaces

Starting desired number of virtual network interfaces (TAPs) can be performed in following way:

```
> tunctl [-t tap<N>]
```

where "tap<N>" is a name of an instance of the virtual network interface, i.e. "tap0", "tap1" etc. Once each virtual network interface instance is created it must be set to the promiscuous mode too:

```
> /sbin/ifconfig tap<N> promisc up
```

3. Creating bridge

To interconnect the physical and virtual network interfaces created at the previous steps the network bridge must be introduced in the following way:

```
> /usr/sbin/brctl addbr br0
```

where "br0" stands for a name of the created bridge.

Now it is possible to add the network interfaces to the created bridge in the following way:

```
> /usr/sbin/brctl addif br0 eth<N>

> /usr/sbin/brctl addif br0 tap0
…
> /usr/sbin/brctl addif br0 tap<N>
```

For example:

```
> /usr/sbin/brctl addif br0 eth1
> /usr/sbin/brctl addif br0 tap0
```

The proposed configuration assumes one and only one network bridge, so loops are not possible. It means it is required to turn off the spanning tree protocol with the following command:

```
> /usr/sbin/brctl stp br0 off
```

4. Starting the bridge

To start the created bridge "br0" use the following command:

```
> /sbin/ifconfig br0 up
```

5. Usage a virtual interface in CHARON-AXP configuration

Once as number of the "tap<N>" interfaces have been created and connected to the corresponding bridge "br0" it is possible to tell CHARON-AXP to use those interfaces in the following way:

```
load tap_port/chnetwrk EWA0 interface="tap<N>"
```