QUICK SETUP
OPENLISP & OPENLISP-CP

PURPOSE

Introduction step by step of installation and configuration of the xTR using:

- OpenLISP data plane
- OpenLISP control plane

OpenLISP data-plane (1)

- Add of the data-plane function of xTR (en/ decapsulation packet) in kernel (now support FreeBSD 8.2, 9.2 and 10.0)
- Requirements:
  - FreeBSD 8.2, 9.2 or 10.0
  - Libconfig
  - Kernel source code
  - OpenLISP-0.2.0.2

OpenLISP data-plane (2)

- Step 1: Install FreeBSD
  - The iso file and documents can be retrieved from http://www.freebsd.org/
- Step 2: Install *Libconfig* using the *ports collection*
  - #***cd /usr/ports/devel/libconfig/***
  - #***make clean install***

  Note: if libconfig does not exist in ports collection, you need to update the *ports collection* by following theses commands (take over 10 minutes, depend on the bandwidth)
  - #***portsnap fetch***
  - #***portsnap extract***
  - #***portsnap fetch***
  - #***portsnap update***

*__Note:__ lines start with **#** and ***italic, bold*** mean command

OpenLISP data-plane (3)

- Step 3: Install the Kernel source code if it does not exist (/usr/src/ is empty), using the package management of system.

  Note:

  - For FreeBSD < 9, the easiest way to install the full source tree is to run #***sysinstall*** as root, and then choosing ***Configure*** -> ***Distributions -> Src -> All***
  - For FreeBSD >= 9.0, you can install by downloading the tar file that matches the version you installed from http://www.freebsd.org/ and extract to /usr/src.

- Step 4: Install OpenLISP

  1. Source code and documents (version 0.2.0.2) can be retrieved from https://github.com/lip6-lisp/data-plane
  2. From the source code directory, run the shell script to patch the kernel source code

     #sh install-lisp.sh

OpenLISP data-plane (4)

- Bellow is an example of kernel compilation. The full document to compile the kernel can be retrieved from: http://www.freebsd.org/doc/en_US.ISO8859-1/books/handbook/makeworld.html
  - Make a new configuration file for a new kernel
    - #***cd /usr/src/sys/amd64/conf***

    Note: *Change* ***amd64*** *to your server architecture*
    - #***cp GENERIC OPENLISP_KERNEL***
    - ***#echo "options LISP" >> OPENLISP_KERNEL***
  - Rebuild a new kernel with a new configuration file
    - #***cd /usr/src***
    - ***#make buildkernel KERNCONF=OPENLISP_KERNEL***

    Or

    #make buildkernel KERNCONF=OPENLISP_KERNEL -j n

    (to speed up, with **n** *<= number of cores or CPUs)*
    - ***#make installkernel KERNCONF=OPENLISP_KERNEL***

  Note: it could take more than 30 minutes, depend on the system

OpenLISP data-plane (5)

4. Installation of the OpenLISP tools
   - OpenLISP map: to manage OpenLISP mapping database
     - ***#cd /usr/src/sbin/map/***
     - ***#make depend***
     - ***#make***
     - ***#make install***
   - OpenLISP mapstat: for statistical of OpenLISP
     - ***#cd /usr/src/usr.bin/mapstat/***
     - ***#make depend***
     - ***#make***
     - ***#make install***

OpenLISP data-plane (6)

- OpenLISP man: man page of OpenLISP
  - ***#cd /usr/src/share/man/man4/***
  - ***#make***
  - ***#make install***

Note: reboot the system to load new kernel

- Some commands to start with OpenLISP
  - ***#man lispintro***
  - ***#man 4 map***
  - ***#man mapstat***
  - ***#mapstat -Xn***
  - ***#mapstat -s -p lisp***

OpenLISP control-plane (1)

- functionality: do the control-plane function of xTR/MS/MR/DDT_NODE (now support both FreeBSD and Linux)
- requirements:
  - Expat library
  - OpenLISP-CP

OpenLISP control-plane (2)

- Step 1: installation of the expat library using ***ports collection*** (on FreeBSD) or ***packaging tool*** (on Linux)
  - FreeBSD
    - ***#cd /usr/ports/textproc/expat2***
    - ***#make clean install***
    - Make sure that ***expat.h*** and ***expat_external.h*** exist in ***/usr/local/include/***, if not you need to copy by hand.
    - ***#cd /usr/ports/textproc/expat2/work/expat-2.0.1/lib***
    - ***#cp expat.h expat_external.h /usr/local/include/***
  - Linux (example)
    - ***#apt-get install libexpat1-dev***

OpenLISP control-plane (2)

- Step 2: installation of the OpenLISP-CP
  - Verify that the ***gcc compiler*** is installed on the machine. If use other complier, set ***new complier*** in the Makefile
    - CC = gcc → CC = new complier
  - Get the sources code and documents from https://github.com/lip6-lisp/control-plane
  - Unpack the tarball source code.
  - From the source code directory, run
    - #***make***
    - #***make install***
  - To start the program for the first time, use
    - #service **opencp** start

    Or
    - /etc/rc.d/opencp start

    Or
    - #./opencp -f [<path_to_opencp.conf>]
  - to allow the program to start automatically after reboot, add the following line to the /etc/rc.conf :
    - opencp_enable="YES"
  - When run manually, opencp show log information to terminal. When run as daemon (autostart when reboot or by service command), opencp log to ***/var/log/opencp.log***. In FreeBSD to rotation log file of opencp, edit the ***/etc/newsyslog.conf*** and add the flow line (opencp.log will be archived each time it turne over 1000KB):
    - /var/log/opencp.log 600 7 1000 * JC /var/run/opencp.pid 30

OpenLISP control-plane (3)

- Step 3: configuration of the OpenLISP-CP
  - Main configuration file (opencp.conf): default put in /etc/rc.d
  - The configuration relies on a main configuration file named "opencp.conf" that points to specific xml files:

```
# Functions: xTR, ms(Map-Server), mr/ddt (DDT Map-Resolver or DDT-only node)
functions = ms mr ddt
#Set debug level
debug_level = 2

#Support LISP-TE
lisp_te = No

#Choose source IP for map-response packet, default is auto select
source_ipv4 = auto
source_ipv6 = auto

#Use random port for map-request
srcport_rand = Yes

#Set size of open control-plane queue size, default is 1000
queue_size = default

 #Parameter to setup worker pool
min_thread = default
max_thread = default
linger_thread = default

# specific xml files
xtr_configure = /etc/opencp_xtr.xml
ms_configure = /etc/opencp_ms.xml
node_configure = /etc/opencp_ddtnode.xml
mr_configure = /etc/opencp_mr.xml
rtr_configure = /etc/opencp_rtr.xml
```

OpenLISP control-plane (3)

- Step 3: configuration of the OpenLISP-CP
  - xTR configuration file (default /etc/opencp_xtr.xml)
    - The <mapserver> section defines the list of MSs the xTR registers to. Each MS needs a key to authenticate.
    - The <mapresolve> section defines the list of MRs the xTR can send map-requests.
    - The <proxy_etr> section defines the list of PETR the xTR can use.
    - One or more <eid_prefix> sections. Each section gives the information for one EID IP prefix to register.

OpenLISP control-plane (4)

- Step 3: configuration of the OpenLISP-CP
  - Map server configuration file (default /etc/opencp_ms.xml)
    - The <authoritative_eid_prefix> section defines the IP prefixes the map-server allows ETR to register to. The IP ranges must not be overlapped.
    - One or more <site> sections. Each section includes the informations for one site:
      - *site name,*
      - *key for map-register messages (NB: the key is case sensitive and must not include spaces),*
      - *EID IP prefixes the site can register.*

OpenLISP control-plane (5)

- Step 3: configuration of the OpenLISP-CP
  - MR configuration file (default /etc/opencp_mr.xml)
    - One or more <eid_prefix> sections. Each section contains the information for one delegated prefix. Special <eid_prefix> sections with prefix equal 0.0.0.0/0 or 0::/0 contains the information of DDT root nodes.

OpenLISP control-plane (6)

- Step 3: configuration of the OpenLISP-CP
  - DDT node configuration file (default /etc/opencp_ddtnode.xml)
    - The <authoritative_eid_prefix> section defines the IP prefix(es) the node is delegated. The IP ranges must not be overlapped. NB:if the node is a DDTroot, then it is here configured as being delegated for 0.0.0.0/0 (IPv4) and 0::/0 (IPv6)
    - One or more <delegated_eid_prefix> sections. Each section contains the information for one delegated prefix.

OpenLISP control-plane (7)

- Step 3: configuration of the OpenLISP-CP
  - RTR/PxTR configuration file (default /etc/opencp_rtr.xml)
    - The <mapresolve> section defines the list of MRs the RTR can send map-requests.
    - One or more <eid> sections.