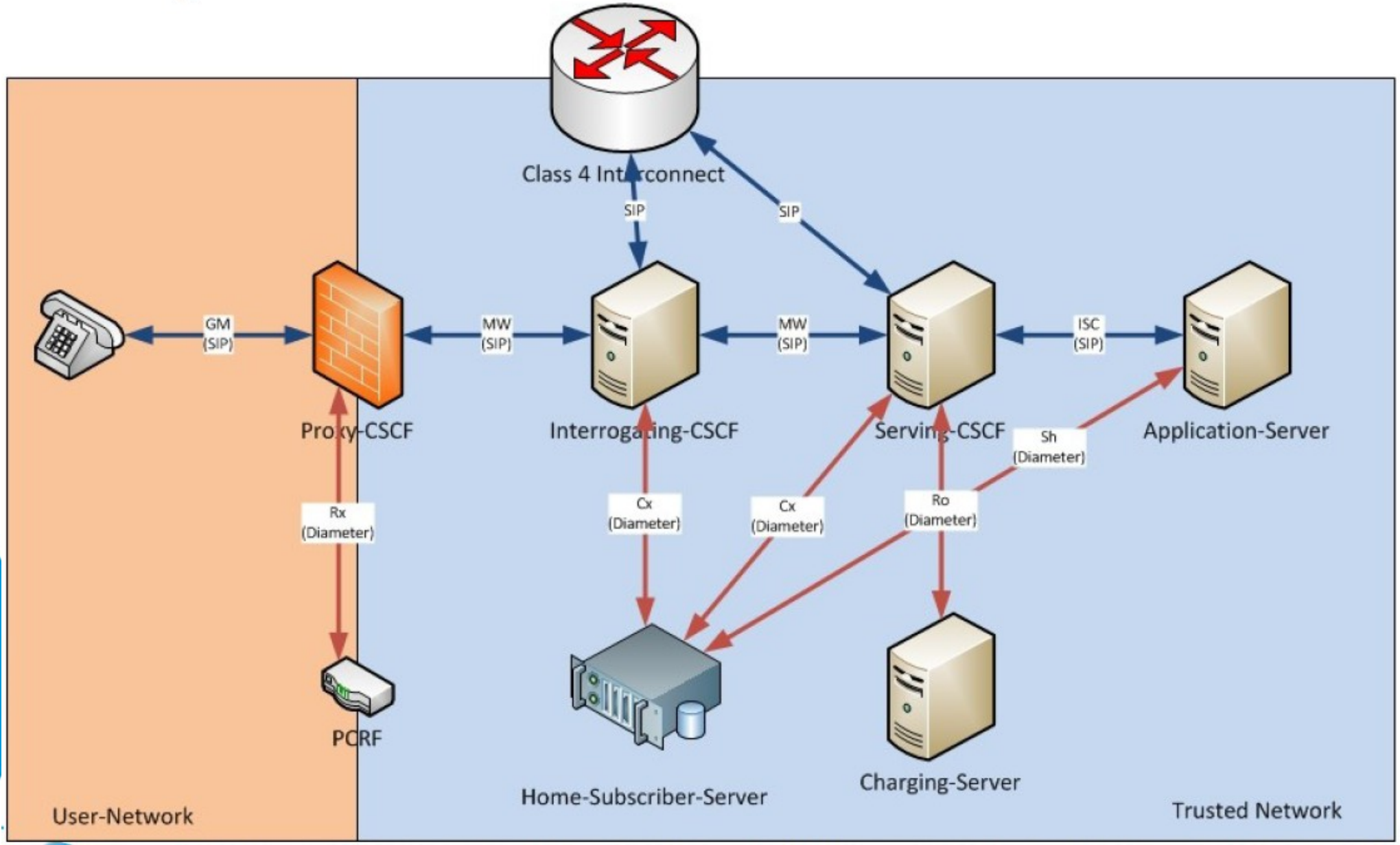
Kamailio for Building an IMS Core for VoLTE

Todays schedule

- Basic IMS Infrastructure overview
- Some Background on IMS on Kamailio
- Live-Installation of the network components
  - Proxy-CSCF (with SEMS for AMR)
  - Interrogating-CSCF
  - Serving-CSCF
  - Fraunhofer's OpenHSS (FhoSS)
  - A simple Aplication Server, based on Kamailio (if time allows)
- Walkthrough of HSS-Webinterface

Basic IMS Infrastructure overview



Background on IMS on Kamailio

- Based on Fraunhofer's OpenIMS-Core
- Highly optimized for performance
- All components for Testbeds available as OpenSource

Preparations: DNS / Bind

```
$ORIGIN kamailio-ims.org.
$TTL 1H
@                       5M IN SOA       localhost. root.localhost. (
                                        4          ; serial
                                        5M               ; refresh
                                        15M              ; retry
                                        1W               ; expiry
                                        5M )             ; minimum

                        6H IN NS        ns1.ng-voice.com.
                        6H IN NS        ns2.ng-voice.com.
ns1             6H IN A         109.239.50.66
ns2             6H IN A         109.239.50.67

; Websites / Public-Services:
www             6H IN A         109.239.57.150

kamailio-ims.org.  5M IN A          46.101.144.112

;kamailio-ims.org.     5M IN NAPTR 10 10 "s" "SIPS+D2T"         ""      _sips._tcp.pcscf
kamailio-ims.org.      5M IN NAPTR 10 30 "s" "SIP+D2U"      ""   _sip._udp.pcscf
kamailio-ims.org.      5M IN NAPTR 10 20 "s" "SIP+D2T"          ""      _sip._tcp.pcscf
```

ng voice

Preparations: DNS / Bind (2)

```
pcscf           5M IN A    46.101.144.112
pcscf           5M IN NAPTR 10 10 "s" "SIP+D2T"      ""  _sip._tcp.pcscf
pcscf           5M IN NAPTR 10 20 "s" "SIP+D2U"      ""  _sip._udp.pcscf
_sip._tcp.pcscf       5M SRV 10 1 4060 pcscf
_sip._udp.pcscf       5M SRV 10 1 4060 pcscf

icscf           5M IN A    46.101.144.112
icscf           5M IN NAPTR 10 50 "s" "SIP+D2U"      ""  _sip._udp.icscf
_sip._udp.icscf       5M SRV 20 0 5060 icscf

scscf           5M IN A    46.101.144.112
scscf           5M IN NAPTR 10 50 "s" "SIP+D2U"      ""  _sip._udp.scscf
_sip._udp.scscf       5M SRV 10 0 6060 scscf

as          5M IN A    46.101.144.112
as          5M IN NAPTR 10 50 "s" "SIP+D2U"      ""  _sip._udp.as
_sip._udp.as       5M SRV 10 0 7060 as

hss         5M IN A    46.101.144.112
```

ng voice

Basic Installation (on Debian)

Add our repository:

```
wget -O - http://repository.ng-voice.com/PublicKey | apt-key add -
echo "deb http://repository.ng-voice.com wheezy ims rtpproxy fhoss sems" >
/etc/apt/sources.list.d/kamailio-ims.list
apt-get update
```

Install some packages:

```
apt-get install kamailio kamailio-ims-modules kamailio-presence-modules
kamailio-tls-modules kamailio-mysql-modules kamailio-xmlrpc-modules ngcp-
rtpengine openimscore-fhoss oracle-java7-installer sems mysql-server mc
ngrep tcpdump vim libevent-2.0-5 libevent-pthreads-2.0-5 libspandsp2
```

- All Configurations are separated in kamailio.cfg (general) and pcscf.cfg / icscf.cfg / scscf.cfg / *.xml

Configuring the Proxy-CSCF (1)

SIP Express Media Server (SEMS) – for AMR-NB

- Apply provided configurations
- Edit /etc/default/sems:

```
RUN_SEMS="yes"
```

- Edit /etc/sems/etc/src_ipmap.conf

```
46.101.144.112=>mo
```

NOTE: Patent licensing for AMR-NB is required!!!

Configuring the Proxy-CSCF (2)

Configure SIPWise' RTPEngine

- Edit /etc/default/ngcp-rtpengine-daemon :

```
RUN_RTPENGINE=yes
 [...]
INTERFACES="46.101.144.112"
 [...]
```

Configuring the Proxy-CSCF (3)

Configure Kamailio for use as a Proxy-CSCF:

- Add the SEMS-SBC to the dispatcher.list file
- Modify pcscf.cfg to fit to your needs (IP-Adresses, Hostnames, ...)
- Create the database for the Proxy-CSCF

Configuring the Interrogating-CSCF

- Modify icscf.cfg (Kamailio-Settings)
- Modify icscf.xml (Diameter-Connection)
- Create the database for the Interrogating-CSCF

Configuring the Serving-CSCF

- Modify scscf.cfg (Kamailio-Settings)
- Modify scscf.xml (Diameter-Connection)
- Create the database for the Serving-CSCF

You can register now!

- Username: alice / bob
- Password: alice / bob
- Registrar: kamailio-ims.org
- Authentication-Username: „alice@kamailio-ims.org“ / „bob@kamailio-ims.org“
- Outbound proxy: pcscf.kamailio-ims.org:4060 (opt)

Adding PSTN-Interconnects

- Inbound calls need to point to the I-CSCF
- Outbound gateways are defined in Dispatcher on the Serving-CSCF
- ENUM is required for number to user mapping

Adding Applications

- The difficult/complex part is to add the proper rules
- Any SIP-Endpoint can be an application

Simple Kamailio-Application-Server

```
route {
     xlog("L_DBG", "$rm ($fu ($si:$sp) to $tu, $ci)\n");

     # per request initial checks
     route(REQINIT);

     # handle requests within SIP dialogs
     route(WITHINDLG);

     ### only initial requests (no To tag)
     # CANCEL processing
     if (is_method("CANCEL")) {
          if (t_check_trans())
               t_relay();
          exit;
     }

     if ($rU =~ "0[0-9]+") {
          strip(1);
          prefix("49");
     }

     # Evaluate Route-Header and set $route_uri
     loose_route();

     t_relay();
}
```

Download: Configurations

All configurations, Zone-Files, etc.:

http://www.ng-voice.com/kamailio-ims-workshop.zip

Thank you!

Contact: www.ng-voice.com - carsten@ng-voice.com