Kea – Modern DHCP Engine

Open Source WG

RIPE68, Warsaw, Poland

14 May 2014

Tomek Mrugalski <tomasz@isc.org>

Who is Tomek?

- M.Sc., Ph.D from Gdansk University of Technology

- Primary author of Dibbler
  - Portable DHCPv6 implementation (srv, cli, relay)
  - Supports Win 2k-Win8, Linux, BSD, Solaris
  - Confirmed use in 34 countries

- 7 years at Intel (Network Quality Labs, chipsets group)

- 3 years at ISC
  - Lead Developer of Kea (formerly BIND10 DHCP)
  - Occasional contributor to ISC-DHCP

- Active IETF participant since 2009
  - DHC WG co-chair
  - 4 RFCs, 18+ drafts (all DHCP-related)

ISC DHCP

- Open-Source
- Managed open source model
  (closed repository, semi-closed bug system)
- First version released in 1997
- Default DHCP software in many distributions
- Server/relay/client for IPv4 & IPv6
- Feature-rich

Why new DHCP implementation?

- Existing code is 18 years old
- Networks have changed
- Hardware has changed
- Use cases have changed
- Drawbacks with ISC DHCP
  - Complex code, difficult to extend
  - Documentation lacking
  - Performance not always sufficient
  - Partial dynamic configuration (OMAPI)

Kea and BIND10 history

- ISC has been developing BIND10 since late 2009
- DHCP components started in mid-2011
- ISC stopped BIND10 development in April 2014
  - => Bundy (non-ISC, http://bundy-dns.de)
  - => Kea (ISC, http://kea.isc.org)

Kea :: Overview

DHCPv4 Server

DHCPv6 Server

DNS Updates

perfdhcp

libdhcp++

- general purpose DHCP library
- IPv4/IPv6 packet parsing/assembly
- IPv4/IPv6 options parsing/assembly
- interface detection (Linux, partial BSD/Mac OS)
- socket management

Kea :: Current status

DHCPv4 Server
    DDNS
    DHCPv6 Server

- Address assignment, renewal, release
- Expiration: expired lease can be reused
- Flexible option definitions
    - Standard options
    - Custom options
    - Nested options
    - Option namespaces
    - Vendor options (including DOCSIS3.0)
- Prefix Delegation (DHCPv6)
- DNS Updates (conflict resolution, no TSIG yet)
- Dynamic reconfiguration (no restart needed)

Kea :: Switchable lease database
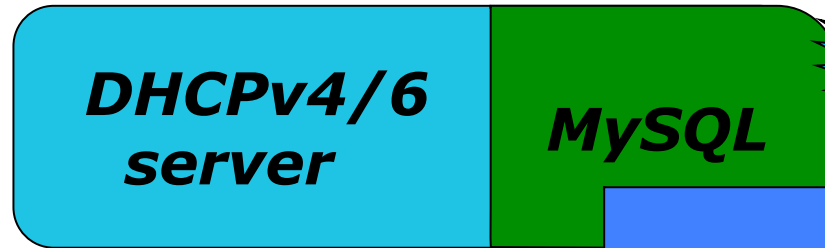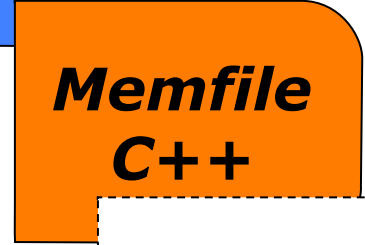
- MySQL
  - Can use standard tools to read/update
- PostgreSQL
  - Can use standard tools to read/update
  - Performance: ??? (haven't measured yet)
- Memfile
  - Custom developed in C++
  - Flat file storage (CSV)
  - Offers memory-only and memory+disk-write
  - Very high performance (in in-memory mode), high performance in memory+disk mode)
- Abstract LeaseMgr
  - C++ class, add your favourite storage

DHCPv4/6 server

MySQL

Scalable 2M devices

PgSQL

Memfile C++

Abstract LeaseMgr

Hooks :: Extending the Kea server
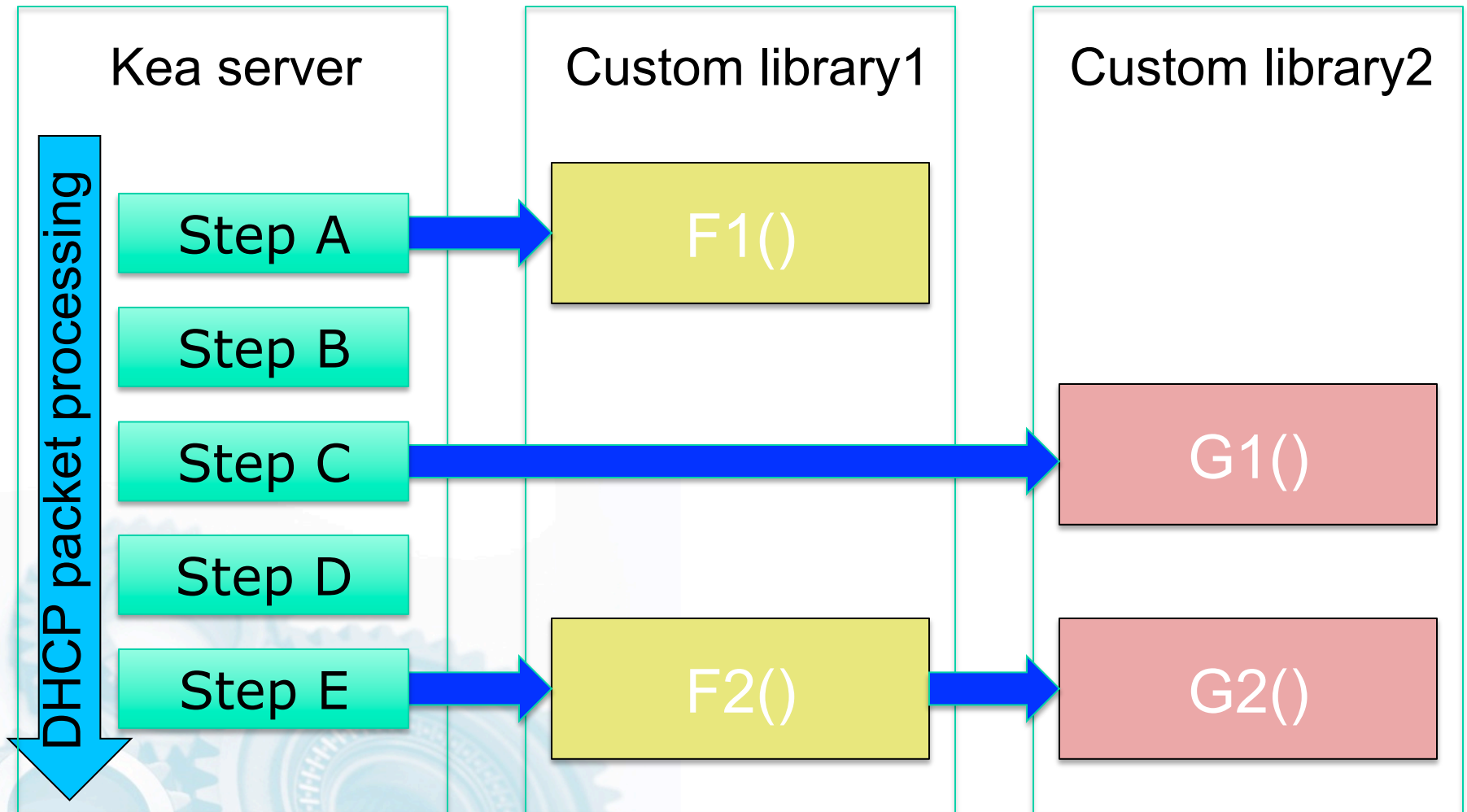
Kea Roadmap (1)

Kea 0.8 (April 2014)

- Available now in BIND 10 1.2

ftp://ftp.isc.org/isc/bind10/1.2.0/bind10-1.2.0.tar.gz

Kea 0.9 (Summer 2014)

- Dropping BIND 10 framework*
- Configuration stored in JSON file
- Keeping on-line reconfiguration (signals, better solution TBD)
- Complete FreeBSD (stretch)

* Details TBD, tentative plan: retain capability to build stand-alone and pluggable into Bundy framework

Kea Roadmap (2)

0.9
Q3 2014

1.0
Q2 2015

2.0
2015

3.0
2016

0.9	**1.0**	**2.0**	**3.0**
BIND10 framework removal **JSON configuration** **BSD (stretch)**	**Host reservation** **Client classification** **Full lease expiration**	**Failover/HA solution** **Statistics** **MAC in DHCPv6** **Reconfiguration** **iPXE** **External API completion**	**Configuration migration** **Basic GUI** **ISC DHCP feature uplift** **2017-18 ISC DHCP EOL?**

Disclaimer 1: The team has not yet scoped beyond 1.0
Disclaimer 2: Dates are tentative and subject to change.

Want to help?

Kea is fully open source

- Core repository is public
- Bug datatase public
- Mailing lists, jabber public
- Test, report bugs

Contribute

- Submit patches (read Contributor's Guide first)
- We are looking for sponsors (money and developers)
- Development contracts
- Review design documents (e.g. requirements)

Looking for contributions:
- Additional back ends
- Apps via Hooks API
- Basic GUI
- …

http://kea.isc.org

Thank you

kea.isc.org