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

**libdhcpp++**

- 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
  - 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)
- DDNS
- DHCPv6 Server
  - 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
Hooks :: Extending the Kea server

Kea server

Step A
Step B
Step C
Step D
Step E

Custom library 1

F1()
F2()

Custom library 2

G1()
G2()

DHCP packet processing
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
BIND10 framework removal
JSON configuration
BSD (stretch)

1.0  
Q2 2015
Host reservation
Client classification
Full lease expiration

2.0  
2015
Failover/HA solution
Statistics
MAC in DHCPv6
Reconfiguration
iPXE
External API completion

3.0  
2016
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 database is public
- Mailing lists, jabber are 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