

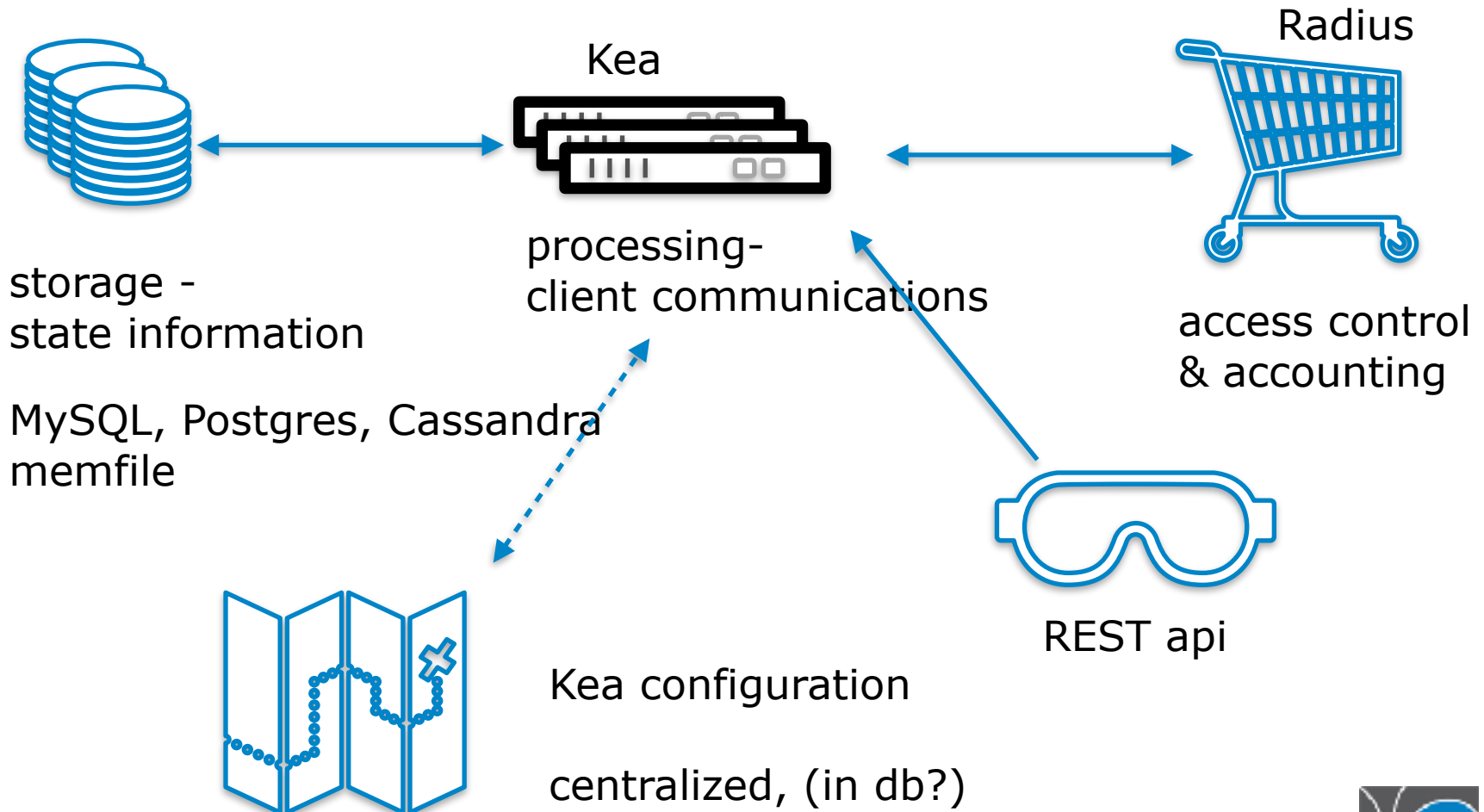
# Kea DHCP Server Update

RIPE 76, May 2018

Vicky Risk, [vicky@isc.org](mailto:vicky@isc.org)



# Goal - disaggregate dhcp





# Kea 1.4 - June 2018

Major new features:

1. **High Availability** feature (premium hook library)
2. **Apache Cassandra** supported backend (open source)
3. **Radius access control and accounting** (premium hook library)

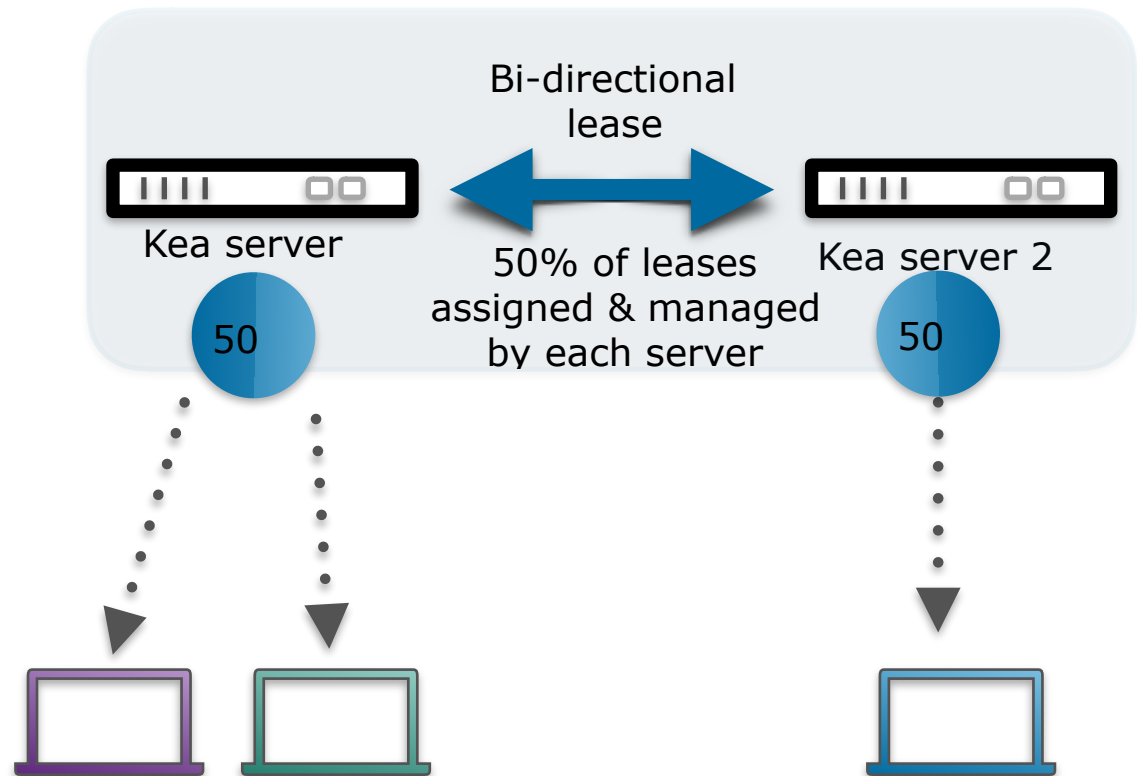
Also:

- Improved shared networks performance
- Improved classification
  - `member(foo) && !member(bar) && (relay4[2].hex == 'abcd')`
- Fixed statistics when run multiple instances with the same DB
- Many smaller bug fixes and improvements  
(100+ tickets closed and counting)

# High Availability (1.4)

Load balancing (50/50) or hot standby (100/0)

- Heartbeats via control channel
- Failure detection based on 'secs' field
- Auto-sync of lease status
- Additional 'Backup server' can receive lease updates



Not the IETF failover draft - works for DHCPv4 or DHCPv6

# Optional Centralized Backends

Leases and host reservations may be stored in:

- local file (default - fastest)
  - CSV
  - MySQL, PostgreSQL
  - **NEW - Cassandra**
- SQL data can be modified any time
  - Changes applied instantly (no restart)
  - Manipulate the DB directly or via hook libraries

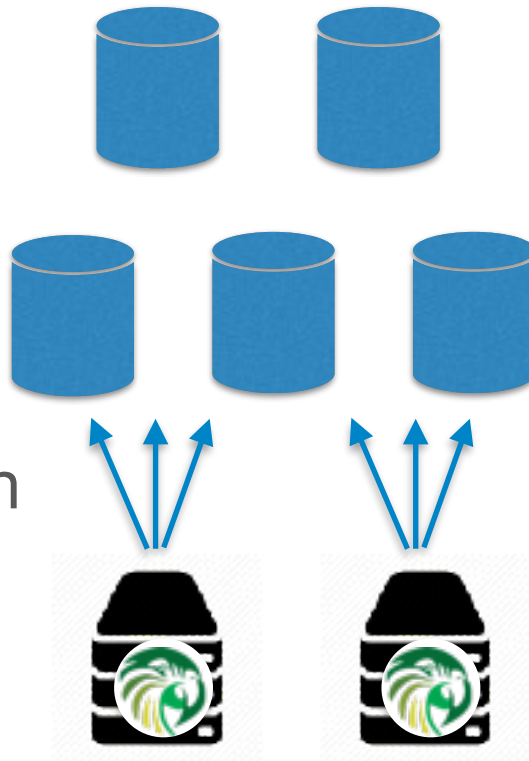




# Apache Cassandra (1.4)



- Distributed non-relational NoSQL database
- Massive scalability without a single point of failure
- Replication factor
- Can operate with at least one node surviving
- CQL
- Data denormalization



HA	NODES	FAILURES
	2	1

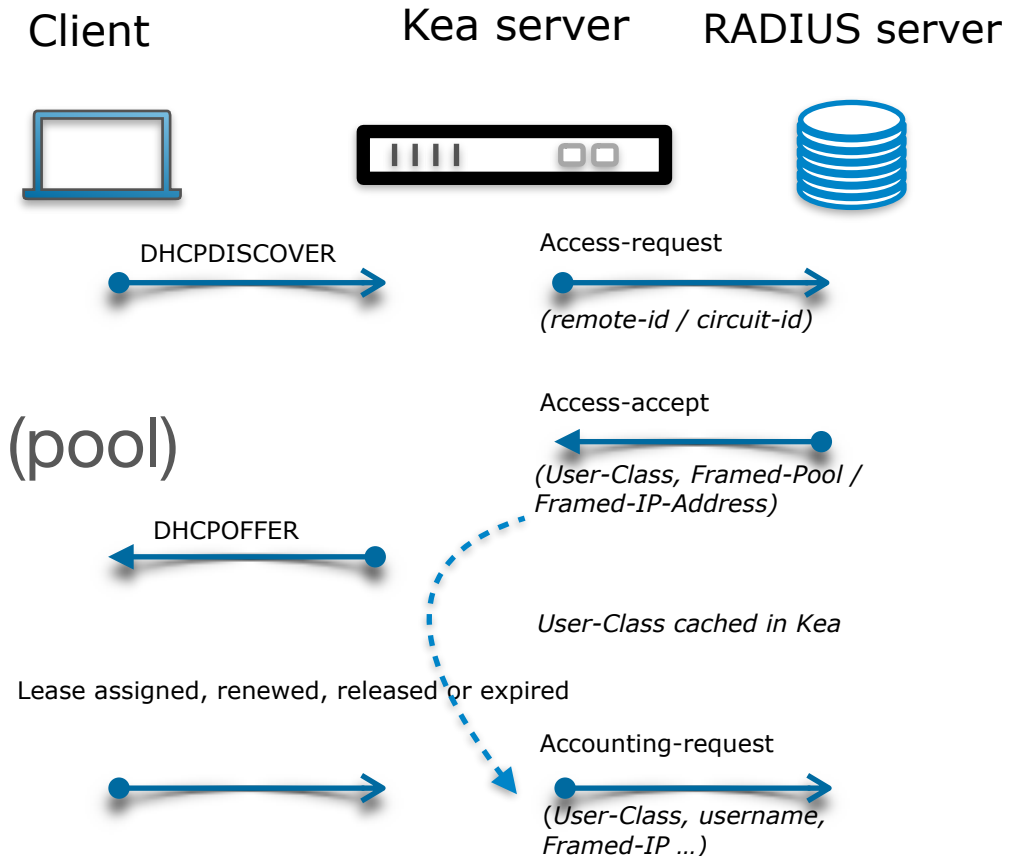
RF	NODES	FAILURES
1	1	0
2	3	1
3	5	2
4	7	3
	...	

**RF = 2N + 1 can survive N failures**



# RADIUS Integration (1.4)

- Authentication
  - Access control
  - Address Reservation
  - Class assignment
- Accounting
- Attributes customizable (pool)
- FreeRadius based
- DHCPv4 and DHCPv6
- **Host caching**





# Kea 1.5 - Fall 2018

- Content still being finalized
- Goal is to extend the ability to centralize server configuration
- Some users have asked for support for Netconf - which is a protocol that uses a standardized data model for multi-vendor compatibility
- Yang data model for DHCPv4 not yet agreed





# Note Well

- We are serious about replacing ISC DHCP with Kea
- We have already reduced the engineering resources on ISC DHCP
- We have done our last major feature branch of ISC DHCP
- When we have a good set of migration tools for ISC DHCP -> Kea, we will establish a timeline

# Thank you

questions



# Kea Management API

## Overview:

- Command Channel (Unix socket)
- REST interface (http/https)
- JSON commands, JSON responses
- kea-shell provided (python 2.x, 3.x example)

## Manipulate:

- Whole **config** (config-get/set/test/write)
- **Shared networks, subnets** (subnet4/6-list/add/get/del)
- **Host Reservations** (reservation-get/add/del)
- **Leases** (lease4/6-get/add/update/del/wipe)
- **Statistics** (statistic-get/reset/get-all)
- **Server** (list-commands, shutdown, version-get, build-report, leases-reclaim, etc.)

```
{
  "command": "subnet6-add",
  "arguments": {
    "subnet6": [ {
      "id": 234,
      "subnet": "2001:db8:1::/64",
      ...
    } ]
  }
}
```

Command

```
{
  "result": 0,
  "text": "IPv6 subnet added",
  "arguments": {
    "subnet6": [
      {
        "id": 234,
        "subnet": "2001:db8:1::/64"
      }
    ]
  }
}
```

Response



# Useful links

- **Kea project homepage:** <http://kea.isc.org>
- **Documentation:** <http://kea.isc.org/docs/>
  - User's Guide - 100+ pages of guidance with examples for users, REST API documentation, and user documentation for premium hooks (easy to see if you would benefit from purchasing them)
  - List of all log messages - with an explanation what happened and why, a nod towards the mainframe era
  - Developer's Guide - for developers and contributors, explains the internals, also includes Hooks interface API
- **Kea business page:** <http://isc.org/kea>
  - High level overview, premium hooks white papers, ISC DHCP vs Kea comparison, support links, 24/7 support available
- **The source code:** <http://github.com/isc-projects/kea>
  - Source code for premium hooks is also provided to purchasers