



Stork Dashboard for Kea

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What is Stork?

- A graphical management **dashboard**
- Makes open source Kea easier to use
- Open source (MPL) + leverages open source
- Central server + agents
- Monthly feature releases - rapid development
- Ubuntu 19.10, CentOS 8, FreeBSD 12
- Docker optional





Target Uses

- Simple, yet comprehensive Kea monitoring and fault management
- Replacement for Anterius (a popular GSOC project, but not maintained)
- Eventually - troubleshooting tool for BIND + Kea



Requirements from Users

1. display pool utilization, alarm on thresholds
2. monitor disk space, cpu utilization
3. monitor, test HA pair status
4. monitor on-going lease activity (LPS), total active leases
5. monitor time to assign a lease, detect unusual slowdowns



Current Features

- Monitor multiple Kea and BIND services
- Configuration inspection
 - subnets, pool, shared networks (per server, aggregated list)
 - filtering/search mechanism
- Host Reservations
- Focus Stork on features Grafana can't easily do
 - Display pool utilization (total, pool, reserved, in use)
 - Single mode/HA/LB status
- Health status:
 - CPU/mem utilization
 - Uptime, time since reconfig, version
 - # of queries
 - Response time?
- DHCP traffic exchange details in Grafana

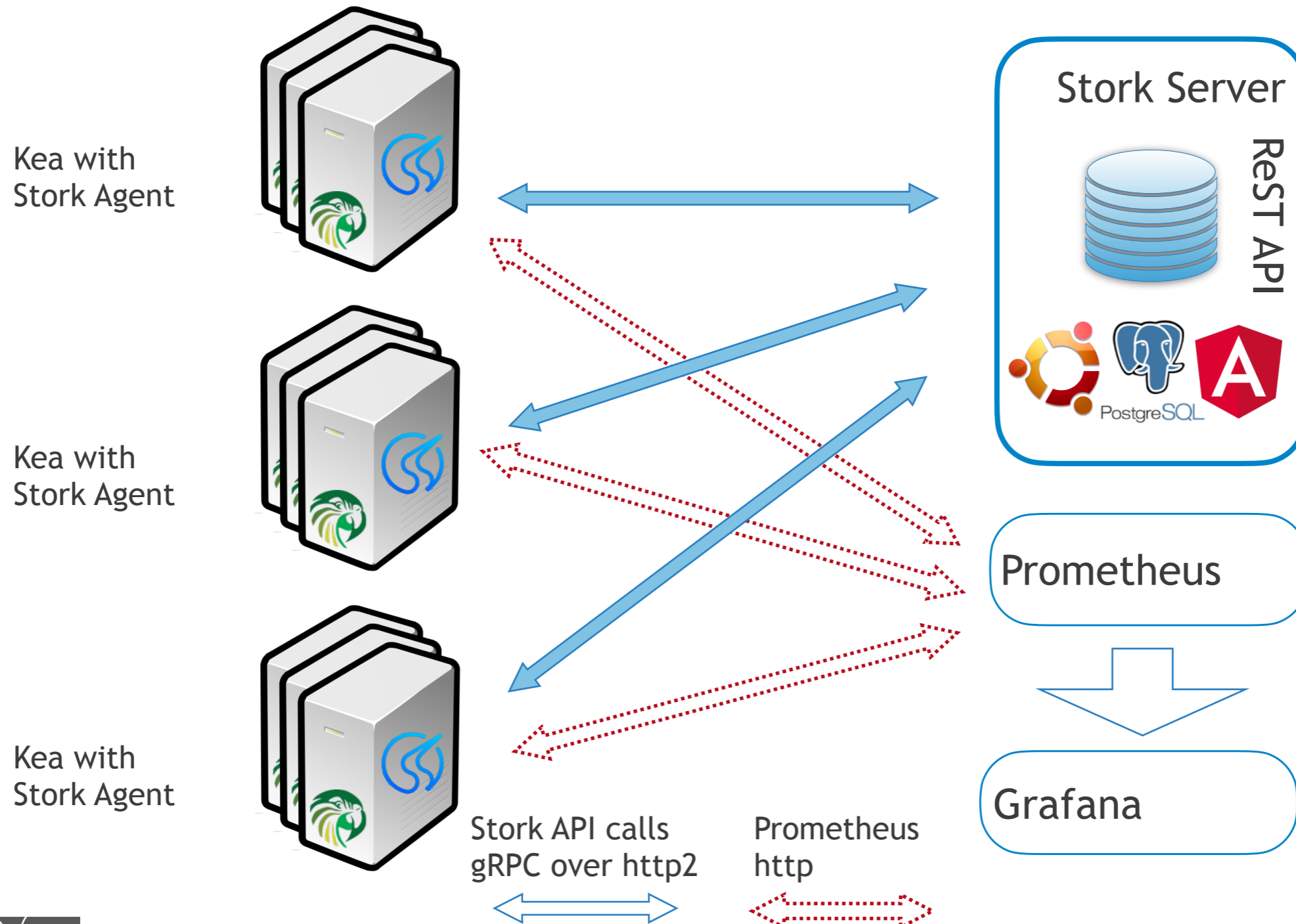


Features TBD

- Log viewer
- Alarms (leverage Grafana for this)
- Current lease status information
- Complex admin roles and privileges
- Event Timings (latency)
- ‘Real user testing’ - automated service probing
- Modify configuration, configuration controls much later



Stork Architecture

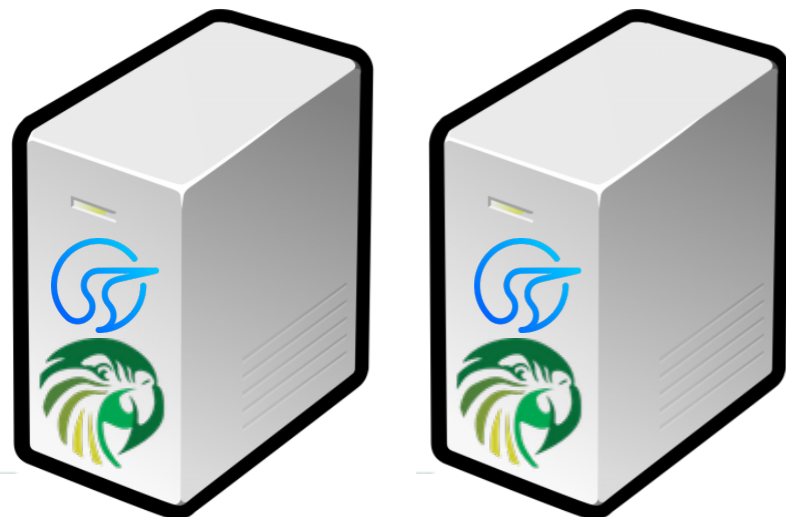




Stork Deployment



- Stork server
 - May be dedicated node
 - May be colocated with Kea
 - Install from packages
 - Run natively on Ubuntu 18.04 or later
 - Stork server will not run on every OS that Kea runs on
- Prometheus and Grafana
 - on the stork server or remote
- Agent
 - Install on every Kea server you want to manage
 - Ubuntu, CentOS8, Fedora, Debian





About the Demo

- Traffic generation w/perfdhcp
 - open source, distributed with Kea



Summary



- <https://gitlab.isc.org/isc-projects/stork> - bookmark it!
 - We need feedback on requirements, priorities, User Interface, bugs, operational use cases
- Debian, RPM packages at <https://cloudsmith.io/~isc/repos/stork/packages/>
- stork-users mailing list at lists.isc.org - subscribe
- a recording of this webinar will be posted at <https://www.isc.org/presentations/>



Photo courtesy of Tomek Mrugalski



Demo

slides in case of network/demo
malfunction



Login screen

192.168.1.100:8080/login

Stork

ver: 0.6.0

Dashboard for [ISC Kea](#) and [ISC BIND](#)

User name

Password

Sign In

Not terribly exciting, but it will get better

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Empty dashboard

The screenshot shows a web browser window with the URL 192.168.1.100:8080. The page header includes the Stork logo, navigation menus for DHCP, Services, Configuration, and Help, a search bar, and a Logout (admin) button. The main content area features a 'Welcome to Stork!' section with the following text:

Stork is a monitoring solution for *ISC Kea DHCP* and *ISC BIND 9*.

There is a [Stork documentation](#) which describes how to configure and use Stork.

Currently, there are no machines with Kea or BIND 9 to monitor defined in Stork. To add new machine visit [machines page](#).

Lone and empty place. Let's get this place going.



Adding new agent

The screenshot shows the Stork web interface. The browser address bar displays `192.168.1.100:8080/machines/all`. The navigation bar includes the Stork logo, menu items (DHCP, Services, Configuration, Help), a search box, and a 'Logout (admin)' button. The main content area is titled 'Machines' and features a search filter 'Filter machines: name or any other field', an '+ Add New Machine' button, and a 'Refresh' button. Below this is a table with columns: Hostname, Address, Agent Version, Apps, CPUs, CPUs Load, Memory, Used Memory, Uptime, Last Visited, Error, and Action. The table is currently empty, displaying 'No machines found.' and a message: 'Machines can be added by clicking **Add New Machine** button at the top.' A modal dialog titled 'New Machine' is open, containing the following text: 'First, install Stork Agent on the machine with Kea or BIND 9. This is described in [the instruction](#).' Below this, it states: 'Machine is located by address and port where 'address' is IP address or FQDN of machine, port is Stork Agent listening port. Port can be omitted, default value is 8080.' The dialog has two input fields: 'Address:' with the value 'agent-kea' and 'Port:' with the value '8080'. At the bottom of the dialog are 'Cancel' and 'Add' buttons.

Adding is simple: address or FQDN and port



Detecting apps

The screenshot shows the Stork web interface for a machine named 'agent-kea'. A green notification bubble in the top right corner states 'New machine added' and 'Adding new machine succeeded.' The interface includes a navigation menu with 'DHCP', 'Services', 'Configuration', and 'Help'. Below the navigation, there is a 'Machines' tab and a 'Refresh State' button. The main content area is divided into two sections: 'System Information' and 'Kea App'.

System Information	
Hostame	agent-kea
Address	agent-kea:8080
Agent Version	0.6.0
CPUs	8
CPUs Load	1.18 0.94 0.62
Memory	15 GiB
Used Memory	61 %
Uptime	? days
OS	linux
Platform Family	debian
Platform	ubuntu
Platform Version	18.04
Kernel Version	5.3.0-46-generic
Kernel Arch	x86_64
Virtualization Role	guest
Virtualization System	docker
Host ID	1e00d860-008c-4400-22c9-f46d04965554
Last Visited	2020-04-20 21:27:46
Error	

Kea App	
Active:	no
Version:	1.7.3
	link to details

Agent detects running/crashed/offline apps automatically.



Inspecting Kea

192.168.1.100:8080/apps/kea/5

Stork DHCP Services Configuration Help Search Logout (admin)

Kea Apps 5. Kea@agent-kea x

Kea App 5. Refresh App

Machine: agent-kea

DHCPv4 ✓ DHCPv6 ! DDNS ! CA ✓

Hosts Reservations Subnets Shared Networks

Overview

Version 1.7.3
Version 1.7.3
Ext tarball
linked with:
log4cplus 1.1.2
OpenSSL 1.1.1 11 Sep 2018
database:
MySQL backend 9.0, library 5.7.29
PostgreSQL backend 6.0, library 100012
Memfile backend 2.1
Hooks /usr/lib/x86_64-linux-gnu/kea/hooks/libdhcp_lease_cmds.so
/usr/lib/x86_64-linux-gnu/kea/hooks/libdhcp_stat_cmds.so
Uptime 3 hours 4 minutes 46 seconds
Last Reloaded 2020-04-20 18:23:00
At

High Availability

High Availability is not enabled on this server.



Pool utilization

Stork DHCP Traffic Simulator

Stork DHCP Services Grafana Configuration Help Search Logout (admin)

DHCP Subnets

Filter subnets: subnet or any other field Protocol: any

Subnet ID	Subnet	Addresses			Pools	Shared Network	AppID @ Machine	Grafana
		Total	Assigned	Used %				
28	192.0.5.0/24	50	22	44 %	192.0.5.1-192.0.5.50	frog	5 @ 127.0.0.1:8000	Grafana
29	192.0.6.0/24	110	45	40.9 %	192.0.6.1-192.0.6.40 192.0.6.61-192.0.6.90 192.0.6.111-192.0.6.150	frog	5 @ 127.0.0.1:8000	Grafana
30	192.0.7.0/24	50	42	84 % ⚠	192.0.7.1-192.0.7.50	frog	5 @ 127.0.0.1:8000	Grafana
31	192.0.8.0/24	50	0	0 %	192.0.8.1-192.0.8.50	frog	5 @ 127.0.0.1:8000	Grafana
32	192.0.9.0/24	50	50	100 % ❗	192.0.9.1-192.0.9.50	frog	5 @ 127.0.0.1:8000	Grafana
33	192.1.15.0/24	50	35	70 %	192.1.15.1-192.1.15.50	mouse	5 @ 127.0.0.1:8000	Grafana
34	192.1.16.0/24	150	0	0 %	192.1.16.1-192.1.16.50 192.1.16.51-192.1.16.100 192.1.16.101-192.1.16.150	mouse	5 @ 127.0.0.1:8000	Grafana

Pool utilization, warning(80%), critical (90%) thresholds, Grafana links



Shared networks view

Stork DHCP Traffic Simulator

Stork DHCP Services Grafana Configuration Help Search Logout (admin)

DHCP Shared Networks

Filter networks: network or any other field Protocol: any

Name	Addresses			Subnets	AppID @ Machine
	Total	Assigned	Used %		
frog	310	159	51.2 %	192.0.8.0/24 192.0.9.0/24 192.0.5.0/24 192.0.6.0/24 192.0.7.0/24	5 @ 127.0.0.1:8000
mouse	445	35	7.8 %	192.1.16.0/24 192.1.17.0/24 192.1.15.0/24	5 @ 127.0.0.1:8000

1 of 1 pages 1 10 Total: 2 shared networks



Dashboard

The screenshot shows the Stork DHCP Traffic Simulator dashboard. The browser address bar shows 192.168.1.100:8080. The dashboard has a blue header with the Stork logo and navigation menus for DHCP, Services, Grafana, Configuration, and Help. A search bar and a 'Logout (admin)' button are also present.

DHCP

DHCPv4

Subnets: 9

[32]	192.0.9.0/24	100% used	
[36]	192.0.2.0/24	97% used	
[30]	192.0.7.0/24	84% used	
[33]	192.1.15.0/24	70% used	
[28]	192.0.5.0/24	44% used	

[more](#)

Shared Networks: 2

frog	5 subnets	51.2% used
mouse	3 subnets	7.8% used

[more](#)

Statistics

Addresses 388 / 955 (40% used)
Declined 0

DHCPv6

Subnets: 0

[more](#)

Shared Networks: 0

[more](#)

Statistics

Addresses 0 / 0 (0% used)
Prefixes 0 / 0 (0% used)
Declined 0

Services Status

Host	[ID] App Version	Daemon	Active	Uptime
agent-kea	[5] Kea 1.7.3	dhcp4	✓	3 hours 4 minutes 46 seconds
agent-kea	[5] Kea 1.7.3	dhcp6	✗	
agent-kea-hosts	[6] Kea 1.7.3	dhcp4	✓	3 hours 7 minutes 32 seconds
agent-kea-hosts	[6] Kea 1.7.3	dhcp6	✗	



Host Reservations

192.168.1.100:8080/dhcp/hosts

Stork DHCP Traffic Simulator

Stork DHCP Services Grafana Configuration Help Search Logout (admin)

DHCP Hosts and Reservations

Filter hosts:

DHCP Identifiers	IP Reservations		Subnet	AppID @ Machine
	IP Addresses	IPv6 Prefixes		
duid=01:02:03:04:05	192.0.2.103		192.0.2.0/24	5 @ 127.0.0.1:8000 config
client-id=01:0a:0b:0c:0d:0e:0f	192.0.2.105		192.0.2.0/24	5 @ 127.0.0.1:8000 config
client-id=01:11:22:33:44:55:66	192.0.2.102		192.0.2.0/24	5 @ 127.0.0.1:8000 config
client-id=01:12:23:34:45:56:67	192.0.2.104		192.0.2.0/24	5 @ 127.0.0.1:8000 config
hw-address=1a:1b:1c:1d:1e:1f	192.0.2.101		192.0.2.0/24	5 @ 127.0.0.1:8000 config
flex-id=73:30:6d:45:56:61:4c:75:65	192.0.2.106		192.0.2.0/24	5 @ 127.0.0.1:8000 config
hw-address=01:01:01:01:01:01	192.0.2.230		192.0.2.0/24	6 @ 127.0.0.1:8000 host_cmds
hw-address=02:02:02:02:02:02	192.0.2.231		192.0.2.0/24	6 @ 127.0.0.1:8000 host_cmds
hw-address=03:03:03:03:03:03	192.0.2.232		192.0.2.0/24	6 @ 127.0.0.1:8000 host_cmds
hw-address=04:04:04:04:04:04	192.0.2.233		192.0.2.0/24	6 @ 127.0.0.1:8000 host_cmds

1 of 2 pages 1 2 10



HA status (all good)

Stork DHCP Traffic Simulator

Stork DHCP Services Grafana Configuration Help Search Logout (admin)

Kea Apps 8. Kea@agent-kea-ha2

Kea App 8. Refresh App

Machine: agent-kea-ha2

DHCPv4 ✓ DHCPv6 ! DDNS ! CA ✓

Hosts Reservations Subnets Shared Networks

Overview

Version 1.7.4
Version Ext 1.7.4
tarball
linked with:
log4cplus 1.1.2
OpenSSL 1.1.1 11 Sep 2018
database:
MySQL backend 9.1, library 5.7.29
PostgreSQL backend 6.0, library 100010
Memfile backend 2.1

Hooks /usr/lib/x86_64-linux-gnu/kea/hooks/libdhcp_lease_cmds.so
/usr/lib/x86_64-linux-gnu/kea/hooks/libdhcp_ha.so

Uptime 3 hours 14 minutes 19 seconds
Last Reloaded 2020-04-20 18:22:58
At

High Availability

Local server ✓

Control status: ✓ online
State: ✓ hot-standby
Role: standby
Scopes served: (none)
Last failover:
Status time: 2020-04-20 21:37:41
Status collected: 13 seconds ago

Remote server: Kea@127.0.0.1 ✓

Control status: ✓ online
State: ✓ hot-standby
Role: primary
Scopes served: server1
Last failover:
Status time: 2020-04-20 21:37:41
Status collected: 14 seconds ago

Note

The remote server responds to the entire DHCP traffic.



HA status (problems detected)

Stork DHCP Traffic Simulator

Kea Apps 9. Kea@agent-kea-ha1

Kea App 9. Refresh App

Machine: agent-kea-ha1

DHCPv4 ✓ DHCPv6 ! DDNS ! CA ✓

Hosts Reservations Subnets Shared Networks

Overview

Version 1.7.4
Version Ext 1.7.4
tarball
linked with:
log4cplus 1.1.2
OpenSSL 1.1.1 11 Sep 2018
database:
MySQL backend 9.1, library 5.7.29
PostgreSQL backend 6.0, library 100010
Memfile backend 2.1

Hooks /usr/lib/x86_64-linux-gnu/kea/hooks/libdhcp_lease_cmds.so
/usr/lib/x86_64-linux-gnu/kea/hooks/libdhcp_ha.so

Uptime 3 hours 15 minutes 27 seconds
Last Reloaded At 2020-04-20 18:22:59

High Availability

Local server ⚠

Control status: ✖ offline
State: ✖
Role: primary
Scopes served: (none)
Last failover:
Status time:
Status collected: 6 seconds ago

Remote server: ⚠

Control status: ✖ offline
State: ✖
Role: standby
Scopes served: (none)
Last failover:
Status time:
Status collected: 6 seconds ago

Note

No servers respond to the DHCP traffic.

(Need a better slide)



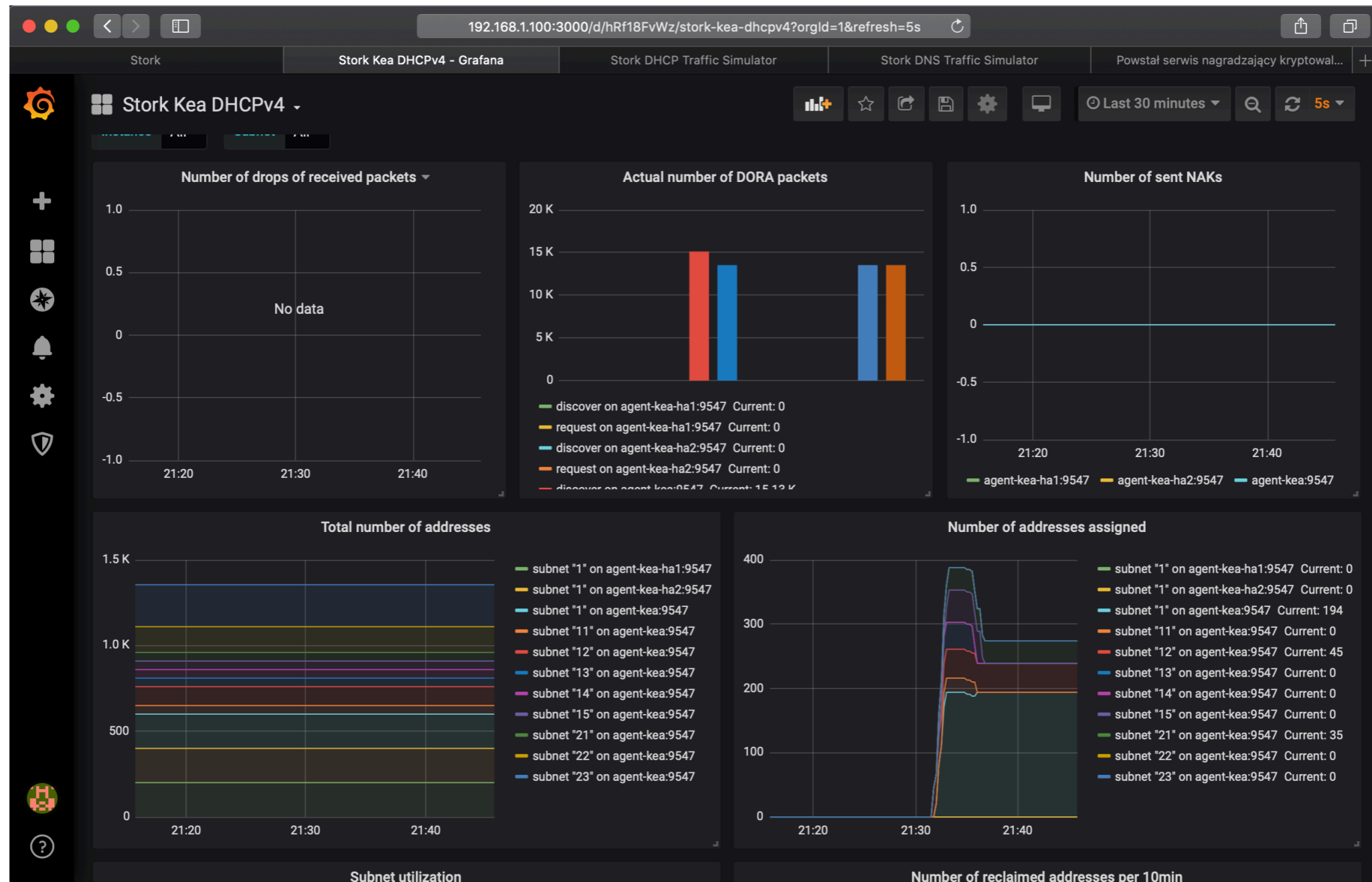
BIND9 status: Cache hit ratio

The screenshot shows the Stork web interface. The browser address bar indicates the URL `192.168.1.100:8080/apps/bind9/10`. The navigation bar includes the Stork logo, menu items for DHCP, Services, Grafana, Configuration, and Help, a search bar, and a Logout button for the user 'admin'. The main content area is titled 'Bind9 Apps' and shows a tab for '10. Bind9@agent-bind9'. Below this, the 'BIND 9 App 10.' status is displayed, including a 'Refresh App' button. The machine is identified as 'agent-bind9'. A 'named' status indicator with a green checkmark is shown. The 'Overview' section provides the following details:

Overview	
Version	BIND 9.11.3-1ubuntu1.11-Ubuntu (Extended Support Version) <id:a375815>
Uptime	3 hours 17 minutes 50 seconds
Last Reloaded At	2020-04-20 18:22:59
Number of Zones	5
Cache Hit Ratio	75% Hits: 174, Misses: 57



Grafana: All DHCP subnets





Grafana : Single subnet

