



Cabinet Office

**Delivering GOV.UK:
DevOps for the nation**



Build Quality In

Continuous Delivery and DevOps
experience reports, edited by
Steve Smith and Matthew Skelton



Cabinet Office

Anna Shipman

Technical Architect

Government Digital Service

@annashipman

Definition of DevOps

A culture where developers and
web ops work together



The Government Digital Service

Our job is to
transform government

We want to make government services so good that people prefer to use them

**GOV.UK was
first**



The best place to find
government services and
information

40 million unique visitors
per month

Does the person you care ...

The Department for Work and ... (GB) https://www.carersallowance.service.gov.uk/allowance/benefits

GOV.UK Carer's Allowance

Get help

[Read the guide](#)

Helpline 0345 608 4321

Mon to Thurs: 8:30am - 5pm
Friday: 8:30am - 4:30pm

Closed public holidays.

Calls answered within 5 minutes.

[Call charges](#)

Can you get Carer's Allowance?

Does the person you care for get one of these benefits?

- Personal Independence Payment (PIP) daily living component.
- Disability Living Allowance (DLA) - middle or highest care rate.
- Attendance Allowance (AA).
- Constant Attendance Allowance (CAA) at or above the normal maximum rate with an Industrial Injuries Disablement Benefit, or basic (full day) rate with a War Disablement Pension.

People come to GOV.UK
when they are at their
most vulnerable

Government policy

Register to vote

Use this service to:

- register to vote
- update your name, address or other details on the electoral register

You need to be on the electoral register to vote in elections and referendums.

Registering takes around 5 minutes.

You'll need your National Insurance number (if you have one).

[Start now >](#)

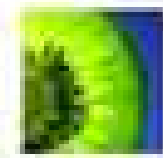
Before you start

Voting

[The electoral register](#)

[Voting in the UK](#)

[More](#)



Pete Herlihy

@yahoo_pete

#NVRD. No pressure.

I'm sure everyone that launches a new digital service gets a NATIONAL LET'S ALL USE THIS ON THE SAME DAY campaign.



RETWEETS

3

FAVORITES

14



10:25 PM - 4 Feb 2015

Overview

Right now

8241

active users on site



Top Referrals:

Pageviews

Per minute



Top Active Pages:

Seasonal rhythm of interaction with the state

Self Assessment tax retur... x +

https://www.gov.uk/self-assessment-tax-returns

GOV.UK

Search

Home > Money and tax > Self Assessment

Self Assessment tax returns

1. Overview
2. [Who must send a tax return](#)
3. [Sending a return](#)
4. [Deadlines](#)
5. [Penalties](#)
6. [Corrections](#)
7. [How to get help](#)
8. [Returns for someone who has died](#)

Self Assessment

- [Register for Self Assessment](#)
- [Log in and file your Self Assessment tax return](#)
- [Understand your Self Assessment tax bill](#)
- [Pay your Self Assessment tax bill](#)
- [More](#)

1. Overview

Self Assessment is a system HM Revenue and Customs' (HMRC) uses to collect Income Tax.

Tax is usually deducted automatically from wages, pensions and savings.

How we got here



**Race
Online
2012**

www.raceonline2012.org

14th October 2010

Dear Francis Maude,

DIRECTGOV 2010 AND BEYOND: REVOLUTION NOT EVOLUTION

You asked me to oversee a strategic review of Directgov and to report to you by the end of September. I have undertaken this review in the context of my wider remit as UK Digital Champion which includes offering advice on “how efficiencies can best be realised through the online delivery of public services.”

Where are you?

If we know your location we can give you details of services local to you

Set location



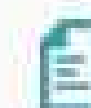
Popular tools and topics



How much is the minimum wage?



Calculate holiday pay
[Business Link](#)



Guide to Childcare



Pay your Council Tax



Should I register for VAT?



Report lost or stolen

Working in an agile way

Infrastructure, operations and compliance are non-negotiable

Developers using their own
laptops to deploy to production
was a big win

“Are we sure that deployments
are going to work?”

How we do DevOps

Developers deploy their
own code



Developers support their code
in production

2nd line

GOV.UK

Production

Staging

Preview

1

1

Performance Platform

Production

Staging

Preview

2

2

5

16

On call

Not Expected:

- Take heroic actions and be able to solve any out-of-hours critical event single handedly.
- Have very detailed knowledge of every nuance of the GOV.UK stack.
- Carrying out risky activities or take judgement calls beyond your comfort zone without support.

Incidents and post-mortems

Technology choices

These are the tools we use at
the moment





Applications | GOV.UK Rel... +

https://release.production.alphagov.co.uk/applications Search

GOV.UK Release **Production** Applications Activity Archived Anna Shipman • Sign out

Applications

Name	In sync?	Staging	Production	Notes
Filter applications				
Asset Manager	Yes	release_68 1:34pm on 3 Feb ↻	release_68 1:44pm on 3 Feb ↻	
Backdrop	Yes	release_1296 12:37pm on Tuesday ↻	release_1296 12:36pm on Tuesday ↻	Performance Platform infrastructure
Backdrop Asset Request Collector	Yes	release_13 2pm on 9 Aug 2013 ↻	release_13 2pm on 9 Aug 2013 ↻	
Bouncer	Yes	release_181 12:24pm on 23 Jan ↻	release_181 12:34pm on 23 Jan ↻	
Business Support API	Yes	release_29 3:32pm on 27 Oct ↻	release_29 3:36pm on 27 Oct ↻	
Business Support Finder	Yes	release_108 2:15pm on 26 Jan ↻	release_108 3:08pm on 26 Jan ↻	
Calculators	Yes	release_123 2:13pm on 26 Jan ↻	release_123 3:05pm on 26 Jan ↻	
Calendars	Yes	release_345 3:03pm on Friday ↻	release_345 3:07pm on Friday ↻	
Collections	Yes	release_71 1:54pm on 3 Feb ↻	release_71 1:57pm on 3 Feb ↻	
Collections API	Yes	release_19	release_19	



@annashipman

GDS

alphagov/release

GitHub, Inc. (US) | https://github.com/alphagov/release

This repository Search Explore Gist Blog Help annashipman

alphagov / release Watch 69 Star 8 For

An application to make managing releases to specific environments easier — Edit

413 commits 16 branches 97 releases 24 contributors

branch: master release / +

Merge pull request #81 from alphagov/friendly_ids

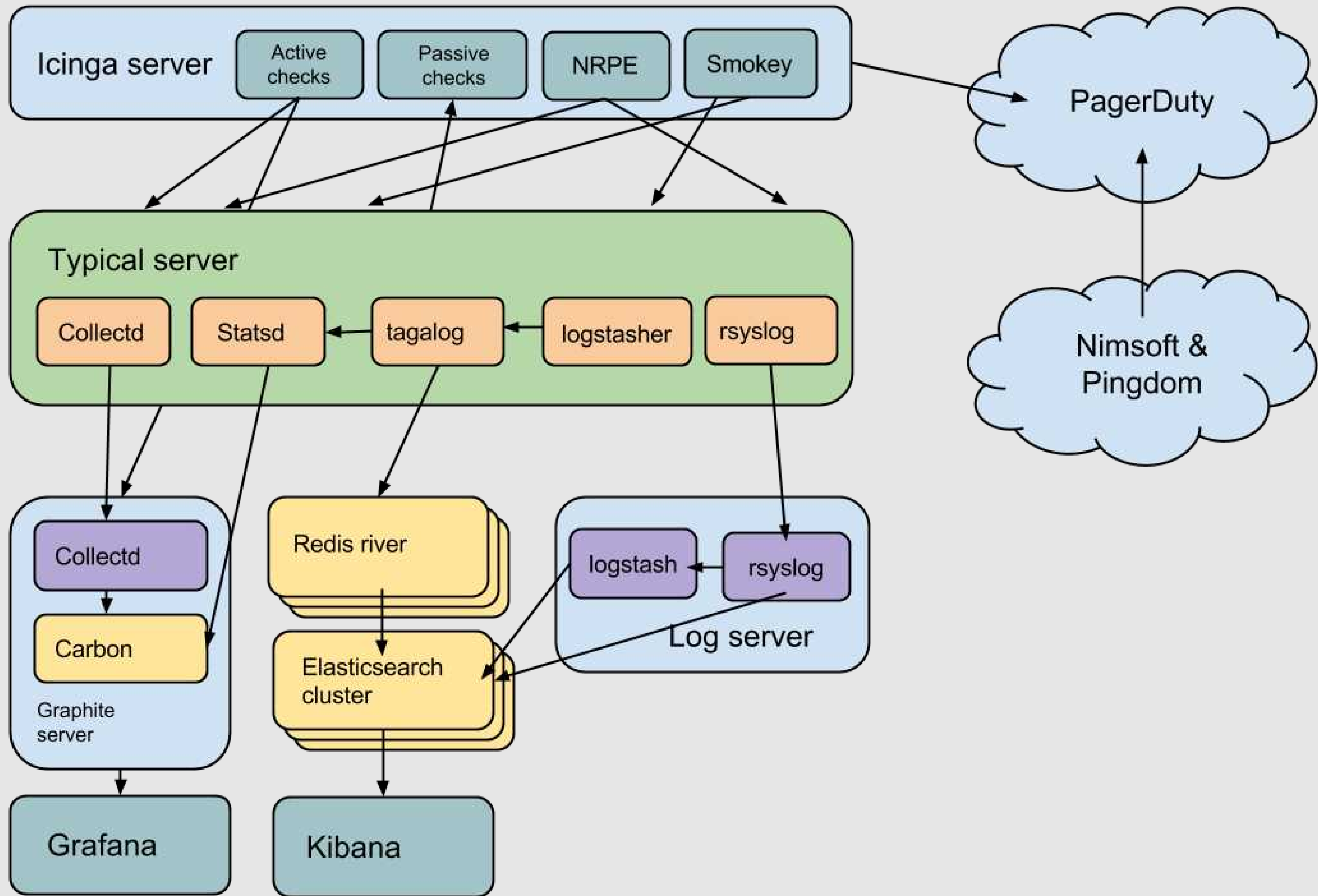
KushalP authored 10 days ago latest commit fd25f5b87f

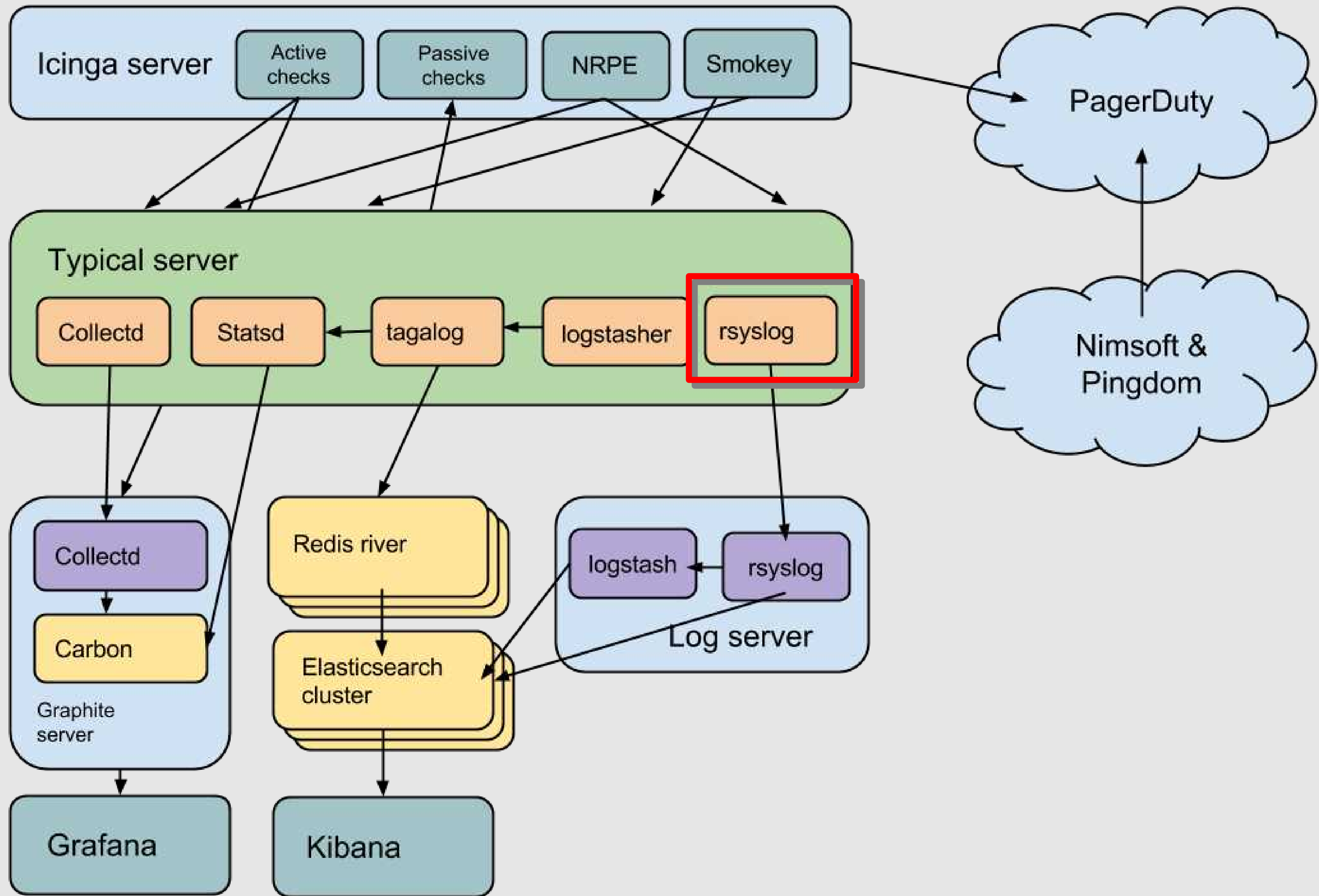
app	Fix typeahead on deploy/release forms.	10 days ago
bin	Config changes.	11 days ago
config	Use friendly_id for Application.	10 days ago
db	Use friendly_id for Application.	10 days ago
doc	Init empty rails app	2 years ago
lib	Only announce candidates mon-fri	2 years ago

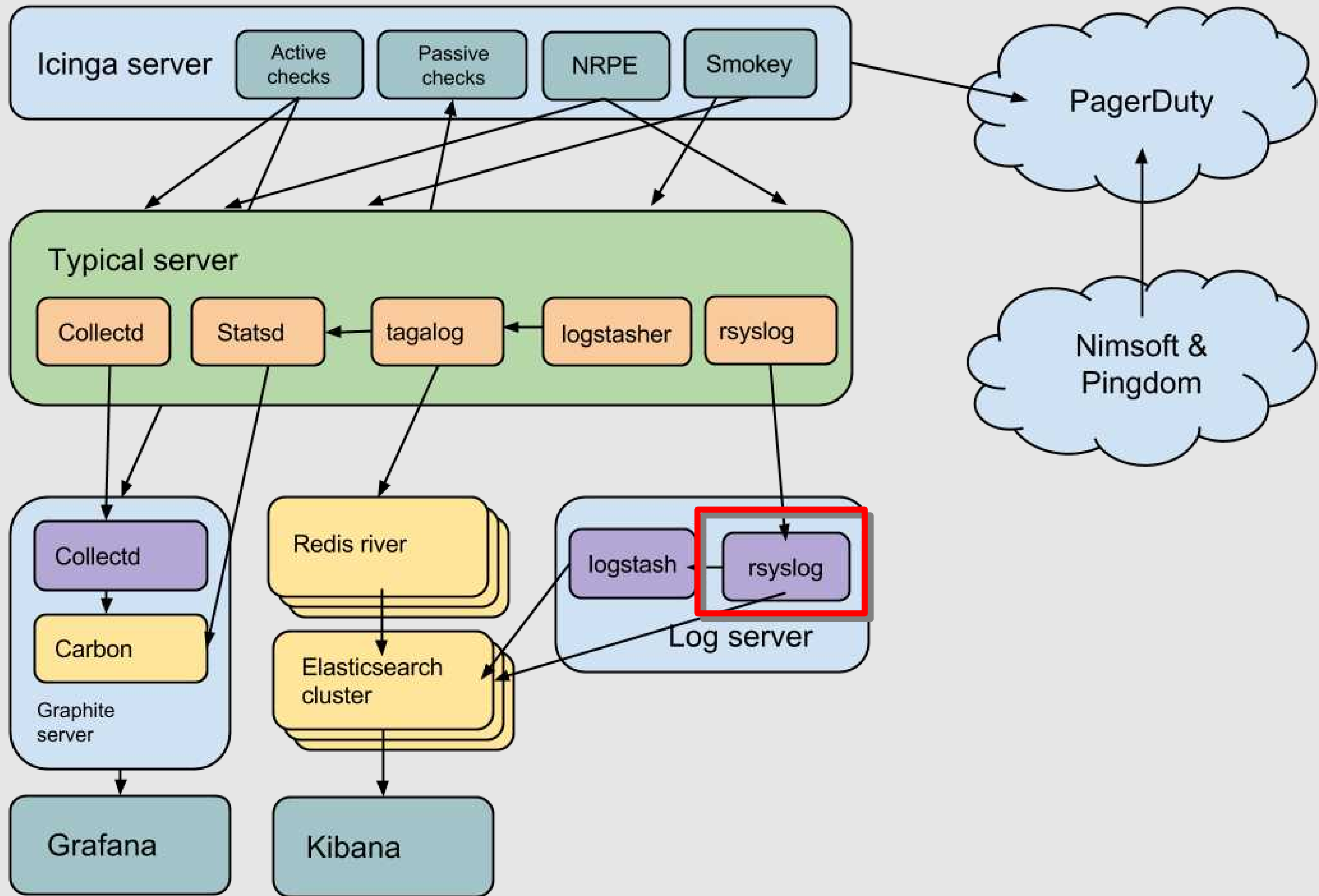
Code Issues Pull Requests Wiki Pulse Graphs Settings

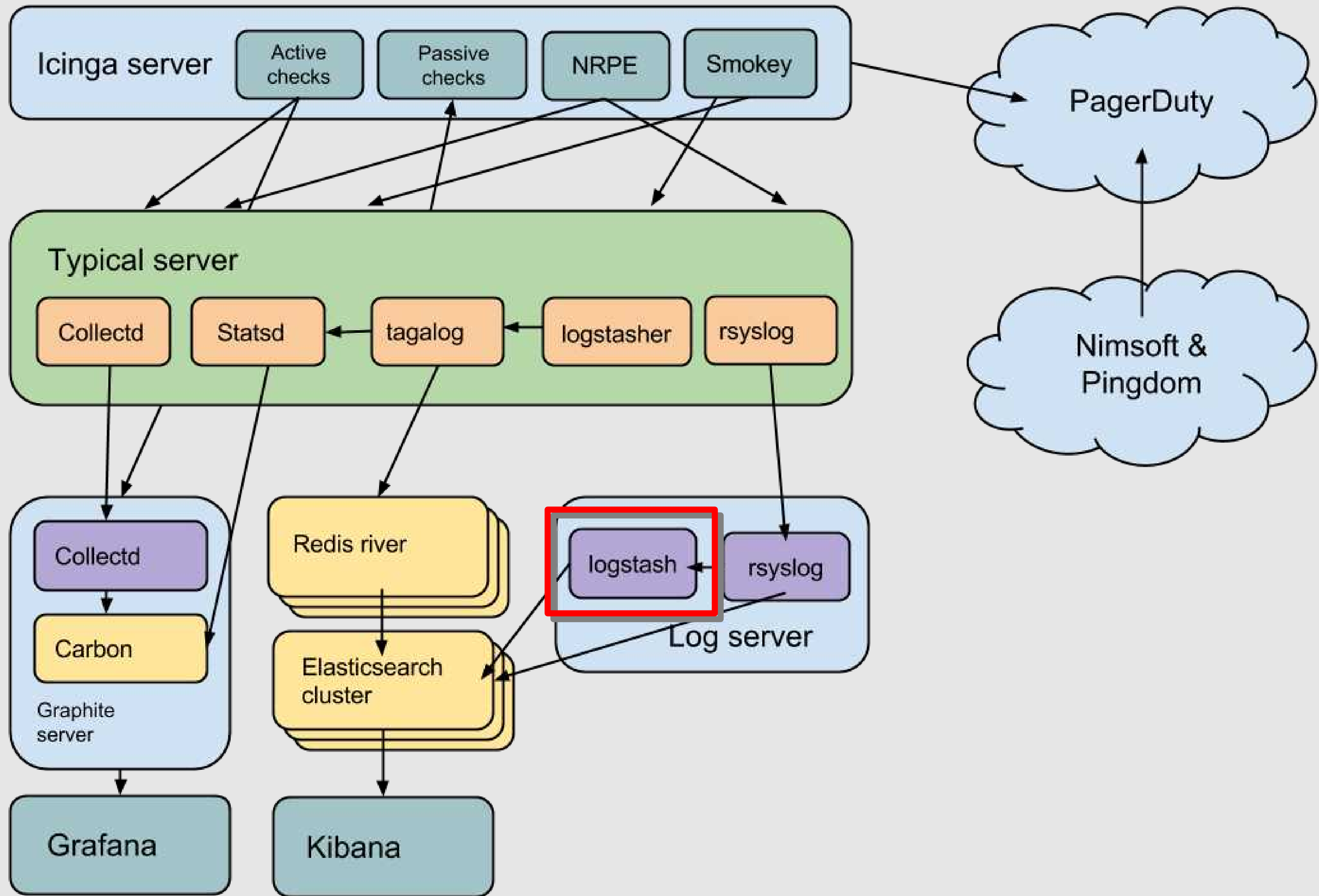
SSH clone URL git@github.com:alp

Monitoring

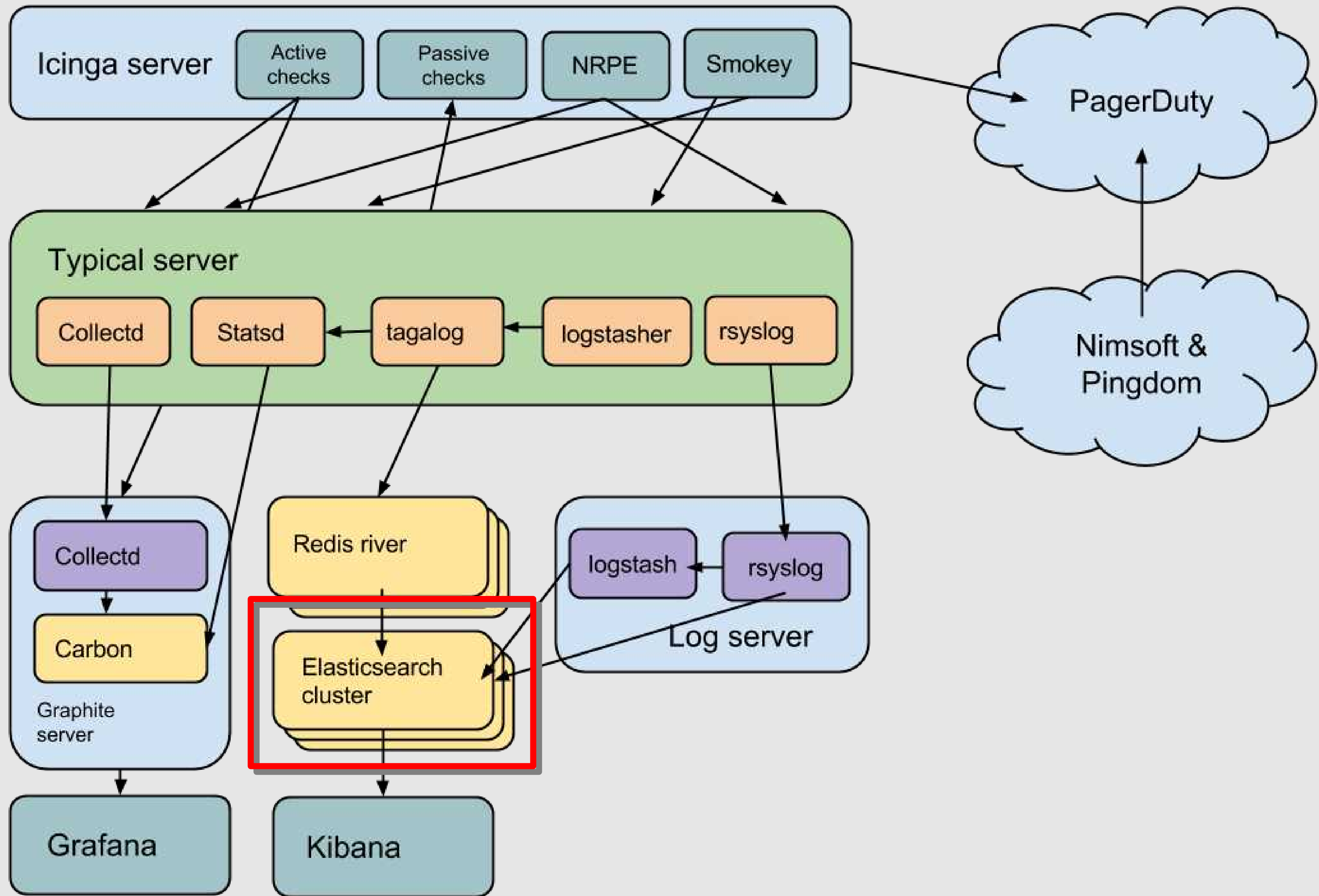


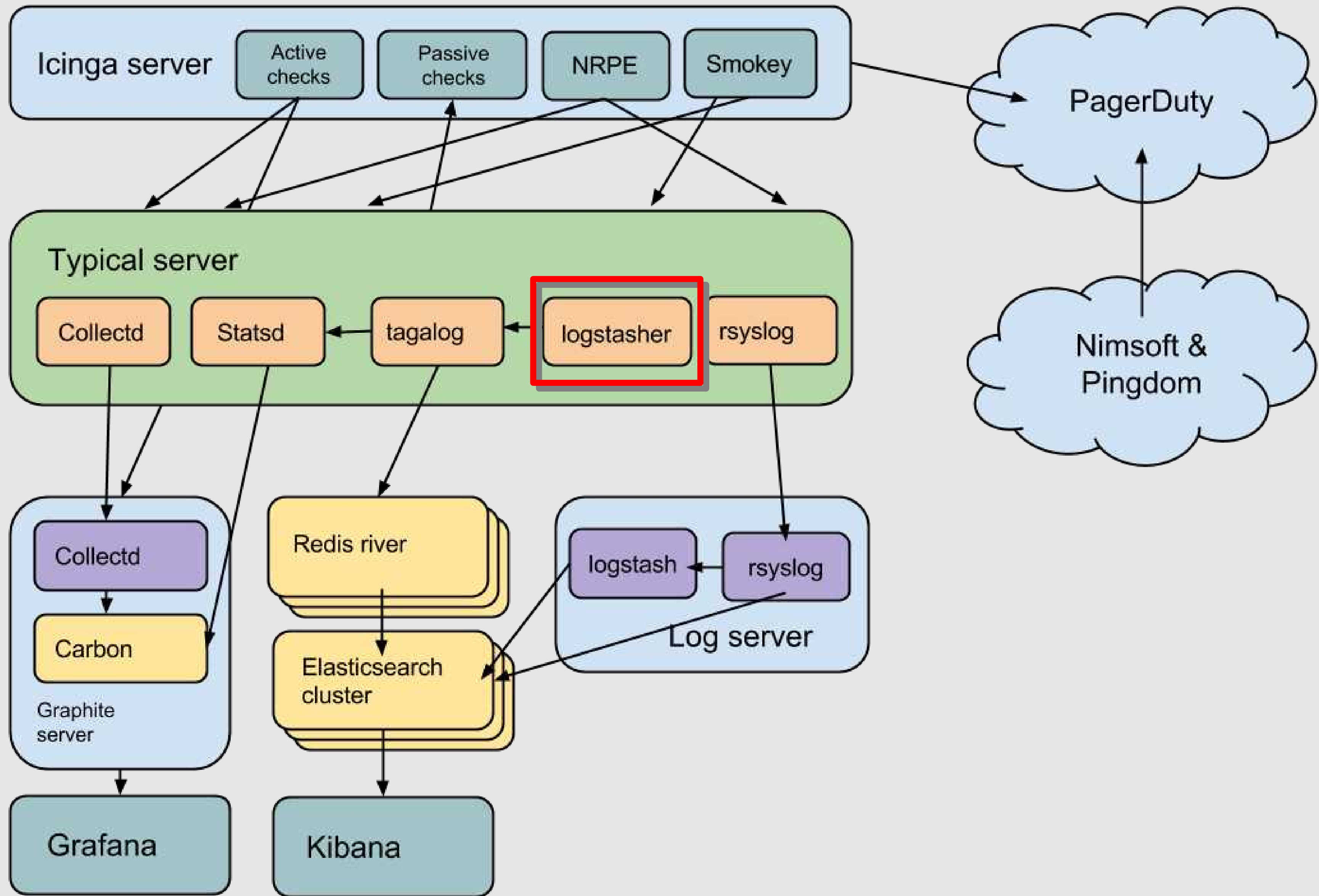


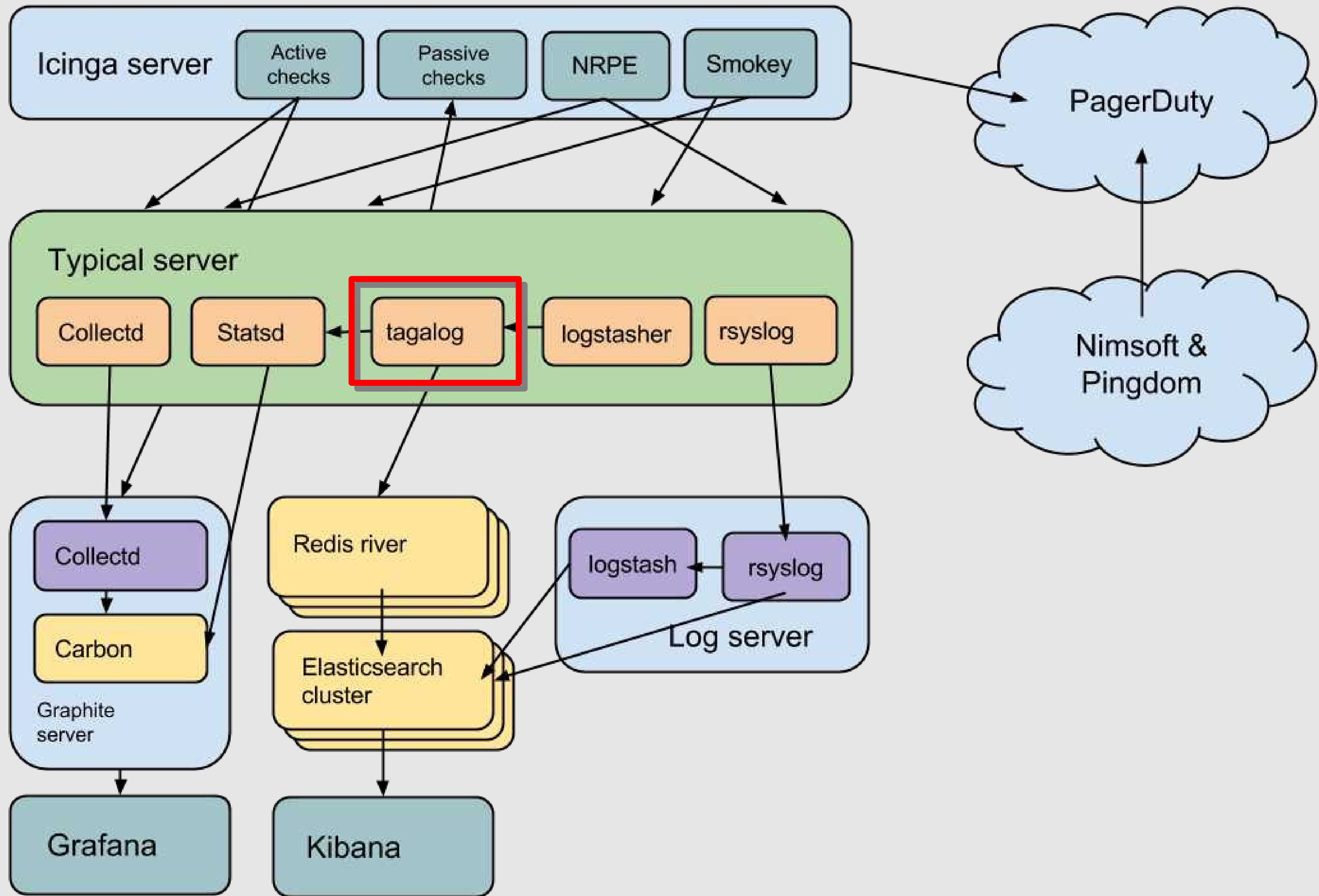




```
75 #configure logstash filters$
76 logstash::filter::grok {'syslog':$
77   type      => 'syslog',$
78   pattern   => [ '<{%{POSINT:syslog_pri}>{%{SYSLOGTIMESTAMP:syslog_timestamp}
79     {%{SYSLOGHOST:syslog_hostname} {%{PROG:syslog_program}(?:\[{%{POSINT:syslog_pid}\
80     ])?': {%{GREEDYDATA:syslog_message}' ],$
81     'received_at' => '%{@timestamp}',$
82     'received_from' => '%{@source_host}'$
83   },$
84   order      => '11',$
85 }$
```





alphagov/tagalog

GitHub, Inc. (US) https://github.com/alphagov/tagalog

This repository Search Explore Gist Blog Help annashipman

alphagov / tagalog
forked from nickstenning/tagalog

Unwatch 22 Star 4 Fork 3

A set of commandline tools for manipulating logfiles on the fly — Edit

139 commits 7 branches 15 releases 9 contributors

branch: master - tagalog / +

This branch is 128 commits ahead, 1 commit behind nickstenning:master Pull Request Compare

Merge pull request #19 from alphagov/58408058-tagalog

samjsharp authored on 9 Jul 2014 latest commit 9633653921

bench	Initial commit	2 years ago
doc	Document pipeline function	2 years ago
tagalog	[#58408058] Bump version -> v0.5.0	8 months ago
test	tidy up tests	2 years ago
.gitignore	Add support for adding key-value entries on logs	2 years ago
.travis.yml	travis: test on Python 3.3 as well	2 years ago
CONTRIBUTING.rst	Add requirements.dev.txt for dev dependencies	2 years ago
LICENSE	Initial commit	2 years ago
MANIFEST.in	Add MANIFEST.in to pick up README and LICENSE	2 years ago

Code

Issues 4

Pull Requests 0

Pulse

Graphs

Settings

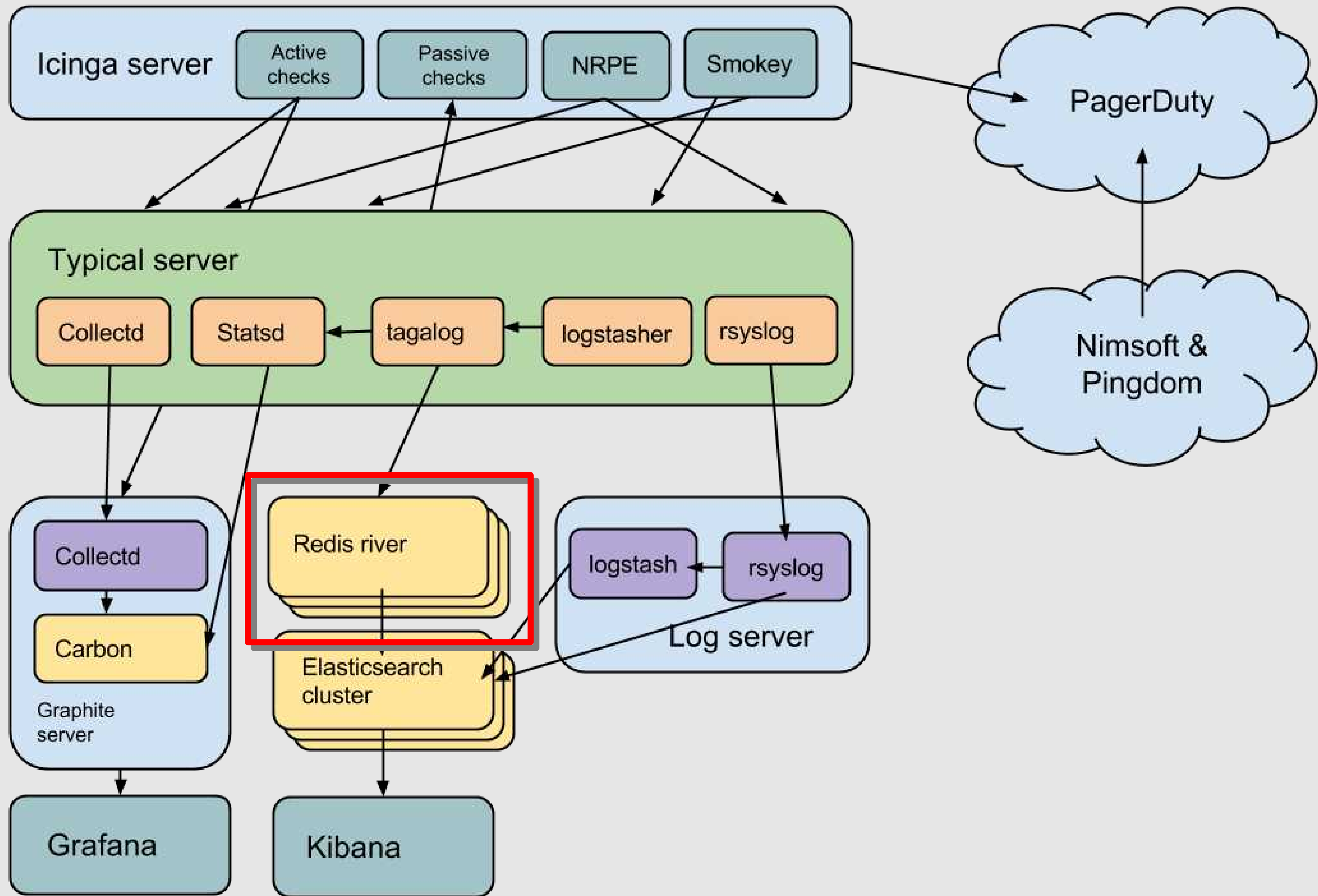
SSH clone URL

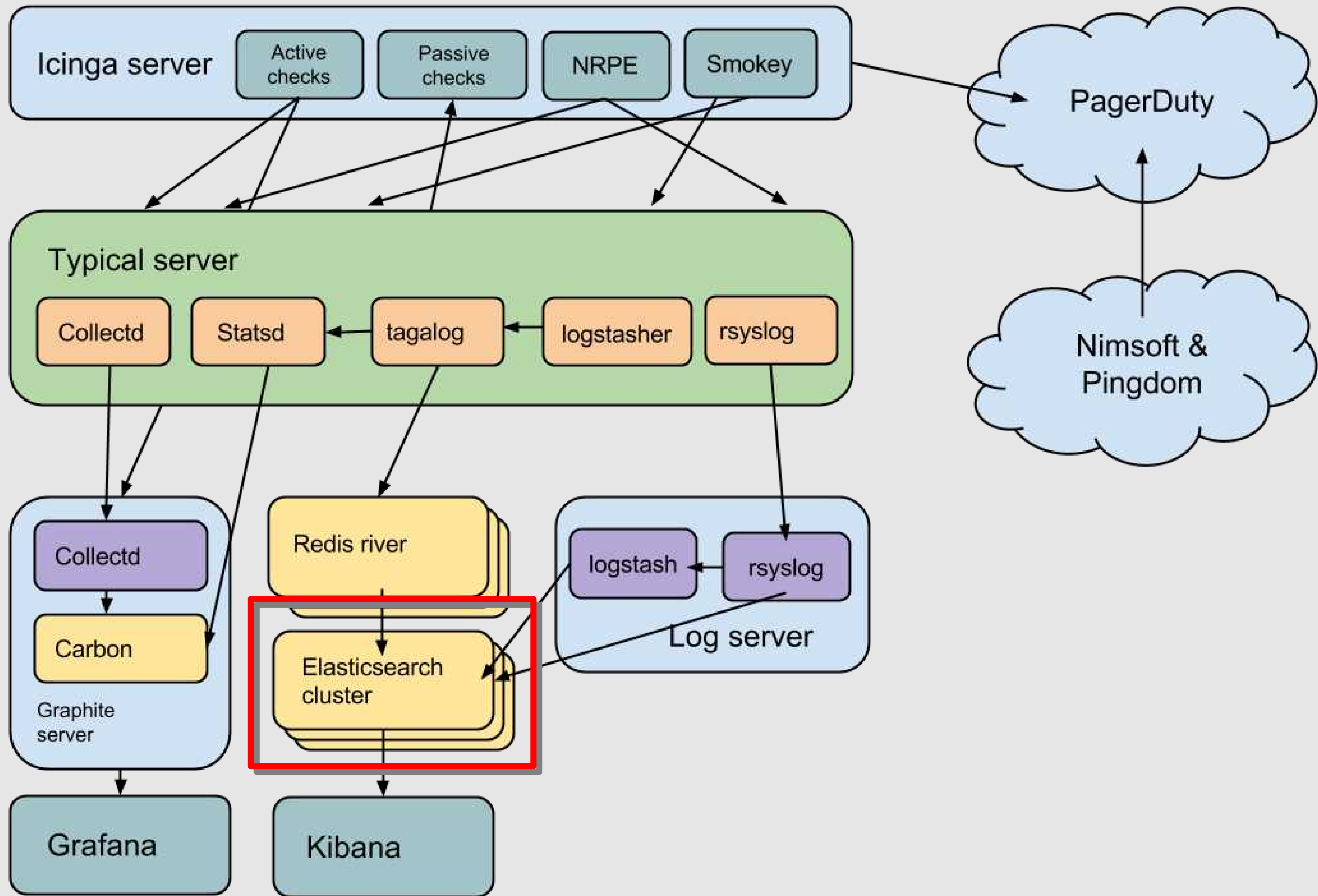
git@github.com:alphagov

You can clone with HTTPS, SSH, or Subversion.

Clone in Desktop

Download ZIP





Kibana 3 - Logstash Search

https://kibana.production.alpha.gov.co.uk/kibana#/dashboard/file/default.json

Logstash Search

a day ago to a few seconds ago

QUERY

* (9932372)

FILTERING

EVENTS OVER TIME

View | Zoom Out | * (9932372) count per 10m | (9932372 hits)

120000
100000
80000
60000
40000
20000
0

18:00 20:00 22:00 00:00 02:00 04:00 06:00 08:00 10:00 12:00 14:00 16:00
02-26 02-26 02-26 02-27 02-27 02-27 02-27 02-27 02-27 02-27 02-27 02-27

ALL EVENTS

Fields

All (91) / Current (20)

Type to filter...

0 to 100 of 500 available for paging

@timestamp	@message
2015-02-27T17:01:07.022851Z	127.0.0.1 - - [27/Feb/2015:17:01:06 +0000] "GET http://www.gov.uk/calculate-state-pension/y/amount/male.json?utf8=%E2%9C%93&response%5Bday%5D=18&a...
2015-02-27T17:01:07.020202Z	127.0.0.1 - - [27/Feb/2015:17:01:06 +0000] "GET http://www.gov.uk/government/organisations/medicines-and-healthcare-products-regulatory-agency HTTP/1....
2015-02-27T17:01:06.985613Z	127.0.0.1 - - [27/Feb/2015:17:01:06 +0000] "GET http://www.gov.uk/marriages-civil-partnerships/documents-to-take-to-the-register-office HTTP/1.0" 200 ...



Last 15m



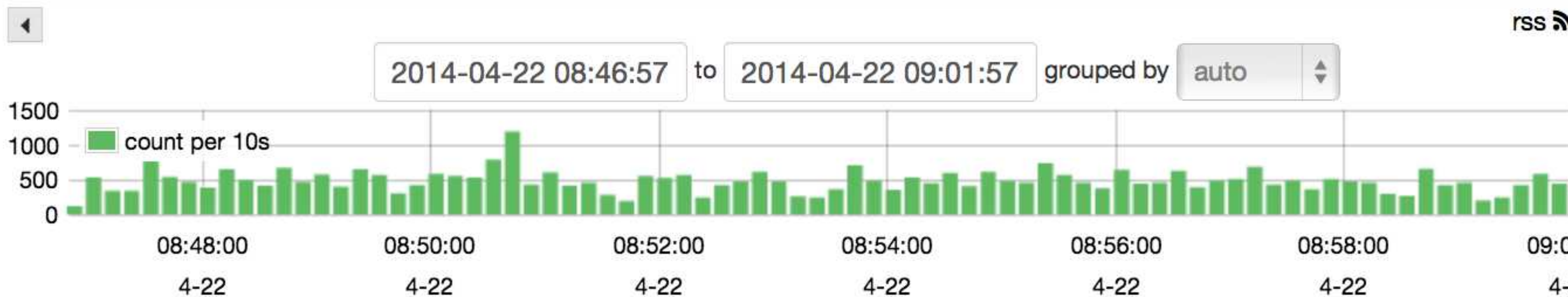
Search

Search

Reset

Columns

- @fields.action ▶
- @fields.application ▶
- + @fields.body_bytes_sent ▶
- + @fields.bytes_sent ▶
- + @fields.controller ▶
- + @fields.db ▶
- @fields.duration ▶
- + @fields.format ▶
- + @fields.govuk_request_id ▶
- + @fields.gzip_ratio ▶
- + @fields.http_host ▶
- + @fields.http_referrer ▶
- + @fields.http_user_agent ▶
- + @fields.ip ▶
- + @fields.length ▶
- + @fields.location ▶
- + @fields.method ▶
- + @fields.path ▶
- @fields.query_string ▶
- + @fields.remote_addr ▶



Older

0 TO 50





Time	@fields.action	@fields.application	@fields.duration	@fields.query_string
2014-04-22T09:01:50		varnish		
2014-04-22T09:01:50		varnish		
2014-04-22T09:01:50		mongodb		
2014-04-22T09:01:50		frontend.preview.alphagov.co.uk-json.event.access		
2014-04-22T09:01:50		contentapi.preview.alphagov.co.uk-json.event.access		
2014-04-22T09:01:50		frontend.preview.alphagov.co.uk-json.event.access		
2014-04-22T09:01:50		frontend.preview.alphagov.co.uk-json.event.access		
2014-04-22T09:01:50		lb-json.event.access		
2014-04-22T09:01:50		bouncer.preview.alphagov.co.uk-json.event.access		
2014-04-22T09:01:50		lb-json.event.access		

Errbit for application exceptions

Apps

 Add a New App

 Successfully authenticated from GDS Signon account.

NAME	REPOSITORY	LAST DEPLOY	ERRORS
Bouncer	alphagov/bouncer	Apr 17 9:10am (db1e038)	
Collections	alphagov/collections		
Contacts		Apr 09 1:06pm (9a7bacf)	
Content Planner		Mar 27 2:42pm (aacacb3)	
Feedback	alphagov/feedback	Mar 11 3:34pm (6f10b2e)	

Bouncer

Errors Caught: 15 Deploy Count: 4 API Key: 20916b35daa32f5d52b6f3270461240d

edit all errs watch

Watchers (show/hide)

Repository (show/hide)

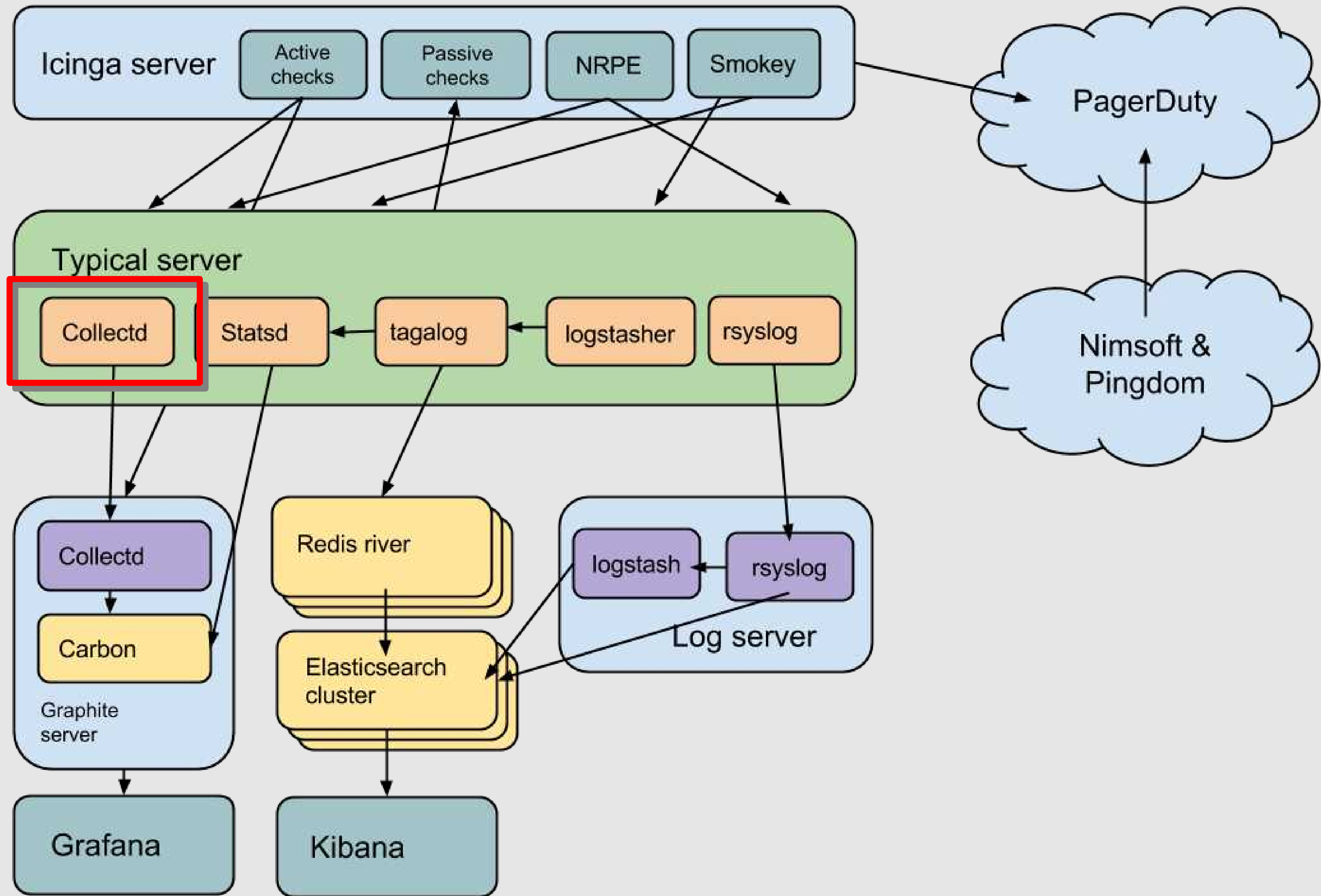
Latest Deploys (show/hide)

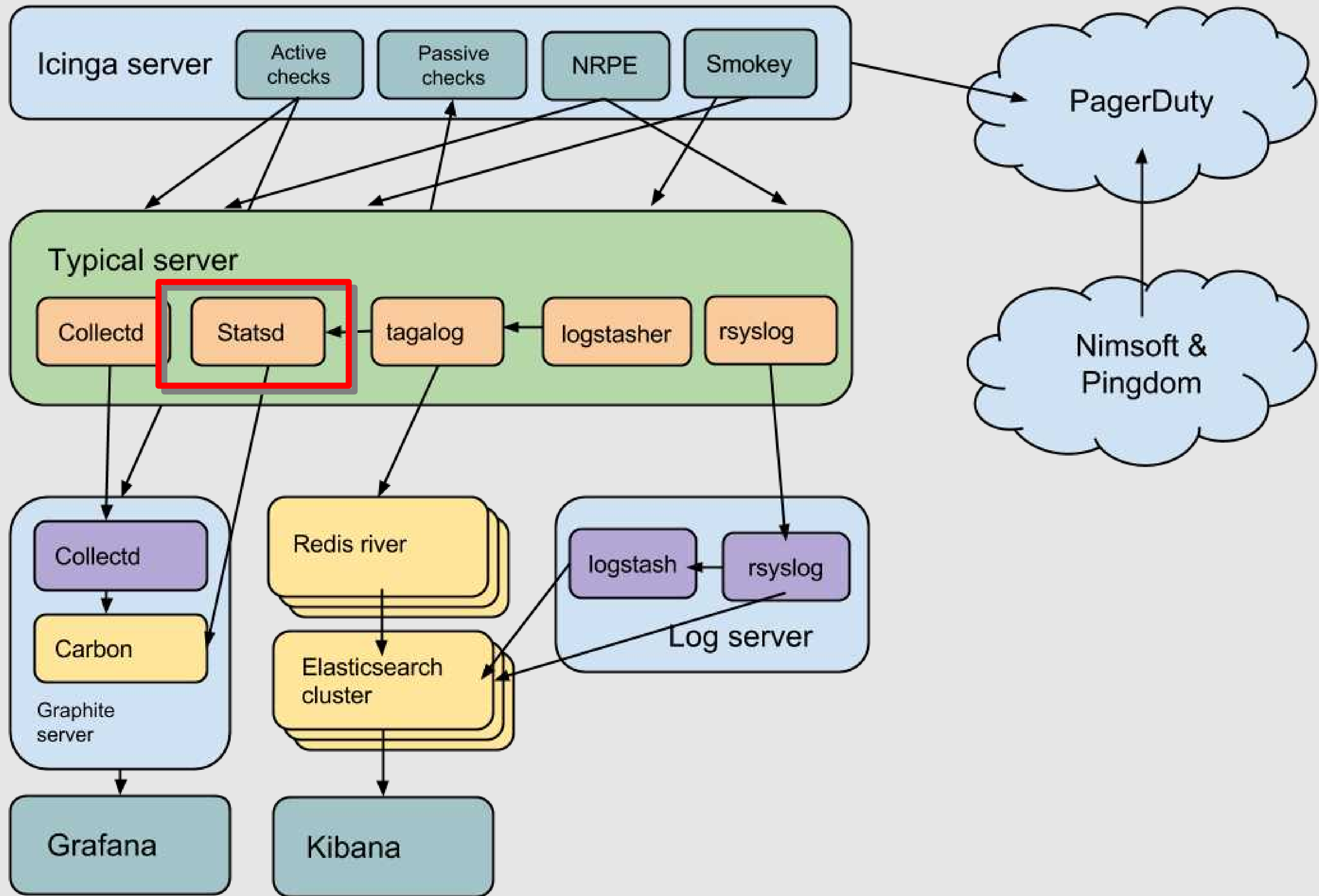
Errors

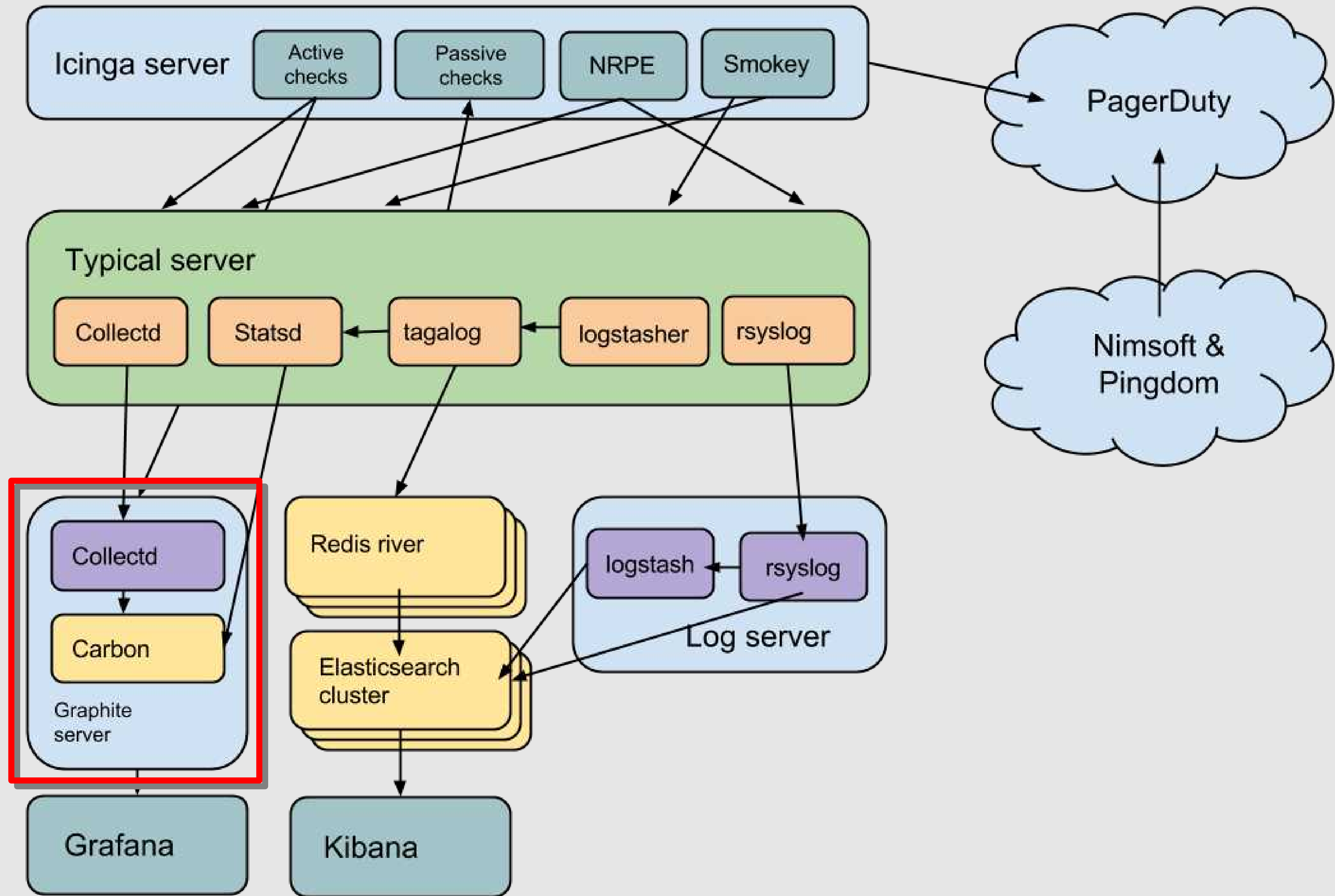
Search for issues

<input type="checkbox"/>	APP	WHAT & WHERE	LATEST ↑	DEPLOY	COUNT	RESOLVE
<input type="checkbox"/>	Bouncer production	Encoding::CompatibilityError: incompatible encoding regexp match (UTF-8 regexp with ASCII-8BIT string) unknown	about 3 hours ago	Apr 17 9:10am	470	

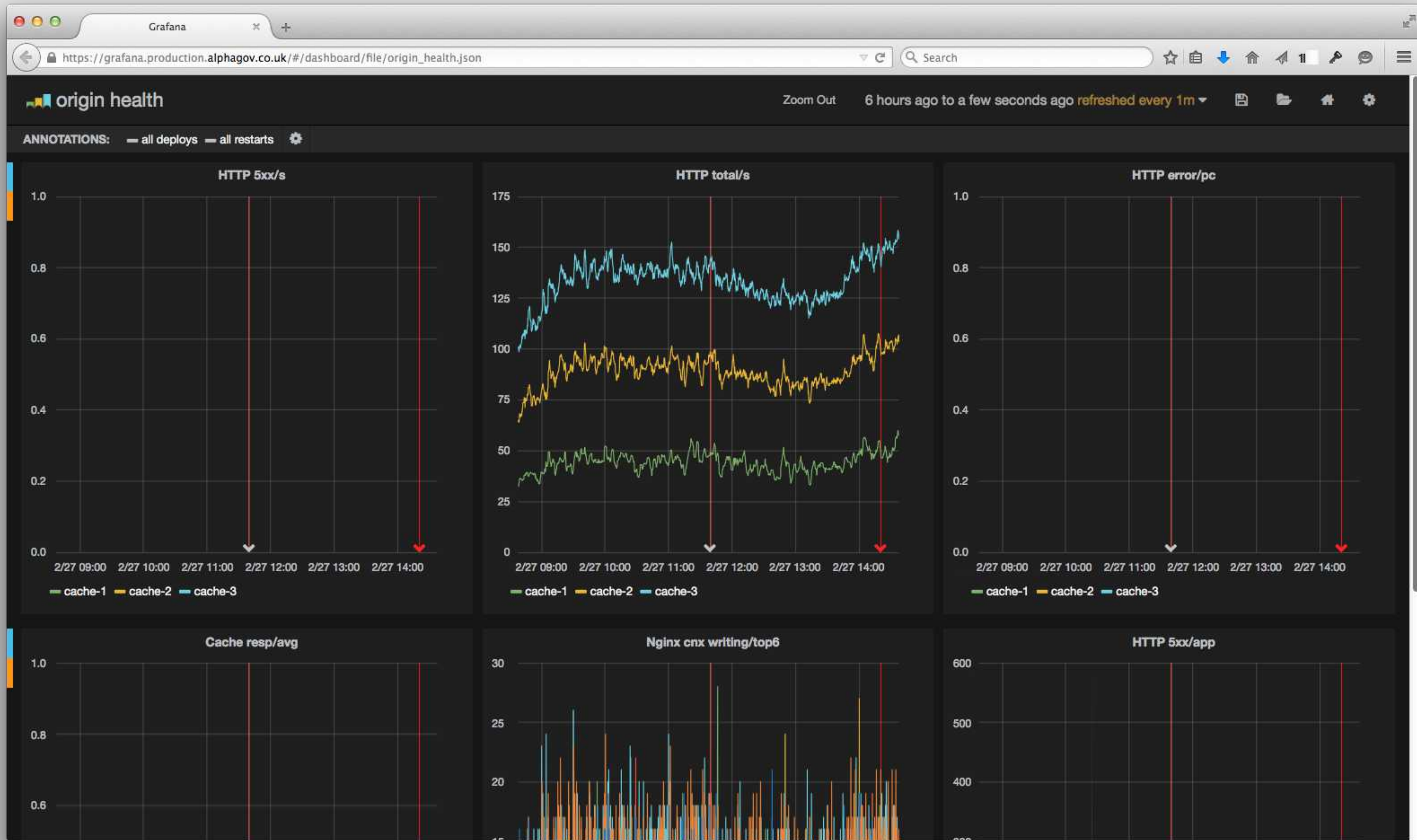
Merge Unmerge Resolve Unresolve Delete

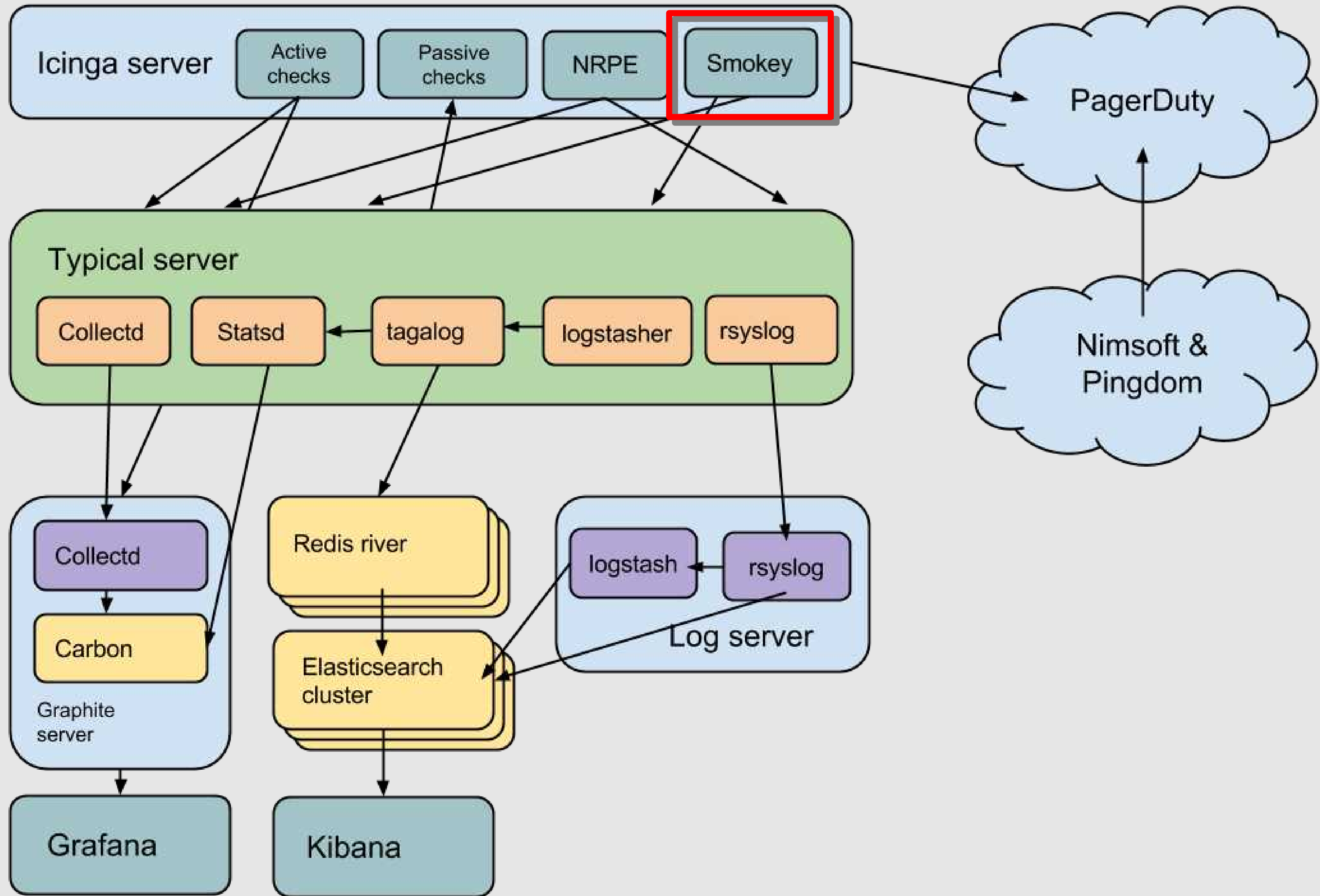




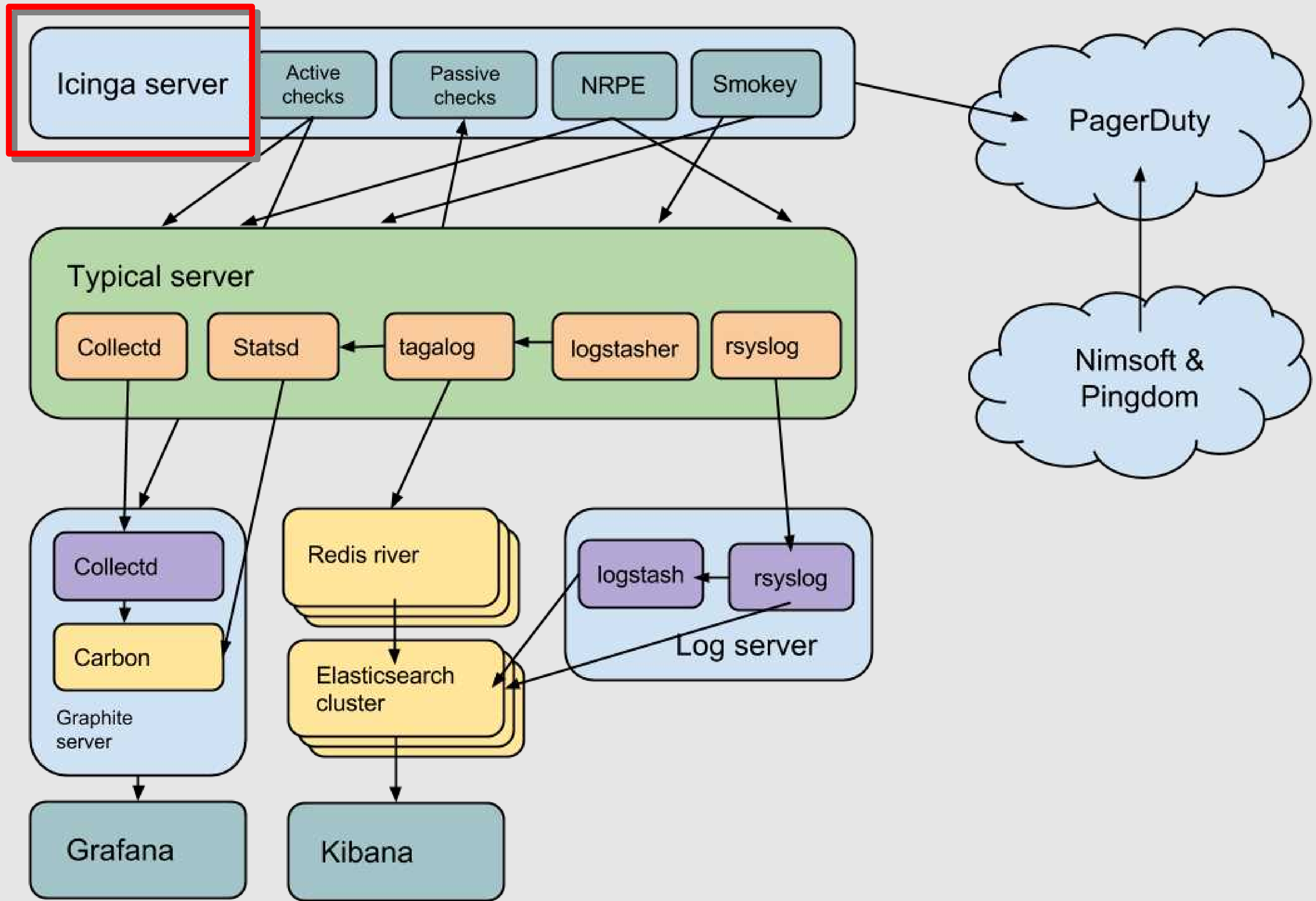








```
1  Feature: Calendars
2
3  @normal
4  Scenario: check calendars loads
5    Given the "calendars" application has booted
6    And I am testing through the full stack
7    And I force a varnish cache miss
8    Then I should be able to visit:
9      | Path |
10     | /when-do-the-clocks-change |
11     | /bank-holidays |
12
```



General

- Home
- Documentation
- Search:

Status

- Tactical Overview
- Host Detail
- Service Detail
- Hostgroup Overview
- Hostgroup Summary
- Servicegroup Overview
- Servicegroup Summary
- Status Map

Problems

- Service Problems
- Unhandled Services
- Host Problems
- Unhandled Hosts
- All Unhandled Problems
- All Problems
- Network Outages

System

- Comments
- Downtime
- Process Info
- Performance Info
- Scheduling Queue

Reporting

- Trends
- Availability
- Alert Histogram
- Alert History
- Alert Summary
- Notifications
- Event Log

Configuration

- View Config

Tactical Monitoring Overview

Last Updated: Tue Apr 22 09:09:45 UTC 2014 - Update in 58 seconds [pause]

Icinga Classic UI 1.10.2 (Backend 1.10.2) - Logged in as ops

Network Outages

0 Outages

Hosts

0 Down 0 Unreachable 83 Up 0 Pending

Services

7 Critical 37 Warning 3 Unknown 3079 Ok 0 Pending

Unhandled Problems 6 Active Acknowledged 1 Active	Unhandled Problems 37 Active	Unhandled Problems 2 Active 1 Passive
-------------------------------------------------------------------	----------------------------------------	----------------------------------------------------

Service Checks Host Checks

Service Checks		Host Checks	
Active	Passive	Active	Passive
Enabled 3036 Enabled	Enabled 90 Enabled	Enabled 83 Enabled	Enabled No Passive Checks

Monitoring Features

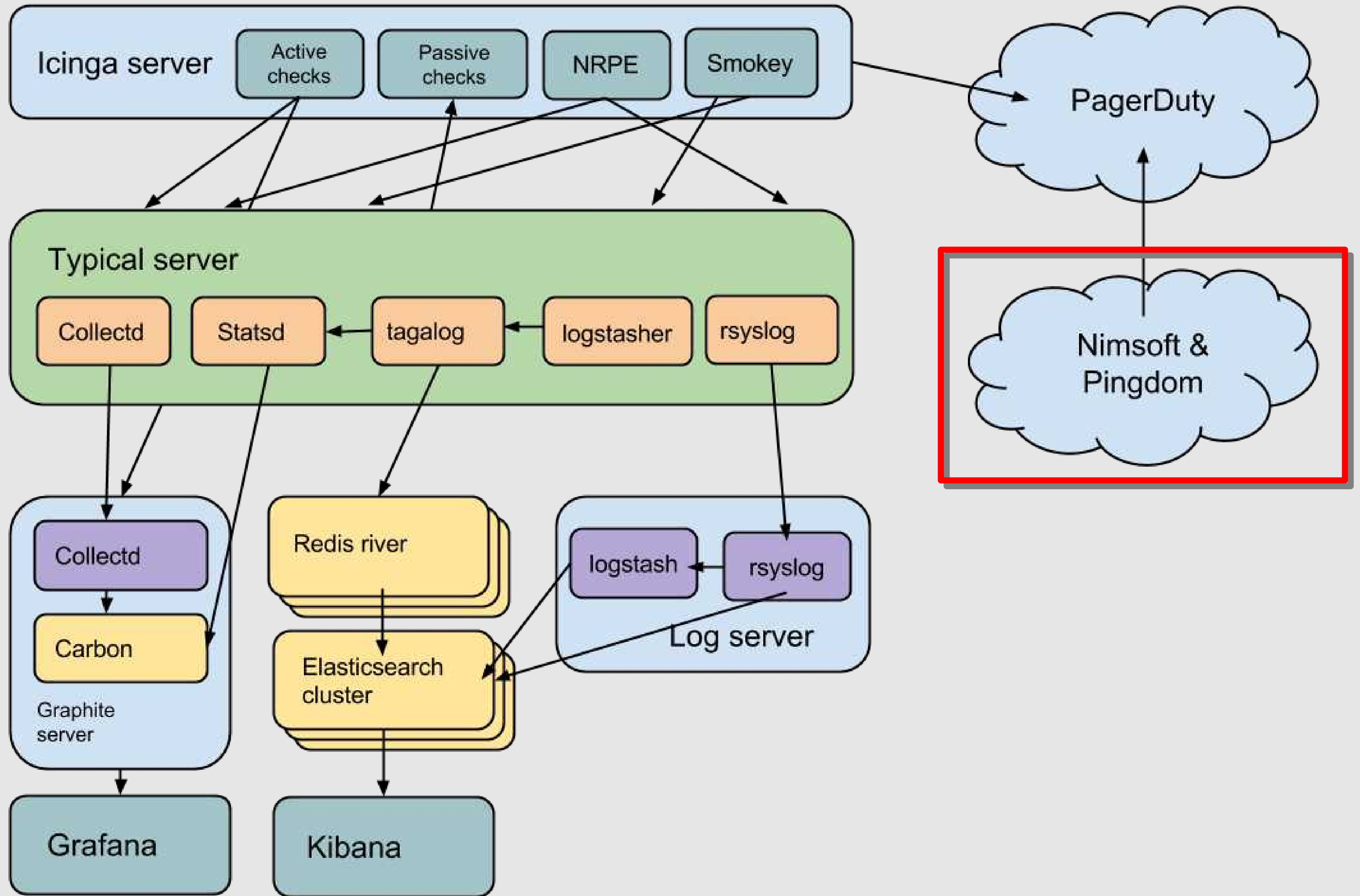
Flap Detection	Notifications	Event Handlers
Enabled All Services Enabled 2 Services Flapping All Hosts Enabled No Hosts Flapping	Enabled All Services Enabled All Hosts Enabled	Enabled All Services Enabled All Hosts Enabled

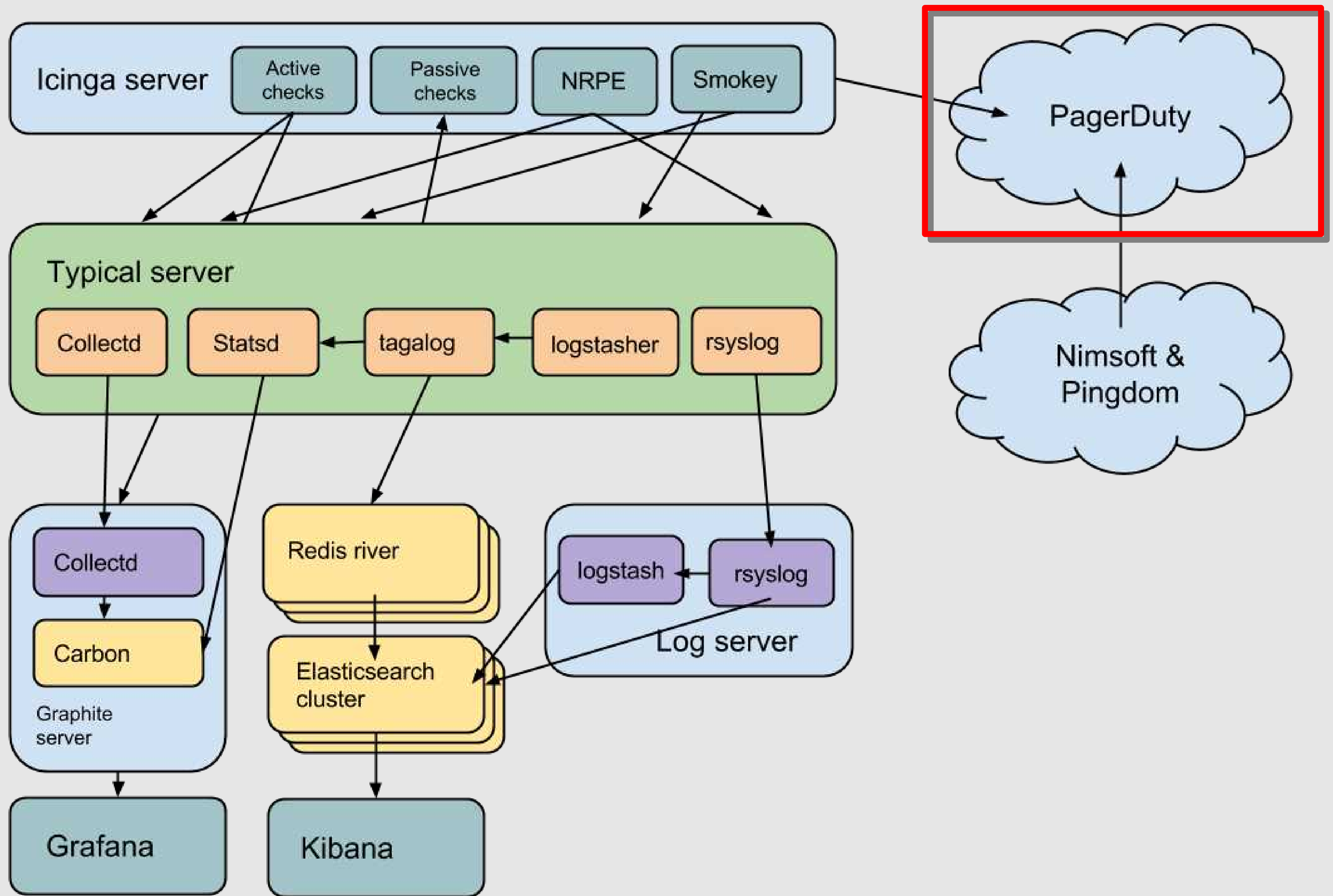
Network Health

Host Health:

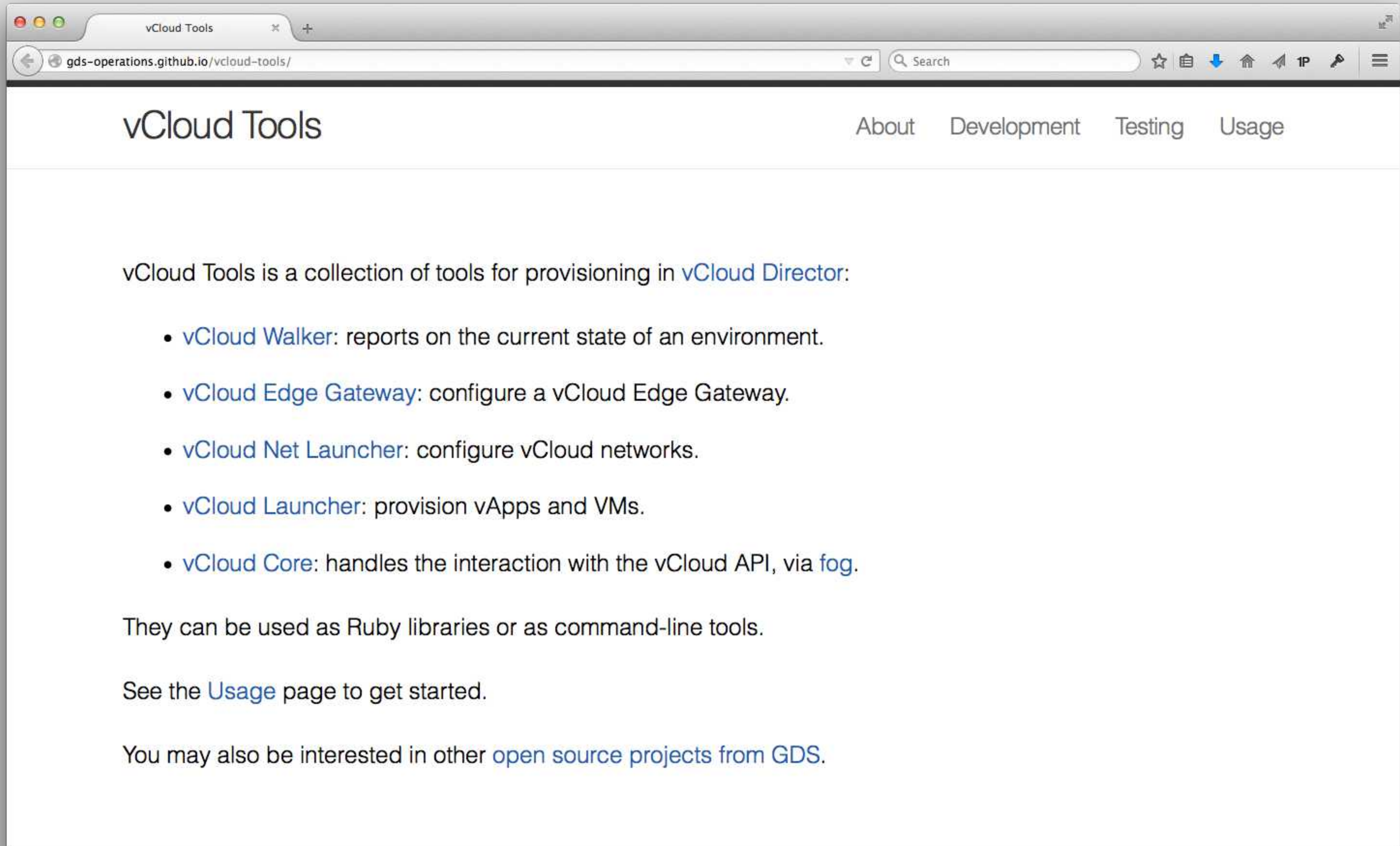
Service Health:

```
11 @@icinga::check { "check_mysql_running_${::hostname}":$
12     check_command      => 'check_nrpe!check_proc_running!mysqld', $
13     service_description => 'mysqld not running', $
14     host_name          => $::fqdn, $
15 }$
16 $
17 @@icinga::check::graphite { "check_mysql_connections_${::hostname}":$
18     target      => "${::fqdn_underscore}.mysql.threads-connected", $
19     warning     => 250, $
20     critical   => 350, $
21     desc       => 'mysql high cur conn', $
22     host_name  => $::fqdn, $
23 }
```





Infrastructure as code



GDS Operations

GitHub, Inc. (US) | <https://github.com/gds-operations/>

Search GitHub

Explore Gist Blog Help

annashipman

GDS Operations

Open source software from UK Government Digital Service

London, UK | <http://gds-operations.gith...> | gds-operations-open-sou...

Filters Find a repository... + New repository

puppet-skeleton Ruby ★ 22 🍴 8
 Skeleton project for infrastructure teams
 Updated 3 days ago

vcloud-edge_gateway Ruby ★ 2 🍴 7
 vCloud Edge Gateway is a CLI tool and Ruby library that supports automated provisioning of a VMware vCloud Director Edge Gateway appliance
 Updated 3 days ago

vcloud-core Ruby ★ 7 🍴 14
 vCloud Core is a gem that supports automated provisioning of VMWare vCloud Director, used by the vCloud Tools gems

People 18 >

Invite someone

Teams 3 >

Jump to a team

Owners
 15 members · 23 repositories

But these are just web
operations tooling

GOV.UK Operations Manual » [next](#) [index](#)

Table Of Contents

- [GOV.UK Operations Manual](#)
- [What is this?](#)
- [Indices and tables](#)

Next topic

- [1st Line Support Processes](#)

This Page

- [Show Source](#)
- [Edit on GitHub](#)

Quick search

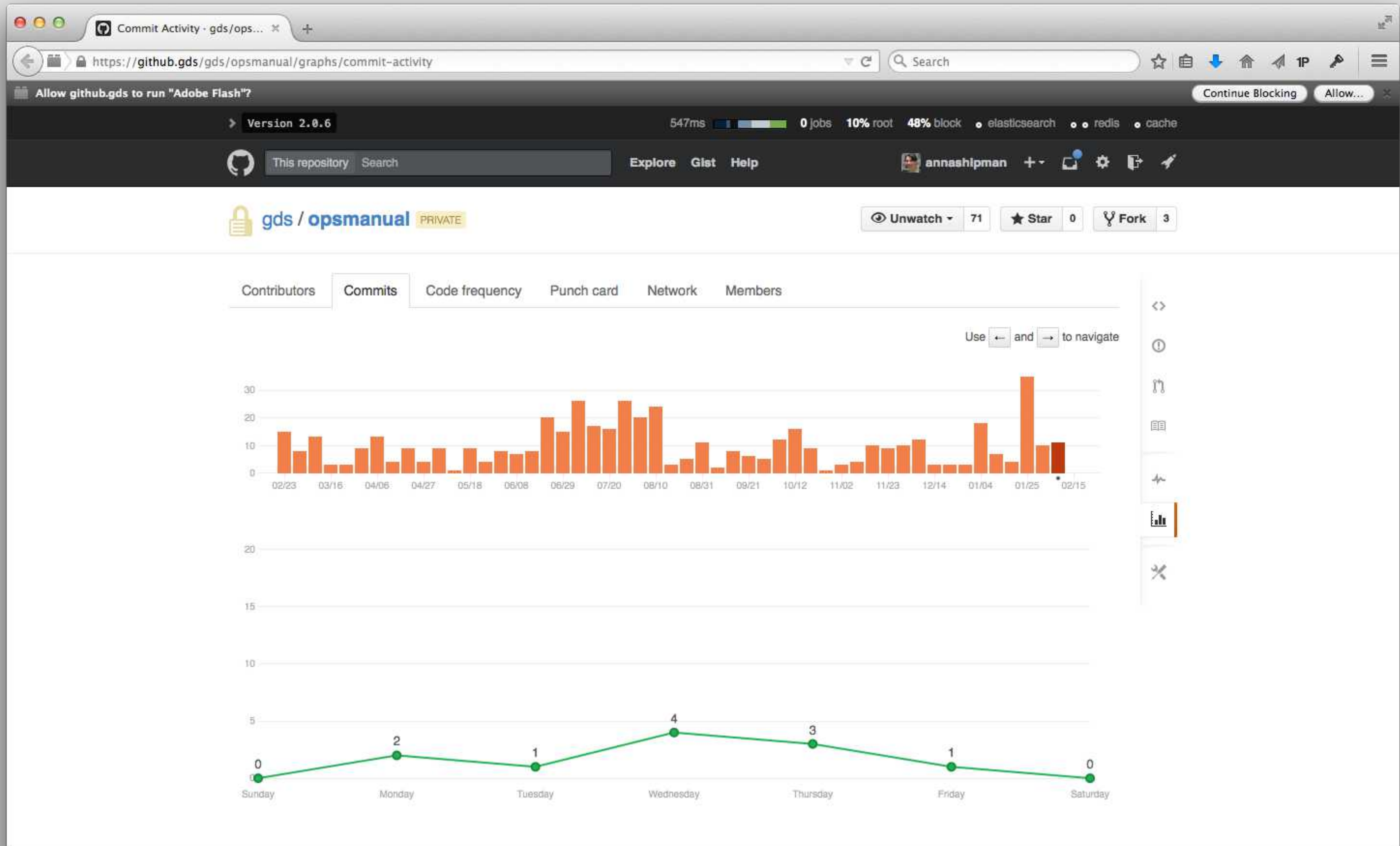
Enter search terms.

GOV.UK Operations Manual

Welcome to the GOV.UK Operations Manual. This is the canonical source for information on GOV.UK Operations and the GDS Infrastructure & Tools team.

- 1st Line Support Processes
 - Contacting others
 - Contact processes
 - Styleguide for support responses
 - Reporting security threats
 - Business Applications Support
- 2nd Line Support Processes
 - General content
 - Incidents
 - Emergency contact numbers
 - Emergency response and disaster recovery
 - App specific information
 - Other 2nd line Tasks & Issues
- Introductions
 - New CI environment
 - Jenkins Swarm Plugin
- Infrastructure wiki
 - CDN Configuration
 - Debian Packaging
 - Dyn
 - GOV.UK Bare Redirect
 - GDS Logging References
 - Managing Ruby Versions
 - vCloud Tools
 - Accounts
 - GitHub Enterprise

<https://github.gds/pages/gds/opsmanual/>



Your first 2nd line might be your first experience of ops

Browser: Icinga: nagios.production...
 URL: https://nagios.production.alphagov.co.uk

Summary: 101 UP, 0 DOWN, 0 UNREACHABLE, 0 PENDING, 0/101 TOTAL
 4170 OK, 1 WARNING, 6 CRITICAL, 29 UNKNOWN, 0 PENDING, 90/4260 TOTAL

ICINGA Performance: 101 / 0 / 0 (0.01 / 0.02 / 0.011 s), 4015 / 245 / 0 (0.01 / 4.04 / 0.235 s), 0.12 / 0.59 / 0.328 s, 0.00 / 0.95 / 0.357 s

Service Information
 low available disk space
 On Host: api-1.api.production (api-1.api.production)
 Member of: No servicegroup
 Service Dependence: 10.7.0.16

Service State Information

Current Status:	OK (for 13d 6h 59m 6s)
Status Information:	DISK OK - free space: / 40865 MB (89% inode=89%); /dev 1966 MB (99% inode=99%); /run 395 MB (99% inode=99%); /boot 259 MB (59% inode=99%);
Performance Data:	/=4543MB;44990;46426;0;47862 /dev=0MB;1848;1907;0;1966 /run=0MB;371;383;0;395 /run/lock=0MB;4;4;0;5 /run/shm=0MB;1857;1916;0;1976 /boot=175MB;435;449;0;463
Current Attempt:	1/4 (HARD state)
Last Check Time:	2015-02-15 22:12:38
Check Type:	ACTIVE
Check Source:	N/A
Check Latency / Duration:	0.282 / 0.029 seconds
Next Scheduled Active Check:	2015-02-15 22:17:38
Last State Change:	2015-02-02 15:17:49
Last Notification:	N/A (notification 0)
Is This Service Flapping?	NO (0.00% state change)
In Scheduled Downtime?	NO
Last Update:	2015-02-15 22:16:54 (0d 0h 0m 1s ago)
Modified Attributes:	None
Executed Command:	Command Expander

Active Checks: **ENABLED**
 Passive Checks: **ENABLED**
 Obsessing: **ENABLED**

Extra Notes (highlighted in red box)

Service Commands

- Disable active checks of this service
- Re-schedule the next check of this service
- Submit passive check result for this service
- Stop accepting passive checks for this service
- Stop obsessing over this service
- Disable notifications for this service
- Send custom service notification
- Schedule downtime for this service
- Disable event handler for this service
- Disable flap detection for this service
- Add a new Service comment
- Reset Modified Attributes

Nagios alerts: documentat...

https://github.gds/pages/gds/opsmanual/2nd-line/nagios.html#low-available-disk-space

Low available disk space

/boot partition is full

We may occasionally find that the `/boot` partition has run out of space because of the conundrum [described here](#).

We have a `govuk_unused_kernels` utility which will identify unused kernel packages. The packages can be removed, with care, using:

```
govuk_unused_kernels | xargs --interactive sudo apt-get -y purge
```

This will print a list of packages that could be removed. Review the packages, and if you're happy for them to be removed, type `y`.

Low available disk space on root

You can try clearing out the APT cache:

```
sudo apt-get clean
```

Low available disc space on /mnt/uploads for asset-master-1 and asset-slave-1

Nagios is set up to monitor disc usage by `/mnt/uploads` on `asset-master-1.backend` and `asset-slave-`

low ava Highlight All Match Case 2 of 7 matches


```
29  @@icinga::check { "check_disk_${::hostname}":$
30      check_command      => 'check_nrpe_1arg!check_disk', $
31      service_description => 'low available disk space', $
32      use                  => 'govuk_high_priority', $
33      host_name           => $::fqdn, $
34      notes_url           => 'https://github.gds/pages/gds/opsmanual/2nd-line/
nagios.html#low-available-disk-space', $
35  }$
```

Document everything for people
who are new to it

Challenges for DevOps

All your developers now
have root

DevOps in a platform environment

<https://gds.blog.gov.uk/jobs/>



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