

OFFICIAL DOCKER IMAGES

LESSONS LEARNED

Philipp Krenn

@xeraa



elastic

DEVELOPER



Who uses
DOCKER?

Who uses

DOCKER IN PRODUCTION?

Who uses

STATEFUL DOCKER IMAGES?

Who uses

OUR IMAGES?

Who uses our stack with

OTHER IMAGES?

Docker: the world's most heavily funded college project

Internal quote from Slack



CONTENT

"Official"

Base Images

Release Policy

Security & Stability

Customization

Orchestration

DOCKER HUB

"OFFICIAL"

WHAT DO YOU GET?

```
docker pull elasticsearch:X
```

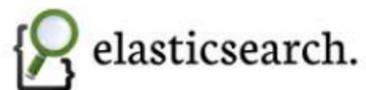
Same for Kibana and Logstash

IT'S COMPLICATED

Docker Inc

Deprecated

Replicated



elasticsearch ☆

Docker Official Images

Elasticsearch is a powerful open source search and analytics engine that makes data easy to explore.

↓ 10M+

Container

Linux

x86-64

Application Services

Official Image

DESCRIPTION

REVIEWS

TAGS

Supported tags and respective Dockerfile links

- 7.3.1
- 6.8.3

Code

Issues 0

Pull requests 0

Actions

Security

Insights

Tree: 4c895ab375

elasticsearch / 7 / Dockerfile

Find file

Copy path

 docker-library-bot Update to 7.3.1

4c895ab 15 days ago

2 contributors  

14 lines (8 sloc) | 621 Bytes

Raw

Blame

History



```
1 # Elasticsearch 7.3.1
2
3 # This image re-bundles the Docker image from the upstream provider, Elastic.
4 FROM docker.elastic.co/elasticsearch/elasticsearch:7.3.1@sha256:d43c5b93c027fbbfc5b24a69a786f66d6d4059360d8c1b9defb661f68dc24c7
5
6 # The upstream image was built by:
7 # https://github.com/elastic/dockerfiles/tree/v7.3.1/elasticsearch
8
9 # For a full list of supported images and tags visit https://www.docker.elastic.co
10
11 # For Elasticsearch documentation visit https://www.elastic.co/guide/en/elasticsearch/reference/current/docker.html
12
13 # See https://github.com/docker-library/official-images/pull/4916 for more details.
```



jethr0null commented on 5 Oct

Contributor



In the interest of providing the best and most reliable support for the official Elasticsearch Docker images, Elastic performs a rigorous set of automated and manual tests as part of the Elasticsearch release process. Beyond testing our own software, these tests have historically uncovered other items such as JVM issues and OS-dependent issues that the Elasticsearch software relied on.

In order to provide the Docker Library community with the same level of support for any Elastic images which are pulled from Docker Hub, it is necessary that these images are equivalent with those which come from the Elastic build system. This equivalence allows us to address issues in a specific version of Elasticsearch with a full understanding of exactly what exists in that version, allowing us to support and troubleshoot any issues effectively and efficiently. It also allows Elastic to respond to issues with any necessary updates rapidly, and without the risk of divergent image content.

After extensive discussions and collaboration with Docker, it has been determined that the easiest, fastest, and most stable way to accomplish this is to use the Elastic images directly rather than rely on setting up an exact replica of Elastic's build and testing systems. The code contained within this image is open (references to the code and the referenced image can be viewed within the image Dockerfile).

CUSTOM REGISTRY

`docker.elastic.co`

I'm surprised more people don't just host their own container registries since doing that is faster than every cloud offering and docker hub

<https://twitter.com/jessfraz/status/978449365261082625>

OUR MOTIVATION

Download statistics

Speed & reliability

Docker @ Elastic

At Elastic, we care about Docker. We provide Docker images for all the products in our stack, and we consider them a first-class distribution format. We also host a dedicated Docker Registry to provide the best possible experience and the most reliable service for you.

On this page, you'll find all the resources — `docker` commands, links to product release notes, documentation and source code — for installing and using the Docker images.

Watch a [presentation](#) from our developers at the Elastic{ON} conference to get details about the background behind our Docker efforts and to see a live demo for the entire stack.



Elasticsearch

7.3 > `docker pull docker.elastic.co/elasticsearch/elasticsearch:7.3.1` >_ 🔗 📄

7.2 > `docker pull docker.elastic.co/elasticsearch/elasticsearch:7.2.1` >_ 🔗 📄

7.1 > `docker pull docker.elastic.co/elasticsearch/elasticsearch:7.1.1` >_ 🔗 📄

7.0 > `docker pull docker.elastic.co/elasticsearch/elasticsearch:7.0.1` >_ 🔗 📄

6.8 > `docker pull docker.elastic.co/elasticsearch/elasticsearch:6.8.3` >_ 🔗 📄

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<https://www.docker.elastic.co>



Elasticsearch

7.3 > `docker pull docker.elastic.co/elasticsearch/elasticsearch:7.3.1` >_ % 📄

7.2 > `docker pull docker.elastic.co/elasticsearch/elasticsearch:7.2.1` >_ % 📄

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7.0 > `docker pull docker.elastic.co/elasticsearch/elasticsearch:7.0.1` >_ % 📄

6.8 > `docker pull docker.elastic.co/elasticsearch/elasticsearch:6.8.3` >_ % 📄

PROBLEMS

Some broken tooling like
automated builds, Kitematic,...

China

IPv6



elastic

Community Organization

Elastic Inc.

<https://www.elastic.co>

Joined September 19, 2014

Repositories

Displaying 11 of 11 repositories



elastic/logstash

By [elastic](#) • Updated 17 hours ago

The Logstash docker images maintained by Elastic!

Container

100K+ Downloads 9 Stars



elastic/packetbeat

By [elastic](#) • Updated 17 hours ago

The Packetbeat docker images maintained by Elastic!

8.2K Downloads 5 Stars

elastic
Community Organization Elastic | https://www.elastic.co/join | September 13, 2016
**https://hub.docker.com/r/elastic/
elasticsearch/
kibana/
*beat/
logstash/
apm-server/**

Repositories

Displaying 11 of 11 repositories

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 By [elastic](#) • Updated 17 hours ago
 The Packetbeat docker images maintained by Elastic!

BASE IMAGES

Elasticsearch

ALPINE

Kibana Beats Logstash

UBUNTU

Common base image in 5.4+

CENTOS 7

<https://github.com/elastic/elasticsearch/blob/master/distribution/docker/src/docker/Dockerfile>

```
FROM centos:7
```

```
RUN groupadd -g 1000 elasticsearch && \  
    adduser -u 1000 -g 1000 -G 0 -d /usr/share/elasticsearch elasticsearch && \  
    chmod 0775 /usr/share/elasticsearch && \  
    chgrp 0 /usr/share/elasticsearch
```

PS: MOVING REPOS IN 6.6 / 7.0

<https://github.com/elastic/elasticsearch/pull/36246>

Upside

SIMILAR SETUP

SHARED LAYERS

JVM LARGE ANYWAY



jarpy commented on 31 Mar • edited

Owner



Actually, my money is on the [native call to getmntent\(3\)](#) .

Oh look! What's the chances we don't have this patch in our musl libc?

<https://git.musl-libc.org/cgi/musl/commit/src/misc/mntent.c?id=05973dc3bbc1aca9b3c8347de6879ed72147ab3b>



 jarpy added the **bug** label on 31 Mar



jarpy commented on 31 Mar

Owner



And I'm a bit late in saying this, but thank you for the excellent reproduction steps. They were extremely useful once we (kinda by accident) found the right environment to run them in.

Downside

SIZE

```
$ docker images
```

REPOSITORY	TAG	IMAGE ID	SIZE
docker.elastic.co/kibana/kibana	7.3.1	b54865ba6b0b	1.01GB
docker.elastic.co/elasticsearch/elasticsearch	7.3.1	3d3aa92f641f	807MB
docker.elastic.co/beats/filebeat	7.3.1	a21a16286594	383MB
docker.elastic.co/kibana/kibana	6.8.2	b8887ba97a3f	765MB
docker.elastic.co/elasticsearch/elasticsearch	6.8.2	dbf758a9f11b	900MB
docker.elastic.co/beats/filebeat	6.8.2	3bf546b134e4	279MB
docker.elastic.co/kibana/kibana	5.6.13	59fcc69d2cc6	653MB
docker.elastic.co/elasticsearch/elasticsearch	5.6.13	21673573a265	525MB
docker.elastic.co/beats/filebeat	5.6.13	2aec30f6b3fc	284MB
docker.elastic.co/kibana/kibana	5.3.3	ffe778f7e489	679MB
docker.elastic.co/elasticsearch/elasticsearch	5.3.3	5857f98b5920	165MB
docker.elastic.co/beats/filebeat	5.3.3	c01be8a8f630	232MB

	5.3	5.6	6.8	73
ES	165MB	525MB	900MB	807MB
Kibana	679MB	653MB	765MB	1.0GB
Filebeat	232MB	284MB	279MB	383MB

Does it matter?

STATEFUL VS STATELESS

What to
INCLUDE?

Single image for 5.x

PLATINUM TRIAL

Three flavors 6.0 to 6.2

BASIC^{*}, OSS, PLATINUM TRIAL

* Default



Two flavors 6.3+

BASIC / PLATINUM TRIAL^{*}, OSS

^{*} Default



Include
PLUGINS?

FUTURE

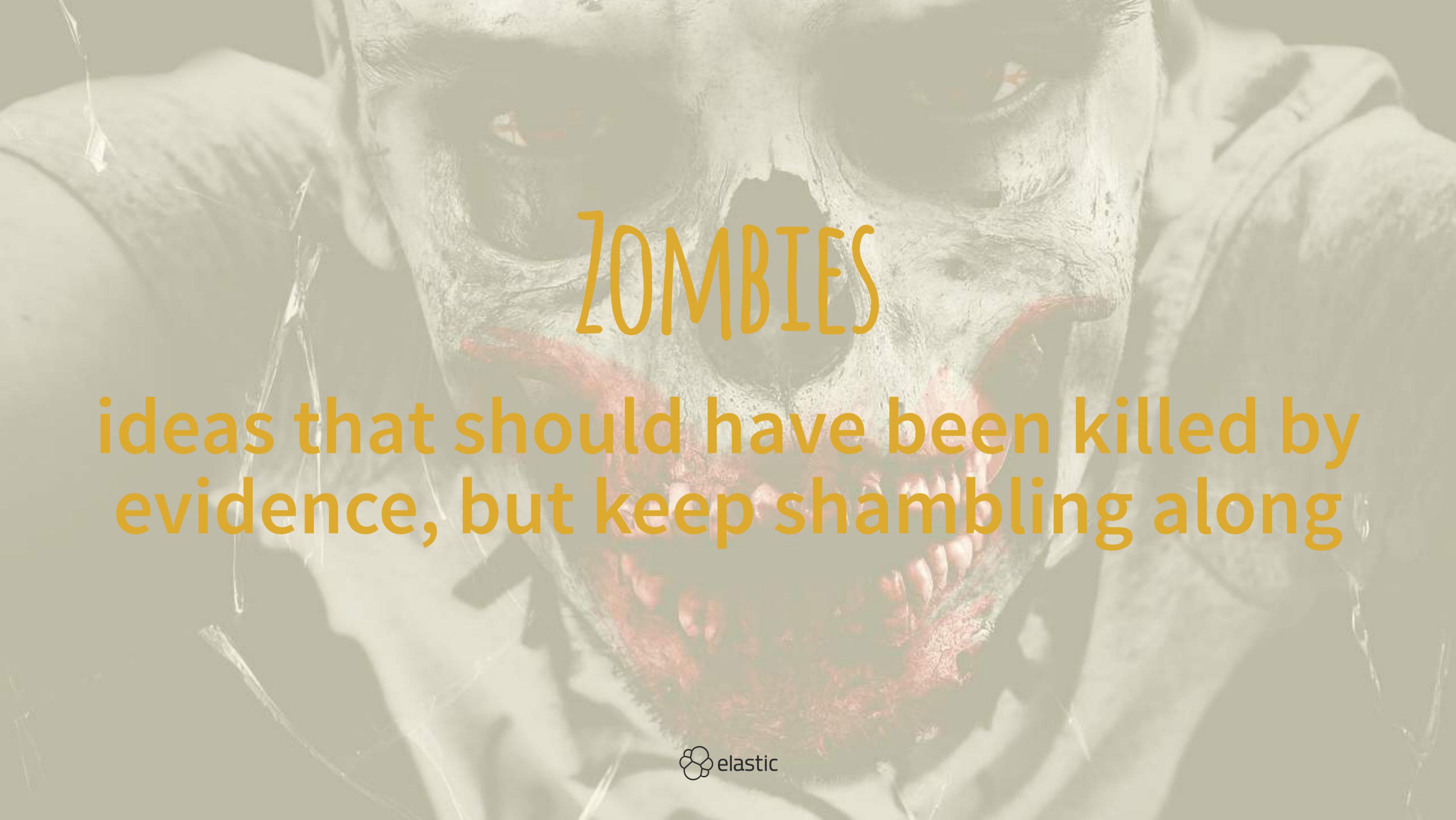
Multiple BASE IMAGES?

Even

WINDOWS?!

RELEASE POLICY

NO : latest



ZOMBIES

ideas that should have been killed by evidence, but keep shambling along

Explore

Repositories

Organizations

Get Help ▼

xeraa ▼



makes data easy to explore.

Copy and paste to pull this image

```
docker pull elasticsearch
```



[View Available Tags](#)

7 AND 7 . 3?

WHAT'S IN A TAG?

<code>docker.elastic.co/elasticsearch/elasticsearch</code>	5.3.3	5857f98b5920	4 months ago
<code>docker.elastic.co/beats/filebeat</code>	5.3.3	c01be8a8f630	5 months ago
<code>docker.elastic.co/kibana/kibana</code>	5.3.3	ffe778f7e489	5 months ago

Currently

OVERWRITE TAG

LABEL SCHEMA

```
LABEL org.label-schema.build-date="${build_date}" \  
  org.label-schema.license="${license}" \  
  org.label-schema.name="Elasticsearch" \  
  org.label-schema.schema-version="1.0" \  
  org.label-schema.url="https://www.elastic.co/products/elasticsearch" \  
  org.label-schema.usage="https://www.elastic.co/guide/en/elasticsearch/reference/index.html" \  
  org.label-schema.vcs-ref="${git_revision}" \  
  org.label-schema.vcs-url="https://github.com/elastic/elasticsearch" \  
  org.label-schema.vendor="Elastic" \  
  org.label-schema.version="${version}" \  
  org.opencontainers.image.created="${build_date}" \  
  org.opencontainers.image.documentation="https://www.elastic.co/guide/en/elasticsearch/reference/index.html" \  
  org.opencontainers.image.licenses="${license}" \  
  org.opencontainers.image.revision="${git_revision}" \  
  org.opencontainers.image.source="https://github.com/elastic/elasticsearch" \  
  org.opencontainers.image.title="Elasticsearch" \  
  org.opencontainers.image.url="https://www.elastic.co/products/elasticsearch" \  
  org.opencontainers.image.vendor="Elastic" \  
  org.opencontainers.image.version="${version}"
```

Base image & JVM direct dependencies

Future

ADD IMAGE VERSION?

SECURITY & STABILITY

Run Elasticsearch as root

A close-up photograph of several cockroaches on a light-colored wooden surface. The cockroaches are dark brown and black, with some showing lighter bands on their abdomens. They are scattered across the wood, some facing towards the camera and others away. The background is slightly blurred, showing more of the wooden surface and some green foliage in the upper right corner.

COCKROACHES

claims that disappear for a while when
proved wrong, but just keep on coming
back

:-p sed s/🐍/🐳/g #Docker



<https://twitter.com/waxzce/status/1151874532686422017>

MODE

Production: Clusterable

Development: Local network

"Docker" mode

`discovery.type=single-node`

6.0+ no more

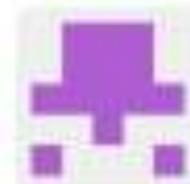
DEFAULT CREDENTIALS

6.x Security non-trial requires

CERTIFICATES

The container runs Elasticsearch as
user `elasticsearch` using `uid:gid`
`1000:1000`.

[https://www.elastic.co/guide/en/elasticsearch/reference/current/
docker.html](https://www.elastic.co/guide/en/elasticsearch/reference/current/docker.html)



bluepuma77 commented on 4 Mar



Bug description

Starting elasticsearch:5.2.2 results in `Failed to created node environment`. This has been covered in [#21](#), the recommendation was to set user permissions on the host system.

```
docker run --rm -v /tmp/elastic:/usr/share/elasticsearch/data docker.elastic.co/elasticsear
# breaks
```

I prefer simple fire & forget docker containers which don't need any preparation on the host system. Would it be an option to check the Elasticsearch image from Docker, that runs fine, without setting any permissions before, and replicate that behaviour in new `elasticsearch-docker` ?

```
docker run --rm -v /tmp/elastic:/usr/share/elasticsearch/data elasticsearch:5.2.2
# runs
```

```
docker run --rm -v /tmp/elastic:/usr/share/elasticsearch
# breaks
```

I prefer simple fire & forget docker containers which don't need any permissions before, and replicate that behaviour in new e

```
docker run --rm -v /tmp/elastic:/usr/share/elasticsearch
# runs
```



DON'T MUTATE

the bind mounted local directory

THOSE WHO DO NOT UNDERSTAND
UNIX ARE CONDEMNED TO REINVENT
IT, POORLY.

— Henry Spencer

Docker default value?

LimitNOFILE & LimitNPROC

infinity

<https://github.com/moby/moby/commit/8db61095a3d0bcb0733580734ba5d54bc27a614d> (July 2016)

TEST

```
$ docker run --rm centos:7 /bin/bash -c \  
  'ulimit -Hn && ulimit -Sn && ulimit -Hu && ulimit -Su'  
1048576  
1048576  
unlimited  
unlimited
```

Limit for virtual memory?

`vm.max_map_count`

TEST

```
$ docker run --rm centos:7 /bin/bash -c \  
  'sysctl vm.max_map_count'  
vm.max_map_count = 262144
```

Must be set on the host

Combine two new systems to get

CHAOS & DESPAIR

Docker is a
LEAKY ABSTRACTION



jarpy commented on 31 Mar

Owner



This reproduces for me on Docker for Windows version 17.03.0-ce-win1, (run from Powershell).

It does not reproduce on Docker for Linux version 17.03.0-ce.

Interesting. I think the Docker VM, as used by OSX and Windows is introducing the problem.

CUSTOMIZATION

FEATURE REQUEST

```
if [ -f /custom/user_init.sh ]  
then  
  . /custom/user_init.sh  
fi
```

Or customization through environment variables

No

RUNTIME MUTATION

DOCKERFILE

```
ARG ELASTIC_VERSION
FROM docker.elastic.co/elasticsearch/elasticsearch:${ELASTIC_VERSION}

RUN bin/elasticsearch-plugin install analysis-phonetic --batch

ARG ELASTIC_VERSION
RUN bin/elasticsearch-plugin install \
  https://github.com/spinscale/elasticsearch-ingest-langdetect/releases/download/
  ${ELASTIC_VERSION}.1/ingest-langdetect-${ELASTIC_VERSION}.1.zip --batch
```

GENERATE KEYSTORE

```
$ docker run -p 9200:9200 -p 9300:9300 -e "discovery.type=single-node" \
-v /Users/philipp/Desktop/demo/config:/usr/share/elasticsearch/config/ \
-it docker.elastic.co/elasticsearch/elasticsearch:7.3.1 /bin/bash
[root@1006ed50b646 elasticsearch]# ./bin/elasticsearch-keystore create
Created elasticsearch keystore in /usr/share/elasticsearch/config
[root@1006ed50b646 elasticsearch]# ./bin/elasticsearch-keystore add test
Enter value for test:
[root@1006ed50b646 elasticsearch]# exit
exit
$ cat config/elasticsearch.keystore
??lelasticsearch.keystore?@g?o!?$?K?Lf?w?VAEŠ]m? [?a6?B??? y?,!B}??H?æ?AU=?C?:?o?
?W?08?}U?;p?т???cQ????7?JY?      2A?:???ZUY??2V?9?g??(??0?q\
```

MOUNT KEYSTORE (DOCKER COMPOSE)

elasticsearch:

image: `docker.elastic.co/elasticsearch/elasticsearch:${ELASTIC_VERSION}`

secrets:

- **source:** `elasticsearch.keystore`

target: `/usr/share/elasticsearch/config/elasticsearch.keystore`

ORCHESTRATION

Who uses
KUBERNETES?

Who uses SWARM?

Who uses

MESOS?

Who uses
NOMAD?

Kubernetes 1.8 allows dots in env vars

<https://github.com/kubernetes/kubernetes/issues/2707>



Pires

@pires_oss

Follow



today, i decided to end my commitment to maintaining github.com/pires/kubernetes it's been 3 years since i last used Elasticsearch and other projects need all the attention i can give them. it was a great run, thank you ALL.



pires/kubernetes-elasticsearch-cluster

Elasticsearch cluster on top of Kubernetes made easy. -
pires/kubernetes-elasticsearch-cluster

github.com

11:10 AM - 7 Nov 2018

Code

Issues 40

Pull requests 16

Actions

Projects 0

Wiki

Security

Insights

You know, for Kubernetes

403 commits

7 branches

14 releases

34 contributors

Apache-2.0

Branch: master

New pull request

Create new file

Upload files

Find File

Clone or download

Crazybus Merge pull request #154 from elastic/configurator_mapinator Latest commit 1ad3826 14 days ago

.ci/jobs Update .ci/jobs/elastic+helm-charts+master+integration-elasticsearch.yml 2 months ago

.github Update issue template to include `helm get release` output 3 months ago

elasticsearch Properly quote bootstrap password 15 days ago

filebeat Clarify priorityClassName default for filebeat chart last month

helpers [elasticsearch] Keystore integration 15 days ago

kibana Clarify priorityClassName default for kibana chart last month

metricbeat Fix octal literal to work in both Python 2 and Python 3 24 days ago

.gitignore first commit 10 months ago

CHANGELOG.md 7.3.0 Release last month

CONTRIBUTING.md Add contributing guide, release process, changelog and templates 4 months ago

Elastic Cloud on Kubernetes

elasticsearch kibana kubernetes kubernetes-operators go

1,446 commits 4 branches 3 releases 24 contributors View license

Branch: master New pull request Create new file Upload files Find File Clone or download

 charith-elastic Fix naming E2E test (#1688)	Latest commit ca95cb1 23 hours ago
 .ci	Remove commas from docker_images array declaration. (#1685) yesterday
 .github	Add relabel bot config for triaging issues (#1672) 4 days ago
 build	Update job for running tests against stack versions to 7.3.1 from 7.3... 3 days ago
 cmd	Move operators dir (#1616) 14 days ago
 config	Support more secret volume fields in secure settings (#1665) 2 days ago
 docs	Support more secret volume fields in secure settings (#1665) 2 days ago
 hack	Remove gke storage class yaml, add patching sc in deployer (#1656) 8 days ago
 pkg	Re-bootstrap single master 7.x clusters when upgrading from 6.x (#1681) 2 days ago
 test/e2e	Fix naming E2E test (#1688) 23 hours ago

ECK ON MINIKUBE

```
minikube config set memory 16384  
minikube config set cpus 4  
minikube start
```

Kubernetes has made huge improvements in the ability to run stateful workloads including databases and message queues, but I still prefer not to run them on Kubernetes.

<https://twitter.com/kelseyhightower/status/963413508300812295>

CONCLUSION

"DOCKER IS DISRUPTING THE
INDUSTRY"

"CAN I RUN ELASTICSEARCH ON
DOCKER?"

"SHOULD I RUN ELASTICSEARCH ON
DOCKER?"

Even when stateful services do the right things managing state is still hard. Mixing stateful and stateless applications on the same cluster elevates the complexity of the entire cluster. Cluster security and upgrades become much harder.

<https://twitter.com/kelseyhightower/status/963417215608369153>

QUICK QUIZ

What do you get?

```
docker pull elastic/elasticsearch
```

```
$ docker pull elastic/elasticsearch
```

```
Using default tag: latest
```

```
Error response from daemon: manifest  
for elastic/elasticsearch:latest not found
```

```
docker pull logstash:alpine
```

`docker pull metricbeat:7.3.1`

```
$ docker pull metricbeat:6.5.2
```

```
Error response from daemon: pull access denied for metricbeat,  
repository does not exist or may require 'docker login'
```

```
docker pull elastic/metricbeat:7.3.1
```

```
docker pull docker.elastic.co/apm/apm-server:7.3.1
```

QUESTIONS & DISCUSSION

Philipp Krenn

@xeraa