Official Docker Images

Lessons Learned

Philipp Krenn @xeraa

elastic



elastic

Developer



Who uses

DOCKER?

Who uses

DOCKER IN PRODUCTION?

elastic

Who uses

STATEFUL DOCKER IMAGES?

Who uses

OUR IMAGES?

elastic

Who uses our stack with

OTHER IMAGES?

elastic

Docker: the world's most heavily funded college project

Internal quote from Slack

elastic


HD

Content

"Official"
Base Images
Release Policy
Security & Stability
Customization
Orchestration

Docker Hub

"official"

elastic

What do you get?

```
docker pull elasticsearch:X
```

Same for Kibana and Logstash

It's Complicated

Docker Inc

Deprecated

Replicated

Full Description

Supported tags and respective `Dockerfile` links

- `6.4.2` (*6/Dockerfile*)
- `5.6.12`, `5.6`, `5` (*5/Dockerfile*)
- `5.6.12-alpine`, `5.6-alpine`, `5-alpine` (*5/alpine/Dockerfile*)

14 lines (8 sloc) | 616 Bytes

Raw | Blame | History

```
# Elasticsearch 6.4.3

# This image re-bundles the Docker image from the upstream provider, Elastic.
FROM docker.elastic.co/elasticsearch/elasticsearch:6.4.3@sha256:ba2d82b70025e503ded44135e2fbb79b0aefa9db17be2750d75565c28d21ea

# The upstream image was built by:
#   https://github.com/elastic/elasticsearch-docker/tree/6.4.3

# For a full list of supported images and tags visit https://www.docker.elastic.co

# For Elasticsearch documentation visit https://www.elastic.co/guide/en/elasticsearch/reference/current/docker.html

# 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).

elastic / tedi

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Template Engine for Docker Images

Edit

Manage topics

165 commits | 1 branch | 8 releases | 1 contributor | Apache-2.0

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



jarpy Bump to version 0.13 — Latest commit 446f3ea 9 days ago

bin	Tag Tedi's own Docker image better	3 months ago
tedi	Tweak some log messages	9 days ago
.gitignore	Add '.tedi' to .gitignore	4 months ago
.travis.yml	Add Docker flags to .travis.yml	5 months ago
Dockerfile	Optimize Tedi's own Dockerfile	4 months ago
LICENSE.txt	Rename test.py -> cli.py	a year ago
README.md	Bump to version 0.13	9 days ago
requirements.txt	Optimize Tedi's own Dockerfile	4 months ago
setup.cfg	Don't run coverage on the tests	4 months ago
setup.cfg.pytest-watch	Remove click-log and fix logging	5 months ago

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

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

6.4 `docker pull docker.elastic.co/elasticsearch/elasticsearch:6.4.3`

6.3 `docker pull docker.elastic.co/elasticsearch/elasticsearch:6.3.2`

6.2 `docker pull docker.elastic.co/elasticsearch/elasticsearch:6.2.4`

6.1 `docker pull docker.elastic.co/elasticsearch/elasticsearch:6.1.4`

6.0 `docker pull docker.elastic.co/elasticsearch/elasticsearch:6.0.1`

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https://www.docker.elastic.co



Elasticsearch

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6.1 `docker pull docker.elastic.co/elasticsearch/elasticsearch:6.1.4`

6.0 `docker pull docker.elastic.co/elasticsearch/elasticsearch:6.0.1`

Problems

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

China

IPv6

Repos



elastic

Elastic

https://www.elastic.co
Joined September 2014

elastic/elasticsearch public	11 STARS	100K+ PULLS	DETAILS
elastic/kibana public	9 STARS	100K+ PULLS	DETAILS
elastic/logstash public	7 STARS	50K+ PULLS	DETAILS
elastic/apm-server public	4 STARS	50K+ PULLS	DETAILS
elastic/auditbeat public	2 STARS	10K+ PULLS	DETAILS
elastic/filebeat	8	10K+	

Search

Dashboard Explore Organizations Create xeraa

Repos

https://hub.docker.com/r/elastic/

elasticsearch/
kibana/
*beat/
logstash/
apm-server/



elastic

Elastic

https://www.elastic.co

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elastic/filebeat	8	10K+	

BASE IMAGES

Elasticsearch

Alpine

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Kibana Beats Logstash

UBUNTU

elastic

Common base image in 5.4+

CentOS 7

https://github.com/elastic/elasticsearch-docker/blob/master/templates/Dockerfile.j2

```
FROM centos:7 AS prep_es_files

ENV PATH /usr/share/elasticsearch/bin:$PATH
RUN curl -s https://download.java.net/java/GA/jdk11/13/GPL/openjdk-11.0.1_linux-x64_bin.tar.gz | \
            tar -C /opt -zxf -
ENV JAVA_HOME /opt/jdk-11.0.1

RUN groupadd -g 1000 elasticsearch && \
    adduser -u 1000 -g 1000 -d /usr/share/elasticsearch 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/cgit/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                             6.5.0   fcc1f039f61c  727MB
docker.elastic.co/elasticsearch/elasticsearch               6.5.0   ff171d17e77c  774MB
docker.elastic.co/beats/filebeat                            6.5.0   aee067f4a241  299MB
docker.elastic.co/kibana/kibana                             6.2.4   327c6538ba4c  933MB
docker.elastic.co/elasticsearch/elasticsearch               6.2.4   7cb69da7148d  515MB
docker.elastic.co/beats/filebeat                            6.2.4   26a00abcde82  319MB
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	6.2	6.5
ES	165MB	525MB	515MB	774MB
Kibana	679MB	653MB	933MB	727MB
Filebeat	232MB	284MB	319MB	299MB

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

elastic

Two flavors 6.3+

Basic / Platinum trial* , OSS

* Default

elastic

Include

PLUGINS?

FUTURE

Multiple

BASE IMAGES?

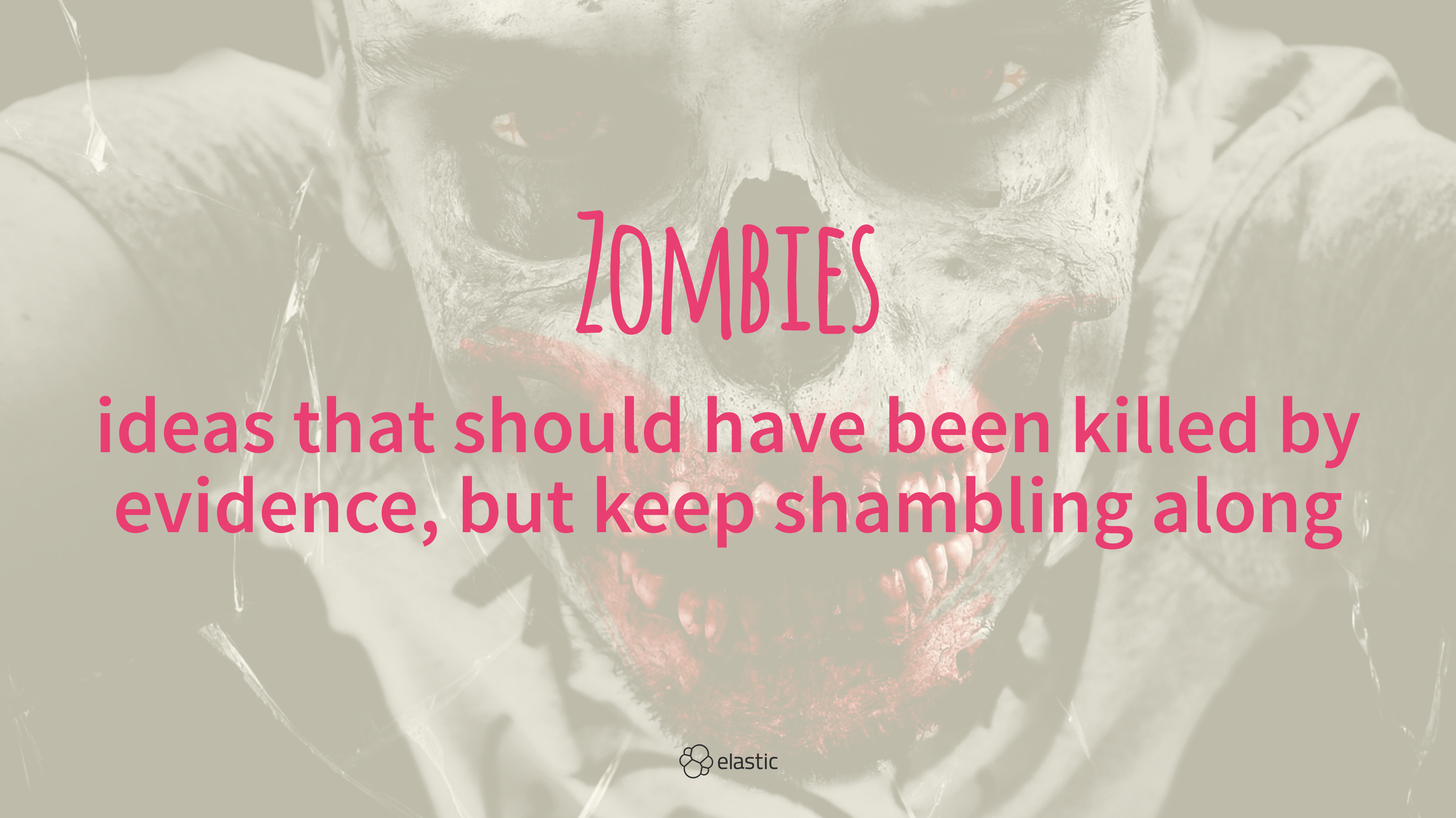
Even

WINDOWS?!

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Release Policy

No :latest



Zombies

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

elastic

6 AND 6.5?

What's in a tag?

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

Currently

Overwrite tag

Label Schema

```
LABEL org.label-schema.schema-version="1.0" \
  org.label-schema.vendor="Elastic" \
  org.label-schema.name="elasticsearch" \
  org.label-schema.version="{{ elastic_version }}" \
  org.label-schema.url="https://www.elastic.co/products/elasticsearch" \
  org.label-schema.vcs-url="https://github.com/elastic/elasticsearch-docker" \
{% if image_flavor == 'oss' -%}
  license="Apache-2.0"
{% else -%}
  license="Elastic License"
{% endif -%}
```

Base image & JVM direct dependencies

Future

ADD IMAGE VERSION?

Security & Stability

elastic

Run Elasticsearch as

`root`



Cockroaches

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

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Mode

Production: Clusterable

Development: Local network

"Docker" mode

`discovery.type=single-node`

Bootstrap checks

are here to stay

elastic

6.0+ no more

DEFAULT CREDENTIALS

elastic

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



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/elasticsearc
# breaks
```

I prefer simple fire & forget docker containers which don't nee

Would it be an option to check the Elasticsearch image from D

any permissions before, and replicate that behaviour in new e

```
docker run --rm -v /tmp/elastic:/usr/share/elasticsearc
# 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:6.5.2 /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?VAEŠЊm?[?a6?B??? y?,!Ƀ}??Ħ?@?AU=?C?:?o?
?W?O8?}U?;p?҂???cQ????7?JY?     2A?:???ZUY??2V?9?ᘐ??(??0?q\
```

elastic

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?

No orchestration

yet

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/kubernet ....
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

elastic / helm-charts Private

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You know, for Kubernetes

Edit

Manage topics

1 commit | 1 branch | 0 releases | 1 contributor | Apache-2.0

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

Crazybus first commit — Latest commit 0f99a55 2 days ago

elasticsearch	first commit	2 days ago
helpers	first commit	2 days ago
kibana	first commit	2 days ago
.gitignore	first commit	2 days ago
LICENSE	first commit	2 days ago
README.md	first commit	2 days ago
requirements.txt	first commit	2 days ago

README.md

Elastic Stack Kubernetes Helm Charts

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



elastic cloud
enterprise

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:6.5.2
```

```
$ 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:6.5.2
```

```
docker pull docker.elastic.co/apm/apm-server:6.5.2
```

Questions & Discussion

Philipp Krenn **@xeraa**