

K8S-L02 镜像缩小

- 66.7MB 原始镜像分析(Dockerfile.offical)
- 66.3MB 基于当前镜像的迁移做法(Dockerfile.migrate)
- 55.9MB 经验来看, php应该就15mb上下, 就算算上fpm, 也不应该66.3m(Dockerfile.offical-reduce)
- 11.7MB 生产不推荐这么搞, 就是一次好玩的分析(Dockerfile.funny)

附录, 简单查阅了一些Lib库, 做个记录

- ld-musl-x86_64.so.1
- libz.so.1.2.12
- libargon2.so.1
- libedit.so.0.0.68
- libformw.so.6.3
- liblzma.so.5.2.5
- libmenuw.so.6.3
- libncursesw.so.6.3
- libpanelw.so.6.3
- libpcre2-8.so.0.11.0
- libpcre2-posix.so.3.0.2
- libxml2.so.2.9.14

残留的问题

附件

- Dockerfile.offical
- Dockerfile.migrate
- Dockerfile.offical-reduce
- Dockerfile.funny

K8S-L02 镜像缩小

66.7MB 原始镜像分析(Dockerfile.offical)

1. 通过 dive shareinto/php:fat 分析得, 存在两个无用模块

OUTPUTTERMINALDEBUG CONSOLE

Layers

Cmp	Size	Command
5.5 MB	FROM	ec26cc0d3f68a95
3.5 MB	apk add	--no-cache ca-certificates curl tar xz openssl
4.7 KB	set -eux;	adduser -u 82 -D -S -G www-data www-data
0 B	set -eux;	mkdir -p "\$PHP_INI_DIR/conf.d"; [! -d /var/www/html]; mkdir -p /var/www/html; chown www-da
10 MB	set -eux;	apk add --no-cache --virtual fetch-deps gnupg; mkdir -p /usr/src; cd /usr/src; curl -fs5
587 B	#(nop)	COPY file:ce57c04b70896f77cc11eb2766417d8a1240fcffe5bba92179ec78c458844110 in /usr/local/bin/
47 MB	set -eux;	apk add --no-cache --virtual build-deps \$PHPIZE_DEPS argon2-dev coreutils curl-dev g
7.2 KB	#(nop)	COPY multi:869bde9d9eae74886a05c9e2107b3e3b4877116db8c69adbaff271949fb5262 in /usr/local/bin/
51 KB	docker-php-ext-enable	sodium
75 KB	set -eux;	cd /usr/local/etc; if [-d php-fpm.d]; then sed 's!-NONE!-lg' php-fpm.conf.default tee p
105 MB	dd if=/dev/zero of=/data.img bs=1024 count=102400	
105 MB	dd if=/dev/zero of=/data.img bs=1024 count=102400	
128 B	#(nop)	COPY file:7d7841b981b83c70587d3e18893f03316961e01d727c9fa011810ff4cac06db in /hello1.php

Current Layer Contents

Permission	UID:GID	Size	Filetree
-rwxr-xr-x	0:0	837 kB	bin
-rwxr-xr-x	0:0	0 B	arch -> /bin/busybox
-rwxr-xr-x	0:0	0 B	ash -> /bin/busybox
-rwxr-xr-x	0:0	0 B	base64 -> /bin/busybox
-rwxr-xr-x	0:0	0 B	bbconfig -> /bin/busybox
-rwxr-xr-x	0:0	837 kB	busybox
-rwxr-xr-x	0:0	0 B	cat -> /bin/busybox
-rwxr-xr-x	0:0	0 B	chattr -> /bin/busybox
-rwxr-xr-x	0:0	0 B	chgrp -> /bin/busybox
-rwxr-xr-x	0:0	0 B	chmod -> /bin/busybox
-rwxr-xr-x	0:0	0 B	chown -> /bin/busybox
-rwxr-xr-x	0:0	0 B	cp -> /bin/busybox
-rwxr-xr-x	0:0	0 B	date -> /bin/busybox
-rwxr-xr-x	0:0	0 B	dd -> /bin/busybox
-rwxr-xr-x	0:0	0 B	df -> /bin/busybox
-rwxr-xr-x	0:0	0 B	dmeg -> /bin/busybox
-rwxr-xr-x	0:0	0 B	domainname -> /bin/busybox
-rwxr-xr-x	0:0	0 B	dumpmap -> /bin/busybox
-rwxr-xr-x	0:0	0 B	echo -> /bin/busybox
-rwxr-xr-x	0:0	0 B	ed -> /bin/busybox
-rwxr-xr-x	0:0	0 B	egrep -> /bin/busybox
-rwxr-xr-x	0:0	0 B	false -> /bin/busybox
-rwxr-xr-x	0:0	0 B	fatattr -> /bin/busybox
-rwxr-xr-x	0:0	0 B	fdflush -> /bin/busybox
-rwxr-xr-x	0:0	0 B	fgrep -> /bin/busybox
-rwxr-xr-x	0:0	0 B	fsync -> /bin/busybox
-rwxr-xr-x	0:0	0 B	getopt -> /bin/busybox
-rwxr-xr-x	0:0	0 B	grep -> /bin/busybox

Layer Details

Tags: (unavailable)

Id: ec26cc0d3f68a58e262d2ae07ad72e2b460f739d374836e910cf6c820221f10

Digest: sha256:24302eb7d9085da80f016e7e4ae55417e412fb7e0a8021e95e3b60c67cde557d

Command: #(nop) ADD file:8e8116368669ed3d361bc898d61bf7249f524139a239fda3ec40869a39921 in /

Image Details

Total Image size: 276 MB

Potential wasted space: 211 MB

Image efficiency score: 61 %

MC Quit | Tab Switch view | F Filter | M Show layer changes | A Show aggregated changes

- 2. 同时 apk add 的动作可以合并为一层
- 3. php 版本为7.4.30


```
$ docker build -f Dockerfile.migrate -t shareinto/php:migrate . && docker images | grep shareinto/php
```

shareinto/php	migrate	
7cdd7b82c617	1 second ago	66.3MB

最终镜像大小为: 66.3MB

可用性测试:

```
rob@THINKPAD-ROBIN:~/workspace/k8s-102$ docker run -p 7100:80 shareinto/php:migrate php -S 0.0.0.0:80 /hello1.php
[Mon Aug 1 16:52:44 2022] PHP 7.4.30 Development Server (http://0.0.0.0:80) started
[Mon Aug 1 16:52:45 2022] 172.17.0.1:54756 Accepted
[Mon Aug 1 16:52:45 2022] 172.17.0.1:54756 Closing
```

```
rob@THINKPAD-ROBIN:~/workspace/k8s-102$ curl 127.0.0.1:7100
<html>
<head>
<title>PHP 测试</title>
</head>
<body>
<p>Hello World, this is app1</p> </body>
</html>
```

55.9MB 经验来看, php应该就15mb上下, 就算算上fpm, 也不应该66.3m(Dockerfile.offical-reduce)

```
$ dive shareinto/php:offical
```

Layers	Current Layer Contents
Cmp Size Command	Permission UID:GID Size Filetree
66 MB FROM 6e9cf9c508f85de	drwxr-xr-x 0:0 60 MB
	drwxr-xr-x 0:0 1.3 MB
	drwxr-xr-x 0:0 0 B
	drwxr-xr-x 0:0 6.5 MB
	drwxr-xr-x 0:0 47 kB
	drwxr-xr-x 0:0 42 MB
	drwxr-xr-x 0:0 14 kB
	drwxr-xr-x 0:0 217 kB
	drwxr-xr-x 0:0 10 MB
	-rwxr-xr-x 0:0 10 MB
	-rwxr-xr-x 0:0 833 B
	drwxr-xr-x 0:0 0 B

Layer Details

Tags: (unavailable)

Id: 6e9cf9c508f85deff899c2f12fb1b5e230c3bf27bcb4875a65d6ee68fe216a7

Digest: sha256:238b01689dbd49cbe0193bbe9eb8ae8ede7961031480281e76ca9591fc95a157

Command: COPY / / # buildkit

Image Details

Filetree

- usr
 - bin
 - include
 - lib
 - libexec
 - local
 - sbin
 - share
 - src
 - php.tar.xz
 - php.tar.xz.asc
 - var

看了下 [官方给的Dockerfile](#), 确实压缩包没删干净

可以通过合并这两个layer来做, 不过我本地构建网络有些慢, 这里换个方式, 也是用二阶段构建, 然后剔除这个压缩包

```
$ docker build -f Dockerfile.offical-reduce -t shareinto/php:offical-reduce . && docker images | grep shareinto/php
```

shareinto/php	offical-reduce	
dca1a4ab5521	1 second ago	55.9MB

最终镜像大小为: 55.9MB

可用性测试:

```
rob@THINKPAD-ROBIN:~/workspace/k8s-102$ docker run -p 7100:80 shareinto/php:offical-reduce php -S 0.0.0.0:80 /hello1.php
[Mon Aug 1 16:53:31 2022] PHP 7.4.30 Development Server (http://0.0.0.0:80) started
[Mon Aug 1 16:53:34 2022] 172.17.0.1:54760 Accepted
[Mon Aug 1 16:53:34 2022] 172.17.0.1:54760 Closing
```

```
rob@THINKPAD-ROBIN:~/workspace/k8s-102$ curl 127.0.0.1:7100
<html>
<head>
<title>PHP 测试</title>
</head>
<body>
<p>Hello World, this is app1</p> </body>
</html>
```

11.7MB 生产不推荐这么搞, 就是一次好玩的分析(Dockerfile.funny)

如果只是考虑让php跑起来，可以用 `php -S`，不一定非得要php-fpm。

其次，有些lib库还真不一定是必须的

alpine 记得因为策略原因，所以只保留了最新的apk包。

所以我们这里

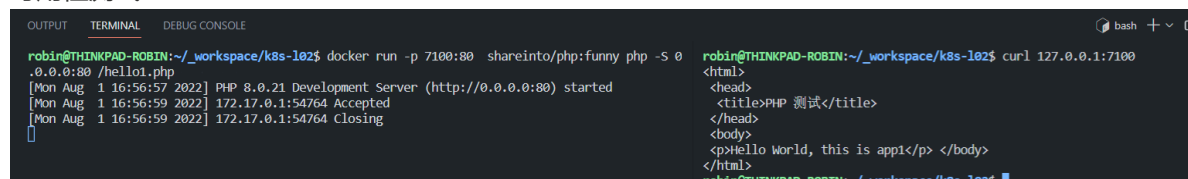
1. 先用alpine来做php的bin
2. 移除所有无用的lib库
3. 二阶段准备一个极度纯净的scrash (正常应该用busybox啦，不然连/bin/bash都没有)
4. 我们只把/bin和需要的/lib 复制过来

```
$ docker build -f Dockerfile.funny -t shareinto/php:funny . && docker images | grep shareinto/php
```

shareinto/php		funny
ef1a5a150dad	7 days ago	11.7MB

最终镜像大小为: 11.7MB

可用性测试:



```
robins@THINKPAD-ROBIN:~/workspace/k8s-102$ docker run -p 7100:80 shareinto/php:funny php -S 0.0.0.0:80 /hello1.php
[Mon Aug 1 16:56:57 2022] PHP 8.0.21 Development Server (http://0.0.0.0:80) started
[Mon Aug 1 16:56:59 2022] 172.17.0.1:54764 Accepted
[Mon Aug 1 16:56:59 2022] 172.17.0.1:54764 Closing

robins@THINKPAD-ROBIN:~/workspace/k8s-102$ curl 127.0.0.1:7100
<html>
<head>
<title>PHP 测试</title>
</head>
<body>
<p>Hello World, this is app1</p> </body>
</html>
```

附录，简单查阅了一些Lib库，做个记录

Permission	UID:GID	Size	Filetree
drwxr-xr-x	0:0	706 kB	lib
drwxr-xr-x	0:0	0 B	firmware
-rwxr-xr-x	0:0	605 kB	ld-musl-x86_64.so.1
-rwxrwxrwx	0:0	0 B	libc.musl-x86_64.so.1 → ld-musl-x86_64.so.1
-rwxrwxrwx	0:0	0 B	libz.so.1 → libz.so.1.2.12
-rwxr-xr-x	0:0	100 kB	libz.so.1.2.12
drwxr-xr-x	0:0	0 B	mdev
drwxr-xr-x	0:0	0 B	modules-load.d
drwxr-xr-x	0:0	1.3 kB	sysctl.d
-rw-r--r--	0:0	1.3 kB	00-alpine.conf
drwxr-xr-x	0:0	11 MB	usr
drwxr-xr-x	0:0	8.4 MB	bin
drwxr-xr-x	0:0	2.8 MB	lib

ld-musl-x86_64.so.1

<https://musl.libc.org/>

linux 标准库，如果没有，二进制的php将无法执行(/usr/bin/php: no such file or directory)

libz.so.1.2.12

https://refspecs.linuxbase.org/LSB_3.0.0/LSB-Core-generic/LSB-Core-generic/libz.html

压缩库，在php中必须(needed by /usr/bin/php)

Permission	UID:GID	Size	Filetree
drwxr-xr-x	0:0	11 MB	usr
drwxr-xr-x	0:0	8.4 MB	bin
-rwxr-xr-x	0:0	8.4 MB	php
drwxr-xr-x	0:0	2.8 MB	lib
drwxr-xr-x	0:0	63 kB	engines-1.1
-rwxr-xr-x	0:0	23 kB	afalg.so
-rwxr-xr-x	0:0	14 kB	capi.so
-rwxr-xr-x	0:0	26 kB	padlock.so
-rw-r--r--	0:0	38 kB	libargon2.so.1
-rwxrwxrwx	0:0	0 B	libcrypto.so.1.1 → ../../lib/libcrypto.so.1.1
-rwxrwxrwx	0:0	0 B	libedit.so.0 → libedit.so.0.0.68
-rwxr-xr-x	0:0	194 kB	libedit.so.0.0.68
-rwxrwxrwx	0:0	0 B	libformw.so.6 → libformw.so.6.3
-rwxr-xr-x	0:0	64 kB	libformw.so.6.3
-rwxrwxrwx	0:0	0 B	liblzma.so.5 → liblzma.so.5.2.5
-rwxr-xr-x	0:0	137 kB	liblzma.so.5.2.5
-rwxrwxrwx	0:0	0 B	libmenuw.so.6 → libmenuw.so.6.3
-rwxr-xr-x	0:0	35 kB	libmenuw.so.6.3
-rwxrwxrwx	0:0	0 B	libncursesw.so.6 → libncursesw.so.6.3
-rwxr-xr-x	0:0	376 kB	libncursesw.so.6.3
-rwxrwxrwx	0:0	0 B	libpanelw.so.6 → libpanelw.so.6.3
-rwxr-xr-x	0:0	18 kB	libpanelw.so.6.3
-rwxrwxrwx	0:0	0 B	libpcre2-8.so.0 → libpcre2-8.so.0.11.0
-rwxr-xr-x	0:0	658 kB	libpcre2-8.so.0.11.0
-rwxrwxrwx	0:0	0 B	libpcre2-posix.so.3 → libpcre2-posix.so.3.0.2
-rwxr-xr-x	0:0	14 kB	libpcre2-posix.so.3.0.2
-rwxrwxrwx	0:0	0 B	libssl.so.1.1 → ../../lib/libssl.so.1.1
-rwxrwxrwx	0:0	0 B	libxml2.so.2 → libxml2.so.2.9.14
-rwxr-xr-x	0:0	1.2 MB	libxml2.so.2.9.14
drwxr-xr-x	0:0	0 B	modules-load.d
drwxr-xr-x	0:0	0 B	php8
drwxr-xr-x	0:0	0 B	modules

libargon2.so.1

<https://packages.debian.org/sid/libargon2-1>

应该是算hash散列的，php有用到(needed by /usr/bin/php)

libedit.so.0.0.68

<https://www.php.net/manual/zh/refs.utilspec.cmdline.php>

<https://www.thrysoee.dk/editline/>

php cli必须，命令行用的东西(needed by /usr/bin/php)

libformw.so.6.3

https://lfs.xry111.site/zh_CN/8.4-systemd/chapter06/ncurses.html

ncurses里的，应该是不需要的，主要是画TUI界面的，类似BIOS一类，libformw是做表单相关的，可以删除

liblzma.so.5.2.5

GitHub - kobolabs/liblzma

压缩相关，xml需要(/usr/lib/libxml2.so.2)

libmenuw.so.6.3

同libformw.so.6.3，属于ncurses里的，画菜单的好像。也可以删

libncursesw.so.6.3

不能删，php cli的时候有用到，应该是对一些宽字符做转义用的(needed by /usr/lib/libedit.so.0)

libpanelw.so.6.3

同libformw.so.6.3，属于ncurses里的，画面板的。可删

libpcre2-8.so.0.11.0

<https://www.pcre.org/>

正则表达式，php要用到(needed by /usr/bin/php)

libpcre2-posix.so.3.0.2

<http://transit.iut2.upmf-grenoble.fr/cgi-bin/dpkg?query=libpcre2-posix3:amd64>

posix兼容perl的正则表达式库，额似乎是运行时如果用到才会被调用，居然可以删

libxml2.so.2.9.14

<https://www.linuxfromscratch.org/blfs/view/svn/general/libxml2.html>

php的老命，没有xml，php/xhr什么的都用不了了(needed by /usr/bin/php)

残留的问题

1. 二阶段如果大家都是busybox，无脑使用，`COPY --from=builder / /` 会不会有什么风险呢？
2. 现在是通过一阶段来做先删再复制，查阅了一番，似乎 `COPY --from=builder` 没有 `.dockerignore` 这个机制，有啥办法能让这个操作更优雅些不？
3. 应该是还能比11.8m小，不过现在很多lib库在高版本的php中是必须的，除非自己在编译php bin的时候，对编译参数做调整，移除一些lib.

附件

```
robin@THINKPAD-ROBIN:~/_workspace/k8s-l02$ docker images | grep shareinto
```

shareinto/php	egg	ffbe4ff5a415	2 minutes ago	11.7MB
shareinto/php	funny	ffbe4ff5a415	2 minutes ago	11.7MB
shareinto/php	offical-reduce	dca1a4ab5521	About an hour ago	55.9MB
shareinto/php	migrate	7cdd7b82c617	2 hours ago	66.3MB
shareinto/php	test	b044a76ce876	7 days ago	11.8MB
shareinto/php	funny-alpine	9818878781a8	7 days ago	19.4MB
shareinto/php	funny-stage1	7e903cc1a902	7 days ago	19.3MB
shareinto/php	offical	1eedbc8bcd92	10 days ago	66.7MB
shareinto/php	slim	1eedbc8bcd92	10 days ago	66.7MB
shareinto/php	fat	4f361562317d	2 weeks ago	276MB

Dockerfile.offical

```
FROM php:7.4.30-fpm-alpine3.16
COPY --from=shareinto/php:fat /hello1.php /hello1.php
```

Dockerfile.migrate

```
FROM scratch as builder

COPY --from=shareinto/php:fat / /
RUN rm /var/www/html/data.img

FROM scratch

COPY --from=builder / /
```

Dockerfile.offical-reduce

```
FROM php:7.4.30-fpm-alpine3.16 as builder
RUN rm -r /usr/src/

FROM scratch

COPY --from=builder / /
COPY --from=shareinto/php:fat /hello1.php /hello1.php
```

Dockerfile.funny

```
FROM alpine:edge as builder
# COPY --from=shareinto/php:fat /usr/local/bin/php /usr/local/bin/php
RUN apk update && apk add php
RUN rm /lib/libcrypto.so.1.1 && rm -r /lib/apk && rm /lib/libssl.so.1.1 && rm
/lib/libapk.so.3.12.0 && rm /usr/lib/libformw.so.6.3 && rm
/usr/lib/libmenuw.so.6.3 && rm /usr/lib/libpcre2-posix.so.3.0.2 && rm -r
/usr/lib/engines-1.1
RUN cp /usr/bin/php8 /dist
# RUN cp /lib /dist

FROM scratch
COPY --from=builder /usr/bin/php8 /usr/bin/php
COPY --from=builder /usr/lib /usr/lib
COPY --from=builder /lib /lib
COPY --from=shareinto/php:fat /hello1.php /hello1.php
CMD ["/usr/bin/php", "-s", "0.0.0.0:80", "/hello1.php"]
```