

13.Nginx平滑升级

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1.Nginx平滑升级概述

- 1.1 什么是平滑升级
- 1.2 平滑升级实现原理
- 1.3 平滑升级实现思路
- 1.4 平滑升级所需信号

2.Nginx平滑升级实践

- 2.1 安装Nginx所需依赖
- 2.2 编译并安装Nginx
- 2.3 备份旧Nginx二进制
- 2.4 向旧Master发送USR2信号
- 2.5 向旧Master发送WINCH信号
- 2.6 向旧Master发送QUIT信号

3.Nginx平滑回滚实践

- 3.1 平滑回退思路
- 3.2 替换nginx二进制文件
- 3.3 向旧的master发送USR2信号
- 3.4 向旧的master发送WINCH信号
- 3.5 向旧的master发送QUIT信号

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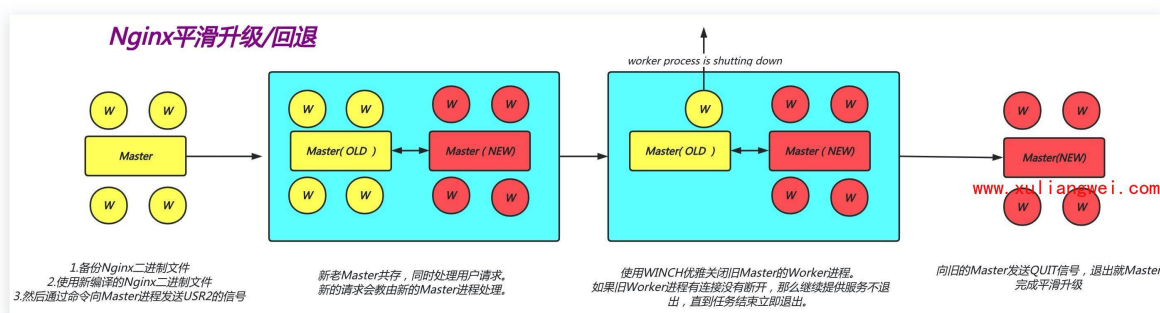
个人博客"[徐亮伟架构师之路](#)"累计受益数万人。

1.Nginx平滑升级概述

1.1 什么是平滑升级

在进行服务版本升级的时候，对于用户访问体验无感知、不会造成服务中断。

1.2 平滑升级实现原理



1.3 平滑升级实现思路

- 如何实现Nginx平滑升级思路（建议准备一个大文件持续下载验证升级是否会影响业务）
 - 1.下载新版本nginx
 - 2.了解原旧版本nginx编译参数
 - 3.将旧nginx二进制文件进行备份，然后替换成为新的nginx二进制文件
 - 4.向旧nginx的Master进程发送USR2 信号
 - 4.1) 旧master进程的pid文件添加后缀 .oldbin

- 4.2) master进程会用新nginx二进制文件启动新的master进程
- 5.向旧master进程发送WINCH信号，旧的worker子进程优雅退出
- 6.向旧master进程发送QUIT信号，旧的master进程就退出了

1.4 平滑升级所需信号

信号	含义
QUIT	优雅关闭、quit
HUP	优雅重启、reload
USR1	重新打开日志文件、reopen
USR2	平滑升级可执行的二进制程序
WINCH	平滑关闭Worker进程

2.Nginx平滑升级实践

2.1 安装Nginx所需依赖

```
[root@web01 ~]# yum install gcc redhat-rpm-  
config \  
libxslt-devel gd-devel perl-ExtUtils-Embed  
\  
geoip-devel gperftools-devel pcre-devel  
openssl-devel -y
```

2.2 编译并安装Nginx

```
[root@web ~]# wget
http://nginx.org/download/nginx-
1.16.1.tar.gz
[root@web ~]# tar xf nginx-1.16.1.tar.gz
[root@web ~]# cd nginx-1.16.1/
```

#编译

```
[root@web ~]# ./configure --
prefix=/etc/nginx --with-compat --with-
file-aio --with-threads --with-
http_addition_module --with-
http_auth_request_module --with-
http_dav_module --with-http_flv_module --
with-http_gunzip_module --with-
http_gzip_static_module --with-
http_mp4_module --with-
http_random_index_module --with-
http_realip_module --with-
http_secure_link_module --with-
http_slice_module --with-http_ssl_module --
with-http_stub_status_module --with-
http_sub_module --with-http_v2_module --
with-mail --with-mail_ssl_module --with-
stream --with-stream_realip_module --with-
stream_ssl_module --with-
stream_ssl_preread_module
```

#仅make即可，不需要make install。因为make后会生成新的二进制文件

```
[root@web ~]# make
```

2.3 备份旧Nginx二进制

```
# 将旧的nginx二进制文件进行备份，然后替换成为新的
nginx二进制文件
[root@web nginx-1.16.1]# mv /usr/sbin/nginx
/usr/sbin/nginx.old
[root@web nginx-1.16.1]# cp objs/nginx
/usr/sbin/nginx
```

2.4 向旧Master发送USR2信号

```
# 向旧的Nginx的Master进程发送USR2信号。（平滑升级
二进制可执行文件）
```

```
[root@web nginx-1.16.1]# ps -ef |grep nginx
root      20848      1  0 10:21 ?
    00:00:00 nginx: master process
/usr/sbin/nginx -c /etc/nginx/nginx.conf
nginx     20863   20848  0 10:22 ?
    00:00:00 nginx: worker process
nginx     20864   20848  0 10:22 ?
    00:00:00 nginx: worker process
```

```
#发送信号
```

```
[root@web nginx-1.16.1]# kill -USR2 20848
```

```
#pid文件会自动添加.olddb后缀，该文件中记录的是旧
master的pid进程号
```

```
[root@web nginx-1.16.1]# cat
/var/run/nginx.pid.olddb
```

20848

#新老master共存了

```
[root@web nginx-1.16.1]# ps -ef |grep nginx
```

```
root      20848      1  0 10:21 ?
```

```
00:00:00 nginx: master process
```

```
/usr/sbin/nginx -c /etc/nginx/nginx.conf
```

```
(OLD)
```

```
nginx     20863    20848  0 10:22 ?
```

```
00:00:00 nginx: worker process
```

```
nginx     20864    20848  0 10:22 ?
```

```
00:00:00 nginx: worker process
```

```
root      24971    20848  0 11:37 ?
```

```
00:00:00 nginx: master process
```

```
/usr/sbin/nginx -c /etc/nginx/nginx.conf
```

```
(NEW)
```

```
nginx     24972    24971  0 11:37 ?
```

```
00:00:00 nginx: worker process
```

```
nginx     24973    24971  0 11:37 ?
```

```
00:00:00 nginx: worker process
```

#验证站点是否正常

2.5 向旧Master发送WINCH信号

向旧的master进程发送WINCH信号，旧的worker子进程优雅退出

```
[root@web nginx-1.16.1]# kill -WINCH 20848
[root@web nginx-1.16.1]# ps -ef |grep nginx
root      20848      1  0 10:21 ?
    00:00:00 nginx: master process
/usr/sbin/nginx -c /etc/nginx/nginx.conf
root      24971  20848  0 11:37 ?
    00:00:00 nginx: master process
/usr/sbin/nginx -c /etc/nginx/nginx.conf
nginx     24972  24971  0 11:37 ?
    00:00:00 nginx: worker process
nginx     24973  24971  0 11:37 ?
    00:00:00 nginx: worker process
```

2.6 向旧Master发送QUIT信号

```
[root@web nginx-1.16.1]# kill -QUIT 20848
[root@web nginx-1.16.1]# ps -ef |grep nginx
root      24971      1  0 11:37 ?
    00:00:00 nginx: master process
/usr/sbin/nginx -c /etc/nginx/nginx.conf
nginx     24972  24971  0 11:37 ?
    00:00:00 nginx: worker process
nginx     24973  24971  0 11:37 ?
    00:00:00 nginx: worker process
```

3.Nginx平滑回滚实践

3.1 平滑回退思路

- 1.替换 `nginx` 二进制文件
- 2.向旧的1.21 `master` 发送`USR2` 信号
- 3.向旧的1.21 `master` 发送`WINCH`
- 4.向旧的1.21 `master` 发送`QUIT`

3.2 替换nginx二进制文件

```
[root@web ~]# mv /usr/sbin/nginx  
/usr/sbin/nginx-1.16  
[root@web ~]# mv /usr/sbin/nginx.old  
/usr/sbin/nginx
```

3.3 向旧的master发送USR2信号

```
[root@web ~]# ps -ef |grep nginx
root      24971      1  0 11:37 ?
    00:00:00 nginx: master process
/usr/sbin/nginx -c /etc/nginx/nginx.conf
nginx     25124    24971  0 11:48 ?
    00:00:00 nginx: worker process
nginx     25125    24971  0 11:48 ?
    00:00:00 nginx: worker process
```

```
[root@web ~]# kill -USR2 24971
[root@web ~]# ps -ef |grep nginx
root      24971      1  0 11:37 ?
    00:00:00 nginx: master process
/usr/sbin/nginx -c /etc/nginx/nginx.conf
(OLD 1.16)
nginx     25124    24971  0 11:48 ?
    00:00:00 nginx: worker process
nginx     25125    24971  0 11:48 ?
    00:00:00 nginx: worker process
root      25163    24971  1 11:50 ?
    00:00:00 nginx: master process
/usr/sbin/nginx -c /etc/nginx/nginx.conf
(NEW 1.14)
nginx     25164    25163  0 11:50 ?
    00:00:00 nginx: worker process
nginx     25165    25163  0 11:50 ?
    00:00:00 nginx: worker process
```

3.4 向旧的master发送WINCH信号

```
# 向旧的master发送WINCH信号，优雅关闭旧的worker  
工作进程  
[root@web ~]# kill -WINCH 24971  
[root@web ~]# ps -ef |grep nginx  
root      24971      1  0 11:37 ?  
    00:00:00 nginx: master process  
/usr/sbin/nginx -c /etc/nginx/nginx.conf  
nginx     25124    24971  0 11:48 ?  
    00:00:00 nginx: worker process is shutting  
down  
root      25163    24971  0 11:50 ?  
    00:00:00 nginx: master process  
/usr/sbin/nginx -c /etc/nginx/nginx.conf  
nginx     25164    25163  0 11:50 ?  
    00:00:00 nginx: worker process  
nginx     25165    25163  0 11:50 ?  
    00:00:00 nginx: worker process
```

3.5 向旧的master发送QUIT信号

向旧的master发送QUIT信号，退出master进程

```
[root@web ~]# kill -QUIT 24971
```

```
[root@web ~]# ps -ef |grep nginx
```

```
root      25163      1  0 11:50 ?
```

```
00:00:00 nginx: master process
```

```
/usr/sbin/nginx -c /etc/nginx/nginx.conf
```

```
nginx     25164  25163  0 11:50 ?
```

```
00:00:00 nginx: worker process
```

```
nginx     25165  25163  0 11:50 ?
```

```
00:00:00 nginx: worker process
```