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# Borcade SAN Switch

## 一、概述

### 1、简介

配置 Zoning 需要涉及到三个对象的配置 Alias, Zone, Configuration。

#### 1. Alias:

别名, 可以把设备的 WWN或 "Domain,Port" 声明为 Alias, 两个作用:

- 使更好更直观的标示设备。使用 Alias 的主要目的是方便用户的使用 (类似身份证号和名字);
- 声明Alias 的另外一个益处是便于 Zone 中成员的更换。当 Zone 中的某个成员更换时, 如果定义了 Alias, 只要修改 Alias 的定义而不用修改 Zone 的配置。

#### 2. Zone

Zone 区域: Zone内的设备可以相互访问, 但不能访问其他 Zone 的设备。

Zone 的成员可以有三种: "Domain,Port"; "WWN"; "Alias"。Zone 对成员的数量没有限制, 可以同时有多个类型的多个设备同时存在于一个 Zone 中。

#### 3. Configuration

在交换机上的一套关于 Zone 的配置, 或者说一系列 Zone 的集合。它可以包含一个或多个 Zone 作为它的成员。在一个SAN 网络中可以有多个配置文件, 但只能有一个处于Effective状态的配置文件, 故而所有要使用的zone都要加到Effective状态的配置文件。Zoning 的配置可以动态的进行, 当使用 cfgEnable 指定某个配置成为生效的配置后, Zoning 的配置会立即在 SAN 网络中生效, 隔离 Zone 间的相互访问。

## 2、光纤通道端口

光纤通道也定义了一系列不同类别可以用于接收和传输光纤通道数据的端口, 如下

#### 1. 设备 (节点)端口

N\_Port = Fabric直接连接设备

NL\_Port = Loop连接设备

#### 2. 交换机端口

E\_Port = 扩展端口 (交换机到交换机)

F\_Port = Fabric端口

FL\_Port = Fabric Loop端口

G\_Port = 通用(Generic)端口 槩 可以转化为E或F

## 二、Brocade SAN Switch日常维护

# 1、信息查询(巡检)

## 1. IP信息查询: `ipaddrshow`

```
moonpac:admin> ipaddrshow

SWITCH
Ethernet IP Address: 10.172.28.6
Ethernet Subnetmask: 255.255.255.0
Fibre Channel IP Address: 0.0.0.0
Fibre Channel Subnetmask: 0.0.0.0
Gateway Address: 10.172.28.1
```

## 2. 查看交换机信息及所有端口状态: `switchshow`

```
moonpac:admin> switchshow
switchName: moonpac
switchType: 34.0
switchState: Online
switchMode: Native
switchRole: Principal
switchDomain: 1
switchId: fffc01
switchWwn: 10:00:00:05:1e:02:22:f1
zoning:      ON (cfg0)
switchBeacon: OFF

Area Port Media Speed State
=====
  0   0   id    N2    Online   F-Port  20:24:00:a0:b8:26:11:a6
  1   1   id    N2    Online   F-Port  20:25:00:a0:b8:26:11:a6
  2   2   id    N2    Online   F-Port  10:00:00:90:fa:ca:87:02
  3   3   id    N2    Online   F-Port  10:00:00:90:fa:ca:87:03
  4   4   id    N2    No_Light
  5   5   id    N2    No_Light
  6   6   id    N2    No_Light
  7   7   id    N2    No_Light
  8   8   --    N4    No_Module (No POD License) Disabled
  9   9   --    N4    No_Module (No POD License) Disabled
 10  10   --    N4    No_Module (No POD License) Disabled
 11  11   --    N4    No_Module (No POD License) Disabled
 12  12   --    N4    No_Module (No POD License) Disabled
 13  13   --    N4    No_Module (No POD License) Disabled
 14  14   --    N4    No_Module (No POD License) Disabled
 15  15   --    N4    No_Module (No POD License) Disabled
```

## 3. 查看交换机运行状态: `switchstatusshow`

交换机状态为**healthy**，则表示交换机当前运行正常，如果有不是**healthy**的状态出现，则需要根据具体问题使用相关命令继续检查。

```
moonpac:admin> switchstatusshow
```

```
Switch Health Report                                Report time: 01/01/2000 08:35:11 PM
Switch Name: moonpac
IP address: 10.172.28.6
SwitchState: HEALTHY
Duration: 20:33

Power supplies monitor HEALTHY
Temperatures monitor HEALTHY
Fans monitor HEALTHY
Flash monitor HEALTHY
Marginal ports monitor HEALTHY
Faulty ports monitor HEALTHY
Missing SFPs monitor HEALTHY
Fabric Watch is not licensed
Detailed port information is not included
```

#### 4. 风扇运行状态: fanshow

```
moonpac:admin> fanshow
Fan 1 is Ok
Fan 2 is Ok
Fan 3 is Ok
```

#### 5. 当前温度查询: tempshow

显示交换机当前温度信息,并检查当前交换机的温度传感器是否为OK状态

```
moonpac:admin> tempshow
Sensor State Centigrade Fahrenheit
ID
=====
1 Ok 29 84
2 Ok 29 84
```

#### 6. 电源运行状态: psshow

电源状态都是OK则表明电源运行正常, **absent**表示没有插电源。

```
moonpac:admin> psshow
Power Supply #1 is OK
```

#### 7. 错误日志: errdump

#### 8. Firmware版本信息: firmwareshow

```
moonpac:admin> firmwareshow
Primary partition: v5.0.1b
```

```
Secondary Partition: v5.0.1b
```

## 9. 显示交换机的工作时间: `uptime`

检查该交换机当前时钟，目前有几个用户登录到这台交换机，以及它已经正常工作了多长时间等信息。

```
moonpac:admin> uptime
5:42am up 3:25, 1 user, load average: 0.00, 0.00, 0.00
```

## 10. License信息查询: `licenseshow`

```
moonpac:admin> licenseshow
cbSRRSzcdccTSSp:
    Web license
RdybRccSdySezcSU:
    Zoning license
```

## 11. zone的配置信息查询: `cfgshow`

```
moonpac:admin> cfgshow
Defined configuration:
cfg: cfg0 dsa_fc1; dsa_fc2; dsb_fc1; dsb_fc2
zone: dsa_fc1 dsa; fc1
zone: dsa_fc2 dsa; fc2
zone: dsb_fc1 dsb; fc1
zone: dsb_fc2 dsb; fc2
alias: dsa 1,0
alias: dsb 1,1
alias: fc1 1,2
alias: fc2 1,3

Effective configuration:
cfg: cfg0
zone: dsa_fc1 1,0
    1,2
zone: dsa_fc2 1,0
    1,3
zone: dsb_fc1 1,1
    1,2
zone: dsb_fc2 1,1
    1,3
```

# 2、维护操作

## 1. IP设置: `ipaddrset`

```
switch:admin> ipaddrset
Ethernet IP Address [10.172.28.6]: 10.172.28.8
Ethernet Subnetmask [255.255.255.0]:
Fibre Channel IP Address [0.0.0.0]:
Fibre Channel Subnetmask [0.0.0.0]:
Gateway IP Address [10.172.28.1]:
Issuing gratuitous ARP...Done.
IP address is being changed...Done.
Committing configuration...Done.
```

## 2. 自定义交换机名称: `switchname newname`

```
switch:admin> switchname moonpac
Committing configuration...
Done.
moonpac:admin>
```

## 3. 导入许可信息: `licenseadd "license-key"`

## 4. 配置备份: `configupload`

- 配置文件的备份的作用: 灾难恢复 故障诊断及恢复 恢复一台无效配置的交换机 修改或者扩展SAN 恢复意外删除的许可 恢复或者重配分区配置
- 需求: 有一台FTP Server.

```
moonpac:admin> configupload
Protocol (scp or ftp) [ftp]: ftp
Server Name or IP Address [host]: 10.172.28.103
User Name [user]: dream
File Name [config.txt]: ds4700_cfg.txt
Password:
Upload complete
```

## 5. 配置恢复: `configdownload`

先要关闭交换机: `switchdisable`

```
moonpac:admin> configdownload
configDownload: This command may not be executed on an operational switch.
You must first disable the switch using the "switchDisable" command.
moonpac:admin> switchdisable
moonpac:admin> configdownload
Protocol (scp or ftp) [ftp]: ftp
Server Name or IP Address [host]: 10.172.28.103
User Name [user]: dream
File Name [config.txt]: ds4700_cfg.txt
Password:

*** CAUTION ***
```

```
This command is used to download a backed-up configuration
for a specific switch. If using a file from a different
switch, this file's configuration settings will override
any current switch settings. Downloading a configuration
file, which was uploaded from a different type of switch,
may cause this switch to fail. A switch reboot might be
required for some parameter changes to take effect.
```

```
Do you want to continue [y/n]: y
download completed.
```

## 6. 修改用户密码: `passwd [username]`

不加username时修改当前用户的密码

```
moonpac:admin> passwd
Changing password for admin
Enter old password:
Enter new password:
Password must be between 8 and 40 characters long.
Enter new password:
Re-type new password:
passwd: all authentication tokens updated successfully
Saving password to stable storage.
Password saved to stable storage successfully.
```

## 3、忘记密码时恢复默认密码

恢复密码的大概过程是:

1. 重启San Switch。
2. 重启的时候可以注意到有一个提示, 4秒内按esc可以中断启动, 进入启动接口模式。
3. 按3进入到command shell 模式,手动启动系统到单用户模式。
4. 恢复密码并重启san switch。

### 1. 串口链接SAN Switch并重启

```
moonpac:admin> reboot
```

### 2. 在交换机启动到 `Press escape within 4 seconds to enter boot interface` 时在4秒内按 `Esc` 进入Boot PROM菜单,一共有3 个选项:

```
Press escape within 4 seconds to enter boot interface.
```

- |                         |  |
|-------------------------|--|
| 1) Start system.        | // 启动系统                                  |
| 2) Recover password.    | // 生成支持提供商的字符串, 以恢复Boot PROM密码; 需要有"Reco |
| very"密码, 仅原厂限内部使用;      |  |
| 3) Enter command shell. | // 打开一个可以输入命令的shell                      |

```
Option? 3
```

### 3. 输入3进入到command shell模式,通过配置以单用户模式启动设备(其实就是一个嵌入式Linux)

```

.....
Option? 3
Password: //输入Boot PROM密码,如果没有设置,则会提示"Boot PROM password has not been set",这个密码可以在"command shell"中设置
> help //帮助
Valid commands are:
  auto Boot per boot environment variable settings
  boot Boot specified image
  date Display or set the system date and time
  debug Hardware debug - General debug utilities
  diag Hardware tests - Hardware test diagnostics
  help Display this list of commands
  helpenv Display help for boot environment variables
  hinv Display hardware inventory
  passwd Set the boot modification password
  ping Ping test
  printenv Display all boot environment variables
  reset Reset the system
  resetpw Remove the boot modification password
  setenv Set a boot environment variable
  saveenv Save the current boot environment variables
  unsetenv Unset a boot environment variable
  version Display boot version info
> passwd //修改Boot PROM密码,这个与恢复系统密码无关.
Old password:
New password:
Re-enter new password:
> saveenv //保存当前的引导环境变量,不保存重启失效.
> resetpw //删除Boot PROM密码,这个与恢复系统密码无关.
> saveenv
> printenv //显示所有引导环境变量,目的是查看switch的系统OSLoader值为多少
AutoLoad=yes
ENET_MAC=00051E0222F1
InitTest=MEM()
LoadIdentifiers=Fabric Operating System;Fabric Operating System
OSLoadOptions=quiet;quiet
OSLoader=ATA()0x10b10;ATA()0x55000 //OS的加载程序(可启动DEVICE),可以看出有两个系统
OSRootPartition=hda1;hda2 //OS的"/"分区,也有两个
SkipWatchdog=yes
> boot ATA()0x10b10 -s //格式为:"boot DEVICE [COMMAND_LINE]":DEVICE一般为OSLoader的第一个值;COMMAND_LINE可以把"-s"更换为"single",与Linux(grub 1.x)何其相似啊
Booting "Manually selected OS" image.
Entry point at 0x01000000 ...
开机自检过程省略.....
INIT: version 2.78 booting
sh-2.04# //已进入单用户模式
sh-2.04#

```

- 启动单用户还有一种设置,原理是一样的,可我做实验失败了,但我同事却在一家客户那边做过,可能版本不同采用的方法不同(猜测哈),就当做个记录,上面的方法不成功是可以试试这个.

```

.....
Option? 3
Boot PROM password has not been set.
> setenv OSLoadOptions=single
> printenv

```



```

Unrecognized command "printenv".
"help" will give a list of commands.
> printenv
AutoLoad=yes
ENET_MAC=00051E0222F1
InitTest=MEM()
LoadIdentifiers=Fabric Operating System;Fabric Operating System
OSLoadOptions=single //表示交换机将引导到单用户模式
OSLoader=ATA() 0x10b10;ATA() 0x55000
OSRootPartition=hda1;hda2
SkipWatchdog=yes
> saveenv //保存, 否则不生效
> boot
.....
> bootenv OSLoadOptions "quiet;quiet" //将OSLoadOptions重置为"quiet; quiet"
> reboot -f

```

#### 4. 恢复密码并重启SAN Switch

```

sh-2.04#
sh-2.04# mount -o remount,rw,noatime / //挂载以下/分区, 否则的话没有恢复密码的权限
EXT3 FS on hda1, internal journal
sh-2.04#
sh-2.04#
sh-2.04# mount /dev/hda2 /mnt/ //把第二个分区也挂载过来, 这样可以把2个操作
系统的密码都恢复
kjournald starting. Commit interval 5 seconds
EXT3 FS on hda2, internal journal
EXT3-fs: mounted filesystem with ordered data mode.
sh-2.04#
sh-2.04#
sh-2.04# passwddefault //输入passwddefault 来恢复密码
All account passwords have been successfully set to factory default.
sh-2.04# reboot -f //reboot -f来重启san switch.
Restarting system.
重启过程省略.....

```

#### 5. 开机设置密码

```

moonpac console login: admin
Password:
Please change passwords for switch default accounts now.
Use Control-C to exit or press 'Enter' key to proceed.

Warning: Access to the Root and Factory accounts may be required for
proper support of the switch. Please ensure the Root and Factory
passwords are documented in a secure location. Recovery of a lost Root
or Factory password will result in fabric downtime.

for user - root
Changing password for root
Enter new password:
Re-type new password:
passwd: all authentication tokens updated successfully
Please change passwords for switch default accounts now.
for user - factory
Changing password for factory
Enter new password:

```

```

Re-type new password:
passwd: all authentication tokens updated successfully
Please change passwords for switch default accounts now.
for user - admin
Changing password for admin
Enter new password:
Re-type new password:
passwd: all authentication tokens updated successfully
Please change passwords for switch default accounts now.
for user - user
Changing password for user
Enter new password:
Re-type new password:
passwd: all authentication tokens updated successfully
Saving passwords to stable storage.
Passwords saved to stable storage successfully

```

## 4、Firmware升级操作

### 1. 备份当前的配置文件

命令: `configupload` ,详细信息请看上面维护操作的配置备份。

### 2. 查看当前的Firmware版本

```

Firmware版本:
moonpac:admin> firmwareshow
Primary partition: v5.0.1b
Secondary Partition: v5.0.1b

也是Fabric OS的版本:
moonpac:admin> version
Kernel:      2.4.19
Fabric OS:   v5.0.1b
Made on:     Wed Aug 17 21:28:18 2005
Flash:       Tue Jan 24 05:24:32 2006
BootProm:    4.5.2

```

### 3. 在FTP Server上解压firmware包

```
$ sudo tar zxvf v5.3.2c.tar.gz -C /srv/ftp/ //选择匿名登录,故而解压到/srv/ftp
```

### 4. 使用 `firmwareDownload` 命令从FTP服务器下载固件并升级。

```

moonpac:admin> firmwareDownload
You can run firmwareDownloadStatus to get the status
of this command.

This command will cause the switch to reset and will
require that existing telnet, secure telnet or SSH
sessions be restarted.

Do you want to continue [Y]: y
Server Name or IP Address: 10.172.28.103 //FTP服务器自个搭建哈
User Name:                          //匿名,直接回车

```

```
File Name: v5.1.0/release.plist
Password: //匿名用户没密码,直接回车
Firmwaredownload has started.
Removing pcmcia-cs-3.1.29-2
Removing fabos-fss-5.0.1b-9
Start to install packages.....
dir #####
此处省略若干行.....
lkcd #####
sysstat #####
Removing unneeded files, please wait ...
Finished removing unneeded files.

All packages have been downloaded successfully.
Firmwaredownload has completed successfully.
HA Rebooting ...
```

#### 重启后验证版本信息:

```
moonpac:admin> version
Kernel: 2.4.19
Fabric OS: v5.1.0
Made on: Thu Feb 23 01:55:30 2006
Flash: Sat Jan 1 00:11:50 2000
BootProm: 4.5.3
moonpac:admin> firmwareshow
Primary version: v5.1.0
Secondary version: Unknown
```

接着升级到 v6.0.1a 又失败了,只好先升到v5.3.2c,方法一样

#### 重启后验证版本信息:

```
moonpac:admin> firmwareshow
Appl Primary/Secondary Versions
-----
FOS v5.3.2c
Unknown
moonpac:admin> version
Kernel: 2.6.14
Fabric OS: v5.3.2c
Made on: Wed Sep 30 16:51:09 2009
Flash: Sat Jan 1 00:27:34 2000
BootProm: 4.6.5
```

接着升级到 v6.0.1a,步骤稍有点不同:

```
moonpac:admin> firmwareDownload
Server Name or IP Address: 10.172.28.103
User Name:
File Name: v6.0.1a/release.plist
Network Protocol(1-auto-select, 2-FTP, 3-SCP) [1]: 2
Password:
Checking system settings for firmwaredownload...
Protocol selected: FTP
Trying address-->AF_INET IP: 10.172.28.103, flags : 2
System settings check passed.
```

You can run firmwaredownloadstatus to get the status of this command.

This command will cause a warm/non-disruptive boot on the switch, but will require that existing telnet, secure telnet or SSH sessions be restarted.

```
Do you want to continue [Y]: y
Firmware is being downloaded to the switch. This step may take up to 30 minutes
.
Preparing for firmwaredownload...
此处省略若干行.....
```

重启后验证版本信息:

```
moonpac:admin> version
Kernel:      2.6.14.2
Fabric OS:   v6.0.1a
Made on:     Thu May 22 17:55:05 2008
Flash:       Sat Jan 1 00:39:02 2000
BootProm:    4.6.6
moonpac:admin> firmwareshow
Appl        Primary/Secondary Versions
-----
FOS         v6.0.1a
            v6.0.1a
```

- 在升级的过程可以用 `firmwareDownloadStatus` 查看升级状态

```
moonpac:root> firmwareDownloadStatus
[1]: Sat Jan 1 00:24:39 2000
Firmware is being downloaded to the switch. This step may take up to 30 minutes
.

[2]: Sat Jan 1 00:29:27 2000
Firmware has been downloaded to the secondary partition of the switch.
```

## 5. 注意

- 我准备直接升级到v6.0.1a的,结果报 `Firmware download failed. (0x29) The pre-install script failed.` 错误,猜测应该是不能跨越太大版本.
- 接着下载了 `v5.3.2c` 进行升级,报 `Cannot upgrade directly to 5.3. Please upgrade to 5.1 or 5.2 first and then upgrade to 5.3.`,确定是不能跨越太大版本.

# 三、Brocade SAN Switch的zoning配置

注意:

- `cfgenable`和`cfgdisable`是对`configuration`的启用和关闭,该命令执行结束后无需执行 `cfgsave`.
- 对`Alias`,`zone`,`configuration`三个对象进行任何操作后都要执行 `cfgsave` 保存,否则重启后操作不会生效.
- `zone`配置的命令都可以用 `zoneHelp` 帮助命令查到.
- Switch**中可以有多个配置文件,但只能有一个处于**Effective**状态的配置文件,故而所有要使用的**zone**都要加到**Effective**状态的配置文件;同样在已有的**SAN**架构中配置新的**zone**也是加到**Effective**状态的配置文件,而不是以新的配置文件使其生效.

## 1、创建zoning配置

注:记住必须用 `cfgsave` 保存, 和 `cfgenable` 让其生效

## 1. 创建Alias

- 基于 `WWPN` 的Alias创建: `alcreate "Alias_name","WWN"`
- 基于 `port` 的Alias创建: `alcreate "Alias_name","Domain,prot"`

## 2. 创建zone

把别名或端口或WWPN分配到 `zone` 中,命令格式如下:

```
zonecreate "zone_name","[Alias_name];...[Domain,prot];...[WWN];..."
```

- "[ ]"是可选的意思,而不是配置中的字符串;
- `zone`的成员是以 `;` 分割的;

## 3. 创建zone的配置文件

把 `zone` 加入到配置文件中,命令格式如下:

```
cfgcreate "cfg_name","zone_name;zone_name;..."
```

## 4. 保存配置

```
cfgsave
```

## 5. 使 `zone` 配置生效

```
cfgenable "cfg_name"
```

## 6. 实践

```
moonpac:admin> switchshow
此处省略若干行.....
switchDomain: 1
此处省略若干行.....
Area Port Media Speed State
=====
 0  0  id    N2    Online   F-Port  20:24:00:a0:b8:26:11:a6
 1  1  id    N2    Online   F-Port  20:25:00:a0:b8:26:11:a6
 2  2  id    N2    Online   F-Port  10:00:00:90:fa:ca:87:02
 3  3  id    N2    Online   F-Port  10:00:00:90:fa:ca:87:03
 4  4  id    N2    No_Light
 5  5  id    N2    No_Light
 6  6  id    N2    No_Light
 7  7  id    N2    No_Light
此处省略若干行.....
moonpac:admin>
moonpac:admin> alcreate "dsa","20:24:00:a0:b8:26:11:a6"
moonpac:admin> alcreate "fc1","1,2"
moonpac:admin> zonecreate "dsa_fc1","dsa;fc1"
moonpac:admin> zonecreate "dsa_fc2","dsa;1,3"
moonpac:admin> zonecreate "dsb_fc1","1,1;10:00:00:90:fa:ca:87:02"
moonpac:admin> zonecreate "dsb_fc2","1,1;1,3"
moonpac:admin> cfgcreate "cfg0","dsa_fc1;dsa_fc2;dsb_fc1;dsb_fc2"
moonpac:admin> cfgshow
Defined configuration:
cfg: cfg0 dsa_fc1; dsa_fc2; dsb_fc1; dsb_fc2
zone: dsa_fc1 dsa; fc1
zone: dsa_fc2 dsa; 1,3
```

```

zone: dsb_fc1 1,1; 10:00:00:90:fa:ca:87:02
zone: dsb_fc2 1,1; 1,3
alias: dsa 20:24:00:a0:b8:26:11:a6
alias: fc1 1,2

Effective configuration:
no configuration in effect

moonpac:admin> cfgsave
You are about to save the Defined zoning configuration. This
action will only save the changes on Defined configuration.
Any changes made on the Effective configuration will not
take effect until it is re-enabled.
Do you want to save Defined zoning configuration only? (yes, y, no, n): [no] y
es
Updating flash ...
moonpac:admin> cfgenble cfg0
此处省略若干行.....

```

- 上述中是为了演示各种配置方式,zone成员采用了多种混合的方式表示的,正常情况是统一的一种方式,要不统一使用Alias,要不统一使用port.

## 2、维护zoning配置

1. 移除zone的成员: `zoneremove "zone_name", "要移除的成员 (Alias或WWN或Domain,port) "`

```

moonpac:admin> cfgshow
此处省略若干行.....
zone: dsb_fc2 1,1; 1,3
此处省略若干行.....
moonpac:admin> zoneremove "dsb_fc2", "1,3"
moonpac:admin> cfgshow
此处省略若干行.....
zone: dsb_fc2 1,1
此处省略若干行.....

```

2. 向zone中添加成员: `zoneadd "zone_name", "要添加的成员 (Alias或WWN或Domain,port) "`

```

moonpac:admin> zoneadd "dsb_fc2", "1,3"
moonpac:admin> cfgshow
.....
zone: dsb_fc2 1,1; 1,3
.....

```

3. 在配置文件中移除zone: `cfgremove "cfg_name", "要移除的zone"`

```

moonpac:admin> cfgshow
Defined configuration:
cfg: cfg0 dsa_fc1; dsa_fc2; dsb_fc1; dsb_fc2
.....
moonpac:admin> cfgremove "cfg0", "dsb_fc2"
moonpac:admin> cfgshow
Defined configuration:

```

```
cfg: cfg0 dsa_fc1; dsa_fc2; dsb_fc1
.....
```

#### 4. 向已有配置文件添加zone: `cfgadd "cfg_name", "要添加的zone"`

```
moonpac:admin> cfgadd "cfg0", "dsb_fc2"
moonpac:admin> cfgshow
Defined configuration:
  cfg: cfg0 dsa_fc1; dsa_fc2; dsb_fc1; dsb_fc2
.....
```

#### 5. 注意

- 一次的维护操作结束后应执行 `cfgsave` 进行保存;\*
- 维护操作结束后还应执行 `cfgenable cfg_name`, 让配置立即生效.

### 3、删除zoning配置

#### 1. 先看看当前的配置

```
moonpac:admin> cfgshow
Defined configuration:
  cfg: cfg0 dsa_fc1; dsa_fc2; dsb_fc1; dsb_fc2
  zone: dsa_fc1 dsa; fc1
  zone: dsa_fc2 dsa; fc2
  zone: dsb_fc1 dsb; fc1
  zone: dsb_fc2 dsb; fc2
  alias: dsa 1,0
  alias: dsb 1,1
  alias: fc1 1,2
  alias: fc2 1,3

Effective configuration:
  cfg: cfg0
  zone: dsa_fc1 1,0
    1,2
  zone: dsa_fc2 1,0
    1,3
  zone: dsb_fc1 1,1
    1,2
  zone: dsb_fc2 1,1
    1,3
```

#### 2. 清除当前所有zoning配置

- 先关闭处于 `Effective` 状态的配置文件, 命令: `cfgdisable`
- 接着清除当前所有 `zone` 配置, 命令: `cfgclear`
- 保存当前设置(如果不保存交换机重启后原来的配置还在), 命令: `cfgsave`
- 实践:

```
moonpac:admin> cfgdisable
```

```

You are about to disable zoning configuration. This
action will disable any previous zoning configuration enabled.
Do you want to disable zoning configuration? (yes, y, no, n): [no] yes
Updating flash ...
moonpac:admin> cfgclear
The Clear All action will clear all Aliases, Zones, FA Zones
and configurations in the Defined configuration.
Do you really want to clear all configurations? (yes, y, no, n): [no] yes
moonpac:admin>
moonpac:admin> cfgsave
You are about to save the Defined zoning configuration. This
action will only save the changes on Defined configuration.
Any changes made on the Effective configuration will not
take effect until it is re-enabled.
Do you want to save Defined zoning configuration only? (yes, y, no, n): [no] y
es
Updating flash ...
moonpac:admin>
moonpac:admin> reboot

.....

dream@Mint ~ $ telnet 10.172.28.6
.....
moonpac:admin> cfgshow
Defined configuration:
  no configuration defined

Effective configuration:
  no configuration in effect

```

### 3. 删除单个对象

- o 删除Alias: `alidelete Alias_name`
- o 删除zone: `zonedeleter zone_name`
- o 删除configuration: `cfgdelete cfg_name`
- o 实践:

```

moonpac:admin> alidelete dsa
moonpac:admin> zonedeleter dsa_fc1
moonpac:admin> cfgdelete cfg0
moonpac:admin>
moonpac:admin> cfgsave
.....

```