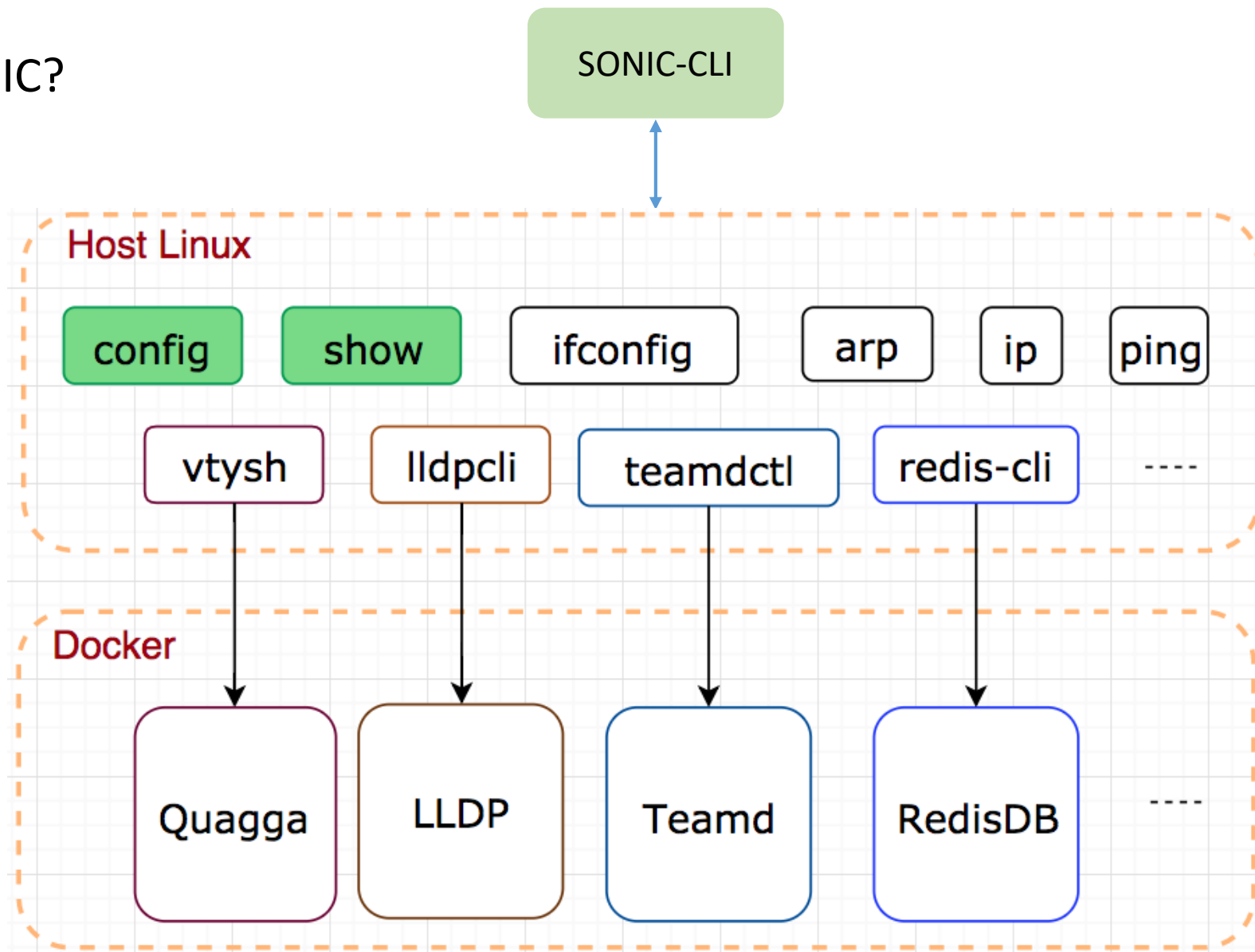


SONIC命令行的扩展与应用

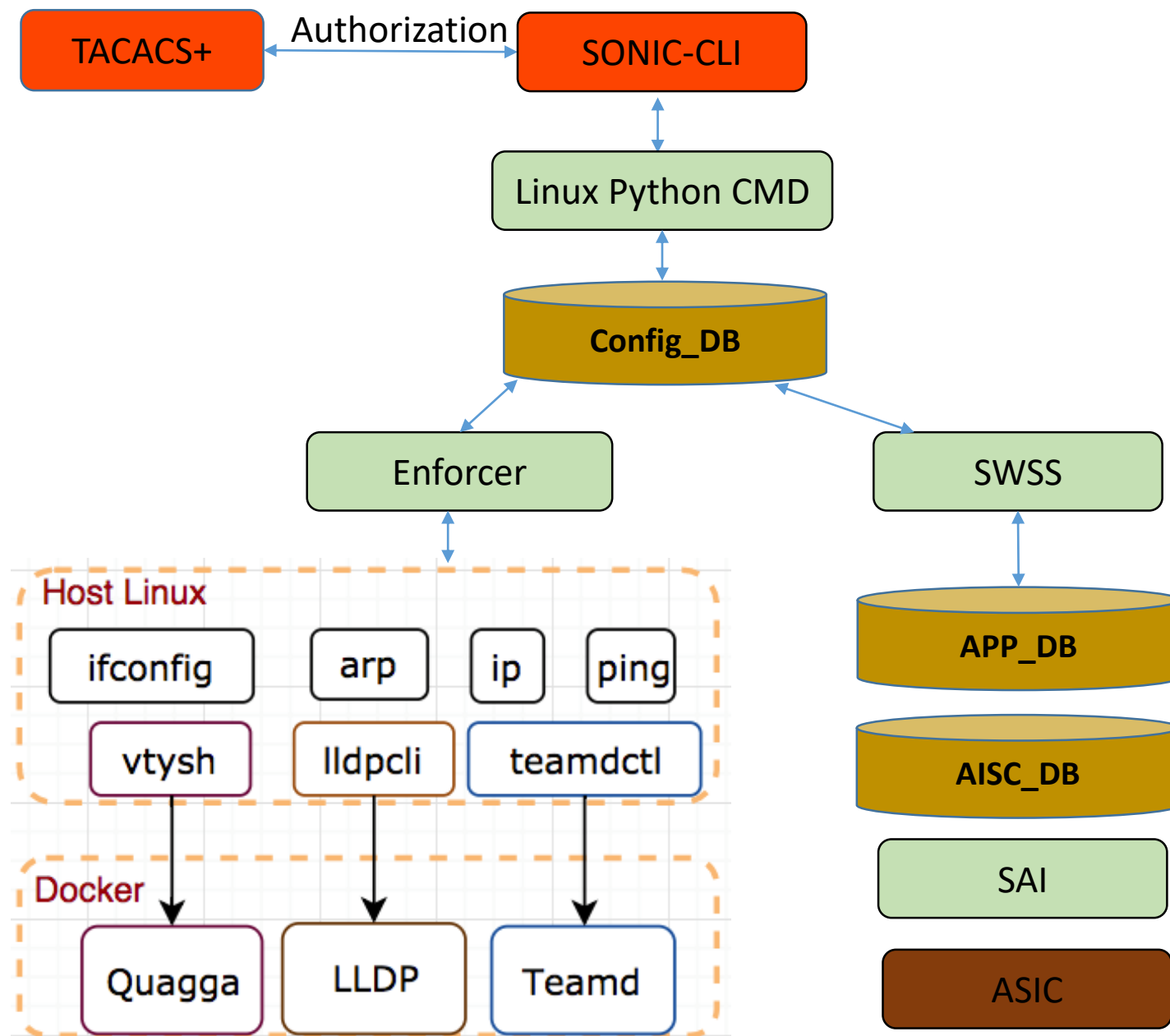
Alibaba AIS
王永灿

Why?

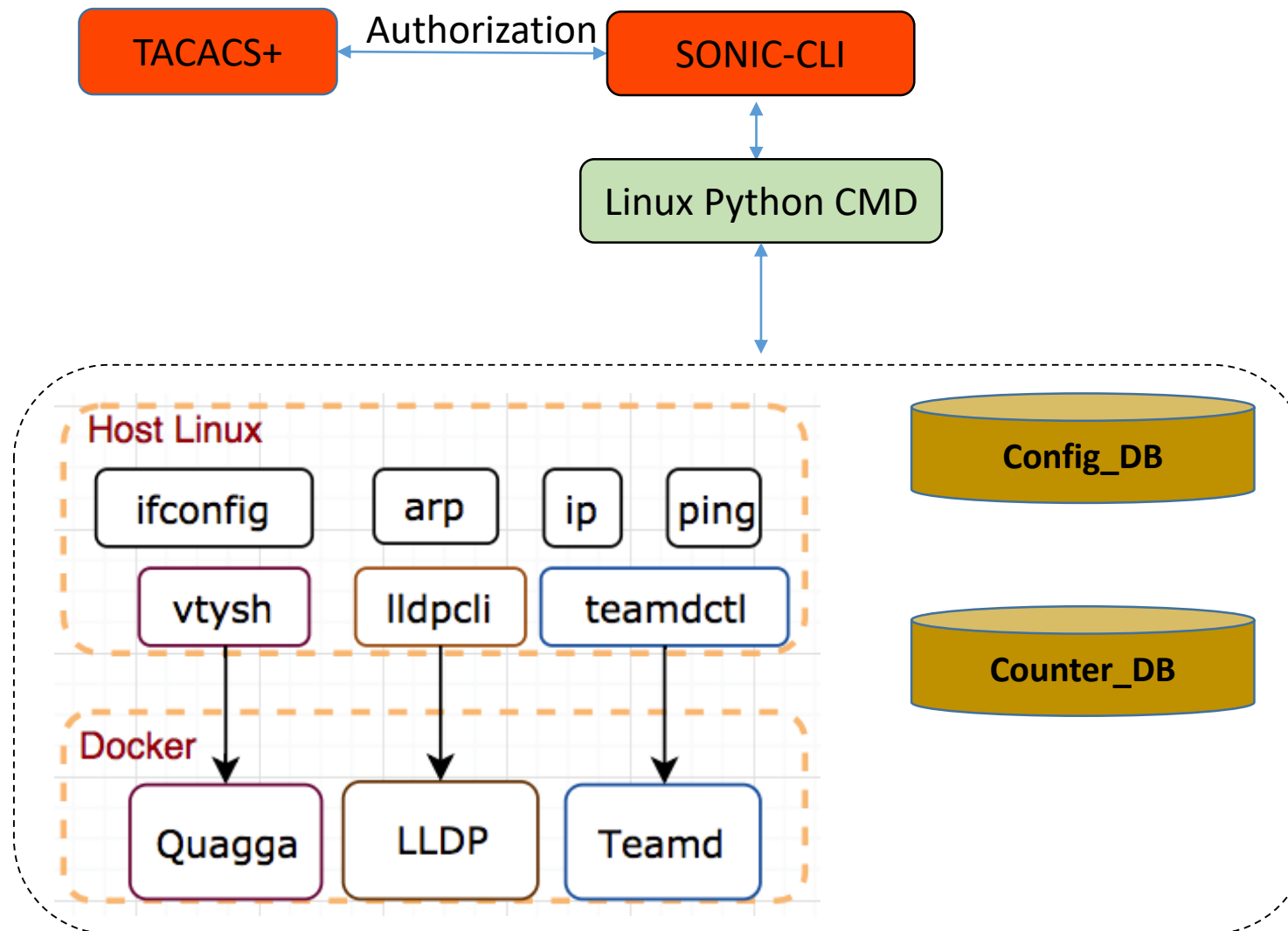
- How to do config on SONIC?
- Authorization



Config



Show



基于VTYSH的SONIC-CLI

- 0开发可以获得所有Quagga的命令
- Quagga拥有完整的常用命令
- 传统交换机的命令行风格，便于使用
 - 支持 Configure mode, Interface mode, BGP mode
 - 支持TAB补全，?帮助
- Vtysh语法简单好用
- 命令树机制

如何获得所有Quagga命令?

➤ 获得Quagga的命令树

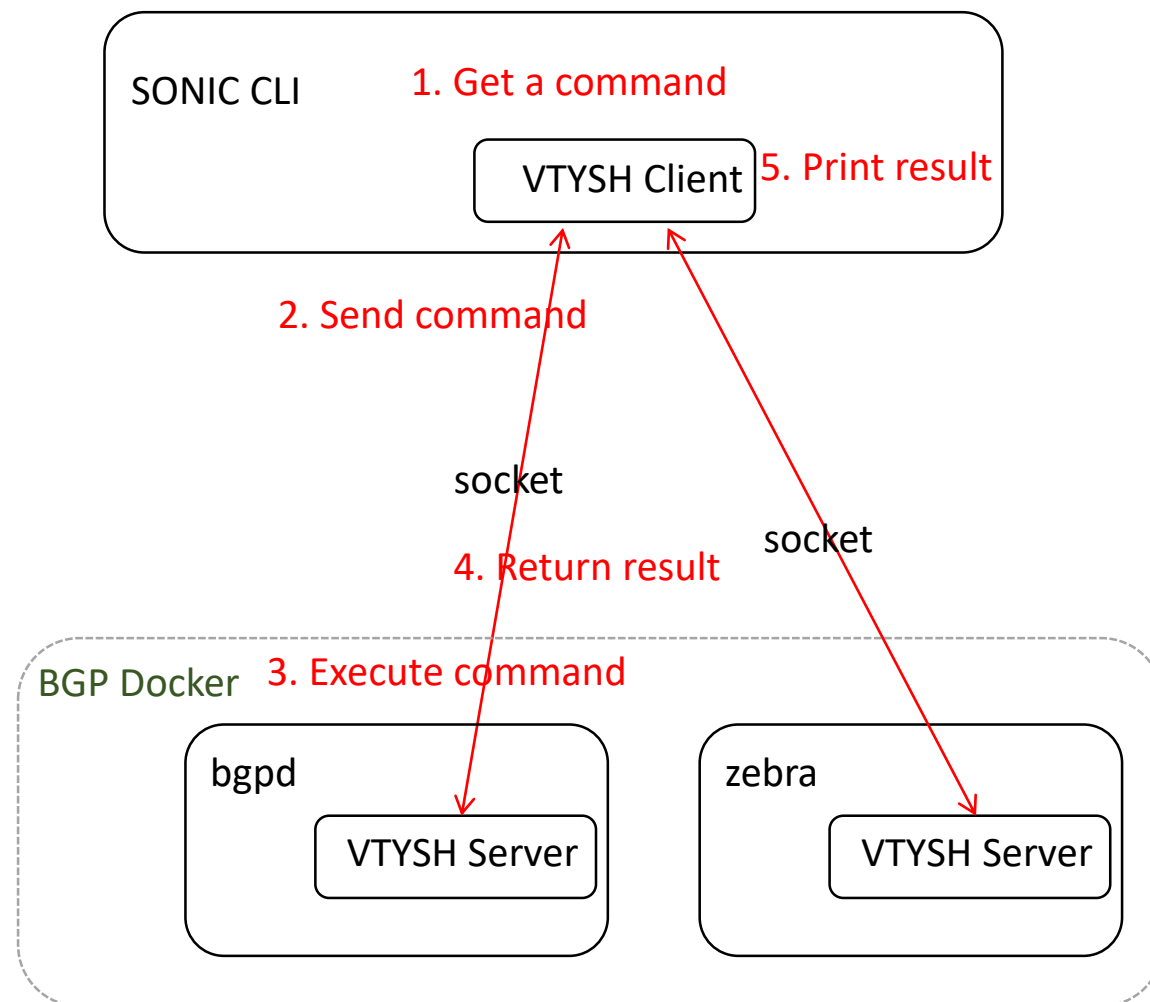
- 编译Quagga生成命令树:

`sonic-quagga/vtysh/vtysh_cmd.c`

- Copy vtysh_cmd.c 到 sonic-cli/vtysh/

➤ 叶子节点标识本地或远程执行

```
DEFSH (VTYSH_ZEBRA,
    show_ip_route_prefix_cmd_vtysh,
    "show ip route A.B.C.D/M",
    "Show running system information\n",
    "IP information\n",
    "IP routing table\n",
    "IP prefix <network>/<length>, e.g., 35.0.0.0/8\n")
```

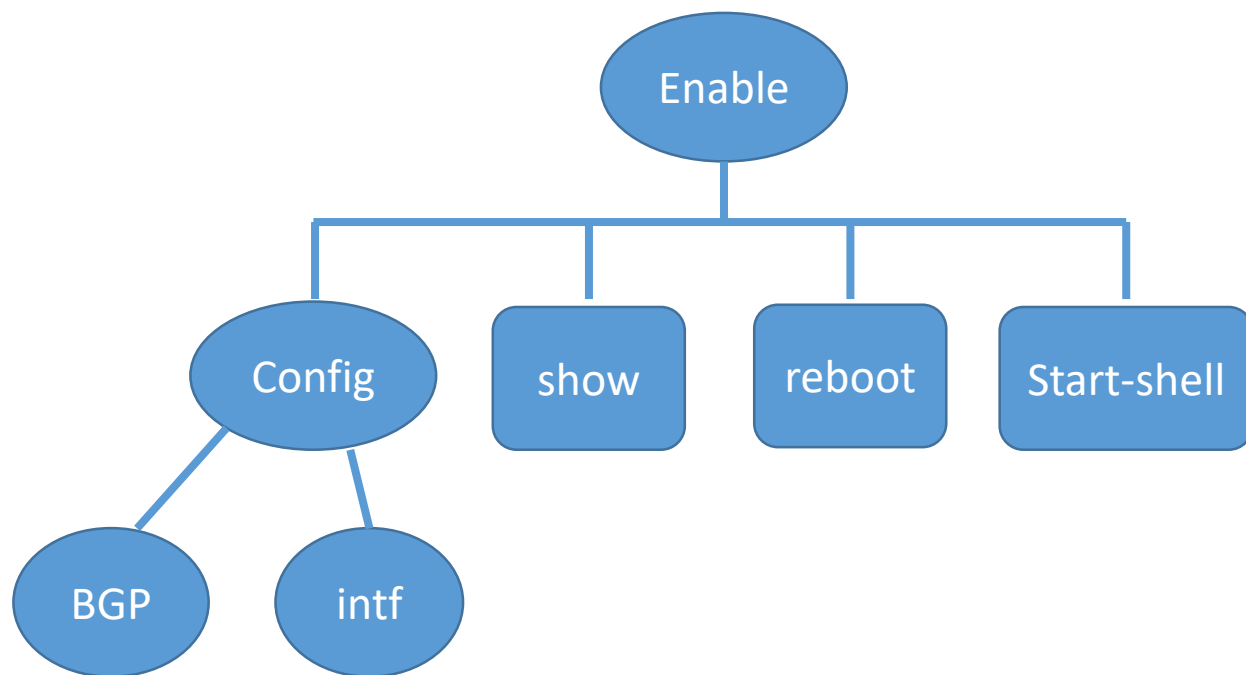


Authorization – 命令树

➤ 基于权限，动态生成命令树

高危命令对Read用户不可见

```
ASW-A1-1.NA62#  
disable      Turn off privileged mode command  
end          End current mode and change to enable mode  
exit         Exit current mode and down to previous mode  
list         Print command list  
no           Negate a command or set its defaults  
ping         Send echo messages  
quit         Exit current mode and down to previous mode  
show         Show running system information  
snapaudit    Snapaudit information command  
ssh          Open an ssh connection  
telnet       Open a telnet connection  
terminal     Set terminal line parameters  
test         Test  
traceroute   Trace route to destination
```



Authorization – TACACS+

- 基于TACACS+, 做每个命令的权限检查
- TACACS+通过就能执行, 部分show命令需要sudo, docker等权限, 所以即使read也加入sudo和docker group
- 用户登陆时, 默认进入CLI界面
/etc/passwd
yongcan.wyc:x:1003:1000:remote_user:/home/yongcan.wyc:/usr/bin/cli
- Start-shell进入Linux

Show version

- Sonic支持独立升级docker、debian，对版本管理提出了更高的要求
- 在编译时根据git commit次数，自动更新debian的版本号
- Show version中标记出哪些debian和docker做了独立的升级

SONIC-CLI的语法 – interface mode

- 支持物理Port, vlan, port-channel

```
ASW-A1-1.NA62(config)# interface
IFNAME          Interface name or index or a range(e.g. 1,5-10)
port-channel    Enter into port-channel mode
vlan            Enter into interface vlan mode
```

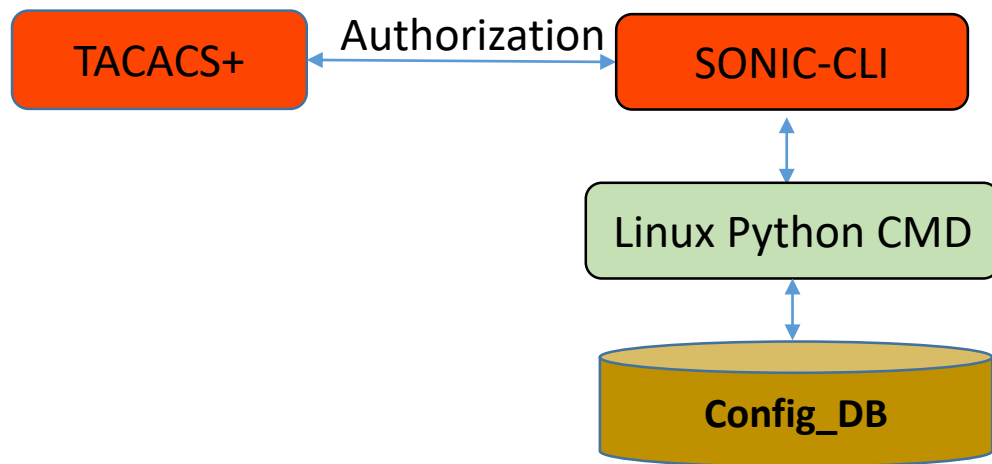
- 支持一组端口同时操作

- interface 1,3,5
- interface 1-20
- interface 1,3,10-20

- 合法性检查

- 与port_config.ini自动关联，检查端口是否存在

与社区现有CLI的关系



- 在社区CLI之上，复用现有CLI
- Python对string、redisDB、调试等，比C语言更方便

如何开发CLI?

基于string的语法解析

```
DEFUN (show_version,  
      show_version_cmd,    ---> function name  
      "show version",      ---> command syntax  
      SHOW_STR. ---> help string  
      "version information\n")  
{  
    execute_linux_cmd_pipe("sudo sw show version");  
    return CMD_SUCCESS;  
}
```

SONIC-CLI的语法 - 选项

➤ () -- 必选

"username WORD secret (md5/sha256/sha512) LINE"

```
ASW-A1-1.NA62(config)# username test secret
md5      Specifies an ENCRYPTED MD5 password will follow
sha256   Specifies an ENCRYPTED SHA256 password will follow
sha512   Specifies an ENCRYPTED SHA512 password will follow
ASW-A1-1.NA62(config)# username test secret md5 xxxx
<cr>
```

➤ [] -- 可选

"show interface [IFNAME]"

➤ {} -- 多次选择, 多条命令

"tacacs-server host A.B.C.D {port <1-65535>/timeout <1-60>/key WORD/auth-type (pap/chap)/priority <1-64>}"

```
ASW-A1-1.NA62(config)# tacacs-server host 1.1.1.1
<cr>
auth-type  Set authentication type. (Override default)
key        Set shared secret
port       Set authentication port
priority   Priority for TACACS+ server
timeout    Set the transmission timeout interval
```

SONIC-CLI的语法 - 变量

➤ String变量 - 大写字母

*"username **WORD** secret (md5/sha256/sha512) **LINE**"*

➤ 数字变量 - 数字

*"metric-type (**1/2**)"*

➤ 数字范围 - <x-y>

*"metric <**0-16777214**>"*

➤ 地址变量

"ip route A.B.C.D/M (reject/blackhole)"

ipv4 = "A.B.C.D"

ipv4_prefix = "A.B.C.D/M"

ipv6 = "X:X::X:X"

ipv6_prefix = "X:X::X:X/M"

如何开发CLI

➤ 复用现有SONIC Python命令实现show

```
DEFUN (show_interface_counters,  
      show_interface_counters_cmd,  
      "show interface counters",  
      SHOW_STR  
      INTERFACE_STR  
      "interfaces counters\n")  
{  
    execute_linux_cmd_pipe("show interface counters -a");  
    return CMD_SUCCESS;  
}
```

如何开发CLI

➤ 复用现有SONIC Python命令实现config

```
DEFUN (cli_aaa_auth_login_one,  
      aaa_auth_login_one_cmd,  
      "aaa authentication login (local|tacacs+)",  
      AAA_HELP_STR  
      AAA_AUTHENTICATION_HELP_STR  
      AAA_LOGIN_HELP_STR  
      "Local authentication\n"  
      "TACACS+ authentication\n")  
{  
    EXEC_CMD_WITH_PARAM("sudo config aaa authentication login %s", argv[0]);  
  
    if(author_update_config())  
        vty_out(vty, "Update TACACS+ configuration fail\n");  
  
    return CMD_SUCCESS;  
}
```


SONIC-CLI

➤ Pull Request

<https://github.com/Azure/sonic-utilities/pull/275>

➤ Design document

<https://github.com/Azure/SONiC/pull/205>

谢谢！