XMC 8.5 Workshop
XMC Advanced coding (for experts only)

Markus Nikulski
Sr. Corporate System Engineer

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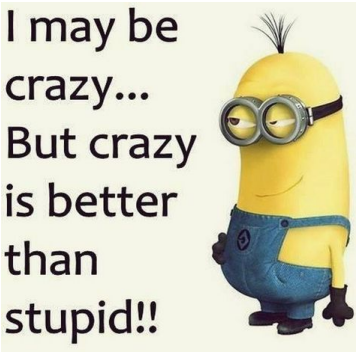
Extreme

Disclaimer



Only for experts who know what they are doing!

Everything shown in this slide deck is not officially supported!
Opening a GTAC case is not an option!

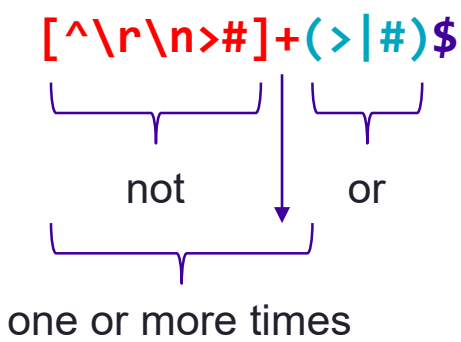
An XMC upgrade can may remove, overwrite or unregister modifications!

Device CLI prompt handling

for experts only

CLI prompt handling (the challenge)

```
OOB-R12>enable
OOB-R12#show vlan
Id    Name                   Type      Protocol          PID      Active IVL/SVL Mgmt
----  ---------------------- --------  ----------------  -------  ------ -------  ----
1     OOB                    Port      None              0x0000   Yes    IVL      Yes
         Port Members: 1/1-30
Total VLANs: 1
OOB-R12#
```

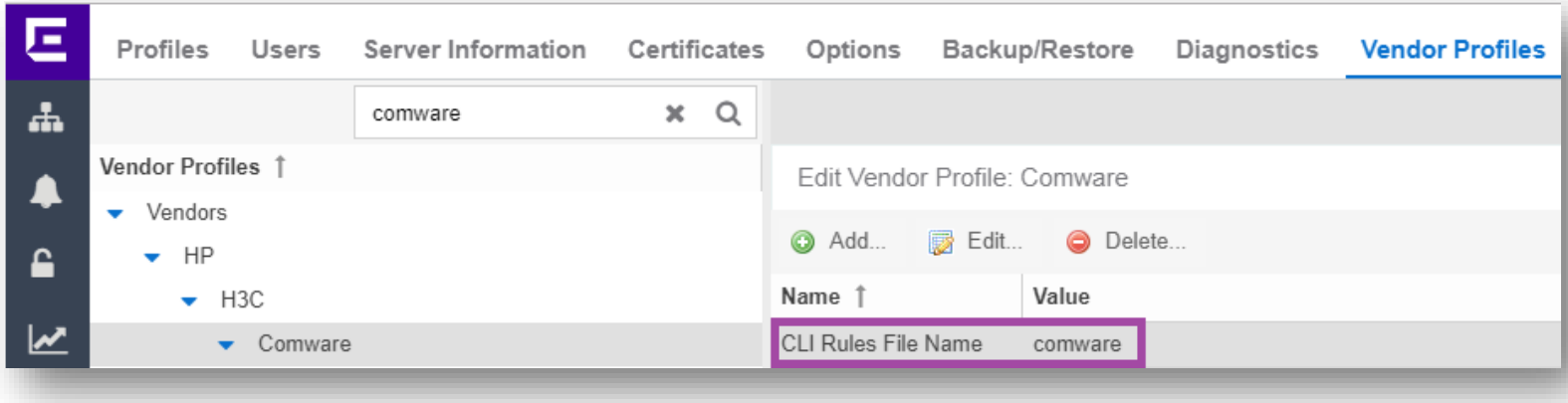


[ ]	group of possible characters
+	quantifier
\r	carriage return (0x0D)
\n	line feed (0x0A)
( )	group
|	‘or’ expression of character(s)
$	datastream end

CLI prompt handling

Is still in beta

Some devices response with an unexpected prompt. For such devices you can create **appdata/scripting/myCLIRules.xml** (no reboot is required).
The myCLIRules.xml "Rule name" must match the Vendor Profiles -> CLI Rules File Name variable.
Vendor Profiles are inherited; you can configure the variable for an entire device-family.



CLI prompt handling

myCLIRules.xml

```
<CLIRules>
    <Rule name="comware">
            <ShellPrompt>
                <defaultPrompt>
                  <prompt>[>\]]$</prompt>
                </defaultPrompt>
            </ShellPrompt>
            <LoginPrompt>
              <defaultPrompt>
                <prompt>(?i)login:</prompt>
              </defaultPrompt>
            </LoginPrompt>
            <PasswordPrompt>
               <defaultPrompt>
                 <prompt>(?i)^(password):</prompt>
               </defaultPrompt>
            </PasswordPrompt>
            <CommandPrompt command=".*">
                <defaultPrompt>
                    <prompt>Press|to continue or|to quit:</prompt>
                    <reply>y</reply>
                </defaultPrompt>
                <errors>
                    <messagePattern>$ERROR</messagePattern>
                </errors>
            </CommandPrompt>
    </Rule>
</CLIRules>
```

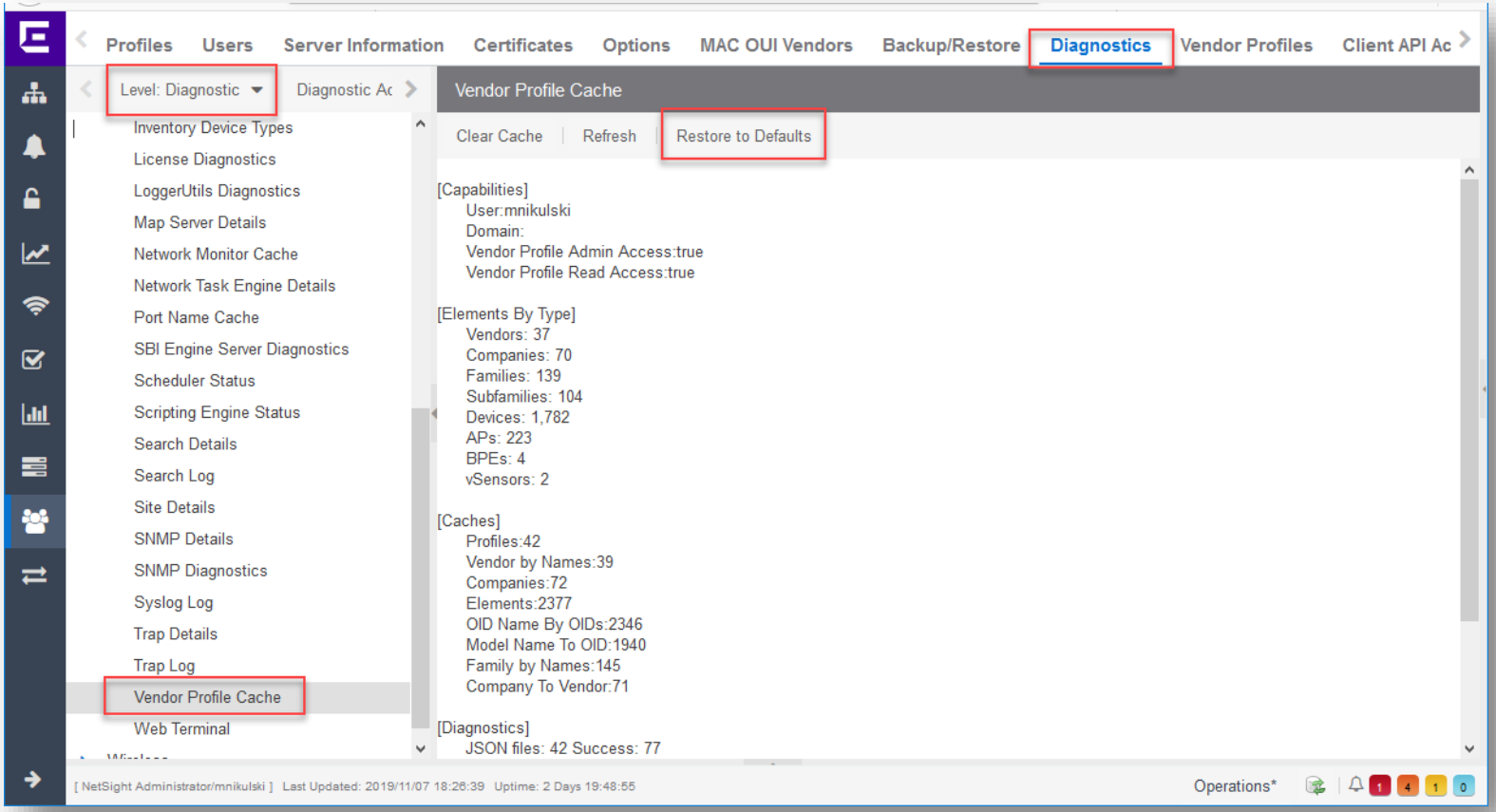
CLI prompt handling

CLI output ending with

```
<CLIRules>
    <Rule name="comware">
        <ShellPrompt>
            <defaultPrompt>
              <prompt>[>\]]$</prompt>
            </defaultPrompt>
        </ShellPrompt>
        <LoginPrompt>
          <defaultPrompt>
            <prompt>(?i)login:</prompt>
          </defaultPrompt>
        </LoginPrompt>
```

Using regular expressions	match
`[>\]]$`	`>$` or `]$`
`(?i)login:`	`login` or `Login`

reset Vendor profile manipulations



Python Package Manager

for experts only

activate PIP on XMC

```
cd /usr/local/Extreme_Networks/NetSight/jython/bin

export JAVA_HOME=/usr/local/Extreme_Networks/NetSight/java

sudo chmod a+x jython
sudo chmod a+x pip

./pip install ipaddress
```

Not all Python packages will work under Jython!

If modules used they should reported back to Extreme so we can consider adding them by default.

activate PIP on XMC

```
root@xmc.reading.ctc.local:~$ cd /usr/local/Extreme_Networks/NetSight/jython/bin
root@xmc.reading.ctc.local:/usr/local/Extreme_Networks/NetSight/jython/bin$ export JAVA_HOME=/usr/local/Extreme_Networks/NetSight/java
root@xmc.reading.ctc.local:/usr/local/Extreme_Networks/NetSight/jython/bin$ sudo chmod a+x pip
root@xmc.reading.ctc.local:/usr/local/Extreme_Networks/NetSight/jython/bin$ ./pip install ipaddress
Collecting ipaddress
  Downloading https://files.pythonhosted.org/packages/c2/f8/49697181b1651d8347d24c095ce46c7346c37335ddc7d255833e7cde674d/ipaddress-
1.0.23-py2.py3-none-any.whl
Installing collected packages: ipaddress
Successfully installed ipaddress-1.0.23
You are using pip version 9.0.1, however version 20.0.2 is available.
You should consider upgrading via the 'pip install --upgrade pip' command.
root@xmc.reading.ctc.local:/usr/local/Extreme_Networks/NetSight/jython/bin$
```

do not upgrade PIP!

Using PIP

```
pip --version

pip help

pip list
pip list --outdated
pip show <package-name>
pip show --files <package-name>

pip search <package-name>

pip install <package-name>
pip install --upgrade <package-name>

pip uninstall <package-name>
```


using your own XMC Python class

for experts only

Jython class path

Own Python classes should go under **appdata/scripting/extensions**

```
root@xmc.reading.ctc.local:~$ mkdir -p /usr/local/Extreme_Networks/NetSight/appdata/scripting/extensions
root@xmc.reading.ctc.local:~$ echo "
class MyFirstClass:
    def __init__(self, name):
        self.data = 'my name is ' + name

    def getText(self):
        return self.data
" > /usr/local/Extreme_Networks/NetSight/appdata/scripting/extensions/MyClass.py
root@xmc.reading.ctc.local:/usr/local/Extreme_Networks/NetSight/appdata/scripting/system/extensions$
```

NOTE: Class files are not part of the XMC backup!

own class execution

Edit Script: Test

Overview | Content | Description | Runtime Setti

```
1 import MyClass
2
3 test = MyClass.MyFirstClass('Max')
4
5 print test.getText()
6
```

MyClass.py

```
class MyFirstClass:
    def __init__(self, name):
        self.data =  'my name is ' + name

    def getText(self):
        return self.data
```

Run Script: Test

1. Device Selection | 2. Device Settings | 3. Runtime Settings | 4. Verify Run Script | 5. Results

Script Information

Task Information: Run Now
Script Name: Test
Script Task Name: N/A
Timeout (sec): 60

Overall Status

COMPLETED

Devices

Name	IP Address	Start Time/Total Run Time
10.128.0.0/20	10.253.0.16	2/24/2020 10:10:42 AM/(0 sec)

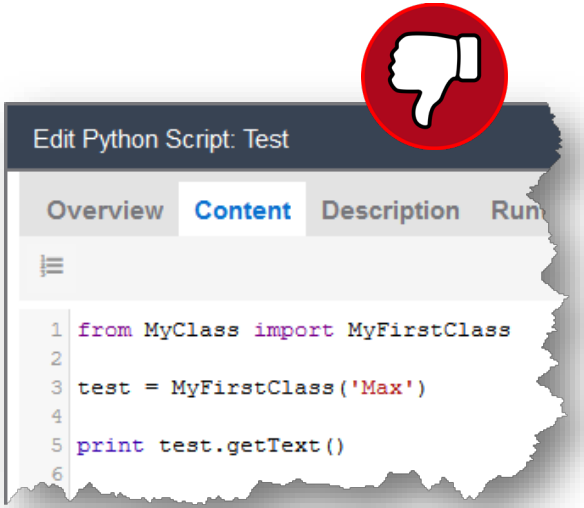
Results

```
Script Name: Test
Date and Time: 2020-02-24T09:10:42.512
XMC User: mnikulski
XMC User Domain:
IP: 10.253.0.16
my name is Max
```

« Previous | Run | Close

```
root@xmc.reading.ctc.local:~$ ls -l /usr/local/Extreme_Networks/NetSight/appdata/scripting/extensions
total 8
-rw-r--r-- 1 root root  142 Feb 24 09:10  MyClass.py
-rw-r--r-- 1 root root 3686 Feb 24 10:08 'MyClass$py.class'
root@xmc.reading.ctc.local:~$
```

own class execution



avoid name collision

XMC Python using SNMP

for experts only

using SNMP-GET

```
from xmclib.snmplib import SnmpRequest
from xmclib.snmplib import SnmpVarbind


# create SNMP request object for the given IP
snmp_request = SnmpRequest( emc_vars["deviceIP"] )

# declare to query OID(s)
varbinds = [
            SnmpVarbind(
                        oid = "rcSysLastRunTimeConfigSave.0 "
                       )
          ]



# perform SNMP-GET
response = snmp_request.snmp_get( varbinds, timeout = 15 )

if response.ok:
    print "last configuration save: ",  response.vars[0].val
else:
    print  "ERROR: SNMP-GET fails"
```


using SNMP-SET

```
from xmclib.snmplib import SnmpRequest
from xmclib.snmplib import SnmpVarbind
from xmclib.snmplib import ASN_INTEGER

# create SNMP request object for the given IP
snmp_request = SnmpRequest( emc_vars["deviceIP"] )

# declare to set OID(s) with definition type and value
varbinds = [
            SnmpVarbind(
                        oid      = "rc2kBootConfigEnableSpbmConfigMode.1",
                        asn_type = ASN_INTEGER,
                        value    = "1"
                       )
          ]

# perform SNMP-SET
response = snmp_request.snmp_set( varbinds, timeout = 15 )

if response.ok:
    print "Enable SPBM boot config flag : success"
else:
    print "Enable SPBM boot config flag : failed"
```

using SNMP-SET

```
from xmclib.snmplib import SnmpRequest
from xmclib.snmplib import SnmpVarbind
from xmclib.snmplib import ASN_INTEGER
```

```
def ifAdminStatusDown(ipAddress, portIndex):
    snmp_request = SnmpRequest( ipAddress )

    try:
        # set the ifAdminStatus OID for the portIndex
        varbinds = [SnmpVarbind(
                        oid      = "1.3.6.1.2.1.2.2.1.7." + str( portIndex ),
                        asn_type = ASN_INTEGER,
                        value    = "2"
                    )]

        response = snmp_request.snmp_set(varbinds, timeout = 5 )

        if response and response.ok:
             print "Port set to down %s %s" % (ipAddress, portIndex)
            return True
        else:
            raise Exception("Unable to set port down %s %s" % (ipAddress, portIndex))
            response.dump()
            return False

    except Exception as e:
        print "ERROR" + e.message
        return False
```

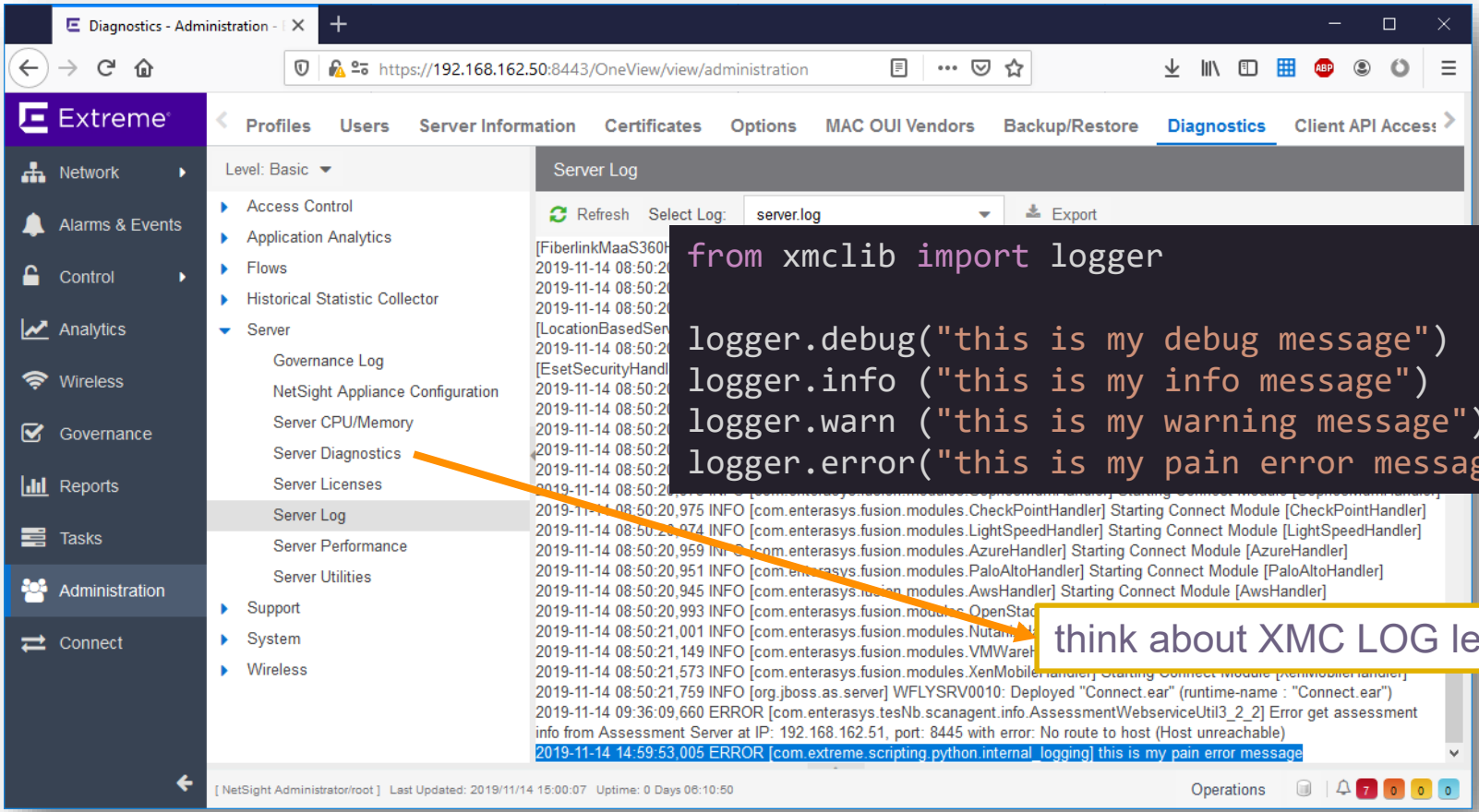
```
ifAdminStatusDown( "1.2.3.4", 7 )
```


write messages to the internal LOG facility

not recommended

internal logging

is not recommended



think about XMC LOG level !

Debugging

better to write your own log file

```
1  import os
2  import time
3  import logging
4
5  loggFileName  = emc_vars['deviceIP'].replace('.','_') + '-' + time.strftime("%Y%m%d-%H%M%S") + '.txt'
6  loggDirectory = str( os.path.abspath( os.path.join( emc_vars['jboss.server.log.dir'] + '/' )))
7
8  logging.basicConfig(level    = logging.DEBUG,
9                      format   = '%(asctime)s,%(msecs)-3d %(levelname)-8s [%(filename)s:%(lineno)d] %(message)s',
10                     filename = loggDirectory + loggFileName,
11                     filemode = 'w')
12
13 logging.debug('This message should go to the log file')
14 logging.info('So it should be')
15 logging.warning('And this, too')
16 logging.error('this is not good')
17 logging.critical('even worse')
```

executed LOG level

overwrite the file
'w+' will append

10-0-8-11_20191112-134855.txt

```
2019-11-13:12:16:53,470 DEBUG    [test.py:13] This message should go to the log file
2019-11-13:12:16:53,470 INFO     [test.py:14] So it should be
2019-11-13:12:16:53,470 WARNING  [test.py:15] And this, too
2019-11-13:12:16:53,471 ERROR    [test.py:16] this is not good
2019-11-13:12:16:53,471 CRITICAL [test.py:17] even worse
```


using the internal API (**WildFly**)

not recommended

using the internal API

```
from xmclib import cli
from device import api

message = emc_vars["banner"]

if api.enable() and api.config():
    cli.check_send("banner custom")
    cli.check_send("banner \"" + message + "\"")

    cli_result = api.save_config()
```

```
cli_result = api.reboot()

if cli_result and cli_result.isSuccess():
    restartStarted = True
```


using the internal API

```
from xmclib import cli
from re import match

if api.enable():
    cli_output = cli.send("show ip ssh  | include Administrative")

    if cli_output.isSuccess():
        isEnabled = cli.check_output_expr_list(cli_output, ["(?i)enabled?"])
        if isEnabled is None:
            print "SSH is enabled"
    else:
        print "SSH is disenabled"
```


using the internal API

```
cli_result = api.download_config(transferProtocol = emc_vars["transferProtocol"],
                                 serverAddress    = emc_vars["serverAddress"],
                                 serverPort       = emc_vars["serverPort"],
                                 isAnonymousLogin = emc_vars["isAnonymousLogin"],
                                 serverUsername   = emc_vars["serverUsername"],
                                 serverPassword   = emc_vars["serverPassword"],
                                 rootDirectory    = emc_vars["rootDirectory"],
                                 serverFilePath   = download_path,
                                 downloadTimeout  = emc_vars["downloadTimeout"])

cli.process_result( cli_result, emc_results )
```

using the internal API

```
cli_result = api.download_firmware(transferProtocol   = emc_vars["transferProtocol"],
                                   serverAddress      = emc_vars["serverAddress"],
                                   serverPort         = emc_vars["serverPort"],
                                   rootDirectory      = emc_vars["rootDirectory"],
                                   firmwareDirectory  = emc_vars["firmwareDirectory"],
                                   isAnonymousLogin   = emc_vars["isAnonymousLogin"],
                                   serverUsername     = emc_vars["serverUsername"],
                                   serverPassword     = emc_vars["serverPassword"],
                                   firmwareName       = emc_vars["firmwareName"],
                                   downloadTimeout    = emc_vars["downloadTimeout"]);

cli.process_result( cli_result, emc_results )
```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