

HPE Gen11 服务器 MR 系列阵列卡

Windows/Linux/VMware 系统下 StorCLI 迁移阵列

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一. 适用范围与注意事项

- 本文档旨在说明 HPE Gen11 系列服务器 MR 系列阵列卡不同系统下使用 MegaRAID Storage Administrator StorCLI 工具扩容阵列的方法,并以 DL380 Gen11 服务器为例进行配置步骤说明。
MR 系列阵列卡包含如下型号:
 - HPE MR416i-p Gen11

- HPE MR416i-o Gen11
 - HPE MR216i-p Gen11
 - HPE MR216i-o Gen11
 - HPE MR408i-o Gen11
- 实际情况是否适用本文档，请通过下面导航链接进行确认：
<https://zhiliao.h3c.com/Theme/details/218271>
- 提示：
本文档中的信息（包括产品，软件版本和设置参数）仅作参考示例，具体操作与目标需求设置请以实际为准。
本文档不定期更新维护，请以发布的最新版本为准。
- 迁移前，请优先通过下表确认可进行迁移的级别后再进行相关操作。

Initial RAID level	Migrated RAID level
RAID 0	RAID 1
RAID 0	RAID 5
RAID 0	RAID 6
RAID 1	RAID 0
RAID 1	RAID 5
RAID 1	RAID 6
RAID 5	RAID 0
RAID 5	RAID 6
RAID 6	RAID 0
RAID 6	RAID 5

二. 配置准备

1. 下载 MegaRAID Storage Administrator StorCLI 工具
 - Windows 下载链接：[HPE MegaRAID Storage Administrator StorCLI for Windows 64-bit \(for Gen10P and Gen11 Controllers\) | HPE Support](#)
 - Linux 下载链接：[HPE MegaRAID Storage Administrator StorCLI for Linux 64-bit \(for Gen10 and Gen10 Plus Controllers\) | HPE Support](#)
 - VMware 下载链接：
 - ESXi 6.5：[HPE MegaRAID Storage Administrator StorCLI for VMware6.5 | HPE Support](#)
 - ESXi 6.7：[HPE MegaRAID Storage Administrator StorCLI for VMware6.7 | HPE Support](#)
 - ESXi 7.0：[HPE MegaRAID Storage Administrator StorCLI for VMware7.0 | HPE Support](#)
2. 连接 iLO 与启用远程控制台

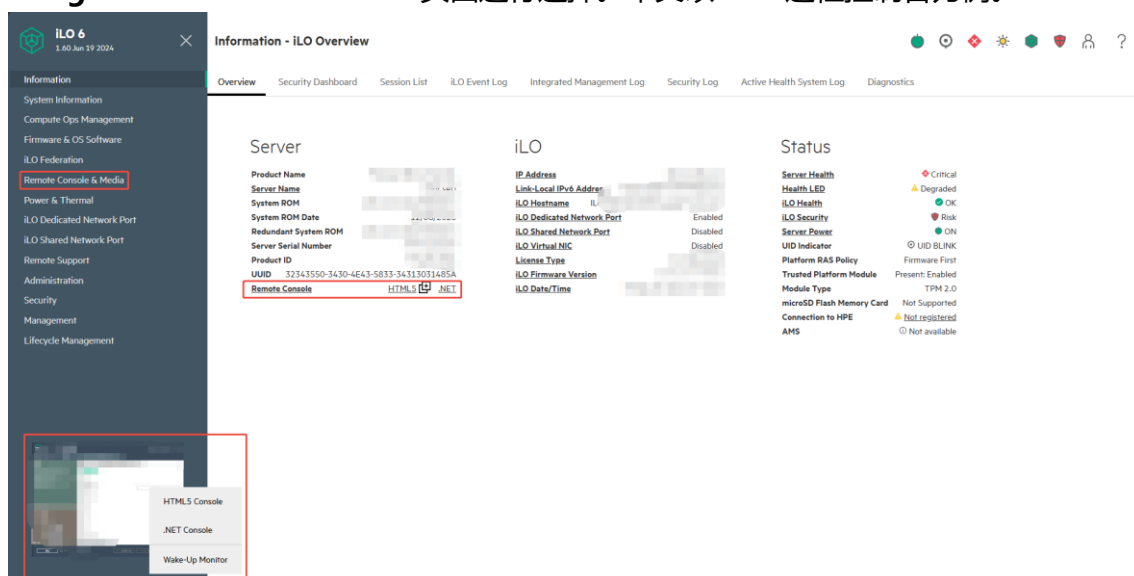
具体方法请参考：<https://zhiliao.h3c.com/Theme/details/216337>

三. 配置步骤

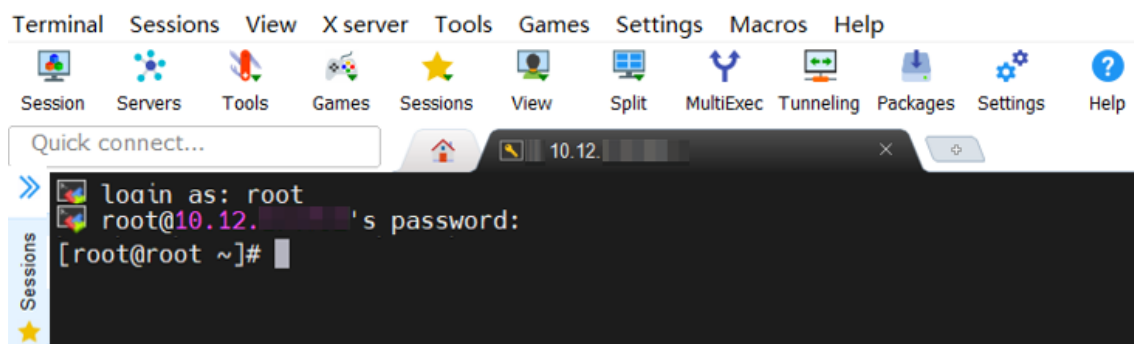
1. 访问系统

1.1 通过 iLO 启用远程控制台访问系统 (Windows Server, Linux, VMware ESXi)

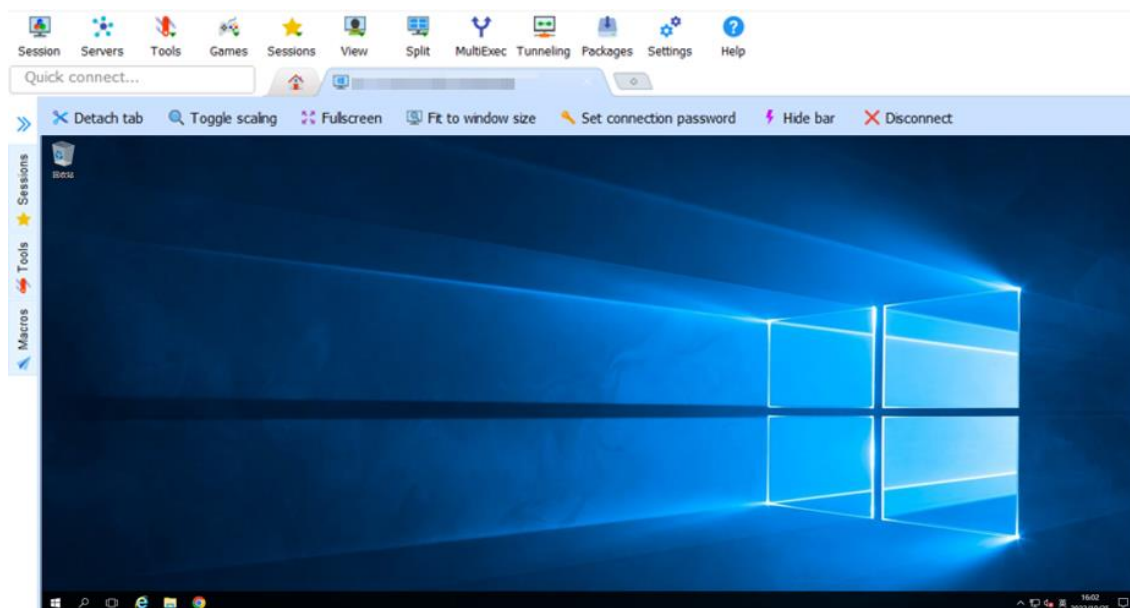
iLO6 页面 **Information -> Overview** 的 **Remote Console** 选项，或页面左下方 Remote Console 选区可直接启用远程控制台；也可在 **Remote Console & Media - iLO Integrated Remote Console** 页面进行选择。本文以.NET 远程控制台为例。



1.2 通过第三方 SSH 工具访问系统 (Linux, VMware ESXi)



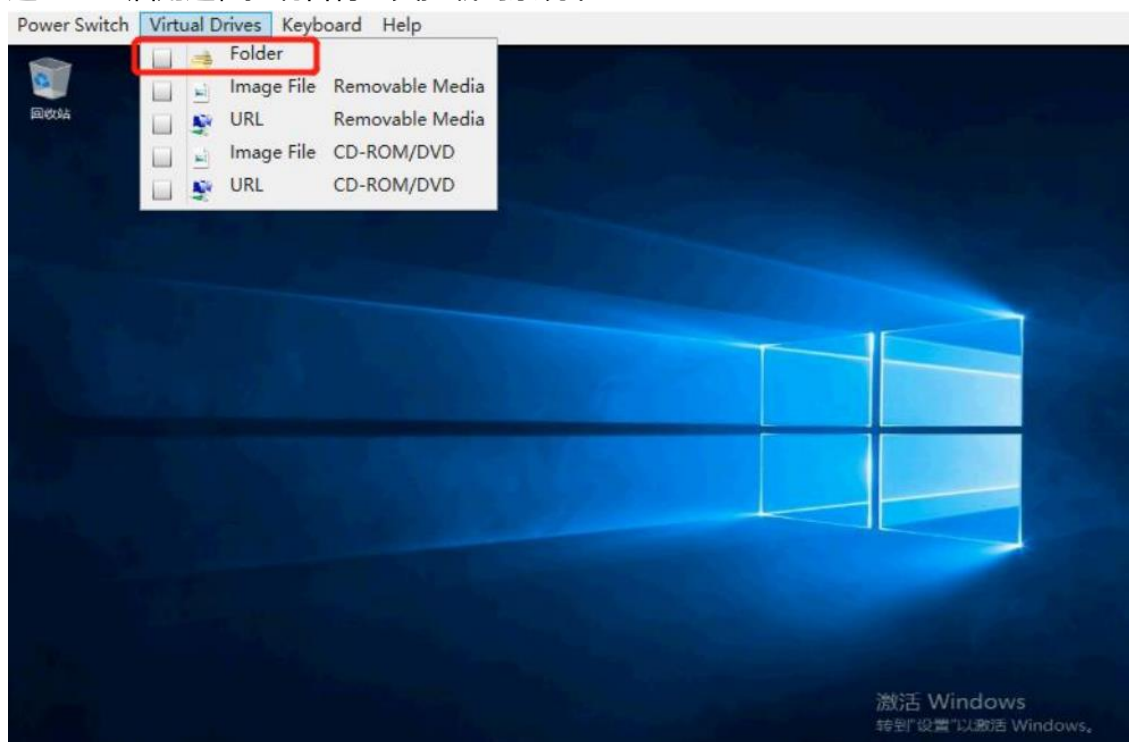
1.3 通过远程桌面或第三方 RDP 工具访问系统 (Windows Server)

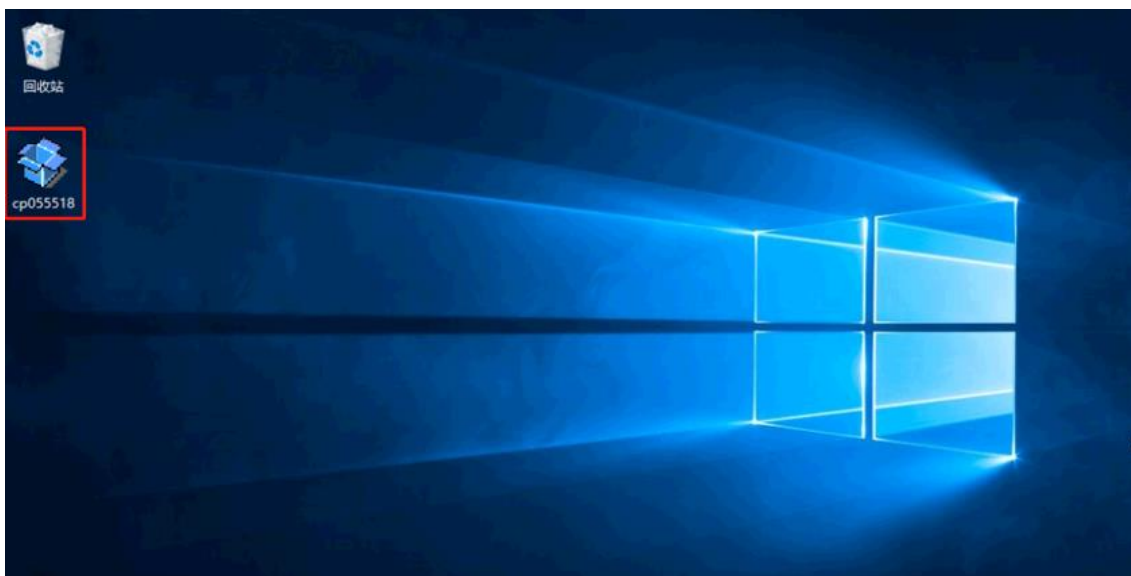


2. 将 MegaRAID Storage Administrator StorCLI 工具保存到系统下

2.1 Windows Server

2.1.1 通过 iLO 启用远程控制台将工具挂载到系统下



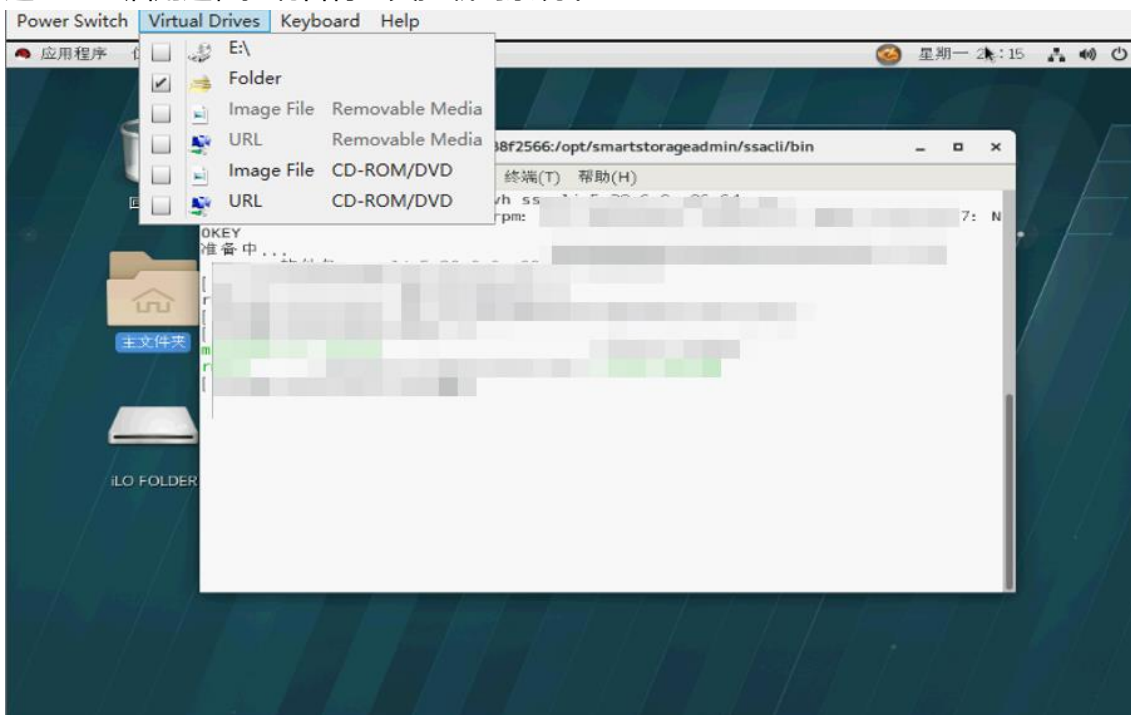


2.1.2 通过 U 盘将文件挂载到系统下

U 盘接入服务器后，在系统下直接访问挂载点。

2.2 Linux

2.2.1 通过 iLO 启用远程控制台将工具挂载到系统下



```
[root@localhost ~]# lsblk
NAME                MAJ:MIN RM   SIZE RO TYPE MOUNTPOINT
sda                  8:0    0 837.9G 0 disk
├─sda1                8:1    0   200M 0 part /boot/efi
├─sda2                8:2    0     1G 0 part /boot
└─sda3                8:3    0 836.7G 0 part
   ├─rhel-root        253:0    0   50G 0 lvm /
   ├─rhel-swap        253:1    0     4G 0 lvm [SWAP]
   └─rhel-home        253:5    0 782.7G 0 lvm /home
sdc                  8:32    1   16M  1 disk /run/media/root/iLO FOLDER
nvme0n1             259:0    0 372.6G 0 disk
├─nvme0n1p1          259:2    0   200M 0 part
├─nvme0n1p2          259:3    0     1G 0 part
├─nvme0n1p3          259:4    0 371.4G 0 part
├─rhel00-swap        253:2    0     4G 0 lvm
├─rhel00-home        253:3    0 317.4G 0 lvm
└─rhel00-root        253:4    0   50G 0 lvm
nvme1n1             259:1    0 372.6G 0 disk
[root@localhost ~]# mount /dev/sdc /mnt
mount: /dev/sdc is write-protected, mounting read-only
[root@localhost ~]# cd /mnt
[root@localhost mnt]# ls
storcli-007.1616.0000.0000-1.x86_64.rpm
```

2.2.2 通过 U 盘将文件挂载到系统下

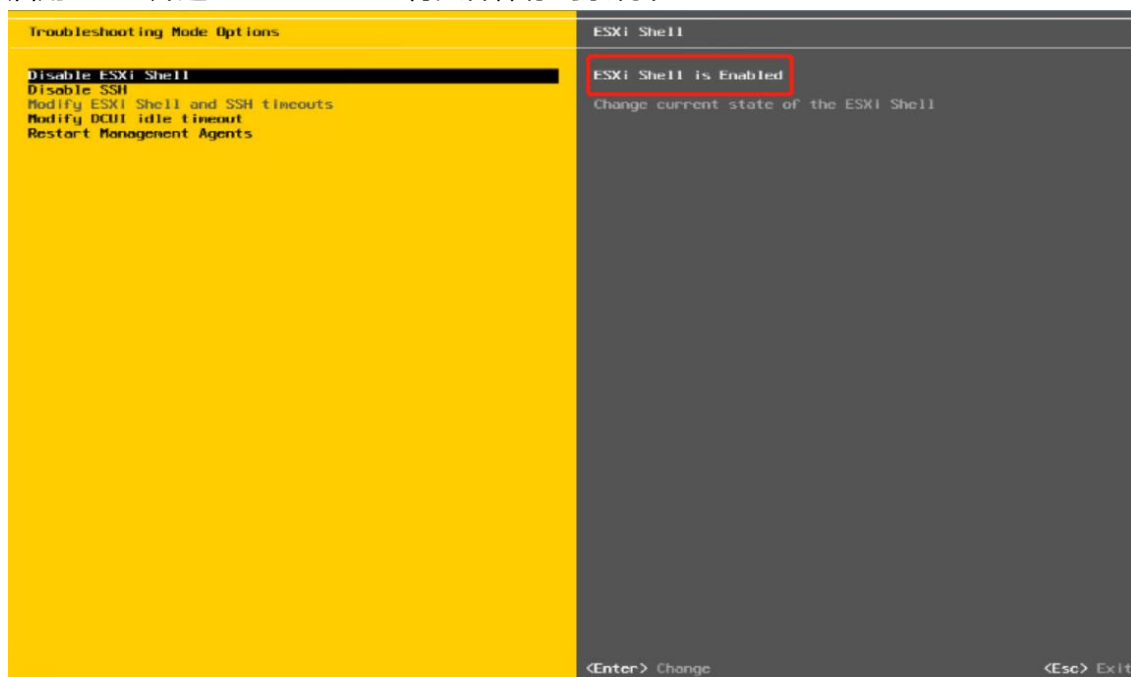
U 盘接入服务器后，在系统下通过 mount 命令挂载。

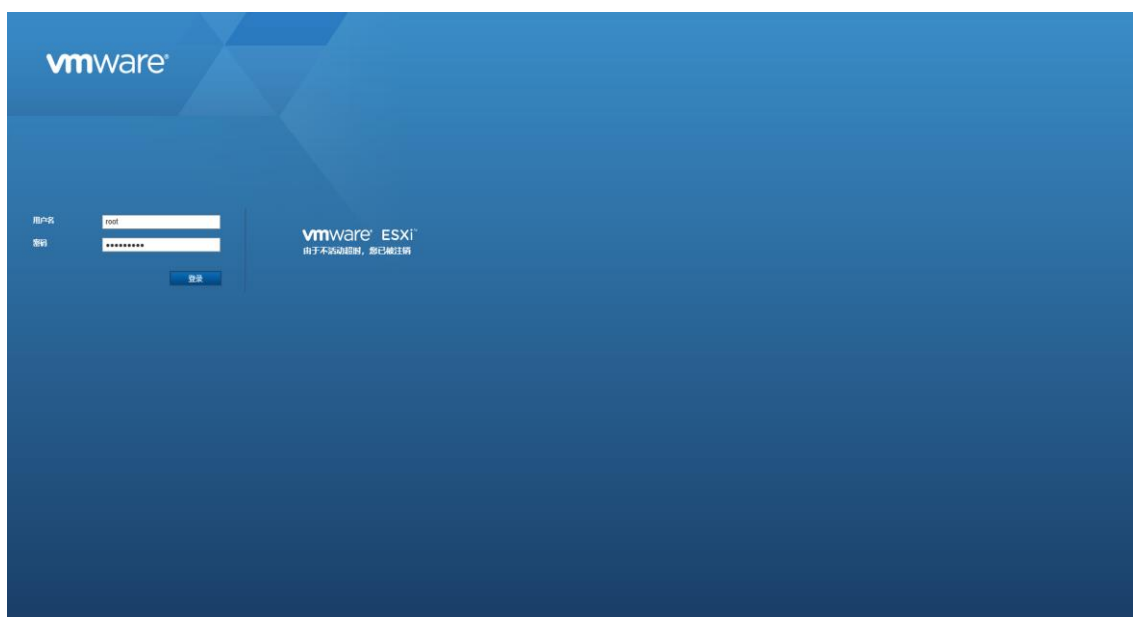
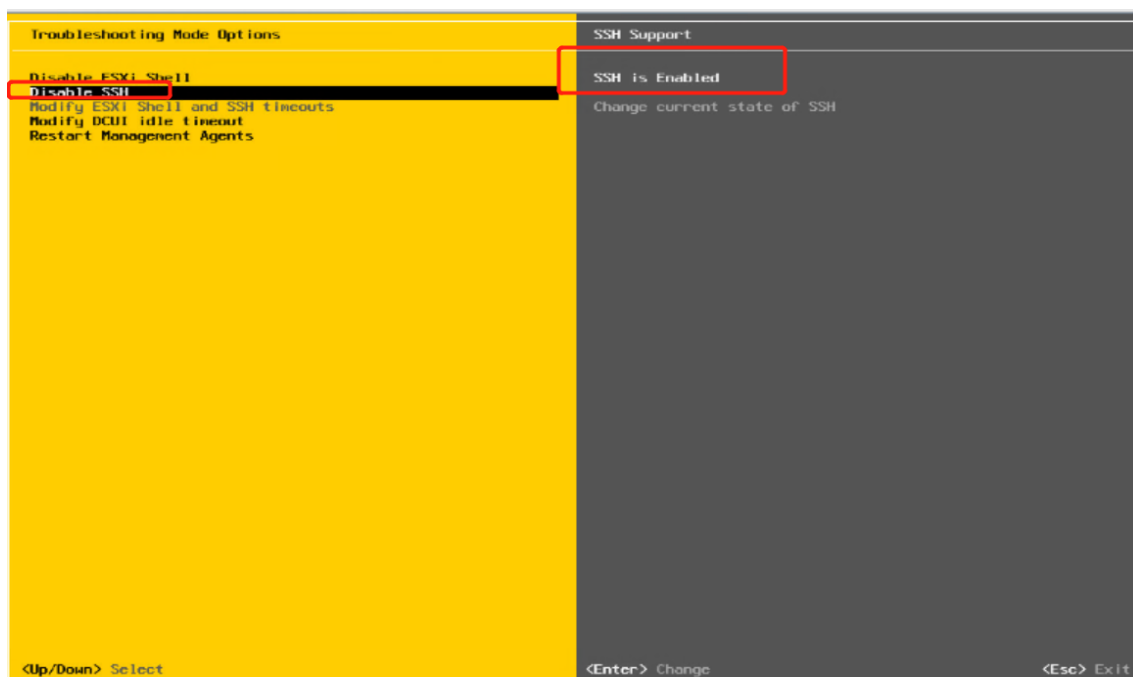
2.2.3 通过第三方 SSH 工具将文件保存到系统下

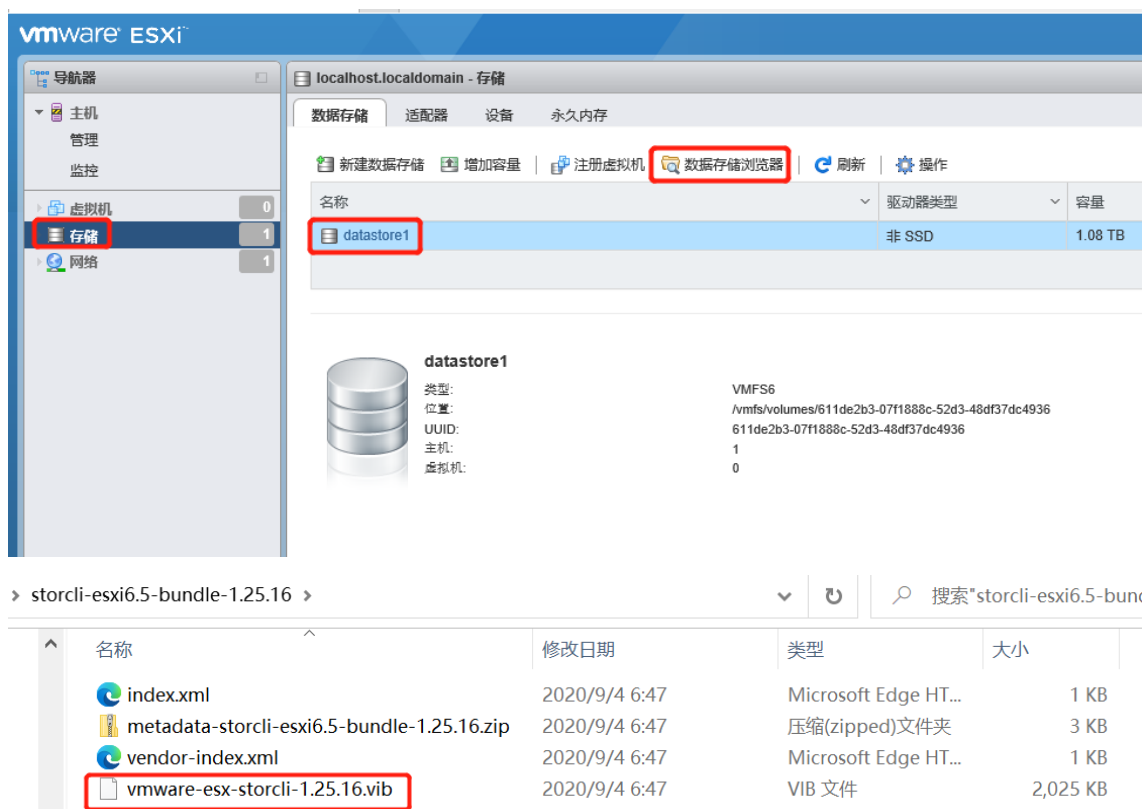
参考第三方工具使用说明。

2.3 VMware ESXi

2.3.1 启用 Shell 并通过 Web Client 将文件保存到系统下







2.3.2 通过第三方 SSH 工具将文件保存到系统下
参考第三方工具使用说明。

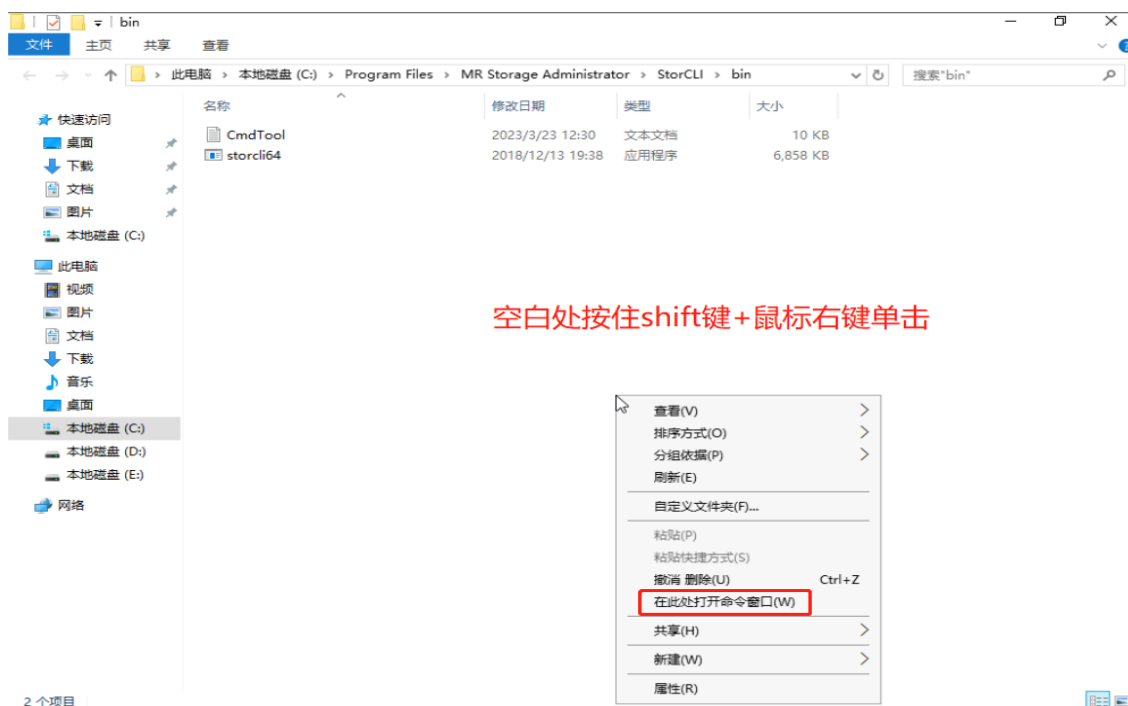
3. 安装 MegaRAID Storage Administrator StorCLI

3.1 Windows Server

1) 双击运行开始安装 StorCLI 工具。



2) 找到 StorCLI 工具所在位置, 按住 Shift 键, 然后鼠标右键点击空白处, 打开命令窗口。



3) `.\storcli64.exe`, 即可运行 StorCLI 工具。

```
C:\Program Files\MR Storage Administrator\StorCLI\bin> .\storcli64.exe show all
Status Code = 0
Status = Success
Description = None

Number of Controllers = 1
Host Name = WIN-QLDN627IMOU
Operating System = Windows Server 2012

System Overview :
=====
Ctl Model          Ports PDs DGs DNOpt VDs VNOpt BBU sPR DS EHS ASOs Hlth
-----
0 HPEMR416i-p      16   6   4   0   4   0 Opt On  -  N   4 Opt

Ctl=Controller Index|DGs=Arrays|VDs=Virtual drives/Logical drives|Flid=Failed
PDs=Physical drives|DNOpt=DG NotOptimal|VNOpt=VD NotOptimal|Opt=Optimal
Msg=Missing|Dgd=Degraded|NdAtn=Need Attention|Chrg=Charging|MsgCbl=Missing Cable
Unkwn=Unknown|sPR=Scheduled Patrol Read|DS=DimmerSwitch|EHS=Emergency Spare Drive
Y=Yes|N=No|ASOs=Advanced Software Options|BBU=Battery backup unit
Hlth=Health|Safe=Safe-mode boot
```

3.2 Linux

1) `rpm -ivh` 安装 StorCLI 工具。

```
[root@localhost Storcli]# ls
storcli-007.1616.0000.0000-1.x86_64.rpm
[root@localhost Storcli]# rpm -ivh storcli-007.1616.0000.0000-1.x86_64.rpm
warning: storcli-007.1616.0000.0000-1.x86_64.rpm: Header V3 RSA/SHA256 Signature, key ID 26
c2b797: NOKEY
Verifying...                               ##### [100%]
Preparing...                                ##### [100%]
Updating / installing...
 1:storcli-007.1616.0000.0000-1             ##### [100%]
```

工具默认安装在 `/opt/hpe/storcli` 目录下, `./storcli64` 命令运行。

```
[root@localhost /]# cd /opt/hpe/storcli/
[root@localhost storcli]# ls
storcli64
[root@localhost storcli]# ./storcli64

StorCli SAS Customization Utility Ver 007.1616.0000.0000 Dec 24, 2020

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help - lists all the commands with their usage. E.g. storcli help
<command> help - gives details about a particular command. E.g. storcli add help

List of commands:

Commands   Description
```

3.3 VMware ESXi

- 1) 进入文件所在位置，使用 **unzip + xxx.zip** 解压，得到.vib 文件。

```
[root@localhost:/tmp/storcli] ls
BCM-vmware-storcli64_007.1616.0000.0000-01_17650073.zip
[root@localhost:/tmp/storcli] unzip BCM-vmware-storcli64_007.1616.0000.0000-01_17650073.zip
Archive:  BCM-vmware-storcli64_007.1616.0000.0000-01_17650073.zip
  inflating: index.xml
  inflating: vendor-index.xml
  inflating: metadata.zip
  inflating: vib20/vmware-storcli64/BCM_bootbank_vmware-storcli64_007.1616.0000.0000-01.vib
```

- 2) 使用 **esxcli software vib install -v [软件包所在的绝对路径] [.vib 文件名]** 进行安装。

```
[root@localhost:/tmp/storcli] esxcli software vib install -v /tmp/storcli/vib20/vmware-storcli64/BCM_bootbank_vmware-storcli64_007.1616.0000.0000-01.vib --no-sig-check
Installation Result
  Message: Operation finished successfully.
  Reboot Required: false
  VIBs Installed: BCM_bootbank_vmware-storcli64_007.1616.0000.0000-01
  VIBs Removed:
  VIBs Skipped:
```

- 3) 工具默认安装在/opt/hpe/storcli64 目录下，使用 **cd /opt/hpe/storcli64/**进入此目录。

```
[root@localhost:/opt/hpe/storcli64] cd /opt/hpe/storcli64/
[root@localhost:/opt/hpe/storcli64] ls
libstorelib.so  storcli.log  storcli64
```

4. 获取阵列卡编号、逻辑盘编号和物理盘编号（命令通用，以 Linux 系统为例）

- 1) **./storcli64 show all** 查看当前阵列卡型号及编号：MR408i-a 阵列卡 编号：c0。

```
[root@localhost storcli] ./storcli64 show all
CLI Version = 007.2207.0000.0000 Sep 22, 2022
Operating system = Linux 3.10.0-1160.el7.x86_64
Status Code = 0
Status = Success
Description = None

Number of Controllers = 1
Host Name = localhost.localdomain
Operating System = Linux 3.10.0-1160.el7.x86_64

System Overview :
=====
---
Ctl Model          Ports PDs DGs DNOpt VDs VNOpt BBU sPR DS EHS ASOs Hlth
---
0  HPEMR408i-oGen11  8    4    1    0    1    0 Opt On  -  N    4 Opt
---
```

- 2) **./storcli64 /c0/vall show all** 查看当前逻辑卷信息为 RAID1，逻辑卷 VD 为 239。（c0 对应阵列卡的信息）

```
[root@localhost storcli]# ./storcli64 /c0/vall show all
CLI Version = 007.2207.0000.0000 Sep 22, 2022
Operating system = Linux 3.10.0-1160.el7.x86_64
Controller = 0
Status = Success
Description = None

/c0/v239 :
=====
-----
DG/VD TYPE State Access Consist Cache Cac sCC Size Name
-----
0/239 RAID1 Optl RW No NRWBD - ON 7.276 TiB A
-----
```

VD 为 239 的逻辑卷 RAID1 是由 EID 为 252: 1、252: 2 的成员盘组成

```
PDs for VD 239 :
=====
-----
EID:SlT DID State DG Size Intf Med SED PI SeSz Model Sp Type
-----
252:1 1 Onln 0 8.00 TB SATA HDD N N 512B MB008000GYDPE U -
252:2 2 Onln 0 8.00 TB SATA HDD N N 512B MB008000GYDPE U -
-----
```

3) ./storcli64 /c0/eall/sall show 查看物理盘信息

本文以 RAID1 加两块硬盘迁移至 RAID5 为例。

```
[root@localhost storcli]# ./storcli64 /c0/eall/sall show
CLI Version = 007.2207.0000.0000 Sep 22, 2022
Operating system = Linux 3.10.0-1160.el7.x86_64
Controller = 0
Status = Success
Description = Show Drive Information Succeeded.

Drive Information :
=====
-----
EID:SlT DID State DG Size Intf Med SED PI SeSz Model Sp Type
-----
252:1 1 Onln 0 8.00 TB SATA HDD N N 512B MB008000GYDPE U -
252:2 2 Onln 0 8.00 TB SATA HDD N N 512B MB008000GYDPE U -
252:3 3 UGood - 8.00 TB SATA HDD N N 512B MB008000GYDPE U -
252:4 0 UGood - 8.00 TB SATA HDD N N 512B MB008000GYDPE U -
-----
```

5. 迁移阵列

1) 将 EID 为 252:3 和 252:4 的盘扩容到 VD 239 的逻辑卷且迁移成 RAID5 级别。

./storcli64 /c0/v239 start migrate type=raid5 option=add drives=252:3,252:4

```
[root@localhost storcli]# ./storcli64 /c0/v239 start migrate type=raid5 option=add drives=252:3,252:4
CLI Version = 007.2207.0000.0000 Sep 22, 2022
Operating system = Linux 3.10.0-1160.el7.x86_64
Controller = 0
Status = Success
Description = Start LD Operation Success
```

✓ 降级迁移如下例，两块盘 Raid1 降级为两块盘 Raid0 可参考命令如下

./storcli64 /c0/v239 start migrate type=raid0

- ✓ 降级减盘迁移如下例，两块盘 Raid1 降级移除 252:1 成单盘 RAID0 可参考命令如下

./storcli64 /c0/v239 start migrate type=raid0 option=remove drives=252:1

- ✓ 注：多盘情况下驱动器列表用逗号隔开，不能有空格。

2) 查看迁移进度，等待扩容迁移完成即可。

./storcli64 /c0/v239 show migrate

```
[root@localhost storcli]# ./storcli64 /c0/v239 show migrate
CLI Version = 007.2207.0000.0000 Sep 22, 2022
Operating system = Linux 3.10.0-1160.el7.x86_64
Controller = 0
Status = Success
Description = None

VD Operation Status :
=====

-----
VD Operation   Progress%   Status      Estimated Time Left
-----
239 Transformation  0 In progress 1 Days 20 Hours 5 Minutes
-----

DG=Arrays | Slot=Drive Bay No|VD=Virtual Drive/Logical Drive|EID=Enclosure Device ID
```