ESM-G空间不足需要扩容

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问题描述

ESM-G空间不足需要扩容

过程分析

使用命令“df -h”查看系统根目录“/”使用是否已经超过90%以上，然后执行数据清理或磁盘扩容步骤。

解决方法

1. 开启数据清理功能

(1) 检查【系统管理】-【数据清理】是否自动打开，降低存储的安全事件和操作日志数量；

(2) 及删除服务器上无关的文件。

2. 重新部署控制中心

尽量使用大空间磁盘安装，推荐硬盘>=2T，在保持控制中心IP地址不变的情况下，控制中心重新部署后客户端会自动连接。

3. 增加硬盘扩容（可选）

增加一块硬盘，将新硬盘分区加载到操作系统根目录“/”下，从而扩展根目录大小。

应用环境：物理机或虚拟化平台，CentOS系统

请使用root权限登录操作系统，操作步骤如下。

(1) 查看磁盘分区

查看系统根目录空间大小

命令：

df -h

图3-1 查看系统根目录空间

```
[root@localhost ~]# df -h
Filesystem              Size  Used Avail Use% Mounted on
/dev/mapper/centos-root  180G   21G  160G  12% /
devtmpfs                 7.8G     0  7.8G   0% /dev
tmpfs                    7.8G     0  7.8G   0% /dev/shm
tmpfs                    7.8G   13M  7.8G   1% /run
tmpfs                    7.8G     0  7.8G   0% /sys/fs/cgroup
/dev/sda1               1014M  171M  844M  17% /boot
overlay                  180G   21G  160G  12% /var/lib/docker
tmpfs                    1.6G   28K  1.6G   1% /run/user/0
```

显示根目录空间大小为180G。

查看磁盘分区信息。

命令：

fdisk -l

图3-2 查看磁盘分区信息

```
[root@localhost ~]# fdisk -l
```

图3-3 系统磁盘信息显示

```
[root@localhost ~]# fdisk -l

Disk /dev/sda: 214.7 GB, 214748364800 bytes, 419430400 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x000a1053

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *        2048     2099199     1048576   83  Linux
/dev/sda2         2099200   390088703   193994752   8e  Linux LVM

Disk /dev/mapper/centos-root: 193.3 GB, 193273528320 bytes, 377487360 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes


Disk /dev/mapper/centos-swap: 5368 MB, 5368709120 bytes, 10485760 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

磁盘信息显示，系统只有1块磁盘，在系统中磁盘名称为“/dev/sda”，磁盘大小为200G，系统根目录“/”使用的分区名称“/dev/mapper/centos-root”。

(2) 增加新硬盘

将服务器正常关机

命令：

poweroff

图3-4 关机命令

```
[root@localhost ~]# poweroff
```

将服务器电源线断开，服务器上安装新硬盘，接通服务器电源线开启服务器。

(3)　格式化新磁盘

查看新磁盘分区。

命令：

fdisk -l

图3-5 磁盘分区信息

```
[root@localhost ~]# fdisk -l
```

图3-6 系统磁盘信息显示

```
[root@localhost ~]# fdisk -l

Disk /dev/sda: 214.7 GB, 214748364800 bytes, 419430400 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x000a1053

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *        2048     2099199     1048576   83  Linux
/dev/sda2         2099200   390088703   193994752   8e  Linux LVM

Disk /dev/sdb: 1099.5 GB, 1099511627776 bytes, 2147483648 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes


Disk /dev/mapper/centos-root: 193.3 GB, 193273528320 bytes, 377487360 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes


Disk /dev/mapper/centos-swap: 5368 MB, 5368709120 bytes, 10485760 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

磁盘信息显示，系统中增加了1块1T的硬盘，在系统中磁盘名称为“/dev/sdb”，磁盘未分区。

对新磁盘“/dev/sdb”创建分区。

命令：

fdisk /dev/sdb

图3-7 创建新磁盘分区

```
[root@localhost ~]# fdisk /dev/sdb
```

输入“m”查看帮助命令

图3-8 输入“m”查看参数说明

```
[root@localhost ~]# fdisk /dev/sdb
Welcome to fdisk (util-linux 2.23.2).

Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Device does not contain a recognized partition table
Building a new DOS disklabel with disk identifier 0xcf7c5107.

Command (m for help): m
Command action
   a   toggle a bootable flag
   b   edit bsd disklabel
   c   toggle the dos compatibility flag
   d   delete a partition
   g   create a new empty GPT partition table
   G   create an IRIX (SGI) partition table
   l   list known partition types
   m   print this menu
   n   add a new partition
   o   create a new empty DOS partition table
   p   print the partition table
   q   quit without saving changes
   s   create a new empty Sun disklabel
   t   change a partition's system id
   u   change display/entry units
   v   verify the partition table
   w   write table to disk and exit
   x   extra functionality (experts only)

Command (m for help):
```

输入“n”在磁盘上创建分区

图3-9 输入“n”创建分区

```
Command (m for help): n
Partition type:
   p   primary (0 primary, 0 extended, 4 free)
   e   extended
```

输入“p”设置分区类型为主分区

图3-10 输入“p”分区设置为主分区

```
Command (m for help): n
Partition type:
   p   primary (0 primary, 0 extended, 4 free)
   e   extended
Select (default p): p
```

分区序号选择输入“1”

图3-11 输入“1”作为序号

```
Command (m for help): n
Partition type:
   p   primary (0 primary, 0 extended, 4 free)
   e   extended
Select (default p): p
Partition number (1-4, default 1): 1
```

选择默认起始位置，按回车键

图3-12 回车键使用默认起始地址

```
Command (m for help): n
Partition type:
   p   primary (0 primary, 0 extended, 4 free)
   e   extended
Select (default p): p
Partition number (1-4, default 1): 1
First sector (2048-2147483647, default 2048):
```

选择默认结束位置，按回车键

图3-13 回车键使用默认结束地址

```
Command (m for help): n
Partition type:
   p   primary (0 primary, 0 extended, 4 free)
   e   extended
Select (default p): p
Partition number (1-4, default 1): 1
First sector (2048-2147483647, default 2048):
Using default value 2048
Last sector, +sectors or +size{K,M,G} (2048-2147483647, default 2147483647):
```

输入“t”按回车键

图3-14 输入“t”

```
Command (m for help): n
Partition type:
   p   primary (0 primary, 0 extended, 4 free)
   e   extended
Select (default p): p
Partition number (1-4, default 1): 1
First sector (2048-2147483647, default 2048):
Using default value 2048
Last sector, +sectors or +size{K,M,G} (2048-2147483647, default 2147483647):
Using default value 2147483647
Partition 1 of type Linux and of size 1024 GiB is set

Command (m for help): t
```

输入小写“l”按回车键

图3-15 输入“l列出文件系统类型

```
Command (m for help): t
Selected partition 1
Hex code (type L to list all codes): l
```

输入“8e”按回车键

图3-16 输入“8e”选择文件系统类型

```
Command (m for help): t
Selected partition 1
Hex code (type L to list all codes): l

 0  Empty           24  NEC DOS         81  Minix / old Lin bf  Solaris
 1  FAT12           27  Hidden NTFS Win 82  Linux swap / So c1  DRDOS/sec (FAT-
 2  XENIX root      39  Plan 9          83  Linux           c4  DRDOS/sec (FAT-
 3  XENIX usr       3c  PartitionMagic  84  OS/2 hidden C:  c6  DRDOS/sec (FAT-
 4  FAT16 <32M      40  Venix 80286     85  Linux extended  c7  Syrinx
 5  Extended        41  PPC PReP Boot   86  NTFS volume set da  Non-FS data
 6  FAT16           42  SFS             87  NTFS volume set db  CP/M / CTOS / .
 7  HPFS/NTFS/exFAT 4d  QNX4.x          88  Linux plaintext de  Dell Utility
 8  AIX             4e  QNX4.x 2nd part 8e  Linux LVM       df  BootIt
 9  AIX bootable    4f  QNX4.x 3rd part 93  Amoeba          e1  DOS access
 a  OS/2 Boot Manag 50  OnTrack DM      94  Amoeba BBT      e3  DOS R/O
 b  W95 FAT32       51  OnTrack DM6 Aux 9f  BSD/OS          e4  SpeedStor
 c  W95 FAT32 (LBA) 52  CP/M            a0  IBM Thinkpad hi eb  BeOS fs
 e  W95 FAT16 (LBA) 53  OnTrack DM6 Aux a5  FreeBSD         ee  GPT
 f  W95 Ext'd (LBA) 54  OnTrackDM6      a6  OpenBSD         ef  EFI (FAT-12/16/
10  OPUS            55  EZ-Drive        a7  NeXTSTEP        f0  Linux/PA-RISC b
11  Hidden FAT12    56  Golden Bow      a8  Darwin UFS      f1  SpeedStor
12  Compaq diagnost 5c  Priam Edisk     a9  NetBSD          f4  SpeedStor
14  Hidden FAT16 <3 61  SpeedStor       ab  Darwin boot     f2  DOS secondary
16  Hidden FAT16    63  GNU HURD or Sys af  HFS / HFS+      fb  VMware VMFS
17  Hidden HPFS/NTF 64  Novell Netware  b7  BSDI fs         fc  VMware VMKCORE
18  AST SmartSleep  65  Novell Netware  b8  BSDI swap       fd  Linux raid auto
1b  Hidden W95 FAT3 70  DiskSecure Mult bb  Boot Wizard hid fe  LANstep
1c  Hidden W95 FAT3 75  PC/IX           be  Solaris boot    ff  BBT
1e  Hidden W95 FAT1 80  Old Minix
Hex code (type L to list all codes): 8e
```

输入“w”保存设置

图3-17 输入“w”保存

```
Hex code (type L to list all codes): l

 0  Empty           24  NEC DOS         81  Minix / old Lin bf  Solaris
 1  FAT12           27  Hidden NTFS Win 82  Linux swap / So c1  DRDOS/sec (FAT-
 2  XENIX root      39  Plan 9          83  Linux           c4  DRDOS/sec (FAT-
 3  XENIX usr       3c  PartitionMagic  84  OS/2 hidden C:  c6  DRDOS/sec (FAT-
 4  FAT16 <32M      40  Venix 80286     85  Linux extended  c7  Syrinx
 5  Extended        41  PPC PReP Boot   86  NTFS volume set da  Non-FS data
 6  FAT16           42  SFS             87  NTFS volume set db  CP/M / CTOS / .
 7  HPFS/NTFS/exFAT 4d  QNX4.x          88  Linux plaintext de  Dell Utility
 8  AIX             4e  QNX4.x 2nd part 8e  Linux LVM       df  BootIt
 9  AIX bootable    4f  QNX4.x 3rd part 93  Amoeba          e1  DOS access
 a  OS/2 Boot Manag 50  OnTrack DM      94  Amoeba BBT      e3  DOS R/O
 b  W95 FAT32       51  OnTrack DM6 Aux 9f  BSD/OS          e4  SpeedStor
 c  W95 FAT32 (LBA) 52  CP/M            a0  IBM Thinkpad hi eb  BeOS fs
 e  W95 FAT16 (LBA) 53  OnTrack DM6 Aux a5  FreeBSD         ee  GPT
 f  W95 Ext'd (LBA) 54  OnTrackDM6      a6  OpenBSD         ef  EFI (FAT-12/16/
10  OPUS            55  EZ-Drive        a7  NeXTSTEP        f0  Linux/PA-RISC b
11  Hidden FAT12    56  Golden Bow      a8  Darwin UFS      f1  SpeedStor
12  Compaq diagnost 5c  Priam Edisk     a9  NetBSD          f4  SpeedStor
14  Hidden FAT16 <3 61  SpeedStor       ab  Darwin boot     f2  DOS secondary
16  Hidden FAT16    63  GNU HURD or Sys af  HFS / HFS+      fb  VMware VMFS
17  Hidden HPFS/NTF 64  Novell Netware  b7  BSDI fs         fc  VMware VMKCORE
18  AST SmartSleep  65  Novell Netware  b8  BSDI swap       fd  Linux raid auto
1b  Hidden W95 FAT3 70  DiskSecure Mult bb  Boot Wizard hid fe  LANstep
1c  Hidden W95 FAT3 75  PC/IX           be  Solaris boot    ff  BBT
1e  Hidden W95 FAT1 80  Old Minix
Hex code (type L to list all codes): 8e
Changed type of partition 'Linux' to 'Linux LVM'

Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.
Syncing disks.
```

查看新磁盘分区

命令：

fdisk -l

图3-18 查看磁盘分区信息

```
[root@localhost ~]# fdisk -l

Disk /dev/sda: 214.7 GB, 214748364800 bytes, 419430400 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x000a1053

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *        2048     2099199     1048576   83  Linux
/dev/sda2         2099200   390088703   193994752   8e  Linux LVM

Disk /dev/sdb: 1099.5 GB, 1099511627776 bytes, 2147483648 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x3b05ae0c

   Device Boot      Start         End      Blocks   Id  System
/dev/sdb1            2048  2147483647  1073740800   8e  Linux LVM

Disk /dev/mapper/centos-root: 193.3 GB, 193273528320 bytes, 377487360 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes


Disk /dev/mapper/centos-swap: 5368 MB, 5368709120 bytes, 10485760 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

格式化磁盘。

命令：

mkfs.ext4 /dev/sdb1

图3-19 格式化磁盘

```
[root@localhost ~]# mkfs.ext4 /dev/sdb1
```

格式化完毕显示。

图3-20 成功格式化

```
[root@localhost ~]# mkfs.ext4 /dev/sdb1
mke2fs 1.42.9 (28-Dec-2013)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
67108864 inodes, 268435200 blocks
13421760 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=2415919104
8192 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
        32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
        4096000, 7962624, 11239424, 20480000, 23887872, 71663616, 78675968,
        102400000, 214990848

Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done
```

(4)　创建磁盘物理卷

对新磁盘分区创建物理卷

命令：

pvcreate /dev/sdb1

图3-21 创建磁盘物理卷

```
[root@localhost ~]# pvcreate /dev/sdb1
WARNING: ext4 signature detected on /dev/sdb1 at offset 1080. Wipe it? [y/n]: y
  Wiping ext4 signature on /dev/sdb1.
  Physical volume "/dev/sdb1" successfully created.
```

显示磁盘物理卷

命令：

pvdisplay

图3-22 显示物理卷

```
[root@localhost ~]# pvdisplay
  --- Physical volume ---
  PV Name               /dev/sda2
  VG Name               centos
  PV Size               <185.01 GiB / not usable 4.00 MiB
  Allocatable           yes
  PE Size               4.00 MiB
  Total PE              47361
  Free PE               1
  Allocated PE          47360
  PV UUID               D90LHy-oG6T-eiN3-dUfv-R9OW-fnPT-yGHqtE

  "/dev/sdb1" is a new physical volume of "<1024.00 GiB"
  --- NEW Physical volume ---
  PV Name               /dev/sdb1
  VG Name
  PV Size               <1024.00 GiB
  Allocatable           NO
  PE Size               0
  Total PE              0
  Free PE               0
  Allocated PE          0
  PV UUID               t3cAsj-uGru-nsqF-zilz-PUyS-NamP-MtwCP1
```

备注：vgreduce --removemissing centos可以删除“VG Name”为空的所有冗余卷；vgreduce cen
tos /dev/sdb1可以删除sdb1卷。

查看磁盘卷信息

命令：

vgdisplay

图3-23 查看卷信息

```
[root@localhost ~]# vgdisplay
  --- Volume group ---
  VG Name               centos
  System ID
  Format                lvm2
  Metadata Areas        1
  Metadata Sequence No  3
  VG Access             read/write
  VG Status             resizable
  MAX LV                0
  Cur LV                2
  Open LV               2
  Max PV                0
  Cur PV                1
  Act PV                1
  VG Size               185.00 GiB
  PE Size               4.00 MiB
  Total PE              47361
  Alloc PE / Size       47360 / 185.00 GiB
  Free  PE / Size       1 / 4.00 MiB
  VG UUID               XZ34xm-25NM-ENWB-IIlP-QoSB-ndF6-fq1mo1
```

(5)　扩展根分区

新分区加入根目录。

根目录“/”使用的分区名为“centos”，新分区为“/dev/sdb1”,请根据系统实际进行替换。

命令：

vgextend centos /dev/sdb1

图3-24 新分区添加根目录

```
[root@localhost ~]# vgextend centos /dev/sdb1
  Volume group "centos" successfully extended
```

重新查看磁盘卷信息。

命令：

vgdisplsy

图3-25 查看磁盘卷

```
[root@localhost ~]#  vgdisplay
  --- Volume group ---
  VG Name               centos
  System ID
  Format                lvm2
  Metadata Areas        2
  Metadata Sequence No  4
  VG Access             read/write
  VG Status             resizable
  MAX LV                0
  Cur LV                2
  Open LV               2
  Max PV                0
  Cur PV                2
  Act PV                2
  VG Size               1.18 TiB
  PE Size               4.00 MiB
  Total PE              309504
  Alloc PE / Size       47360 / 185.00 GiB
  Free  PE / Size       262144 / 1.00 TiB
  VG UUID               XZ34xm-25NM-ENWB-IIlP-QoSB-ndF6-fq1mo1
```

进行卷扩容

命令：

lvextend -l +100%free /dev/mapper/centos-root

图3-26 将磁盘剩余空间全部添加

```
[root@localhost ~]# lvextend -l +100%FREE /dev/mapper/centos-root
  Size of logical volume centos/root changed from 180.00 GiB (46080 extents) to <1.18 TiB (308224 extents).
  Logical volume centos/root successfully resized.
```

调整卷分区大小

命令：

xfs_growfs /dev/mapper/centos-root

图3-27 调整卷大小

```
[root@localhost ~]# xfs_growfs /dev/mapper/centos-root
meta-data=/dev/mapper/centos-root isize=512    agcount=4, agsize=11796480 blks
         =                       sectsz=512   attr=2, projid32bit=1
         =                       crc=1        finobt=0 spinodes=0
data     =                       bsize=4096   blocks=47185920, imaxpct=25
         =                       sunit=0      swidth=0 blks
naming   =version 2              bsize=4096   ascii-ci=0 ftype=1
log      =internal               bsize=4096   blocks=23040, version=2
         =                       sectsz=512   sunit=0 blks, lazy-count=1
realtime =none                   extsz=4096   blocks=0, rtextents=0
data blocks changed from 47185920 to 315621376
```

如果提示不是xfs系统时使用resize2fs –f命令调整卷大小。

查看扩容结果

图3-28 查看根目录“/”扩容是否成功

根目录空间已由180G扩容到1.2T。