肖李 2016-12-06 发表

随着IT行业在全球范围内的快速发展,IT平台的规模和复杂程度出现了大幅度的提升,但是 ,高昂的硬件和运维管理成本、漫长的业务部署周期以及缺乏统一管理的基础架构为企业IT部门 制造了重重障碍。云计算技术颠覆性的改变了传统IT行业的消费模式和服务模式,消费者实现了 从以前的"购买软硬件产品"向"购买IT服务"转变,并通过Internet自助式的获取和使用服务,大大 提高了IT效率和敏捷性。

本文分两部分,首先分享H3Cloud OS安装过程中手动分区的操作详细步骤;其次分享经验:如何解决因默认分区带来根分区空间过小;导致制作云主机镜像时,根分区利用率达100%的问题

由于CentOS 7安装过程中默认分区的情况下,将根分区划分较小,而H3Cloud OS使用到的虚机镜像 文件存放于分区/var/lib/glance/images目录下,并且镜像文件一般较大几个G甚至是几十G的大小,很 快将根分区磁盘空间占用完。

根分区空间不足最终导致Docker容器进程异常。

1、H3Cloud OS安装部署规范检查

需要对照《H3Cloud云操作系统单机模式部署指导》或《H3Cloud云操作系统集群模式部署 指导》检查安装选择的服务器性能是否符合配置要求。并且虚拟机的配置不能低于同等配置的物 理机。该配置是我们推荐的运行H3Cloud OS最基本的部署要求,请严格执行。

2、H3Cloud OS安装过程中如何手动自定义分区大小

H3Cloud OS安装过程与CentOS 7等Linux操作系统类似,分区必须要存在根分区(用符号表示为"/")和Swap分区(也成为交换分区)。

其中根分区是文件系统的最根本的挂载点,任何分区或文件都挂载于根分区下,如果以一颗 倒着树来比作Linux的文件系统,那么根分区则是树根,树干和所有的枝叶都基于它而存在。

交换分区也称为虚拟内存,顾名思义就是针对内存不足问题。Linux操作系统一大优势是对 老设备的兼容性良好,对资源要求低,为解决设备内存不足问题,Linux系统将硬盘划分交换分 区来虚拟内存,当内存不足时,交换分区便充当内存使用。一般情况下(内存远小于磁盘容量) ,建议交换分区为服务器或个人PC物理内存的1到3倍之间,更大的配额是允许的,但是具体分 配是需要结合实际物理内存容量。如今的服务器内存配置充裕情况下(尤其是内存大于磁盘容量

时),只需象征性给出10G甚至更小的分区即可。

使用free命令可以直观查看交换分区大小及使用情况,具体如图-1所示: 图-1 free命令查看交换分区

[root@clc	oudos1 ~]#					
[root@clo	oudos1 ~]# fre	e				
	total	used	free	shared	buff/cache	available
Mem:	3868520	3115148	165636	92060	587736	314028
Swap:	4063228	3865884	197344			
[root@clo	oudos1 ~]#					
[root@clo	oudos1 ~]#					
[root@clc	oudos1 ~]# fre	ee -h				
	total	used	free	shared	buff/cache	available
Mem:	3.7G	3.0G	131M	8 9 M	602M	305M
Swap:	3.9G	3.7G	193M			
[root@clo	oudos1 ~]#					

下文结合对应截图细述H3Cloud OS安装过程中分区自定义划分。

第一步,选择"Install H3Cloud OS",按"enter"键,进行安装,如图-2所示: 图-2选择"Install H3Cloud OS"进行安装操作



【说明】: 介于实验室环境资源有限,本文安装H3Cloud OS的虚机磁盘大小为80G,内存为 4G,CPU为4核。客户实际环境需要参考安装文档推荐资源配置,严禁以本文具体资源配置用于 实际生产环境。

第二步,在"INSTALLATION SUMMARY"界面选择安装语言,默认为英文。具体如图-3所示

图-3 选择语言

:

20	INSTALLATION	SUMMARY		H3CLOUD OS INSTALLATION
U H3Cloud 05				🕮 us Help!
	LOCALIZA	TION		
	Θ	DATE & TIME Asia/Shanghai timezone		KEYBOARD English (US)
	á	LANGUAGE SUPPORT English (United States)		
	SOFTWAR	E		
	0	INSTALLATION SOURCE		SOFTWARE SELECTION Source changed - please verify
	SYSTEM			
	2	INSTALLATION DESTINATION Custom partitioning selected		KDUMP Kdump is enabled
	Q	NETWORK & HOST NAME Not connected		
X				
			We w	Quit Begin Installation
	A Please complete	e items marked with this icon before continuing t	o the next step.	

第三步,对云操作系统可以选择中文(此处中文是待安装的云操作系统的系统语言,不是安装过程的中文显示。),但建议采用英文环境(未安装中文输入法,切换中文路径不方便)具体如图-4所示:

图-4 选择中文

				🖽 us
Selec	t additional langu	age suppo	rt to be installed:	
Русский	Russian		简体中文 (中国)	
සිංහල	Sinhala		繁体中又(台湾) 繁体中文(由国香港结别行政)5	7
Slovenčina	Slovak		简体中文 (新加坡)	-/
Slovenščina	Slovenian			
Shqip	Albanian			
Српски	Serbian			
Svenska	Swedish			
தமிழ்	Tamil			
తెలుగు	Telugu			
Точикй	Tajik			
ไทย	Thai			
Türkçe	Turkish			
Українська	Ukrainian			
اردو	Urdu			
Tiếng Việt	Vietnamese			
✔ 中文	Chinese	>		
IsiZulu	Zulu			
Type here to search.		•		



10	INSTALLATION	SUMMARY			H3CLOUD OS IN	STALLATION
UHBCloud OS					🕮 us	Help!
	LOCALIZA	TION				
	Θ	DATE & TIME Asia/Shanghai timezone		KEYBOARD English (US)		
	á	LANGUAGE SUPPORT English (United States)				
	SOFTWAR	E				
	0	INSTALLATION SOURCE	4	SOFTWARE Source chan	E SELECTION ged - please verify	
	SYSTEM		_			•
	2	INSTALLATION DESTINATION Custom partitioning selected		KDUMP Kdump is en	abled	
0	<u>ð</u>	NETWORK & HOST NAME Not connected				
0			Wew	von't touch your	Quit E	legin Installation Begin Installation'.
	A Please complet	e items marked with this icon before continuing	to the next step.			

第五步,此处选择"H3Cloud OS Master Node",具体参照单机或集群安装文档,此处如图-6

所示:

图-6选择软件包

SOFTWARE SELECTION		H3CLOUD OS INSTALLATION
Base Erwironment H3Cloud OS Mester Node hostall H3Cloud OS master node H3Cloud OS Cluster Node Install H3Cloud OS cluster node. H3Cloud OS Compute Node Install H3Cloud OS master node. H3Cloud OS Network Node Install H3Cloud OS network node.	Add-Ons for Selected Environment	

第六步,选择"INSTALLATION DESTINATION",如图-7所示: 图-7 选择"INSTALLATION DESTINATION"

20	INSTALLATION	SUMMARY		÷	3CLOUD O	S INSTALLATION
				1	🕮 us	Help!
H3CIOUD OS	LOCALIZA	TION				
	Θ	DATE & TIME Asia/Shanghai timezone		KEYBOARD English (US)		
	á	LANGUAGE SUPPORT English (United States)				
	SOFTWAR	RE				
	0	INSTALLATION SOURCE		SOFTWARE S H3Cloud OS C	ELECTION luster Node	
	SYSTEM		1			
	2	INSTALLATION DESTINATION Custom partitioning selected		KDUMP Kdump is enab	led	
of	Ō5	NETWORK & HOST NAME Not connected				
					Quit	Begin Installation
			We w	on't touch your dis	ks until you cl	ick 'Begin Installation'.

第七步,进入分区界面,选择"I will configure partitioning"为自定义模式,如图-8所示: 图-8选择"I will configure partitioning"自定义分区

INSTALLATION DESTINATION	H3CLOUD OS INSTALLATION
Done	🖽 us Help!
Device Selection	
Select the device(s) you'd like to install to. They will be left untouched until you click on the \ensuremath{n}	ain menu's "Begin Installation" button.
Local Standard Disks	
80 G/B	
-0	
Virtio Block Device	
vda / 992.5 KiB free	
	Disks left unselected here will not be touched.
Specialized & Network Disks	
Add a disk	
	Disks left unselected here will not be touched.
Other Storage Options	
Partitioning	
Automatically configure partitioning O I will configure partitioning.	
I would like to make additional space avanable.	
Encryption	
Encrypt my data. You'll set a passphrase later.	
Full disk summary and boot loader	1 disk selected; 80 GiB capacity; 992.5 KiB free

第八步,进入"MANUAL PARTITIONING"界面,显示默认分区情况,如图-9所示: 图-9 "MANUAL PARTITIONING"界面显示默认分区情况

			H3CLOUD OS INSTALLATIC
▼ New H3Cloud OS 7 I	nstallation	vdal	
DATA		Mount Point:	Device(s):
/boot vdal	500 MIB >	/boot Desired Capacity:	No disks assigned Modify
/ centos-root	71.47 GiB	500 MiB	
SWAP centos-swap	8192 MIB	Device Type: Standard Partition v Encrypt File System: xfs v V Reformat	
		Label:	Name: vdal
			Update Settings
+ - 0 0			not be applied until you click on the main menu's
AVAILABLE SPACE 992.5 KIB 80 GIE 1 storage device selected	ACE B		'Begin Installation' button. Reset All

第九步,调整分区,点击"-"可以删除原有分区,此处保留交换分区,其他分区自定义调整,如图-10所示:

图-10 调整分区

DATA		centos-swap	
OVER		Mount Point:	Device(s):
swap	8192 MiB		Virtio Block Device (vda)
centos-swap	01521110	Desired Capacity:	
		8192 MiB	
		Device Type:	Volume Group
		LVM 🗸 🗆 Encrypt	centos (71.51 GiB free) ♥
		File System:	Modify
		swap 🗸 🕅 Reformat	
		Label:	Name:
			swap
			Update Settings
			Update Settings Note: The settings you make on this screen will

增加/boot分区,用来存放操作系统核心文件,如图-11所示: 图-11 增加/boot分区

MANUAL PARTITIONING		H3CLOUD OS INSTALLATION
▼ New H3Cloud OS 7 Installation DATA SYSTEM Swap 8192 MiB >	Centos-swap Mount Point: Device(s): Virto Block Device (vds) Desired Capacity: S192 MB	
	ADD A NEW MOUNT POINT ne Group More customization options are available after creating the mount point below. Mount Point: //toot v Desired Capacity: 2504b Cancel Add mount point	(71.51.68 free) ¥
+ - C E AVALABLE SPACE SOO.97 MIB BOGIB 1 storage device selected	Note: The setting not be applied un	Update Settingp is you make on this screen will if you click on the main menu's 'Begin installation' button Reset All

增加根分区(即"/"分区),如图-12所示: 图-12 增加大小为50G的根分区,如图-13所示: 图-13 增加根分区

MANUAL PARTITIONING Done V New H3Cloud OS 7 Installation	H3CLOUD OS INSTALLATION Rep: Vda1
SYSTEM /boot 250 MiB > val swap 8192 MiB	Mount Point: Device(s): /boot Vittis Black Device (vds) Desired Capacity: Modify 250 MiB
centor-ways	ADD A NEW MOUNT POINT More customization options are available after creating the mount point below. Mount Point: Desired Capacity: Cancel Add mount point Cancel Add mount point Update Settings Note: The settings you make on this screen will not be applied until you click on the main menu's Begin installation button.
1 storage device selected	Reset All

增加大小为20G的/var分区,该分区下存放云主机镜像(存放路径: /var/lib/glance/images),建议提前和客户沟通,以分配充裕的空间满足客户镜像需求。分区如图-14所示:

MANUAL PARTITIONING			H3CLOUD OS INSTALLATI
Done			He
Vew H3Cloud OS 7 Installation	centos-root		
	Mount Point:	Device(s):	
		Virtio Block Device (vda	
/boot 250 MiB	Desired Capacity:		
/ 50 GIB >	50 GiB		
swap 8192 MiB	ADD A NEW MOUNT POINT	ne Group	
	More customization options a	os re available	(21.51 GiB free) 🗡
	after creating the mount point	t below. lify	
	Mount Point: /var	~	
	Desired Groupity 206/8		
	Desired Capacity.	=:	
	Cancel	f mount point	
	Caller	initialité pointe	
		Note: The cetti	and you make on this series will
+ - C E		not be applied u	ntil you click on the main menu's
			'Begin Installation' button.
AVAILABLE SPACE TOTAL SPACE 249.97 MiB 80 GiB			
1 storage device selected			Reset All

完成分区后,查看全部分区结果,如图-15所示: 图-15 查看分区结果

MANJAL PARTITIONING			H3CLOUD OS INSTALLATION E us Help!
Vew H3Cloud OS 7 Ins	tallation	centos-var	
DATA		Mount Point:	Device(s):
/boot vdal	250 MiB	/var Desired Capacity:	Virtio Block Device (vda) Modify
/var centos-var	20 GIB >	20 GiB	
/ centos-root	50 GiB	Device Type:	Volume Group
swap centos-swap	8192 MiB	LVM v 🗆 Encrypt	centos (1544 MiB free) 🗸
		File System: xfs V Reformat	Modify
		Label:	Name: var
+ - C E			Update Settings Note: The settings you make on this screen will not be applied unit you cluk on the main menu's Begin Installation Duton.
AVAILABLE SPACE TOTAL SPACE 249.97 MiB 80 GiB	CE .		
<u>1 storage device selected</u>			Reset All

第十步,点击"Done",弹出"SUMMARY OF CHANGES",如图-16所示: 图-16 SUMMARY OF CHANGES页面

ew H3Cloud OS	New H3Cloud OS 7 Installation		centos-var			
			Mount Point:	Device	:(s):	
/boot			/var	Virtio E	Block Device (vda)	
/dal	SUMMA	RY OF CHANGES	;			
/var	Your cus	stomizations will I	esult in the following cha	nges taking effect on the d	disks you've selected	£
entos -var	Order	Action	Туре	Device	Mount point	1
entos-root	1	Destroy Format	Unknown	Virtio Block Device (vda)		
swap	2	Create Format	partition table (MSDOS)	Virtio Block Device (vda)		(1544 MiB free) ¥
centos-swap	3	Create Device	partition	vda1 on Virtio Block Dev	ice	(1344 HID NEC) *
	4	Create Format	ext4	vdal on Virtio Block Dev	ice /boot	
	5	Create Device	partition	vda2 on Virtio Block Dev	ice	
	6	Create Format	physical volume (LVM)	vda2 on Virtio Block Dev	ice	
	7	Create Device	lvmvg	centos		
	8	Create Device	lvmlv	centos var		
	9	Create Format	xfs	centos-var	/var	
	10	Create Device	lvmlv	centos-root		
	11	Create Format	xfs	centos-root		
			Cancel & Return	n to Custom Partitioning	Accept Changes	
						Update Setting
- C 🗉	3				Note: The settings not be applied unti	you make on this screen you click on the main mer 'Begin Installation' butt

第十一步,选择上图中"Accept Changes",进入安装界面,如图-17所示: 图-17 安装界面,选择"Begin Installation"按钮

H3Cloud OS	INSTALLATION	SUMMARY		H3CLOUD ⊞ us	OS INSTALLATION Help!
		TION DATE & TIME Asia/Shanghai timezone LANGUAGE SUPPORT		KEYBOARD English (US)	
	SOFTWAR	INSTALLATION SOURCE	4	SOFTWARE SELECTIOI H3Cloud OS Cluster Not	N de
0	SYSTEM	INSTALLATION DESTINATION Custom partitioning selected NETWORK & HOST NAME Not connected		KDUMP Kdump is enabled	
Q			We w	Quit von't touch your disks until you	Begin Installation

第十二步,软件安装完成,如图-18所示: 图-18 软件安装完成



第十三步,重启,登陆H3Cloud OS后台,验证分区结果,如图-19所示: 图-19 验证分区结果

CentOS Linux 7 (Core) Kernel 3.10.0-229.el7.xd	36_64 c	m an :	×86_64			
masternode login: root						
Password:						
Last login: Sun May 15 1	10:56:2	9 on				
[root@masternode ~]# df						
llesystem	Size	Used	Avail	Use% Mounted on		
/dev/mapper/centos-root	50G	8.56	426	17% /		
levtmpfs	1.96	0	1.96	0% /dev		
tmpfs	1.96	12K	1.96	1% /dev/shm		
tmpfs	1.96	8.5M	1.96	1% /run		
mpfs	1.96	0	1.96	0% /sys/fs/cgroup		
/dev/uda1	239M	107M	115M	49% /boot		
/dev/mapper/centos-var	ZØG	97M	20G	1% /var		
tmpfs	379M	ß	379M	0% /run/user/0		
root@masternode "]#						

- 至此,上述共13步详细给出自定义分区操作步骤及说明。
- 3、H3Cloud OS安装后如何实现分区大小调整
- 当安装过程中未选择自定义分区时,由于默认选择为LVM(Logical Volume Manager逻辑卷
- 管理,简单地讲能动态调整Linux主机分区大小)。因此可以参考下述经验对分区进行调整。 【说明】此处实验主机配置:350G磁盘,4G内存,4核CPU,如图-20所示 图-20 主机配置

导航	主机: cvk3									
小板洗	○ 総計主社 ★ 開始主社 単	· 连接主机区关闭主机 ◎ ● 自主机 ●	→洗卵ぬ計 ★讲入细护根 √ 得出油	10世 主統開 務	教设 〇治	加速税 第三人成税 🏮	秘書OVF機			
◎ 〒云虚控 ▲ □ 云接版		■ 虚拟 () ● 存体 ● 虚拟交排	机 🧧 物理同卡 🔰 存储适置器	▲ 高級设置	局任务					
* (a hostpool	根要				Top5	组队机CPU利用车				
 ✓ Cvk3 	Pitti	192 168 113 3			87-1	242		CPUHIER/SA)		
() master1	主机型号	H3C FlexServe	r R390		mast	er1		010101040	5.53%	
国家利頼物	CPU##册	210124						-		
# 唐秋田 (F)) # 唐秋田 (F))));	CPU멾号	16 选择存储					×			
· 3 括扑	CPU主频	显示名称	文件 名称 ·	文件大小	승립	使用者				
電磁採机視的	1917 ##	isoppol	SQLServer2008R2.ISO	4.34GB	iso					
★通去並分 ● 計応流預扩展	成中	nopeor	cloudos1	350.00GB	qcow2					
·····································	ME19/14	detaultpool	master1	90.00GP	acow2	master1		内容利用案(%)		
● 製 姑点容灾	主机本地存储		test	1000.0000	DCC(M2			1313 1313 44 (11)	53.05%	
> CVXLAN <u>IF</u> 务	状态		herti	1000.00MB	orou0	tort				
> 2 告寄信理	系统运行时间		100(1	30.00GB	4:042	(03)				
◎ III 统计报表 ◎ 系统管理	存鋒使用軍(%)									
	(Pahathat	_								
	marting									
		T.	▶ 11 4 第1 页共1页 >	이 🥹 被索:	清箱入び	(洋名称。 👂 显示 1・	5,共5; 40 0			
							网络石时	#		
			总 增加存储34 含 上桥文件 16	新建存储费	補命	× 关闭	1	~ 1		
		0 200	1 8 /	1	K	1		100		

此处主要关心磁盘大小,本文目的是调整磁盘分区,以解决主机镜像存放目录/var/lib/glance/images所在分区空间不足问题。

选择默认安装,未自定义划分分区,如图-21所示: 图-21 安装过程选择默认分区情况

INSTALLATION DESTINATION	H3CLOUD OS INSTALLATION I us Help!
Device Selection	
Select the device(s) you'd like to install to. They will be left untouched until you click on t	the main menu's "Begin Installation" button.
Local Standard Disks	
350 GiB	
Virtio Block Device	
vda / 992.5 KiB free	
	Disks left unselected here will not be touched.
Specialized & Network Disks	
Add a disk	
	Disks left unselected here will not be touched.
ther Storage Options	
Partitioning	
Automatically configure partitioning. I will configure partitioning.	
I would like to make additional space available.	
Encryption	
Encrypt my data. You'll set a passphrase later.	
Full disk summary and boot loader	1 disk selected; 350 GiB capacity; 992.5 KiB free

完成安装后,查看分区结果,每一个分区可以对照WINDOWS系统下的盘符,如图-22所示

图-22 查看默认分区结果

:

Default administrator login: root Default administrator password: cloudos
Default Deployer UI login: admin Default Deployer UI password: admin
Please change root password on first login.
cloudos1 login: root Passward: Frietgestem Size Used Avail Usez Mounted on Adex/mapper/loc_loudos1-root 566 176 346 342 / dex/mapper/loc_loudos1-root 566 176 82 /dex/shm tmp1s 1.96 8.4M 1.96 12 /dex/shm tmp1s 1.96 8.4M 1.96 12 /run tmp1s 2.96 33 /196 82 /dex/shm tmp1s 2.96 33 /196 82 /dex/shm dex/mapper/loc_loudos1-home 2966 33M /looke /dex/walat 377M 87M 341H 242 /boot tmp1s 379M 8 379M 82 /run/user/8 Iroot%cloudos1 ~JB

系统默认分区会根据总磁盘容量大小,进行LVM智能分区,分区是默认为个人PC主机,因此对/home目录(通常称为家目录)划分80%左右的空间,主要目的是存放个人文件,当根分区出现故障时,由于"/"和"/home"是独立分区,"/home"分区内用户数据依然完整,此时最坏的情况是重装或修复"/"分区,并不会造成"/home"分区数据丢失,能保护用户数据。

而此时在大云环境中/var/lib/glance/images目录所在分区为根分区(默认情况下未划分独立/var分区),因此空间大小受限于根分区。

根分区大小为50G,占总空间350G的14.29%。

家目录大小为296G,占总空间350G的84.57%。

从实际使用情况家目录由于不是个人PC应用场景(即不存放个人数据)严重浪费,而根分区则配额不足,一般主机镜像在3G到几十个G之间,客户需要win7,win2008,及不同Linux版本镜像时根分区大小不能满足要求。

此时根据下述分享经验进行分区调整。

【注意事项说明】:此方法是减少家目录(/home)的大小,将减小的空间增加到根分区(/ 目录)上,但XFS文件系统的分区空间无法缩小,导致/home目录无法缩小,所以最后需要备份/ home目录中的数据,删除/home目录的lvm卷,然后重建/home目录,操作之前一定要在虚拟机操 作一遍,然后再到生产环境修改,有问题及时联系售后。

第一步,运行lvdisplay命令,查看lvm分区情况:

[root@cloudos1 ~]# lvdisplay

Logical volume					
LV Path	/dev/ho_cloudos1/swap				
LV Name	swap				
VG Name	ho_cloudos1				
LV UUID	UKwQS9-CjpJ-XRRz-BCng-h4IB-hdbC-KemkES				
LV Write Access	read/write				
LV Creation host	t, time localhost, 2016-05-15 11:13:04 +0800				
LV Status	available				
# open	2				
LV Size	3.88 GiB				
Current LE	992				
Segments	1				
Allocation	inherit				
Read ahead sec	tors auto				
- currently set to	8192				
Block device	253:0				
Logical volum	e				
LV Path	/dev/ho_cloudos1/home				
LV Name	home				
VG Name	ho_cloudos1				
LV UUID	0W1D1T-keel-EOno-KxgW-88tp-BNqz-wvHv6L				
LV Write Access	read/write				

LV Creation host, time localhost, 2016-05-15 11:13:04 +0800

LV Status available

open 1 LV Size 295.57 GiB Current LE 75666 Segments 1 Allocation inherit Read ahead sectors auto - currently set to 8192 Block device 253:2 --- Logical volume ---LV Path /dev/ho_cloudos1/root LV Name root VG Name ho_cloudos1 LV UUID hwmhD7-OwP5-0DcS-cDkT-SCfn-fnsX-ESCy6N LV Write Access read/write LV Creation host, time localhost, 2016-05-15 11:13:36 +0800 LV Status available # open 1 LV Size 50.00 GiB Current LE 12800 Segments 1 Allocation inherit Read ahead sectors auto - currently set to 8192 Block device 253:1

第二步,运行umount /home命令,卸载家目录,结果如下图-23所示: 图-23 卸载家目录

[root@cloudos1 ~]#					
<pre>[root@cloudos1 ~] # umount /]</pre>	home/				
[root@cloudos1 ~]#					
[root@cloudos1 ~]# df -l					
Filesystem	1K-blocks	Used	Available	Use∜	Mounted on
/dev/mapper/ho_cloudos1-root	52403200	29322980	23080220	56%	
devtmpfs	1923240	0	1923240	0%	/dev
tmpfs	1934260	16	1934244	1%	/dev/shm
tmpfs	1934260	186964	1747296	10%	/run
tmpfs	1934260	0	1934260	0 8	/sys/fs/cgroup
/dev/vda1	487634	109352	348586	24%	/boot
tmpfs	386852	0	386852	80	/run/user/0
[root@cloudos1 ~]#					

第三步,减小家目录磁盘空间至100G,运行lvreduce -L 100G /dev/ho_cloudos1/home命令,如图-24所示:

图-24 减小家目录空间至100G

[root@cloudos1 ~]#
[root@cloudos1 ~]# lvreduce -L 100G /dev/ho_cloudos1/home
WARNING: Reducing active logical volume to 100.00 GiB
THIS MAY DESTROY YOUR DATA (filesystem etc.)
Do you really want to reduce home? [y/n]: Y
Size of logical volume ho_cloudos1/home changed from 295.57 GiB (75666 extents) to 100.00 GiB (25600 extents).
Logical volume home successfully resized.
[root@cloudos1 ~]#

第四步,查看物理可分配空间大小,运行vgdisplay –v命令,如图-25所示: 图-25 查看物理空间可分配空间大小

```
--- Physical volumes ---

PV Name /dev/vda2

PV UUID DgdxPG-MGpe-nVVk-I3M3-ydkW-BZG9-9raMwf

PV Status allocatable

Total PE / Free PE 89474 / 50082

[root@cloudos1 ~]#
```

Free PE值50082表示为可分配大小。

第五步,运行Ivextend -I +50082 /dev/ho_cloudos1/root命令调整分区,如图-26所示: 图-26 调整物理分区



第六步,激活空间变化项,运行xfs_growfs /dev/ho_cloudos1/root命令,如图-27所示: 图-27 使能空间变化项

[root@c	loudos1 ~]#		
[root@c	loudos1 ~]# xfs growfs	/dev/ho cloud	dos1/root
meta-da	ta=/dev/mapper/ho cloudo	s1-root isize=	=256 agcount=4, agsize=3276800 blks
		sectsz=512	attr=2, projid32bit=1
		crc=0	finobt=0
data		bsize=4096	blocks=13107200, imaxpct=25
		sunit=0	swidth=0 blks
naming	=version 2	bsize=4096	ascii-ci=0 ftype=0
log	=internal	bsize=4096	blocks=6400, version=2
		sectsz=512	<pre>sunit=0 blks, lazy-count=1</pre>
realtim	e =none	extsz=4096	blocks=0, rtextents=0
data bl	ocks changed from 131072	00 to 64391168	3
[root@c]	loudos1 ~l#		

第七步,新建/root/homebackup目录,备份/home目录下数据,如图-28所示: 图-28 备份/home目录下数据

```
[root@cloudos1 ~]# cd /home/
[root@cloudos1 home]# 11
total 8
drwxr-xr-x 2 root root 23 May 16 06:43 te
rw-r--r-- 1 root root 61 May 16 06:42 xiaollllll.txt
rw-r--r-- 1 root root 36 May 16 06:43 xlkj.txt
[root@cloudos1 home]#
[root@cloudos1 home]# pwd
/home
[root@cloudos1 home]# mkdir /root/homebackup
[root@cloudos1 home]#
[root@cloudos1 home]# cp -rp * /root/homebackup/
[root@cloudos1 home]#
[root@cloudos1 home]# ll /root/homebackup/
total 8
drwxr-xr-x 2 root root 23 May 16 06:43
rw-r--r-- 1 root root 61 May 16 06:42 xiaollllll.txt
rw-r--r-- 1 root root 36 May 16 06:43 xlkj.txt
[root@cloudos1 home]#
```

第八步,卸载家目录,删除家目录的逻辑卷,先运行umount /home确保家目录处于未挂载

状态,再运行Ivremove /dev/ho_cloudos1/home命令删除逻辑卷。如图-29所示: 图-29 删除家目录逻辑卷



当输入umount /home命令时返回"umount: /home/: not mounted"表明家目录当前未处于挂载状态。

第九步, 创建家目录的逻辑卷, 运行lvcreate -L 100G -n home ho_cloudos1命令, 如图-30 所示:

图-30 创建家目录逻辑卷

```
[root@cloudos1 ~]# lvcreate -L 100G -n home ho_cloudos1
WARNING: xfs signature detected on /dev/ho_cloudos1/home at offset 0. Wipe it? [y/n]: y
Wiping xfs signature on /dev/ho_cloudos1/home.
Logical volume "home" created.
[root@cloudos1 ~]#
[root@cloudos1 ~]#
```

第十步,格式化新建的家目录,运行mkfs.xfs /dev/ho_cloudos1/home命令,如图-31所示:图-31格式化新建家目录

[root@clo	oudos1 ~]# mkfs.xfs /de	v/ho_cloudos1,	/home
meta-data	a=/dev/ho_cloudos1/home	isize=256	agcount=4, agsize=6553600 blks
		sectsz=512	attr=2, projid32bit=1
		crc=0	finobt=0
data		bsize=4096	blocks=26214400, imaxpct=25
	=	sunit=0	swidth=0 blks
naming	=version 2	bsize=4096	ascii-ci=0 ftype=0
log	=internal log	bsize=4096	blocks=12800, version=2
		sectsz=512	<pre>sunit=0 blks, lazy-count=1</pre>
realtime	=none	extsz=4096	blocks=0, rtextents=0
[root@clo	oudos1 ~]#		

第十一步, 挂载家目录, 运行mount /dev/ho_cloudos1/home /home命令, 如图-32所示: 图-32 挂载家目录



第十二步,查看调整后分区明细,运行df -h命令,如图-33所示: 图-33 查看分区后明细

[root@cloudos1 ~]# df -h					
Filesystem	Size	Used	Avail	Use∜	Mounted on
/dev/mapper/ho_cloudos1-root	246G	29G	218G	12%	/
devtmpfs	1.9G	0	1.9G	<mark>0</mark> %	/dev
tmpfs	1.9G	16K	1.9G	1%	/dev/shm
tmpfs	1.9G	175M	1.7G	10%	/run
tmpfs	1.9G	0	1.9G	<mark>0</mark> %	/sys/fs/cgroup
/dev/vda1	477M	107M	341M	24%	/boot
tmpfs	378M	0	378M	<mark>0</mark> %	/run/user/0
/dev/mapper/ho_cloudos1-home	100G	33M	100G	1%	/home
[root@cloudos1 ~]#					

第十三步,恢复家目录下数据,运行cp -rp /root/homebackup /home命令,如图-34所示: 图-34 恢复数据

[root@cloudos1 ~]# cd /home/	
[root@cloudos1 home]#	
[root@cloudos1 home]# 11	
total O	
[root@cloudos1 home]#	
[root@cloudos1 home]#	
<pre>[root@cloudos1 home]# cp -rp /root/homebackup/* .</pre>	
[root@cloudos1 home]#	
[root@cloudos1 home]# 11	
total 8	
drwxr-xr-x 2 root root 23 May 16 06:43 <mark>test</mark>	
-rw-rr 1 root root 61 May 16 06:42 xiaollllll.txt	
-rw-rr 1 root root 36 May 16 06:43 xlkj.txt	
[root@cloudos1 home]#	
[root@cloudos1 home]#	

上述通过13个详细步骤并结合截图,给出调整分区操作。