AIX -- extending Logical Volumes online

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In this post, we will extend an Logical Volume size in AIX system.
The AIX system used in this example, is AIX 5.3.
The operation is online, and the effects of it can be seen instantaneously.
We use commands like lsvg, lslv, chfs, chlv and df in this example..
Here is a general information about them:

lsvg: *Displays information about volume groups*
lslv: *Displays information about a logical volume*
chfs: *Changes attributes of a file system*
chlv :*Changes only the characteristics of a logical volume*

df : *Reports information about space on file systems*

Also, I will give general information about the terms used in this example.

LV: *Logical Volume*

LP: *Logical Partition*

PP: *Physical Partition*

PPSIZE : *Physical Partition Size*

JFS: journaled file system

JFS2: Enhanced journaled file system. JFS2 is designed to accommodate a 64-bit kernel and larger files

So , lets start..
First, we check the volume groups in this system and then get the information about the relevant volume group ..

ermansrv1: / > lsvg

rootvg

oravg --> this volume group is in our focus..

ermanrv1: / > lsvg oravg

VOLUME GROUP: oravg VG IDENTIFIER: 00c6265000004c0000000116a075433a
VG STATE: active PP SIZE: 256 megabyte(s)
VG PERMISSION: read/write TOTAL PPs: 1596 (408576 megabytes)
MAX LVs: 256 FREE PPs: 143 (36608 megabytes)
LVs: 5 USED PPs: 1453 (371968 megabytes)
OPEN LVs: 5 QUORUM: 3
TOTAL PVs: 4 VG DESCRIPTORS: 4
STALE PVs: 0 STALE PPs: 0
ACTIVE PVs: 4 AUTO ON: yes
MAX PPs per VG: 32512
MAX PPs per PV: 1016 MAX PVs: 32
LTG size (Dynamic): 1024 kilobyte(s) AUTO SYNC: no

HOT SPARE: no BB POLICY: relocatable

So, "There are 143 PPs, almost 35 GB free area in the volume group."
Okay.. We have free PPs to grow, but do quota to grow?
I mean, If we are not in the limit of max allocations; we can just extent the filesystem.

ermanrv1: / > chfs -a size=+1G /orahome
Filesystem size changed to 44040192
ermandbsrv1: / > df

Filesystem 512-blocks Free %Used Iused %Iused Mounted on
/dev/fslv02 44040192 2096832 96% 39495 15% /orahome *(Enlarged)*

But if we have reached the max allocation for a logical volume;
We will get error while using chfs;

ermanrv1: / > chfs -a size=+20G /data
0516-787 extendlv: Maximum allocation for logical volume fslv00 is 1000.

If that's the case, we need to increase the max allocation for that volume group reasonably.
To find the correct limit to set the lv; we use lsvg and lslv commands.. ;
(the LV is made up of LPs. The LP corresponds to 1 or more (in the case of mirroring) PPs.)

lsvg shows us, the PPSIZE;

lsvg oravg
VOLUME GROUP: oravg VG IDENTIFIER: 00c6265000004c0000000116a075433a
VG STATE: active **PP SIZE: 256 megabyte(s)**
VG PERMISSION: read/write TOTAL PPs: 1596 (408576 megabytes)
MAX LVs: 256 FREE PPs: 39 (9984 megabytes)
LVs: 5 USED PPs: 1557 (398592 megabytes)
OPEN LVs: 5 QUORUM: 3
TOTAL PVs: 4 VG DESCRIPTORS: 4
STALE PVs: 0 STALE PPs: 0
ACTIVE PVs: 4 AUTO ON: yes
MAX PPs per VG: 32512
MAX PPs per PV: 1016 MAX PVs: 32
LTG size (Dynamic): 1024 kilobyte(s) AUTO SYNC: no

HOT SPARE: no BB POLICY: relocatable

lslv shows us how much LP corresponds to how much PP and what is our limit is..

Note that: while listing the logical volume information, we need to pass the logical volume name as input.. The logical volume name can be derived using the lsvg command;

ermansrv1: / > lsvg -l oravg (what logical volumes do we have in our volume group named oravg)
oravg:
LV NAME TYPE LPs PPs PVs LV STATE MOUNT POINT
loglv00 jfs2log 1 1 1 open/syncd N/A
fslv00 jfs2 1008 1008 4 open/syncd /data --> *here we have logical volume named fslv00 for the /data mount point, so we will use fslv00 as an input while using lslv and chlv commands.*
fslv01 jfs2 336 336 4 open/syncd /index
fslv02 jfs2 104 104 3 open/syncd /orahome
fslv03 jfs2 108 108 1 open/syncd /appl_top

Then we use the lslv command to see the current allocation and quota for our logical volume..

ermansrv1: / > lslv fslv00
LOGICAL VOLUME: fslv00 VOLUME GROUP: oravg
LV IDENTIFIER: 00c6265000004c0000000116a075433a.2 PERMISSION: read/write
VG STATE: active/complete LV STATE: opened/syncd
TYPE: jfs2 WRITE VERIFY: off
MAX LPs: 1000 PP SIZE: 256 megabyte(s)
COPIES: 1 SCHED POLICY: parallel
LPs: 960 PPs: 960
STALE PPs: 0 BB POLICY: relocatable
INTER-POLICY: minimum RELOCATABLE: yes
INTRA-POLICY: middle UPPER BOUND: 32
MOUNT POINT: /data LABEL: /data
MIRROR WRITE CONSISTENCY: on/ACTIVE
EACH LP COPY ON A SEPARATE PV ?: yes
Serialize IO ?: NO

From this ouput , we see the PP size , MAX LPs and current LPs..

So we are now ready to execute chlv to increase our MAX LP limit accordingly..

ermansrv1: / > chlv -x 1100 fslv00 , we change the lp limit (logical partition limit) it makes 256 * 1100 /1024 GB = 275GB
and then execute lslv again..

ermansrv1: / > lslv fslv00
LOGICAL VOLUME: fslv00 VOLUME GROUP: oravg
LV IDENTIFIER: 00c6265000004c0000000116a075433a.2 PERMISSION: read/write
VG STATE: active/complete LV STATE: opened/syncd
TYPE: jfs2 WRITE VERIFY: off
MAX LPs: **1100** PP SIZE: 256 megabyte(s)
COPIES: 1 SCHED POLICY: parallel
LPs: 1008 PPs: 1008
STALE PPs: 0 BB POLICY: relocatable
INTER-POLICY: minimum RELOCATABLE: yes
INTRA-POLICY: middle UPPER BOUND: 32
MOUNT POINT: /data LABEL: /data
MIRROR WRITE CONSISTENCY: on/ACTIVE
EACH LP COPY ON A SEPARATE PV ?: yes
Serialize IO ?: NO

So,the MAX LP value is increased as you see.. Good..

At this point we can execute chfs again.

ermansrv1: / > chfs -a size=+20G /data
Filesystem size changed to 528482304

ermansrv1: / > df -g
Filesystem GB blocks Free %Used Iused %Iused Mounted on
/dev/fslv00 252.00 20.61 92% 2213 1% /data *(Enlarged)*

That 's all. Note that: this is an online operation.. So Your Oracle Database may be running, your Oracle Applications or any other application may be running during this operation..

Note that: The filesystems used in this example are jfs2.. In jfs2, we can even decrease the filesystem size, but in jfs the filesystem size can not be reduced..

Gönderen Unknown zaman: 10:47:00 AM