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Linux Kernel Parameter - Dirty ; Page cache control

: http://kakaodbe.blogspot.kr/2014/03/linux-kernel-parameters-and-mysql_2226.html

Overview

MySQL

Definition

Linux `/proc/sys/vm` , Page Cache , dirty data disk flush 6

Kernel Parameter	description	Default
<code>dirty_background_ratio</code>	dirty page , pdflush	10(%)
<code>dirty_ratio</code>	process가 dirty page ,	40(%)
<code>dirty_background_bytes</code>	dirty_background_ratio (dirty_background_ratio) , 0 가	0
<code>dirty_bytes</code>	dirty_ratio (dirty_ratio) , 0 가	0
<code>dirty_writeback_centisecs</code>	page flush dirty	500(1/100sec)
<code>dirty_expire_centisecs</code>	page dirty page가 ,	3000(1/100sec)

Process

pdflush 'dirty_writeback_centisecs' writeback ,
 page cache dirty page
 'dirty_background_ratio' 'dirty_expire_centisecs'
 dirty page disk flush .

Opinion

dirty_background_ratio

I/O . pdfflush disk flush dirty page I/O ,
 가 . (DB insert update !)
 dirty_background_ratio

dirty_writeback_centisecs

page 가 . page

dirty_expire_centisecs

30 , disk
 30 dirty data가 disk
 . (InnoDB innodb_flush_method . innodb_max_dirty_pages_pct .)
 .) ** innodb_max_dirty_pages_pct : innodb buffer fool dirty page

Latest Issue and Kernel Parameters

i/o 가 가 . 가
 Filesystem Cache dirty data , swap
 cache unmap 가 dirty page 1 가 Cache
 Cache data dirty data disk i/o가 가

```
/proc/sys/vm/dirty_background_ratio : 10 ==> 1
/proc/sys/vm/dirty_expire_centisecs : 3000 ==> 1000
```

dirty_background_ratio 1 cache 1% dirty page가
 , dirty_expire_centisecs 10 dirty page가 cache

Details of Mysql_Cache_Unmap

Kakao DB Team Filesystem Cache swap cache_unmap
 . (url :
<http://kakaodbe.blogspot.kr/2013/09/mysql-linux-file-system-cache-2.html>) cache
 unmap

db	mysql_cache_unmap	Matt	가
	. (: mysql_cache_unmap.c)	
cache unmapping		Crontab	.

```
# Crontab Setting
*/10 * * * * root LD_LIBRARY_PATH=/otp/mysql/lib:
/otp/mysql/admin/mysql_cache_unmap --defaults-file=/etc/my.cnf --
binary_os_cache_size=1024M > /otp/mysql/admin/mysql_cache_unmap.log2>&1
```

```
-defaults-file          mysql server  configuration files          . cache unmap
                        binary log   data file          innodb redo log
                        . -binary_os_cache_size      Linux OS Cache
cache_unmap              (          1024M)  Linux OS
Cache
mysql_cache_unmap
```

```
root@host:~ 14:10:09> cat /opt/mysql/admin/mysql_cache_unmap.log
Read configuration
innodb_data_dir : /opt/mysql/data
innodb_log_dir  : /opt/mysql/data
binary_log_dir  : /opt/mysql/data/mysql-binary
binary_os_cache_size : 1073741824
relay_log_dir   : /opt/mysql/data/mysql-relay
> unmap_file_all : datafile : /opt/mysql/data/dbname1/tablename1.ibd
> unmap_file_all : datafile : /opt/mysql/data/dbname1/tablename2.ibd
> unmap_file_all : logfile  : /opt/mysql/data/ib_logfile0
> unmap_file_all : logfile  : /opt/mysql/data/ib_logfile1
> skip unmap file: binary   : /opt/mysql/data/mysql-binary.041728 : 0 ~
60083119
> skip unmap file: binary   : /opt/mysql/data/mysql-binary.041727 : 0 ~
104857974
> skip unmap file: binary   : /opt/mysql/data/mysql-binary.041726 : 0 ~
104857975
> skip unmap file: binary   : /opt/mysql/data/mysql-binary.041725 : 0 ~
104857883
> skip unmap file: binary   : /opt/mysql/data/mysql-binary.041724 : 0 ~
104857852
> skip unmap file: binary   : /opt/mysql/data/mysql-binary.041723 : 0 ~
104857920
> skip unmap file: binary   : /opt/mysql/data/mysql-binary.041722 : 0 ~
104857989
> skip unmap file: binary   : /opt/mysql/data/mysql-binary.041721 : 0 ~
104857781
> skip unmap file: binary   : /opt/mysql/data/mysql-binary.041720 : 0 ~
104857784
> skip unmap file: binary   : /opt/mysql/data/mysql-binary.041719 : 0 ~
104857666
> unmap_file_segment : binary : /opt/mysql/data/mysql-binary.041718 : 0 ~
```

```
34920063 of 104857944
> unmap_file_all : binary : /opt/mysql/data/mysql-binary.041717 : 0 ~ 104857764
> unmap_file_all : binary : /opt/mysql/data/mysql-binary.041716 : 0 ~ 104857852
> unmap_file_all : binary : /opt/mysql/data/mysql-binary.041715 : 0 ~ 104857772
> unmap_file_all : binary : /opt/mysql/data/mysql-binary.041714 : 0 ~ 104857847
```

mysql_cache_unmap filesystem cache datafile redo_log_file,
binary_log_file caching unmap . mysql_cache_unmap CentOS 5.x
Filesystem Cache 가 free memory가 memory 가
application swap . memory 가
MySQL MySQL swap ,
mysql_cache_unmap 가 cache size가 가

Attention

cache_unmap redo log innodb system data file Cache
purge . redo log innodb data file (innodb_flush_method)
innodb_flush_method =O_DIRECT innodb data file direct io innodb redo
log direct_io가 cached io redo log cache
unmap , innodb_flush_method가 O_DIRECT ALL_O_DIRECT (MariaDB &
PerconaServer only) redo log Innodb data file cache unmap
mysql_cache_unmap

mysql_cache_unmap 'posix_fadvise' caching
unmap .

```
## posix_fadvise SYNOPSIS
#define _XOPEN_SOURCE 600
#include <fcntl.h>
int posix_fadvise(int fd, off_t offset, off_t len, int advice);
```

fd가 len offset '0' , len bytes advice 가
가 '0' , 가
mysql_cache_unmap posix_fadvise cache
unmap .

```
#define _XOPEN_SOURCE 600
#include <fcntl.h>
```

```

int unmap_file_segment(const char *fpath, size_t start, size_t len){
    int fd = open(fpath, O_RDONLY);
    if (fd < 0){
        fprintf(stderr, "ERROR : Failed to open %s\n", fpath);
        return 1;
    }
    int r = posix_fadvise(fd, start, len, POSIX_FADV_DONTNEED);
    if (r != 0){
        fprintf(stderr, "ERROR : posix_fadvise failed for %s\n", fpath);
    }
    close(fd);
    /* if posix_fadvise is succeeded, then sleep 25 milli seconds */
    usleep(25 * 1000);
    return 0;
}

```

advice		'POSIX_FADV_DONTNEED'		
advice	가	, 'POSIX_FADV_DONTNEED'		page
cache(filesystem cache)		file	offset	len
unmapping		.		

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