Backup

Content

I. Backup and restore data
II. Backup files and directories
III. Backup partition and disks

Why do we need to backup data?

- System failure
  - Hardware, software, admin operations
- Data can be destroyed
  - Hardware, software, human mistakes
  - Natural disasters, fires, short circuit, etc.
- Need to restore systems after incidents
- To successfully restore data, we need to backup the system
- Incidents can happen at any time
- Always need to create updated backup versions

Backup types

- Use reserved hardware
- Backup files and directories
  - command tar
- Backup partitions and disks
  - dump and restore

Reserved storage devices

- Reserved servers
- Reseverd disks
- Reserved services
- Reserved types
  - Cold backup: computers are ready to restore after getting backup data
  - Warm: computers have data to restore already
  - Hot: computers are ready to operate
- Locations
  - Same location
  - Different locations of the same unit
  - A different unit, with agreement of sharing devices to backup
  - Not the same loation

Backup data

- Tasks
  - Copy data to a safe location
  - Check whether reserved data can be restored
  - Ready to restore
- Strategy to backup
  - Regulations of timings, people, and tools for backup
  - Procedure to backup and restore

Backup classification

- Backup objects
  - Files and directories
  - The whole system
- Backup methods
  - Full backup
  - Differential Backup
  - Incremental backup
- Backup environment
  - Tapes
  - Hard drives
  - Network drives

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II. Backup files and directories

Using ‘tar’ command

```
(1)# tar cvf file1.tar ./homework1
(2) # tar x file1.tar
(a)# tar cvfz backup.tar.gz file1 file2 file3

(c)# tar xvfz backup.tar.gz
```

II. Backup files and directories

Using ‘cpio’ command

```
(1)# ls | cpio –ov > /home/linux/compress.cpio
(2)# ls | cpio –ov –H tar >
   /home/linux/compress.tar
(3)# find . -iname "*.txt" | cpio -ov >
   /home/linux/txtfiles.cpio
(4)# cpio –iv < /home/linux/compress.cpio
(5)# cpio -iv -F < archive.tar
(6)# cpio -it < archive.tar
```

Commands on tapes

```
(1)  #mt -f /dev/nst0 fsf 2
(2)  #mt- f /dev/nst0 bsfm 1
(3)  #mt -f /dev/st0 rewind
```

Backup files and directories

- Sources
  - /home/~user
  - /etc/
  - /var/ ?
- Destinations
  - /archives/
  - Other partitions/disks

Restore files and directories

- Need to check files before restoring
- Full restoration
- Parted restoration

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Command dd

- dd: copy data at low level →block
- Can copy the whole partition/disk to a file and reversed
- Can be used to backup, copy or move partitions
- Require the same hardware backgrounds at the source and destination
- No data compression
- Speed is fast

Command dd

dd count=xxx if=/dev/hda of=/dev/hdb2

count: numbers of block

if: source

of: destination

dd count=xxx if=/dev/hda1 of=/dev/hdb2

dd count=xxx if=/dev/hda of=/dev/hdb

dd count=xxx if=/dev/hda1 of=/dev/hdb1

dd count=xxx if=/dev/hda of=f1

dd count=xxx if=f1 of=/dev/hda

Command dump and restore

- dump : backup a copy of the file system into storage devices and save backup history
  - Dump is used to check files and save necessary files
  - Full dump (level 0): full backup
  - Incremental dump (level >0):
    - Only save new and modified files
- Restore : restore the system file from the backup files
  - Full restoration
  - Parted restoration

Command dump

(1) Switch to single-user mode

```
# init 1
```

(2) unmount and check the file system

```
# umount /home; fsck -aV /dev/hda6
```

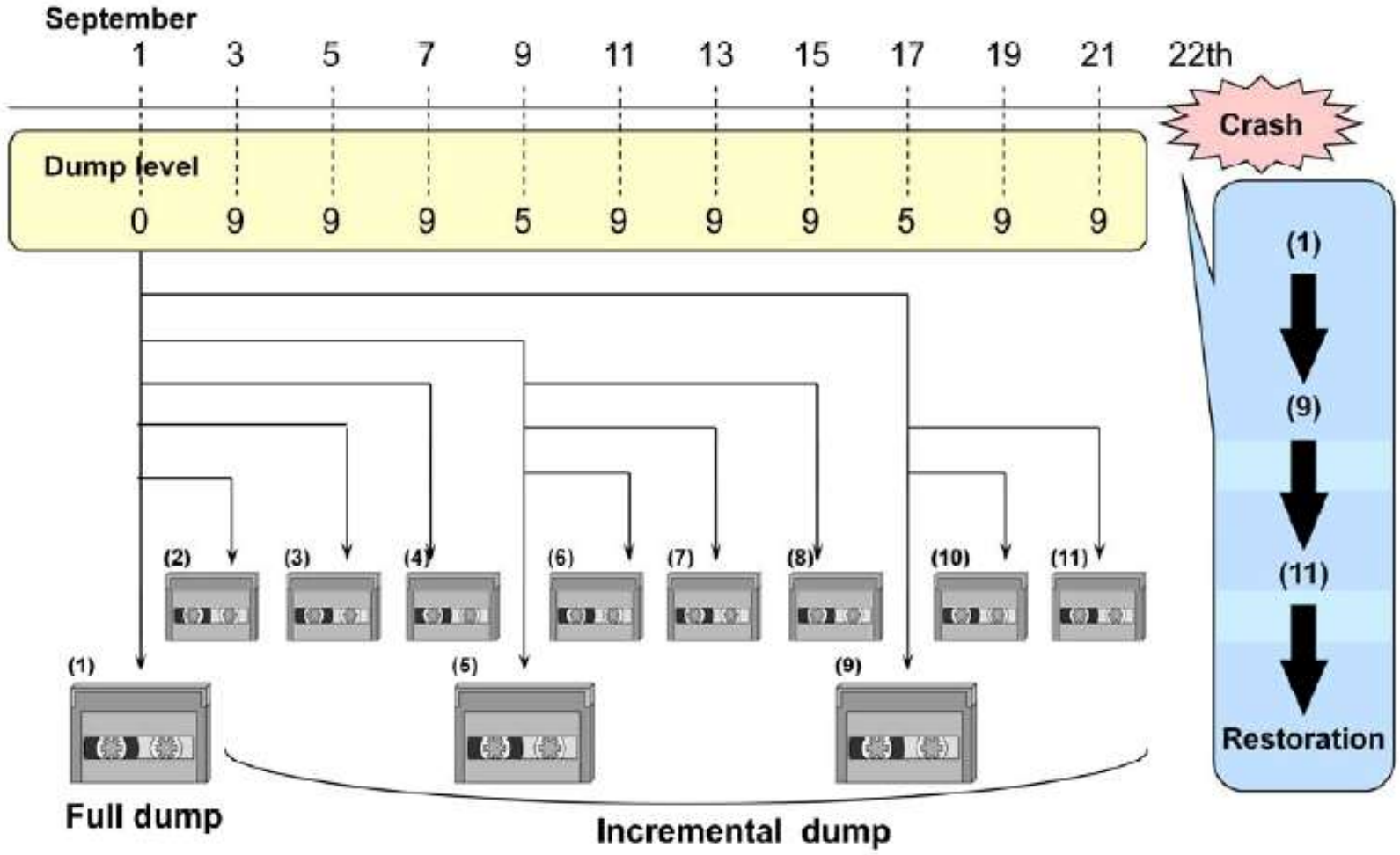
(3) Dump to external devices

```
(a)# dump 0uf /dev/st0 /dev/hda6
(b)# dump 5uf /dev/st0 /dev/hda6
(c)# dump 9uf /dev/st0 /dev/hda6
   # dump 9uf /dev/nst0 /dev/hda5
   # dump 9uf /dev/nst0 /dev/hda1
```

Command dump

- Options
  - u: update dump timing to /etc/dumpdates
  - f: dump to a file, can be a block file (device)
- Dump level
  - Level 0: Dump all files → Full dump
  - Level N >0: Dump new or modified files from the last dump with levels lover than N.

Dump levels and managed copies



Examples of dumping

Tháng Năm 09						
Thứ Hai	Thứ Ba	Thứ Tư	Thứ Năm	Thứ Sáu	Thứ Bảy	Chủ Nhật
Tháng Tư 27	28	29	30	Tháng Năm 1	2	3
Dump mức 4	Dump mức 5	Dump mức 6	Dump mức 7	Dump mức 8	Dump mức 9	Dump mức 0
4	5	6	7	8	9	10
Dump mức 4	Dump mức 5	Dump mức 6	Dump mức 7	Dump mức 8	Dump mức 9	Dump mức 1
11	12	13	14	15	16	17
Dump mức 4	Dump mức 5	Dump mức 6	Dump mức 7	Dump mức 8	Dump mức 9	Dump mức 2
18	19	20	21	22	23	24
Dump mức 4	Dump mức 5	Dump mức 6	Dump mức 7	Dump mức 8	Dump mức 9	Dump mức 3
25	26	27	28	29	30	31
Dump mức 4	Dump mức 5	Dump mức 6	Dump mức 7	Dump mức 8	Dump mức 9	Dump mức 0

Command restore

(2) Restore all files to the current directory

```
# restore -rf /dev/st0
```

(3) Restore some files and directories

```
# restore -cf /dev/st0 .x/usr00
```

(4) Restore some files and directories using interactive interface

```
# restore -if /dev/st0
```

Example of restoring home folder

```
#  mkfs /dev/hda6
#  fsck –aV /dev/hda6
#  mount  /dev/hda6   /home
# cd /home #  cd /home
#  restore  rf /dev/st0
#  rm restoresymtable
```