

CONNECTIVITY PART

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A further important function of the media manager is so-called tape reclamation. As a result of the incremental-forever strategy, more and more data that is no longer needed is located on the back-up tapes. If, for example, a file is deleted or changed very frequently over time, earlier versions of the file can be deleted from the back-up medium. The gaps on the tapes that thus become free cannot be directly overwritten using current techniques. In tape reclamation, the media manager copies the remaining data that is still required from several tapes, of which only a certain percentage is used, onto a common new tape.

The tapes that have thus become free are then added to the pool of unused tapes. There is one further technical limitation in the handling of tapes: current tape drives can only write data to the tapes at a certain speed. If the data is transferred to the tape drive too slowly this interrupts the write process, the tape rewinds a little and restarts the write process. The repeated rewinding of the tapes costs performance and causes unnecessary wear to the tapes so they have to be discarded more quickly. It is therefore better to send the data to the tape drive quickly enough so that it can write the data onto the tape in one go (streaming).

The problem with this is that in network back-up the back-up clients send the data to be backed up via the LAN to the back-up server, which forwards the data to the tape drive. On the way from back-up client via the LAN to the back-up server there are repeated fluctuations in the transmission rate, which means that the streaming of tape drives is repeatedly interrupted.

This storage hierarchy is used, for example, for the back-up of user PCs (Figure 7.2). Many user PCs are switched off overnight, which means that back-up cannot be guaranteed overnight. Therefore, network back-up systems often use the midday period to back up user PCs. Use of the incremental-forever strategy means that the amount of data to be backed up every day is so low that such a back-up strategy is generally feasible. All user PCs are first of all backed up to the hard disk of the back-up server in the time window from 11 : 15 to 13 : 45. The media manager in the back-up server then has a good twenty hours to move the data from the hard disks to tapes. Then the hard disks are once

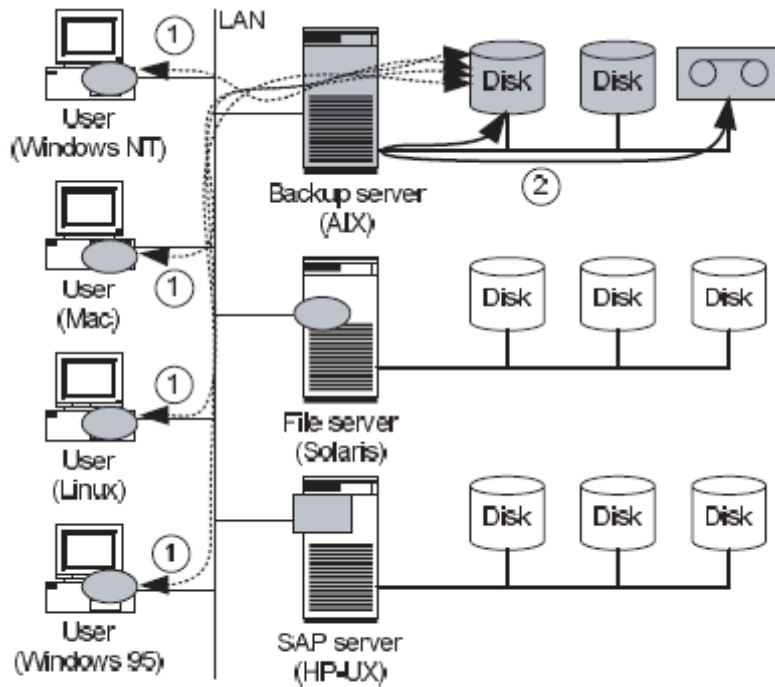


Figure 7.2 The storage hierarchy in the back-up server helps to back user PCs up efficiently. First of all, all PCs are backed up to the hard disks of the back-up server (1) during the midday period. Before the next midday break the media manager copies the data from the hard disks to tapes (2) again free so that the user PCs can once again be backed up to hard disk in the next midday break.

In all operations described here the media manager checks whether the correct tape has been placed in the drive. To this end, the media manager writes an unambiguous signature to every tape, which it records in the metadata database. Every time a tape is inserted the media manager compares the signature on the tape with the signature in the metadata database. This ensures that no tapes are accidentally overwritten and that the correct data is written back during a restore operation.

Furthermore, the media manager monitors how often a tape has been used and how old it is, so that old tapes are discarded in good time. If necessary, it first copies data that is still required to a new tape. Older tape media formats also have to be wound back and forwards now and then so that they last longer; the media manager can also automate the winding of tapes that have not been used for a long time. A further important function of the media manager is the management of data in a so-called off-site store. To this end, the media manager keeps two copies of all data to be backed up. The first copy is always stored on the back-up

server, so that data can be quickly restored if it is required. However, in the event of a large-scale disaster (fire in the data centre) the copies on the back-up server could be destroyed. For such cases the media manager keeps a second copy in an off-site store that can be several kilometres away.

The media manager supports the system administrator in moving the correct tapes back and forwards between back-up server and off-site store. It even supports tape reclamation for tapes that are currently in the off-site store and it.

Source :<http://elearningatria.files.wordpress.com/2013/10/cse-viii-storage-area-networks-06cs833-notes.pdf>