

Draft:

Requirement spesification for
backup in Skolelinux

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1 Introduction

The Skolelinux project are developing a Linux distribution for schools. Their aim is to make it simple to install and maintain. Furthermore, to be of real use to primary school and above, it should be available in as many local languages as possible. For Norway, that means both the official standards of Norwegian (Bokmål and Nynorsk) as well as northern Sami.

Skolelinux currently does not have a working configuration for backup. This requirement specification, RS, describes Skolelinux's requirements for a back-up solution.

The word "backup service" is defined as the product this requirement specification describes and "user" is defined as the user of the backup service, which can be both the system administrator, SA, and the end users, teachers, and pupils.

2 Primary system description

A Skolelinux-network mainly contains a file server, a LTSP-server and thin clients. The backup service is supposed to back up home-directories on the file server, the user- and configuration database (LDAP) on the file server and configuration files on the file server and LTSP-server(s).

Skolelinux wants a backup service that is working "out of the box", and of course is a full backup service where the SA easily can restore files and directories in case of an accident. The operator interface shall be as easy as possible.

A main goal with the system is to eliminate the pro-active and routine tasks of backup. This is important as the teachers that have the responsibility for doing the system administration task do not have very much time for this (three hours a week, depending on the size of the school). The system shall inform the SA when it need maintenance.

The backup service shall be so general that other distributions than Skole-linux can reuse the design and implementation.

3 General requirements

This chapter specifies the general requirements with respect to the backup service. The most important requirements are:

- must be able to be distributed with the Skolelinux CD (GPL, BSD or similar license)

- must support the architecture, the software, and the hardware that is used in Skolelinux
- both the backup- and restore-part must be extensively tested
- all communication between the backup server and the file server/LTSP-server(s) must be encrypted
- must be possible to place the backup server on another network than the file server and LTSP-server(s)

3.1 Availability and reliability

Backup shall start after 12PM and be completed before 5am (except for initial backup). The system shall be available for restore between 6am and 11PM.

The backup service shall in case of any failure send a failure report to the SA.

The schools/institutions who want to use the backup system have to decide how much money they will invest in hardware, but this backup project must document the available options and how they impact the reliability and functionality of the system.

3.2 Security

The backup service must be secured in a way that denies intruders (over the network). No other computers than the file server and the LTSP-server(s) shall be accepted by the backup server. The schools/institutions have to decide how much money they will invest in physically securing the backup server (burglary, physical destruction etc.). The documentation shall point out possible options to increase the backup servers (physically) security.

3.3 Capacity

The network bandwidth shall be at least 100Mbit/s. The speed on initial backup shall be at least 2GB/h.

The schools/institutions who are going to use the backup system have to decide how much capacity (hard drive, CPU, and memory) they can afford. The documentation shall contain guidelines to planning how much capacity that is needed for the service to work in a satisfactorily way.

3.4 Extensibility

It shall be possible to extend the backup servers capacity with more hard disk, CPU, and memory.

3.5 User-friendliness

There shall not be made any demands on the SA's IT-knowledge. Every manual operation that is offered by the backup service shall be briefly described in the documentation, and the documentation should be easy to understand.

4 Requirements to the systems functional properties

It is **required** that the backup service have the following properties:

- take daily backup of specified directories/files to a hard drive on an external backup server (on a Skolelinux-installation these directories/files would be predefined, but changes shall be possible)
- the daily backup transfer rate (not initial backups) shall exceed 1GB/h
- keep ownership and privileges to files and directories
- perform restore of directories/files (user decides placing)
- restore of 1MB data shall at a maximum take 2 minutes (excluding the SA's preparations and keyboard typing)
- the backup software on the file server and LTSP-server(s) shall be included on the Skolelinux CD and the only input at configuration is the IP-address to the backup server and a password
- the backup server is installed on a separate computer and shall only require input from the SA about which computers (IP-addresses) it shall receive backup from, which computer it shall use as syslog-server (if any), and the email-address to the SA

It is **desirable** that the backup service have the following properties:

- archives are stored encrypted on the backup server (at least 128bits key length and a cipher equal to or better than DES)
- possibility to fetch data from the backup server (over the network) for an offline backup
- the end-user, pupils, and teachers shall be able to restore their personal files (the SA must be able to enable or disable this service)
- the backup system is managed through the Webmin interface, and the backup system's Webmin-module should have the following properties:
 - define all files and directories to be backed up at each server
 - define off-site or on-site machines where backup should be stored on daily, weekly and monthly basis
 - check the quality of backup-files (monitor file sizes, numbers, successful/failed logins, disk full, disk failure etc.)
 - define mail and SMS recipients in case of trouble and errors
 - maintain logs
 - provide browser facilities to restore files from backup
 - restore data
 - syslog monitoring

5 Sketch of the technical solution

Figure 1 shows how the Skolelinux-network is planned with the backup server included. The plan is to take daily backup of files/directories at the file server and the LTSP-server(s).

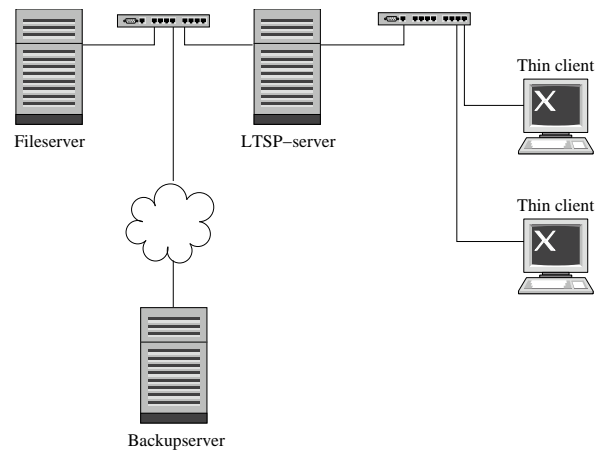


Figure 1: Sketch of the Skolelinux network

Daily backups are to be stored for a month, weekly backups for four months and monthly backups for one year. This is illustrated in figure 2.

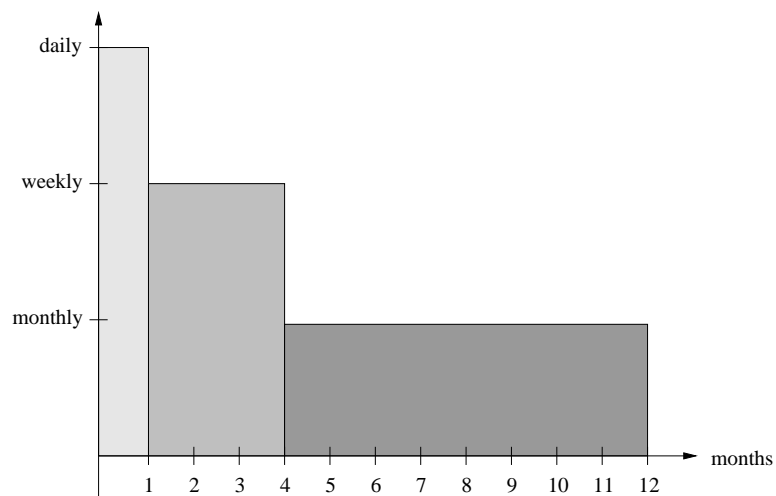


Figure 2: Storage of daily, weekly and monthly backups

6 Documentation

All code that is written shall be well documented.

These following documents shall be included (in Norwegian):

- User’s manual
(contains information about how to do restore of files/directories)

- System administrator’s manual
(contains information about how to install and configure the backup service, alternative actions to make the backup server more reliable, alternative actions to increase the backup servers physical security, information about how to plan the capacity of the service and how to upgrade the backup server with hard drive, CPU and memory)