Abstract—In view of the current handset short message service unceasing development, the design development based on Linux platform school short message system, implements between the school, teacher, the guardian the immediate relation and the feedback modern school comprehensive work system. In the article introduced under the Linux platform the short message system development principle and the design proposal. This article proposed an optimized secure access authentication method.

Index Terms—Linux, short message system, authentication

I. INTRODUCTION

School short message system(SMS) is the use of the existing mobile messaging network and SMS communication technology. SMS through Internet instant messaging service system will be sent to mobile phone users and school teachers, achieving schools, teachers, parents, students between the smooth transfer information, school activities and information and so on.

The system is a message of office, e-mail, instant messaging as one of the schools integrated office systems. The issue of secure access, authentication server, MySQL database server, and mainly by the RADIUS server form.

RADIUS server is responsible for the users of mobile terminals and timely information to respond to the information given in return. MySQL database is responsible for recording the user authentication information and the related information in the database operation to return information for the RADIUS server.

II. LINUX AND MOBILE COMMUNICATIONS

A. Linux System

August 1991, the Finn Linus Torvalds released a similar set of external Unix operating system, and named it Linux. Linux from the start as a follow GPL free software, open good, its simple functionality, open architecture, soon aroused particular, tertiary students and research officers. They have it as the object of study and research to begin in-depth analysis of reform, and continue to add new features.

Coupled with the popularization of Internet, just a few years, Linux has quickly grown into a huge user, stable, fully functional operating system. Currently there are common Linux distributions Redhat Linux9.0, RedFlag2.4. [1]

B. Mobile Communications Technology

Mobile communication has experienced three generations. The first generation mobile communication systems (1G), is

III. SHORT MESSAGE SYSTEM DESIGN

A. Short message system

School Short message system from the network topology can be divided into mobile operator networks, SMS, operator networks, the school network and Internet users in four main parts. [3]Which mobile operators for mobile users to send and receive SMS, SMS operators to mobile operators for SMS gateway through the Internet to handle the user's short message, the school user can operate through the Internet messaging system for user management, and short information distribution and management. SMS system as shown in Figure 1.

Sms operators within the LAN, including SMS servers, Web servers, database servers and firewalls. SMS server is the main business processes running the background, the gateway program and internal interfaces.

Web server provide web services for user and administrator login page. Database server is for storing data records.
B. SMS System Process Design

First, the mobile phone users to edit text, submitted to the SMS Center (SMC). SMS center number to the user sorted ascending purpose processing, launch up instructions submitted to the network operator's gateway.

After receiving the gateway to the data submitted after the sorting to the local uplink interface to submit the uplink processing.

Uplink processing results according to the system, the contents of the request to write the corresponding data in the table. SMS process as shown in Figure 2.

Message handling system to monitor the uplink data table, data table is written in the uplink data, once the data extraction, has been compiled based on text processing and management methods for processing. Treatment, visit the SMS messages issued downstream interface.

Then the network operator issued the procedural gateway to read from the database records submitted to the SMS center, SMS center next to users.

C. Website Design

Site structure composed mainly of two parts. Front page is the school system's main components of SMS. Users in the use of the system, can be Internet way, in your browser to access the specified URL.

Then authenticate the login page, you can go to the user area after a successful online using text messages sent, the school management (administrators teachers only), mail management, personal settings and other functions.

Admin message is the school system's main components, the system administrator can manage the school messaging system. Administrators to access back office management URL, and authentication.

Authentication is passed, the appropriate management in a systematic page additions and deletions, modifications, look at the relevant statistical data and other operations.

Background management system to support multiple users and rights distribution and management, thus increasing the system security and manageability. Site structure as shown in Figure 3.

IV. SHORT MESSAGE SYSTEM DESIGN AND IMPLEMENTATION

A. System operating environment

1. OS: Linux (redhat 9.0 or above)
2. Database: mysql 3.23.58 for Linux
3. Programming environment: php 5.0 for Linux
   Perl 5.8 for Linux
4. WEB Server: Apache 2.0 or above

B. Design and implementation of security authentication server

Mobile access system is mainly divided into three parts, the access control module, the network settings module, gateway control module. Network Settings module can be configured in the Linux DHCP server implementations. [4] In the Linux operating system to install Iptables firewall to achieve gateway control module.

Access control module through the network for mobile data packets sent by the client, the initial phase will move the client authentication information is extracted, is responsible for its authentication information to be packaged into a RADIUS packet, sent to the RADIUS authentication server.

In addition, the need to return in time to RADIUS authentication server authentication protocol packets encapsulated in EAP packets back to the mobile client. [5]

Linux system can be used in the API library to access the wireless LAN in the valid data packets. [6] Linux system provide us with libpcap libraries. At the same time using the Linux system libnet library to directly link layer data frame.

Mainly by the authentication server and RADIUS server, MySQL database server form. RADIUS server is responsible for the wireless terminal user information in a timely manner to respond to the information given in return. MySQL database is responsible for recording the user authentication information and the related information in the database operation to return information for the RADIUS server.

FreeRADIUS is an open source Linux system that can run on powerful RADIUS authentication server for distributed and heterogeneous computing environments. [7] FreeRADIUS not only support the LDAP, MySQL, PostgreSQL and Oracle databases, and with the EAP, and Cisco LEAP compatible, and many other network protocols.

In addition, FreeRADIUS can support many different platforms, the client software. FreeRADIUS is currently installed in many large-scale network system server. FreeRADIUS authentication service shown in Figure 4.
Security certification mobile terminal as the user will use FreeRADIUS authentication server. [8] Linux operating system installation and configuration of FreeRADIUS as follows. First, free download of the source installation package to extract.

tar-jxvf freeradius-server-2.0.5.tar into the extracted directory.

cd freeradius-server-2.0.5 / Configure - with-openssl - with-openssl-includes = /usr/include/openssl / - with-openssl-libraries = /usr/lib/openssl /

Then, start compile install.

make

make install

By radtest test after installation, you can execute the command.

radtest admin password localhost 0 testing123

After successfully testing the configuration of the following.

Sending Access-Request of id 80 to 127.0.0.1 port 1020

User-Name = "admin"

User-Password = "admin"

NAS-IP-Address = 127.0.0.1

NAS-Port = 0

rad_recv: Access-Accept packet from host 127.0.0.1 port 1020, id=80, length=20

Import MySQL database to connect the dynamic link library.

export

LD_LIBRARY_PATH=/usr/local/mysql/lib/mysql/

Then, to import a MySQL database table FreeRADIUS

cd /usr/local/mysql/bin/mysql-u root -p ****

radius< /home/lbh/freeradius-1.1.2/doc/examples/mysql.sql

In the MySQL database access authentication account to add security.

bin/mysql -u root -p ****

insert into radgroupreply (groupname,attribute,op,value) values ('user','Auth-Type',':=', 'Local');

insert into radgroupreply (groupname,attribute,op,value) values ('user','Service-Type',':=', 'Framed-User');

insert into radgroupreply (groupname,attribute,op,value) values ('user','Framed-IP-Address',':=', '255.255.255.0');

insert into radgroupreply (groupname,attribute,op,value) values ('user','Framed-IP-Netmask',':=', '255.255.255.0');

insert into radcheck (username,attribute,op,value) values ('admin','User-Password',':=', 'admin');

insert into usergroup (username,groupname) values ('admin','admin');

Freeradius start and test this command executable.

sbin/radiusd –X

bin/radtest test test localhost 0 testing123

Freeradius in the Linux operating system with the above configuration after installation and can be used.

ACKNOWLEDGMENT

SMS system for the school the school provides a fully functional information processing platform school day, you can easily reach out and school organization, student information management, improved overall efficiency and management level.

On the Application of Linux, combined with many years of development experience, the design of stability, security and efficient platform for a mobile messaging program, and have made satisfactory results. At present, many schools, businesses, research institutions, the promotion and application messaging system gradually, with good market prospects.

We sincerely thank our colleague Shanli Wang for his valuable role in developing the school short message system design and implementation.

REFERENCES


