

# CONCEPTION OF SOFTWARE COMPLEX FOR REMOTE TARGETS CONTROL

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## Abstract

In this article a conception of control system, using Internet for data transmission was considered. The main feature of such a system is using sites for getting access to the necessary information about controlled system state. The instruments for development all stages of such a system were suggested.

## I. INTRODUCTION

Nowadays the remote objects control is quiet an actual problem. Control is collecting and storing the information, which reflects the state of the object. Until recent days, the data about controlled object have been transmitted to the central supervision station mainly by means of wired wireless communication channels (specialized or GSM), telephone lines, dedicated wired lines and so on. The process of global Internet propagation caused the development of special systems of remote target control, which use Internet channels for data exchange.

This type of control systems has two parts – hardware and software. Hardware part is a set of specialized devices, which takes part of interface between controlled object and internet. DigiPing is an example of such a device [1]. This device provides supervision of different sensors and can be remotely controlled via SNMP-protocol. DigiPing can be connected to Ethernet and has an IP-address. Software part of control system is a set of applications, which organize the process of information transmission to the staff and storage of this information. The most part of applications, which were developed for this aim, have a closed code, difficult interface, high cost or are provided only together with bought equipment, for example Viessmann-ILON, EMC Control Center and so on. All of these makes upgrade of the program or its adaptation to specific system of control practically

impossible. Besides the weak part of these programs is their's orientation to the concrete platform.

## II. DESCRIPTION OF THE SYSTEM

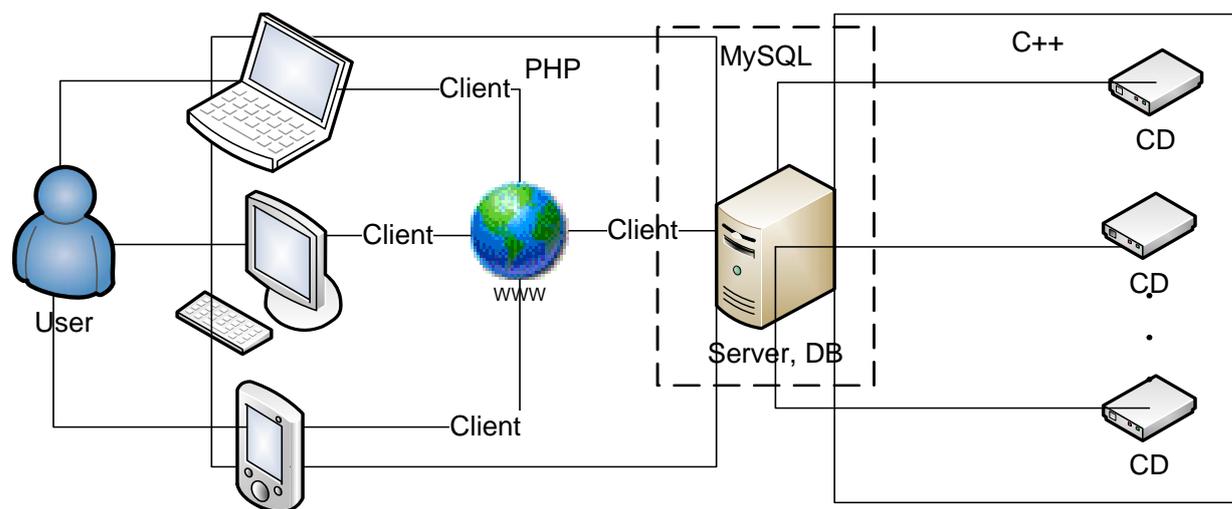
The purpose of this work is development of conception of control system, which is able to analyze and store the data, and can be remotely controlled via the Internet. The software part of it shouldn't have the shortcomings described above.

The structure of the suggested system consists of three basic parts (look at the picture below):

1. Controlled Device (CD), connected to Ethernet and having embedded software which supports network protocol.
2. Server – PC, which inquiries devices via Ethernet and forms data base (DB) about the state of CDs.
3. Client – application, which accesses to the server and gives information from DB to the user.

The most devices, which provide access to the controlled target from Ethernet, are operated via SNMP protocol (DigiPing, described above, is an example). So, for writing a program that is to make a inquiry of CDs via SNMP it is necessary to choose the language which supports proper libraries (C/C++ for example). For the C++ language it was developed the library SNMP++ with open code, containing functions SetRequest (for setting the variable to the defined value), GetRequest (query to agent information about one variable), GetNextRequest (query to agent about data of next variable in turn). Combining these functions it is possible to organize inquiry with cyclogramm of any complication [2].

But, the C++ language doesn't intend for the work with data bases and for creating remote interface. Nowadays for working with databases MySQL is mainly used. So, the mechanism of information transmission about state of CDs, from inquiring application of control to DB is needed. It can be done by inquiring application which creates file-scenario \*.sql, which keep some instructions for changing content of DB and executes automatically.



For provision the data from DB to remote user, on the server must be installed and properly adjusted MySQL-server [3]. Tools of MySQL-server allow to solve the problem of data safety by SSL-coding of messages, which which server and client are exchanging. It can be carried out with such commands of MYSQL as CREATE (for creation of bases, tables), GRANT (for creation of user of base, determinations of parameters of its authentication and, by the attribute of REQUIRE, obligating an client to use the SSL-channel coding of information), USE (choice of base) etc.

After creation of DB, it is necessary to provide the remote access and simple interface, allowing to make authentication of users and gives to them information according to their's rights.

User access to the DB should be made via internet-browser, which automatically updates with fixed intervals. So, the interface of system will be a site, that allows to access to information from any place, where the internet is. For creation of sites the language PHP is mainly use. It allows to create internet pages and to co-operate with a MYSQL database [4]. Basic required functions of language PHP are `mysql_connect()` (for connection with the DB, in it determined address of server of MYSQL and login/password of user), `mysql_select_db()` (for the choice of database, attributes are the name of base and identifier of connection with a server), `mysql_query()` (for various required to DB, such for

example SELECT – choice of concrete information from a table, INSERT – adding the data to the table, LOAD DATA – load in the table data from a text file, DELETE – delete of concrete data from a table, UPDATE – update of values of the already existent fields), `mysql_free_result()` (clear the selected for processing of data memory of server), `mysql_close()` (end of work with DB) and so on.

### III. CONCLUSION

Summarizing, we may say that the offered conception of the remote control system can be easily made by the modern tools of software development. The described in this article approach to the construction of the system of information collection allows operatively and ergonomically get all the required information, and at the necessity can be freely extended in accordance to the specific of considered task.

### REFERENCES

- [1] LightCom's "DigiPing v2" Technical Description.
- [2] [www.simple-times.org](http://www.simple-times.org)
- [3] Симдяков И. MySQL на примерах. СПб: БХВ- Петербург, 2007. 592 с.
- [4] Бенкен Е. PHP, MySQL, XML. Программирование для Интернета. СПб: БХВ-Петербург, 2007. 336 с.