Digitalization In Scanning And Remote Shutdown Host of Computer Using Apache Cordova Framework

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ABSTRACT

Internet of Things is one concept in technology 4.0, this technology combine of two component, that is internet and mechine. Internet use to send signal from mechine to second device like mobilephone or from the mobilephone to mechine to execution task. Information Technnology infrastructure in industrial company has many complexity in network, hardware, or software. Especially for hardware like desktop computer or laptop, ech employee has one of them. And many of them, sometime forget to shutdown they computer or they has purpose did not shutdown they computer just for download the big file. Indirectly, the computer that run more than 24 hours in industrial company, it will be degrade service of life, and the consumption of electricity need the high cost. In this paper, our purpose is how to reduce computer that not needed run 24 hours can be monitor and can be shutdown in the out of company area. This is need concept of internet of things and digitalitation to make it. For this problem can be used monitoring system by mobile application, this system will be show about the host computer still be on, and can be remote shutdown with mobile device. This application use cordova to build it and the command from mobile be send to server to shutdown computer that still online.

Kata Kunci: digitalization, remote shutdown, internet of things, technologi 4.0, ip scan

I. INTRODUCTION

INDUSTRIAL area or some instantion in this modern technology, always tend of using device in daily activity. Some of them like computer, mobile phone, and others is one of device that will be help people doing they job activity in every day. Look at, the people or employee in company, every times they use computer to finish they task, they always use internet to get the solution when found bottleneck idea. The computer or internet not only use to support they job, but also used to find entertaint when they are boring with the activity in office. The people can use his computer to search some article, to create blog, to download film, to watch film, and sometime to play the game. This activity occured in evey day in the company or instantion. The problem of this case, sometime people or employee did not shutdown the computer in 24 hours, because they need to download data or the computer still need by another employee to finish job, for shift employee. The effect of this case can be degrade the service of life the computer device, the side of accounting be effect of the cost electricity will be increased, and this is make effect the company no have standard as green activity. Based on this case, we need some digitalitation technology by applying internet to build a mobile system that can be monitor all computer in the company or instantion that still be on, and use remote shutdown using this application.

Digitalitation, augmented reality, and internet of things is one of technology in technology 4.0 that need implemented and challanges of company how to use it to help the job of people or employees. [1] Many of student interest with how to make technology 4.0 but did know how to implement it in a device. How to break this problem is need to recognize the concept of technology to people as a user. Like one of this case is how to use internet and mobile apps to help the IT technician to monitor all computer in company, especially at the night time. This article show how to implement the concept and build mobile application to scan and remote shutdown computer just one click. Like of the case in above paragraph about the desktop computer that still be running in the out of time working activity. The concept is to shutdwon in a long distance, in any time and any place like using the process of remote desktop [2][3][4] . This is one of part using internet and mobile device as internet of things, using remote to monitor the activity of the host computer [5][6]. To implement this concept to application, need to know the protocol that be need to access computer and give command to shutdown computer. One of the protocol that need to use, it is TCP protocol with port 3389. [4] But to open this port need attention to protect computer with antivirus. This

application using cordova framework, this framework has advantages for web developer because the source code use web languange like Javascript, HTML and CSS and do not have to skill about native language like java when to build application in android mobile. Moreove, this framework as framework of mobile hybrid can use for developing mobile application in various of mobile phone like ios, android, blackberry and windows phone just with use one source code. That is web languange, and the programmer do not need to know about swift languange for developt application in ios, or java for android application. Java as native language in android application can not customized with mobile and desktop interface by using one source code, developer must make two source code one another, even though java has interface library like javafx [7]. Different with cordova framework can build desktop and mobile using one source code, without build different framework. [8][9][10] Cordova framework is easy to use for developing mobile application and reduce time cost to build source code than use native programming.

The problem in this article about monitoring computer host in a long distance and how to remote shutdown that device just one click using mobile application. To developt this mobile application need some requirement like protocol remote desktop in windows, script using php to execution command of scan and shutdown host of computer, another requirement is webserver for implement php and cordova framework to build mobile application as interface between mobile and user to execution command for each computer. The remote desktop protocol must be active in each computer to shutdown the computer from long distance with mobile application, and the port for this protocol is 3389. And backend programming to execution command to computer and server using PHP programming. First, making script to scan IP addres to search all computer in local area network. After all IP address was found the computer that still on, then make script to execution shutdown command that implemented in webserver. When this script execute, the remote shutdown will be run and send command to specific host computer that has the specific IP address. Framework cordova use for implemented interface between user and smartphone, the interface of mobile application tend of two part section, that is interface to scan IP address and to shutdown computer based on spesific IP address.

II. METHOD AND REFERENCE

This application using cordova framework to build application and the concept is using internet connection to access the webserver and send command shutdown through webserver. Figure 1 show about how interface send to backend logic to shutdown computer.
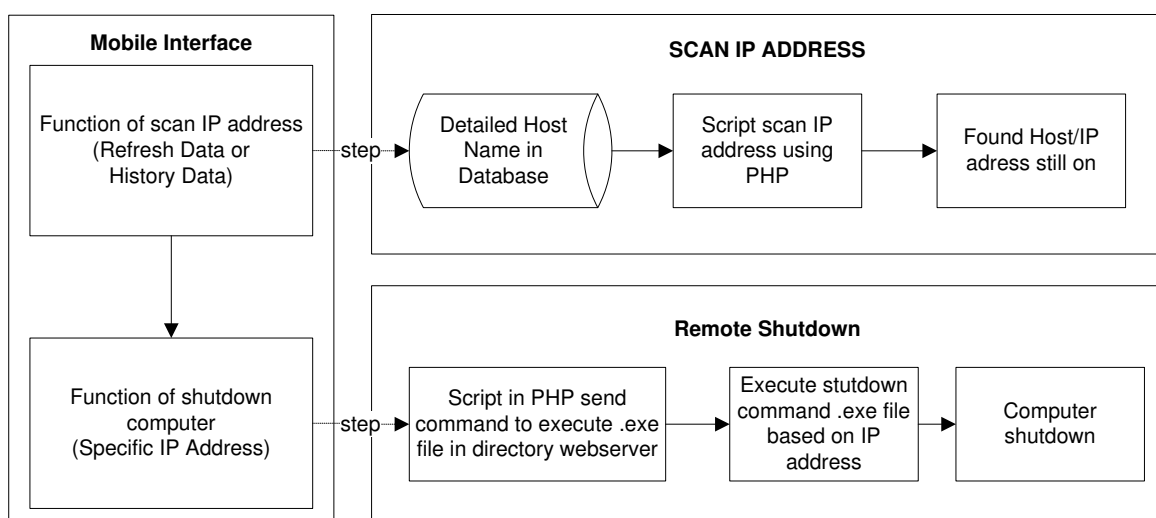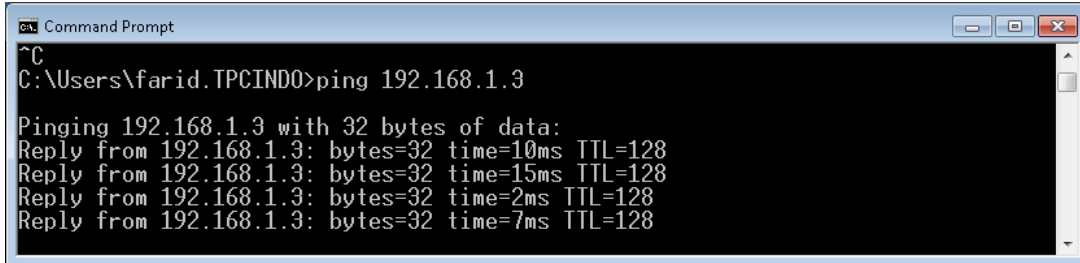

Figure 1. The concept interface of remote shutdown mobile application

A. Scan IP Address

This function use to scan ip address in the local network company. Where is detailed computer already save in database like ip address, computer name, working time the computer is online. When this function run that will be

check the computer that still has respond using "ping –ip address". Figure 2 show how the computer of user respond the request from server, "reply" message indicate the host of computer still on or active.
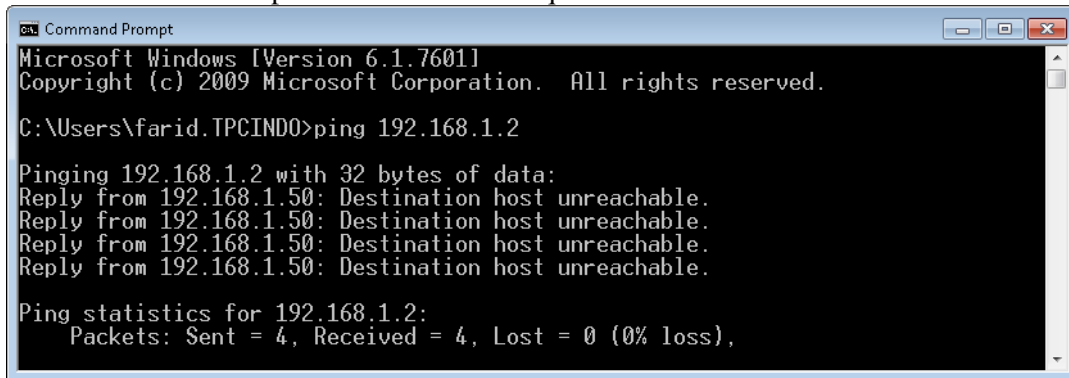

Figure 2. Respond request the IP of computer still on

Figure 3 show about the host computer is off and send request "destination host unreachable".

Figure 3. Respond request the IP of computer still off

Look at figure 3 the respond host to answer request data from server about the condition of host connect with network or not. All detailed hostname already save in database, so this process only scan all ip that available in database and not range ip like 192.168.1.1 until 192.168.1.255. Look at figure 4 about the design database detailed host name of computer in local area network.

Figure 4. Table of detailed host name

For example about the record of data from figure 4, show in table 1 the group of data host name in local area network that be scan when script scan ip address run by application.

Table I. Detailed host name

Id_Ip	Ip_Address	Own Name	Start	End	Category	State
116	192.168.1.116	Wid	8:00:00	17:00:00	Client	ON
117	192.168.1.117	Dit	8:00:00	17:00:00	Client	ON
119	192.168.1.119	Gus	8:00:00	17:00:00	Client	OFF
120	192.168.1.120	Hen	8:00:00	17:00:00	Client	ON
121	192.168.1.121	Wot	8:00:00	17:00:00	Client	OFF
122	192.168.1.122	Ope	8:00:00	17:00:00	Client	ON
123	192.168.1.123	Yue	8:00:00	17:00:00	Client	ON
124	192.168.1.124	Ziz	8:00:00	17:00:00	Client	ON
127	192.168.1.127	Her	8:00:00	17:00:00	Client	ON
128	192.168.1.128	Des	8:00:00	17:00:00	Client	ON
129	192.168.1.129	Geng	8:00:00	17:00:00	Client	OFF

Look at table I on column state, after scan ip in column ip address the state of hostname with spesific ip will be update. If the condition like in figure 2 the state will be on, and if the condition like in figure 3 the state will be off. How the script work in the webserver to scan all ip in database and know the ip address.

Table II. Script to scan IP address in Network Using Database

```php
<?php
......
$data_client = '';
$sql = 'SELECT ip_address, own_name, start, end FROM mobile_detail_ip_address WHERE cate-
gory="Client" ORDER BY ip_address ASC';
$result = mysqli_query($con, $sql);

if(mysqli_num_rows($result) == 0){
  echo "Empty";
}else{
  while($row = mysqli_fetch_assoc($result)){
    $output = ''; $status = '';
    $ip = $row['ip_address'];

          // request answer to host
    $ping = exec("ping -n 1 $ip", $output, $status);

          // give state of host is off or on
    if (strpos($output[2], 'unreachable') !== FALSE) {
      $state = 'ON';
    } else {
      $state = 'OFF';
    }

}

....
?>
```

Table II show, the process scan ip address in the network. This use for effective searching host name in the network than use range ip address from 192.168.1.1 – 192.16.1.255. When using database scanning process only search all ip address and already available in network. So execution time is less than searching with range ip address. In that script, give the process how to get request answer from the host and how to give state.

B. Shutdown Computer Using IP Address

From table II already know to get the host that still be on in the network. Next is how to shutdown the computer after the scan ip address. The concept is using the command of windows operating system with command prompt. This article only has concept with all computer that running is Windows OS and not for others system. In the windows command the process of shutdown from remote computer using ip address like in table III.

Table III. Shutdown Command Using .bat File

```
cd \
shutdown /s /f /m \\192.168.1.84 /t 00
```

In table III the script is save in .bat file, in that example the script has the name file is 192.168.1.84.bat. This name use to execute the file using php script based on ip address that already confirm from user to shutdown this host and computer. Anothe requirement for run this command is make sure the remote setting in windows OS already configure to allow user from computer running the remote desktop and the port 3389 not blocked by others software like antivirus. Figure 5. Show about configure remote setting in windows OS.
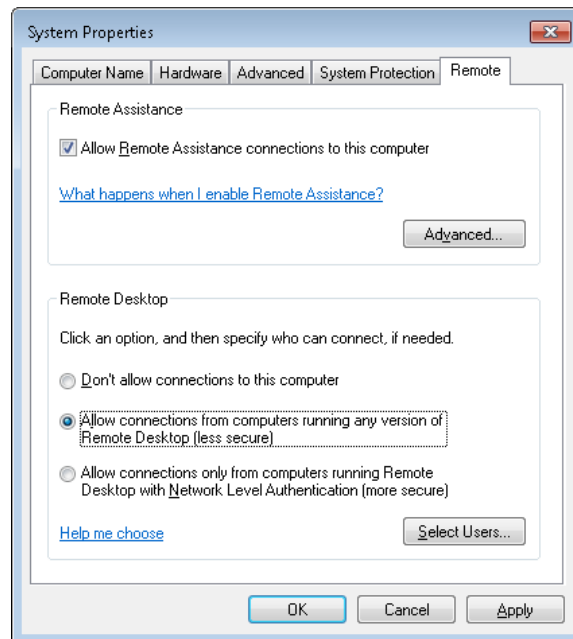

Figure 5. Configure Remote Setting in Windows OS

Next in table IV show about the script to execute script shutdown computer using ip address. This script using the command of table III to shutdown computer, in the PHP script only for executing the .bat file.

Table IV. PHP script to execute .bat file

```
//-- Get IP address --
$ip=$_POST['ip'];
//--shutdown command--//
exec ($ip.'.bat');

$output = ''; $status = '';
$ping = exec("ping -n 30 $ip", $output, $status);

echo '
    <div class="alert alert-success" role="alert">
      '.$ip.' already success to shutdown
    </div>
  ';

?>
```

When the script in the table IV execute then .bat file will be running and try to shutdown the computer that has specific ip address.

Based on the statement above, the concept reote shutdwon computer has a flow like the flowchart in the figure 6. This flowchart show about the process scan ip address from webserver until shutdown computer success or failed.
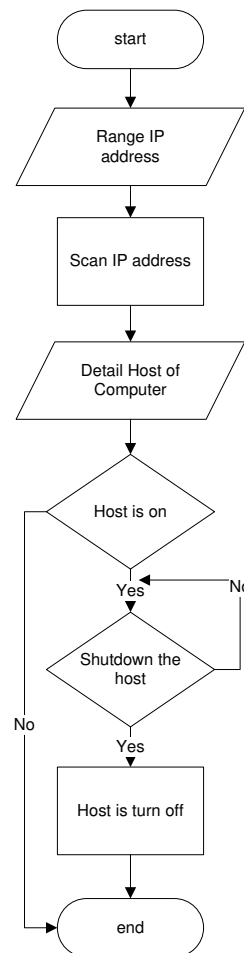
Figure 6. Flowchart of remote shutdown mobile application

III. RESULT AND DISCUSSION

Developing mobile application for scanning and remote shutdown host in long distance in this article need some requirements, webserver using XAMPP for supporting apache to developt php script to scan and shutdown the ip address. This script can be ask as backend programming language. An for developing front end programming in mobile using apache cordova with HTML, CSS, and Javascript as programming language. Then in the client computer, Windows OS must use in each host, because the script and protocol of remote shutdown only support for this OS.

The figure 7 show about the button from mobile application in this case. Two button available in this image, record button and refresh button. The record button has function to get the data of the host computer that still on or off, in last time or historical time. And for refresh button use for to get the condition of host computer in the current time.The two function button has different in the execution time. Certainly, the record function is faster that use refresh function, because the refresh function need to send request answer to ervery host of computer that still on or off. Different with record function that only get the condition of host from the database. The different method for this function is use to shutdown computer in a that time. Because if the record function not available in this mobile application, just for shutdown computer need to scan all condition host again and this make a musch waste time for user to use this application just for shutdown computer. Based on that statement, the record function is need to shutdown computer in that time, and the refresh button use for getting condition of the host in that time.
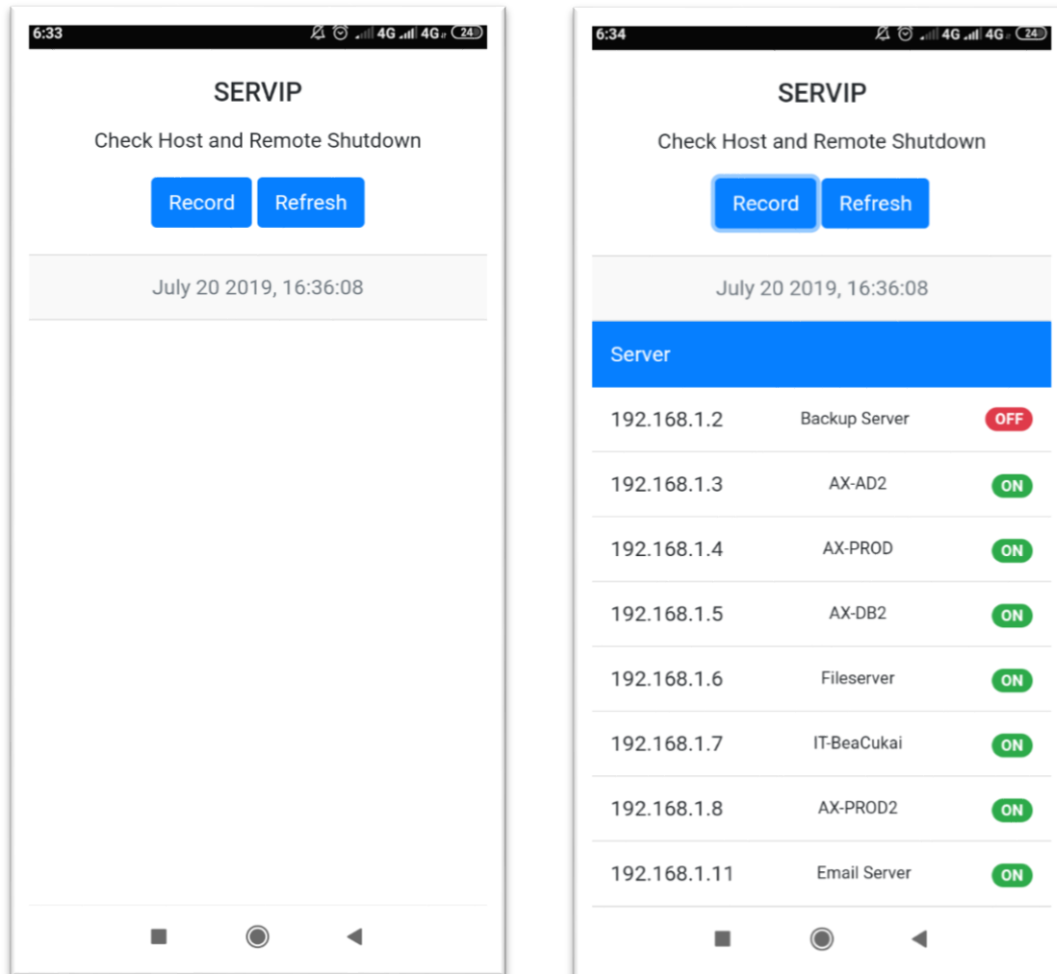
Figure 7. Interface Mobile Application for Check Host and Remote Shutdown

The right image in figure 7 is the result of the host computer after push the button of the record function or refresh button. The red condition indicate the host computer is off, and for the green color indicate the host computer still on. The different things is client and server computer in the time of the computer running in that day. The server computer need to run for 24 hours, and for client computer just permit to run in 8 hours in each day. Figure 8 show about the detail of client computer in 20 July 2019, 16:36:08. This is make easy for technician to take decision what computer that must be shutdown based on the client. The standard computer for client still online between 08:00 until 17:00. If less than that time or more than that time, the client computer must be offline. With this application the technician can monitor what host that must to shutdown. And the shutdown only with this application, by press the green button in the spesific ip address and then will be show interface like in the figure 9 about confirmation to shutdown the computer.

Figure 8. Detail condition of client computer Figure 9. Interface to shutdown the computer
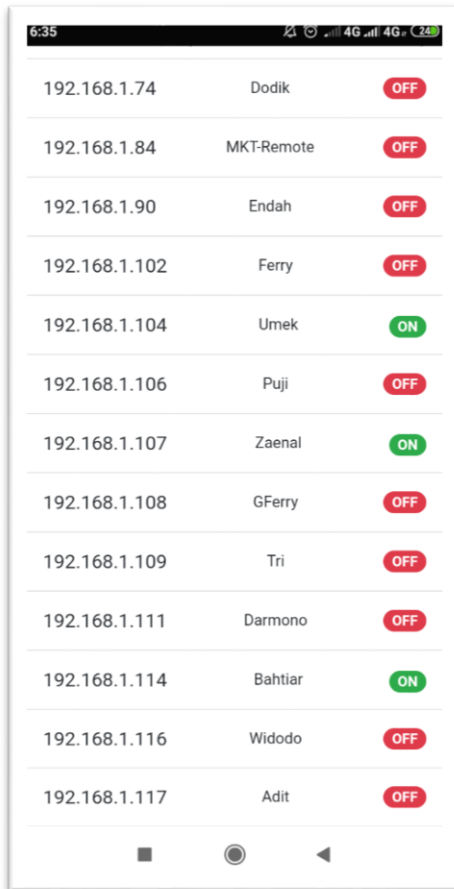
Figure 8. Detail condition of client computer

Figure 9. Interface to shutdown the computer

IV. CONCLUSION

Internet of things as technology 4.0 need combination with some another technology 4.0 like digitalization. Like in this article show how the internet of things work to remote shutdown using another computer in the local area network, but has limited only in the area of network and can't show all host in that network with one interface. With the digitalization by mobile application, scanning and remote shutdown can manage in one interface, the easiest way to search the host that still online and offline. Another function with just one press the shutdown in this interface the process of remote shutdown will be execute in that time. And with this application will make impact to technican to make decision about the condition computer in the local area network without shutdown one by one computer by press the power button. But in anywhere, anyplace and anytime now the technican can make decision just using this application. Based on this article just prove the mobile application not only can develop using native programming but can use web programming by Apache Cordova. Hope, this can make concept for all developer about digitalization using web programming in mobile application.

V. SUGGESTION

Based on this article, the author has purposed to develop again using another port of remote shutdown in the Windows OS. So when the port is blocked by some service, this application can use another port to remote shutdown the host of computer.

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