Comparison of Home Automation System Using IPV-4 and IPV-6 Based On Mitigate Reconnaissance Attacks.

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Abstract

This research is designed to help and offer hold up to complete the requirements of aged and disable in a home. The control approach and the tone approach are used to manage the house appliances. The major organize system implementation in technology of wireless to offer distant contact from a phone Internet Protocol connectivity for access and calculating strategy and appliance remotely. The planned system no need a committed server PC with value of parallel systems and offers a new communication-protocol to observe and control a house environment with more than just the switch functionality. To express the possibility and efficiency of this system, devices like as lights switches, power plugs, and motion-sensors have been included with the planned home control system and supply more security manage on the control with low electrical energy activate method. The rank of switches is corresponding in all this control system whereby all user interfaces indicate the real time existing status. This system planned to manage electrical-appliances and devices in house with reasonably low cost of design, user friendly interface, easily install and provide high security. Research community generally specified that the network "Reconnaissance Attacks" in IPv6 are usually impossible due to they will take huge challenge to carry out address scanning of 264 hosts in an IPv6 subnet."It being deployed of IPv6 shows that it definitely enhances security and undermines the probability". This research of the IPv6 addressing-strategies at present utilizes and planned a new strategy and move toward to "mitigate reconnaissance attacks".

Keywords: *ipv-4; ipv-6; Mitigate Reconnaissance; Automation, Security*

1. Introduction

The "Comparison of Automation System Using ipv4 and ipv6 to Mitigate Reconnaissance" idea has not existed for many years. The expression "Comparison of ipv4 and ipv6"has been used to introduce the perception of automation .Automation definite as "use of organizes systems and information technologies to decrease the need of human work with high security". Home Automation, this term was created by the American-Association of House Builder in 1984. The plan of home automation isn't a current idea in any case but it has been additional of a case of technology catching up with the idea. For your home to be Automatic home, you require to combine a selection of sub-systems [1]. The majority of general component of home automation system includes lighting, security and media etc. We live in a time like any other. With so many technologies and advancements at our fingertips by which our lives are made greatly easier.

In fact houses have been labeled as "Automatic" that they can apparently think their own. This skill of "thinking" is also known as automated home. Networking appliances is serving to create latest fields in Computing, and Engineering. H.A.S includes central Systems (HAS) represent a huge investigate chance in Home automation manage of "lighting, appliances, locks of gates and doors and additional systems", to offer better calm, efficiency of energy and security system. H.A.S attractive trendy these days and go into rapidly in this rising marketplace. Home automation provides an entity the skill to distantly or automatically control all things [2].

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1.1 Goals and Objectives

Home Automation System (HAS) is providing the stage which can outbreak the intelligence of coming generations. Our generation can live their life more relaxed and easier. And secondly, Home Automation System (HAS) is the next level after the elderly technology and there are many modifications which can be done with passage of time. The major objective of this research was to execute a low cost wireless home system with high security.

- A user interface that takes instructions from the user.
- A communication-system that carries the user instructions to the terminals.
- Remote access of the home appliances from any location.
- Voice Recognition mode that allows the user to trigger any of the home appliances.
- Live stream of the house through IP-Cam that allows the user security check from anywhere.
- An extensible application with opportunity of addition of features in the expectations as needed.
- Used ipv6 with new strategy SEUI (64-bits).

1.2 Major Factors of the Automation System

"Automation" is the use of controls systems to manage processes, reducing the want for human invention. Putting this into background, automation is having knowledge do thing for you so that you don't have to. We had only selected this project because I want our country should developed more and more. As European countries, there is a lot of comfort and simplicity for their people just because they are using automation home concepts, in which lights, doors and many electrical appliances are functioning automatically [3].

A personalized home automation system can help capitalize on the management and can combine your alarms, cameras, recorders, and even house lights and convinced appliances to make it easier for you to verify your home anytime and anywhere. A user-friendly automation system can enables you to activate functions even if you are lying in the bed either out of your home or in other place [4].

1.3 Design of Android Application

1.4 Stages of Implementation

Before this system start and use I have to make confident the system "goals, objectives, scope, risks, issues, budget, timescale and approach" have been defined. This system must be converse to each and every stakeholder to get its point of view and agreement. Any variation of view must be determined before work creates and implement.

1.5 Preparation and Collecting Components

The explanation to an unbeaten system is in the research and planning. Create a system plan is the primary task you must do when responsibility any system. Regularly system preparation is unseen in support of going on with the process. However, a lot of people being unsuccessful to realize the worth of a system plan into economy, time and for avoid a lot of other difficulties.

1.6 Assembly Semantics

This system stage is the most inner segment of any system as it is set the conditions of indication inside which the system will be work. If it is not complete well, the development will have a high opportunity of failure. Time spends on planning, refinement the system and converse the projected profit will lend a hand to develop the possibility of success. It is attractive to begin effort quickly, but a deprived assembly of system regularly leads to troubles and constant failure.

1.7 Testing

In this before time phase of testing, test one is a first non-formal step, now to make clear the idea of the designer by introducing the model showing in depth design-phase. These models are situating to cover the system quality; it is deal with the method to show how greatly it can handle the job. Every system has to pass throughout testing phase, types of testing and its justification is described below:

2. Literature Review

Previous to time automation began with work saving. "Self-governing electric or gas mechanical home appliance became feasible in the 1900s with the foreword of electric power supply and led to the foreword of" washing machinery (1904), water heaters (1889), refrigerators, sewing machines, dishwashers, and cloth dryers". Through 2012, in the United States, according to ABI Research, 1.5 million and automation systems were installed" In IPv6, All interface has to be assign a routable, which is unique in the net and classically well-known as 64. IPv6 is separated into 2 parts: (pre-fix and line ID). Prefix is obtaining from an ISP and typically separated into 2 little parts: the global prefix is one and the subnet ID is second. Designed for attackers, "it is easy to get a prefix in network". The next part, ID recognize exclusively an interface of an testing node not allowing for of task method, an IPv6 is configured for network by the prefix and add a locally generated ID for it. IPv6 is assign in special ways; manual assignment called static ipv6, DHCPv6 is stateless and state full modes, and (SLAAC).

3. Problem Statement:

IPV4 is an explanation section of the existing infrastructure. There are some difficulties by IPV4 like very few address, very large routing, be short of security as IPV4 does not use IPsec by force and maintain for data transfer. "To reduce some of the mention imperfection, network operational group of the internet engineering task force (IETF) designed a new set of protocols called the internet protocol version (IPV6). IPV4 specify a 32 bit IP address, which cannot complete the condition of the investigational increase of internet so IPV6 was begin with 128 bit IP address fields which offers the huge address and get better security by using IPsec.

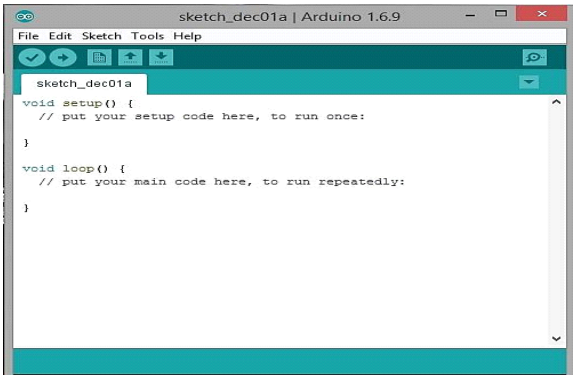
4. Methodology

The fundamental development implement used for the system Implementation is Arduino IDE.

i) Arduino IDE

It created as of the IDE for the verbal communication "Wiring and Processing". It is planned to system programming to performer and further beginners who strange with software progress. It contains a code with editor of some features like as "bracing, syntax, and indentation by automatic, and offers easy only on single click method to compile and load programs to a board of Arduino". The instruction written in program by the IDE software for Arduino is identify a "sketch".

Figure 1: Arduino IDE Example Sketch



(ii) Components and Implementation of Modules

Components that are included in my first module are mentioned as follows:

- Arduino Microcontroller (UNO)
- Android Application
- Ultrasonic Sensors (HC-SR04)
- LEDs

ARDUINO MICROCONTROLLER

The (UNO) is a board of microcontroller. This platform based on easy to use hardware and programming languages and using the Arduino development environment. It controls micro circuits according to the commands of known program. User gives a suitable program by attaching it to computer. It can control different circuits e.g." Servo Motor, P.I.R Sensors" etc. Arduino Software (IDE) is released on UNO microcontroller electronic board. The version 1.0 of Arduino Software (IDE) and the UNO board were the proposal edition of Arduino. The UNO is the initial in a sequence of USB Arduino boards, and the situation representation for the Arduino electrical platform.

Stipulation	
Input Voltage:	DC 3-5V

Output signal:	3.3V (motion detected-output high)
Detection Angle:	110 degree
Detection Angle:	max 7 m

Table 1: Arduino Microcontroller UNO Stipulation

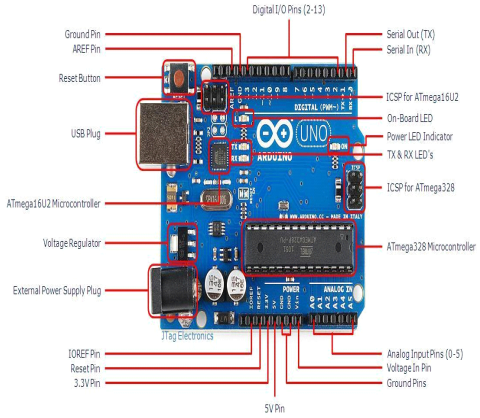


Figure 2: Arduino Microcontroller UNO ULTRASONIC SENSOR

Ultrasonic HC-SR04 is transducers that replace ultrasound effect to electrical indications or vice versa. These are equally transmit and receive might also be named ultrasound transceivers; numerous sensors of ultrasound as well being sensors are definitely transceivers because they can both transmit and intelligence.

LEDs

We do not need any particular kind of lights. As an alternative these will be the room lights whichever they are to be controlled or automated. We just need to attach them with relay and we're good to go. But for the system example we are making use of following simple LEDs.

Arduino with Ultrasonic Transceivers
It is the circuit diagram of Sensor and Micro-Controller given below that shows how to connect both of them. "The Ultrasonic Module of HC-SR04 has four pins, VCC, Ground, Echo and Trig. The Ground and the VCC pins of the section want to be linked to the Ground and the five volts pins on the board of Arduino in to order and the trig pin and echo pin to every Digital Input or Output pin on the board of Arduino" [5].

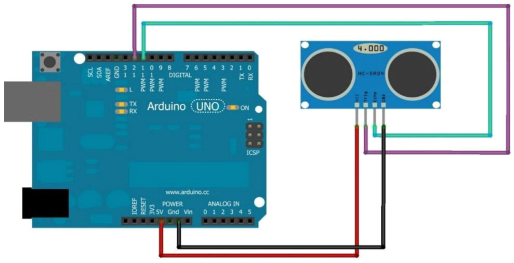


Figure 3: Ultrasonic Sensor

Arduino with Relay

The NC stands for "normally closed" with 120-240V terminal, the NO stands for normally open with 120-240Vterminal and C stands for Common terminal with the component is a 120-240V control that is connected to an electromagnet. while the relay obtain a HIGH signal on signal pin, the electromagnet turn
out to be electric and shifts the associates of the 120-240V control close or open [6].

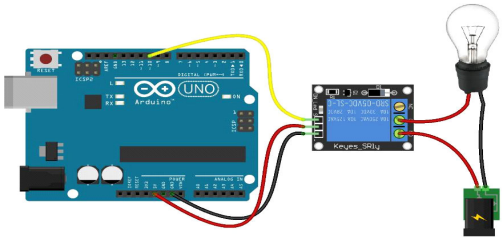


Figure 4: Arduino with Ultrasonic Transceivers

Normally Open Vs Normally Closed

The relay which actually used in this system has 2 diverse kinds of electrical associates within normally close (NC) and normally open (NO). The single you utilize will depend on whether you desire the 5V signal to turn around the button on or twist the button off. The 120-240V provides there come into the relay on the common (C) mortal in both configurations. To utilize the normally open contacts, apply the NO mortal or terminal. To apply the normally closed contacts, apply the NC mortal or terminal.

5. Results and Discussion

1) Important Aspects

The major purpose of this work is to propose and execute a low price smart automation system. This system will be developed to allow scheming different devices and tools. A major characteristic of the system is that it will apply the standard home appliances and devices with smallest modification. And used IPv6 for fast and secure

system with introduced a new strategy SEUI(64-bits).Because IPv4 is not enough for user in future.

Important Aspects Include

- This system is easy to use that will obtain the instructions from the user.
- Wireless system that brings the user instructions to the terminals.
- The act taken through the terminal as getting the user commands from the major controller.

2) Evaluated Information

Since all the modules in this system make up a smart existence. Stylish home is referred to a house that is completely secure and novel since we existing in the era of smart technologies; we all have to go with this era which means technology is becoming very important in our daily life. Just to make your home a "SMART HOME" I introduced the following modules in my system.

- Smart Light
- High Security
- Ethernet Control

3) Smart Light

It is a unit which is the instance of clean new technology as we previously discussed former that in this unit lights of your home will be controlled throughout different method like if a human being steps in a room the lights will turn on and lights will turn off as that human being moves out of the room, one more thing a person can control its lights by using voice recognition like lights will act in response to a human being according to its instructions, and the last thing in this module is controlling lights over control of predefine gestures like if a human being moves his hand upright the lights will turn on and on the other hand if a human being moves his hand vertically downward the lights will turn off.

4) Smart Security

Moving on to next module that is of smart security, as most of you are awake of this part as its name depicts that it provides you a secure home like if an stalker tries to enter in your home its alarms you about danger, so what I made in this part or you can say evaluated is when you are not at home and set the security code no stalker can break in your house if he tries to do it then there will be a camera that will capture intruders pictures and security alarm starts buzzing. And for network security I introduced a new strategy SEUI (64-bits).

5) Ethernet Control

Last but not the least this module makes easy for a human being to right of entry its home appliances throughout anywhere and anytime. The thing is now a day's number of internet users are growing which means demand for Ethernet is increased this helps the user to control his home appliances through anywhere. For example if a human being is not at home and wants to turn on his air conditioner before getting home he just have to turn on his mobile app or web page and by giving required command he can get his desired request. And this way used ipv6 for fast and more secure system.

6) Benefits of IPV6

Though growing the group of addresses is solitary of the majority frequently converse regarding advantages of IPv6, there are further significant technical revolutionize in IPv6 so as to will get better the protocol of IP [8],[9]:

- No further NAT stands for Network Address Translation.
- Configuration by automatically
- No further private address conflict
- Improved multicast direction finding (routing).
- Uncomplicated header arrangement
- Simplified, extra well-organized routing
- Included verification and isolation carry
- Supple choices and conservatory
- Uncomplicated management

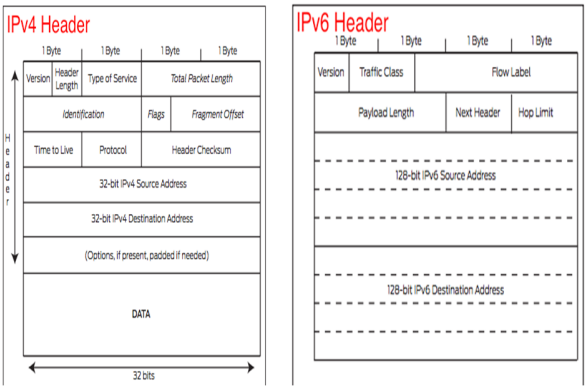


Figure 5: iPv4 and iPv6 Header

Table 2: Comparison of IPv4 and IPv6 [7]

Features	Ipv4	Ipv6
Addressing	32 IP addressing bits	128 IP addressing bits
IP-sec	Optional	IP-sec support is Required
Quality of service	Differentiated Service	Traffic classes and flow-labels use
Fragmentations	By routers and source-node	By the Source-node only
Unicast and multicast, broadcast	Use each and every one	Uni-cast ,Multicast Any-cast are used and cannot used broadcast
Configuration	Physically or DHCP	Auto-configuration or DHCP
Checksum system	Header include With Checksum system	Does not Include checksum system
Option-field in Header	Require	addition header
ARP(Address Resolution Protocol)	resolving an ipv4address	replace with ND(Neighbor Discovery)
Mobility	Uses mobile IPv4	IPV6 with faster Handover, routing and hierarchical Mobile
Internet Group Management Protocol(IGMP)	Use to manage Local-subnet Group	Replaced with Multicast
Size of packets	576 byte packet Size (possibly fragmented)	1280 byte packet Size (without fragmentation)

6. Conclusion

It could be accomplished that "SYSTEM OF AUTOMATION WITH ARDUINO FOR HIGH SECURITY" was an achievement. This system have an "Arduino-UNO board, power sockets, home appliances, PIR sensor, ultrasonic sensor, WI-FI module and camera, buzzer, servo motor and a mobile application to operate things". It is easy to use, cost efficient and more secure to introduce new strategy of ipv6 SEUI(64-bits). It can be expert that the purposes of this system have been effectively met and they are as follow:

- Build a "wireless automation system" restricted by an android phone especially throughout human action and gestures.
- Designed and execute cost well-organized automation system up till now a well-organized one.
- Considered an easy to use and a secure organization to manage a house appliances particularly expected to assist the senior and handicapped.

This system has been effectively planned to check and organize the lights status by an Android phone. It is confirmed to be extremely well-organized and suitable. It is completed that Smart existing will regularly revolve into an actuality that clients can manage their home distantly and wirelessly.IPV6 is the latest version of the protocol will alter of the IPV4. Suitable toward obtainable protection harms happen in IPV4 with the time receiving of the IPV6 on the net is grown-up at the extremely greatest speed in the current scenario. The latest description of the internet protocol offers some features more than IPV4 which get better security used for strategy that are linked to the net. Throughout these developments a few the security matters are survives and wants systematic notice in present. IPsec in IPV6 is orders which superior the safety in IPV6 but it resolution complete security troubles cannot be present in addressing of IPV6. Although IPV6 is conventional procedure other than if we give some extra conduct and resources to resolution the accessible matters in IPV6 than it can be extensively conventional procedure on the network of net.

7. Future Work

These are some of the recommendations for Future work:

- Well again to use relay module and attach it straight than using breadboard for relays.
- Test all sections before use them specially the relays for defense purposes.
- Implement automation on every appliances of the home.
- Enhancing the security module to provide improved security measures for home.
- Need to more work on SEUI(64-bits) for more secure system.
- Used ipv6 for more customers used system without any delay because ipv4 is not enough to use in future.
- Need work on ipv6 for make it more secure and fast than ipv4.

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