SMART SECURITY ALERT SYSTEM

ABSTRACT:

With many cases of theft and robbery in the whole world, the number of robberies reached 57,396 during 2011 including 65 armed robberies and those numbers are increasing every year , so we decided to use Cisco Packet Tracer, to establish a high smart security alert system for homes.

Methodology- Smart Security Alert System consists of modules like Web Camera, Raspberry Pi, PIR Sensor, Alarm, Door Rules. The Web Camera captures the images of any inactivity happening at home while the user is not available at home. The PIR sensor detects any inactivity in the home and instantly sends signals. Raspberry Pi then fetches the signal from webcams and PIR sensors and sends captured images to Homeowners. Various conditions and constraints are programmed based on the smart object connected to the home gateway. Once any movement is detected, a loud alarm is produced to alert those nearby of the unauthorized entry.

Major Result- Created a smart security alert system that considers one of the most important ways of protection that majority of society seeks to own their homes and use because it is one of the latest ways of protection for homes and the most easy use has been established the system of protection of the home using Cisco Packet Tracer

Implications- The system can be connected with a smart house be associated with a government system to report by the competent authorities if there is a dangerous situation for a particular area such as earthquakes or volcanoes by sending an alert message to the homeowner's number associated with the system

OBJECTIVE:

The aim of this project is to come up with a simulation of smart security devices that can be controlled by the end-user smart device remotely and then show the concept called smart security alert home. Use of Cisco Packet Tracking Features Simulated smart security alerts home and IoT devices are monitored.This gives protection and Safety to home and reduces exposures to common hazards and theft,it alerts the user as soon as they occur.

INTRODUCTION:

With the increase of thefts and the speed of their spread,people's fear and anxiety increased,concern and afraid of being psychologically or physically harmed by the robber,the developers of computer technologies began to create different and diverse protection and security system to protect and secure home by informing owners that a stranger is in their house or alarm them when danger occurs.

MODULES:

Webcam: Webcam is used in a proposed approach that captures the images of any inactivity happening at home while the user is not available at home. Webcam and PIR sensor detects any inactivity in home and instantly sends signals and captures images to Raspberry PI.

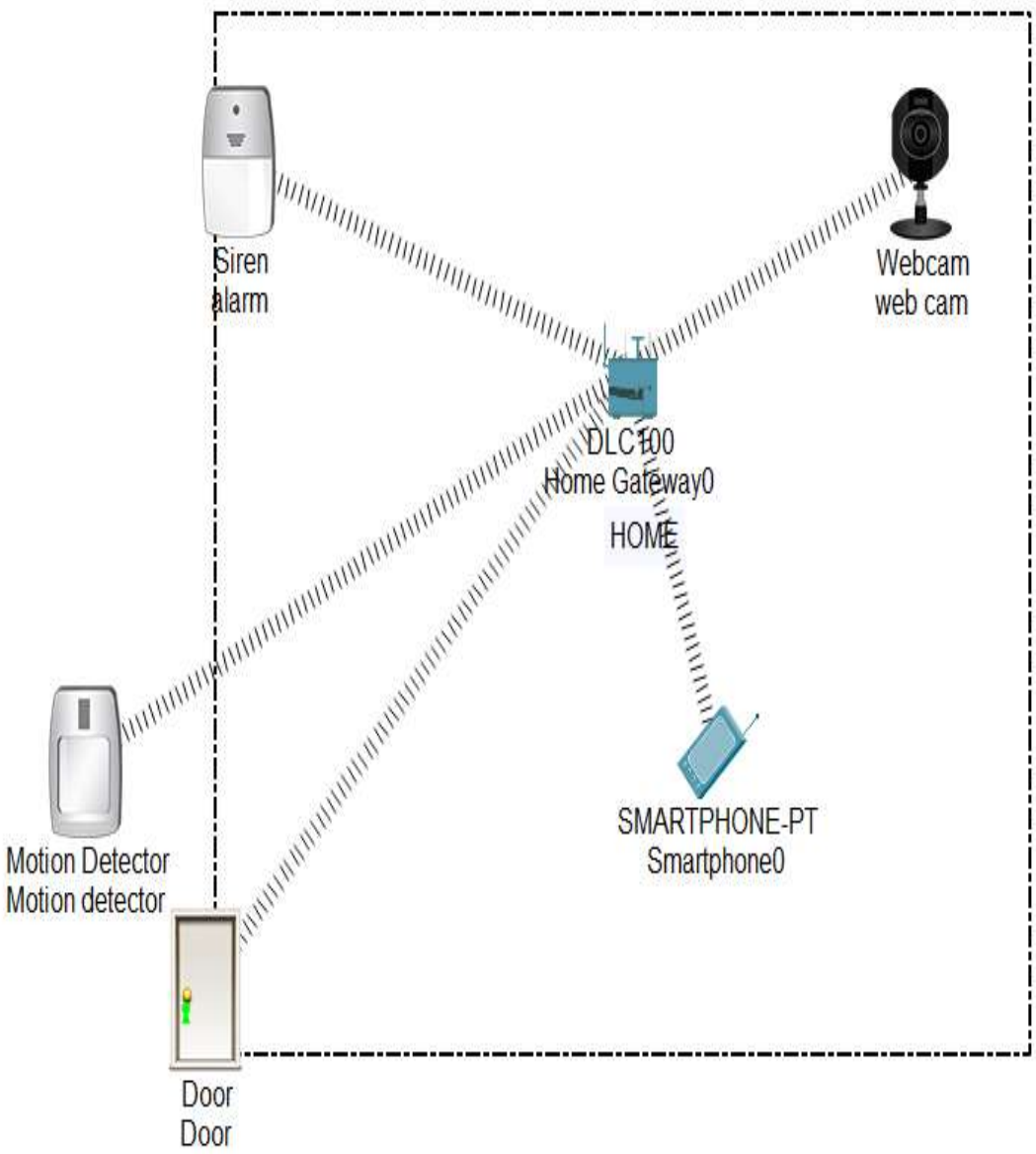
PIR Sensor (Passive Infrared Sensor): PIR sensor is used in a proposed approach that is frequently utilized as a part of movement detectors by measuring infrared lights which are transmitting from the object over sensor range. For home security, we have used it for motion detection in home. PIR sensors also work in darkness, so we get more security instead of just using a camera for detection.

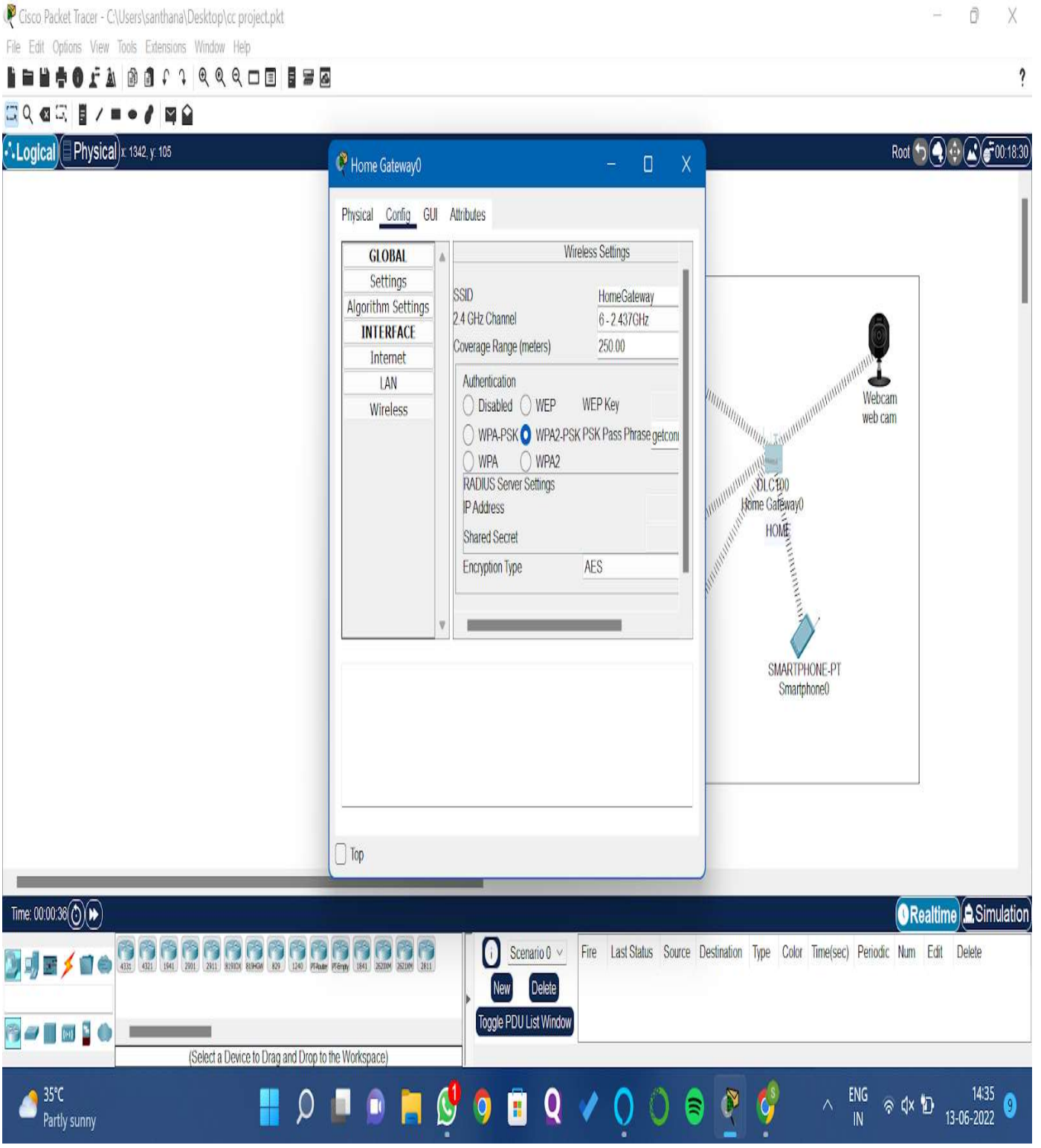
Alarm: A burglar alarm system consists of a series of electrical components that are connected to a property. Via sensors and contacts, they detect movement or the opening of doors and windows, upon which a loud alarm is produced to alert those nearby of the unauthorized entry.Often deemed to be a security essential, these systems are a universal fixture of most premises.

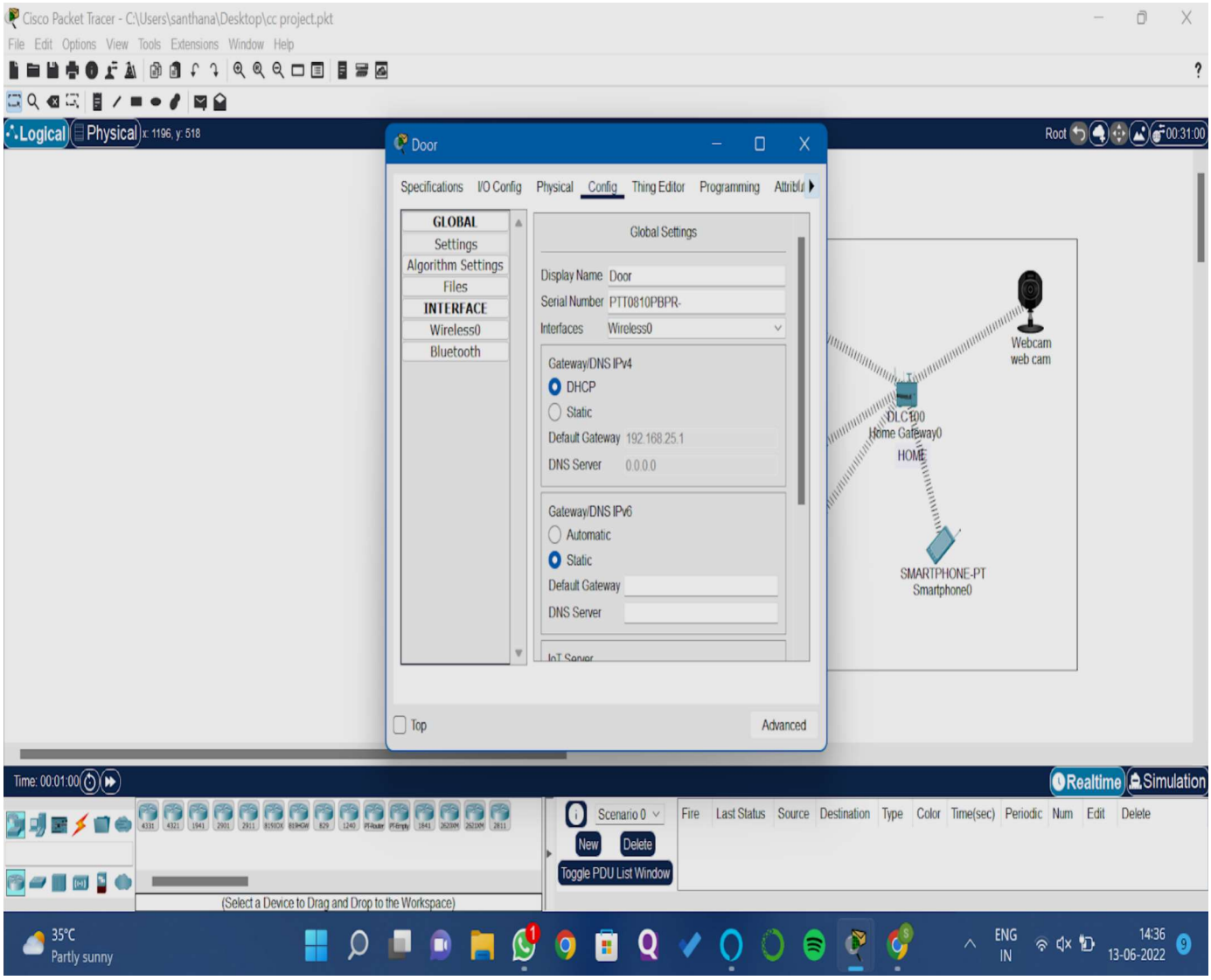
Door Rules: Different conditions and rules are programmed based on the smart object connected to the home gateway. These steps have to be repeated for all objects.

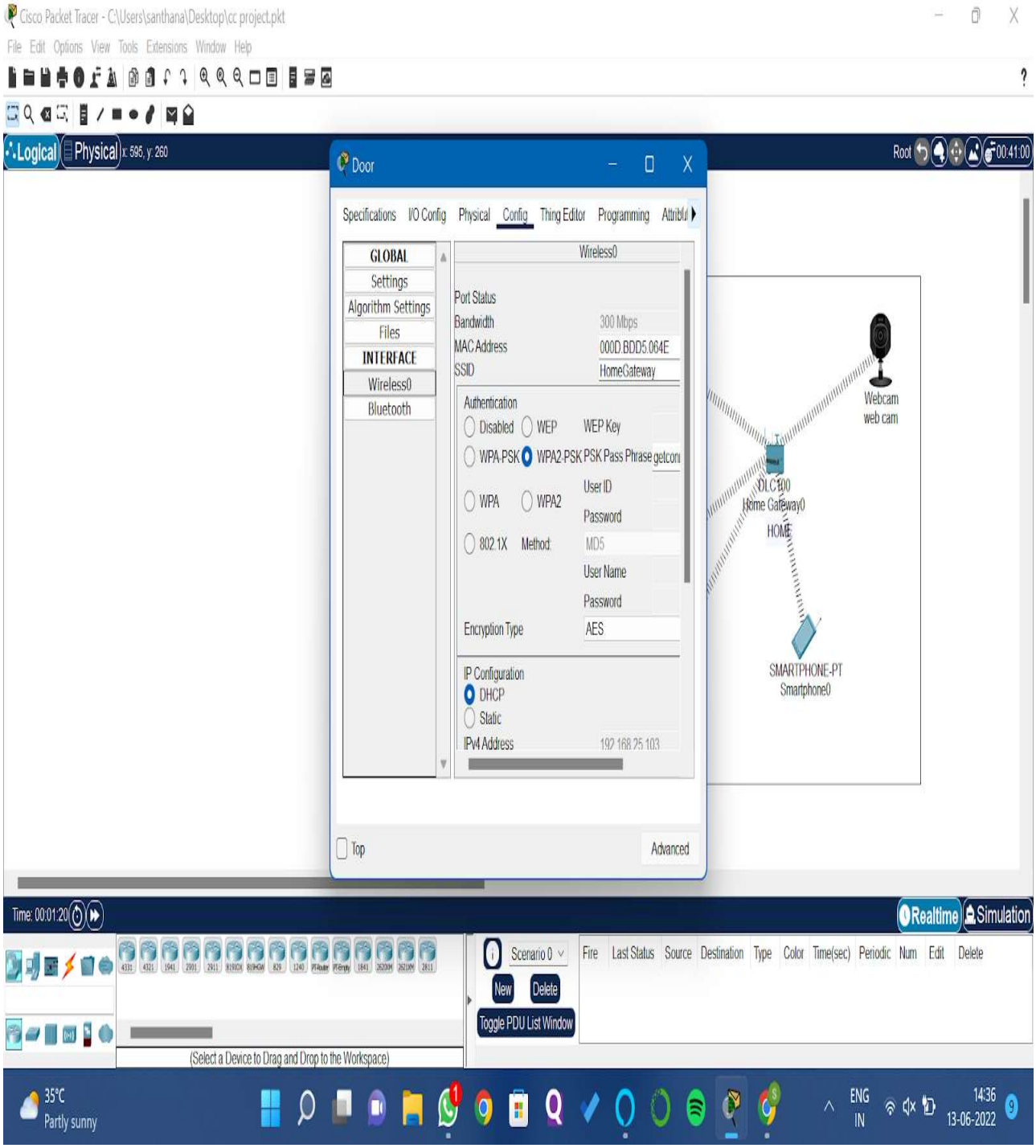
Device Led Conversion: Device Led Conversion (DLC) is the process where a new device or a product instance is upgraded from Traditional to Smart Licensing when registered in Cisco Smart Software Manager (CSSM). All licenses on the device automatically convert from Classic or Perpetual Right-to-Use (RTU) License to Smart License without the need for any manual conversion.

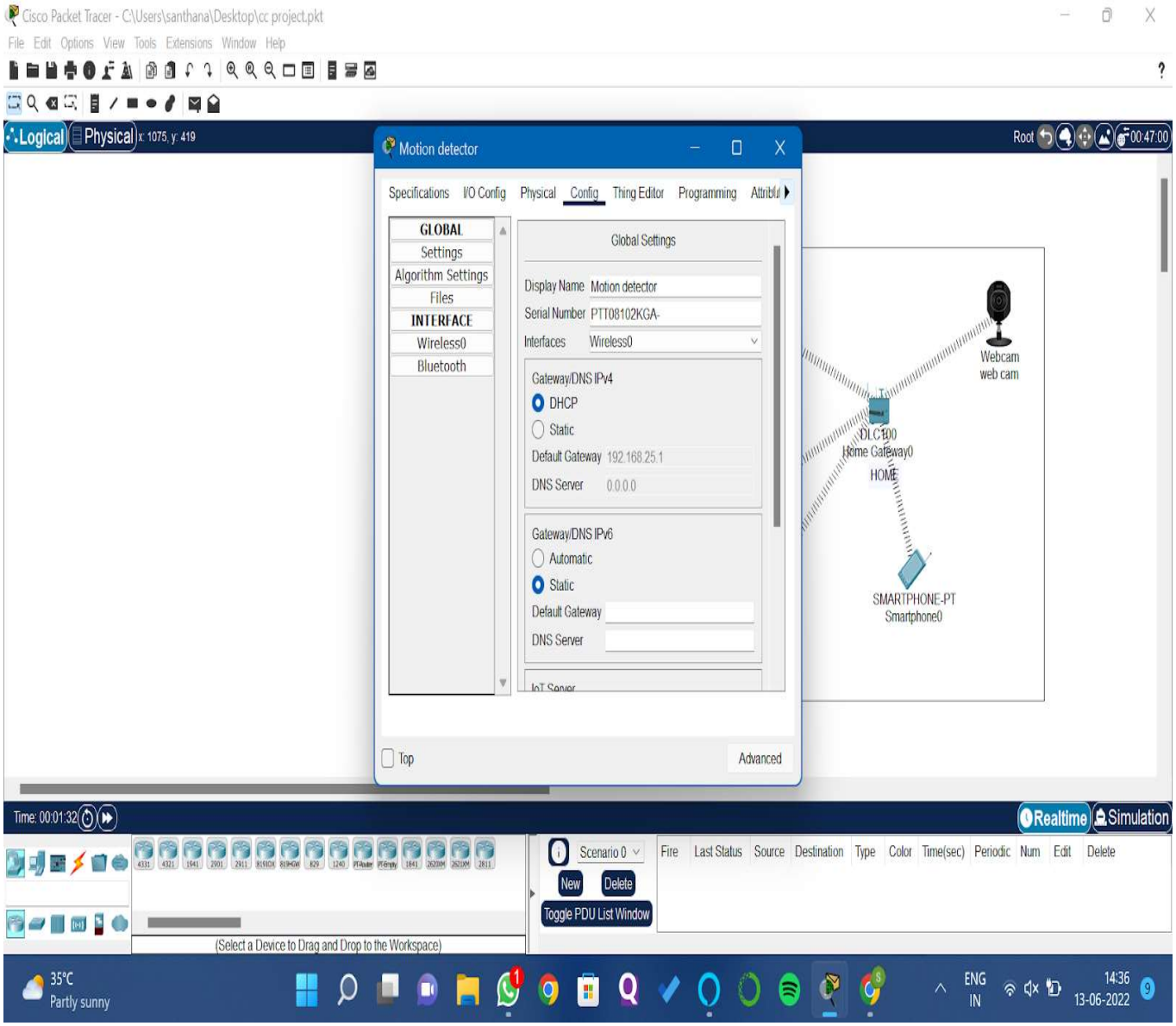
SIMULATION OF THE PROJECT:

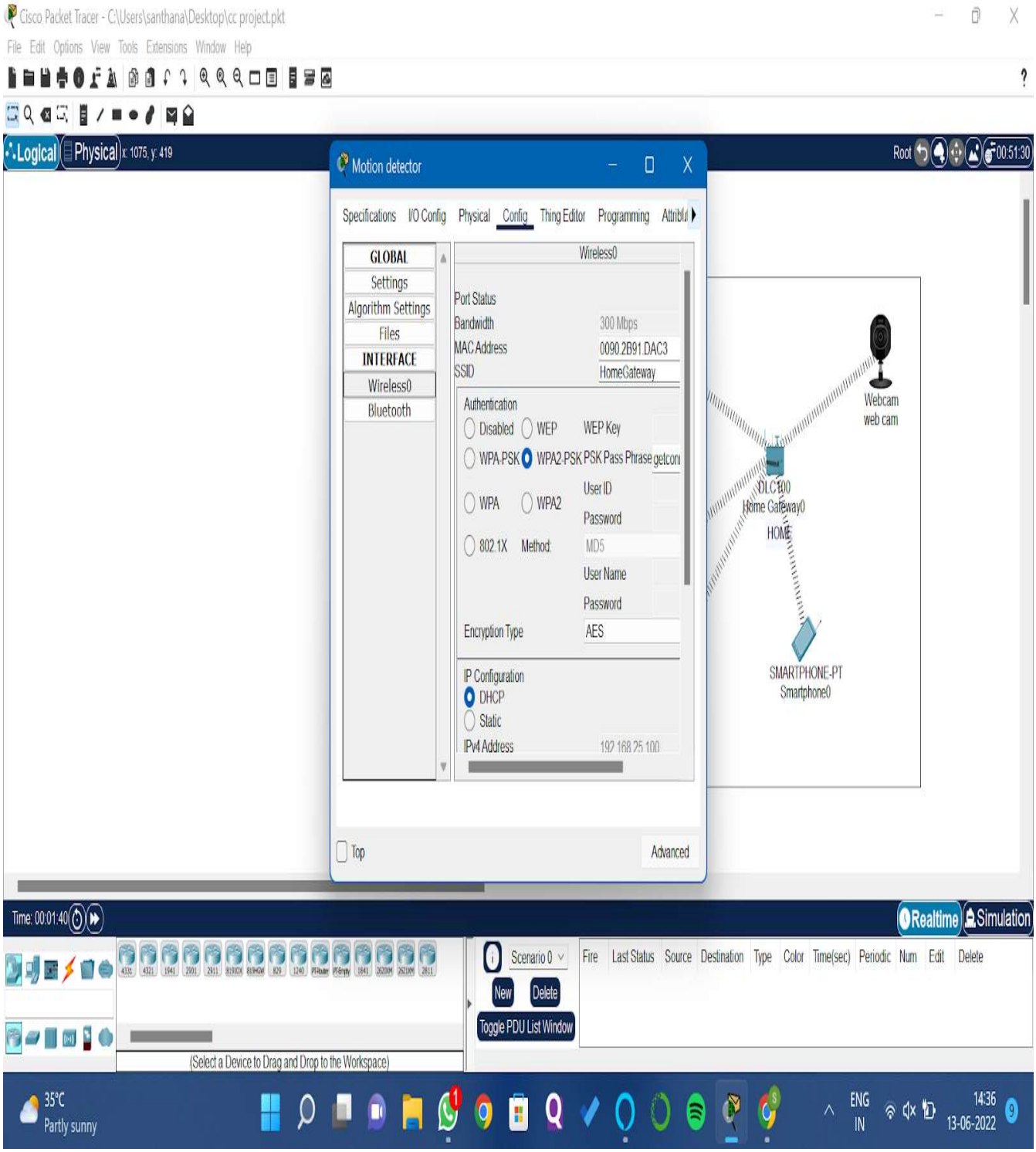


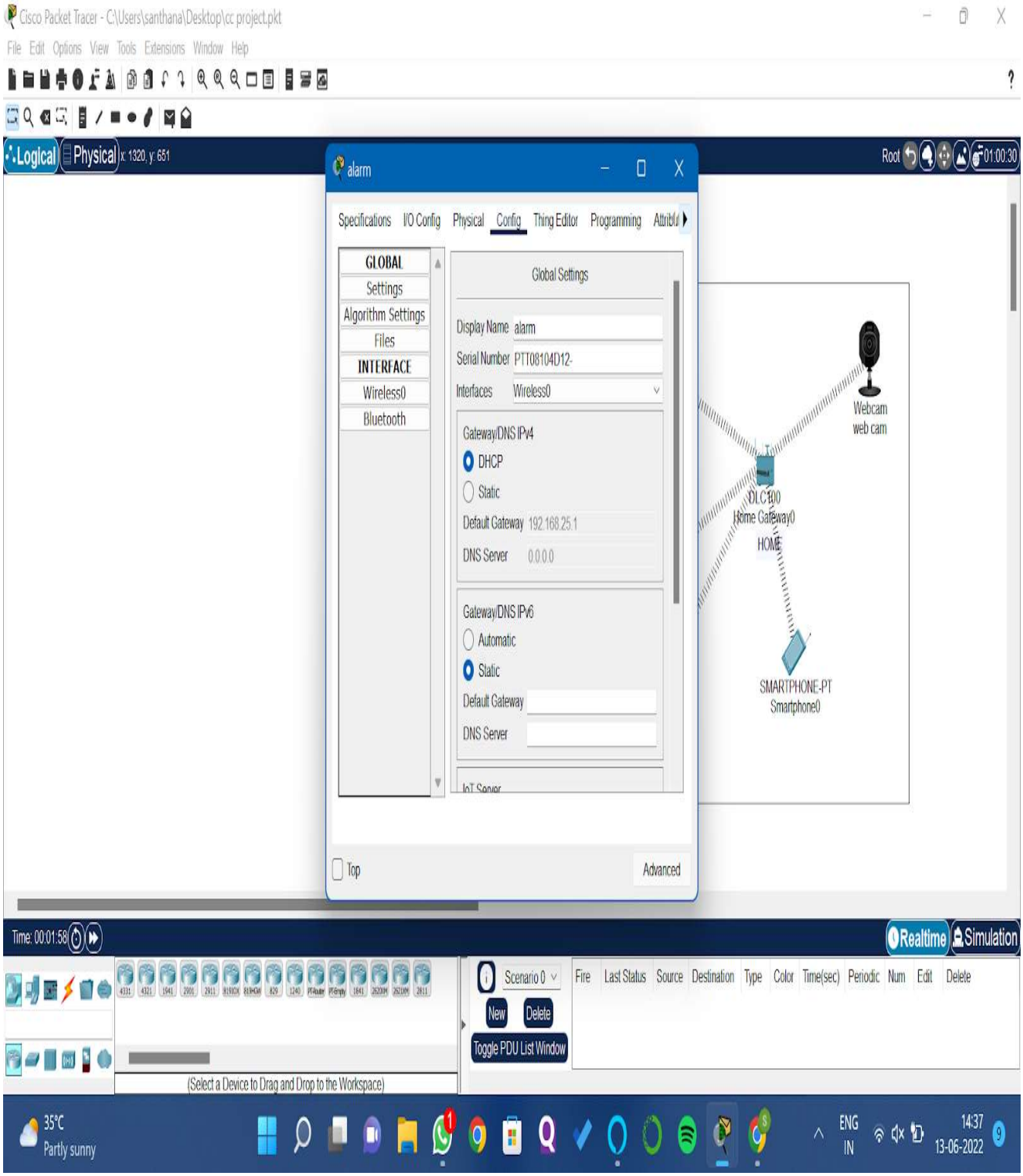

Cisco Packet Tracer - C:\Users\santhana\Desktop\cc project.pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 1342, y: 105
Root
00:18:30
Home Gateway0
Physical Config GUI Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
Internet
LAN
Wireless
Wireless Settings
SSID
HomeGateway
2.4 GHz Channel
6 - 2.437GHz
Coverage Range (meters)
250.00
Authentication
Disabled
WEP
WEP Key
WPA-PSK
WPA2-PSK
PSK Pass Phrase
getconi
WPA
WPA2
RADIUS Server Settings
IP Address
Shared Secret
Encryption Type
AES
Top
Webcam
web cam
DLC-D0
Home Gateway0
HOME
SMARTPHONE-PT
Smartphone0
Time: 00:00:36
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
(Select a Device to Drag and Drop to the Workspace)
35°C
Partly sunny
ENG
IN
14:35
13-06-2022

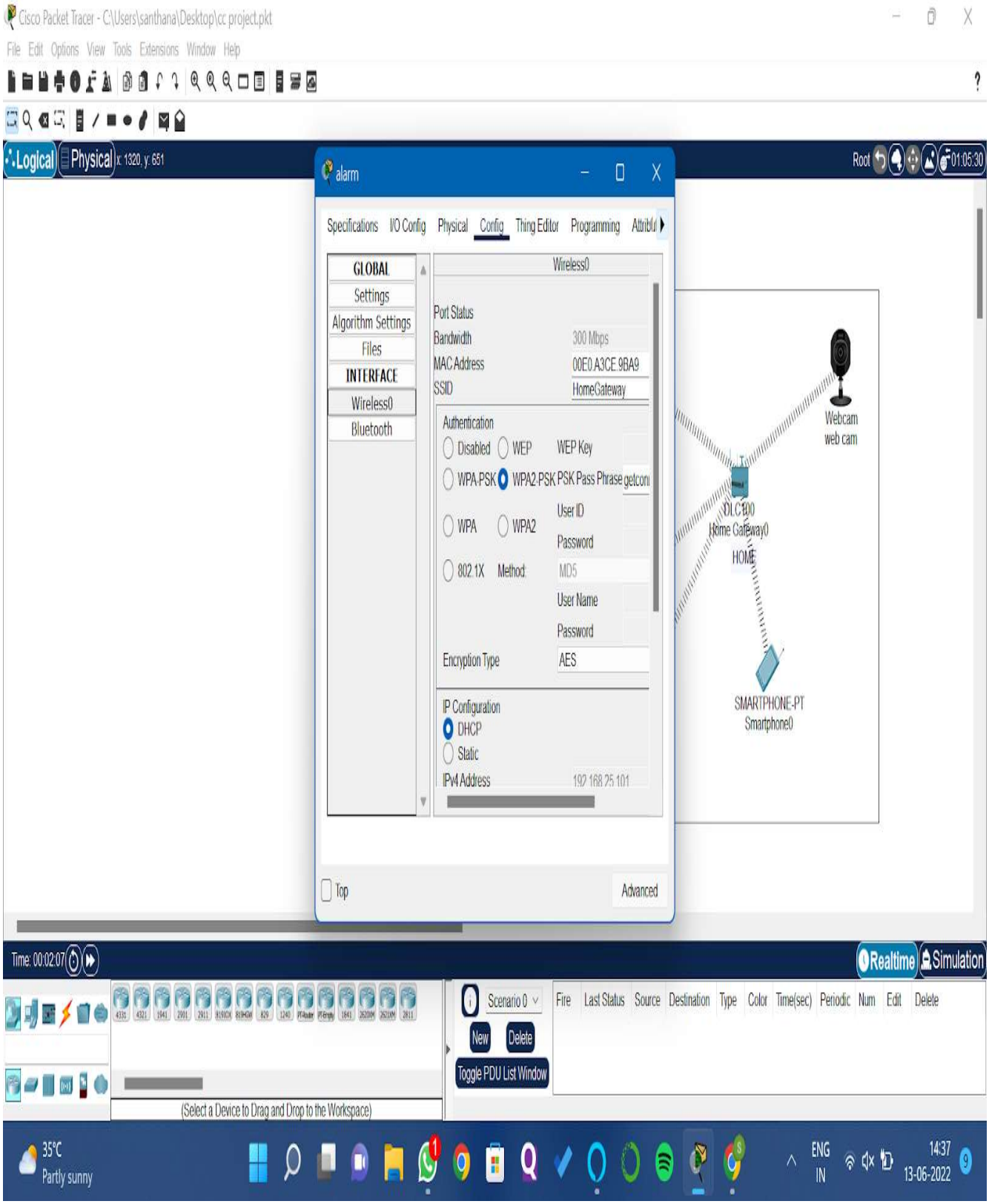

Cisco Packet Tracer - C:\Users\santhana\Desktop\cc project.pkt
File Edit Options View Tools Extensions Window Help
Logical Physical x: 1196, y: 518
Root 00:31:00
Door
Specifications I/O Config Physical Config Thing Editor Programming
GLOBAL
Settings
Algorithm Settings
Files
INTERFACE
Wireless0
Bluetooth
Global Settings
Display Name Door
Serial Number PTT0810PBPR-
Interfaces Wireless0
Gateway/DNS IPv4
DHCP
Static
Default Gateway 192.168.25.1
DNS Server 0.0.0.0
Gateway/DNS IPv6
Automatic
Static
Default Gateway
DNS Server
IoT Server
Top
Advanced
Webcam
web cam
DLC100
Home Gateway0
HOME
SMARTPHONE-PT
Smartphone0
Time: 00:01:00
Realtime Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
(Select a Device to Drag and Drop to the Workspace)
35°C
Partly sunny
ENG
IN
14:36
13-06-2022

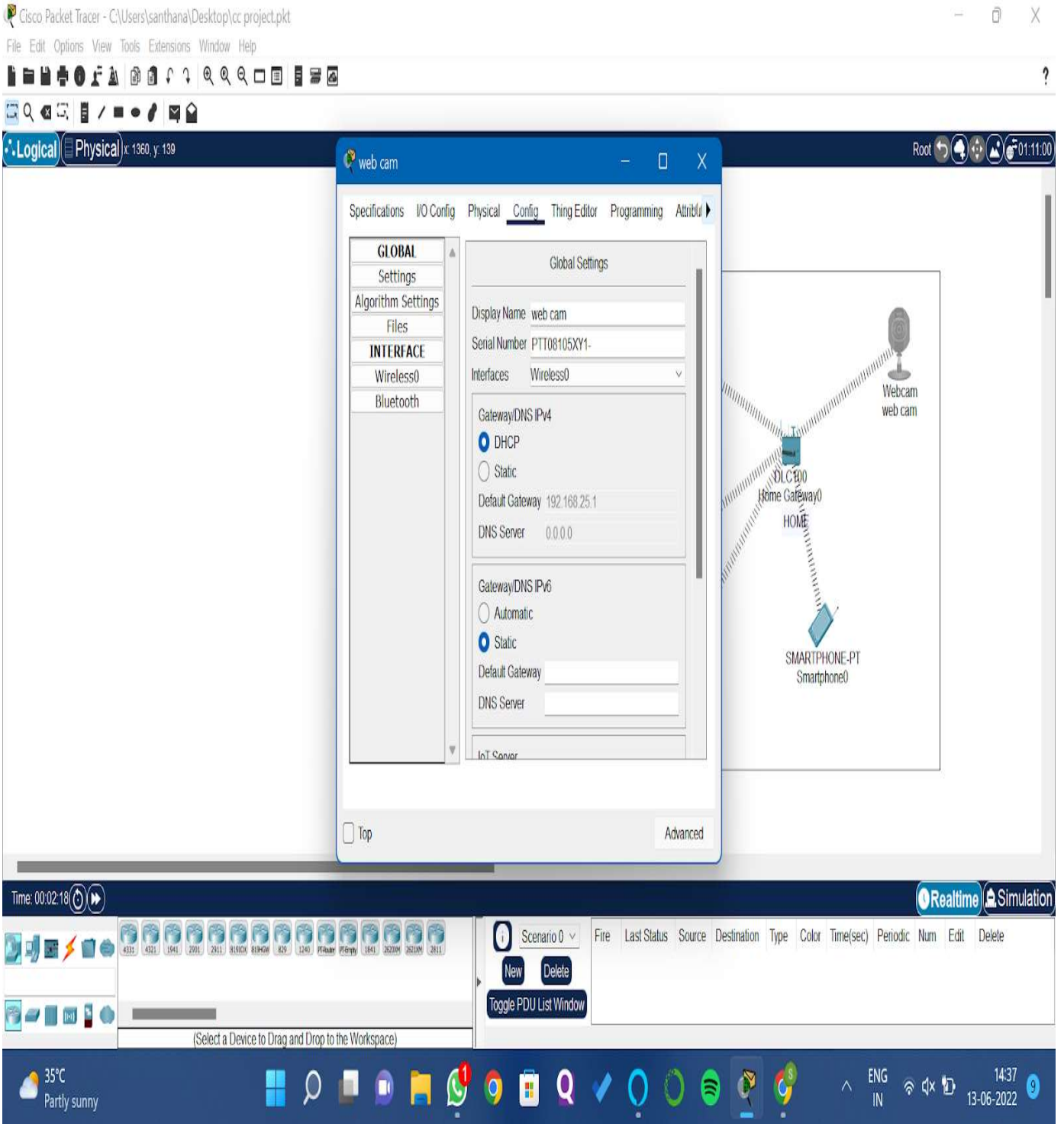

Cisco Packet Tracer - C:\Users\santhana\Desktop\cc project.pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 596, y: 260
Root
00:41:00
Door
Specifications
I/O Config
Physical
Config
Thing Editor
Programming
GLOBAL
Settings
Algorithm Settings
Files
INTERFACE
Wireless0
Bluetooth
Wireless0
Port Status
Bandwidth
300 Mbps
MAC Address
000D.BDD5.064E
SSID
HomeGateway
Authentication
Disabled
WEP
WEP Key
WPA-PSK
WPA2-PSK
PSK Pass Phrase
getcon
WPA
WPA2
User ID
Password
802.1X
Method
MD5
User Name
Password
Encryption Type
AES
IP Configuration
DHCP
Static
IPv4 Address
192.168.25.103
Top
Advanced
Webcam
web cam
DLC100
Home Gateway0
HOME
SMARTPHONE-PT
Smartphone0
Time: 00:01:20
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
(Select a Device to Drag and Drop to the Workspace)
35°C
Partly sunny
ENG
IN
14:36
13-06-2022

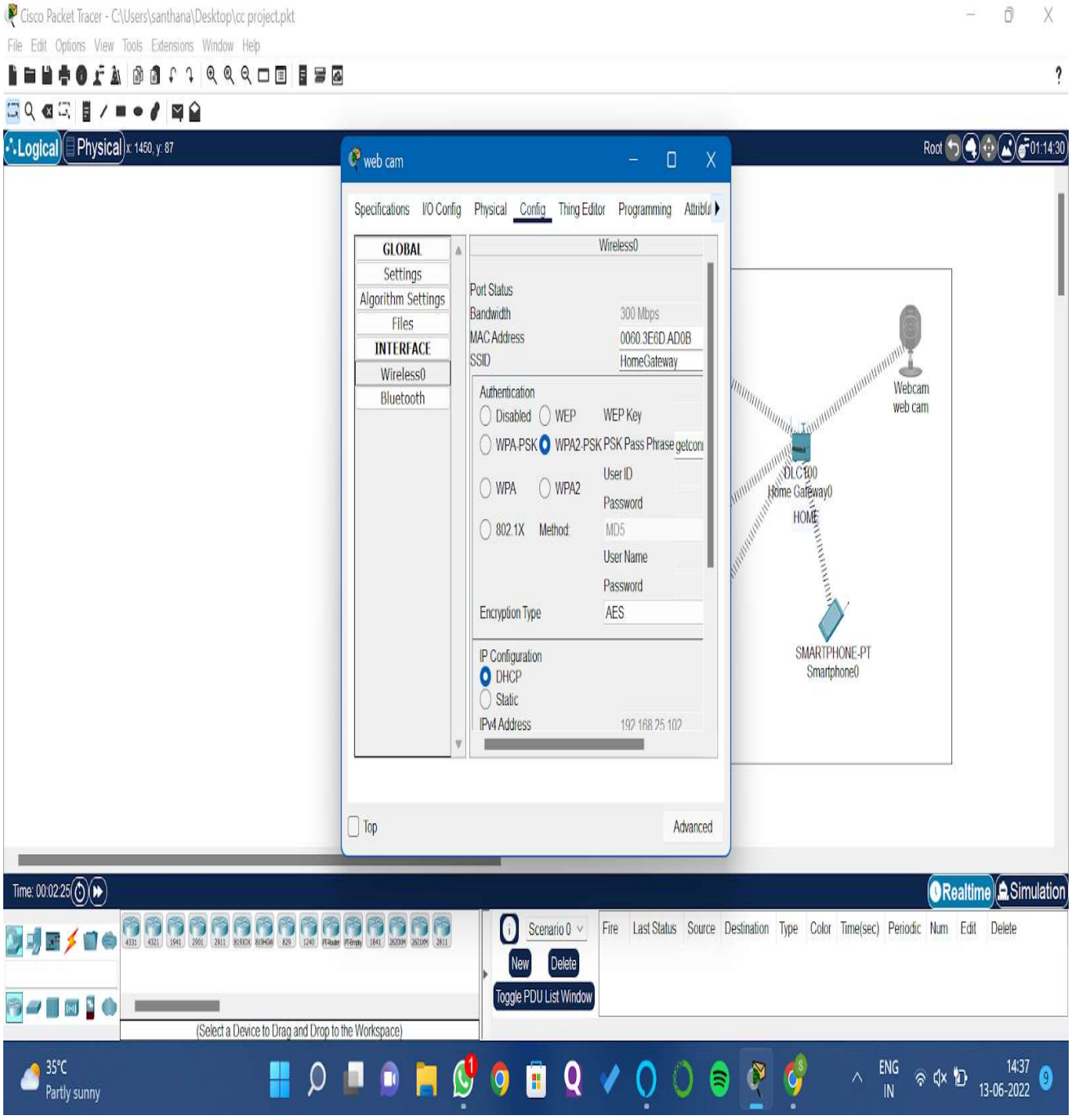

Cisco Packet Tracer - C:\Users\santhana\Desktop\cc project.pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 1075, y: 419
Root
00:47:00
Motion detector
Specifications
I/O Config
Physical
Config
Thing Editor
Programming
GLOBAL
Settings
Algorithm Settings
Files
INTERFACE
Wireless0
Bluetooth
Global Settings
Display Name Motion detector
Serial Number PTT08102KGA-
Interfaces Wireless0
Gateway/DNS IPv4
DHCP
Static
Default Gateway 192.168.25.1
DNS Server 0.0.0.0
Gateway/DNS IPv6
Automatic
Static
Default Gateway
DNS Server
Top
Advanced
Webcam
web cam
Home Gateway0
HOME
SMARTPHONE-PT
Smartphone0
Time: 00:01:32
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
(Select a Device to Drag and Drop to the Workspace)
35°C
Partly sunny
ENG
IN
14:36
13-06-2022

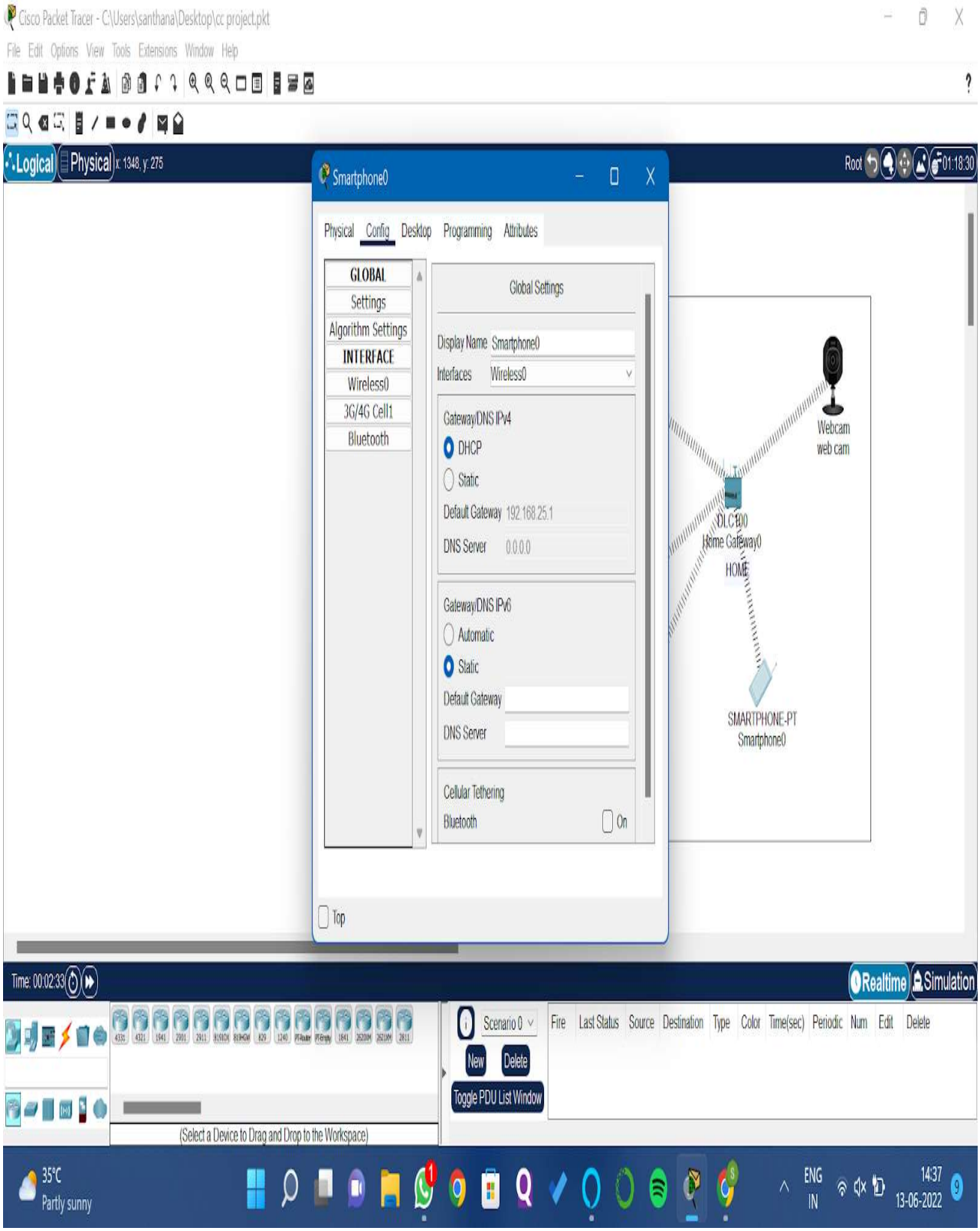

Cisco Packet Tracer - C:\Users\santhana\Desktop\cc project.pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 1075, y: 419
Root
00:51:30
Motion detector
Specifications I/O Config Physical Config Thing Editor Programming Attribut
GLOBAL
Settings
Algorithm Settings
Files
INTERFACE
Wireless0
Bluetooth
Wireless0
Port Status
Bandwidth 300 Mbps
MAC Address 0090.2B91.DAC3
SSID HomeGateway
Authentication
Disabled WEP WEP Key
WPA-PSK WPA2-PSK PSK Pass Phrase getconi
WPA WPA2 User ID Password
802.1X Method: MD5 User Name Password
Encryption Type AES
IP Configuration
DHCP
Static
IPv4 Address 192.168.25.100
Top
Advanced
Webcam
web cam
Home Gateway0
HOME
SMARTPHONE-PT
Smartphone0
Time: 00:01:40
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
(Select a Device to Drag and Drop to the Workspace)
35°C
Partly sunny
ENG
IN
14:36
13-06-2022

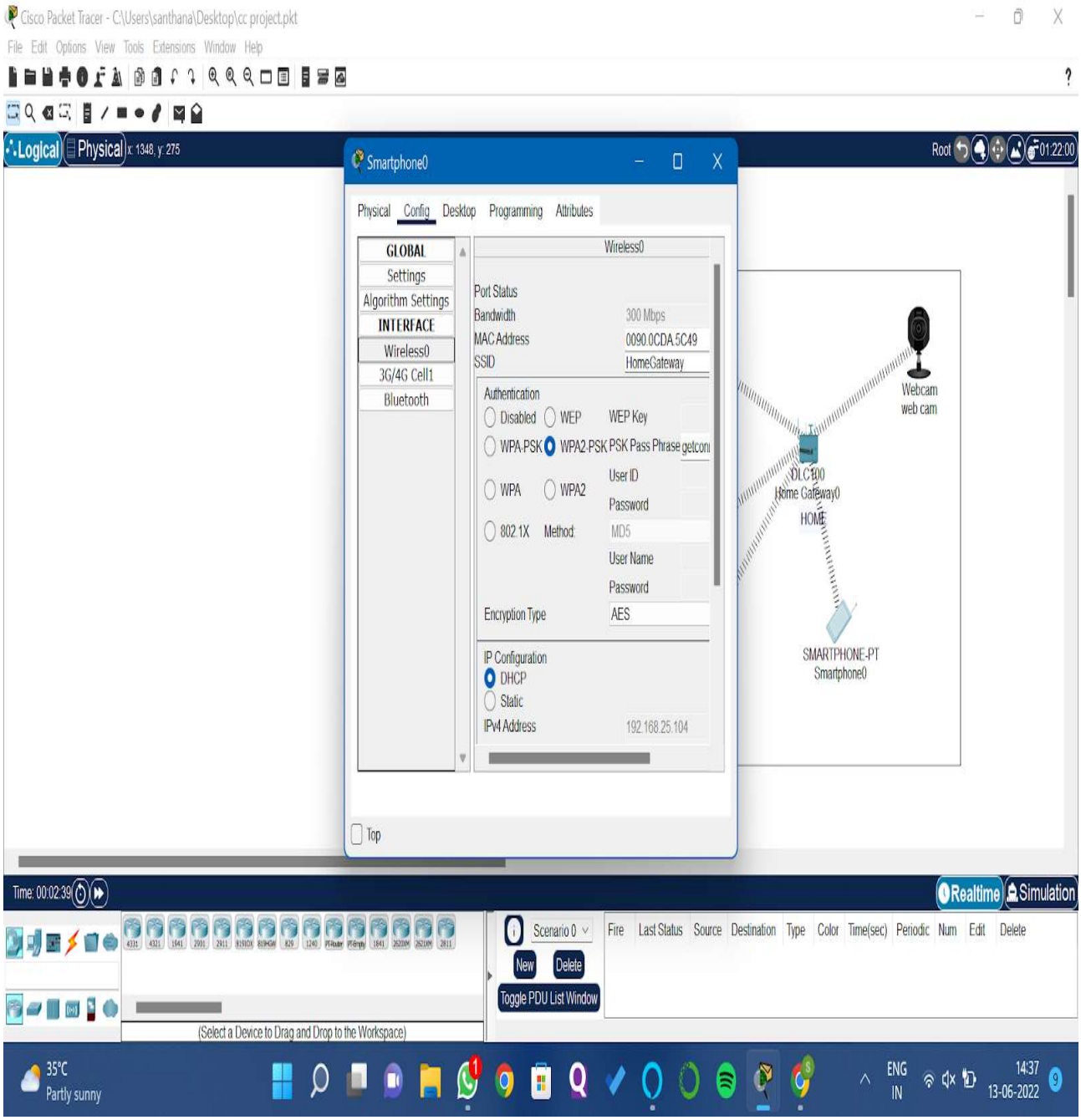

Cisco Packet Tracer - C:\Users\santhana\Desktop\cc project.pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 1320, y: 651
Root
01:00:30
alarm
Specifications
I/O Config
Physical
Config
Thing Editor
Programming
GLOBAL
Settings
Algorithm Settings
Files
INTERFACE
Wireless0
Bluetooth
Global Settings
Display Name alarm
Serial Number PTT08104D12-
Interfaces Wireless0
Gateway/DNS IPv4
DHCP
Static
Default Gateway 192.168.25.1
DNS Server 0.0.0.0
Gateway/DNS IPv6
Automatic
Static
Default Gateway
DNS Server
IoT Server
Top
Advanced
Webcam
web cam
DLC100
Home Gateway0
HOME
SMARTPHONE-PT
Smartphone0
Time: 00:01:58
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
(Select a Device to Drag and Drop to the Workspace)
35°C
Partly sunny
ENG
IN
14:37
13-06-2022

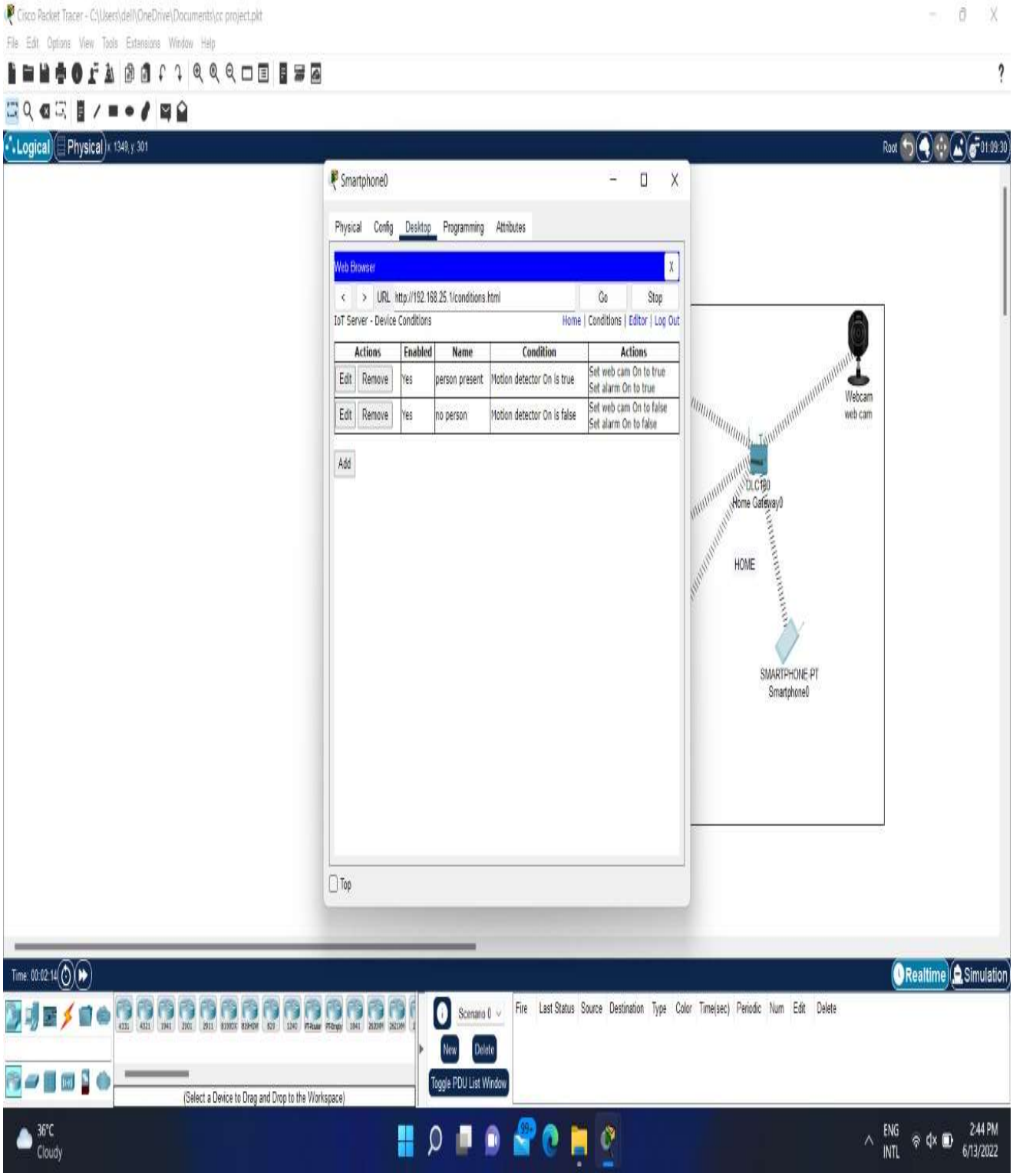

Cisco Packet Tracer - C:\Users\santhana\Desktop\cc project.pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 1320, y: 651
Root
01:05:30
alarm
Specifications
I/O Config
Physical
Config
Thing Editor
Programming
GLOBAL
Settings
Algorithm Settings
Files
INTERFACE
Wireless0
Bluetooth
Wireless0
Port Status
Bandwidth
300 Mbps
MAC Address
00E0.A3CE.9BA9
SSID
HomeGateway
Authentication
Disabled
WEP
WEP Key
WPA-PSK
WPA2-PSK
PSK Pass Phrase
getconi
WPA
WPA2
User ID
Password
802.1X
Method:
MD5
User Name
Password
Encryption Type
AES
IP Configuration
DHCP
Static
IPv4 Address
192.168.25.101
Top
Advanced
Webcam
web cam
DLC100
Home Gateway0
HOME
SMARTPHONE-PT
Smartphone0
Time: 00:02:07
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
(Select a Device to Drag and Drop to the Workspace)
35°C
Partly sunny
ENG
IN
14:37
13-06-2022

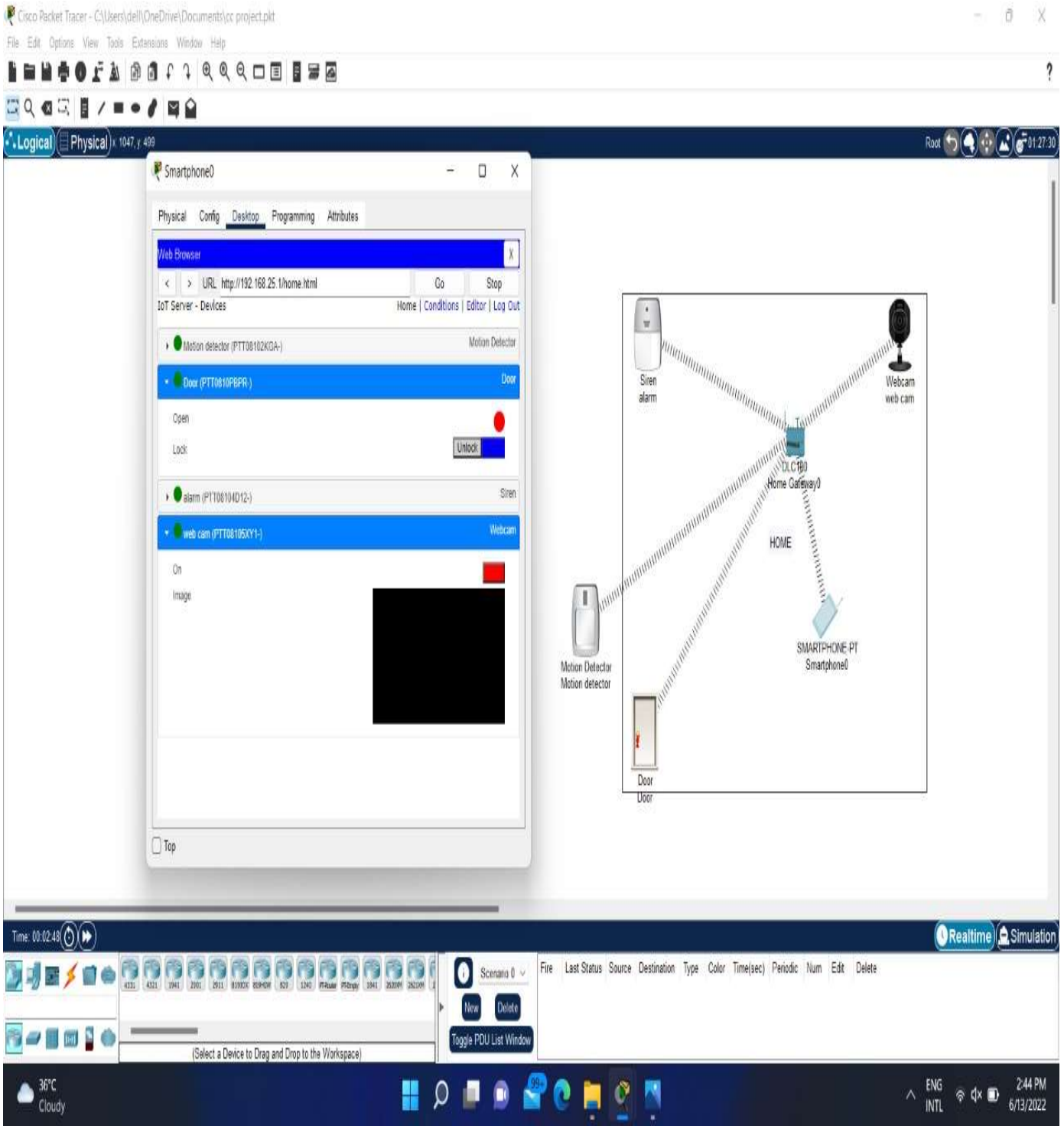

Cisco Packet Tracer - C:\Users\santhana\Desktop\cc project.pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 1360, y: 139
Root
01:11:00
web cam
Specifications
I/O Config
Physical
Config
Thing Editor
Programming
GLOBAL
Settings
Algorithm Settings
Files
INTERFACE
Wireless0
Bluetooth
Global Settings
Display Name web cam
Serial Number PTT08105XY1-
Interfaces Wireless0
Gateway/DNS IPv4
DHCP
Static
Default Gateway 192.168.25.1
DNS Server 0.0.0.0
Gateway/DNS IPv6
Automatic
Static
Default Gateway
DNS Server
Top
Advanced
Webcam
web cam
Home Gateway0
HOME
SMARTPHONE-PT
Smartphone0
Time: 00:02:18
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
(Select a Device to Drag and Drop to the Workspace)
35°C
Partly sunny
ENG
IN
14:37
13-06-2022


Cisco Packet Tracer - C:\Users\santhana\Desktop\cc project.pkt
File Edit Options View Tools Extensions Window Help
Logical Physical x: 1450, y: 87
Root 01:14:30
web cam
Specifications I/O Config Physical Config Thing Editor Programming
GLOBAL
Settings
Algorithm Settings
Files
INTERFACE
Wireless0
Bluetooth
Wireless0
Port Status
Bandwidth 300 Mbps
MAC Address 0060.3E6D.AD0B
SSID HomeGateway
Authentication
Disabled WEP WEP Key
WPA-PSK WPA2-PSK PSK Pass Phrase getcon
WPA WPA2 User ID
Password
802.1X Method: MD5
User Name
Password
Encryption Type AES
IP Configuration
DHCP
Static
IPv4 Address 192.168.25.102
Top
Advanced
Webcam
web cam
DLC100
Home Gateway0
HOME
SMARTPHONE-PT
Smartphone0
Time: 00:02:25
Realtime Simulation
Scenario 0
New Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
(Select a Device to Drag and Drop to the Workspace)
35°C
Partly sunny
ENG
IN
14:37
13-06-2022

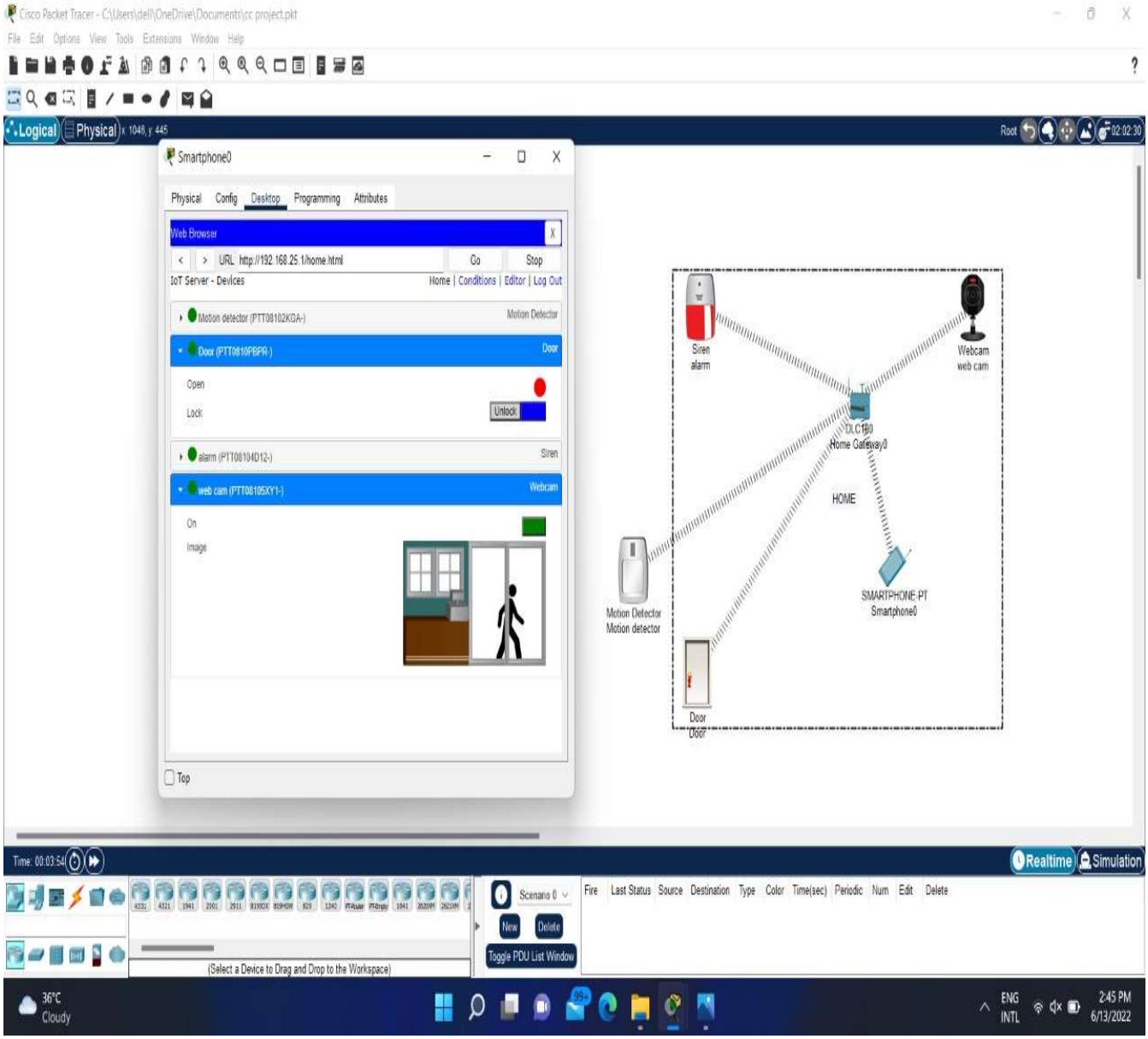

Cisco Packet Tracer - C:\Users\santhana\Desktop\cc project.pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 1348, y: 275
Root
01:18:30
Smartphone0
Physical Config Desktop Programming Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
Wireless0
3G/4G Cell1
Bluetooth
Global Settings
Display Name Smartphone0
Interfaces Wireless0
Gateway/DNS IPv4
DHCP
Static
Default Gateway 192.168.25.1
DNS Server 0.0.0.0
Gateway/DNS IPv6
Automatic
Static
Default Gateway
DNS Server
Cellular Tethering
Bluetooth
On
Top
Webcam
web cam
DLC100
Home Gateway0
HOME
SMARTPHONE-PT
Smartphone0
Time: 00:02:33
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
(Select a Device to Drag and Drop to the Workspace)
35°C
Partly sunny
ENG
IN
14:37
13-06-2022


Cisco Packet Tracer - C:\Users\santhana\Desktop\cc project.pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
x: 1348, y: 275
Root
01:22:00
Smartphone0
Physical Config Desktop Programming Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
Wireless0
3G/4G Cell1
Bluetooth
Wireless0
Port Status
Bandwidth
300 Mbps
MAC Address
0090.0CDA.5C49
SSID
HomeGateway
Authentication
Disabled
WEP
WEP Key
WPA-PSK
WPA2-PSK
PSK Pass Phrase
getcon
WPA
WPA2
User ID
Password
802.1X
Method:
MD5
User Name
Password
Encryption Type
AES
IP Configuration
DHCP
Static
IPv4 Address
192.168.25.104
Top
Webcam
web cam
DLC100
Home Gateway0
HOME
SMARTPHONE-PT
Smartphone0
Time: 00:02:39
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
(Select a Device to Drag and Drop to the Workspace)
35°C
Partly sunny
ENG
IN
14:37
13-06-2022


Cisco Packet Tracer - C:\Users\dell\OneDrive\Documents\cc project.pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
Root
Smartphone0
Physical Config Desktop Programming Attributes
Web Browser
URL http://192.168.25.1/conditions.html
Go
Stop
IoT Server - Device Conditions
Home | Conditions | Editor | Log Out
Actions Enabled Name Condition Actions
Edit Remove Yes person present Motion detector On is true Set web cam On to true Set alarm On to true
Edit Remove Yes no person Motion detector On is false Set web cam On to false Set alarm On to false
Add
Top
Webcam
web cam
Home Gateway0
HOME
SMARTPHONE-PT
Smartphone0
Time: 00:02:14
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
(Select a Device to Drag and Drop to the Workspace)
36°C
Cloudy
ENG
INTL
2:44 PM
6/13/2022


Cisco Packet Tracer - C:\Users\dell\OneDrive\Documents\cc project.pkt
File Edit Options View Tools Extensions Window Help
Logical
Physical
Smartphone0
Physical Config Desktop Programming Attributes
Web Browser
URL http://192.168.25.1/home.html
Go
Stop
IoT Server - Devices
Home | Conditions | Editor | Log Out
Motion detector (PTT08102KGA-)
Motion Detector
Door (PTT0810PBPR-)
Door
Open
Lock
Unlock
alarm (PTT08104D12-)
Siren
web cam (PTT08105XY1-)
Webcam
On
Image
Top
Siren
alarm
Webcam
web cam
DLC100
Home Gateway0
HOME
SMARTPHONE-PT
Smartphone0
Motion Detector
Motion detector
Door
Door
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
(Select a Device to Drag and Drop to the Workspace)
36°C
Cloudy
ENG
INTL
2:44 PM
6/13/2022

OUTPUT:


Cisco Packet Tracer - C:\Users\dell\OneDrive\Documents\cc project.pkt
Logical
Physical
Smartphone0
Physical
Config
Desktop
Programming
Attributes
Web Browser
URL http://192.168.25.1/home.html
Go
Stop
IoT Server - Devices
Home | Conditions | Editor | Log Out
Motion detector (PTT08102KGA-)
Motion Detector
Door (PTT0810PBPR-)
Door
Open
Lock
Unlock
alarm (PTT08104D12-)
Siren
web cam (PTT08105XY1-)
Webcam
On
Image
Top
Siren
alarm
Webcam
web cam
DLC100
Home Gateway0
HOME
SMARTPHONE-PT
Smartphone0
Motion Detector
Motion detector
Door
Door
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
(Select a Device to Drag and Drop to the Workspace)
36°C
Cloudy
ENG
INTL
2:45 PM
6/13/2022

CISCO PACKET TRACER:

To create a Smart Home Security Alert System we have modules like Home gateway,Doors,Web camera,Siren,Motion Detector and Smartphone.First select Home Gateway 100(DLC) from wireless devices , from end devices select smartphone and from home select Door,Motion Detector,Web Camera and Siren.All the home devices will be connected to Home Gateway automatically.To create a better view for Smart Home Security Alert System we need to create home by making rectangle and name it as Home.Put every home components inside home box except Motion Detector.To connect home devices wirelessly to home gateway we need to follow steps :

- First select home gateway and click on configure and go to wireless and then name SSID as home gateway,then in authentication select WPA2-PSK ,set the password as getconnect.
- Now we have to connect home devices to home gateway , so first select motion detector,go to configure set the display name as motion detector and set IoT server as home gateway.then click on advance and click on I/O configure.Set the Network Adapter as PT–IoT–NM–TW ,then click on configure ,click wireless and in authentication select WPA2-PSK and enter password getconnect.
- Connect other home devices to the same as the connection of the motion detector to the home gateway.
- Select smart phone,click on configure then click on wireless,set SSID as home gateway and in authentication select WPA2-PSK and enter password getconnect.
- Now go to the desktop of smartphone,click on the web browser and type the URL as 192.168.25.1 and click go.
- Put Username and password as admin for both,and now we can see all home devices connected to home gateway by logical connection.
- Now set conditions if any person is trying to enter or leave the house.
    - If person presents at the doorstep,the motion detector is ON is TRUE.Set the actions,web camera is ON is TRUE and Alarm sound is ON is TRUE.
    - If no person is present at the doorstep ,the motion detector is ON is FALSE.Set the actions,web camera is ON is FALSE and Alarm sound is ON is FALSE.
- Now verify if the person is there on the doorstep or not,so go home,click on the web camera and door,set the door in lock condition.
- To enable motion detector click alt put the mouse pointer on motion detector,now motion detector is ON and siren goes ON,the owner can see the webcamera by using the smartphone if anyone present at the doorstep or not. According to that the owner can let the person in or not.
- Now set the door in unlock condition:
    - If no person is present at the doorstep ,the motion detector is OFF ,web camera is OFF and Alarm sound is OFF.

- If a person presents at the doorstep,the motion detector is ON ,web camera is ON and Alarm sound is ON,then the owner can look at the web camera and lock the door.

INFERENCE:

We designed a smart home security alert system using Cisco packet tracer and tried to make it as secure as possible by linking it to the owner of the house. All the information of anything happening in the house will be sent to the owner via text message or phone alarm.
It is one of the most important ways of protecting the majority of society that seeks to own their homes and use because it is one of the latest way for protection of homes and the most easy use has been established, the system of the protection of the home using cisco packet tracer.

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