

Women for Health Programme

Installation and Configuration of 10 Solar Classrooms

Aliyu Adamu

Month / Year
February/2017

Funded by:



Managed by:



The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.

Final Approval

Report Approved and Signed off by:

	Date	Initials
For Final		

[The final report must be approved and signed off by the Responsible Person as shown in the Terms of Reference]

Table of Contents

Section			Page No.
<i>Section 1</i>		Title Page	
		Table of Contents	
		Abbreviations and Acronyms	
<i>Section 2</i>		Executive Summary	
<i>Section 3</i>	3.1	Objective of the Assignment	
	3.2	Network Design	
	3.3	Installed Devices	
	3.4	Network Configuration	
	3.5	Network testing	
	3.6	Unresolved Issues	
	3.7	Next Steps	

Abbreviations and Acronyms

LAN	Local Area Network
SLA	Service Level Agreement
HTI	Health Tertiary Institutions
VSAT	Very Small Aperture Terminal
UPS	Uninterrupted Power Supply
SOM	School of Midwifery
SON	School of Nursing
SHT	School of Health Technology
SONM	School of Nursing and Midwifery

SECTION 2 – EXECUTIVE SUMMARY

A successful installation, configuration and testing of e-learning system was done across ten W4H supported Health Tertiary Institution (HTIs). The executive summary includes list of tertiary institutions visited, a summary of the installation, configuration and testing done at the 10 solar classrooms.

List of Visited Tertiary Institutions

1. School of Nursing Kano State
2. School of Midwifery Kano State
3. School of Midwifery Danbatta, Kano State
4. School of Health Technology Jahun, Jigawa State
5. School of Nursing Damaturu, Yobe State
6. School of Midwifery Damaturu, Yobe state
7. School of Nursing Katsina State
8. School of Health Technology Kankiya, Katsina State
9. School of Midwifery Malunfashi, Katsina State
10. School of Nursing Gusau, Zamfara State

Assembling and Installation

A cubox-i server, 24 remix mini PCs with 24 BenQ low power monitors and a mikrotik router configured to provide connectivity between cubox-i server and 24 remix mini PCs were assembled and installed across the above mentioned 10 W4H supported HTIs. The entire solar classroom infrastructure is powered using solar system.



School of Nursing, Damaturu, Yobe State Solar Classroom

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.



School of Health Technology Jahun, Jigawa State Solar classroom

Configuration

Both the remix mini PCs and Mikrotik router were configured to allow users have access to the e-learning server. As discussed in the main body of the report the table below captures the various configurations done on both the wireless router and the clients

Mikrotik Router	Description
Basic configuration	Configuration of username, passwords and IP Addresses
DHCP configuration	Automatically assigned IP addresses to remix mini PCs Reserve and assign 192.168.0.2 to the e-learning server
DNS configuration	To allow clients to use domain name in accessing the e-learning server
QoS configuration	PCQ queuing was configured to enable the Mikrotik router share the limited bandwidth equally among the 24 remix clients
Remix mini PCs	Description
Basic configuration	Password configuration to enable clients get IP address

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.

	automatically
Software installation	Microsoft word, Excel and Powerpoint were installed. Safe delivery, an educational software for students was installed

Testing

The main aim of the testing is to ensure that the devices installed are working well and importantly the 24 remix clients can connect and access the e-learning server through the wireless network.

Specifically, the testing involves

1. Testing of the physical connectivity
2. Testing of Username and passwords configuration
3. Testing of DHCP configuration
4. Testing of DNS configuration
5. Testing of QoS configuration
6. Testing of Solar system

SECTION 3 – MAIN REPORT

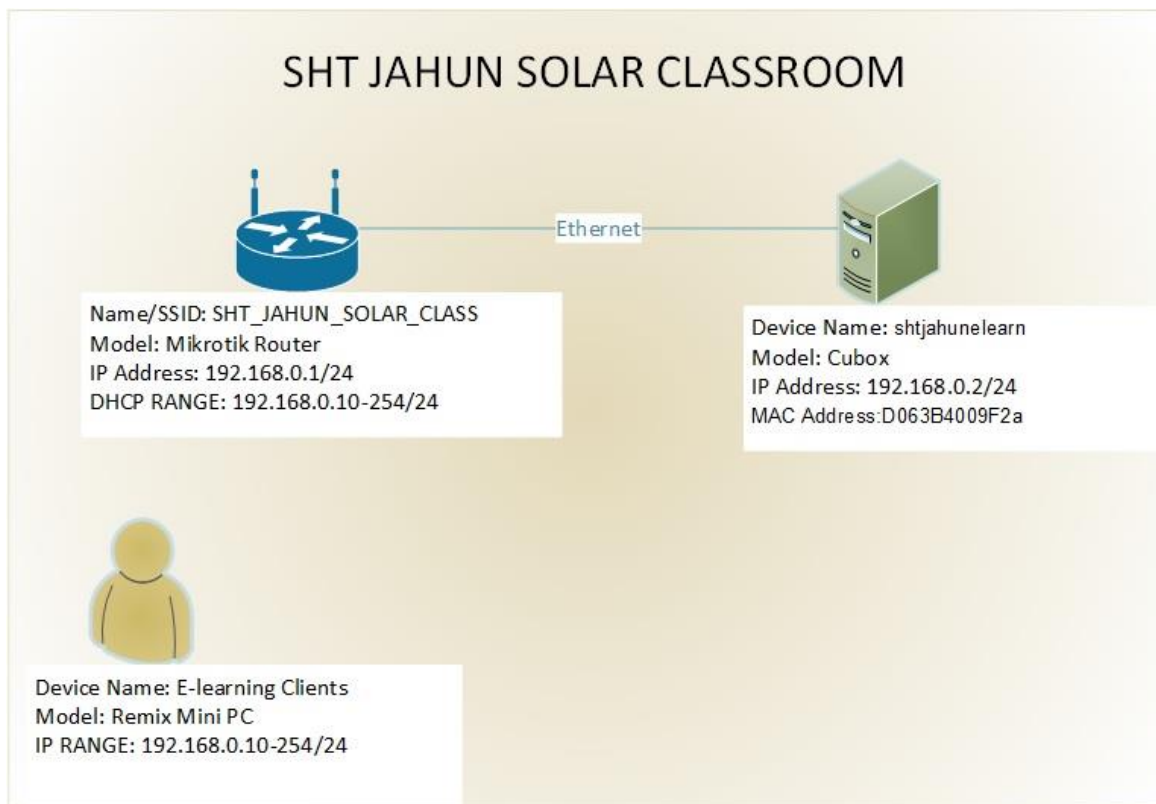
3.1 The installation and configuration of 10 solar classrooms was done from 15 January to 23 February 2017. The installation and configuration covers 10 Health tertiary institute (HTIs) across W4H supported states. The aim is to install and configure the e-learning system. Specifically, the installation and configuration of the e-learning system covers

1. The installation and configuration of 24 Remix Mini PC
2. The installation and configuration of the E-learning server
3. The installation and configuration of Mikrotik router
4. The testing of e-learning and solar system

The section below is broken down into the HTIS visited

SCHOOL OF HEALTH AND TECHNOLOGY, JAHUN JIGAWA STATE (SHT JAHUN)

3.2 NETWORK DESIGN



The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.

3.3 INSTALLED DEVICES

Devices installed at SHT Jahun that will allow students to have access to the e-learning system are captured in the table below. The e-learning system devices namely: Remix Mini PC, Cubox-i server and the Mikrotik are powered using solar system

S/N	Devices/Accessories	Quantity	Purpose
1	Cubox-i	1	E-learning Server
2	Mikrotik hAP ac lite Router	1	Wirelessly connecting e-learning Server with the Remix Clients
3	Remix Mini PC	24	E-learning Client
4	BenQ Monitor	24	Remix monitor
5	Standard Keyboard	24	Remix Keyboard
6	Mouse	24	Remix Mouse

3.4 NETWORK CONFIGURATION

Device Name	Mikrotik Router (hAP ac lite)
SSID	SHT_JAHUN_SOLAR_CLASS
Wifi Password	
Admin Password	
IP Address	192.168.0.1/24
DHCP Server	192.168.0.1/24
DHCP IP RANGE	192.168.0.10-192.168.0.254
E-learning Server DHCP Configuration	Click on IP from the menu Click on DHCP Server under the IP menu Under DHCP Server Click on Leases Then Add New Enter The IP address of the Server 192.168.0.2 Enter the MAC address of the Server D0:63:B4:00:9F:2a
E-learning Server DNS Configuration	Click on IP from the menu Click on DNS under the IP menu Click on Static Click on Add New NAME: shtjahunelearn ADDRESS: 192.168.0.2

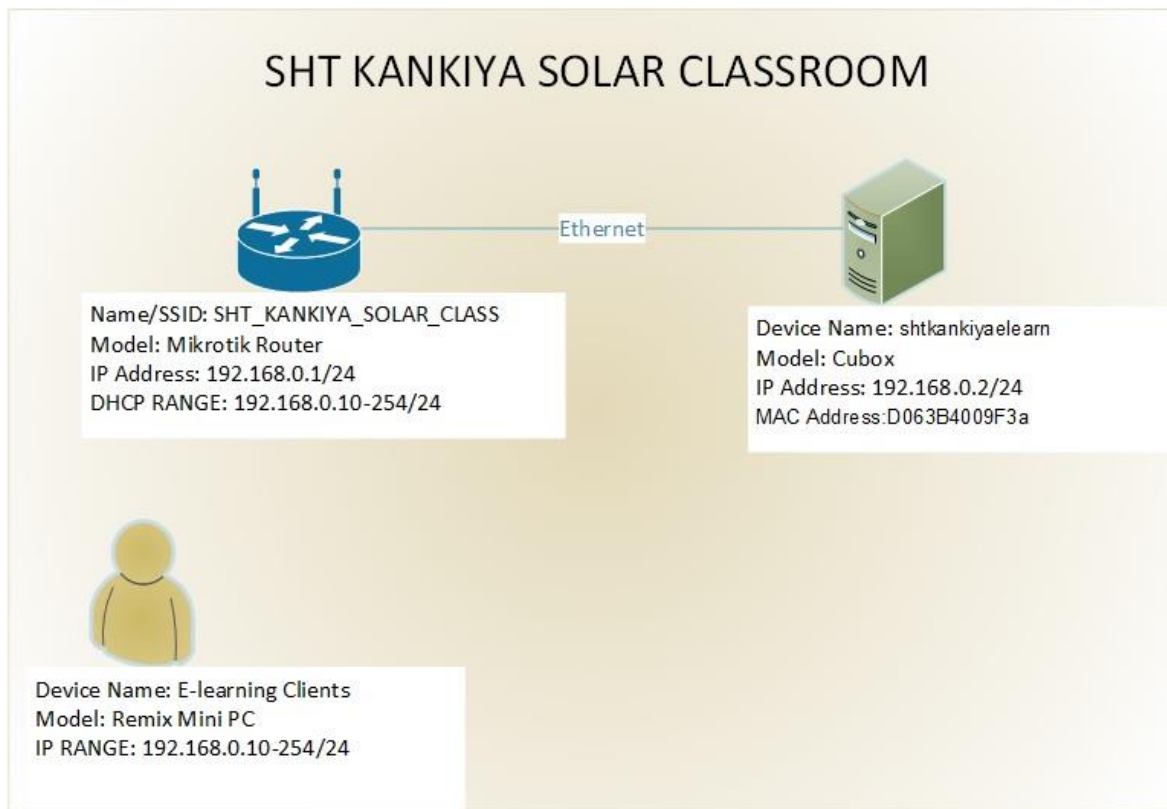
The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.

QoS Configuration	<p>Select QUEUES from the MAIN menu Select QUEUE TYPES Click on ADD NEW SOLAR-CLASS-DOWNLOAD (Name of download limitation) PCQ (Type of download limitation) Rate 100M Limit 50 enable Dst. Address Src. Address Mask 32 Dst. Address Mask 32 Click APPLY</p> <p>SOLAR-CLASS-UPLOAD (Name of upload limitation) PCQ (Type of upload limitation) Rate 100M Limit 50 enable Src. Address Src. Address Mask 32 Dst. Address Mask 32 Click APPLY Click OK</p> <p><i>Applying the QUEUES</i> Select QUEUES Select Simple Queues Click on ADD NEW Name SOLAR-CLASS-CLIENTS Target 192.168.0.0/24 Queue Type SOLAR-CLASS-UPLOAD && SOLAR-CLASS-DOWNLOAD Click APPLY Click OK</p>
-------------------	--

3.5 NETWORK TEST

The assembling and installation of 24 remix units was successful. Furthermore, the testing was done on only 14 clients due to the limited number of power outlet. Fourteen clients out of the 24 were connected to the E-learning Server through the wireless router. The 14 connected clients got their IP addresses from the DHCP server. They were used to test the E-learning DNS configuration by using *shthahunelearn* as the domain name to connect to the e-learning server. Finally, the clients were connected to the W4H e-learning site using the admin profile. Specifically, global health video installed by Roose was used to test the quality of service configuration. All the 14 clients played the video without any visible delays or jitters.

3.2 NETWORK DESIGN



3.3 INSTALLED DEVICES

Devices installed at SHT kankiya to allow students have access to the e-learning system. The devices mentioned below were powered using solar system

S/N	Devices/Accessories	Quantity	Purpose
1	Cubox-i	1	E-learning Server
2	Mikrotik hAP ac lite Router	1	Wirelessly connecting e-learning Server with the Remix Clients
3	Remix Mini PC	24	E-learning Client
4	BenQ Monitor	24	Remix monitor

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.

5	Standard Keyboard	24	Remix Keyboard
6	Mouse	24	Remix Mouse

3.4 NETWORK CONFIGURATION

Device Name	Mikrotik Router (hAP ac lite)
SSID	SHT_KANKIYA_SOLAR_CLASS
Wifi Password	
Admin Password	
IP Address	192.168.0.1/24
DHCP Server	192.168.0.1/24
DHCP IP RANGE	192.168.0.10-192.168.0.254
E-learning Server DHCP Configuration	Click on IP from the menu Click on DHCP Server under the IP menu Under DHCP Server Click on Leases Then Add New Enter The IP address of the Server 192.168.0.2 Enter the MAC address of the Server D0:63:B4:00:9F:3a
E-learning Server DNS Configuration	Click on IP from the menu Click on DNS under the IP menu Click on Static Click on Add New NAME: shtkankiyaelearn ADDRESS: 192.168.0.2
QoS Configuration	Select QUEUES from the MAIN menu Select QUEUE TYPES Click on ADD NEW SOLAR-CLASS-DOWNLOAD (Name of download limitation) PCQ (Type of download limitation) Rate 100M Limit 50 enable Dst. Address Src. Address Mask 32 Dst. Address Mask 32 Click APPLY SOLAR-CLASS-UPLOAD (Name of upload limitation) PCQ (Type of upload limitation) Rate 100M Limit 50

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.

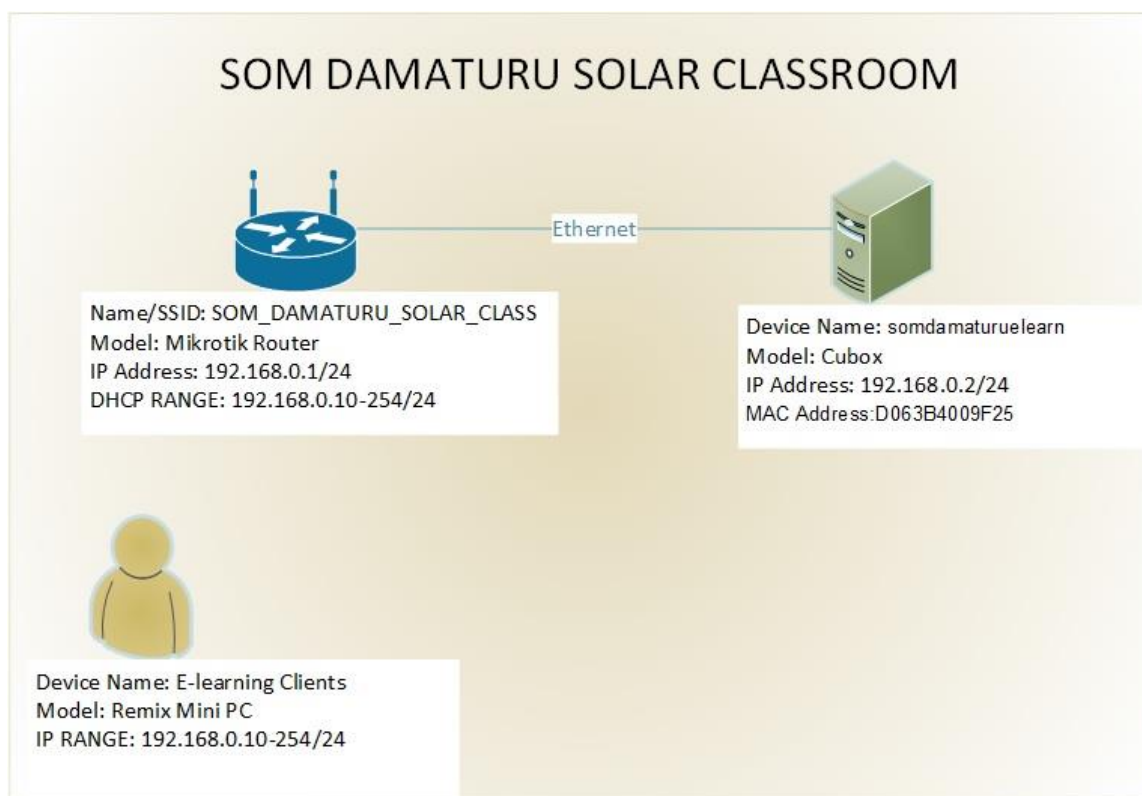
	enable Src. Address Src. Address Mask 32 Dst. Address Mask 32 Click APPLY Click OK <i>Applying the QUEUES</i> Select QUEUES Select Simple Queues Click on ADD NEW Name SOLAR-CLASS-CLIENTS Target 192.168.0.0/24 Queue Type SOLAR-CLASS-UPLOAD && SOLAR-CLASS-DOWNLOAD Click APPLY Click OK
--	---

3.5 NETWORK TEST

The assembling and installation of 24 remix units was successful. Furthermore, the testing was done on all the 24 units of remix mini PC. Twenty-four clients were connected to the E-learning Server through the wireless router. The 24 connected clients got their IP addresses from the DHCP server. They were used to test the E-learning DNS configuration by using *shtkankiyaelearn* as the domain name to connect to the e-learning server. Finally, the clients were connected to the W4H e-learning site using the admin profile. Specifically, global health video installed by Roose was used to test the quality of service configuration. All the 24 clients played the video at the same time without any visible delays or jitters.

SCHOOL OF MIDWIFERY, DAMATURU YOBE STATE (SOM DAMATURU)

3.2 NETWORK DESIGN



3.3 INSTALLED DEVICES

Devices installed at SOM Damaturu to allow students have access to the e-learning system. The devices mentioned below were powered using solar system

S/N	Devices/Accessories	Quantity	Purpose
1	Cubox-i	1	E-learning Server
2	Mikrotik hAP ac lite Router	1	Wirelessly connecting e-learning Server with the Remix Clients
3	Remix Mini PC	24	E-learning Client
4	BenQ Monitor	24	Remix monitor
5	Standard Keyboard	24	Remix Keyboard
6	Mouse	24	Remix Mouse

3.4 NETWORK CONFIGURATION

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.

Device Name	Mikrotik Router (hAP ac lite)
SSID	SOM_DAMATURU_SOLAR_CLASS
Wifi Password	
Admin Password	
IP Address	192.168.0.1/24
DHCP Server	192.168.0.1/24
DHCP IP RANGE	192.168.0.10-192.168.0.254
E-learning Server DHCP Configuration	<p>Click on IP from the menu Click on DHCP Server under the IP menu Under DHCP Server Click on Leases Then Add New Enter The IP address of the Server 192.168.0.2 Enter the MAC address of the Server D0:63:B4:00:9F:25</p>
E-learning Server DNS Configuration	<p>Click on IP from the menu Click on DNS under the IP menu Click on Static Click on Add New NAME: somdamaturuelearn ADDRESS: 192.168.0.2</p>
QoS Configuration	<p>Select QUEUES from the MAIN menu Select QUEUE TYPES Click on ADD NEW SOLAR-CLASS-DOWNLOAD (Name of download limitation) PCQ (Type of download limitation) Rate 100M Limit 50 enable Dst. Address Src. Address Mask 32 Dst. Address Mask 32 Click APPLY</p> <p>SOLAR-CLASS-UPLOAD (Name of upload limitation) PCQ (Type of upload limitation) Rate 100M Limit 50 enable Src. Address Src. Address Mask 32 Dst. Address Mask 32 Click APPLY Click OK</p> <p><i>Applying the QUEUES</i></p>

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.

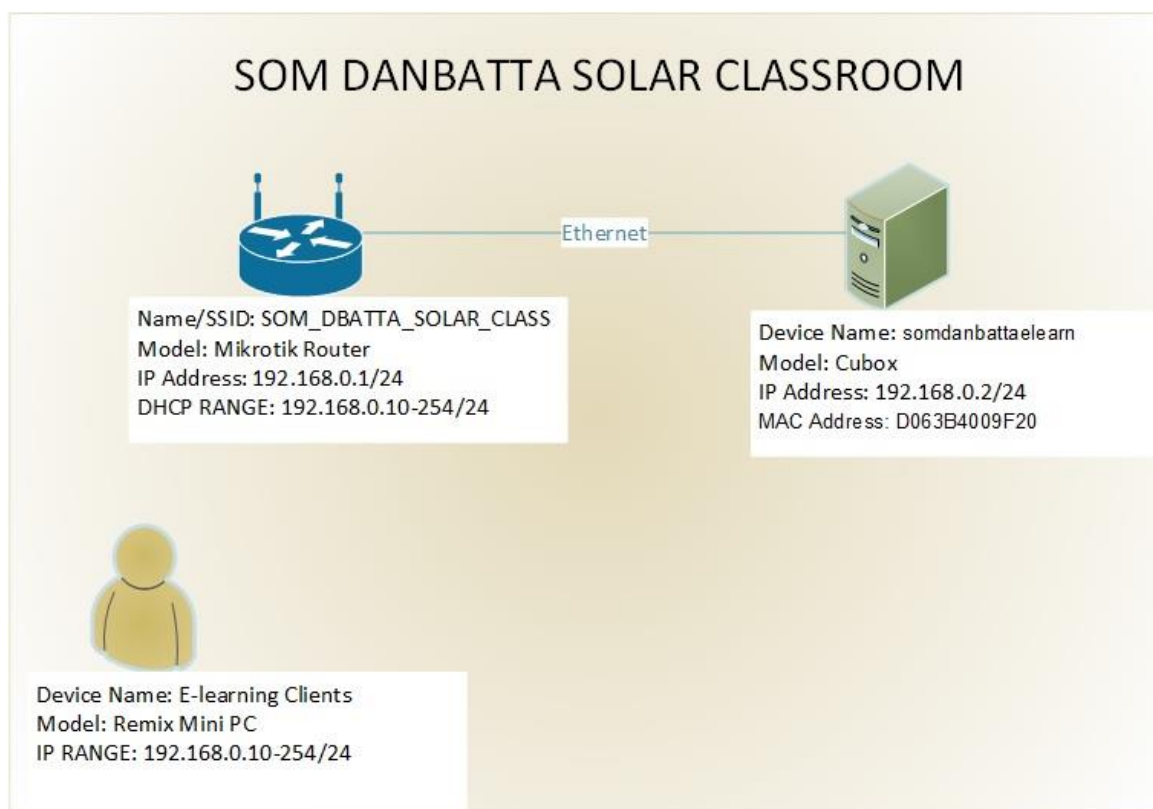
	Select QUEUES Select Simple Queues Click on ADD NEW Name SOLAR-CLASS-CLIENTS Target 192.168.0.0/24 Queue Type SOLAR-CLASS-UPLOAD && SOLAR-CLASS-DOWNLOAD Click APPLY Click OK
--	---

3.5 NETWORK TEST

The assembling and installation of 24 remix units was successful. Furthermore, the testing was done on only 15 clients due to the limited number of power outlet. Fifteen clients out of the 24 were connected to the E-learning Server through the wireless router. The 15 connected clients got their IP addresses from the DHCP server. They were used to test the E-learning DNS configuration by using *somdamaturuelearn* as the domain name to connect to the e-learning server. Finally, the clients were connected to the W4H e-learning site using the admin profile. Specifically, global health video installed by Roose was used to test the quality of service configuration. All the 15 clients played the video without any visible delays or jitters.

SCHOOL OF MIDWIFERY, DANBATTA KANO STATE (SOM DANBATTA)

3.2 NETWORK DESIGN



3.3 INSTALLED DEVICES

Devices installed at SOM Danbatta to allow students have access to the e-learning system. The devices mentioned below were powered using solar system

S/N	Devices/Accessories	Quantity	Purpose
1	Cubox-i	1	E-learning Server
2	Mikrotik hAP ac lite Router	1	Wirelessly connecting e-learning Server with the Remix Clients
3	Remix Mini PC	24	E-learning Client
4	BenQ Monitor	24	Remix monitor
5	Standard Keyboard	24	Remix Keyboard
6	Mouse	24	Remix Mouse

3.4 NETWORK CONFIGURATION

Device Name	Mikrotik Router (hAP ac lite)
SSID	SOM_DANBATTASOLAR_CLASS

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.

Wifi Password	
Admin Password	
IP Address	192.168.0.1/24
DHCP Server	192.168.0.1/24
DHCP IP RANGE	192.168.0.10-192.168.0.254
E-learning Server DHCP Configuration	<p>Click on IP from the menu Click on DHCP Server under the IP menu Under DHCP Server Click on Leases Then Add New Enter The IP address of the Server 192.168.0.2 Enter the MAC address of the Server D0:63:B4:00:9F:20</p>
E-learning Server DNS Configuration	<p>Click on IP from the menu Click on DNS under the IP menu Click on Static Click on Add New NAME: somdanbattalearn ADDRESS: 192.168.0.2</p>
QoS Configuration	<p>Select QUEUES from the MAIN menu Select QUEUE TYPES Click on ADD NEW SOLAR-CLASS-DOWNLOAD (Name of download limitation) PCQ (Type of download limitation) Rate 100M Limit 50 enable Dst. Address Src. Address Mask 32 Dst. Address Mask 32 Click APPLY</p> <p>SOLAR-CLASS-UPLOAD (Name of upload limitation) PCQ (Type of upload limitation) Rate 100M Limit 50 enable Src. Address Src. Address Mask 32 Dst. Address Mask 32 Click APPLY Click OK</p> <p><i>Applying the QUEUES</i> Select QUEUES Select Simple Queues Click on ADD NEW</p>

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.

	Name SOLAR-CLASS-CLIENTS Target 192.168.0.0/24 Queue Type SOLAR-CLASS-UPLOAD && SOLAR-CLASS-DOWNLOAD Click APPLY Click OK
--	--

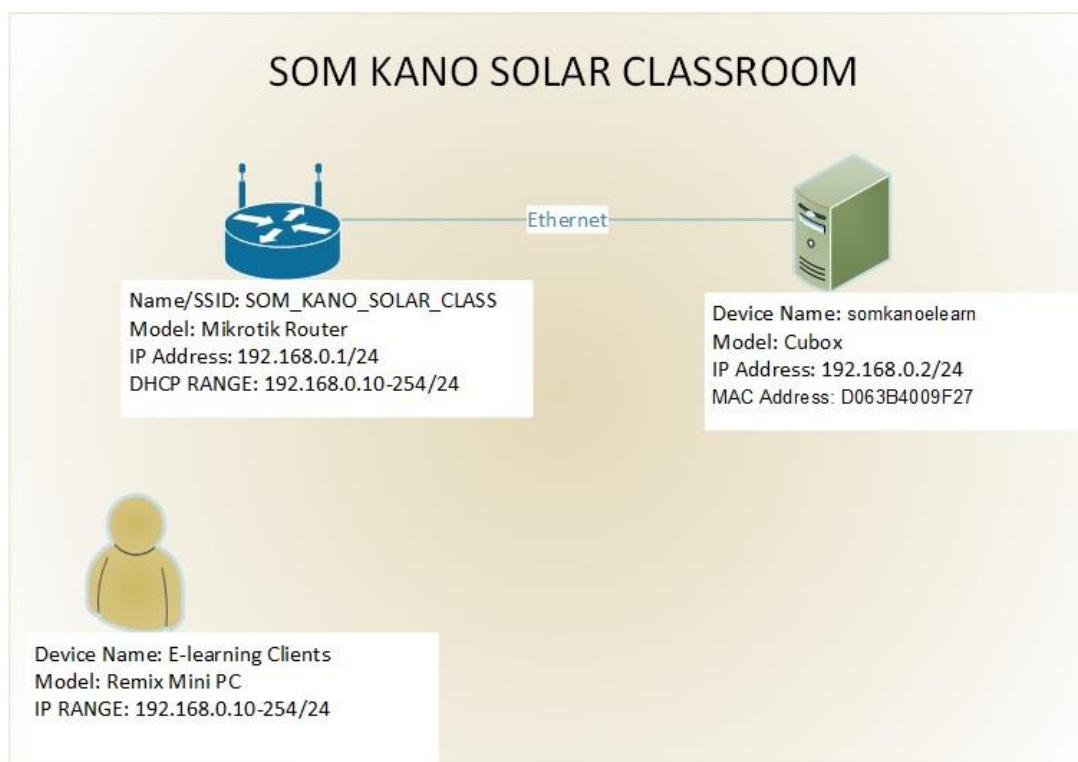
3.5 NETWORK TEST

The assembling and installation of 24 remix units was successful. Furthermore, the testing was done on only 14 clients due to the limited number of power outlet. Fourteen clients out of the 24 were connected to the E-learning Server through the wireless router. The 14 connected clients got their IP addresses from the DHCP server. They were used to test the E-learning DNS configuration by using *somdanbattaelearn* as the domain name to connect to the e-learning server. Finally, the clients were connected to the W4H e-learning site using the admin profile. Specifically, global health video installed by Roose was used to test the quality of service configuration. All the 14 clients played the video without any visible delays or jitters.

SCHOOL OF MIDWIFERY, KANO KANO STATE (SOM KANO)

3.2 NETWORK DESIGN

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.



3.3 INSTALLED DEVICES

Devices installed at SOM Kano to allow students have access to the e-learning system. The devices mentioned below were powered using solar system

S/N	Devices/Accessories	Quantity	Purpose
1	Cubox-i	1	E-learning Server
2	Mikrotik hAP ac lite Router	1	Wirelessly connecting e-learning Server with the Remix Clients
3	Remix Mini PC	24	E-learning Client
4	BenQ Monitor	24	Remix monitor
5	Standard Keyboard	24	Remix Keyboard
6	Mouse	24	Remix Mouse

3.4 NETWORK CONFIGURATION

Device Name	Mikrotik Router (hAP ac lite)
SSID	SOM_KANO_SOLAR_CLASS
Wifi Password	

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.

Admin Password	
IP Address	192.168.0.1/24
DHCP Server	192.168.0.1/24
DHCP IP RANGE	192.168.0.10-192.168.0.254
E-learning Server DHCP Configuration	Click on IP from the menu Click on DHCP Server under the IP menu Under DHCP Server Click on Leases Then Add New Enter The IP address of the Server 192.168.0.2 Enter the MAC address of the Server D0:63:B4:00:9F:27
E-learning Server DNS Configuration	Click on IP from the menu Click on DNS under the IP menu Click on Static Click on Add New NAME: somkanoelern ADDRESS: 192.168.0.2
QoS Configuration	Select QUEUES from the MAIN menu Select QUEUE TYPES Click on ADD NEW SOLAR-CLASS-DOWNLOAD (Name of download limitation) PCQ (Type of download limitation) Rate 100M Limit 50 enable Dst. Address Src. Address Mask 32 Dst. Address Mask 32 Click APPLY SOLAR-CLASS-UPLOAD (Name of upload limitation) PCQ (Type of upload limitation) Rate 100M Limit 50 enable Src. Address Src. Address Mask 32 Dst. Address Mask 32 Click APPLY Click OK <i>Applying the QUEUES</i> Select QUEUES Select Simple Queues Click on ADD NEW Name SOLAR-CLASS-CLIENTS Target 192.168.0.0/24

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.

	Queue Type SOLAR-CLASS-UPLOAD && SOLAR-CLASS-DOWNLOAD Click APPLY Click OK
--	---

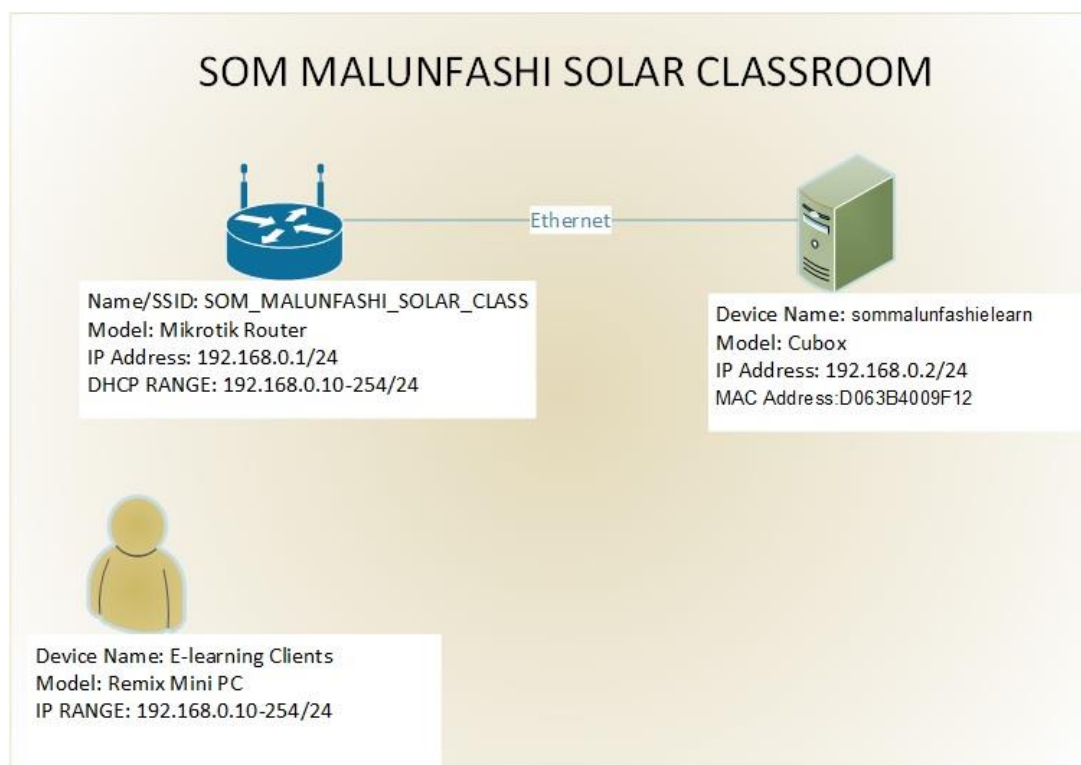
3.5 NETWORK TEST

The assembling and installation of 24 remix units was successful. Furthermore, the testing was done on only 14 clients due to the limited number of power outlet. Fourteen clients out of the 24 were connected to the E-learning Server through the wireless router. The 14 connected clients got their IP addresses from the DHCP server. They were used to test the E-learning DNS configuration by using *somkanoelern* as the domain name to connect to the e-learning server. Finally, the clients were connected to the W4H e-learning site using the admin profile. Specifically, global health video installed by Roose was used to test the quality of service configuration. All the 14 clients played the video without any visible delays or jitters.

SCHOOL OF MIDWIFERY, MALUNFASHI KATSINA STATE (SOM MALUNFASHI)

3.2 NETWORK DESIGN

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.



3.3 INSTALLED DEVICES

Devises installed at SOM Malunfashi to allow students have access to the e-learning system. The devices mentioned below were powered using solar system

S/N	Devices/Accessories	Quantity	Purpose
1	Cubox-i	1	E-learning Server
2	Mikrotik hAP ac lite Router	1	Wirelessly connecting e-learning Server with the Remix Clients
3	Remix Mini PC	24	E-learning Client
4	BenQ Monitor	24	Remix monitor
5	Standard Keyboard	24	Remix Keyboard
6	Mouse	24	Remix Mouse

3.4 NETWORK CONFIGURATION

Device Name	Mikrotik Router (hAP ac lite)
SSID	SOM_MALUNFASHI_SOLAR_CLASS

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.

Wifi Password	
Admin Password	
IP Address	192.168.0.2/24
DHCP Server	192.168.0.1/24
DHCP IP RANGE	192.168.0.10-192.168.0.254
E-learning Server DHCP Configuration	<p>Click on IP from the menu Click on DHCP Server under the IP menu Under DHCP Server Click on Leases Then Add New Enter The IP address of the Server 192.168.0.4 Enter the MAC address of the Server D0:63:B4:00:9F:12</p>
E-learning Server DNS Configuration	<p>Click on IP from the menu Click on DNS under the IP menu Click on Static Click on Add New NAME: sommalunfashielearn ADDRESS: 192.168.0.4</p>
QoS Configuration	<p>Select QUEUES from the MAIN menu Select QUEUE TYPES Click on ADD NEW SOLAR-CLASS-DOWNLOAD (Name of download limitation) PCQ (Type of download limitation) Rate 100M Limit 50 enable Dst. Address Src. Address Mask 32 Dst. Address Mask 32 Click APPLY</p> <p>SOLAR-CLASS-UPLOAD (Name of upload limitation) PCQ (Type of upload limitation) Rate 100M Limit 50 enable Src. Address Src. Address Mask 32 Dst. Address Mask 32 Click APPLY Click OK</p> <p><i>Applying the QUEUES</i> Select QUEUES Select Simple Queues Click on ADD NEW</p>

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.

	Name SOLAR-CLASS-CLIENTS Target 192.168.0.0/24 Queue Type SOLAR-CLASS-UPLOAD && SOLAR-CLASS-DOWNLOAD Click APPLY Click OK
--	--

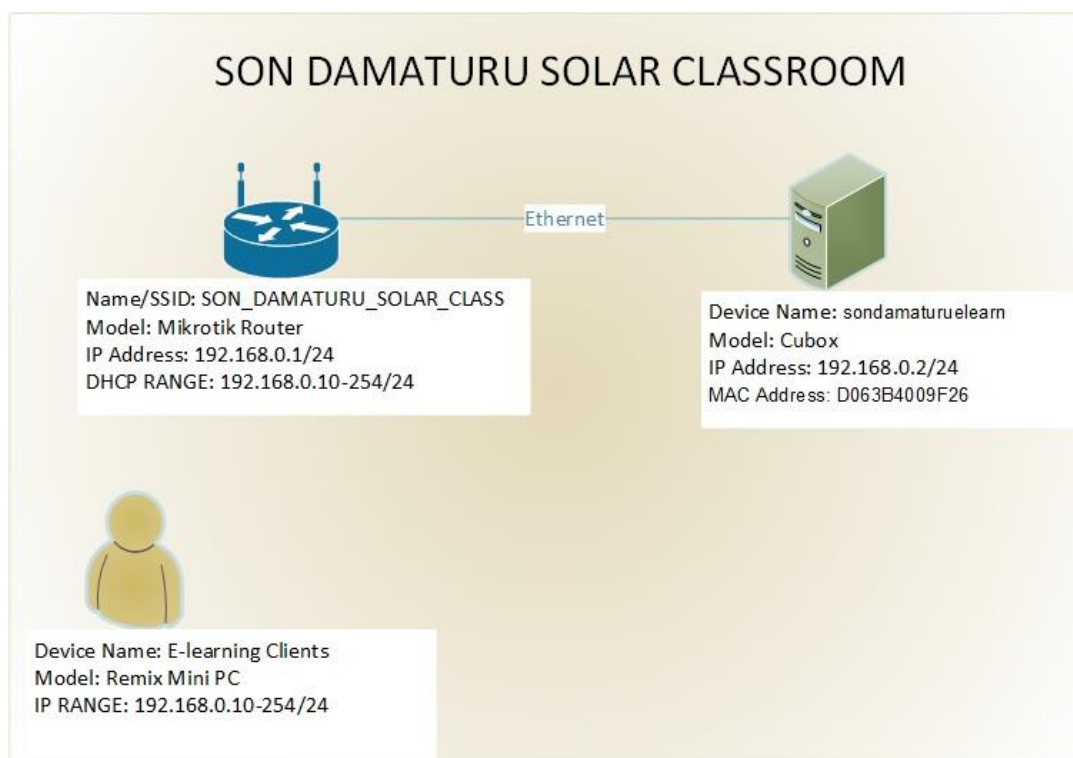
3.5 NETWORK TEST

The assembling and installation of 24 remix units was successful. Furthermore, the testing was done on only 14 clients due to the limited number of power outlet. Fourteen clients out of the 24 were connected to the E-learning Server through the wireless router. The 14 connected clients got their IP addresses from the DHCP server. They were used to test the E-learning DNS configuration by using *sommalunfashielearn* as the domain name to connect to the e-learning server. Finally, the clients were connected to the W4H e-learning site using the admin profile. Specifically, global health video installed by Roose was used to test the quality of service configuration. All the 14 clients played the video without any visible delays or jitters.

SCHOOL OF NURSING, DAMATURU YOBE STATE (SON DAMATURU)

3.2 NETWORK DESIGN

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.



3.3 INSTALLED DEVICES

Devises installed at SON Damaturu to allow students have access to the e-learning system. The devices mentioned below were powered using solar system

S/N	Devices/Accessories	Quantity	Purpose
1	Cubox-i	1	E-learning Server
2	Mikrotik hAP ac lite Router	1	Wirelessly connecting e-learning Server with the Remix Clients
3	Remix Mini PC	24	E-learning Client
4	BenQ Monitor	24	Remix monitor
5	Standard Keyboard	24	Remix Keyboard
6	Mouse	24	Remix Mouse

3.4 NETWORK CONFIGURATION

Device Name	Mikrotik Router (hAP ac lite)
SSID	SON_DAMATURU_SOLAR_CLASS

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.

Wifi Password	
Admin Password	
IP Address	192.168.0.1/24
DHCP Server	192.168.0.1/24
DHCP IP RANGE	192.168.0.10-192.168.0.254
E-learning Server DHCP Configuration	<p>Click on IP from the menu Click on DHCP Server under the IP menu Under DHCP Server Click on Leases Then Add New Enter The IP address of the Server 192.168.0.2 Enter the MAC address of the Server D0:63:B4:00:9F:26</p>
E-learning Server DNS Configuration	<p>Click on IP from the menu Click on DNS under the IP menu Click on Static Click on Add New NAME: sondamaturuelearn ADDRESS: 192.168.0.2</p>
QoS Configuration	<p>Select QUEUES from the MAIN menu Select QUEUE TYPES Click on ADD NEW SOLAR-CLASS-DOWNLOAD (Name of download limitation) PCQ (Type of download limitation) Rate 100M Limit 50 enable Dst. Address Src. Address Mask 32 Dst. Address Mask 32 Click APPLY</p> <p>SOLAR-CLASS-UPLOAD (Name of upload limitation) PCQ (Type of upload limitation) Rate 100M Limit 50 enable Src. Address Src. Address Mask 32 Dst. Address Mask 32 Click APPLY Click OK</p> <p><i>Applying the QUEUES</i> Select QUEUES Select Simple Queues Click on ADD NEW</p>

	Name SOLAR-CLASS-CLIENTS Target 192.168.0.0/24 Queue Type SOLAR-CLASS-UPLOAD && SOLAR-CLASS-DOWNLOAD Click APPLY Click OK
--	--

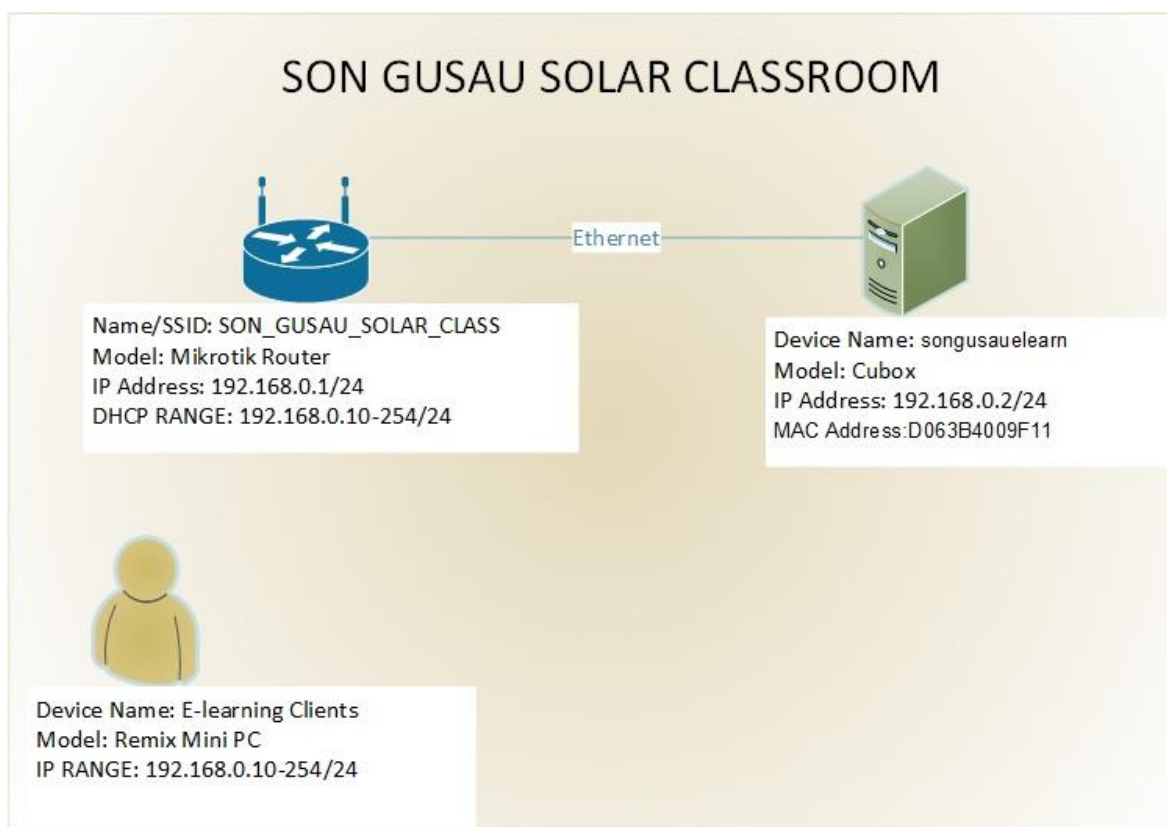
3.5 NETWORK TEST

The assembling and installation of 24 remix units was successful. Furthermore, the testing was done on only 14 clients due to the limited number of power outlet. Fourteen clients out of the 24 were connected to the E-learning Server through the wireless router. The 14 connected clients got their IP addresses from the DHCP server. They were used to test the E-learning DNS configuration by using *sondamaturuelearn* as the domain name to connect to the e-learning server. Finally, the clients were connected to the W4H e-learning site using the admin profile. Specifically, global health video installed by Roose was used to test the quality of service configuration. All the 14 clients played the video without any visible delays or jitters.

SCHOOL OF NURSING, GUSAU ZAMFARA STATE (SON GUSAU)

3.2 NETWORK DESIGN

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.



3.3 INSTALLED DEVICES

Devices installed at SON Gusau to allow students have access to the e-learning system. The devices mentioned below were powered using solar system

S/N	Devices/Accessories	Quantity	Purpose
1	Cubox-i	1	E-learning Server
2	Mikrotik hAP ac lite Router	1	Wirelessly connecting e-learning Server with the Remix Clients
3	Remix Mini PC	24	E-learning Client
4	BenQ Monitor	24	Remix monitor
5	Standard Keyboard	24	Remix Keyboard
6	Mouse	24	Remix Mouse

3.4 NETWORK CONFIGURATION

Device Name	Mikrotik Router (hAP ac lite)
-------------	-------------------------------

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.

SSID	SON_GUSAU_SOLAR_CLASS
Wifi Password	
Admin Password	
IP Address	192.168.0.1/24
DHCP Server	192.168.0.1/24
DHCP IP RANGE	192.168.0.10-192.168.0.254
E-learning Server DHCP Configuration	<p>Click on IP from the menu Click on DHCP Server under the IP menu Under DHCP Server Click on Leases Then Add New Enter The IP address of the Server 192.168.0.2 Enter the MAC address of the Server D0:63:B4:00:9F:11</p>
E-learning Server DNS Configuration	<p>Click on IP from the menu Click on DNS under the IP menu Click on Static Click on Add New NAME: songusaelearn ADDRESS: 192.168.0.2</p>
QoS Configuration	<p>Select QUEUES from the MAIN menu Select QUEUE TYPES Click on ADD NEW SOLAR-CLASS-DOWNLOAD (Name of download limitation) PCQ (Type of download limitation) Rate 100M Limit 50 enable Dst. Address Src. Address Mask 32 Dst. Address Mask 32 Click APPLY</p> <p>SOLAR-CLASS-UPLOAD (Name of upload limitation) PCQ (Type of upload limitation) Rate 100M Limit 50 enable Src. Address Src. Address Mask 32 Dst. Address Mask 32 Click APPLY Click OK</p> <p><i>Applying the QUEUES</i> Select QUEUES Select Simple Queues</p>

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.

	Click on ADD NEW Name SOLAR-CLASS-CLIENTS Target 192.168.0.0/24 Queue Type SOLAR-CLASS-UPLOAD && SOLAR-CLASS-DOWNLOAD Click APPLY Click OK
--	--

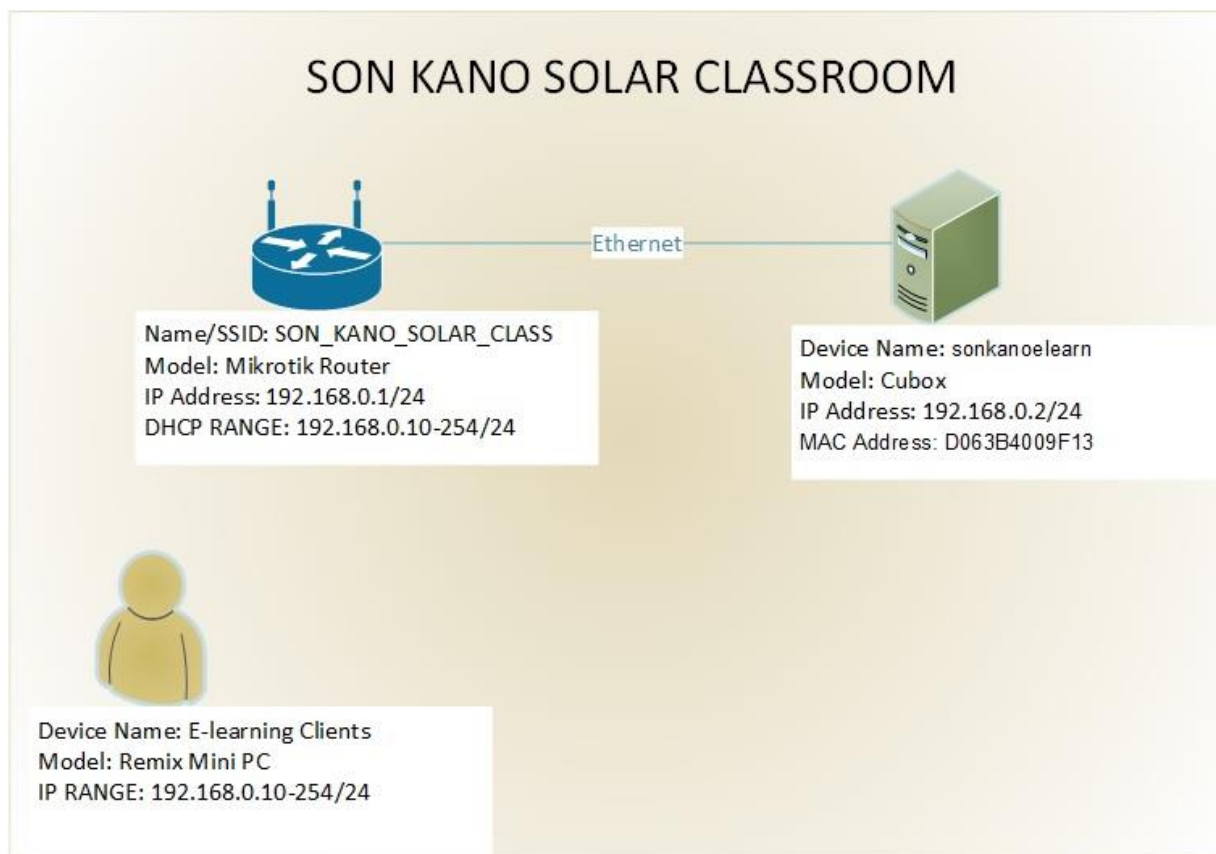
3.5 NETWORK TEST

The assembling and installation of 24 remix units was successful. Furthermore, the testing was done on only 18 clients due to the limited number of power outlet. Eighteen clients out of the 24 were connected to the E-learning Server through the wireless router. The 18 connected clients got their IP addresses from the DHCP server. They were used to test the E-learning DNS configuration by using *songusauelearn* as the domain name to connect to the e-learning server. Finally, the clients were connected to the W4H e-learning site using the admin profile. Specifically, global health video installed by Roose was used to test the quality of service configuration. All the 18 clients played the video without any visible delays or jitters.

SCHOOL OF NURSING, KANO, KANO STATE (SON KANO)

3.2 NETWORK DESIGN

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.



3.3 INSTALLED DEVICES

Devises installed at SON Kano to allow students have access to the e-learning system. The devices mentioned below were powered using solar system

S/N	Devices/Accessories	Quantity	Purpose
1	Cubox-i	1	E-learning Server
2	Mikrotik hAP ac lite Router	1	Wirelessly connecting e-learning Server with the Remix Clients
3	Remix Mini PC	24	E-learning Client
4	BenQ Monitor	24	Remix monitor
5	Standard Keyboard	24	Remix Keyboard
6	Mouse	24	Remix Mouse

3.4 NETWORK CONFIGURATION

Device Name	Mikrotik Router (hAP ac lite)
-------------	-------------------------------

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.

SSID	SON_KANO_SOLAR_CLASS
Wifi Password	
Admin Password	
IP Address	192.168.0.1/24
DHCP Server	192.168.0.1/24
DHCP IP RANGE	192.168.0.10-192.168.0.254
E-learning Server DHCP Configuration	<p>Click on IP from the menu Click on DHCP Server under the IP menu Under DHCP Server Click on Leases Then Add New Enter The IP address of the Server 192.168.0.2 Enter the MAC address of the Server D0:63:B4:00:9F:13</p>
E-learning Server DNS Configuration	<p>Click on IP from the menu Click on DNS under the IP menu Click on Static Click on Add New NAME: sonkanoellearn ADDRESS: 192.168.0.2</p>
QoS Configuration	<p>Select QUEUES from the MAIN menu Select QUEUE TYPES Click on ADD NEW SOLAR-CLASS-DOWNLOAD (Name of download limitation) PCQ (Type of download limitation) Rate 100M Limit 50 enable Dst. Address Src. Address Mask 32 Dst. Address Mask 32 Click APPLY</p> <p>SOLAR-CLASS-UPLOAD (Name of upload limitation) PCQ (Type of upload limitation) Rate 100M Limit 50 enable Src. Address Src. Address Mask 32 Dst. Address Mask 32 Click APPLY Click OK</p> <p><i>Applying the QUEUES</i> Select QUEUES Select Simple Queues</p>

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.

	Click on ADD NEW Name SOLAR-CLASS-CLIENTS Target 192.168.0.0/24 Queue Type SOLAR-CLASS-UPLOAD && SOLAR-CLASS-DOWNLOAD Click APPLY Click OK
--	--

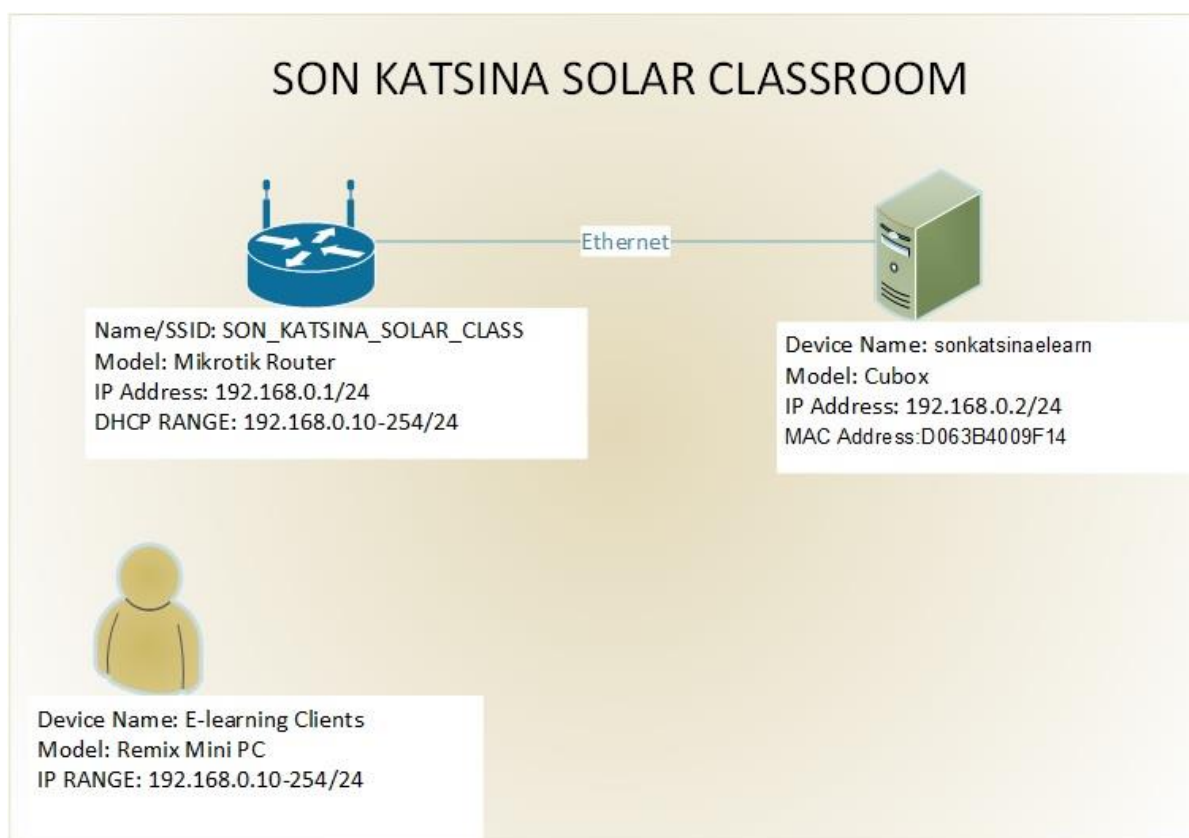
3.5 NETWORK TEST

The assembling and installation of 24 remix units was successful. Furthermore, the testing was done on only 18 clients due to the limited number of power outlet. Eighteen clients out of the 24 were connected to the E-learning Server through the wireless router. The 18 connected clients got their IP addresses from the DHCP server. They were used to test the E-learning DNS configuration by using *sonkanoelern* as the domain name to connect to the e-learning server. Finally, the clients were connected to the W4H e-learning site using the admin profile. Specifically, global health video installed by Roose was used to test the quality of service configuration. All the 18 clients played the video without any visible delays or jitters.

SCHOOL OF NURSING, KATSINA, KATSINA STATE (SON KATSINA)

3.2 NETWORK DESIGN

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.



3.3 INSTALLED DEVICES

Devices installed at SON Katsina to allow students have access to the e-learning system. The devices mentioned below were powered using solar system

S/N	Devices/Accessories	Quantity	Purpose
1	Cubox-i	1	E-learning Server
2	Mikrotik hAP ac lite Router	1	Wirelessly connecting e-learning Server with the Remix Clients
3	Remix Mini PC	24	E-learning Client
4	BenQ Monitor	24	Remix monitor
5	Standard Keyboard	24	Remix Keyboard
6	Mouse	24	Remix Mouse

3.4 NETWORK CONFIGURATION

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.

Device Name	Mikrotik Router (hAP ac lite)
SSID	SON_KATSINA_SOLAR_CLASS
Wifi Password	
Admin Password	
IP Address	192.168.0.1/24
DHCP Server	192.168.0.1/24
DHCP IP RANGE	192.168.0.10-192.168.0.254
E-learning Server DHCP Configuration	Click on IP from the menu Click on DHCP Server under the IP menu Under DHCP Server Click on Leases Then Add New Enter The IP address of the Server 192.168.0.2 Enter the MAC address of the Server D0:63:B4:00:9F:14
E-learning Server DNS Configuration	Click on IP from the menu Click on DNS under the IP menu Click on Static Click on Add New NAME: sonkantsinaelearn ADDRESS: 192.168.0.2
QoS Configuration	Select QUEUES from the MAIN menu Select QUEUE TYPES Click on ADD NEW SOLAR-CLASS-DOWNLOAD (Name of download limitation) PCQ (Type of download limitation) Rate 100M Limit 50 enable Dst. Address Src. Address Mask 32 Dst. Address Mask 32 Click APPLY SOLAR-CLASS-UPLOAD (Name of upload limitation) PCQ (Type of upload limitation) Rate 100M Limit 50 enable Src. Address Src. Address Mask 32 Dst. Address Mask 32 Click APPLY Click OK

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.

	<p><i>Applying the QUEUES</i> Select QUEUES Select Simple Queues Click on ADD NEW Name SOLAR-CLASS-CLIENTS Target 192.168.0.0/24 Queue Type SOLAR-CLASS-UPLOAD && SOLAR-CLASS-DOWNLOAD Click APPLY Click OK</p>
--	--

3.5 NETWORK TEST

The assembling and installation of 24 remix units was successful. Furthermore, the testing was done on all the 24 units of remix mini PC. Twenty-four clients were connected to the E-learning Server through the wireless router. The 24 connected clients got their IP addresses from the DHCP server. They were used to test the E-learning DNS configuration by using *sonkatsinaelearn* as the domain name to connect to the e-learning server. Finally, the clients were connected to the W4H e-learning site using the admin profile. Specifically, global health video installed by Roose was used to test the quality of service configuration. All the 24 clients played the video at the same time without any visible delays or jitters.

The W4H Programme is funded & supported by UKaid from the Department for International Development. The programme is managed by Health Partners International (HPI), Save the Children UK and GRID Consulting, Nigeria.