รายงาน

เรื่อง Network Design

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รายงานเล่มนี้เป็นส่วนหนึ่งวิชา

Internetworking Standards and Technologies รหัสวิชา 01076040

ภาคเรียนที่ 1 ปีการศึกษา 2565

คณะวิศวกรรมศาสตร์ ภาควิชาวิศวกรรมคอมพิวเตอร์

สถาบันเทคโนโลยีพระจอมเกล้าเจ้าคุณทหารลาดกระบัง

คำนำ

รายงานฉบับนี้เป็นส่วนหนึ่งของวิชา Internetworking Standards and Technologies รหัสวิชา 01076040 โดยมีเนื้อหาเกี่ยวกับการกำหนดค่าการทำงานของระบบเครือข่ายด้วย Cisco Packet Tracer อันประกอบไปด้วยลักษณะการเชื่อมต่อในระบบเครือข่าย , จำนวน IP Address , Network ID , Broadcast , Subnet Maskการทำ Dynamic Routing , Static Routing การตั้งค่าการใช้งาน Switch การทำ Trunk Port และอื่นๆ

คณะผู้จัดทำหวังเป็นอย่างยิ่งว่ารายงานฉบับนี้จะมีประโยชน์ต่อผู้ที่สนใจหรือต้องการศึกษาและค้นคว้าเพิ่มเติมในหัวข้อที่เกี่ยวข้องนี้ไม่มากก็น้อย หากมีข้อผิดพลาดประการใดต้องขออภัยมา ณ ที่นี้

คณะผู้จัดทำ

สารบัญ

1.แนวคิดและการออกแบบ

กลุ่มของเราจะออกแบบตัวเครือข่ายไว้สำหรับโรงพยาบาลเฉพาะทางโดยตัวโรงพยาบาลจะมีสาขาหลักอยู่ที่กรุงเทพและมีสาขาย่อยอยู่สองแห่งได้แก่สาขา ปัตตานี และ เชียงใหม่

เริ่มต้นที่ สาขา กรุงเทพ สาขากรุงเทพนี้จะเป็นสาขาหลัก มีอาคาร 4 ตึก เริ่มที่อาคารที่ 1 Building A มีการแบ่งชั้นเป็น 3 ชั้น Zone A (ชั้น1)จะมีห้องดังนี้ Counter-service,ห้องจ่ายยา,การเงิน,ห้องซักประวัติ,ห้องตรวจ แต่ละห้องจะมีการใช้ VLAN คนละ VLAN

Zone B (ชั้น2) จะมีห้องดังนี้ X-ray and Operation Room โซนนี้จะมี VLAN เดียว

Zone C (ชั้น3) จะเป็นห้องพักฟื้นสำหรับผู้ป่วย โซนนี้จะมี VLAN เดียว

อาคารที่ 2 Building B สำหรับอาคารนี้จะเป็นอาคารชั้นเดียวแบ่งเป็น4ห้อง ทั้ง4ห้องจะเป็นห้องสำหรับการประชุม ภายในอาคารนี้จะมีสอง VLAN

อาคารที่ 3 Building C อาคารนี้จะเป็นพื้นที่ใช้เป็นโรงหาร มีการแจกไวไฟภายในอาคาร

อาคารที่ 4 ICT จะเป็นอาคารที่ไว้เก็บ Web Server, DNS , Mail Sever

สาขา ปัตตานี จะมีอาคารอยู่สองตึกจะเป็นโรงพยาบาลที่เล็กกว่ากรุงเทพ

เริ้มต้นที่อาคารที่ 1 PTN Building A อาคารนี้จะมีการแบ่งเป็น3ห้อง Counter-Service,การเงิน,ห้องจ่ายยา ทั้ง3ห้องนี้จะใช้ VLAN คนละ VLAN กัน

อาคารที่ 2 PTN Building B อาคารนี้จะมีการแบ่งเป็น 3 ห้อง Screening Room, Examination, ICT จะเป็นการใช้ VLAN คนละ VLAN

สาขาที่ 3 เชียงใหม่ จะมีอาคารอยู่แค่หนึ่งอาคาร ภายในอาคารนี้จะมีการแบเป็น3ชั้น

เริ้มต้นที่ ชั้นที่ 1 ชั้นที่ 1 จะมีห้องอยู่ด้วยกัน3ห้อง Counter-Service,ห้องจ่ายา,การเงิน แต่ละห้องจะใช้ VLAN ที่แตกต่างกัน

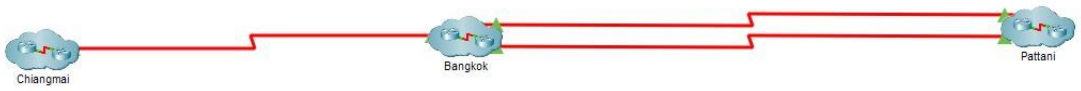
ชั้นที่ 2 จะมีการแบ่งห้องเป็น 2 ห้อง ห้องซักประวัติ,ห้องตรวจโรค แต่ละห้องจะมี VLAN ที่ต่างกัน

ชั้นที่ 3 จะมี 2 ห้อง X-ray Room, ICT จะมี VLAN แค่ห้อง X-ray Room

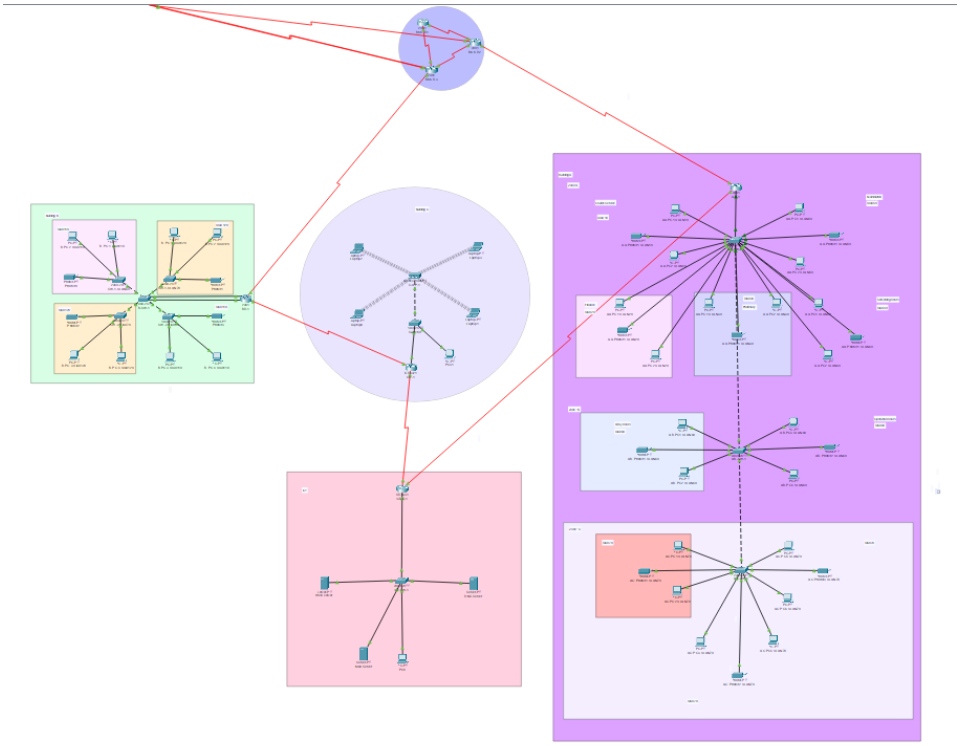
2.ลักษณะการเชื่อมต่อในระบบเครือข่าย

การเชื่อมต่อในระบบเครือข่ายของโรงพยาบาลเฉพาะทาง(Rock clinic) มีภาพรวมเป็นดังนี้

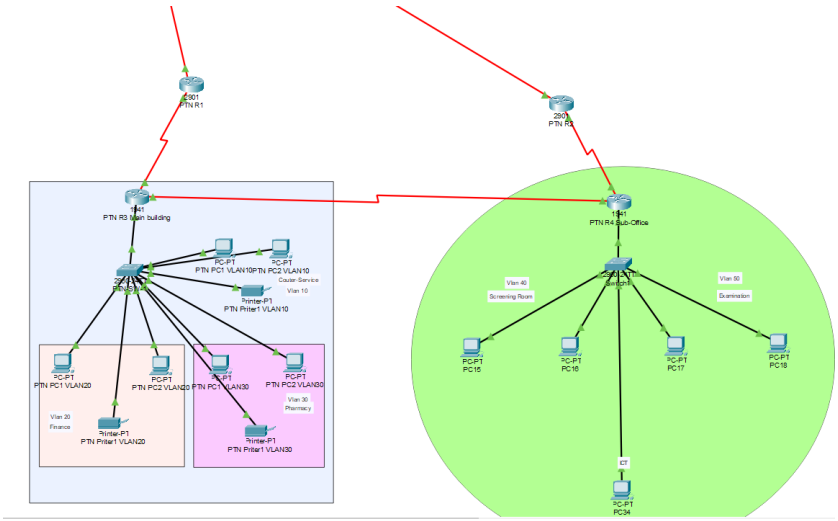
Logical View



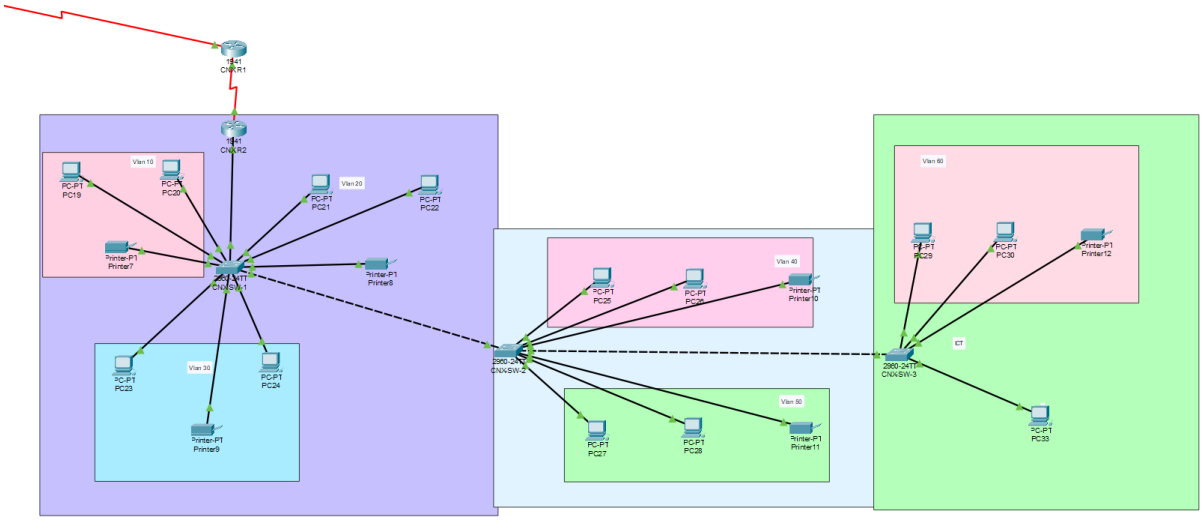
Bangkok



Pattani

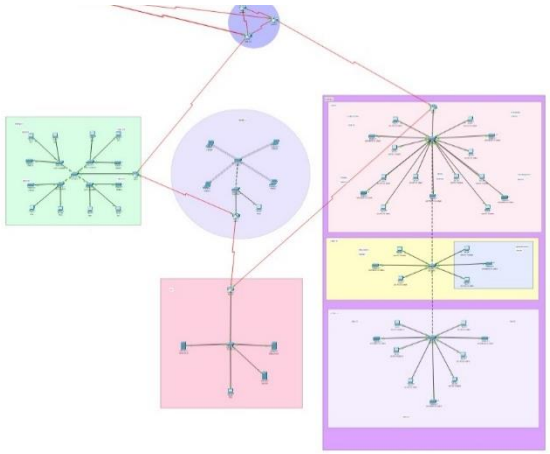


Chiang Mai



IP Address เบอร์หลักที่ใช้ 192.168.1.0/23 เนื่องจากภายในเครือข่ายทั้งหมดใช้ 276 เครื่อง IP ที่นำมาใช้จึงเป็น /23 เพราะมีจำนวนที่ให้มา 512 เครื่อง

ส่วนที่1 Bangkok



Router Name	Interface	Network ID	IP address
BKK R1	S0/0/1	192.168.1.0/30	192.168.1.1
	S0/0/0	192.168.1.4/30	192.168.1.5
	Loopback 0	10.10.10.0/30	10.10.10.1
BKK R2	S0/0/0	192.168.1.0/30	192.168.1.2
	S0/0/1	192.168.1.8/30	192.168.1.9
	S0/1/0	192.168.1.12/30	192.168.1.13
	S0/3/0	192.168.2.16/30	192.168.2.17
BKK R3	S0/0/0	192.168.1.4/30	192.168.1.6
	S0/0/1	192.168.1.8/30	192.168.1.10
	S0/1/0	192.168.1.192/30	192.168.1.194
	S0/1/1	192.168.2.20/30	192.168.2.21
	S0/2/0	192.168.1.196/30	192.168.1.197

BKK-R1, BKK-R2, BKK-R3 (EIGRP, OSPF, RIP, STATIC(Loopback0))

- Router 3 ตัวนี้ เป็น Router กลางที่เชื่อมต่อระหว่าง 3 จังหวัด โดยมี Bangkok, Pattani, Chiang Mai
- โดยตัว Router BKK R1 มี Interface loopback 0 (เป็นตัวจำลอง ISP) เป็นการ Routing แบบ Static
- Router ทั้ง 3 ตัวจะมี Routing Protocol อยู่ 3 Protocols โดยมี EIGRP, OSPF, RIPv2

Router BKK R1 (Config)

```
hostname BKK-R-1
ip domain-name BKK-R2
interface Loopback0
ip address 10.10.10.1 255.255.255.252
no shutdown
interface Serial0/0/0
ip address 192.168.1.5 255.255.255.252
no shutdown
interface Serial0/0/1
ip address 192.168.1.1 255.255.255.252
no shutdown
router eigrp 1
eigrp router-id 1.1.1.1
redistribute rip
redistribute ospf 10 metric 1 1 1 1 1
redistribute static
network 192.168.1.0
exit
router ospf 10
router-id 8.8.8.8
log-adjacency-changes
redistribute rip
redistribute eigrp 1 subnets
redistribute static
network 192.168.1.0 0.0.0.3 area 0
network 192.168.1.4 0.0.0.3 area 0
exit
router rip
version 2
redistribute eigrp 1
redistribute ospf 10
redistribute static
network 192.168.1.0
network 192.168.2.0
no auto-summary
exit
ip route 0.0.0.0 0.0.0.0 Loopback0
line con 0
password bangkok
login
exit
line vty 0 4
```

login local

transport input ssh

transport input ssh

line vty 5 15

login local

ip ssh version 2

username admin password 0 bangkok

รูป IP route Router BKK R1

```
     10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       10.10.10.0/30 is directly connected, Loopback0
L       10.10.10.1/32 is directly connected, Loopback0
     192.168.1.0/24 is variably subnetted, 27 subnets, 4 masks
C       192.168.1.0/30 is directly connected, Serial0/0/1
L       192.168.1.1/32 is directly connected, Serial0/0/1
C       192.168.1.4/30 is directly connected, Serial0/0/0
L       192.168.1.5/32 is directly connected, Serial0/0/0
D       192.168.1.8/30 [90/2681856] via 192.168.1.6, 00:02:44, Serial0/0/0
                       [90/2681856] via 192.168.1.2, 00:02:43, Serial0/0/1
D       192.168.1.12/30 [90/2681856] via 192.168.1.2, 00:02:43, Serial0/0/1
D       192.168.1.16/29 [90/2684416] via 192.168.1.2, 00:02:43, Serial0/0/1
D       192.168.1.24/29 [90/2684416] via 192.168.1.2, 00:02:43, Serial0/0/1
D       192.168.1.32/29 [90/2684416] via 192.168.1.2, 00:02:43, Serial0/0/1
D       192.168.1.40/29 [90/2684416] via 192.168.1.2, 00:02:43, Serial0/0/1
D       192.168.1.48/29 [90/2684416] via 192.168.1.2, 00:02:43, Serial0/0/1
D       192.168.1.64/28 [90/2684416] via 192.168.1.2, 00:02:43, Serial0/0/1
D       192.168.1.80/28 [90/2684416] via 192.168.1.2, 00:02:43, Serial0/0/1
D       192.168.1.96/30 [90/3193856] via 192.168.1.2, 00:02:43, Serial0/0/1
D       192.168.1.104/29 [90/3196416] via 192.168.1.2, 00:02:43, Serial0/0/1
D       192.168.1.112/30 [90/3705856] via 192.168.1.6, 00:02:44, Serial0/0/0
                         [90/3705856] via 192.168.1.2, 00:02:43, Serial0/0/1
D       192.168.1.128/28 [90/3196416] via 192.168.1.6, 00:02:44, Serial0/0/0
D       192.168.1.144/30 [90/3193856] via 192.168.1.6, 00:02:44, Serial0/0/0
D       192.168.1.160/28 [90/2684416] via 192.168.1.6, 00:02:44, Serial0/0/0
D       192.168.1.176/28 [90/2684416] via 192.168.1.6, 00:02:44, Serial0/0/0
D       192.168.1.192/30 [90/2681856] via 192.168.1.6, 00:02:44, Serial0/0/0
D       192.168.1.196/30 [90/2681856] via 192.168.1.6, 00:02:44, Serial0/0/0
R       192.168.1.200/30 [120/2] via 192.168.1.6, 00:00:23, Serial0/0/0
R       192.168.1.224/29 [120/2] via 192.168.1.6, 00:00:23, Serial0/0/0
R       192.168.1.232/29 [120/2] via 192.168.1.6, 00:00:23, Serial0/0/0
R       192.168.1.240/29 [120/2] via 192.168.1.6, 00:00:23, Serial0/0/0
R       192.168.1.248/29 [120/2] via 192.168.1.6, 00:00:23, Serial0/0/0
     192.168.2.0/24 is variably subnetted, 14 subnets, 2 masks
R       192.168.2.0/29 [120/2] via 192.168.1.6, 00:00:23, Serial0/0/0
R       192.168.2.8/29 [120/2] via 192.168.1.6, 00:00:23, Serial0/0/0
D       192.168.2.16/30 [90/2681856] via 192.168.1.2, 00:02:43, Serial0/0/1
D       192.168.2.20/30 [90/2681856] via 192.168.1.6, 00:02:43, Serial0/0/0
O       192.168.2.24/30 [110/192] via 192.168.1.6, 00:02:22, Serial0/0/0
O       192.168.2.28/30 [110/192] via 192.168.1.2, 00:02:22, Serial0/0/1
O       192.168.2.32/30 [110/256] via 192.168.1.6, 00:02:22, Serial0/0/0
                        [110/256] via 192.168.1.2, 00:02:22, Serial0/0/1
O       192.168.2.64/29 [110/193] via 192.168.1.2, 00:02:22, Serial0/0/1
O       192.168.2.72/29 [110/193] via 192.168.1.2, 00:02:22, Serial0/0/1
O       192.168.2.80/29 [110/193] via 192.168.1.2, 00:02:22, Serial0/0/1
O       192.168.2.96/29 [110/193] via 192.168.1.6, 00:02:22, Serial0/0/0
O       192.168.2.104/29 [110/193] via 192.168.1.6, 00:02:22, Serial0/0/0
R       192.168.2.112/30 [120/2] via 192.168.1.6, 00:00:23, Serial0/0/0
O       192.168.2.116/30 [110/193] via 192.168.1.6, 00:02:22, Serial0/0/0
S*   0.0.0.0/0 is directly connected, Loopback0
```

Router BKK R2 (Config)

```
hostname BKK-R-2
ip domain-name BKK-R2
interface Serial0/0/0
ip address 192.168.1.2 255.255.255.252
interface Serial0/0/1
ip address 192.168.1.9 255.255.255.252
interface Serial0/1/0
ip address 192.168.1.13 255.255.255.252
interface Serial0/3/0
ip address 192.168.2.17 255.255.255.252
router eigrp 1
eigrp router-id 3.3.3.3
redistribute rip
redistribute ospf 10 metric 1 1 1 1 1
network 192.168.1.0
network 192.168.2.0
router ospf 10
router-id 9.9.9.9
log-adjacency-changes
redistribute rip
redistribute eigrp 1 subnets
redistribute static
network 192.168.1.0 0.0.0.3 area 0
network 192.168.1.8 0.0.0.3 area 0
network 192.168.1.12 0.0.0.3 area 0
network 192.168.2.16 0.0.0.3 area 0
router rip
version 2
redistribute eigrp 1
redistribute ospf 10
network 192.168.1.0
network 192.168.2.0
no auto-summary
line con 0
password bangkok
login
line vty 0 4
login local
transport input ssh
enable secret bangkok
```

line vty 0 15

login local

transport input ssh

username admin password 0 bangkok

ip ssh version 2

รูป IP route Router BKK R2

```
     192.168.1.0/24 is variably subnetted, 28 subnets, 4 masks
C       192.168.1.0/30 is directly connected, Serial0/0/0
L       192.168.1.2/32 is directly connected, Serial0/0/0
D       192.168.1.4/30 [90/2681856] via 192.168.1.10, 00:03:52, Serial0/0/1
                       [90/2681856] via 192.168.1.1, 00:03:51, Serial0/0/0
C       192.168.1.8/30 is directly connected, Serial0/0/1
L       192.168.1.9/32 is directly connected, Serial0/0/1
C       192.168.1.12/30 is directly connected, Serial0/1/0
L       192.168.1.13/32 is directly connected, Serial0/1/0
D       192.168.1.16/29 [90/2172416] via 192.168.1.14, 00:03:52, Serial0/1/0
D       192.168.1.24/29 [90/2172416] via 192.168.1.14, 00:03:52, Serial0/1/0
D       192.168.1.32/29 [90/2172416] via 192.168.1.14, 00:03:52, Serial0/1/0
D       192.168.1.40/29 [90/2172416] via 192.168.1.14, 00:03:52, Serial0/1/0
D       192.168.1.48/29 [90/2172416] via 192.168.1.14, 00:03:52, Serial0/1/0
D       192.168.1.64/28 [90/2172416] via 192.168.1.14, 00:03:52, Serial0/1/0
D       192.168.1.80/28 [90/2172416] via 192.168.1.14, 00:03:52, Serial0/1/0
D       192.168.1.96/30 [90/2681856] via 192.168.1.14, 00:03:52, Serial0/1/0
D       192.168.1.104/29 [90/2684416] via 192.168.1.14, 00:03:52, Serial0/1/0
D       192.168.1.112/30 [90/3193856] via 192.168.1.14, 00:03:52, Serial0/1/0
D       192.168.1.128/28 [90/3196416] via 192.168.1.14, 00:03:52, Serial0/1/0
                         [90/3196416] via 192.168.1.10, 00:03:52, Serial0/0/1
D       192.168.1.144/30 [90/3193856] via 192.168.1.10, 00:03:52, Serial0/0/1
D       192.168.1.160/28 [90/2684416] via 192.168.1.10, 00:03:52, Serial0/0/1
D       192.168.1.176/28 [90/2684416] via 192.168.1.10, 00:03:52, Serial0/0/1
D       192.168.1.192/30 [90/2681856] via 192.168.1.10, 00:03:52, Serial0/0/1
D       192.168.1.196/30 [90/2681856] via 192.168.1.10, 00:03:52, Serial0/0/1
R       192.168.1.200/30 [120/2] via 192.168.1.10, 00:00:06, Serial0/0/1
R       192.168.1.224/29 [120/2] via 192.168.1.10, 00:00:06, Serial0/0/1
R       192.168.1.232/29 [120/2] via 192.168.1.10, 00:00:06, Serial0/0/1
R       192.168.1.240/29 [120/2] via 192.168.1.10, 00:00:06, Serial0/0/1
R       192.168.1.248/29 [120/2] via 192.168.1.10, 00:00:06, Serial0/0/1
     192.168.2.0/24 is variably subnetted, 15 subnets, 3 masks
R       192.168.2.0/29 [120/2] via 192.168.1.10, 00:00:06, Serial0/0/1
R       192.168.2.8/29 [120/2] via 192.168.1.10, 00:00:06, Serial0/0/1
C       192.168.2.16/30 is directly connected, Serial0/3/0
L       192.168.2.17/32 is directly connected, Serial0/3/0
D       192.168.2.20/30 [90/2681856] via 192.168.1.10, 00:03:52, Serial0/0/1
O       192.168.2.24/30 [110/192] via 192.168.1.10, 00:03:35, Serial0/0/1
O       192.168.2.28/30 [110/128] via 192.168.2.18, 00:03:35, Serial0/3/0
O       192.168.2.32/30 [110/192] via 192.168.2.18, 00:03:35, Serial0/3/0
O       192.168.2.64/29 [110/129] via 192.168.2.18, 00:03:35, Serial0/3/0
O       192.168.2.72/29 [110/129] via 192.168.2.18, 00:03:35, Serial0/3/0
O       192.168.2.80/29 [110/129] via 192.168.2.18, 00:03:35, Serial0/3/0
O       192.168.2.96/29 [110/193] via 192.168.2.18, 00:03:25, Serial0/3/0
                        [110/193] via 192.168.1.10, 00:03:25, Serial0/0/1
O       192.168.2.104/29 [110/193] via 192.168.2.18, 00:03:25, Serial0/3/0
                         [110/193] via 192.168.1.10, 00:03:25, Serial0/0/1
R       192.168.2.112/30 [120/2] via 192.168.1.10, 00:00:06, Serial0/0/1
O       192.168.2.116/30 [110/193] via 192.168.2.18, 00:03:25, Serial0/3/0
                         [110/193] via 192.168.1.10, 00:03:25, Serial0/0/1
O*E2 0.0.0.0/0 [110/1] via 192.168.1.10, 00:03:35, Serial0/0/1
```

Router BKK R3 (Config)

```
hostname BKK-R-3
ip domain-name AR-1
interface Serial0/0/0
ip address 192.168.1.6 255.255.255.252
no shutdown
interface Serial0/0/1
ip address 192.168.1.10 255.255.255.252
no shutdown
interface Serial0/1/0
ip address 192.168.1.194 255.255.255.252
no shutdown
interface Serial0/1/1
ip address 192.168.2.21 255.255.255.252
no shutdown
interface Serial0/2/0
ip address 192.168.1.197 255.255.255.252
no shutdown
router eigrp 1
eigrp router-id 2.2.2.2
redistribute rip
redistribute ospf 10 metric 1 1 1 1 1
redistribute static
network 192.168.1.0
network 192.168.2.0
router ospf 10
router-id 5.5.5.5
redistribute rip
redistribute eigrp 1 subnets
redistribute static
network 192.168.1.4 0.0.0.3 area 0
network 192.168.1.8 0.0.0.3 area 0
network 192.168.1.192 0.0.0.3 area 0
network 192.168.2.20 0.0.0.3 area 0
network 192.168.1.196 0.0.0.3 area 0
default-information originate
router rip
version 2
redistribute eigrp 1
redistribute ospf 10
redistribute static
```

network 192.168.1.0

network 192.168.2.0

no auto-summary

line con 0

password bangkok

login

line vty 0 4

login local

transport input ssh

enable secret bangkok

ip ssh version 2

username admin password 0 bangkok

line vty 0 15

login local

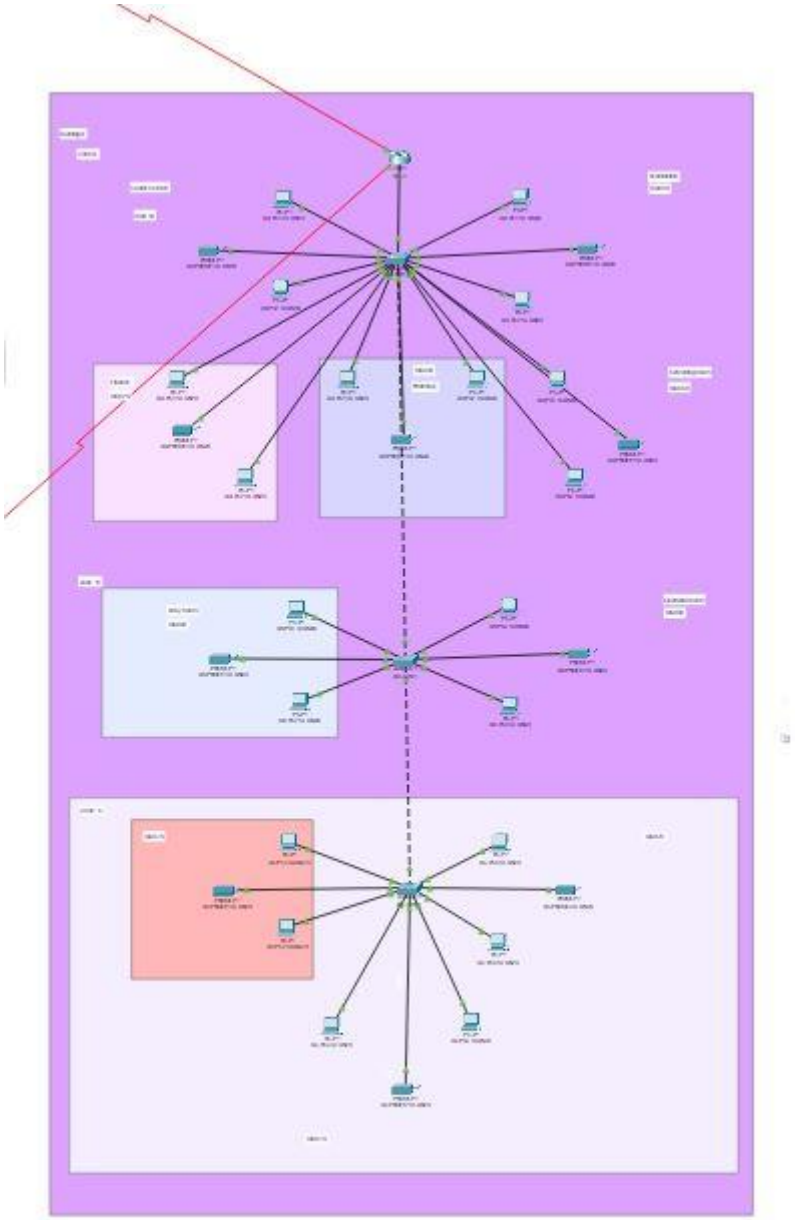
transport input ssh

รูป IP route Router BKK R3

```
     192.168.1.0/24 is variably subnetted, 29 subnets, 4 masks
D       192.168.1.0/30 [90/2681856] via 192.168.1.9, 00:05:28, Serial0/0/1
                       [90/2681856] via 192.168.1.5, 00:05:27, Serial0/0/0
C       192.168.1.4/30 is directly connected, Serial0/0/0
L       192.168.1.6/32 is directly connected, Serial0/0/0
C       192.168.1.8/30 is directly connected, Serial0/0/1
L       192.168.1.10/32 is directly connected, Serial0/0/1
D       192.168.1.12/30 [90/2681856] via 192.168.1.9, 00:05:28, Serial0/0/1
D       192.168.1.16/29 [90/2684416] via 192.168.1.9, 00:05:28, Serial0/0/1
D       192.168.1.24/29 [90/2684416] via 192.168.1.9, 00:05:28, Serial0/0/1
D       192.168.1.32/29 [90/2684416] via 192.168.1.9, 00:05:28, Serial0/0/1
D       192.168.1.40/29 [90/2684416] via 192.168.1.9, 00:05:28, Serial0/0/1
D       192.168.1.48/29 [90/2684416] via 192.168.1.9, 00:05:28, Serial0/0/1
D       192.168.1.64/28 [90/2684416] via 192.168.1.9, 00:05:28, Serial0/0/1
D       192.168.1.80/28 [90/2684416] via 192.168.1.9, 00:05:28, Serial0/0/1
D       192.168.1.96/30 [90/3193856] via 192.168.1.9, 00:05:28, Serial0/0/1
D       192.168.1.104/29 [90/3196416] via 192.168.1.193, 00:05:28, Serial0/1/0
                         [90/3196416] via 192.168.1.9, 00:05:28, Serial0/0/1
D       192.168.1.112/30 [90/3193856] via 192.168.1.193, 00:05:28, Serial0/1/0
D       192.168.1.128/28 [90/2684416] via 192.168.1.193, 00:05:28, Serial0/1/0
D       192.168.1.144/30 [90/2681856] via 192.168.1.193, 00:05:28, Serial0/1/0
D       192.168.1.160/28 [90/2172416] via 192.168.1.193, 00:05:28, Serial0/1/0
D       192.168.1.176/28 [90/2172416] via 192.168.1.193, 00:05:28, Serial0/1/0
C       192.168.1.192/30 is directly connected, Serial0/1/0
L       192.168.1.194/32 is directly connected, Serial0/1/0
C       192.168.1.196/30 is directly connected, Serial0/2/0
L       192.168.1.197/32 is directly connected, Serial0/2/0
R       192.168.1.200/30 [120/1] via 192.168.1.198, 00:00:27, Serial0/2/0
R       192.168.1.224/29 [120/1] via 192.168.1.198, 00:00:27, Serial0/2/0
R       192.168.1.232/29 [120/1] via 192.168.1.198, 00:00:27, Serial0/2/0
R       192.168.1.240/29 [120/1] via 192.168.1.198, 00:00:27, Serial0/2/0
R       192.168.1.248/29 [120/1] via 192.168.1.198, 00:00:27, Serial0/2/0
     192.168.2.0/24 is variably subnetted, 15 subnets, 3 masks
R       192.168.2.0/29 [120/1] via 192.168.1.198, 00:00:27, Serial0/2/0
R       192.168.2.8/29 [120/1] via 192.168.1.198, 00:00:27, Serial0/2/0
D       192.168.2.16/30 [90/2681856] via 192.168.1.9, 00:05:28, Serial0/0/1
C       192.168.2.20/30 is directly connected, Serial0/1/1
L       192.168.2.21/32 is directly connected, Serial0/1/1
O       192.168.2.24/30 [110/128] via 192.168.2.22, 00:05:11, Serial0/1/1
O       192.168.2.28/30 [110/192] via 192.168.1.9, 00:05:11, Serial0/0/1
O       192.168.2.32/30 [110/192] via 192.168.2.22, 00:05:11, Serial0/1/1
O       192.168.2.64/29 [110/193] via 192.168.1.9, 00:05:01, Serial0/0/1
                        [110/193] via 192.168.2.22, 00:05:01, Serial0/1/1
O       192.168.2.72/29 [110/193] via 192.168.1.9, 00:05:01, Serial0/0/1
                        [110/193] via 192.168.2.22, 00:05:01, Serial0/1/1
O       192.168.2.80/29 [110/193] via 192.168.1.9, 00:05:01, Serial0/0/1
                        [110/193] via 192.168.2.22, 00:05:01, Serial0/1/1
O       192.168.2.96/29 [110/129] via 192.168.2.22, 00:05:11, Serial0/1/1
O       192.168.2.104/29 [110/129] via 192.168.2.22, 00:05:11, Serial0/1/1
R       192.168.2.112/30 [120/1] via 192.168.1.198, 00:00:27, Serial0/2/0
O       192.168.2.116/30 [110/129] via 192.168.2.22, 00:05:11, Serial0/1/1
R*   0.0.0.0/0 [120/1] via 192.168.1.5, 00:00:23, Serial0/0/0
```

Building A (Zone A)

จะเป็นตึกหลักของโรงพยาบาลเฉพาะทางเกี่ยวกับการผ่าตัด(Rock Clinic)



แบ่ง IP ให้ตามแต่ละโซน Building A

- Counter-Service 4 เครื่อง
- ห้องจ่ายยา 4 เครื่อง
- ห้องการเงิน 4 เครื่อง
- ห้องคัดกรอง 4 เครื่อง
- ห้องตรวจโรคทั่วไป 4 เครื่อง
- ห้อง X-ray และ ผ่าตัด 6 เครื่อง
- ห้องพักฟื้น 9 เครื่อง

โดยการแบ่งNetwork ID จะได้ตามตารางนี้

Router Name	Interface	Network ID	IP address
AR 1 Password: bangkok	S0/0/0	192.168.1.12 /30	192.168.1.14
	S0/0/1	192.168.1.96 /30	192.168.1.97
	G0/0	192.168.1.16 /25	192.168.1.17
	G0/0.10	192.168.1.16 /29	192.168.1.17
	G0/0.20	192.168.1.24 /29	192.168.1.25
	G0/0.30	192.168.1.32 /29	192.168.1.33
	G0/0.40	192.168.1.40 /29	192.168.1.41
	G0/0.50	192.168.1.48 /29	192.168.1.49
	G0/0.60	192.168.1.64 /28	192.168.1.65
	G0/0.70	192.168.1.80 /28	192.168.1.81

Router AR1 (DHCP, EIGRP, ACL)

โดย Router ตัวนี้จะมีการแจก DHCP ให้กับแต่ละ VLAN โดย VLAN ที่มีอยู่ในตึกนี้จะมี VLAN 10, 20, 30, 40, 50, 60, 70

- ตั้งรหัสผ่านเพื่อความปลอดภัย
- เปิดการใช้งาน SSH
- Router ตัวนี้ใช้การ Routing แบบ EIGRP
- มีการตั้งค่า ACL ดังนี้

- Counter-Service(vlan10) อณุญาติให้Pingได้ดังนี้
  - All in Building A
  - All Counter-Service
  - All in Build C
- Finance(vlan20) อณุญาติให้Pingได้ดังนี้
  - Pharmacy(Vlan30)

- Counter-service(vlan10)

- Pharmacy(Vlan30) อณุญาติให้Pingได้ดังนี้
  - Finance(vlan20)
  - Examination(vlan50)
  - Counter-service(vlan10)
- Screening Room(vlan40) อณุญาติให้Pingได้ดังนี้
  - Examination(vlan50)
  - Counter-service(vlan10)
- Examination(vlan50) อณุญาติให้Pingได้ดังนี้
  - Screening Room(vlan40)
  - Pharmacy(Vlan30)
  - X-ray and Operation (vlan60)
  - Counter-service(vlan10)
  - Zone C
- X-ray and Operation (vlan60) อณุญาติให้Pingได้ดังนี้
  - Counter-service(vlan10)
  - Examination(vlan50)
- PauseAwake Room(vlan70) อณุญาติให้Pingได้ดังนี้
  - All in Building A

Router AR1 (Config)

```
hostname AR-1
ip dhcp excluded-address 192.168.1.17
ip dhcp excluded-address 192.168.1.25
ip dhcp excluded-address 192.168.1.33
ip dhcp excluded-address 192.168.1.41
ip dhcp excluded-address 192.168.1.49
ip dhcp excluded-address 192.168.1.65
ip dhcp excluded-address 192.168.1.81
ip dhcp pool LAN-VLAN-10
network 192.168.1.16 255.255.255.248
default-router 192.168.1.17
dns-server 192.168.1.106
ip dhcp pool LAN-VLAN-20
network 192.168.1.24 255.255.255.248
default-router 192.168.1.25
dns-server 192.168.1.106
ip dhcp pool LAN-VLAN-30
network 192.168.1.32 255.255.255.248
default-router 192.168.1.33
dns-server 192.168.1.106
ip dhcp pool LAN-VLAN-40
network 192.168.1.40 255.255.255.248
default-router 192.168.1.41
dns-server 192.168.1.106
ip dhcp pool LAN-VLAN-50
network 192.168.1.48 255.255.255.248
default-router 192.168.1.49
dns-server 192.168.1.106
ip dhcp pool LAN-VLAN-60
network 192.168.1.64 255.255.255.240
default-router 192.168.1.65
dns-server 192.168.1.106
ip dhcp pool LAN-VLAN-70
network 192.168.1.80 255.255.255.240
default-router 192.168.1.81
dns-server 192.168.1.106
ip domain-name AR-1
interface GigabitEthernet0/0.10
encapsulation dot1Q 10
ip address 192.168.1.17 255.255.255.248
ip access-group 1 out
interface GigabitEthernet0/0.20
```

```
encapsulation dot1Q 20
ip address 192.168.1.25 255.255.255.248
ip access-group 2 out
interface GigabitEthernet0/0.30
encapsulation dot1Q 30
ip address 192.168.1.33 255.255.255.248
ip access-group 3 out
interface GigabitEthernet0/0.40
encapsulation dot1Q 40
ip address 192.168.1.41 255.255.255.248
ip access-group 4 out
interface GigabitEthernet0/0.50
encapsulation dot1Q 50
ip address 192.168.1.49 255.255.255.248
ip access-group 5 out
interface GigabitEthernet0/0.60
encapsulation dot1Q 60
ip address 192.168.1.65 255.255.255.240
ip access-group 6 out
interface GigabitEthernet0/0.70
encapsulation dot1Q 70
ip address 192.168.1.81 255.255.255.240
interface Serial0/0/0
ip address 192.168.1.14 255.255.255.252
no shutdown
interface Serial0/0/1
ip address 192.168.1.97 255.255.255.252
no shutdown
int g 0/0
no shutdown
router eigrp 1
eigrp router-id 7.7.7.7
network 192.168.1.0
access-list 1 permit 10.10.10.0 0.0.0.3
access-list 1 permit 192.168.1.12 0.0.0.3
access-list 1 permit 192.168.1.96 0.0.0.3
access-list 1 permit 192.168.1.16 0.0.0.7
access-list 1 permit 192.168.1.24 0.0.0.7
access-list 1 permit 192.168.1.32 0.0.0.7
access-list 1 permit 192.168.1.40 0.0.0.7
access-list 1 permit 192.168.1.48 0.0.0.7
access-list 1 permit 192.168.1.64 0.0.0.15
access-list 1 permit 192.168.1.80 0.0.0.15
access-list 1 permit 192.168.1.160 0.0.0.15
```

```
access-list 1 permit 192.168.1.176 0.0.0.15
access-list 1 permit 192.168.1.128 0.0.0.15
access-list 1 permit 192.168.2.64 0.0.0.7
access-list 1 permit 192.168.1.224 0.0.0.7
access-list 1 permit 192.168.1.104 0.0.0.7
access-list 1 deny any
access-list 2 permit 10.10.10.0 0.0.0.3
access-list 2 permit 192.168.1.12 0.0.0.3
access-list 2 permit 192.168.1.96 0.0.0.3
access-list 2 permit 192.168.1.16 0.0.0.7
access-list 2 permit 192.168.1.24 0.0.0.7
access-list 2 permit 192.168.1.32 0.0.0.7
access-list 2 permit 192.168.1.80 0.0.0.15
access-list 2 permit 192.168.1.128 0.0.0.15
access-list 2 permit 192.168.1.104 0.0.0.7
access-list 2 deny any
access-list 3 permit 10.10.10.0 0.0.0.3
access-list 3 permit 192.168.1.12 0.0.0.3
access-list 3 permit 192.168.1.96 0.0.0.3
access-list 3 permit 192.168.1.16 0.0.0.7
access-list 3 permit 192.168.1.24 0.0.0.7
access-list 3 permit 192.168.1.32 0.0.0.7
access-list 3 permit 192.168.1.48 0.0.0.7
access-list 3 permit 192.168.1.80 0.0.0.15
access-list 3 permit 192.168.1.128 0.0.0.15
access-list 3 permit 192.168.1.104 0.0.0.7
access-list 3 deny any
access-list 4 permit 10.10.10.0 0.0.0.3
access-list 4 permit 192.168.1.12 0.0.0.3
access-list 4 permit 192.168.1.96 0.0.0.3
access-list 4 permit 192.168.1.16 0.0.0.7
access-list 4 permit 192.168.1.40 0.0.0.7
access-list 4 permit 192.168.1.48 0.0.0.7
access-list 4 permit 192.168.1.80 0.0.0.15
access-list 4 permit 192.168.1.128 0.0.0.15
access-list 4 permit 192.168.1.104 0.0.0.7
access-list 4 deny any
access-list 6 permit 10.10.10.0 0.0.0.3
access-list 6 permit 192.168.1.12 0.0.0.3
access-list 6 permit 192.168.1.96 0.0.0.3
access-list 6 permit 192.168.1.16 0.0.0.7
access-list 6 permit 192.168.1.48 0.0.0.7
access-list 6 permit 192.168.1.64 0.0.0.15
access-list 6 permit 192.168.1.80 0.0.0.15
```

```
access-list 6 permit 192.168.1.128 0.0.0.15
access-list 6 permit 192.168.1.104 0.0.0.7
access-list 6 deny any
access-list 5 permit 10.10.10.0 0.0.0.3
access-list 5 permit 192.168.1.12 0.0.0.3
access-list 5 permit 192.168.1.96 0.0.0.3
access-list 5 permit 192.168.1.16 0.0.0.7
access-list 5 permit 192.168.1.32 0.0.0.7
access-list 5 permit 192.168.1.40 0.0.0.7
access-list 5 permit 192.168.1.48 0.0.0.7
access-list 5 permit 192.168.1.80 0.0.0.15
access-list 5 permit 192.168.1.64 0.0.0.15
access-list 5 permit 192.168.1.128 0.0.0.15
access-list 5 permit 192.168.1.104 0.0.0.7
access-list 5 deny any
line con 0
password bangkok
login
line vty 0 4
login local
transport input ssh
ip ssh version 2
line vty 0 15
login local
transport input ssh
username admin password 0 bangkok
enable secret 5 bangkok
```

รูป Ip route Router AR1

```
     192.168.1.0/24 is variably subnetted, 29 subnets, 4 masks
D       192.168.1.0/30 [90/2681856] via 192.168.1.13, 00:07:44, Serial0/0/0
D       192.168.1.4/30 [90/3193856] via 192.168.1.13, 00:07:44, Serial0/0/0
D       192.168.1.8/30 [90/2681856] via 192.168.1.13, 00:07:44, Serial0/0/0
C       192.168.1.12/30 is directly connected, Serial0/0/0
L       192.168.1.14/32 is directly connected, Serial0/0/0
C       192.168.1.16/29 is directly connected, GigabitEthernet0/0.10
L       192.168.1.17/32 is directly connected, GigabitEthernet0/0.10
C       192.168.1.24/29 is directly connected, GigabitEthernet0/0.20
L       192.168.1.25/32 is directly connected, GigabitEthernet0/0.20
C       192.168.1.32/29 is directly connected, GigabitEthernet0/0.30
L       192.168.1.33/32 is directly connected, GigabitEthernet0/0.30
C       192.168.1.40/29 is directly connected, GigabitEthernet0/0.40
L       192.168.1.41/32 is directly connected, GigabitEthernet0/0.40
C       192.168.1.48/29 is directly connected, GigabitEthernet0/0.50
L       192.168.1.49/32 is directly connected, GigabitEthernet0/0.50
C       192.168.1.64/28 is directly connected, GigabitEthernet0/0.60
L       192.168.1.65/32 is directly connected, GigabitEthernet0/0.60
C       192.168.1.80/28 is directly connected, GigabitEthernet0/0.70
L       192.168.1.81/32 is directly connected, GigabitEthernet0/0.70
C       192.168.1.96/30 is directly connected, Serial0/0/1
L       192.168.1.97/32 is directly connected, Serial0/0/1
D       192.168.1.104/29 [90/2172416] via 192.168.1.98, 00:07:45, Serial0/0/1
D       192.168.1.112/30 [90/2681856] via 192.168.1.98, 00:07:44, Serial0/0/1
D       192.168.1.128/28 [90/2684416] via 192.168.1.98, 00:07:44, Serial0/0/1
D       192.168.1.144/30 [90/3193856] via 192.168.1.98, 00:07:44, Serial0/0/1
D       192.168.1.160/28 [90/3196416] via 192.168.1.98, 00:07:44, Serial0/0/1
                         [90/3196416] via 192.168.1.13, 00:07:44, Serial0/0/0
D       192.168.1.176/28 [90/3196416] via 192.168.1.98, 00:07:44, Serial0/0/1
                         [90/3196416] via 192.168.1.13, 00:07:44, Serial0/0/0
D       192.168.1.192/30 [90/3193856] via 192.168.1.13, 00:07:44, Serial0/0/0
D       192.168.1.196/30 [90/3193856] via 192.168.1.13, 00:07:44, Serial0/0/0
     192.168.2.0/24 is variably subnetted, 11 subnets, 2 masks
D       192.168.2.16/30 [90/2681856] via 192.168.1.13, 00:07:44, Serial0/0/0
D       192.168.2.20/30 [90/3193856] via 192.168.1.13, 00:07:44, Serial0/0/0
D EX    192.168.2.24/30 [170/2561024256] via 192.168.1.13, 00:07:22, Serial0/0/0
D EX    192.168.2.28/30 [170/2561024256] via 192.168.1.13, 00:07:22, Serial0/0/0
D EX    192.168.2.32/30 [170/2561024256] via 192.168.1.13, 00:07:22, Serial0/0/0
D EX    192.168.2.64/29 [170/2561024256] via 192.168.1.13, 00:07:22, Serial0/0/0
D EX    192.168.2.72/29 [170/2561024256] via 192.168.1.13, 00:07:22, Serial0/0/0
D EX    192.168.2.80/29 [170/2561024256] via 192.168.1.13, 00:07:22, Serial0/0/0
D EX    192.168.2.96/29 [170/2561024256] via 192.168.1.13, 00:07:22, Serial0/0/0
D EX    192.168.2.104/29 [170/2561024256] via 192.168.1.13, 00:07:22, Serial0/0/0
D EX    192.168.2.116/30 [170/2561024256] via 192.168.1.13, 00:07:22, Serial0/0/0
D*EX 0.0.0.0/0 [170/5497856] via 192.168.1.98, 00:07:43, Serial0/0/1
```

AA-SW-1 (INTER-VLAN, VTP)

- Switch ตัวนี้มีการทำ VTP บน Inter VLAN Switch ตัวนี้เป็น VTP mode server โดยการตั้งค่า VLAN ทั้งหมดจะถูกตั้งค่าใน AA-SW-1 และ ส่ง VLAN ไปยัง AB-SW-1, AC-SW-1

AA-SW-1 (Config)

```
hostname AA-SW-1
vtp version 2
vtp mode server
vtp domain Bangkok
vtp password 123456789
interface FastEthernet0/1
switchport mode trunk
interface FastEthernet0/2
switchport access vlan 10
switchport mode access
interface FastEthernet0/3
switchport access vlan 10
switchport mode access
interface FastEthernet0/4
switchport access vlan 10
switchport mode access
interface FastEthernet0/5
switchport access vlan 20
switchport mode access
interface FastEthernet0/6
switchport access vlan 20
switchport mode access
interface FastEthernet0/7
switchport access vlan 20
switchport mode access
interface FastEthernet0/8
switchport access vlan 30
switchport mode access
interface FastEthernet0/9
switchport access vlan 30
switchport mode access
interface FastEthernet0/10
switchport access vlan 30
switchport mode access
interface FastEthernet0/11
switchport access vlan 40
```

```
switchport mode access
interface FastEthernet0/12
switchport access vlan 40
switchport mode access
interface FastEthernet0/13
switchport access vlan 40
switchport mode access
interface FastEthernet0/14
switchport access vlan 50
switchport mode access
interface FastEthernet0/15
switchport access vlan 50
switchport mode access
interface FastEthernet0/16
switchport access vlan 50
switchport mode access
```

AB-SW-1, AC-SW-1 (INTER-VLAN, VTP)

- Switch 2 ตัวนี้เป็น VTP mode client

AB-SW-1(config)

```
hostname AB-SW-1
vtp version 2
vtp mode Client
vtp domain Bangkok
vtp password 123456789
interface FastEthernet0/1
switchport mode trunk
interface FastEthernet0/2
switchport access vlan 60
switchport mode access
interface FastEthernet0/3
switchport access vlan 60
switchport mode access
interface FastEthernet0/4
switchport access vlan 60
switchport mode access
interface FastEthernet0/5
switchport access vlan 60
switchport mode access
interface FastEthernet0/6
switchport access vlan 60
switchport mode access
interface FastEthernet0/7
switchport access vlan 60
switchport mode access
interface FastEthernet0/8
switchport access vlan 60
switchport mode access
interface FastEthernet0/9
switchport access vlan 60
switchport mode access
interface FastEthernet0/10switchport
access vlan 60
switchport mode access
interface FastEthernet0/24
switchport mode trunk
```

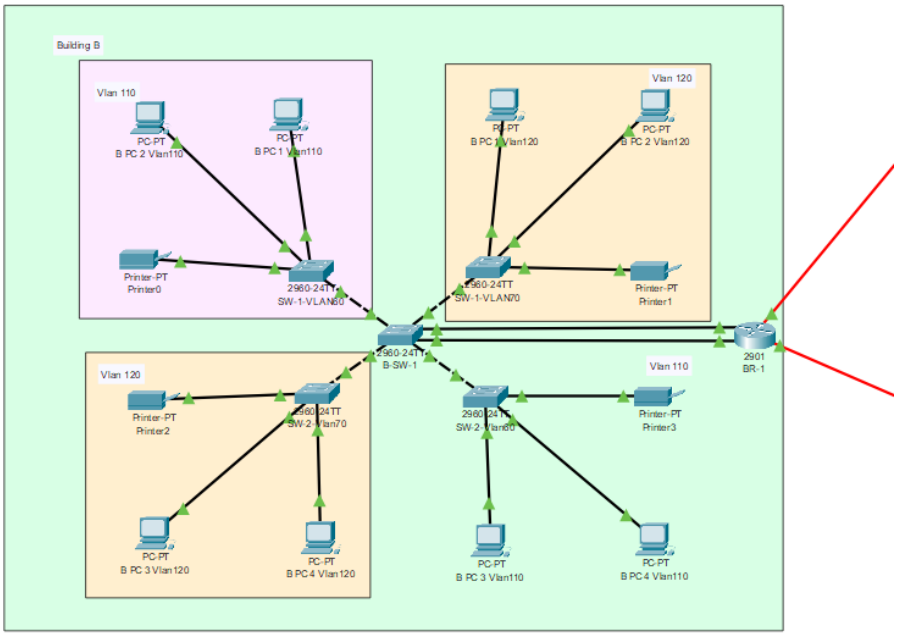
AC-SW-1(config)

```
hostname AC-SW-1
vtp version 2
vtp mode Client
vtp domain Bangkok
vtp password 123456789
interface FastEthernet0/1
switchport mode trunk
interface FastEthernet0/2
switchport access vlan 70
switchport mode access
interface FastEthernet0/3
switchport access vlan 70
switchport mode access
interface FastEthernet0/4
switchport access vlan 70
switchport mode access
interface FastEthernet0/5
switchport access vlan 70
switchport mode access
interface FastEthernet0/6
switchport access vlan 70
switchport mode access
interface FastEthernet0/7
switchport access vlan 70
switchport mode access
interface FastEthernet0/8
switchport access vlan 70
switchport mode access
interface FastEthernet0/9
switchport access vlan 70
switchport mode access
interface FastEthernet0/10
switchport access vlan 70
switchport mode access
interface FastEthernet0/11
switchport access vlan 70
switchport mode access
interface FastEthernet0/12
switchport access vlan 70
switchport mode access
interface FastEthernet0/13
switchport access vlan 5
```

```
switchport mode access
interface FastEthernet0/14
switchport access vlan 5
switchport mode access
interface FastEthernet0/15
switchport access vlan 5
switchport mode access
interface FastEthernet0/16
switchport access vlan 5
switchport mode access
interface FastEthernet0/17
switchport access vlan 5
switchport mode access
interface FastEthernet0/18
switchport access vlan 5
switchport mode access
interface FastEthernet0/19
switchport access vlan 5
switchport mode access
interface FastEthernet0/20
switchport access vlan 5
switchport mode access
```

Building B

ตึกนี้เป็นตึกสำหรับการประชุมคณะกรรมการ ของโรงพยาบาล



แบ่ง IP ให้ตามแต่ละโซน Building B

- ห้องที่ 1 VLAN 110 6 เครื่อง
- ห้องที่ 2 VLAN 110 6 เครื่อง
- ห้องที่ 1 VLAN 120 6 เครื่อง
- ห้องที่ 2 VLAN 120 6 เครื่อง

โดยการแบ่งNetwork ID จะได้ตามตารางนี้

Router Name	Interface	Network ID	IP address
BR 1	S0/0/0	192.168.1.192 /30	192.168.1.193
	S0/0/1	192.168.1.144 /30	192.168.1.146
	G0/0	192.168.1.160 /26	192.168.1.161
	G0/0.110	192.168.1.160 /28	192.168.1.161
	G0/0.120	192.168.1.176 /28	192.168.1.177

Router BR 1 (EIGRP, DHCP, ACL)

- จะมีการแจก DHCP ตามแต่ละ VLAN ให้กับ PC ภายในตึก VLAN ในตึก จะมี VLAN 110, 120
- Routerตัวนี้ใช้ Routing แบบ EIGRP
- ตั้งรหัสผ่านเพื่อความปลอดภัย
- เปิดการใช้งาน SSH
- มีการตั้งค่า ACL อณุญาติให้Pingได้ดังนี้
    - All in Build B
    - Counter-Service(vlan10) in Build A

Router BR 1 (config)

```
hostname BR-1
enable secret bangkok
ip dhcp excluded-address 192.168.1.161
ip dhcp excluded-address 192.168.1.177
ip dhcp pool POOL-VLAN-110
network 192.168.1.160 255.255.255.240
default-router 192.168.1.161
dns-server 192.168.1.106
ip dhcp pool LAN-VLAN-120
network 192.168.1.176 255.255.255.240
default-router 192.168.1.177
dns-server 192.168.1.106
username admin password  bangkok
ip ssh version 2
ip domain-name BR-1
interface GigabitEthernet0/0
ip address 1.1.1.1 255.255.255.0
no sh
interface GigabitEthernet0/0.110
encapsulation dot1Q 110
ip address 192.168.1.161 255.255.255.240
ip access-group 1 out
interface GigabitEthernet0/1
ip address 1.1.2.1 255.255.255.0
no sh
interface GigabitEthernet0/1.120
```

```
encapsulation dot1Q 120
ip address 192.168.1.177 255.255.255.240
ip access-group 2 out
interface Serial0/0/0
ip address 192.168.1.193 255.255.255.252
interface Serial0/0/1
ip address 192.168.1.146 255.255.255.252
router eigrp 1
eigrp router-id 4.4.4.4
network 192.168.1.0
access-list 1 permit 10.10.10.0 0.0.0.3
access-list 1 permit 192.168.1.192 0.0.0.3
access-list 1 permit 192.168.1.144 0.0.0.3
access-list 1 permit 192.168.1.160 0.0.0.15
access-list 1 permit 192.168.1.176 0.0.0.15
access-list 1 permit 192.168.1.16 0.0.0.7
access-list 1 permit 192.168.1.128 0.0.0.15
access-list 1 permit 192.168.1.104 0.0.0.7
access-list 1 deny any
access-list 2 permit 10.10.10.0 0.0.0.3
access-list 2 permit 192.168.1.192 0.0.0.3
access-list 2 permit 192.168.1.144 0.0.0.3
access-list 2 permit 192.168.1.160 0.0.0.15
access-list 2 permit 192.168.1.176 0.0.0.15
access-list 2 permit 192.168.1.16 0.0.0.7
access-list 2 permit 192.168.1.128 0.0.0.15
access-list 2 permit 192.168.1.104 0.0.0.7
access-list 2 deny any
line con 0
password bangkok
login
line vty 0 4
login local
transport input ssh
line vty 5 15
login local
transport input ssh
```

รูป Ip Route Router BR 1

```
     1.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C       1.1.1.0/24 is directly connected, GigabitEthernet0/0
L       1.1.1.1/32 is directly connected, GigabitEthernet0/0
C       1.1.2.0/24 is directly connected, GigabitEthernet0/1
L       1.1.2.1/32 is directly connected, GigabitEthernet0/1
     192.168.1.0/24 is variably subnetted, 24 subnets, 4 masks
D       192.168.1.0/30 [90/3193856] via 192.168.1.194, 00:09:49, Serial0/0/0
D       192.168.1.4/30 [90/2681856] via 192.168.1.194, 00:09:49, Serial0/0/0
D       192.168.1.8/30 [90/2681856] via 192.168.1.194, 00:09:49, Serial0/0/0
D       192.168.1.12/30 [90/3193856] via 192.168.1.194, 00:09:49, Serial0/0/0
D       192.168.1.16/29 [90/3196416] via 192.168.1.145, 00:09:50, Serial0/0/1
                        [90/3196416] via 192.168.1.194, 00:09:49, Serial0/0/0
D       192.168.1.24/29 [90/3196416] via 192.168.1.145, 00:09:50, Serial0/0/1
                        [90/3196416] via 192.168.1.194, 00:09:49, Serial0/0/0
D       192.168.1.32/29 [90/3196416] via 192.168.1.145, 00:09:50, Serial0/0/1
                        [90/3196416] via 192.168.1.194, 00:09:49, Serial0/0/0
D       192.168.1.40/29 [90/3196416] via 192.168.1.145, 00:09:50, Serial0/0/1
                        [90/3196416] via 192.168.1.194, 00:09:49, Serial0/0/0
D       192.168.1.48/29 [90/3196416] via 192.168.1.145, 00:09:50, Serial0/0/1
                        [90/3196416] via 192.168.1.194, 00:09:49, Serial0/0/0
D       192.168.1.64/28 [90/3196416] via 192.168.1.145, 00:09:50, Serial0/0/1
                        [90/3196416] via 192.168.1.194, 00:09:49, Serial0/0/0
D       192.168.1.80/28 [90/3196416] via 192.168.1.145, 00:09:50, Serial0/0/1
                        [90/3196416] via 192.168.1.194, 00:09:49, Serial0/0/0
D       192.168.1.96/30 [90/3193856] via 192.168.1.145, 00:09:50, Serial0/0/1
D       192.168.1.104/29 [90/2684416] via 192.168.1.145, 00:09:50, Serial0/0/1
D       192.168.1.112/30 [90/2681856] via 192.168.1.145, 00:09:50, Serial0/0/1
D       192.168.1.128/28 [90/2172416] via 192.168.1.145, 00:09:50, Serial0/0/1
C       192.168.1.144/30 is directly connected, Serial0/0/1
L       192.168.1.146/32 is directly connected, Serial0/0/1
C       192.168.1.160/28 is directly connected, GigabitEthernet0/0.110
L       192.168.1.161/32 is directly connected, GigabitEthernet0/0.110
C       192.168.1.176/28 is directly connected, GigabitEthernet0/1.120
L       192.168.1.177/32 is directly connected, GigabitEthernet0/1.120
C       192.168.1.192/30 is directly connected, Serial0/0/0
L       192.168.1.193/32 is directly connected, Serial0/0/0
D       192.168.1.196/30 [90/2681856] via 192.168.1.194, 00:09:49, Serial0/0/0
     192.168.2.0/24 is variably subnetted, 11 subnets, 2 masks
D       192.168.2.16/30 [90/3193856] via 192.168.1.194, 00:09:49, Serial0/0/0
D       192.168.2.20/30 [90/2681856] via 192.168.1.194, 00:09:49, Serial0/0/0
D EX    192.168.2.24/30 [170/2561024256] via 192.168.1.194, 00:09:27, Serial0/0/0
D EX    192.168.2.28/30 [170/2561024256] via 192.168.1.194, 00:09:27, Serial0/0/0
D EX    192.168.2.32/30 [170/2561024256] via 192.168.1.194, 00:09:27, Serial0/0/0
D EX    192.168.2.64/29 [170/2561024256] via 192.168.1.194, 00:09:27, Serial0/0/0
D EX    192.168.2.72/29 [170/2561024256] via 192.168.1.194, 00:09:27, Serial0/0/0
D EX    192.168.2.80/29 [170/2561024256] via 192.168.1.194, 00:09:27, Serial0/0/0
D EX    192.168.2.96/29 [170/2561024256] via 192.168.1.194, 00:09:27, Serial0/0/0
D EX    192.168.2.104/29 [170/2561024256] via 192.168.1.194, 00:09:27, Serial0/0/0
D EX    192.168.2.116/30 [170/2561024256] via 192.168.1.194, 00:09:27, Serial0/0/0
D*EX 0.0.0.0/0 [170/3961856] via 192.168.1.194, 00:09:48, Serial0/0/0
```

B-SW-1(VLAN)

- ภายใน Switch นี้ มีVLAN 2 VLANคือ 110, 120 เพื่อแจก DHCP ให้แต่ละ VLAN

B-SW-1(config)

```
hostname B-SW-1
vlan 110
name VLAN-110
vlan 120
name VLAN-120
interface FastEthernet0/1
switchport trunk allowed vlan 110
switchport mode trunk
interface FastEthernet0/2
switchport access vlan 110
switchport mode access
interface FastEthernet0/3
switchport access vlan 120
switchport mode access
interface FastEthernet0/4
switchport access vlan 120
switchport mode access
interface FastEthernet0/5
switchport access vlan 110
switchport mode access
interface FastEthernet0/10
switchport trunk allowed vlan 120
switchport mode trunk
```

SW-1VLAN110, SW-2-VLAN110 (VLAN)

- ภายใน switch สองตัวนี้ได้ทำ access เฉพาะ vlan110 เพื่อที่จะแจก DHCP ให้กับ PC, Printer ในแผนก

SW-1VLAN110, SW-2VLAN110(config)

vlan 110	switchport mode access
name VLAN-110	interface FastEthernet0/4
interface FastEthernet0/1	switchport access vlan 110
switchport access vlan 110	switchport mode access
switchport mode access	interface FastEthernet0/5
interface FastEthernet0/2	switchport access vlan 110
switchport access vlan 110	switchport mode access
switchport mode access	interface FastEthernet0/6
interface FastEthernet0/3	switchport access vlan 110
switchport access vlan 110	switchport mode access

SW-1VLAN120, SW-2-VLAN120 (VLAN)

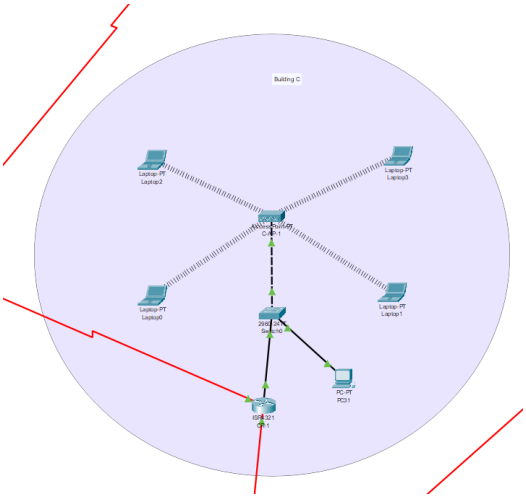
- ภายใน switch สองตัวนี้ได้ทำ access เฉพาะ vlan120 เพื่อที่จะแจก DHCP ให้กับ PC, Printer ในแผนก

SW-1VLAN120, SW-2-VLAN120 (config)

vlan 120	switchport mode access
name VLAN-120	interface FastEthernet0/4
interface FastEthernet0/1	switchport access vlan 120
switchport access vlan 120	switchport mode access
switchport mode access	interface FastEthernet0/5
interface FastEthernet0/2	switchport access vlan 120
switchport access vlan 120	switchport mode access
switchport mode access	interface FastEthernet0/6
interface FastEthernet0/3	switchport access vlan 120
switchport access vlan 120	switchport mode access

Build C

ตึกนี้เป็นโรงอาหารสวัสดีการของทางโรงพยาบาล โซนนี้จะเป็นการเชื่อมต่อแบบ Wireless



แบ่ง IP ให้ตามแต่ละโซน Building C

- **โรงอาหาร 12 เครื่อง**

โดยการแบ่งNetwork ID จะได้ตามตารางนี้

Router Name	Interface	Network ID	IP address
CR 1	S0/1/0	192.168.1.144 /30	192.168.1.145
	S0/1/1	192.168.1.112 /30	192.168.1.114
	G0/0/0	192.168.1.128 /28	192.168.1.129

Router CR 1 (EIGRP, ACL)

- มีการแจก DHCP ให้กับ PC และมีการทำ Wireless
- Router ตัวนี้ใช้ Routing แบบ EIGRP
- Routerตัวนี้ใช้ Routing แบบ EIGRP
- ตั้งรหัสผ่านเพื่อความปลอดภัย
- เปิดการใช้งาน SSH
- มีการตั้งค่า ACL อณุญาติให้Pingได้ดังนี้
    - All in Build C

Router CR 1(config)

```
hostname CR-1

enable secret bangkok

ip dhcp excluded-address 192.168.1.129

ip dhcp pool LAN-POOL-1

network 192.168.1.128 255.255.255.240

default-router 192.168.1.129

dns-server 192.168.1.106

username admin password 0 bangkok

ip ssh version 2

ip domain-name CR-1

interface GigabitEthernet0/0/0

ip address 192.168.1.129 255.255.255.240

ip access-group 1 out

interface Serial0/1/0

ip address 192.168.1.145 255.255.255.252

no sh

interface Serial0/1/1

ip address 192.168.1.114 255.255.255.252
```

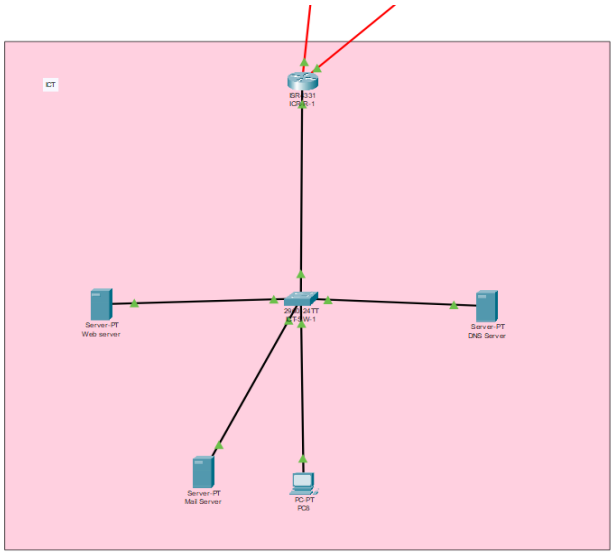
รูป Ip Route Router CR 1

```
     192.168.1.0/24 is variably subnetted, 23 subnets, 4 masks
D       192.168.1.0/30 [90/3705856] via 192.168.1.113, 00:12:08, Serial0/1/1
                       [90/3705856] via 192.168.1.146, 00:12:08, Serial0/1/0
D       192.168.1.4/30 [90/3193856] via 192.168.1.146, 00:12:08, Serial0/1/0
D       192.168.1.8/30 [90/3193856] via 192.168.1.146, 00:12:08, Serial0/1/0
D       192.168.1.12/30 [90/3193856] via 192.168.1.113, 00:12:08, Serial0/1/1
D       192.168.1.16/29 [90/2684416] via 192.168.1.113, 00:12:09, Serial0/1/1
D       192.168.1.24/29 [90/2684416] via 192.168.1.113, 00:12:09, Serial0/1/1
D       192.168.1.32/29 [90/2684416] via 192.168.1.113, 00:12:09, Serial0/1/1
D       192.168.1.40/29 [90/2684416] via 192.168.1.113, 00:12:09, Serial0/1/1
D       192.168.1.48/29 [90/2684416] via 192.168.1.113, 00:12:09, Serial0/1/1
D       192.168.1.64/28 [90/2684416] via 192.168.1.113, 00:12:09, Serial0/1/1
D       192.168.1.80/28 [90/2684416] via 192.168.1.113, 00:12:09, Serial0/1/1
D       192.168.1.96/30 [90/2681856] via 192.168.1.113, 00:12:09, Serial0/1/1
D       192.168.1.104/29 [90/2172416] via 192.168.1.113, 00:12:09, Serial0/1/1
C       192.168.1.112/30 is directly connected, Serial0/1/1
L       192.168.1.114/32 is directly connected, Serial0/1/1
C       192.168.1.128/28 is directly connected, GigabitEthernet0/0/0
L       192.168.1.129/32 is directly connected, GigabitEthernet0/0/0
C       192.168.1.144/30 is directly connected, Serial0/1/0
L       192.168.1.145/32 is directly connected, Serial0/1/0
D       192.168.1.160/28 [90/2172416] via 192.168.1.146, 00:12:09, Serial0/1/0
D       192.168.1.176/28 [90/2172416] via 192.168.1.146, 00:12:09, Serial0/1/0
D       192.168.1.192/30 [90/2681856] via 192.168.1.146, 00:12:08, Serial0/1/0
D       192.168.1.196/30 [90/3193856] via 192.168.1.146, 00:12:08, Serial0/1/0
     192.168.2.0/24 is variably subnetted, 11 subnets, 2 masks
D       192.168.2.16/30 [90/3705856] via 192.168.1.113, 00:12:08, Serial0/1/1
                        [90/3705856] via 192.168.1.146, 00:12:08, Serial0/1/0
D       192.168.2.20/30 [90/3193856] via 192.168.1.146, 00:12:08, Serial0/1/0
D EX    192.168.2.24/30 [170/2561536256] via 192.168.1.146, 00:11:46, Serial0/1/0
D EX    192.168.2.28/30 [170/2561536256] via 192.168.1.146, 00:11:46, Serial0/1/0
D EX    192.168.2.32/30 [170/2561536256] via 192.168.1.146, 00:11:46, Serial0/1/0
D EX    192.168.2.64/29 [170/2561536256] via 192.168.1.146, 00:11:46, Serial0/1/0
D EX    192.168.2.72/29 [170/2561536256] via 192.168.1.146, 00:11:46, Serial0/1/0
D EX    192.168.2.80/29 [170/2561536256] via 192.168.1.146, 00:11:46, Serial0/1/0
D EX    192.168.2.96/29 [170/2561536256] via 192.168.1.146, 00:11:46, Serial0/1/0
D EX    192.168.2.104/29 [170/2561536256] via 192.168.1.146, 00:11:46, Serial0/1/0
D EX    192.168.2.116/30 [170/2561536256] via 192.168.1.146, 00:11:46, Serial0/1/0
D*EX 0.0.0.0/0 [170/4473856] via 192.168.1.146, 00:12:07, Serial0/1/0
```

ICT Room

เป็นห้องไว้สำหรับ Manage ระบบทุกอย่างในองค์กร เอาไว้จัดการปัญหาต่างๆ ของNetwork และเป็นที่เก็บ

Web-Server, DNS-Server, Mail-Server



แบ่ง IP ให้ตามแต่ละโซน ICT

- **โรงอาหาร 4 เครื่อง**

โดยการแบ่งNetwork ID จะได้ตามตารางนี้

Router Name	Interface	Network ID	IP address
ICR R1	S0/1/0	192.168.1.112 /30	192.168.1.113
	S0/1/1	192.168.1.96 /30	192.168.1.98
	G0/0/0	192.168.1.104 /29	192.168.1.105

Router ICR R1 (EIGRP, ACL)

- Router ตัวนี้ใช้ Routing แบบ EIGRP
- ตั้งรหัสผ่านเพื่อความปลอดภัย
- เปิดการใช้งาน SSH
- มีการตั้งค่า ACL อณุญาติให้Pingได้ดังนี้
  - All

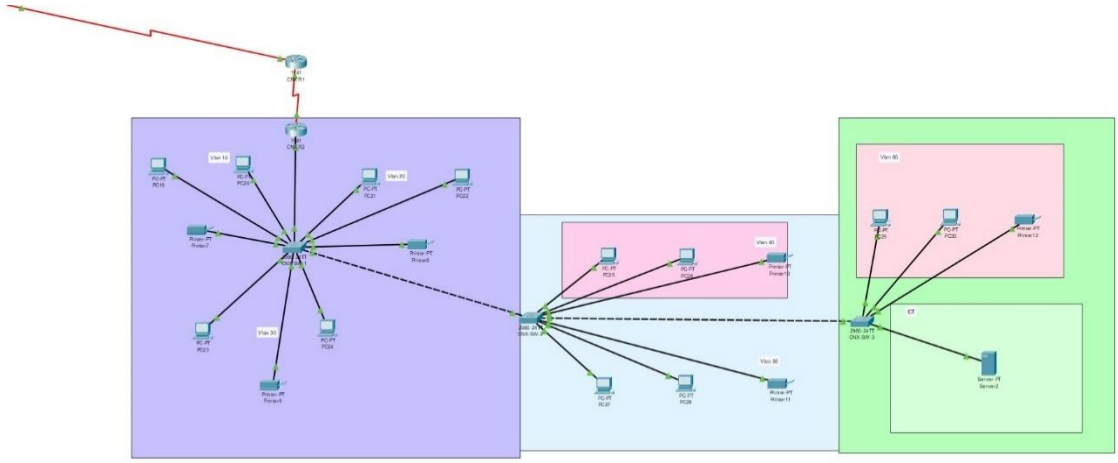
Router ICR R1(config)

```
hostname ICT-R-1
enable secret bangkok
ip dhcp excluded-address 192.168.1.105
ip dhcp pool ICT
username admin password  bangkok
ip ssh version 2
ip domain-name ICT-R1
interface GigabitEthernet0/0/0
ip address 192.168.1.105 255.255.255.248
no sh
interface Serial0/1/0
ip address 192.168.1.113 255.255.255.252
no sh
interface Serial0/1/1
ip address 192.168.1.98 255.255.255.252
no sh
router eigrp 1
eigrp router-id 6.6.6.6
network 192.168.1.0
line con 0
password bangkok
login
line vty 0 4
login local
transport input ssh
line vty 5 15
login local
transport input ssh
```

รูป Ip Route Router ICR R1

```
     192.168.1.0/24 is variably subnetted, 23 subnets, 4 masks
D       192.168.1.0/30 [90/3193856] via 192.168.1.97, 00:13:16, Serial0/1/1
D       192.168.1.4/30 [90/3705856] via 192.168.1.114, 00:13:16, Serial0/1/0
                       [90/3705856] via 192.168.1.97, 00:13:16, Serial0/1/1
D       192.168.1.8/30 [90/3193856] via 192.168.1.97, 00:13:16, Serial0/1/1
D       192.168.1.12/30 [90/2681856] via 192.168.1.97, 00:13:16, Serial0/1/1
D       192.168.1.16/29 [90/2172416] via 192.168.1.97, 00:13:17, Serial0/1/1
D       192.168.1.24/29 [90/2172416] via 192.168.1.97, 00:13:17, Serial0/1/1
D       192.168.1.32/29 [90/2172416] via 192.168.1.97, 00:13:17, Serial0/1/1
D       192.168.1.40/29 [90/2172416] via 192.168.1.97, 00:13:17, Serial0/1/1
D       192.168.1.48/29 [90/2172416] via 192.168.1.97, 00:13:17, Serial0/1/1
D       192.168.1.64/28 [90/2172416] via 192.168.1.97, 00:13:17, Serial0/1/1
D       192.168.1.80/28 [90/2172416] via 192.168.1.97, 00:13:17, Serial0/1/1
C       192.168.1.96/30 is directly connected, Serial0/1/1
L       192.168.1.98/32 is directly connected, Serial0/1/1
C       192.168.1.104/29 is directly connected, GigabitEthernet0/0/0
L       192.168.1.105/32 is directly connected, GigabitEthernet0/0/0
C       192.168.1.112/30 is directly connected, Serial0/1/0
L       192.168.1.113/32 is directly connected, Serial0/1/0
D       192.168.1.128/28 [90/2172416] via 192.168.1.114, 00:13:17, Serial0/1/0
D       192.168.1.144/30 [90/2681856] via 192.168.1.114, 00:13:16, Serial0/1/0
D       192.168.1.160/28 [90/2684416] via 192.168.1.114, 00:13:16, Serial0/1/0
D       192.168.1.176/28 [90/2684416] via 192.168.1.114, 00:13:16, Serial0/1/0
D       192.168.1.192/30 [90/3193856] via 192.168.1.114, 00:13:16, Serial0/1/0
D       192.168.1.196/30 [90/3705856] via 192.168.1.114, 00:13:16, Serial0/1/0
                         [90/3705856] via 192.168.1.97, 00:13:16, Serial0/1/1
     192.168.2.0/24 is variably subnetted, 11 subnets, 2 masks
D       192.168.2.16/30 [90/3193856] via 192.168.1.97, 00:13:16, Serial0/1/1
D       192.168.2.20/30 [90/3705856] via 192.168.1.114, 00:13:16, Serial0/1/0
                        [90/3705856] via 192.168.1.97, 00:13:16, Serial0/1/1
D EX    192.168.2.24/30 [170/2561536256] via 192.168.1.97, 00:12:54, Serial0/1/1
D EX    192.168.2.28/30 [170/2561536256] via 192.168.1.97, 00:12:54, Serial0/1/1
D EX    192.168.2.32/30 [170/2561536256] via 192.168.1.97, 00:12:54, Serial0/1/1
D EX    192.168.2.64/29 [170/2561536256] via 192.168.1.97, 00:12:54, Serial0/1/1
D EX    192.168.2.72/29 [170/2561536256] via 192.168.1.97, 00:12:54, Serial0/1/1
D EX    192.168.2.80/29 [170/2561536256] via 192.168.1.97, 00:12:54, Serial0/1/1
D EX    192.168.2.96/29 [170/2561536256] via 192.168.1.97, 00:12:54, Serial0/1/1
D EX    192.168.2.104/29 [170/2561536256] via 192.168.1.97, 00:12:54, Serial0/1/1
D EX    192.168.2.116/30 [170/2561536256] via 192.168.1.97, 00:12:54, Serial0/1/1
D*EX 0.0.0.0/0 [170/4985856] via 192.168.1.114, 00:13:15, Serial0/1/0
```

ส่วนที่ 2 Chiang Mai



แบ่ง IP ให้ตามแต่ละโซน CNX Building A

- Counter-Service 4 เครื่อง
- ห้องจ่ายยา 4 เครื่อง
- ห้องการเงิน 4 เครื่อง
- ห้องคัดกรอง 4 เครื่อง
- ห้องตรวจโรคทั่วไป 4 เครื่อง
- ห้อง X-ray 4 เครื่อง

โดยการแบ่งNetwork ID จะได้ตามตารางนี้

Router Name	Interface	Network ID	IP address
CNX R1	s0/0/0	192.168.1.196 /30	192.168.1.198
	S0/0/1	192.168.1.200 /30	192.168.1.201
CNX R2	S0/0/0	192.168.1.200 /30	192.168.1.202
	G0/0	192.168.1.224 /26	192.168.1.225
	G0/0.10	192.168.1.224 /29	192.168.1.225
	G0/0.20	192.168.1.232 /29	192.168.1.233
	G0/0.30	192.168.1.240 /29	192.168.1.241
	G0/0.40	192.168.1.248 /29	192.168.1.249
	G0/0.50	192.168.2.0 /29	192.168.2.1
	G0/0.60	192.168.2.8 /29	192.168.2.9

Router CNX R1 (RIPv2, Static)

- CNX R1 Router ตัวนี้ เป็น Router ที่เชื่อมต่อระหว่าง Bangkok เพื่อให้ฝั่ง Bangkok คุยกับฝั่ง Chiang Mai ได้
- Router CNX R1 จะมี Routing Protocol อยู่ 2 Protocols เป็น RIPv2 และ Static Route
- ตั้งรหัสผ่านเพื่อความปลอดภัย
- เปิดการใช้งาน SSH

Router CNX R1(config)

```
hostname CNX-R-1
enable secret CNX
username admin password  CNX
ip ssh version 2
ip domain-name BKK-R2
interface Serial0/0/0
ip address 192.168.1.198 255.255.255.252
no sh
interface Serial0/0/1
ip address 192.168.1.201 255.255.255.252
no sh
router rip
version 2
redistribute eigrp 1
redistribute ospf 10
redistribute static
network 192.168.1.0
network 192.168.2.0
no auto-summary
ip classless
ip route 192.168.1.224 255.255.255.248
192.168.1.202
ip route 192.168.1.232 255.255.255.248
192.168.1.202
ip route 192.168.1.240 255.255.255.248
192.168.1.202
ip route 192.168.1.248 255.255.255.248
192.168.1.202
ip route 192.168.2.0 255.255.255.248
192.168.1.202
```

ip route 192.168.2.8 255.255.255.248

192.168.1.202

ip route 192.168.2.112 255.255.255.252

192.168.1.202

line con 0

password CNX

login

line vty 0 4

login local

transport input ssh

line vty 5 15

login local

transport input ssh

รูป Ip Route Router CNX R1

```
     192.168.1.0/24 is variably subnetted, 13 subnets, 3 masks
R       192.168.1.0/30 [120/2] via 192.168.1.197, 00:00:25, Serial0/0/0
R       192.168.1.4/30 [120/1] via 192.168.1.197, 00:00:25, Serial0/0/0
R       192.168.1.8/30 [120/1] via 192.168.1.197, 00:00:25, Serial0/0/0
R       192.168.1.12/30 [120/2] via 192.168.1.197, 00:00:25, Serial0/0/0
R       192.168.1.192/30 [120/1] via 192.168.1.197, 00:00:25, Serial0/0/0
C       192.168.1.196/30 is directly connected, Serial0/0/0
L       192.168.1.198/32 is directly connected, Serial0/0/0
C       192.168.1.200/30 is directly connected, Serial0/0/1
L       192.168.1.201/32 is directly connected, Serial0/0/1
S       192.168.1.224/29 [1/0] via 192.168.1.202
S       192.168.1.232/29 [1/0] via 192.168.1.202
S       192.168.1.240/29 [1/0] via 192.168.1.202
S       192.168.1.248/29 [1/0] via 192.168.1.202
     192.168.2.0/24 is variably subnetted, 6 subnets, 2 masks
S       192.168.2.0/29 [1/0] via 192.168.1.202
S       192.168.2.8/29 [1/0] via 192.168.1.202
R       192.168.2.16/30 [120/2] via 192.168.1.197, 00:00:25, Serial0/0/0
R       192.168.2.20/30 [120/1] via 192.168.1.197, 00:00:25, Serial0/0/0
R       192.168.2.28/30 [120/3] via 192.168.1.197, 00:00:25, Serial0/0/0
S       192.168.2.112/30 [1/0] via 192.168.1.202
R*   0.0.0.0/0 [120/2] via 192.168.1.197, 00:00:25, Serial0/0/0
```

Router CNX R2 (Static, DHCP)

- Router CNX R2 จะมี Routing เป็นแบบ Static Route
- โดย Router ตัวนี้จะมีการแจก IP DHCP ให้แต่ละ VLAN โดย VLAN ที่มีอยู่ในตึกนี้จะมี VLAN 10, 20, 30, 40, 50, 60
- ตั้งรหัสผ่านเพื่อความปลอดภัย
- เปิดการใช้งาน SSH

Router CNX R2 (config)

---

hostname CNX-R-2

enable secret CNX

ip dhcp excluded-address

192.168.1.225

ip dhcp excluded-address

192.168.1.233

ip dhcp excluded-address

192.168.1.241

ip dhcp excluded-address

192.168.1.249

ip dhcp excluded-address

192.168.2.1

ip dhcp excluded-address

192.168.2.9

ip dhcp pool LAN-VLAN-1

network 192.168.1.224

255.255.255.248

default-router 192.168.1.225

dns-server 192.168.1.106

ip dhcp pool LAN-VLAN-2

network 192.168.1.232

255.255.255.248

default-router 192.168.1.233

dns-server 192.168.1.106

ip dhcp pool LAN-VLAN-3

network 192.168.1.240

255.255.255.248

default-router 192.168.1.241

```
dns-server 192.168.1.106
ip dhcp pool LAN-VLAN-4
network 192.168.1.248
255.255.255.248
default-router 192.168.1.249
dns-server 192.168.1.106
ip dhcp pool LAN-VLAN-5
network 192.168.2.0
255.255.255.248
default-router 192.168.2.1
dns-server 192.168.1.106
ip dhcp pool LAN-VLAN-6
network 192.168.2.8
255.255.255.248
default-router 192.168.2.9
dns-server 192.168.1.106
username admin password 0 CNX
ip ssh version 2
ip domain-name BKK-R2
interface GigabitEthernet0/0
ip address 192.168.2.113
255.255.255.252
interface GigabitEthernet0/0.10
encapsulation dot1Q 10
ip address 192.168.1.225
255.255.255.248
interface GigabitEthernet0/0.20
encapsulation dot1Q 20
ip address 192.168.1.233
255.255.255.248
interface GigabitEthernet0/0.30
encapsulation dot1Q 30
ip address 192.168.1.241
255.255.255.248
interface GigabitEthernet0/0.40
encapsulation dot1Q 40
ip address 192.168.1.249
255.255.255.248
interface GigabitEthernet0/0.50
encapsulation dot1Q 50
ip address 192.168.2.1
255.255.255.248
interface GigabitEthernet0/0.60
encapsulation dot1Q 60
```

```
ip address 192.168.2.9
255.255.255.248
no sh
interface Serial0/0/0
ip address 192.168.1.202
255.255.255.252
no sh
ip classless
ip route 192.168.1.196
255.255.255.252 192.168.1.201
ip route 0.0.0.0 0.0.0.0 Serial0/0/0
ip route 0.0.0.0 0.0.0.0 Serial0/0/1
line con 0
password CNX
login
line vty 0 4
login local
transport input ssh
line vty 5 15
login local
transport input ssh
```

รูป Ip Route Router CNX R2

```
     192.168.1.0/24 is variably subnetted, 11 subnets, 3 masks
S       192.168.1.196/30 [1/0] via 192.168.1.201
C       192.168.1.200/30 is directly connected, Serial0/0/0
L       192.168.1.202/32 is directly connected, Serial0/0/0
C       192.168.1.224/29 is directly connected, GigabitEthernet0/0.10
L       192.168.1.225/32 is directly connected, GigabitEthernet0/0.10
C       192.168.1.232/29 is directly connected, GigabitEthernet0/0.20
L       192.168.1.233/32 is directly connected, GigabitEthernet0/0.20
C       192.168.1.240/29 is directly connected, GigabitEthernet0/0.30
L       192.168.1.241/32 is directly connected, GigabitEthernet0/0.30
C       192.168.1.248/29 is directly connected, GigabitEthernet0/0.40
L       192.168.1.249/32 is directly connected, GigabitEthernet0/0.40
     192.168.2.0/24 is variably subnetted, 6 subnets, 3 masks
C       192.168.2.0/29 is directly connected, GigabitEthernet0/0.50
L       192.168.2.1/32 is directly connected, GigabitEthernet0/0.50
C       192.168.2.8/29 is directly connected, GigabitEthernet0/0.60
L       192.168.2.9/32 is directly connected, GigabitEthernet0/0.60
C       192.168.2.112/30 is directly connected, GigabitEthernet0/0
L       192.168.2.113/32 is directly connected, GigabitEthernet0/0
S*   0.0.0.0/0 is directly connected, Serial0/0/0
```

CNX-SW-1 (INTER-VLAN, VTP)

- Switch ตัวนี้มีการทำ VTP บน Inter VLAN Switch ตัวนี้เป็น VTP mode server โดยการตั้งค่า VLAN ทั้งหมดจะถูกตั้งค่าใน CNX-SW-1 และ ส่ง VLAN ไปยัง CNX-SW-2, CNX-SW-3

CNX-SW-1(config)

```
hostname CNX-SW-1
vtp version 2
vtp mode server
vtp domain CNX
vtp password 123456789
interface FastEthernet0/1
switchport mode trunk
interface FastEthernet0/2
switchport access vlan 10
switchport mode access
interface FastEthernet0/3
switchport access vlan 10
switchport mode access
interface FastEthernet0/4
switchport access vlan 10
switchport mode access
interface FastEthernet0/5
switchport access vlan 20
switchport mode access
interface FastEthernet0/6
switchport access vlan 20
switchport mode access
interface FastEthernet0/7
switchport access vlan 20
switchport mode access
interface FastEthernet0/8
switchport access vlan 30
switchport mode access
interface FastEthernet0/9
switchport access vlan 30
switchport mode access
interface FastEthernet0/10
switchport access vlan 30
switchport mode access
```

CNX-SW-2, CNX-SW-3

- Switch 2 ตัวนี้เป็น VTP mode client

CNX-SW-2

```
hostname CNX-SW-2
vtp version 2
vtp mode client
vtp domain CNX
vtp password 123456789
interface FastEthernet0/1
switchport mode trunk
interface FastEthernet0/2
switchport access vlan 40
switchport mode access
interface FastEthernet0/3
switchport access vlan 40
switchport mode access
interface FastEthernet0/4
switchport access vlan 40
switchport mode access
interface FastEthernet0/5
switchport access vlan 50
switchport mode access
interface FastEthernet0/6
switchport access vlan 50
switchport mode access
interface FastEthernet0/7
switchport access vlan 50
switchport mode access
```

CNX-SW-2

vtp version 2

vtp mode client

vtp domain CNX

vtp password 123456789

hostname CNX-SW-3

interface FastEthernet0/1

switchport mode trunk

interface FastEthernet0/2

switchport access vlan 60

switchport mode access

interface FastEthernet0/3

switchport access vlan 60

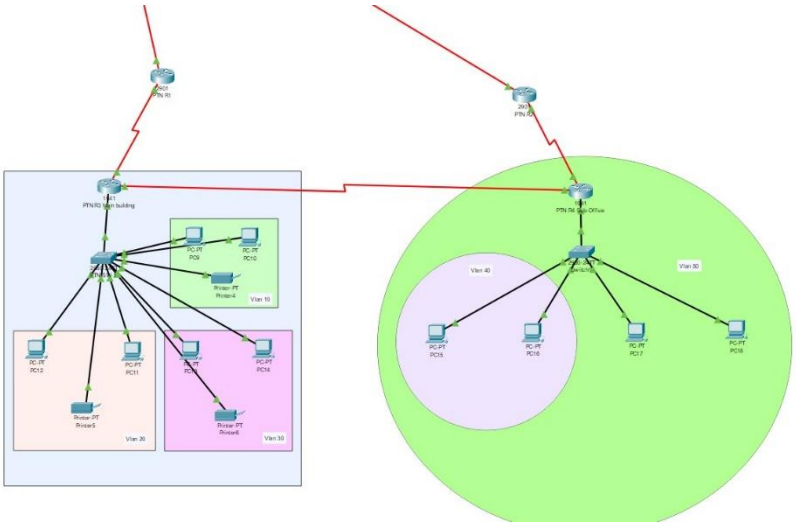
switchport mode access

interface FastEthernet0/4

switchport access vlan 60

switchport mode access

ส่วนที่ 3 Pattani



Router Name	Interface	Network ID	IP address
PTN R1	S0/0/0	192.168.2.16 /30	192.168.2.18
	S0/0/1	192.168.2.28 /30	192.168.2.29
PTN R2	S0/0/0	192.168.2.20 /30	192.168.2.22
	S0/0/1	192.168.2.24 /30	192.168.2.25

PTN R1 (OSPF, EIGRP, RIPv2)

- Router ตัวนี้ เป็น Router ที่เชื่อมต่อกับ Bangkok เพื่อให้ฝั่ง Pattani คุยกับฝั่ง Bangkok ได้
- Router PTN R1 จะมี Routing Protocol อยู่ 3 Protocols โดยมี EIGRP, OSPF และ RIPv2

PTN R1(config)

```
hostname PTN-R-1
enable secret pattani
username admin password 0 pattani
ip ssh version 2
ip domain-name BKK-R2
crypto key generate
interface Serial0/0/0
ip address 192.168.2.18 255.255.255.252
no shutdown
interface Serial0/0/1
ip address 192.168.2.29 255.255.255.252
no shutdown
```

router eigrp 1

redistribute rip

router ospf 10

router-id 1.1.1.1

log-adjacency-changes

redistribute rip

network 192.168.2.16 0.0.0.3 area 0

network 192.168.2.28 0.0.0.3 area 0

router rip

version 2

redistribute eigrp 1

redistribute ospf 10

network 192.168.2.0

line con 0

password pattani

login

line vty 0 4

login local

transport input ssh

line vty 5 15

login local

transport input ssh

รูป Ip Route PTN R1

```
     192.168.1.0/24 is variably subnetted, 25 subnets, 3 masks
O       192.168.1.0/30 [110/128] via 192.168.2.17, 00:16:22, Serial0/0/0
O       192.168.1.4/30 [110/192] via 192.168.2.17, 00:16:22, Serial0/0/0
O       192.168.1.8/30 [110/128] via 192.168.2.17, 00:16:22, Serial0/0/0
O       192.168.1.12/30 [110/128] via 192.168.2.17, 00:16:22, Serial0/0/0
O E2    192.168.1.16/29 [110/20] via 192.168.2.17, 00:16:22, Serial0/0/0
O E2    192.168.1.24/29 [110/20] via 192.168.2.17, 00:16:22, Serial0/0/0
O E2    192.168.1.32/29 [110/20] via 192.168.2.17, 00:16:22, Serial0/0/0
O E2    192.168.1.40/29 [110/20] via 192.168.2.17, 00:16:22, Serial0/0/0
O E2    192.168.1.48/29 [110/20] via 192.168.2.17, 00:16:22, Serial0/0/0
O E2    192.168.1.64/28 [110/20] via 192.168.2.17, 00:16:22, Serial0/0/0
O E2    192.168.1.80/28 [110/20] via 192.168.2.17, 00:16:22, Serial0/0/0
O E2    192.168.1.96/30 [110/20] via 192.168.2.17, 00:16:22, Serial0/0/0
O E2    192.168.1.104/29 [110/20] via 192.168.2.17, 00:16:22, Serial0/0/0
O E2    192.168.1.112/30 [110/20] via 192.168.2.17, 00:16:22, Serial0/0/0
O E2    192.168.1.128/28 [110/20] via 192.168.2.17, 00:16:22, Serial0/0/0
O E2    192.168.1.144/30 [110/20] via 192.168.2.17, 00:16:22, Serial0/0/0
O E2    192.168.1.160/28 [110/20] via 192.168.2.17, 00:16:22, Serial0/0/0
O E2    192.168.1.176/28 [110/20] via 192.168.2.17, 00:16:22, Serial0/0/0
O       192.168.1.192/30 [110/192] via 192.168.2.17, 00:16:12, Serial0/0/0
O       192.168.1.196/30 [110/192] via 192.168.2.17, 00:16:12, Serial0/0/0
R       192.168.1.200/30 [120/3] via 192.168.2.17, 00:00:09, Serial0/0/0
R       192.168.1.224/29 [120/3] via 192.168.2.17, 00:00:09, Serial0/0/0
R       192.168.1.232/29 [120/3] via 192.168.2.17, 00:00:09, Serial0/0/0
R       192.168.1.240/29 [120/3] via 192.168.2.17, 00:00:09, Serial0/0/0
R       192.168.1.248/29 [120/3] via 192.168.2.17, 00:00:09, Serial0/0/0
     192.168.2.0/24 is variably subnetted, 16 subnets, 3 masks
R       192.168.2.0/29 [120/3] via 192.168.2.17, 00:00:09, Serial0/0/0
R       192.168.2.8/29 [120/3] via 192.168.2.17, 00:00:09, Serial0/0/0
C       192.168.2.16/30 is directly connected, Serial0/0/0
L       192.168.2.18/32 is directly connected, Serial0/0/0
O       192.168.2.20/30 [110/192] via 192.168.2.17, 00:16:12, Serial0/0/0
O       192.168.2.24/30 [110/192] via 192.168.2.30, 00:16:12, Serial0/0/1
C       192.168.2.28/30 is directly connected, Serial0/0/1
L       192.168.2.29/32 is directly connected, Serial0/0/1
O       192.168.2.32/30 [110/128] via 192.168.2.30, 00:16:22, Serial0/0/1
O       192.168.2.64/29 [110/65] via 192.168.2.30, 00:16:22, Serial0/0/1
O       192.168.2.72/29 [110/65] via 192.168.2.30, 00:16:22, Serial0/0/1
O       192.168.2.80/29 [110/65] via 192.168.2.30, 00:16:22, Serial0/0/1
O       192.168.2.96/29 [110/129] via 192.168.2.30, 00:16:12, Serial0/0/1
O       192.168.2.104/29 [110/129] via 192.168.2.30, 00:16:12, Serial0/0/1
R       192.168.2.112/30 [120/3] via 192.168.2.17, 00:00:09, Serial0/0/0
O       192.168.2.116/30 [110/129] via 192.168.2.30, 00:16:12, Serial0/0/1
O*E2 0.0.0.0/0 [110/1] via 192.168.2.17, 00:16:22, Serial0/0/0
```

PTN R2 (OSPF)

- Router PTN R2 จะมี Routing Protocol อยู่ 1 Protocols เป็น OSPF
- Router ตัวนี้ เป็น Router ที่เชื่อมต่อกับ Bangkok เพื่อให้ฝั่ง Pattani คุยกับฝั่ง Bangkok ได้

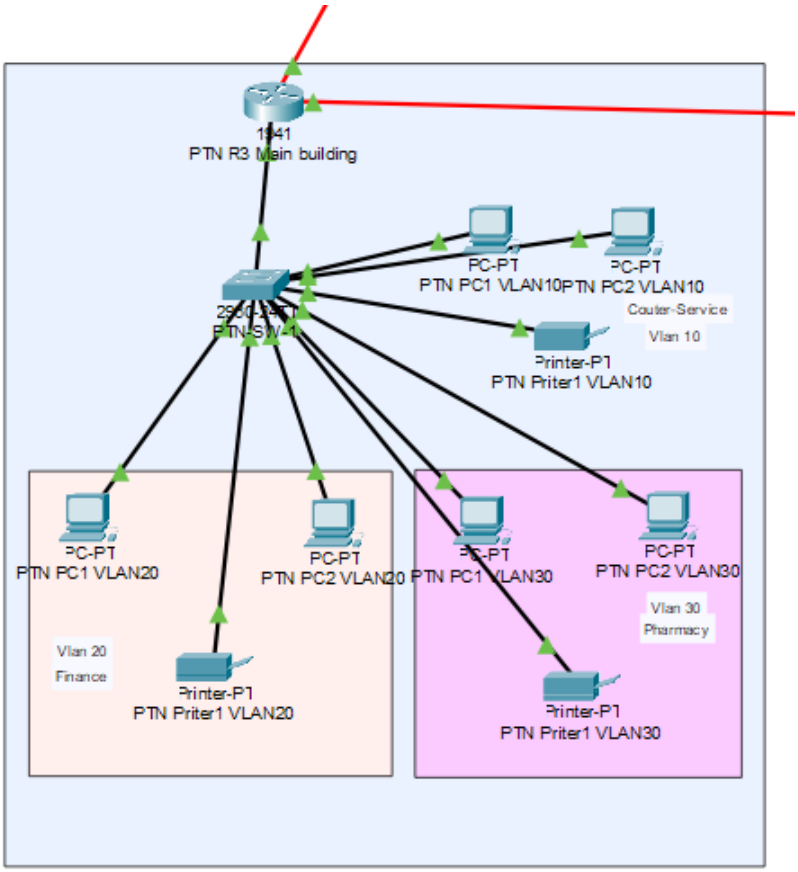
PTN R2(config)

hostname PTN-R-2	router-id 2.2.2.2
crypto key generate 1024	log-adjacency-changes
enable secret pattani	network 192.168.2.20 0.0.0.3 area 0
username admin password pattani	network 192.168.2.24 0.0.0.3 area 0
ip ssh version 2	line con 0
ip domain-name BKK-R2	password pattani
interface Serial0/0/0	login
ip address 192.168.2.22 255.255.255.252	line vty 0 4
no shutdown	login local
interface Serial0/0/1	transport input ssh
ip address 192.168.2.25 255.255.255.252	line vty 5 15
no shutdown	login local
router ospf 10	transport input ssh

รูป Ip Route PTN R2

```
     192.168.1.0/24 is variably subnetted, 20 subnets, 3 masks
O       192.168.1.0/30 [110/192] via 192.168.2.21, 00:17:36, Serial0/0/0
O       192.168.1.4/30 [110/128] via 192.168.2.21, 00:17:36, Serial0/0/0
O       192.168.1.8/30 [110/128] via 192.168.2.21, 00:17:36, Serial0/0/0
O       192.168.1.12/30 [110/192] via 192.168.2.21, 00:17:36, Serial0/0/0
O E2    192.168.1.16/29 [110/20] via 192.168.2.21, 00:17:36, Serial0/0/0
O E2    192.168.1.24/29 [110/20] via 192.168.2.21, 00:17:36, Serial0/0/0
O E2    192.168.1.32/29 [110/20] via 192.168.2.21, 00:17:36, Serial0/0/0
O E2    192.168.1.40/29 [110/20] via 192.168.2.21, 00:17:36, Serial0/0/0
O E2    192.168.1.48/29 [110/20] via 192.168.2.21, 00:17:36, Serial0/0/0
O E2    192.168.1.64/28 [110/20] via 192.168.2.21, 00:17:36, Serial0/0/0
O E2    192.168.1.80/28 [110/20] via 192.168.2.21, 00:17:36, Serial0/0/0
O E2    192.168.1.96/30 [110/20] via 192.168.2.21, 00:17:36, Serial0/0/0
O E2    192.168.1.104/29 [110/20] via 192.168.2.21, 00:17:36, Serial0/0/0
O E2    192.168.1.112/30 [110/20] via 192.168.2.21, 00:17:36, Serial0/0/0
O E2    192.168.1.128/28 [110/20] via 192.168.2.21, 00:17:36, Serial0/0/0
O E2    192.168.1.144/30 [110/20] via 192.168.2.21, 00:17:36, Serial0/0/0
O E2    192.168.1.160/28 [110/20] via 192.168.2.21, 00:17:36, Serial0/0/0
O E2    192.168.1.176/28 [110/20] via 192.168.2.21, 00:17:36, Serial0/0/0
O       192.168.1.192/30 [110/128] via 192.168.2.21, 00:17:36, Serial0/0/0
O       192.168.1.196/30 [110/128] via 192.168.2.21, 00:17:36, Serial0/0/0
     192.168.2.0/24 is variably subnetted, 13 subnets, 3 masks
O       192.168.2.16/30 [110/192] via 192.168.2.21, 00:17:36, Serial0/0/0
C       192.168.2.20/30 is directly connected, Serial0/0/0
L       192.168.2.22/32 is directly connected, Serial0/0/0
C       192.168.2.24/30 is directly connected, Serial0/0/1
L       192.168.2.25/32 is directly connected, Serial0/0/1
O       192.168.2.28/30 [110/192] via 192.168.2.26, 00:17:36, Serial0/0/1
O       192.168.2.32/30 [110/128] via 192.168.2.26, 00:17:36, Serial0/0/1
O       192.168.2.64/29 [110/129] via 192.168.2.26, 00:17:36, Serial0/0/1
O       192.168.2.72/29 [110/129] via 192.168.2.26, 00:17:36, Serial0/0/1
O       192.168.2.80/29 [110/129] via 192.168.2.26, 00:17:36, Serial0/0/1
O       192.168.2.96/29 [110/65] via 192.168.2.26, 00:17:36, Serial0/0/1
O       192.168.2.104/29 [110/65] via 192.168.2.26, 00:17:36, Serial0/0/1
O       192.168.2.116/30 [110/65] via 192.168.2.26, 00:17:36, Serial0/0/1
O*E2 0.0.0.0/0 [110/1] via 192.168.2.21, 00:17:36, Serial0/0/0
```

Building A PTN



แบ่ง IP ให้ตามแต่ละโซน Pattani Building A

- Counter-Service 4 เครื่อง
- ห้องการเงิน 4 เครื่อง
- ห้องจ่ายยา 4 เครื่อง

โดยการแบ่งNetwork ID จะได้ตามตารางนี้

Router Name	Interface	Network ID	IP address
PTN R3	S0/0/0	192.168.2.28 /30	192.168.2.30
	S0/0/1	192.168.2.32 /30	192.168.2.33
	G0/0	192.168.2.64 /27	192.168.2.65
	G0/0.10	192.168.2.64 /29	192.168.2.65
	G0/0.20	192.168.2.72 /29	192.168.2.73
	G0/0.30	192.168.2.80 /29	192.168.2.81

Router PTN R3 (OSPF, ACL, DHCP)

-จะมีการแจก DHCP ให้แต่ละ VLAN

-Router ตัวนี้ใช้ Routing Protocols เป็น OSPF

-มีการตั้งค่า ACL ดังนี้

Counter-Service(vlan10)

-All in Building

-All Counter-Service

Finance(vlan20)

-Pharmacy(Vlan30)

-Counter-service(vlan10)

Pharmacy(Vlan30)

-Finance(vlan20)

-Examination(vlan50)

-Counter-service(vlan10)

Router PTN R3 (config)

hostname PTN-R-3

enable secret pattani

ip dhcp excluded-address 192.168.2.65

ip dhcp excluded-address 192.168.2.72

ip dhcp excluded-address 192.168.2.81

ip dhcp pool VLAN-1

network 192.168.2.64 255.255.255.248

default-router 192.168.2.65

dns-server 192.168.1.106

ip dhcp pool VLAN-2

network 192.168.2.72 255.255.255.248

default-router 192.168.2.73

dns-server 192.168.1.106

ip dhcp pool VLAN-3

network 192.168.2.80 255.255.255.248

default-router 192.168.2.81

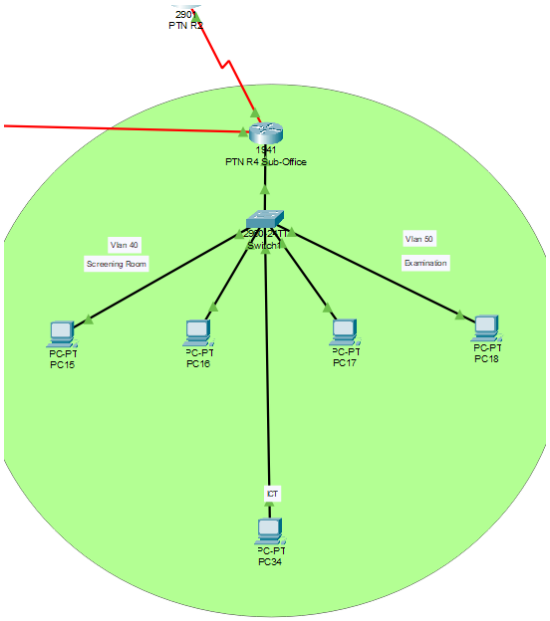
```
dns-server 192.168.1.106
username admin password  pattani
ip ssh version 2
ip domain-name BKK-R2
interface GigabitEthernet0/0.10
encapsulation dot1Q 10
ip address 192.168.2.65 255.255.255.248
ip access-group 1 out
interface GigabitEthernet0/0.20
encapsulation dot1Q 20
ip address 192.168.2.73 255.255.255.248
ip access-group 2 out
interface GigabitEthernet0/0.30
encapsulation dot1Q 30
ip address 192.168.2.81 255.255.255.248
ip access-group 3 out
interface Serial0/0/0
ip address 192.168.2.30 255.255.255.252
interface Serial0/0/1
ip address 192.168.2.33 255.255.255.252
no shutdown
router ospf 10
router-id 3.3.3.3
log-adjacency-changes
network 192.168.2.28 0.0.0.3 area 0
network 192.168.2.32 0.0.0.3 area 0
network 192.168.2.64 0.0.0.7 area 0
network 192.168.2.72 0.0.0.7 area 0
network 192.168.2.80 0.0.0.7 area 0
access-list 2 permit 10.10.10.0 0.0.0.3
access-list 2 permit 192.168.2.16 0.0.0.3
access-list 2 permit 192.168.2.28 0.0.0.3
access-list 2 permit 192.168.2.20 0.0.0.3
access-list 2 permit 192.168.2.24 0.0.0.3
access-list 2 permit 192.168.2.32 0.0.0.3
access-list 2 permit 192.168.2.64 0.0.0.7
access-list 2 permit 192.168.2.72 0.0.0.7
access-list 2 permit 192.168.2.80 0.0.0.7
access-list 2 permit 192.168.1.104 0.0.0.7
access-list 2 permit 192.168.2.116 0.0.0.3
access-list 2 deny any
access-list 1 permit 10.10.10.0 0.0.0.3
access-list 1 permit 192.168.2.16 0.0.0.3
access-list 1 permit 192.168.2.28 0.0.0.3
access-list 1 permit 192.168.2.20 0.0.0.3
access-list 1 permit 192.168.2.24 0.0.0.3
```

```
access-list 1 permit 192.168.2.32 0.0.0.3
access-list 1 permit 192.168.2.64 0.0.0.7
access-list 1 permit 192.168.2.72 0.0.0.7
access-list 1 permit 192.168.2.80 0.0.0.7
access-list 1 permit 192.168.2.96 0.0.0.7
access-list 1 permit 192.168.1.104 0.0.0.7
access-list 1 permit 192.168.1.16 0.0.0.7
access-list 1 permit 192.168.2.116 0.0.0.3
access-list 1 permit 192.168.2.104 0.0.0.7
access-list 1 deny any
access-list 3 permit 10.10.10.0 0.0.0.3
access-list 3 permit 192.168.2.16 0.0.0.3
access-list 3 permit 192.168.2.28 0.0.0.3
access-list 3 permit 192.168.2.20 0.0.0.3
access-list 3 permit 192.168.2.24 0.0.0.3
access-list 3 permit 192.168.2.32 0.0.0.3
access-list 3 permit 192.168.2.64 0.0.0.7
access-list 3 permit 192.168.2.72 0.0.0.7
access-list 3 permit 192.168.2.96 0.0.0.7
access-list 3 permit 192.168.1.104 0.0.0.7
access-list 3 permit 192.168.2.104 0.0.0.7
access-list 3 permit 192.168.2.116 0.0.0.3
access-list 3 deny any
line con 0
password pattani
login
line vty 0 4
login local
transport input ssh
line vty 5 15
login local
transport input ssh
```

รูป Ip Route PNN R3

```
     192.168.1.0/24 is variably subnetted, 20 subnets, 3 masks
O       192.168.1.0/30 [110/192] via 192.168.2.29, 00:19:37, Serial0/0/0
O       192.168.1.4/30 [110/256] via 192.168.2.29, 00:19:37, Serial0/0/0
O       192.168.1.8/30 [110/192] via 192.168.2.29, 00:19:37, Serial0/0/0
O       192.168.1.12/30 [110/192] via 192.168.2.29, 00:19:37, Serial0/0/0
O E2    192.168.1.16/29 [110/20] via 192.168.2.29, 00:19:37, Serial0/0/0
O E2    192.168.1.24/29 [110/20] via 192.168.2.29, 00:19:37, Serial0/0/0
O E2    192.168.1.32/29 [110/20] via 192.168.2.29, 00:19:37, Serial0/0/0
O E2    192.168.1.40/29 [110/20] via 192.168.2.29, 00:19:37, Serial0/0/0
O E2    192.168.1.48/29 [110/20] via 192.168.2.29, 00:19:37, Serial0/0/0
O E2    192.168.1.64/28 [110/20] via 192.168.2.29, 00:19:37, Serial0/0/0
O E2    192.168.1.80/28 [110/20] via 192.168.2.29, 00:19:37, Serial0/0/0
O E2    192.168.1.96/30 [110/20] via 192.168.2.29, 00:19:37, Serial0/0/0
O E2    192.168.1.104/29 [110/20] via 192.168.2.29, 00:19:37, Serial0/0/0
O E2    192.168.1.112/30 [110/20] via 192.168.2.29, 00:19:37, Serial0/0/0
O E2    192.168.1.128/28 [110/20] via 192.168.2.29, 00:19:37, Serial0/0/0
O E2    192.168.1.144/30 [110/20] via 192.168.2.29, 00:19:37, Serial0/0/0
O E2    192.168.1.160/28 [110/20] via 192.168.2.29, 00:19:37, Serial0/0/0
O E2    192.168.1.176/28 [110/20] via 192.168.2.29, 00:19:37, Serial0/0/0
O       192.168.1.192/30 [110/256] via 192.168.2.29, 00:19:37, Serial0/0/0
O       192.168.1.196/30 [110/256] via 192.168.2.29, 00:19:37, Serial0/0/0
     192.168.2.0/24 is variably subnetted, 16 subnets, 3 masks
O       192.168.2.16/30 [110/128] via 192.168.2.29, 00:19:37, Serial0/0/0
O       192.168.2.20/30 [110/192] via 192.168.2.34, 00:19:37, Serial0/0/1
O       192.168.2.24/30 [110/128] via 192.168.2.34, 00:19:37, Serial0/0/1
C       192.168.2.28/30 is directly connected, Serial0/0/0
L       192.168.2.30/32 is directly connected, Serial0/0/0
C       192.168.2.32/30 is directly connected, Serial0/0/1
L       192.168.2.33/32 is directly connected, Serial0/0/1
C       192.168.2.64/29 is directly connected, GigabitEthernet0/0.10
L       192.168.2.65/32 is directly connected, GigabitEthernet0/0.10
C       192.168.2.72/29 is directly connected, GigabitEthernet0/0.20
L       192.168.2.73/32 is directly connected, GigabitEthernet0/0.20
C       192.168.2.80/29 is directly connected, GigabitEthernet0/0.30
L       192.168.2.81/32 is directly connected, GigabitEthernet0/0.30
O       192.168.2.96/29 [110/65] via 192.168.2.34, 00:19:37, Serial0/0/1
O       192.168.2.104/29 [110/65] via 192.168.2.34, 00:19:37, Serial0/0/1
O       192.168.2.116/30 [110/65] via 192.168.2.34, 00:19:37, Serial0/0/1
O*E2 0.0.0.0/0 [110/1] via 192.168.2.29, 00:19:37, Serial0/0/0
```

Building B



แบ่ง IP ให้ตามแต่ละโซน Pattani Building B

- ห้องซักประวัติ 4 เครื่อง
- ห้องตรวจโรค 4 เครื่อง

โดยการแบ่งNetwork ID จะได้ตามตารางนี้

Router Name	Interface	Network ID	IP address
PTN R4	S0/0/0	192.168.2.24 /30	192.168.2.26
	S0/0/1	192.168.2.32/30	192.168.2.34
	G0/0	192.168.2.96 /28	192.168.2.97
	G0/0.40	192.168.2.96 /29	192.168.2.97
	G0/0.50	192.168.2.104 /29	192.168.2.105
	G0/0	192.168.2.116 /30	192.168.2.117

Router PTN R4 (OSPF, ACL, DHCP)

-จะมีการแจก DHCP ให้แต่ละ VLAN

-Router ตัวนี้ใช้ Routing Protocols เป็น OSPF

-มีการตั้งค่า ACL ดังนี้

Screening Room(vlan40)

-Examination(vlan50)

-Counter-service(vlan10)

Examination(vlan50)

-Screening Room(vlan40)

-Pharmacy(Vlan30)

-Counter-service(vlan10)

Router PTN R4(config)

```
hostname PTN-R-4
enable secret 5 pattani
ip dhcp excluded-address 192.168.2.105
ip dhcp excluded-address 192.168.2.97
ip dhcp pool LAN-2
network 192.168.2.104 255.255.255.248
default-router 192.168.2.105
dns-server 192.168.1.106
ip dhcp pool LAN-1
network 192.168.2.96 255.255.255.248
default-router 192.168.2.97
dns-server 192.168.1.106
username admin password 0 pattani
ip ssh version 2
ip domain-name BKK-R2
interface GigabitEthernet0/0
ip address 192.168.2.117 255.255.255.252
no sh
interface GigabitEthernet0/0.40
encapsulation dot1Q 40
ip address 192.168.2.97 255.255.255.248
ip access-group 4 out
interface GigabitEthernet0/0.50
encapsulation dot1Q 50
ip address 192.168.2.105 255.255.255.248
ip access-group 5 out
interface Serial0/0/0
```

```
ip address 192.168.2.26 255.255.255.252
interface Serial0/0/1
ip address 192.168.2.34 255.255.255.252
router ospf 10
router-id 4.4.4.4
log-adjacency-changes
network 192.168.2.24 0.0.0.3 area 0
network 192.168.2.32 0.0.0.3 area 0
network 192.168.2.96 0.0.0.7 area 0
network 192.168.2.104 0.0.0.7 area 0
network 192.168.2.116 0.0.0.3 area 0
access-list 5 permit 10.10.10.0 0.0.0.3
access-list 5 permit 192.168.2.16 0.0.0.3
access-list 5 permit 192.168.2.28 0.0.0.3
access-list 5 permit 192.168.2.20 0.0.0.3
access-list 5 permit 192.168.2.24 0.0.0.3
access-list 5 permit 192.168.2.32 0.0.0.3
access-list 5 permit 192.168.2.64 0.0.0.7
access-list 5 permit 192.168.2.80 0.0.0.7
access-list 5 permit 192.168.2.96 0.0.0.7
access-list 5 permit 192.168.1.104 0.0.0.7
access-list 5 permit 192.168.2.116 0.0.0.3
access-list 5 deny any
access-list 4 permit 10.10.10.0 0.0.0.3
access-list 4 permit 192.168.2.16 0.0.0.3
access-list 4 permit 192.168.2.28 0.0.0.3
access-list 4 permit 192.168.2.20 0.0.0.3
access-list 4 permit 192.168.2.24 0.0.0.3
access-list 4 permit 192.168.2.32 0.0.0.3
access-list 4 permit 192.168.2.64 0.0.0.7
access-list 4 permit 192.168.2.96 0.0.0.7
access-list 4 permit 192.168.1.104 0.0.0.7
access-list 4 permit 192.168.2.104 0.0.0.7
access-list 4 permit 192.168.2.116 0.0.0.3
access-list 4 deny any
line con 0
password pattani
login
line vty 0 4
login local
transport input ssh
line vty 5 15
login local
transport input ssh
```

รูป Ip Route PTN R4

```
     192.168.1.0/24 is variably subnetted, 20 subnets, 3 masks
O       192.168.1.0/30 [110/256] via 192.168.2.25, 00:20:43, Serial0/0/0
                       [110/256] via 192.168.2.33, 00:20:43, Serial0/0/1
O       192.168.1.4/30 [110/192] via 192.168.2.25, 00:20:43, Serial0/0/0
O       192.168.1.8/30 [110/192] via 192.168.2.25, 00:20:43, Serial0/0/0
O       192.168.1.12/30 [110/256] via 192.168.2.25, 00:20:43, Serial0/0/0
                        [110/256] via 192.168.2.33, 00:20:43, Serial0/0/1
O E2    192.168.1.16/29 [110/20] via 192.168.2.25, 00:20:43, Serial0/0/0
                        [110/20] via 192.168.2.33, 00:20:43, Serial0/0/1
O E2    192.168.1.24/29 [110/20] via 192.168.2.25, 00:20:43, Serial0/0/0
                        [110/20] via 192.168.2.33, 00:20:43, Serial0/0/1
O E2    192.168.1.32/29 [110/20] via 192.168.2.25, 00:20:43, Serial0/0/0
                        [110/20] via 192.168.2.33, 00:20:43, Serial0/0/1
O E2    192.168.1.40/29 [110/20] via 192.168.2.25, 00:20:43, Serial0/0/0
                        [110/20] via 192.168.2.33, 00:20:43, Serial0/0/1
O E2    192.168.1.48/29 [110/20] via 192.168.2.25, 00:20:43, Serial0/0/0
                        [110/20] via 192.168.2.33, 00:20:43, Serial0/0/1
O E2    192.168.1.64/28 [110/20] via 192.168.2.25, 00:20:43, Serial0/0/0
                        [110/20] via 192.168.2.33, 00:20:43, Serial0/0/1
O E2    192.168.1.80/28 [110/20] via 192.168.2.25, 00:20:43, Serial0/0/0
                        [110/20] via 192.168.2.33, 00:20:43, Serial0/0/1
O E2    192.168.1.96/30 [110/20] via 192.168.2.25, 00:20:43, Serial0/0/0
                        [110/20] via 192.168.2.33, 00:20:43, Serial0/0/1
O E2    192.168.1.104/29 [110/20] via 192.168.2.25, 00:20:43, Serial0/0/0
                         [110/20] via 192.168.2.33, 00:20:43, Serial0/0/1
O E2    192.168.1.112/30 [110/20] via 192.168.2.25, 00:20:43, Serial0/0/0
                         [110/20] via 192.168.2.33, 00:20:43, Serial0/0/1
O E2    192.168.1.128/28 [110/20] via 192.168.2.25, 00:20:43, Serial0/0/0
                         [110/20] via 192.168.2.33, 00:20:43, Serial0/0/1
O E2    192.168.1.144/30 [110/20] via 192.168.2.25, 00:20:43, Serial0/0/0
                         [110/20] via 192.168.2.33, 00:20:43, Serial0/0/1
O E2    192.168.1.160/28 [110/20] via 192.168.2.25, 00:20:43, Serial0/0/0
                         [110/20] via 192.168.2.33, 00:20:43, Serial0/0/1
O E2    192.168.1.176/28 [110/20] via 192.168.2.25, 00:20:43, Serial0/0/0
                         [110/20] via 192.168.2.33, 00:20:43, Serial0/0/1
O       192.168.1.192/30 [110/192] via 192.168.2.25, 00:20:43, Serial0/0/0
O       192.168.1.196/30 [110/192] via 192.168.2.25, 00:20:43, Serial0/0/0
     192.168.2.0/24 is variably subnetted, 16 subnets, 3 masks
O       192.168.2.16/30 [110/192] via 192.168.2.33, 00:20:43, Serial0/0/1
O       192.168.2.20/30 [110/128] via 192.168.2.25, 00:20:43, Serial0/0/0
C       192.168.2.24/30 is directly connected, Serial0/0/0
L       192.168.2.26/32 is directly connected, Serial0/0/0
O       192.168.2.28/30 [110/128] via 192.168.2.33, 00:20:43, Serial0/0/1
C       192.168.2.32/30 is directly connected, Serial0/0/1
L       192.168.2.34/32 is directly connected, Serial0/0/1
O       192.168.2.64/29 [110/65] via 192.168.2.33, 00:20:43, Serial0/0/1
O       192.168.2.72/29 [110/65] via 192.168.2.33, 00:20:43, Serial0/0/1
O       192.168.2.80/29 [110/65] via 192.168.2.33, 00:20:43, Serial0/0/1
C       192.168.2.96/29 is directly connected, GigabitEthernet0/0.40
L       192.168.2.97/32 is directly connected, GigabitEthernet0/0.40
C       192.168.2.104/29 is directly connected, GigabitEthernet0/0.50
L       192.168.2.105/32 is directly connected, GigabitEthernet0/0.50
```

```
O*E2 0.0.0.0/0 [110/1] via 192.168.2.25, 00:20:43, Serial0/0/0
```

PTN-SW-1 (INTER VLAN)

Switch ตัวนี้จะทำการกระจาย DHCP ให้กับ Device ต่างๆในตึก

PTN-SW-1 (config)

```
hostname PTN-SW-1
interface FastEthernet0/1
switchport mode trunk
interface FastEthernet0/2
switchport access vlan 10
switchport mode access
interface FastEthernet0/3
switchport access vlan 10
switchport mode access
interface FastEthernet0/4
switchport access vlan 10
switchport mode access
interface FastEthernet0/5
switchport access vlan 20
switchport mode access
interface FastEthernet0/6
switchport access vlan 20
switchport mode access
interface FastEthernet0/7
switchport access vlan 20
switchport mode access
interface FastEthernet0/8
switchport access vlan 30
switchport mode access
interface FastEthernet0/9
switchport access vlan 30
switchport mode access
interface FastEthernet0/10
switchport access vlan 30
switchport mode access
```

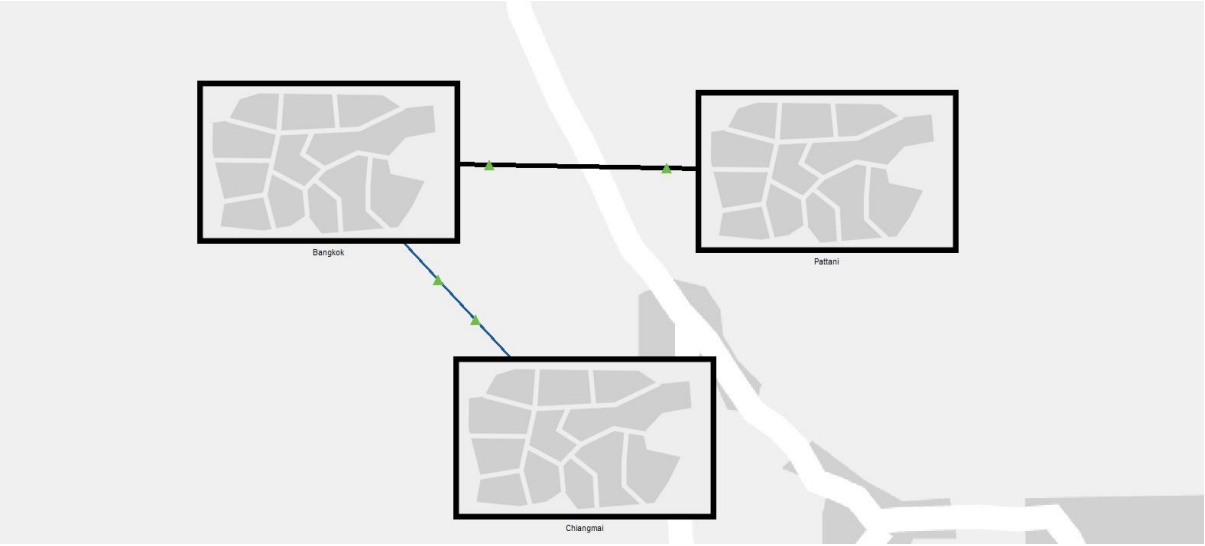
PTN-SW-2 (INTER VLAN)

Switch ตัวนี้จะทำการกระจาย DHCP ให้กับ Device ต่างๆในตึก

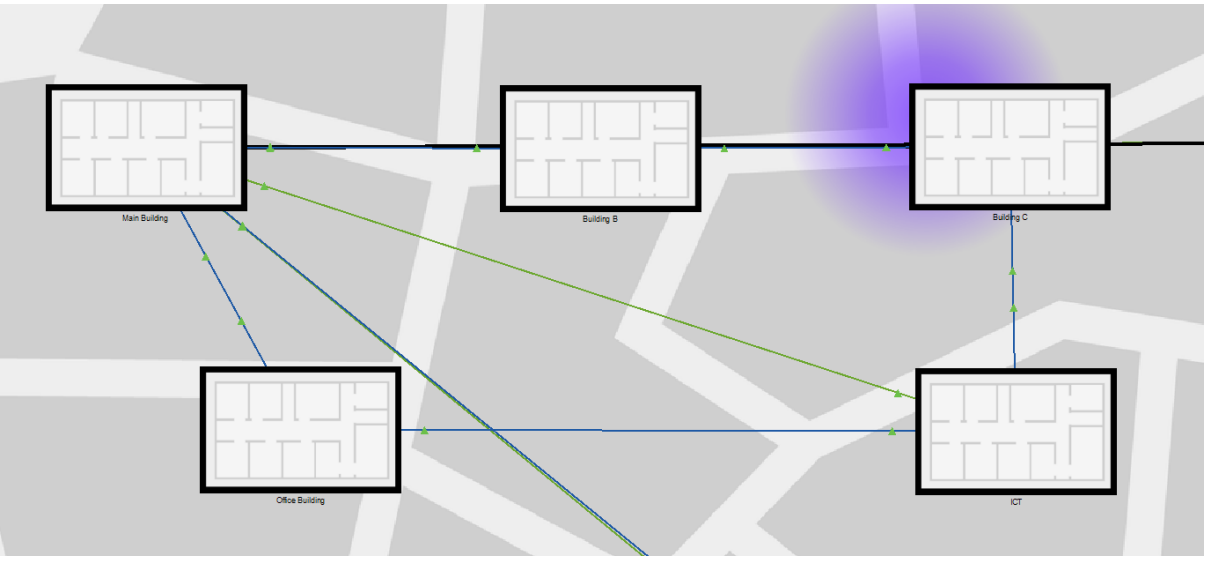
PTN-SW-2 (config)

```
hostname PTN-SW-2
interface FastEthernet0/1
switchport mode trunk
interface FastEthernet0/2
switchport access vlan 40
switchport mode access
interface FastEthernet0/3
switchport access vlan 40
switchport mode access
interface FastEthernet0/4
switchport access vlan 50
switchport mode access
interface FastEthernet0/5
switchport access vlan 50
switchport mode access
```

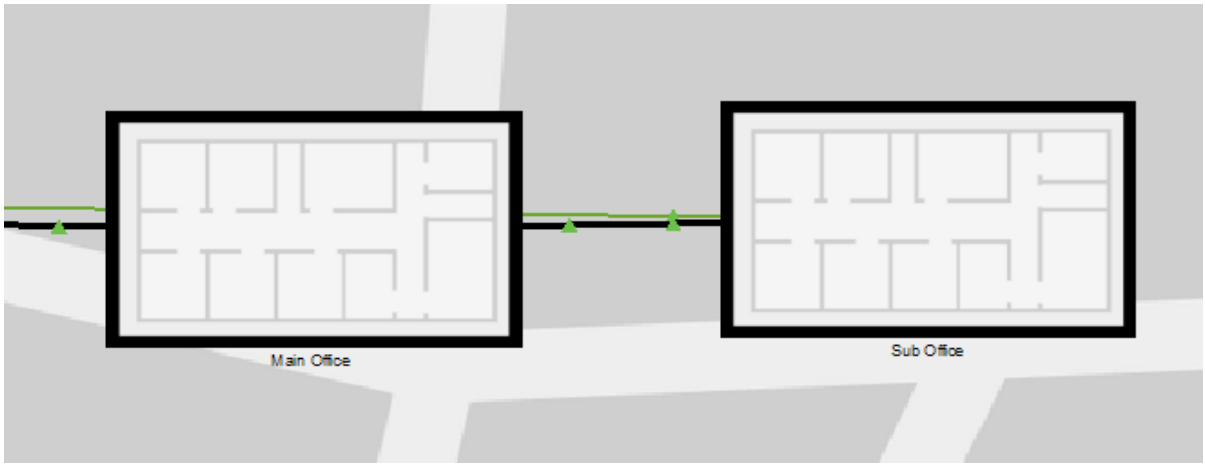
Physical View



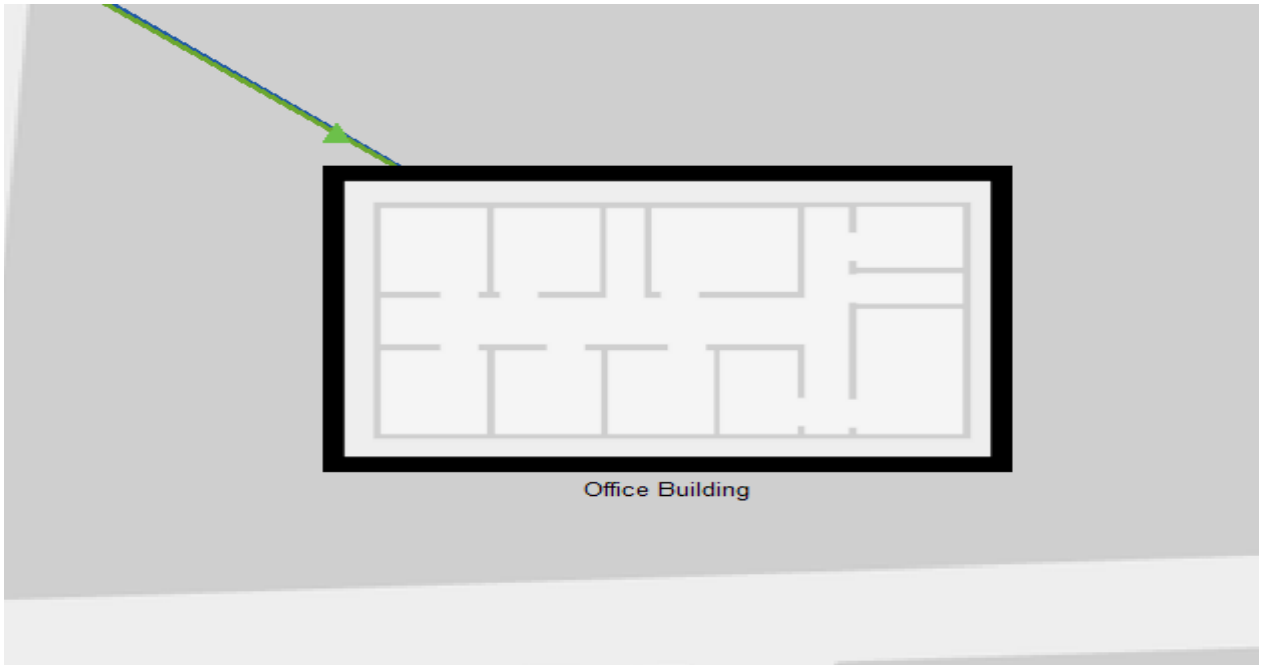
Bangkok



Pattani



Chiang Mai



3.เนื้อหาส่วนที่เพิ่มเติม

กลุ่มผมได้ทำการเพิ่มในส่วนที่เพิ่มเติมอยู่ 4 อย่าง

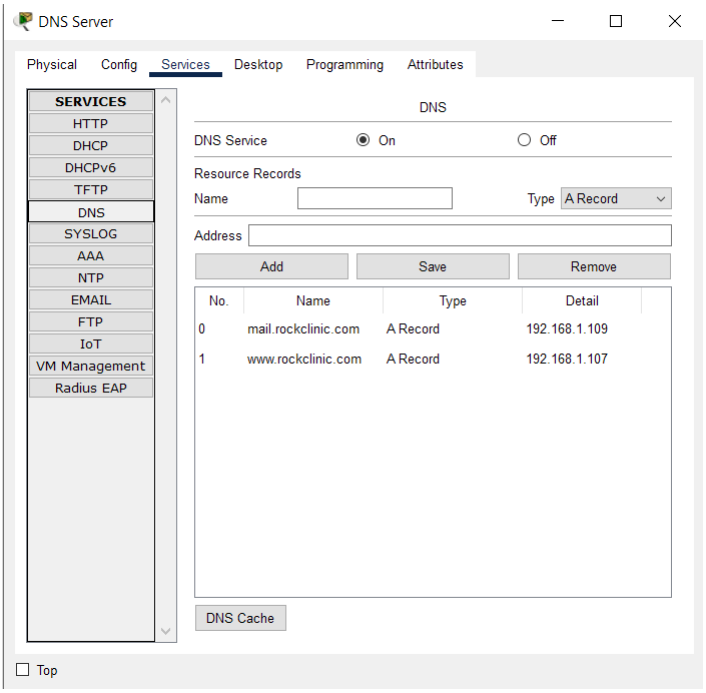
- DNS
- Email
- Web-Server
- Wireless

3.1 DNS (Domain Name Server)

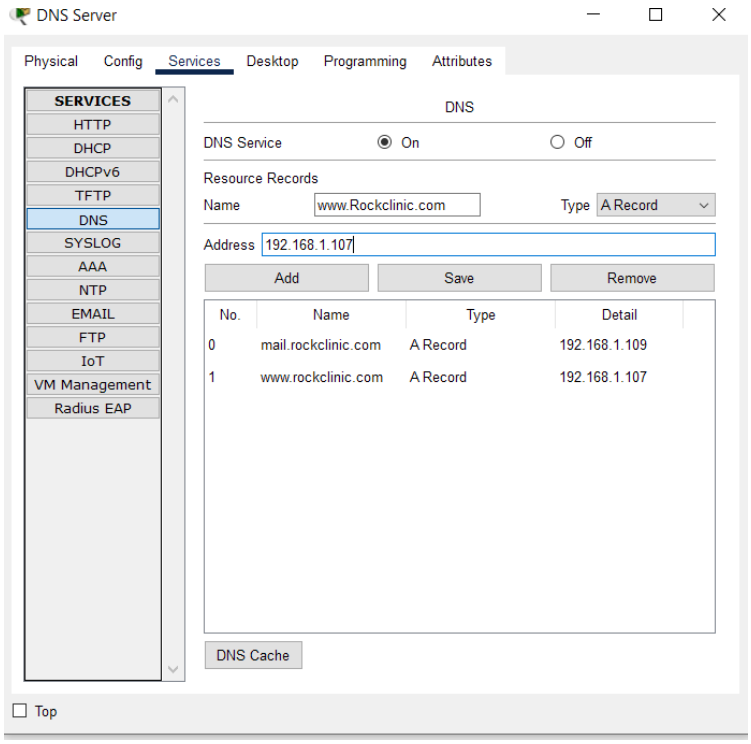
DNS คือการนำ ชื่อเว็ปไปเป็น Ip เช่น www.Rockclinic.com แปลงเป็น 192.168.1.107

วิธีการสร้าง

1.เลือกตัว service ของ server คลิกไปที่ DNS

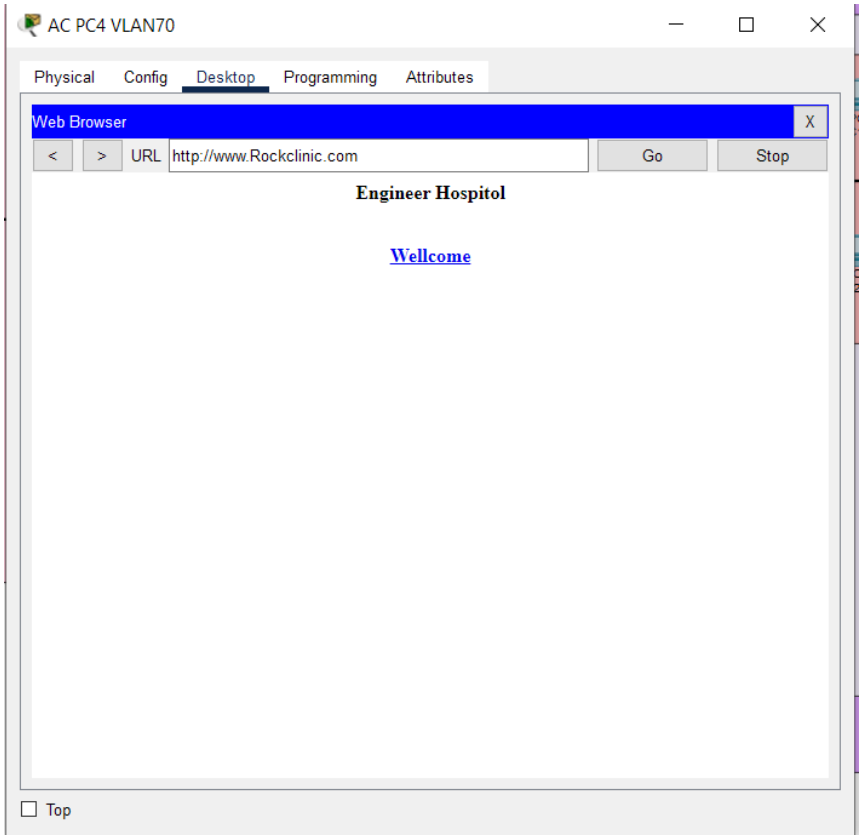


2.กรอกชื่อเว็ปลงไป และ กรอก ip ที่ต้องการแปลงจากชื่อไปเป็น ip แล้วกด add



แค่นี้ก็เสร็จแล้วครับ

มาเทสกัน!!!!

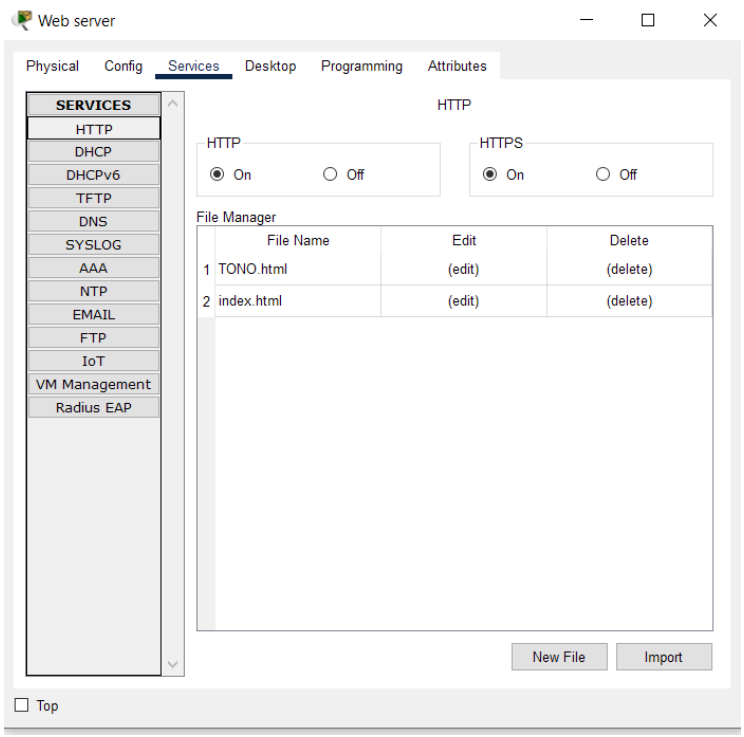


3.2 Web-Server

Web-server จะเป็นเว็บไซต์ของโรงพยาบาล

วิธีการสร้าง

1.คลิกที่ service แล้วเปิด HTTPและHTTPS เป็น on

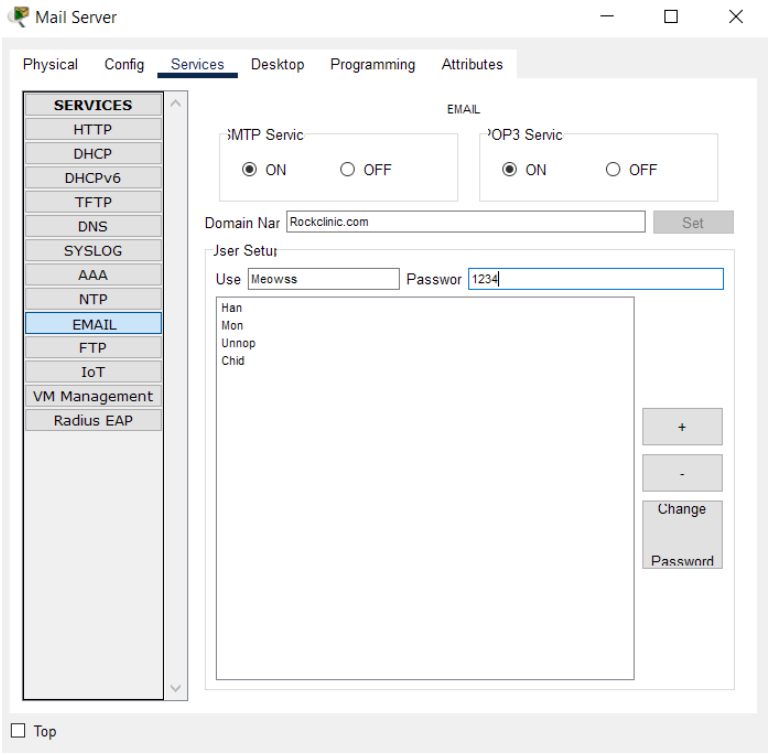


3.3 Email

วิธีสร้าง

1.คลิกที่ service และเลือก Email เปิด On SMTP และ เปิด On POP3 Service

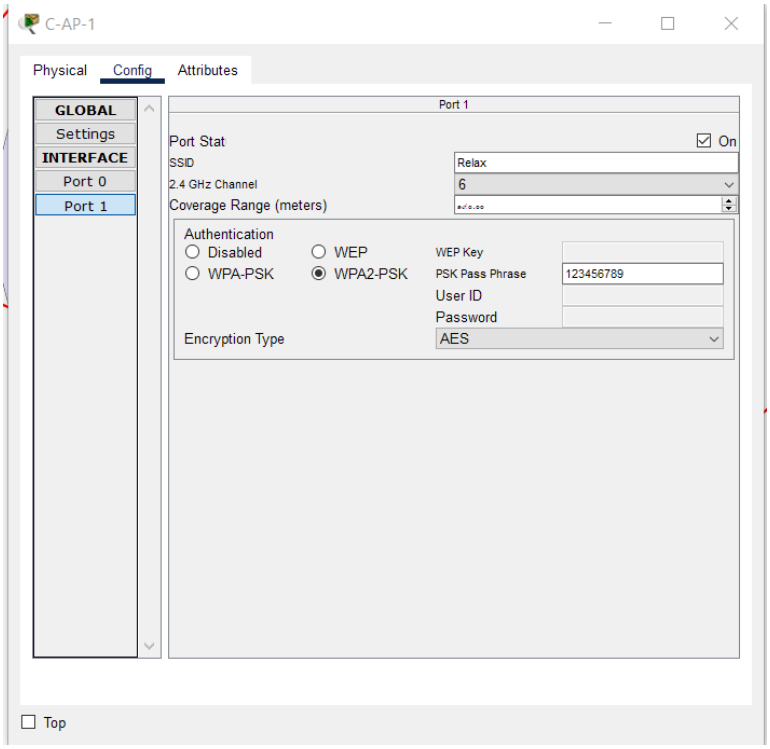
โดย SMTP จะเป็นserviceฝั่งรับข้อความ POP 3 จะเป็นฝั่งส่ง



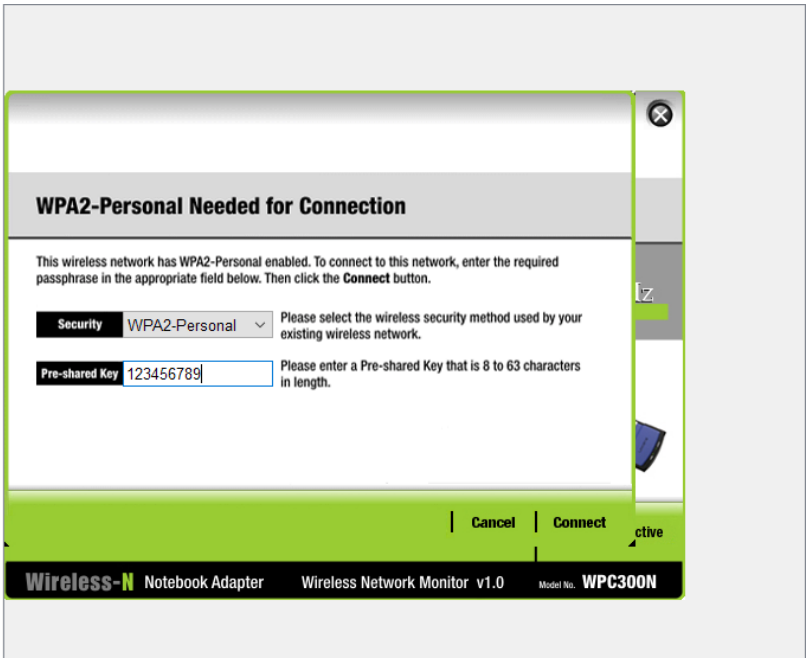
3.4 Wireless

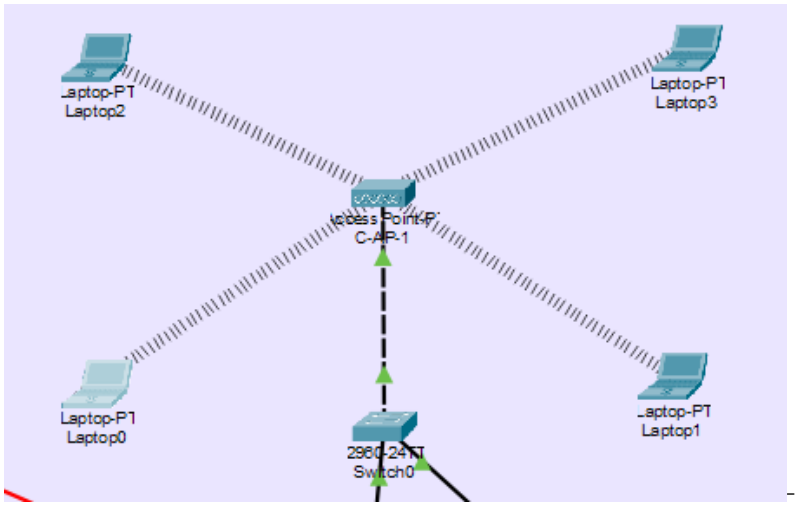
วิธีสร้าง

1.คลิก Ap ออกมา เลือก Port1 ตั้งชื่อ SSID ตั้งรหัสผ่าน



ทดลองเชื่อมต่อ




Laptop-PT
Laptop2
Laptop-PT
Laptop3
Access Point-PT
AP-1
Laptop-PT
Laptop0
Laptop-PT
Laptop1
2960-24TT
Switch0

สำเร็จครับ