MMU
MULTIMEDIA UNIVERSITY

TSN2201 Computer Network Assignment
Lecture Section: TC01
Tutorial Section: TT03
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Group

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Network Design Description

A network design for Sarawak Borneo Tourism Board with a total number of 185 employees with larger IP address block **162.30.14/16** will be assigned as its major IP address.
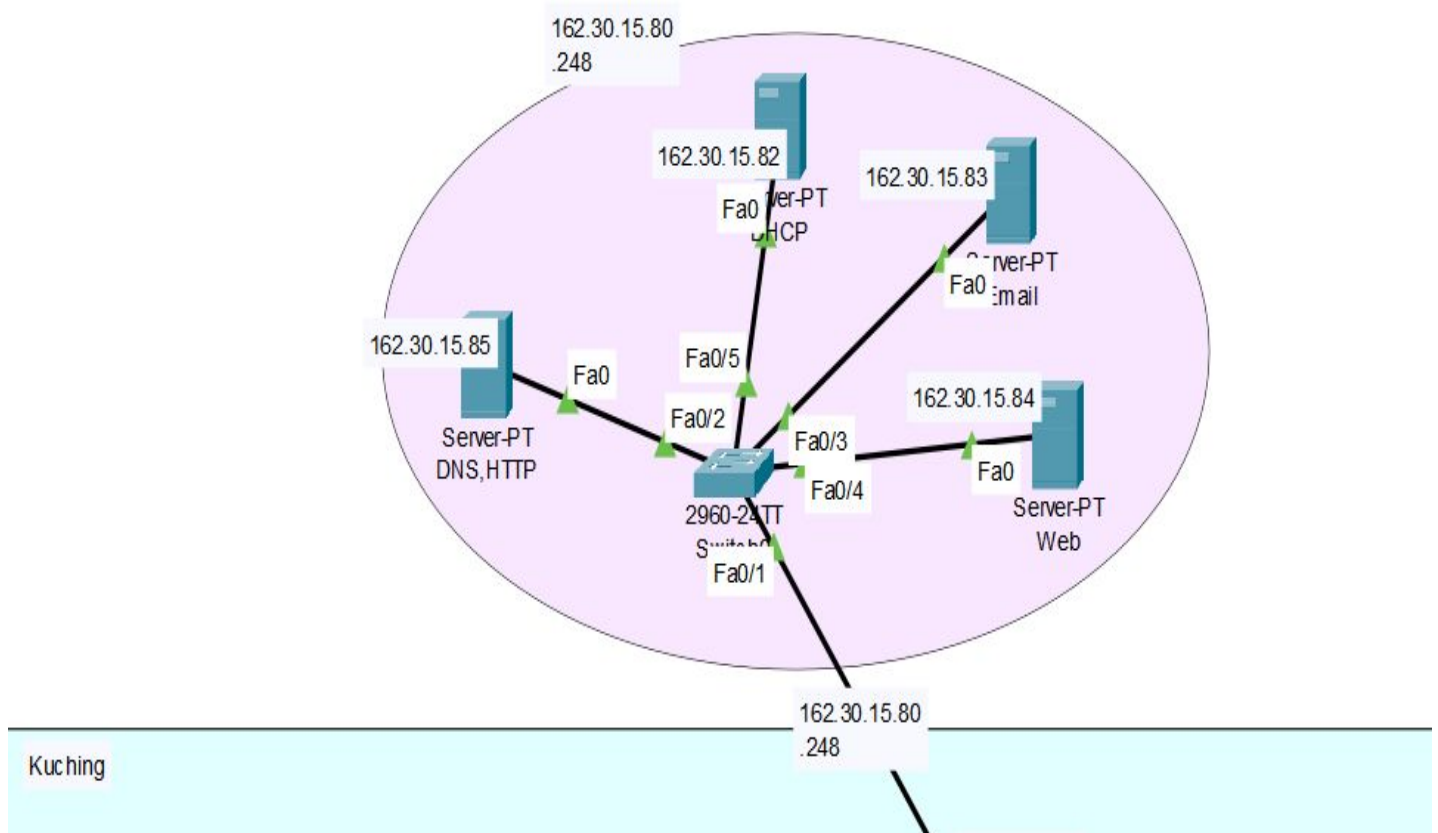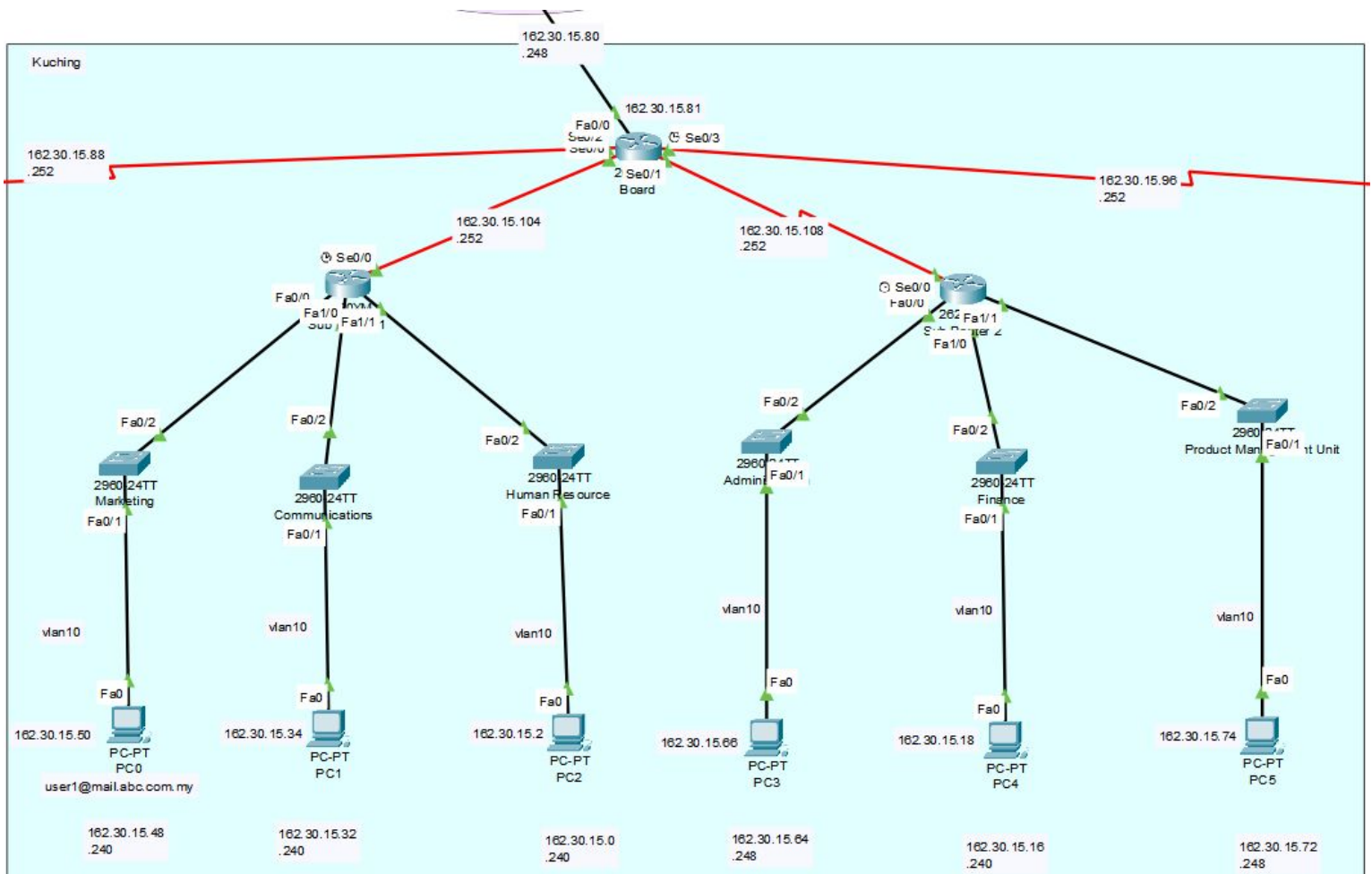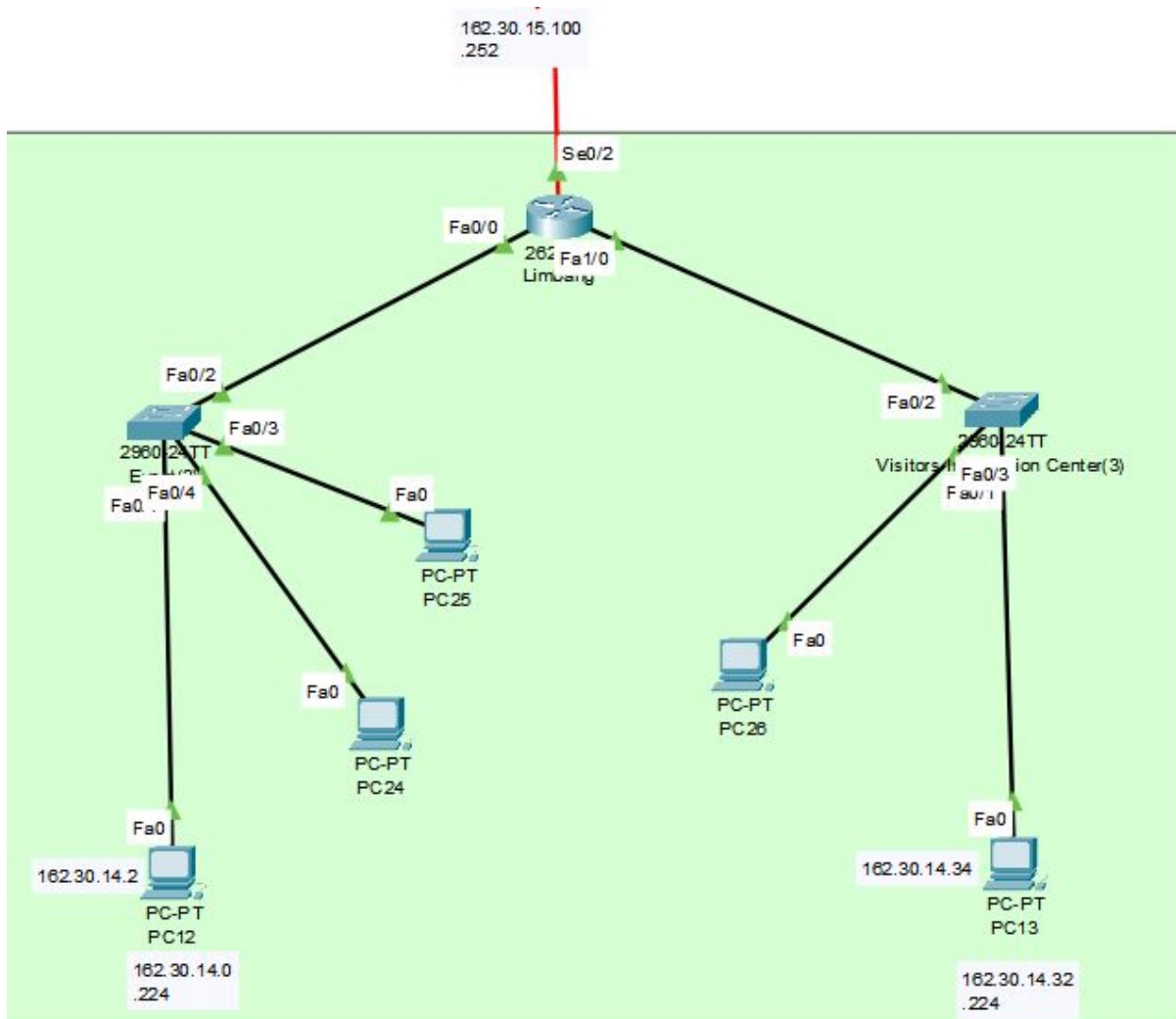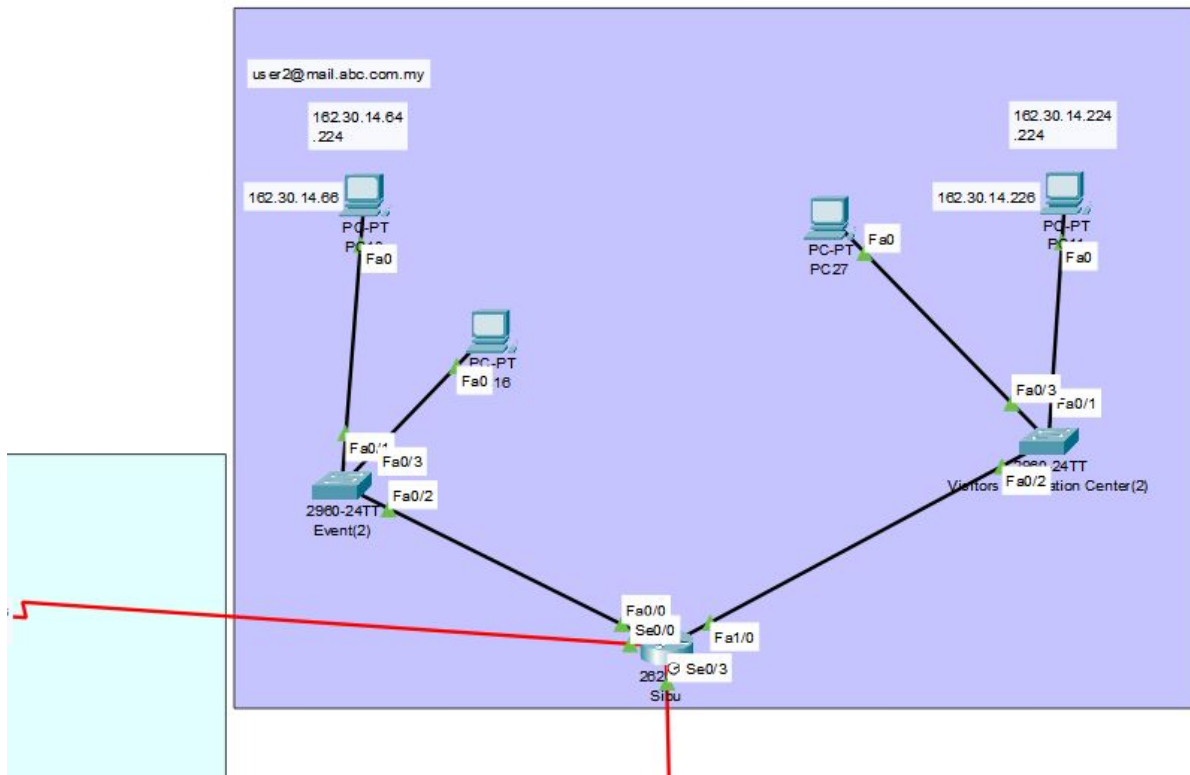
The Main office Kuching site will connect to other 4 branches office Bintulu, Miri, Sibu and Limbang through point to point leased line made of fiber optics.

The main offices there are the Finance department, Marketing department, communications division, Human resource department, administration and product management department and the Kuching office are handling IP addresses up to 56 hosts. Also Assigning IP addresses to host in different VLANs in the network.

The Main Office will house the server room with DNS, DHCP, Mail and web Server connecting with an encrypted router.

user2@mail.abc.com.my

162.30.14.64
.224

162.30.14.224
.224

162.30.14.66
PC-PT
PC12
Fa0

162.30.14.226
PC-PT
PC11
Fa0

Fa0
PC-PT
PC27

PC-PT
Fa0 16

Fa0/3
Fa0/1

Fa0/1
Fa0/3

2960-24TT
Visitors Fa0/2 ation Center(2)

Fa0/2
2960-24TT
Event(2)

Fa0/0
Se0/0
Fa1/0

262 Se0/3
Sibu

162.30.15.100
.252

Se0/2

Fa0/0
262 Fa1/0
Limbang

Fa0/2

Fa0/2
2960-24TT
Visitors I ion Center(3)

2960-24TT
E t(3)
Fa0/3

Fa0/3
Fa0/1

Fa0 Fa0/4

Fa0
PC-PT
PC25

Fa0
PC-PT
PC26

Fa0
PC-PT
PC24

Fa0
162.30.14.2
PC-PT
PC12

Fa0
162.30.14.34
PC-PT
PC13

162.30.14.0
.224

162.30.14.32
.224

The Event Organization Department and Visitors information centres will be Situated in Bintulu, Miri, Sibu and Limbang. The four branches are responsible for these two departments. The network will have the capacity of providing 234 hosts.

Network Protocol Used in this Network Design
Routing

OSPF- Router ospf 1
Dynamic routes are configured on each branches office and in main office, to route the traffic from inside network to another branch network.

DNS(Domain name system)

DNS is configured in DNS server, which is in the server room in kuching office. All the hosts in this network are assumed to be connected to domain. 162.30.15.85 and 162.30.15.84 will be assigned to Web Server.

(DHCP, HTTP)
DHCP is configured in the DHCP server, which is in the server room in the Kuching office 162.30.15.82 will be assigned to this server . Each of the hosts' IP addresses in this network system will be Allocated dynamically.

(SMTP- simple mail transfer protocol)
Email, FTP is configured in the FTP server, which is in the server room in the Kuching office 162.30.15.83 will be assigned to this server. Sarawak Borneo Tourism Board has their own email server. This could provide email addresses as much as needed and any Employee can send and receive email through this network system. For instance Email: user1@mail.abc.com.my

VLAN
Vlan 10 is used to group the Board Unit.

Network Security

Every router has been configured with access control.

for example Username: Limbang , Password:1234.

Network performance

No.	Items	Suggested Areas
1.	Network Equipment	The Router, Switches, Server Equipment used:- Wan router: CISCO2620XM 10/100 ethernet router Estimate cost 1470 USD Switches to BLocks & Floor : WS-C2960-24TT-L Estimate cost 3500 USD Server: Cisco UCS C220 M5 Estimate cost 8000 USD
2.	Wide Area Network Technology	A leased line is a private bidirectional or symmetric telecommunications line between two or more locations provided in exchange for a monthly rent. Leased Line in Malaysia: - Telekom Malaysia Berhad leased line. Estimate cost RM 100,000 per year.

Division	Number Of Employees	Locations
Marketing	7	Kuching
Communications	8	Kuching
Human Resource	14	Kuching
Administration	6	Kuching
Finance	16	Kuching
Product	5	Kuching
Event	16	Bintulu
Visitor	15	Bintulu
Event(1)	16	Miri
Visitor(1)	16	Miri
Event(2)	16	Sibu
Visitor(2)	15	Sibu
Event(3)	19	Limbang
Visitor(3)	16	Limbang

VLSM SUBNETTING

Branch	Subnet Name	Needed Size	Network Address	CIDR	Subnet Mask	Assignable Range	Broadcast
Kuching	Marketing	9	162.30.15.48	/28	255.255.255.240	162.30.15.49 – 162.30.15.62	162.30.15.63
	Communications	10	162.30.15.32	/28	255.255.255.240	162.30.15.33 – 162.30.15.46	162.30.15.47
	Human Resource	16	162.30.15.0	/28	255.255.255.240	162.30.15.1 – 162.30.15.14	162.30.15.15
	Administration	8	162.30.15.64	/29	255.255.255.248	162.30.15.65 – 162.30.15.70	162.30.15.71
	Finance	16	162.30.15.16	/28	255.255.255.240	162.30.15.17 – 162.30.15.30	162.30.15.31

	Product	7	162.30.15.72	/29	255.255.255.248	162.30.15.73 – 162.30.15.78	162.30.15.79
Bintulu	Event	18	162.30.14.160	/27	255.255.255.224	162.30.14.161 – 162.30.14.190	162.30.14.191
	Visitors	17	162.30.14.192	/27	255.255.255.224	162.30.14.193 – 162.30.14.222	162.30.14.223
Miri	Event (1)	18	162.30.14.96	/27	255.255.255.224	162.30.14.97 – 162.30.14.126	162.30.14.127
	Visitors (1)	18	162.30.14.128	/27	255.255.255.224	162.30.14.129 – 162.30.14.158	162.30.14.159
Sibu	Event (2)	18	162.30.14.64	/27	255.255.255.224	162.30.14.65 – 162.30.14.94	162.30.14.95
	Visitors (2)	17	162.30.14.224	/27	255.255.255.224	162.30.14.225 – 162.30.14.254	162.30.14.255
Limbang	Event (3)	21	162.30.14.0	/27	255.255.255.224	162.30.14.1 - 162.30.14.30	162.30.14.31
	Visitors (3)	18	162.30.14.32	/27	255.255.255.224	162.30.14.33 – 162.30.14.62	162.30.14.63
	Kuching-Bintulu	4	162.30.15.88	/30	255.255.255.252	162.30.15.89 - 162.30.15.90	162.30.15.91
	Bintulu-Miri	4	162.30.15.92	/30	255.255.255.252	162.30.15.93 – 162.30.15.94	162.30.15.95
	Kuching-Sibu	4	162.30.15.96	/30	255.255.255.252	162.30.15.97 - 162.30.15.98	162.30.15.99
	Sibu-Limbang	4	162.30.15.100	/30	255.255.255.252	162.30.15.101 – 162.30.15.102	162.30.15.103
	Board-SubRouter1	4	162.30.15.104	/30	255.255.255.252	162.30.15.105 - 162.30.15.106	162.30.15.107
	Board-SubRouter2	4	162.30.15.108	/30	255.255.255.252	162.30.15.109 – 162.30.15.110	162.30.15.111
	Server	7	162.30.15.80	/29	255.255.255.248	162.30.15.81 - 162.30.15.86	162.30.15.87