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Network Overview:

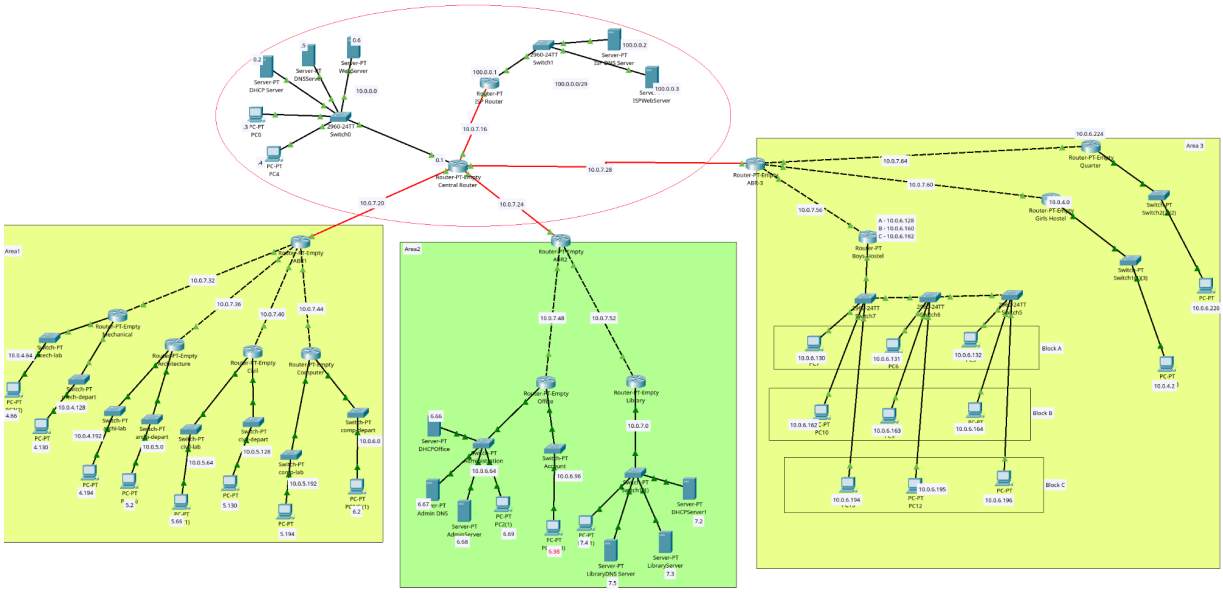
Here, a campus ‘xyz’ is assumed and its network is realized.
The network is segmented into four primary areas:

1. Area 0 (Backbone Area): This area serves as the core of the network, facilitating inter-area communication and connecting to the Internet Service Provider (ISP).
2. Area 1 (Departments): This area includes the Computer, Civil, Mechanical, and Architecture departments.
3. Area 2 (Administration and Library): This area encompasses the campus administration offices and the library.
4. Area 3 (Hostels and Quarters): This area includes the boys' and girls' hostels and the staff quarters.
5. VLANs: A VLAN was implemented in the boys hostel for three different blocks viz. Block A, Block B and Block C using three switches. The corresponding router is configured as a "router on a stick," connected to all three VLANs through a single physical interface that handles inter-VLAN routing.

Changes from the Proposal:

DHCP is implemented in a few areas and an IP is assigned to the ISP. Similarly, DNS servers and web servers are also added in a few places.

The illustration of the network topology is:



Subnet Division:

The assumed IP is 10.0.0.0/21. The network is meticulously divided into multiple subnets to ensure efficient data routing and isolation between departments which is shown below:

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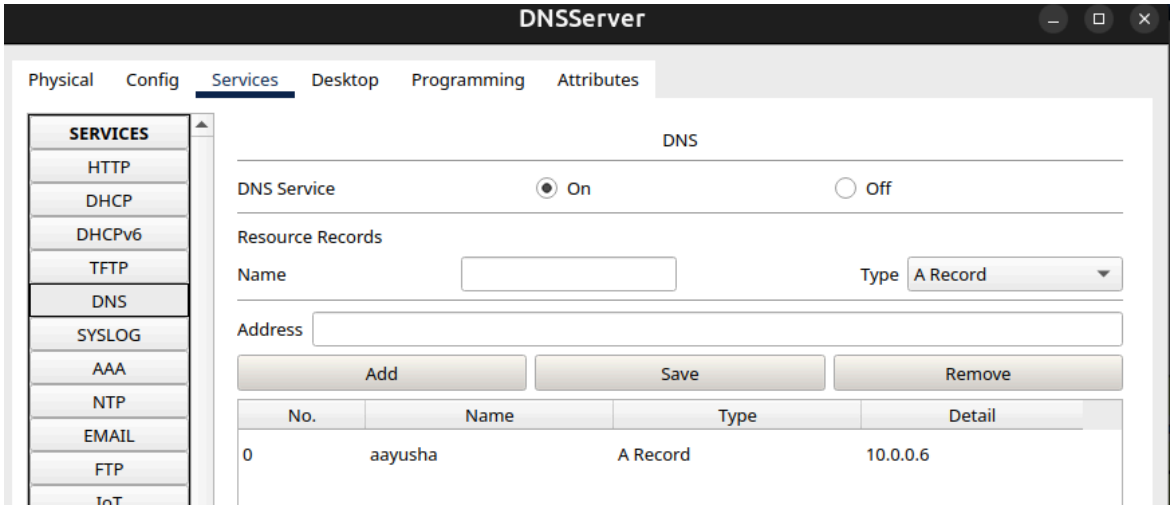
SN	Name	Hosts	Network Address	Slash	Usable Range	Broadcast	Mask	Wildcard
1	CentralRouter	700	10.0.0.0	/22	10.0.0.1 - 10.0.3.254	10.0.3.255	255.255.252.0	0.0.3.255
2	Girls Hostel	60	10.0.4.0	/26	10.0.4.1 - 10.0.4.62	10.0.4.63	255.255.255.192	0.0.0.63
3	Mechanical Lab	50	10.0.4.64	/26	10.0.4.65 - 10.0.4.126	10.0.4.127	255.255.255.192	0.0.0.63
4	Mechanical Depart	50	10.0.4.128	/26	10.0.4.129 - 10.0.4.190	10.0.4.191	255.255.255.192	0.0.0.63
5	Architecture Lab	50	10.0.4.192	/26	10.0.4.193 - 10.0.4.254	10.0.4.255	255.255.255.192	0.0.0.63
6	Architecture Depart	50	10.0.5.0	/26	10.0.5.1 - 10.0.5.62	10.0.5.63	255.255.255.192	0.0.0.63
7	Civil Lab	50	10.0.5.64	/26	10.0.5.65 - 10.0.5.126	10.0.5.127	255.255.255.192	0.0.0.63
8	Civil Depart	50	10.0.5.128	/26	10.0.5.129 - 10.0.5.190	10.0.5.191	255.255.255.192	0.0.0.63
9	Computer Lab	50	10.0.5.192	/26	10.0.5.193 - 10.0.5.254	10.0.5.255	255.255.255.192	0.0.0.63
10	Computer Depart	50	10.0.6.0	/26	10.0.6.1 - 10.0.6.62	10.0.6.63	255.255.255.192	0.0.0.63
11	Administration	30	10.0.6.64	/27	10.0.6.65 - 10.0.6.94	10.0.6.95	255.255.255.224	0.0.0.31
12	Account	30	10.0.6.96	/27	10.0.6.97 - 10.0.6.126	10.0.6.127	255.255.255.224	0.0.0.31

13	Block A	30	10.0.6.128	/27	10.0.6.129 - 10.0.6.158	10.0.6.159	255.255.255.224	0.0.0.31
14	Block B	30	10.0.6.160	/27	10.0.6.161 - 10.0.6.190	10.0.6.191	255.255.255.224	0.0.0.31
15	Block C	30	10.0.6.192	/27	10.0.6.193 - 10.0.6.222	10.0.6.223	255.255.255.224	0.0.0.31
16	Quarter	20	10.0.6.224	/27	10.0.6.225 - 10.0.6.254	10.0.6.255	255.255.255.224	0.0.0.31
17	Library	10	10.0.7.0	/28	10.0.7.1 - 10.0.7.14	10.0.7.15	255.255.255.240	0.0.0.15
18	Central-ISP	2	10.0.7.16	/30	10.0.7.17 - 10.0.7.18	10.0.7.19	255.255.255.252	0.0.0.3
19	Central-ABR1	2	10.0.7.20	/30	10.0.7.21 - 10.0.7.22	10.0.7.23	255.255.255.252	0.0.0.3
20	Central-ABR2	2	10.0.7.24	/30	10.0.7.25 - 10.0.7.26	10.0.7.27	255.255.255.252	0.0.0.3
21	Central-ABR3	2	10.0.7.28	/30	10.0.7.29 - 10.0.7.30	10.0.7.31	255.255.255.252	0.0.0.3
22	ABR1-Mechanical	2	10.0.7.32	/30	10.0.7.33 - 10.0.7.34	10.0.7.35	255.255.255.252	0.0.0.3
23	ABR1-Architecture	2	10.0.7.36	/30	10.0.7.37 - 10.0.7.38	10.0.7.39	255.255.255.252	0.0.0.3
24	ABR1-Civil	2	10.0.7.40	/30	10.0.7.41 - 10.0.7.42	10.0.7.43	255.255.255.252	0.0.0.3

25	ABR1-Computer	2	10.0.7.44	/30	10.0.7.45 - 10.0.7.46	10.0.7.47	255.255.255.252	0.0.0.3
26	ABR2-Office	2	10.0.7.48	/30	10.0.7.49 - 10.0.7.50	10.0.7.51	255.255.255.252	0.0.0.3
27	ABR2-Library	2	10.0.7.52	/30	10.0.7.53 - 10.0.7.54	10.0.7.55	255.255.255.252	0.0.0.3
28	ABR3-Boys Hostel	2	10.0.7.56	/30	10.0.7.57 - 10.0.7.58	10.0.7.59	255.255.255.252	0.0.0.3
29	ABR3-Girls Hostel	2	10.0.7.60	/30	10.0.7.61 - 10.0.7.62	10.0.7.63	255.255.255.252	0.0.0.3
30	ABR3-Quarter	2	10.0.7.64	/30	10.0.7.65 - 10.0.7.66	10.0.7.67	255.255.255.252	0.0.0.3
31	ISP Router	4	100.0.0.0	/29	100.0.0.1 - 100.0.0.6	100.0.0.7	255.255.255.248	0.0.0.7

Some screenshots from the network:

DNS Server Configuration:



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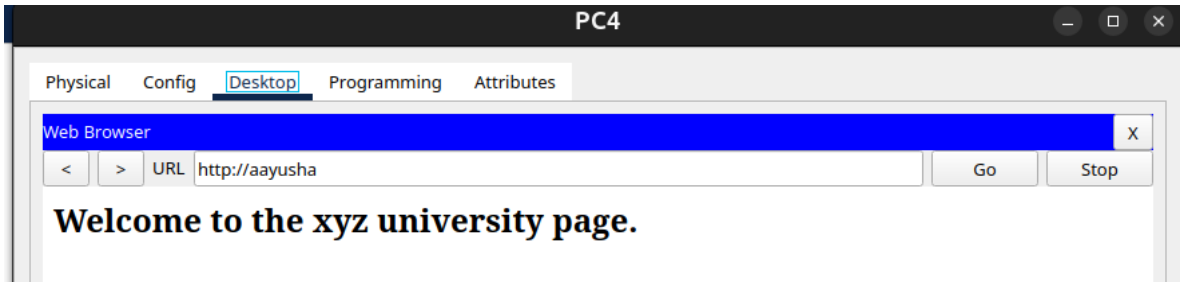

Route to the ISP from computer department:

```
C:\>tracert 100.0.0.3

Tracing route to 100.0.0.3 over a maximum of 30 hops:

  1    0 ms      0 ms      0 ms      10.0.6.1
  2    0 ms      0 ms      0 ms      10.0.7.45
  3    0 ms      1 ms      0 ms      10.0.7.21
  4    6 ms      34 ms     19 ms     10.0.7.18
  5    29 ms     6 ms      0 ms      100.0.0.3

Trace complete.
```

Tracing from Archi lab to PC of Block C boys hostel (Inter-area communication):

```
C:\>tracert 10.0.6.195

Tracing route to 10.0.6.195 over a maximum of 30 hops:

  1    0 ms      0 ms      0 ms      10.0.4.193
  2    0 ms      0 ms      0 ms      10.0.7.37
  3    13 ms     13 ms     6 ms      10.0.7.21
  4    7 ms      23 ms     7 ms      10.0.7.30
  5    1 ms      36 ms     5 ms      10.0.7.58
  6    *         6 ms      26 ms     10.0.6.195
```

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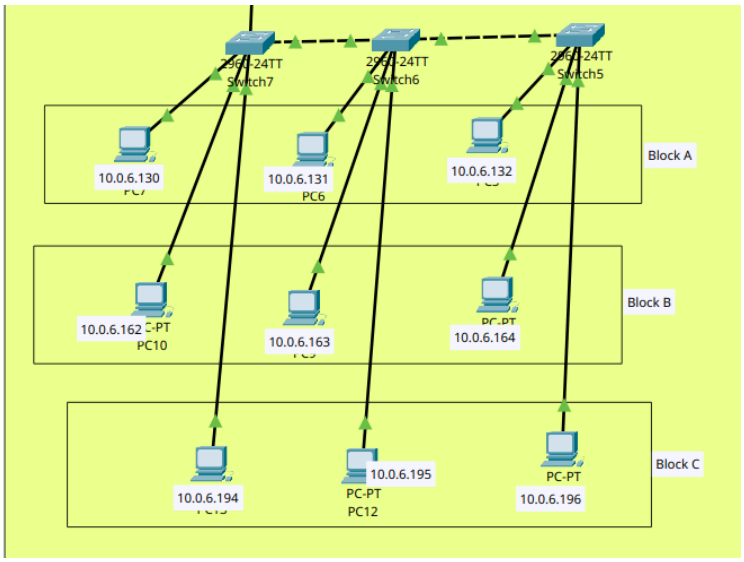
Tracing route from the Quarter Area to the Account Section:

```
C:\>tracert 10.0.6.98

Tracing route to 10.0.6.98 over a maximum of 30 hops:

  1    0 ms       0 ms       0 ms       10.0.6.225
  2    0 ms       0 ms       0 ms       10.0.7.65
  3    1 ms       22 ms      38 ms      10.0.7.29
  4    1 ms       5 ms       18 ms      10.0.7.26
  5    17 ms      13 ms      11 ms      10.0.7.50
  6    0 ms       1 ms       5 ms       10.0.6.98

Trace complete.
```

All the random networks forwarded from any PC is forwarded to the ISP:

```
Tracing route to 44.4.0.0 over a maximum of 30 hops:

  1    0 ms       0 ms       0 ms       10.0.6.65
  2    0 ms       0 ms       0 ms       10.0.7.49
  3    13 ms      33 ms      36 ms      10.0.7.25
  4    65 ms      52 ms      1 ms       10.0.7.18
  5    13 ms      *          18 ms      10.0.7.18
  6    *          47 ms      *          Request timed out.
  7    6 ms       *          44 ms      10.0.7.18
  8    *          0 ms       *          Request timed out.
  9    2 ms       *          18 ms      10.0.7.18
  10    *          27 ms      *          Request timed out.
  11    2 ms       *          7 ms       10.0.7.18
  12    *          35 ms
```

VLAN Configuration in the Boys Hostel:



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Conclusion:

The network design for the fictional campus 'xyz' has been implemented, featuring detailed subnetting across various segments, robust DNS and server configurations, and strategic router and VLAN setups to ensure efficient traffic management and security. OSPF routing has been seamlessly deployed to maintain internal connectivity, while traffic is efficiently forwarded to the ISP. Each network component, including subnets, VLANs, routers, and servers, has been labeled and strategically assigned IP addresses, ensuring easy identification and streamlined management.