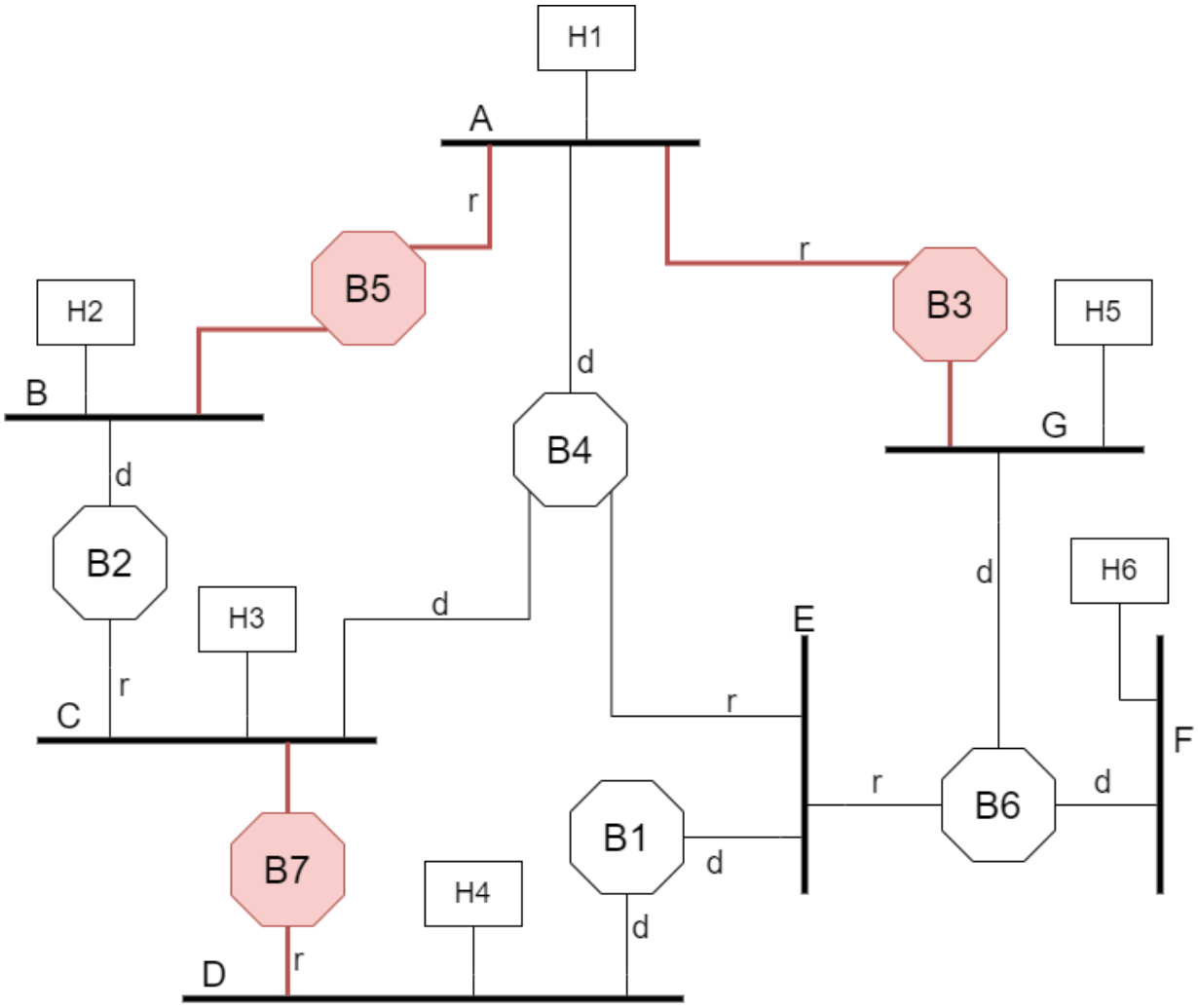
Rajat Sethi – ECE 4380 – HW 6

1a.) LAN A, B, C, D, E, and F

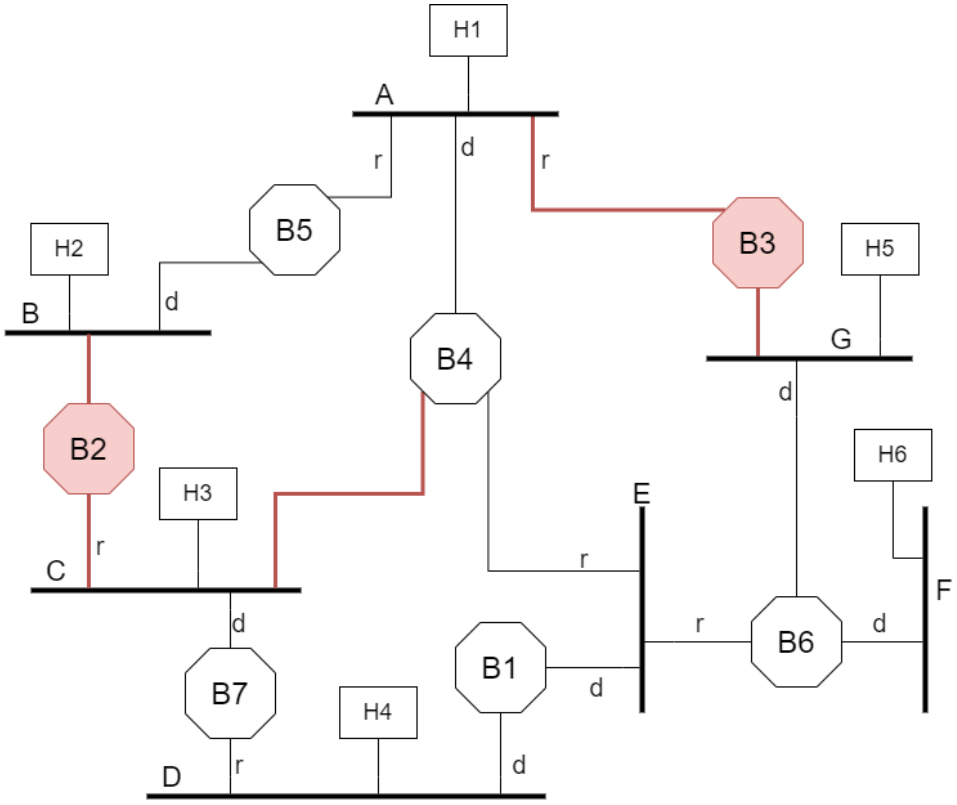
1b.) LAN D and E

1c.) LAN B, A, E, and D

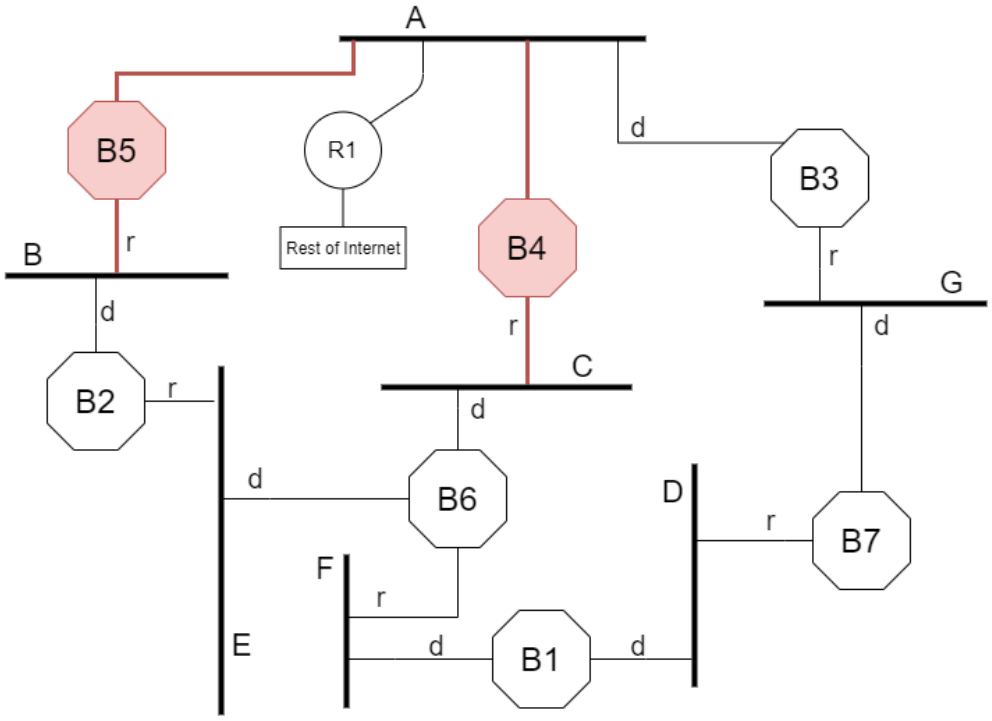
2a.)



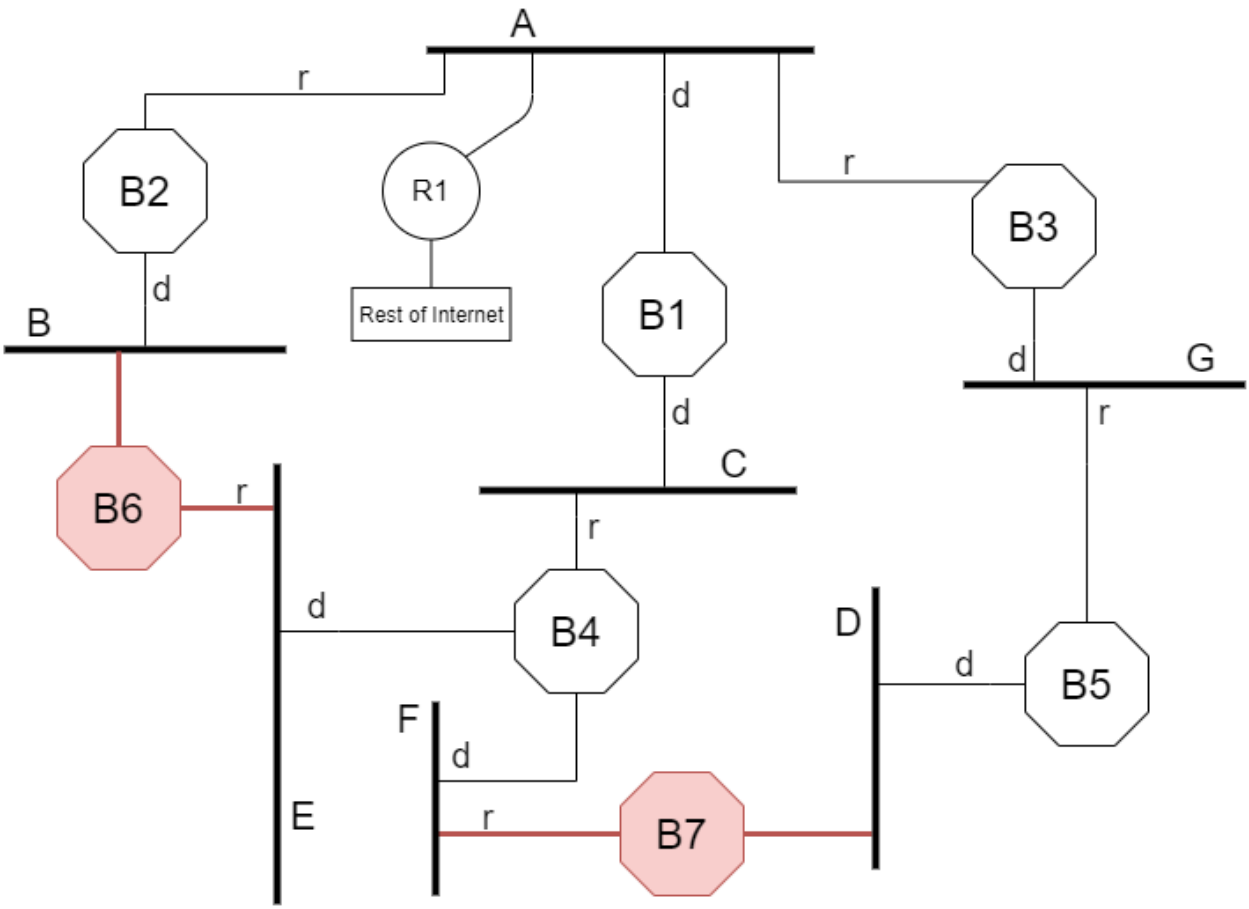
2b.)


H1
A
r
d
r
B5
B3
H2
H5
B
d
B4
G
d
B2
H6
H3
E
r
r
C
F
d
r
B6
d
B1
d
B7
H4
D
r
d

3a.)


A
B5
R1
d
B3
r
B
Rest of Internet
B4
G
d
r
d
B2
r
C
d
d
B6
D
r
B7
F
r
E
d
B1
d

3b.)



4a.)

If S1 forwards all frames, that is the equivalent of having direct links between all the switches that connect to S1. For example, S2 would simulate a direct connection to S4, S5, S6, and S7.

Likewise:

S4 would simulate a direct connection to S5, S6, and S7.

S5 would simulate a direct connection to S6 and S7.

S6 would simulate a direct connection to S7.

In this scenario, S2 is the Root Node. S4, S5, S6, and S7 set their root ports to S1, while S3 sets its root port directly to S2.

4b.)

If S1 blocks and drops all spanning tree messages, the network would create two root nodes; S2 and S4. S7 sets its root port to S5, S5 sets its root port to S3, S3 sets its root port to S2.

On the other hand, S6 will set its root port to S4.

5a.)

Packet 1:

Length – 900 Bytes (880 Data + 20 Header)

M Bit – 1

Offset – 0

Packet 2:

Length – 340 Bytes (320 Data + 20 Header)

M Bit – 0

Offset – 64

5b.)

Packet 1:

Length – 596 Bytes (576 Data + 20 Header)

M Bit – 1

Offset – 0

Packet 2:

Length – 324 Bytes (304 Data + 20 Header)

M Bit – 1

Offset – 64

Packet 3:

Length – 340 Bytes (320 Data + 20 Header)

M Bit – 0

Offset – 128

5c.)

Packet 1:

Length – 596 Bytes (576 Data + 20 Header)

M Bit – 1

Offset – 0

Packet 2:

Length – 324 Bytes (304 Data + 20 Header)

M Bit – 1

Offset – 64

Packet 3:

Length – 340 Bytes (320 Data + 20 Header)

M Bit – 0

Offset – 128

6.) The Offset field is 13 bits and the Length field is 16 bits. For the offset to represent 65536 (2^{16}) Bytes using only 8192 (2^{13}) numbers, the best solution was to use 8-Byte intervals.

7.) IPv4 waits for reassembly until all packets reach the destination because it is possible for some of the packets to take different router paths (due to congestion), and therefore cannot reassemble.

IPv6 does not allow for fragmentation because creating and reassembling fragments would be too much work for intermediate routers, which would hamper performance.