# NAME:

Rulebook:

1. Please read the entire paper before you start.
2. No cell phones, no Internet allowed for the 3 hour exam.
3. Use of comm. server is compulsory. (No points for using it, but negative 5 for not using it.)
4. Make necessary assumptions; just don't change the network, and addition of extra physical
connections is strictly prohibited. Mail the SA's in case of a doubt
5. Please clean up all the devices before you leave (Negative 10 for not cleaning your devices).
Do not save any configurations in your flash drive or in the PC.
6. Everything will be tested before giving out any perfect points. Try working on all objectives,
partials might be granted based on class performance
7. If at all there is any proved discrepancy in the paper then points will be awarded based on
appropriate solution that you have. Mail the SA if you think youhave found a "bug" in the paper
8. If required you may take a 10 min meditation break by taking the permission of the proctoring
TA.
9. 'Copy Run start' or 'write men' at regular intervals to ensure that you don't lose your
configurations if a device crashes. :(
10. Make sure you roll up all the cables and keep them in their correct drawers after finishing up.
(-5 for the entire batch if the cables are not kept in order, so ensure that your peers too keep the
cables properly)
11. DO NOT WRITE ANYTHING ON THE DIAGRAM

GAME OF THRONES
WAR AGAINST THE WHITE WALKERS!

The seven kingdoms of Westeros are in embroiled in violent dynastic conflict as they determine who would take over the Iron Throne. The Starks of Winterfell, the Baratheons of Kings Landing, the Freys from The Twins, the Tarths, along with Deanerys Stormborn and her army are at war. There is increasing mayhem as the White Walkers from beyond the Wall have infiltrated Westeros. The only way to survive is to travel to the lands beyond the Wall. It lies in your hands to join hands with the right allies and escape. As you build your strategy for victory, beware of your enemies! You have two days to plan your strategy, work you way around the kingdoms to finally win the war! Act fast, for 'Winter is coming' .

Layer 2 map
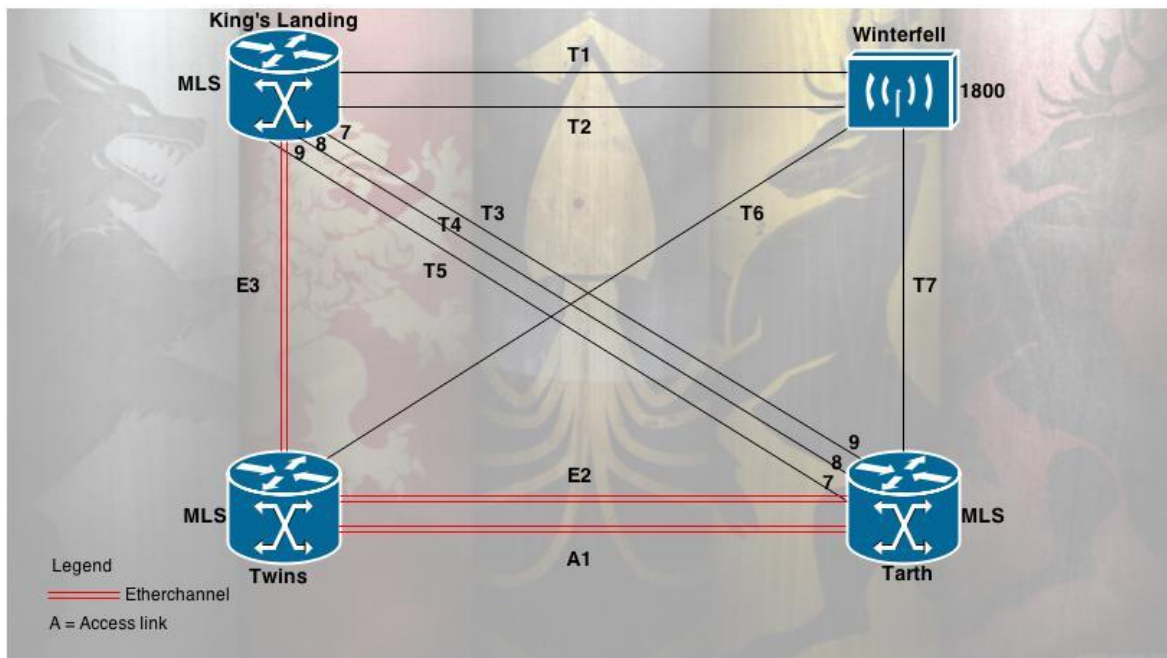
Layer 3 map
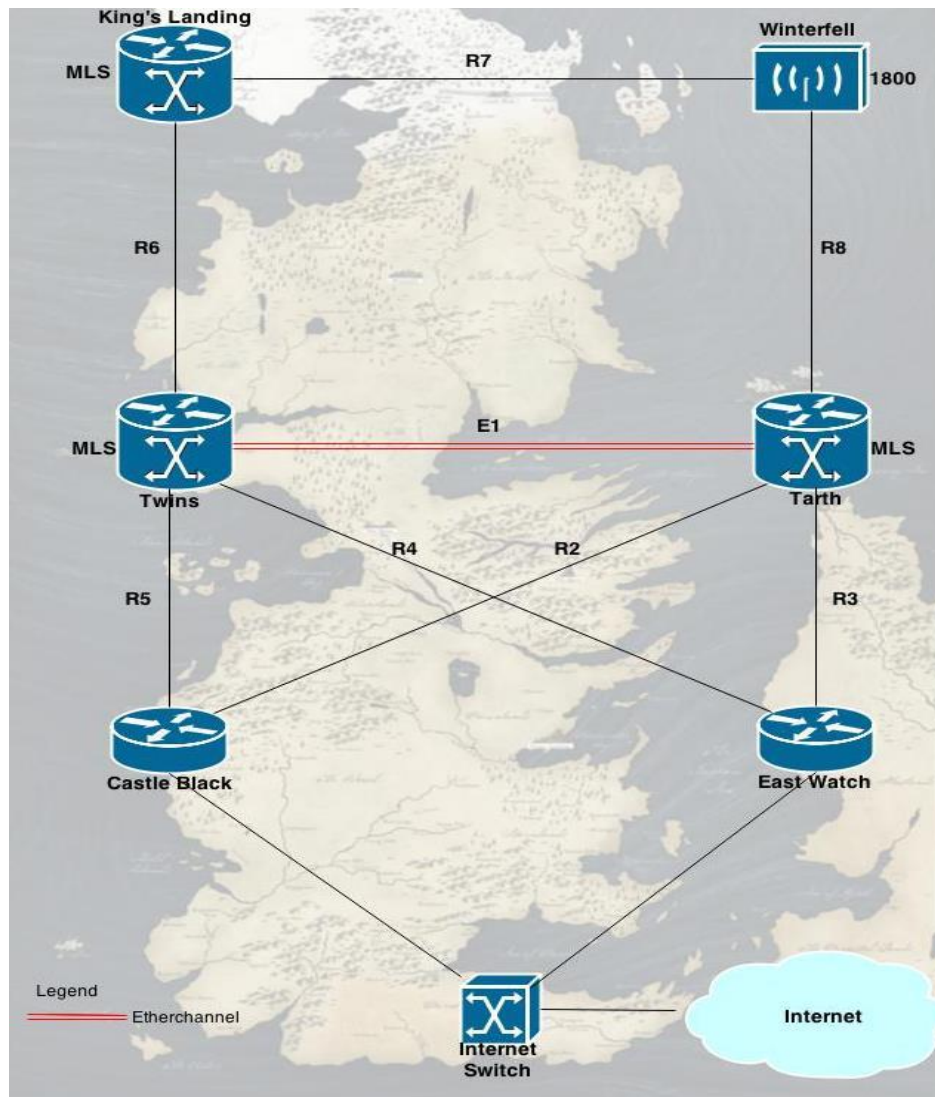
Your mission is spread across the regions of Winterfell, Kings Landing, The Twins, Tarth, Eastwatch and Castle Black. The Internet switch exists at the Wall. There is a wireless 1800 MLS at Winterfell, and one MLS each at Kings Landing, Tarth and Twins. You will use Eastwatch and Castle Black to route your way beyond the Wall. But as the Wall separates the seven kingdoms of Westeros from the dreaded White Walkers, you would need to translate your addresses and disguise your origins before you reach the Wall.

Your aim is to reach beyond the Wall with your allies — Starks, Tarths, Deanerys Stormborn, Maester Aemon and John Snow and leave behind your enemies — Joffery Baratheon, Walder Frey, and the White Walkers. Beware of your enemies else, destructive evil shall spread beyond Westeros (and yes, you would lose points)! Charge ahead! Valar Morghulis!

For you to proceed you should know who is leading each house and where they are stationed — Eddard (Ned) Stark leads the Starks from Winterfell, Brienne Tarth leads the Tarths from Tarth, Joffery Baratheon rules from Kings Landing and Walder Frey holds court for the Freys from the Twins.

Daenerys Stormborn has a magnanimous army of 12384 freed slaves at Kings Landing while Joffery's royal army consists of 11381 soldiers at Winterfell. At Winterfell, Ned Stark also has his army of 8189 men standing guard. Brienne Tarth has 4095 soldiers stationed at Tarth. Maester Aemon has 200 courtiers at Kings Landing; while Walder Frey has his army of 3200 minions at the Twins. The Night's Watch lead by John Snow has 2040 dedicated men at Tarth fighting to protect Westeros from an army of 254 White Walkers that walk and kill innocents in Westeros as you read this!

While you number the armies, keep it in mind to reserve some space for additional allies to join the houses they prefer. You have been assigned the space of 172.2X.88.224/16 where X is your rack number. Save some space at

172.2X.45.222/21,   172.2X.175.18/20,   172.2X.178.80/22,   172.2X.191.16/21   and 172.2X.182.252/24. Use 192.168.2X.0/24 for your routed links.

To better manage their communication channels, each house has set up etherchannels. Etherchannel E1 is a routed link between Twins and Tarth constructed using Cisco proprietary protocol where Tarth initiates the channel and Twins listens. Etherchannel E2 is built between Twins and Tarth using a protocol that is the IEEE standard. This link has a throughput of 1100Mbps and is built such that Twins initiates and Tarth listens. Etherchannel E3 is built between Kings Landing and Twins with a throughput of 600 Mbps. Link A1 is built between Twins and Tarth and has throughput of 300 Mbps and allows only Danearys Stormborn to use it. This link uses the Cisco proprieatory protocol again.

For etherchannel E2, DTP negotiations are started by Tarth while Twins listens. Link T3 is constructed such that Kings Landing initiates the DTP negotiations and Tarth listens. For T4, the DTP configuration for T3 is reversed. You can configure T5 unconditionally while for T6 , Winterfell negotiates the DTP connection while Twins listens. T1 link is to be used by the Starks, Brienne, Jon Snow and Danearys Stormborn only while only Maestor Aemon, Joffery, Walder Frey and White Walkers can use the T2 link.

Kings Landing and Tarth distribute VLAN information to all other switches in Westeros. The Twins learns VLAN information from them while Winterfell has its own database of VLANs. However, VLAN information is propagated by Winterfell even if domain names do not match.

For STP topologies, you can refer to the end of the paper. However, be careful while making your spanning trees. Links T3, T4 and T5 are present for redundancy and you need to be extra vigilant while configuring your STPs!

One port on Kings Landing does not allow any other user, but Maester Aemon to connect to it. This port is secured to shut down incase any other house tries to access it. However, it recovers in 45 seconds. The secured port is aware of Maester Aemon's identity before he connects to it. One port on Twins allows any two Frey men to connect to it. However, if any other house tries to connect to this port, this port restricts them from connecting. This port has no information of the Frey men connecting to it beforehand. Both these ports on Kings Landing and Twins do not participate in spanning tree.

Ned Stark has his wireless VLAN hidden at Winterfell. He has secured it with WPA2 security and configured it such that only two Starks can access it. Joffery Baratheon also has his VLAN at Winterfell. However, it can be seen by all. Wired and wireless VLANs are able to talk to each other. The format of SSIDs is – XY_NAME where X is your rack number and Y is 'A' if you are in 1B40 and 'B' if you are in 1B20.

Any Stark gets his/her IP from Castle Black and uses Tarth as the default gateway. Men from Joffery's army get their IPs from Twins and use the same as their default gateway. However, they can use those IPs for a maximum of two days at a time. Maester Aemon's men have their default gateway at Twins and get their IPs from there itself. Brienne Tarth needs to go all the way to Eastwatch to get her army their IPs, after using Tarth as her default gateway; while Deanerys Stormborn goes to Winterfell to get IPs for her army and uses it as a default gateway too. John Snow has his default gateway at Tarth.

Remember that you need to access the Internet to reach beyond the Wall. For this, you will need to obtain appropriate DNS information to route yourself into the free (public) world!

All houses have opted to use for the classless version of RIP in order to route their way to the Wall. The Wall is your barrier and is connected to the free (public) world

on port 0/X and 0/1X where X is your rack number. You should be able to reach the Wall and beyond either via Castle Black or Eastwatch after translating your address appropriately. Both CastleBlack and Eastwatch are one hop away from the Wall and they advertise this default information throughout Westeros. However, each house makes use of only their specified routing paths to reach the Wall.

Ned Stark and Brienne Tarth use Tarth as their active gateway to exit the network and reach Castle Black. Incase R2 link fails, Twins takes over and continues routing the packets. The switches are configured such that even if Twins switch comes online first, Tarth switch takes over and becomes active. Enable tracking for link R2. Tarth uses Castle Black as default gateway.
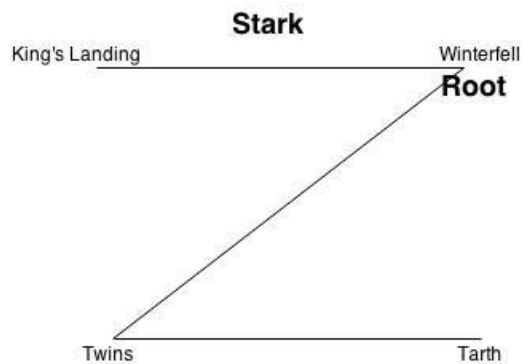
Maester Aemon and Joffery use Twins as their active gateway to exit the network and reach Eastwatch. Incase R4 link fails, Tarth takes over and continues routing the packets. The switches are configured such that even if Tarth switch comes online first, Twins switch takes over and becomes active. Enable tracking for link R4. Twins uses Eastwatch as default gateway.

Ned Stark and his army should reach the Wall from Castle Black and should use link R5 to Twins, R6 to Kings Landing and R7 to Winterfell for the reverse route. Maestor Aemon reaches his default gateway at Twins and then reaches Eastwatch using R4 thus reaching the Wall. For the return route, he uses R3 to reach Tarth and R8 to reach Winterfell and then finally R7 to reach back to Kings Landing. Brienne Tarth reaches Castle Black and then the Wall and uses R5 to Twins, R6 to Kings Landing, R7 to Winterfell and R8 to Tarth as her reverse route.
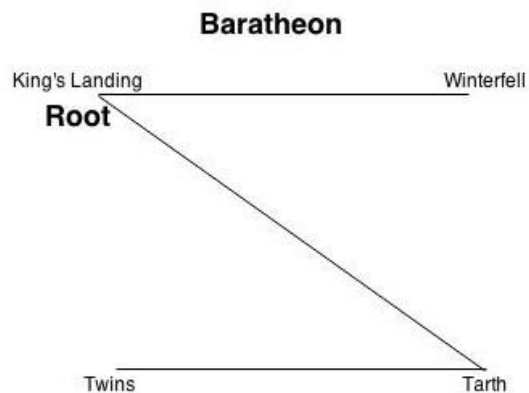
Walder Frey advertises his routes but his routes are not seen by anyone. Joffery Baratheon and the White Walkers advertise their routes too. But they are not able to reach the Wall. Jon Snow and Deanerys Stormborn should be able to reach beyond the Wall and free themselves. Reach http://www.hbo.com/game-of-thrones#/ to escape beyond the wall and to safety.
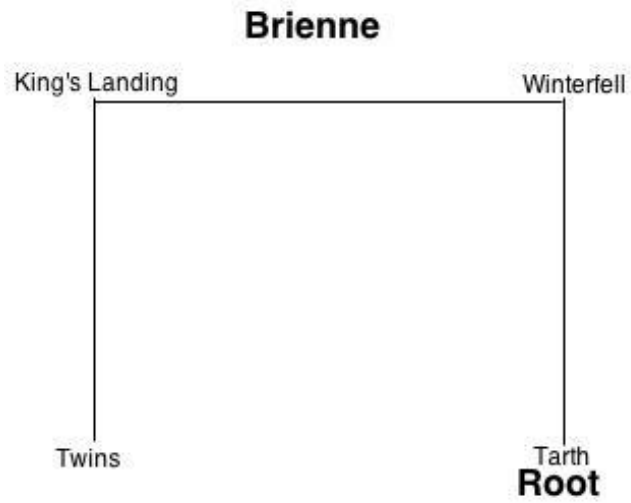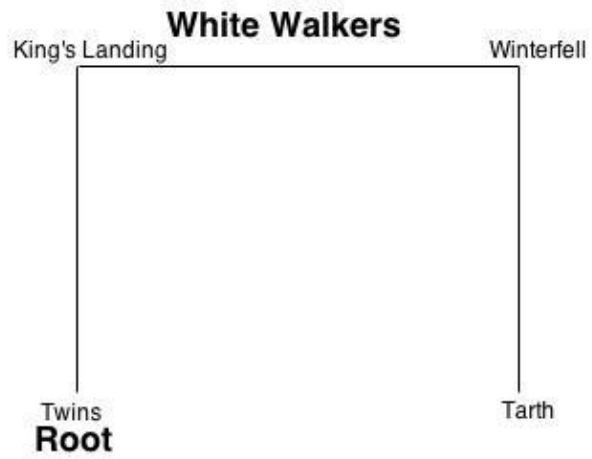
You also need to secure remote access to all cities. For security reasons, Westeros does allow access to any of its cities on the traditional port 22 assigned for SSH. Use SSH port-forwarding with different ports but one public IP address to remotely access cities that support it.

Loop free topology

Stark

King's Landing ———————————— Winterfell
                                      Root
                                   /
                                /
                             /
                          /
                       /
Twins ———————————— Tarth

For Baratheon, use T5 as the primary link. If T5 fails, use T4, then T3

Baratheon

King's Landing ———————————— Winterfell
Root \
      \
       \
        \
         \
          \
Twins ———————————— Tarth

White Walkers

King's Landing   Winterfell

Twins   Tarth
Root

Brienne

King's Landing   Winterfell

Twins   Tarth
Root

IP Addressing:
Use this page to write your answers only