

12 Tüdalen

1. Rhwch yr holl wybodaeth y gofynnir amdani yn y blychau isod.
2. Rhwch eich enw yn y lle ddarparwyd ar y dde, plynwch et a'i selio i lawr (gan ddefnyddio'r label a ddarparwyd) !
guddio'ch enw.

CYFENN:

ENW(AU) CYNTAF:

5. Dechreuwch bob ateb ar dudalen newydd. Gwnewch unrhyw fras nodiadau yn y llyfr atebion a thynnu llinell drwyddynt.

4. Ysgriennwch eich atebion mewn inc.

6. Ni ddylid rhwgo unrhyw ran o'r llyfr hwn; rhaid ei gyflwyno yn gyfan.

7. Os defnyddir mwy nag un llyfr, rhwymwch hwy gyda'i gilydd gan ddefnyddio'r tagiau sydd ar gael oddi wrth y gwyllwyr/gwylwyr.

8. Rhaid dychwelyd pob llyfr. Ni chaniateir mynd â llyfrau atebion, wedi eu defnyddio neu heb eu defnyddio, allan o'r lleoliad arholi o dan unrhyw amgylchiadau.

(See the other side for English version)

[illegible]

12 Pages

1. Please give the information requested in the boxes below.
2. Enter your name in the space provided to the right, fold over and seal down (using the label provided) to hide your name.
3. The answers must be legibly written. The Examiners can either ignore illegible script or have it typed and the expense of typing charged to the candidate.
4. Write your answers in ink.
5. Begin each answer on a fresh page. Do all rough work in the answer book and cross it through.
6. No part of this book is to be torn out; it must be handed in complete.
7. If more books than one are used, fasten them together using the tags available from the invigilator(s).
8. **Every book must be handed in. In no circumstances may answer books, used or unused, be taken out of the examination venue.**

(Gweler yr ochr arall am y fersiwn Cymraeg)

40	41
53%	55%

SURNAME: MIRCEA-RADO-SERBAN

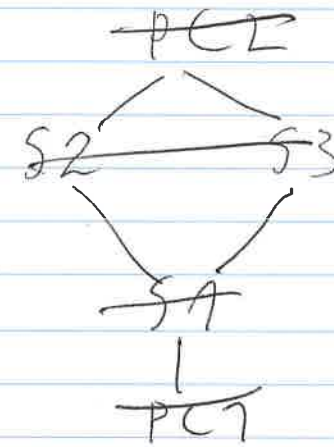
FORENAME(S): DOBRAV

- 1 a) I The use of redundant switches causes frame forwarding loops due to the operation and design of the switches themselves.

S1

S3

S2



Where are the problem?
Loops, multiple frames
broadcast storms etc



Put the question
numbers correctly
so want to find

Due to the way switches function (forwarding frames out all ports except the incoming port during a broadcast) a loop ~~could~~ ^{is} established. Following the above diagram the following happens during a broadcast: S1 to S2, S2 to S3, S3 to S1, S1 to S2 etc.

As such, the frames travel endlessly causing congestion and possible network failure.

II The solution to this problem is to use the Spanning Tree Protocol (STP). STP's rule is to remove the presence of redundant or looping paths as well as to maintain a loop-free topology. It does this through the root bridge election process.

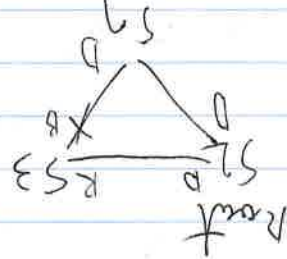
For each network segment a VLA that segment's root bridge is the master with the lowest BID (bridge ID), which is composed of:
Priority (+ VLAN number in PIST or Rapid-PIST) + MAC address.

~~For example 32768.~~

The other members of the segment are non-root bridges. These elect a master bridge of that network. Root bridge ID is the lowest cost to the root bridge.

Designated port: All ports of the root bridge are designated ports. On non-root bridges the designated port is the port which is not root port. Alternate/non-designated port: All ports which lead to the root bridge are blocked from transmitting to ensure a loop-free topology.

~~When a~~



When a designated port fails STP activates the blocked port as in the above a working topology.

Use may put an STP instance per each segment of LAN. Switches in a segment have topology community number BPSV.

(Bridge Protocol Data Unit) and ICA BPDUs with TCN (Topology Change) flag set.

le) Finally make sure that both ports on both ends of the EC (Ether Channel) have full duplex and matching speed settings.

Afterwards, the following can assign both links on both ends to the same EC group and channel aggregation protocol (PAGP or LACP). Next, depending on the aggregation protocol chosen, choose the appropriate negotiation system:

LACP ✓

On On On
Active On Passive
Passive OFF Passive
On OFF Passive
Active On Active

PAGP ✓

On On On
Auto On Desirable
Auto OFF Auto
Auto OFF On

Afterwards, configure the ECs as if they were a single interface (with an IP address etc).

- c) Broadcast storm - redundant switch topology fully congested by broadcast traffic due to the lack of a spanning tree implementation



S1 sends out all ports, so it reaches to S2 and S3, which in turn send out all ports so S3 to S2, S2 to S1, S1 to S3 and so on, causing a continuous loop of frame forwarding.

not this speed, mod. duplex etc.

2 ✓

2 ✓

more of (a) answers than c.

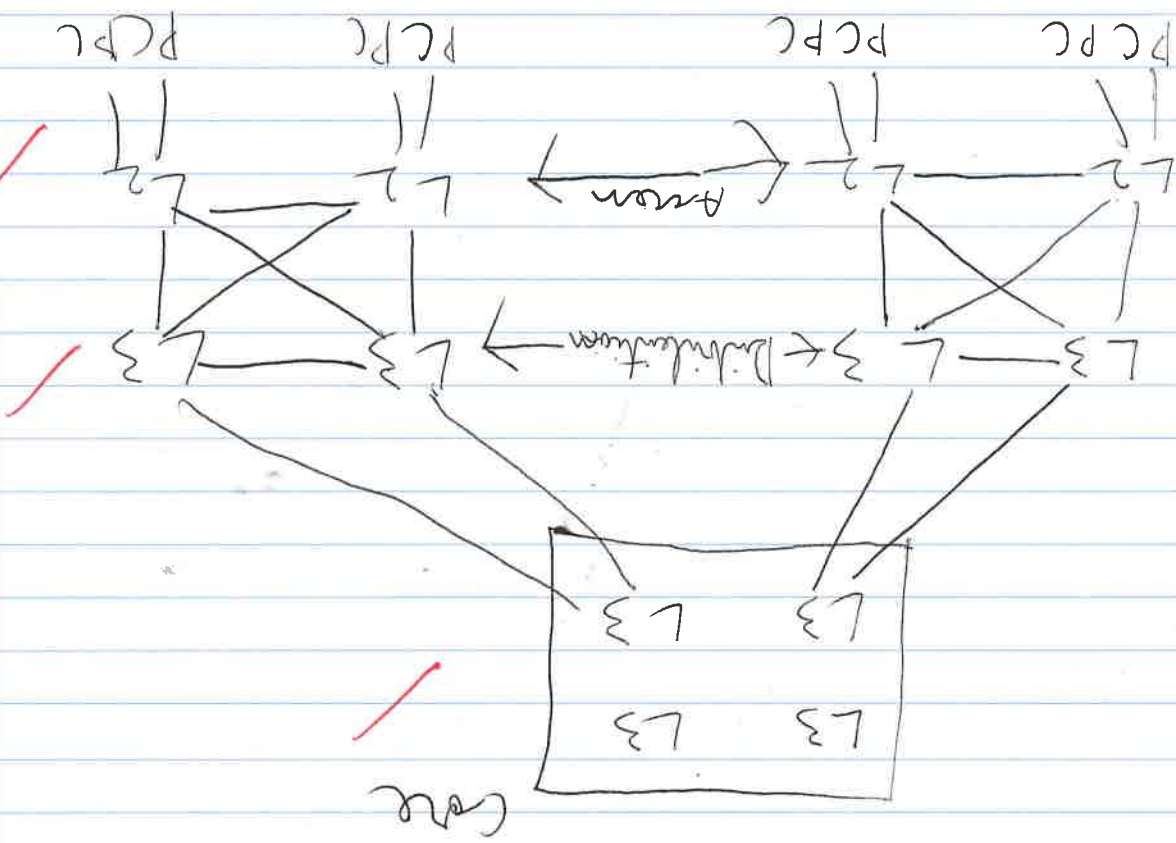
4 ✓

Solution: we 5 TP:

ARP poisoning: Attacker with rogue device with legitimate host on the network. By spoofing IP address and MAC address, the attacker may send traffic to other hosts, not knowing the true identity. Result: we DHCP message in well on 1056 (IP source spoofed) and DAH (Dynamic ARP injection).

2) a) I

2



L3 - Layer 3 switch
L2 - Layer 2 switch
PC - End device

4

II Core layer - Function on the backbone of the network, aggregating multiple campus buildings together, or pull out to provide internet connectivity.

Reliability should be 24/7 and highly secure.

Distribution layer - Aggregates VLANs together, implements ACLs, QoS, other policies, routes traffic from one VLAN to another, and connects together VLANs of the same building. Core layer is the core layer. Provider inter-VLAN routing.

Access layer - Provides connectivity to end-devices, such as computers and IP phones, enables devices to communicate with each other. Each access layer switch may function as a termination point for a specific VLAN.

III Access layer switches most often do not have IP support as its essential function is to forward frames.

If necessary, the ALS (Access layer switch) may implement 802.1X policy.

Furthermore, PoE-enabled ALS may provide power to IP phones.

Finally, common ALS have 24 Fast Ethernet (100 Mbps) ports and two Gigabit Ethernet (1 Gbps) ports. Normally, Fast Ethernet ports are the access ports connected to end devices, whilst the Gigabit Ethernet ports are used as uplinks to the distribution switches (DS switches).

b) First of all, include only the necessary SIDs in a summarized range.

Secondly, use both strong authentication (sha 256) and give encryption (aes 256).

