

SURNAME: SEARLE

FORENAME(S): GEORGE PAUL

Examination Answer Books

12 Pages

Instructions to Candidates

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 cannot 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.**

1	Student Number	P148812
2	Title of Examination Paper	ROUTING AND SWITCHING CONCEPTS
3	Module Code	ACCA5002
4	Date and Time of Examination	18/05/2019 9:00 am
5	Examination Venue	TOWNHALL GYM
6	Seat Number	G005
7	Number of Answer Books handed in	1

List the numbers of the questions you have attempted	Office Use
1	20
4	23
2	51
Total	54

(Gweler yr ochr arall am y fersiwn Cymraeg)



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Llyfr Atebion Arholiadau

12 Tudalen

Cyfarwyddiadau i Ymgeiswyr

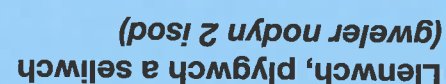
1. Rhwch yr holl wybodaeth y gofynnir amdani yn y blychau isod.
2. Rhwch eich enw yn y lle a ddarparwyd ar y dde, pigwch ef a'i selio i lawr (gan ddefnyddio'r label a ddarparwyd) i guddio'ch enw.

3. Rhaid i'r atebion fod mewn llawysgriften ddarlennadwy. Gall yr Arholwyr naill ai anwybyddu sgrïp annarllennadwy, neu drefnu iddi gael ei theipio a chael yr ymgeisydd i dalu.
4. Ysgrifennwch eich atebion mewn inc.
5. Dechreuwch bob ateb ar dudalen newydd. Gwnewch unrhyw fras nodiadau yn y llyfr atebion a thynnwch llinell drwyddynt.
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 gwyllwrr/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.

[illegible]

7	Nifer y Llyfrau Atebion a gyflwynwyd	
6	Rhif Sedd	
5	Lleoliad yr Arholiad	
4	Dyddiad ac Amser yr Arholiad	
3	Cod y Modwl	
2	Teitl y Papur Arholiad	
1	Rhif Myfyriwr	

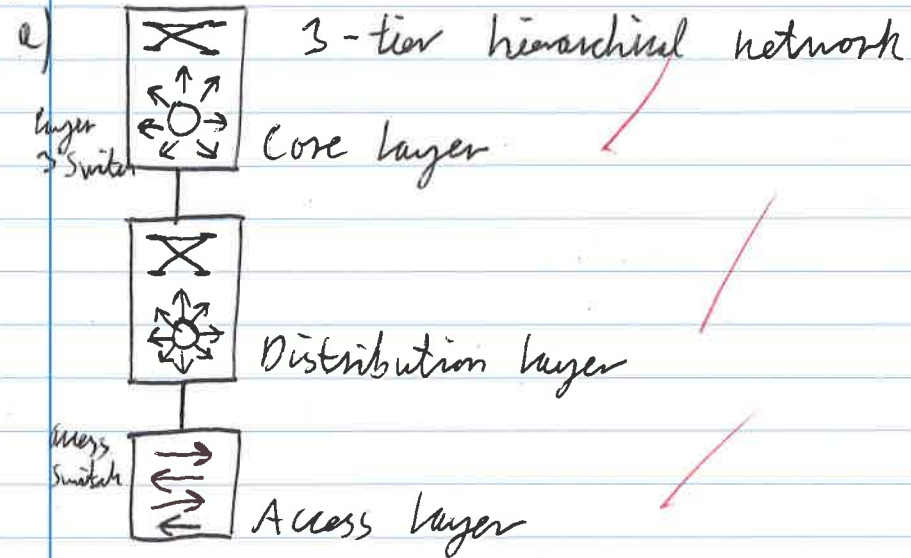
(See the other side for English version)



CYFENW:

ENNW(AU) CYNTAF:

1.



- Core layer - Provides a fast switching backbone to the network. It is the aggregator of other layers (campus blocks). It reduces ~~fast~~ domains and can be combined with the distribution layer for a collapsed design.

- Distribution layer - Interfaces with the backbone and provides intelligent routing, switching and security access control ~~junction~~ functions. Allows traffic to flow on equal cost switching paths to the backbone. Features ~~redundant~~ redundant components. Provides differentiated ~~server~~ services to various classes of applicant at the network edge. Supports layer 2 broadcast domains and layer 3 routing boundaries.

- Access layer - IS the edge of the network. Provides the means for users to connect to the switched network. ~~It~~ Allows ^{application} of applications to operate more safely and securely. ✓

2

1) b)

Inbound ACL

- Processes a packet before it is routed to the outbound interface.
- Efficient - as it saves overhead of routing lookups if the packet is denied and discarded.
- Best used when there is only one source network connected to the inbound interface.
- A series of sequential access control entries that permit or deny packets to be forwarded by a router based on information in the packet header. ✓

2

Outbound ACL

- Processes a packet after it has been routed to the outbound interface.
- Best used when there are multiple inbound interfaces that the ACL will apply to when exiting the outbound interface that the ACL is applied to.
- A series of sequential access control entries that permit or deny packets to be ~~for~~ forwarded by a router based on info in the packet header. ✓

2

1) c) Store-and-forward

- IS a switching mechanism
- It will accept the whole frame
- Perform a frame check sequence (CRC) ✓
- If the frame is valid it ~~is~~ the destination MAC address ~~is~~ will be looked up and the frame ~~is~~ sent to the correct exit interface. ✓
- Provides error checking
- ~~Buffer~~ Buffers frames ✓
- IS a slower method ✓

3

Cut through

- Forwards a frame before it is completely received. ✓
- At a minimum the destination address must be read. ✓
- No frame check sequence (no error checking) ✓
- Does not buffer frames ✓
- IS a very fast method ✓
- Used in High performance computing ✓
- ~~From~~ Fragment free switching is a modified form of cut through switching. ✓

3

4)

a)

- i)
- Reduces broadcast domains ✓
 - Improves security as there is less chance of an information breach. ✓
 - Better performance as unnecessary traffic is reduced. ✓
 - Improves IT ~~efficiency~~ and management efficiency. ✓
 - Cost saving as devices can be used more efficiently. ✓
 - Allows the segmentation of project groups and applications. ✓
 - Increased flexibility ✓

ii) Data VLAN

- A VLAN that carries user generated traffic ✓
- Voice and management traffic is not part of the data VLAN. ✓

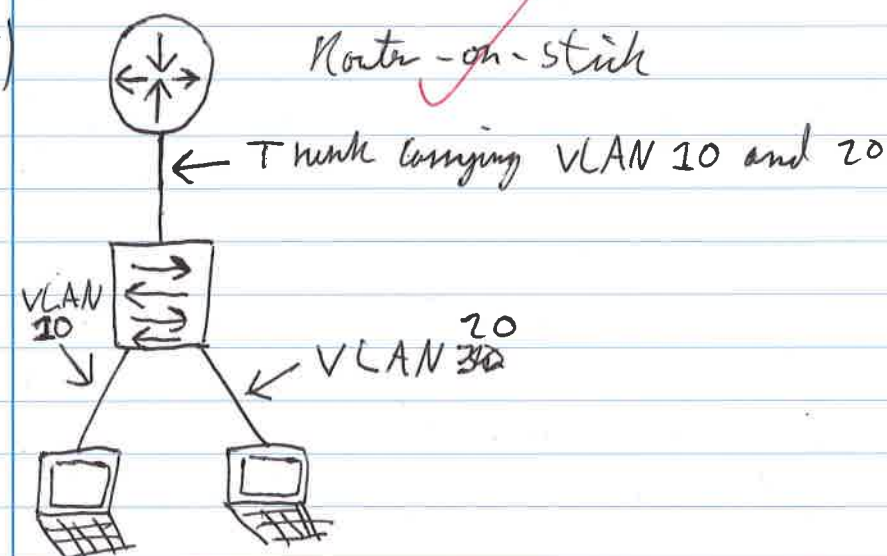
Management VLAN

- IS any VLAN that has been configured to access management capabilities on a switch. ✓
- By default this is VLAN 1, it should be changed to a different number for security best practice ✓

Default VLAN

- This is the VLAN that every switch port is assigned to after an initial boot with a default configuration. ✓
- This is VLAN 1 by default on a Cisco switch. ✓

iii)



- Router-on-Stick is a form of inter-VLAN routing. ✓
- It uses only one physical interface ✓
- ~~Like~~ It uses subinterfaces, 1 per VLAN ✓
- The router is connected to a trunk port on a switch so it can accept VLAN tagged traffic. ✓
- The router is configured with a trunking protocol such as IEEE 802.1Q so it can interpret VLAN tagged traffic. ✓
- When the router receives VLAN tagged traffic it will route the traffic to the subinterface ✓

- that ~~also~~ ^{destination} correspond to the destined VLAN.
- The sub interface acts as a gateway to the VLAN
 - The router then forwards the packet through the same interface it received the packet to the adjacent switch.

- iv) • A VLAN trunk allows VLAN traffic to propagate between switches.
- It is a point-to-point link between switches that carries VLAN tagged traffic and untagged traffic (on the native VLAN).
 - Allows same VLAN devices to communicate even when physically connected to a different switch.
 - Various trunking protocols exist e.g. IEEE 802.1Q
 - The trunking protocol defines the identifier header added to a frame e.g. 4 bytes for IEEE 802.1Q

2

- i) The address of source as seen from inside the network (e.g. a PC with a private IP address).

a)

- ii) The address of the destination as seen from inside the network (e.g. public web server).

- iii) The address of the source as seen from outside the network (e.g. the translated address).

- iv) The address of the destination as seen from outside the network. Often the same as the inside global.

b)

Process Switching

- Old method still available on Cisco ~~xxx~~ devices.
- IS a slow method but often used anymore.
- When a packet is received on an interface:
 - ↳ It is forwarded to the control plane where the router looks up the destination address in its routing table.
 - ↳ the exit interface is determined and the packet forwarded through that interface.
 - ↳ this process is performed for every packet received even if it is part of the same stream of packets.

b)
ii)

Fast Switching

- A popular method that uses a fast switching cache with next hop information.
- When a packet is received on an interface:
 - ↳ It is forwarded to the control plane where the router looks for a match in the fast switching cache.
 - ↳ If there is ~~no~~ no match the packet is process switched.
 - ↳ The flow information is stored in the fast switching cache.
 - ↳ If another packet is received with the same destination address the fast switching cache uses next hop information without CPU intervention.

iii) Cisco Express Forwarding

- The fastest and most preferred method.
- Uses a Forwarding Information Base (FIB) and adjacency table.
- The tables are not packet triggered but change triggered (e.g. change in topology).
- When the network converges the router will have all the information it will need to forward packets.
- The FIB contains pre-computed reverse lookups, next hop information and ~~interface~~ interface and layer 2 information.

c)

- Routing to a specific network
- Acting as a default route and gateway of last resort for a stub network, which will match all packets that don't have a more specific ~~match~~ in the routing table.
- Can reduce router advertisements by ~~summarizing~~ summarizing contiguous networks into one static summary route.
- Can also act as a backup route (e.g. floating static route).

d)

- The command shown is a default route.
- This route will match all packets that don't have a more specific match in the routing table.
- A reverse lookup will be needed to identify the exit interface.
- The default route has its administrative distance (AD) set at 95. The default is 1. This means that if there is another default route with a lower AD that will be the preferred route.

floating static route

Question No.		Examiner Only		Question No.		Examiner Only	

Question No.

Examiner Only



Artholwyr yn unig

Rhif y Cwestiwn

Arhif y Cwestiwn