



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

Examination Answer Books

12 Pages

Instructions to Candidates

- Please give the information requested in the boxes below.
- Enter your name in the space provided to the right, fold over and seal down (using the label provided) to hide your name.
- 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.
- Write your answers in ink.
- Begin each answer on a fresh page. Do all rough work in the answer book and cross it through.
- No part of this book is to be torn out; it must be handed in complete.
- If more books than one are used, fasten them together using the tags available from the invigilator(s).
- Every book must be handed in. In no circumstances may answer books, used or unused, be taken out of the examination venue.**

Complete, fold and seal
(see note 2 below)

SURNAME:

Jones

FORENAME(S):

James Robert

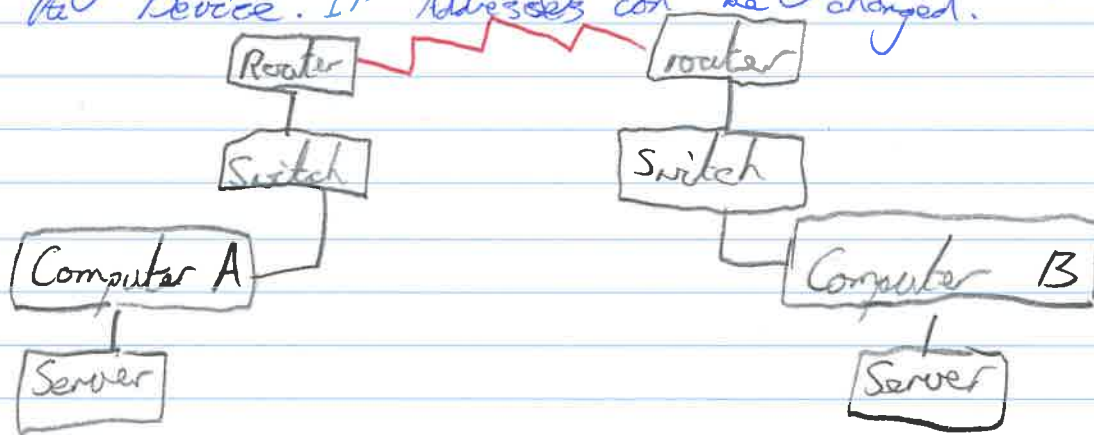
1	Student Number	<i>P138563</i>
2	Title of Examination Paper	<i>Web Services</i>
3	Module Code	<i>ACCA7003</i>
4	Date and Time of Examination	<i>13/05/19</i> <i>9am</i>
5	Examination Venue	<i>307</i>
6	Seat Number	<i>-</i>
7	Number of Answer Books handed in	<i>1</i>

List the numbers of the questions you have attempted	Office Use
<i>1</i>	<i>6</i>
<i>2</i>	<i>4</i>
<i>3</i>	<i>10</i>
<i>4</i>	<i>11</i>
Total	<i>31</i>

(Gweler yr ochr arall am y fersiwn Cymraeg)

✓ GT 31/5/19

Q1A) firstly when we look at a given web address such as <https://google.com> this is a DNS representation meaning Domain Name System. DNS is used mainly for the user to understand where and what we are searching for. what is actually happening is assigned to the <https://google.com> is an IP Address. An IP address is an unique identifier and a way in devices communicating with each other. Each device also has a MAC address which is an unique identifier which cannot be changed and is usually made by the manufacturer of the Device. IP Addresses can be changed.



When looking at the illustration above if Computer A browser is used the first thing it will do is look into the ARP Cache (Address Resolution Protocol) if it finds the IP Address searched for then a quick response of the given website will appear because the website has already been visited before and the memory of Computer A manages it. But if this is not the case, then the Smarts of a router is used to look behind the network onto the internet to retrieve the information, Routers communicate with other routers which are connected to other DNS Servers to retrieve the IP address.

Going back to IP addresses (Internet protocol) just because its name Internet Protocol doesn't necessarily mean its on the internet, IP addresses can be

Manually assigned to a computer which is not so good if there are very few computers to connect in a local subnet but if we were to be managing hundreds of computers the use of DHCP comes in very useful (Dynamic Host Configuration Protocol) DHCP automatically assigns IP addresses for each device it is clever enough to make ~~sure~~ no two given devices have the same IP address on the network to avoid IP conflicts.

Within the process along with IP addresses the Subnet mask is setup along with the DNS Server number, when the IP address is found a handshake ^{is needed} the IP address basically send a request the IP address send back a response saying it there then our IP asks for information from that device and the data is sent.

b) URI - The URI (^{uniform} ^{resource} identifier) is an identifier for the website and name.

URL - Uniform ^{resource} identifier ^{language} Points to endpoint of given website.

URN - Uniform ^{resource} identifier ^{language} Relationship of IP on some network.

2a) HTTP Verbs used in CRUD include GET, POST, PUT & Delete

GET - A Get request is used to retrieve data needed say from a database to the frontend, backend code is used to retrieve the data needed for example in a JSON response and then to display on a website.

Post - A Post request acts almost in the opposite direction a user of the front end may want to store information. A Post request retrieves the given data and can store somewhere on the database again using JSON or xml / PHP.

DELETE - delete request are self explanatory if something is needed to be deleted this request can be used to remove data no longer needed.

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b) HTTP operations is slowed to idempotence due to needing security measures and authentication.

c) Response codes are given as error handlers for various web services

200 - whitespace error.

401 - response error ~~error~~

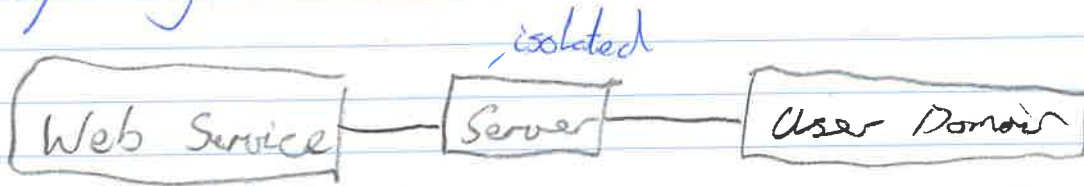
402 - response error ~~error~~ (Request)

404 - Non responsive external error

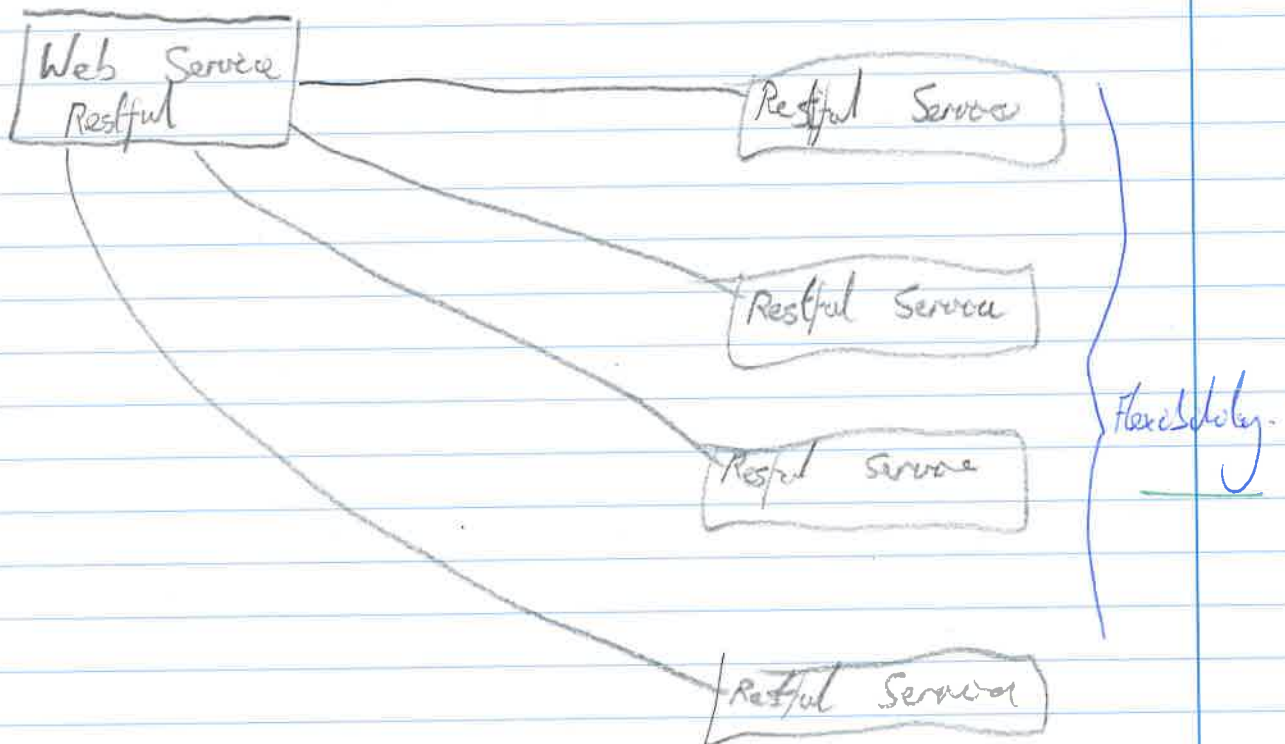
500 - Server ~~done~~

d) 401 and 402 and response error one says 'it can retrieve information and the other cannot send and receive anything from the sent request.

3a) A RESTful web Service allows huge advantages when it comes to flexibility. In old type web Service would all be ran together causing J2EE problems because of dependency issues, as shown below:-



RESTful splits all the services needed into usable chunks allowing developers to actively work on different parts.



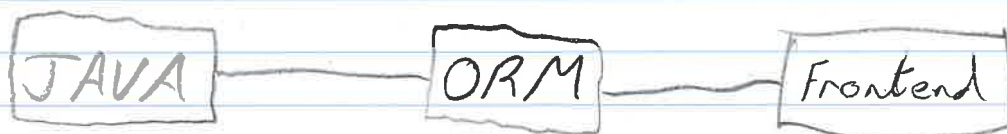
Instead of working from one Server RESTful allows a whole network of different needed Service to work independently from each other. This removes isolation from a developer. It allows different languages to be used together and collectively. For example using a RESTful web Service such as Springboot takes away a lot of the heavy work needed. ~~For~~ If something was to fall over a RESTful Service can see what is going on instead of the whole server falling over.

- b) The JPA can access a database by using various options a relevant format would be to use a JSON format which can be sent using an AJAX Method in javascript, JSON is regularly used in today's computing as it sends strings of data easily and can be deserialised easily to retrieve the given data needed.

Relevant Transport formats:-

Common Transport formats ~~to use~~ ^{to use} JSON but there is also the use of XML and PHP. By using these formats data is able to be transferred for example a frontend to Database or over retrieved from a backend Database to be displayed easily by using these formats.

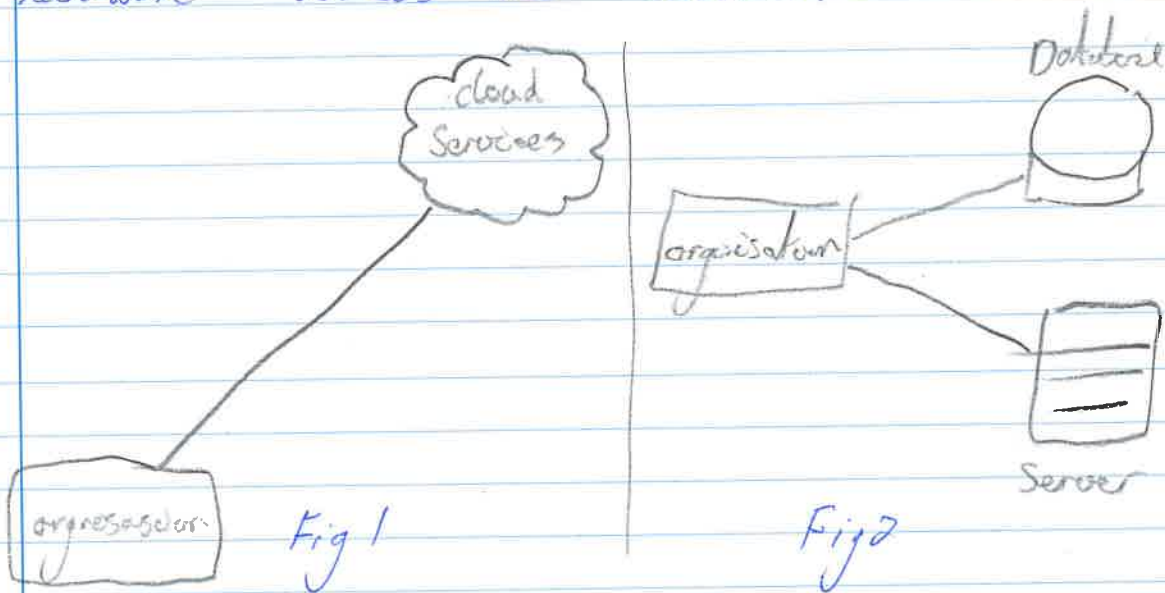
Hibernate is a Java Service which can be used along with a Spring Boot Service it's able to load and build and compile different language styles and do all the heavy lifting.



ORM (Object relational mapping) is used for example to allow a Java object class to be able to communicate with other languages. The ORM has boilercode that does all the heavy lifting for a developer and allow a nice key for languages to be able to collaborate and speak with each other.

40) ~~Benefits~~

Benefits of on-demand Cloud Computer platforms are instead of having to use ^{big} dated Server rooms like some organisations ^{not really, they're just on the internet} still use the benefits are cloud Computing removes all of this and different services can be used and accessed from a cloud server reliably it cuts costs because less hardware resources are needed:-



As a simple example organisation can use a cloud based service and retrieve everything they need efficiently and effectively through servers provided by other organisations. Prime example of this type of service is Amazon web services (AWS) which offer a wide range of services through cloud base systems to help run your business and cut out a ~~lot~~ lot of work needed from previous web system as shown on fig 2 where there the need for large server and database use.

There are still limitations to consider such as authentication and security. Cloud Computing platforms are designed by other companies which in turn does help but the services might not help you achieve what specification is needed for your own organisation meaning that maybe important things are missed out from a

Service that might of been easier to build yourself. Such as Specification Rules and regulations.

- b) Vulnerabilities when having your web Service can be authentication when a user has access to your hosted website we need to make sure the user can only access what is needed. Compared to an admin user who would generally need access to everything. We wouldn't want a user to be able to change important thing on our web Service. This is where Security comes in there's many way of Securing and sometime high level Security is needed such as 2 key verification to prove that you are the person who you say you are. With this type of Security it removes the Vulnerability of Personal Data being lost, stolen or corrupted.

- c) The key benefits of an Automator tools to facilitate implementation is to cut costs and time, there are very good tools out there that can be used. For example if I needed to test a car vehicle type this vehicle may contain 50 other field which need to be correct to be able to move forward within the websites overflow, say I put every bit of default in which is perfectly fine to do so the moved on in the process but needed to start the test again it would be impractical to re-type 50 field all over again. This is where for example Swagger Comes in very handy, Swagger exports PARAOAS, payloads can carry the needed data for each field and can be changed slightly in accordance to each test and gives us the response needed. The Automator

tool is very useful in cutting time hence cost and
Allows a developer to create test efficiently.

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