Platinum - Unit 40 - Cloud Based Services and Applications

Relevant LINKS

BACK TO ITQ UNITS **[1]**

Handbook home page **[2]**

Overview

The candidate can plan and execute the transition to a cloud based system. They will analyse issues such as connectivity and match the cusotmer requirments to the available hardware and software. They will evalaute and carry out detailed account management tasks and detail possible costs over the long and short term. They will analyse and evaluate interoperability solutions and make recommendations based on their findings..

A work activity will typically be 'non-routine or unfamiliar' because the task or context is likely to require some preparation, clarification or research to separate the components and to identify what factors need to be considered. For example, time available, audience needs, accessibility of source, types of content, message and meaning, before an approach can be planned; and the techniques required will involve a number of steps and at times be non-routine or unfamiliar.

Example of context – candidates can investigate and assist in the migraito of a local company or charity to cloud based services and applications.

Activities supporting the assessment of this unit **[3]**

Example of work at this level **[4]**

Assessor's guide to interpreting the criteria

General Information

RQF general description for Level 3 qualifications

- Achievement at RQF level 3 (EQF Level 4) reflects the ability to identify and use relevant understanding, methods and skills to complete tasks and address problems that, while well defined, have a measure of complexity. It includes taking responsibility for initiating and completing tasks and procedures as well as exercising autonomy and judgment within limited parameters. It also reflects awareness of different perspectives or approaches within an area of study or work.
- Use factual, procedural and theoretical understanding to complete tasks and address problems that, while well defined, may be complex and non-routine.
- Address problems that, while well defined, may be complex and non-routine. Identify, select and use appropriate skills, methods and procedures. Use appropriate investigation to inform actions. Review how effective methods and actions have been.

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- Take responsibility for initiating and completing tasks and procedures, including, where relevant, responsibility for supervising or guiding others. Exercise autonomy and judgement within limited parameters information and ideas

Requirements

- Standards must be confirmed by a trained Platinum Level Assessor or higher
- Assessors must at a minimum record assessment judgements as entries in the on-line mark book on the INGOTs.org certification site.
- Routine evidence of work used for judging assessment outcomes in the candidates' records of their day to day work will be available from their e-portfolios and on-line work. Assessors should ensure that relevant web pages and files are available to their Account Manager on request by supply of the URL.
- When the candidate provides evidence of matching all the criteria to the specification subject to the guidance below, the assessor can request the award using the link on the certification site. The Account Manager will request a random sample of evidence from candidates' work that verifies the assessor's judgement.
- When the Account Manager is satisfied that the evidence is sufficient to safely make an award, the candidate's success will be confirmed and the unit certificate will be printable from the web site.
- This unit should take an average level 3 learner 55 hours TQT to complete.

Assessment Method

Assessors can score each of the criteria N, L, S or H. N indicates no evidence. L indicates some capability but some help still required. S indicates that the candidate can match the criterion to its required specification. H indicates performance that goes beyond the expected in at least some aspects. Candidates are required to achieve at least a S on all the criteria to achieve the full award.

Expansion of the assessment criteria

1. Candidates will Plan select and analyse the connectivity required for cloud based services and applications

1.1 I can describe the connectivity needed for cloud based services to work

Candidates should be able to describe the main issues with connectivity when using cloud based services.

Evidence: will be provided directly from student portfolios and assessor feedback.

Additional information and guidance

Learners should be able to demonstrate that they can research the possible options and find some detail about how they work in terms of performance. It would be useful if they can illustrate some of the elements that will affect connectivity, such as interference on wi-fi, contention levels or being in areas where there is little or no phone

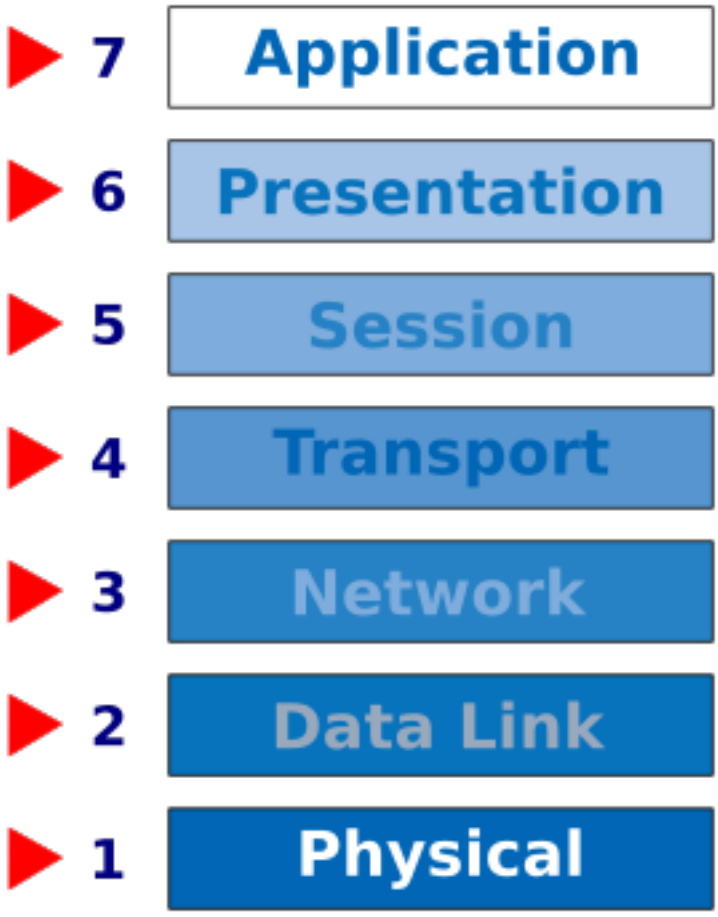
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connectivity. Some indication of the required performance for specified tasks would be useful. If they want to get some HD video up onto their cloud based video server, then a poor quality 2G connection will not be suitable, so there is a need to plan around connectivity and how much impact it has on tasks overall. It might be useful for them to use this in conjunction with their project so that they may do a check-list of tasks required and describe the connectivity needs of each of these and discuss how they might be met, or at least mitigated. If they combine this with their real-world project, they can carry out some basic connectivity tests for a client and assess how well they work and what some of the main issues were (if any) that needed to be resolved.

One key issue of Internet connectivity that candidates need to understand is the importance of the OSI model.
https://en.wikipedia.org/wiki/OSI_model [5]

The Open Standards Connection model has been used to make sure that devices working on the Internet, regardless of level and function, will generally be able to talk to each other. In this way, regardless of your initiating (sending) or terminating (receiving) device, it will generally work. Therefore, if you send an email from your Apple phone, it will pass through Linux or Windows servers and be presented to your friend on a Windows device and look pretty much the same as how you sent it.

The following is a standard diagram of the OSI from openclipart.org.



Candidates need to be familiar with the main functions and attributes of each layer, but do not need to know them in great detail. They should also understand what hardware or software usually operates at each layer and there are plenty of websites to explain this detail.

1.2 I can analyse the connectivity needed to make cloud based services productive and efficient

Candidates should be able to analyse the main features of cloud based connectivity and relate these

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to its effectiveness and efficiency.

Evidence: will be provided directly from student portfolios and assessor feedback.

Additional information and guidance
Learners should be able to carry out some research into the different aspects of cloud based services and look at the ways that people use these, or might use these. They could carry out a simple survey in order to gather data to support their conclusions and guide their solutions. The key terms here might well be “productivity and efficiency”. Do people working in a local office really need some of the advanced features of a desktop based, full-featured word processor? How can you assess what their needs are and what package might meet them. Most companies are moving to the cloud as a cost saving exercise, but also for more efficiency. There is little or no training required if the word processor being used has only the basic features required. Candidates need to show this level of research and understanding. If systems are less feature rich, this might also translate into less connectivity needs. However, many organisations, such as primary schools, are moving to completely mobile systems. What are the connectivity requirements now?

1.3 I can critically assess the needs of different devices needed to connect and use the cloud, including any limitations they might have

Candidates should be able to assess in detail connectivity issues, including any limitations.

Evidence: will be provided directly from student portfolios and assessor feedback.

Additional information and guidance

Learners should be able to demonstrate their complete understanding of the range of needs of connectivity for any organisation considering a move to the cloud. One key aspect which is sometimes overlooked is the use of responsive theme designs or sites that use elements such as Flash. As of 2016, Google and Apple will no longer support Flash with their browsers. What impact will this have on connectivity? How many organisations that develop material for devices are designing using HTML5 and what impact will this have on the functionality and usability of various devices. Are some devices more useful than others? What speed and range are required for different environments and how can these be accurately assessed. if limitations are recognised, what general considerations need to be made to address this weakness?

1.4 I can research and recommend applications for cloud based services dependent on needs

Candidates should be able to make realistic and reasoned recommendations to meet real needs based on solid research.

Evidence: will be provided directly from student portfolios and assessor or client feedback.

Additional information and guidance

Learners should be able to match user needs to their clear understanding of applications. They will need to research in detail the different solutions and be able to accurately match these to perceived needs. In some cases, they may be able to make recommendations which exceed client’s needs as they have been so detailed in their research and understanding.
At Level 3 they would be expected to be at this level of professionalism. As with 1.3, it would be useful to deploy various techniques to assess needs such as surveys or interviews. In terms of applications, they should show that they do not rely just on manufacturer’s claims, but research more widely and use opinions from forums and other social media sites.

1.5 I can describe and evaluate the limitations on connectivity based on speed and expected outcomes

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Candidates should be able to describe and evaluate connectivity on a range of issues and relate these to expectations and needs.
Evidence: will be provided directly from student portfolios and assessor feedback.

Additional information and guidance
Expected outcomes are often closely related to speed of devices and connections, though most people do not appreciate this. If someone is having difficulty viewing a video from a website on their hand-held device they will blame the site more than anything else, though the problem is more likely to be with their device and/or connection. Some people view videos and complain that they have an Internet connection problem when the server they are connecting to is probably an old system that can't deliver a fast enough data rate from it's old disk to satisfy the speed of video streaming. The Internet itself hides the fact that media rich content is passing through many, many disparate devices before it gets to the end user and any one of these could produce a bottleneck or cause issues. Candidates need to be aware of some of these restrictions and the impact they have when evaluating and describing connectivity issues.
Any home user will tell you that the 8Mbit connection they are paying monthly for is rarely that fast, especially if they are in a busy area or more than 1km from the exchange. What are the realistic speeds and outcomes from 2G, 3G or 4G compared to wi-fi? What sort of speeds and connectivity quality can you expect from public wi-fi? What sort of considerations should designers of websites make for the variety of devices and speeds connecting to their sites? Should they cater for the LCD (Lowest Common Denominator)? A recent article asked if Windows 10 might have been significantly better if they had designed it for high- end computing equipment (like Apple does with proprietary and non- backwards compatible hardware) than trying to cater for legions of low spec old computers. Even with an 80Mbit fibre Internet connection, a low spec Atom computer still struggles with media rich websites.

2. Candidates will evaluate the account management and costs involved in cloud based services and applications

2.1 I can analyse the requirements for account management

Candidates should be able to demonstrate all of the key aspects of account management and the range of requirements.
Evidence: will be provided directly from student portfolios and assessor feedback.

Additional information and guidance
There are a vast array of possible needs when it comes to cloud services, and although there are a number of basic types of account, the learners need to demonstrate that they have researched and understood as much as possible of the options. Some people will require very limited access to data and perhaps no real security or storage; others will require a sophisticated array of security elements, unlimited data and backup options and other services. How do we determine what is required and what does this do to the proposed service? Is there any aspects of account management that can not be met, if so, what is it and why?
What are the key drivers that determine a user's account and what would they need to be advised when trying to organise a cloud based account for the first time? Much of the cost associated with cloud based services is related to the management of your account. The less you want to know about it and worry, the more you will need to get someone else to do that for you. Some people have multiple accounts for different purposes and many people use free online mail accounts for their "junk" accounts. What criteria do they use for their "premium" accounts?

2.2 I can assess the needs of account management and recommend procedures and processes for optimal use

Candidates should be able to work out what is required of different accounts, in terms of management, and recommend to clients how to optimise these.
Evidence: will be provided directly from student portfolios and client feedback.

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Additional information and guidance
Candidates should effectively, through their research and practice, be cloud based “super users”. They should be in full control of their accounts and know what their status is and have processes and procedures ready to deal with any issues. Many organisations, for example, offer free online storage, but it is restricted in the amount. If you
use this up, but don’t want to pay for the next level of service, how do you manage your accumulated digital life? Although storage is relatively cheap, this is no real excuse for digital clutter. How do you assist people in managing their data and keeping it to workable levels, given the above example of needing to move it elsewhere. many service providers don’t charge for storing your content, but might charge a great deal for the traffic to and from your account. What technologies can you use in this instance and what options are available? Some systems organise digital artefacts in terms of content, although the blurring of social media systems these days makes it hard to know if the site you are using is for pictures, words or videos, or all three. It might not matter too much in terms of storage, but is it good to spread your digital material over several platforms? Does it really matter? If your system provider does not offer regular back-ups, how will these be managed? What are the sharing options and issues they will need to deal with.
It would be useful if candidates can get access to a linux based network as this will offer the easiest and widest range of account management experience. The Raspberry Pi is a cheap and easy way to achieve this.

2.3 I can verify account management procedures are fit for purpose
Candidates should be able to show effective account management based on a sound understanding.

Evidence: will be provided directly from student portfolios and assessor feedback.

Additional information and guidance
Fit for purpose will perhaps be difficult to always understand, though if they have researched enough they should know what people require. Some sites that have different levels of access for users may be easy enough to work out and others can be adjusted to suit. In a popular blogging system like Wordpress, there are pre-set accounts that can be assigned. Are these obvious? They are Administrator, Editor, Author, Contributor and Subscriber. What is the difference between an editor and author? In addition, they have a super administrator as well, how does this differ. Candidates will need to research various systems and fully understand what these roles do and how to properly deploy them.

Starting with some software site, like Wordpress, can be helpful here.

http://codex.wordpress.org/Roles_and_Capabilities [6]

Once set up, they will need to be checked to make sure they do not give any extra access to the roles to make sure that security is tight. The above link goes into great detail about the access and responsibilities of these roles. Many systems will be similar, but candidates will need to show that in their own case they understand the wider issue of account management, as well as the more specific ones related to what they are setting up themselves.

2.4 I can evaluate costs associated with cloud based access against requirements
Candidates should be able to analyse the main costs associated with cloud systems and make informed recommendations as a result.

Evidence: will be provided directly from student portfolios and client feedback.

Additional information and guidance
In their project work, candidates will be able to look in detail at the costs involved in moving to the cloud. They need to take “the long view”. In many cases with technology, there are some steep initial costs, but if you look at it across 5 or 10 years, there are significant savings to be had. These types of detailed cost analysis decisions need to be explored. It is perfectly legitimate to conclude that it is not worth it for an organisation if there is sufficient evidence to back up the conclusion. Candidates will need to use spreadsheets and other analytical tools to compare and contrast all of the costs factors and look at both direct and indirect costs to make sure they get

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a complete picture. In a small number of cases, the company they are investigating for might be happy with additional costs as the benefits are significant in terms of productivity or efficiency.
In this competitive world, the slightest edge over competitors can have a huge impact.
Some of the costs will be related to the set-up and ongoing costs, as well as other charges. Many cloud solution providers offer web pages where different parameters can be “dialed in” to see the potential costs.

https://www.cloudorado.com/cloud_server_comparison.jsp [7]

2.5 I can describe and recommend account management packages based on value for money and suitability

Candidates should be able to analyse the main account management packages against criteria for value and whether they are suitable for the client.
Evidence: will be provided directly from student portfolios and assessor feedback.

Additional information and guidance
Most cloud based systems come with a range of account management features. You can sign up for some free trials on some platforms (though Google requires a credit card which could be an issue). There are multiple services that can be deployed, depending on the type of service needed and the type of user. Once the server or service has been deployed, there are then more detailed control panels for management. More traditional servers, or indeed virtual machines, offer account management via software such as CPanel or Webmin.
TLM partner organisations should be able to provide cloud based servers and control panels if candidates can’t secure these themselves.
Most site also have some sort of documentation to help users.

http://aws.amazon.com/resources/ [8]

A useful overview of the main proprietary and open source systems is here:
http://www.techmint.com/web-control-panels-to-manage-linux-servers [9]

Note: We have a relationship with the Manchester based ISP UKFast who will allow candidates taking this course to have a working server and the Cisco Netacad account also allows a working web based server.

2.6 I can use/evaluate different tools/control panels/portals to manage cloud based products

Candidates should be able to use and appreciate the features of various control software systems.
Evidence: will be provided directly from student portfolios and assessor feedback.

Additional information and guidance
Using some of the control panels and services listed above, candidates should be able to demonstrate their knowledge and competence with these to carry out a number of basic tasks such as creating new systems, managing data levels and general account management tasks. If they are carrying this out for a potential clients, it would be useful to create a table of strengths and weaknesses to back up any recommendations they might make. If candidates can try out a number of systems, they can get a better sense of what is on offer across the range and therefore make more informed choices based on practical experience.

2.7 I can compare several different offerings and recommend the best one based on cost, services and account flexibility

Candidates should be able to summarise all of their research and trial work
Evidence: will be provided directly from student portfolios and assessor feedback.

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Additional information and guidance
Having looked at all of the offerings available and tried out the services on behalf of their client, the candidates should now be able to recommend their top choices. This could be in terms of value for money, or the one that is the most feature rich. This can be determined in advance by the client's needs. It may be useful to write it as a report and include some screen grabs and callouts to better show that they are talking about or by carrying out a presentation with a shared screen.

2.8 I can use account management techniques in line with local guidelines and legal restrictions

Candidates should be able to work with systems in line with any rules about privacy and possible legal restrictions.
Evidence: will be provided directly from student portfolios and assessor feedback.

Additional information and guidance
One of the key issues relating to cloud computing is that it is global. Most of the main cloud based companies, at least the big ones, are US headquartered. This can cause problems for us in the UK. A recent European law decreed that the European government no longer recognised the Safe Harbour agreement. This was an agreement
between Europe and the US where Europe accepted that the US servers were safe to store data on European citizens and companies.

http://www.politico.eu/wp-content/uploads/2015/10/schrems-judgment.pdf [10]

Since they no longer accept this, it means that UK companies can't really use US based servers. The US ones tend to be cheaper and more cost effective so it is something of a barrier. Candidates need to show an appreciation for these types of issues in their work and possible solutions. There are obviously many laws, for instance the Data Protection Act, that come into play when storing and exchanging data on servers which candidates need to investigate. If they set up a server and it is used for illegal activities, it is essentially the server "owner" who is responsible, so how they can they monitor for this and make sure they don't fall foul of the law?

3. Candidates will analyse and evaluate the interoperability requirements and suggest solutions

3.1 I can analyse system needs based on effectiveness and efficiency
The candidate should be able to show clearly what the system can achieve with examples of efficiency and effectiveness.

Evidence: will be provided directly from student portfolios and assessor feedback.

Additional information and guidance
As students investigate various systems, they should become increasingly proficient at understanding the complex needs of the system and begin to be able to recommend the best ways to improve the system.
The improvements will be in terms of how effective it will be or could be. Effectiveness is a qualitative term for the most part. Do the new features make it easy to complete tasks, is it more enjoyable to use and accessible for people with limited prior skills and knowledge. These types of issues will help to make the system work better and therefore be more effective. Issues of efficiency are more quantitative in focus. If the existing system takes a day of technical time to do a back-up, but only takes 5 hours on the cloud based system, this is a clear and visible measure of the efficiency gains. The terms do overlap to some extent and quantitative and qualitative labels should only be used as loose guides in working with this criterion. As long as the candidates written analysis has some examples to back up their claims, then this will be satisfactory.

3.2 I can document and describe system needs to match outcomes

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The candidate should be able to write clear and unambiguous documentation to match their outcomes to requirements and needs.
Evidence: will be provided directly from student portfolios and assessor feedback.

Additional information and guidance
In most projects and investigations, there is a basic need set at the outset. Most candidates will set themselves these types of needs. For example, the basic need to go further in education will require an outcome of 3 good A levels. The candidates can then set about a plan on meeting this end goal. The same applies to system analysis and
development. Candidates need to look at existing systems and determine some of the areas of weakness (criterion 3.1 above). This information will give them clear objectives to meet and if these have been discussed with the client, meeting these objectives should satisfy the needs. In some cases, clients will be unaware of what is possible, so will
need some clear and understandable guidance. Therefore, the need for clear documentation in this process can not be overstated. The documentation should set out the agreed needs, show analysis and examples of how these should be met, and end with some conclusions about how well these were met.

3.3 I can describe and explain different file types relating to expected needs and outcomes
The candidate should be able to show a good understanding of the range of file types required.

Evidence: will be provided directly from student portfolios and assessor feedback.

Additional information and guidance
The overall analysis will indicate different tasks within the system and these tasks may well require different data types. For example, most LAMP based data management systems will have a web based front end for the collection of data, this will use HTML, XML or PHP file types. The data collected will be stored and analysed as part of a database which will likely be an SQL type of system. The data will need to be output and presented in other forms for people to understand and look at so this could be some type of document or portable document type and these may well contain graphic elements such as PNG or SVG files. This level of detail will need to be shown in the documentation and planning process of the candidate's work and will show that they understand the micro and macro elements of system design and analysis.

3.4 I can describe and explain file extensions in terms of strengths and weaknesses
The candidate should be able to detail the different file types deployed in their solutions and list their attributes that make them suitable or not.

Evidence: will be provided directly from student portfolios and assessor feedback.

Additional information and guidance
The different characteristics of file types and extensions are important for good system reliability and functioning. It is also important to have an awareness in terms of system longevity. the recent announcements by Google and Apple to no longer support Flash based videos is an example of making sure you appreciate what is occurring in technology and as much as possible make your system designs future proof. One advantage of using open file types and standards is there is more chance that they will continue to be developed and supported and will work with other existing open standards. Candidates should show this level of awareness when describing the files they are using in their designs and investigations.

3.5 I can present my research and match my findings to the requirements of different needs and expectations

The candidate should be able to professionally present their overall findings.

Evidence: will be provided directly from student presentations and assessor or client feedback.

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Additional information and guidance
Once they have completed all of their research and analysis, they should be in a position to present their material to their client. The presentation should be professional and cover all of the main areas of interest to the client and not be overly complicated. The client can investigate their findings in more detail in supplementary documents and links. The presentation should convince the client of their solution and they should be prepared to answer questions and get some critical feedback in order to improve their offering.

The reasons will probably vary as much as the clients themselves, but some common themes are likely to be:

1. **Cost** - does it save the client money? It does not have to be an instantaneous saving and could be something relating to TCO (Total Cost of Ownership) and take several years to be realised.
2. **Usability** - if a small company can use the account management system and not have to rely on external experts to assist them, this is a significant saving in time and money.
3. **Security** - is the backup and storage of their data regular and secure? Is it monitored so that there is always a reliable copy that can be retrieved? The more you pay, the better the future proofing and it is like insurance, it costs a lot, but nowhere near as much as if you don’t buy it and have a disaster.
4. **Future-proofing** - is the solution likely to be around and improve over time or will the cloud company be gone in 3 years and leave you with no access to your valuable data. Some cheap hosting packages use old operating systems and do not update them for you. If you use front-end software that requires up-to-date versions of key software like PHP, you might not always get it or have to struggle to install it yourself.
5. **Support** - is there plenty of help on technical issues or is it all DIY. Most cheaper are that way because the help is via you reading lots of books and web pages or using public forums. This might be enough, but perhaps not for all small businesses.

Moderation/verification

The assessor should keep a record of assessment judgements made for each candidate and make notes of any significant issues for any candidate. They must be prepared to enter into dialog with their Account Manager and provide their assessment records to the Account Manager through the on-line mark book. They should be prepared to provide evidence as a basis for their judgements through reference to candidate e-portfolios and through signed witness statements associated with the criteria matching marks in the on-line markbook. Before authorizing certification, the Account Manager must be satisfied that the assessors judgements are sound.

Source URL: https://theingots.org/community/sil3u40x

Links
[1] http://theingots.org/community/ITQ_unit_development
[2] http://theingots.org/community/handbook2
[3] http://www.theingots.org/community/ITQcourse1
[4] https://theingots.org/community/sites/default/files/uploads/user4/PupilFNC7.pdf
[5] https://en.wikipedia.org/wiki/OSI_model
[6] http://codex.wordpress.org/Roles_and_Capabilities
[7] https://www.cloudorado.com/cloud_server_comparison.jsp
[8] http://aws.amazon.com/resources/
[9] http://www.techmint.com/web-control-panels-to-manage-linux-servers
[10] http://www.politico.eu/wp-content/uploads/2015/10/schrems-judgment.pdf

(function(i,s,o,g,r,a,m){i['GoogleAnalyticsObject']=r;i[r]=i[r]||function(){ (i[r].q=i[r].q||[]).push(arguments)},i[r].l=1*new Date();a=s.createElement(o), m=s.getElementsByTagName(o)[0];a.async=1;a.src=g;m.parentNode.insertBefore(a,m) })(window,document,'script','//www.google-analytics.com/analytics.js','ga'); ga('create', 'UA-46896377-2', 'auto'); ga('send', 'pageview');

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(function(i,s,o,g,r,a,m){i['GoogleAnalyticsObject']=r;i[r]=i[r]||function(){ (i[r].q=i[r].q||[]).push(arguments)},i[r].l=1*new Date();a=s.createElement(o), m=s.getElementsByTagName(o)[0];a.async=1;a.src=g;m.parentNode.insertBefore(a,m) })(window,document,'script','//www.google-analytics.com/analytics.js','ga'); ga('create', 'UA-46896377-2', 'auto'); ga('send', 'pageview');