Cloud computing

Cloud computing

What is the Cloud & Cloud Computing

- **Cloud computing and storage techniques and technology have revolutionised the approach to IT and how it is deployed.**

Cloud computing

Cloud Computing Fundamentals Includes:

What is the Cloud Infrastructure as a Service, IaaS Platform as a Service, PaaS Choose best cloud service provider

- **With all the changes rapidly taking place within the information technology, IT arena, it is difficult to keep up with all the technology.**
- **One area of IT that has taken off in recent years is that of Cloud technology - there is a huge amount of talk about cloud computing, storing data on the cloud, and using cloud services.**
- **Knowing exactly what they are and how they work and can be used is often difficult, but knowing a little about it can unlock many new concepts and ways of working that can save significant amounts of money and provide many new and convenient facilities for both home and business.**

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- In reality the term: "the cloud" just means "cloud computing", and this just refers to the concept of using computing resources of various forms over the Internet from your own computer.
- The services may include storing data, running software programmes of Apps, or it may be a web-server . . . there are many different ways in which the cloud can be used.

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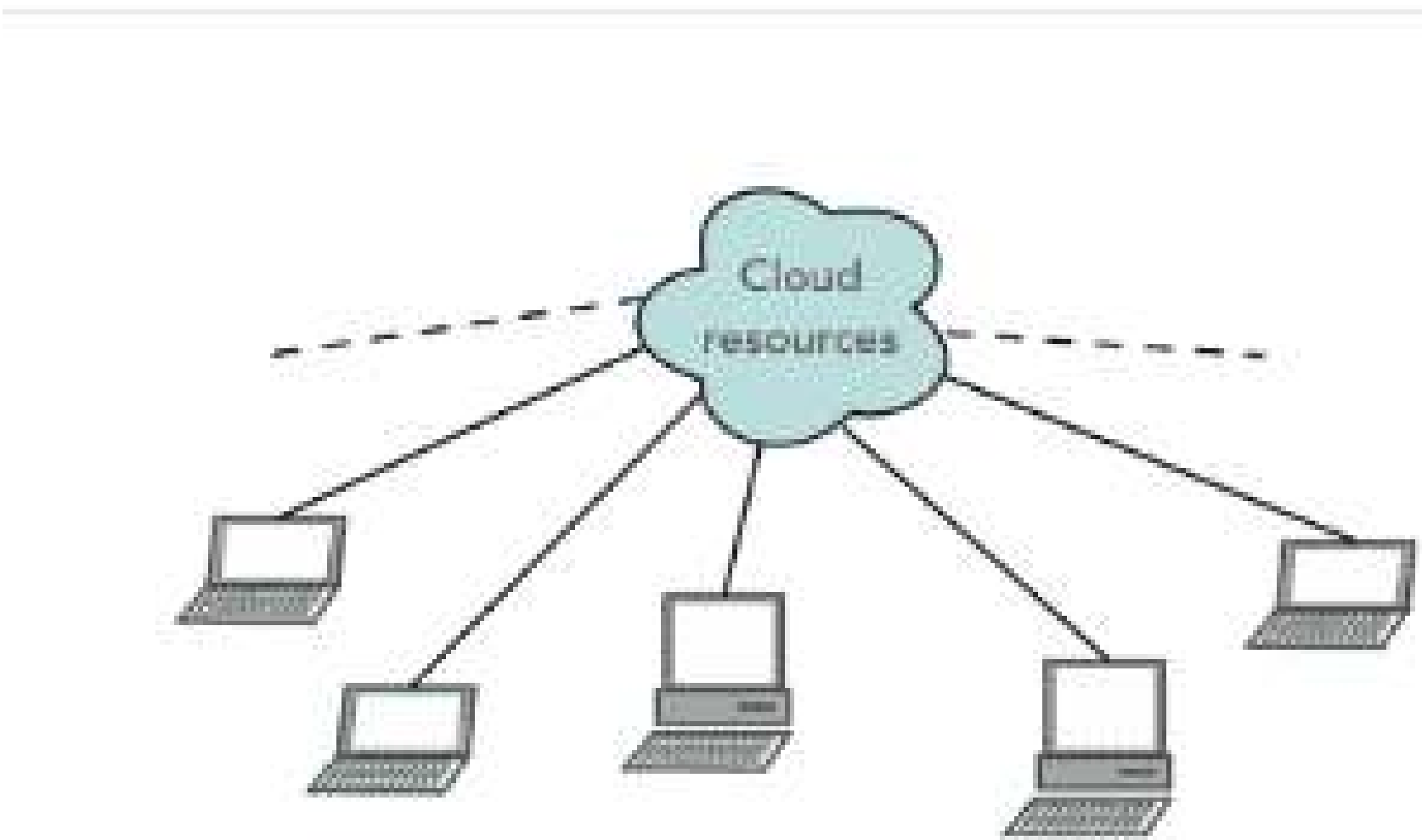
- **It is said that the name cloud computing came from the cloud symbol that is often used to represent the Internet in flowcharts and diagrams.**



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What is the cloud - definition

- As the name cloud may seem a little vague a definition of what it actually is can be useful. Rather than defining "the Cloud" the more exact term, cloud computing is defined below.

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The Cloud definition:

- **Cloud computing is a generalised term for computing technology and techniques that involves delivering hosted services, often by accessing data centres, etc over a wide area network like the Interent. The cloud is not a physical entity, but it is a vast network of remote servers located around the globe which are able to provide services on demand, often via subscription, etc.**

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What is the cloud - the basics

- The definition of cloud computing above gives a general overview of the concept.
- Cloud computing uses servers that provide a large number of different types of service: they can be used to store and manage data, run applications, deliver content.
- They can deliver video streaming, they can provide web email services, they can run office or general productivity software.

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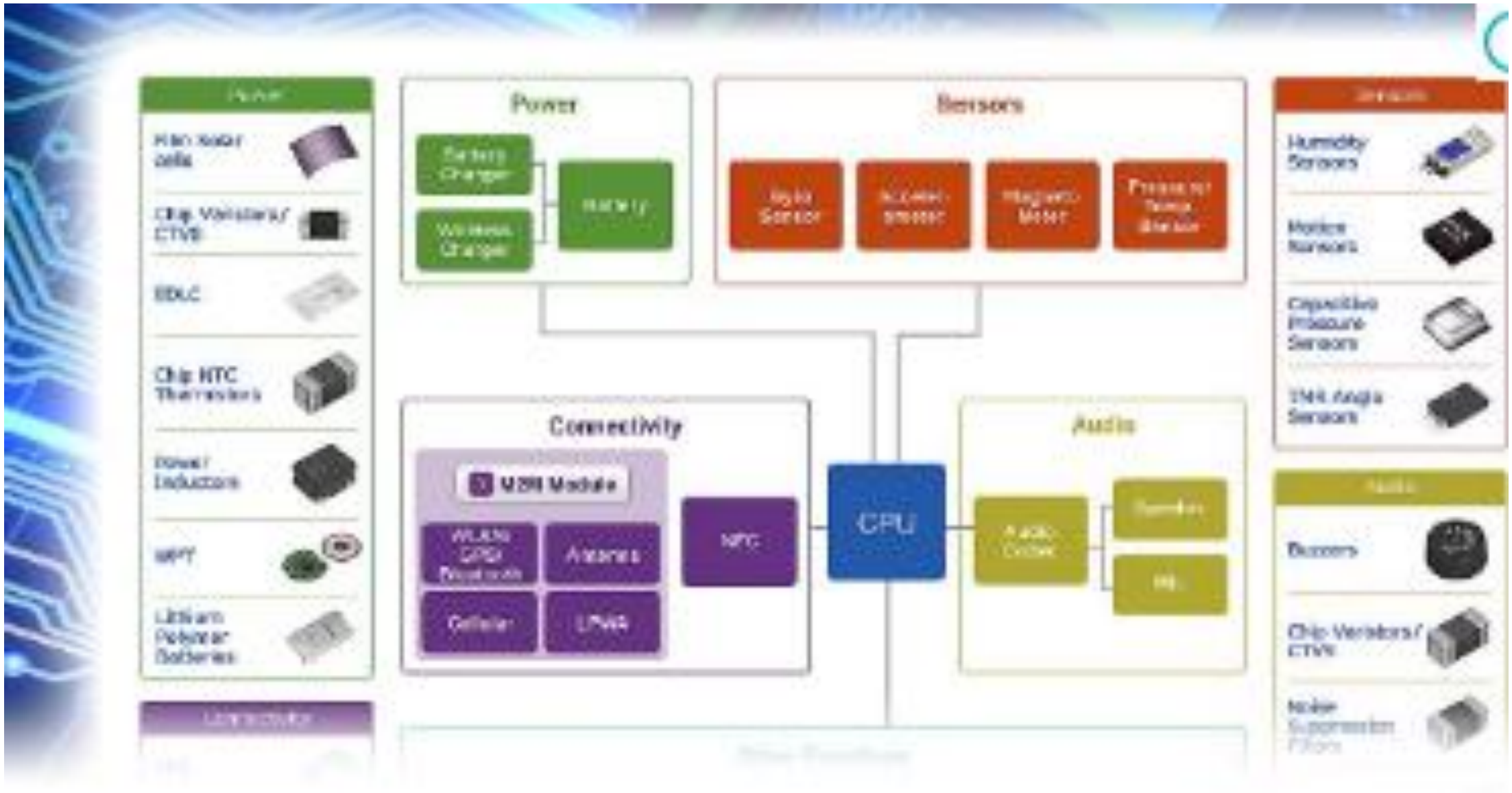

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Types of cloud services

- **Cloud services can come in a variety of forms to meet a host of different needs that the end users may have.**
- **Cloud services are broadly divided into three main categories:**

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Infrastructure-as-a-Service (IaaS):

- **The Infrastructure-as-a-Service (IaaS) form of cloud technology refers to the use of the hardware building blocks of computing namely physical or virtual servers, storage and networking. These services are rented as required and used remotely over a wide area network which is typically the Internet.**
- **This is form of cloud service is very attractive to organisations that may have variable requirements for hardware or may not want to run and maintain them themselves. It does however sometimes require a a level of technical expertise to implement the use of the remote cloud services dependent upon what is actually needed.**

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Infrastructure-as-a-Service (IaaS):

- **One common use of these cloud services is the use of cloud web servers that can be used to deliver content. A company may not want to own its own servers, but rely on a hosting company with its own servers and expertise. Normally these services are relatively straightforward to access and operate.**

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Platform-as-a-Service (PaaS):

- **This form of cloud computing service can often be considered as the next layer up. It includes not only the hardware including the storage, servers and networking capability, but it will also include tools and software needed to build applications, etc.**

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Software-as-a-Service (SaaS):

- This form of cloud service is becoming increasingly popular both for home and business use. It entails the use of a software package remotely, often using a web browser. The user is able to use the software package from their computer, and any suitable device by logging into their account. The application is run on the cloud services server and data is stored securely there.
- This type of cloud service is useful because payments are often monthly and on a per user or per seat basis, and can be used for as long or as short a period of time as is needed. Also updates are implemented on the cloud system and in this way new updates do not need to be bought or downloaded onto the end user system.

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Cloud computing deployment models

- There are several different ways in which cloud computing services can be deployed.
- It is often useful to define and describe the different types of cloud services deployment methods:

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Cloud computing deployment models

- ***Public cloud:*** **The public cloud model is probably the most widely thought of model for deployment. Using this mode, users can access a large pool of computing power over the internet for all types of cloud services including IaaS, PaaS, or SaaS.**

- **The advantage of the public cloud services deployment model is that the cloud computing suppliers have colossal resources at their disposal and these are shared out between a very large number of customers. This means that if one customer has a sudden increase in their requirement, this can easily be met by the cloud service as they will have sufficient spare capacity. The margin the cloud service providers can give will be significantly above the step demand change of a user which will be comparatively small.**

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Cloud computing deployment models

- **Private cloud:** Private cloud services as somewhat different to those of the public could services in that the private cloud will offer its services only to users of that company or organisation - the cloud services will be contained behind a firewall, and in this way the security concerns can be overcome and data held within the confines of the company's infrastructure.
- The private cloud will be set to operate in a similar way to that of a public cloud and can provide services of IaaS, PaaS, or SaaS.

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Cloud computing deployment models

- **The downside to this form of cloud service is that even the largest of organisations is unlikely to bring the resources of the big cloud services to bear on any increase in resource required. Also Cloud based software will have to be run on internal networks and this will require individual negotiations to be set up for this and updates will need to be managed by the company.**
- **However, where security and control of services and data are needed, this type of cloud service may be the best option.**

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- **Hybrid cloud:** Hybrid cloud services try to bring the best of private and public cloud services together. It can enable some data to be held within the company infrastructure and some on the cloud.
- Hybrid cloud services are probably what most business use - external cloud services where they are needed and some internal. It means that public cloud is used where it is applicable and not for all services.
- The reasons for choosing hybrid cloud could be for disaster recovery planning and the need to avoid hardware costs when expanding existing computer and network infrastructure.

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- **Community cloud:** Community cloud services are an interesting development. Here the cloud infrastructure is shared between users in a community where there may not be concerns of competition and inter-company security.

- The costs of the infrastructure are spread over a number of different users within the community and there will be greater margins if one users suddenly has an increased requirement, and there are cost savings incurred by having a large system maintained for several users.

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Advantages & disadvantages of cloud services

- **Although cloud technology can provide many advantages, there are also some drawbacks. When deciding on whether to use the cloud, it is wise to understand not only the advantage, but also the disadvantages. It is always best to adopt a technology knowing both sides of the story, so that the disadvantages can be accommodated either by adopting a work around, or simply being aware of them.**

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Cloud computing advantages

There are many advantages to using cloud computing technology.

- **Easily expandable:** **One of the key advantages of the cloud is that it is very easy to expand a capability. Cloud services providers have a huge capability as the services are shared by very many different users. If one user needs to expand a capability, this will only represent a small increase in terms of the overall cloud capability and it will be easy to accommodate this. Accordingly it is very easy to increase the usage of a cloud service**

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- **Utilise the economies of scale:** The cloud services providers have huge operations typically located on large sites. Accordingly there will be significant cost savings resulting from the scale, and many of these will be seen by the user.

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- **Utilise cloud services expertise:** Many companies will not want to run large amounts of IT infrastructure as they may not have the expertise. If this can be outsourced it can enable the user to focus on their business better.

- **Offsite backups:** One of the advantages of cloud services is that the data can be held off-site, and will be backed-up by the cloud services provider. This enables the cloud to provide secure off-site data storage.

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Cloud computing disadvantages

There are also some disadvantages to using cloud computing.

- **Renting can be more expensive over a long term:** **Although there can be economies of scale, renting a service can sometimes be more expensive over the longer term. Costs need to be carefully viewed and balanced against buying, and the other advantages of using the cloud.**

- **Storage of sensitive data:** **Some companies have issues with the security of their data. By being held on the cloud, data can be open to data breaches, and this may mean that cloud services are not applicable for some or all of the operations.**

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- **Migrating data to the cloud may not be easy:** It is normally easy to set up and start using a new cloud application. However migrating existing data or applications to the cloud can be quite involved and it may be more expensive than is anticipated. When considering the cloud these costs should be investigated and included in the budget. Realistic costs and timescales should be estimated. The issue can be made worse by the fact that there appears to be a shortage of people with cloud skills. Staff with DevOps and multi-cloud monitoring and management knowledge are in demand and few experienced people are available.

- **Internet connection is required:** To use public cloud capabilities a good Interent connection is required. If the connection goes down as sometimes happens, the cloud facilities will not be available.

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Cost models for cloud computing

- When considering a move to the cloud it is necessary to look not only at the cost but the cost model.
- Cloud computing moves a cost that would normally have been a capital expenditure, CapEx to a service which will come under the operational expenditure, OpEx budgets.
- This move can enable companies to avoid some of the large amounts of capital expenditure and effectively have a more managed level of cost, although it may not necessarily result on overall reduced costs.
- This can be a significant advantage in terms of expenditure planning and management.

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Cloud Infrastructure as a Service, IaaS

- **Infrastructure as a Service, IaaS is one of the services that can be provided with cloud computing where computer hardware capability is provided remotely on demand.**