Preoperie Irina

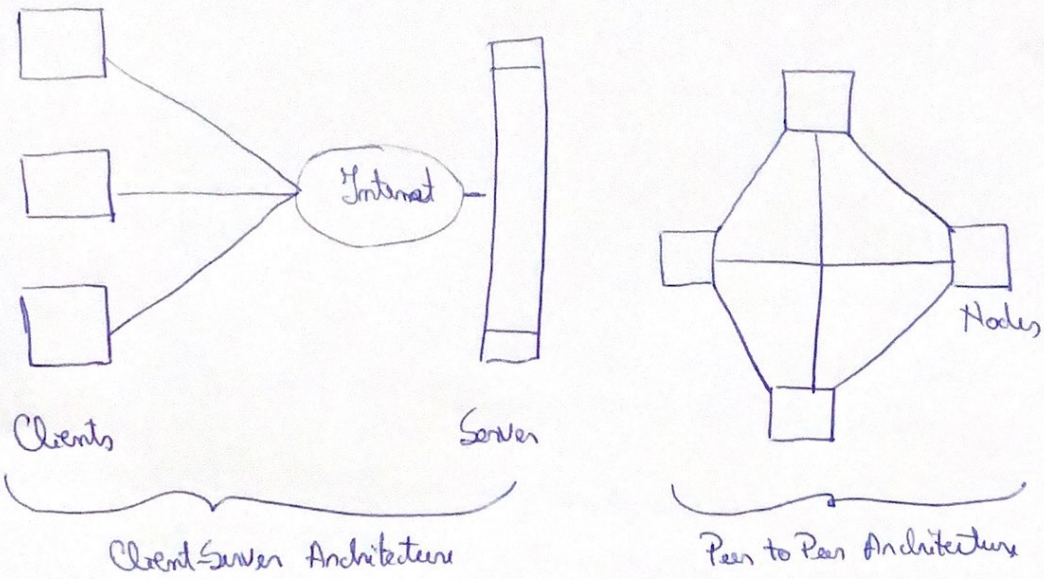
Examen PCD - 26.05.2021

(2p) 1. P2P vs Client/Server

(2p) 2. Explicați conceptul de Maintainability. Identificați cel puțin două aspecte care țin de acest concept. Specificați cum pot acestea influența adoptarea unei soluții software în cloud.

(3p) 3. Proiectați o arhitectură pentru un sistem care să contribuie la caracteristica de smart-city a unui oraș. Specificați cel puțin 3 moduri în care soluția propusă apelează la tehnologii cloud și cu caracteristicile sistemului sunt asigurate de acestea.

1.



As we can observe in the figures above, in the case of Client-Server architecture the nodes are differentiated, there are some nodes which are clients and one node which is the server. In contrast with this, in the Peer-to-Peer architecture a node can have both roles, client and server, and can request or respond to services.
Client-Server Network focuses on information sharing, so that each client will get ~~its information~~ the right information as quick as possible.
In the other hand, Peer to Peer Network is focused on connectivity, as we can see above all nodes are interconnected.

Preoperiuc Irina - 26.03.2021

In the Client-Server architecture the server is used as the central node that stores all the data. In regards to the storing problem, in Peer to Peer architecture each node has its own data.
In the case of Client Server model, a Client requests a service and a Server comes with a response for it. In the Peer to Peer model, any of the nodes can perform both operations, request and response.
Client-Server architecture is more stable than Peer-to-Peer architecture, even more when the number of nodes from Peer-to-Peer network increases. This is the reason why Peer-to-Peer model is ~~used~~ more suitable for small networks, while Client-Server architecture can be used for both, small or large, networks.

2. Maintainability is the degree of facility with which an equipment or ~~machine~~ system is capable of being retained in, or restored to, serviceable operation. It refers to the amount of ~~effort~~ workload needed to have a specific service up and running again.
There are more types of maintainability: corrective (includes detection and correction of faults or bugs identified by the team or by users), adaptive (includes the changes to the software node in order to keep it compatible with the changing software environments, hardware & software), perfective (includes the improvements added to the system functionality) and preventive (includes tackling potential issues).
The maintainability of a software solution depends on more factors:

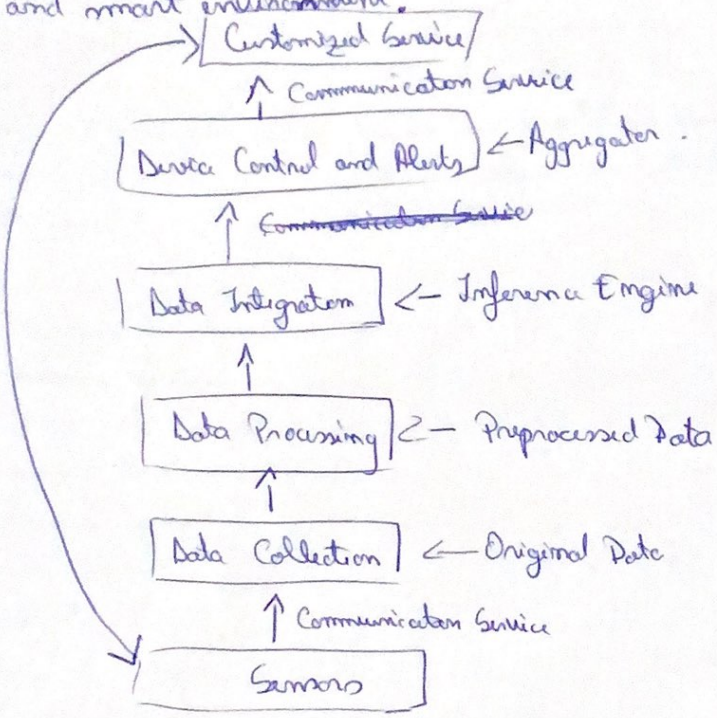
- the ability to modify the code (things are tightly or loosely coupled)
- the ability to test the product (how much of the application is tested)
- the ability to understand the code and to have less technical-depth
- how easy is to say what the application is supposed to do and correlate it to how it is being done, related to the written code.

The adoption of a cloud based software solution can be influenced, firstly, by the way in which the code can be modified an reviewed by the team members. Also, cloud tools offer metrics that indicate the amount of technical depth, code duplication, unit size, complexity, coupling and other metrics that, if taken into account, can improve the code quality and the maintainability of the final software application.

Prezentie Timo - 26.05.2011

Also, a cloud solution could make it easier for team members to collaborate and share code-quality guidelines so that the code will be understood by new colleagues.

3. A smart city should have among its components smart buildings, smart transportation system, smart health, smart administration and smart environment.



In this architecture the sensors will collect all the data from the environment. This data, represented by pressure, temperature, will follow a processing phase which will have as a result a resource description format. All the processed data will be integrated using Semantic web technologies and will be passed to the control devices in form of messages, alerts or warnings.

A cloud platform could be used to store all the data. Also, the security part, as it is a high priority when it comes to all the devices that collect data around us, ~~must~~ will be met by the cloud services. The data backup and the authority management will be easily done by the cloud provider.