1. What is it? Manuel

Peer-to-Peer architecture is used for computer networking where each instance or node contains the same capabilities and responsibilities. Where in a sense the same instance is able to act as both client and server. Since nodes/instances have the ability to act as both client and server, it is a decentralized way to distribute workloads between peers. In contrast of a sever/client model where all the tasks are central to the server holding all the information.

1. What problem does it solve? Manuel

Peer-to-Peer resolves bottleneck issues that might happen if servers become an issue in terms of data availability. It reduces the vulnerability of having a centralize center of information and reduces the expenses of maintaining dedicated servers.

1. How does it solve the problem? Liz

Rather than having a centralized server, it distributes information over machines participating in a protocol. Instead of putting content on a centralized server, the content gets distributed over several machines. As long as enough of the clients are available and can communicate with each other the system can continue to run. Although peer to peer doesn’t have a main centralized infrastructure, in order for the machines to find each other the machines some type of directory that the other machines will need to be connected to, to find out all the peers in the network. Once that is completed there can be communication between the peers directly and avoid reliance on a centralized server.

1. Who are the actors (i.e., main elements)? Liz

The peers are the actors, essentially a group of clients/ machines that are part of a protocol over a network.

1. How do they relate to each other? Antoine

The actors relate to each other in that they are independent nodes on a network. Because each node in the network has the capability to act as a server or client to other nodes, each is independent of each other in terms of functionality. However, nodes depend on each other for the transmission of data that’s distributed amongst others in the network.

1. What’re the strengths and drawbacks? Yamel

Anyone is a server & client, you can request and send information, you aren’t tied down by a specific role, and everyone else has access to that information within the network. This enables you to solve bigger problems, but as a result it is more complicated. Difficult to provide security, difficult to back up data

1. Example applications? Yamel

Skype, Ares Galaxy, Popcorn Time (it’s a bit torrent), Pidgin, Bitcoin.

1. Security Implications? Antoine
   1. DDoS
   2. Poisoning
   3. Privacy
      1. Direct access to packets
      2. Unknowingly sharing financial, email, web cache data for noobs
   4. Solutions
      1. Anonymous P2P
      2. Encryption

Sources:

<https://en.wikipedia.org/wiki/Peer-to-peer>

<https://www.youtube.com/watch?v=w2u4eN_WWvc>

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<https://www.cs.dartmouth.edu/~campbell/cs60/p2p-examples.pdf>

<https://www.techopedia.com/definition/454/peer-to-peer-architecture-p2p-architecture>

<https://www.quora.com/What-problem-does-peer-to-peer-networking-solve?share=1>

<https://www.tutorialspoint.com/Peer-to-Peer-Computing>

Quiz Questions:

1. What type of hierarchical structure does Peer-to-Peer architecture implement?
2. What types of problems does Peer-to-Peer architecture attempt to solve?
3. What is one advantage of using Peer-to-Peer architecture over client-server?
4. What is one application that uses Peer-to-Peer architecture?
5. What are some vulnerabilities of applications that implement Peer-to-Peer architecture?