**Network Engineer**

**Network Topology**

Network topology in an on-premises network refers to how the computers, servers and other gadgets which are used to connect a company’s operations within a local network are connected.   
Star Topology: All devices are connected in a central hub whether it is a switch or router. At the center is the point for managing the communications between the devises. Something like that: if a central point is out of order, the whole network ceases to function.  
  
Bus Topology: Devices are arranged in linear fashion wherein they are all connected to a single a primary cord. All data are transmitted through this cable and every device gets it but only the specific device uses it. This type is old and has very limited use as if the main cable is severed, the network ceases.  
  
Ring Topology: Devices are connected in a closed loop meaning data goes round and round the circle until it gets to the right device. This means that in case one equipment or connection is faulty, the entire network may fail in delivering if there is no backup solution.  
  
Mesh Topology: Every device is also linked with every other device. It makes the network very reliable because if this path is blocked the data can go through another path. Though it has an intensive number of connections, making it cumbersome and costly to establish an account at and deal with.  
  
Hybrid Topology: This means a combination of two or even more topologies such as star and bus according to the requirements required. It allows flexibility but at the same time it can be even more difficult to control.

**OSI Model:**

The OSI (Open Systems Interconnection) model is a scheme that describes transmission of data on a network. It divides the process into 7 levels and assign each a distinct task of interpreting data and therefore makes it easier to comprehend how devices interact.  
  
Layer 1 - Physical Layer: This layer concerns itself with the physical interface including such elements as cables, switches as well as signals. It explains in detail the transmission of data (in the form of bits) across the network.  
  
Layer 2 - Data Link Layer: This layer is used in the transfer of data from one device to the other within the same network. It helps to check whether data is free from any errors and is appropriately presented for the network.   
  
Layer 3 - Network Layer: The network layer is designed to work as the ‘postman’ whose function is to forward data from one network to another. It employs IP addresses to find out the most appropriate route through which the information will have to pass just like a map for data.  
  
Layer 4 - Transport Layer: This layer guarantees that data is received without any errors and is in the correct sequence, without repetition. TCP controls the flow of data while UDP stands for User Datagram Protocol which also controls the flow of data but not as strictly stringent as TCP.  
  
Layer 5 - Session Layer: The session layer has responsibility for controlling communication link between two devices. We know it opens, maintains, and closes sessions through which devices can communicate with each other without any inhibition.  
  
Layer 6 - Presentation Layer: This layer is responsible for converting data from the network layer suitable to fit the application layer. It deals with encryption, compression and data conversion with a view of ensuring that the data on either of the devices is intelligible to the other.  
  
Layer 7 - Application Layer: The first layer is the most exposed to the end user as it consists of applications accessed by the user such as email of web browsers. As it enables applications to interface with the network it helps to manage the data or requests from the user.