

# “The Device” of the Transport layer

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# Introduction

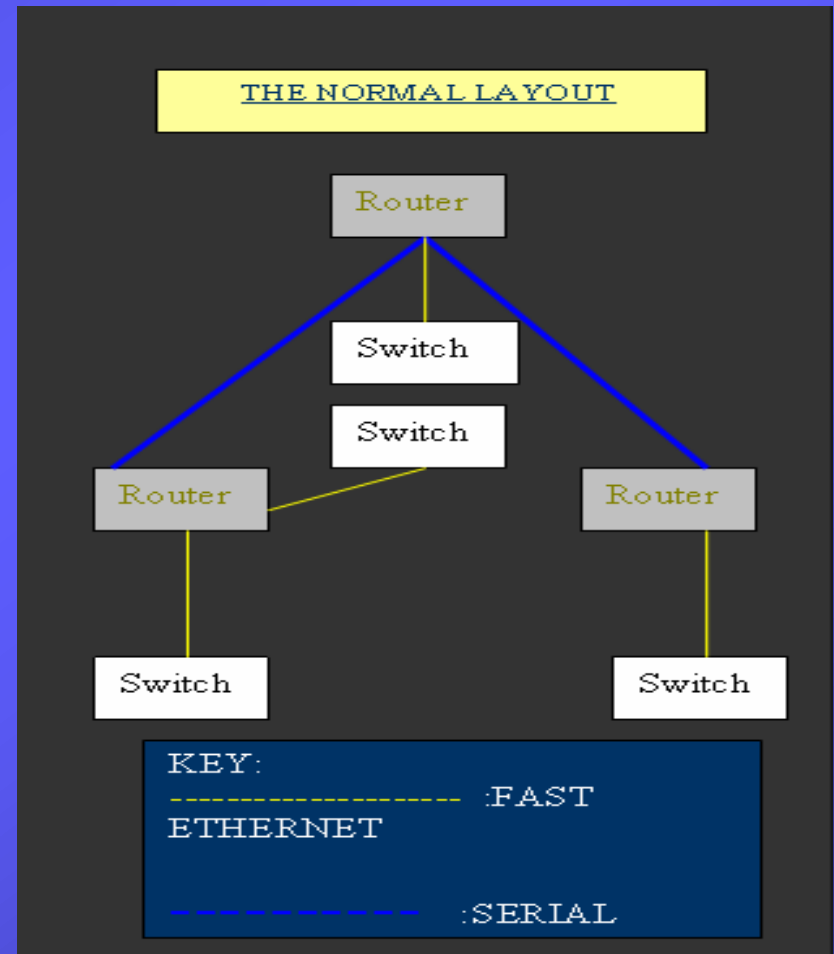
- The aim of this project is to develop a device that is able to simplify a WAN, by connecting all routers present in the WAN to this single device
- The purpose of this project is to connect routers of different vendors with their own proprietary encapsulation protocol, using a device which can also solve the complexity of a WAN having a large number of routers and large number of interconnections between them.

# Objectives

- 1. The device thus can have a main objective as connecting routers of different vendors in a WAN, even when they work in their own proprietary encapsulation protocol.
- 2. The next objective of the device is to reduce the number of chains in the network and hence reduce the complexity of network interconnections.
- 3. The third objective of the data is faster data transfer. The device can have a routing table which is automatically updated for a particular time interval, and due to direct connection between all the routers in the WAN and the device data transmission is faster.
- 4. If the device could support V-WAN it ensures that data between particular networks are restricted and hence improves individuality and security of the whole network. The port access control for every router need not be monitored individually, as this is implemented collectively at the device and can be configured in the device itself.

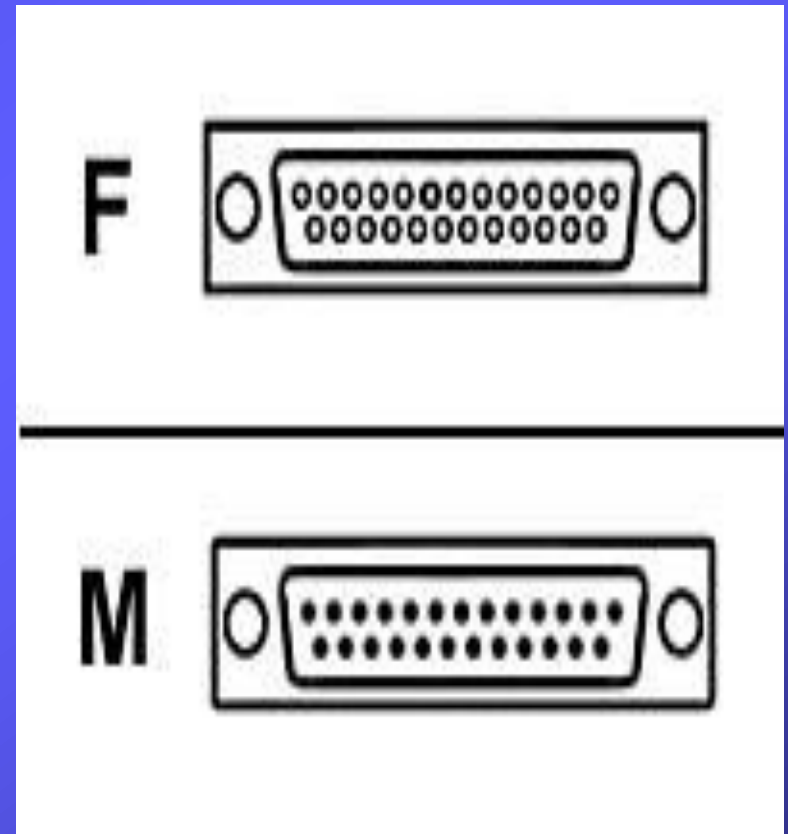
# Current trend

- Under the normal layout the packet from outside network has to come only through the router and the switch or the hub
- In this case the network administrator has to maintain the configurations for several routers which may become complex
- Further in a heterogeneous network each router may use its own proprietary protocols.



# Device's Physical Layout

- The device is a DCE device.  
Hence ensuring that all synchronizations can be controlled at the Device itself
- The device will contain only the female ports and the routers will contain only the male connectors.
- The bandwidth will match the maximum supported by the serial port of the router.



# Device's internal functions

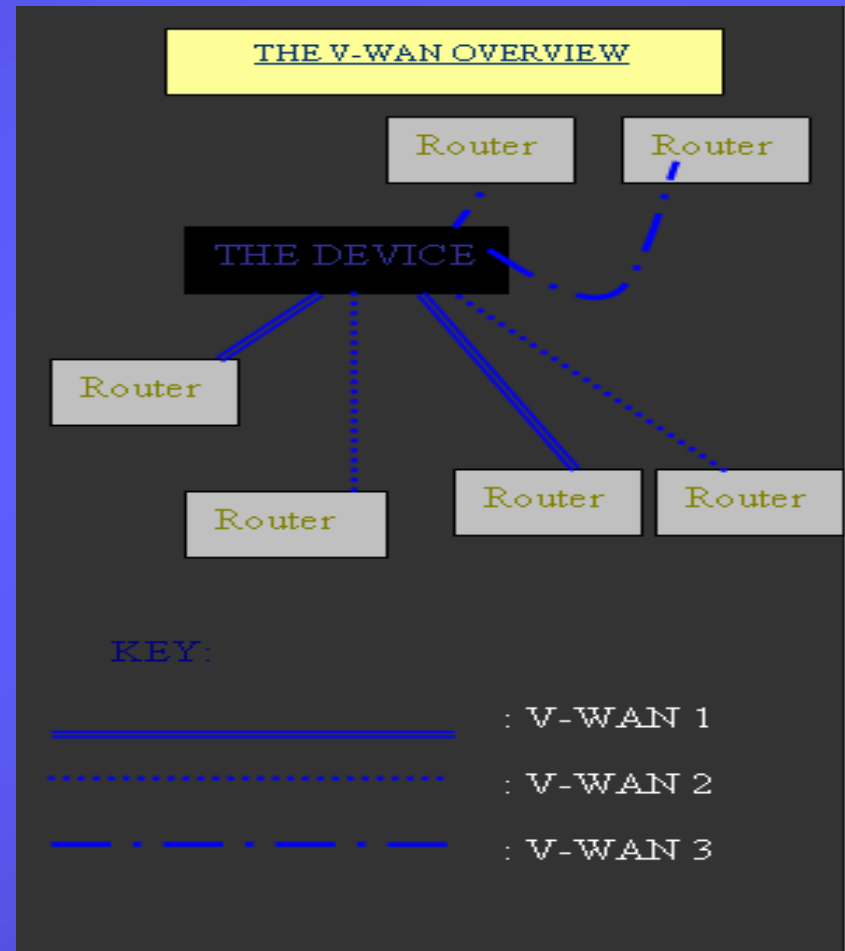
- The device will maintain a routing table whose size is dependent on the size of the WAN and the device will ensure that overall security of the network is maintained.
- This can be implemented by making the device support V-WAN. By supporting V-WAN the device can also work on the security function of a switch, with regard to each router and the network below each router.
- The device will update its routing table automatically. This means that it will maintain a database of the routers connected to it. This will be updated at stipulated time interval . This ensures that it is well aware of the networks connected to it and indirectly the hosts present in each network.

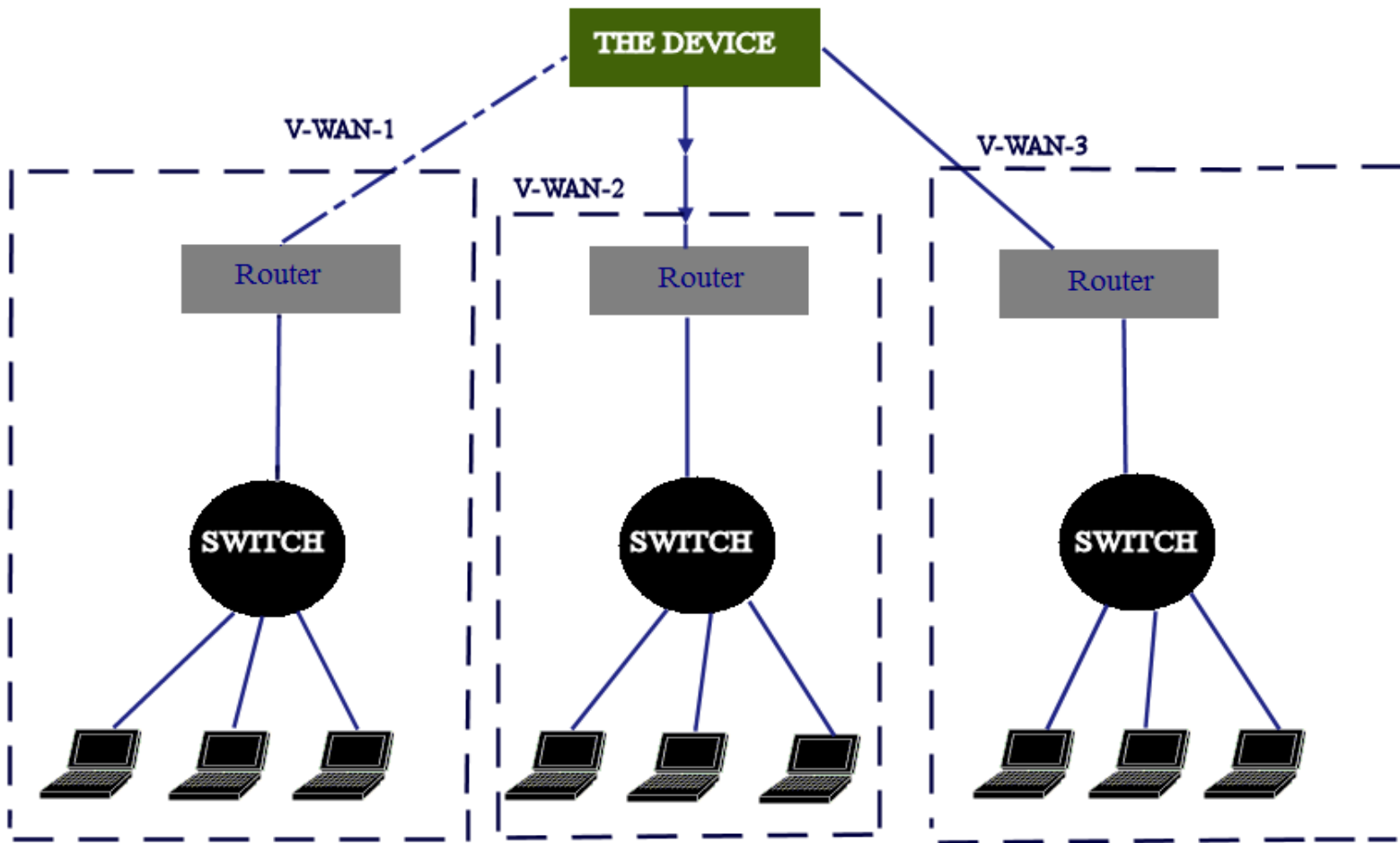
# Encapsulation Overview

- The device's main objective is to connect routers of different vendors in a WAN, even when they work in their own proprietary encapsulation protocol. For achieving this the device on receiving the encapsulated packets of data de-encapsulates it, and again re-encapsulates the data to the receiving router's encapsulation and sends it to the router.
- Since the device should have an updated encapsulation list of all routers in the network, the device will also update its table on each of the router's encapsulation protocol.
- Any change in the encapsulation type of any router under the device can be intimated to the device when it communicates with each router.
- When the encapsulation of the source and destination router is the same or PPP the device just directs the data packet to its destination.

# V-WAN Overview

- The device can support V-WAN also. Hence we can achieve several WANs from the single available WAN by using V-WAN.
- The V-WAN will thereby improve the efficiency and security of the network.
- This implementation could reduce the overhead of the administrator as the need of monitoring several network devices can be reduced by a great degree.

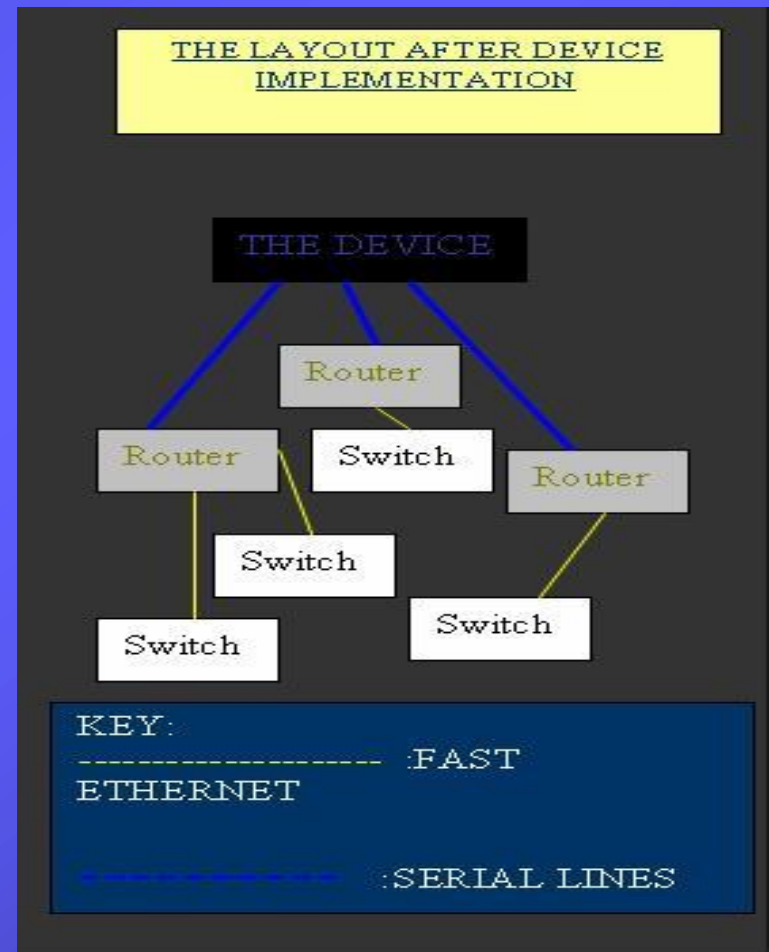




# V-WAN IMPLEMENTATION

# Device Implementation layout

- The layout after the device's implementation looks like this.
- The device connects all the routers of the network irrespective of their proprietary protocol.
- The device updates its routing table automatically at specified time intervals.
- By this the administrator can maintain the whole network's configuration through this single device



# Conclusion

The project hence arrives at the following conclusion,  
On using this device the administrator can

- Connecting routers of different vendors in a WAN, even when they work in their own proprietary encapsulation protocol.
- Reduce the number of chains in the network, and thus reduce complexity of the network.
- Transfer data quickly.
- Enhance security of the network by implementation of V-WAN
- Have a dynamically updated routing table database, which enables overcoming problems of broken network and encapsulation in an efficient manner