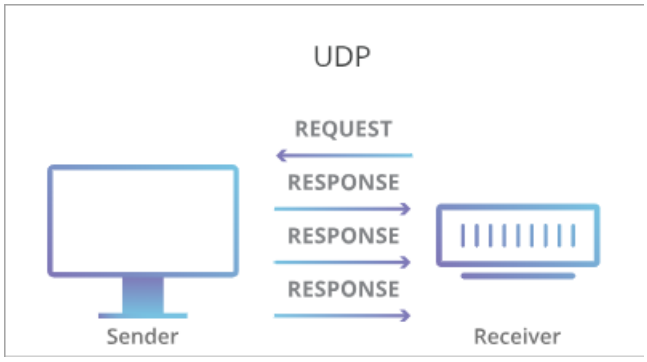
UDP & CAN PROTOCOLS

UDP:

The User Datagram Protocol, or UDP, is a communication protocol used across the Internet for especially time-sensitive transmissions such as video playback. It speeds up communications by not formally establishing a connection before data is transferred. This allows data to be transferred very quickly, but it can also cause higher packet loss and is more susceptible to DDoS attacks.

Unlike TCP, UDP works by sending out packets known as datagrams to a target computer without checking if the data arrived as intended or indicating the order of the sent datagrams. This connectionless feature allows UDP to send data far faster than TCP at the cost of additional packet loss. Therefore, this communication protocol is used in applications that require real-time data transmissions at a high rate and can tolerate minor



losses in data such as:

-video streaming (packet loss often causes only a few pixelations)

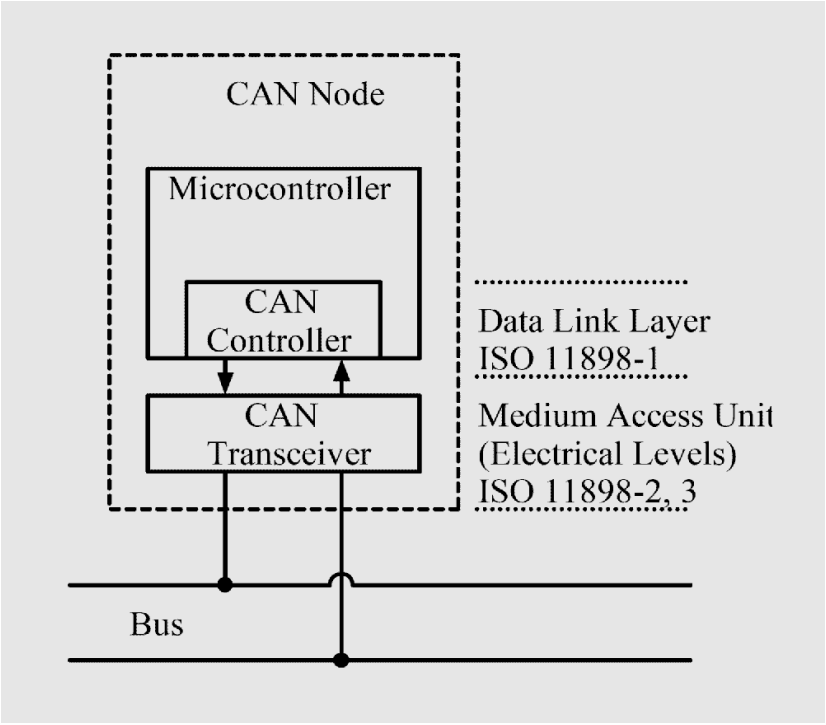
-Voice over IP (causes a static-y voice but minimizes delay)

-online multiplayer gaming (because DNS servers require quick responses)

CAN:

Controller area network is a communication protocol most commonly used in the automobile industry as well as the aerospace industry that is used to set up a connection relay between several electronic control units or ECUs.

CAN communication is referred to as a CAN bus as it sets up 2 communication lines known as the CAN HIGH and CAN LOW where They connect to every device in the configuration and allow each ECU to send and transmit data unlike a master slave connection. An ECU sends data through the CAN bus accompanied by an ID. This ID is unique for each device in the communication line and while all devices received the data, only the device with the corresponding ID can respond using a half-duplex communication system.



CAN protocol also uses a differential signal meaning the data is sent on both CAN HIGH and CAN LOW channels, but in opposite polarities that are used to take a differential reading minimizing any errors that affect the signal making the system extremely resilient against electric disturbances and electromagnetic interference. This resistance to errors is also strengthened by the CRC implementation in CAN bus which has the sender calculate the CRC value for the data to be sent, the receiver then gets the data along with the CRC value and recalculates the value from the received data to check if both values are the same or not.

Some disadvantages of the CAN bus protocol include:

-limited cable length of 40 meters (could be a limiting factor in some applications)

-difference in baud rate between devices will prevent communication