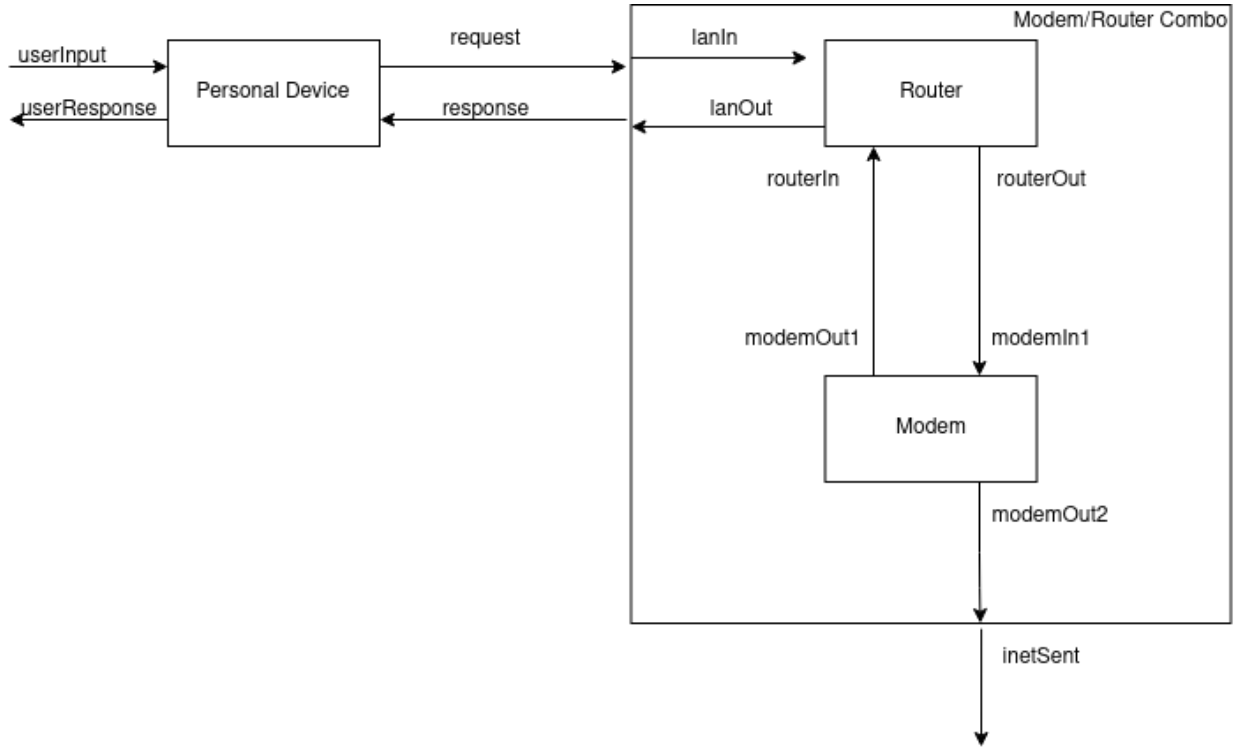
Modeling a Typical Home Network

A typical home network only needs a few devices to fulfill a basic standard of service. Most people use the modem/router combination given to them by their ISP as the main access point. Personal devices are required to communicate with one another as well as send and receive communication from the internet. A lot of the variability in the network comes from the speed of the connection to different servers on the internet.

The model I propose consists of 2 main components: Personal Devices, and the Modem/Router Combo. The Modem/Router Combo can be decomposed into two separate subcomponents (Modem, and Router). The Personal Devices communicate through the Router and the network is connected to the internet through the Modem. (see Figure 1)



The Personal Device will simulate receiving a userInput (from a file) and sends a request to the Modem/Router Combo. It will wait to receive a response until a predetermined timeout and resend the same request if not received. If a response is received in time, it will output it as a userResponse and continue to the next userInput.

The behavior of the Modem is to receive a request and attempt to send it out to the internet. The Modem will have a randomized wait time between receiving a request and sending the request out to the internet to simulate the variable upload speeds. If the randomized wait

time is less than the predetermined timeout, the Modem will send a response as an acknowledgment back to the Router to be sent to the Personal Device.

The role of the Router is to pass on the requests from the Personal Device to the Modem in the Combo as well as the responses from the Modem back to the Personal Device. The Router will have a constant wait time to simulate the processing of the request.