CMP2205-Computer Networks (Assignment One)

Each message is M-byte long. There are t-layers each one adding an h-byte headers, so the total number of header byte is. Then the total packet size is.

The fraction of each packet size used by the protocol header becomes;

(b) If it is assumed that the bottom layer (physical) does not generate any header, then there shall be headers generate, so the fraction of the network bandwidth that is filled with headers is given by;

:

Given;

Bandwidth,

Capacity,

From;

Therefore,

From;

Question Three:

Protocol Layering is a technique we observe in TCP/IP (Transmission Control Protocol/Internet Protocol), OSI, and in other similar reference model. In these reference models protocols are divided according to functionality creating multiple abstraction layers. The reasons/advantages for using layered protocols are:

* Protocol Layering simplifies network designs by dividing protocols into multiple functional layers.
* Each functional layer is responsible for the task that is assigned to it, hence protocol management becomes easier.
* According to the requirement of an application, individual protocols can be added or replaced without affecting other components
* It simplifies maintenance of large systems

Disadvantage

* Lower performance because each data packet has to go through multiple layers and each layer headers create complexity in computation.

:

Given:

From,

Given;

Signal level,