

ETSF05/ETSF10 Internet Protokoll

Assignment 3

This assignment will assess your ability to design a simple link layer protocol that meets some strict requirements. You are required to work independently and as usual, all material must be properly referenced. In the CS community, the following citation style is standard, but you may use a different citation style if you wish.

Example citations:

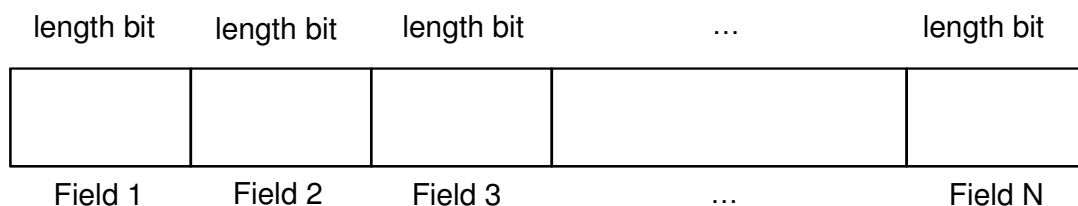
In [1] Borg et al. showed that it is possible to stack 45 camels using superglue. However, they failed to reproduce the claims of 100 camels claimed in [2, 3].

- 1) "On the stacking of larger camels in the Sahara sun", B. Borg and P. Rafter, International journal of the mystic arts, vol.3 pp.77-89, 2006
- 2) I Nastase, "Can camels be stacked?", third SIAM workshop on things, Vancouver Canada October 2001.
- 3) J. Docic, "Why I stack Camels and how many I can stack with my eyes closed", In Proc. Camelstackers, Newcastle Australia, Sep. 2003.

Assignment task:

You shall design a link layer protocol for a specific environment, and clearly show how your technical solutions meet the requirements. The design should be reported in essay form, i.e. in the form of a document that specifies the requirements, how each requirement is met, and sources from which technical solutions have been taken. The report should have a maximum page limit of 3 pages. An important aspect of this assignment is the ability to seek information (in the library and on the Internet). Information about how to solve the technical design issues and meet the requirements is readily available nowadays. Consult your textbook as a first port of call, all information needed is in the book, but you may want alternative explanations or you may use a different textbook.

All design decisions should be clearly motivated and calculations provided. The protocol header should also be provided as a figure in the following style:



Environment:

The protocol should enable transmission of frames over a satellite link with errors. However, the link is a microwave link which is fairly reliable so that bursts of errors no more than 30 bits in length occur. The satellite orbits at a height of 40000 km (geo stationary) and the maximum frame size is 1500 bytes. The transmission rate is 100 Mbps.

Requirements:

- The protocol should be able to fully utilize the link
- The protocol should be able to capture ALL errors that can occur
- The protocol should include functions to demultiplex the payload to either IPv4 or IPv6
- The protocol should be extensible, allowing the addition of up to 5 information fields of length 16 bits
- The protocol should acknowledge successful transmissions and include an error correction scheme.
- The protocol should be designed in an efficient way, minimizing the overheads.

Hints:

Assume propagation speed of 3×10^8 m/s.

Revise material on flow control, error detection and correction.

Deadline for submission: December 22, 2014 at 12.00 midday. Assignments should be uploaded to moodle.