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8. Blatt: Network Protocols and Architectures WS 11/12

Aufgabe 1: $(15 + 15 + 0 + 0 = 30$ Punkte) *RFC 1149*

(a) Lies das unten angefügte RFC 1149 und erkläre, aufgrund welcher Eigenschaft von IP es funktionieren könnte.

(b) Gib an, wovon Transmission Delay, Propagation Delay und Packet Loss abhängen. Welche Auswirkungen ergeben sich daraus für die Flusskontrolle von TCP („flow control“)?

(c) Überprüfe Deine Aussagen aus (b) in einem praktischen Versuch. Beachte dabei die relevanten Tierschutzrichtlinien!

(d) Wenn dich dieses Thema interessiert, empfehlen wir als weitere Literatur das RFC 2549: `http://rfc.net/rfc2549.html`.

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Network Working Group                                          D. Waitzman
Request for Comments: 1149                                         BBN STC
                                                             1 April 1990


      A Standard for the Transmission of IP Datagrams on Avian Carriers

Status of this Memo

      This memo describes an experimental method for the encapsulation of
      IP datagrams in avian carriers.  This specification is primarily
      useful in Metropolitan Area Networks.  This is an experimental, not
      recommended standard.  Distribution of this memo is unlimited.

Overview and Rational

      Avian carriers can provide high delay, low throughput, and low
      altitude service.  The connection topology is limited to a single
      point-to-point path for each carrier, used with standard carriers,
      but many carriers can be used without significant interference with
      each other, outside of early spring.  This is because of the 3D ether
      space available to the carriers, in contrast to the 1D ether used by
      IEEE802.3.  The carriers have an intrinsic collision avoidance
      system, which increases availability.  Unlike some network
      technologies, such as packet radio, communication is not limited to
      line-of-sight distance.  Connection oriented service is available in
      some cities, usually based upon a central hub topology.

Frame Format
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   The IP datagram is printed, on a small scroll of paper, in
   hexadecimal, with each octet separated by whitestuff and blackstuff.
   The scroll of paper is wrapped around one leg of the avian carrier.
   A band of duct tape is used to secure the datagram's edges.  The
   bandwidth is limited to the leg length.  The MTU is variable, and
   paradoxically, generally increases with increased carrier age.  A
   typical MTU is 256 milligrams.  Some datagram padding may be needed.

   Upon receipt, the duct tape is removed and the paper copy of the
   datagram is optically scanned into a electronically transmittable
   form.

Discussion

   Multiple types of service can be provided with a prioritized pecking
   order.  An additional property is built-in worm detection and
   eradication.  Because IP only guarantees best effort delivery, loss
   of a carrier can be tolerated.  With time, the carriers are self-



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   regenerating.  While broadcasting is not specified, storms can cause
   data loss.  There is persistent delivery retry, until the carrier
   drops.  Audit trails are automatically generated, and can often be
   found on logs and cable trays.

Security Considerations

   Security is not generally a problem in normal operation, but special
   measures must be taken (such as data encryption) when avian carriers
   are used in a tactical environment.
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Abgabe bis Donnerstag, den 5. Januar 2012 nur bis 13:55 h s. t.

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- **In Papierform:** Postfach im Telefunkenhochhaus (Erdgeschoss, hinter dem Pförtner rechts)
- Gib auf deiner Lösung deinen Namen, deine Matrikelnummer **und** den Namen deines Tutors an.