RFC1006 Extension
ISO Transport Class 2 Non-use of Explicit Flow Control over TCP/IP

Yanick Pouffary
pouffary@taec.enet.dec.com
Digital Equipment Corporation

Topics

- Need: Run DECnet over TCP/IP
- Possible solutions?
- Why RFC1006 extension?
- RFC1006 extension Protocol
- Implementation Status
- Discussions

DECnet over TCP/IP

Needs

- Guarantee independence of normal and interrupt data channel
- Guarantee that all data in transit must be delivered before initiating release the transport connection (Synchronous Disconnect)

Requirements of Solution

- Two independent Channels:
  - Use Splitting and Recombining mechanism over two separate TCP connections
- Synchronous Disconnection
  - Use DR/DC TPDU with additional Information
- Minimise Changes to ISO Transport + RFC1006

Possible Solutions

- ISO TP0 over TCP/IP
  - Add ED TPDU + Allow splitting/recombining + Change TP0 TPDU format to include reference number.
  - Add DR/DC TPDU
- ISO TP class with flow control (TP2 or TP4)
  - Allow TP2 to do splitting / recombining
  - Results in dual Flow Control (ISO TP + TCP) for single transport connection
- ISO TP2 (No Flow Control) over TCP/IP
  - Add ED TPDU + Allow TP2 to do splitting / recombining

Choice

- ISO Transport Class 2 with No Flow Control

RFC1006 Extension - Protocol

- ISO 8073 Transport Class 2 Non-Use of Explicit Flow Control, with the following extensions
  - Expedited Data is Allowed
  - Splitting and Recombining may be used to provide separate channels for Normal and Expedited data.
- Own TCP Well Known Port Number (399)

RFC1006 Extension - Connection

- Connection establishment is based on ISO 8073 with the following extensions
  - Connection Request and Connection Confirm may negotiate use of Expedited Data
  - Connection Request and Connection Confirm must not negotiate “Use of Explicit Flow Control”.

RFC1006 Extension - Data Transfer

- Data Transfer is based on ISO 8073 with the following extensions
  - Expedited data may be supported
    - Expedited Data Acks. are not required as there is no Flow Control.

RFC1006 Extension - Data Transfer

- Splitting and Recombining:
  - A second TCP connection is used for Expedited Data
  - It's recommended to create it only when Expedited Data is sent but it must then remain established until the end of the Transport Connection
  - It must not be shared between transport connections
  - Expedited data must only be sent on outgoing TCP connection

RFC1006 Extension - Disconnection

- Disconnect Initiation based upon ISO 8073, With the following rules:
  - Abort Disconnect
    - DR/DC as normal
  - Sync Disconnect
    - DR/DC with "Additional Information" parameter
      - Hold DR on transmitter until TCP takes all data.
      - Hold DR at receiver until the user takes all data.

Implementation Status

- Two implementations (separate code streams)
  - Digital DECnet/OSI for OpenVMS
  - Digital DECnet/OSI for UNIX

Discussions

- TCP Port Number
  - Currently recommend to not use RFC1006 port number, to protect existing implementation.
  - Should it be forbidden?
- Multiplexing
  - Currently not recommended in this extension
  - Should it be forbidden?
- Other?