McTcp

Multiple Channels over TCP/IP

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About this document

The original GDoc:
https://docs.google.com/document/d/1Wqa8rDi0QYcqcf0oecD8GW53nMVXj3ZFSmcF81zAa8g/edit?usp=sharing

Abstract

Coding

Byte order

The byte order can be defined for the driver at compile time.
Note: In this document, big endian is used for the examples.

Integral types

This protocol support the only the type INT32. It is a signed integer encoded in the defined byte order.

String and raw data

Both string and raw data is encoded into as a leading size and a byte array sequence of data.
Strings are encoded as UTF-8 bytes.
No alignment is added.

Example: "Bye"
00 00 00 03 42 79 65

Blocks

Block are the smallest part transmitted over the tcp connection.
The maximum block size is 1200 bytes.

Structure

Type	Meaning
UINT16	channel id
UINT16	payload size
UINT16	block seq id
UINT16	block arm id
...	payload

Block Sequence Id

The block sequence id starts with 1 for each stream.
It is incremented by 1 for each block and wrap around at 0xFFFF to 0.

The block id is transferred as uint16, but the endpoint maintain a block id as uint32.

Block Arm Id

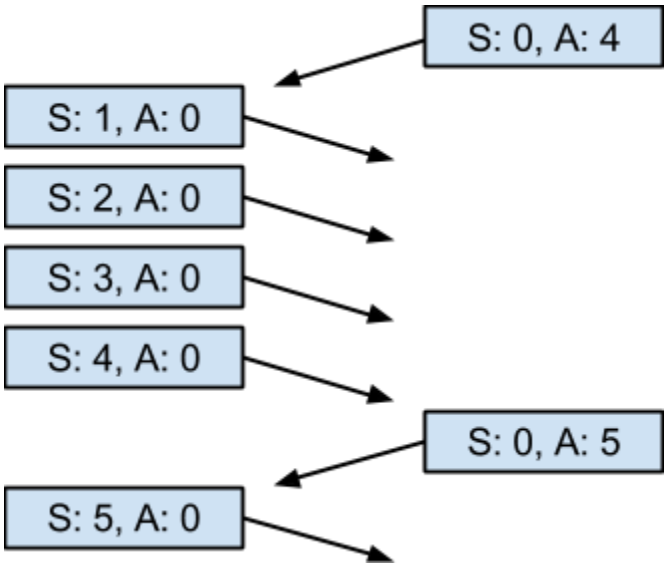
If the arm id is given, it tell the sender, that the receiver is ready to receive up to this id, inclusive.
After connection, no blocks are allowed to be sent.

Channel

A channel is like a tcp connection, having a «in» and a «out» stream.
There is one special channel for protocol internal use. It's id is 0.

Flow Control

Each stream sends as first transmit action an empty block with the ack id set to the negative count of blocks it can buffer on the receive side.
This is the «ack offset»



Connection Process

Each side starts to send the «arm ids» with the channel from the highest channel id downwards until 1.
If the channel count does not match, the connection is either aborted or the connection is ignoring the channels that are not supported by the other side.