
1394B Synchronization Signals

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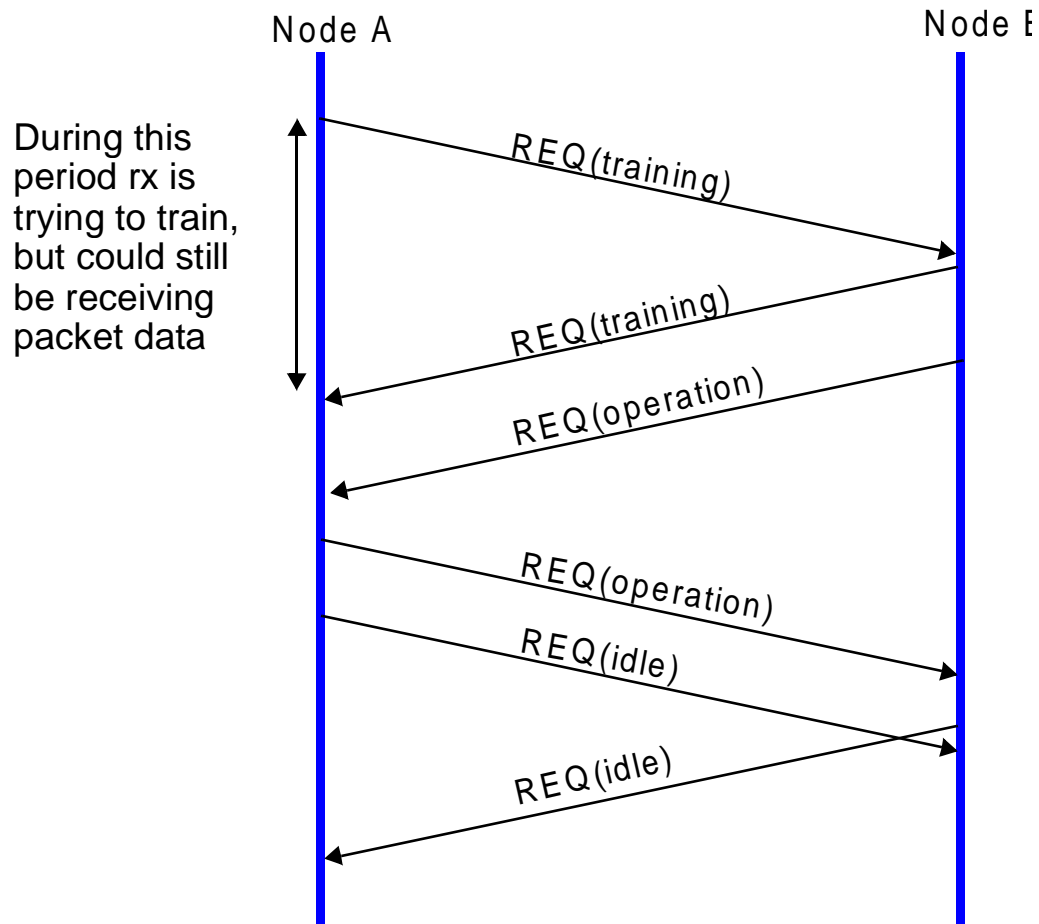
— 1394B synchronization

- Current proposal is that the training handshake signals, REQUEST(training) and REQUEST(operation) are request type signals that are mapped to Dx.0 or Dx.4 codewords (see Eric Deliot's presentation in March).
- Specifically:

Request type	symbol HGFEDCBA
TRAINING	0xx00000
OPERATION	0xx00110

- These signals must be suitable for bit, character and scrambler synchronization.
- They replace the previous scheme which used Cz control codewords during training.

Character synchronization (1)



We need to ensure that a receiver cannot acquire (the wrong) character synchronization while receiving any signal other than REQ(training) or REQ(operation).

This is a particular problem now that request types are represented by data characters.

— Character synchronization (2)

- REQ(training) and REQ(operation) signals are made unique from data by periodically inserting a special comma character.
- Specifically:
 - whenever a D28.0 character would be sent during REQ(training) or REQ(operation), send a K28.5 instead.
- Receiver only acquires codeword synchronization when a comma character is received.
- Receiver also checks that comma character is preceded by at least two Dx.0 or Dx.4 characters. This protects against the possibility of a false K28.5 being generated by the concatenation of Dxx.y and Cz codewords at packet boundaries.

Scrambler synchronization

- Once character sync. is done, receiver is able to use decoded request type values to train scrambler:

Request type	symbol HGFEDCBA
TRAINING	0xx00000
OPERATION	0xx00110

Before scrambling, msb is always zero during training. After scrambling it will be equal to the scrambler state. 1 in 8 scrambler states are provided to receiver for descrambler training.

- Training mechanism is similar to previous scheme.

Automatic polarity correction

- Dx.0 and Dx.4 character coding is such that if the received signal is inadvertently inverted (e.g. UTP is mis-wired):
 - The three decoded msb's (HGF) are unaffected. The five decoded lsb's (EDCBA) are either inverted or unaffected. i.e. :

Request type	symbol HGFEDCBA
TRAINING	0xx00000
OPERATION	0xx00110

unaffected →

either unaffected or inverted →

- Scrambler training bit is unaffected by polarity. Character sync. is unaffected by polarity.
- Incorrect polarity is easily detected by checking for complement of REQ(training) or REQ(operation). No need to re-train.

Summary

