

Figure 8. Using Control Signal Memory

E. Policy for applying the Forward Error Correction(FEC)

In the one-way transmission, it is not possible retransmission about transmission error basically, it is the policy to correct transmission error at the receiving node.

Forward error correction (FEC) is a technique used for controlling errors in data transmission over unreliable or noisy communication channels. The central idea is the sender encodes the message in a redundant way by using an error-correcting code.[12]

There are various algorithms of FEC such as Hamming Code, Turbo Code, Reed-Solomon, LDPC, RaptorQ, and so on.

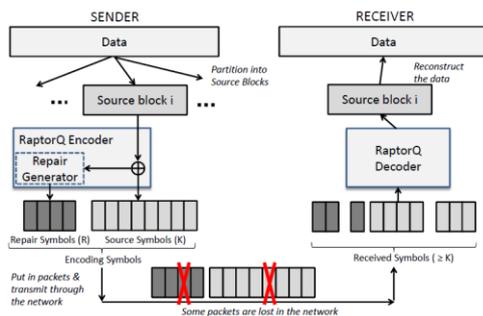


Figure 9. Sample of FEC : RaptorQ FEC[13]

The send node creates Repair Symbols to correct errors and transmits them. When the error occurs, the receive node can corrects the error by FEC decoding using additional information such as Repair Symbol and Source Symbol.

V. CONCLUSIONS

Through Stuxnet in 2010, the security of the industrial control system has become a big issue. Data Diode has been emerged from the need for solving such a security problem.

In this paper, we described Data Diode that provide a one-way communication physically. We also analyse the commercial products that are currently available on the market and the various techniques that can be applied to the actual ICS.

In the future, we will carry out our research on the retransmission mechanism to ensure reliability of the one-way data transmission by minimizing impact on transmission performance.

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