# Review Report

**Title:** ANC: Adaptive Unsegmented Network Coding for Applicability
**Conference:** ICC 2013

**Summary:** Several technologies are proposed to solve the major shortcomings of unsegmented network coding (UNC). This paper reinvestigates UNC in light of a new decoding constraint. Using the decoding constraint, a control overhead reduction approach and a novel hybrid source packets admission (HSPA) scheme aiming to enhance universality are proposed. Simulation results show further throughput gain achieved by ANC over unsegmented network coding (UNC) and segmented network coding (SNC) in various network conditions.

**Strong Points:**

1) A new decoding constraint is introduced. Some new and interesting features of UNC are derived based on the new constraint.
2) Control overhead is mitigated through replacing witness-ACK by decoding-ACK. and turning the size of the slide window to the number of decoding-unacknowledeged packets.
3) HSPA is proposed to achieve a tunable compromise between UNC and SNC.

**Weak Points and Recommended Changes:**

1) There is no proof about the new decoding constraint proposed in the authors' previous work. Although related reference is provided, the loss of the proof on the key theorem makes the paper less persuasive. The decoding constraint is the foundation of the proposed improvements. A brief proof about the decoding constraint could be added to make the paper more complete.
2) A further analysis on the control overhead reduction is needed. What's the corresponding change at the receiver side after replacing the witness-ACK by decoding-ACK? What's the effect brought by the proposed control overhead reduction approach on the throughput, delay, resource utilization and the interference between data and feedback?
3) There is no discussion on how the key parameter $x_0$ in the HSPA is determined. HSPA is a simple thresholding method and combination of UNC and SNC. Limited performance improvements on universality and throughput gain are achieved. Some essential contributions are needed.
4) In Fig. 5, the optimal $x_0$ that maximize throughput of ANC is labeled. However, the optimal $x_0$ labeled in Fig. 5 (b) when network size, K, equals 40 obviously disagrees with the results shown in Fig. 4 (b) with the same K and end-to-end loss probability, e. In addition, more performance enhancement validation for control overhead control such as the comparison of delay and resource utilization between ANC and UNC with no control overhead mechanism is needed.