

## **Evaluation of paper: Coupons: A Multilevel Incentive Scheme for Information Dissemination in Mobile Networks**

**Familiarity:** Some knowledge

**Recommendation:** Likely Accept

### **Strengths:**

- This paper presents a novel new concept which brings the concept of peer-to-peer into the wireless domain. It provides strong motivation for the need for incentive schemes using the concept of a coupon.
- Although many of the ideas presented are already foundational principles in the networking domain - they were given a fresh angle in light of disseminating information where the destination is not known but the intention is to achieve a high level of penetration.
- The resilience of the scheme to malicious users is impressive
- The multiple mechanisms to prevent broadcast storms were well argued and well demonstrated with results. Another cursory advantage of coupons de-valuing with each hop that is not explicitly mentioned in the text is the value of forwarding decreases as the value coupon value decreases which will also disincentivize ongoing broadcasts.

### **Weaknesses:**

- It was not always clear whether these nodes would always need to be in ad-hoc mode to disseminate information to their neighbours. It appeared from the simulations that this was the case, but in reality mobile devices may be in a client mode – connecting to an 802.11 access point for example and then would need to switch to ad-hoc mode when neighbours are in range to send a coupon. This switching would also incur additional overhead and inconvenience. Bluetooth could also be used but its range is severely limited. More discussion on these practicalities would be good.
- In section 4 on simulation-based evaluation, there were a lot of ranges or numbers that were specified without motivation. For example why was the counter limit set to 10.
- I would have liked to have seen an implementation on a larger Testbed to verify the simulations and this section seemed rather cursory and perhaps could have been left out. The only important lesson from the few nodes that were used was MAC addresses can be extracted from protocols like ARP, DHCP, ICMP to build up a list of neighbours quickly.

### **Detailed comments:**

#### **1. Introduction:**

- Add information on what type of environment these devices operate in – often it might be that Internet is available using WiFi/3G but they still send coupon information to neighbours in range using Bluetooth for example. You could also mention other alternatives like the option of using mobile phone geolocation applications as a means to drop coupons at certain geo-referenced locations that people in your social networking group could pick up (of course it has the disadvantage of relying on a connection to the Internet)
- 1<sup>st</sup> paragraph on pg 793, you announce that this will open up a new area of research, but the following sentence uses the word platform – and I would agree that this is a new platform for more applications to be built on rather than a new area of research.

## 2. System Description:

- On page 793, last bullet, why is there mention of a network service provider if this is an ad-hoc network. If it is a network service provider, then they would want more traffic to generate more revenue anyway.

## 4. Simulation-based environment

- Typo at bottom of page 796: batter → battery
- page 797: 6<sup>th</sup> bullet – “The sections below” rather list the sections
- page 798: 2<sup>nd</sup> column, 1<sup>st</sup> paragraph. Typo suing → using
- page 799 Fig. 5 fix legend in graph (a)

## 5. Extended evaluation and implementation

- page 801 Fig.8 Change y-axis label to “extra earned points” – as this reflects the difference between no cheating and cheating
- page 802: first paragraph – Add a plot of 100 percent malicious users to Figure 9. to match text.

## 6. Conclusions

- Perhaps say a little more about what this new platform can do for the research community in the area of peer-to-peer like schemes in wireless networks.

**Evaluation of paper: Cross-Layer Design of Ad Hoc Networks for Real-Time Video Streaming**  
<http://msw3.stanford.edu/~zhuxq/papers/wcomm2005.pdf>

**Familiarity:** Some knowledge

**Recommendation:** Likely Accept

**Strengths:**

- The paper provides a clear sense of which parameters need to be shared across layers to optimize performance and acknowledges the need for caution in cross layer communication to prevent a high degree of complexity.
- First paper to address all layers of the network protocol stack relevant to real-time video streaming over ad hoc networks.
- The performance gain from using cross layer techniques for video streaming is clearly demonstrated by graphics which show
  - better throughput performance with adaptive link layer techniques
  - better peak signal to noise ratio when cross-layer techniques are used to optimally assign capacity and flow.
  - Improvement in quality when prioritising important video frames such as I frames.
  - Higher achievable rate when chosen rate for video stream is based on current network conditions and delay requirements.

**Weaknesses:**

- There were a few instances where insufficient context or information was provided to fully understand the text, for example the subscripts in  $r_{12}$  and  $r_{34}$  were not explained in Fig.3 and the subscripts  $i$  and  $j$  were not explained in equation 3.
- No comparisons were made with any existing cross-layer work, only with results where no cross-layer techniques were used.
- I would have hoped for a little more discussion or evaluation on the increased complexity that comes with cross-layer techniques in the context of this work.

**Detailed comments:**

**Introduction:**

- 3<sup>rd</sup> paragraph, the extent of coding errors propagating to subsequent portions of the video is highly dependent on the coding scheme – this should be mentioned.

**Related work**

- last paragraph, qualify the phrase “much work still needs to be done” what work?

**Cross-layer design framework**

- 2<sup>nd</sup> last paragraph: typo tht → that
- 3<sup>rd</sup> paragraph, it isn't clear from the text what you mean by the optimal symbol error rate remaining constant in equation 1 – when which parameters are changed?
- Figure 1. Use simple arrows for messages between layers of the stack, the 3 dimensional arrows are obscure and distracting
- Figure 3. Label of graph e) is incorrectly shown as a c)

- Explain subscripts in  $r_{12}$  and  $r_{34}$

Joint allocation of capacity and flow

- The cross-layer graph had a higher number of quality drops - you need to give an explanation for this.

Determining the optimal operating rate

- 3rd paragraph, typo difference  $\rightarrow$  different

Conclusion

- last paragraph: explain how it can also greatly increase complexity.
- What are the important areas of future research?