Title: Performance Evaluation of In-network Integrated Caching
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Summary:

This paper refines the Integrated Caching mechanism by introducing neighborhood-awareness feature, aiming to let a router have a knowledge of its neighbors' cached contents as well as to improve the collective cache utillization. More
interestingly, a detailed performance evaluation work is done to show the two enhanced caching technologies' outperforming over traditional caching solutions as well as the "Cache-n-Capture".

Strong points:

1. Based on the Integrated Caching proposed by some previous work, this paper refines the caching algorithm by introducing broadcasting and coordinating mechanism, which will surely boost the caching performance.

2. This paper compares the performance of different caching methods by in-depth simulations and the models are meaningful for future work.

Week points:

1. As the authors said, this paper designed a caching mechaism for next-generation network. But they didn't give a relative concrete description for the next-generation network architecture. The caching algorithms mentioned in this paper does not follow OSI or TCP/IP model, it seems like a mixture for network layer, transport layer and application layer. Although the routing performance is likely better than traditional routing solutions, the mixing architecture adds to the complexity for system implementations and mitigates the isolation and decoupling merits, which are the goals for traditional designs.

2. This paper does not cover the cache invalidation issues, which will be critical for passive caching just like in web
caching. For this caching structure, the distributed caches will be difficult to manage since some routing paths will not be used for next routing process and the "dirty caches" along those paths are hard to maintain or update. This paper assumes the content routing takes priority over IP routing, users will never know whether the version of contents they retrieve is the latest.

3. When computing the feasibility of CB and CCB, this paper asserts that no large content routing tables are not needed. I have a doubt here. Since the simulation only counts a small number of contents, which is not true in reality. Global contents will be too many to cache even this paper thinks a ratio less than 10% of the total contents are needed. Besides, in a backbone network, the routing speed is critical. To search an entry in the content routing table will also be a time-consuming job, an optimized storage structure is essential as well.

4. Security issues are unavoidable. The mixing structure (L3 routing, L5 searching) makes the encryption work more difficult. The payload within a packet will be no longer transparent for routers. So some encryption methods such as IPSec will fail in this design. The router begins to care what the packets are about but not just forward them as before. Besides, the home server does not know how many copies of its contents reside in the interim routers without its permission.

5. No replacement policies are included in the simulation work. So the simulation can be thought as a short-term one. For long-term running network infrastructure, an appropriate replacement policy is needed.

Typos:
1. page 1, variety of => a variety of
2. page 2, demonstrated => demonstrates
3. Page 11, their neighbors => its neighbors
4. Page 11, coordinate => coordinates

Recommendation:

Evaluational work done by this paper treats Hierarchical Caching and CDN Caching as total-isolated caching mechanisms. The results for CDN is undesirable because this paper assumes only global contents are cached on CDN servers but a small fraction of global contents are requested by end users, which may not be true. Traffic incured by Some streaming service like Youtube is non-trivial. So a hybrid of CDN caching and CCB (The technologies mentioned in this paper) is likely promising. CDN cachin g is for global contents while CCB is for local contents.