Response to Reviewer 1 Comments

key issues:

**Point 1:** The proposed algorithms only have marginal improvements over the current state-of-the-art algorithm (i.e., Lee's algorithms). The paper fall short in convincing me whether these marginal improvements are that significant in a real setting.

**Response 1:** Our proposed algorithms have some improvements in network performance (path cost, load balance, maximum link utilization). More importantly, the proposed algorithms have achieved obvious results in path comprehensive evaluation compared with other traditional algorithms. Our algorithms can select the most suitable path according to the needs of different users based on optimizing the basic performance of the network. Firstly, our proposed algorithms select k paths for the purpose of optimizing network performance, and then considers the users need to select one path from k paths. Most of the existing routing algorithms are either considered from the perspective of optimizing network performance (load balance, link utilization, etc) or from the perspective of users’ requirements (packet loss rate, delay, bandwidth, etc). Our algorithms not only optimize the network performance, but also consider the user requirements from the users’ perspective.

**Point 2:** The paper only evaluates improvements in the network (i.e., the data plane). There are no control-plane evaluations, i.e., how much time the algorithms take to compute, etc. When considering a logically-centralized environment (like SDN), control plane quickly becomes a primary bottleneck as the network scales.

**Response 2:** The evaluation of the control plane of the algorithms have been supplemented in Table 4 by taking the running time as an example. It's true that our algorithms add a little bit of computational complexity to the control plane. However, with the improvement of computing power of hardware devices and the application of distributed multi-controllers in SDN (we are studying this aspect), the computational complexity of control planes will be alleviated. We have already supplemented this point in the section 3.3 algorithm summary and in the section 4.2 simulation results. And how to design a multi-targets algorithm with lower complexity and faster speed is also a problem to be solved in the future.

**Point 3:** SR is designed to mitigate the need for a control plane (as in SDN) and let end-hosts dictate which route packets should take in a source-routed fashion. Therefore, it's confusing when the paper talks about merging SR with SDN. It seems like the approach, presented in
the paper, would bring back the limitations that SR is trying to solve. It'd be nice to see if these algorithms can be deployed in a distributed fashion at the end-hosts.

**Response 3:** Our proposed routing algorithms in the paper are designed for SR in SDN. The SDN controller only needs to code end-to-end routing information into an ordered list of tags and store it in the packet header. Routing is performed by the ordered list of tags in the packet header. And SR avoids the requirement for millions of tag encodings to be stored along each path in each network device and eliminates the complexity of maintaining a mass of forwarding rules. Of course, our method can also be applied to traditional distributed networks. We have already supplemented this point in the section 3.3 algorithm summary.

**Minor nits:**

**Point 1:** There is heavy use of passive voice, making it hard to link who is doing what in the sentences.

**Response 1:** The passive voice in the sentences has been modified. Such as the 33,57,118,126,128,146,178,185,236,258,275,295,296,297,309,353,354,394,553 lines, etc.

**Point 2:** The term "cost of a path" is confusing. Authors do make it clear later in the paper, but it's not at all clear when reading the abstract and intro.

**Response 2:** The term "cost of a path" has been supplemented in the 303 to 307 lines of section 3.1.

**Point 3:** "actualize differentiated business networks. Not sure what this phrase means.

**Response 3:** "actualize differentiated business networks." have been supplemented by examples in the 41 to 47 lines.

**Point 4:** "and efficient configuration for the upper layer." What does "upper layer" mean?

**Response 4:** "upper layer" means the upper application layer. We have modified it in the 29 lines.

**Point 5:** "needs of new business." What business? Give examples and citations.
**Response 5:** "needs of new business." have been supplemented by examples in the 41 to 47 lines.

**Point 6:** "a certain network performance guaranteed." guaranteed --> guarantees.

**Response 6:** We have changed guaranteed to guarantees.

**Point 7:** Section 2.1 is on Segment Routing but also talks about SDN ... confusing. Have a separate section on SDN or update the title accordingly.

**Response 7:** We have updated the title to “Segment Routing based on SDN”.

**Point 8:** "We summarize some of the research on this issue in the following paragraphs. The ..." This sentence is already a part of that paragraph; made me wonder if you are talking about the paragraph after this one; which isn't the case?

**Response 8:** We have updated the sentences "We summarize some of the research on this issue in the following paragraphs” to “Some works have been done on this issue”.

**Point 9:** "list at the previous first hop router." Is it only for the first-hop router that precedes a switch or any router?

**Response 9:** We have updated the sentences "list at the previous first hop router." to “list at the previous first hop or segment changed router”.

**Point 10:** "As SDN has a global view of the network resource, it can monitor network traffic at any time, ..." This is an extreme assertion, without any accompanying references.

**Response 10:** "it can monitor network traffic at any time." has been deleted.

**Point 11:** "The traffic matrix G1 can be updated by the controller at intervals." What's the frequency of these intervals. Give numbers or citations?
**Response 11:** "The traffic matrix G1 can be updated by the controller at intervals." has been updated to "The traffic matrix G1 can be updated by the controller after each routing request."

**Point 12:** "each flow packet is in the range of 10 MB/s to 100 MB/s." Confusing, how can a packet be in units of MB/s. Did you mean MB? Still odd.

**Response 12:** "each flow packet is in the range of 10 MB/s to 100 MB/s." has been updated to "each flow packet is in the range of 10 MB to 100 MB."