**Comments by the Editor**

1. The investigation, analysis, and results of the AOI-to-zone-size issues is not strong enough for journal publication. The kind of analysis discussed in 3.4, "Setting an Optimal Size for AOI", is potentially very interesting.  Done thoroughly, on a large carefully chosen set of situations, results could make a strong contribution.
2. But the given analysis seems simplistic and the conclusion that 2 is a good ratio does not seem very well supported at all.
3. I also found it odd that the charts and the discussion pretty much ignores ratios less than 1.  There is data in the charts for ratios < 1, but it's hard to see and not discussed. Certainly in some applications ratios less than 1 are quite good!
4. If DiVE is to be the primary focus, however, I think better, more careful comparison with other frameworks should be done.  I understand the comparisons with Second Life and OpenSimulator.  However, I would also like to see a bit more careful discussion of relationship to other frameworks used in, e.g., MMOGs.   Without this the impact/interested audience is pretty small.
5. If the primary focus of the paper is interest management, then the abstract should be reorganized, some of the DiVE system info in 4 shortened, and, most importantly, additional work on optimality analysis should be done and carefully presented.
6. I agree with one of the reviewers that DiVE is an unfortunate name and think it would be best to change it.
7. In Section 3.4 the focus on "number of messages" and "number of 'entering/leaving zone' events" is a bit mysterious to me.  How do those numbers relate to overall run time?
8. Figure 7 should be split into two rather than have two pretty different sets of data overlaid on the same chart - I see no insight added (and only potential confusion) by having them in the same place - the numbers are not directly comparable, e.g.
9. In 5.3, Results of Systematic Testing, there is not much said about the Local vs Optimized zones.  From a quick look at the charts, I think many would say the Optimized results are not obviously better, certainly not enough so to be sure in a variety of situations beyond the simple few tested.

**Comments by the Referee 1**

1. The Distributed Virtual Environment usages it supports is limited. Due to the design and the validate method (validated in LAN setup only), it’s not convincing that it can become a networking framework in general to support massively multi-user virtual worlds and scales to the level as claimed in the paper.
2. DiVE handles the simulation scalability problem by running simulation on client machines and letting each client simulating its own entity’s movement. This puts strong requirements on hardware configuration and capability of  client machines, which limit the types of VE applications that DiVE can support.
3. Second, DiVE does not really address the consistency maintenance of distributed simulations – which would become a significant problem when clients are spread across Internet and experience long network delays.  The usages that DiVE supported seemed to run in the same LAN, and hence the network delay was not a big issue. For many distributed VEs, however, client machines at different geo locations would be the norm and network delays need to be addressed. More importantly, it’s the inconsistency among the client machines caused by long network delays that need to be addressed. Otherwise, it is not a complete solution. Testing the system in a WAN setup (e.g. by deploying servers and clients in different sites of public clouds) is recommended.

**Comments by the Referee 2**

1. The authors should address the existing frameworks and compare them to the proposed DiVE framework. What is missing in the existing frameworks? Why the proposed framework is better than the existing ones? These are the questions the reviewer expects to be answered and thoroughly discussed, with the support of experimental evidence or quantitative analysis.
2. The authors claim that the novelty of this work is to determine the optimal proportion of the size of a zone and the size of the AOI. Although not exactly identical to this problem, the optimal zone size has already been discussed in the literature.
3. Using another name (for 'DiVE') may help the readers to avoid confusion.
4. Is ‘OpenSim’ an abbreviation of OpenSimulator (Page 1, Line 36)? If so the abbreviation should be defined. Otherwise, a reference of ‘OpenSim’ should be added.
5. Page 4, Line 18 The acronym ‘AOI’ has already been defined (Page 2, Line 34).
6. The disadvantage of the inner/outer AOI has not been discussed in this section. Assume the inner AOI represents the actual visibility scope of an entity, adding a larger outer AOI may reduce the chance of oscillation, however, the outer AOI would also subscribe to zones that the entity does not see. Consequently, the owner of the entity would have more chance to receive irrelevant data with this approach. For example, in figure 4(b), the 4th case, the entity cannot see the zone but it still receive data from this irrelevant zone. Experimental evaluation on this disadvantage is also expected.
7. Page 8, Line 22-23 ‘With the zone-based approach, the number of AOI checks become independent of the number of entities on the server.’ Section 3.3 describes that two AOIs are associated with each entity. Therefore, the number of AOI checks should definitely be dependent on the number of entities.
8. Page 8, Line 4 Error sentence: `So we chose choose 100m2 100……’
9. Page 10, Line 45 Is it `DiVE FRAMEWORK’?
10. Page 10, Line 50 ‘Standard Development Kit (SDK)’ Is it Software Development Kit?
11. Page 16, Line 45. The authors used two paragraphs to described Lake et al.’s architecture and experimental results. It is unclear how this work is related to the tests described in Section 5.2 and 5.3. A more detailed explanation is expected. Moreover, even if Lake et al.’s work is related to the tests, it would be better to put its detailed description in Section 2, rather than 5.2.Page 17, Line 5-15. The reviewer fail to see the result described in Line 5-9 indicates the conclusions (1) and (2). A more detailed and comprehensive explanation is expected.
12. Page 20, Line 5-8 This seems to be an engineering problem. If the connection is overloaded when the number of clients is larger than 120, all of the comparisons (e.g. Fig. 12, bandwidth usage) would become problematic since they failed to reveal the actual difference between the three approaches. Therefore, only the undistorted results should be presented (i.e. when the number of clients is smaller than 120).