Cloning Mechanisms for High Level Architecture Based Distributed Simulation

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Part 1

General comments

The thesis has investigated novel control mechanisms for large-scale, HLA based, distributed simulations based on cloning. It establishes an infrastructure incorporating the distributed simulation cloning technology to serve as a decision support tool. The aim is "to develop novel control mechanisms for large-scale distributed simulations based on the HLA." In support of this, the following objectives are attempted:

- to establish a theory of distributed simulation cloning
- to investigate and design an efficient, reliable mechanism to enable distributed simulation cloning
- to develop a generic approach to cloning federates at runtime
- to manage concurrent scenarios in a cloning-enabled distributed simulation
- to provide user transparency and reusability to existing simulation models
- to design (and evaluate) alternative simulation cloning mechanism (entire/incremental)

The thesis attempts to satisfy these in ten chapters.

- 2 introduces relevant literature
- 3 introduces a fundamental theory of distributed simulation cloning
- 4 proposes an approach to cloning using the HLA
- 5 implements and evaluates this
- 6 investigates and evaluates two approaches to using DDM support for cloning
- 7 investigates and designs the overall approach to cloning
- 8 evaluates this
- 9 discusses fault tolerances and a web/grid environment.
- 10 concludes the thesis.

Assessment

*Overall this is an excellent piece of work.* I am very pleased to see work of this quality and length. In many ways there are almost 1.5 theses work presented here! In my opinion the candidate has excelled in his work and, with the caveats presented below, has produced a document that I would be very proud to show my students what can be done in a thesis. In contemporary distributed simulation research it is often the case that work is incremental and does not really move the field forward. This work represents a considerable step forward and will lead to much new work in the area – I strongly recommend the candidate to continue publishing work from this thesis (in addition to the papers already published).

My only criticism of the thesis is the way chapter 1 (introduction) and chapter 10 (conclusions) are set out. In my overview I wrote my version of the objectives presented in chapter 1. Objectives tend to be written as “to investigate…” “to design and evaluate…” Similarly I would expect a specific accounting of how the aim & objectives were satisfied in chapter 10. While there is no doubt in my mind that this is worthy of the award of PhD, to complete the work I would suggest the following:
• restate the objectives in chapter 1 as “to investigate...” etc.

• in 10.1 Achievements specifically state what the main contribution of the thesis is (the theory of cloning) and what the other contributions are (as a list). Then present the objectives and a short discussion of how each was met. All this is there in 10.1 but presented in an essay style.

I regards these as minor corrections.

Specific comments

I have marked in places in the returned copy of the thesis a few grammatical and typographical errors. I have also indicated where a reference is incomplete (use of et al. in reference section for example).

There were two copies of chapter 10 in my version.