PARTIAL FUNCTIONALITY AND SERVICE WORTHINESS IN COMPREHENSIVE NETWORKED VIRTUAL ENVIRONMENT

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ABSTRACT — Middleware services for management of shared state in comprehensive distributed interactive applications with partial functionality and network virtual environment (NVEs). This research section introduces some mechanisms and concepts of NVEs and service worthiness. Sometime service worthiness, NVEs and partial functionality characteristics and requirement change dynamically due to changing user preferences or due to changes in environment.

Keywords — Network Virtual Environments, Partial Functionality, Service Worthiness

1. INTRODUCTION

In Networked virtual Environments (NVEs) allow multiple users to interact with each other in real time even through users may be located around the world. This environment is characterized by good 3D graphics for closer experiences in a real life scenario. We have seen in the last few years an increasing interest and popular by among professional researchers at universities and laboratories commercial companies and groups to develop NVEs.

NVEs have been applied successfully in the gaming industry and it led to the development of interactive applications large scale network spread-out. A person who is moving in the real world is constantly experiencing his limit perceptional. Many cooperative applications try to recreate this reality in the digital domain, for example in distributed virtual environments. As a generic service our research is thus pursuing the goal of extracting this face of distributed applications.

We can start the research with the following hypothesis:

• Management of shared state information can be factorized out of applications; it provides a middleware service to the user for supporting on application which is specific presentation of the state information.

• Thus, by masking out issues we can simplify development application, such as heterogeneity of networks and resource availability.

• By combining state management in middleware with appropriate resource management, monitoring and reservations. So we can increase the applications scalability and its performance.

By this hypothesis, we want to support developers in making their distributed interactive applications reliable, reactive and scalable. We have identified several basic mechanisms that can be employed by our middleware that already employed separately in dedicated applications. So we can develop another mechanism by combining these mechanisms, during the course of research.

2. RESEARCH AIMS

The aim of the project is to create a middleware for managing shared space, which will provide developers of distributed interactive applications it means to make their applications scalable, increase their performance, and decrease their resource consumption. Here, the research area is divided into three i.e. data reduction, latency hiding and replication [1]. In middleware, we will combine them in such a way that they become usable for application developers. Now also it is not
immediately after how this can be achieved if the appropriate use depends on application semantics.

In development time we consider two independent tasks firstly development of data types and then the development of the application itself. In data type development, data type development applications are similar to standard data types in fashion. Data type can be instantiated as distributed objects that are controlled by the middleware work. In application development, applications are written in non-distributed application manner.

From these specifications, the run time application is generated, and the specific data types are translated into distribution code that is integrated with the middleware. The transparent communication needs and update notification are take care by the middleware. The data type specifications applicable policies and current resource conditions of hosts and network are based on the data type specifications. It will manage replication, de-replication, frequency of updates, and it gives preference of updating some objects our others.

3. GOAL OF NVE

The fundamental goal of an NVE is to give users to illusion that they are seeing the something and interacting with each other within that virtual space [2]. In other we can say that, NVEs present the virtual world that every player is experiencing the same environment at all times. In theoretical we say this is close to if not impossible, but in human perspective, the human eye and brain can only process information at a Fault Tolerance in NVEs certain speed making it possible to minimize the latency such that it is hidden from human.

This section introduces some concepts and some new mechanism for this research proposal. The concepts are fault tolerance, quality of service, latency minimization and interest management in NVEs and mechanisms are replication area of interest and multicasting.

3.1 Concepts

The overall purpose of the project is to achieve a degree of fault tolerance and quality of service. From this we also want to minimize the latency experienced by the clients. In the next part these terms are introduced.

3.2 Fault tolerance

A characteristics feature of distributed systems that distinguishes them from single machine system is the notational of partial failure. [3]. the proper operation of other component may be affected by this failure, but on that time leaving other component to totally unaffected. For understanding the role of fault tolerance in any distributed system we first need to take a closer look at what is actually means for tolerate fault. A fault tolerant system is strongly related to what are called dependable systems. The term dependability is cover a number of useful requirements for distributed system including the following property are availability, reliability, safety and maintainability.

3.3 Quality of service

In computer network we generally have applications with different requirements to the performance in terms of end-to-end latency available bond with Jitter etc. [4] a collective term of quality of service in focused on giving application certain degree of network service guarantees.

The internet cannot give end-to-end quality of service guarantees this does not means that the quality of service mechanism’s using the internet is useless in a distributed system. On the contrary, it has been shown that having soft QoS guarantees can improve the service experienced by the end user [5]. Network virtual environment is spread out in a geographically large area having considerable amount of clients and services involved. The communication between the clients and servers must be efficient to enhance the performance [6].

3.4 Latency Minimization

A certain delay or latency is occur whom ever there is need to send a message between two points. Where as in computer network latency is described as the time it taken from sending a packet Until it is received. In NVEs the latency is one of the biggest challenges that a developer has to face, because latency directly impacts the NVE experiences of the realism.

In computer terminology band width refers that a data is a given transport medium can deliver per time until. The focus as the main research area within network virtual environment shifting toward as latency minimization
The source of latency in an NVE can typically be divided into three categories [7].

- In the physical transport medium
- In the network intersection (routers)
- In the endpoint computers.

### 3.5 Interest Management in NVEs

Interest management in NVEs consists of resource optimization techniques that aims to reduce bandwidth consumption by reducing the average number of receive each message [8].

Interest management in NVEs is generally divided into three categories [8]:

- Area-of-Interest Management
- Multicast Routing
- Subscription-Based Aggregation

### 4. MECHANISMS

Thus the mechanisms for conceived to take part in the project in NVE will be replication, area-of-interest management and multicast routing. They all are introduced in this section.

#### 4.1 Replication

Replication is used for improving the reliability and the performance of a system. If the system avoids a single point of failure by using replicas distributed, then the reliability is increased. When the clients are close to replica server and main serves then the performance is improved. There are one major problem with replication that a replicas consistent, it means that whenever one copy is updated then we have to be ensure for updating other copies otherwise the replication will no longer be the same. An inconsistency measurement function must include the number of replicas at a given time in the system. In network virtual environment a typically relaxed consistency model is applied.

Replication for performance is important to keeping all the (data) replicas up to date.

#### 4.2 Multicast Routing

Some application requires that widely separated processes work together in groups, for example a group of processes implementing a distributed database system [7]. Multicasting routing is used when groups are large, but small comparison with entire network is generally used. When we applying multicasting in scenarios the problems rises with broadcasting and unicasting messages are avoid in large groups. In Broadcasting messages are send to all nodes in the networks regardless to whether they are interested or not. In unicasting, it requires the source to send one message per received and that is expensive in large group.

#### 4.3 Area of Interest

Area of interest be a mechanisms that filter the data, such that client ideally do not received for process data they not need any order to proceed correctly in the virtual environment.

For each entity area of interest can be divided into aura, focus and nimbus. Whereas aura is influence sphere, focus is a sphere of observer interest and nimbus is a sphere of interest of the observed object. In an area of interest filtering scheme the node transmit their state changes to subscription manager [8]. These managers also receive information interest subscription for express nodes. The manager will transmit interesting data to the subscriber nodes only. An area of interest approach the number of updates required is reduced by disseminating the information about the different players in an intelligent manner.

### 5. FUTURE WORK

Area of research such as latency minimization, fault tolerance and quality of rescue are tightly linked with the research. For the candidates a big part of research will consist of thoroughly testing mechanism for se how they work together in different scenarios.

Previously mentioned the research will be divide into three parts: latency hiding data aggregation and replication. It is expected that these three parts will interoperate in varying degree throughout the research period, in particular data reduction and replication.

#### 5.1 Replication

Replication is in large scale but NVEs is in vital. Replication will add complication in handling the inconsistencies that occur in the replicated data. Performance degradation may be cause by avoiding temporary. In consistencies, this is hard in NVEs. So it is important to relax the consistency demands and focus. The main goal of any multimedia application should always be to satisfy the users first.
For satisfy application specific constraints middleware will replicate objects. Every node in the system may be holders of replica and the number and the placement of replica will be varying dynamically. Objects in distributed application will be typically related to each other semantically. These relation will impose constraints in the sensibility of replication them separately. These relations may dynamically change while the distributed application on runs. So, we will develop a means of specifying them at time of application development in a formal manner, from which the middleware can perform replication of groups of objects transparently.

5.2 Area of Interest

In this research we plan to implement test existing approaches in different scenarios [9]. When we add the algorithms to our middleware then we get some functional result which used as guidelines for developers. We want to design and implement our own algorithm with the help of existing ideas to see how they compare with existing ones. An idea in which we are considering for our area of interest algorithms is a mobility predication of players where we record a client data throughout this session and from that performance of a prediction that aids an area of interest fitter in its decision making.

5.3 Multicast Routing

Previously explained that multicast routing is a network protocol technique that realizes like are of interest approach. Multicast routing is a dissemination protocol which compares unicast and broadcast. Our purpose to implement and test different multicast routing algorithms and compare them with teaches other. Let we assume that IOP multicast is not available then we will apply application layer multicast. The multicast algorithms currently being considered are the center based [10] and the Steiner-tree [11] multicast.

In term of latency the center based multicast algorithm based on the root selection in which node is closest to the center of the tree. This is the valuable property of large-scale NVEs, where potentially we have huge differences in latency based on which node functions are the roots.

In our case Steiner tree multicast is optimal with respect to cost. Constructing Steiner trees is an NP-complete problem but there are algorithms that approaches the problem by optimizing greedy minimum spanning tree algorithms [12]

A group management handling needed by a multicast routing scheme, therefore one of the most important purposes is to create a protocol that can handle various types of failure that might occur in diverse large scale NVEs.

5.4 Field Test Application

For evaluating and demonstrate our ideas, we intend to apply our results to a massive multiplayer role playing game based on existing open source development, such as Vega strike [13] parsec [14] or BE Flag[15]. Another application that can exploit all of these abilities are remote control, central systems, distributed simulation, and financial and stoke market. All participants manipulate the distributed interactive computer games that have a single environment. In middleware our approach allows us to focus on the distribution system, while the objective of the application, its storyline and its user interface are developed externally. We expect a large number of users without much solicitation and cheap development from such a non-critical application we expect to receive a large amount of user feedback and debugging support. Users of such an application are using different network connections, hardware, and these users access it from worldwide distribution location.

5.5 Applying to middleware

In this research paper, we will add replication, area of interest filters and multicast routing schemes to out middleware. We should give the developer recommendations that in which scenarios what schemes we use together. This recommendation must be based on simulation results. The result presentation should be in formal that makes it possible for a game developer to informed design decisions fairly quickly.

For all application transparency should be a main aim but generic transparency is not a main aim. For NVEs transparency is a aim for only certain degree.

6. CONCLUSION

This research is for implement and test existing schemes within replication fault tolerance and quality of service and we these in varying scenarios to make it possible for all on application designer to
choose the mechanisms from a middleware most fitting to the interaction application. The middleware consist algorithms that designed log the candidate in collaboration with the all team members that are specially designed for NVEs and add them to the proposed middleware. Here we also introduce consistency problem of replication.

7. REFERENCES