

Study of Risks for Mobile Agents on Various Domains

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ABSTRACT

In the modern communication system for Mobile agent, where security is major issue to safe transfer the data by secure method. Mobile agents have autonomous software entity when a mobile agent works in the host environment due to security problem raises during functioning, for the high security it resume its execution in another host after suspend its execution in previous host. Due to this it can be loss some of its important data (i.e. Personal information, internal code, state and password).

This personal information is updated by host and another mobile agent working under same host environment. In this research paper, an algorithm is proposed to secure mobile agent from the agent platform in which they can execute to do their necessary computation. So in this system various agents work concurrently and use their resources for concerned host platform in random manner. Mobile agent can travel in different number of hosts in distributed network; during the journey it can change its state and secret code. Mobile agent technology has many benefits but it has a possibility risks from risky platform that can change their internal state and code. In this proposed system/infrastructure SAB (Security Alert Bank) serves as a group of agent platform, which is called domain. The SAB maintains information about the domain, which is used by mobile agents to decide whether it is safe to visit the domain or not.

KEYWORDS

Security, Domain, Agent Platform, Security Issues, SAB.

1. INTRODUCTION

Mobile agents are software agents that can move around the network to complete a given task. Mobile agents are software entities when a mobile agent work in the host environment some security problem raises [8], it can be work in distributed network. Mobile agent can suspend its execution in one host and resume its execution in another host [9]. When mobile agent resume its execution, It can loss some of its important data. Mobile agent have their personal information like, internal code, state and password. These personal information are updated by host and another mobile agent working under that host environment. So that mobile agent systems are that in which various agents works concurrently and uses the resources of that host platform in random manner. Agent platform is an infrastructure providing the environment for mobile agents to be executed there. A mobile agent arrives and executes its task according to the priority assigned by the creator of an agent and agent platform.

This paper focus on Security issues and method through which mobile agent is capable of determine whether the particular domain is safer for it or not. Through this mechanism the possibility of an attack from malicious agent platform on mobile agent is decreased. A Domain has mainly two parts i.e. agent Platform and mobile agent and these both parts are

controlled by the Security Alert Bank (SAB). SAB provides the security tips to the mobile agent in advance. It can have all previous history of visits on that particular domain. SAB works with all domains to guide the mobile agents. Mobile agent can move around the domain and do their necessary computation and send result back to the SAB and their owner. In the fields of mobile agents there are various security issues, these security issues are Transfer Security, authentication and Authorization Security, Host system Security, Computational environment Security.

2. OBJECTIVES

1. Analysis study about the behaviors of mobile agent according their internal code and state.
2. Identified Risk and attacks in the field of mobile agent.
3. Apply Domain based security to overcome the risk and attacks.
4. To compile the research work in the form of Ph.d thesis based on the results obtained.

3. RESEARCH METHODOLOGY

The proposed method in which mobile agent is decided whether the visited domain is safer to make a visit or not to do their necessary computation. Through this approach the mobile agent is avoid the risk to lose their data or code. SAB has full knowledge about the execution history of the particular domain. Domain has the HL value i.e. harmful Value, this value indicates about the malicious behavior of the domain to mobile agents and ST value i.e. Status Value of agent Platform that can indicate the reputation of agent platform. This reputation indicates about the malicious behavior of the agent platform. Mobile agent is a software entity that can move around the network to do their computation and move back to their owner. In the field of mobile agent there are various security issues that can create the problem in the execution of code or task of mobile agent. In our proposed mechanism the security Alert bank can play an important role to avoid the risk in execution of mobile agent in particular domain.

4. SIMULATION RESULT DISCUSSION

4.1 Scenario from Simulation

In our simulation, we virtually build a SAB (Security Alert Bank) and Domain. Each Domain reference one SAB. Here SAB has the information about the HL (Harmful Level) and ST (Status Value) of the concerned Domain. Initially the HL value for the domain assigned 0 and ST value for Agent platform is 1. Agent platform connected within each Domain. In this scenario there are five Domains and Five SAB. Domain 1 has connected to SAB 1, Domain 2 connected to SAB 2, Domain 3 connected to SAB 3, Domain 4 connected to SAB 4 and Domain 5 connected to SAB 5. In Domain 1 there are five

numbers of AP's (Agent Platforms). If any mobile agents want to visit any Domain then it can first check HL and ST of that Domain and platform for that mobile agent concerned to the SAB of that Domain for verification of HL and ST values. If these HL and ST values are acceptable then mobile agent can make a visit to that domain. Otherwise if the HL and ST value of the domain is not acceptable then mobile agent can migrate on to the next domain and check the HL and ST values of next domain from there concerned SAB.

In this simulation any mobile agent sent on to the domain 1. Mobile agent assigned HL and ST values by the creator of mobile agent, in domain 1 mobile agent can visit in AP 1 (Agent Platform 1). In AP 1 there are two check points, one for visit and other for malicious agent. When mobile agent enters in the domain 1 then visit check point of AP 1 make checked. So that in AP1 mobile agent make a first visit, after this visit we can check the HL and ST values for that we simulate by making click on simulate button. This simulation can verify the HL and ST values of the domain and agent platform. In first visit the HL value of platform is 1 and HL values for the domain is -1, next time if another mobile agent visit the domain 1, then the HL value of the domain is -2 and ST value is remained unchanged i.e.1, ST value remain unchanged because mobile agent has successfully completed their task.

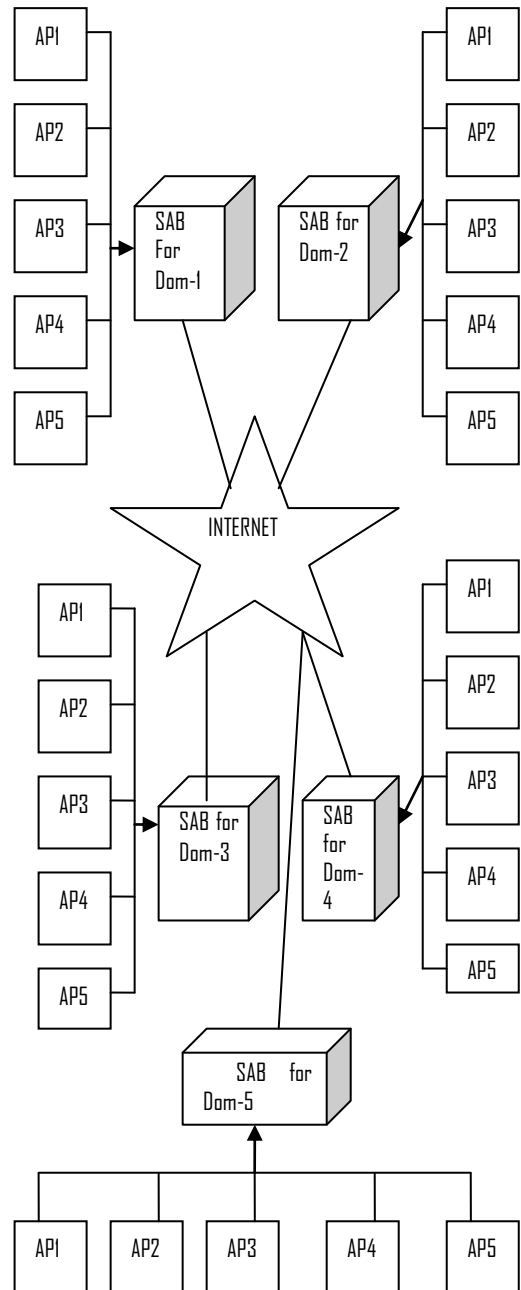


Fig. 1. Represents the infrastructure providing mechanism of risk avoidance to the mobile agent from risky agent platform

In next time another mobile agent visit that domain and at that time the agent platform can change or update the information of the mobile agent, this is due to the malicious behavior of agent platform, in that visit the malicious check point of the AP1 make checked. In this visit (3rd visit) the ST value and HL value of domain is changed. HL value incremented by 1 and ST value is decreased. So that HL and ST value for the domain has been changed in every step it will incremented or decremented depends upon the nature of the visit. If the mobile agent has successfully completed their task then ST value increased and if the mobile agent doesn't complete their task successfully then ST value decreased. So that HL value also changed according to their visit on the basis of the nature of visit of the mobile agent

Table 1. Show simulation results for AP-1 in Domain 1

Sr. No.	Number of Mobile Agents visit in the AP-1)	No. of effected Mobile Agents from risky AP	ST(Status Value For AP-1)	HL(Harmful level for Domain-1)
1	1	0	1	-1
2	2	0	1	-2
3	4	2	0.7	-1
4	7	2	0.892857	0
5	10	5	0.727272	1

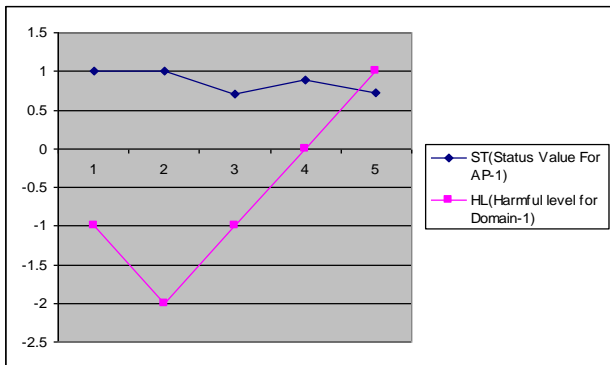


Fig. 2. Represents HL and ST values for AP 1 in Domain-1

4.2 Simulation Results for Domain-2

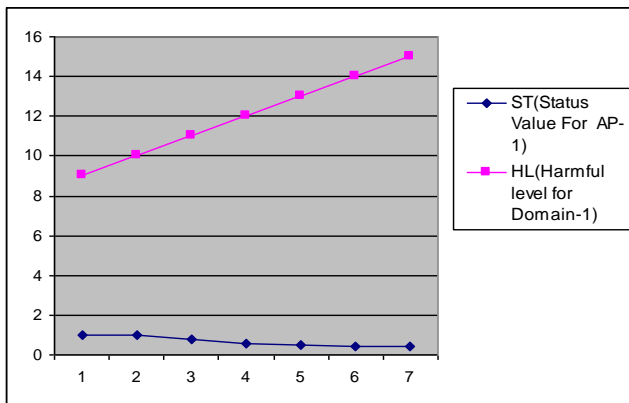


Fig. 3. Represents HL and ST values for AP 1 in Domain 2

Table 2. Represents Simulation results for AP-1 in Domain -2

Sr. No.	Number of Mobile Agents visit in the AP-1)	No. of effected Mobile Agents from risky AP	ST(Status Value For AP-1)	HL(Harmful level for Domain-1)
1	1	0	1	9

2	3	0	1	10
3	5	2	0.8	11
4	8	5	0.583333	12
5	10	7	0.490909	13
6	12	9	0.423076	14
7	13	10	0.395604	15

5. CONCLUSION

The proposed method is implemented for mobile agents and behalf of results obtained that may possible to avoided from the risk of malicious attack of agent platform in the particular domain for data transmission in secure way.

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