

## Secure mobile agents communication on intranet

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### ABSTRACT

In Swarm Intelligence, Ant Colony Optimization algorithm is used to find network vulnerability and restoration system. It is used to improve the performance of network. Mobile agents can communicate by using this new technique named multi mobile Agent Vulnerability Detection & Restoration System (MAVDRS). This technique implements ACO. Due to this Network manager work will be reduced.

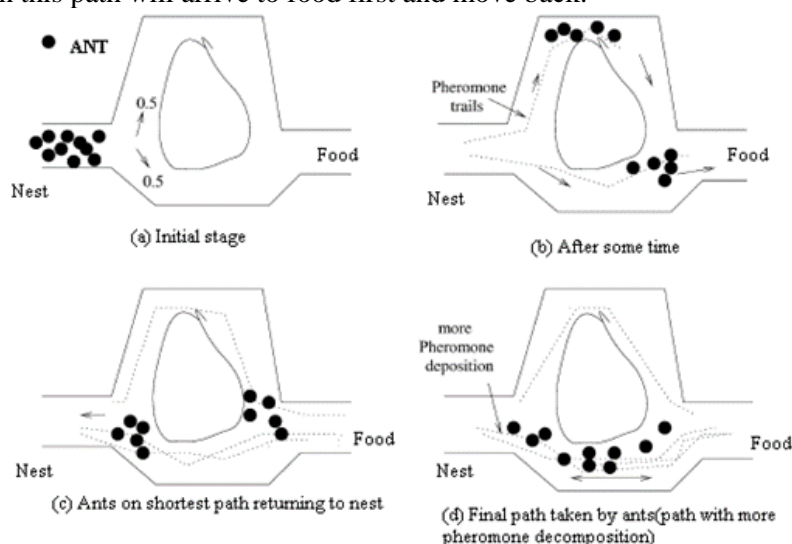
**KEY WORDS:** ACO, Network Security Management, mobile agent, restoration mechanism

### 1. INTRODUCTION

It is important to detect vulnerability to ensure security system of intranet. Now a day, Vulnerability scanning system is used to detect vulnerability. This contains lot of drawbacks. This cause to increase the burden of network manager when they check frequently. And it is affects the bandwidth of networks. In this paper provides a protected communication between mobile agents by using MAVDRS. This method uses ACO algorithm. Mobile agent research topics contains lot of advantages like the intelligent agent locally complete the task. So network manager burden is reduced automatically. And network load is reduced. The plan of these agents is not transfer the data to the calculation. Instead of this transmit the data to calculation. So we can easily transmit the data.

**Mobile agents:** These are, the autonomous and located on a network or a host. It senses environment and depends on it act. In this system, the agents transfer from one machine to another to finish its task. They can interrelate to the user in local as well as remote resources, environment and other static/mobile agents in the environment. These contain a set of coding, data and execution data to locations. These details are needed to finish its task. In this paradigm, data is transfer to specified location for a needed resource/service. These agents communicate by using architecture of blackboard at high level.

**Ant colony optimization:** The routing of agents was not clear. They have not contains the features of route computation. Agents are act like ants. They are used to balance the load in telecommunication networks routing. Swarm intelligence of ants offers the ant metaphor. The ants are used pheromone to find minimum distance paths to food from their nest. The ants are depositing a chemical substance on its path. It is explained in the following Fig. The 10 ants search the food from nest. There are two paths. With equal probability, the ants select the paths to find path (Fig 1.). The ants in this path will arrive to food first and move back.



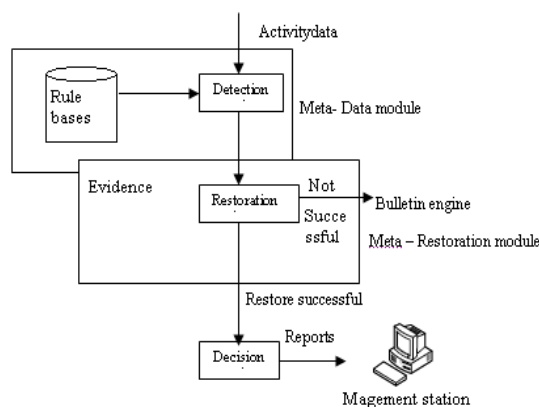
**Figure.1. Shortest path finding by ants**

Here, the path contains more pheromone is the shortest path. The same method is followed by intelligent ants. In our system, pheromone deposition is automatically generated depend upon the amount of nodes. The agents behave like ants to reach a node. Instead of routing tables, pheromone tables are used.

### System architecture:

**Platform for mobile agents:** The transmission expenses can be reduced by following

(1) Simple Agent needs for complete vulnerability detection and restoration. (2) To decrease the size of these agent, use Component technology.



**Figure.2. Single mobile agent's internal system**

The computational agent can be created, interpreted, executed, transferred, and terminated by MAP (mobile agent platform). The platform is used to accept all network users' requests and generate mobile agents. And then the agents are transferred to corresponding places to complete their tasks. Each of them has individual table. It contains details of nodes present in that network. If agent is not visit a node, the status of node indicates Null. When an agent visits a node, it the details of node entry will destroy from table automatically.

#### **Collaborative restoration mechanism:**

##### **Five categories:**

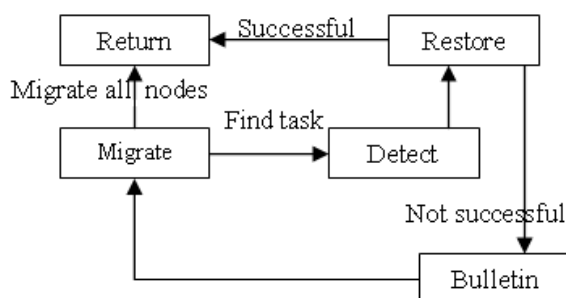
**Detect:** Agents travel around nodes present in network. Check the status of node. If it is null, mark it as vulnerability detection.

**Bulletin:** Used to mention the status

**Migrate:** Agents travel the network nodes. If any incomplete restoration, it transfer to next un-visited node.

**Restore:** If it detects vulnerability, transmit to restoration of vulnerability.

**Return:** The task completed agents and incomplete agents will be returned.



**Figure.3. Transition diagram**

**Restoration mechanism:** Suppose, an Agent x detects vulnerability, it will give effort to finish the task .If it is completed, returns result. Else, information of task s is written on the blackboard by agent. The small equation used in this system is  $\tau s = \tau s + \Delta\tau$ .

Here  $\Delta\tau$  represents incremental of pheromone and s represents task. Finally, the managers manually deal the vulnerability.

**Communication among the agents:** All the agents are entered their vulnerability details and initial value of pheromone of task in blackboard.

**Implementation:** Here ASDK and JDK is used as a tool for MAVDRS. And MYSQL as database. And it uses IBM Aglets Work Bench (AWB) to develop. Java is used to write coding. Aglets and agent transfer protocol also used to design this system. This protocol is used to transfer messages between agents.

## **2. CONCLUSION AND FUTURE WORK**

This system creates new agents for handle new vulnerabilities. It reduces network manage burden. It offers secure communication between not only the agents and also administrator. If the size of network is increased, we need more agents. Securities of mobile agents are the future enhancement.

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