Mobile Agent Paradigm in Computer Networks

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Mobile agent paradigm

No universal definition on agent.

Agent can be defined as is pieces of code that can act autonomously on behalf of its owner and other entities

Mobile agent paradigm

Mobile agent = agent + mobility

Mobile agent is agent with ability to freely migrate between locations across networks

Mobile agent paradigm

Mobile agent is a self-standing software segment, possibly written in a script language, and with a varying degree of autonomy. It can freely migrate across a network to perform tasks on behalf of many actors in the network system, such as other agents or moreover users. is pieces of code that can act autonomously on behalf of its owner and other entities

Mobile agent paradigm

Advantages of mobile agents are indicated in "Seven good reasons for mobile agents" by Danny and et al. They are:

-Reduce network load

-Overcome network latency

-Encapsulate protocol

-Execute asynchronously and autonomously

-Adapt dynamically and naturally

-Robustness

-Fault tolerance

Mobile agent paradigm

We emphasize two advantages of mobile agent over Client/Server model:

Reduce network load

Mobile agent	Client/Server
Hide communication channel	No hide, =>program explicitly
Move near to source data	Requests, responses
Interaction is local	Interaction is remote
Only transport result data	Transport raw data

Mobile agent paradigm

Execute asynchronous interaction

Mobile agent	Client/Server
No ongoing communication	Ongoing communication
=>	=>
Can exchange interactions without using network	Can't exchange interaction without using network

=> overcome problems caused by low-bandwidth, unreliable network connections such as mobility or wireless network

Mobile agent paradigm

⇒Advantages on performance. They are:

- Throughput
- Network bandwidth
- Availability
- Network utilization
- Cost
- Completion time
- Convenience
- Latency
- Easy to implement

Current state for mobile agent development

Communities researching on agent:

- Intelligent agent and multi agent system
- Mobile agent

Current state for mobile agent development

Intelligent agent and multi agent system research on static agent and intelligence of agents where agents communicate and rely on co-operation, co-ordination

Mobile agent concentrates the research on exploiting and applying mobility of agent

Current state for mobile agent development

Mobile agents have been developed very fast and they attract many attentions of researchers in academia and industry

=> Many mobile agents systems are released: e.g Telescript, Aglet, Voyager, Concordia, Agent Tcl, TACOMA and MOA

Current state for mobile agent development

Requirements of mobile agent systems:

- Can migrate freely across a network

- Guarantee privacy and integrity for agents and the underlying computer system.

- Security

Current state for mobile agent development

- None or very few indications for “killer” application based on the mobile agent approach

- Need standardization for different mobile agent systems.

- Security: need to continue research on protecting an agent from potential malicious system when visited by agents

Mobile agent applications

Mobile agent paradigm has a wide potential for use in programming languages design and implementation, decision support, expert systems and management

Mobile agent applications

- Electronic commerce

- Network management, network monitoring and resource management

- Gathering and retrieving information in unreliable, low-bandwidth network environment

- Routing

- Fault tolerant and secure networks

Mobile agent applications

User Experience:

Mobile agent should be applied in anywhere where there is a need for adaptive entities, with high degree of flexibility and dynamism.

Sumarry

Advantages of Mobile agent :

- Improve significantly network performance

- Be very useful for distributed applications.

- Over come technical limitations of client/server

- Resolve rather easily problems risen by dynamic distributed open network environment

Sumarry

Limitations for using widely mobile agent:

- Availability of mobile agent environment

- No “killer” application

Ongoing researches:

- Standardization

- Security for mobile agent

Summary

We believe that

Mobile agents will become main paradigm for next generation of distribution system

Thanks
for your attention