

# School of Computing Science and Engineering

Course Code : BCSE3065

Course Name: Mobile Computing

The logo of Galgotias University is a stylized circular emblem composed of several overlapping, curved segments in shades of red, yellow, and blue, creating a sense of motion or a globe.

## Mobile Agent

GALGOTIAS  
UNIVERSITY

## What are Mobile Agents??

- A mobile agent is an executing program that can migrate, at times of its own choosing, from machine to machine in a heterogeneous network.
- On each machine, the mobile agent interacts with stationary service agents and other resources to accomplish its task.
- Mobile Agents are an effective paradigm for distributed applications, and are particularly attractive for partially connected computing.

GALGOTIAS  
UNIVERSITY

# Mobile Agent

How does a mobile agent work?

- An agent migrates off a mobile device and roams the network to gather information.
- It accesses the needed resources efficiently.
- Not affected by sudden loss of connection.
- When the user reconnects, the agent returns to the mobile device with the results.
- Can work in the reverse manner too!!

# Mobile Agent

## Advantages of using mobile agents

- Ease the development, testing and deployment of distributed applications.
- Do not require the pre installation of application specific software at each site.
- Move the programmer away from the rigid client- server model to the more flexible peer-peer model.
- Lead to more scalable operations.

GALGOTIAS  
UNIVERSITY

## Applications of Mobile Agents

- NOT an ENABLING technology since there are FEW applications(if any) that are IMPOSSIBLE without Mobile Agents.
- Distributed information processing :
  - Searching distributed collection of
    - Technical reports
    - Medical records
  - Searching three dimensional drawings of mechanical parts

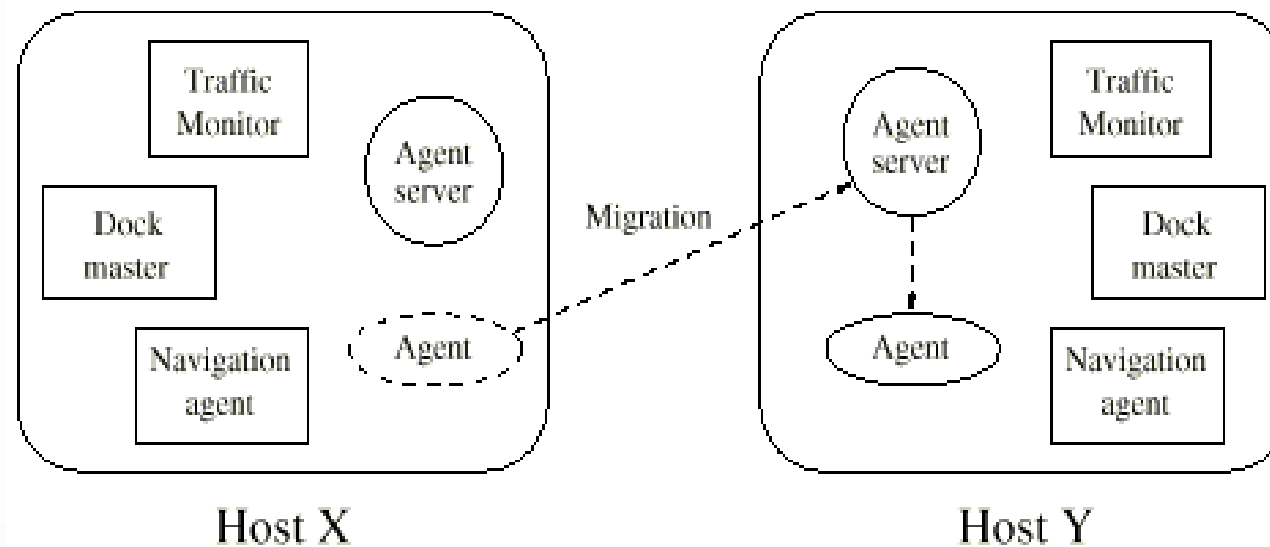
GALGOTIAS  
UNIVERSITY

# Mobile Agent

## Architecture of Agent TCL

- Primarily used in information retrieval applications.

### Server Based Architecture of Agent TCL



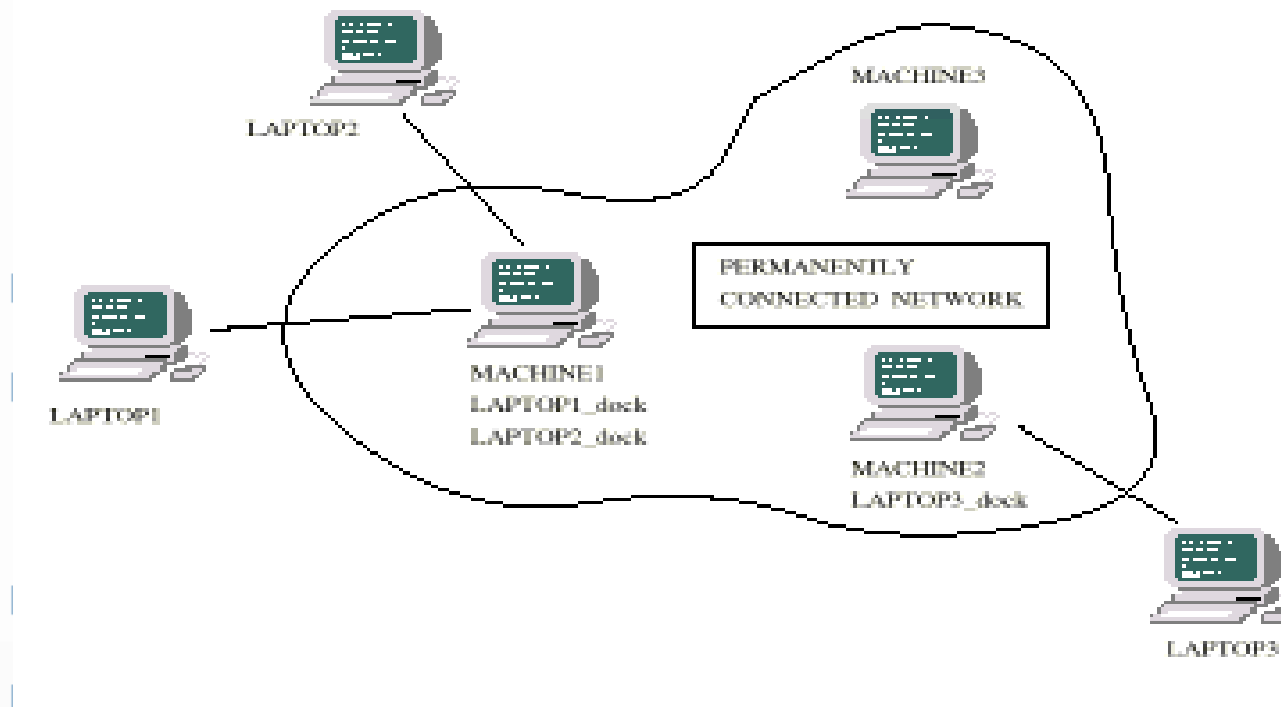
## Agents in Mobile Computing

- Support for disconnected operation
  - Dock Master
  - Jump Off Process
- Agent Navigation and adaptation
  - Network Sensing
  - Navigation Agents
- Inter-agent Communication
  - Agent\_meet
  - Agent Remote Procedure Call(ARPC)

# Mobile Agent

Support for disconnected operations

Laptop Docking System

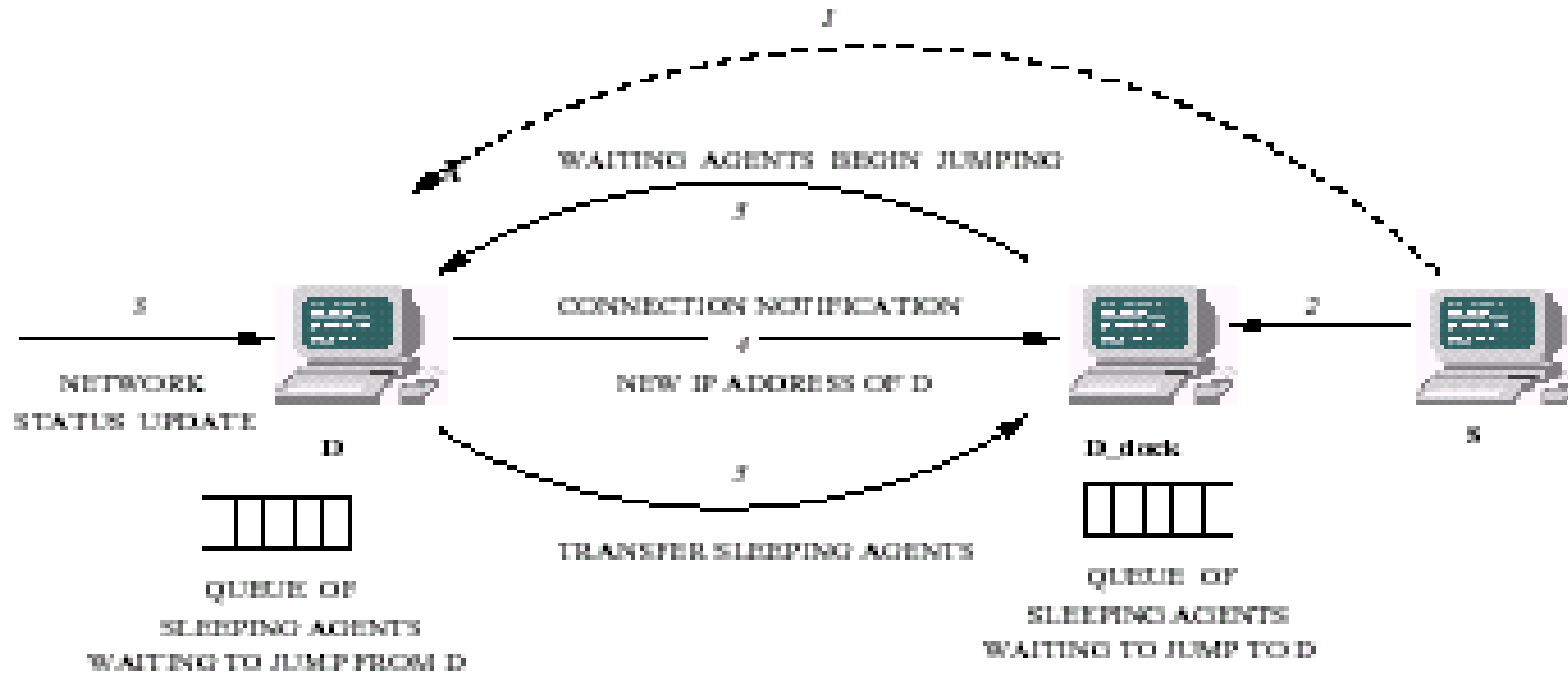




# Mobile Agent

## Support for disconnected operations

Jumping to or from the laptop



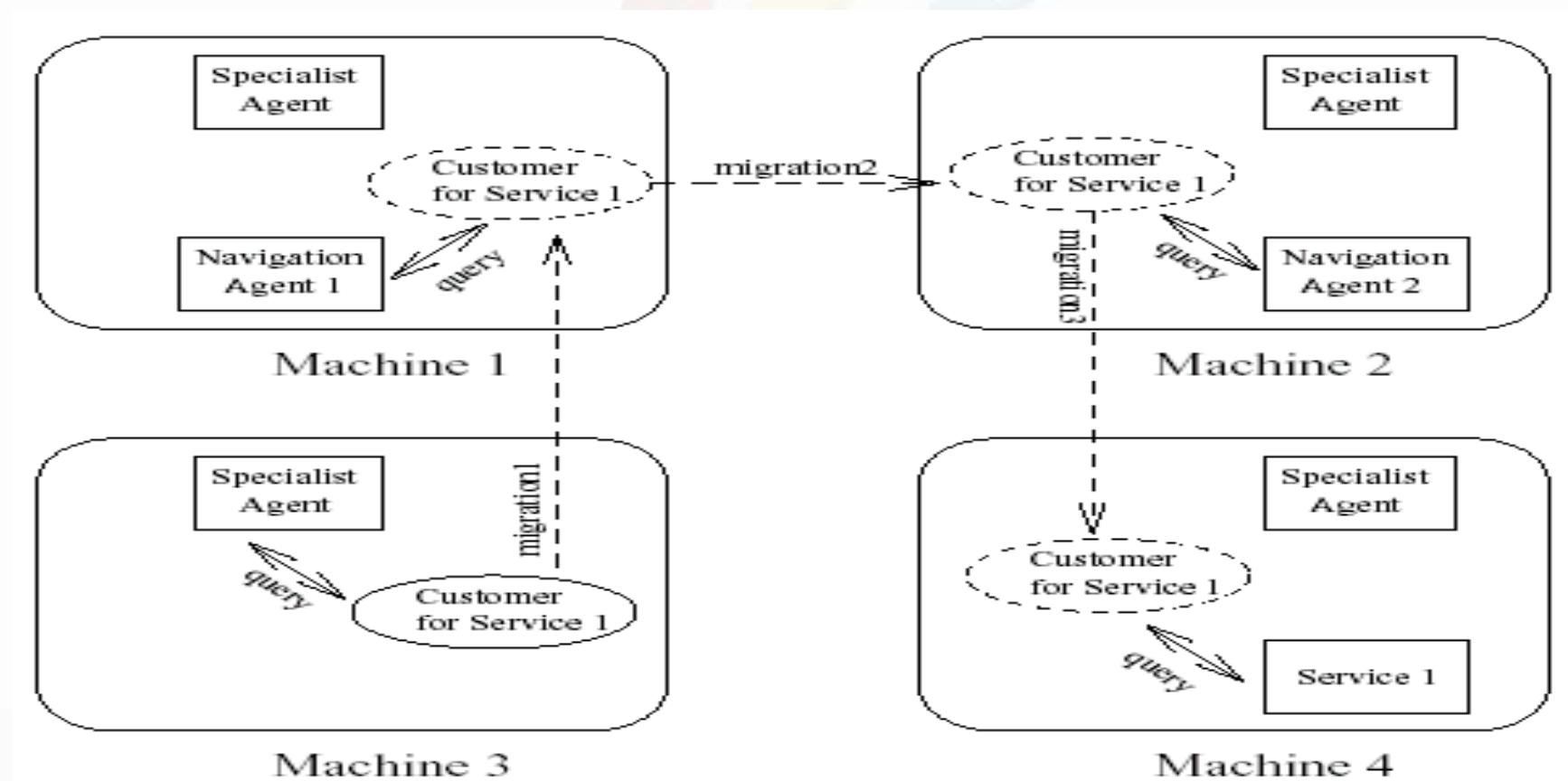
## Agent Navigation And Adaptation

- Network Sensing
  - Tool for determining whether the local host is physically connected.
  - Tool to determine whether a specific host is reachable.
  - Tool to determine the expected bandwidth to a remote host – Traffic monitor agent.
- Navigation Agent
  - Locate other agents that can serve their needs – Dynamic index of service agents and their locations.
  - Virtual yellow pages.

GALGOTIAS  
UNIVERSITY

# Mobile Agent

An example of navigation



# Mobile Agent

## Inter-agent communication

- Agent Meet – Low level mechanism which allows agent communication through message passing or through direct connection.
- Agent Remote Procedure Call – Higher level mechanism

GALGOTIAS  
UNIVERSITY

# Mobile Agent

## Conclusion

- Mobile agents are a general purpose framework for implementing distributed applications.
- Current research is going on to develop a mobile agent system that
  - Adequately protects an agent from malicious machines.
  - Supports agent migration that is only a small factor slower than a RPC call that transmits an equivalent amount of data.
  - Allow agents to execute nearly as quickly as if they were compiled (directly) into native machine codes.

GALGOTIAS  
UNIVERSITY



Thank You