**Aim –** To study and implement Deadlock management in distributed system.

**Theory –**

Distributed deadlocks can occur when distributed transactions or concurrency control are utilized in distributed systems. It may be identified via a distributed technique like edge chasing or by creating a global wait-for graph (WFG) from local wait-for graphs at a deadlock detector. Phantom deadlocks are identified in a distributed system but do not exist due to internal system delays.

In a distributed system, deadlock cannot be prevented nor avoided because the system is too vast. As a result, only deadlock detection is possible. The following are required for distributed system deadlock detection techniques:

1. Progress - The method may detect all the deadlocks in the system.

2. Safety - The approach must be capable of detecting all system deadlocks.

Approaches to detect deadlock in the distributed system-

1. Centralized Approach - Only one resource is responsible for detecting deadlock in the centralized method, and it is simple and easy to use.

2. Hierarchical Approach- In this strategy, a single node handles a set of selected nodes or clusters of nodes that are in charge of deadlock detection.

3. Distributed Approach- In the distributed technique, various nodes work to detect deadlocks. There is no single point of failure as the workload is equally spread among all nodes.

Deadlock detection algorithms in Distributed System-

Path-Pushing Algorithms

Edge-chasing Algorithms

Diffusing Computations Based Algorithms

Global State Detection Based Algorithms

For our case we will be focusing on Edge-chasing algorithms

Edge-Chasing Algorithms - An edge-chasing method verifies a cycle in a distributed graph structure by sending special messages called probes along the graph's edges. These probing messages are distinct from request and response messages. If a site receives the matching probe that it previously transmitted, it can cancel the formation of the cycle. Eg- CHM (Chandy- Hass -Misra) algorithm.

**Conclusion –** Successfully Implemented Deadlock detection algorithm.