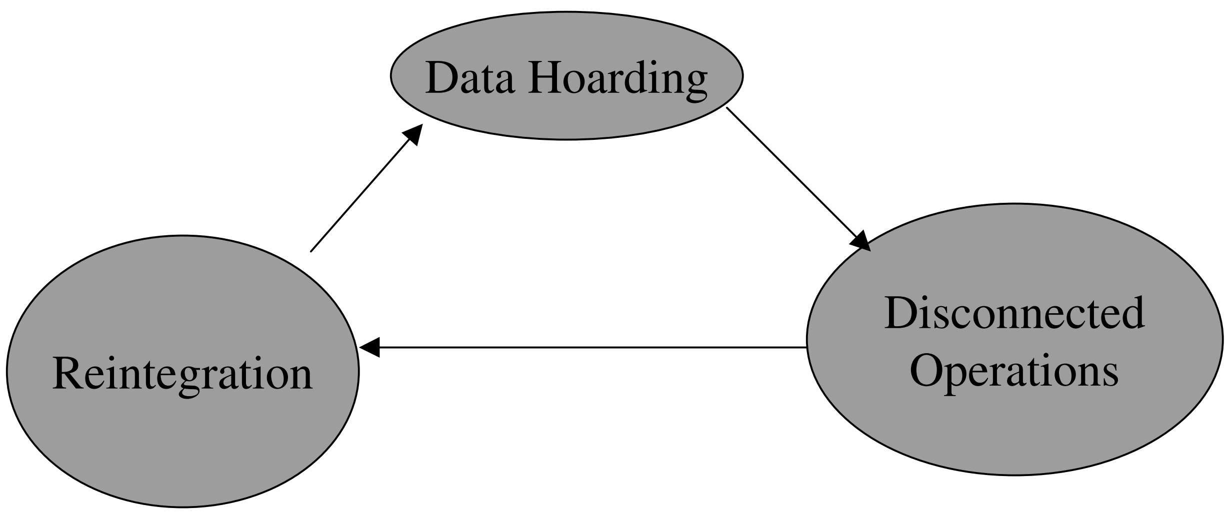
System-Level Support

Four characteristics

- Disconnection: autonomous operation of a mobile host during disconnection
- Weak connectivity: low bandwidth, high latency, expensive prices
- Mobility: set up new communication links, migrate executing processes
- Failure recovery: some mobile elements are prone to hard failures

Disconnected Operation

- Idea: when disconnection is anticipated, move data items and computation to the mobile client
- Hoarding: preloading of data



Data hoarding state

- Data hoarding state: data items either
  - relocated or move from the host to the mobile unit
  - replicated or cached at the mobile unit
- How to anticipate the future needs for data
  - let users specify which data items to hoard
  - use past history to predict future needs
- Others may need shared resources moved to the client

Disconnected state

- requests for data not available are blocked or queued/continue
- updates of shared data
  - pessimistic approach -- only at one site with lock or check-in/check-out
  - optimistic approach
- updates are logged in the client's stable storage
- Optimize the log 1) to save local memory and 2) to reduce time to update propagation during reintegration
- Optimization can be done 1) incrementally or 2) when reconnected

Reintegration state

- Integrate updates at the mobile host and at other sites
- Done by executing the log
- What to do with conflicts depends on concurrency semantics
  - transaction serializability, ...