

# A P2P swarming technique for traffic intensive VoD services

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# Motivation

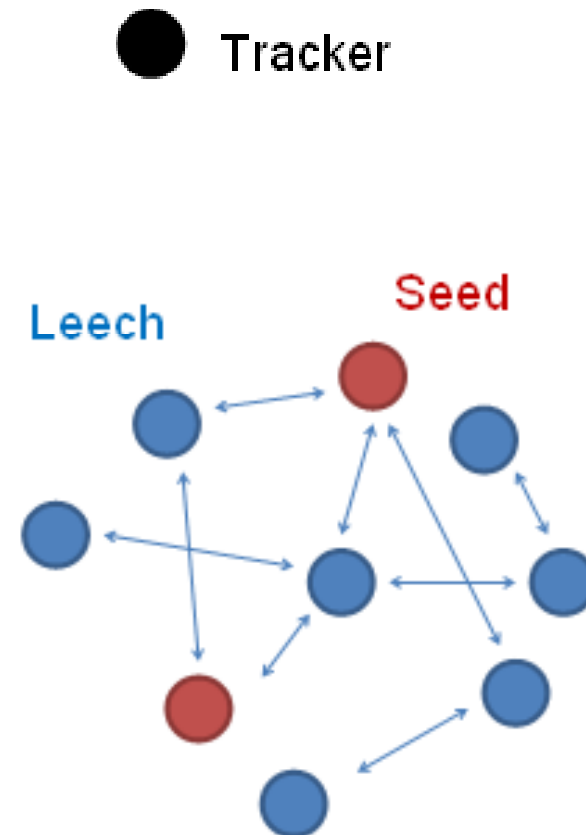
- Traffic intensive VoD services are getting popular in the Future Internet
  - HD contents, 3D media (>10GB)
- They incur significant volume of traffic
  - Bandwidth efficient scheme is required

# Target

- A P2P swarming technique for traffic intensive VoD services
- Requirements
  - Low bandwidth consumption
  - Timely delivery

# Related Work: BitTorrent

- Tracker
  - keeps the list of seeds and leeches
- Seed
  - has the whole file
- Leech
  - downloads the file
- Bottleneck of BT is the seed
  - Number of seeds
  - Capacity of seeds



# Content Division

- A content is divided into  $n$  units
  - ex) 1 minute as 1 unit in streaming application



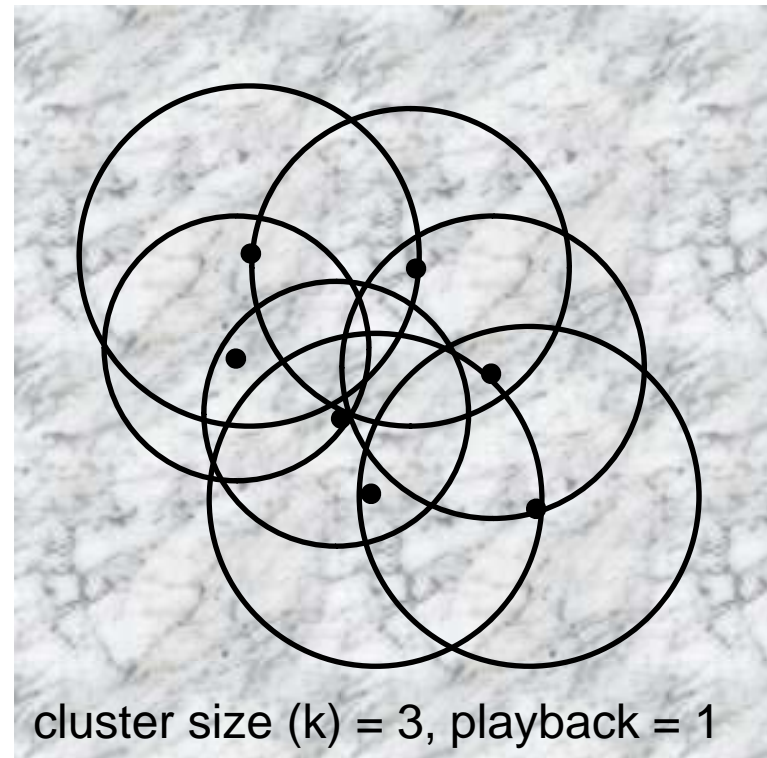
Video start

Video end

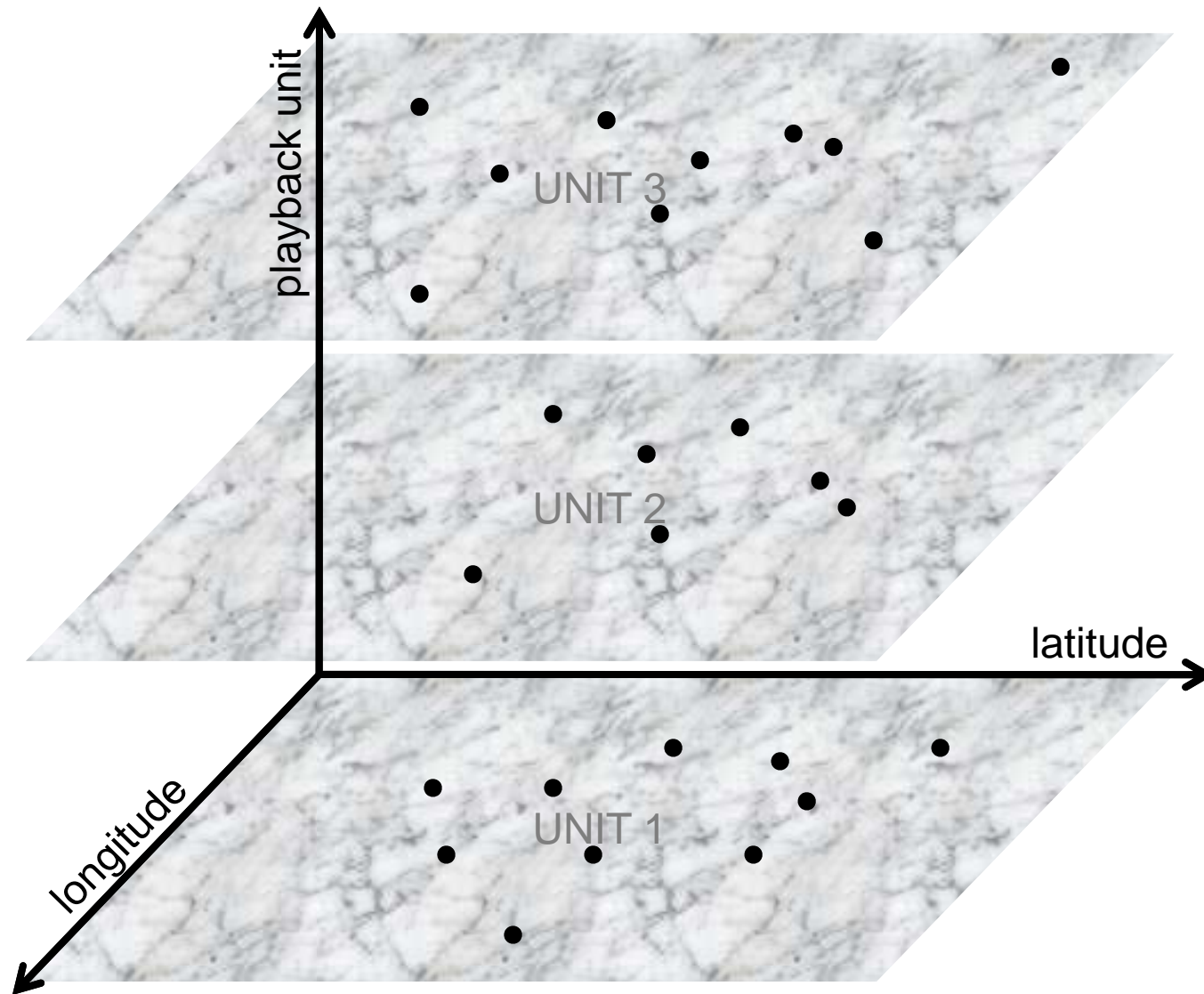
- *Playback* is the unit a node is currently watching

# Cluster

- Every node maintains a cluster
  - Each node is the cluster head of its cluster
  - A node can be included into several clusters
- Nodes in a same cluster
  - are closest  $k$  nodes to the cluster head
  - are in the same playback unit

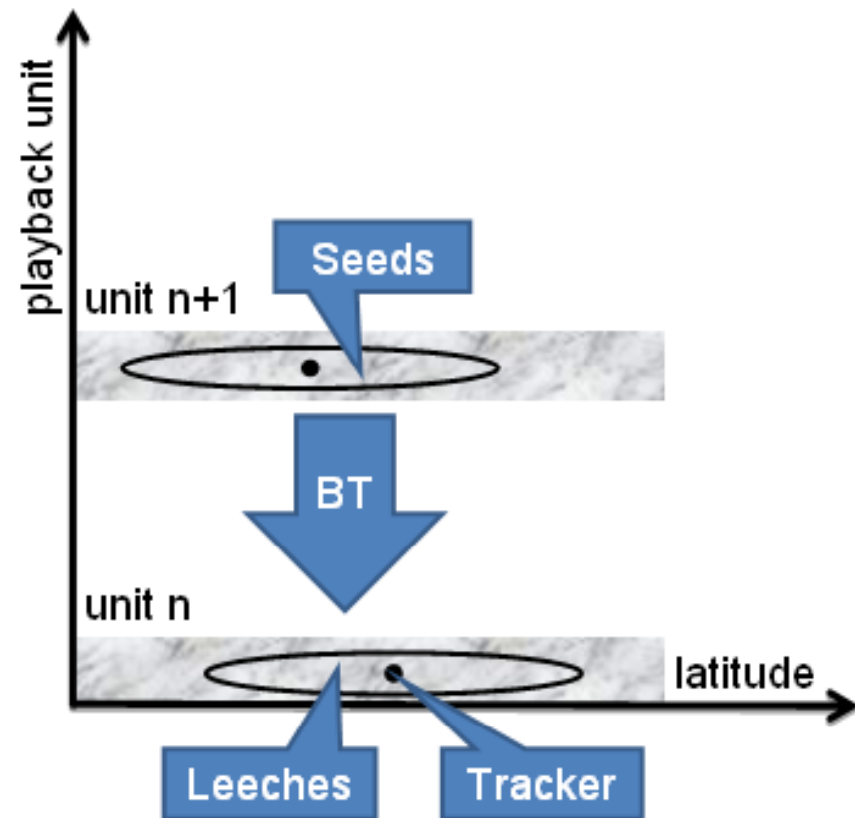


# Logical Topology



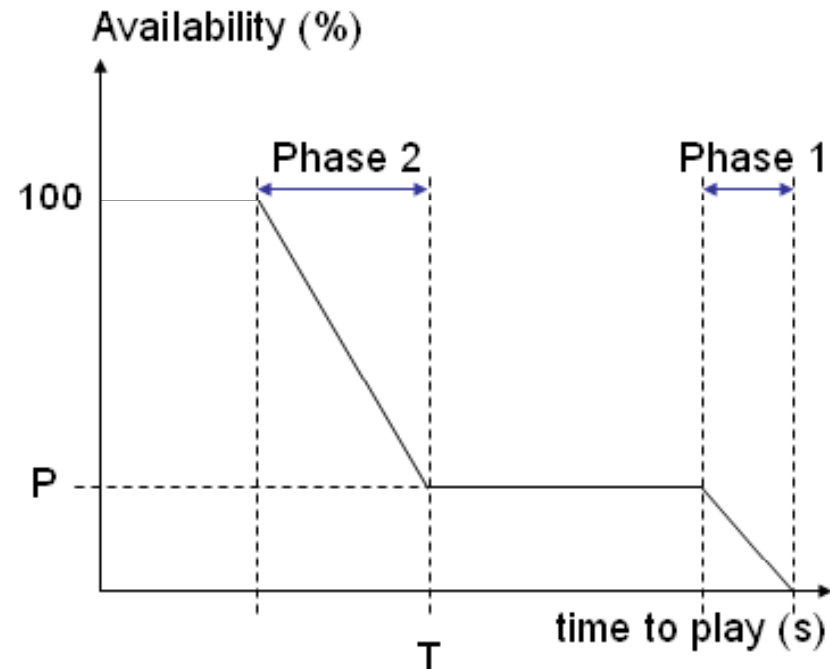
# Side View

- Cluster head is the tracker of the cluster
- Nodes in unit  $n+1$  are seeds of nodes in unit  $n$



# Data Retrieval

- Cluster head adjusts the availability (redundancy) of the next unit in the cluster
- **Phase 1:** prefetch
  - If the availability reaches  $P$ , download next unit
- **Phase 2:** fetch
  - If the remaining time is shorter than  $T$ , replicate the unit



# Summary

- A P2P swarming technique for traffic intensive VoD services
- Low bandwidth consumption
  - not every nodes struggle to keep the next unit
  - data are replicated when it is needed
- Timely delivery
  - content is divided into units and transmitted
- VoD features such as fast forward/rewind
  - nodes can join the upper or lower group of units