

Messaging Coordination Platform: Federated Publish/Subscribe for Internet of Things

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Internet of Things (IoT)

- Interconnection of computing devices within the Internet infrastructure
- Gartner: 26 billions devices by 2020

Research and Development

- Advanced connectivity: devices, systems, and services
- New protocols, domains, and applications

Publish/Subscribe for IoT Importance

- Applications and standards social networks, MQTT
- Industrial adoptions: GooPS, PNuts

Key components

- Membership service
- Overlay design

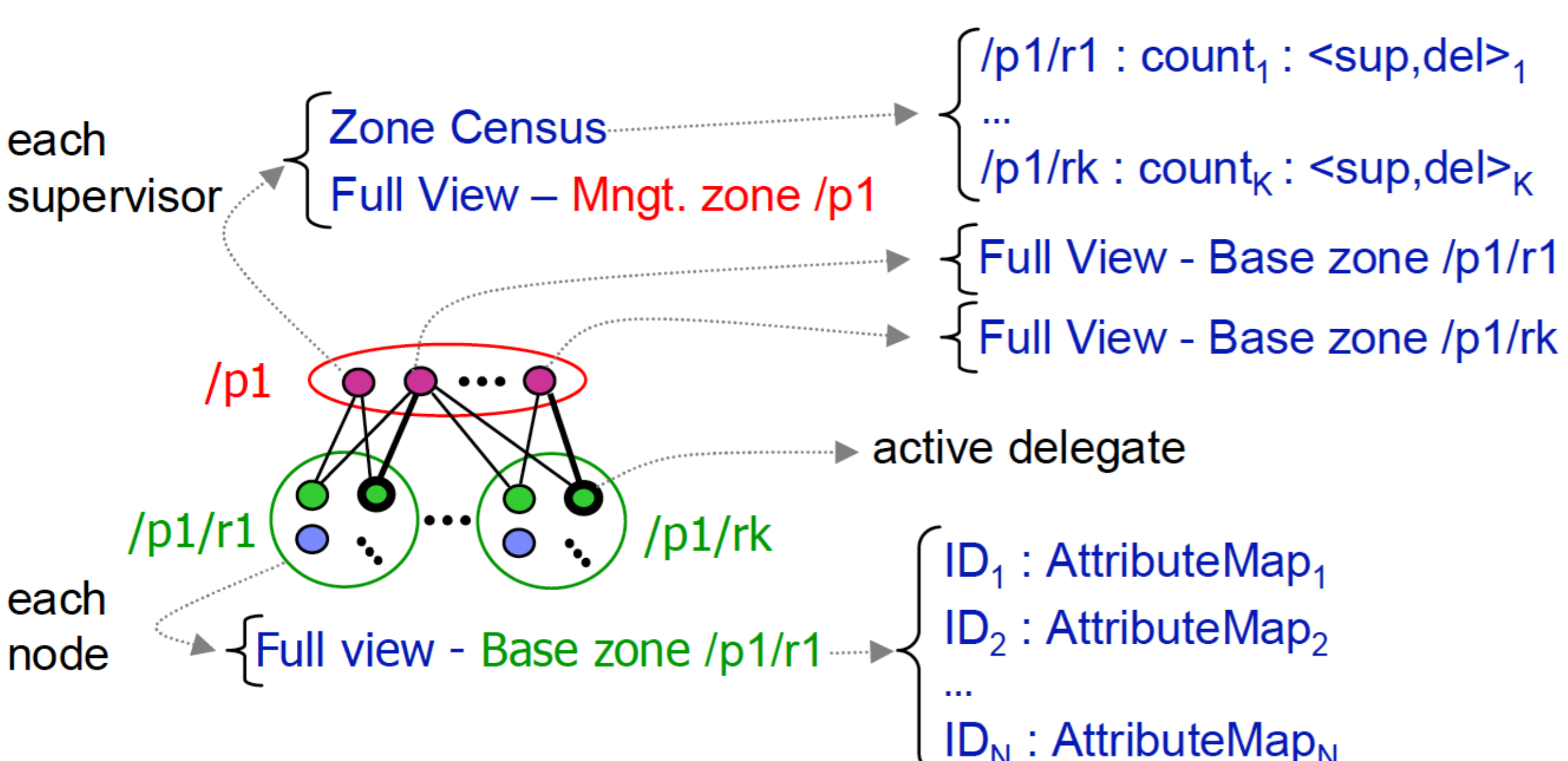
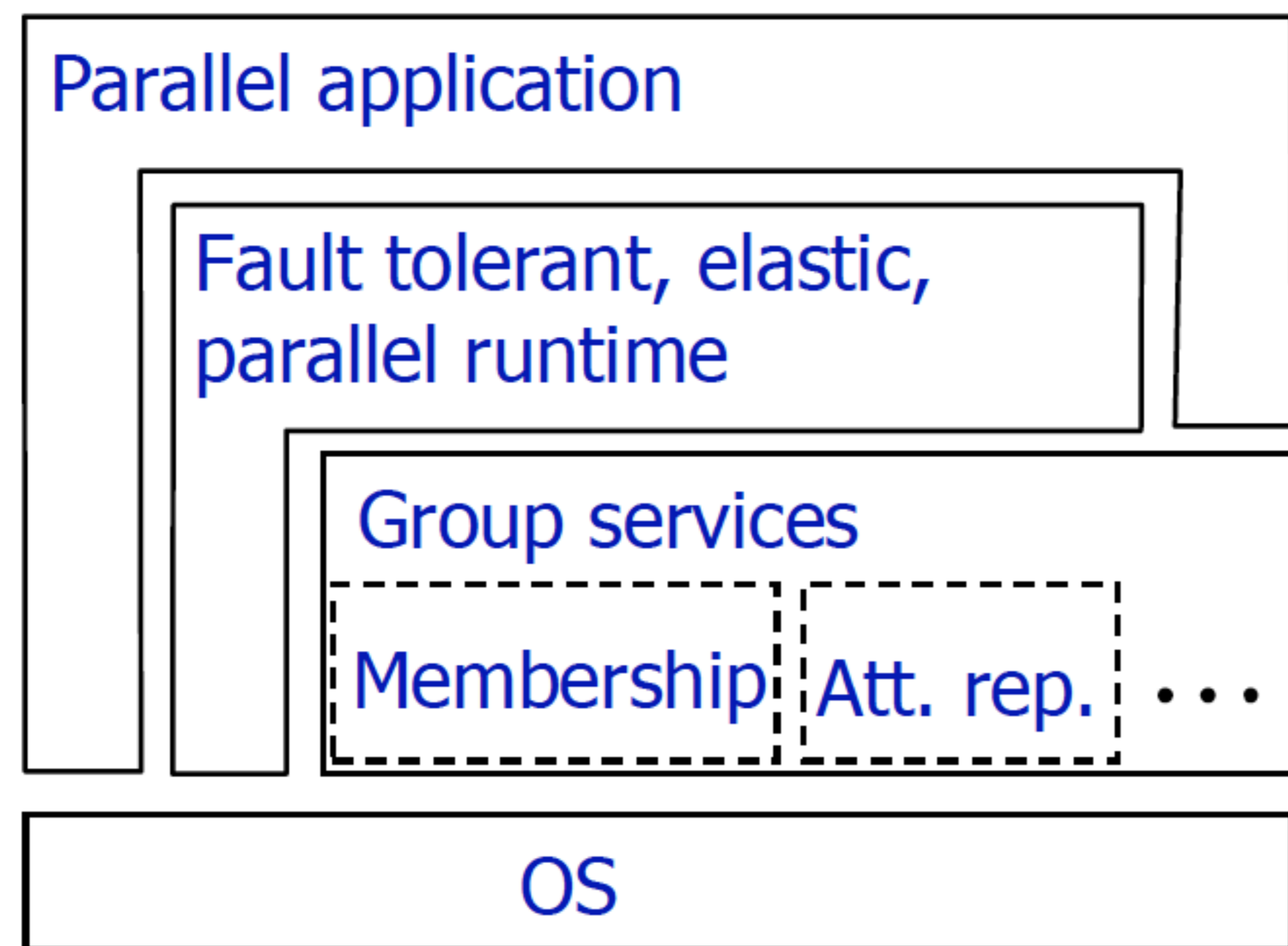
Membership Service

Major functions

- Local view maintenance
- Attribute replication
- Group communication

Design elements

- Hierarchical architecture
- Relaxed consistency model
- Churn handling mechanism



Overlay Design

Motivations and challenges

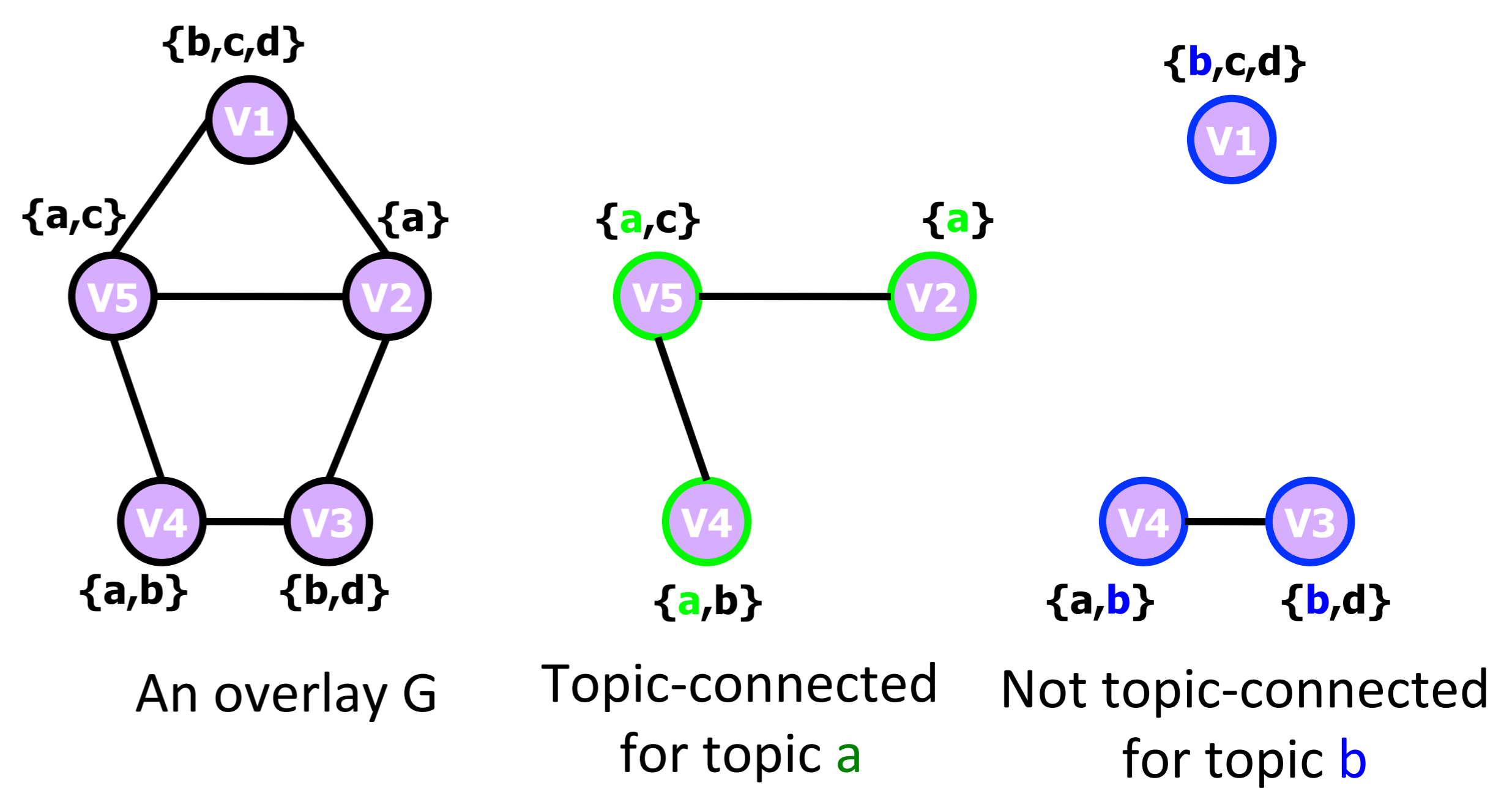
- Overlay is essential for pub/sub
- IoT can reside across data centers
- Locality awareness

Problem statement

Given an instance (V, T, I, w)

- V , a set of nodes
- T , a set of topics
- I , an interest matrix
- w , an edge weight function

Construct a **topic-connected overlay (WTCO)** s.t. the sum of overlay edge weights is minimum.



A greedy algorithm with log approximation

