

Task Scheduling in Fog-Cloud Computing

Ramesh Adhikari

Augusta University

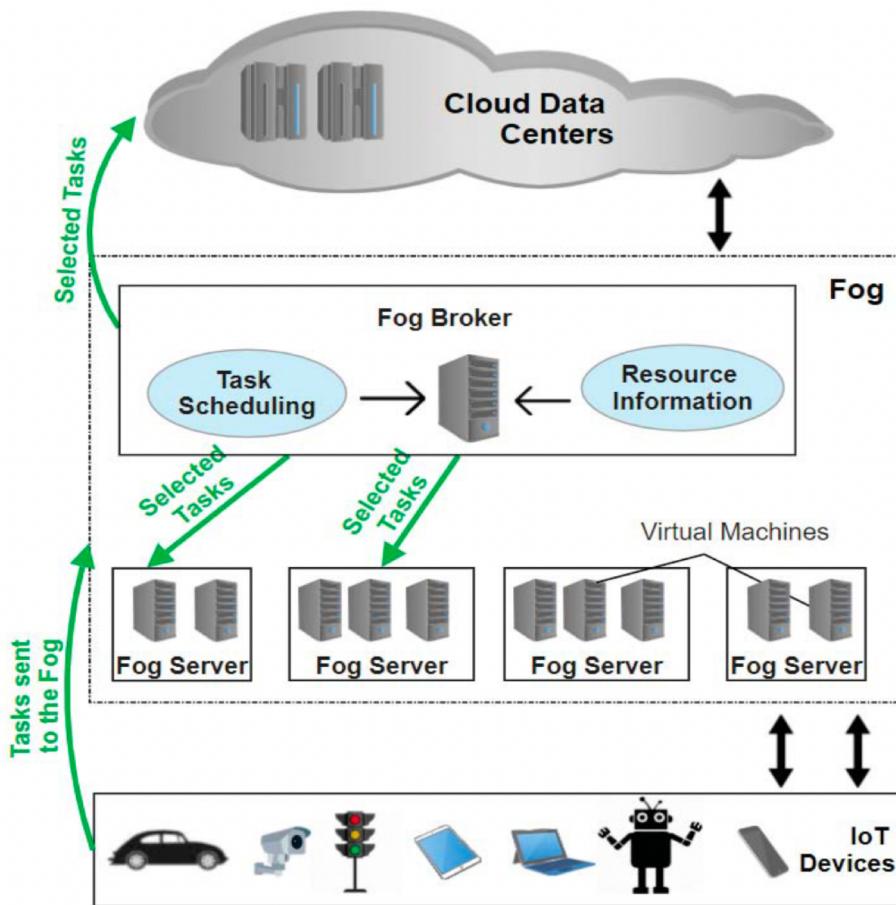
January 29, 2024

-Fog computing was first proposed by Cisco

Why Fog computing?

- **Cloud computing:** Provides resources over the Internet. (Centralized)
- **Challenges (Delay)-**sensitive applications like smart health and city applications face performance issues due to data transfer to centralized cloud data centers.
- **Fog computing:** Solutions with resources closer to users (IOT devices) for low latency and energy efficiency. (distributed)
- **Goal:** Optimal placement in the three-tier IoT for improved efficiency, QoS, security, and privacy.

1. Real-Time Task Scheduling in Fog-Cloud Computing Framework for IoT Applications: A Fuzzy Logic based Approach [2021 IEEE]



- “task” is used to indicate an atomic unit of processing, and group of task called “Jobs”
- Task has parameters including resource requirements, size of task, ready time and deadline
- Deadline is the time that t_i should be completed

Task requirements (e.g., computation, storage, bandwidth) and their **constraints** (e.g., deadline, data size)

Tasks t_i and t_j are **dependent** if t_j must start after t_i completes

Fig: Fog-Cloud Computing Architecture Framework with Task scheduling

2. Cost-Aware Task Scheduling in Fog-Cloud Environment [2020 IEEE]

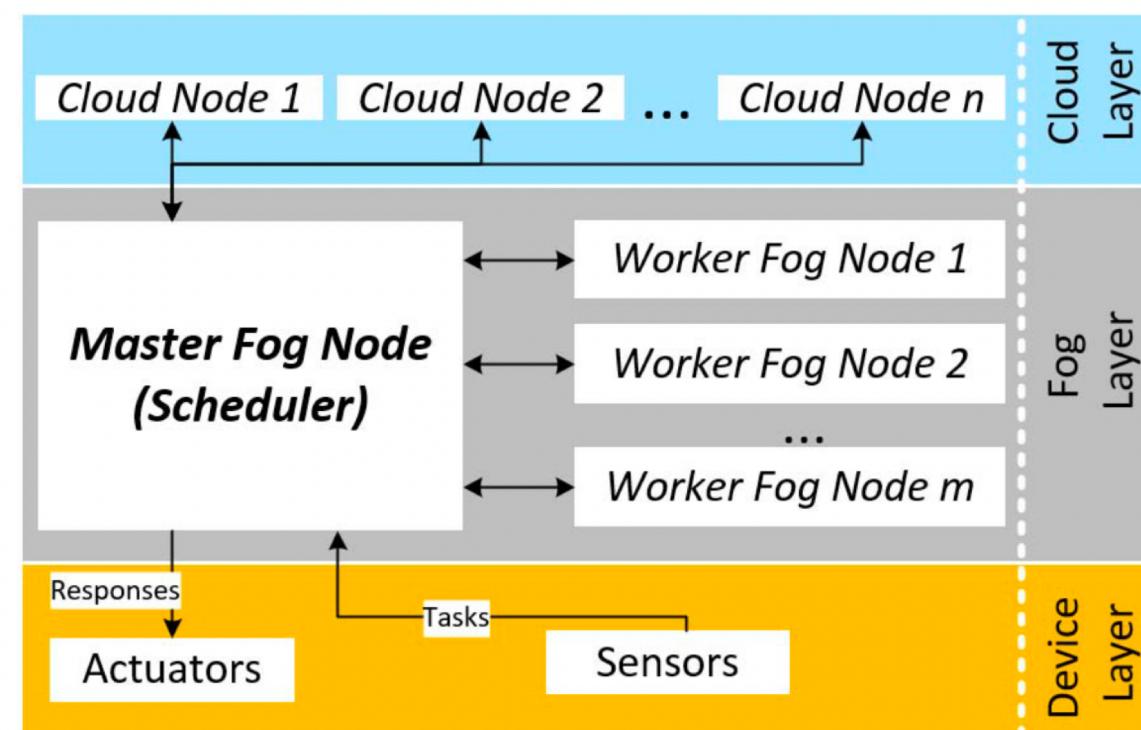


Fig. 1: Fog-cloud based task scheduler model

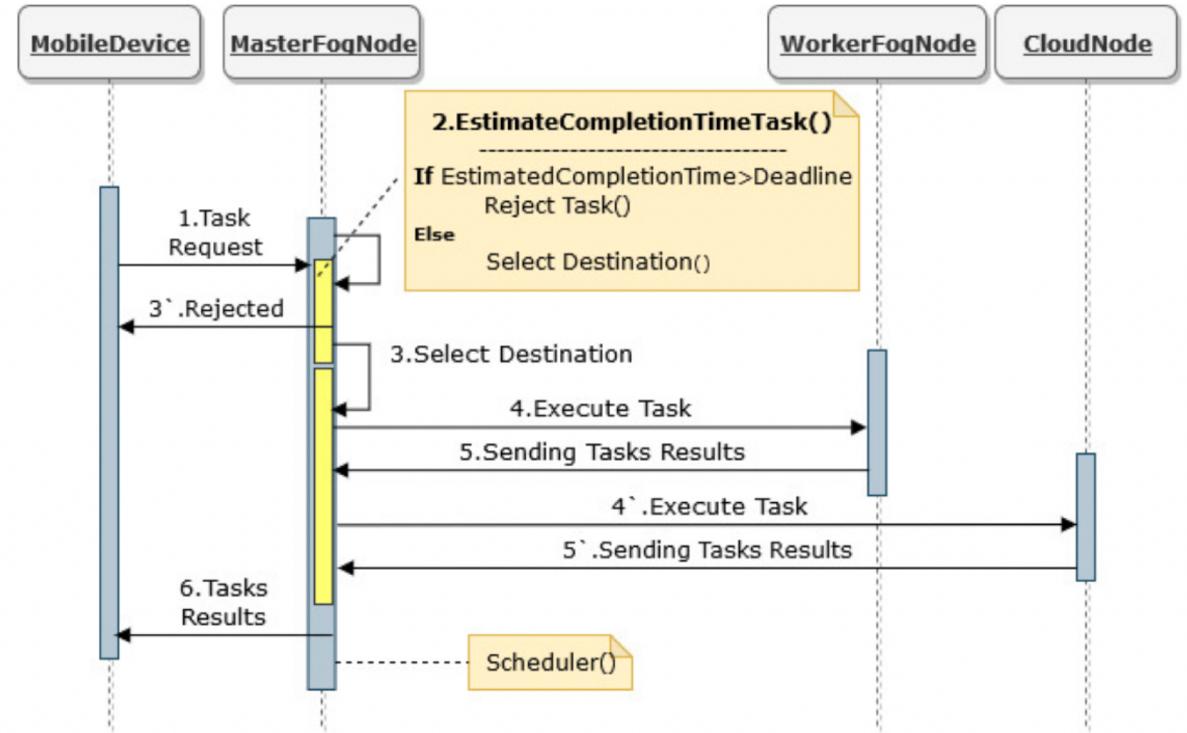


Fig. 2: System model of scheduling

3. Real-Time Task Scheduling Algorithm for IoT-Based Applications in the Cloud–Fog Environment [Journal 2022]

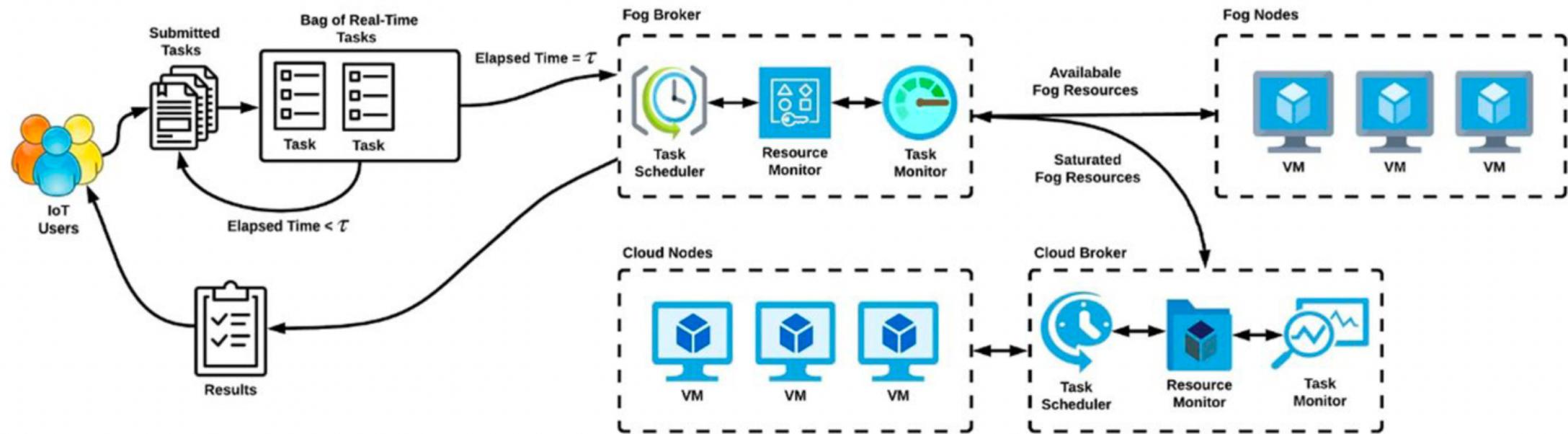


Fig: Graphical Abstract of Fog-Cloud computing

3. Continue...

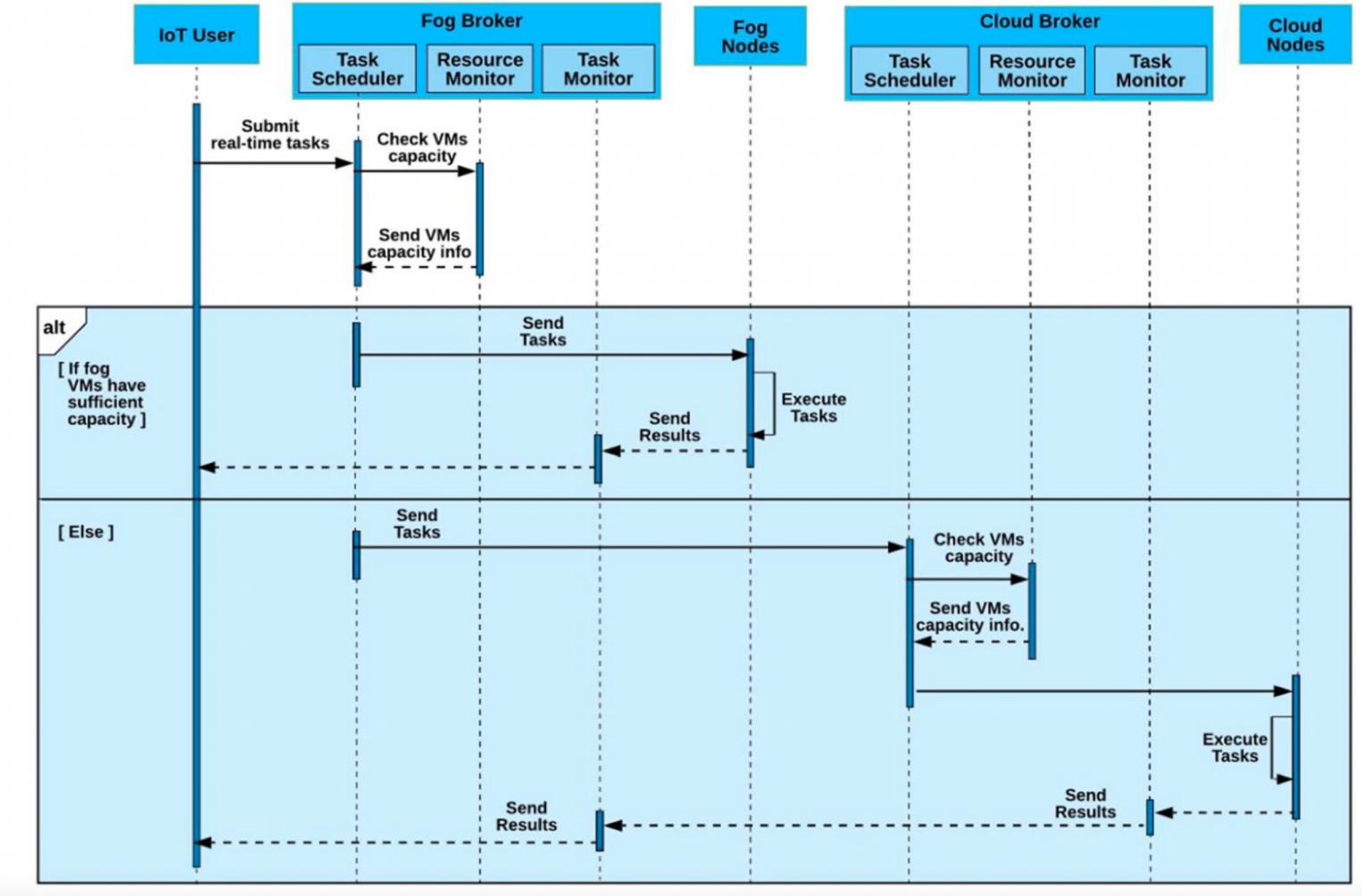


Fig: A sequence diagram of task scheduling operation in a cloud–fog system

Thank You!