

# Securing Next Generation Smart Cars: Access Control Needs and Solutions

Maanak Gupta

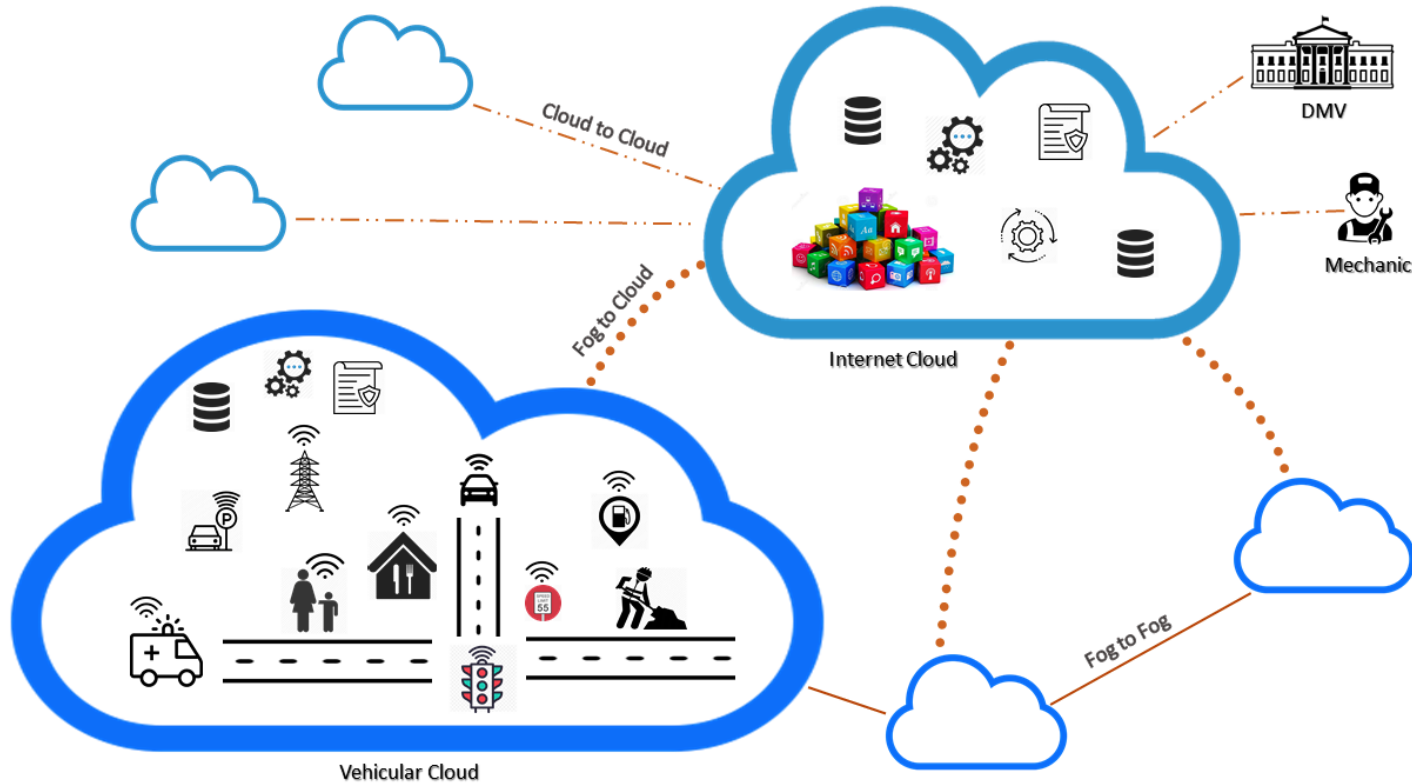
PhD Student

Advisor: Ravi Sandhu

Institute for Cyber Security,  
Center for Security and Privacy Enhanced Cloud Computing,  
Department of Computer Science  
University of Texas at San Antonio

**ICS C-SPECC Student Seminar**

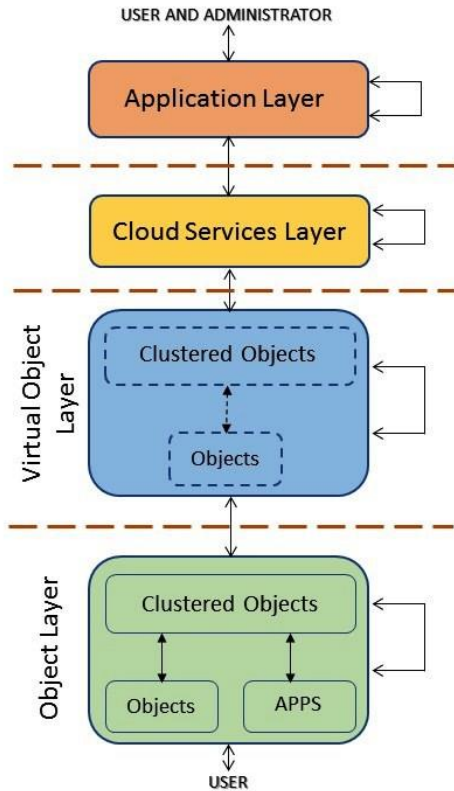
**June 11, 2018**



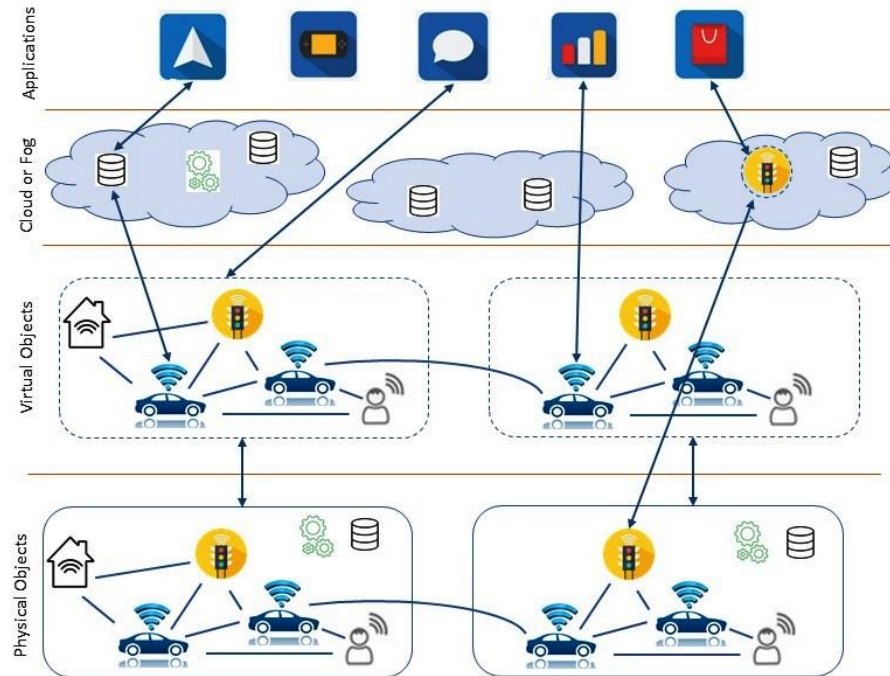
- On-Board Application and Sensors
  - Tesla and Jeep X
- Over the Air updates
- V2X fake messages
- In-vehicle ECU communication
- Personal Data
- Third Party devices
- User Privacy Preferences
- Spoofing, Ransomware, Injection...
- Loss of Information in Cloud

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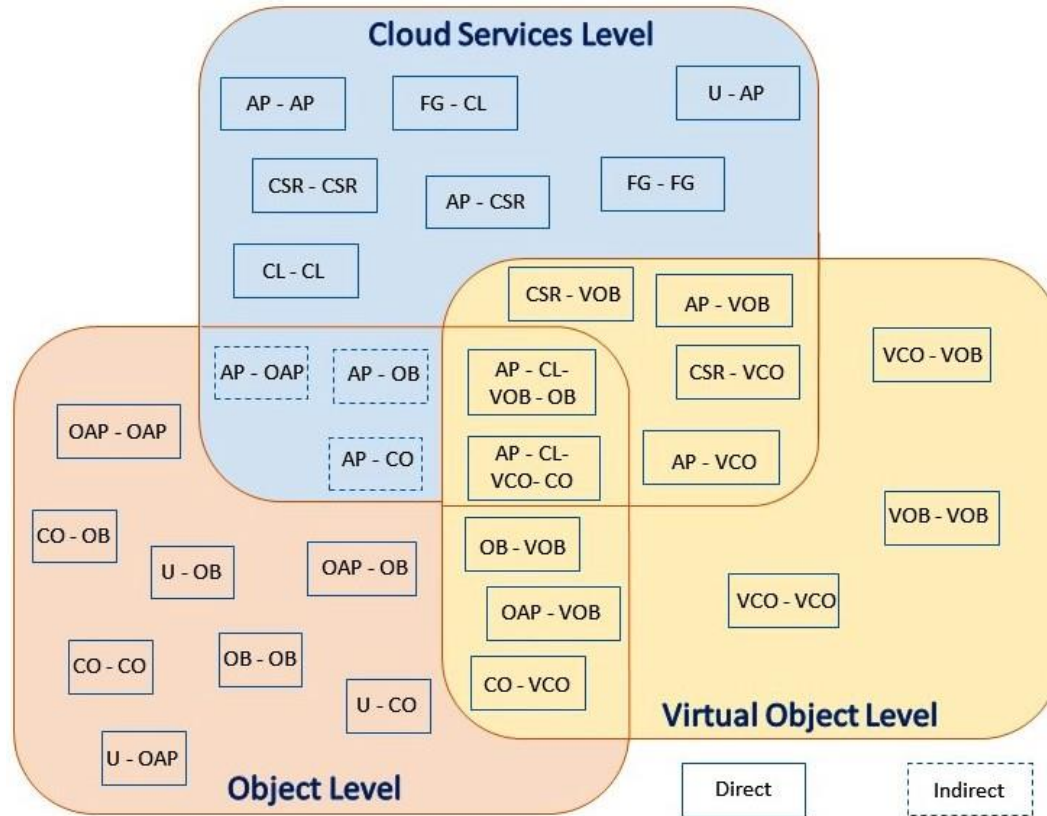
- Software Reliance
- Broad Attack Surface
- Untrusted Entities



a) Extended ACO Architecture for Connected Car and IoV



b) Connected Car and Vehicular IoT Components in Extended ACO Layers

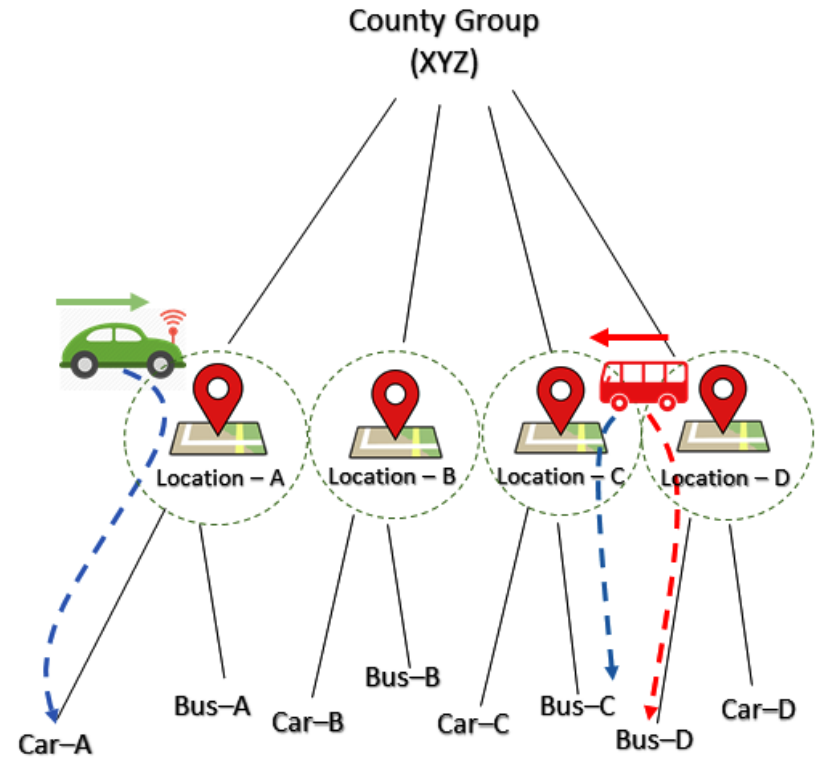
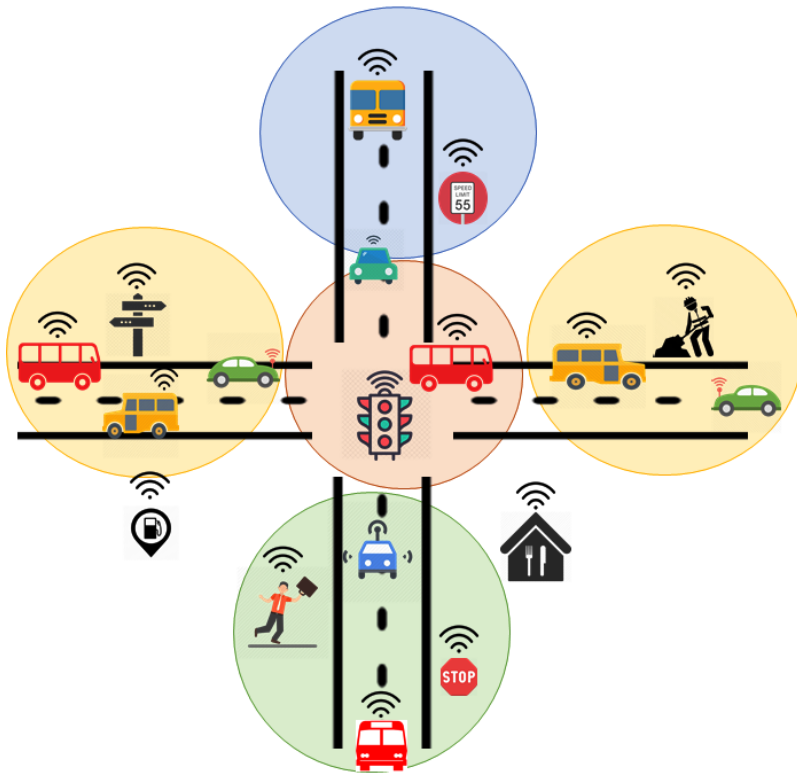


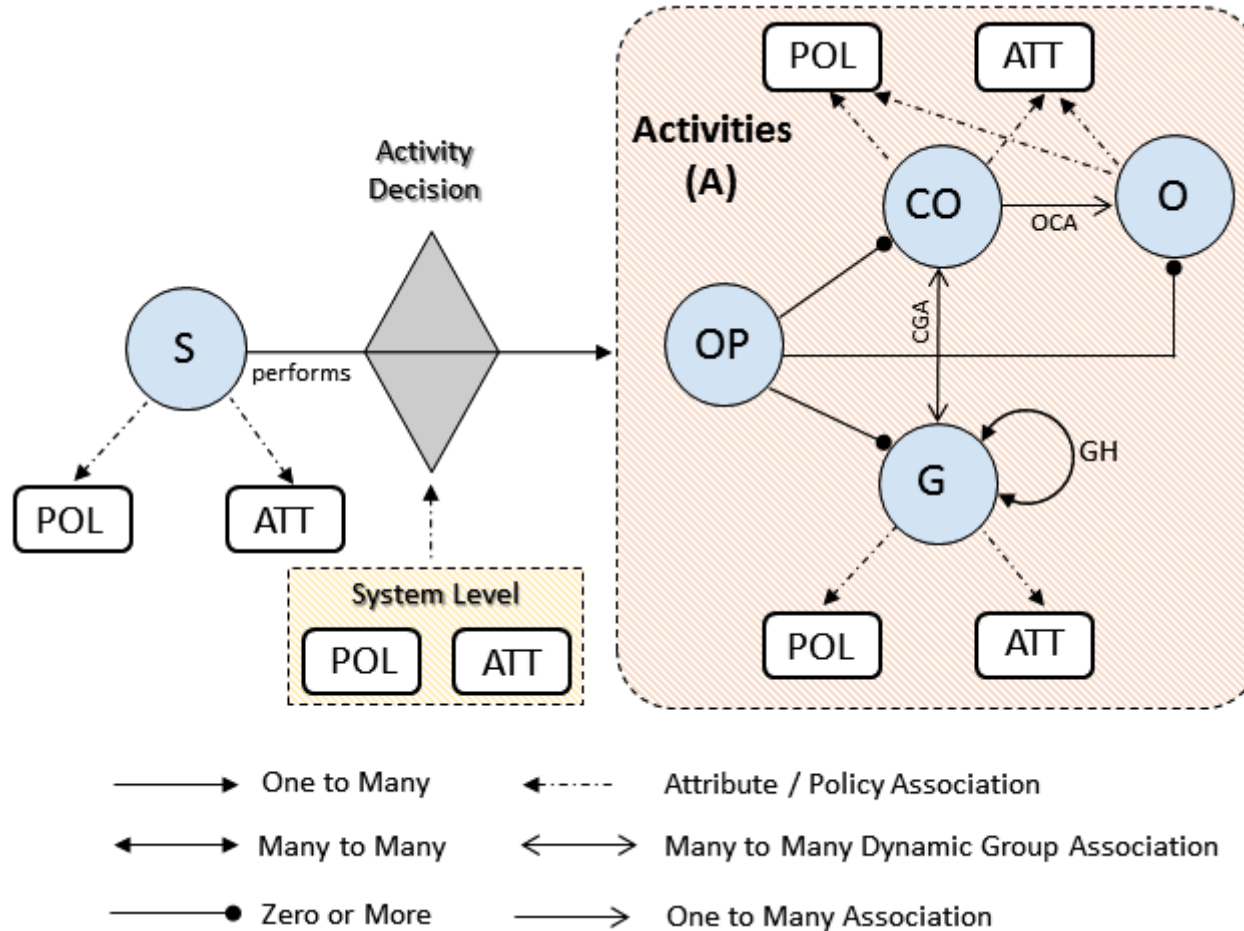
**U:** User **CO:** Clustered Objects **OB:** Objects **OAP:** Object Layer Applications **CL:** Cloud **FG:** Fog  
**CSR:** Cloud Services **VCO:** Virtual Clustered Objects **VOB:** Virtual Objects **AP:** User Applications

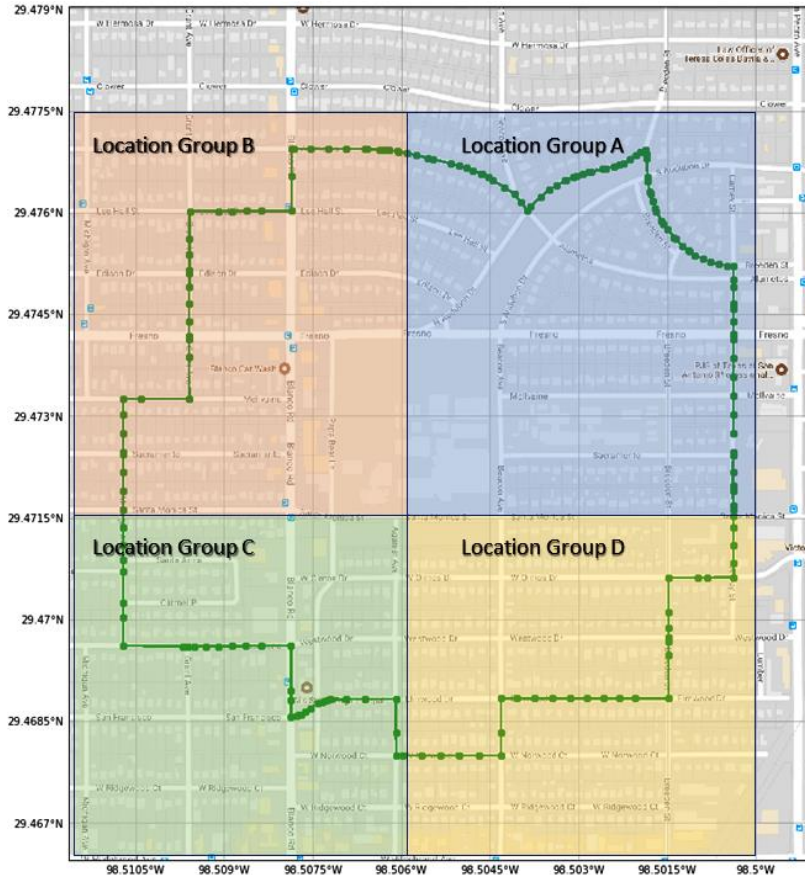
- Static vs Dynamic
- What kind of relationship they have?
  - Owner
  - Manufacturer
  - Friend
- Multi-Layered
- Groups Based
- Trusted Interaction
  - How I trust you?
  - Previous interaction..?
- ABAC, ReBAC Models
- Who will administer ?
- Data in Cloud, cross cloud sharing, how?

# Dynamic Groups and Attribute Based Access Control

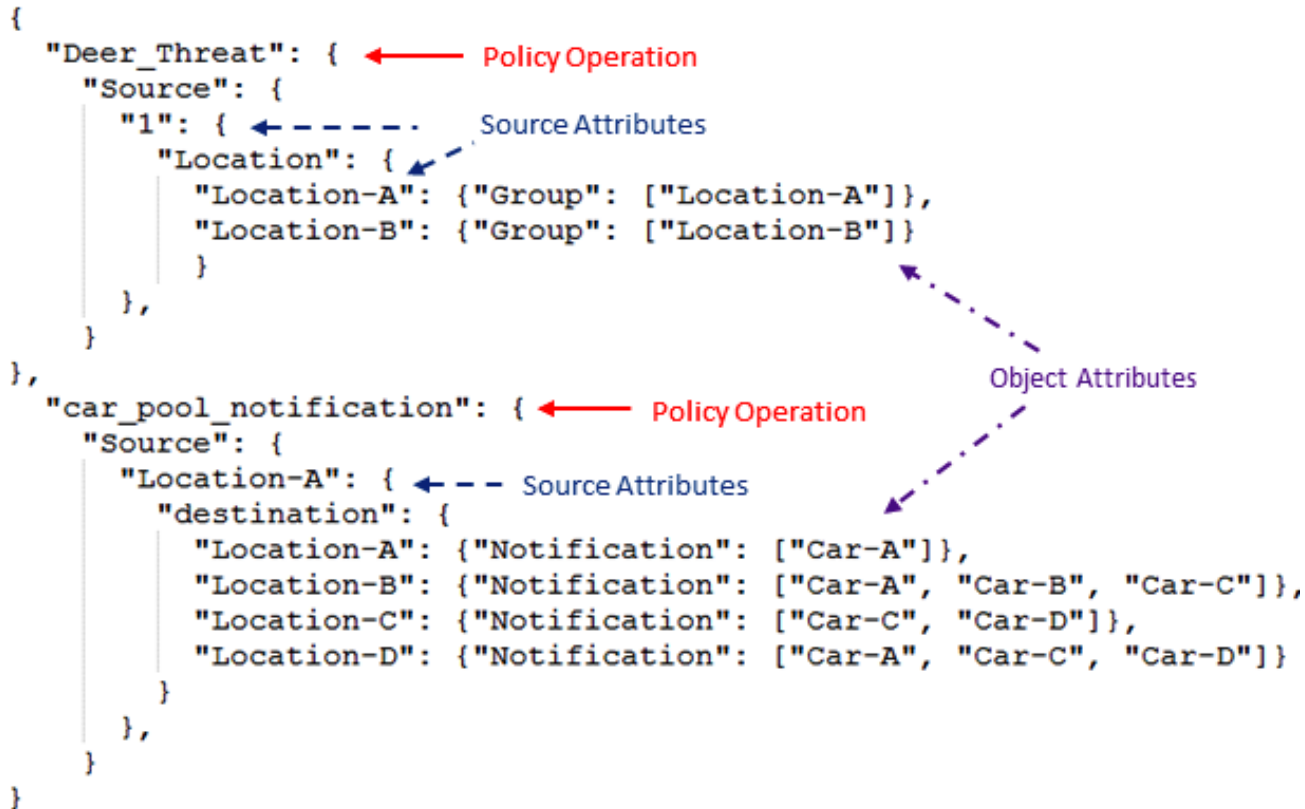


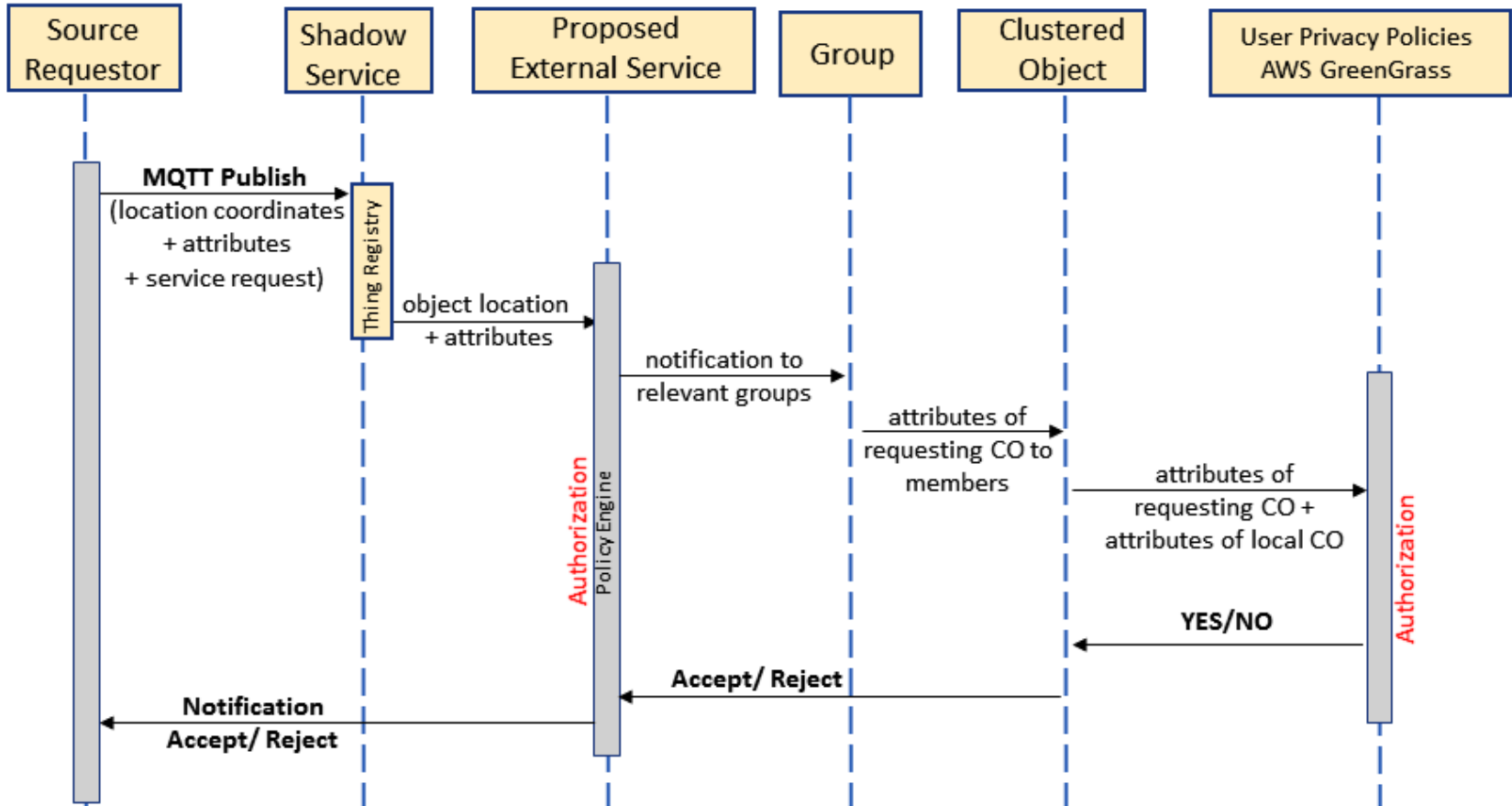






```
('Received new coordinates from:', 'Vehicle-1')
Sun May 27 02:56:30 2018
Location A
    Car-A : [u'Vehicle-1', u'Vehicle-2']
    Bus-A : []
Location B
    Car-B : []
    Bus-B : [u'Vehicle-6']
Location C
    Car-C : [u'Vehicle-3', u'Vehicle-4']
    Bus-C : []
Location D
    Car-D : []
    Bus-D : [u'Vehicle-5']
```





Number of Requests	Policy Enforcer Execution Time (in ms)
10	0.0501
20	0.1011
30	0.1264
40	0.1630
50	0.1999

nth Request	Cars Notified	
	With ABAC Policy	Without Policy
41st	2	5
42nd	3	5
43rd	5	5
44th	3	5
45th	2	5
46th	3	5

