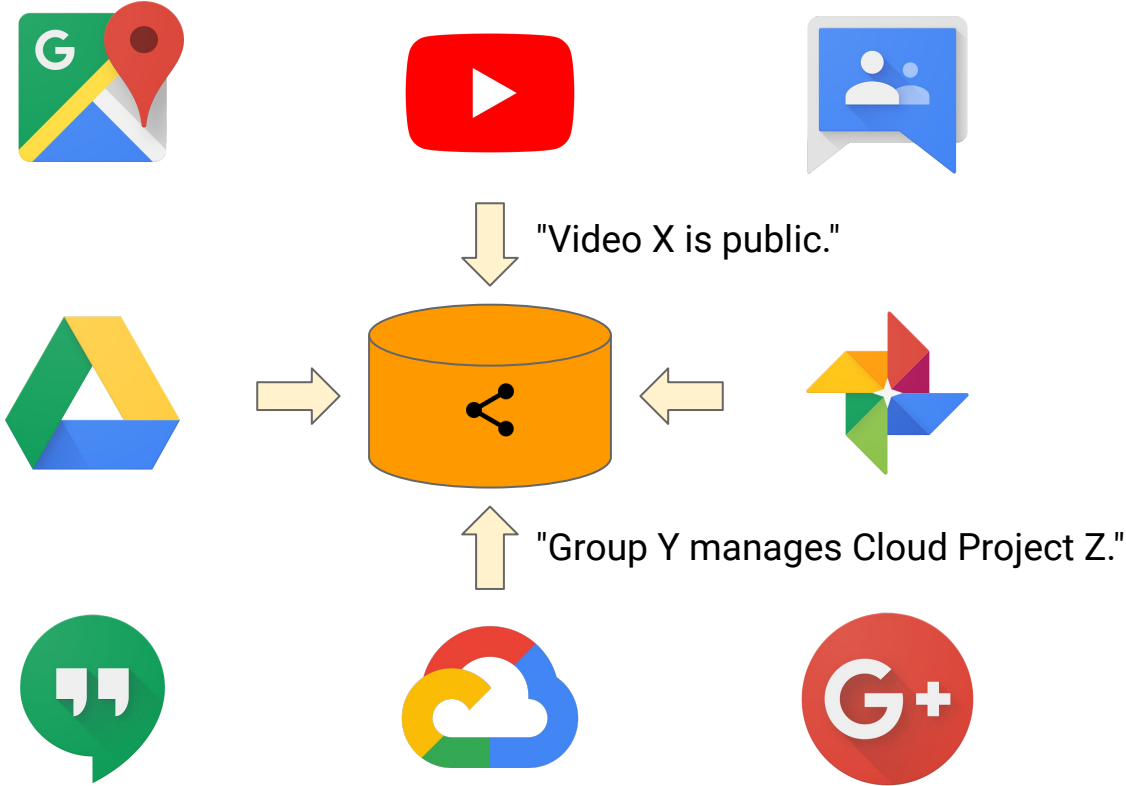




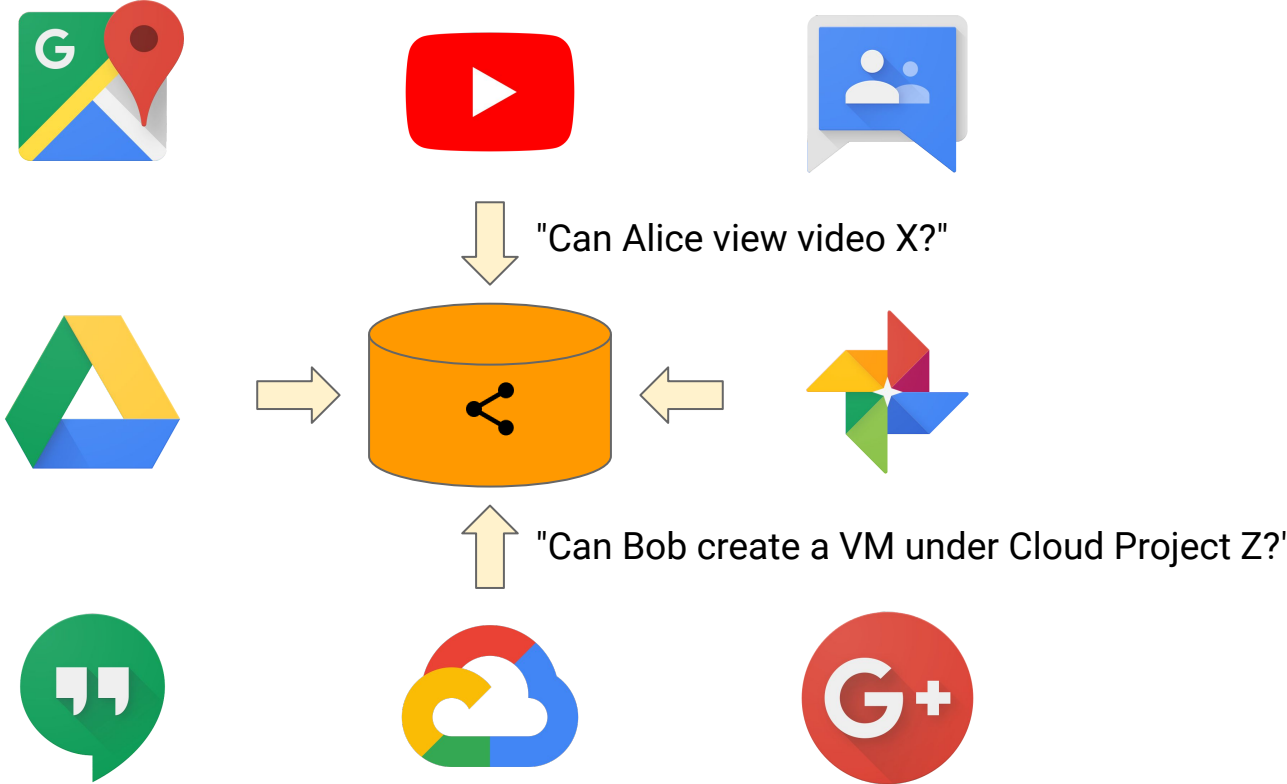
# Zanzibar: Google's Consistent, Global Authorization System

Ruoming Pang, Ramon Caceres, Mike Burrows, Zhifeng Chen, Pratik Dave, Nathan Germer, Alexander Golynski, Kevin Graney, and Nina Kang, *Google*; Lea Kissner, *Humu, Inc.*; Jeffrey L. Korn, *Google*; Abhishek Parmar, *Carbon, Inc.*; Christina D. Richards and Mengzhi Wang, *Google*

# Storage System for Access Control Lists (ACLs)



# Authorization Engine



# Zanzibar is Designed to Be ...

- Correct:      Respects **causal** ordering of updates

# Zanzibar is Designed to Be ...

- Correct: Respects causal ordering of updates
- Flexible: Supports rich variety of access control policies

# Zanzibar is Designed to Be ...

- Correct: Respects causal ordering of updates
- Flexible: Supports rich variety of access control policies
- Scalable:  $O(\text{trillion})$  ACL entries,  $O(\text{million})$  authorization checks/second

# Zanzibar is Designed to Be ...

- **Correct:** Respects causal ordering of updates
- **Flexible:** Supports rich variety of access control policies
- **Scalable:** O(trillion) ACL entries, O(million) authorization checks/second
- **Fast:** < 10ms @ 95%, <100ms @ 99.9%
- **Available:** 99.999% over the past 3 years

# Track 1

"Real-World Deployed Systems"

11:20 - 12:40

July 10, 2019