Inter-domain cooperative DDoS protection problems and mechanism

draft-nishizuka-dots-inter-domain-mechanism-00

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Overview

Cooperative DDoS Protection:

- utilize other organization's resources each other through DOTS to share the burden of the protection

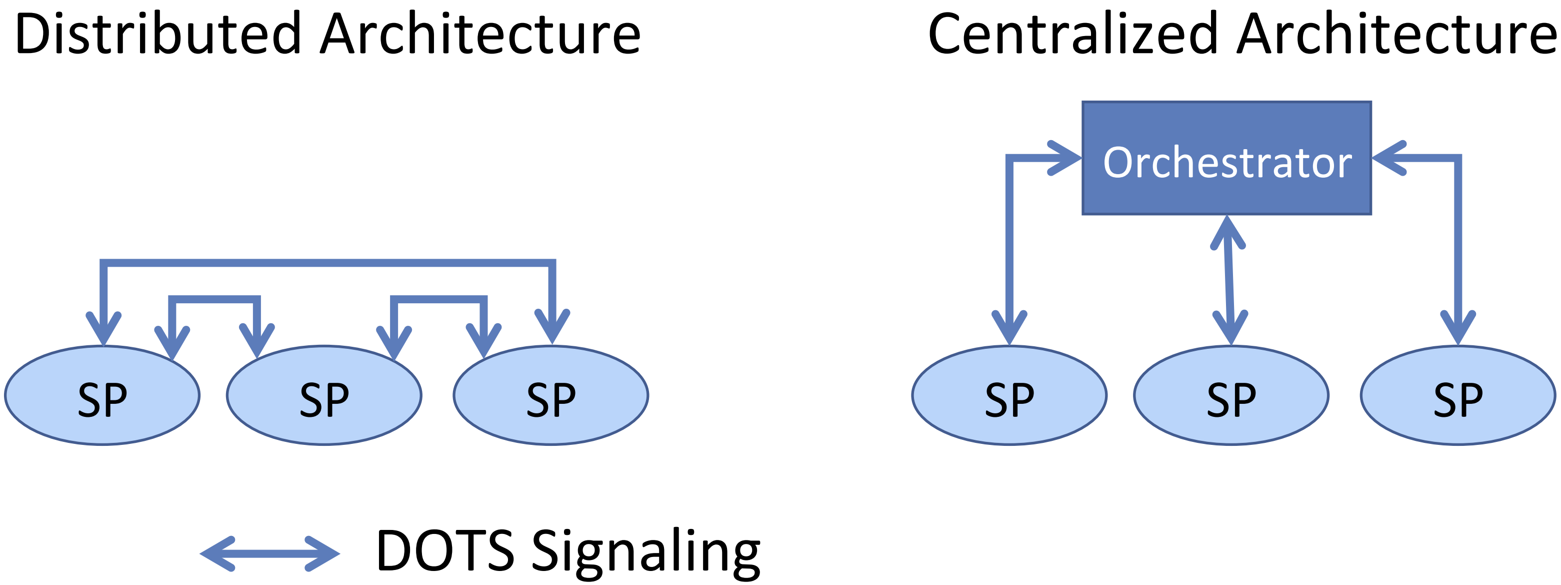
This draft describes:

1. Architecture & Problems
2. Protocol

of the “Cooperative DDoS Protection”

Architecture of Cooperative DDoS Protection

- 2 or more DDoS protection service providers are cooperating with each other via DOTS
- Focusing on the relationship of those providers

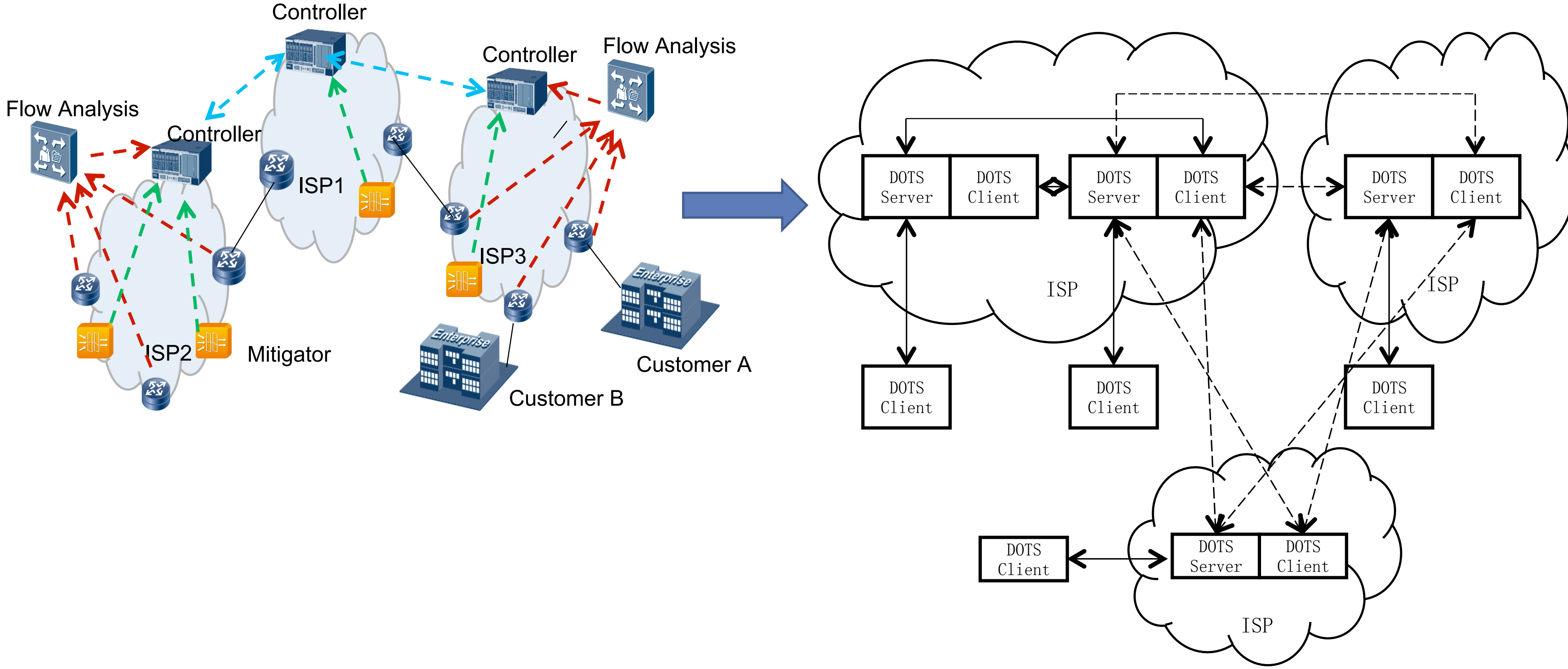


Distributed Architecture

Centralized Architecture

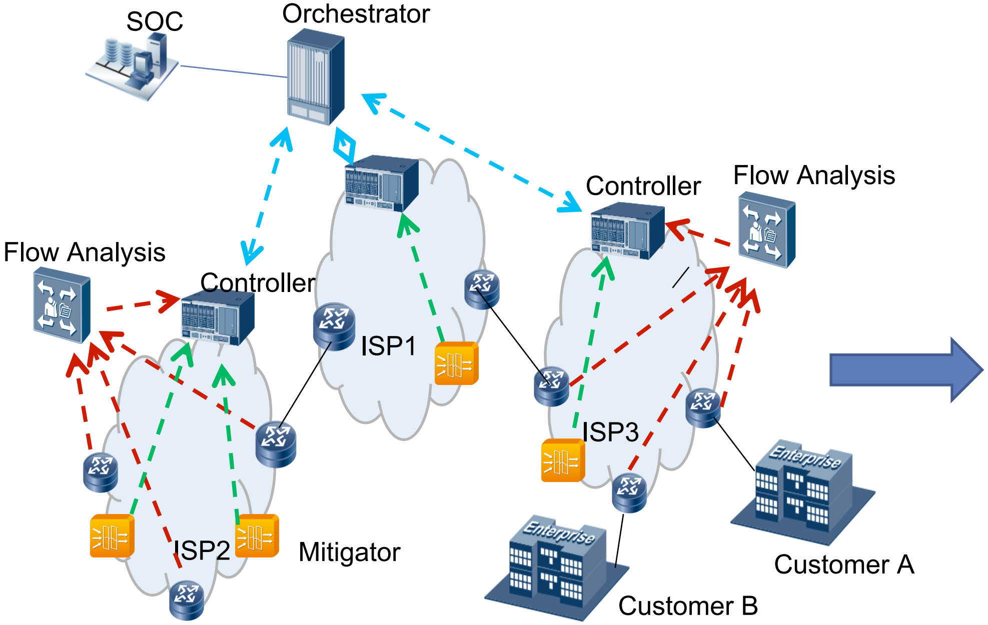
SP: DDoS Protection Service Provider

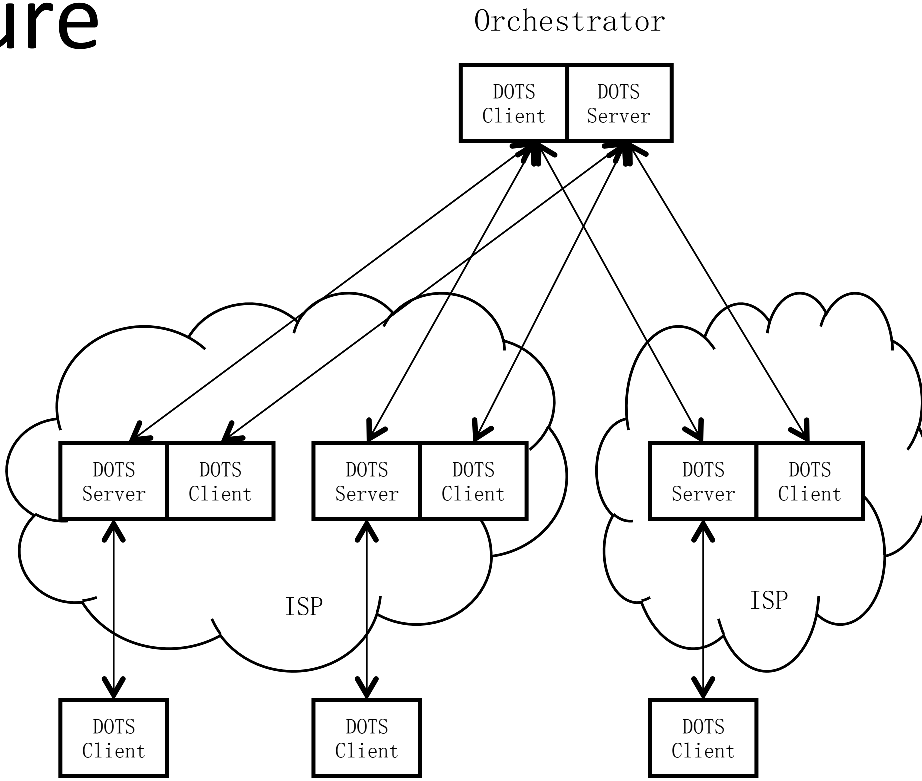
Distributed Architecture



- *Peer-to-peer coordination；*
- *customer<->DOTS client, ISP controller<->DOTS server + DOTS client;*
- *The inter-domain coordination can be a repeated process;*
- *A straightforward and simple solution for the DDoS protection cooperation among small number of ISPs:*
  - ✓ *The incomplete information may not lead to the most optimized operation;*
  - ✓ *Configurations become more complex and error prone as the number of ISPs increases;*
  - ✓ *By repeated coordination among multiple ISPs, It may take a long time to enforce the mitigation.*

Centralized Architecture





- *the centralized orchestrator is the core component to the inter-domain system;*
- *customer<->DOTS client, ISP controller<->DOTS server + DOTS client, orchestrator<->DOTS server + DOTS client;*
- *The inter-domain coordination is bridged by the orchestrator;*
- *Comparing to distributed architecture:*
  - ✓ *The orchestrator has the HA problem;*
  - ✓ *Centralized way facilitates the automatic provisioning of DDoS protection resource and comprehensive information for overall optimized mitigation;*
  - ✓ *Direct communication with orchestrator guarantees quick and fixed DDoS response time.*

Challenges for Inter-domain Cooperative DDoS Protection

1. Bootstrapping Problems (automatic provisioning):
   - Trust relation and secure channel set up;
   - Auto-discovery and capability negotiation, etc.
2. Coordination problems:
   - How to get the appropriate mitigation service from other operators with high efficiency: make the decision based on information sharing;
   - Near source mitigation: spoofed address, privacy protection;
   - Others: accounting, returning path, etc.