Multicast Segment Routing IPv6 (MSR6) Introduction

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Background

Pure IPv6 networks will be / is deployed soon, and single IPv6 data plane is possible?

- IPv6 traffic is increasing very fast
  - More and more applications and the Web sites begin to support IPv6
  - Most operators' networks have already support IPv6 well
  - IPv6 traffic is growing rapidly around the world. In some countries the annual growth rate even exceeds 10%.

  Example of China Mobile **: 0.75 billion LTE subscribers** and **27% traffic** running over IPv6

- SRv6 will be / is deployed in large scale

Potential Use Cases

New types of live video traffic in the network bring new opportunities and requirements for multicast solutions.

OTT Live Video (Douyin, Taobao, Tik Tok)	Video Surveillance	Financial Securities	Media Asset Network (TV station)
✓ A person can be a multicast source and the huge number of sources ✓ Large number of online viewers and Frequent interaction ✓Multicast As A Service	Subway and city security protection: Multiple clients simultaneously monitor live video from a camera.	AB dual planes for multicast distribution of securities transaction services	New media programs by using the IP technology.

For IPv6 network, Service oriented Multicast Technology is need

Network	Service oriented Point-to-multipoint forwarding effectively reduces redundant network traffic and network load, as well as service guarantee	Platform	Point-to-multipoint applications reduce the server and CPU loads and decouple the impact of the increase in the number of users on the multicast source.

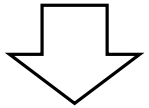
Background: Existing Work

Traditional Multicast Solutions

- Request multicast tree-building on control plane
- Maintain end-to-end tree state per flow
- E.g., PIM, P2MP RSVP-TE

Source Routing Technologies

- Reduce the state of intermediate nodes
- Indicate forwarding behaviors in the ingress nodes near to the service source
- Simplify deployment and maintenance
- E.g., SRv6, BIER



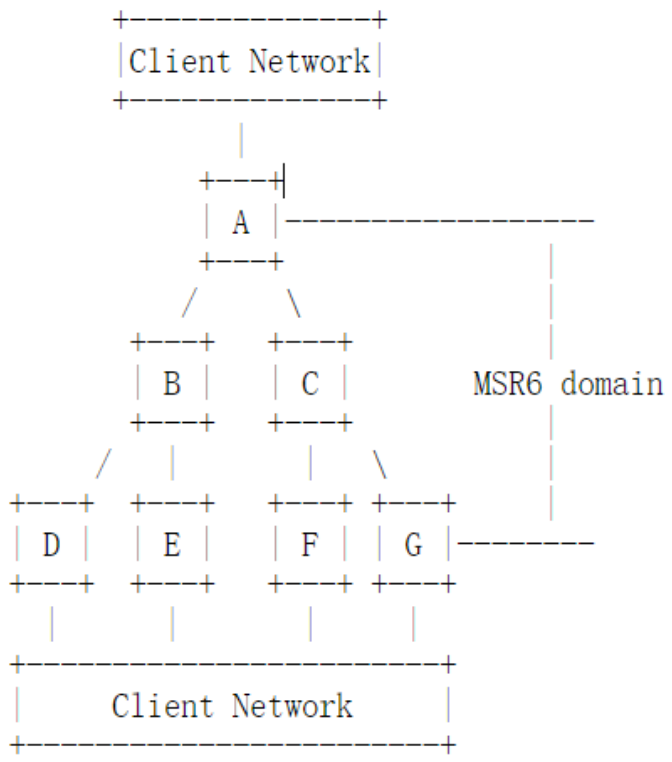
IPv6 + Multicast + Source Routing

IPv6 multicast source routing (MSR6) solution is requested in the IPv6 network?

So We Propose the requirement of : MSR6 (Multicast Segment Routing over IPv6)

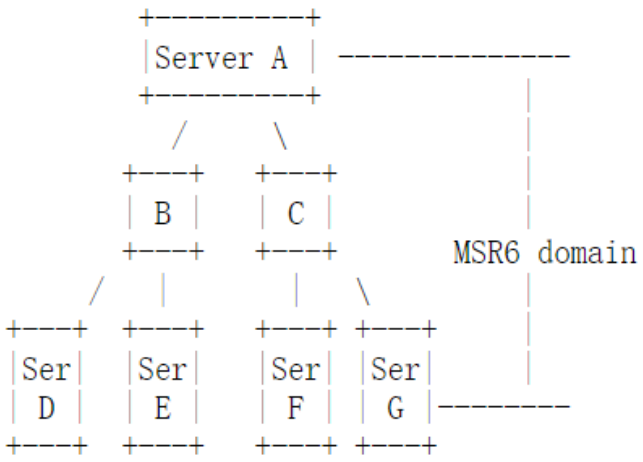
- Key Features of MSR6:
  - IPv6:
    - Allowing Host-Initiated multicast with IPv6 encapsulation;
    - Transit through unicast nodes in the network
    - Easy to support inter-domain deployment
  - Network Programming
    - Flexible encoding based on different scenarios/use cases
    - Able to program the packet at the ingress node, controlling leaf to join or leave a multicast tree.
    - Stateless in the network domain;
    - Able to steer the multicast traffic over different trees according to service requirement; Path optimization is allowed based on network status;

MSR6 Possible Deployment Modes



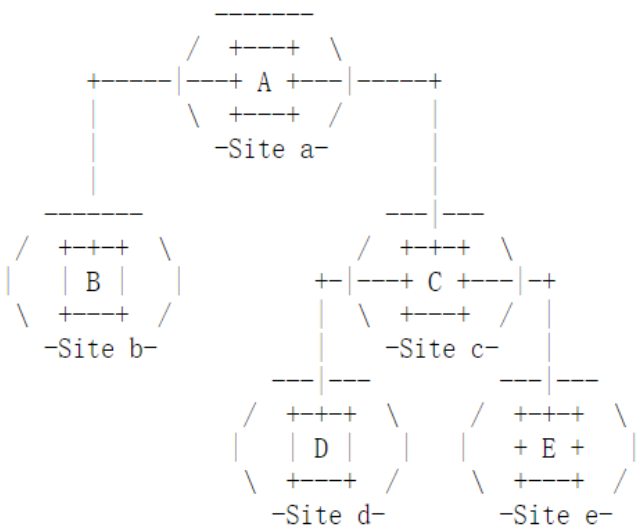
Conventional Multicast Deployment

E.g., IPTV, live video



Host-Initiated Multicast Deployment

E.g., MSDC (Massively Scalable Data Center), Cloud for Tenant Multicast



Multicast Overlay Network

E.g., SD-WAN

MSR6 Requirements

- Path Programming
- High Reliability
- Resource Assurance
- Deterministic Delay
- Performance Measurement
- Forwarding Efficiency

Thank you