

# MSR6 Use Cases

draft-liu-msr6-use-cases

Y. Liu (**Ed.**), F. Yang, T. Jiang

China Mobile

A. Wang

China Telecom

X. Zhang

China Unicom

X. Geng, Z. Li

Huawei

# Native Stateless IPv6 Multicast is Necessary

MSR6 focuses on use cases with the following characteristics:

- **Large-scale** network with **numerous multicast streams**
- **Host-initiated** or overlay Multicast Transport
- **IPsec** to guarantee the security of multicast transmission over the Internet

MSR6 use case includes:

- Multicast for Telecom Network: **5G Transport Network**
- Multicast for IDC Network: **Large Scale Data Center**
- Multicast for Enterprise Network: **Surveillance Camera**
- A holistic multicast solution with add-on features: **SD-WAN**

MSR6 could also be applied to traditional multicast scenarios

# Use-case: Multicast for Telco: 5G Transport

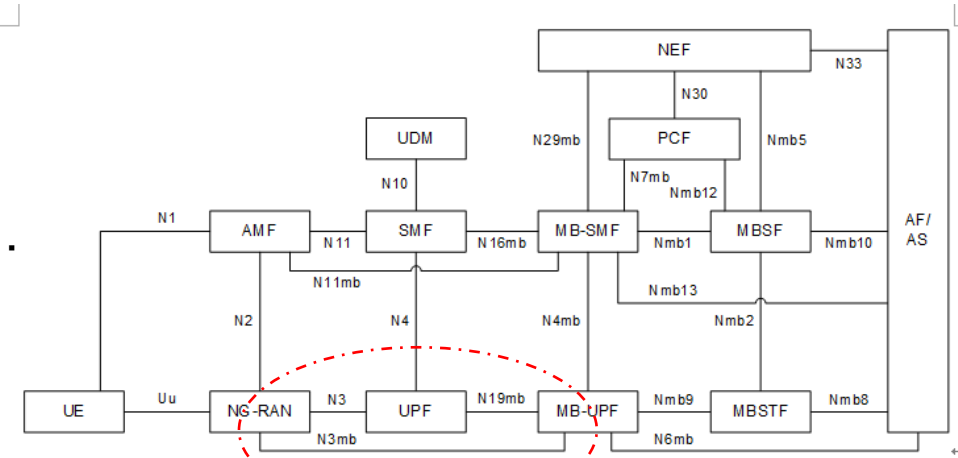


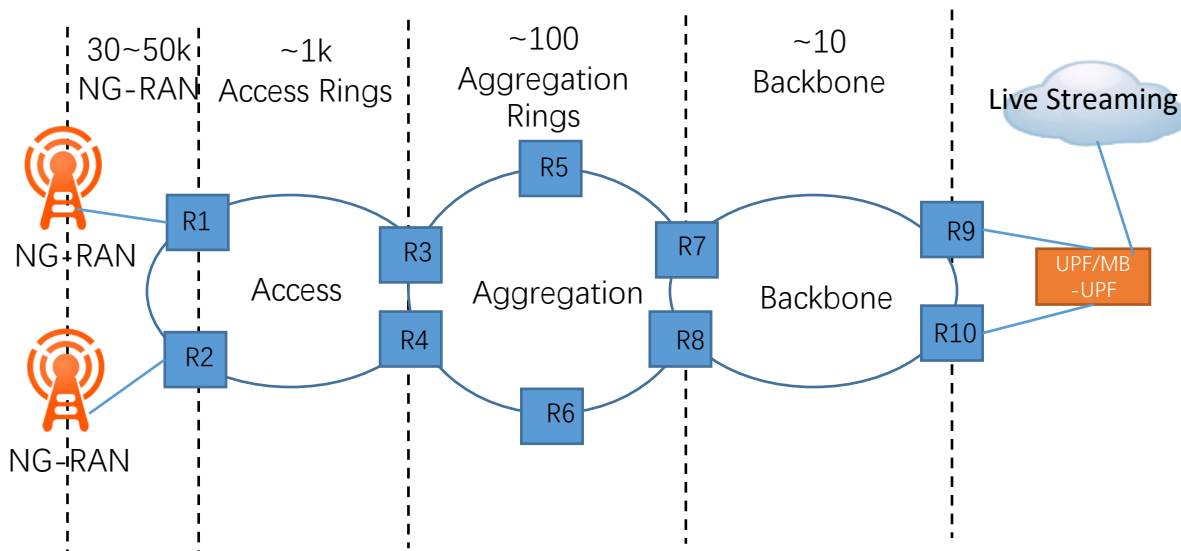
Figure 5.1-2: 5G System architecture for Multicast and Broadcast Service in reference point representation.

**5G Transport Network is a large scale network which can potentially support a large number of multicast services**

- 3GPP TS 23.247 defines architectural enhancements for 5G multicast-broadcast services (MBS);
- IPv6 based 5G Transport Network (from a real deployment) :
  - 30k NG-RAN;
  - Potential solution for live video streaming transport, such as Tiktok

**MSR6 provides packet encoding multicast tree that is decoupled from the network scale and the number of multicast services**

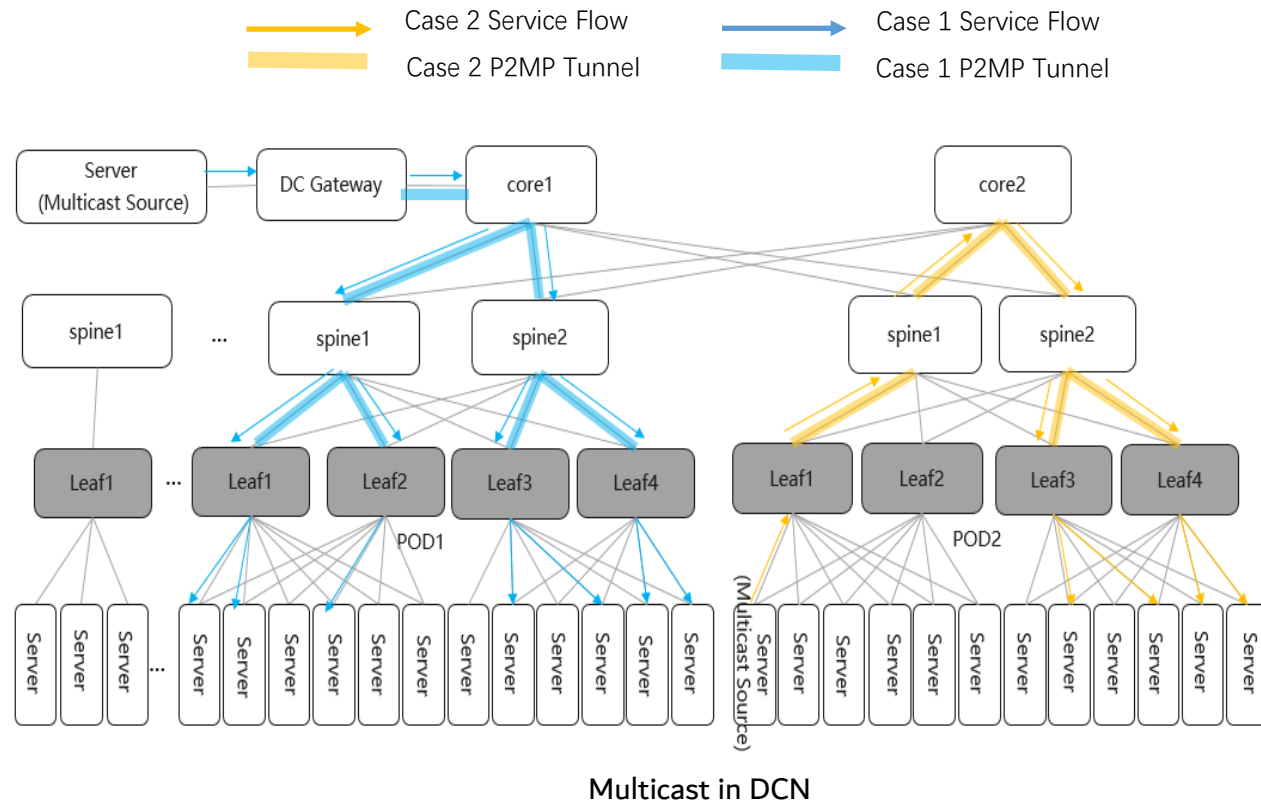
- Avoid per-flow states for soft-state protocols or potentially overwhelmed multicast signaling messages in network
- Prefer selective- over inclusive- mode multicast
- Avoid unnecessary packet encapsulation overhead and excessive multicast forwarding table entries



## Multicast in 5G Transport Network

\*3GPP TS 23.247: Architectural enhancements for 5G multicast-broadcast services

# Use-case: Multicast for large-scale DC Network



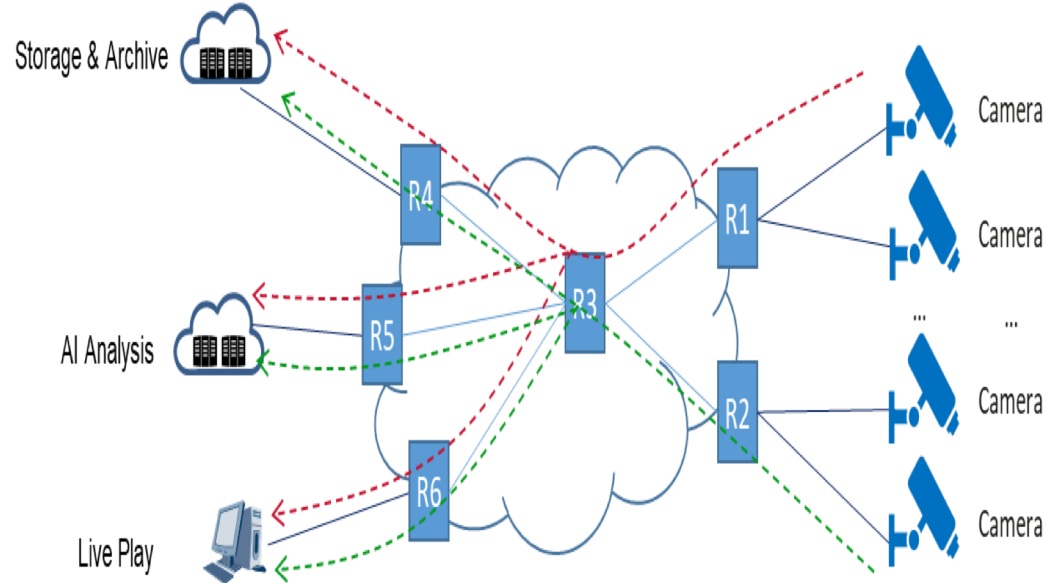
**Large-Scale DC Network could have numerous number of multicast services running**

- Dual-homes hosts for reliability
- Scalability: Switches ~ 3k, links ~ 60k;

**MSR6 provides packet encoding multicast tree that is decoupled from the network scale and the number of multicast services**

- Avoid per-flow states for soft-state protocols or potentially overwhelmed multicast signaling messages in network
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# Use-case: Multicast for Enterprise – Host-initiated Multicast



Multicast for Surveillance  
Camera Data Transmission

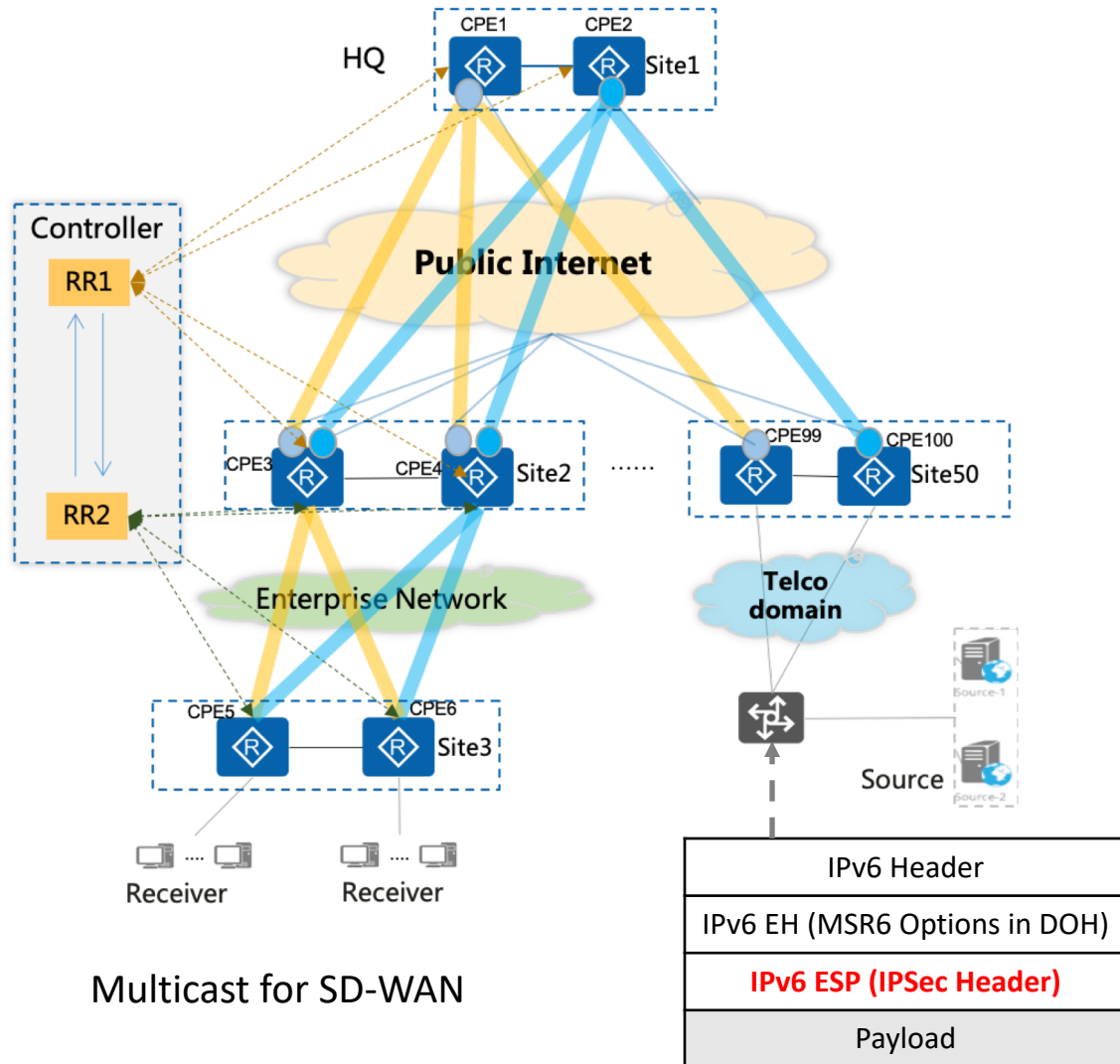
**Host-initiated multicast is requested in certain enterprise environment where hosts (i.e., end devices) and intermediate network nodes are administrated in the same domain :**

- Cameras as multicast sources are stable but the number of which is huge;
- Data generated from cameras is supposed to transmit & synchronize to different backend sites for further processing
- Multicast could save bandwidth during transmission.

**MSR6 could be used to simplify the multicast deployment without incurring control-plane protocol for multicast joining and leaving.**

- An alternative way to associate hosts and network.
- As multicast sources, hosts as a whole could send massive number of multicast flows and offer multicast services i.e. many many multicast trees.

# A Holistic Use Case with Add-on Features/Value – Multicast for SD-WAN



**A large-scale network that might span Telco-, cloud-, enterprise- and the public Internet :**

- SD-WAN (real-field case): Nationwide ~ 100k CPE

**Encryption is required to traverse the Internet :**

- When SD-WAN service is deployed across the public Internet, the underlay IP network provides nothing but the simple "Best Effort" service. In this case, security is one of the fundamental requirement in SD-WAN service. Multicast services for SD- WAN also request encryption.

**MSR6: Reuse IPv6 Authentication header and Encapsulating Security Payload header. Same for other functionalities.**

- Challenges of Independent layer for multicast: new IPSec Header has to be defined
- Avoid maintaining per flow states in intermediate nodes

# Native Stateless IPv6 Multicast is Necessary

- **Native IPv6 is requested**

- Multicast is supposed to align with the progress of Unicast deployment, for example IPv6/SRv6 based network is well accepted in IETF and industry;
- P2MP communications among Hosts could benefit from Native IP multicast solution, eliminating protocols between host and network, such as IGMP, MLD;

- **Stateless is important**

- Maintaining excessive multicast states inside a network may cause overwhelmed network overhead that would lead to network stability challenge and operational complexity.
- Large-size network brings challenge for existing stateless multicast solutions

**Thanks**