ZXR10 5250 Series Access Switch Multicast IGMP Snooping Limits - Official Technical Overview & Hardware Datasheet

EXECUTIVE SUMMARY

The ZXR10 5250 Series is a family of intelligent access switches engineered for carrier and enterprise edge deployments requiring precise multicast traffic control. This document focuses specifically on the platform's IGMP Snooping limit mechanisms, which govern the maximum number of multicast groups per VLAN and the maximum host join limits per group. By enforcing these hardware and software boundaries, the 5250 Series prevents multicast flooding from exhausting forwarding resources, ensures deterministic service delivery for IPTV and VoD applications, and maintains line-rate performance under dense subscriber conditions. The following sections detail the architectural constraints, configuration limits, and compliance specifications that define the multicast control plane of the ZXR10 5250 Series.



ARCHITECTURE & CHASSIS DESIGN

The ZXR10 5250 Series utilizes a store-and-forward switching architecture with dedicated hardware resources for multicast replication and snooping table management. IGMP Snooping operates at Layer 2, intercepting IGMP membership reports and leave messages between hosts and multicast routers to build a precise forwarding table. The switch does not require IGMP querying to be enabled globally for basic snooping operation, though a querier function can be activated for standalone VLAN deployments.

The critical architectural constraint for multicast scalability is the maximum group number per VLAN. According to the platform configuration manual, the 5250 Series supports a maximum of 1,024 multicast groups per VLAN . When this limit is reached, the switch will not create additional snooping entries, and

new join requests for groups beyond the threshold are ignored. This hard limit ensures that the limited multicast forwarding table resources remain available for active, authorized streams rather than being exhausted by spurious or unauthorized joins.

HARDWARE FEATURES

IGMP Snooping Support: The 5250 Series supports IGMP Snooping versions 1, 2, and 3, providing compatibility with legacy and modern multicast routers. The snooping function is VLAN-aware and can be enabled per VLAN.

Maximum Group Limit: The platform enforces a configurable maximum number of multicast groups per VLAN, with a default and maximum value of 1,024 groups . This limit applies to dynamic groups learned via IGMP reports. Once the limit is reached, no new groups are added until existing entries age out or are administratively removed.

Host Join Limit per Group: While the 5250 Series configuration manual documents the group limit explicitly, the broader ZXR10 platform supports per-group host join limits via the ip igmp max-host-limit group command. This mechanism caps the number of Layer 3 interfaces that can join a specific multicast group, preventing a single group from consuming excessive

replication resources across multiple downstream interfaces . The platform supports configuring host limits for up to 2,048 individual groups .

Group Replacement Behavior: When the maximum group limit is reached, the switch can be configured to replace the least-responsive existing group entry with a new join request, ensuring that active viewers are not denied service due to stale entries from departed hosts.

COMPLIANCE & STANDARDS

The ZXR10 5250 Series complies with IEEE 802.1Q VLAN tagging, IEEE 802.1p priority, and RFC 1112 (IGMPv1), RFC 2236 (IGMPv2), and RFC 3376 (IGMPv3) specifications for multicast group management. The IGMP Snooping implementation follows the framework defined in RFC 4541 for snooping switches.

TECHNICAL SPECIFICATIONS

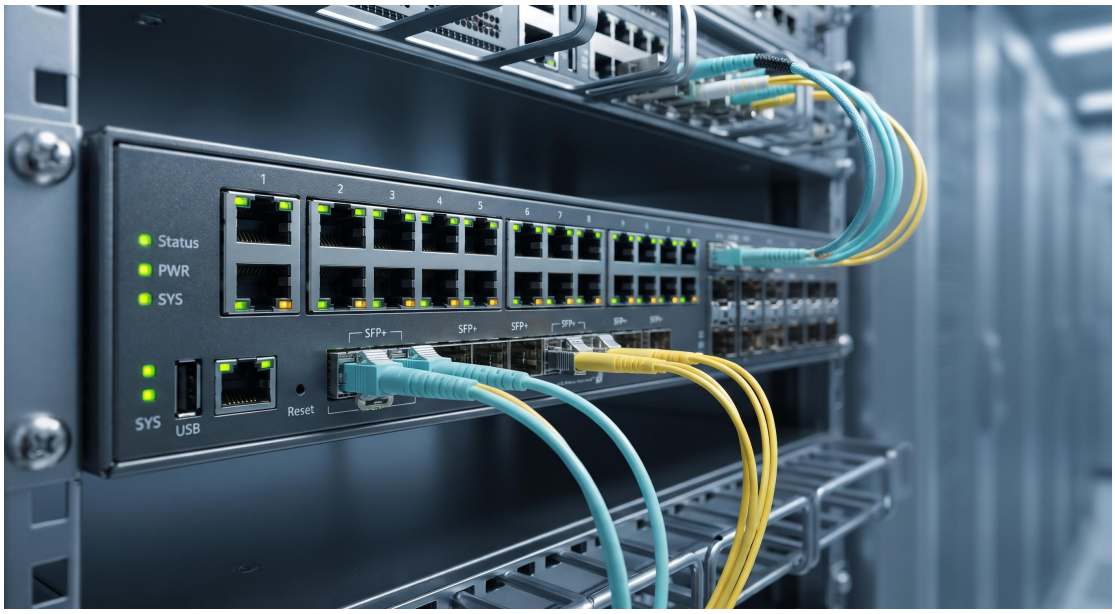
The following table summarizes the key multicast-related limits and hardware parameters for the ZXR10 5250 Series.

Parameter	**Specification**

IGMP Snooping Versions	IGMPv1, IGMPv2, IGMPv3
Maximum Multicast Groups per VLAN	1,024
Group Limit Behavior at Threshold	New joins rejected until entries age out or are replaced
Per-Group Host Join Limit Support	Supported on ZXR10 platform (up to 2,048 groups configurable)
VLAN Support	4,096 VLANs (802.1Q)
Switching Capacity (5250-28TS-L)	256 Gbps
Forwarding Rate (5250-28TS-L)	78 Mpps
MAC Address Table	16K entries
Power Supply	AC 100-240V, 50-60Hz
Operating Temperature	-5°C to 50°C

ORDERING OPTIONS

The ZXR10 5250 Series is available in multiple port configurations to suit different access densities. Multicast IGMP Snooping limits are consistent across the series, with the 1,024-group-per-VLAN ceiling applying uniformly to all models. Customers requiring higher multicast scale should consider the ZXR10 5900E or 5960 series platforms.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