



IGMP / MLD Extension for Signaling Eco-Mode

draft-contreras-pim-eco-mode-01

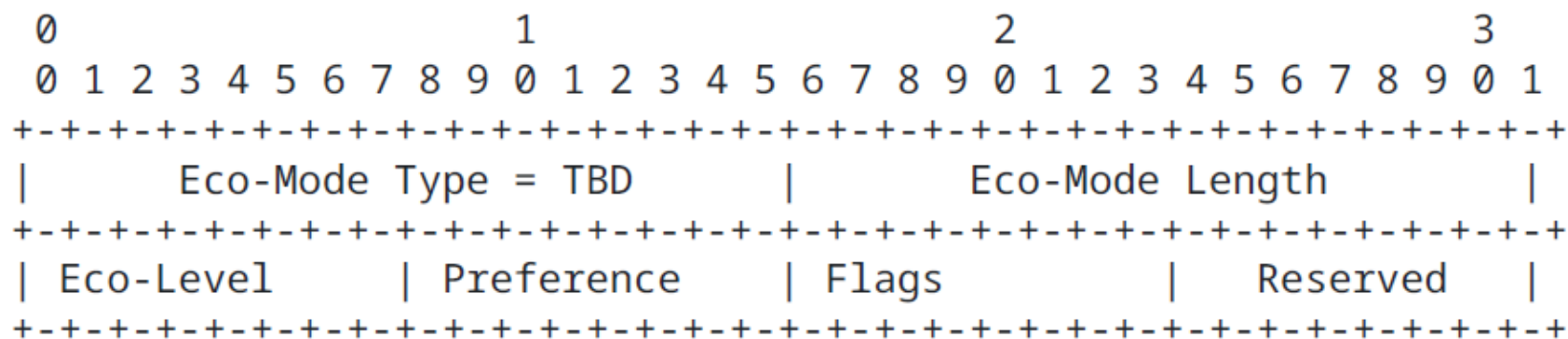
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Rationale

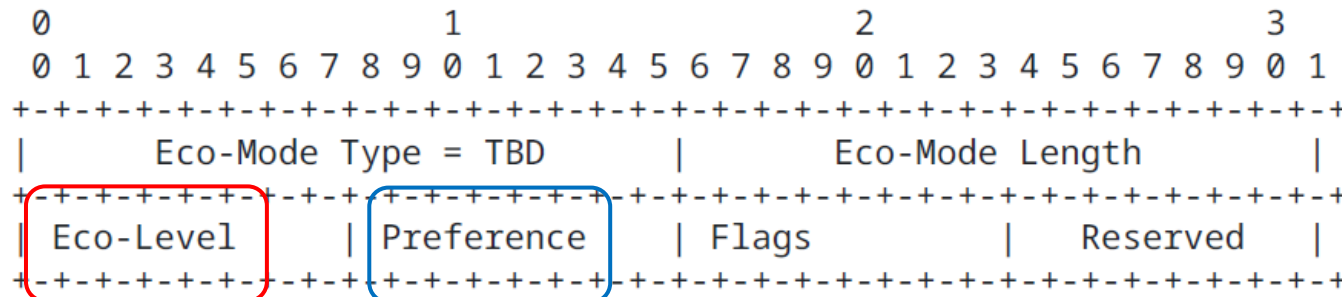
- Video contents represent one of the major sources of traffic in operator's networks
 - The same content can be distributed in multicast with different resolution
 - The multicast flow throughput is dependent of the video resolution encoding (as higher as the subscribers' devices support)
 - Distribution trees are built in the network, in most cases proactively subscribing to channels to minimize access time to the content even during periods of low (or inexistent) demand.
- No mechanism available today for allowing the subscribers to indicate their willingness of applying an eco-mode consumption
 - It indicates receiver preference signaling for multicast-aware energy optimization (it could also be activated by default)
- An eco-mode, when applied to multicast distribution, can further optimize resource utilization
 - E.g., adjusting transmission power, reducing active network elements, enabling sleep modes, etc
- This document proposes an extension of IGMP and MLD messages for supporting the signaling of eco-mode.
 - The implications of the eco-mode either in the receiver or the provider side is out of the scope of this document.

Eco-mode Extension

- Leverage on RFC9279 for defining a mechanism to extend IGMPv3 and MLDv2 messages to allow the indication of eco-mode
- Eco-mode intended to be supported in both the Query and Report messages
- The logic behind the inclusion of the eco-mode extension at both subscriber and provider side is out of the scope of this draft



Eco-mode Extension



Eco-Level	Meaning	Interpretation
0	No Eco Mode	Full service delivery. No energy-aware optimization signaled.
1	Light Eco Mode	Energy-saving actions are acceptable if service impact is negligible.
2	Moderate Eco Mode	Receiver accepts noticeable energy-oriented optimizations, such as lower-quality representations or more efficient delivery alternatives.
3	Aggressive Eco Mode	Maximum preference for energy and carbon reduction. Service quality may be significantly adapted to maximize efficiency.

Preference	Meaning	Typical Objective
0	Energy Efficiency	Minimize network energy consumption.
1	Carbon Awareness	Minimize carbon footprint associated with service delivery.
2	Renewable Energy Preference	Favor delivery alternatives powered by renewable energy sources.
3	Operator Defined	Deployment-specific sustainability objective or policy.

Values proposed for Eco-Level and Preference are initial propositions, to be discussed (feedback is more than welcome)

Next steps

- The draft contributes a new multicast listener-level signal useful for service-level optimization
 - optimization behavior outside the protocol specification
- Collect feedback and interest from GREEN WG
 - This draft provides a protocol-level signal that energy-aware network management functions may consume
 - how this could fit with other work in GREEN (use cases, framework, YANG model, etc)?
- The document will be also presented in PIM this week