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W. Kumari
Google, Inc.
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Deprecation of BGP AS_SET.
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Abstract

This document deprecates the use of the AS_SET type of the AS_PATH in BGPv4. This is done to simplify the design and implementation of the BGP protocol and to make the semantics of the originator of a route more clear.

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1. Requirements notation

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [[RFC2119](#)].

2. Introduction

The AS_SET path segment type of the AS_PATH attribute ([\[RFC4271\]](#), [Section 4.3](#)) is created by a router that is performing route aggregation and contains an unordered set of ASs that the update has traversed. By performing aggregation, a router is, in essence, combining multiple routes into a new route.

The RPKI ([\[I-D.ietf-sidr-arch\]](#)) provides a cryptographic means to validate that a specific AS is authorized to announce a specific network. The creation of an aggregate that contains an AS_SET means that the aggregating router is originating a route for address space that it cannot cryptographically prove that it is authorized to originate. While it may be possible to include the route origin attestations (ROA) from all of the routes that contribute to the aggregate into the aggregate, this ends up being messy, inelegant and has partial states that suck caterpillar snot!

From analysis of past Internet routing dumps it is apparent that aggregation that involves AS_SETs is almost never used in practice and, when it is usually contains reserved AS numbers ([\[RFC1930\]](#)) and / or only a single AS in the AS_SET. The reductions in table size provided by the aggregation is outweighed by additional complexity in the BGP protocol and confusion regarding what exactly is meant by originating a route.

[3.](#) Deployment and modification of behavior

It is expected that initially AS_SETs will be deprecated by the few operators that are currently generating them, and operator policy changing to filter them. Over time BGP implementations MAY no longer support generating them, and eventually implementations MAY quietly ignore updates with AS_SETs in them. Operators should take note that new protocols (such as those that make use of the RPKI) are likely to not work with AS_SETs and may ignore routes (treat as infeasible) containing them.

[4.](#) IANA Considerations

This document contains no IANA considerations.

[5.](#) Security Considerations

By removing support for the AS_SET path segment type of the AS_PATH attribute future BGP implementations can be simplified.. This will also simplify the design and implementation of the RPKI and systems that will rely on it. By removing corner cases we remove complexity and code that is not exercised very often, which decreases the attack surface.

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Apologies to those who I may have missed.

7. Normative References

[I-D.ietf-sidr-arch]

Lepinski, M. and S. Kent, "An Infrastructure to Support Secure Internet Routing", [draft-ietf-sidr-arch-09](#) (work in progress), October 2009.

[RFC1930] Hawkinson, J. and T. Bates, "Guidelines for creation, selection, and registration of an Autonomous System (AS)", [BCP 6](#), [RFC 1930](#), March 1996.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.

[RFC4271] Rekhter, Y., Li, T., and S. Hares, "A Border Gateway Protocol 4 (BGP-4)", [RFC 4271](#), January 2006.

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Author's Address

Warren Kumari
Google, Inc.
1600 Amphitheatre Parkway
Mountain View, CA 94043
US

Phone: +1 571 748 4373
Email: warren@kumari.net

Kumari

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