

**IPv6 Routing Policies Guidelines**  
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Abstract

Guidelines on how to handle IPv6 routes are needed for operators of networks, either providers or enterprises. This document is a followup on [RFC2772](#) work but for the production IPv6 Internet. [RFC2772](#) becomes historic.

## Table of Contents

<a href="#">1.</a>	<a href="#">Introduction</a>	<a href="#">3</a>
<a href="#">2.</a>	<a href="#">Address Types</a>	<a href="#">3</a>
<a href="#">2.1.</a>	<a href="#">Node-scoped Unicast</a>	<a href="#">3</a>
<a href="#">2.2.</a>	<a href="#">Compatibility Addresses</a>	<a href="#">3</a>
<a href="#">2.3.</a>	<a href="#">Link-scoped Unicast</a>	<a href="#">3</a>
<a href="#">2.4.</a>	<a href="#">Site-scoped Unicast</a>	<a href="#">3</a>
<a href="#">2.5.</a>	<a href="#">Global Unicast</a>	<a href="#">3</a>
<a href="#">2.5.1.</a>	<a href="#">Documentation Prefix</a>	<a href="#">4</a>
<a href="#">2.5.2.</a>	<a href="#">6to4</a>	<a href="#">4</a>
<a href="#">2.5.3.</a>	<a href="#">6bone</a>	<a href="#">4</a>
<a href="#">2.6.</a>	<a href="#">Default Route</a>	<a href="#">4</a>
<a href="#">2.7.</a>	<a href="#">Multicast</a>	<a href="#">4</a>
<a href="#">2.8.</a>	<a href="#">Unknown addresses</a>	<a href="#">4</a>
<a href="#">3.</a>	<a href="#">RPSL</a>	<a href="#">5</a>
<a href="#">4.</a>	<a href="#">Document Status</a>	<a href="#">5</a>
<a href="#">5.</a>	<a href="#">Security Considerations</a>	<a href="#">5</a>
<a href="#">6.</a>	<a href="#">Acknowledgements</a>	<a href="#">5</a>
<a href="#">7.</a>	<a href="#">References</a>	<a href="#">5</a>
	<a href="#">Author's Address</a>	<a href="#">7</a>
	<a href="#">Intellectual Property and Copyright Statements</a>	<a href="#">8</a>



## **1. Introduction**

To maintain stability, efficiency and scalability of the IPv6 Internet, guidelines for routing policies are needed for operators deploying IPv6 networks. Prior experience on IPv6 routing guidelines on the 6bone[RFC2772], practical deployment of the IPv6 internet and IPv6 specifications were used as input to this document.

This document first describes the different types of addresses and then summarizes the suggested policies in RPSL.

## **2. Address Types**

### **2.1. Node-scoped Unicast**

The node-scoped unicast addresses[RFC3513] such as the loopback (::1/128), the unspecified (::/128) must not be advertised in an IGP or EGP and should be filtered out when received.

### **2.2. Compatibility Addresses**

IPv4-mapped addresses (::FFFF:0:0/96)[RFC3513] must not be advertised and should be filtered out.

### **2.3. Link-scoped Unicast**

The link-scoped unicast[RFC3513] routes (fe80::/16) must not be advertised in an IGP or EGP and should be filtered out when received.

### **2.4. Site-scoped Unicast**

The site-scoped unicast routes (fc00::/7) may be advertised in an IGP. It must not be advertised in an EGP connected to the global Internet and should be filtered out when received. However, it may be advertised in an EGP between two networks sharing a private interconnect, but must not be advertised outside the scope of these networks. When advertised in an EGP, these routes should be of length /48.

### **2.5. Global Unicast**

The global unicast routes (2000::/3)[RFC3513] may be advertised in an IGP or EGP. A minimal EGP routing policy should filter out routes that exceed a maximum length. Determining the maximum length of a global Internet route is outside the scope of this document.

A finer EGP routing policy may use only the allocated address space



from IANA to registry as specified in <http://www.iana.org/assignments/ipv6-unicast-address-assignments>. This would result in better filtering since the non-allocated prefixes will be filtered out.

An even finer EGP routing policy may use only the assigned address space from registries to providers as available in the registry databases. This would result in the best filtering since the non-assigned prefixes will be filtered out. However, this requires the synchronization of the filters with the registry databases.

#### **2.5.1. Documentation Prefix**

The 2001:0db8::/32 prefix[RFC3849] is used for documentation purposes and must not be advertised in an IGP or EGP and should be filtered out when received.

#### **2.5.2. 6to4**

The 6to4 prefix (2002::/16) may be advertised in an IGP or EGP, when the site is running a 6to4 relay. However, the provider of this service should be aware of the implications of running such service[RFC3964], which includes some specific filtering rules for 6to4.

#### **2.5.3. 6bone**

The 6bone experimental network used some experimental allocations, such as 5f00::/8[RFC1987] and 3ffe::/16[RFC2471] that were later returned to IANA[RFC3701]. These prefixes should not be advertised in an EGP unless IANA reallocates them subsequently.

#### **2.6. Default Route**

The default unicast route (::) may be advertised in an IGP. In an EGP, it may be only advertised to the downstream but must not be advertised in the core.

#### **2.7. Multicast**

Multicast addresses (ff00::/8)[[RFC3513](#)] have a scope in the address field. In the multicast routing, the routes should be announced according to the scope, similar to unicast routes. Multicast routes must not appear in unicast routing tables.

#### **2.8. Unknown addresses**

Any non listed address above must not be advertised and should be



filtered out.

### **3. RPSL**

The Route Policy Specification Language(RPSL)[[RFC4012](#)] used in route registries supports the policies described in this document and should be considered to manage route policies.

The following RPSL code implements the policies described in this document.

TBD: RPSL code to fill

### **4. Document Status**

This document should be a BCP. This document should put [RFC 2772](#) as historic.

### **5. Security Considerations**

TBD.

### **6. Acknowledgements**

Florent Parent, Pekka Savola and Tim Chown have provided input and suggestions to this document.

### **7. References**

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