Using Regular Expressions in BGP

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Introduction

You can use regular expressions in the **ip as−path access−list** command with Border Gateway Protocol (BGP). This document describes scenarios for using regular expressions. For more general information about regular expressions, see the Cisco Documentation on Regular Expressions.

Prerequisites

Requirements

Readers of this document should be knowledgeable of the following:

- Basic BGP configuration. For more information, see the BGP Case Studies and Configuring BGP.

Components Used

The information in this document is based on the software and hardware versions:

- Cisco IOS® Software Release 12.0

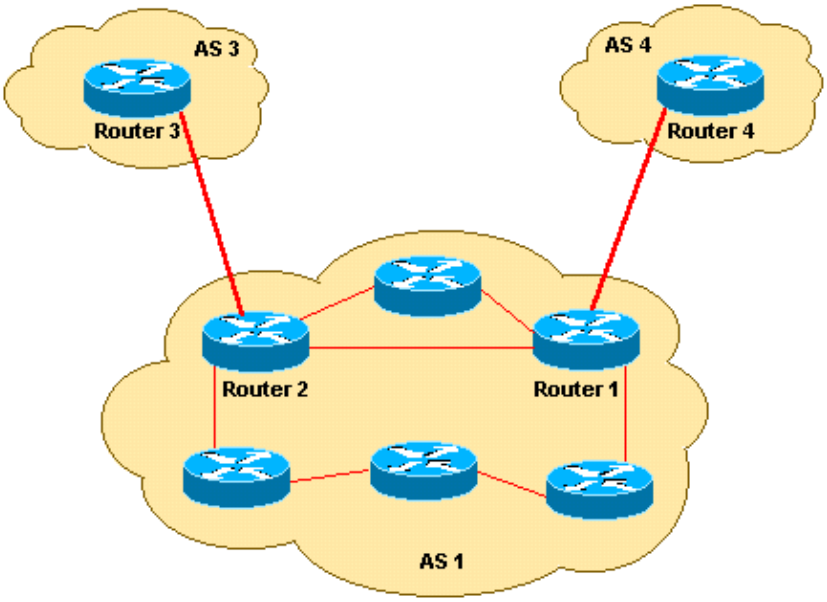
The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Conventions

For more information on document conventions, see the Cisco Technical Tips Conventions.

Network Scenarios

The following network diagram is referred to in these three scenarios.



Only Allow Networks Originating from AS 4 to Enter Router 1

If you would like for Router 1 to receive only the routes originated from AS 4 (and no Internet routes), you can apply an inbound access list on Router 1 as follows:

```
ip as-path access-list 1 permit ^4$

router bgp 1
 neighbor 4.4.4.4 remote-as 4
 neighbor 4.4.4.4 route-map foo in

route-map foo permit 10
 match as-path 1
```

This ensures only networks originated from AS 4 are allowed into Router 1.

Only Allow Networks That Have Passed Through AS 4 to Enter AS 3

If you want only the networks that have passed through AS 4 to enter AS 3 from Router 3, you can apply an inbound filter on Router 3.

```
ip as-path access-list 1 permit _4_

router bgp 3
 neighbor 2.2.2.2 remote-as 1
 neighbor 2.2.2.2 route-map foo in

route-map foo permit 10
 match as-path 1
```

You can use an underscore (_) as the input string and output string in the **ip as-path access-list** command. Note that in this example anchoring (for instance, there is no ^) is not used, so it does not matter what autonomous systems come before and after AS 4.

Deny Networks Originated in AS 4 to Enter AS 3 and Permit all other Networks

If you want to deny all the networks that have originated in AS 4 and permit all other routes to enter AS 3 from Router 3, you can apply an inbound filter at Router 3, as follows:

```
ip as−path access−list 1 deny _4$
ip as−path access−list 1 permit .*

router bgp 3
 neighbor 2.2.2.2 remote−as 1
 neighbor 2.2.2.2 route−map foo in

route−map foo permit 10
 match as−path 1
```

Only Allow Networks Originated from AS 4, and ASs Directly Attached to AS 4, to Enter Router 1

If you want AS 1 to get networks originated from AS 4 and all directly attached ASs of AS 4, apply the following inbound filter on Router 1.

```
ip as−path access−list 1 permit ^4_[0−9]*$

router bgp 1
 neighbor 4.4.4.4 remote−as 4
 neighbor 4.4.4.4 route−map foo in

route−map foo permit 10
 match as−path 1
```

In the **ip as−path access−list** command, the carat (^) starts the input string and designates "AS". The underscore (_) means there is a a null string in the string that follows "AS 4". The [0−9]* specifies that any connected AS with a valid AS number can pass the filter. The advantage of using the [0−9]* syntax is that it gives you the flexibility to add any number of ASs without modifying this command string. For additional information, see AS−Regular Expression.

Related Information

- **BGP Support Page**
- **Technical Support − Cisco Systems**

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