Chapter 29
Matching AS Paths

29.1 AS Path Overview

An AS path includes a list of autonomous systems that routing information has passed through to get to a specified router and an indicator of the origin of this route. The AS path is used to prevent routing loops in BGP.

This routing information can be used to prefer one path to a destination network over another. The primary method for preferring a route with GateD is to specify a list of filters to be applied to AS paths when importing and exporting routes.

Each autonomous system through which a route passes prepends its AS number to the beginning of the AS path.

AS path regular expressions are defined in RFC1164, Section 4.2. For more information about RFC1164, see:

http://www.ietf.org/rfc/rfc1164.txt

29.2 Matching AS Path Syntax

An AS path is matched using the following syntax.

```
aspath "( aspath_regexp )"
origin ( any |  igp  | egp | [ incomplete )
```

More detailed descriptions of these commands can be found on page 583 of the *Command Reference Guide*.

29.3 AS Path Regular Expressions

GateD includes a powerful implementation of AS path regular expressions. The entire AS path regular expression must be contained within parentheses. These parentheses also have meaning within the language. Left parentheses match the beginning of the AS path. Right parentheses match the end of the AS path. The alphabet (set of valid members) is the valid range of AS numbers, or more specifically, {1 … 65535}. Also, GateD supports the following "wildcards" or expressions that can be used to build a regular expression:

. - (period) represents any valid member of the alphabet.

* - (asterisk) matches zero or more of the preceding element/expression.

+ - (plus sign) matches one or more of the preceding element/expression.

? - (question mark) matches zero or one occurrence of the preceding element/expression.

Binary operators:

" " (AND) - any sequence of elements and/or expressions separated by a space (" ").

"|" (OR) - any sequence of elements and/or expressions separated by the vertical line symbol ("|").

The symbols "`[]`" are used to delimit a set of AS numbers. The set may be a list of AS numbers separated by a space or a range of AS numbers separated by a dash (`-`). If the entire list of members is prefixed with a "`^`", then the valid members are those not listed in the set. (Because a null string or empty string is not an instance in the alphabet, AS numbers such as `[^808]` will not match an empty string.) Examples of AS path regular expressions follow:

Match any single AS number as the AS path:

`(.)`

Match all AS paths coming from a given AS that start with 808:

`(808 .*)`

Match all paths that do not end with the given AS numbers but must have at least one AS:

`(.* [^808 809])`

Match a path that has only valid exterior AS numbers:

`([1-64999]+)`

Match 305 808 and exactly one other AS number other than 100:

`(305 808 [^100])`

Match 305 808 and any other AS number except 100 or no additional AS. That is, match either 305 808 as the complete path or 305 808 x, where x is any integer other than 100:

`(305 808 [^100]?)`

Match either 808 or 305 with no additional AS numbers in the path:

`(305|808)`

To exclude a certain AS from an arbitrary path:

`(.* 65535 .*)`