ISP Load-balancing and Failover

Software Requirement Specification

Revision History

Version	Date	Author(s)	Description
v0.1	20-10-2013	J.P Jangid, Umang Jain, Vikhyat Korrapati	Initial Version

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1. Introduction

1.1 Need and Purpose

Growing organizations are typically served by multiple ISPs in order to provide greater cumulative bandwidth by load-balancing and availability via automatic failover. There is a definite need for a generic tool to facilitate this which can run on a generic server because dedicated hardware will become obsolete as the organization grows.

1.2 Intended Audience

This document is intended for the users, developers and administrators of this system. It provides details of the kind of interfaces that end-users and administrators can expect, and also provides valuable information for the implementers of the system.

1.3 References

[1] http://info.iet.unipi.it/~luigi/dummynet/
[2] http://www.techrepublic.com/article/how-to-use-bgp-to-achieve-internet-redundancy/
[3] http://www.ietf.org/rfc/rfc4271.txt
[4] http://en.wikipedia.org/wiki/Exterior_Gateway_Protocol
[5] http://en.wikipedia.org/wiki/Border_Gateway_Protocol
[6] http://haproxy.1wt.eu/
[7] http://blog.khax.net/2009/12/01/multi-gateway-balancing-with-iptables/
[8] http://tipstricks.itmatrix.eu/?p=676

2. Description

2.1 Features and Functions

The tool will support automatic failover and load balancing between multiple upstream ISP connections. Additionally, it will also provide real-time metrics that will be used to indicate the health of each upstream connection and keep track of the availability of each link.

2.2 Users

There are two types of users who will use the software:

1. **Regular users**: The software will be completely invisible to these users, however all of their network traffic will pass through the software and hence they will be affected by any downtime caused by malfunctioning of the software.
2. **Network Administrators**: These users will configure the software to indicate the upstream router IP addresses and rate-limits. They will also access the statistics collected by the software.

2.3 Operating Environment

2.3.1 Hardware

The tool will require a server machine which is sufficiently fast and has enough free RAM and Hard Disk Memory. This machine will be used as a router.

2.3.2 Software

The server machine must be running a recent version of a Linux/BSD operating system such as Ubuntu, Debian, Fedora Core, Red Hat Linux, FreeBSD etc.

3. Specific Requirements

The software must reliably perform failover between multiple connections, as well as be able to perform load-balancing between all functional upstream links in order to provide higher throughput when possible.

3.1 Performance Requirements

The statistics, logging and load balancing should not consume an excessive amount of server resources, and must not compromise the connection speed users get.