

Rtanaly: A Tool to Detect and Measure Intra-Domain Routing Changes

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11/7/2004

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Overview

- Motivation
- Rtanaly
 - Features
 - Methodology
- Measurements using rtanaly
- Future work

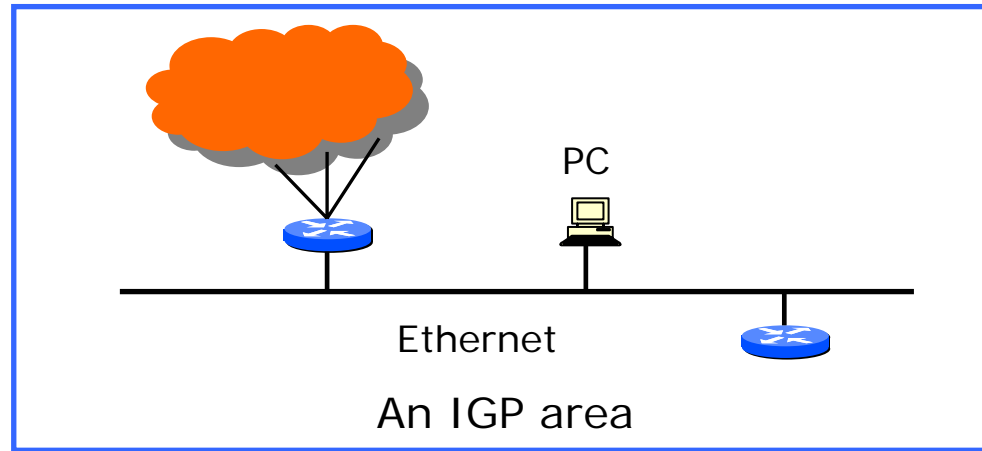
Background & Motivation

- Routing changes directly impact on the reliability of the network
- Though operators hardly notice, unexpected intra-domain routing changes can occur, and sometimes quite frequently
- It's hard to detect such changes because of the lack of efficient tools
- Purpose
 - Help operators to figure out to what extent such changes can occur on their networks
 - Find correlations between patterns of routing changes and specific network trouble to facilitate troubleshooting

Rtanaly

- Rtanaly
 - A tool to detect, measure and visualize IGP changes, especially for unexpected ones
- Features
 - Detects changes in real-time and alert operators
 - Uses completely passive approach
 - Can also be used for offline data analysis
 - Libpcap/tcpdump data format is supported
 - Visualization
 - Supports OSPFv2, OSPFv3 and IS-IS
 - Accessible through the web interface
 - *BSD and Linux
 - Distribution based on BSD license

Methodology (1/2)



- Link-state routing protocols flood routing information throughout the domain
- Libpcap is used to capture routing messages in real-time

Methodology (2/2)

- Counting routing changes
 - Changes in the content of link state information that could lead to changes of SPT
 - Can be obtained by comparing different instances of a same LSA or LSP
 - LSAs for OSPFv2
 - Router-LSA, network-LSA, summary-LSA
 - LSAs for OSPFv3
 - Router-LSA, network-LSA, inter-area-prefix-LSA, inter-area-router-LSA, link-LSA, intra-area-prefix-LSA
 - LSPs for IS-IS
 - IS neighbors TLV, IP interface address TLV, IP internal reachability TLV, IPv6 interface address TLV, extended IS reachability TLV, extended IP reachability TLV,

Future Work

- Estimation of the impact that routing changes have on SPT and individual prefix
 - i.e. how long can a routing change affect the reachability towards a network
- Analysis of hello packets

- Test version v0.1-beta1 is available at

<http://rtanaly.koganei.wide.ad.jp/rtanaly>

Comments, questions are welcome.