

ATOL: Load Balancing

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Advanced Topics of Linux Administration

Introduction to load-balancing

- ▶ Technique to distribute workload across several computers
- ▶ Increase reliability through redundancy
- ▶ Application based solutions
- ▶ General solutions based on Linux Virtual Server
 - ▶ ipvsadm + pulse / piranha (Red Hat)
 - ▶ ipvsadm + ldirectord (Novell)
- ▶ General solutions based on DNS (round robin)
- ▶ Solutions based on specified network protocol

Application based solutions

- ▶ Application is written with load-balancing as a feature
- ▶ Usually based on active-active model (service is running on several machines at same time)
- ▶ Examples: Clustered Samba, Oracle RAC
- ▶ Advantages: Better performance, Everything included
- ▶ Disadvantages: Very difficult to rewrite existing application

Framework based solutions

- ▶ Application does not know about load-balancing
- ▶ Active-active model but YOU HAVE TO take care of data (common storage, persistence of connections)
- ▶ ipvsadm
 - ▶ Kernel + user-space part (ipvsadm)
 - ▶ Protocol independent
- ▶ pulse + piranha
 - ▶ Checking of service availability
 - ▶ Improve configuration management
 - ▶ piranha (Web User Interface)

Protocol specific solutions

- ▶ Mostly dedicated for HTTP
- ▶ e.g. nginx
 - ▶ Reverse proxy
 - ▶ Support HTTP, HTTPS, SMTP, POP3, IMAP (nothing else)
 - ▶ Used by Sourceforge.net, AOL, WordPress.com

- ▶ kvm virtualization – packet is lost on router between virbr0 and eth0 is caused by problem with incorrect checksum. On each 'real' server you have to run `ethtool -K eth0 tx off`
- ▶ QEMU and XEN virtualization – packet is lost on router between virbr0 and eth0 - problem is not solved yet
- ▶ how to setup arptables? Look at <http://sources.redhat.com/cluster/wiki/PiranhaSetupSimple>

- ▶ Create a load-balancing solution based on ipvsadm on router (1PC) and two load-balanced servers (2PC)
- ▶ Create an HTTP service that will be load-balanced (use different text on each server to find out that it works correctly)