Implementation and Simulation of LVS in ns-2

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Roadmap

- Project introduction and motivation
- Related work
- Implementation issues of lvs in ns
- Simulation scenarios
- Future work
Project Goal and Motivation

- Goal: implement and simulate lvs in ns-2
- Understanding lvs
- Understanding ns
- Evaluate the performance of lvs
- Provide a platform for further research and study of lvs
What is LVS?

Diagram showing the structure of a load-balancing system with a load balancer, real servers, and user communication.
LVS via NAT

1. Requests
2. Scheduling & rewriting packets
3. Processing the request
4. Rewriting replies
5. Replies

Virtual Server via NAT

Internet/Intranet

Load Balancer/Linux Box

Switch/HUB

Real Server 1

Real Server 2

Real Server n
LVS via IP Tunneling
LVS via Direct Routing
Related work

- DNS redirection
- Client side approach
- The server side application level scheduling approach
- The server side ip level scheduling approach
Implementation Issues in ns-2

- How to accept a packet whose destination ip address is different from the node’s address?
- How to send a packet whose source ip address is different from the node’s address?
Solutions

- Add a virtual ip address in ns agent here_.addr_ virtual_addr_
- Add a route for virtual ip address to demultiplexer dmux_
- Note the port of an agent is different from the port of tcp or udp
Node in ns2
LAN in ns-2

Figure 14.1: Connectivity within a LAN
Simulation Scenario for VS via NAT

Realserver ip, port
Realserver ip, port
Realserver ip, port
Realserver ip, port

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Simulation scenario via Tunneling

Realserver ip, port
Realserver ip, port
Realserver ip, port
Realserver ip, port

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Simulation scenario for vs via direct routing

Agent

Realserver ip, port
Realserver ip, port
Realserver ip, port
Realserver ip, port
Realserver ip, port
Realserver ip, port
Realserver ip, port
Realserver ip, port

Agent

Agent
Completed and ongoing work

- Work completed necessary changes in ns-2, simulation script, much of the implementation

- Need to complete the implementation soon, simulation, final report
Future work

- Add support for tcp and ftp
- Think about how to deal with the extremely busy web site