Anycast as a Load Balancing Feature

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Introduction

- Service availability is critical to business function
- Large scale failures often require slow, manual restoration
- Maintenance of next-nearest fallback configuration is painful
- Traditional Anycast deployments scale poorly with capacity

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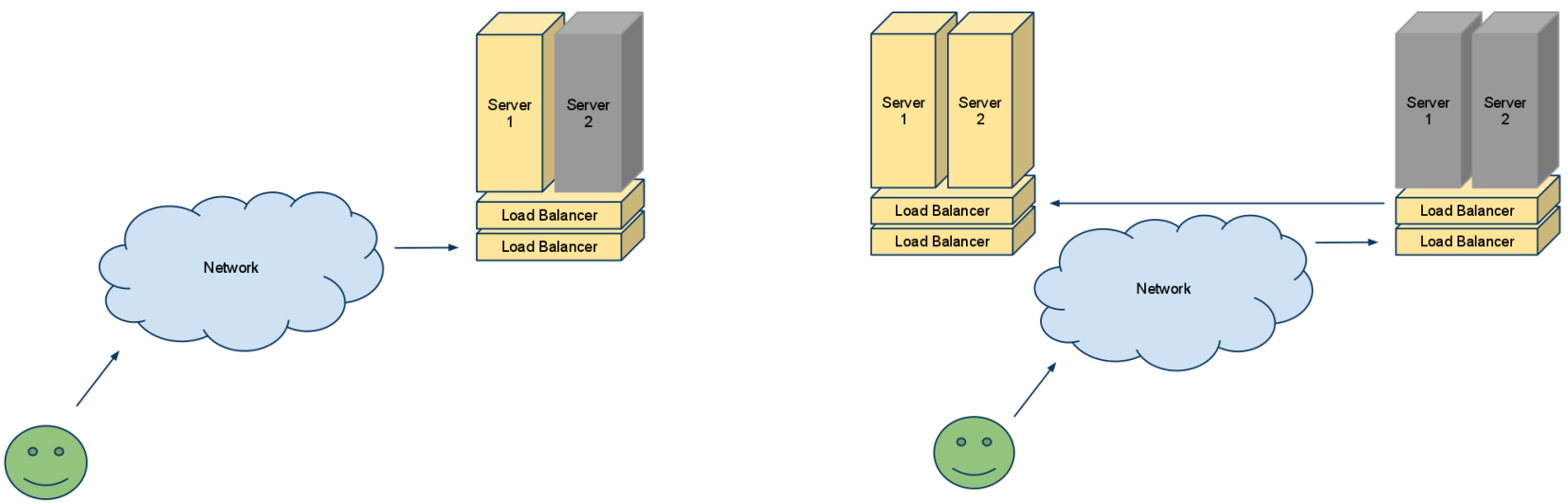
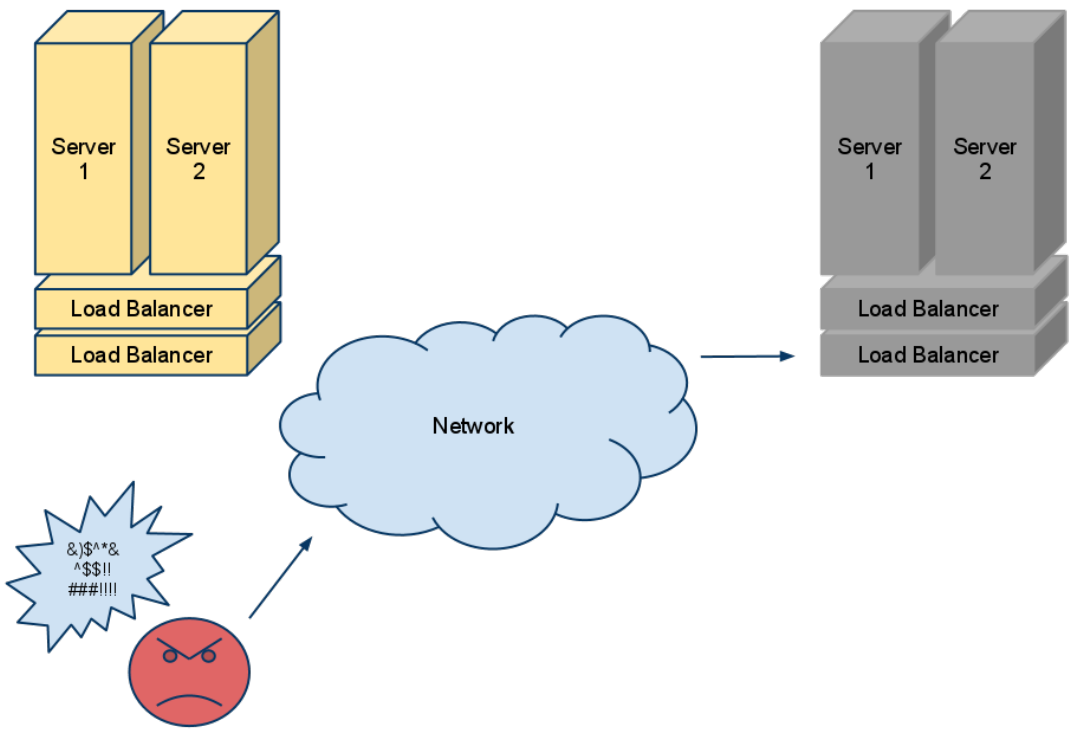
Failover Techniques

- Backend failure



Failover Techniques

- Load Balancer failure, site failure



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Anycast

Anycast is a network routing technique where many hosts have the exact same IP address.

Clients trying to reach that IP address are routed to the nearest host.

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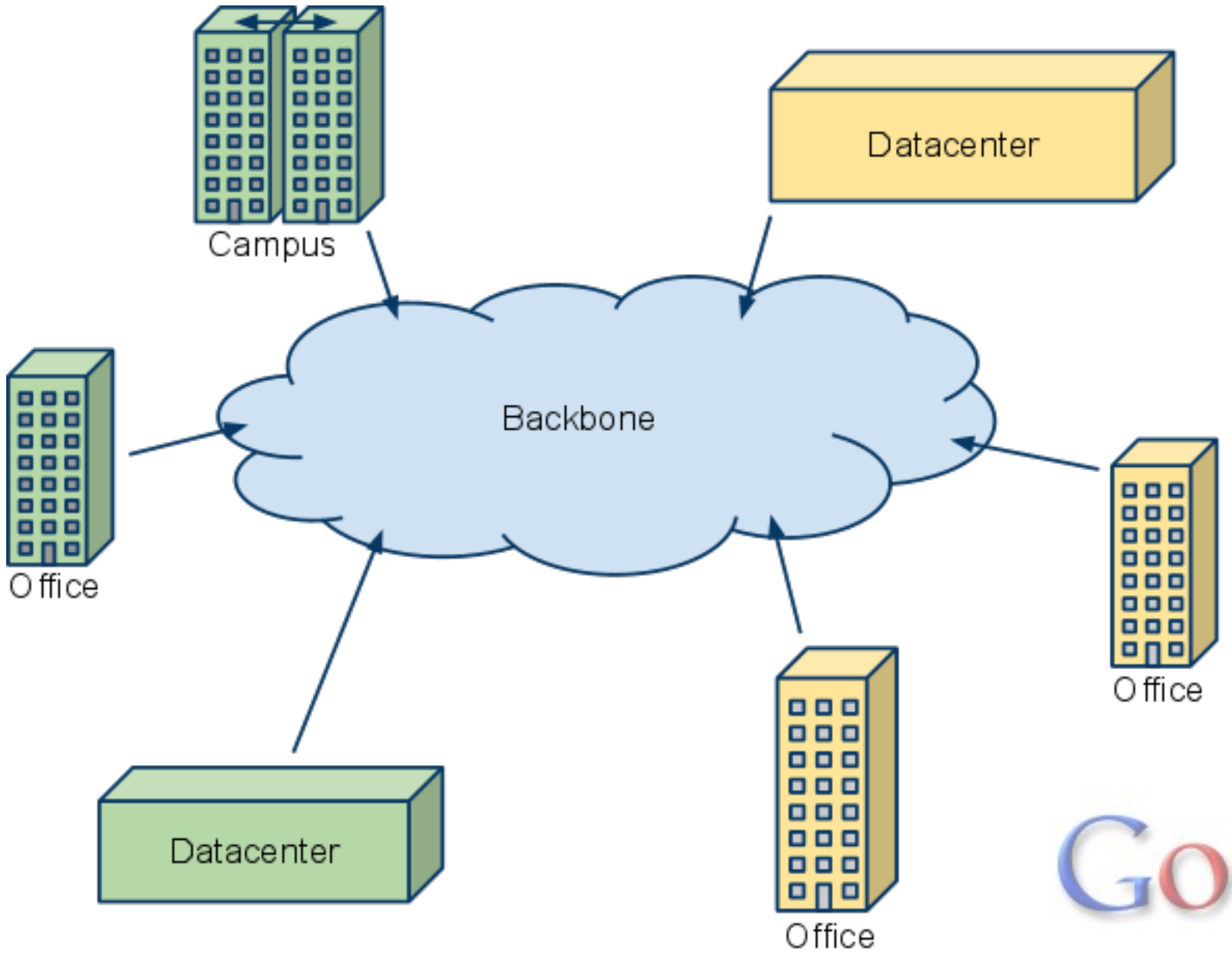
Architecture



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Combining Load Balancing and Anycast

- Reduced amount of route advertisers
- Reduced number of routing changes
- Tolerates LB failure
- No need for manual configuration to define failover location
- No need for manual intervention to deal with LB failure

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...and turning it into a service

- Many services per location
- One load balancing instance per location
- Centralized management for it all
- Simple to use to by other service owners/sysadmins

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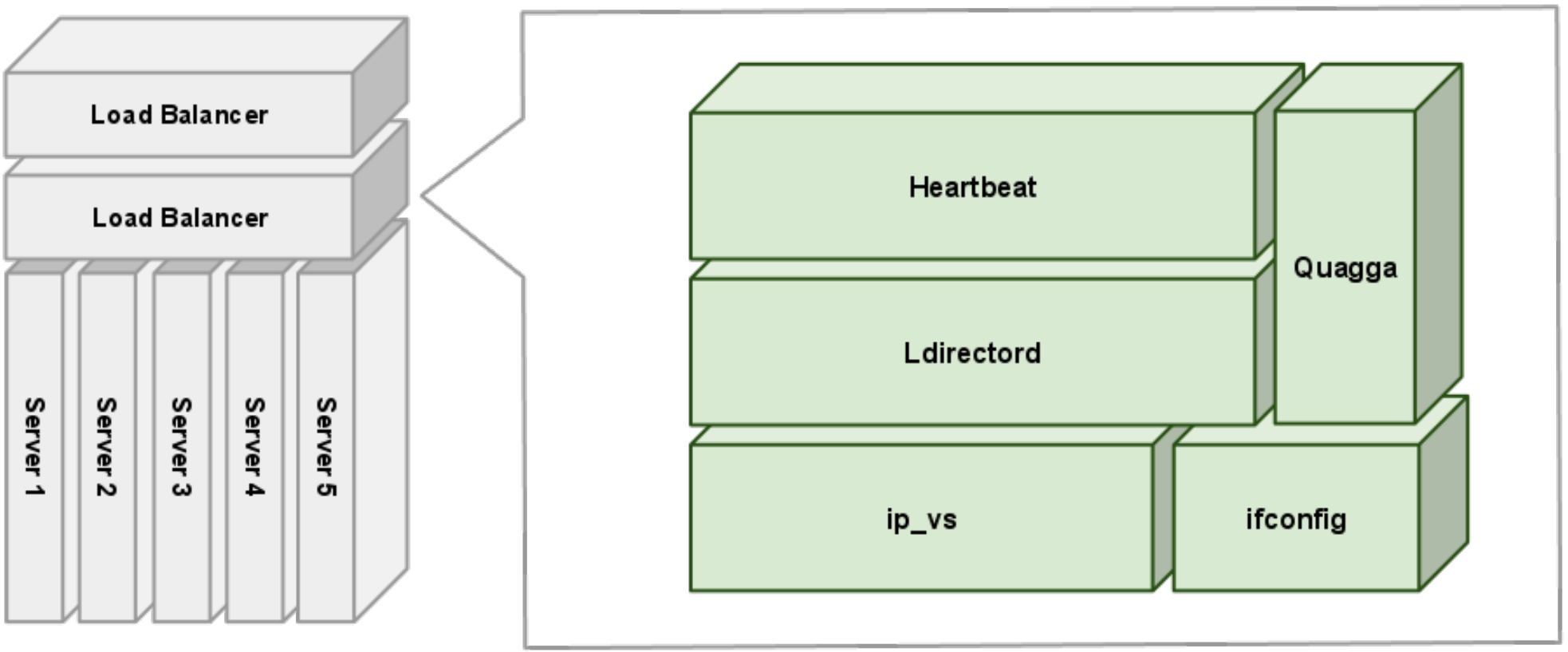
Implementation Details - Load Balancer



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Software details

Heartbeat

- Active-passive cluster resource management

ldirectord

- Backend monitoring software
- Patched to add "fallback command"

ip_vs

- Linux kernel module for load balancing

Quagga

- Software implementation of routing protocol daemons
- Advertises availability of services using /32 routes

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If a new service owner wants to use it...

- Reserve IP on the Anycast subnet.
- Create the new Anycast VIP config:
  - Same as a normal/local VIP
  - Plus a "fallback command"
- Done.

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Reference links

- Load Balancing, http://en.wikipedia.org/wiki/Load_balancing_(computing)
- The Linux Virtual Server Project, http://www.linuxvirtualserver.org
- High Availability, http://www.linux-ha.org
- Quagga, a software routing suite, http://www.quagga.net
- RFC1771 - A Border Gateway Protocol 4, http://www.faqs.org/rfcs/rfc1771.html
- Ldirectord, http://www.vergenet.net/linux/ldirectord/

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Questions?

Thank you!