

# POOR MAN'S CLOUD

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# Oblíbené reklamní slogany

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## Cloudové řešení

*„Cloudová řešení umožňují využívání IT prostředků – především hardwaru a softwaru – vzdáleně a odkudkoli, prostřednictvím internetu“*

## High-availability

*„Systém je k dispozici v případě, že je vyžádáno jeho použití.“*

## Load-balancing

*„Technika pro rozložení zatížení mezi více zařízení.“*

# Our goals

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- no single point of failure
- no black box magic
- without “pointless” cost
- easy application deployment
- simple maintenance

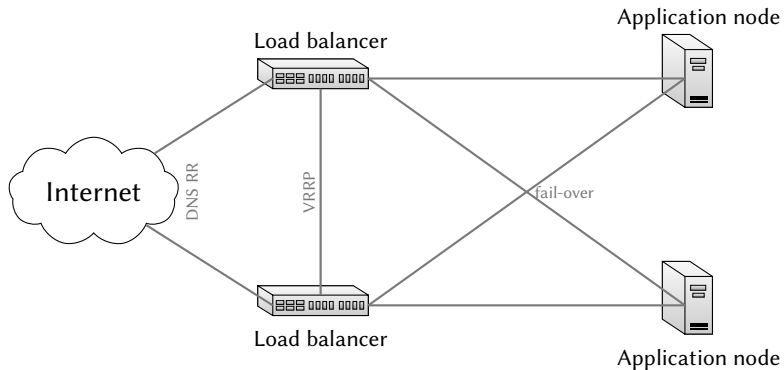
# Architecture

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Main motto: *“All at least twice!”*

- 2 public addresses
- 2 front-ends
- 2 back-ends
- 2 database servers
- ...

# Architecture



# Hardware requirements

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- two network interfaces
- redundant power supply
- at least two 3,5" hard-drives
- hot-swap (on everything)
- “low” cost



# Hardware does not solve everything

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- public IP load balancing
- public IP fail-over
- load balancing/fail-over for application nodes

## Bind9

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```
; zone file fragment
proxy.example.net. 3600    IN  A   192.0.2.1
proxy.example.net. 3600    IN  A   192.0.2.2
```



# Keepalived

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- routing software written in C
- Layer4 load-balancing
- router fail-over using VRRP

# Virtual Router Redundancy Protocol

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- RFC 5798
- virtual routers (00-00-5E-00-01-XX)
- physical routers communicating via multicast
- master router dealing with packets
- backup routers

# Keepalived

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/etc/keepalived.conf

```
global_defs {
    lvs_id LoadBalancer
}

vrrp_sync_group SyncGroup {
    group {
        FloatIP
    }
}

vrrp_instance FloatIP {
    interface eth0
    virtual_router_id 10
    priority 150
    advert_int 1
    virtual_ipaddress {
        192.0.2.1
    }
}
```

# HAProxy

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- TCP/HTTP proxy
- load-balancing
- complex ACL
- SSL support
- health checks

# HAProxy

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```
frontend http
  bind *:80
  use_backend www if { hdr_dom(host) example.net }

backend www
  mode http
  option forwardfor
  server www1 192.0.2.101:80
  server www2 192.0.2.102:80

listen db
  bind *:9200
  mode tcp
  server db1 192.0.2.103
```

# GlusterFS

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- scalable network file system
- NFS and FUSE support
- mirroring and replication

# Virtualization technologies

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- OpenVZ
- LXC
- Docker
- systemd-nspawn

# Management software


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- Ansible
- Puppet
- Chef



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