Running a Home Server
Configurations & Considerations

7 November 2018

Talking Points

Introduction
Architecture
Configurations
Unique Challenges
Conclusion

About
Motivation

Section 1

Introduction

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About
Motivation

About my home server

A little about my home server setup:

- 4 Physical Servers
- 7 Websites (all w/ current SSL Certs)
- 2 Radio Stations
- 530 new posts per-month across 2 Discussion Forums

Notable WWW spaces I host:

https://ralee.org Textboard / Futuristic Discussion Space

https://howler.space NCSU Campus Imageboard

https://prettyboytellem.com My Personal Website

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Motivation / Advantages

Why are home-servers nice?

- Complete control of your server hardware
- Minimize monthly, recurring costs
- Use existing hardware
- Personal storage accessible from anywhere
- Hands-on experience!

A home-server lets you do what you <u>want</u>, and you can learn a lot about how servers work!

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Motivation / Downsides

But running a server can also be messy business! You have expectations to meet as a webmaster:

- Your website is expected to just "work"
- It should always be on-line, too!

Who's responsible for:

- System setup?
- Maintainance?
- Server upgrades (hardware / software)?
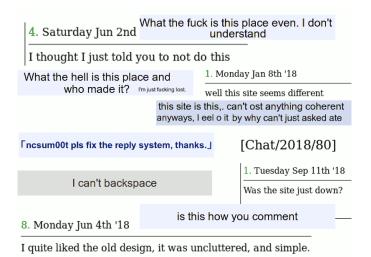- Who gets blamed for down-time?

No matter of how difficult it may be: **It's all up to you!**

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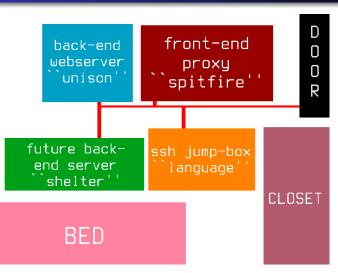Conclusion

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Fanmail

4. Saturday Jun 2nd

What the fuck is this place even. I don't understand

I thought I just told you to not do this

What the hell is this place and who made it? I'm just fucking lost.

1. Monday Jan 8th '18

well this site seems different

this site is this,. can't ost anything coherent anyways, I eel o it by why can't just asked ate

「ncsum00t pls fix the reply system, thanks.」

[Chat/2018/80]

I can't backspace

1. Tuesday Sep 11th '18

Was the site just down?

is this how you comment

8. Monday Jun 4th '18

I quite liked the old design, it was uncluttered, and simple.

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Server Room
Hardware
Proxying Requests

Section 2

Architecture

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Server Room
Hardware
Proxying Requests

My Room

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Server Room
Hardware
Proxying Requests

Spitfire (Front-end)

nginx Reverse-proxy
Client HTTP(S)
Requests

tor Provide access via a
.onion URL

ngircd IRC Network
Daemon

dovecot Receiving Mail

postfix Relaying Mail

icecast Radio Broadcast

XOrg Desktop

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Server Room
Hardware
Proxying Requests

Unison (Back-end)

lighttpd Serve HTTP
requests proxied by
"spitfire"

php-fpm Run PHP Scripts

mysql SQL Database

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Server Room
Hardware
Proxying Requests

Reverse Proxy

All the hardware is set up but how will clients connect to my site?
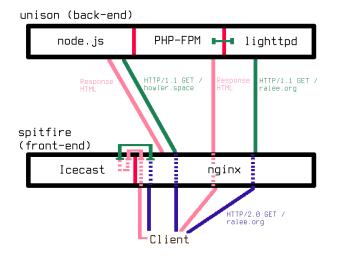
- Only one external :80 when using DNAT
- Which domain do you want?

Solution: Use a reverse-proxy!

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Client Request Example

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Implications

Benefits of using the reverse-proxy:

- Map multiple domains to one port
- Centralized SSL certs
- Centralized logging
- "Gatekeeping" traffic rules
- Load Balancing

Section 3

Configurations

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spitfire
unison

Spitfire's Configurations

nginx https://cdn.prettyboytellem.com/etc/
spitfire-nginx.conf

icecast https://cdn.prettyboytellem.com/etc/
spitfire-icecast.xml

alice-dj https://cdn.prettyboytellem.com/etc/
spitfire-boot-alice

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spitfire
unison

Unison's Configurations

lighttpd https://cdn.prettyboytellem.com/etc/
unison-lighttpd.conf

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DNS
Dealing with the ISP

Section 4

Unique Challenges

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DNS
Dealing with the ISP

DNS

DNS is how domain names (like `ralee.org` are resolved to IP addresses. Your consumer-grade uplink is likely to have a dynamic IP address instead of a static address:

- Likely to change over time
- May change on router reboot
- Will probably change when you least want it to

Not everyone can have a static address!

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DNS
Dealing with the ISP

DNS / Solutions

How can we mitigate the problems of a dynamic address?

- Upgrade to a static IP ($$$)
- DDNS (Dynamic DNS)
- Strictly resolve domains to IPv6
- Deal with it

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DNS
Dealing with the ISP

Dealing with the ISP

Your ISP thinks you're an idiot

- May block ports you "don't need"
- May throttle traffic

You may become the victim of:

- 2AM "maintainance"
- Random packet dropping
- Traffic Shaping

If you run anything abnormal (.onion, I2P) **you are suspicious to the ISP!**

Section 5

Conclusion