# **Homelab & Stuff**

**Folke Johansson** 

#### Where the hell do I start?

#### Where the hell do I start?

#### **Good question!**

#### Where the hell do I start?

#### **Good question!**

#### Buy something cheap and old of Blocket or similar

#### **My first Homelab**



2 Core – Hyperthreaded 8gb DDR3 RAM SSD + HDD Storage





#### My first Homelab



2 Core – Hyperthreaded 8gb DDR3 RAM SSD + HDD Storage



BONK



#### Homelab Grows



#### Homelab Grows



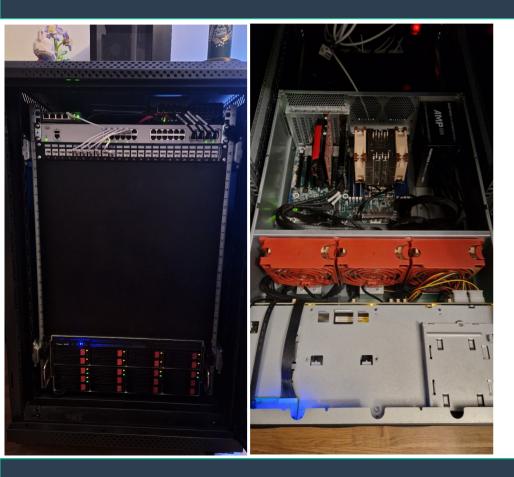
#### Homelab Grows



#### Where are we now?

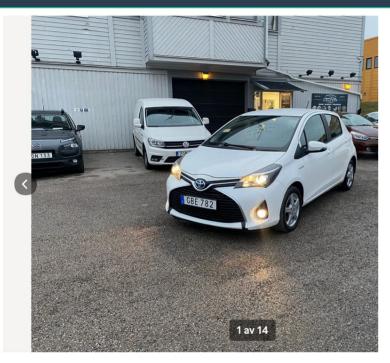


#### **Today's Homelab - Asgard**



- 32 Core Epyc 7542 @2.9-3.4GHz
- 128GB DDR4@3200MHz ECC
- 20x SAS3 Connections

#### **Today's Homelab - Asgard**

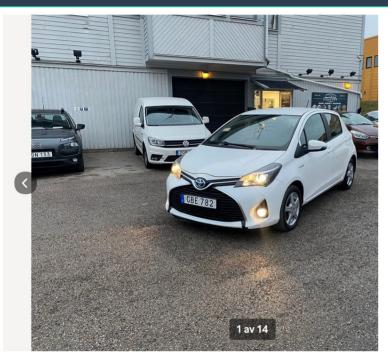


Inlagd: idag 16:07

Opplands Väsby (hitta.se)

#### Toyota Yaris Hybrid e-CVT Active Eu6

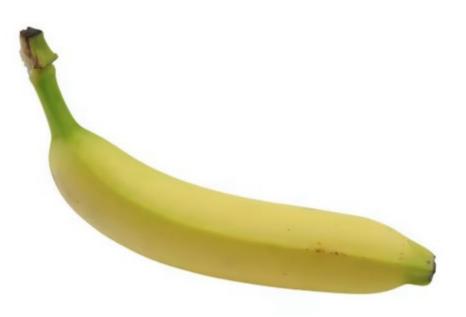
#### **Today's Homelab - Asgard**



Inlagd: idag 16:07

Opplands Väsby (hitta.se)

#### Toyota Yaris Hybrid e-CVT Active Eu6







#### **Cornerstones of Homelabbing**

- Storage
- Networking
- Virtualization

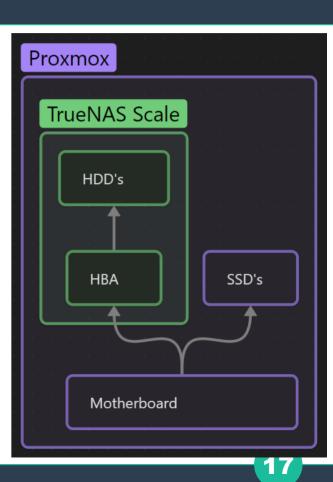




Virtualized network storage

Fast local storage

HBA (it mode)



## **Storage – ZFS**

Mirrored	RA	ID-Z1		
Data		Data	Data	Parity
Disk Disk		Disk	Disk	Disk





ZFS Pool			 			 		
VDEV			 VDEV			VDEV		
Data Disk	Data Disk	Parity Disk	Data Disk	Data Disk	Parity Disk	Data Disk	Data Disk	Parity Disk

## **Storage – ZFS**

Z	=5	5	P	Ö	ol	Ì.	•	• •	•	•		- -	•		•	•		 						• •	•			•	•	
		Di	rec	to	ry	•		•	•	•	•			- - -	•	•		Da	tas	et		•	•		•		•	•	·	ء بر بر بر
	•				•	•	Ţ	•	: :	•	- -	- -	-					• •					Ļ		•	-	•	•		
	I	Di	rec	cto	ry												ſ	Da	tas	et										
	-		-	-	-		-	-	-	-		-											Į							
																		Dir	ect	tor	y									
																					_	_							ر 	





## To many drives for a single RAIDz group?

Use dRAID :)

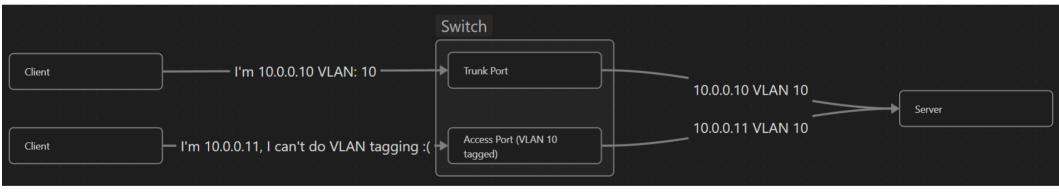


21

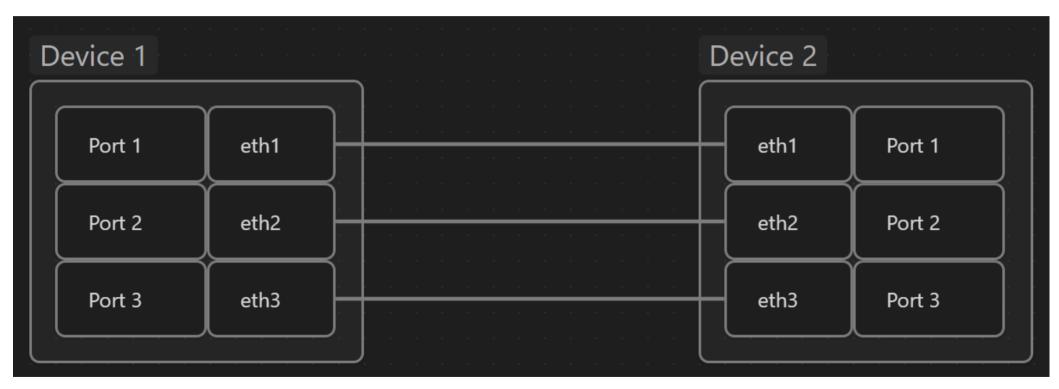
ChatGPT's interpretation:

# Networking

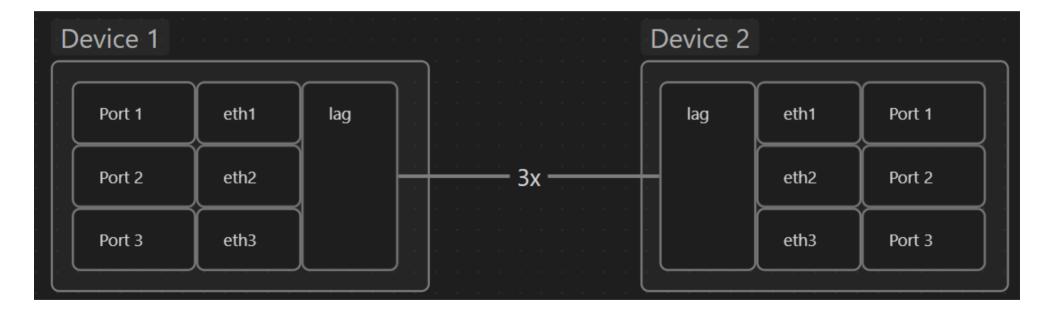
#### Networking – VLAN trunk and access ports



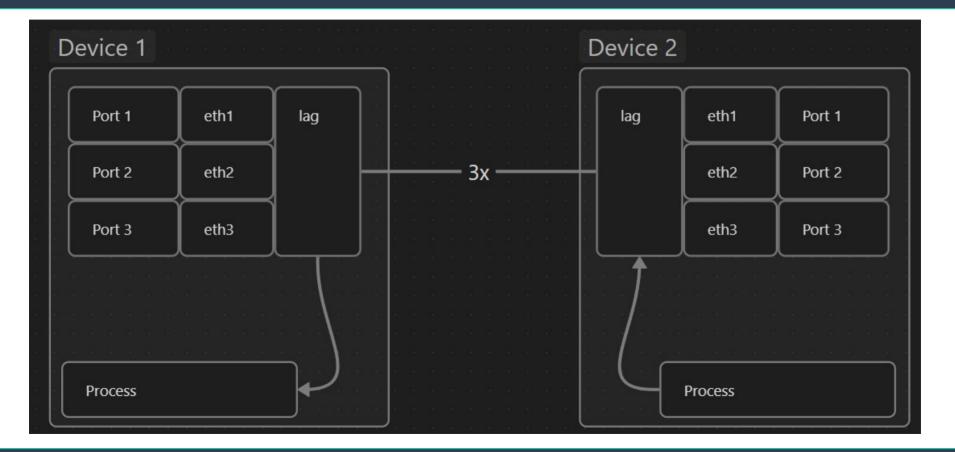
#### **Networking – LAGs**



#### **Networking – LAGs**



#### **Networking – LAGs**



#### Networking

INTERNET Notes WAN = RJ45 1G Connection lag = 4x SFP 1G Connection 1G = RJ45 1G Connection WAN 10G = SFP+ 10G Connection OpnSense 10G Firewall lag Floki Core L3 Switch Server 1G 1G 🗌 1G 1G TL-SG105PE TL-SG105S Archer AXE75 OTHER CLIENTS Edge L2 PoE Switch Edge Switch WiFi AP WiFi 1G 1G OTHER CLIENTS OTHER CLIENTS OTHER CLIENTS

## Networking

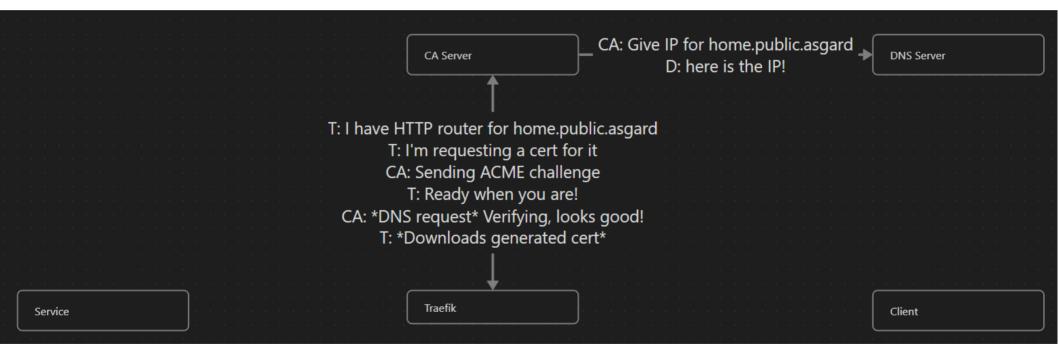
Local Physical Clients	Management	WiFi Authenticated Clients						
VLAN 1300 - 10.3.0.1/24	VLAN 1000 - 10.0.0.1/24	VLAN 1510 - 10.5.10.1/24						
TV DHCP	Router Admin Webpage 10.0.0.1	Quest 3 DHCP						
Docking Station DHCP	Core Switch Admin Webpage 10.0.0.2	Phone DHCP						
PC DHCP	Edge IoT Switch Admin Webpage 10.0.0.3	Laptop DHCP						
	WiFi AP Admin Webpage 10.0.0.4							
	Floki IPMI 10.0.0.5							

#### **Networking – A service perspective**

	c	CA Server	DNS Server
		C: Where	can I find home.public.asgard? D: At 10.6.0.3
Service	T: I have a router for it, sending!	Traefik C: Request for home.public.asgard —	Client



#### **Networking – A service perspective**





## **Network Schmetwork**



#### IP done Quick! (IPv4)

An IP is 32 bit divided into 4 bytes separated by .

/0-32 at the ends specifies how many bits are "locked"

10.0.0/24 means the first 24 bits are locked so only the last byte can be changed

 $10.0.0.0/24 \rightarrow 10.0.0.0$  to 10.0.0.255

The above shows how a network range or "subnet is specified"

# Virtualization

#### **Virtualization – Hypervisors**

#### Type 1

- Proxmox
- VMware vSphere
- Microsoft Hyper-V

#### Type 2

- VirtualBox
- VMware fusion



#### Virtualization – Proxmox

XPROXMOX Virtual Environm	ent 8.0.4 Search	Documentation	占 root@pam 🗸
Server View 🗸 🌞	Node 'morpheus'	🕲 Reboot 🖞 Shutdown >_ Shell 🗸 🗄 Bulk Actions	e v 🕜 Help
✓	Q Search	Package versions Hour (average to the second s	ge)
~ 🛃 m1	Summary	morpheus (Uptime: 1 day 23:14:57)	
<ul> <li>200 (tsdev-authkey)</li> <li>204 (nixos)</li> </ul>	D Notes	norpheus (optime: 1 day 23.14.57)	
1999 (tsdev-opnsense)	>_ Shell	CPU usage 3.20% of 6 CPU(s)	0.15%
2000 (tsdev-nixos-builder)	📽 System 🔍 🔻	S to delay	0.15%
2001 (tsdev-nixos-server)	≓ Network		
2002 (tsdev-nixos-desktop)	Certificates	RAM usage 33.35% (20.86 GiB of 62.53 GiB) KSM sharing	0 B
2010 (tsdev-ubu2204-desktop)		□ / HD space 26.24% (122.76 GiB of 467.89 GiB) 3 SWAP usage	N/A
SOs (m1)	G Hosts		
■ loce (iiii) ■ data (m1)	Options	CPU(s) 6 x Intel(R) Core(TM) i5-8500 CPU @ 3.00GHz	
local (m1)		Kernel Version Linux 6.2.16-8-pve #1 SMP PREEMPT_DYNAMIC PMX 6.2.16-8 (2023-08-0	
■ pve-morpheus (m1)	<ul> <li>Time</li> </ul>	PVE Manager Version pve-manager/8.0.4/d258a81	
√🛃 morpheus	🔳 Syslog	Repository Status Status Proxmox VE updates (1) Non production-ready repository e	enabled! >
150 (nix)	🗧 Updates 🛛 👻		
<ul> <li>142 (dev)</li> <li>203 (calibre)</li> </ul>	街 Repositories	CPU usage OPU usage IO	delay 😑
203 (calibre)	♥ Firewall	60	
localnetwork (morpheus)	🖨 Disks 🔻	50	
ISOs (morpheus)		30	
😂 🔲 data (morpheus)	LVM		
iocal (morpheus)	LVM-Thin	8 30	
e pve-morpheus (morpheus)	Directory		
Statute (morpheus)	E ZFS	20	
√ <mark>II</mark> ∕ zoidberg		10	
4201 (pinole)	Replication		
<ul><li>↓ 4203 (tailscale)</li></ul>	Task History	0 2023-08-19 2028-19 2023-08-19 2023-19 2023-19 2023-19 2023-19 2023-19 2023-19 2023-19 2023-19 2022-19 2023-19 2023-19 2023-19 202023-19 20202020-19 20202	2023-08-19
1204 (unifi)		11:16:00 11:22:00 11:28:00 11:34:00 11:40:00 11:46:00 11:52:00 11:58:00 12:04:00 12:10:00 12:16:00	12:22:00
4200 (pihole)	Subscription		
localnetwork (zoidberg)		Server load o Load av	rerage 😑

#### There's like 50 Vms!?



#### **Virtualization – Terraform**



#### Virtualization – Ansible and Terraform

38

#### Terraform

- Used for VM and LXC provisioning
- Desired state driven, Idempotent
- Has a good Proxmox provider
- IaC

Ansible

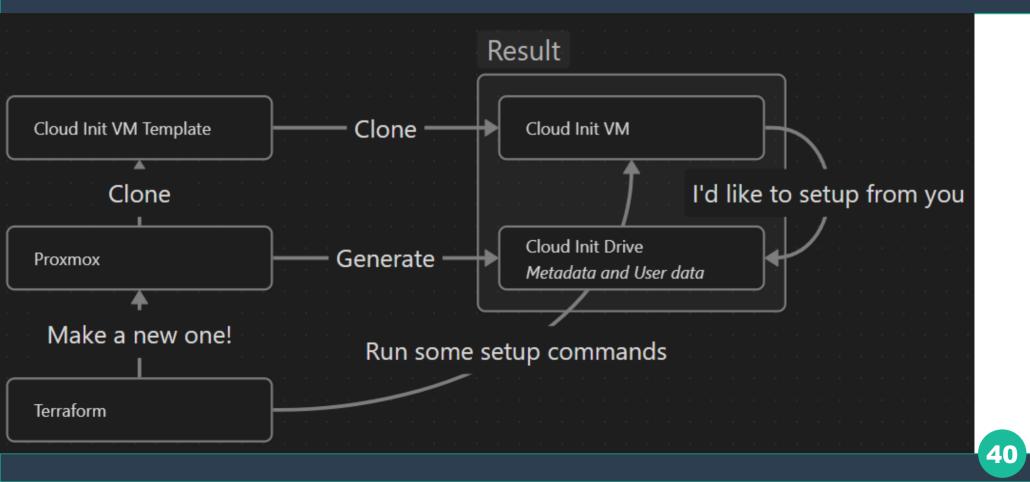
- Used for service setup on Vms and LXCs
- Desired state driven, Idempotent
- Widly adopted and works with docker
- IaC

#### **Virtualization – Ansible**

hosts	Role (Ansible Dependencies)
variables Playbook (Traefik)	Role (Docker)
	· · · · · · · · · · · · · · · · · · ·
vault	Role (Traefik)



#### **Virtualization – Cloud Init in Proxmox**





# **Thanks for Listening!**

# **Questions?**