CS labs Infrastructure Hardware Requirements Specification for CS labs Operations and Application

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Group Member - Zach Bouvier, Group Member - Mamadou Thiello

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Abstract

The CS Infrastructure team covers every aspect of operations for this project. We cover the setup, maintenance, and upgrades of all the servers, services, and communication in the domain.

Contents

1 Contribution Breakdown

Zac Clifton – Project leader, contributes by creating reports, deciding infrastructure architecture and project decisions.
Zach Bouvier – IT Operations, contributes by implementing infrastructure automation and monitoring.
Mamadou Thiello – IT Operations, contributes by implementing infrastructure automation and integration.

Time Sheet	User	Mamadou	Zac	Zach	Grand Total
	0:00:00				0:00:00
09/01/2019			3:45:00		3:45:00
09/08/2019			17:15:00	13:15:00	30:30:00
09/15/2019		6:00:00	17:52:00	12:00:00	35:52:00
09/22/2019		2:00:00	13:45:00	7:45:00	23:30:00
09/29/2019			13:00:00		13:00:00
10/06/2019			3:15:00		3:15:00
Grand Total	**0:00:00**	**8:00:00**	**68:52:00**	**33:00:00**	**109:52:00**

SUM of Total

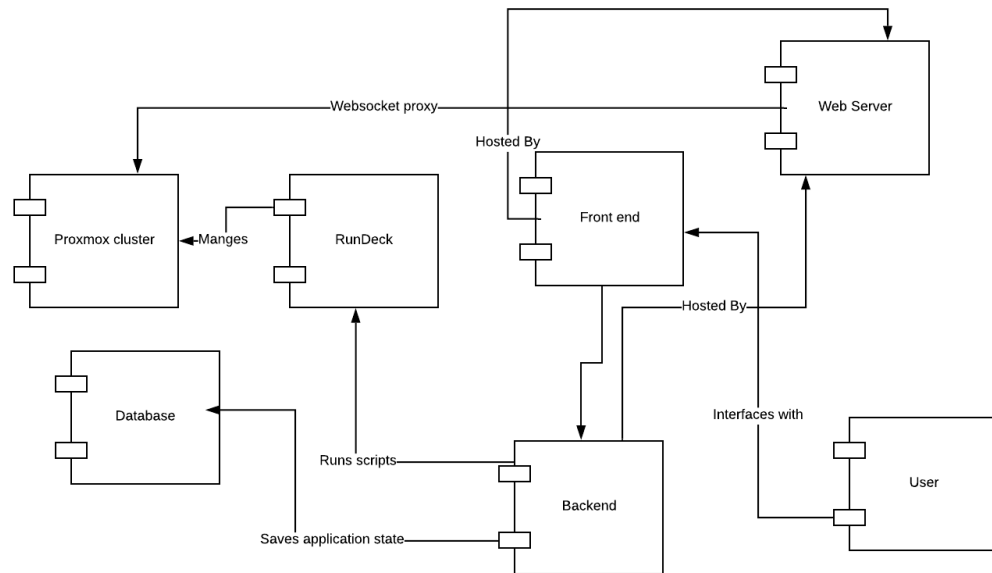| Task Name (Please use the name of the trello card)	User	Mamadou	Zac	Zach	Grand Total
	0:00:00				
Create excel time sheet			0:12:00		
On call with APC Support			0:25:00		
Metting with elastic			0:30:00		
Diagnosis UPS critical outage alert			0:35:00		
Tried to finish Vlan			0:45:00		
Diagnosis unresponsive prox4			1:00:00		
Meeting with volunterr			1:15:00		
Pick up servers from LGE			1:15:00		
Clean 119 for server move			1:30:00		
Diagnosis rasp pi network issue			1:30:00		
Meeting with the team			1:30:00		
diagnosis supermicro rouge website			2:00:00		
Environment set up and testing		2:00:00			
Setup elkstack			2:00:00		
troubleshoot vpn			2:00:00		
Work on Documentation		2:00:00			
Attempt to set a up static ips on UPS			2:15:00		
set up elkstack			3:00:00		
Redo Rack for new UPS			3:45:00		
Create GUI windows		4:00:00			
Get Quarum on internal proxmox cluster & set up PXE server			4:15:00		
Set up Application cluster			5:00:00		
Create vpn			6:30:00		
Migrate Internal VMs to new servers			8:00:00		
Register UPS' with APC			8:45:00		
Event Monitoring				10:00:00	
Set Up Wifi, Finish vlans, Diagnosis network slowdowns			10:55:00		
Temperature Probe				23:00:00	
Grand Total	**0:00:00**	**8:00:00**	**68:52:00**	**33:00:00**	

2
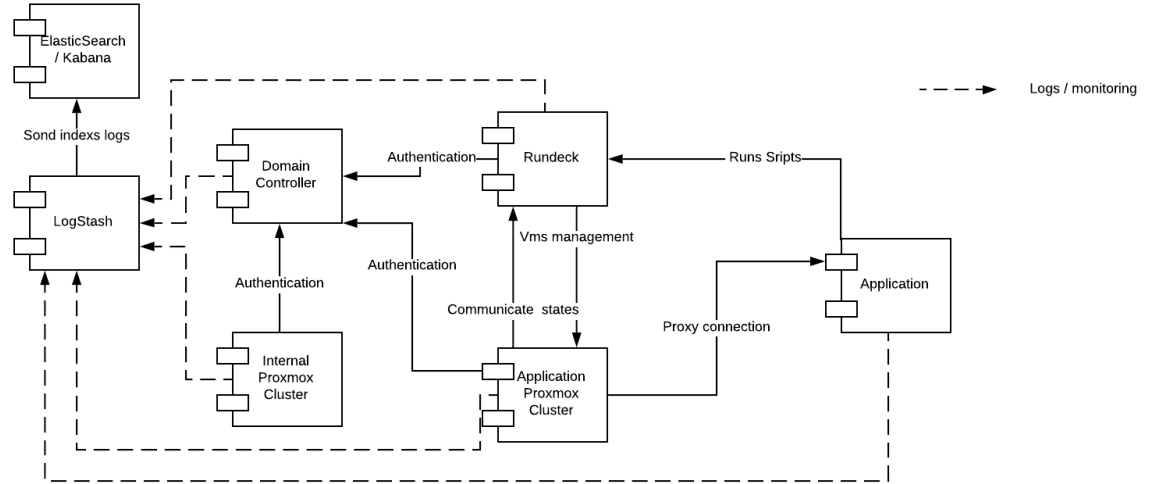
2 Proposed Software Architecture

2.1 Overview

The system is divided in the following parts; Application, Domain Controller, Rundeck, Application cluster, Internal Cluster, Database, and monitoring system (ELK Stack). The application will hold the backend to the website that forwards VM's. This is the centerpiece of the operation, everything else supports this. Every system we have decided to use is open source and supported in the long term.

2.2 Subsystem decomposition

Websocket proxy

Web Server

Hosted By

Proxmox cluster — Manges — RunDeck

Front end

Database

Hosted By

Interfaces with

Runs scripts

User

Saves application state

Backend
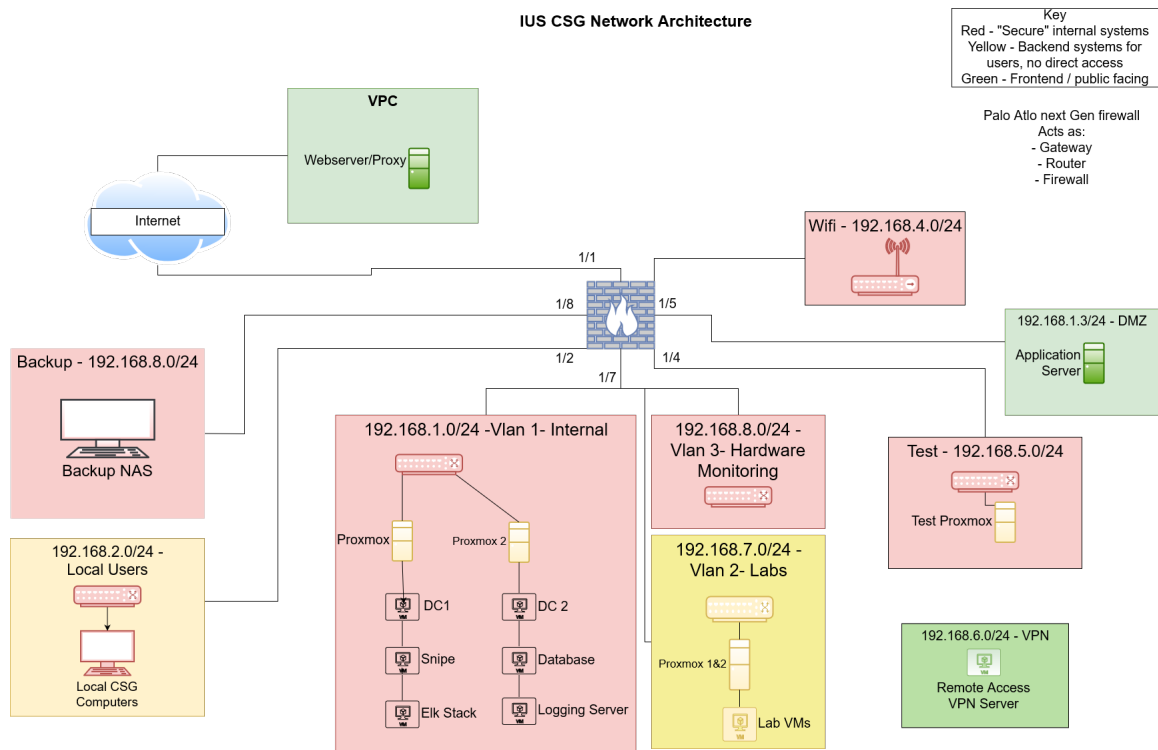
2.3 Hardware/software mapping

2.4   Persistent Data Management

There are 3 main data stores that will be stored in a Network storage array. The first thing will be stored and back-up will be the application's data held on our database. The second is all VMs on our Internal Cluster will be fully backed up since if one of these goes down the whole thing does. Lastly, the Monitoring data will be saved as we ingest and parse through it

2.5   Access Control Security

To control access we will base our security with different groups:

1. Domain Admins- These users will have access to everything, and will only be given to specific people.

2. Rundeck User - Devs in this group will have access to Rundeck to write automatons.

3. Elk-Stack Users - Devs in this group will have access to the monitoring platform.

4. IPA Users- These users will be able to add people to the domain.

5. Proxmox admins- Devs in this group will be able to manage the clusters.

6. Local Endpoint Admin- These users will have access to set up local machines to use for any need.

7. Firewall Admins- These Devs will have access to change things in the firewall.

8. Database Users- these users will have access to the database.

9. VPN Users- These users will be able to remote in to the network.

10. Application-Only-User - This is the common user group and users in this group will just be able to use the application.

Key
Red - "Secure" internal systems
Yellow - Backend systems for users, no direct access
Green - Frontend / public facing

Palo Atlo next Gen firewall
Acts as:
- Gateway
- Router
- Firewall

VPC

Webserver/Proxy

Internet

Wifi - 192.168.4.0/24

1/1

1/8   1/5

192.168.1.3/24 - DMZ

Application Server

1/2   1/4

1/7

Backup - 192.168.8.0/24

Backup NAS

192.168.1.0/24 -Vlan 1- Internal

192.168.8.0/24 - Vlan 3- Hardware Monitoring

Test - 192.168.5.0/24

Test Proxmox

192.168.2.0/24 - Local Users

Proxmox   Proxmox 2

192.168.7.0/24 - Vlan 2- Labs

Local CSG Computers

DC1   DC 2

Proxmox 1&2

192.168.6.0/24 - VPN

Snipe   Database

Remote Access VPN Server

Elk Stack   Logging Server

Lab VMs

2.6   Global Network Control

The global network control is manged by a Palo Alto next-gen firewall, here on referenced as the firewall. The firewall manages the interzone traffic between the different defined zones inside our network, which can be referenced on the next figure.