



Network Hardware Resource Management System

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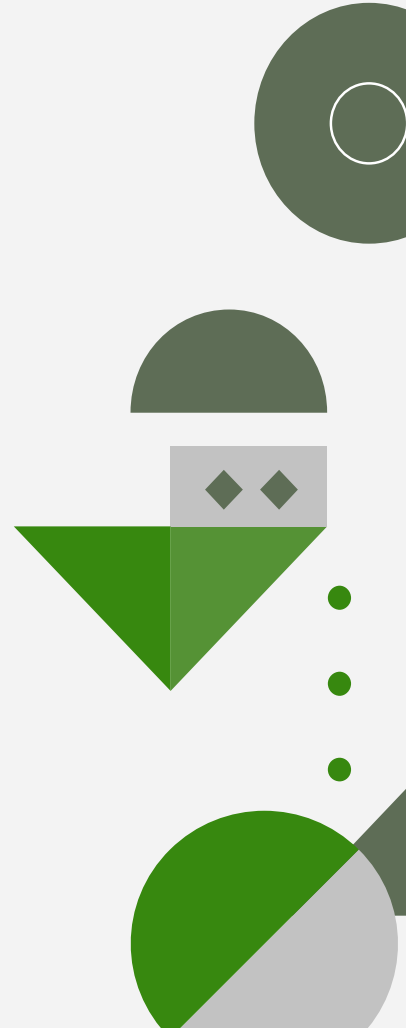





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01





Overview



Introduction

The Network Hardware Resource Management System is a web-based application designed to efficiently manage hardware resources within a network environment. It allows users to add new hardware resources, remove existing ones, monitor resource usage, and so on.



The slide features a light grey background with various geometric shapes in green and grey. In the top left, there is a large grey circle with a white outline, a green semi-circle, and a green triangle with a white diagonal line. In the top right, there are green and grey squares, a white square, and three green dots. In the bottom left, there is a green diamond, a green square, and a green line. In the bottom right, there are green and grey triangles, a green circle with a white outline, and two green diamonds.

02

Requirements



Functional Requirements



**List Hardware
Resources**

**View Live
Resource Usage**

**Add New Hardware
Resources**

**Remove Existing
Hardware Resources**

**View User/Group-Based
Resources**

**Manage Docker
Containers**



Non-functional Requirements

Usability Requirements

- Responsive Design
- Minimal Steps
- Cross-Browser Compatibility

Performance Requirements

- Response Time
- Scalability

Security Requirements

- Authentication
- Data Encryption

The background features an abstract geometric design. In the top-left corner, there is a large dark grey circle with a white outline, partially overlapping a green circle. Below it is a small green semi-circle. To the right is a green triangle with a white diagonal line. In the top-right corner, there is a grid of squares in green, white, and dark grey, with three small green dots to its right. In the bottom-left corner, there is a green diamond and a green line. In the bottom-right corner, there is a green triangle, a dark grey circle with a white outline, and two small green diamonds.

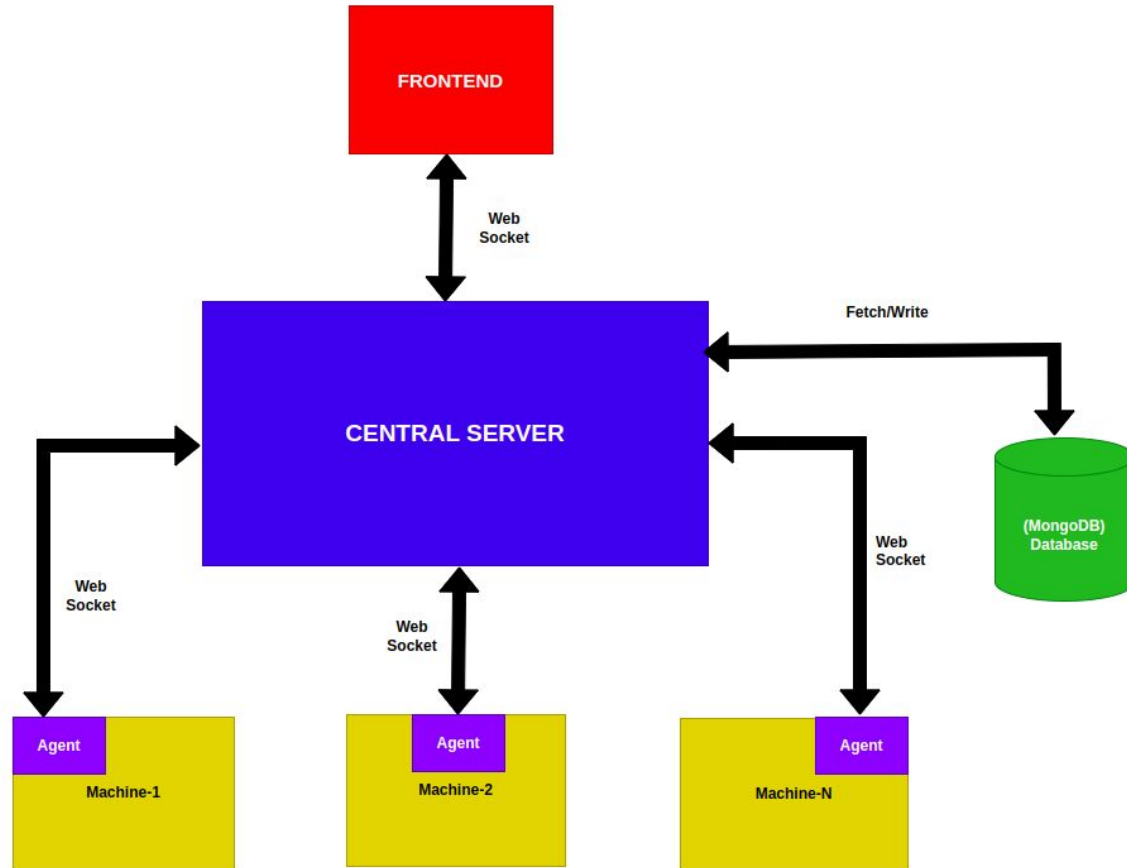
03



Design

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04

Architecture Overview

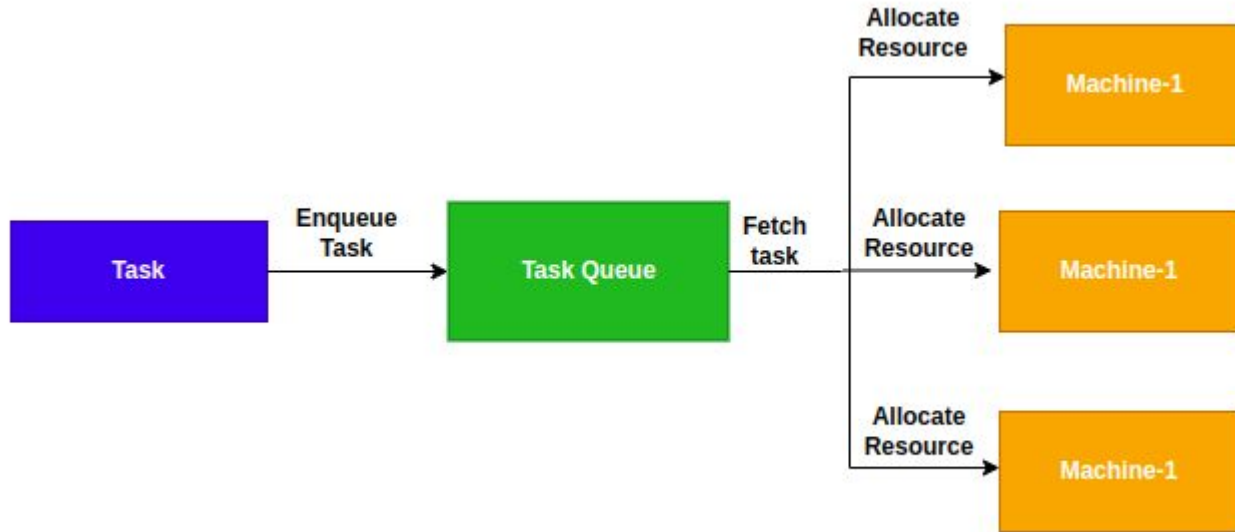


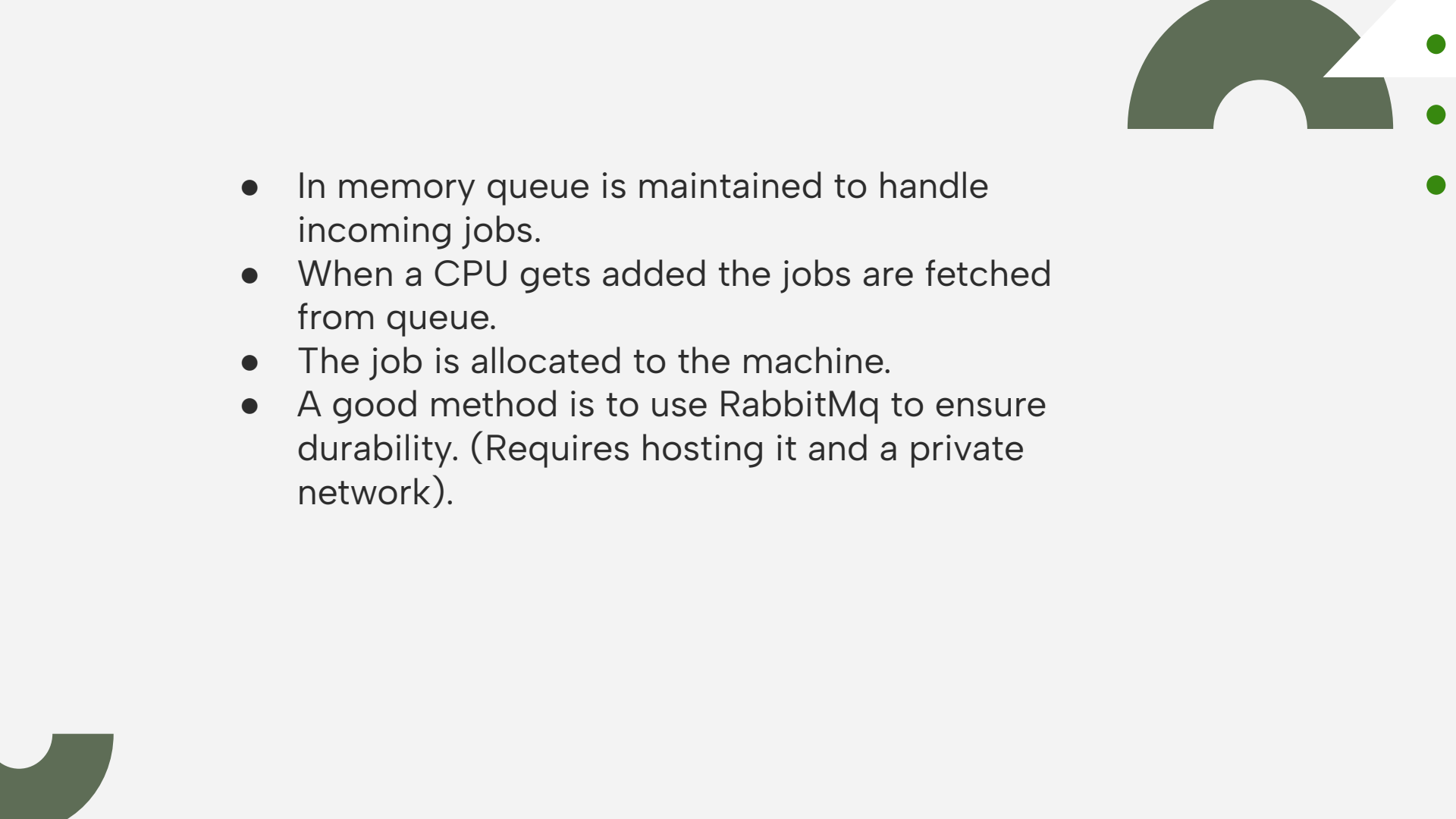
- 
- Utilized web sockets for bi-directional communication.
 - Agent runs on each machine to establish the connection to the central server.
 - Central server stores the agent information on a mongodb database hosted on cloud.
 - Agent periodically sends system information to the server.
- 

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05

Internal Working



- 
- In memory queue is maintained to handle incoming jobs.
 - When a CPU gets added the jobs are fetched from queue.
 - The job is allocated to the machine.
 - A good method is to use RabbitMq to ensure durability. (Requires hosting it and a private network).



06

Web App



DEVICE NAME	GPU	CPU	MEMORY	CPU HEALTH	ACTIONS
shreyansh-Lenovo-Legion-Y530-15ICH	VGA compatible controller View All	Intel(R) Core(TM) i5-8300H CPU @ 2.30GHz - 2300 View All	7.63 GB	Unhealthy	Deallocate

Run your scripts by uploading file

Drag & drop a file here, or click to select a file

Upload File



Computer

System Information



Memory Information



Kernel Modules



Boot-Info



File Systems



Users



Groups



Devices

Processors



GPU Info



Env Variable Info



PCI Devices



USB Devices



Battery Information



Sensors Information



Input Devices



Storage Devices



Network

Network Interface



Ip Connections



Routing Table



Arp Table



Dns Servers





Computer

System Information

▼
Model: Intel(R) Core(TM) i5-8300H CPU
@ 2.30GHz
Hostname : shreyansh-Lenovo-Legion-
Y530-15ICH
Operating System: Linux
Release: 5.15.0-87-generic
Architecture: x64
Free Memory: 2.1 GB
Platform: linux
Total Memory: 7.6 GB
Speed: 2300

Memory Information



Kernel Modules

▼
name: xt_state
size: 16384
used: 0

name: xt_conntrack
size: 16384
used: 1

name: ipt_REJECT
size: 16384
used: 2

name: nf_reject_ipv4
size: 16384
used: 1
by: ipt_REJECT

name: iptable_filter
size: 16384
used: 1

Boot-Info



File Systems

▼
device: udev
size: 3.8G
used: 0
available: 3.8G
usePercentage: 0%
mountPoint: /dev

device: tmpfs
size: 782M
used: 2.2M
available: 779M
usePercentage: 1%
mountPoint: /run

device: /dev/sda7
size: 169G
used: 31G
available: 130G

Users



Groups



Devices

Processors



GPU Info



Env Variable Info



PCI Devices



USB Devices



- React based front-end
- Dynamic update
- Inuitive UI



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07

Plan & Progress

Project Progress

01	Phase-1	Web Interface Listing Down All hardware Resources	✓
02	Phase-2	Functionality that will enable the admin to monitor the usage of different resources. This will enable us to figure out which of the resources are being overused or underused	✓
03	Phase-3	Creation of API to allocate/deallocate resources	✓

The slide features a light grey background with the text "Thank You" centered. The corners are decorated with various geometric shapes in green and grey. Top-left: a grey square with three green dots, a white square, and a green square. Top-right: a grey semi-circle, a green and white split circle, and a grey circle with a white outline. Bottom-left: two small green diamonds, a green triangle, and a grey circle with a white outline. Bottom-right: a green diamond, a green triangle, a white triangle, and a green line.

Thank You