


Upgradation of web portal for centralized management of network resources(IPAM)

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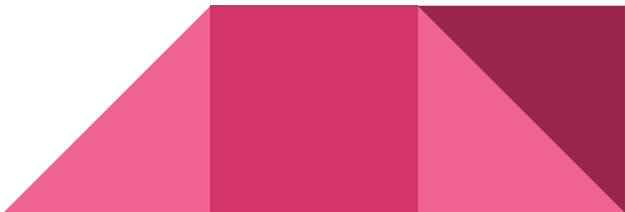
Introduction

- ❖ IP address are typically an extremely important part of a network, and managing them can become pretty difficult as the number of IP addresses used on a network are scaling up in a daily basis.
 - ❖ IP Address Management(IPAM) is a way by which we can track and manage the IP address space on our network.
 - ❖ Typically, IPAM integrates DHCP and DNS, which allows for changes in one to be seen by the other.
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Motivation

- ❖ In this internet driven era, everyone is concerned not just about using and exploring the internet, but using it in the most efficient way.
 - ❖ Nowadays, due to increase in the usage of internet, as observed there is an upsurge of its related protocols, basically the IP's.
 - ❖ And so, for the same a demand has arised to manage it so that there is an effective usage of software as well as hardware resources.
 - ❖ As observed, all this situation indicates to a simple solution that is an IPAM system.
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Objectives

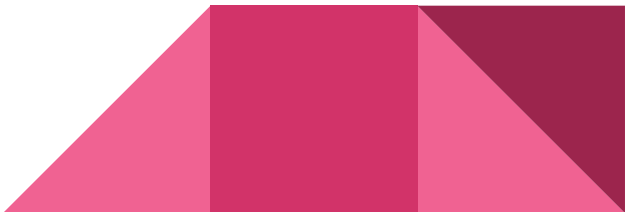
- ❖ To automate administrator's work i.e. changes in the configuration files when user requests for new/edit/delete wired connection based on VLAN.
 - ❖ Moreover, user can request (new/edit/delete) for Wireless and Mobile/Tablet Connections.
 - ❖ Addition of New Network by Admin through Interface.
 - ❖ Provide a Graphical View of (Reserve, Used & Free) IP Addresses to the Admin.
 - ❖ Monitoring the Activity Logs.
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Applications

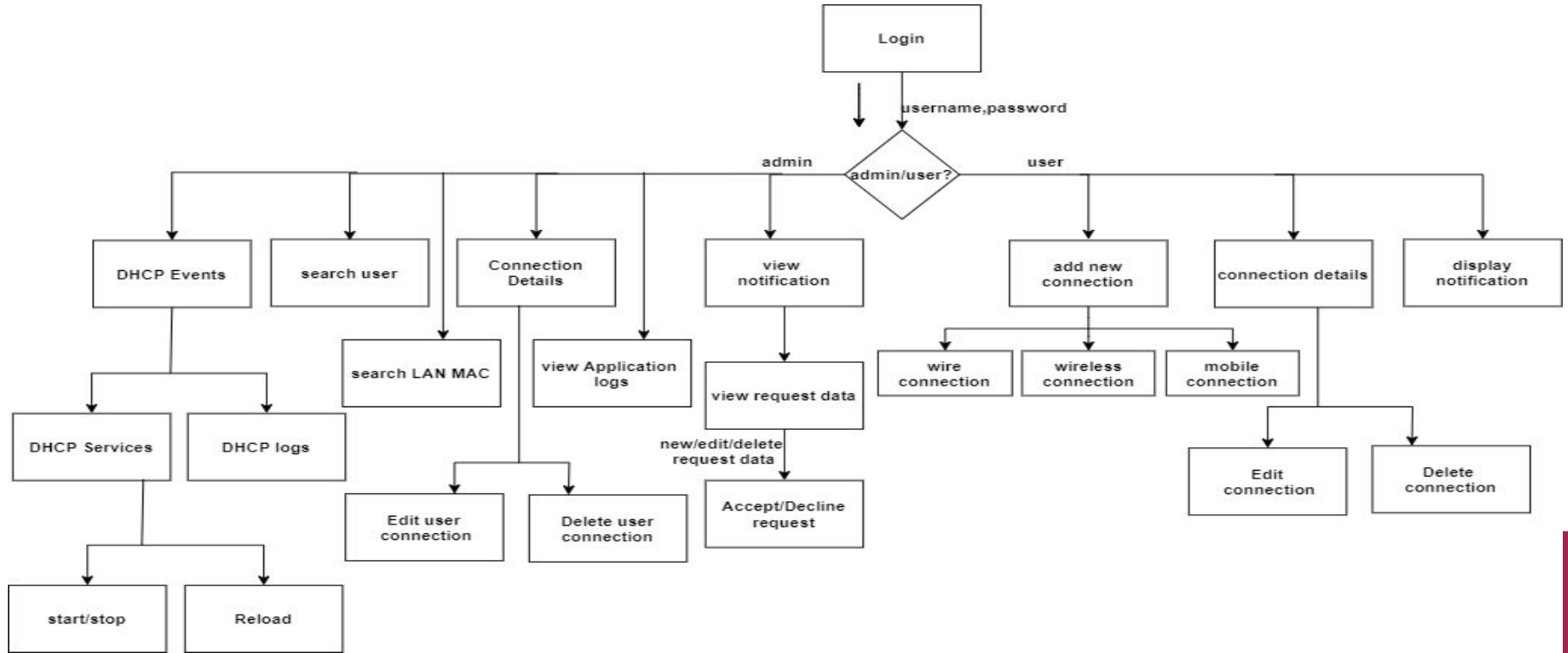
- ❖ User can request for new network connection which can be a wired, wireless or mobile connection.
- ❖ Managing IP addresses over a specific subnet.
- ❖ Retrieving of user information based on their IP address.
- ❖ Admin can check the status of a particular user's request.



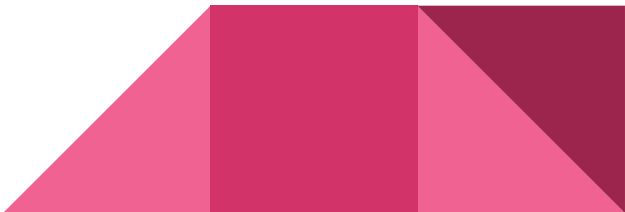
Important Definitions

- ❖ **IP Address Space Management:** IP address space management refers to allocating and managing IP addresses for use on computer networks.
 - ❖ **DHCP:** Dynamic Host Configuration Protocol (DHCP) is a network protocol that is used to configure network devices to communicate on an IP network.
 - ❖ **DNS:** DNS stands for Domain Name System, which is a decentralized naming system used to translate human-friendly domain names into IP addresses that computers can understand.
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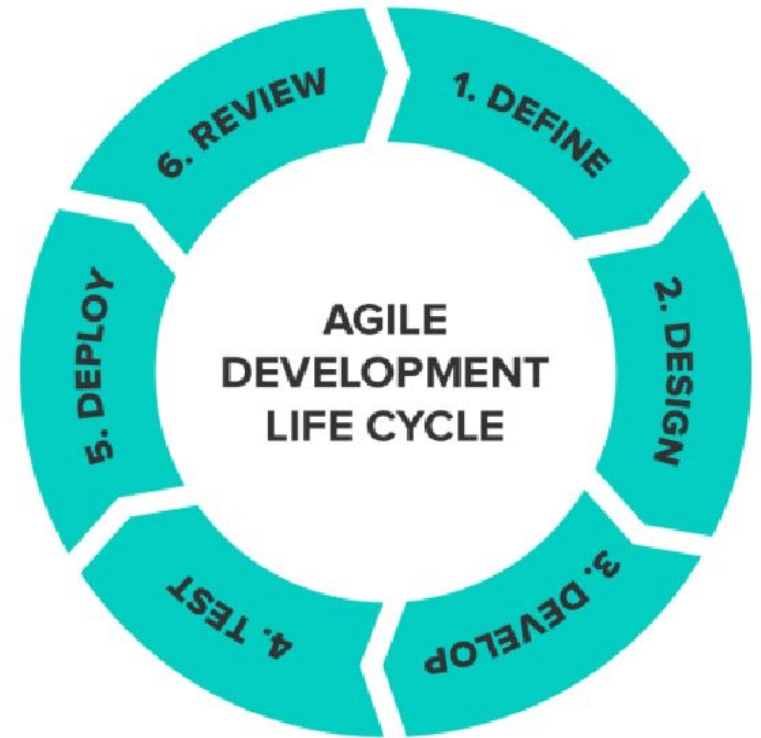
Flow of our System



Tools / Technologies Used


- ❖ PHP
 - ❖ Laravel Framework
 - ❖ MVC (Model View Controller)
 - ❖ DHCP & DNS
 - ❖ MySQL Database
 - ❖ SMTP (Secure Mail Transfer Protocol)
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Approach



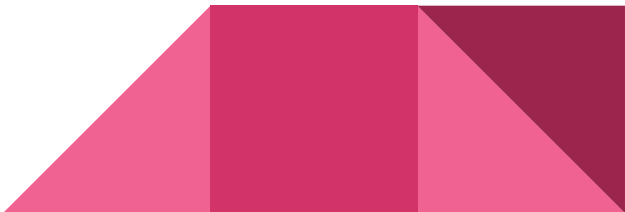
Approach

Why Agile Methodology?

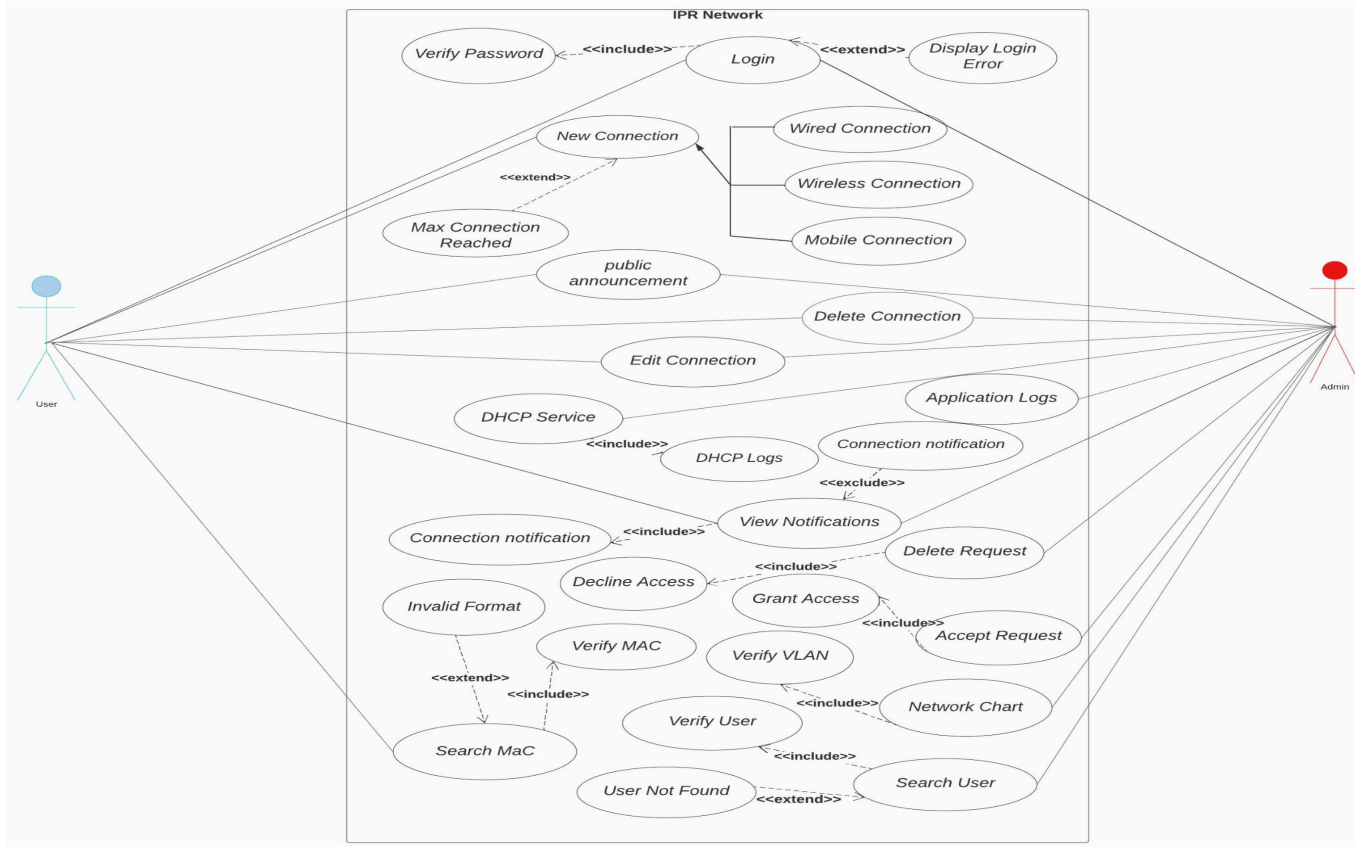
- ❖ The main aim of Agile model is to facilitate quick project completion.
 - ❖ Agile employs an adaptable methodology where there is no specific planning and job clarity only pertains to the features that need to be built in the future.
 - ❖ Moreover, we worked according to the daily tasks provided by our external guide to ensure that we accomplish the desired deliverables on time.
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Approach

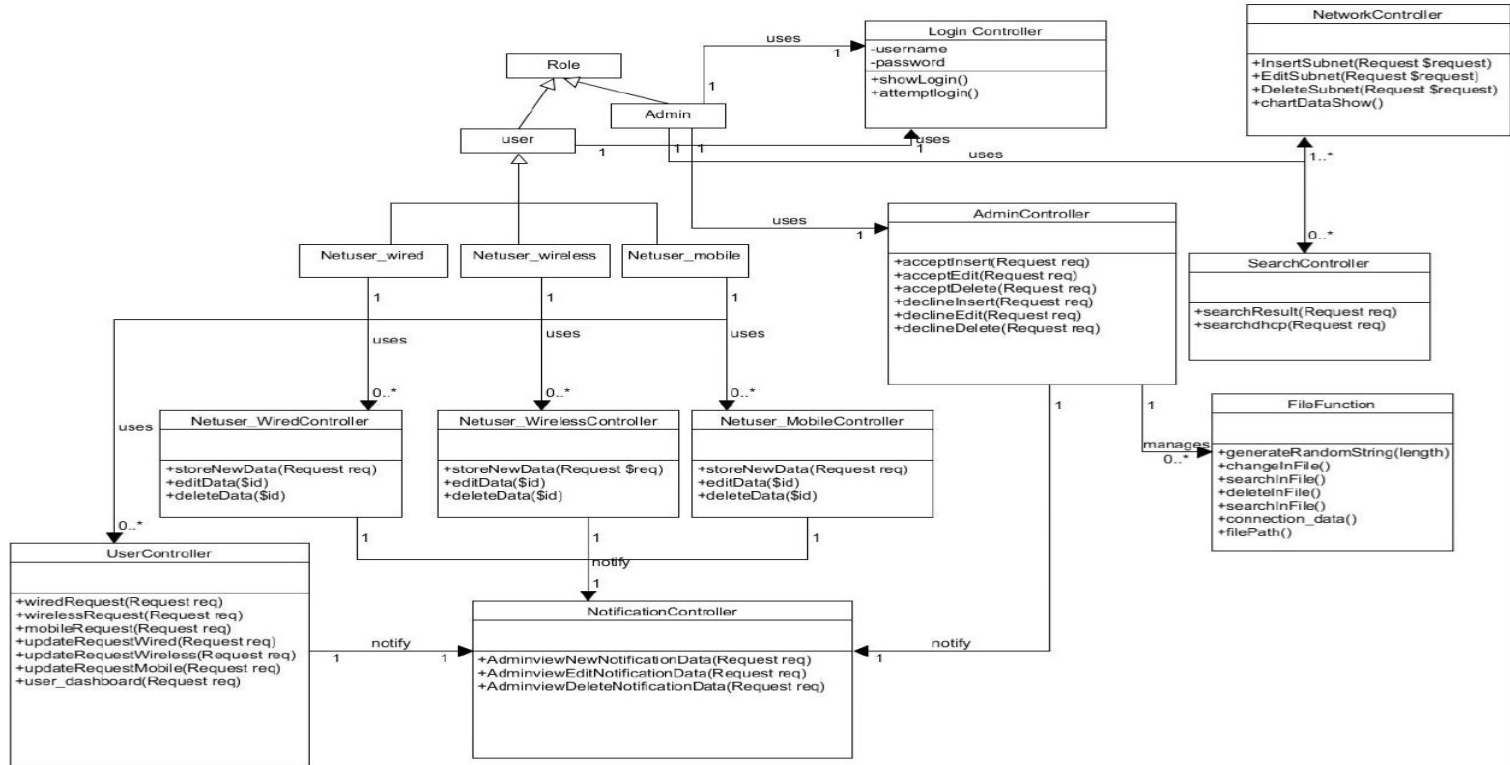
Advantages :-

- ❖ Working through Pair Programming produce well written compact programs which has fewer errors as compared to programmers working alone.
 - ❖ It reduces total development time of the whole project.
 - ❖ Customer Representative get the idea of updated software products after each iteration. So, it is easy for him/her to change any requirement if needed.
 - ❖ Even late changes in requirements are welcomed.
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USE-CASE DIAGRAM



CLASS DIAGRAM








ER DIAGRAM

ER DIAGRAM



Testing Results (User Connections)

 IPAM

-  Dashboard
-  My Devices
-  New Connection
-  Logout

Your Approved Requests

Wired

Wireless

Mobile & Tablet

WL_ID	Wireless ownership	Device Type(Wireless)	Host	Purchase Order/Equipment No.	wifi MAC	Action
1016	Personal	Laptop	temp-student	NA	41:8A:5A:26:49:B8	<div>EditDelete</div>

Your Pending Requests

Wired

Wireless

Mobile & Tablet

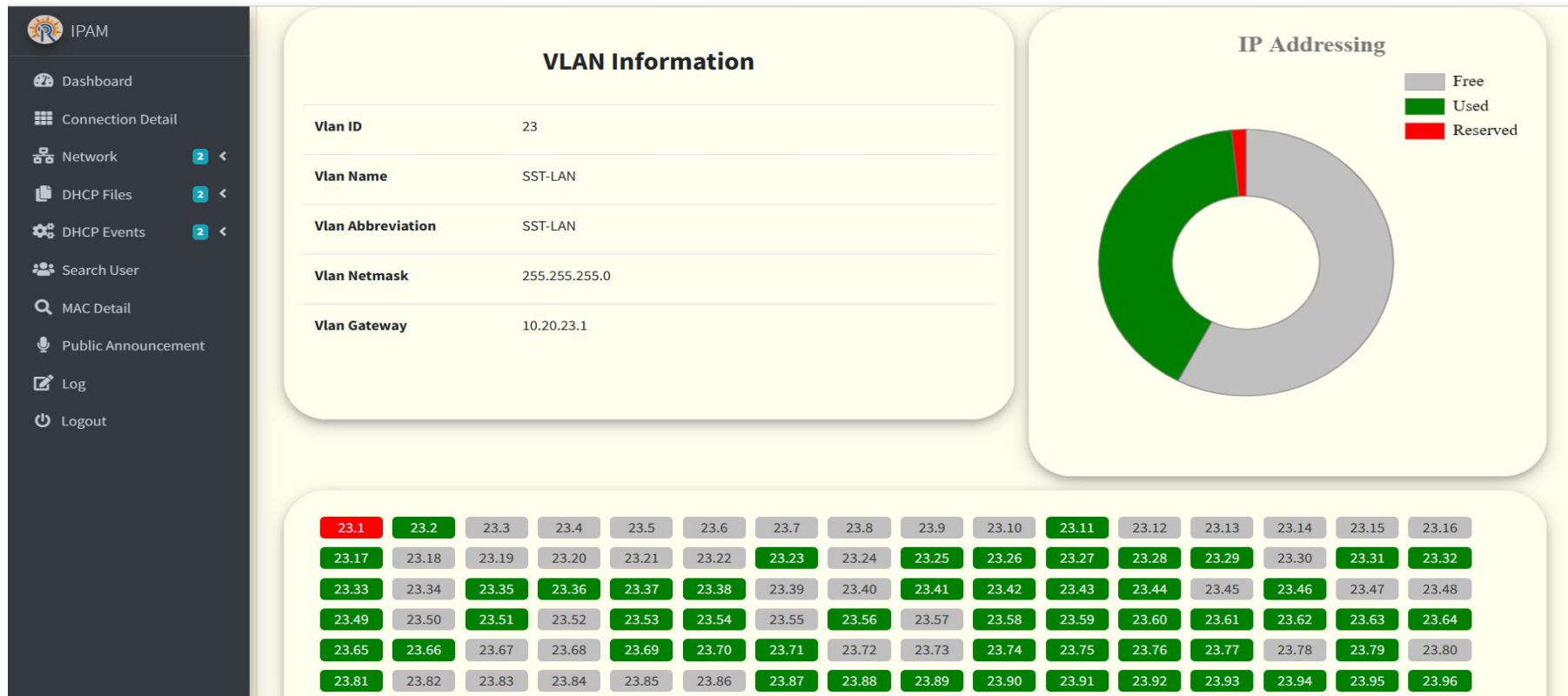
WL_ID	Wireless ownership	Device Type (Wireless)	Host	Purchase Order/Equipment No.	wifi MAC	Action
376	Personal	Laptop	temp-student	NA	A8:A1:59:D5:82:24	<div>PendingDelete</div>
377	Personal	ALL-IN-ONE	student-new	NA	51:8A:5A:26:49:B7	<div>PendingDelete</div>

Testing Results (Admin Dashboard)


The screenshot displays the IPAM Admin Dashboard. On the left is a dark sidebar with navigation links: Dashboard, Connection Detail, Network (with a '2' badge), DHCP Files (with a '2' badge), DHCP Events (with a '2' badge), Search User, MAC Detail, Public Announcement, Log, and Logout. The main content area has a light yellow background. At the top, there's a search bar and a 'Dashboard' title. Below this, a red banner indicates 'Pending Requests'. A table titled 'Requests' shows a single entry: 'Temp Student has Requested for NEW Connection.' with a 'View' button in the 'Action' column.

Requests	Action
Temp Student has Requested for NEW Connection .	View

Testing Results (Admin-Vlan Charts)




Testing Results (Admin-Conf Files)

 IPAM


- Dashboard
- Connection Detail
- Network 2 <
- DHCP Files 2 <
- DHCP Events 2 <
- Search User
- MAC Detail
- Public Announcement
- Log
- Logout


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Search 


#	Modified Date	Modified Time	File Name
1	17/02/2023	16:23:53	Vlan100.conf
2	16/03/2023	14:08:13	mobile.conf
3	16/03/2023	13:38:54	Vlan120.conf
4	07/03/2023	15:58:07	Vlan4000.conf
5	17/02/2023	15:54:11	Vlan10.conf
6	07/03/2023	15:29:34	Vlan5.conf
7	09/03/2023	10:40:11	subnets.conf
8	16/03/2023	14:20:22	wireless.conf
9	17/02/2023	16:11:40	Vlan11.conf


Testing Results (Admin-Activity Log)


 IPAM


 Dashboard


 Connection Detail


 Network 2 <


 DHCP Files 2 <


 DHCP Events 2 <

 Search User

 MAC Detail

 Public Announcement

 Log

 Logout

Search

Activity Logs

Mobile:connection Deleted Record for Mobile with MAC : 4A:B2:33:D4:E5:F6 requested by temp student on 16-03-23 14:03:13

Wired:connection(Admin) Edited Record for Other Scientific Equipment with MAC : 18:8B:5A:26:39:B4 for Location : New Lab Building and Room : NLB-First Floor by test admin on 16-03-23 13:03:54

Wired:connection(Admin) Edited Record for Other Scientific Equipment with MAC : 18:8B:5A:26:39:B4 for Location : New Lab Building and Room : NLB-First Floor by test admin on 16-03-23 13:03:21

Wired:connection(Admin) Edited Record for Other Scientific Equipment with MAC : 18:8B:5A:26:39:B4 for Location : New Lab Building and Room : NLB-First Floor by test admin on 16-03-23 13:03:03


Mobile:connection(Admin) Edited Record for Mobile with MAC : 6A:B2:33:D4:E5:F0 by temp student on 9-03-23 14:03:16

Wired:connection(Admin) Edited Record for Other Scientific Equipment with MAC : 18:8B:5A:26:39:B4 for Location : New Lab Building and Room : NLB-First Floor by test admin on 6-03-23 14:03:11

Wired:connection(Admin) Edited Record for Other Scientific Equipment with MAC : 18:8B:5A:26:39:B4 for Location : New Lab Building and Room : NLB-First Floor by test admin on 6-03-23 12:03:41

Wired:connection(Admin) Edited Record for Other Scientific Equipment with MAC : 18:8B:5A:26:39:B4 for Location : New Lab Building and Room : NLB-First Floor by test admin on 6-03-23 12:03:05

Testing Results (Admin-Public Announcement)

 IPAM

- Dashboard
- Connection Detail
- Network 2 <
- DHCP Files 2 <
- DHCP Events 2 <
- Search User
- MAC Detail
- Public Announcement
- Log
- Logout

New Announcement

Attribute	Data	Publish Now
Description	<div>This is a new Public Announcement for Testing Purpose.</div>	<div>Yes</div> <div>Yes</div> <div>No</div>

Publish

Current Announcements

Description	Status	Action
Welcome to IPR's IP Address Management (IPAM) System	Inactive	<div>Delete</div> <div>Active</div>
IPR's IP Address Management (IPAM) System has been integrated with the new centralized authentication system. All the users are requested to use their new credentials to log in to the IPAM portal for device registration purposes.	Inactive	<div>Delete</div> <div>Active</div>

Conclusions

- ❖ The IPAM site is outfitted with a range of features.
- ❖ The IPAM portal is an optimized way for users to access the internet just by filling in their connection details and sending it for approval to the network admins, allowing them to have a centralized control over the network.
- ❖ The email and alert service gives a personalized experience to the user.



Future Extensions

- ❖ Separate Functionality to add Location and Room Directly from the UI instead of manual entry to the Database.
- ❖ Optimize the Admin Dashboard such that all the admins can have synced data on their respective dashboard.
- ❖ Expand to create functionality where the command line instructions can be executed from a click of a button.



Bibliography

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Stack Overflow :- <https://stackoverflow.com/>

GitHub :- <https://github.com/>

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Thank You