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Table of Contents

Table of Contents	2
List of Tables	6
List of Figures	8
Definitions, Acronyms, and Abbreviations.....	11
A. Introduction.....	12
1. Project Information.....	12
2. Introduction	12
3. Current Situation.....	12
4. Problem Definition	12
5. Proposed Solution	13
5.1. Feature functions.....	13
5.2. Advantages and disadvantages	14
6. Functional Requirements	14
7. Roles and Responsibility	15
B. Software Project Management Plan	16
1. Problem Definition	16
1.1. Name of this Capstone Project	16
1.2. Problem Abstract.....	16
1.3. Project Overview	16
2. Project organization.....	19
2.1. Software Process Model.....	19
2.2. Roles and responsibilities	19
2.3. Tools and Techniques	20
3. Project Management Plan	20
3.1. Software development life cycle.....	20
3.2. Phase Detail	21
3.3. All Meeting Minutes.....	22
4. Coding Convention	22
C. Software Requirement Specification.....	24
1. User Requirement Specification.....	24
1.1. Shift Head requirement.....	24
1.2. Staff requirement	24

1.3.	Shift Manager requirement	25
1.4.	Customer requirement.....	25
2.	System Requirement Specification	25
2.1.	External Interface Requirement.....	25
2.2.	System Overview Use Case	26
2.3.	List of Use Case.....	27
3.	Software System Attribute	96
3.1.	Usability	96
3.2.	Reliability.....	96
3.3.	Availability	96
3.4.	Security.....	96
3.5.	Maintainability	96
3.6.	Portability.....	97
3.7.	Performance	97
4.	Conceptual Diagram.....	98
D.	Software Design Description.....	100
1.	Design Overview	100
2.	System Architecture Design.....	100
3.	Component Diagram.....	101
4.	Detailed Description	102
4.1.	Class Diagram	102
4.2.	Class Diagram Explanation.....	104
4.3.	Interactive Diagram.....	111
5.	User Interface Design	130
5.1.	User Login	130
5.2.	View List Racks and Locations	131
5.3.	View List IP Addresses	131
5.4.	Add new rack	132
5.5.	Add IP Address	133
5.6.	View Schedule.....	134
5.7.	View Report Block IP	135
5.8.	Add New Staff.....	136
5.9.	Request Add Server	136
5.10.	Add Server Information	137

5.11.	Request Return IP	138
5.12.	Request Return Rack.....	139
5.13.	View List Requests.....	140
5.14.	View List Servers.....	141
5.15.	Request Add Server Info.....	141
5.16.	Request Change IP Info	142
5.17.	Request Rent Rack Info	143
5.18.	View Server Detail.....	143
6.	Database Design	144
6.1	Entity relationship diagram	144
6.2.	Entity Dictionary.....	145
7.	Algorithms	145
7.1	Generate AssignedShift.....	145
7.2	Generate IP Address Range	146
7.3	Find list of available Racks.....	148
7.4	State machine diagram for Request Offline Status	150
7.5	State machine diagram for Request Online Status	150
7.6	State machine diagram for Task Status	150
7.7	State machine diagram for Server Status.....	151
E.	番 5 のレポート。システムの展開とテスト	151
1.	はじめに.....	151
1.1	概要	151
1.2	テストアプローチ	151
2.	データベース関係ダイアグラム.....	151
2.1	ウェブアプリケーション物理的なダイアグラム.....	151
2.2	ウェブアプリケーションデータ辞書	153
3.	パフォーマンス対策	159
3.1	情報検索のパフォーマンス	159
3.2	メールを送信するパフォーマンス	159
3.3	IP アドレスを生成するパフォーマンス	159

4.	テスト計画.....	159
4.1	テストする機能.....	160
4.2	テストされない機能.....	161
5.	システムテストのテストケース.....	161
5.1	ウェブシステムのテストケース.....	161
F.	番 6 のレポート。ソフトウェアユーザーズマニュアル.....	185
1.	インストレーションガイド.....	185
1.1.	サーバ側で環境を設定	185
1.2.	サーバ側で展開	185
2.	ユーザーガイド	191
2.1.	“Add Server”のリクエストを作成する	191
2.2.	“Add Server”のリクエストをプロセスする	192
2.3.	IP アドレスを割り当てる	193
2.4.	位置を割り当てる	193
2.5.	手作りをエクスポートする	194
2.6.	スタッフにタスクを割り当てる.....	194
2.7.	タスクを再割り当てる	194
2.8.	IP アドレスを追加する.....	196
2.9.	IP アドレスをブロックする.....	197
2.10.	ブロックした IP アドレスのレポートを見る.....	197
2.11.	スケジュールを見る	198
2.12.	通知が出る	199
G.	Appendix	200

List of Tables

Table 1: Definitions, Acronyms, and Abbreviations	11
Table 2: Roles and Responsibility.....	15
Table 3: Hardware requirement for client	18
Table 4: Hardware requirement for server	18
Table 5 : Software requirement.....	19
Table 6: Roles and responsibilities.....	20
Table 7: Software development life cycle	21
Table 8: Phase 1 – Requirement Analysis.....	21
Table 9: Phase 2 - Design.....	22
Table 10: Phase 3 - Implementation.....	22
Table 11: Phase 4 - Testing.....	22
Table 12: Phase 5 - Maintenance.....	22
Table 13: Use case IMS001 - <Shift Head> View request detail.....	29
Table 14: Use case IMS002 - <Shift Head> Accept request “Add Server”	31
Table 15: Use case IMS005 - <Shift Head> Accept request “Change IP Address”	33
Table 16: Use case IMS009 - <Shift Head> Process request “Add Server”	35
Table 17: Use case IMS010 - <Shift Head> Process request “Bring Server Away”	36
Table 18: Use case IMS011 - <Shift Head> Process request “Assign IP Address”	39
Table 19: Use case IMS012 - <Shift Head> Process request “Change IP Address”	40
Table 20: Use case IMS013 - <Shift Head> Process request “Return IP Address”	42
Table 21: Use case IMS014 - <Shift Head> Process request “Rent Rack”	44
Table 22: Use case IMS015 - <Shift Head> Process request “Return Rack”	45
Table 23: Use case IMS016 - <Shift Head> Reject request “Add Server”	47
Table 24: Use case IMS020 - <Shift Head> Reject request “Return IP Address”	49
Table 25: Use case IMS022 - <Shift Head> Reject request “Return Rack”	51
Table 26: Use case IMS024 - <Shift Head> Reassign task.....	53
Table 27: Use case IMS025 - <Shift Head> View daily schedule.....	55
Table 28: Use case IMS026 - <Shift Head> Write note	56
Table 29: Use case IMS028 - <Shift Head> Change server location.....	58
Table 30: Use case IMS035 - <Shift Head> Receive notification.....	60
Table 31: Use case IMS036 - <Shift Head> View report Blocked IP Address	61
Table 32: Use case IMS057 - <Staff> Add IP Address.....	65
Table 33: Use case IMS058 - <Staff> Block IP Address.....	66
Table 34: Use case IMS059 - <Staff> Unblock IP Address	68
Table 35: Use case IMS060 - <Staff> View list location.....	69
Table 36: Use case IMS061 - <Staff> Add rack.....	70
Table 37: Use case IMS064 - <Staff> View list task.....	72
Table 38: Use case IMS065 - <Staff> Accept task.....	73
Table 39: Use case IMS066 - <Staff> Confirm task status.....	74
Table 40: Use case IMS068 - <Customer> View Request History	76
Table 41: Use case IMS069 - <Customer> Create request “Add Server”	78
Table 42: Use case IMS070 - <Customer> Create request “Bring Server Away”	80

Table 43: Use case IMS073 - <Customer> Create request “Return IP Address”	82
Table 44: Use case IMS075 - <Customer> Create request “Return Rack”	83
Table 45: Use case IMS076 - <Customer> Cancel request “Add Server”	85
Table 46: Use case IMS080 - <Customer> Cancel request “Return IP Address”	87
Table 47: Use case IMS082 - <Customer> Cancel request “Return Rack”	89
Table 48: Use case IMS084 - <Customer> View rented rack.....	90
Table 49: Use case IMS088 - <Shift Manager> Add staff.....	92
Table 50: Use case IMS089 - <Shift Manager> Update staff.....	94
Table 51: Use case IMS094 - <Authenticated User> Reset password.....	96
Table 52: Data dictionary.....	99
Table 53: Component Dictionary	102
Table 54 : Entity dictionary.....	145
Table 55 : ウエブデータ・ディクショナリ	153
Table 56: ウエブ属性データディクショナリ.....	159

List of Figures

Figure 1: Sashimi Waterfall Model	19
Figure 2: System Overview Use Case.....	26
Figure 3: <Shift Head> Overview Use Case	27
Figure 4: <Shift Head> View request detail	28
Figure 5: <Shift Head> Accept request “Add Server”	29
Figure 6: <Shift Head> Accept request “Change IP Address”	31
Figure 7: <Shift Head> Process request “Add Server”	33
Figure 8: <Shift Head> Process request “Bring Server Away”	35
Figure 9: <Shift Head> Process request “Assign IP Address”	37
Figure 10: <Shift Head> Process request “Change IP Address”	39
Figure 11: <Shift Head> Process request “Return IP Address”	41
Figure 12: <Shift Head> Process request “Rent Rack”.....	42
Figure 13: <Shift Head> Process request “Return Rack”	44
Figure 14: <Shift Head> Reject request “Add Server”	46
Figure 15: <Shift Head> Reject request “Assign IP Address”	48
Figure 16: <Shift Head> Reject request “Return Rack”	50
Figure 17: <Shift Head> Reassign task	52
Figure 18: <Shift Head> View daily schedule.....	54
Figure 19: <Shift Head> Write note	55
Figure 20: <Shift Head> Change server location.....	57
Figure 21: <Shift Head> Receive notification.....	59
Figure 22: <Shift Head> View report Blocked IP Address	60
Figure 23: <Staff> Overview Use Case	62
Figure 24: <Staff> Add IP Address.....	64
Figure 25: <Staff> Block IP Address.....	65
Figure 26: <Staff> Unblock IP Address	67
Figure 27: <Staff> View list location	68
Figure 28: <Staff> Add rack.....	69
Figure 29: <Staff> View list task.....	71
Figure 30: <Staff> Accept task.....	72
Figure 31: <Staff> Confirm task status	73
Figure 32: <Customer> Overview Use Case	75
Figure 33: <Customer> View Request History	75
Figure 34: <Customer> Create request “Add Server”	76
Figure 35: <Customer> Create request “Bring Server Away”	79
Figure 36: <Customer> Create request “Return IP Address”	81
Figure 37: <Customer> Create request “Return Rack”	82
Figure 38: <Customer> Cancel request “Add server”	84
Figure 39: <Customer> Cancel request “Return IP Address”	86
Figure 40: <Customer> Cancel request “Return Rack”	88
Figure 41: <Customer> View rented rack.....	89
Figure 42: <Shift Manager> Overview Use Case	90

Figure 43: <Shift Manager> Add Staff	91
Figure 44: <Shift Manager> Update Staff	93
Figure 45: <Authenticated User> Overview Use Case	94
Figure 46: <Authenticaed User> Reset password	95
Figure 47: Conceptual Diagram	98
Figure 48: System architecture design	100
Figure 49 : Component Diagram	101
Figure 50 : Class Diagram	103
Figure 51: Sequence Diagram <Customer> Create request “Add Server”	111
Figure 52: Sequence Diagram <Customer> Cancel request “Add Server”	112
Figure 53: Sequence Diagram <Customer> Create request “Return IP Address”	113
Figure 54: Sequence Diagram <Customer> Create request “Rent Rack”	114
Figure 55: Sequence Diagram<Shift Head> Complete request “Add Server”	116
Figure 56: Sequence Diagram <Shift Head> Complete request “Change IP Address”	117
Figure 57: Sequence Diagram <Shift Head> Complete request “Rent Rack”	118
Figure 58: Sequence Diagram <Shift Head> Reject request “Assign IP Address”	119
Figure 59: Sequence Diagram <Shift Head> Reject request “Add Server”	120
Figure 60: Sequence Diagram <Shift Head> Reassign task	121
Figure 61: Sequence Diagram <Shift Head> Write note	122
Figure 62: Sequence Diagram <Shift Head> Add New IP	123
Figure 63: Sequence Diagram <Shift Head> Add New Rack	124
Figure 64: Sequence Diagram <Shift Head> Export Procedure	125
Figure 65: Sequence Diagram <Shift Head> Block IP	126
Figure 66: Sequence Diagram <Shift Manger> Add New Staff	127
Figure 67: Sequence Diagram <Shift Manger> Deactivate Account	128
Figure 68: Sequence Diagram <Shift Manger> Edit Staff Profile	129
Figure 69 : Entity relationship diagram	144
Figure 70: Flowchart of Generate IP Address Range	146
Figure 71: Flowchart of Generate IP Address Range	147
Figure 72: Flowchart of Find list of available Racks	149
Figure 73: State Machine Diagram for Request Offline Status	150
Figure 74: State Machine Diagram for Request Online Status	150
Figure 75: State Machine Diagram for Staff Status	150
Figure 76: State Machine Diagram for Server Status	151
Figure 77: ウェブサイトアプリケーション物理的なダイアグラム	152
Figure 78: 「カスタマー」新しいサーバーを追加するリクエスト送信	162
Figure 79: 「カスタマー」ラックを復帰するリクエスト送信	162
Figure 80: 「カスタマー」IP アドレスを変更するリクエストをキャンセル	163
Figure 81: 「人員」新しい IP アドレスを追加	163
Figure 82: 「人員」新しいラックを追加	163
Figure 83: 「人員」新しいサーバーを追加するリクエストを承認	164

Figure 84: 「人員」ラックを借りるリクエストを拒否	164
Figure 85: 「人員」サーバーの位置を変更.....	165
Figure 86: 「人員」IP アドレスを割り当てるリクエストを承認.....	165
Figure 87: 「管理」新しいスタッフを追加	165
Figure 88: デプロイメントパッケージの準備	186
Figure 89: 「Internet Information System」 1.....	187
Figure 90: 「Internet Information System」 2.....	187
Figure 91: 「Internet Information System」 3.....	188
Figure 92: 「Internet Information System」 4.....	188
Figure 93: サーバのウェバー・アプリケーションをデプロイ。	189
Figure 94: 「Add Website」 1	189
Figure 95: 「Add Website」 2	190
Figure 96: “Add Server“のリクエストを作成する	191
Figure 97: “Add Server“のきる工スとをプロセスする.....	192
Figure 98: IP アドレスを割り当てる.....	193
Figure 99: 位置を割り当てる	193
Figure 100: スタッフにタスクを割り当てる	194
Figure 101: ラックを追加する	195
Figure 102: IP アドレスを追加する	196
Figure 103: IP アドレスをブロックする	197
Figure 104: ブロックした IP アドレスのレポートを見る	197
Figure 105: スケジュールを見る.....	198

Definitions, Acronyms, and Abbreviations

Name	Definition
IMS	Information Management System

Table 1: Definitions, Acronyms, and Abbreviations

A. Introduction

1. Project Information

- Project name: **Build an Information Management System for a datacenter**
- Project Code: **IMS**
- Product Type: **Web Application**
- Start Date: **4th January, 2016**
- End Date: **25th April, 2016**

2. Introduction

In the “Information technology age”, the need of using servers as data storage, hosting website or even to archive useful softwares. Normally, people prefer rental server or entrusting their servers in datacenter. One of the reasons is because the cost to buy and maintain server is so expensive, and other related matters such as space, power, cooling, bandwidth, and physical security (copy data, computer burglary, ...). In order to cut down amount of expenses, the individuals or companies often entrust their servers or rent servers at the prestigious datacenter.

Datacenter is the place that has good condition to run and maintain server. In current situation, some datacenters are still facing many difficulties. For instance, customer information, sever configuration or IP address mostly managed by Excel or Word. It causes a lot of time and efforts not only for staff in datacenter, but also the customer.

3. Current Situation

Management of a huge system as datacenter is really a big deal. There are not only 24/24 server monitoring, but also manage and maintain other infrastructure such as network, temperature, cables and so on. Manually managing will take a lot of time and efforts, even more human errors. It will be annoying to customer if their server information is tracked incorrectly. They would be in trouble with lots of nonsensical procedure. Or when IP address of a server is changed, staff has to find the server's location to change the IP tag on it. It must take time to find the location even in a small datacenter.

4. Problem Definition

Below are disadvantages of current situation:

- Customer-related and server-related information can be lost.
- Must have a large storage to save information.
- Waste lots of time of datacenter's staff and customers.
- Waste lots of efforts of datacenter's staff and customers.
- Sometimes cause conflict between datacenter's staff and customers.
- Cause dissatisfaction to the customers when they use datacenter's service.

- Very difficult to manage information when too many servers are entrusted.
- Unprofessional process, losing trust with customers.
- Need many staff to manage.

5. Proposed Solution

The solution of these problems is to build a website named “Information Management System for a datacenter”. This website can help the staff of datacenter to search and handle customer information, server information, server placement, and IP address allocation faster and easier. Information can be stored and accessed quickly and safely.

IMS has following functions:

5.1. Feature functions

- **Create request:**
 - Customer can send request for their need instead of contacting by phone.
 - Request status will be tracked and notified by both email and the IMS system.
 - Customer can manage his current and old requests by the system.
 - Customer also can observe his servers and rental IP addresses, racks.
- **Customer information management:**
 - Only shift manager can create and update customer's information. If customer stops using data center's service, shift manager will deactivate his account.
- **Server information management:**
 - Customer can be able to view their server's information and related information such as IP addresses or location just in one page.
 - Staff and customer can easily find server and its current status.
- **Server location management:**
 - Staff can add rack (where server is placed, a rack has 42 locations) to the system.
 - Staff can change server location if necessary.
 - By searching for server, its current location will be showed to help staff find the physical server faster.
 - The system also reminds staff whether server can be placed in a particular rack.
- **IP address management:**
 - Staff can add new range of IP address into the system.
 - They also can block or unblock IP address if necessary.
 - Search available/unavailable IP address quickly.
- **Blocked IP address report**
 - This system can help staff to create report of blocked IP address.
- **Task assignment:**
 - Shift head can assign task (process request) to another staff if he's busy.

- Staff will confirm his work afterwards.

5.2. Advantages and disadvantages

- Advantages:
 - Support staff managing information easier and faster, save time and reduce effort of staff.
 - Customer can view information of their servers immediately by this system.
 - Reduce conflicts, satisfy customer by meeting their need.
 - Avoid mistakes by human as much as possible.
 - Can create report to make a fast decision.
- Disadvantages:
 - Initially, it takes time to input information into the system.
 - The staff must spend time to learn how to use the system and practice to use expertly.
 - A few problems can be happen and the system cannot cover all of the functions.

6. Functional Requirements

- a. Manage customer information:
 - i. Add/Update/Active or Deactivate customer information
 - ii. Record time customer go into datacenter
- b. Manage server information:
 - i. Add/Edit/Search/Delete configuration of a server
 - ii. Record history of a server: carry on/out server room
 - iii. Create report of server delivery
 - iv. Record time server which was upgraded configuration.
- c. Manage placement of server:
 - i. Add/ Update/ Search/ Delete location of server on a rack
 - ii. Add network configuration of server
 - iii. Record time server is moved from a rack to a rack
 - iv. Create report of server moving.
- d. Manage IP address allocation:
 - i. Add new IP address
 - ii. Update usage status of IP address
 - iii. Record IP address assigned to server. IP assignment can be done manually or automatically
 - iv. Search available/ unavailable IP addresses
- e. Report usage history of IP address.

- i. Report blocked IP address
- ii. Report free IP address
- iii. Statistic IP addresses being used by customers

7. Roles and Responsibility

No	Full Name	Role	Position	Contact
1	Ngô Đăng Hà An	Project Manager	Supervisor	anndh@fpt.edu.vn
2	Lê Thị Thu Hà	Developer	Leader	halttse60943@fpt.edu.vn
3	Huỳnh Lâm Hà Tiên	Developer	Member	tienhlhse60932@fpt.edu.vn
4	Cao Hồng Nam – Dropped out	Developer	Member	namchse61061@fpt.edu.vn
5	Huỳnh Hiếu Bảo – Dropped out	Developer	Member	baohhse60708@fpt.edu.vn

Table 2: Roles and Responsibility

B. Software Project Management Plan

1. Problem Definition

1.1. Name of this Capstone Project

- **Official name:** Build an Information Management System for a datacenter
- **Vietnamese name:** Xây dựng hệ thống quản lý thông tin của một trung tâm dữ liệu
- **Abbreviation:** IMS

1.2. Problem Abstract

In current situation, the information management system of several small-scale data centres are still facing some problems. In the scope of this project, we focus on QTSC datacenter in Quang Trung software park. Almost processes are being handled manually with Excel, Word, etc. Therefore, the staff of data centre has to spend a lot of time and efforts to manage customer information, server configuration, server location, IP address and so on. In addition, this is easy to cause a loss of data, affect to customer satisfaction and reduce work performance.

To overcome these problems, we provide a convenient system for the data centre. Firstly, this system helps staff to manage information easier, work faster and enhance the accuracy. Secondly, it helps the admin of data centre to manage staff, tracking several activities of data centre. Finally, it helps customers to have an usable interface to manage their server information and interact with the centre easier.

1.3. Project Overview

1.3.1. Current Situation

Below are the problems encountered in this project:

- **Depend on an existed data centre:** In developing time, we must contact to this datacenter to study about their workplace, how they are working and rules in datacenter. From that, understand their problems and find the best solution for them.
- **Knowledge about network configuration:** To deal with function named “Add network configuration of server”, the members of teams have to spend time to research about network configuration.
- **Testing:** hardly to test cover all of the cases which can happen, must list as many as possible test cases.
- **Absent of team members:** team members get sick or unexpected problems. Working time and learning time are different among members.

- **Ability of team members:** working abilities are different among members. Therefore, the leader must know about the ability of each member and assign task appropriately.

1.3.2. The Proposed System

From current issues, combined with research results in datacenter at QTSC, we create a system which is user-friendly and strictly designed to avoid as many errors as possible. It must support the most needs in information management and provide reports and logs of all basic activities or changes which take place at datacenter.

1.3.2.1. Customer information

- Shift manager can add/update customer information.
- Shift manager can active/ deactivate customer account.
- Customer can send request to go into datacenter and shift head or staff will response their request

1.3.2.2. Server information

- Staff can add/edit/search/delete configuration of a server.
- Staff can comply with the necessary formalities when a server was carried on/out server room by customer.
- Customers can search and view the information and history of their servers.

1.3.2.3. Server placement

- Staff can add/update/search/delete location of server on a rack.
- Staff can add network configuration of server.
- The system can record time when server is moved from a rack to a rack.
- The system can create report of server moving.

1.3.2.4. IP address location

- Staff can add new IP addresses.
- Staff can update usage status of IP address.
- Staff can comply with the necessary formalities when IP address assigned to server.
- Staff can search available/ unavailable IP addresses.

1.3.2.5. Usage history of IP address

- The system can report blocked IP address.
- The system can report free IP address.
- The system can create statistic IP addresses being used by customers.

1.3.3. Boundaries of the System

- The system could be used by staff and customer with a laptop, PC or MAC.
- The used language of the system is English.
- The complete product includes:
 - The website
 - All the process document involved.

1.3.4. Future Plans

In the future, we plan to use tracking information to create more reports and statistic about customer transaction per day, popular request type and so on. Increase some more request types, for example “Request Bring Server In” and “Request Bring Server Out”.

1.3.5. Development Environment

1.3.5.1. Hardware requirement

For client:

Hardware	Minimum Requirements	Recommended
Operating System	Windows 7	Windows 7, 8, 10
Computer Processor	Intel® Core 2(TM) i3 CPU M370 @2.4GHz 3.39GHz	Intel® Core(TM) i5-2410M CPU @ 2.30GHz
Computer Memory	2GB RAM	4GB or more
Internet Connection	Cable, Wi-Fi (2 Mbps)	Cable, Wi-Fi (12 Mbps)

Table 3: Hardware requirement for client

For server:

Hardware	Minimum Requirements	Recommended
Operating System	Window Server 2008	Window Server 2008
Computer Processor	CPU Intel Xeon E3 2.0GHz	2.0 GHz CPU 6 core E5-2620
Computer Memory	2 GB RAM DDR3	4 GB RAM DDR2
HDD	100 GB HDD Raid 0,1	500 GB HDD Raid 0,1
Bandwidth	300Mbps	500Mbps
International bandwidth	2Mbps	10Mbps

Table 4: Hardware requirement for server

1.3.5.2. Software requirement

Software	Name / Version
Operating system	Windows 7 or above
Modeling tool	StartUML, Gliffy
DBMS	SQL Server 2012
Source control	GitHub, Source Tree 1.7.0.32509
Web browser	Google Chrome

Team Collaboration	Slack
Issues and Task Management	GitHub and Trello
Implement web-application	Visual Studio 2015

Table 5 : Software requirement

2. Project organization

2.1. Software Process Model

Project is developed under Sashimi Waterfall Model.

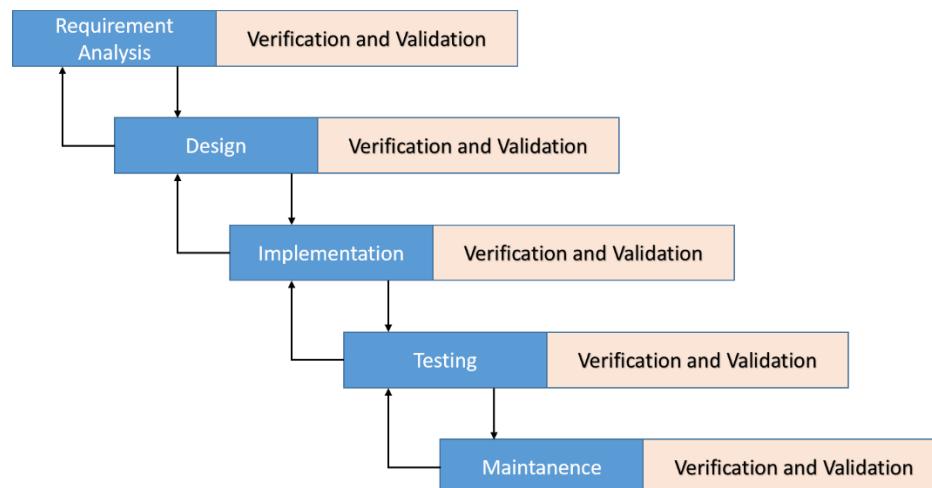


Figure 1: Sashimi Waterfall Model

For more information: <http://www.waterfall-model.com/sashimi-waterfall-model/>

The purpose of applying Sashimi Waterfall model for IMS-datacenter is because of:

- Requirements of the project may be made clearly and difficult to change.
- In current phrase, if the error which in previous phrase or the update occur, we can return and fix it.

2.2. Roles and responsibilities

No	Full name	Role in Group	Responsibilities
1	Ngo Dang Ha An	Project manager	<ul style="list-style-type: none"> • Specify user requirement • Control the development process • Give out technique and business analysis support
2	Le Thi Thu Ha	Team Leader, BA, DEV, Tester	<ul style="list-style-type: none"> • Managing process • Designing database • Clarifying requirements • Prepare documents • GUI Design

			<ul style="list-style-type: none"> • Create test plan • Coding • Testing
3	Huynh Lam Ha Tien	Team Member, BA, DEV, Tester	<ul style="list-style-type: none"> • Designing database • Clarifying requirements • Prepare documents • GUI Design • Create test plan • Coding • Testing

Table 6: Roles and responsibilities

2.3. Tools and Techniques

- Front-end technologies: HTML5, CSS3, JavaScript, jQuery
- Application is built on .NET platform.
- Web Server: Microsoft IIS version 7.
- Database Management System: MS SQL Server 2012

3. Project Management Plan

3.1. Software development life cycle

Phase	Description	Deliverables	Resource needed	Dependencies and Constrains	Risks
Requirement Analysis	- Collect requirements base on user's behaviours - Identify and clarify requirements for the system in general	- Introduction of project - Software requirement specification - Project task plan - Prototypes	40 man-days	N/A	- Missing requirement - Unclear scope - Not have a clear understanding about business process
Design	- Design system Architecture - Design component Diagram, conceptual diagram - Detail design	- Software design description - Technology notes	60 man-days	Depend on "Requirement Analysis"	- Lack of experience - Not full fill requirements
Implementation	- Implement physical database - Coding system core	- Physical database diagram - Main user's functions on	80 man-days	Depend on "Design"	- Lack of experience - Human mistake

	functions and other feature with GUI - Unit test	website			
Testing	- Write test case - Do Integration test the system test - Do Alpha test - Correct bugs - Beta test - Acceptance test	- Test document	40 man-days	Depend on "Implementation"	- Lack of experience - Missing test case
Maintenance	- Deploy on sever	- Installation guide - User Manual	20 man-days	Depend on "Testing"	- Lack of experience

Table 7: Software development life cycle

3.2. Phase Detail

3.2.1. Phase 1: Requirement Analysis

Task	Description	Author
1. Collect requirements	- Analysis real user's behaviours - Find which systems currently provide similar service, their strengths and weaknesses	HaLTT, TienHLH
2. Identify and clarify main functions	- Define which main functions system should provide	HaLTT, TienHLH
3. Create System Introduction	- Create Introduction Report.	HaLTT, TienHLH
4. Software Project Management Plan	- Create Project Management Plan	HaLTT, TienHLH
5. Prototype	- Build a prototype of propose website	TienHLH
6. SRS	- Create SRS document	HaLTT, TienHLH

Table 8: Phase 1 – Requirement Analysis

3.2.2. Phase 2: Design

Task	Description	Author
1.Design system Architecture	- Design system architecture - Design component diagram	HaLTT, TienHLH
2. Database Design	- Based on parsed data to recommendation - Based on other needs to recommendation	HaLTT, TienHLH
3.Detail design	- Design for each function	HaLTT, TienHLH
4. Technology research	- Note some technology will be applied in project	HaLTT

5. Design Document	- Create software design document	HaLTT, TienHLH
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Table 9: Phase 2 - Design

3.2.3. Phase 3: Implementation

Task	Description	Author
1. Physical database	- Implement physical database	HaLTT
2. Front-end web functions	- Implement front-end functions on web	HaLTT, TienHLH
3. Back-end web functions	- Implement back-end functions on web	HaLTT, TienHLH
4. Unit testing	- Write test case and testing for web functions	HaLTT, TienHLH

Table 10: Phase 3 - Implementation

3.2.4. Phase 4: Testing

Task	Description	Author
1. Integration testing	- Write test case and testing Modules	HaLTT, TienHLH
2. System testing	- Write test case and testing System	HaLTT, TienHLH
2. Alpha testing	- Do alpha test with customer	HaLTT, TienHLH

Table 11: Phase 4 - Testing

3.2.5. Phase 5: Maintenance

Task	Description	Author
1. Installation guide	- Write installation guide	HaLTT, TienHLH
2. User manual	- Write user manual	HaLTT, TienHLH

Table 12: Phase 5 - Maintenance

3.3. All Meeting Minutes

Refer to "Meeting minutes" folder.

4. Coding Convention

Using C# language to develop website:

- Naming Convention:
 - Using Camel Case for method arguments and local variables.
 - Using Pascal Case for class names and method names.
 - Layout Convention:
- Write only one statement per line.
 - Write only one declaration per line.
 - If continuation lines are not indented automatically, indent them one tab stop (four spaces).
 - Add at least one blank line between method definitions and property definitions.

- Use parentheses to make clauses in an expression apparent, as shown in the following code
- Commenting Convention:
 - Place the comment on a separate line, not at the end of a line of code.
 - Begin comment text with an uppercase letter.
 - End comment text with a period.
 - Insert one space between the comment delimiter (//) and the comment text, as shown in the following example.

Ex: // Here is your comment.

- Do not create formatted blocks of asterisks around comments.

Using C# Coding Convention from:

<https://msdn.microsoft.com/en-us/library/ff926074.aspx>

C. Software Requirement Specification

1. User Requirement Specification

1.1. Shift Head requirement

- A group has one shift head and two staff. Shift head has higher authority of using the system than staff. Shift head can use the following functions:
 - o View request detail
 - o Accept request
 - o Process request
 - o Reject request
 - o View server detail
 - o View IP Address
 - o View list location
 - o View report
 - o View daily schedule
 - o Add IP Address
 - o Add rack
 - o Change server's location
 - o Receive notification (customer's request status, unfinished task)
 - o Export procedure
 - o Assign task
 - o Reassign task
 - o Write note about "Pending" and "Processing" requests
 - o View profile
 - o Change password

1.2. Staff requirement

- Staff is a person who supports shift head to observe data centre's information. Staff can only view data and be able to process a request if assigned. These are some functions staff can use:
 - o View request detail
 - o Process request (if assigned)
 - o Reject request (if assigned)
 - o View server detail
 - o View IP Address
 - o View list location
 - o View report
 - o View daily schedule
 - o Add IP Address
 - o Add rack
 - o Change server's location

- Receive task
- Export procedure (if assigned)
- View profile
- Change password

1.3. Shift Manager requirement

- There's only one manager who takes charge in managing this system. He is super user who can use more functions than shift head as below:
 - Create customer account
 - Update customer account
 - Create staff account
 - Update staff account
 - Deactivate account
 - Configure system

1.4. Customer requirement

- Customer is a person who owns servers and want to keep it in a good condition. Customer interacts with the system when he wants to make a request or observe his server's information. With customer role, the system will support some functions as below:
 - Create request "Add server", "Bring Server Away", "Assign IP Address", "Change IP Address", "Return IP Address", "Rent Rack", "Return Rack"
 - Cancel request
 - View request history
 - View his server's information
 - View his rented racks
 - View profile
 - Change password

2. System Requirement Specification

2.1. External Interface Requirement

2.1.1. User interface

- General requirement for graphics user interface of website is the GUI should be simple, clear, intuitive, and reminiscent.
- Some design principle will be taken into consideration:
 - + UI for business web applications - Janko Jovanovic [Ref: Appendix 1]
 - + Ten principles of effective web design – Vitaly Friedman [Ref: Appendix 2]

2.1.2. Hardware Interface

- N/A

2.1.3. Software Interface

- Chromes (version 41.0.2272.118), Firefox (version 37.0.1) with resolution (1024 x 768) or bigger and must support JavaScript and HTML5.

2.1.4. Communication Protocol

- Using HTTP/HTTPS and SMTP protocol.

2.2. System Overview Use Case

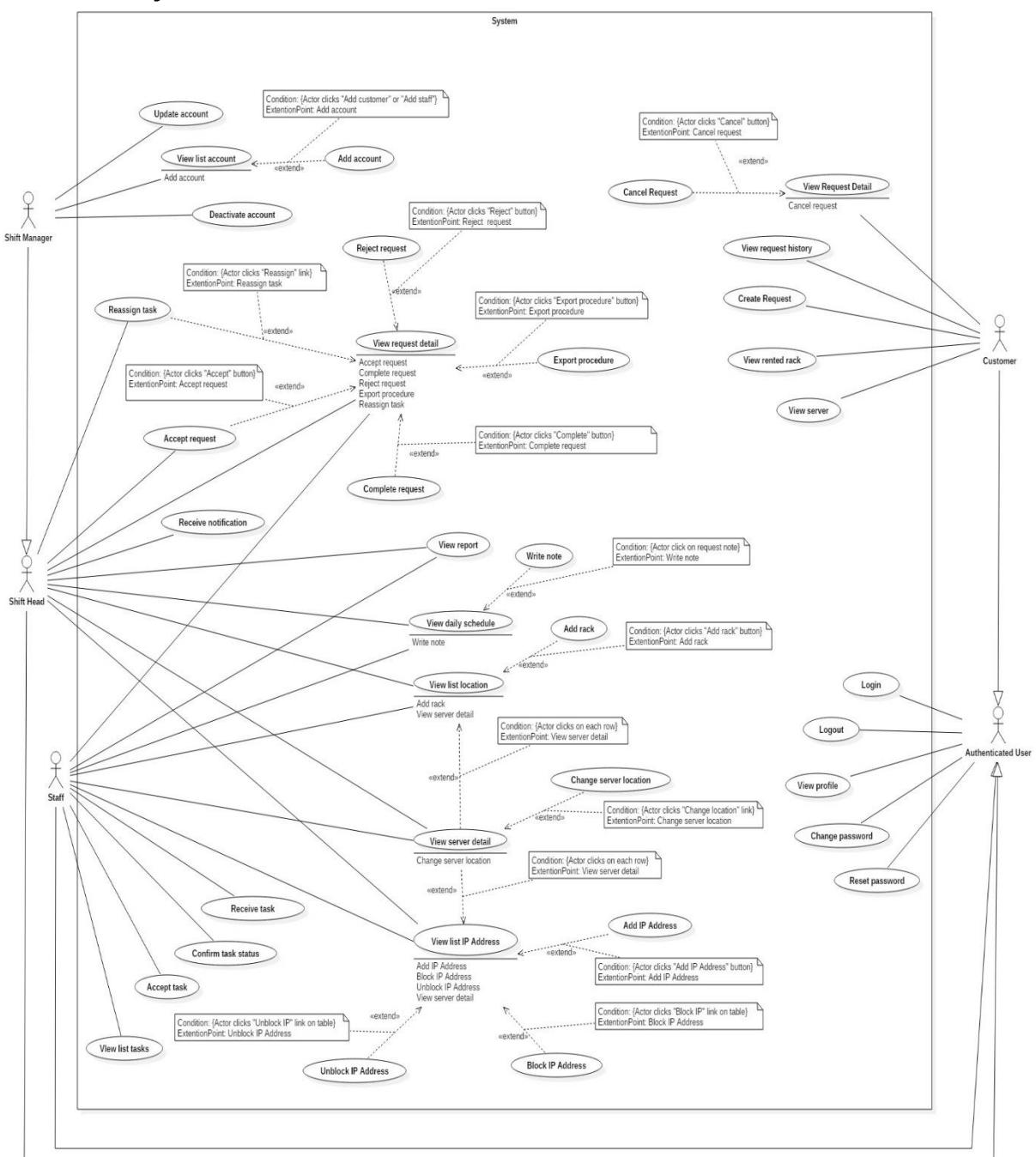


Figure 2: System Overview Use Case

2.3. List of Use Case

2.3.1. <Shift Head> Overview Use Case

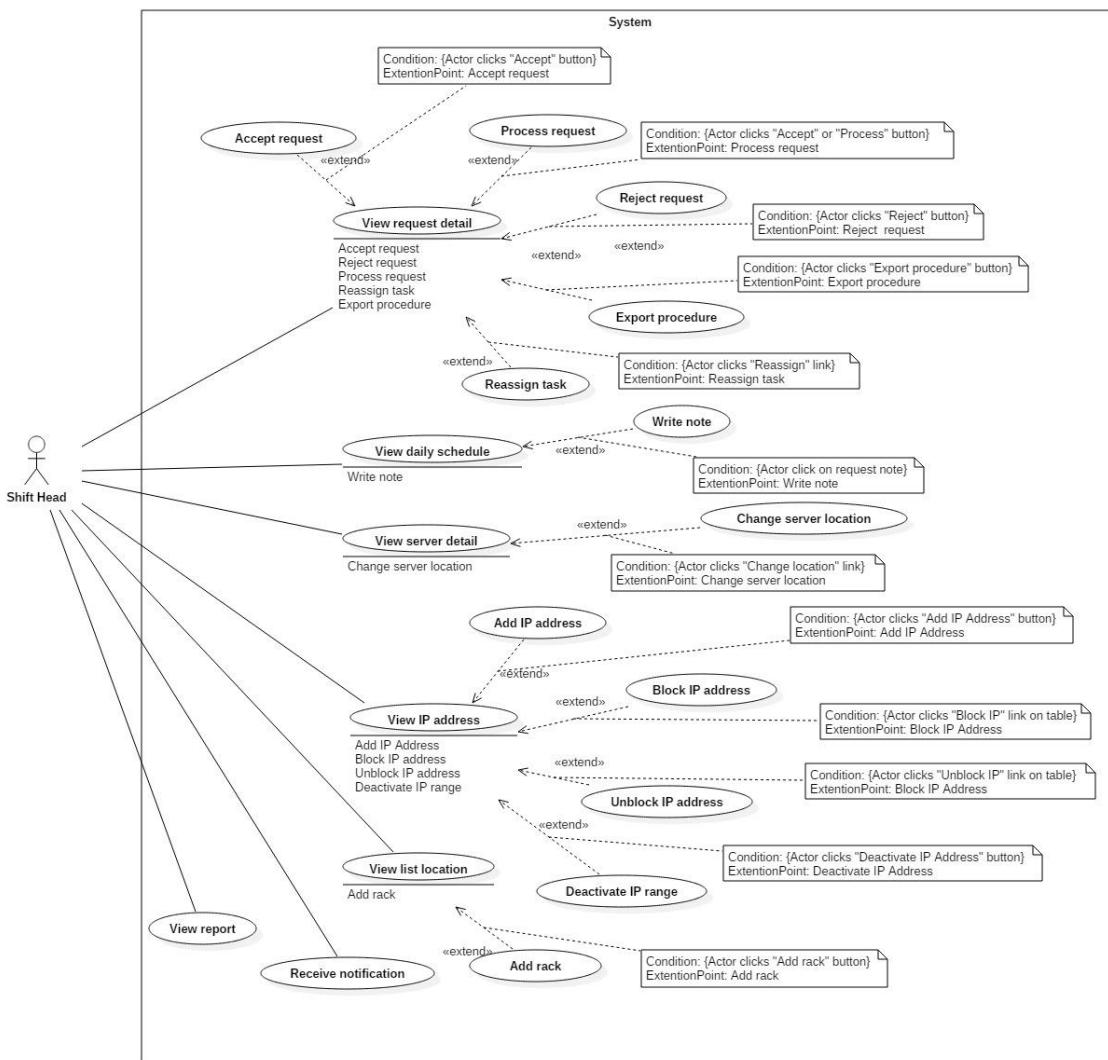


Figure 3: <Shift Head> Overview Use Case

2.3.1.1. <Shift Head> View request detail

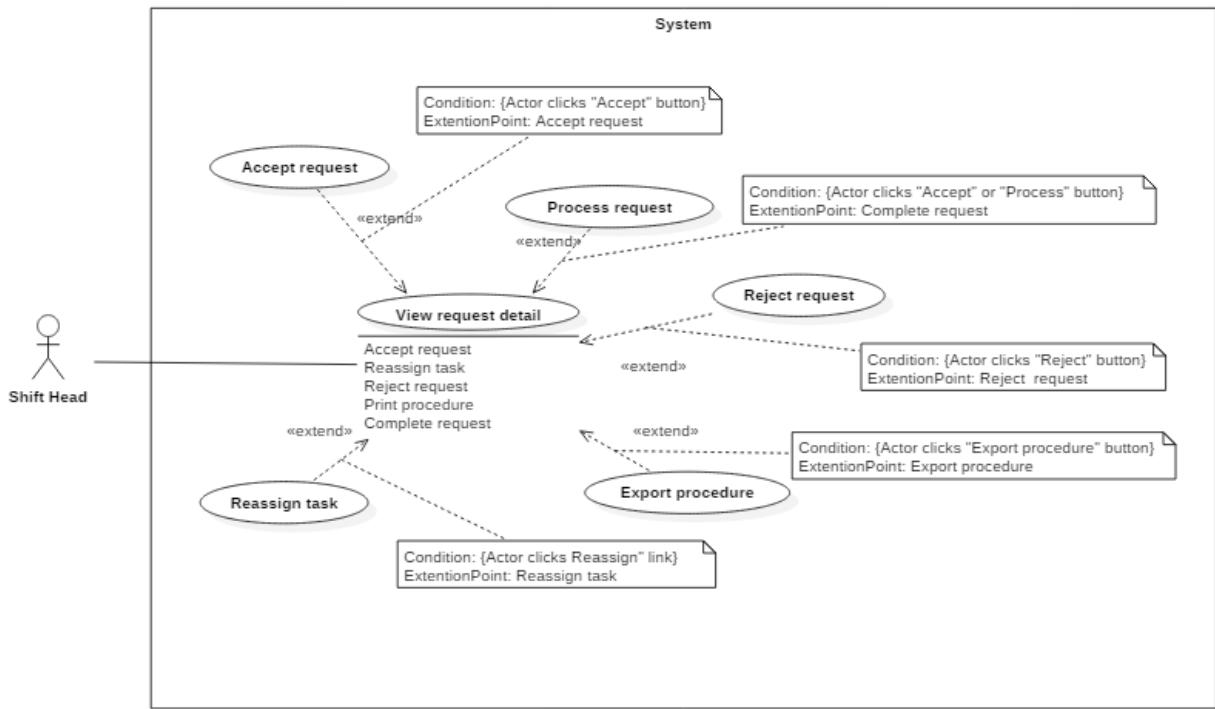


Figure 4: <Shift Head> View request detail

USE CASE – IMS001			
Use Case No.	IMS001	Use Case Version	2.0
Use Case Name	View request detail		
Author	Lê Thị Thu Hà		
Date	18/01/2016	Priority	Normal
Actor:	<ul style="list-style-type: none"> - Shift Head 		
Summary:	<ul style="list-style-type: none"> - This use case allows Shift Head to view request detail. 		
Goal:	<ul style="list-style-type: none"> - Shift Head can access to appropriate request detail. 		
Triggers:	<ul style="list-style-type: none"> - Shift head clicks view notification or “Request” in sidebar. 		
Precondition:	<ul style="list-style-type: none"> - The Shift Head must login to the system with Shift Head role at his shift. 		
Post Conditions:	<ul style="list-style-type: none"> - Success: Shift Head can view request detail - Fail: Nothing will be created. Show message error with specified content. 		
Main Success Scenario:			
Step	Actor Action	System Response	
1	Shift head clicks on notification in header	Navigate to appropriate request detail	

Alternative Scenario:

Step	Actor Action	System Response
1	Shift head clicks "Request" tab in sidebar	List of requests will be displayed. New request is placed on the first line of the table
2	Click on request link	Redirect to particular request detail page

Step	Actor Action	System Response
1	Shift head clicks "Server" tab in sidebar	If request has information related to "Server", there's a link of this request displayed in "Action" field.
2	Click on request link	Redirect to particular request detail page

Exceptions: N/A**Relationships:** Extend to Accept request, Process request, Reject request, Export procedure, Reassign task**Business Rules:**

- In "Server" page, link of the request only appeared when this request status is "Pending", "Waiting" and "Processing"

Table 13: Use case IMS001 - <Shift Head> View request detail

2.3.1.2. <Shift Head> Accept request "Add Server"

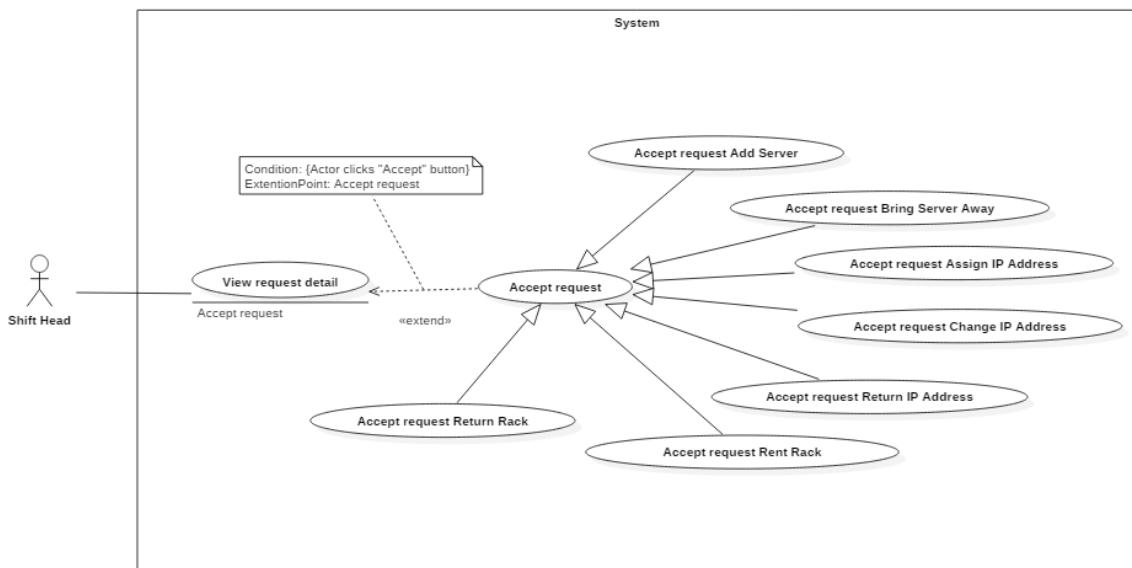


Figure 5: <Shift Head> Accept request "Add Server"

USE CASE – IMS002			
Use Case No.	IMS002	Use Case Version	2.0

Use Case Name	Accept request “Add Server”		
Author	Lê Thị Thu Hà		
Date	19/01/2016	Priority	medium

Actor:

- Shift Head.

Summary:

- This use case allows Shift Head to accept request “Add Server” from customer.

Goal:

- Request status changes from “Pending” to “Waiting”, button “Process” will appear to ready when customer arrives. After “Accept” button is clicked, customer will immediately receive notification from this system and also via email.

Triggers:

- Shift head clicks “Accept” button on request detail page.

Preconditions:

- User logins will Shift Head role.
- Request status is “Pending”.

Post Conditions:

- **Success:** System shows message “Success! You’ve ACCEPTED Request Add Server.”
- **Fail:** System shows error message.

Main Success Scenario:

Step	Actor Action	System Response
1	Shift Head clicks on not-viewed notification on the header panel.	Navigated to “Add Server” request detail page.
2	Shift Head checks request detail and clicks on “Accept” button at the bottom of the page.	<ul style="list-style-type: none"> - System shows message “Success! You’ve ACCEPTED Request Add Server.” - Request status changes to “Waiting” - Assignee drop down list and “Process” button are showed. - Changed request status is notified to customer via both system and email.

Alternative Scenario: N/A.**Exceptions:**

No	Actor Action	System Response
1	Connect to Internet fail	Show message “Cannot send email to customer, please connect to the Internet and try again!”

Relationships: Extend to View request detail detail.**Business Rules:**

- When Shift Head accepts the request, system will log the time when he changed the request status from “Pending” to “Waiting”.
- Four shift heads of datacenter can be able to click on the “Accept” button of a request anytime. But as the rule, only the one who is responsible for

confirming request at current shift is authorized. Unauthorized person will be discovered by log system.

Table 14: Use case IMS002 - <Shift Head> Accept request "Add Server"

2.3.1.3. <Shift Head> Accept request "Bring Server Away"

Please refer full document in CD.

2.3.1.4. <Shift Head> Accept request "Assign IP Address"

Please refer full document in CD.

2.3.1.5. <Shift Head> Accept request "Change IP Address"

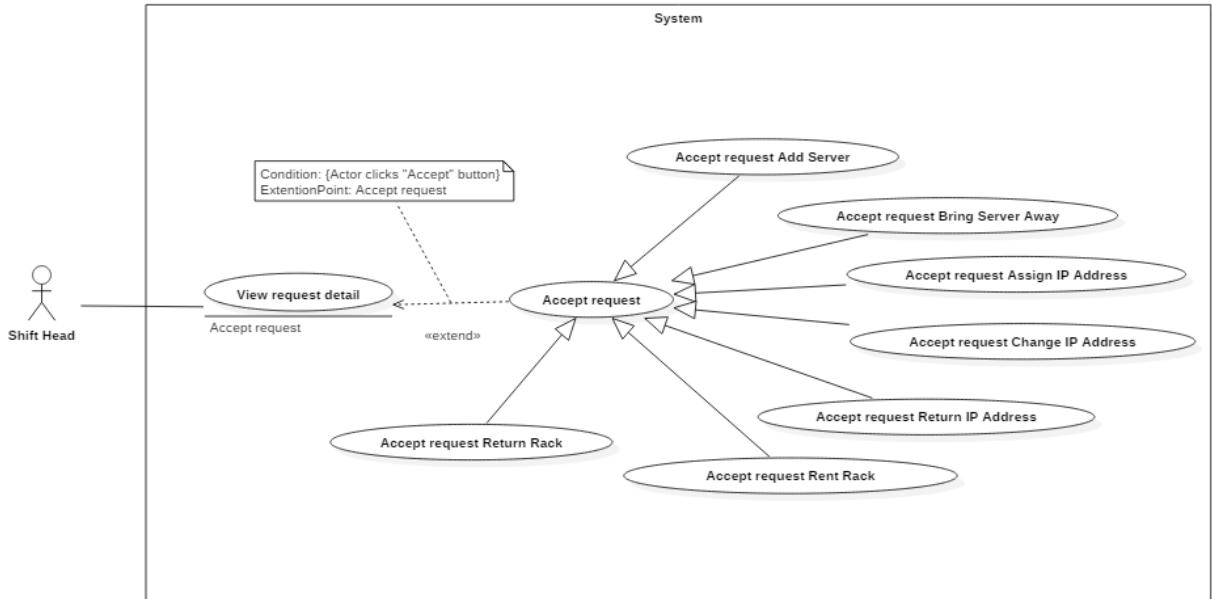


Figure 6: <Shift Head> Accept request "Change IP Address"

USE CASE - IMS005			
Use Case No.	IMS005	Use Case Version	2.0
Use Case Name	Accept request "Change IP Address"		
Author	Lê Thị Thu Hà		
Date	19/01/2016	Priority	medium
Actor:	<ul style="list-style-type: none"> - Shift Head. 		
Summary:	<ul style="list-style-type: none"> - This use case allows Shift Head to accept request "Change IP Address" from customer. 		
Goal:	<ul style="list-style-type: none"> - Request status changes from "Pending" to "Processing", button "Complete" will appear right that. After "Accept" button is clicked, customer will immediately receive notification from this system and also via email. 		
Triggers:	<ul style="list-style-type: none"> - Shift head clicks "Accept" button on request detail page. 		
Preconditions:	<ul style="list-style-type: none"> - User logs in with Shift Head role. 		

- Request status is “Pending”.

Post Conditions:

- **Success:** System shows message “Success! You’ve ACCEPTED Request Change IP Address.”
- **Fail:** System shows error message.

Main Success Scenario:

Step	Actor Action	System Response
1	Shift Head clicks on not-viewed notification on the header panel.	Navigated to “Change IP Address” request detail page.
2	Shift Head checks request detail and clicks on “Accept” button at the bottom of the page without reselect assignee.	<ul style="list-style-type: none"> - System shows message “Success! You’ve ACCEPTED Request Change IP Address.” - Request status changes to “Processing” - “Complete” button is replaced for “Accept” button - Shift head is default assignee. - Changed request status is notified to customer via both system and email.

Alternative Scenario:

Step	Actor Action	System Response
1	Shift Head clicks on not-viewed notification on the header panel.	Navigated to “Change IP Address” request detail page.
2	<ul style="list-style-type: none"> - Shift Head selects who will process this request - Shift Head checks request detail and clicks on “Accept” button at the bottom of the page. 	<ul style="list-style-type: none"> - System shows message “Success! You’ve ACCEPTED Request Change IP Address.” - Request status changes to “Processing” - “Complete” button is replaced for “Accept” button - Selected member will take charge in processing this request - Changed request status is notified to customer via both system and email.

Exceptions:

No	Actor Action	System Response
1	Connect to Internet fail	Show message “Cannot send email to customer, please connect to the Internet and try again!”

Relationships: Extend to View request detail detail.

Business Rules:

- When Shift Head accepts the request, system will log the time when he changed the request status from “Pending” to “Processing”.
- Four shift heads of datacenter can be able to click on the “Accept” button of a request anytime. But as the rule, only the one who is responsible for confirming request at current shift is authorized. Unauthorized person will be discovered by log system.
- If Shift Head is busy and can’t process the request or assign it to another staff, Shift Manager will take over it

Table 15: Use case IMS005 - <Shift Head> Accept request “Change IP Address”

2.3.1.6. <Shift Head> Accept request “Return IP Address”

Please refer full document in CD.

2.3.1.7. <Shift Head> Accept request “Rent Rack”

Please refer full document in CD.

2.3.1.8. <Shift Head> Accept request “Return Rack”

Please refer full document in CD.

2.3.1.9. <Shift Head> Process request “Add Server”

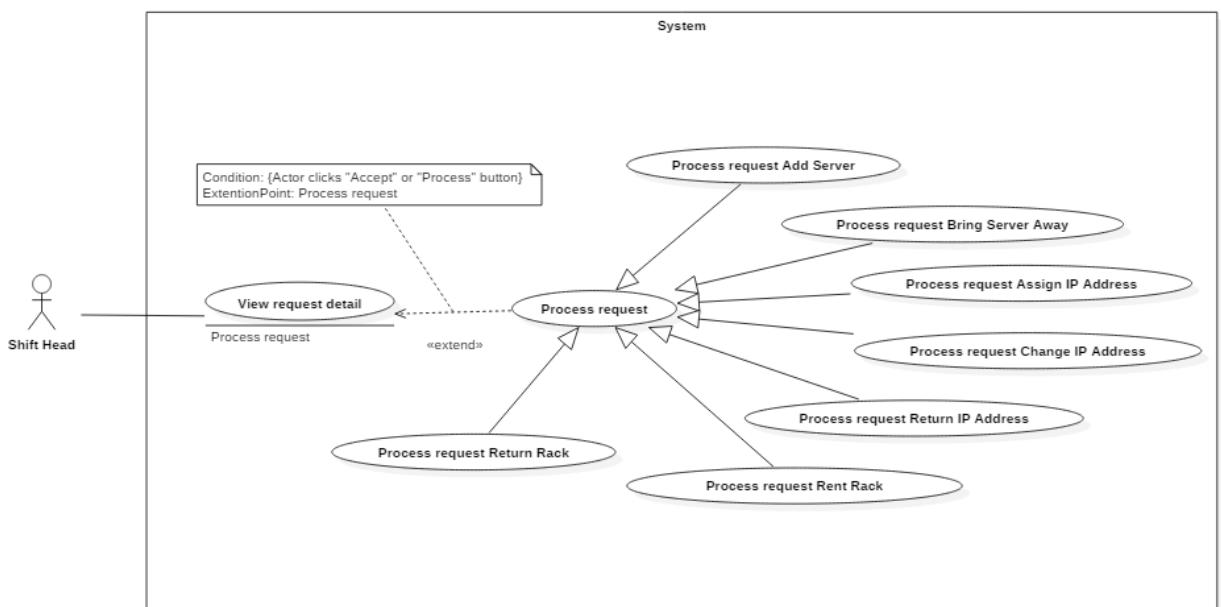


Figure 7: <Shift Head> Process request “Add Server”

USE CASE – IMS009			
Use Case No.	IMS009	Use Case Version	2.0
Use Case Name	Process request “Add Server”		
Author	Lê Thị Thu Hà		
Date	21/01/2016	Priority	medium
Actor:	<ul style="list-style-type: none"> - Shift Head. 		
Summary:			

- This use case allows Shift Head to process request "Add Server", recording customer officially brought his servers into the datacenter. Furthermore, necessary information as Default IP Address and Server Location are also processed in this phase.

Goal:

- Complete the request with "Done" status. Customer's servers are already placed in a rack of datacenter.

Triggers:

- Shift Head accesses to the appropriate request detail page.

Preconditions:

- Shift Head must login into the system with role Shift Head.
- The request was sent to datacenter by customer.

Post Conditions:

- Success: Server status will be changed from "Waiting" to "Running". Request status is updated to "Done". Notification will be sent automatically to customer via system and also email
- Fail: System shows error message

Main Success Scenario:

Step	Actor Action	System Response
1	Shift Head clicks on not-viewed notification on the header panel.	The system will display "Add Server" request detail
2	Shift Head clicks on "Add IP"	The picked up IP Address Popup will be displayed.
3	Shift Head searches suitable IP Address, select it and clicks "OK" button.	Return to Request Add New Server Page and the selected IP Address will be display on field "Default IP"
4	Shift Head clicks on "Add location"	The picked up Location Popup will be displayed.
5	Shift Head selects suitable location and clicks "OK" button.	Return to Request Add New Server Page and the selected location will be display on field "Location"
6	Shift Head clicks on "Complete" button	<ul style="list-style-type: none"> - System will save new information of this server into database. - System will change status of this server(s) to "Running" - System will log who processed the request at this time

Alternatives Scenario: N/A**Exceptions:**

Step	Cause	System Response
1	Shift Head not assign default IP to server	System will show message: "You must assign default IP Address to server."
2	Shift Head not assign location to server	System will show message: "You must assign location to server."

3	Connect to Internet fail	Show message “Cannot send email to customer, please connect to the Internet and try again!”
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Relationships: Extend to View request detail

Business Rules:

- When customer want to entrust his servers to datacenter, he must input server configuration by himself using the “Add Server” request.
- After finishing setting up servers, then Shift Head will assign Default IP Address to each server and decide where to place the servers to datacenter.
- In datacenter, Default IP is an identity of server. On each server will be tagged Default IP

Table 16: Use case IMS009 - <Shift Head> Process request “Add Server”

2.3.1.10. <Shift Head> Process request “Bring Server Away”

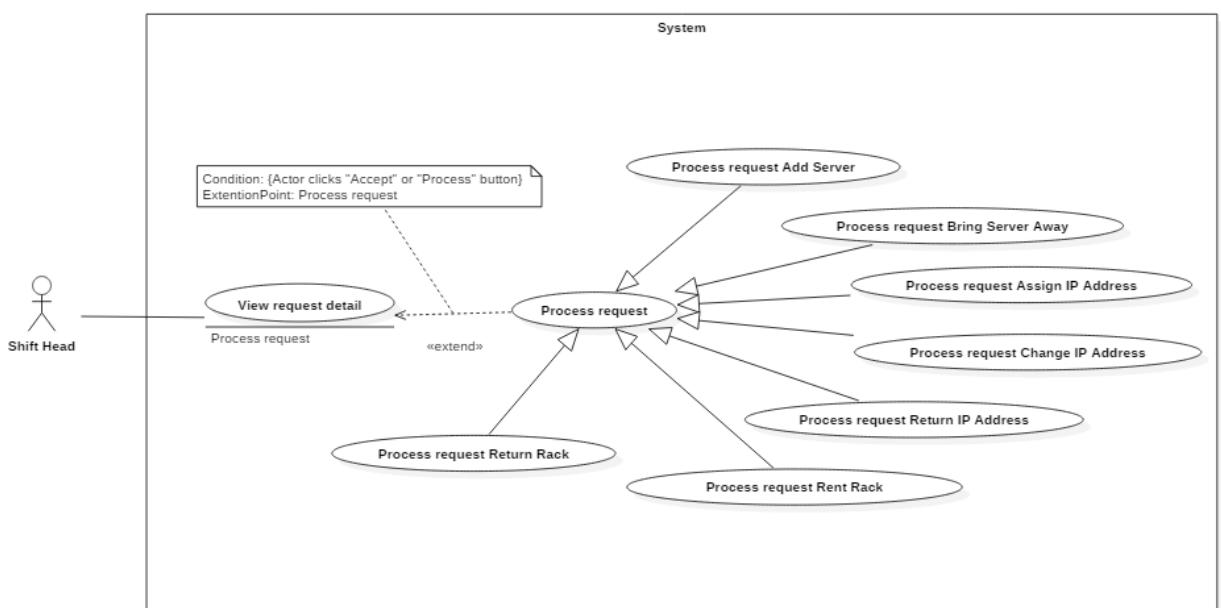


Figure 8: <Shift Head> Process request “Bring Server Away”

USE CASE – IMS010			
Use Case No.	IMS010	Use Case Version	2.0
Use Case Name	Process request “Bring Server Away”		
Author	Lê Thị Thu Hà		
Date	21/01/2016	Priority	medium
Actor:	<ul style="list-style-type: none"> - Shift Head. 		
Summary:	<ul style="list-style-type: none"> - This use case allows Shift Head to process request “Bring Server Away”, he can check server’s information before customer brings their servers away. 		
Goal:	<ul style="list-style-type: none"> - Complete the request with “Done” status. Server status changed to “Deactivate” and all information related to this server such as IP Address, location,.. will be set to “Available” 		

Triggers:	<ul style="list-style-type: none"> - Shift Head accesses to the appropriate request detail page. 	
Preconditions:	<ul style="list-style-type: none"> - Shift Head must login into the system with role Shift Head. - The request was sent to datacenter by customer. 	
Post Conditions:	<ul style="list-style-type: none"> - Success: Server status will be changed from “Running” to “Deactivate”. Request status is updated to “Done”. Notification will be sent automatically to customer via both IMS system and email - Fail: System shows error message 	
Main Success Scenario:		
Step	Actor Action	System Response
1	Shift Head clicks on not-viewed notification on the header panel.	The system will display “Bring Server Away” request detail
2	Shift Head clicks on “Complete” button	<ul style="list-style-type: none"> - System will change server status to “Deactivate”. - IP Address and location related to this server will be reset to “Available” - Request status changed to “Done” - System will log who processed the request at this time
Alternatives Scenario: N/A		
Exceptions:		
No	Actor Action	System Response
1	Connect to Internet fail	Show message “Cannot send email to customer, please connect to the Internet and try again!”
Relationships: Extend to View request detail detail		
Business Rules:		
<ul style="list-style-type: none"> - This system doesn't handle whether customer paid enough money before he finishes the service at datacenter. Shift Head will confirm with sale man beforehand. 		

Table 17: Use case IMS010 - <Shift Head> Process request “Bring Server Away”

2.3.1.11. <Shift Head> Process request “Assign IP Address”

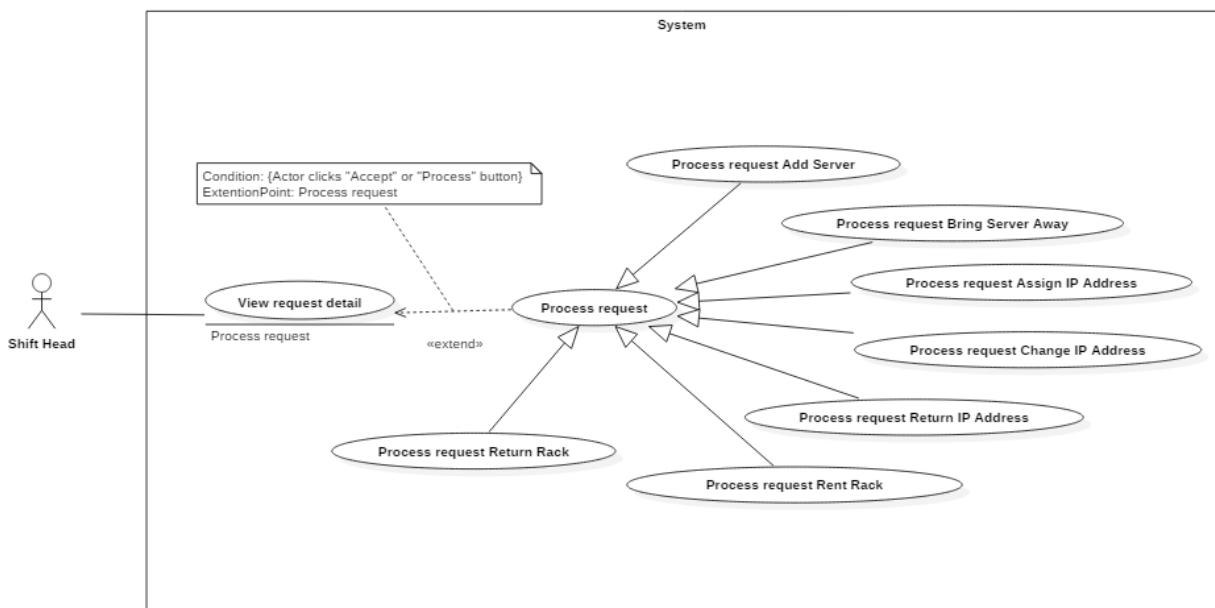


Figure 9: <Shift Head> Process request “Assign IP Address”

USE CASE – IMS011						
Use Case No.	IMS011	Use Case Version	2.0			
Use Case Name	Process request “Assign IP Address”					
Author	Lê Thị Thu Hà					
Date	21/01/2016	Priority	medium			
Actor:	<ul style="list-style-type: none"> - Shift Head. 					
Summary:	<ul style="list-style-type: none"> - This use case allows Shift Head to process request “Assign IP Address”, he can select which IP Address to assign to requested server. The number of IP Address is allocated by customer. 					
Goal:	<ul style="list-style-type: none"> - Complete the request with “Done” status. New IP Addresses are assigned to appointed server 					
Triggers:	<ul style="list-style-type: none"> - Shift Head accesses to the appropriate request detail page. 					
Preconditions:	<ul style="list-style-type: none"> - Shift Head must login into the system with role Shift Head. - The request was sent to datacenter by customer. 					
Post Conditions:	<ul style="list-style-type: none"> - Success: Assigned IP Address will be changed its status from “Available” to “Used”. Request status is updated to “Done”. Notification will be sent automatically to customer via both IMS system and email - Fail: System shows error message 					
Main Success Scenario:	<table border="1"> <thead> <tr> <th>Step</th><th>Actor Action</th><th>System Response</th></tr> </thead> </table>			Step	Actor Action	System Response
Step	Actor Action	System Response				

1	Shift Head clicks on not-viewed notification on the header panel.	The system will display "Assign IP Address" request detail
2	Shift Head checks request detail and necessary action for this request	IP Address will be randomly selected by the system, and the number of it is equals to the number appointed by customer.
3	Shift Head clicks on "Complete" button	<ul style="list-style-type: none"> - System will change IP Address status to "Used". - New IP Address is assign to appropriate server - Request status changed to "Done" - System will log who processed the request at this time

Alternatives Scenario:

Step	Actor Action	System Response
1	Shift Head clicks on not-viewed notification on the header panel.	The system will display "Assign IP Address" request detail
2	Shift Head selects available IP Address to assign	
3	Shift Head clicks on "Complete" button	<ul style="list-style-type: none"> - System will change IP Address status to "Used". - New IP Address is assign to appropriate server - Request status changed to "Done" - System will log who processed the request at this time

Exceptions:

No	Actor Action	System Response
1	Shift Head assigns the number of IP Address more or less than customer requirement	System shows message "You need to choose the number of IP Address as customer requirement. Please try again."
2	Number of available IP Addresses is less than customer requirement	System shows message "Number of available IP Address is less than required number. Please confirm with customer to change IP range."
3	Connect to Internet fail	Show message "Cannot send email to customer, please connect to the Internet and try again!"

Relationships: Extend to View request detail detail**Business Rules:**

- This system doesn't handle whether customer paid enough money before he finishes the service at datacenter. Shift Head will confirm with sale man beforehand.

Table 18: Use case IMS011 - <Shift Head> Process request "Assign IP Address"

2.3.1.12. <Shift Head> Process request "Change IP Address"

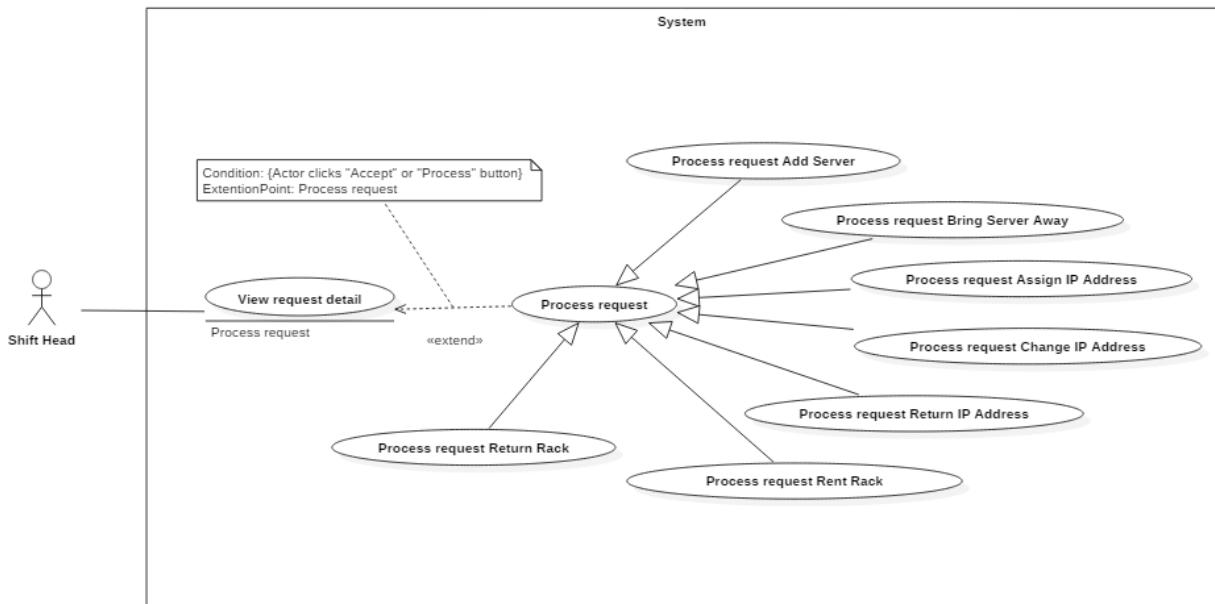


Figure 10: <Shift Head> Process request "Change IP Address"

USE CASE – IMS012			
Use Case No.	IMS012	Use Case Version	2.0
Use Case Name	Process request "Change IP Address"		
Author	Lê Thị Thu Hà		
Date	21/01/2016	Priority	medium
Actor:	<ul style="list-style-type: none"> - Shift Head. 		
Summary:	<ul style="list-style-type: none"> - This use case allows Shift Head to process request "Change IP Address", he will change selected IP Addresses to the new ones that are in the same range. 		
Goal:	<ul style="list-style-type: none"> - Complete the request with "Done" status. New IP Addresses are assigned to appointed server. Old IP Addresses will be changed status to "Available". 		
Triggers:	<ul style="list-style-type: none"> - Shift Head accesses to the appropriate request detail page. 		
Preconditions:	<ul style="list-style-type: none"> - Shift Head must login into the system with role Shift Head. - The request was sent to datacenter by customer. 		
Post Conditions:	<ul style="list-style-type: none"> - Success: Assigned IP Address will be changed its status from "Available" to "Used". Old IP Addresses will be changed status to "Available". Notification will be sent automatically to customer via both IMS system and email - Fail: System shows error message 		
Main Success Scenario:			

Step	Actor Action	System Response
1	Shift Head clicks on not-viewed notification on the header panel.	The system will display “Change IP Address” request detail
2	Shift Head selects IP Address to assign for each IP Address that customer wants to change.	
3	Shift Head clicks on “Complete” button	<ul style="list-style-type: none"> - System will change new IP Address status to “Used”. - System will change old IP Address status to “Available”. - Request status changed to “Done” - System will log who processed the request at this time

Alternatives Scenario: N/A.

Exceptions:

No	Actor Action	System Response
1	Shift Head forgot to select new IP Address from drop down list	System shows message “You need to select new IP Address. Please try again.”
2	Number of available IP Addresses is less than customer requirement	System shows message “Number of available IP Address is less than required number. Please confirm with customer to change IP range.”
3	Connect to Internet fail	Show message “Cannot send email to customer, please connect to the Internet and try again!”

Relationships: Extend to View request detail

Business Rules:

- This system doesn't handle whether customer paid enough money before he finishes the service at datacenter. Shift Head will confirm with sale man beforehand.

Table 19: Use case IMS012 - <Shift Head> Process request “Change IP Address”

2.3.1.13. <Shift Head> Process request “Return IP Address”

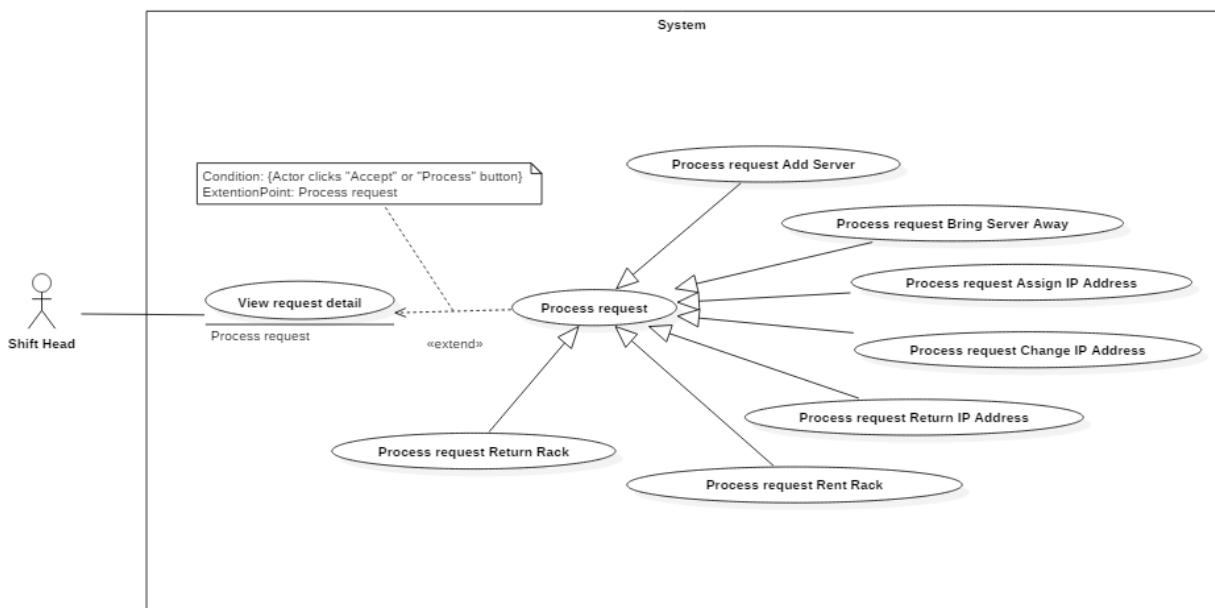


Figure 11: <Shift Head> Process request “Return IP Address”

USE CASE – IMS013						
Use Case No.	IMS013	Use Case Version	2.0			
Use Case Name	Process request “Return IP Address”					
Author	Lê Thị Thu Hà					
Date	21/01/2016	Priority	medium			
Actor:	<ul style="list-style-type: none"> - Shift Head. 					
Summary:	<ul style="list-style-type: none"> - This use case allows Shift Head to process request “Return IP Address”, he will approve IP Addresses that customer wants to return to datacenter. 					
Goal:	<ul style="list-style-type: none"> - Complete the request with “Done” status. IP Addresses will be returned to datacenter with status “Available” 					
Triggers:	<ul style="list-style-type: none"> - Shift Head accesses to the appropriate request detail page. 					
Preconditions:	<ul style="list-style-type: none"> - Shift Head must login into the system with role Shift Head. - The request was sent to datacenter by customer. 					
Post Conditions:	<ul style="list-style-type: none"> - Success: IP Address will be changed its status from “Used” to “Available”. Request status is updated to “Done”. Notification will be sent automatically to customer via both IMS system and email - Fail: System shows error message 					
Main Success Scenario:	<table border="1"> <thead> <tr> <th>Step</th><th>Actor Action</th><th>System Response</th></tr> </thead> </table>			Step	Actor Action	System Response
Step	Actor Action	System Response				

1	Shift Head clicks on not-viewed notification on the header panel.	The system will display “Return IP Address” request detail
2	Shift Head checks request detail	
3	Shift Head clicks on “Complete” button	<ul style="list-style-type: none"> - System will change IP Address status to “Available”. - Request status changed to “Done” - System will log who processed the request at this time

Alternatives Scenario: N/A.

Exceptions:

No	Actor Action	System Response
1	Connect to Internet fail	Show message “Cannot send email to customer, please connect to the Internet and try again!”

Relationships: Extend to View request detail detail

Business Rules:

- This system doesn't handle whether customer paid enough money before he finishes the service at datacenter. Shift Head will confirm with sale man beforehand.

Table 20: Use case IMS013 - <Shift Head> Process request “Return IP Address”

2.3.1.14. <Shift Head> Process request “Rent Rack”

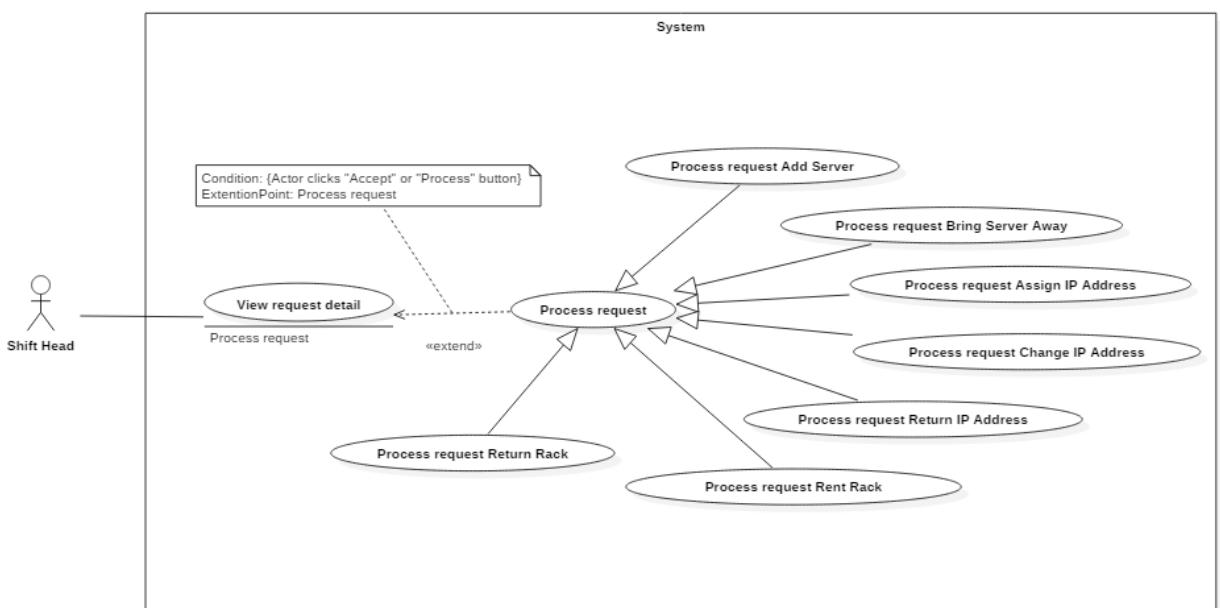


Figure 12: <Shift Head> Process request “Rent Rack”

USE CASE - IMS014			
Use Case No.	IMS014	Use Case Version	2.0
Use Case Name	Process request “Rent Rack”		

Author	Lê Thị Thu Hà		
Date	21/01/2016	Priority	medium
Actor:			
<ul style="list-style-type: none"> - Shift Head. 			
Summary:			
<ul style="list-style-type: none"> - This use case allows Shift Head to process request “Rent Rack”, he will select rack for customer to rent. 			
Goal:			
<ul style="list-style-type: none"> - Complete the request with “Done” status. Rack status will be changed to “Rented” 			
Triggers:			
<ul style="list-style-type: none"> - Shift Head accesses to the appropriate request detail page. 			
Preconditions:			
<ul style="list-style-type: none"> - Shift Head must login into the system with role Shift Head. - The request was sent to datacenter by customer. 			
Post Conditions:			
<ul style="list-style-type: none"> - Success: Rack status will be changed from “Available” to “Rented”. Request status is updated to “Done”. Notification will be sent automatically to customer via both IMS system and email - Fail: System shows error message 			
Main Success Scenario:			
Step	Actor Action	System Response	
1	Shift Head clicks on not-viewed notification on the header panel.	The system will display “Rent Rack” request detail	
2	Shift Head selects number of racks as customer requirement		
3	Shift Head clicks on “Complete” button	<ul style="list-style-type: none"> - System will change rack status to “Rented”. - Request status changed to “Done” - System will log who processed the request at this time 	
Alternatives Scenario:			
Step	Actor Action	System Response	
1	Shift Head clicks on not-viewed notification on the header panel.	The system will display “Rent Rack” request detail	
2	Shift Head selects alphabet letter that ruled as the first character of rack name.	The system will return appropriate racks with the first letter as selected.	
3	Shift Head selects number of racks as customer requirement		
3	Shift Head clicks on “Complete” button	<ul style="list-style-type: none"> - System will change rack status to “Rented”. - Request status changed to “Done” 	

		- System will log who processed the request at this time
--	--	--

Exceptions:

No	Actor Action	System Response
1	Shift Head forgot to select rack	System shows message "You need to select rack for rent. Please try again."
2	Shift Head selected the number of racks that is different from customer requirement	System shows message "Please select the number of racks equal to customer requirement."
3	Available racks are less than customer requirement	System shows message "Available racks are not enough for rent. Please add more racks to the system."
4	Connect to Internet fail	Show message "Cannot send email to customer, please connect to the Internet and try again!"

Relationships: Extend to View request detail detail**Business Rules:**

- This system doesn't handle whether customer paid enough money before he finishes the service at datacenter. Shift Head will confirm with sale man beforehand.

Table 21: Use case IMS014 - <Shift Head> Process request "Rent Rack"

2.3.1.15. <Shift Head> Process request "Return Rack"

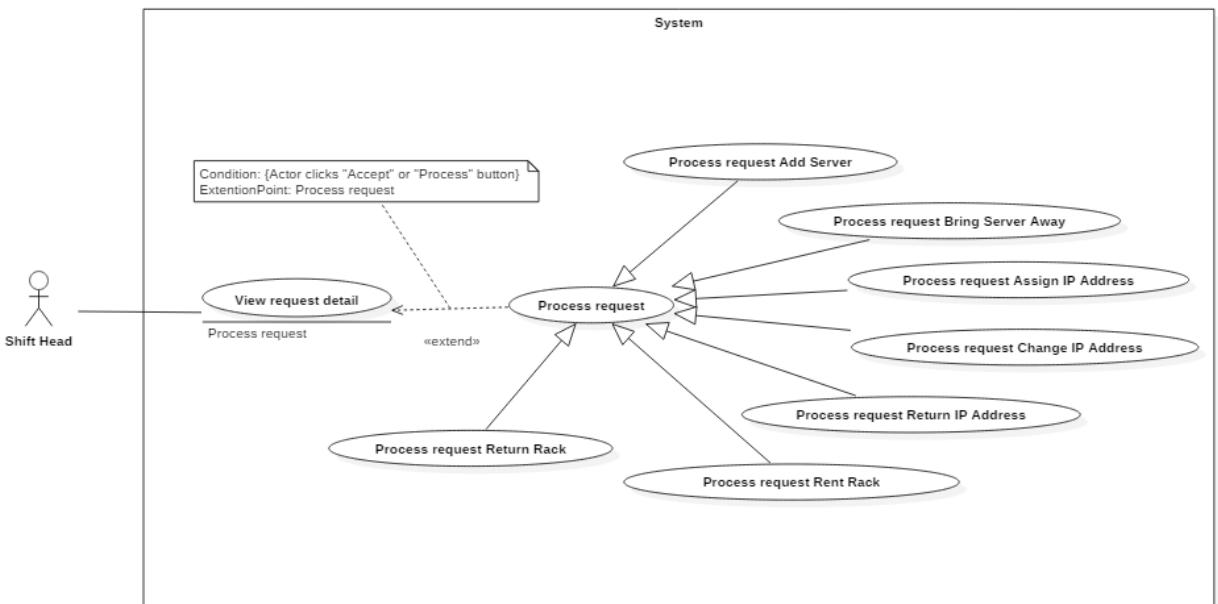


Figure 13: <Shift Head> Process request "Return Rack"

Use Case No.	IMS015	Use Case Version	2.0
Use Case Name	Process request “Return Rack”		
Author	Lê Thị Thu Hà		
Date	21/01/2016	Priority	medium

Actor:

- Shift Head.

Summary:

- This use case allows Shift Head to process request “Return Rack”.

Goal:

- Complete the request with “Done” status. Rack status will be changed to “Available”.

Triggers:

- Shift Head accesses to the appropriate request detail page.

Preconditions:

- Shift Head must login into the system with role Shift Head.
- The request was sent to datacenter by customer.

Post Conditions:

- Success: Rack status will be changed from “Returning” to “Available”. Request status is updated to “Done”. Notification will be sent automatically to customer via both IMS system and email
- Fail: System shows error message

Main Success Scenario:

Step	Actor Action	System Response
1	Shift Head clicks on not-viewed notification on the header panel.	The system will display “Return Rack” request detail
2	Shift Head checks request detail	
3	Shift Head clicks on “Complete” button	<ul style="list-style-type: none"> - System will change rack status to “Available”. - Request status changed to “Done” - System will log who processed the request at this time

Alternatives Scenario: N/A.**Exceptions:**

No	Actor Action	System Response
1	Connect to Internet fail	Show message “Cannot send email to customer, please connect to the Internet and try again!”

Relationships: Extend to View request detail detail**Business Rules:**

- This system doesn't handle whether customer paid enough money before he finishes the service at datacenter. Shift Head will confirm with sale man beforehand.

Table 22: Use case IMS015 - <Shift Head> Process request “Return Rack”

2.3.1.16. <Shift Head> Reject request “Add Server”

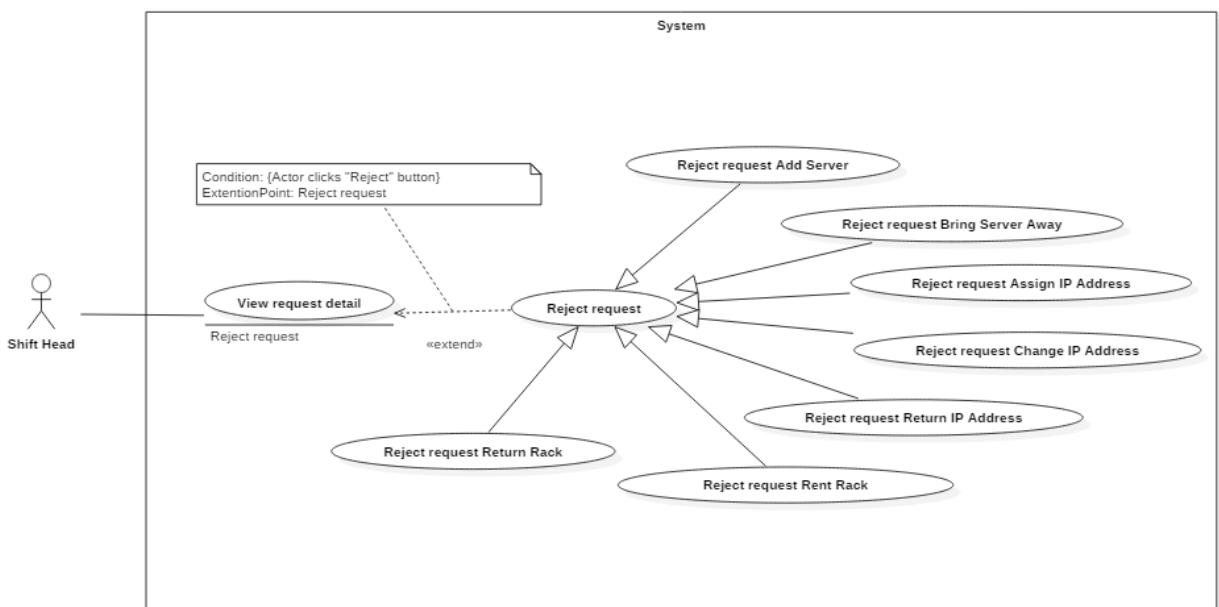


Figure 14: <Shift Head> Reject request “Add Server”

USE CASE – IMS016						
Use Case No.	IMS016	Use Case Version	2.0			
Use Case Name	Reject request “Add Server”					
Author	Lê Thị Thu Hà					
Date	23/01/2016	Priority	medium			
Actor:	<ul style="list-style-type: none"> - Shift Head. 					
Summary:	<ul style="list-style-type: none"> - This use case allows Shift Head to reject request “Add Server”. 					
Goal:	<ul style="list-style-type: none"> - Reject request “Add Server” which was sent by customer. 					
Triggers:	<ul style="list-style-type: none"> - Shift Head accesses to the appropriate request detail page. 					
Preconditions:	<ul style="list-style-type: none"> - Shift Head must login into the system with role Shift Head. - The request was sent to datacenter by customer. 					
Post Conditions:	<ul style="list-style-type: none"> - Success: Customer will receive notification about reject request. Request status will be changed to “Rejected”. Server information will be removed from database. - Fail: Show error message with specified content. 					
Main Success Scenario:	<table border="1"> <thead> <tr> <th>Step</th><th>Actor Action</th><th>System Response</th></tr> </thead> </table>			Step	Actor Action	System Response
Step	Actor Action	System Response				

1	Shift Head clicks on not-viewed notification on the header panel.	The system will display “Add Server” request detail
2	Shift Head clicks on “Reject” button	System shows pop-up to confirm
3	Shift Head clicks “OK” button	<ul style="list-style-type: none"> - The new server information which customer sent will be deleted from database. - Request status will be changed to “Rejected”. - Customer will receive notification via both IMS system and email.

Alternatives Scenario:

Step	Actor Action	System Response
1	Shift Head clicks on not-viewed notification on the header panel.	The system will display “Add Server” request detail
2	Shift Head clicks on “Reject” button	System shows pop-up to confirm
3	Shift Head clicks “Cancel” button	“Add Server” request detail displays again.

Exceptions:

No	Cause	System Response
1	Connect to Internet fail	Show message “Cannot send request, please connect to the Internet!”

Relationships: Extend to View request detail.

Business Rules:

- “Reject” button appears when request status is “Pending”, “Waiting” or “Processing”
- The system only deletes the information of new server which customer sent, does not delete different information of this request.

Table 23: Use case IMS016 - <Shift Head> Reject request “Add Server”

2.3.1.17. <Shift Head> Reject request “Bring Server Away”

Please refer full document in CD.

2.3.1.18. <Shift Head> Reject request “Change IP Address”

Please refer full document in CD.

2.3.1.19. <Shift Head> Reject request “Return IP Address”

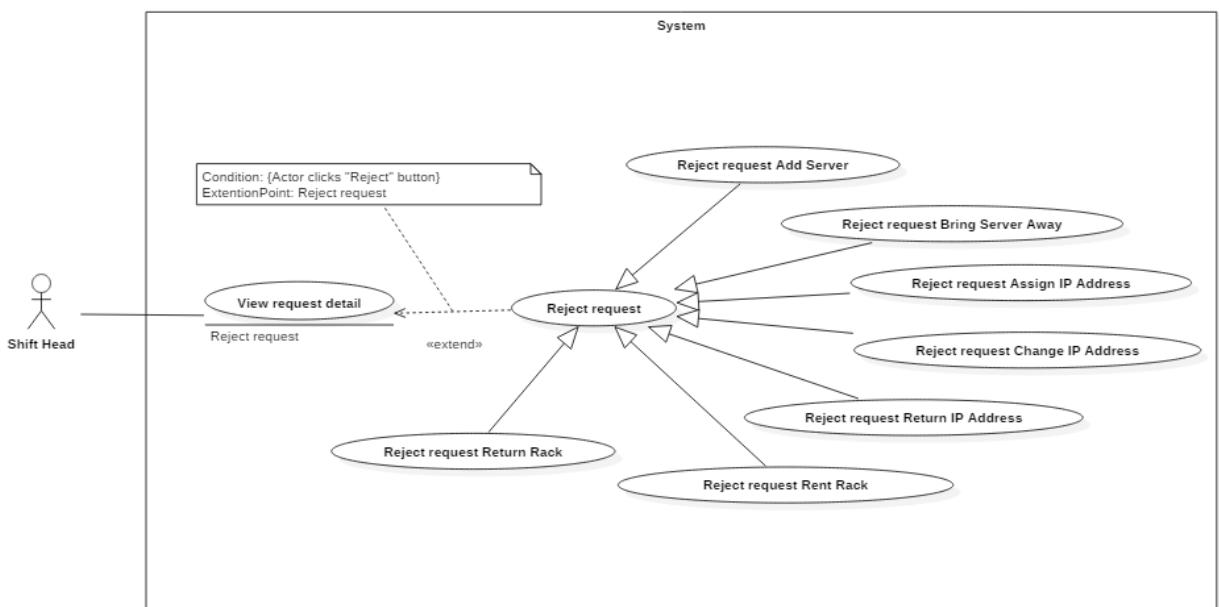


Figure 15: <Shift Head> Reject request “Assign IP Address”

USE CASE - IMS020						
Use Case No.	IMS020	Use Case Version	2.0			
Use Case Name	Reject request “Return IP Address”					
Author	Lê Thị Thu Hà					
Date	23/01/2016	Priority	medium			
Actor:	<ul style="list-style-type: none"> - Shift Head. 					
Summary:	<ul style="list-style-type: none"> - This use case allows Shift Head to reject request “Return IP Address”. 					
Goal:	<ul style="list-style-type: none"> - Reject request “Return IP Address” successfully. 					
Triggers:	<ul style="list-style-type: none"> - Shift Head accesses to the appropriate request detail page. 					
Preconditions:	<ul style="list-style-type: none"> - Shift Head must login into the system with role Shift Head. - The request was sent to datacenter by customer. 					
Post Conditions:	<ul style="list-style-type: none"> - Success: Customer will receive notification about reject request. Request status will be changed to “Rejected”. Server information will be removed from database. - Fail: Show error message with specified content. 					
Main Success Scenario:	<table border="1"> <thead> <tr> <th>Step</th><th>Actor Action</th><th>System Response</th></tr> </thead> </table>			Step	Actor Action	System Response
Step	Actor Action	System Response				

1	Shift Head clicks on not-viewed notification on the header panel.	The system will display “Return IP Address” request detail
2	Shift Head clicks on “Reject” button	System shows pop-up to confirm
3	Shift Head clicks “OK” button	<ul style="list-style-type: none"> - Request status will be changed to “Rejected”. - Customer will receive notification via both IMS system and email.

Alternatives Scenario:

Step	Actor Action	System Response
1	Shift Head clicks on not-viewed notification on the header panel.	The system will display “Return IP Address” request detail
2	Shift Head clicks on “Reject” button	System shows pop-up to confirm
3	Shift Head clicks “Cancel” button	“Change IP Address” request detail displays again.

Exceptions:

No	Cause	System Response
1	Connect to Internet fail	Show message “Cannot send request, please connect to the Internet!”

Relationships: Extend to View request detail.

Business Rules:

- “Reject” button appears when request status is “Pending” or “Processing”
- The system only deletes the information of new server which customer sent, does not delete different information of this request.

Table 24: Use case IMS020 - <Shift Head> Reject request “Return IP Address”

2.3.1.20. <Shift Head> Reject request “Rent Rack”

Please refer full document in CD.

2.3.1.21. <Shift Head> Reject request “Return Rack”

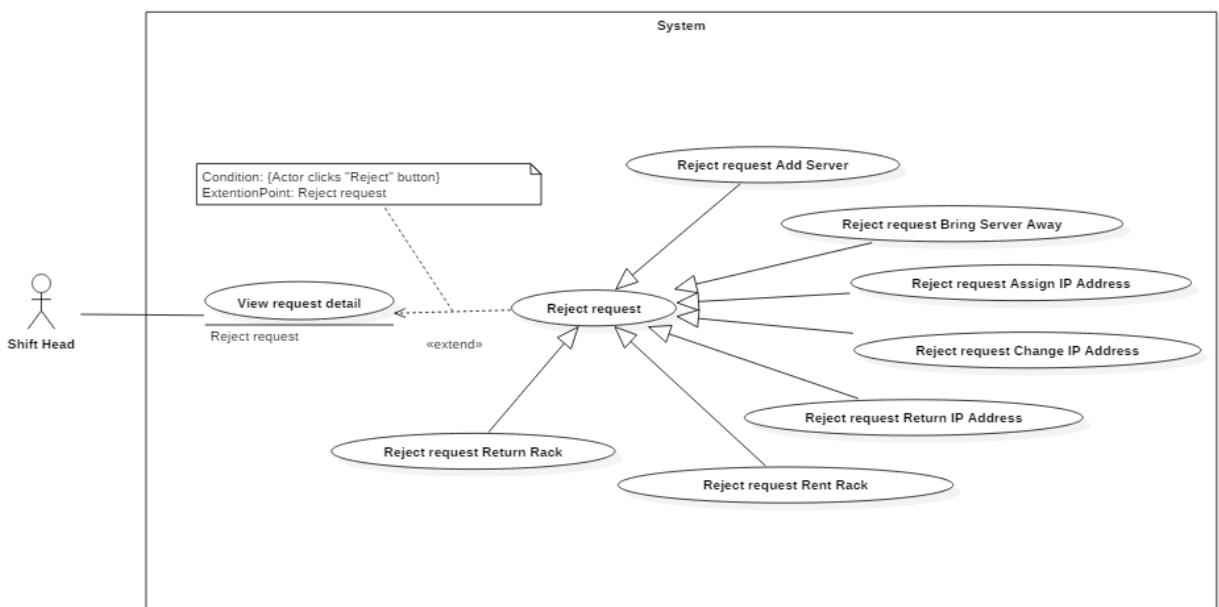


Figure 16: <Shift Head> Reject request “Return Rack”

USE CASE - IMS022						
Use Case No.	IMS022	Use Case Version	2.0			
Use Case Name	Reject request “Return Rack”					
Author	Lê Thị Thu Hà					
Date	23/01/2016	Priority	medium			
Actor:	<ul style="list-style-type: none"> - Shift Head. 					
Summary:	<ul style="list-style-type: none"> - This use case allows Shift Head to reject request “Return Rack”. 					
Goal:	<ul style="list-style-type: none"> - Reject request “Return Rack” successfully. 					
Triggers:	<ul style="list-style-type: none"> - Shift Head accesses to the appropriate request detail page. 					
Preconditions:	<ul style="list-style-type: none"> - Shift Head must login into the system with role Shift Head. - The request was sent to datacenter by customer. 					
Post Conditions:	<ul style="list-style-type: none"> - Success: Customer will receive notification about reject request. Request status will be changed to “Rejected”. Server information will be removed from database. - Fail: Show error message with specified content. 					
Main Success Scenario:	<table border="1"> <thead> <tr> <th>Step</th><th>Actor Action</th><th>System Response</th></tr> </thead> </table>			Step	Actor Action	System Response
Step	Actor Action	System Response				

1	Shift Head clicks on not-viewed notification on the header panel.	The system will display “Return Rack” request detail
2	Shift Head clicks on “Reject” button	System shows pop-up to confirm
3	Shift Head clicks “OK” button	<ul style="list-style-type: none"> - Request status will be changed to “Rejected”. - Customer will receive notification via both IMS system and email.

Alternatives Scenario:

Step	Actor Action	System Response
1	Shift Head clicks on not-viewed notification on the header panel.	The system will display “Return Rack” request detail
2	Shift Head clicks on “Reject” button	System shows pop-up to confirm
3	Shift Head clicks “Cancel” button	“Return Rack” request detail displays again.

Exceptions:

No	Cause	System Response
1	Connect to Internet fail	Show message “Cannot send request, please connect to the Internet!”

Relationships: Extend to View request detail.**Business Rules:**

- “Reject” button appears when request status is “Pending” or “Processing”
- The system only deletes the information of new server which customer sent, does not delete different information of this request.

*Table 25: Use case IMS022 - <Shift Head> Reject request “Return Rack”***2.3.1.22. <Shift Head> Export procedure**

Please refer full document in CD.

2.3.1.23. <Shift Head> Reassign task

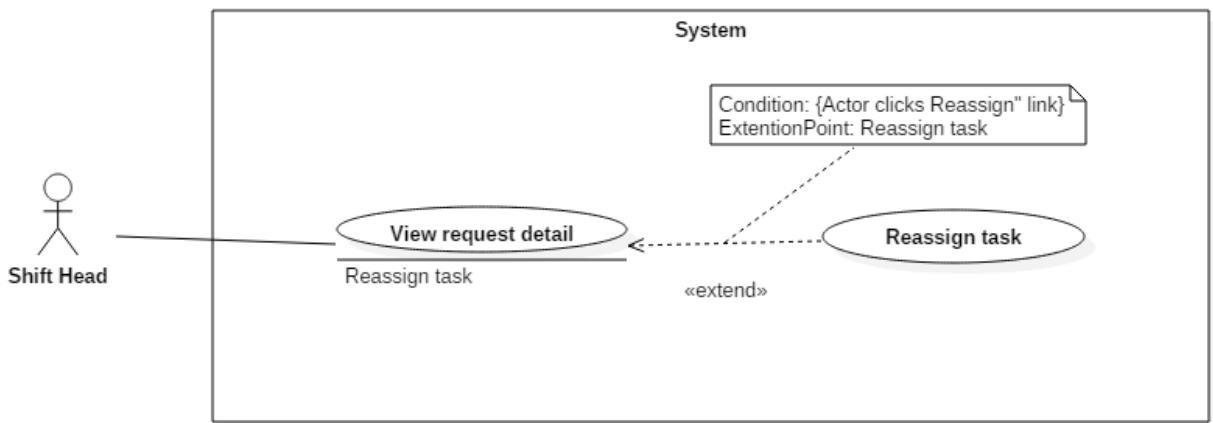


Figure 17: <Shift Head> Reassign task

USE CASE - IMS024			
Use Case No.	IMS024	Use Case Version	2.0
Use Case Name	Reassign task		
Author	Lê Thị Thu Hà		
Date	18/01/2016	Priority	Normal
Actor:			
- Shift Head			
Summary:			
- This use case allows Shift Head to reassign task that was assigned but still not be accepted by staff.			
Goal:			
- Reassign task successfully.			
Triggers:			
- Shift head clicks “Reassign task” link on request detail page.			
Precondition:			
- Shift Head must login into the system with role Shift Head.			
- The request was sent to datacenter by customer.			
- Request is already assigned.			
Post Conditions:			
- Success: This task will be assigned to corresponding Staff. Staff will have notification about this assignment.			
- Fail: Show message error with specified content.			
Main Success Scenario:			
Step	Actor Action	System Response	
1	Shift head clicks “Reassign task” link on request detail page	Pop-up will display and show info: - Assigned staff - Task status - Drop down list: includes name of member in current group.	

2	Shift Head selects himself in the drop down list	<ul style="list-style-type: none"> - Shift Head will be able to process this request. - If pre-assigned staff is not shift head, he will receive notification about his task status - Shift Head won't receive notification about task.
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Alternative Scenario:

Step	Actor Action	System Response
1	Shift head clicks “Reassign task” link on request detail page	<p>Pop-up will display and show info:</p> <ul style="list-style-type: none"> - Assigned staff - Task status - Drop down list: includes name of member in current group.
2	Shift Head selects another staff in the drop down list	<ul style="list-style-type: none"> - Selected staff will be able to process this request. - If pre-assigned staff is not shift head, he will receive notification about his task status - New-assigned staff will receive notification about new task.

Exceptions: N/A.

Relationships: Extend to View request detail.

Business Rules:

- Shift Head can only assign task for members in the same group.
- If Shift Head assigns task for himself, he won't receive notification related to task
- Shift Head can reassign task until assigned staff clicks “Accept task”.
- One request is just edited by one person.

Table 26: Use case IMS024 - <Shift Head> Reassign task

2.3.1.24. <Shift Head> View daily schedule

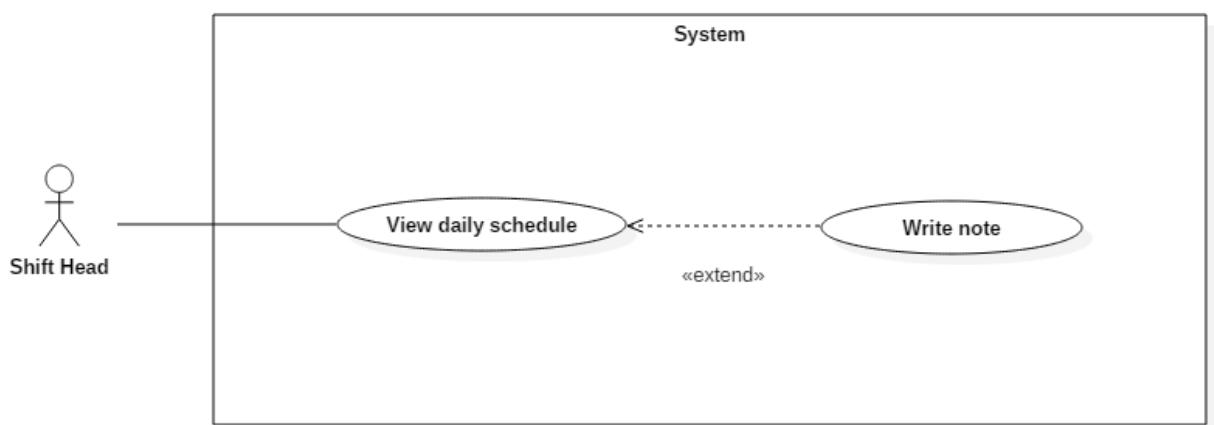


Figure 18: <Shift Head> View daily schedule

USE CASE - IMS025			
Use Case No.	IMS025	Use Case Version	2.0
Use Case Name	View daily schedule		
Author	Huỳnh Lâm Hà Tiên		
Date	18/01/2016	Priority	medium
Actor:	<ul style="list-style-type: none"> - Shift Head. 		
Summary:	<ul style="list-style-type: none"> - This use case allows Shift Head to view all of the today's appointments and note from previous shift. 		
Goal:	<ul style="list-style-type: none"> - System provides schedule which helps Shift Head to control the appointments with customers. 		
Triggers:	<ul style="list-style-type: none"> - When Shift Head login to the system, the page contains daily schedule and the note of previous shift will be showed. 		
Preconditions:	<ul style="list-style-type: none"> - The Shift Head must login to the system with Shift Head role. 		
Post Conditions:	<ul style="list-style-type: none"> - Success: The daily schedule and note will be showed. - Fail: N/A 		
Main Success Scenario:			
Step	Actor Action	System Response	
1	Shift Head login to the system	The page contains daily schedule and note will be showed.	
Alternative Scenario:			
Step	Actor Action	System Response	
1	Shift Head login to the system and today does not	A message will be showed "Today does not have any appointment!"	

	have any customer's arrival.	
Exceptions: N/A		
Relationships:		
<ul style="list-style-type: none"> - Extended by Write note. 		

Business Rules:

- The customer link in daily schedule will be showed when today has appointments.

Table 27: Use case IMS025 - <Shift Head> View daily schedule

2.3.1.25. <Shift Head> Write note

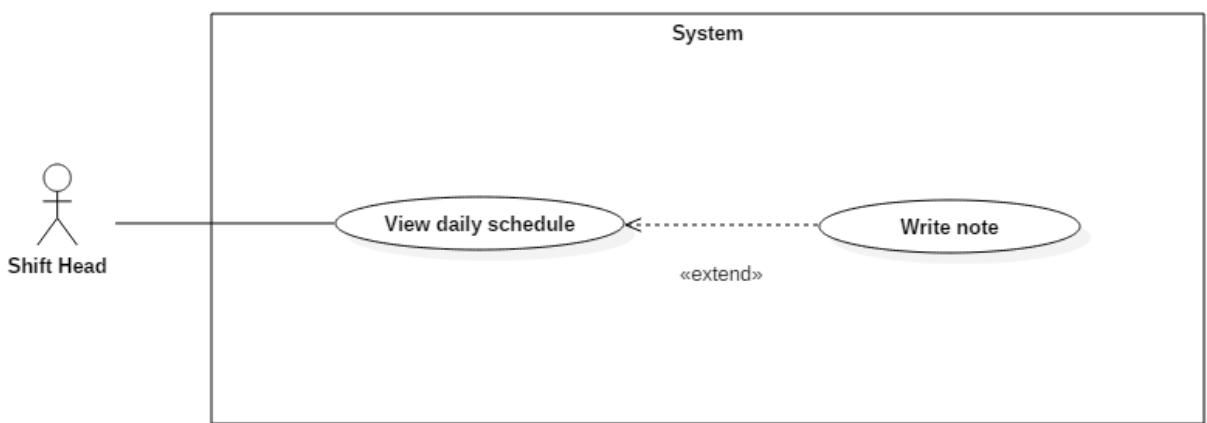


Figure 19: <Shift Head> Write note

USE CASE - IMS026			
Use Case No.	IMS026	Use Case Version	2.0
Use Case Name	Write note		
Author	Huỳnh Lâm Hà Tiên		
Date	18/01/2016	Priority	Normal
Actor:	<ul style="list-style-type: none"> - Shift Head 		
Summary:	<ul style="list-style-type: none"> - This use case allows Shift Head to write note about customer's arrival for the next shift. 		
Goal:	<ul style="list-style-type: none"> - Creating note about customer's arrival for the next shift. 		
Triggers:	<ul style="list-style-type: none"> - Shift head clicks "Write note for the next shift" link on the Daily Schedule Page. 		
Precondition:	<ul style="list-style-type: none"> - The Shift Head must login to the system with Shift Head role at right shift. 		
Post Conditions:	<ul style="list-style-type: none"> - Success: The note of this shift will be created. - Fail: Nothing will be created. Show message error with specified content. 		

Main Success Scenario:

Step	Actor Action	System Response
1	Shift head clicks "Write note for the next shift" link on the Daily Schedule Page.	The popup contains blank note will be showed.
2	Shift head inputs data and clicks "Submit note" button	The note of this shift will be created.

Alternative Scenario:

Step	Actor Action	System Response
1	Shift head clicks "Write note for the next shift" link on the Daily Schedule Page.	The popup contains blank note will be showed.
2	Shift head inputs data and clicks "Cancel" button	Return to Daily Schedule Page.

Exceptions:

Step	Cause	System Response
1	The note is blank	Show message error: "The note is blank. Please input data!"

Relationships: Extend to View daily Schedule.

Business Rules:

- The time when the note was created and the created Shift Head must be saved into database.
- If the Shift Head login to the system at different people's shift, the link "Write note for the next shift" is disabled.

Table 28: Use case IMS026 - <Shift Head> Write note

2.3.1.26. <Shift Head> View server detail

Please refer full document in CD.

2.3.1.27. <Shift Head> Change server location

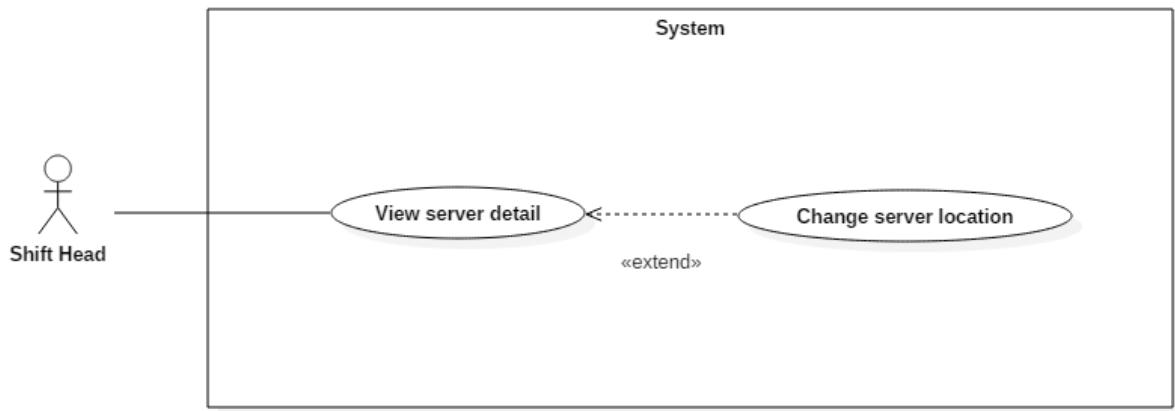


Figure 20: <Shift Head> Change server location

USE CASE – IMS028			
Use Case No.	IMS028	Use Case Version	2.0
Use Case Name	Change server location		
Author	Huỳnh Lâm Hà Tiên		
Date	23/01/2016	Priority	medium
Actor:	<ul style="list-style-type: none"> - Shift Head. 		
Summary:	<ul style="list-style-type: none"> - This use case allows Shift Head to change location of server in datacenter 		
Goal:	<ul style="list-style-type: none"> - Change location of server successfully. 		
Triggers:	<ul style="list-style-type: none"> - Shift Head clicks on “Change location” link in “Server Detail” page 		
Preconditions:	<ul style="list-style-type: none"> - Shift Head must login into the system with role Shift Head. 		
Post Conditions:	<ul style="list-style-type: none"> - Success: New location of server is updated successfully. - Fail: N/A. 		
Main Success Scenario:			
Step	Actor Action	System Response	
1	Shift Head clicks on “Change location” link in “Server Detail” page	Navigate to “Change Location” page to select available location	
2	Shift Head selects suitable location and clicks “Save” button.	Redirect to the previous “Server Detail” page. “Location” field will be updated	
Alternative Scenario:			
Step	Actor Action	System Response	

1	Shift Head clicks on “Change location” link in “Server Detail” page	Navigate to “Change Location” page to select available location
2	Shift Head clicks “Cancel” button.	Return to Request Page.

Exceptions: N/A.

Relationships:

- Extended to View server detail.

Business Rules:

- Shift Head makes sure that information saved in the system is the same with reality
- All members in datacenter can update server location. Action will be logged.

Table 29: Use case IMS028 - <Shift Head> Change server location

2.3.1.28. <Shift Head> View IP address

Please refer full document in CD.

2.3.1.29. <Shift Head> Add IP address

Please refer full document in CD.

2.3.1.30. <Shift Head> Block IP address

Please refer full document in CD.

2.3.1.31. <Shift Head> Unblock IP address

Please refer full document in CD.

2.3.1.32. <Shift Head> View list location

Please refer full document in CD.

2.3.1.33. <Shift Head> Add rack

Please refer full document in CD.

2.3.1.34. <Shift Head> Receive notification

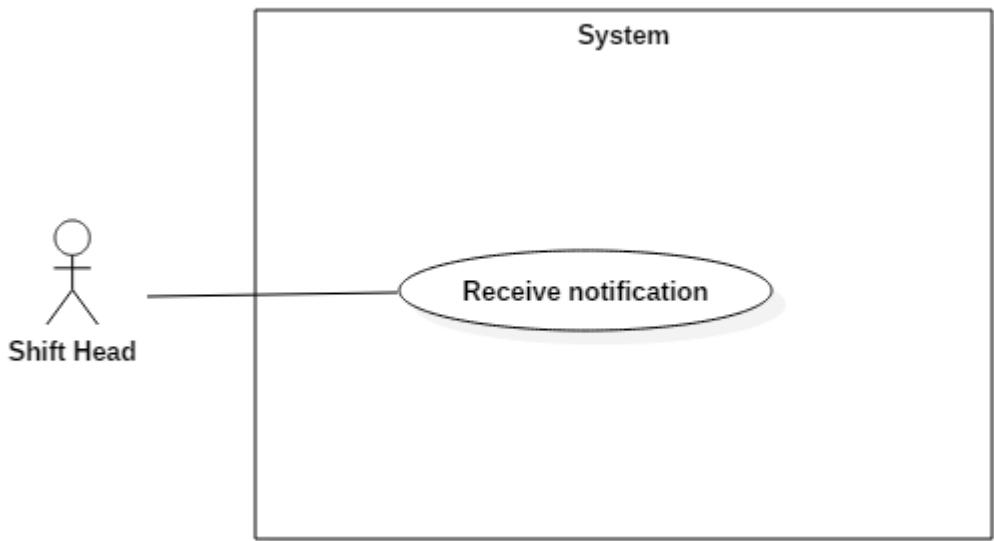


Figure 21: <Shift Head> Receive notification

USE CASE – IMS035			
Use Case No.	IMS035	Use Case Version	2.0
Use Case Name	Receive Notification		
Author	Lê Thị Thu Hà		
Date	18/01/2016	Priority	medium
Actor:			
- Shift Head.			
Summary:			
- This use case allows Shift Head to receive notification.			
Goal:			
- View new request from customer.			
Triggers:			
- Shift Head clicks on a bell symbol on the header of website			
Preconditions:			
- Shift Head must login into the system with role Shift Head.			
Post Conditions:			
- Success: Shift Head can view new request fast			
- Fail: System shows error message.			
Main Success Scenario:			
Step	Actor Action	System Response	
1	Shift Head clicks on a bell symbol on the header of website	List of new notification will be scrolled down.	

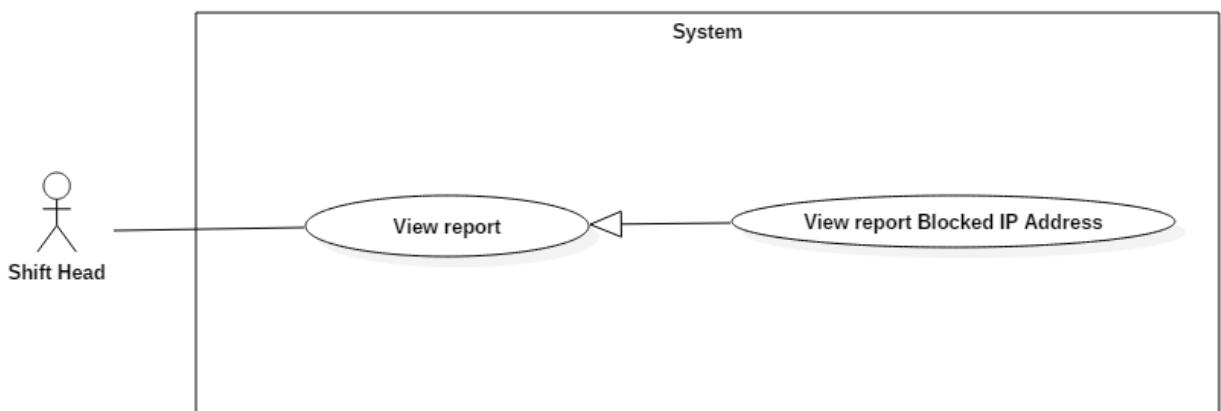
2	Shift Head clicks on an item in this list	Redirect to appropriate request detail.
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Alternatives Scenario:

Step	Actor Action	System Response
1	Shift Head clicks on a bell symbol on the header of website	List of new notification will be scrolled down.
2	Shift Head clicks on "View All" notification	Redirect to list all notification. Unread notification will be highlighted.

Exceptions: N/A.**Relationships:** N/A.**Business Rules:**

- Each role will receive different content of notification
- Only Shift Head who is working in current shift can be able to receive notification. Other Shift Heads don't receive notification, but they can check new requests by accessing to request list.

*Table 30: Use case IMS035 - <Shift Head> Receive notification***2.3.1.35. <Shift Head> View report Blocked IP Address***Figure 22: <Shift Head> View report Blocked IP Address*

USE CASE – IMS036			
Use Case No.	IMS036	Use Case Version	2.0
Use Case Name	View report Blocked IP Address		
Author	Huỳnh Lâm Hà Tiên		
Date	18/01/2016	Priority	medium
Actor:			

- Shift Head.

Summary:

- This use case allows Shift Head to view report related to blocked IP address.

Goal:

- View IP address which was block and still be blocked.

Triggers:

- Shift Head clicks “Report” tab on the sidebar

Preconditions:

- Shift Head must login into the system with role Shift Head.

Post Conditions:

- Success: Report of blocked IP addresses is showed
- Fail: System shows error message.

Main Success Scenario:

Step	Actor Action	System Response
1	Shift Head clicks “Report” tab on the sidebar Report” link on the panel.	Redirect to “Blocked IP report” page. List all blocked IP address will be displayed

Alternatives Scenario: N/A.**Exceptions:** N/A.**Relationships:** N/A.**Business Rules:**

- Shift Head can view report block IP address to observe which IP address is blocked for a long time.
- This page is only for view. If Shift Head want to unblock an IP address, he must access “IP Address” page.

Table 31: Use case IMS036 - <Shift Head> View report Blocked IP Address

2.3.2. <Staff> Overview Use Case

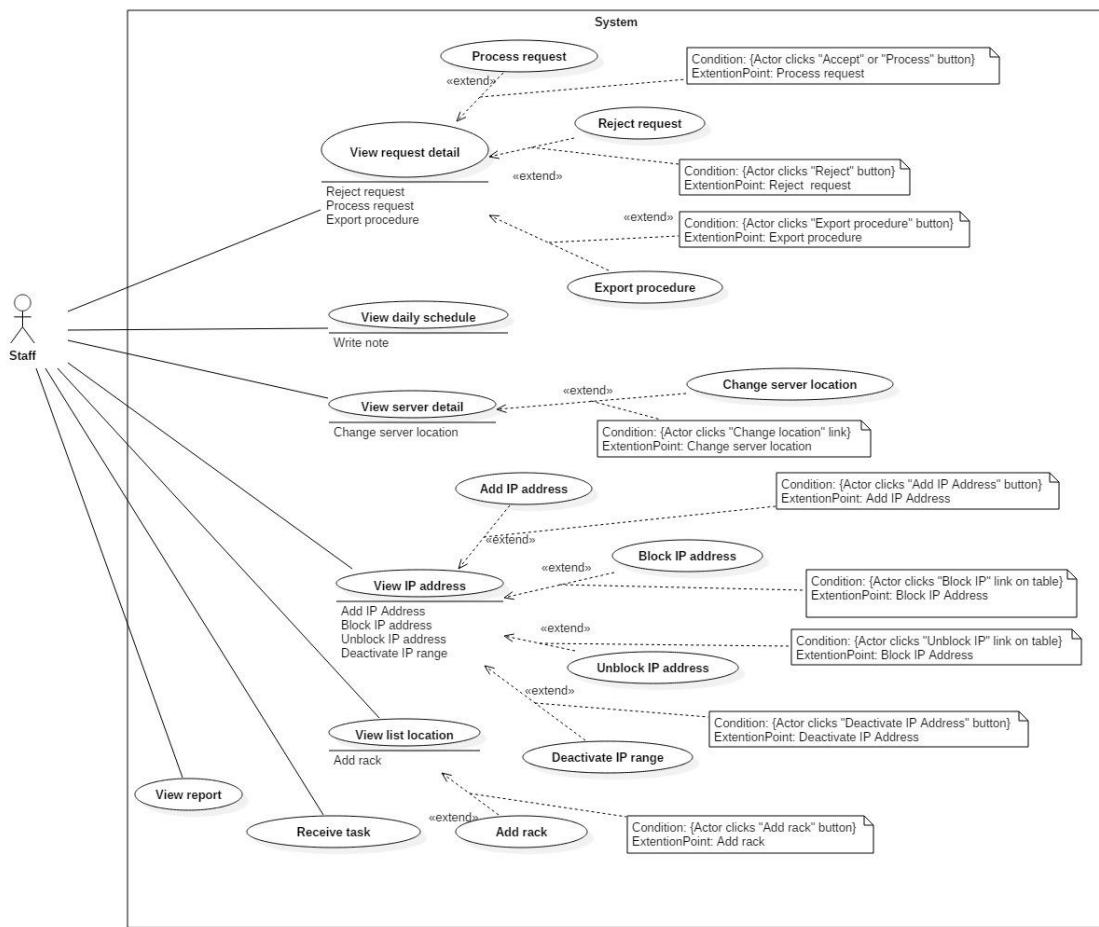


Figure 23: <Staff> Overview Use Case

2.3.2.1. <Staff> View request detail

Please refer full document in CD.

2.3.2.2. <Staff> Process request “Add Server”

Please refer full document in CD.

2.3.2.3. <Staff> Process request “Bring Server Away”

Please refer full document in CD.

2.3.2.4. <Staff> Process request “Assign IP Address”

Please refer full document in CD.

2.3.2.5. <Staff> Process request “Change IP Address”

Please refer full document in CD.

2.3.2.6. <Staff> Process request “Return IP Address”

Please refer full document in CD.

2.3.2.7. <Staff> Process request “Rent Rack”

Please refer full document in CD.

2.3.2.8. <Staff> Process request “Return Rack”

Please refer full document in CD.

2.3.2.9. <Staff> Reject request “Add Server”

Please refer full document in CD.

2.3.2.10. <Staff> Reject request “Bring Server Away”

Please refer full document in CD.

2.3.2.11. <Staff> Reject request “Assign IP Address”

Please refer full document in CD.

2.3.2.12. <Staff> Reject request “Change IP Address”

Please refer full document in CD.

2.3.2.13. <Staff> Reject request “Return IP Address”

Please refer full document in CD.

2.3.2.14. <Staff> Reject request “Rent Rack”

Please refer full document in CD.

2.3.2.15. <Staff> Reject request “Return Rack”

Please refer full document in CD.

2.3.2.16. <Staff> Export procedure

Please refer full document in CD.

2.3.2.17. <Staff> View daily schedule

Please refer full document in CD.

2.3.2.18. <Staff> View server detail

Please refer full document in CD.

2.3.2.19. <Staff> Change server location

Please refer full document in CD.

2.3.2.20. <Staff> View IP address

Please refer full document in CD.

2.3.2.21. <Staff> Add IP address

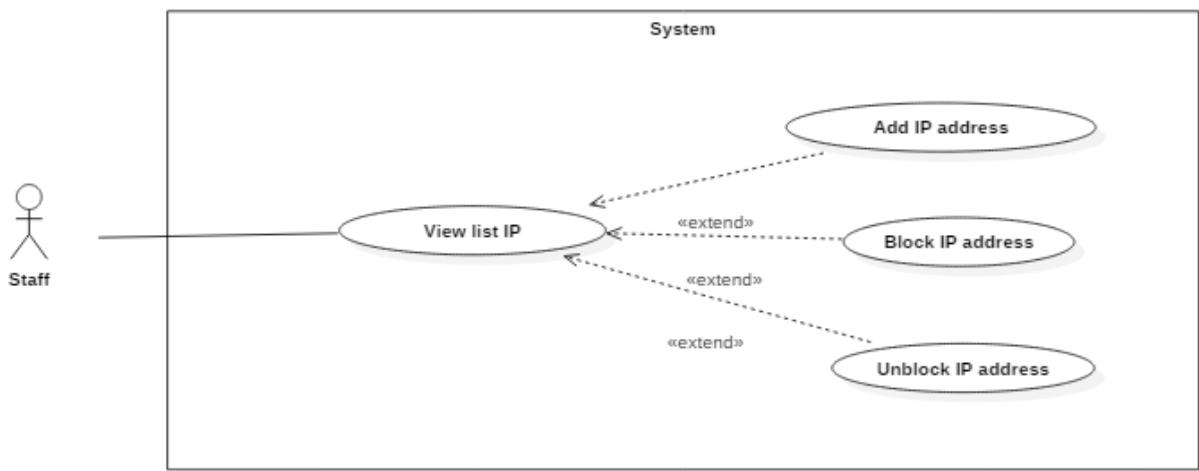


Figure 24: <Staff> Add IP Address

USE CASE – IMS057												
Use Case No.	IMS057	Use Case Version	2.0									
Use Case Name	Add IP Address											
Author	Huỳnh Lâm Hà Tiên											
Date	23/01/2016	Priority	medium									
Actor:	<ul style="list-style-type: none"> - Staff. 											
Summary:	<ul style="list-style-type: none"> - This use case allows Staff to add range of IP address to the pool 											
Goal:	<ul style="list-style-type: none"> - Add information of IP address quickly. 											
Triggers:	<ul style="list-style-type: none"> - Staff clicks on “Add IP Address” on “IP Address” page 											
Preconditions:	<ul style="list-style-type: none"> - Staff must login into the system with role Staff. 											
Post Conditions:	<ul style="list-style-type: none"> - Success: Staff enter the IP address, and the system automatically generate other IP address in the range. Staff click “Save” to save all of generated IP addresses to database - Fail: Show error message with specified content. 											
Main Success Scenario:	<table border="1"> <thead> <tr> <th>Step</th><th>Actor Action</th><th>System Response</th></tr> </thead> <tbody> <tr> <td>1</td><td>Staff clicks on “Add IP Address” on “IP Address” page</td><td>System will display Add IP Address pop-up</td></tr> <tr> <td>2</td><td>Input IP address and default gateway</td><td>After entering IP address range, system automatically return the subnet mask code</td></tr> </tbody> </table>			Step	Actor Action	System Response	1	Staff clicks on “Add IP Address” on “IP Address” page	System will display Add IP Address pop-up	2	Input IP address and default gateway	After entering IP address range, system automatically return the subnet mask code
Step	Actor Action	System Response										
1	Staff clicks on “Add IP Address” on “IP Address” page	System will display Add IP Address pop-up										
2	Input IP address and default gateway	After entering IP address range, system automatically return the subnet mask code										

3	Click “OK”	System generates all of IP address in the same range and return to previous “IP address” page
---	------------	---

Alternatives Scenario:

Step	Actor Action	System Response
1	Staff clicks on “Add IP Address” on “IP Address” page	System will display Add IP Address pop-up
2	Input IP address and default gateway	After entering IP address range, system automatically return the subnet mask code
3	Click “Cancel”	Return to view “IP Address” without changed information

Exceptions: N/A.**Relationships:** N/A.**Business Rules:** N/A.

Table 32: Use case IMS057 - <Staff> Add IP Address

2.3.2.22. <Staff> Block IP address

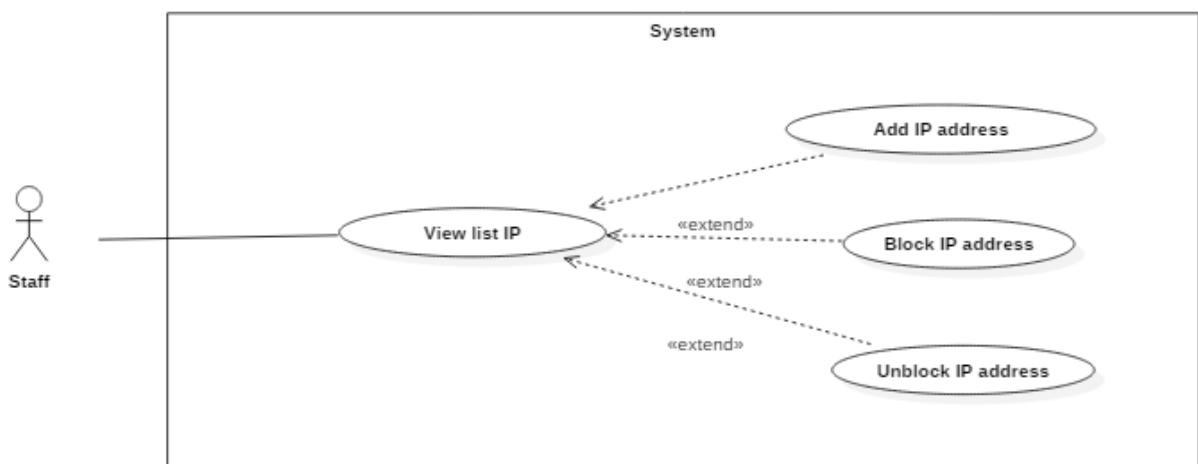


Figure 25: <Staff> Block IP Address

USE CASE – IMS058			
Use Case No.	IMS058	Use Case Version	2.0
Use Case Name	Block IP Address		
Author	Huỳnh Lâm Hà Tiên		
Date	23/01/2016	Priority	medium
Actor:	- Staff.		
Summary:			

- This use case allows Staff to change IP address status from “Available” to “Blocked”

Goal:

- Change IP address status to “Blocked”. It can't be used to assign until unblocked.

Triggers:

- Staff clicks “Block” link on a row on the table in “IP Address” page.

Preconditions:

- Staff must login into the system with role Staff.

Post Conditions:

- **Success:** The status of IP address will be changed to “Blocked”.
- **Fail:** The status of IP address will not be changed. Show error message with specified content.

Main Success Scenario:

Step	Actor Action	System Response
1	Staff clicks “Block” link on a row on the table in “IP Address” page.	Confirmation pop-up will display
2	Click “OK”	Return to previous page with updated status of selected IP address.

Alternatives Scenario:

Step	Actor Action	System Response
1	Staff clicks “Block” link on a row on the table in “IP Address” page.	Confirmation pop-up will display
2	Click “Cancel”	Return to previous page with nothing changed.

Exceptions: N/A.**Relationships:** N/A.**Business Rules:**

- Only “blocked” status is able to be updated manually

Table 33: Use case IMS058 - <Staff> Block IP Address

2.3.2.23. <Staff> Unblock IP address

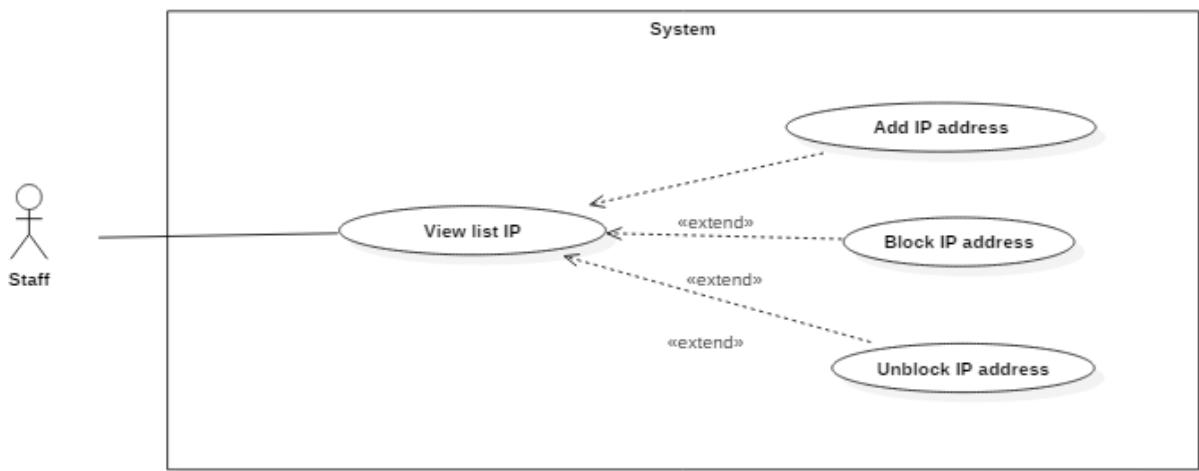


Figure 26: <Staff> Unblock IP Address

USE CASE – IMS059												
Use Case No.	IMS059	Use Case Version	2.0									
Use Case Name	Unblock IP Address											
Author	Huỳnh Lâm Hà Tiên											
Date	23/01/2016	Priority	medium									
Actor:	<ul style="list-style-type: none"> - Staff. 											
Summary:	<ul style="list-style-type: none"> - This use case allows Staff to change IP address status from “Blocked” to “Available” 											
Goal:	<ul style="list-style-type: none"> - Selected IP address status will be changed to “Available”. 											
Triggers:	<ul style="list-style-type: none"> - Staff clicks “Unblock” link on a row on the table in “IP Address” page. 											
Preconditions:	<ul style="list-style-type: none"> - Staff must login into the system with role Staff. 											
Post Conditions:	<ul style="list-style-type: none"> - Success: The status of IP address will be changed to “Available”. - Fail: The status of IP address will not be changed. Show error message with specified content. 											
Main Success Scenario:	<table border="1"> <thead> <tr> <th>Step</th><th>Actor Action</th><th>System Response</th></tr> </thead> <tbody> <tr> <td>1</td><td>Staff clicks “Unblock” link on a row on the table in “IP Address” page.</td><td>Confirmation pop-up will display</td></tr> <tr> <td>2</td><td>Click “OK”</td><td>Return to previous page with updated status of selected IP address.</td></tr> </tbody> </table>			Step	Actor Action	System Response	1	Staff clicks “Unblock” link on a row on the table in “IP Address” page.	Confirmation pop-up will display	2	Click “OK”	Return to previous page with updated status of selected IP address.
Step	Actor Action	System Response										
1	Staff clicks “Unblock” link on a row on the table in “IP Address” page.	Confirmation pop-up will display										
2	Click “OK”	Return to previous page with updated status of selected IP address.										
Alternatives Scenario:	<table border="1"> <thead> <tr> <th>Step</th><th>Actor Action</th><th>System Response</th></tr> </thead> </table>			Step	Actor Action	System Response						
Step	Actor Action	System Response										

1	Staff clicks “Unblock” link on a row on the table in “IP Address” page.	Confirmation pop-up will display
2	Click “Cancel”	Return to previous page with nothing changed.

Exceptions: N/A.
Relationships: N/A.
Business Rules:

- Only “Blocked” status is able to be updated manually

Table 34: Use case IMS059 - <Staff> Unblock IP Address

2.3.2.24. <Staff> View list location

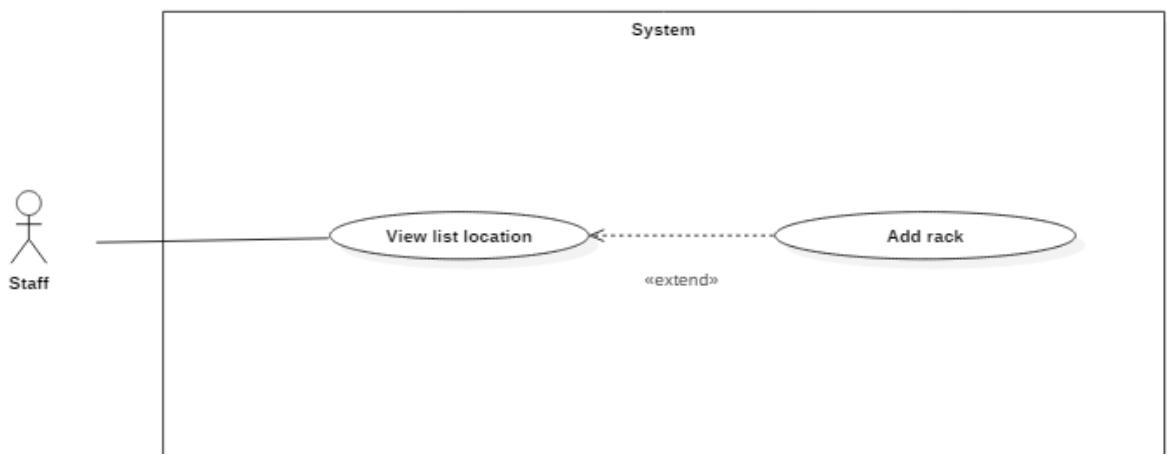


Figure 27: <Staff> View list location

USE CASE – IMS060			
Use Case No.	IMS060	Use Case Version	2.0
Use Case Name	View list location		
Author	Huỳnh Lâm Hà Tiên		
Date	23/01/2016	Priority	medium
Actor:	<ul style="list-style-type: none"> - Staff. 		
Summary:	<ul style="list-style-type: none"> - This use case allows Staff to view list all location of the system 		
Goal:	<ul style="list-style-type: none"> - View location and filtered by rack name. 		
Triggers:	<ul style="list-style-type: none"> - Staff clicks on “Location” tab on the sidebar. 		
Preconditions:	<ul style="list-style-type: none"> - Staff must login into the system with role Staff. 		

Post Conditions:

- **Success:** All location information will be showed.
- **Fail:** N/A.

Main Success Scenario:

Step	Actor Action	System Response
1	Staff clicks on “Location” tab on the sidebar.	Navigate to View location information page

Alternative Scenario: N/A.**Exceptions:** N/A.**Relationships:** Extend to Add Rack.**Business Rules:**

- A rack has 42 location.
- A server size can take 1,2 or 4 location.

Table 35: Use case IMS060 - <Staff> View list location

2.3.2.25. <Staff> Add rack

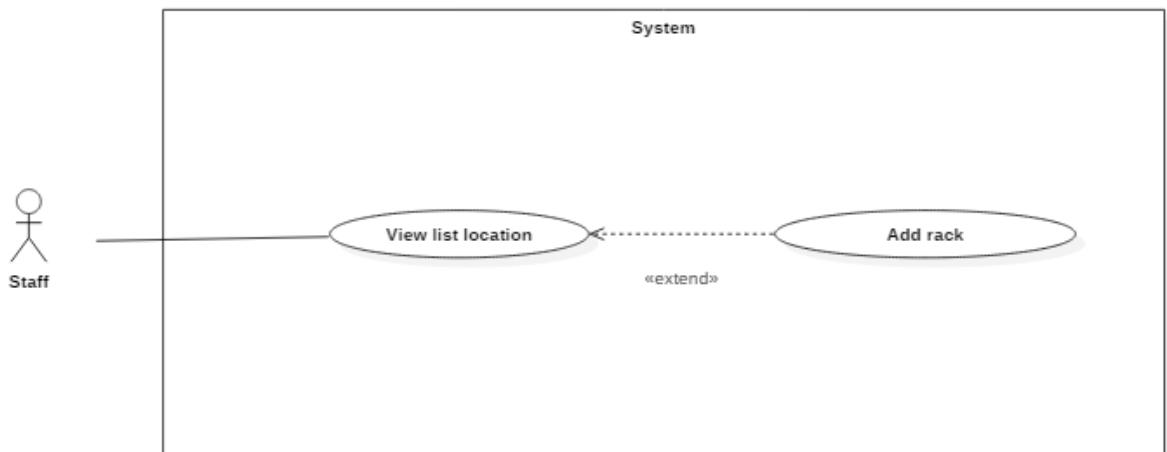


Figure 28: <Staff> Add rack

USE CASE - IMS061			
Use Case No.	IMS061	Use Case Version	2.0
Use Case Name	Add rack		
Author	Huỳnh Lâm Hà Tiên		
Date	23/01/2016	Priority	medium
Actor:	<ul style="list-style-type: none"> - Staff. 		
Summary:	<ul style="list-style-type: none"> - This use case allows Staff add new rack information to database. 		
Goal:	<ul style="list-style-type: none"> - Add new location to the center quickly and easily manage 		
Triggers:			

- Staff clicks on “Add rack” on “Location” page

Preconditions:

- Staff must login into the system with role Staff.

Post Conditions:

- **Success:** Staff add new location successfully
- **Fail:** Show error message with specified content.

Main Success Scenario:

Step	Actor Action	System Response
1	Customer clicks on “Add location” on “Location” page	System will display Popup
2	Input rack name	
3	Click “OK”	System will automatically generate 42 location by each rack added and save to database

Alternatives Scenario:

Step	Actor Action	System Response
1	Customer clicks on “Add location” on “Location” page	System will display Popup
2	Input rack name	
3	Click “Cancel”	Return to previous view with nothing changed

Exceptions:

No	Cause	System Response
1	Input existed rack name	System shows message “Rack name is existed.”

Relationships: N/A.**Business Rules:**

- Rack name is ruled by the datacenter

*Table 36: Use case IMS061 - <Staff> Add rack***2.3.2.26. <Staff> Receive task**

Please refer full document in CD.

2.3.2.27. <Staff> View report Blocked IP Address

Please refer full document in CD.

2.3.2.28. <Staff> View list task

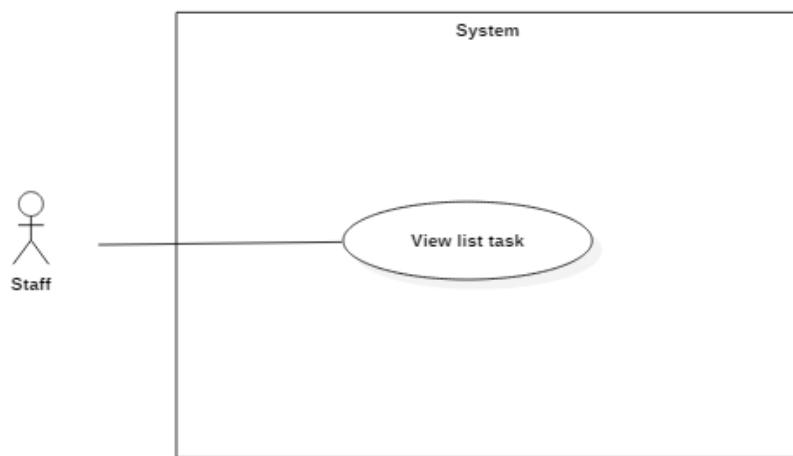


Figure 29: <Staff> View list task

USE CASE – IMS064												
Use Case No.	IMS064	Use Case Version	2.0									
Use Case Name	View list task											
Author	Lê Thị Thu Hà											
Date	22/01/2016	Priority	medium									
Actor: Staff												
Summary:	<ul style="list-style-type: none"> - This use case allows Staff to view his tasks. 											
Goal:	<ul style="list-style-type: none"> - View all of tasks and its status. 											
Triggers:	<ul style="list-style-type: none"> - Staff clicks on “Task” tab on the sidebar 											
Preconditions:	<ul style="list-style-type: none"> - Staff must login into the system with role Staff. - Staff was assigned this task. 											
Post Conditions:	<ul style="list-style-type: none"> - Success: Staff can see all of his tasks - Fail: Show error message with specified content. 											
Main Success Scenario:	<table border="1"> <thead> <tr> <th>Step</th><th>Actor Action</th><th>System Response</th></tr> </thead> <tbody> <tr> <td>1</td><td>Staff clicks on “Task” tab on the sidebar</td><td>Navigate to “Task” page. List of this staff’s tasks are showed</td></tr> <tr> <td>2</td><td>Staff views and searches by task status</td><td>Appropriate values are displayed</td></tr> </tbody> </table>			Step	Actor Action	System Response	1	Staff clicks on “Task” tab on the sidebar	Navigate to “Task” page. List of this staff’s tasks are showed	2	Staff views and searches by task status	Appropriate values are displayed
Step	Actor Action	System Response										
1	Staff clicks on “Task” tab on the sidebar	Navigate to “Task” page. List of this staff’s tasks are showed										
2	Staff views and searches by task status	Appropriate values are displayed										
Alternatives Scenario:	N/A.											
Exceptions:	N/A.											
Relationships:	Extend to View daily schedule.											
Business Rules:	<ul style="list-style-type: none"> - Staff in the same group and Shift Manager can assign task to Staff. 											

- Only when task status is “Doing”, staff can be able to edit it.

Table 37: Use case IMS064 - <Staff> View list task

2.3.2.29. <Staff> Accept task

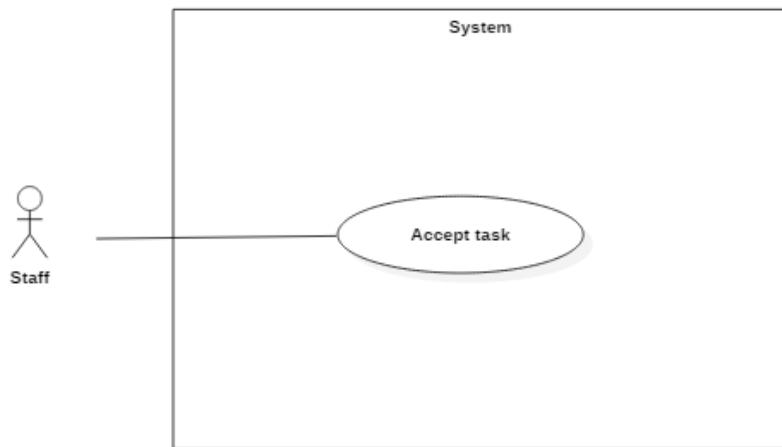


Figure 30: <Staff> Accept task

USE CASE – IMS065									
Use Case No.	IMS065	Use Case Version	2.0						
Use Case Name	Accept task								
Author	Lê Thị Thu Hà								
Date	22/01/2016	Priority	medium						
Actor:	Staff.								
Summary:	<ul style="list-style-type: none"> - This use case allows Staff to accept task, and then he will be able to process his task. 								
Goal:	<ul style="list-style-type: none"> - Task status is changed from “Waiting” to “Doing”. Staff can be able to edit this request. 								
Triggers:	<ul style="list-style-type: none"> - Staff clicks “Accept task” link on request detail page 								
Preconditions:	<ul style="list-style-type: none"> - Staff must login into the system with role Staff. - Staff was assigned this task. 								
Post Conditions:	<ul style="list-style-type: none"> - Success: Staff can be able to process this request. - Fail: Show error message with specified content. 								
Main Success Scenario:	<table border="1"> <thead> <tr> <th>Step</th><th>Actor Action</th><th>System Response</th></tr> </thead> <tbody> <tr> <td>1</td><td>Staff clicks “Accept task” link on request detail page</td><td>Task status will be changed from “Waiting” to “Doing”</td></tr> </tbody> </table>			Step	Actor Action	System Response	1	Staff clicks “Accept task” link on request detail page	Task status will be changed from “Waiting” to “Doing”
Step	Actor Action	System Response							
1	Staff clicks “Accept task” link on request detail page	Task status will be changed from “Waiting” to “Doing”							
Alternatives Scenario:	N/A.								

Exceptions: N/A.

Relationships: N/A.

Business Rules:

- Staff have to click “Accept task” to let Staff know that he has started to process the request

Table 38: Use case IMS065 - <Staff> Accept task

2.3.2.30. <Staff> Confirm task status

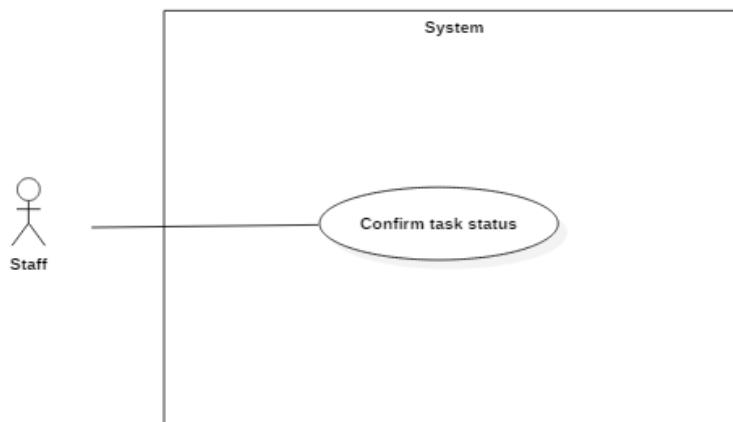


Figure 31: <Staff> Confirm task status

USE CASE – IMS066			
Use Case No.	IMS066	Use Case Version	2.0
Use Case Name	Confirm task status		
Author	Lê Thị Thu Hà		
Date	22/01/2016	Priority	medium
Actor:	Staff.		
Summary:	<ul style="list-style-type: none"> - This use case allows Staff confirm his current task status 		
Goal:	<ul style="list-style-type: none"> - Task status will be changed to “Not Finished” or “Completed”. 		
Triggers:	<ul style="list-style-type: none"> - If Staff still not finish his task before he finishes his work, he have to click “Not Finish” link in request detail page. If Staff finished the request by clicking on “Complete” button, his task status will be change to “Completed”. 		
Preconditions:	<ul style="list-style-type: none"> - Staff must login into the system with role Staff. - Staff was assigned this task. 		
Post Conditions:	<ul style="list-style-type: none"> - Success: Task status is changed to “Not Finished” or “Completed” - Fail: Show error message with specified content. 		
Main Success Scenario:			
Step	Actor Action	System Response	

1	Staff clicks on “Not Finish” link in request detail page	Pop-up will display to confirm and note the reason.
2	Staff clicks on “OK” button	<ul style="list-style-type: none"> - Task status will be changed to “Not Finished”. Staff can't edit this request anymore - Staff who assigned task to Staff will receive notification about not finished request.

Alternatives Scenario:

Step	Actor Action	System Response
1	Staff clicks on “Not Finish” link in request detail page	Pop-up will display to confirm and note the reason.
2	Staff clicks on “Cancel” button	Redirect to previous request detail page with nothing changed.

Step	Actor Action	System Response
1	Staff clicks on “Complete” button in request detail page	<ul style="list-style-type: none"> - Task status is changed to “Completed”

Exceptions: N/A.**Relationships:** N/A.**Business Rules:**

- System will push notification ends to staff who is assigned to process request in current shift. Notification is pushed 30 minutes before the current shift.
- If Staff is assigned tasks but can't finish it on time before he stops working, he must report his work status to Staff. If he not follow this rule, he'll be punished.

Table 39: Use case IMS066 - <Staff> Confirm task status

2.3.3. <Customer> Overview Use Case

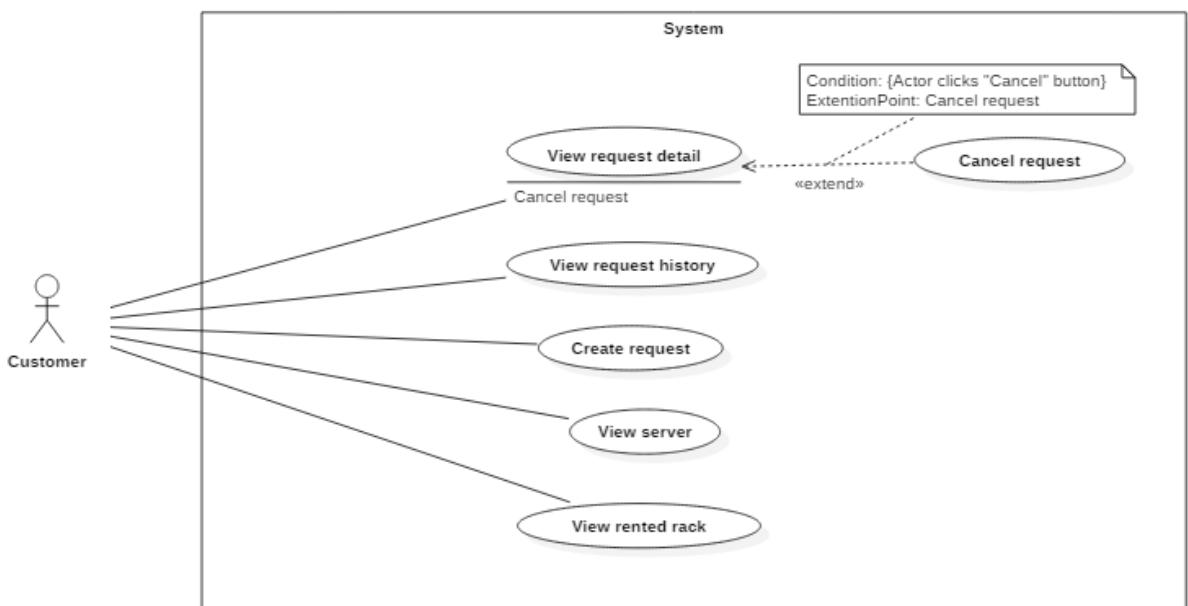


Figure 32: <Customer> Overview Use Case

2.3.3.1. <Customer> View request detail

Please refer full document in CD.

2.3.3.2. <Customer> View Request History

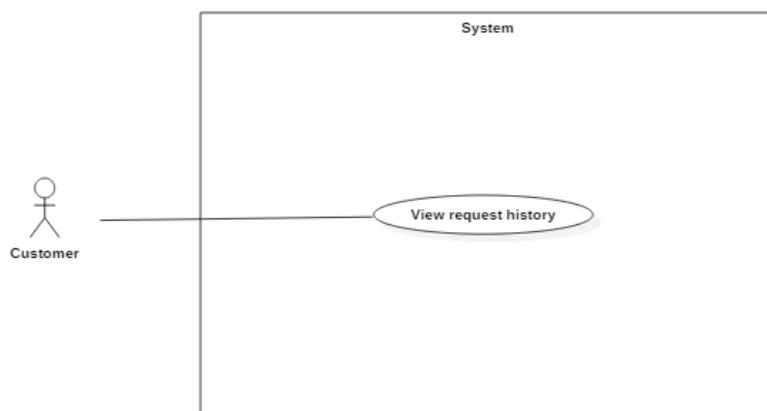


Figure 33: <Customer> View Request History

USE CASE – IMS068			
Use Case No.	IMS068	Use Case Version	2.0
Use Case Name	View Request History		

Author	Lê Thị Thu Hà					
Date	23/01/2016	Priority	medium			
Actor:						
- Customer.						
Summary:						
- This use case allows customers to view history of their requests.						
Goal:						
- Customer can view history of requests.						
Triggers:						
- Customer clicks on “Request History” in sidebar.						
Preconditions:						
- Customer must login into the system with role Customer.						
Post Conditions:						
- Success: List of history of requests will be displayed. - Fail: Show error message with specified content.						
Main Success Scenario:						
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #cccccc;">Step</th> <th style="background-color: #cccccc;">Actor Action</th> <th style="background-color: #cccccc;">System Response</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>Customer clicks on “Request History” in sidebar.</td> <td>List of history of requests will be displayed</td> </tr> </tbody> </table>	Step	Actor Action	System Response	1	Customer clicks on “Request History” in sidebar.	List of history of requests will be displayed
Step	Actor Action	System Response				
1	Customer clicks on “Request History” in sidebar.	List of history of requests will be displayed				
Alternatives Scenario: N/A.						
Exceptions: N/A.						
Relationships: N/A.						
Business Rules: N/A						

Table 40: Use case IMS068 - <Customer> View Request History

2.3.3.3. <Customer> Create request “Add Server”

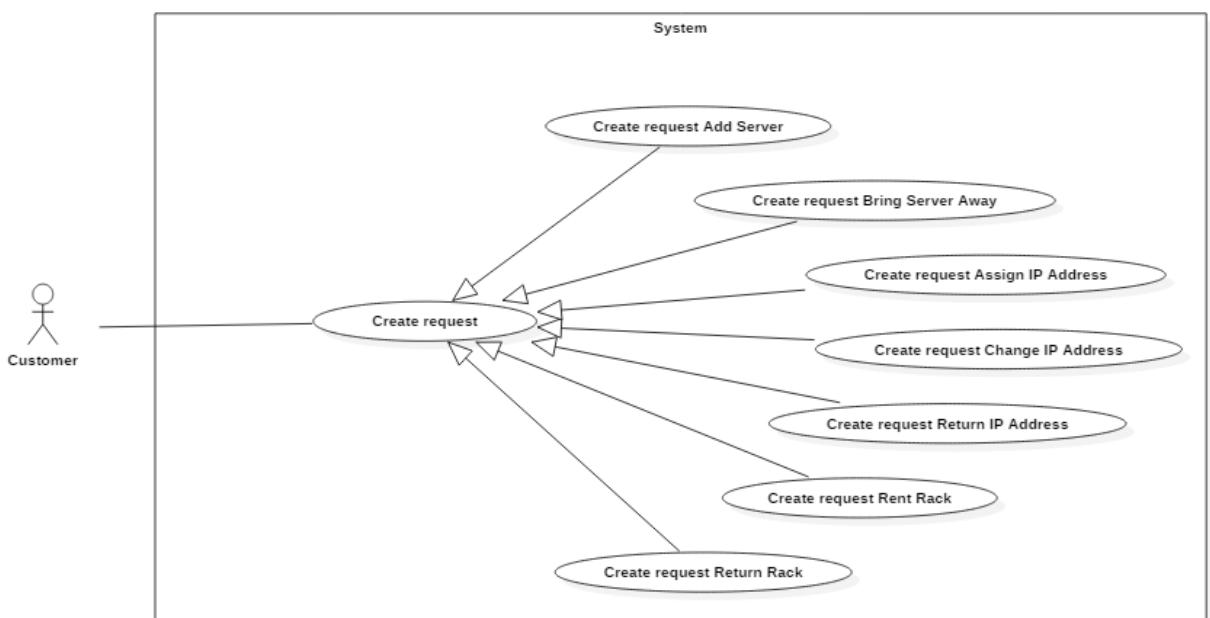


Figure 34: <Customer> Create request “Add Server”

USE CASE – IMS069																					
Use Case No.	IMS069	Use Case Version	2.0																		
Use Case Name	Create request “Add Server”																				
Author	Lê Thị Thu Hà																				
Date	23/01/2016	Priority	medium																		
Actor:	<ul style="list-style-type: none"> - Customer. 																				
Summary:	<ul style="list-style-type: none"> - This use case allows customer to add new server into datacenter. 																				
Goal:	<ul style="list-style-type: none"> - Add information of new server quickly. 																				
Triggers:	<ul style="list-style-type: none"> - Customer clicks on “Create Request” → “Add Server” 																				
Preconditions:	<ul style="list-style-type: none"> - Customer must login into the system with role Customer. 																				
Post Conditions:	<ul style="list-style-type: none"> - Success: Customer send request “Add Server” successfully. - Fail: Show error message with specified content. 																				
Main Success Scenario:	<table border="1"> <thead> <tr> <th>Step</th><th>Actor Action</th><th>System Response</th></tr> </thead> <tbody> <tr> <td>1</td><td>Customer clicks on “Create Request” → “Add Server”</td><td>“Add Server” request detail will be displayed</td></tr> <tr> <td>2</td><td>Input data in fields of Request Add Server Popup. Then customer clicks “Add” button on the pop-up</td><td>Server information will be displayed in the table “Servers” of “Add server” request detail.</td></tr> <tr> <td>3</td><td>Customer clicks “Sent request”</td><td>Redirect to “Add Server” request detail page. Request status is “Pending” Request is sent and system will send notification to current Shift Head.</td></tr> </tbody> </table>			Step	Actor Action	System Response	1	Customer clicks on “Create Request” → “Add Server”	“Add Server” request detail will be displayed	2	Input data in fields of Request Add Server Popup. Then customer clicks “Add” button on the pop-up	Server information will be displayed in the table “Servers” of “Add server” request detail.	3	Customer clicks “Sent request”	Redirect to “Add Server” request detail page. Request status is “Pending” Request is sent and system will send notification to current Shift Head.						
Step	Actor Action	System Response																			
1	Customer clicks on “Create Request” → “Add Server”	“Add Server” request detail will be displayed																			
2	Input data in fields of Request Add Server Popup. Then customer clicks “Add” button on the pop-up	Server information will be displayed in the table “Servers” of “Add server” request detail.																			
3	Customer clicks “Sent request”	Redirect to “Add Server” request detail page. Request status is “Pending” Request is sent and system will send notification to current Shift Head.																			
Alternatives Scenario:	<table border="1"> <thead> <tr> <th>Step</th><th>Actor Action</th><th>System Response</th></tr> </thead> <tbody> <tr> <td>1</td><td>Customer clicks on “Create Request” → “Add Server”</td><td>“Add Server” request detail will be displayed</td></tr> <tr> <td>2</td><td>Input data in fields of Request Add Server Popup. Then customer clicks “Add” button on the pop-up</td><td>Server information will be displayed in the table “Servers” of “Add server” request detail.</td></tr> <tr> <td>3</td><td>Customer clicks “Edit” on a row of the table.</td><td>“Edit” pop-up displays for customer to edit.</td></tr> <tr> <td>4</td><td>Customer clicks “OK” on “Edit” pop-up</td><td>Updated server information will be displayed in the table of “Add Server” request</td></tr> <tr> <td>5</td><td>Customer clicks “Sent request”</td><td>Redirect to “Add Server” request detail page. Request status is “Pending”</td></tr> </tbody> </table>			Step	Actor Action	System Response	1	Customer clicks on “Create Request” → “Add Server”	“Add Server” request detail will be displayed	2	Input data in fields of Request Add Server Popup. Then customer clicks “Add” button on the pop-up	Server information will be displayed in the table “Servers” of “Add server” request detail.	3	Customer clicks “Edit” on a row of the table.	“Edit” pop-up displays for customer to edit.	4	Customer clicks “OK” on “Edit” pop-up	Updated server information will be displayed in the table of “Add Server” request	5	Customer clicks “Sent request”	Redirect to “Add Server” request detail page. Request status is “Pending”
Step	Actor Action	System Response																			
1	Customer clicks on “Create Request” → “Add Server”	“Add Server” request detail will be displayed																			
2	Input data in fields of Request Add Server Popup. Then customer clicks “Add” button on the pop-up	Server information will be displayed in the table “Servers” of “Add server” request detail.																			
3	Customer clicks “Edit” on a row of the table.	“Edit” pop-up displays for customer to edit.																			
4	Customer clicks “OK” on “Edit” pop-up	Updated server information will be displayed in the table of “Add Server” request																			
5	Customer clicks “Sent request”	Redirect to “Add Server” request detail page. Request status is “Pending”																			

		Request is sent and system will send notification to current Shift Head.
Step	Actor Action	System Response
1	Customer clicks on “Make request” on the panel and select “Add New Server”	System will display Request Add New Server Popup
2	Input data in fields of Request Add Server Popup. Then customer clicks “Add” button on the pop-up	Server information will be displayed in the table “Servers” of “Add server” request detail.
3	Customer clicks “Delete” on a row of the table.	Pop-up displays to confirm “Delete” action.
4	Customer clicks “OK” on pop-up “Delete”	Return to previous view, the selected server in the table will be removed.
5	Customer clicks “Sent request”	Redirect to “Add Server” request detail page. Request status is “Pending” Request is sent and system will send notification to current Shift Head.

Exceptions:

No	Cause	System Response
1	Customer don't input “Appointment Time” field	Show message “Appointment Time is required. Please select time to go to the center.”
2	Customer don't add Server	Show message “Please add at least a server.”

Relationships: N/A.**Business Rules:**

- Customer can add one or more new servers in one request.

Table 41: Use case IMS069 - <Customer> Create request “Add Server”

2.3.3.4. <Customer> Create request “Bring Server Away”

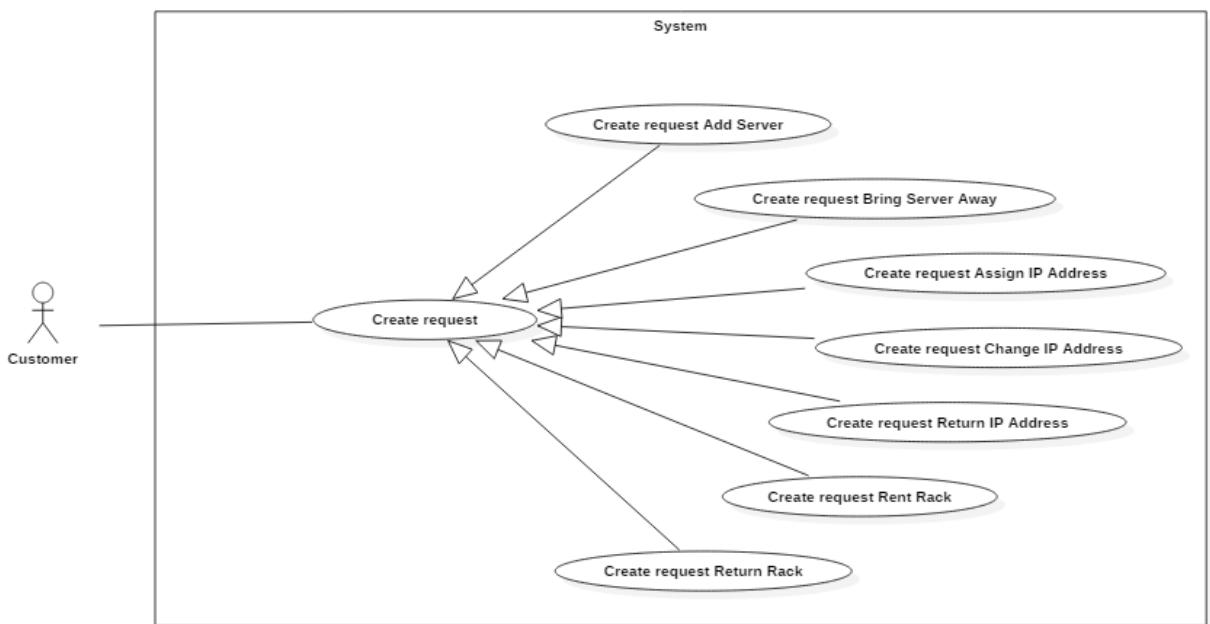


Figure 35: <Customer> Create request “Bring Server Away”

USE CASE – IMS070												
Use Case No.	IMS070	Use Case Version	2.0									
Use Case Name	Create request “Bring Server Away”											
Author	Lê Thị Thu Hà											
Date	23/01/2016	Priority	medium									
Actor:	<ul style="list-style-type: none"> - Customer. 											
Summary:	<ul style="list-style-type: none"> - This use case allows customer to bring his server away. 											
Goal:	<ul style="list-style-type: none"> - Bring his server away from datacenter successfully. 											
Triggers:	<ul style="list-style-type: none"> - Customer clicks on “Create Request” → “Bring Server Away” 											
Preconditions:	<ul style="list-style-type: none"> - Customer must login into the system with role Customer. 											
Post Conditions:	<ul style="list-style-type: none"> - Success: Customer send request “Bring Server Away” successfully. - Fail: Show error message with specified content. 											
Main Success Scenario:	<table border="1"> <thead> <tr> <th>Step</th><th>Actor Action</th><th>System Response</th></tr> </thead> <tbody> <tr> <td>1</td><td>Customer clicks on “Create Request” → “Bring Server Away”</td><td> <p>“Bring Server Away” request detail will be displayed.</p> <p>All servers of customer are displayed in the table</p> </td></tr> <tr> <td>2</td><td>Customer select server he wants to bring away from</td><td></td></tr> </tbody> </table>			Step	Actor Action	System Response	1	Customer clicks on “Create Request” → “Bring Server Away”	<p>“Bring Server Away” request detail will be displayed.</p> <p>All servers of customer are displayed in the table</p>	2	Customer select server he wants to bring away from	
Step	Actor Action	System Response										
1	Customer clicks on “Create Request” → “Bring Server Away”	<p>“Bring Server Away” request detail will be displayed.</p> <p>All servers of customer are displayed in the table</p>										
2	Customer select server he wants to bring away from											

	datacenter and input “Appointment Time”	
3	Customer clicks “Sent request”	Redirect to “Bring Server Away” request detail page. Request status is “Pending” Request is sent and system will send notification to current Shift Head.

Alternatives Scenario:

Step	Actor Action	System Response
1	Customer clicks on “Create Request” → “Bring Server Away”	“Bring Server Away” request detail will be displayed. All servers of customer are displayed in the table
2	Customer selects his rented racks by clicking on drop down list	Servers placed in selected rack will be displayed in the table.
	Customer select server he wants to bring away from datacenter and input “Appointment Time”	
3	Customer clicks “Sent request”	Redirect to “Bring Server Away” request detail page. Request status is “Pending” Request is sent and system will send notification to current Shift Head.

Exceptions:

No	Cause	System Response
1	Customer don't set “Appointment Time”	Show message “Appointment Time is required. Please select time to go to the center.”
2	Customer don't select server	Show message “Please choose at least one server.”

Relationships: N/A.**Business Rules:**

- Customer can add one or more new servers in one request.

*Table 42: Use case IMS070 - <Customer> Create request “Bring Server Away”***2.3.3.5. <Customer> Create request “Assign IP Address”**

Please refer full document in CD.

2.3.3.6. <Customer> Create request “Change IP Address”

Please refer full document in CD.

2.3.3.7. <Customer> Create request “Return IP Address”

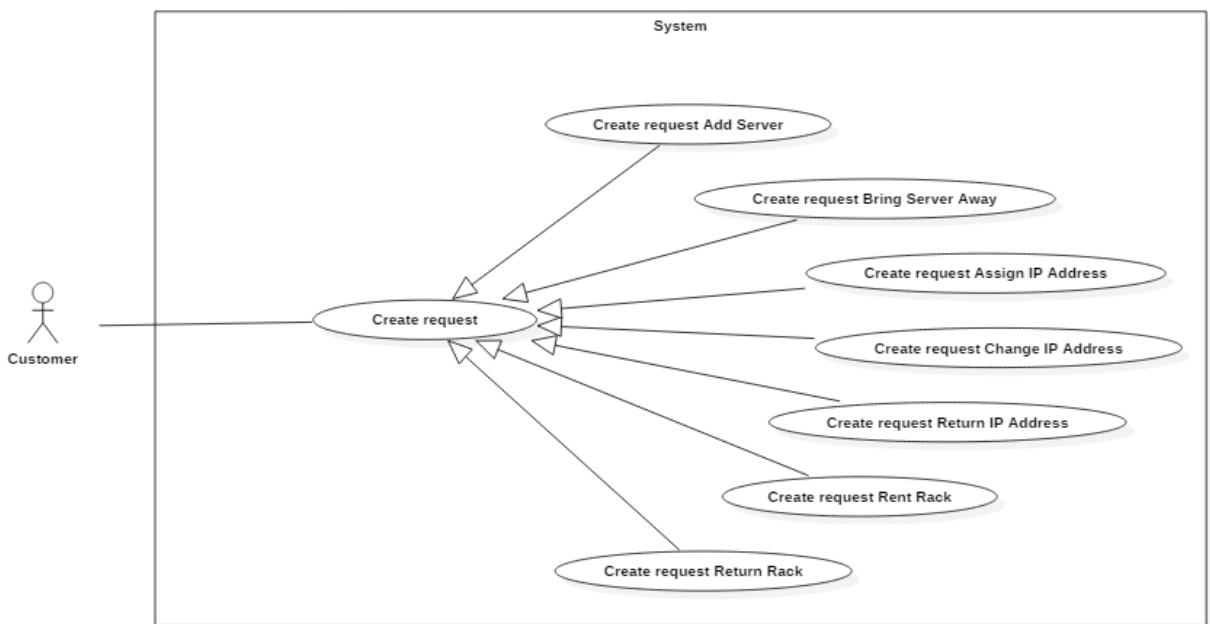


Figure 36: <Customer> Create request “Return IP Address”

USE CASE – IMS073												
Use Case No.	IMS073	Use Case Version	2.0									
Use Case Name	Create request “Return IP Address”											
Author	Lê Thị Thu Hà											
Date	23/01/2016	Priority	medium									
Actor:	<ul style="list-style-type: none"> - Customer. 											
Summary:	<ul style="list-style-type: none"> - This use case allows customer to return IP address 											
Goal:	<ul style="list-style-type: none"> - Return IP address to datacenter successfully. 											
Triggers:	<ul style="list-style-type: none"> - Customer clicks on “Create Request” → “Return IP Address” 											
Preconditions:	<ul style="list-style-type: none"> - Customer must login into the system with role Customer. 											
Post Conditions:	<ul style="list-style-type: none"> - Success: Customer send request “Return IP Address” successfully. - Fail: Show error message with specified content. 											
Main Success Scenario:	<table border="1"> <thead> <tr> <th>Step</th><th>Actor Action</th><th>System Response</th></tr> </thead> <tbody> <tr> <td>1</td><td>Customer clicks on “Create Request” → “Return IP Address”</td><td>“Return IP Address” request detail will be displayed.</td></tr> <tr> <td>2</td><td>Customer select server that he wants to return IP by drop down list</td><td>IP addresses of selected server will be displayed in a table. Default IP Address is highlighted.</td></tr> </tbody> </table>			Step	Actor Action	System Response	1	Customer clicks on “Create Request” → “Return IP Address”	“Return IP Address” request detail will be displayed.	2	Customer select server that he wants to return IP by drop down list	IP addresses of selected server will be displayed in a table. Default IP Address is highlighted.
Step	Actor Action	System Response										
1	Customer clicks on “Create Request” → “Return IP Address”	“Return IP Address” request detail will be displayed.										
2	Customer select server that he wants to return IP by drop down list	IP addresses of selected server will be displayed in a table. Default IP Address is highlighted.										

3	Customer select IP Address he wants to return	
3	Customer clicks "Sent request"	Redirect to "Return IP Address" request detail page. Request status is "Pending" Request is sent and system will send notification to current Shift Head.

Alternatives Scenario: N/A.

Exceptions:

No	Cause	System Response
1	Customer don't select "Server"	Show message "Please select your server."
2	Customer don't select "IP Address"	Show message "Please select at least one IP Address."

Relationships: N/A.

Business Rules:

- Customer can add one or more new servers in one request.
- Basically, new IP Address will be in the same range with Default IP Address

Table 43: Use case IMS073 - <Customer> Create request "Return IP Address"

2.3.3.8. <Customer> Create request "Rent Rack"

Please refer full document in CD.

2.3.3.9. <Customer> Create request "Return Rack"

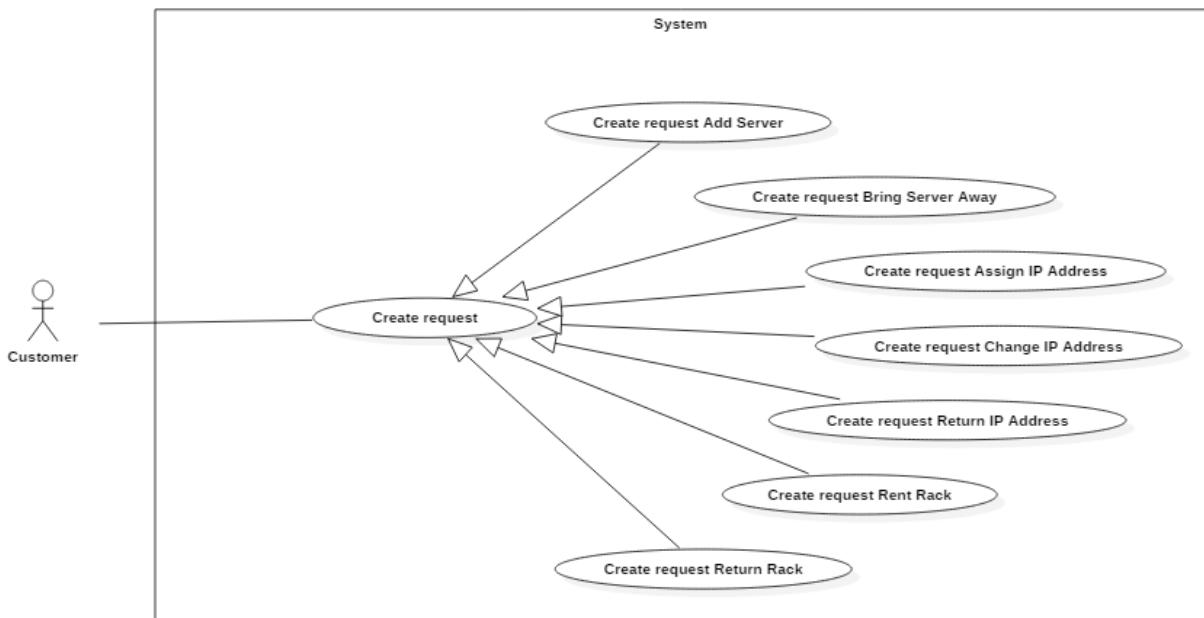


Figure 37: <Customer> Create request "Return Rack"

USE CASE – IMS075			
Use Case No.	IMS075	Use Case Version	2.0

Use Case Name	Create request “Return Rack”				
Author	Lê Thị Thu Hà				
Date	23/01/2016	Priority	medium		
Actor:					
- Customer.					
Summary:					
- This use case allows customer to return rack.					
Goal:					
- Return rack to datacenter successfully.					
Triggers:					
- Customer clicks on “Create Request” → “Return Rack”					
Preconditions:					
- Customer must login into the system with role Customer.					
Post Conditions:					
- Success: Customer send request “Return Rack” successfully.					
- Fail: Show error message with specified content.					
Main Success Scenario:					
Step	Actor Action	System Response			
1	Customer clicks on “Create Request” → “Return Rack”	“Return Rack” request detail will be displayed. All rented rack of this customer will be displayed.			
2	Customer selects rack he wants to return				
3	Customer clicks “Sent request”	Redirect to “Return Rack” request detail page. Request status is “Pending”. Request is sent and system will send notification to current Shift Head.			
Alternatives Scenario: N/A.					
Exceptions:					
No	Cause	System Response			
1	Customer don't select “Rack”	Show message “Please select at least one rack.”			
Relationships: N/A.					
Business Rules:					
- Customer can add one or more new servers in one request.					
- All rack that customer's using will be displayed. Rack that still has servers can't selected.					

Table 44: Use case IMS075 - <Customer> Create request “Return Rack”

2.3.3.10. <Customer> Cancel request “Add Server”

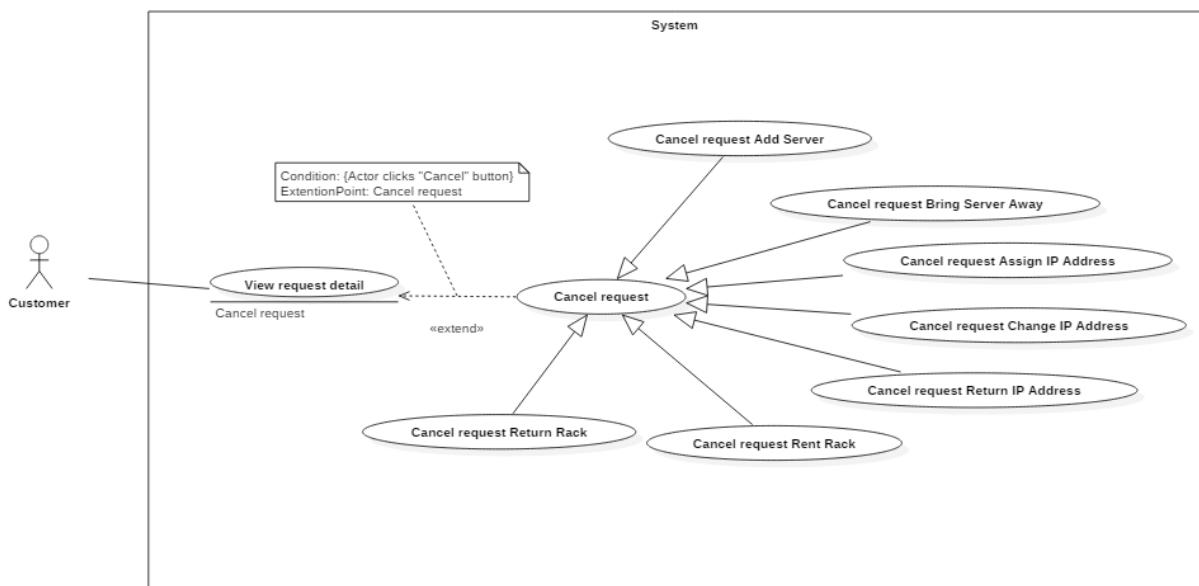


Figure 38: <Customer> Cancel request “Add server”

USE CASE - IMS076									
Use Case No.	IMS076	Use Case Version	2.0						
Use Case Name	Cancel request “Add server”								
Author	Lê Thị Thu Hà								
Date	24/01/2016	Priority	medium						
Actor:	<ul style="list-style-type: none"> - Customer. 								
Summary:	<ul style="list-style-type: none"> - This use case allows customer to cancel request Add Server which was sent. 								
Goal:	<ul style="list-style-type: none"> - Cancel request “Add Server” which was sent. 								
Triggers:	<ul style="list-style-type: none"> - Customer clicks on “Cancel Request” button on “Add Server” request detail. 								
Preconditions:	<ul style="list-style-type: none"> - Customer must login into the system with role Customer. - The request which want to cancel was sent to datacenter. 								
Post Conditions:	<ul style="list-style-type: none"> - Success: Shift Head will receive notification about cancel request. At the same time, the new server information which customer sent will be deleted out of database. The status of this request in database will be changed. - Fail: Show error message with specified content. 								
Main Success Scenario:	<table border="1"> <thead> <tr> <th>Step</th><th>Actor Action</th><th>System Response</th></tr> </thead> <tbody> <tr> <td>1</td><td>Customer clicks on “Cancel Request” button on “Add Server” request detail.</td><td>System will display confirmation pop-up with text “Are you sure to CANCEL your request?”</td></tr> </tbody> </table>			Step	Actor Action	System Response	1	Customer clicks on “Cancel Request” button on “Add Server” request detail.	System will display confirmation pop-up with text “Are you sure to CANCEL your request?”
Step	Actor Action	System Response							
1	Customer clicks on “Cancel Request” button on “Add Server” request detail.	System will display confirmation pop-up with text “Are you sure to CANCEL your request?”							

2	Customer clicks on “OK” button	The new server information which customer sent will be deleted out of database. The status of this request in database will be changed. Shift Head will receive notification about cancel request.
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Alternatives Scenario:

Step	Actor Action	System Response
1	Customer clicks on “Cancel Request” button on “Add Server” request detail.	System will display confirmation pop-up with text “Are you sure to CANCEL your request?”
2	Customer clicks on “Cancel” button	Return to previous request detail

Exceptions: N/A.**Relationships:** Extended by View request detail.**Business Rules:**

- Customer can cancel his request when its status is “Pending”, “Waiting” and “Processing”.

Table 45: Use case IMS076 - <Customer> Cancel request “Add Server”

2.3.3.11. <Customer> Cancel request “Bring Server Away”

Please refer full document in CD.

2.3.3.12. <Customer> Cancel request “Assign IP Address”

Please refer full document in CD.

2.3.3.13. <Customer> Cancel request “Change IP Address”

Please refer full document in CD.

2.3.3.14. <Customer> Cancel request “Return IP Address”

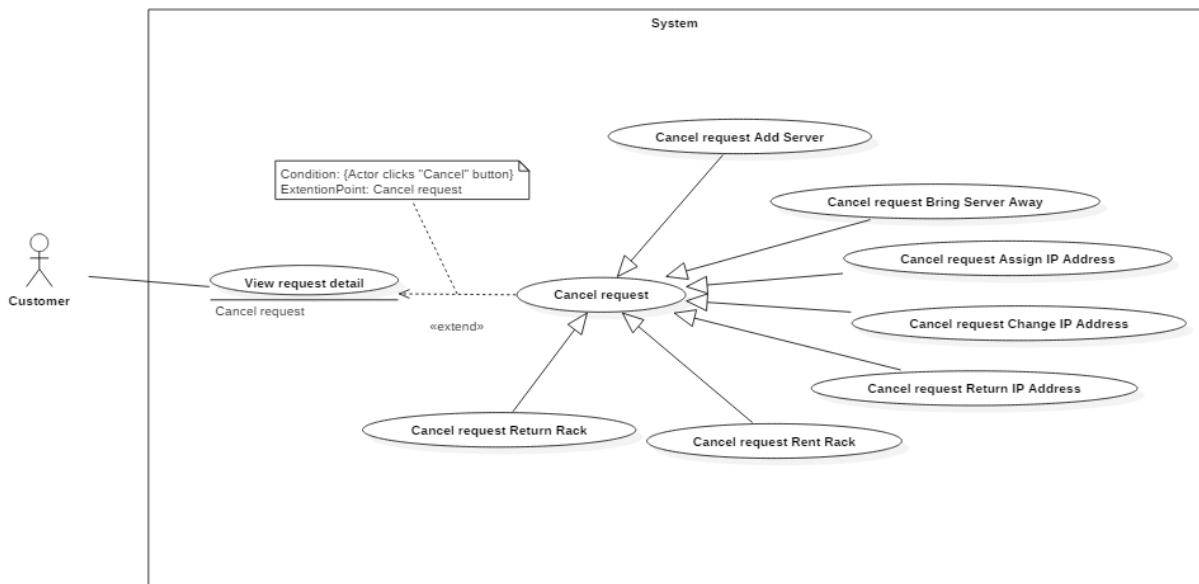


Figure 39: <Customer> Cancel request “Return IP Address”

USE CASE - IMS080						
Use Case No.	IMS080	Use Case Version	2.0			
Use Case Name	Cancel request “Return IP Address”					
Author	Lê Thị Thu Hà					
Date	24/01/2016	Priority	medium			
Actor:	<ul style="list-style-type: none"> - Customer. 					
Summary:	<ul style="list-style-type: none"> - This use case allows customer to cancel request “Return IP Address” which was sent. 					
Goal:	<ul style="list-style-type: none"> - Cancel request “Return IP Address” which was sent. 					
Triggers:	<ul style="list-style-type: none"> - Customer clicks on “Cancel Request” button on “Return IP Address” request detail. 					
Preconditions:	<ul style="list-style-type: none"> - Customer must login into the system with role Customer. - The request which want to cancel was sent to datacenter. 					
Post Conditions:	<ul style="list-style-type: none"> - Success: Shift Head will receive notification about cancel request. At the same time, the data of return IP Address which customer sent will be deleted out of database. The status of this request in database will be changed. - Fail: Show error message with specified content. 					
Main Success Scenario:	<table border="1"> <thead> <tr> <th>Step</th><th>Actor Action</th><th>System Response</th></tr> </thead> </table>			Step	Actor Action	System Response
Step	Actor Action	System Response				

1	Customer clicks on “Cancel Request” button on “Assign IP Address” request detail.	System will display confirmation pop-up with text “Are you sure to CANCEL your request?”
2	Customer clicks on “OK” button	Selected IP address status will be rolled back to “Used”. The status of this request in database will be changed to “Cancelled”. Shift Head will receive notification about cancel request.

Alternatives Scenario:

Step	Actor Action	System Response
1	Customer clicks on “Cancel Request” button on “Return IP Address” request detail.	System will display confirmation pop-up with text “Are you sure to CANCEL your request?”
2	Customer clicks on “Cancel” button	Return to previous request detail

Exceptions: N/A.**Relationships:** Extended by View request detail.**Business Rules:**

- Customer can cancel his request when its status is “Pending” and “Processing”.

*Table 46: Use case IMS080 - <Customer> Cancel request “Return IP Address”***2.3.3.15. <Customer> Cancel request “Rent Rack”**

Please refer full document in CD.

2.3.3.16. <Customer> Cancel request “Return Rack”

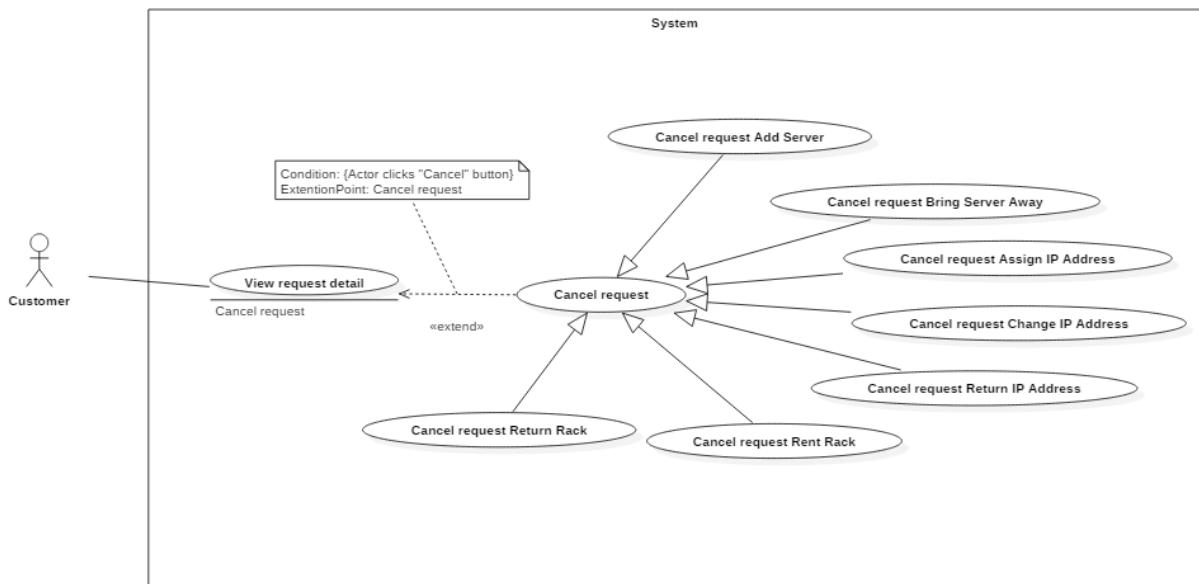


Figure 40: <Customer> Cancel request “Return Rack”

USE CASE - IMS082						
Use Case No.	IMS082	Use Case Version	2.0			
Use Case Name	Cancel request “Return Rack”					
Author	Lê Thị Thu Hà					
Date	24/01/2016	Priority	medium			
Actor:	<ul style="list-style-type: none"> - Customer. 					
Summary:	<ul style="list-style-type: none"> - This use case allows customer to cancel request “Return Rack” which was sent. 					
Goal:	<ul style="list-style-type: none"> - Cancel request “Return Rack” which was sent. 					
Triggers:	<ul style="list-style-type: none"> - Customer clicks on “Cancel Request” button on “Return Rack” request detail. 					
Preconditions:	<ul style="list-style-type: none"> - Customer must login into the system with role Customer. - The request which want to cancel was sent to datacenter. 					
Post Conditions:	<ul style="list-style-type: none"> - Success: Shift Head will receive notification about cancel request. At the same time, the data of request “Return Rack” which customer sent will be deleted out of database. The status of this request in database will be changed. - Fail: Show error message with specified content. 					
Main Success Scenario:	<table border="1"> <thead> <tr> <th>Step</th><th>Actor Action</th><th>System Response</th></tr> </thead> </table>			Step	Actor Action	System Response
Step	Actor Action	System Response				

1	Customer clicks on “Cancel Request” button on “Return Rack” request detail.	System will display confirmation pop-up with text “Are you sure to CANCEL your request?”
2	Customer clicks on “OK” button	Selected rack status will be rolled back to “Rented” The status of this request in database will be changed to “Cancelled”. Shift Head will receive notification about cancel request.

Alternatives Scenario:

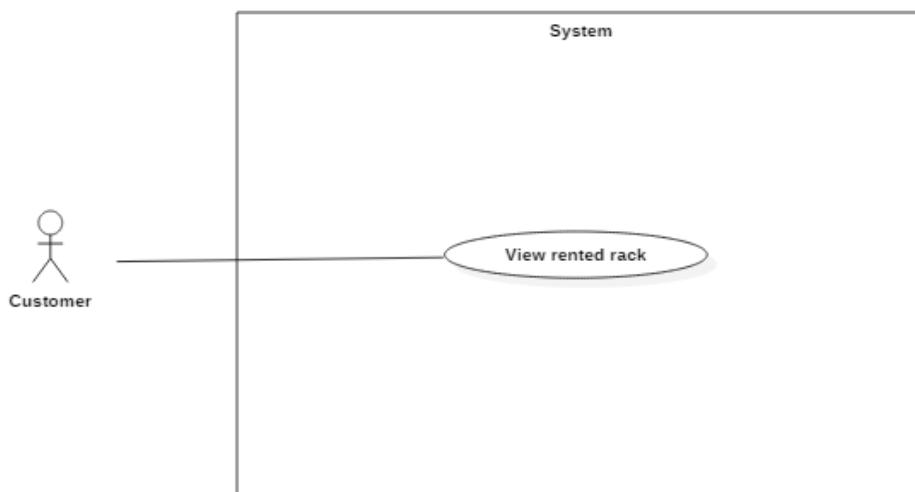
Step	Actor Action	System Response
1	Customer clicks on “Cancel Request” button on “Return Rack” request detail.	System will display confirmation pop-up with text “Are you sure to CANCEL your request?”
2	Customer clicks on “Cancel” button	Return to previous request detail

Exceptions: N/A.**Relationships:** Extended by View request detail.**Business Rules:**

- Customer can cancel his request when its status is “Pending” and “Processing”.

*Table 47: Use case IMS082 - <Customer> Cancel request “Return Rack”***2.3.3.17. <Customer> View server**

Please refer full document in CD.

2.3.3.18. <Customer> View rented rack*Figure 41: <Customer> View rented rack*

USE CASE – IMS084			
Use Case No.	IMS084	Use Case Version	2.0
Use Case Name	View rented rack		

Author	Huỳnh Lâm Hà Tiên				
Date	20/01/2016	Priority	medium		
Actor:					
- Customer.					
Summary:					
- This use case allows Customer to view list of his rented racks.					
Goal:					
- Customer can view his rented racks.					
Triggers:					
- Customer clicks on "Server" tab in the sidebar.					
Preconditions:					
- Customer must login into the system with role Customer.					
Post Conditions:					
- Success: Server information will be showed. - Fail: Server information will not be showed. Show error message with specified content.					
Main Success Scenario:					
Step	Actor Action	System Response			
1	Customer clicks on "Rack" tab in the sidebar.	Rack that customer has rented will display.			
Alternative Scenario: N/A.					
Exceptions: N/A.					
Relationships: N/A.					
Business Rules:					

Table 48: Use case IMS084 - <Customer> View rented rack

2.3.4. <Shift Manager> Overview Use Case

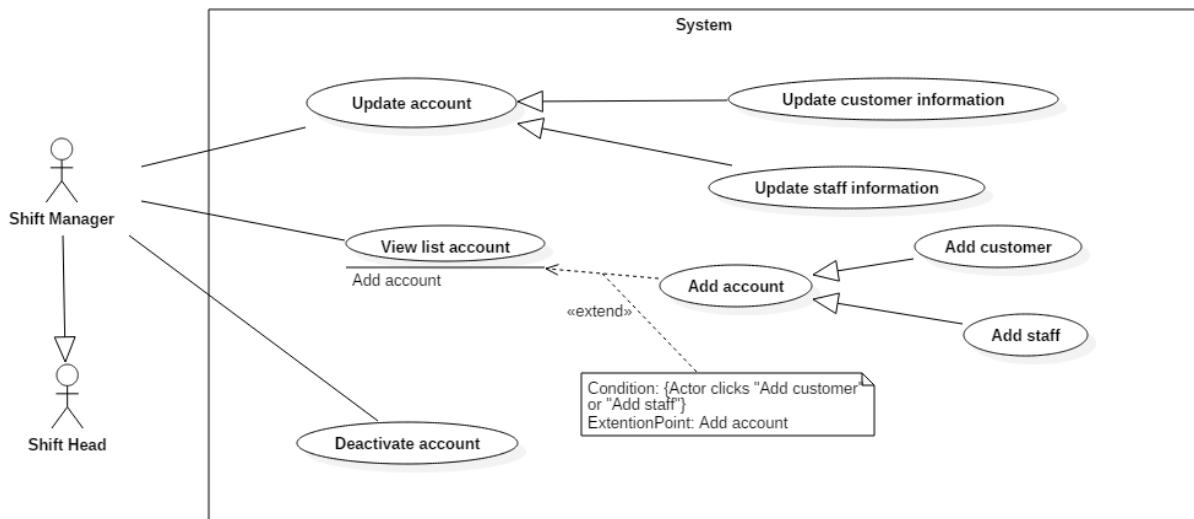


Figure 42: <Shift Manager> Overview Use Case

2.3.4.1. <Shift Manager> View list account

Please refer full document in CD.

2.3.4.2. <Shift Manager> Add Customer

Please refer full document in CD.

2.3.4.3. <Shift Manager> Update customer

Please refer full document in CD.

2.3.4.4. <Shift Manager> Add Staff

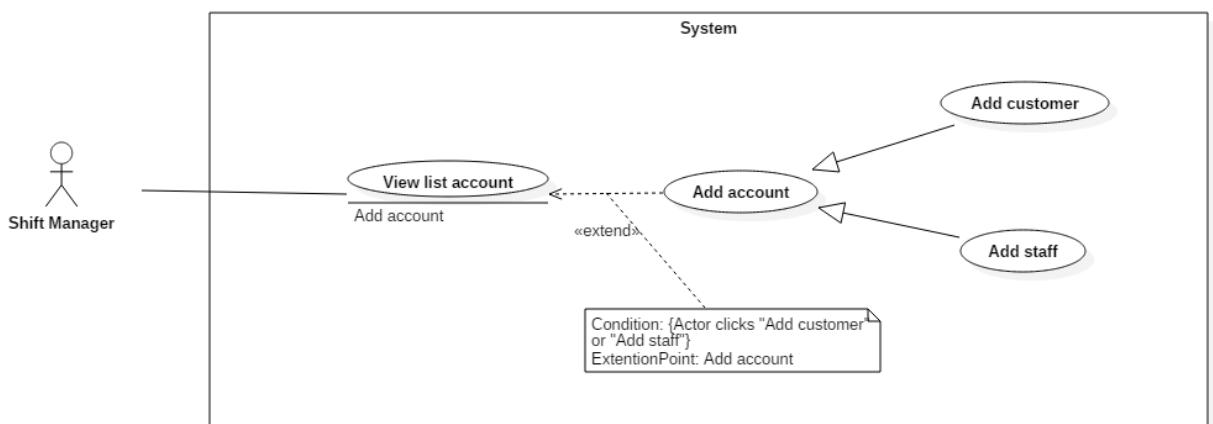


Figure 43: <Shift Manager> Add Staff

USE CASE - IMS088

Use Case No.	IMS088	Use Case Version	2.0
Use Case Name	Add staff		
Author	Huỳnh Lâm Hà Tiên		
Date	18/01/2016	Priority	medium
Actor:			
- Shift Manager.			
Summary:			
- This use case allows Shift Manager to add staff information.			
Goal:			
- Staff information saved successfully to the system			
Triggers			
- Shift Manager clicks “Add staff” button in “Account” page.			
Preconditions:			
- Shift Manager must login into the system with role Shift Manager.			
Post Conditions:			
- Success: Add new staff information successfully. - Fail: System shows error message.			
Main Success Scenario:			
Step	Actor Action	System Response	
1	Shift Manager clicks “Add staff” button in “Account” page.	System shows pop-up to add new staff information	
2	Input customer information		

3	Click “OK” button	New staff information will be saved. Redirect to previous “Account” page
Alternatives Scenario:		
Step	Actor Action	System Response
1	Shift Manager clicks “Add staff” button in “Account” page.	System shows pop-up to add new customer information
2	Input customer information	
3	Click “Cancel” button	Redirect to previous “Account” page with nothing changed.
Exceptions:		
No	Actor Action	System Response
1	Shift Manager forgot to input required field (marked with ‘*’)	System shows message “This field is required. Please input.”
Relationships:		
<ul style="list-style-type: none"> - Extend to View list account 		
Business Rules:		
<ul style="list-style-type: none"> - An email address must be validated by this regular expression: $/^([a-z0-9_\.]+)@([\da-z_.]+)\.([a-z_.]\{2,6})\$/$ - Password must be encrypted before save to database. - A group has 3 members, a shift head (kind of staff, but higher authority), and two staff. If a group already has 3 active members, new staff can't be added to this group. - Account information will be sent to staff via his email. 		

Table 49: Use case IMS088 - <Shift Manager> Add staff

2.3.4.5. <Shift Manager> Update Staff

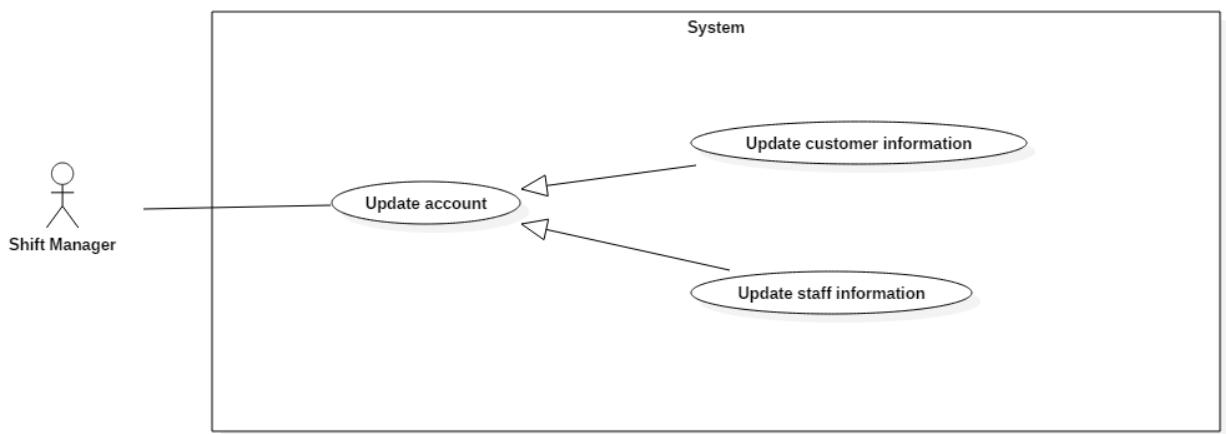


Figure 44: <Shift Manager> Update Staff

USE CASE – IMS089			
Use Case No.	IMS089	Use Case Version	2.0
Use Case Name	Update staff		
Author	Huỳnh Lâm Hà Tiên		
Date	18/01/2016	Priority	medium
Actor:	<ul style="list-style-type: none"> - Shift Manager. 		
Summary:	<ul style="list-style-type: none"> - This use case allows Shift Manager to update staff information. 		
Goal:	<ul style="list-style-type: none"> - Update staff information. 		
Triggers:	<ul style="list-style-type: none"> - Shift Manager clicks on “Edit” link on a row of Account table in “Account” page 		
Preconditions:	<ul style="list-style-type: none"> - Shift Manager must login into the system with role Shift Manager. 		
Post Conditions:	<ul style="list-style-type: none"> - Success: Update staff information successfully. - Fail: System shows error message. 		
Main Success Scenario:			
Step	Actor Action	System Response	
1	Shift Manager clicks on “Edit” link on a row of Account table in “Account” page	“Edit” pop-up displays	
2	Edit staff information		
3	Click “OK”	Staff information will be updated, then system redirects to previous “Account” page.	
Alternatives Scenario:			

Step	Actor Action	System Response
1	Shift Manager clicks on “Edit” link on a row of Account table in “Account” page	“Edit” pop-up displays
2	Edit staff information	
3	Click “Cancel”	System redirects to previous “Account” page with nothing changed

Exceptions:

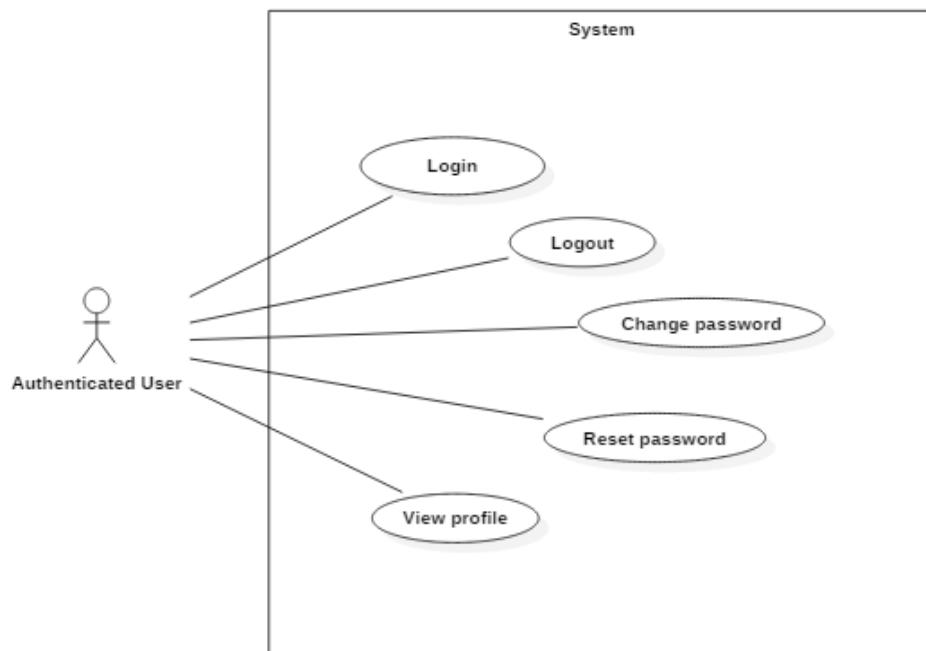
No	Actor Action	System Response
1	Edit with required fields are blanked	Show message “You have to input to required field.”

Relationships: Extended by View list account**Business Rules:**

- Only Shift Manager can edit staff information
- A group has 3 members, a shift head (kind of staff, but higher authority), and two staff. If a group already has 3 active members, new staff can't be added to this group.

*Table 50: Use case IMS089 - <Shift Manager> Update staff***2.3.4.6. <Shift Manager> Deactivate account**

Please refer full document in CD.

2.3.5. <Authenticated User> Overview Use Case*Figure 45: <Authenticated User> Overview Use Case*

2.3.5.1. <Authenticated User> Login

Please refer full document in CD.

2.3.5.2. <Authenticated User> Logout

Please refer full document in CD.

2.3.5.3. <Authenticated User> Change Password

Please refer full document in CD.

2.3.5.4. <Authenticated User> Reset password

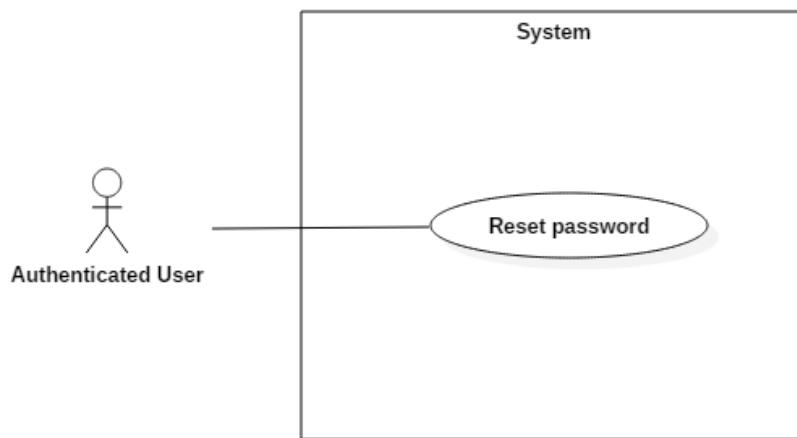


Figure 46: <Authenticaed User> Reset password

USE CASE - IMS094						
Use Case No.	IMS094	Use Case Version	2.0			
Use Case Name	Reset password					
Author	Huỳnh Lâm Hà Tiên					
Date	18/01/2016	Priority	Normal			
Actor:	<ul style="list-style-type: none"> - Authenticated user. 					
Summary:	<ul style="list-style-type: none"> - This use case allows authenticated user reset his password. 					
Goal:	<ul style="list-style-type: none"> - Reset password successfully and receive new password via email. 					
Triggers:	<ul style="list-style-type: none"> - Authenticated user clicks on “Reset password” link on login page. 					
Preconditions:	<ul style="list-style-type: none"> - User forgets his password. 					
Post Conditions:	<ul style="list-style-type: none"> - Success: System shows success message, and then customer can get new random password via his email. - Fail: System shows error message. 					
Main Success Scenario:	<table border="1"> <thead> <tr> <th>Step</th><th>Actor Action</th><th>System Response</th></tr> </thead> </table>			Step	Actor Action	System Response
Step	Actor Action	System Response				

1	Authenticated user clicks on “Reset password” link on login page	System shows success message “New password is sent to your email. Please check it.”
---	--	---

Alternatives Scenario: N/A.
Exceptions: N/A.
Relationships: N/A.
Business Rules:

- Registered email of customer must be valid to be able to receive new password. If not, he has to contact directly to shift manager to update his email and get new password.
- No one can reset password but the owner. New random password is only allocated via email.

Table 51: Use case IMS094 - <Authenticated User> Reset password

2.3.5.5. <Authenticated User> View profile

Please refer full document in CD.

3. Software System Attribute

3.1. Usability

3.1.1. Graphic User Interface

- Using language should be English.

3.1.2. Usability

- All users should need less than one training week to interact with website.

3.1.3. Installation

- Customer can deploy successfully and learn to configure, maintain the system within one day of training.
- The attached manual guide must be clear. User can read and do themselves without developer's help.

3.2. Reliability

- Information related to customer such as server's upgraded information will be saved by each interaction

3.3. Availability

- The website should be available 24 hours per day, 7 days per week.

3.4. Security

- Only user who has account can access into System.
- Each role of user has a specific permission to interact with system.
- System always checks authorization before process user's request.

3.5. Maintainability

- Code is easy to maintain and upgrade.

3.6. Portability

- The system can be deployed into many type of servers those have IIS server.

3.7. Performance

- Response time of almost functions should be less than 2s.

4. Conceptual Diagram

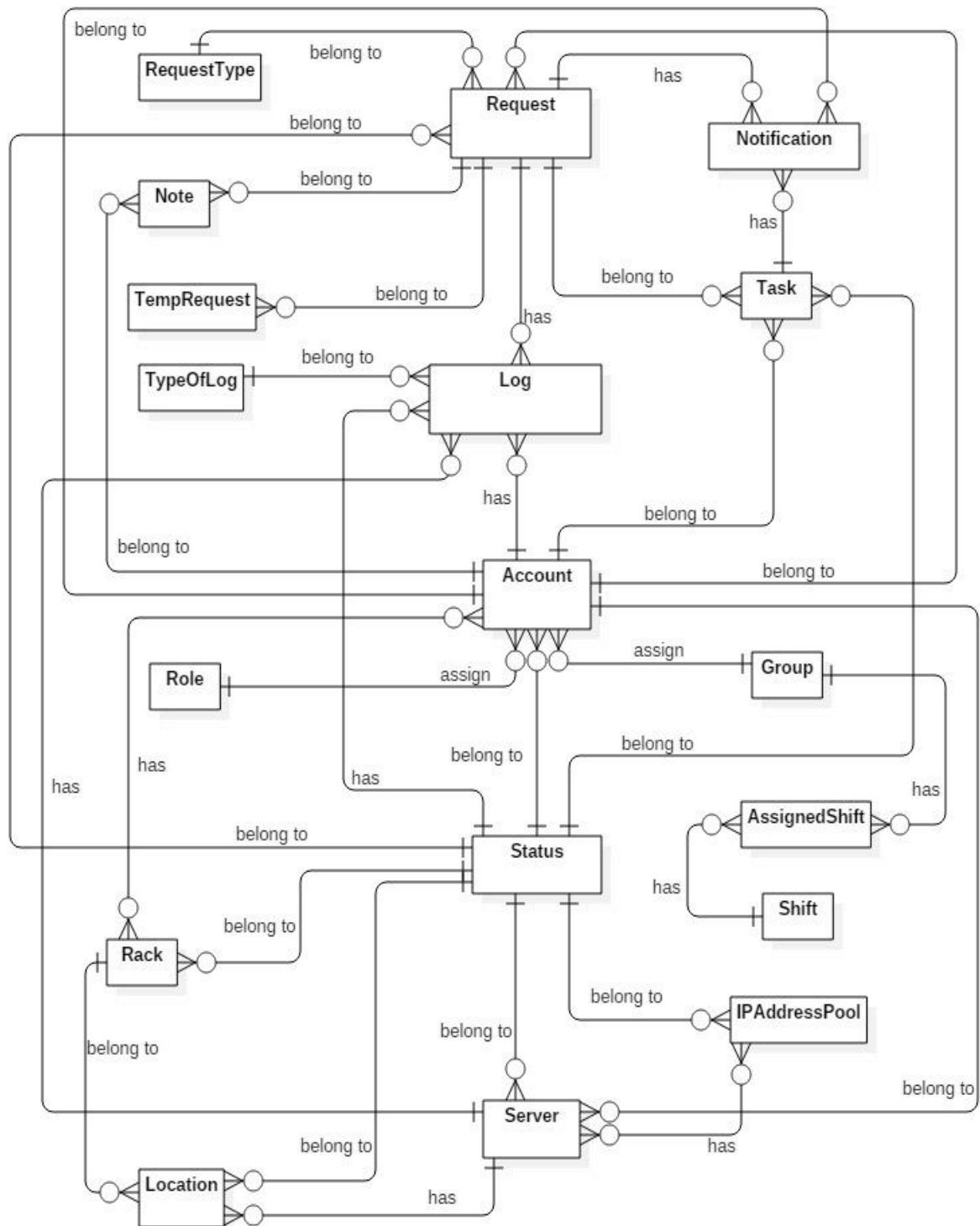


Figure 47: Conceptual Diagram

Data Dictionary

Entity Data dictionary: describe all content of all entities	
Entity Name	Description
Server	Contain the server information in datacenter.
Status	Contain all of statuses of objects in datacenter.
Location	Contain all location information in datacenter.
Rack	Contain all racks information which are putting in datacenter.
Log	Contain all logs about object's changes in datacenter.
Role	Contain all roles in the system.
Request	Contain all request content which was sent by customer.
Account	Contain all user information in the system.
Note	Contain all note which was wrote by previous shift for the next shift.
TempRequest	Contain temporary detail of all requests.
IPAddressPool	Contain all IP Addresses information which datacenter is keeping.
RequestType	Contain all types of request.
TypeOfLog	Contain all types of log.
Group	Contain all shift group of datacenter.
AssignedShift	Contain which group is in which shift each day.
Shift	Contain started time and ended time of each shift group.
Notification	Contain all notification information.
Task	Contain all contents of each task.

Table 52: Data dictionary

D. Software Design Description

1. Design Overview

- This document describes the technical and user interface design of **Information Management System of a datacenter**. It includes the architectural design, the detailed design of common functions and business functions.
- The architectural design describes the overall architecture of the system and the architecture of each main component and subsystem.
- The detailed design describes static and dynamic structure for each component and functions. It includes class diagrams, class explanations and sequence diagrams for each use cases.
- The database design describes the relationships between entities and details of each entity.
- Document overview:
 - **Section 2:** The overall description of the system architectural design.
 - **Section 3:** Component diagrams that describe the connection and integration of the system.
 - **Section 4:** Detail design description, which includes class diagram, class explanation, and sequence diagram to describe the functions.
 - **Section 5:** The user interface of application.
 - **Section 6:** Database design with logical diagram.
 - **Section 7:** The algorithms used for academic classification, considering honor, considering upgrading.

2. System Architecture Design

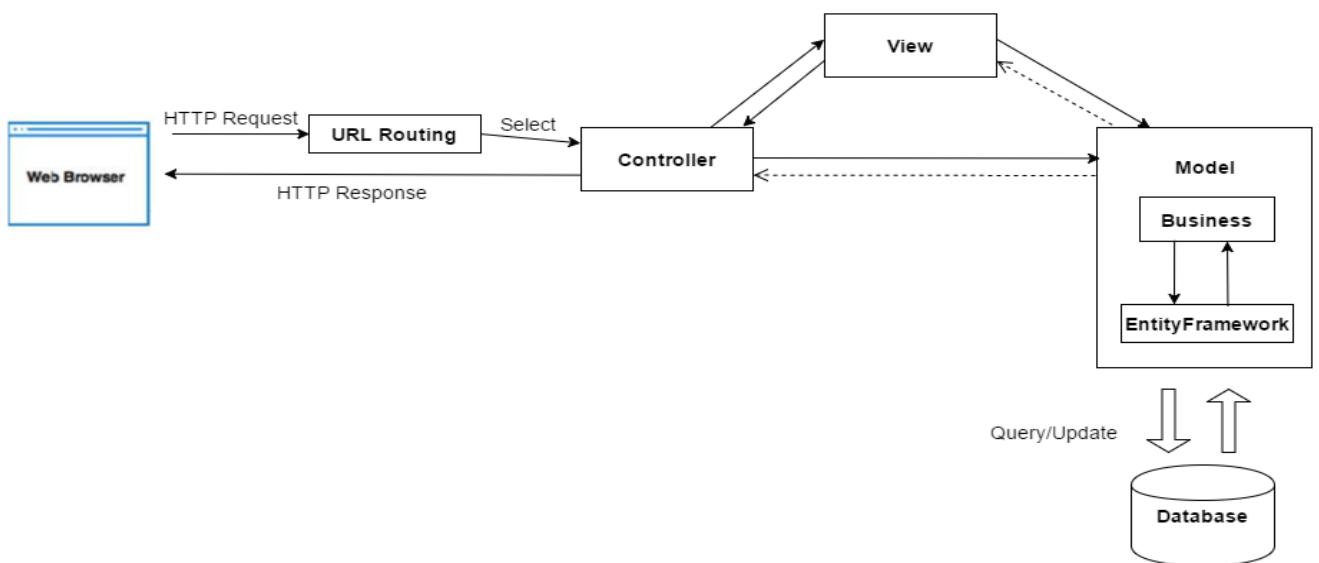


Figure 48: System architecture design

We use MVC architecture style to develop IMS web. Specifically, customized it as convenient and suitable as possible to meet the customer's requirement.

Controller: Receive requests from clients and transfers to Business to handle request then use processed result from Business to render View and return view to clients.

View: handles for display data from Model. The creation of View is under control of Controller.

Model: is generated by mapping database table by Entity Framework 6, Model is used like a data transfer object between the system and database.

Business: Handles the business logic of the system.

3. Component Diagram

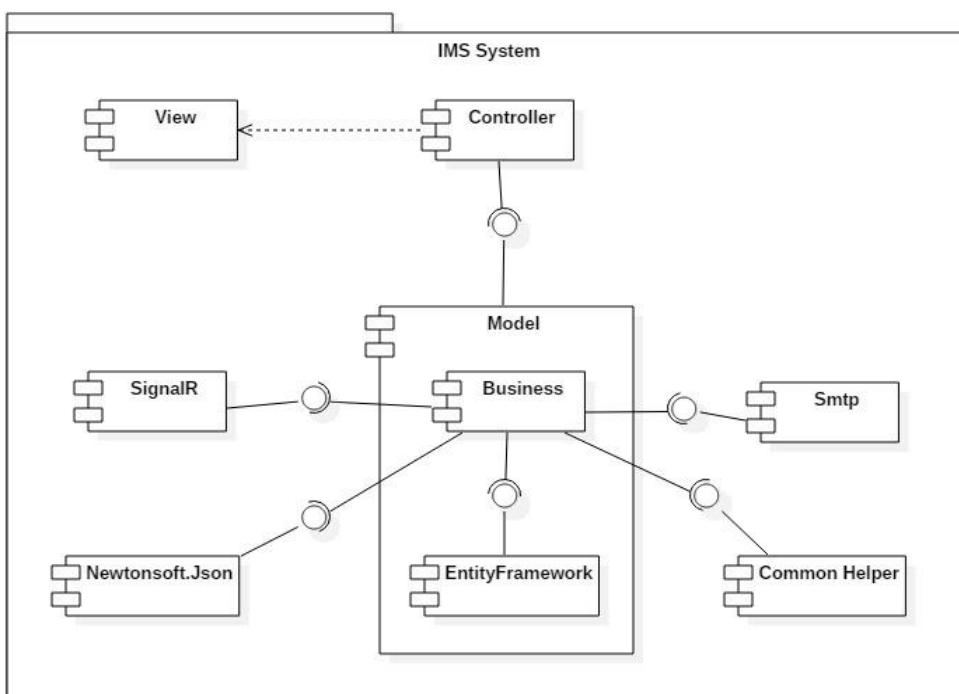


Figure 49 : Component Diagram

Component Dictionary: Describes components	
Controller	Contain all controllers in the system.
View	Contain all views in the system.
Business	Contain all business logic processing in the system.
Model	Entity Framework 6 mapping models.
Smtp	Component is used to send asynchronous emails.
EntityFramework	Component is used to map database table, generate Model.

SignalR	Library which is used to add notification, a sort of "real-time" web functionality to ASP.NET application.
Newtonsoft.Json	A popular high-performance JSON framework for .NET.
Common Helper	Contain common libraries which are used to develop the system.

Table 53: Component Dictionary

4. Detailed Description

4.1. Class Diagram

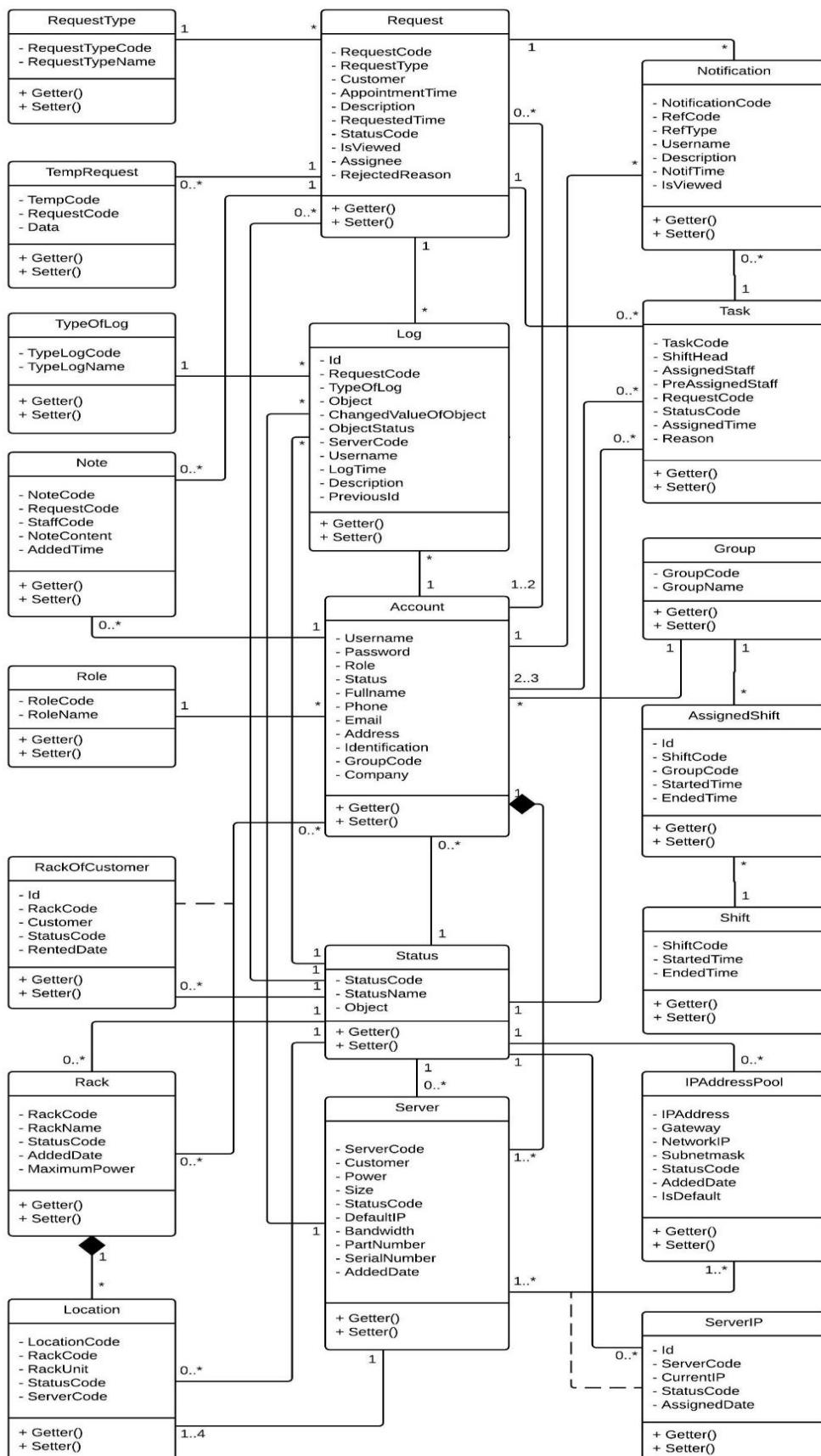


Figure 50 : Class Diagram

4.2. Class Diagram Explanation

4.2.1. Account

Attribute

Attribute	Type	Visibility	Description
Username (PK)	String	Private	Username of an account, identifier of an account
Password	String	Private	Password of an account
Role	String	Private	Role name of an account
Status	Boolean	Private	Current status of user
Fullscreen	String	Private	Full name of user
Phone	String	Private	Phone of user
Email	String	Private	Email address of user
Address	String	Private	Address of user
Identification	String	Private	Identification Number of user
GroupCode	String	Private	Group of user
Company	String	Private	Company of customer

Method

Method	Return type	Visibility	Description
Getter	Attribute type	Public	Get attribute value
Setter	Void	Public	Set value of attribute

4.2.2. AssignedShift

Attribute

Attribute	Type	Visibility	Description
Id (PK)	Integer	Private	Unique identifier of AssignedShift, auto increment
ShiftCode	String	Private	Code of Shift
GroupCode	String	Private	Code of Group
StartTime	Datetime	Private	The started time of shift
EndTime	Datetime	Private	The ended time of shift

Method

Method	Return type	Visibility	Description
Getter	Attribute type	Public	Get attribute value
Setter	Void	Public	Set value of attribute

4.2.3. Group

Attribute

Attribute	Type	Visibility	Description
GroupCode (PK)	String	Private	Code of Group, identifier of a group
GroupName	String	Private	Name of group

Method

Method	Return type	Visibility	Description
Getter	Attribute type	Public	Get attribute value
Setter	Void	Public	Set value of attribute

4.2.4. IPAddressPool

Attribute

Attribute	Type	Visibility	Description
IPAddress (PK)	String	Private	IP Address of datacenter, identifier of IP Address
Gateway	String	Private	Gateway of IP Address
Subnetmask	String	Private	Subnetmask of IP Address
StatusCode	String	Private	Current status of IP Address
NetworkIP	String	Private	NetworkIP of IP Address
IsDefault	Boolean	Private	The IP Address is a default IP or not
AddedDate	Datetime	Private	The date when IP Address was added into system

Method

Method	Return type	Visibility	Description
Getter	Attribute type	Public	Get attribute value
Setter	Void	Public	Set value of attribute

4.2.5. Location

Attribute

Attribute	Type	Visibility	Description
LocationCode (PK)	String	Private	Code of Location, identifier of a location
RackCode	String	Private	Code of rack
ServerCode	String	Private	Server which was put on location
RackUnit	Integer	Private	Rack Unit of each location
StatusCode	String	Private	Status of location

Method

Method	Return type	Visibility	Description
Getter	Attribute type	Public	Get attribute value
Setter	Void	Public	Set value of attribute

4.2.6. Log

Attribute

Attribute	Type	Visibility	Description
Id (PK)	Integer	Private	Unique identifier of a log, auto increment.
RequestCode	String	Private	Code of request which was logged
LogTime	Datetime	Private	The time when logged
TypeOfLog	String	Private	The type of log
Object	String	Private	Object which was logged
ChangedValueOfObject	String	Private	The changed value of Object
ObjectStatus	String	Private	The status of object which was logged

ServerCode	String	Private	The code of server which was logged
Username	String	Private	The username of user who logged
Description	String	Private	Description of log
PreviousId	int	Private	Id of the previous record

Method

Method	Return type	Visibility	Description
Getter	Attribute type	Public	Get attribute value
Setter	Void	Public	Set value of attribute

4.2.7. Note**Attribute**

Attribute	Type	Visibility	Description
NoteCode (PK)	String	Private	Code of note, identifier of a note
RequestCode	String	Private	Code of request which has note
StaffCode	String	Private	Code of staff who added note
NoteContent	String	Private	Content of note
AddedTime	Datetime	Private	The time when note was added

Method

Method	Return type	Visibility	Description
Getter	Attribute type	Public	Get attribute value
Setter	Void	Public	Set value of attribute

4.2.8. Notification**Attribute**

Attribute	Type	Visibility	Description
NotificationCode (PK)	String	Private	Code of notification, identifier of a notification
RefCode	String	Private	Code of object which has notification
RefType	String	Private	Type of object which has notification
Username	String	Private	User who will receive the notification
IsViewed	Boolean	Private	The notification which was viewed or not
NotifTime	Datetime	Private	The time which send notification
Description	String	Private	The description of notification

Method

Method	Return type	Visibility	Description
Getter	Attribute type	Public	Get attribute value
Setter	Void	Public	Set value of attribute

4.2.9. Rack**Attribute**

Attribute	Type	Visibility	Description
RackCode (PK)	String	Private	Code of Rack, identifier of a request
RackName	String	Private	Name of Rack
StatusCode	String	Private	Current status of Rack
AddedDate	Datetime	Private	The date when rack was added into datacenter
MaximumPower	Integer	Private	The power of Rack

Method			
Method	Return type	Visibility	Description
Getter	Attribute type	Public	Get attribute value
Setter	Void	Public	Set value of attribute

4.2.10. RackOfCustomer

Attribute

Attribute	Type	Visibility	Description
Id (PK)	Integer	Private	Unique identifier of RackOfCustomer, auto increment
RackCode	String	Private	Code of rack which customer rented
Customer	String	Private	Customer who rented rack
StatusCode	String	Private	Status of RackOfCustomer
RentedDate	Datetime	Private	The time when customer rented rack

Method

Method	Return type	Visibility	Description
Getter	Attribute type	Public	Get attribute value
Setter	Void	Public	Set value of attribute

4.2.11. Request

Attribute

Attribute	Type	Visibility	Description
RequestCode (PK)	String	Private	Code of Request, identifier of a request
RequestType	String	Private	Type of each request
Customer	String	Private	Customer who sent request
AppointmentTime	Datetime	Private	The time when customer registered to have appointment with datacenter
Description	String	Private	The description of customer in request
RequestedTime	Datetime	Private	The time when request was sent
StatusCode	String	Private	Current status of request
IsViewed	Boolean	Private	Check whether request is viewed
Assignee	String	Private	The staff who was assigned this request
RejectedReason	String	Private	Reason when request is rejected

Method

Method	Return type	Visibility	Description
Getter	Attribute type	Public	Get attribute value
Setter	Void	Public	Set value of attribute

4.2.12. RequestType**Attribute**

Attribute	Type	Visibility	Description
RequestTypeCode (PK)	String	Private	Code of Request Type, identifier of a request type
RequestTypeName	String	Private	Code of Request Type, identifier of a request type

Method

Method	Return type	Visibility	Description
Getter	Attribute type	Public	Get attribute value
Setter	Void	Public	Set value of attribute

4.2.13. Role**Attribute**

Attribute	Type	Visibility	Description
RoleCode (PK)	String	Private	Unique identifier of a role
RoleName	String	Private	Name of role

Method

Method	Return type	Visibility	Description
Getter	Attribute type	Public	Get attribute value
Setter	Void	Public	Set value of attribute

4.2.14. Server**Attribute**

Attribute	Type	Visibility	Description
ServerCode (PK)	String	Private	Code of server, identifier of a server
Customer	String	Private	Customer who own this server
Power	Integer	Private	The power of server
Size	Integer	Private	The size of server: 1U, 2U or 4U
Bandwidth	String	Private	Bandwidth of server
SerialNumber	String	Private	Serial number of server
PartNumber	String	Private	Part number of server
StatusCode	String	Private	Current status of server.
Default IP	String	Private	Default IP of server
AddedDate	Datetime	Private	The date when server was registered.

Method

Method	Return type	Visibility	Description
Getter	Attribute type	Public	Get attribute value
Setter	Void	Public	Set value of attribute

4.2.15. ServerIP

Attribute

Attribute	Type	Visibility	Description
Id (PK)	Integer	Private	Unique identifier of ServerIP, auto increment.
ServerCode	String	Private	Code of Server
CurrentIP	String	Private	Current IP of server
StatusCode	String	Private	Status of ServerIP
AssignedDate	Datetime	Private	The date when IP Address was assigned for server

Method

Method	Return type	Visibility	Description
Getter	Attribute type	Public	Get attribute value
Setter	Void	Public	Set value of attribute

4.2.16. Shift

Attribute

Attribute	Type	Visibility	Description
ShiftCode (PK)	String	Private	Code of shift, identifier of shift
StartTime	Datetime	Private	The time when shift started
EndTime	Datetime	Private	The time when shift ended

Method

Method	Return type	Visibility	Description
Getter	Attribute type	Public	Get attribute value
Setter	Void	Public	Set value of attribute

4.2.17. Status

Attribute

Attribute	Type	Visibility	Description
StatusCode (PK)	String	Private	Code of Status, identifier of a status
Status	String	Private	Status name of each Object
Object	String	Private	The Object of system

Method

Method	Return type	Visibility	Description
Getter	Attribute type	Public	Get attribute value
Setter	Void	Public	Set value of attribute

4.2.18. Task

Attribute

Attribute	Type	Visibility	Description
TaskCode (PK)	String	Private	Code of Task, identifier of a task
ShiftHead	String	Private	ShiftHead who assigned task
AssignedStaff	String	Private	The Staff who was assigned task

RequestCode	String	Private	The code of Request which was assigned
StatusCode	String	Private	The status code of Task
Reason	String	Private	The reason when task does not finish
AssignedTime	Datetime	Private	The time when task was assigned
PreAssignedStaff	String	Private	The Staff who was assigned previous

Method

Method	Return type	Visibility	Description
Getter	Attribute type	Public	Get attribute value
Setter	Void	Public	Set value of attribute

4.2.19. TypeOfLog**Attribute**

Attribute	Type	Visibility	Description
TypeLogCode (PK)	String	Private	Code of Type of Log
TypeLogName	String	Private	Name of Type of Log

Method

Method	Return type	Visibility	Description
Getter	Attribute type	Public	Get attribute value
Setter	Void	Public	Set value of attribute

4.2.20. TempRequest**Attribute**

Attribute	Type	Visibility	Description
TempCode (PK)	String	Private	Code of TempRequest, identifier of a TempRequest
RequestCode	String	Private	Code of Request which was saved TempData
Data	String	Private	Data which was saved temporary for request

Method

Method	Return type	Visibility	Description
Getter	Attribute type	Public	Get attribute value
Setter	Void	Public	Set value of attribute

4.3. Interactive Diagram

4.3.1. <Customer> Create request “Add Server”

Summary: This diagram shows how the customer add new server into datacenter.

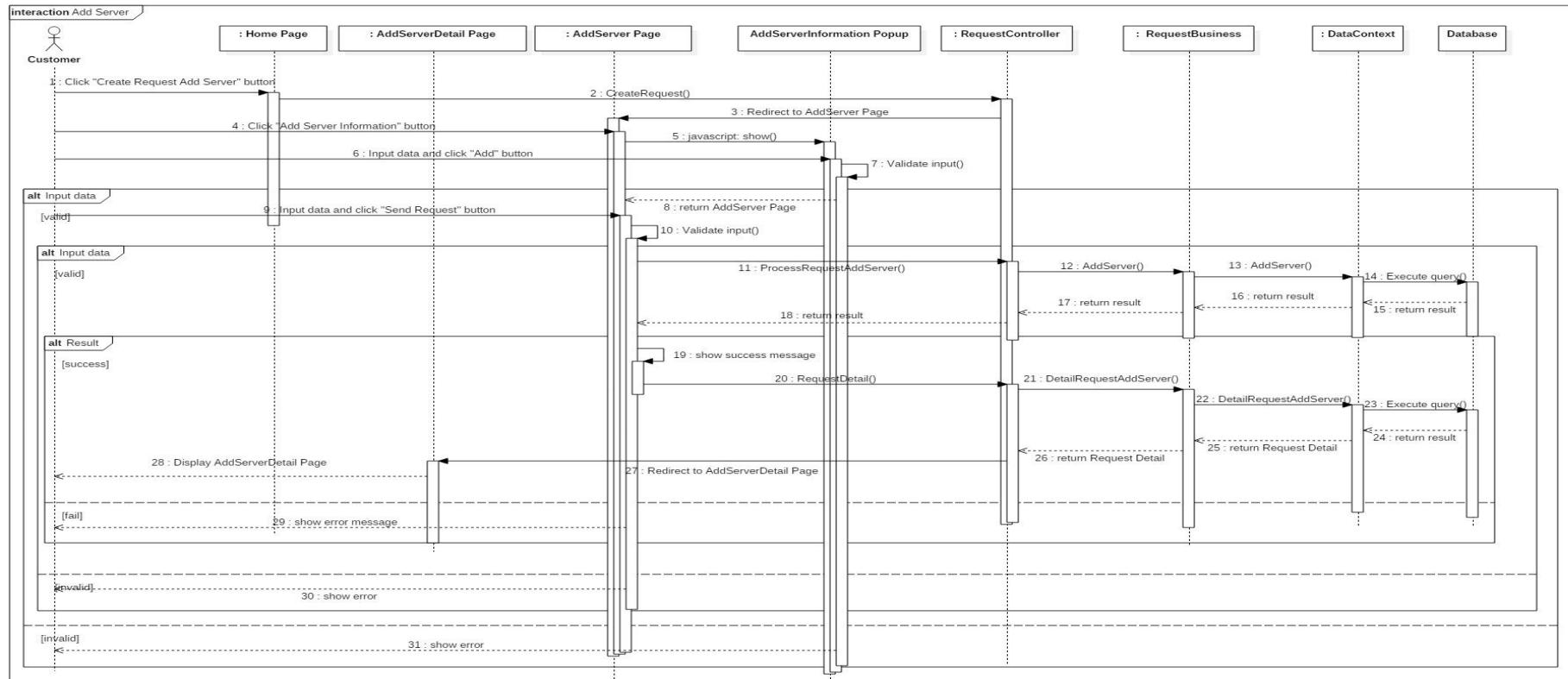


Figure 51: Sequence Diagram <Customer> Create request “Add Server”

4.3.2. <Customer> Cancel request “Add Server”

Summary: This diagram shows how customer cancel request Add Server.

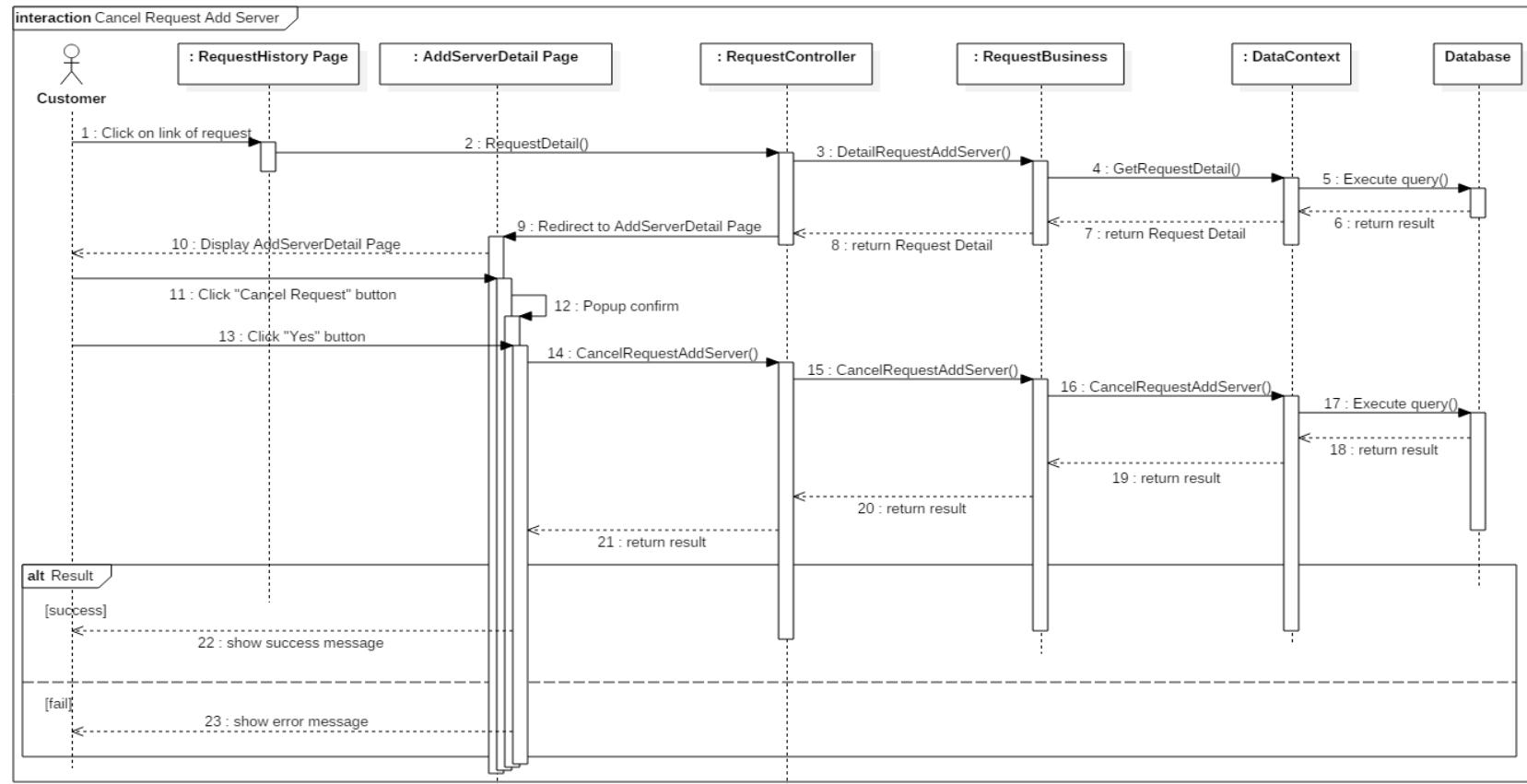


Figure 52: Sequence Diagram <Customer> Cancel request “Add Server”

4.3.3. <Customer> Create request “Return IP Address”

Summary: This diagram shows how customer return IP Address to datacenter.

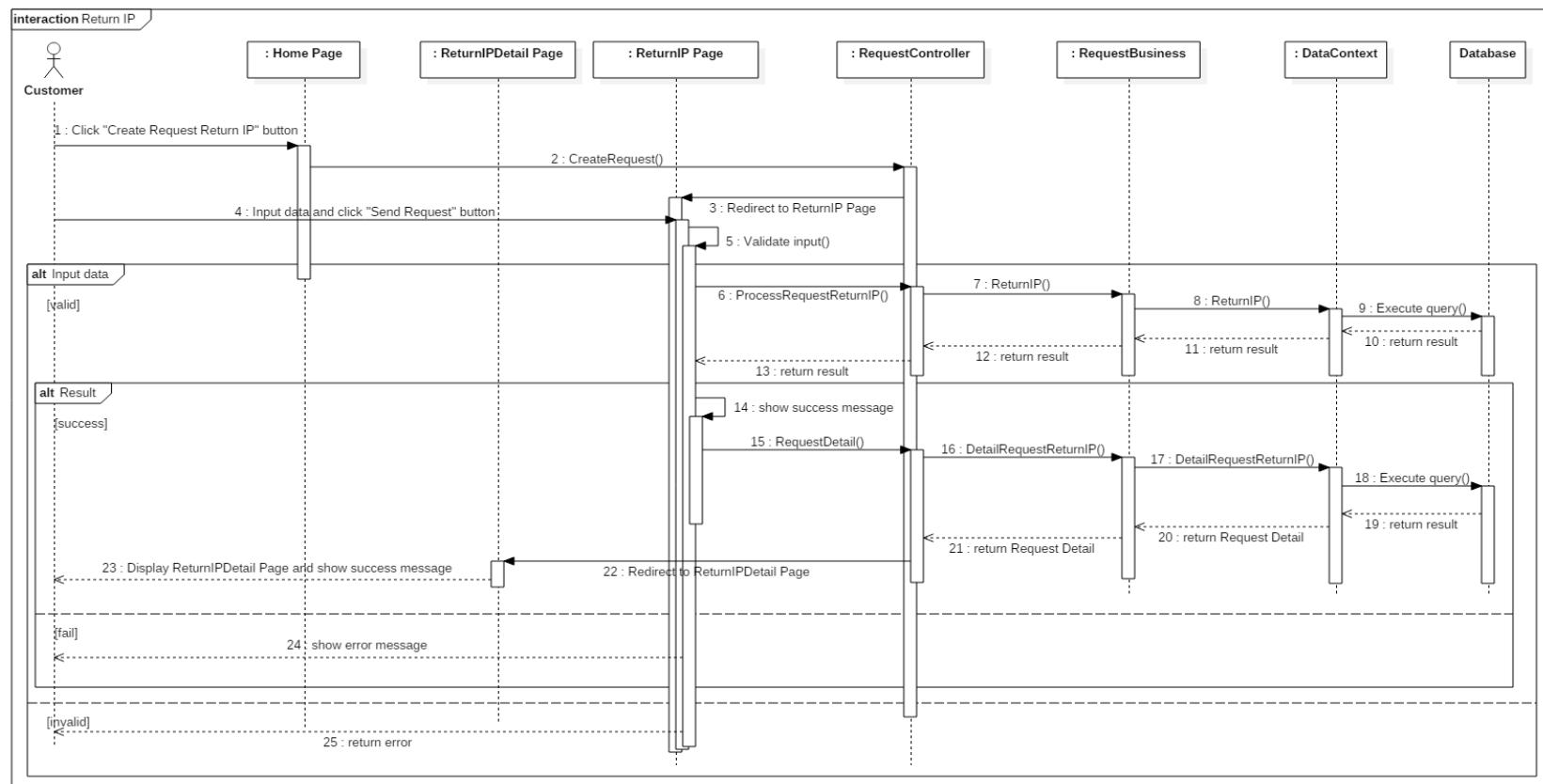


Figure 53: Sequence Diagram <Customer> Create request “Return IP Address”

4.3.4. <Customer> Create request “Rent Rack”

Summary: This diagram shows how to Customer create request rent rack from data center.

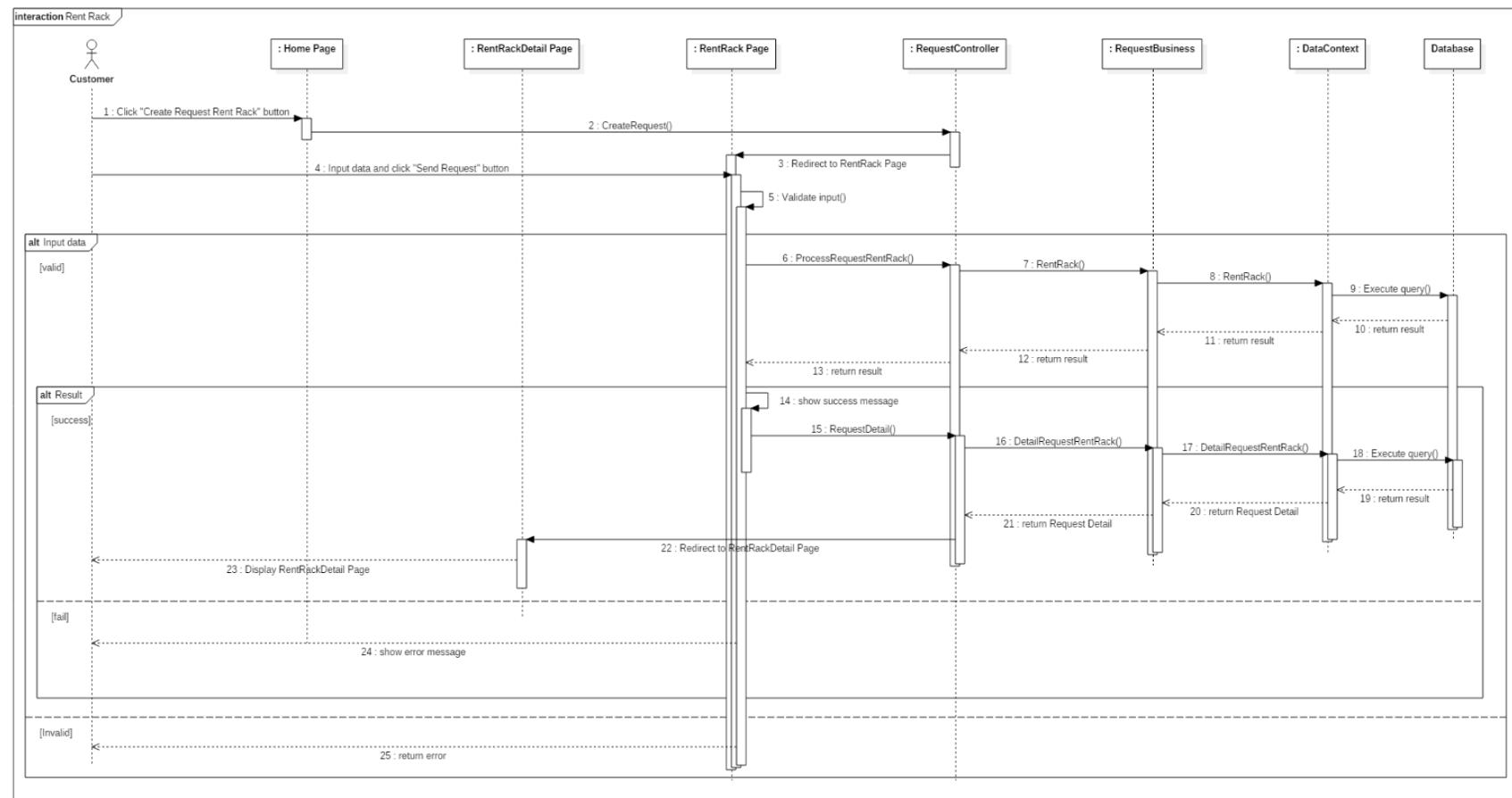


Figure 54: Sequence Diagram <Customer> Create request “Rent Rack”

4.3.5. <Shift Head> Complete request “Assign IP Address”

Please refer full document in CD.

4.3.6. <Shift Head> Complete request “Add Server”

Summary: This diagram shows how Shift Head complete the request Add New Server

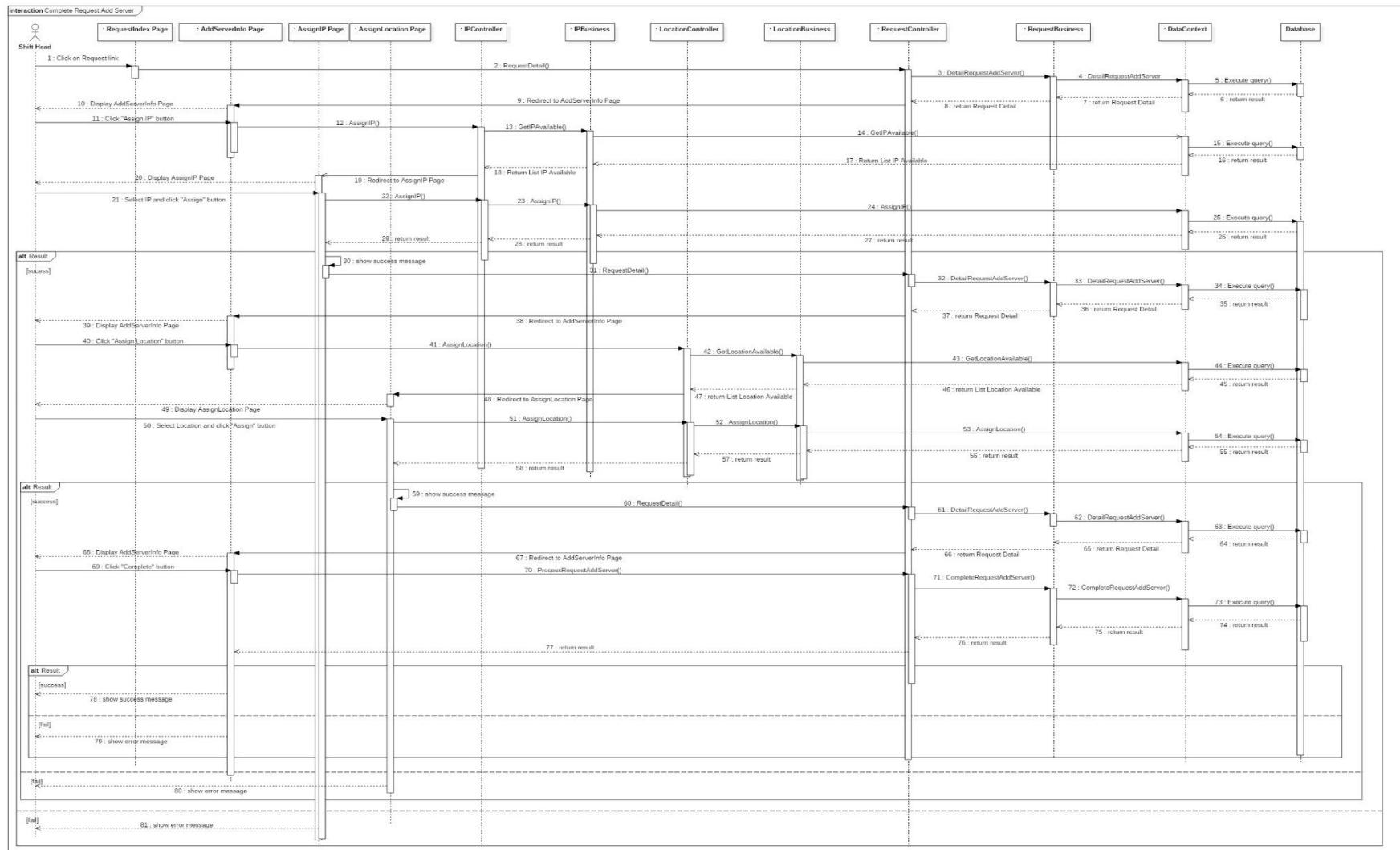


Figure 55: Sequence Diagram<Shift Head> Complete request "Add Server"

4.3.7. <Shift Head> Complete request “Change IP Address”

Summary: This diagram shows how Shift Head complete request Change IP Address.

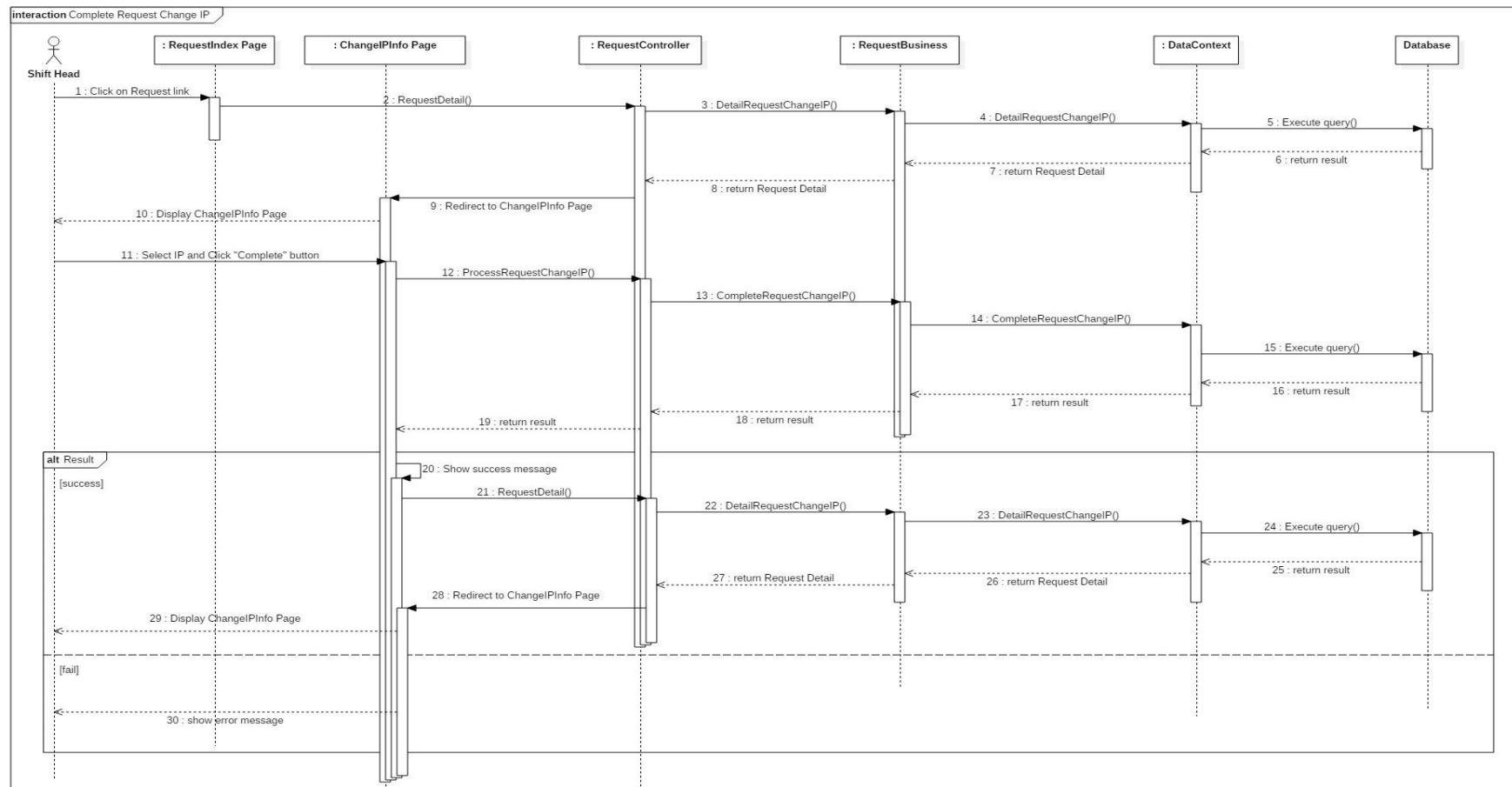


Figure 56: Sequence Diagram <Shift Head> Complete request “Change IP Address”

4.3.8. <Shift Head> Complete request “Rent Rack”

Summary: This diagram shows how Shift Head complete request Rent Rack.

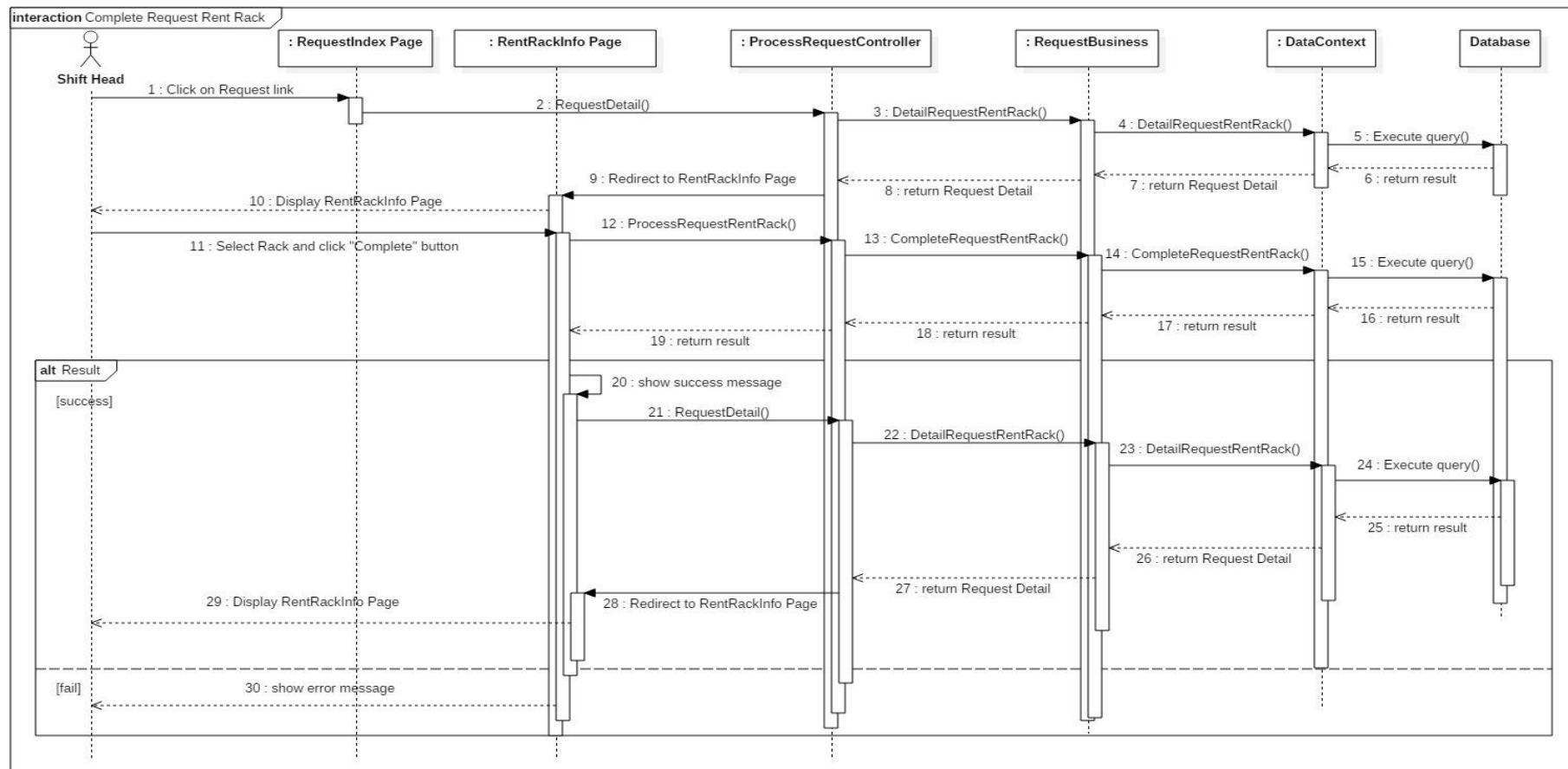


Figure 57: Sequence Diagram <Shift Head> Complete request “Rent Rack”

4.3.9. <Shift Head> Reject request “Assign IP Address”

Summary: This diagram shows how Shift Head reject request Assign IP Address

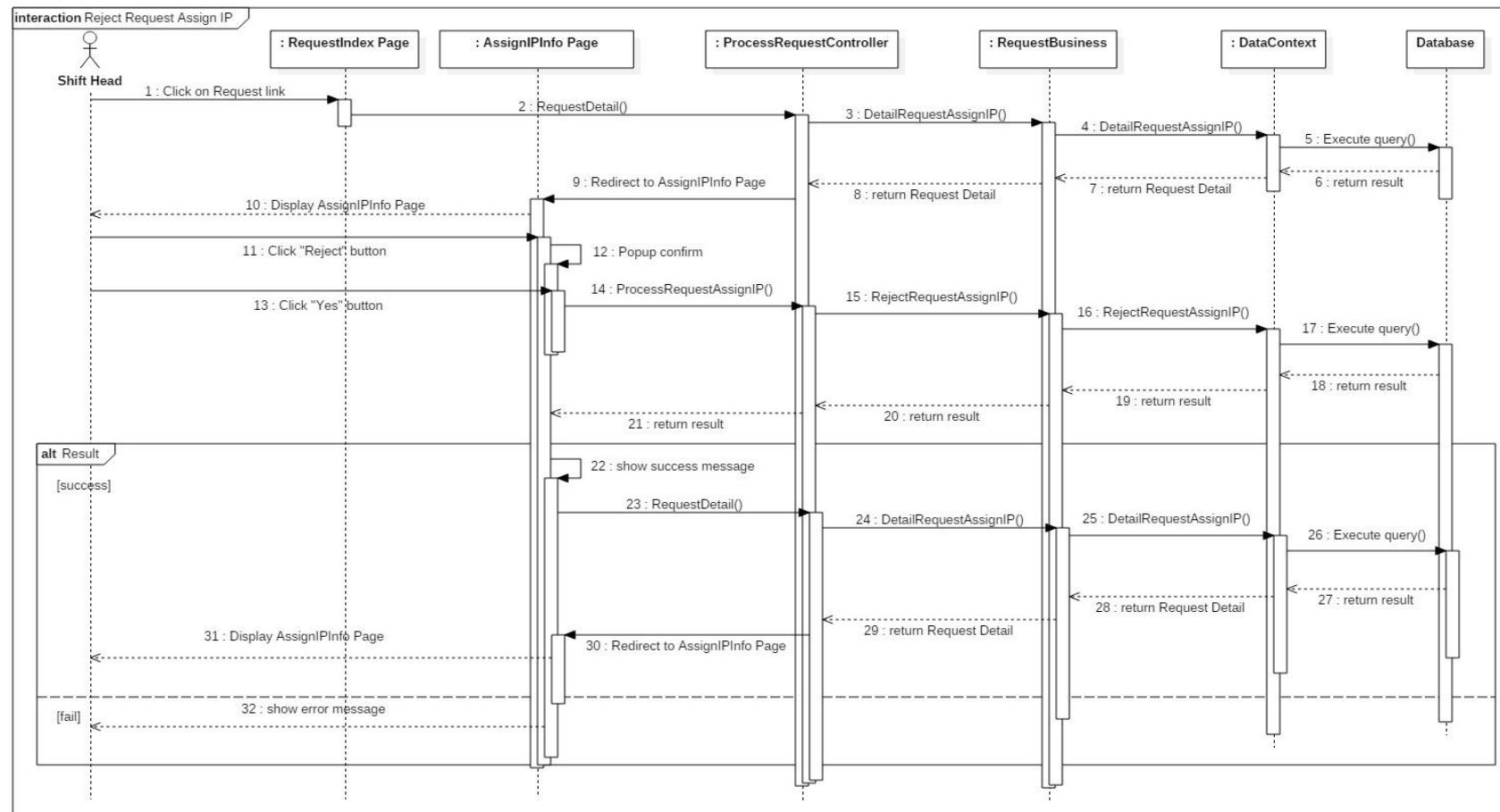


Figure 58: Sequence Diagram <Shift Head> Reject request “Assign IP Address”

4.3.10. <Shift Head> Reject request “Add Server”

Summary: This diagram shows how Shift Head reject request Add Server.

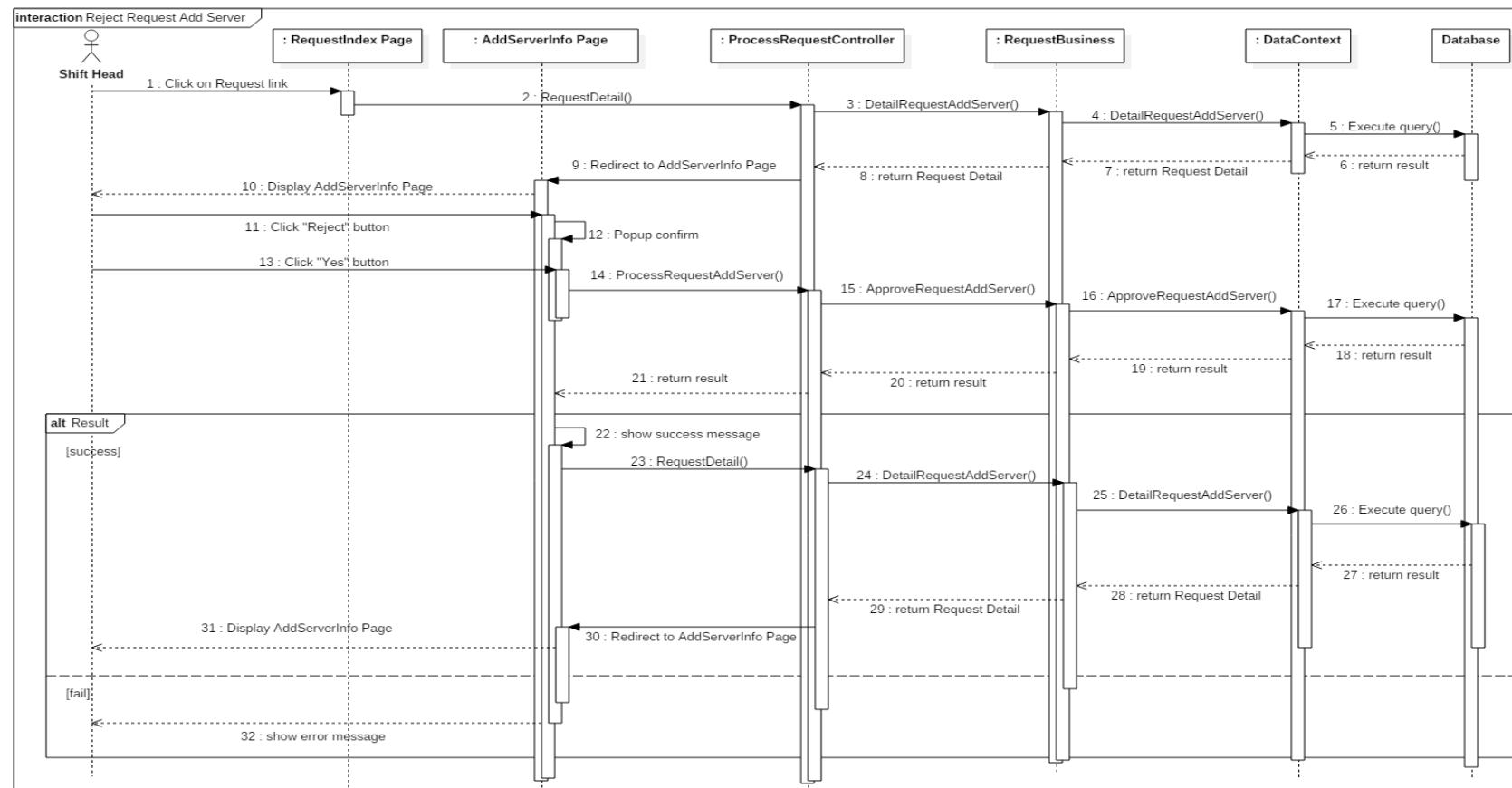


Figure 59: Sequence Diagram <Shift Head> Reject request “Add Server”

4.3.11. <Shift Head> Reassign task

Summary: This diagram shows how Shift Head reassign task for Staff

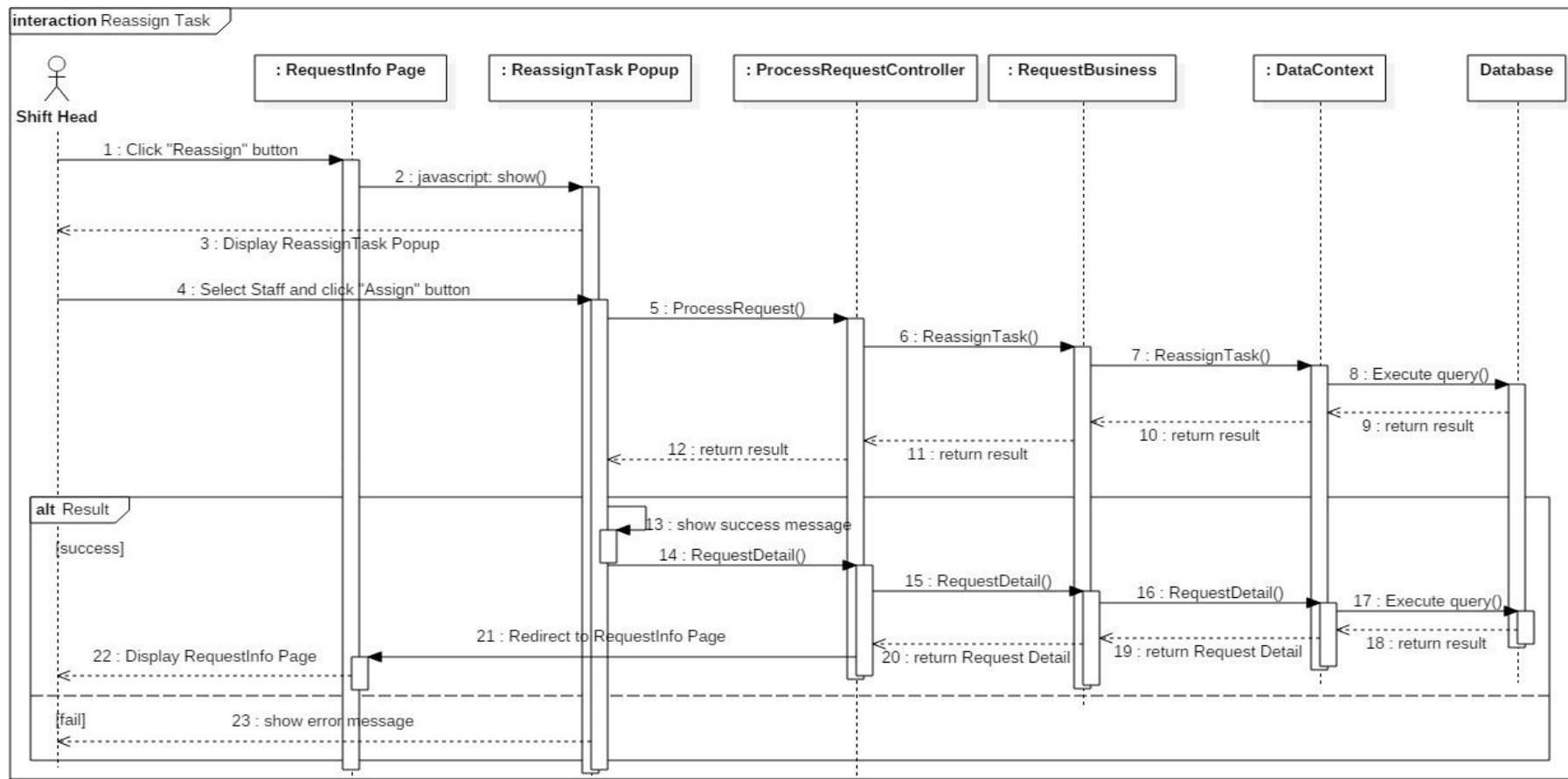


Figure 60: Sequence Diagram <Shift Head> Reassign task

4.3.12. <Shift Head> Write note

Summary: This diagram shows how Shift Head write note for the next shift.

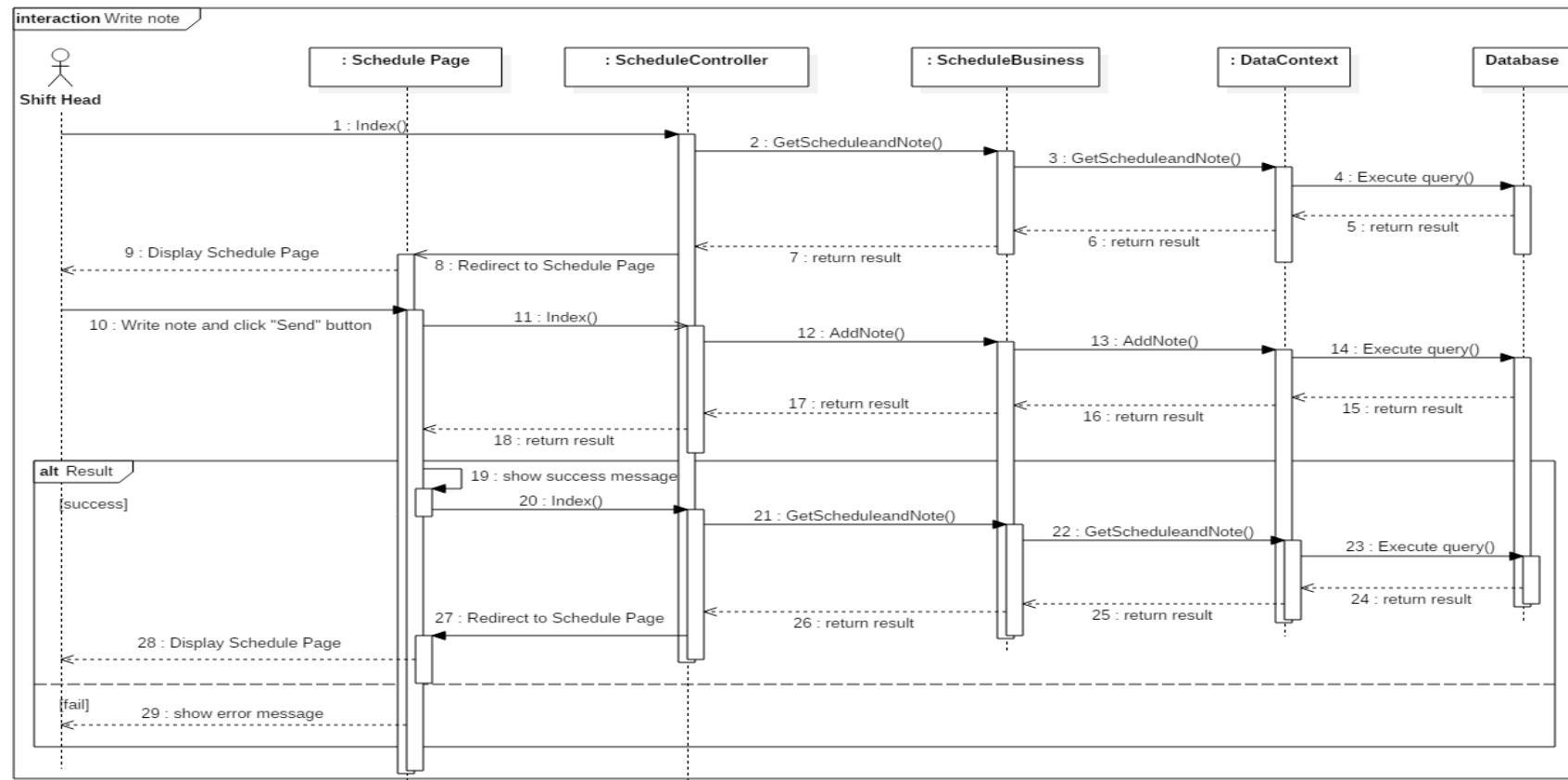


Figure 61: Sequence Diagram <Shift Head> Write note

4.3.13. <Shift Head> Add New IP

Summary: This diagram shows how Shift Head add new IP into datacenter

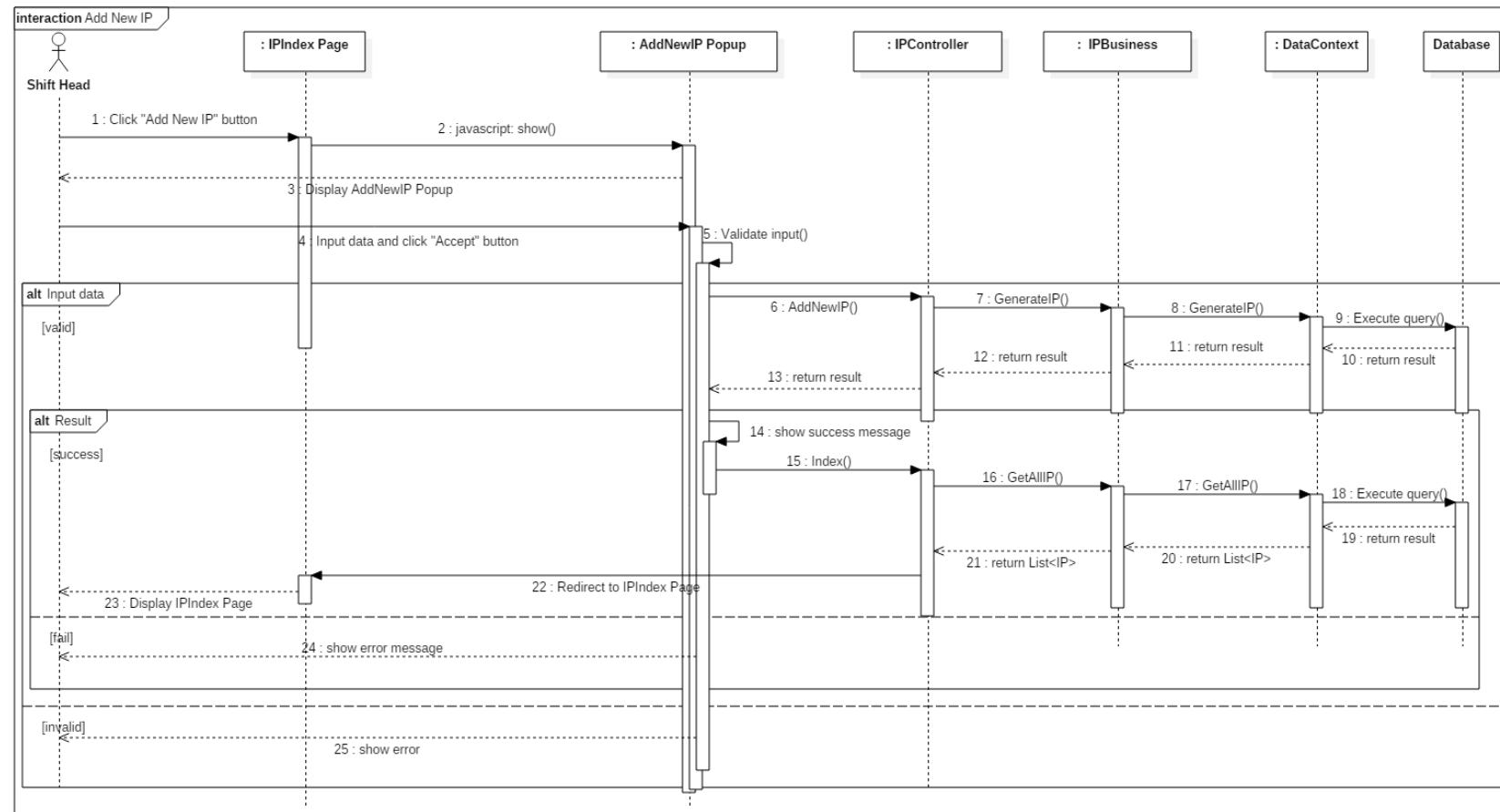


Figure 62: Sequence Diagram <Shift Head> Add New IP

4.3.14. <Shift Head> Add New Rack

Summary: This diagram shows how Shift Head add new rack into datacenter

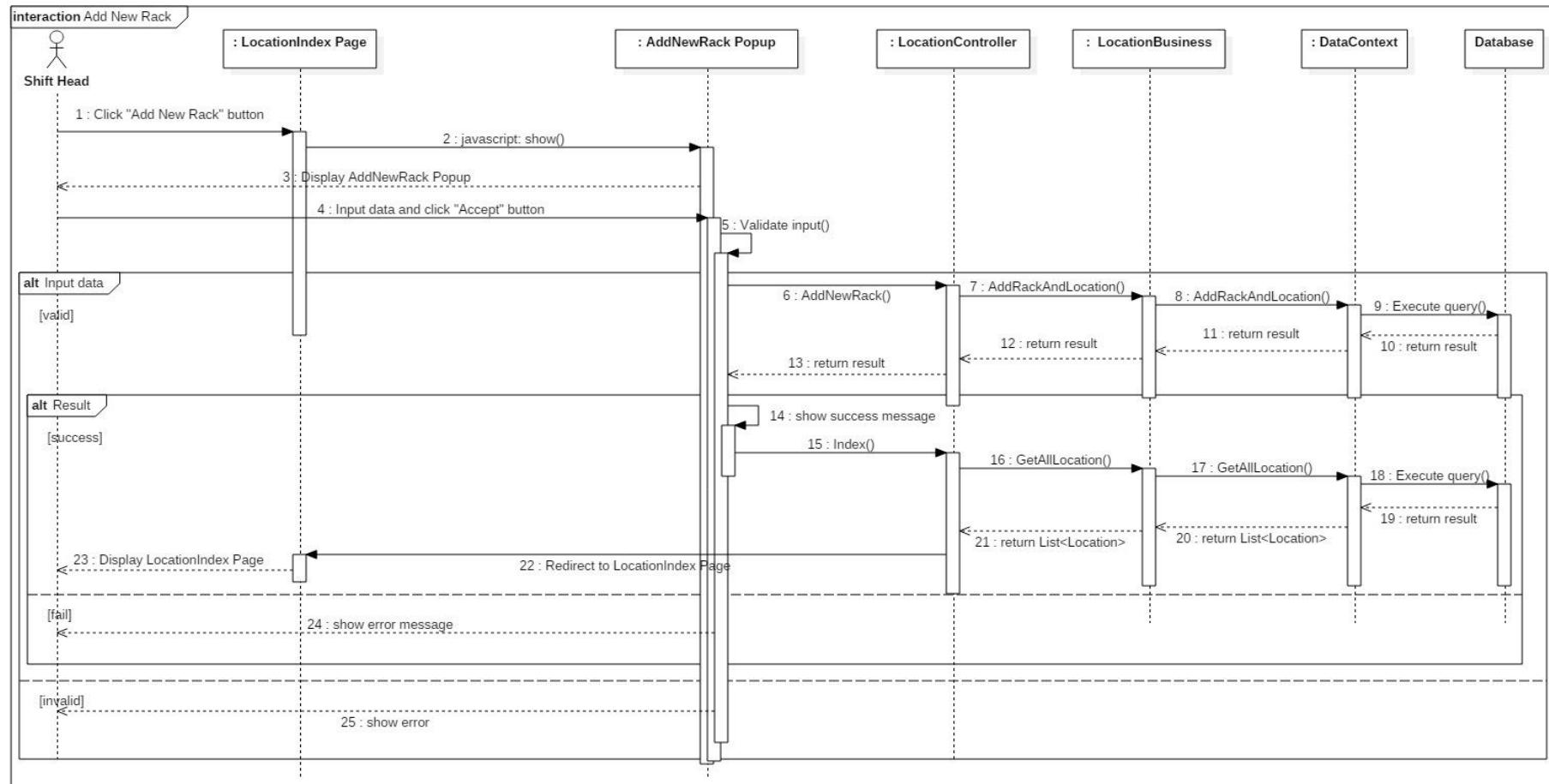


Figure 63: Sequence Diagram <Shift Head> Add New Rack

4.3.15. <Shift Head> Export Procedure

Summary: This diagram shows how Shift Head export procedure for customer

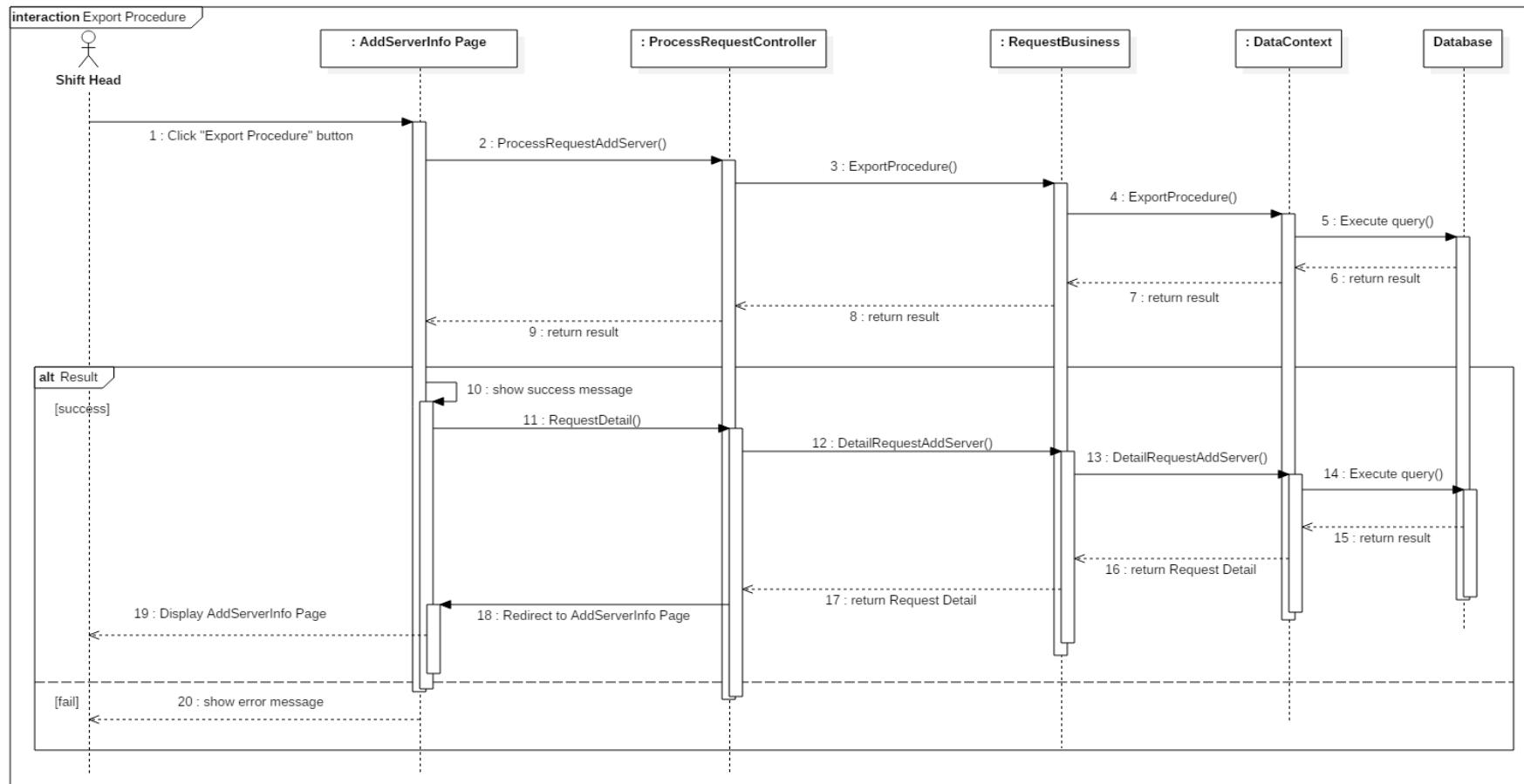


Figure 64: Sequence Diagram <Shift Head> Export Procedure

4.3.16. <Shift Head> Block IP

Summary: This diagram shows how Shift Head Block IP

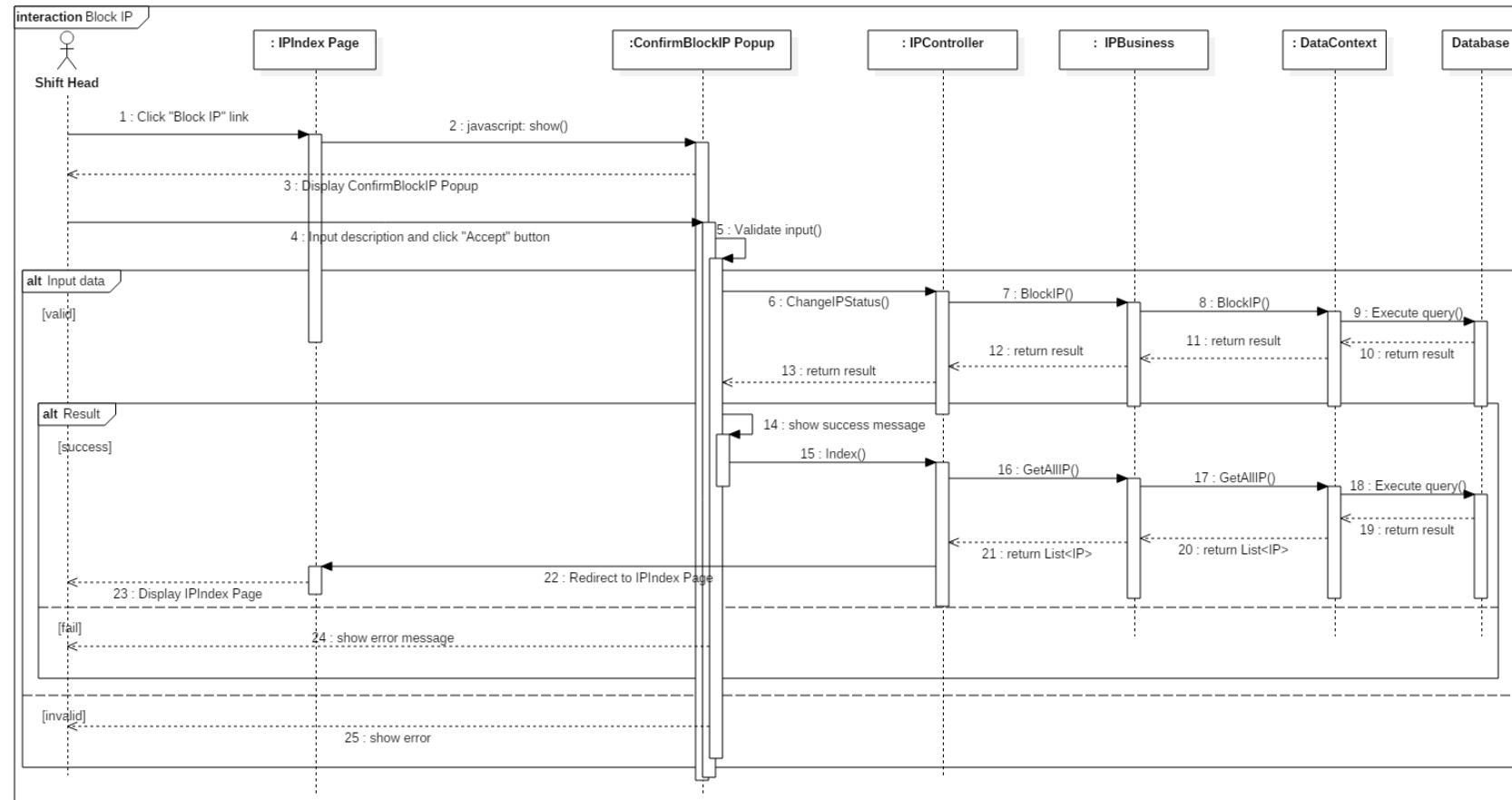


Figure 65: Sequence Diagram <Shift Head> Block IP

4.3.17. <Shift Manager> Add New Staff

Summary: This diagram shows how Shift Manager add new Staff for datacenter

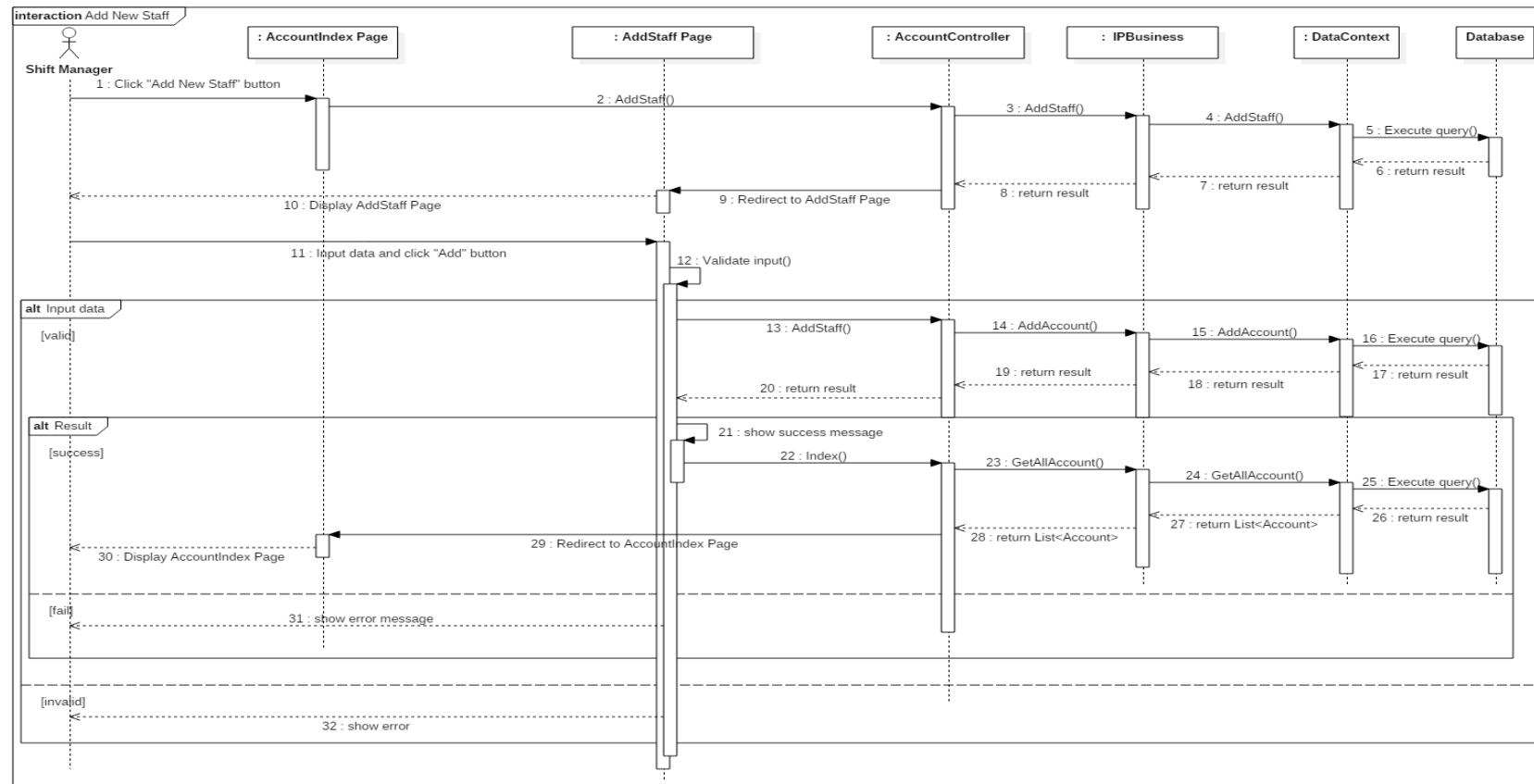


Figure 66: Sequence Diagram <Shift Manger> Add New Staff

4.3.18. <Shift Manager> Deactivate Account

Summary: This diagram shows how Shift Manager deactivate an Account

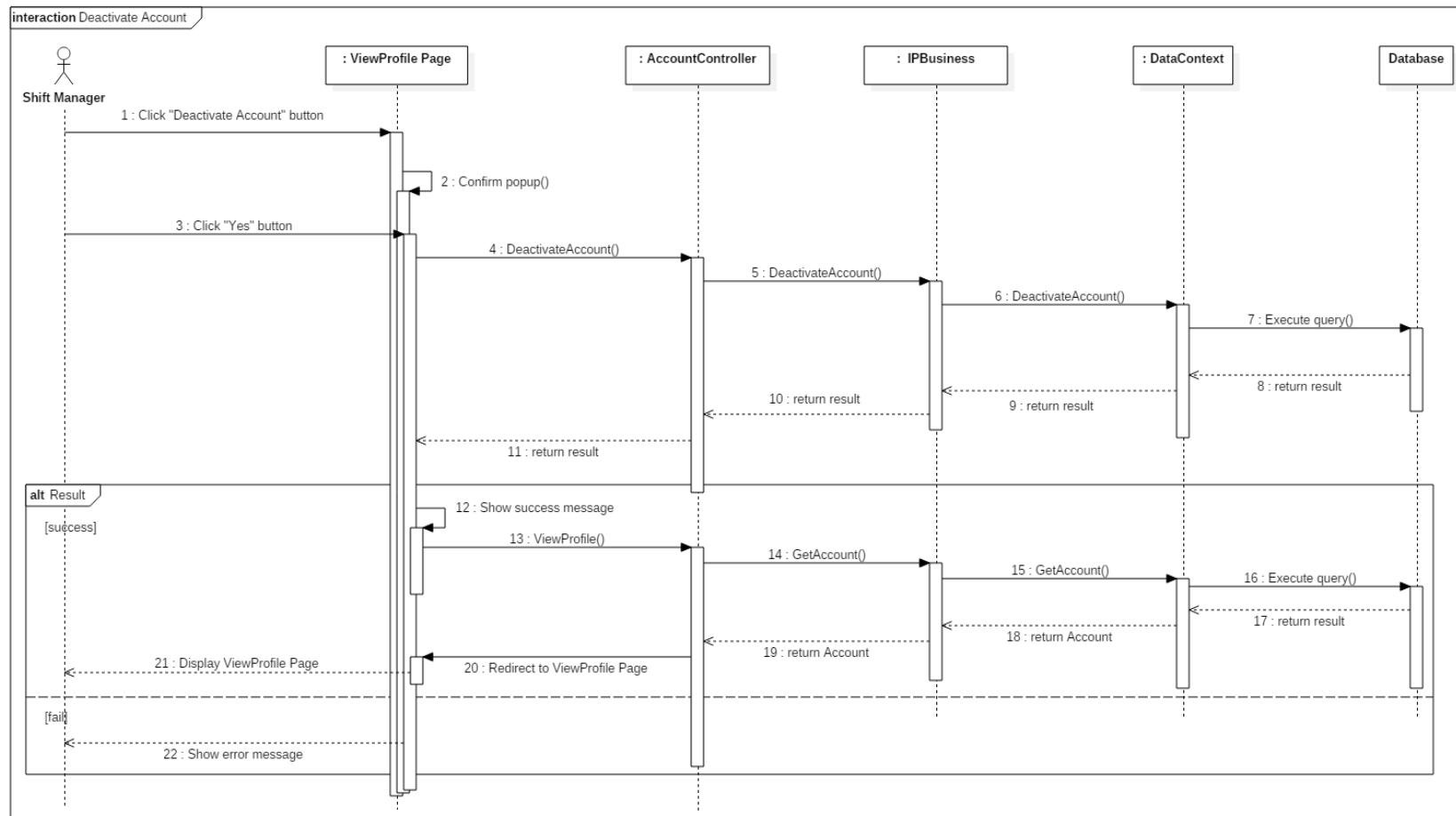


Figure 67: Sequence Diagram <Shift Manager> Deactivate Account

4.3.19. <Shift Manager> Edit Staff Profile

Summary: This diagram shows how Shift Manager edit Profile of Staff

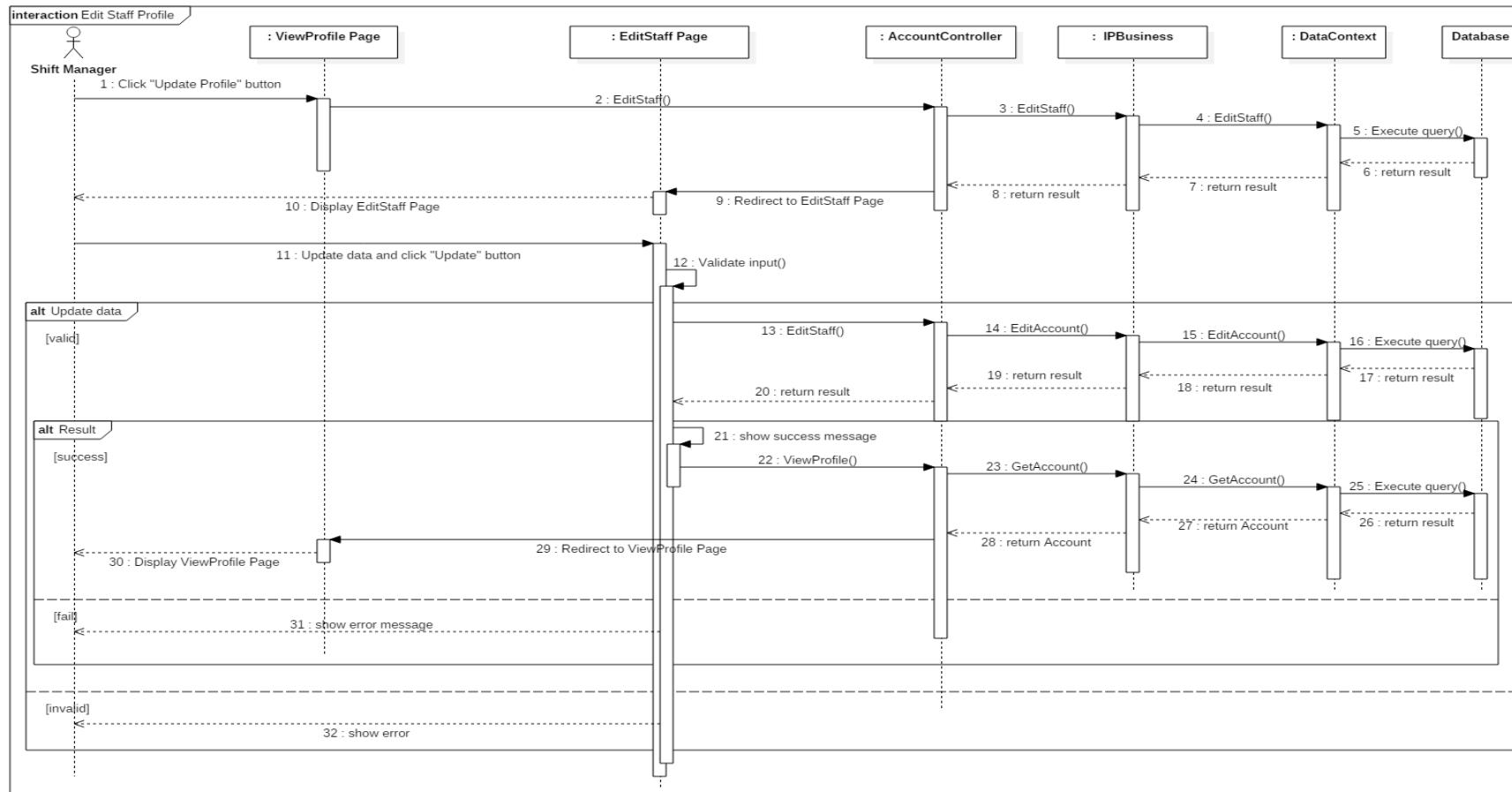


Figure 68: Sequence Diagram <Shift Manager> Edit Staff Profile

5. User Interface Design

5.1. User Login

The image shows a mobile-style sign-in interface. At the top is a green header bar with the text "Sign In". Below it is a white input field labeled "Username" (marked with a red number 1). Below that is another white input field labeled "Password" (marked with a red number 2). At the bottom of the white area is a green rectangular button labeled "Login" (marked with a red number 3). At the very bottom of the screen, in blue text, is a link labeled "Reset password" (marked with a red number 4).

Fields

No.	Field name	Description	Read only	Mandatory	Control type	Data type	Length
1	Username	User enters his/ her username to login	No	Yes	textbox	string	N/A
2	Password	User enters his/ her password to login	No	Yes	textbox	password	N/A

Buttons/Hyperlinks

No.	Function	Description	Validation	Outcome
3	Login	User clicks on "Login" when want to login into the system	N/A	Show Home page corresponding role
2	Reset password	User clicks on "Reset password" link when forgot password and want to reset password	N/A	Show the popup Reset password

5.2. View List Racks and Locations

Please refer full document in CD.

5.3. View List IP Addresses

+ Add IP Address 1				
Show 32 entries				
Network IP: All IP Addresses 2 Search: <input type="text"/> 3				
IP Address	Gateway	Subnet mask	Status	
120.72.84.0	120.72.84.30	255.255.255.224	Reserve	
120.72.84.1	120.72.84.30	255.255.255.224	Available	Block IP 4
120.72.84.2	120.72.84.30	255.255.255.224	Used	
120.72.84.3	120.72.84.30	255.255.255.224	Used	
120.72.84.4	120.72.84.30	255.255.255.224	Used	
120.72.84.5	120.72.84.30	255.255.255.224	Used	
120.72.84.6	120.72.84.30	255.255.255.224	Available	Block IP
120.72.84.7	120.72.84.30	255.255.255.224	Blocked	Unblock IP 6
120.72.84.8	120.72.84.30	255.255.255.224	Available	Block IP
120.72.84.9	120.72.84.30	255.255.255.224	Available	Block IP 7

Fields

No.	Field name	Description	Read only	Mandatory	Control type	Data type	Length
3	Search	User enters content that want to search	No	No	textbox	string	N/A

Buttons/Hyperlinks

No.	Function	Description	Validation	Outcome
1	Add IP Address	User clicks on “Add IP Address” button when want to add new IP Address Range for datacenter	N/A	Show popup Add IP Address
2	Filter	User filter by Network IP on DropDownList when want to view IP of that Network	N/A	Show the IP Address of selected Network IP
4	Block IP	User clicks on “Block IP” link when want to block IP	N/A	Show popup Block IP
5	View Server Detail	User clicks on row which have Status “Used” when want to view server detail	N/A	Navigate to Server Detail Page
6	UnBlock IP	User clicks on “Unblock IP” link when want to unblock IP	N/A	Show popup Unblock IP

7	IP Index	List all IP Addresses of datacenter	N/A	List all IP of datacenter
---	----------	-------------------------------------	-----	---------------------------

5.4. Add new rack

The screenshot shows a modal dialog box titled "+ Add new rack". Inside the dialog, there are two input fields: "RackName" and "Power". The "RackName" field is empty and has a red number "1" above it. The "Power" field contains the value "10KW" and has a red number "2" above it. At the bottom right of the dialog are two buttons: "Accept" (blue) and "Cancel" (grey). Red numbers "3" and "4" are placed near the "Accept" and "Cancel" buttons respectively.

Fields

No .	Field name	Description	Rea d only	Mandator y	Control type	Data type	Lengt h
1	RackName	User enters name of rack which want to add	No	Yes	textbox	string	N/A
2	Power	User selects power of rack	No	Yes	Dropdownlist	string	N/A

Buttons/Hyperlinks

No.	Function	Description	Validation	Outcome
3	Accept	User clicks on "Accept" when accept to add new rack for datacenter	N/A	Return to List of Racks page with new rack was added
4	Cancel	User clicks on "Cancel" when want to cancel this popup	N/A	Return to List of Racks page

5.5. Add IP Address

Fields

No .	Field name	Description	Rea d only	Mandator y	Control type	Data type	Lengt h
1	Address	User enters IP Address in Range which want to add	No	Yes	textbox	string	N/A
2	Netmas k	User selects netmask of IP Address range	No	Yes	Dropdownlis t	int	N/A
3	Type of Gateway	User select type of Gateway: after the first IP Address or before the last IP Address in Range	No	Yes	Radio button	string	N/A

Buttons/Hyperlinks

No.	Function	Description	Validation	Outcome
-----	----------	-------------	------------	---------

3	Accept	User clicks on “Accept” when accept to add new IP Address Range for datacenter	N/A	Return to List IP Addresses page with new IP Addresses were added
4	Cancel	User clicks on “Cancel” when want to cancel this popup	N/A	Return to List IP Addresses page

5.6. View Schedule

Schedule

The screenshot shows a 'Schedule' interface. On the left, there's a red box labeled '1' containing a note input field with placeholder text 'thaohq--Add server--Processing 4'. Below it is another red box labeled '2' containing the text 'Note of Previous Shift' and 'Do not have note from previous shift'. On the right, there's a red box labeled '3' containing a timeline for Wednesday, Mar 30, 2016. The timeline shows several tasks: a red box from 9am to 10am labeled '[Add server] Huỳnh Quang Thảo--Processing' (highlighted with a red box), a green box from 10am to 10:00pm labeled '[Add server] Nguyễn Trung Nam--Done' (highlighted with a green box), and a green box from 5pm to 7pm labeled '[Add server] Nguyễn Hùng Mạnh--Done'.

Fields

No.	Field name	Description	Read only	Mandatory	Control type	Data type	Length
5	Note	User enters content of note which want to send for next shift	No	No	textbox	string	N/A

Buttons/Hyperlinks

No.	Function	Description	Validation	Outcome
-----	----------	-------------	------------	---------

1	Add Note form	Allow user add note here	N/A	Add note for the next shift
2	Note of Previous Shift form	Allow user view the note of previous shift	N/A	Note of previous shift
3	Schedule	Allow user view the schedule by day, week, month	N/A	Schedule with the time when customer will come datacenter
6	Send Note	User clicks on "Send" when want to send note to Next Shift	N/A	The note will be saved
4,7	View Request Detail	User clicks on request link to view Request Detail	N/A	Navigate to Request Detail Page

5.7. View Report Block IP

Report of Block IP Address

Number of Blocking IP: 2

IP Address	Blocked Time	Unblocked Time	Blocked Reason	Blocked Duration
120.72.84.1	26-03-2016 15:51:42	---	IP was attacked, @@	---
120.72.84.6	26-03-2016 15:51:49	26-03-2016 15:52:08	Ip has problem	<1 day
120.72.84.11	26-03-2016 15:51:59	27-03-2016 11:37:52	Oh no	1 day
120.72.84.12	27-03-2016 11:40:21	---	it was attacked	---

Show 25 entries Filter: All Blocked IP Search:

Showing 1 to 4 of 4 entries

1 2 3 Previous 1 Next

Fields

No.	Field name	Description	Read only	Mandatory	Control type	Data type	Length
1	Search	User enters content which want to search	No	No	textbox	string	N/A

Buttons/Hyperlinks

No.	Function	Description	Validation	Outcome
2	Filter	User filter by blocked duration of IP Address on DropDownList	N/A	Show the IP Address following the selected condition
3	Blocked IP Index	List all of blocking and blocked IP Address in data center	N/A	List all of blocking and blocked IP Address in data center

5.8. Add New Staff

Please refer full document in CD.

5.9. Request Add Server

The screenshot shows a web-based application interface for requesting the addition of a new server. At the top, there's a breadcrumb navigation: IMS > Requests > Create Request > Request Add Server. Below the navigation, the title "Request Add Server" is displayed. The main form consists of several sections:

- AppointmentTime:** A date and time input field showing "30/03/2016 21:00" with a red validation error indicator "1".
- Servers:** A table with columns: No, Power, Size, Bandwidth, Serial Number, Part Number, Edit, and Delete. One row is shown with values: 1, 600W, 2U, 100Mbps, 1234567, 7878567, Edit 2, Delete 3.
- Add Server Information:** A blue button labeled "Add Server Information" with a red validation error indicator "4".
- Description:** A text area containing a red validation error indicator "5".
- Send Request:** A blue button labeled "Send Request" with a red validation error indicator "6".

Field:

No.	Field name	Description	Read only	Mandatory	Control type	Data type	Length
1	AppointmentTime	The time when customer will bring server to datacenter	No	Yes	textbox	datetime	N/A
5	Description	Customer's description about this request	No	No	textarea	string	N/A

Buttons/Hyperlinks:

No.	Function	Description	Validation	Outcome
2	Edit server information	User clicks on “Edit” link when want to edit server information	N/A	Show Edit Server Information popup
3	Delete server	User clicks on “Delete” link when want to delete server	N/A	Show confirm popup
4	Add Server Information	User clicks on “Add Server Information” when want to add information of new server	N/A	Show Add Server Information popup
6	Send Request	User clicks on “Send Request” when want to send this request	N/A	Navigate to Request Add Server Detail Page

5.10. Add Server Information

The screenshot shows a modal dialog box titled "+ Add Server". Inside the dialog, there are four input fields labeled "Power", "Size", "SerialNumber", and "PartNumber", each with a red validation error indicator. Below these is a "Bandwidth" section with two radio buttons: "100Mbps" and "1Gbps", with "100Mbps" selected. At the bottom of the dialog are two buttons: a blue "Accept" button and a grey "Cancel" button. The entire dialog is overlaid on a dark background of a web application interface.

Field:

No .	Field name	Description	Rea d only	Mandator y	Control type	Data type	Lengt h
1	Power	Server's power	No	Yes	textbox	int	N/A
2	Size	Server's size (1U, 2U, 4U)	No	Yes	dropdownli st	int	N/A

3	SerialNumber	Server's serial number	No	No	textbox	string	N/A
4	PartNumber	Server's part number	No	No	textbox	string	N/A
5	Bandwidth	Server's bandwidth	No	Yes	radio button	string	N/A

Buttons/Hyperlinks:

No.	Function	Description	Validation	Outcome
9	Accept	User clicks on “Accept” when want to add server information into request Add Server	N/A	Return to Create Request Add Server Page with server was added
10	Cancel	User clicks on “Cancel” when want to cancel this popup	N/A	Return to Create Request Add Server Page

5.11. Request Return IP

Request Return IP Address

IMS > Requests > Create Request > Request Change IP Address

Server	S623544616 - Default IP: 120.72.84.5	1							
Return IP	<table border="1"> <tr> <td>IP Address</td> </tr> <tr> <td>120.72.84.5</td> <td>3</td> </tr> <tr> <td>120.72.84.53</td> </tr> <tr> <td>120.72.84.56</td> </tr> <tr> <td>120.72.84.60</td> </tr> <tr> <td>120.72.84.61</td> </tr> </table>		IP Address	120.72.84.5	3	120.72.84.53	120.72.84.56	120.72.84.60	120.72.84.61
IP Address									
120.72.84.5	3								
120.72.84.53									
120.72.84.56									
120.72.84.60									
120.72.84.61									
Description	4								
<input style="background-color: #0070C0; color: white; border: none; padding: 5px; margin-right: 10px;" type="button" value="Send Request"/> 5									

Field:

No .	Field name	Description	Rea d only	Mandator y	Control type	Data type	Lengt h
------	------------	-------------	------------	------------	--------------	-----------	---------

1	Select Server	List server of this customer	No	Yes	dropdownlist	string	N/A
4	Description	Customer's description about this request	No	No	textarea	string	N/A

Buttons/Hyperlinks:

No.	Function	Description	Validation	Outcome
2	List of IP Address	List of IP Addresses of above selected server	N/A	List of IP Addresses of above selected server
3	Default IP Address	User check on check box of Default IP to return all IP of selected server	N/A	All of IP Addresses of server will be checked automatically
5	Send Request	User clicks on "Send Request" when want to send this request	N/A	Navigate to Request Return IP Detail Page

5.12. Request Return Rack

Request Return Rack

IMS > Requests > Create Request > Request Return Rack

Rack	Rack	Number of server(s)
<input type="checkbox"/> 1	A2	1 Return all servers 2

Description 3

Send Request 4

Field:

No.	Field name	Description	Read only	Mandatory	Control type	Data type	Length
-----	------------	-------------	-----------	-----------	--------------	-----------	--------

3	Description	Customer's description about this request	No	No	textarea	string	N/A
---	-------------	---	----	----	----------	--------	-----

Buttons/Hyperlinks:

No.	Function	Description	Validation	Outcome
1	List of Rented Rack	List of rack which this customer rented	N/A	List of rack which this customer rented
2	Return all server of this rack	User clicks on "Return all servers" link to create request return all server of this rack	N/A	Navigate to Create Request Bring Server Away Page
4	Send Request	User clicks on "Send Request" when want to send this request	N/A	Navigate to Request Return Rack Detail Page

5.13. View List Requests

IMS > Requests

List of Requests

Request Type	Select All	1	
Status	Select All	2	
Period of Time	One Week	3	
Show	10 entries	5	
Search: <input style="width: 100px; border: 1px solid black; border-radius: 5px; padding: 2px; color: red;" type="text"/>			
Customer	Request Type	Status	Requested Time
Nguyễn Hùng Mạnh	Assign new IP address	Done	30-03-2016 21:15
Nguyễn Hùng Mạnh	Add Server	Done	30-03-2016 21:13
Huỳnh Quang Thảo	Assign new IP address	Processing	28-03-2016 16:52
Nguyễn Hùng Mạnh	Add Server	Pending	28-03-2016 15:33
Nguyễn Hùng Mạnh	Add Server	Pending	28-03-2016 10:08
Nguyễn Trung Nam	Add Server	Done	26-03-2016 16:08
Huỳnh Quang Thảo	Rent rack	Done	26-03-2016 16:05
Huỳnh Quang Thảo	Add Server	Done	26-03-2016 16:03
Nguyễn Trung Nam	Add Server	Done	26-03-2016 15:58
Customer	RequestType	Status	RequestedTime

Fields

No.	Field name	Description	Read only	Mandatory	Control type	Data type	Length
4	Search	User enters content that want to search	No	No	textbox	string	N/A

Buttons/Hyperlinks

No.	Function	Description	Validation	Outcome
1	Filter by Request Type	User filter by Request Type on DropDownList when want to view requests of that Type	N/A	Show list of requests of selected type
2	Filter by Status	User filter by Status on DropDownList when want to view requests of that status	N/A	Show list of requests of selected status
3	Filter Period of Time	User filter by Period of Time on DropDownList when want to view requests of that period time	N/A	Show list of requests of selected period time
5	Request Index	List all requests which were sent to datacenter	N/A	List all requests which were sent to datacenter

5.14. View List Servers

Please refer full document in CD.

5.15. Request Add Server Info

Add Server

IMS > Requests > Add Server

Request Status	Processing	Customer	Huỳnh Quang Thảo 1	Assignor	Lê Thị Thu Hà			
Requested Time	01-04-2016 22:47	Phone	0967345813	Assignee	Lê Thị Thu Hà [Reassign Task] 2			
Appointment Time	02-04-2016 15:00							
Description								
Servers	No	Power	Size	Bandwidth	Serial Number	Part Number	Default IP	Location
	1	500W	2U	100Mbps	123213213	24234234	Assign Default IP 3	Assign Location 4
	5	6						
	Complete		Reject					

Buttons/Hyperlinks

No.	Function	Description	Validation	Outcome
-----	----------	-------------	------------	---------

1	View Customer Detail	User clicks on customer name link to view customer detail	N/A	Navigate to Profile of Customer Page
2	Reassign Task	User clicks on “Reassign Task” link to reassign this request for different staff	N/A	Show “Reassign Task” popup
3	Assign Default IP	User clicks on “Assign Default IP” link to assign default IP for new server	N/A	Navigate to “AssignIP” Page
4	Assign Location	User clicks on “Assign Location” link to assign location for new server	N/A	Navigate to “AssignLocation” Page
5	Complete request	User clicks on “Complete” button to complete this request	N/A	Show “AddServerInfo” page with the status of request is done.
6	Reject request	User clicks on “Reject” button to reject this request	N/A	Show confirm popup of Reject Request

5.16. Request Change IP Info

Change IP Address

IMS > Requests > Change IP Address

Request Status	Processing	Customer	Nguyễn Hùng Mạnh 1	Assignor	Lê Thị Thu Hà
Requested Time	30-03-2016 22:11	Phone	0945683220	Assignee	Lê Thị Thu Hà [Reassign Task] 2
Description	change 2 ips				

Server S623544616 - Default IP: 120.72.84.5 **3**

Old IPs	New IPs
120.72.84.56	-- Select IP -- 4
120.72.84.53	-- Select IP -- 5

6 Complete **7** Reject

Buttons/Hyperlinks

No.	Function	Description	Validation	Outcome
1	View Customer Detail	User clicks on customer name link to view customer detail	N/A	Navigate to Profile of Customer Page
2	Reassign Task	User clicks on “Reassign Task” link to reassign this request for different staff	N/A	Show “Reassign Task” popup

3	View Server detail	User clicks on server link to view Server detail	N/A	Navigate to Server Detail Page
4,5	Select New IP to change	User clicks on "Select IP" dropdownlist to select new IP to change	N/A	Show list IP to change
6	Complete request	User clicks on "Complete" button to complete this request	N/A	Show "ChangeIPInfo" page with the status of request is done.
7	Reject request	User clicks on "Reject" button to reject this request	N/A	Show confirm popup of Reject Request

5.17. Request Rent Rack Info

Please refer full document in CD.

5.18. View Server Detail

The screenshot shows a 'Server Detail' page with the following information:

- Server Code:** S623544616
- Location:** A1 U 23
A1 U 24
[Change Location 1](#)
- Customer:** Nguyễn Hùng Mạnh 2
- Power:** 600W
- Size:** 2U
- Current IPs:** [120.72.84.5](#)
120.72.84.61
120.72.84.56
120.72.84.60
120.72.84.53
- Bandwidth:** 100Mbps
- Part Number:** 7878567
- Serial Number:** 1234567
- Started Date:** 30-03-2016 21:07
- Server Status:** Running

Buttons/Hyperlinks

No.	Function	Description	Validation	Outcome
1	Change location of server	User clicks on "Change Location" link to change location of this server	N/A	Navigate to Change Location Page
2	View Customer Detail	User clicks on customer name link to view customer detail	N/A	Navigate to Profile of Customer Page

6. Database Design

6.1 Entity relationship diagram

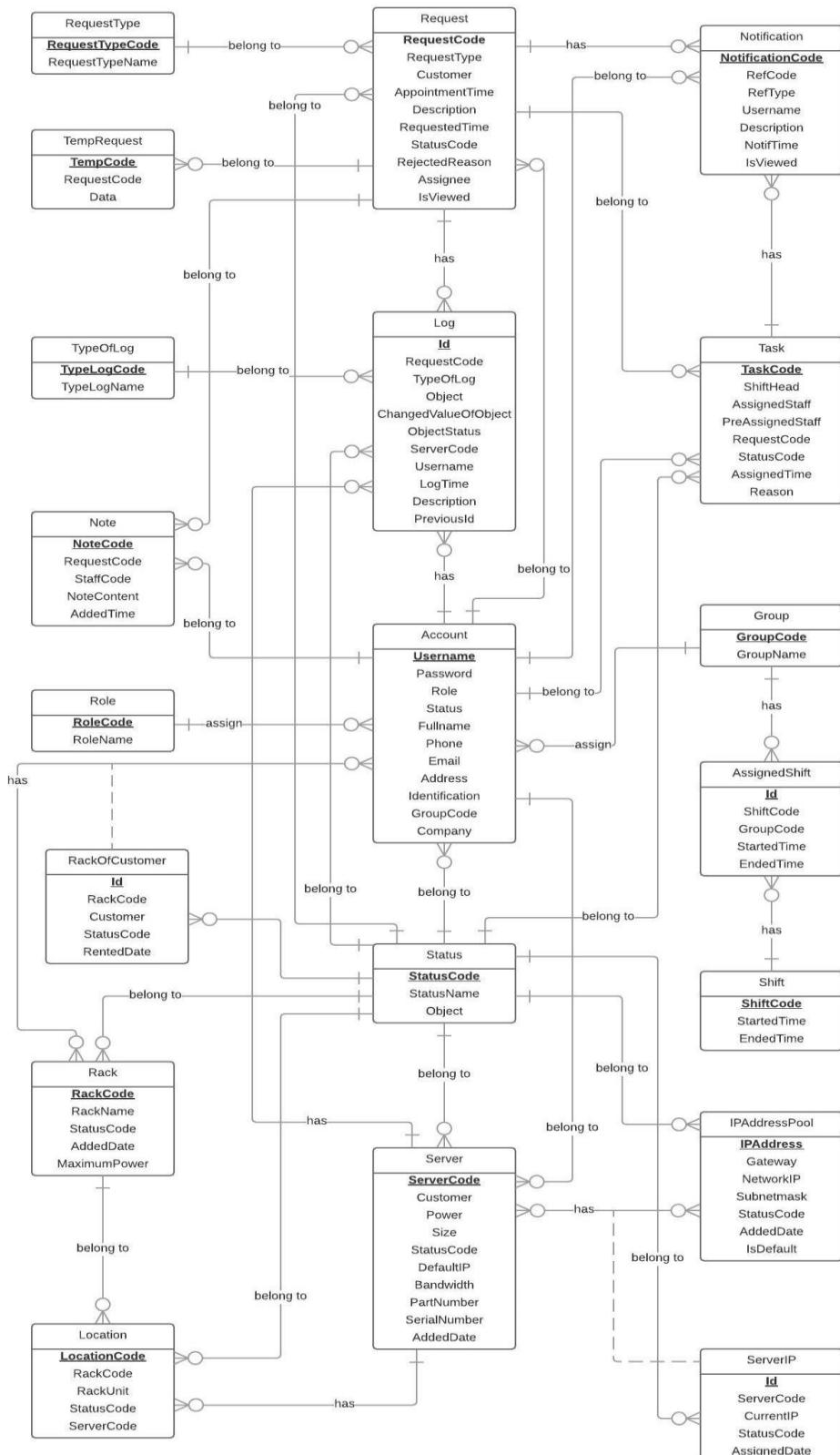


Figure 69 : Entity relationship diagram

6.2. Entity Dictionary

Entity Data Dictionary: describe content of all entities	
Entity name	Description
Server	Describe all server information in datacenter.
Status	Describe all of statuses of objects in datacenter.
Location	Describe all location information in datacenter.
Rack	Describe all racks information which are putting in datacenter.
Log	Describe all logs about object's changes in datacenter.
Role	Describe all roles in the system.
ServerIP	Describe all of current IP Addresses of server.
Request	Describe all request content which was sent by customer.
Account	Describe all user information in the system.
Note	Describe all note which was wrote by previous shift for the next shift.
TempRequest	Describe temporary detail of all requests.
IPAddressPool	Describe all IP Addresses information which datacenter is keeping.
RequestType	Describe all types of request.
TypeOfLog	Describe all types of log.
Group	Describe all groups of datacenter.
AssignedShift	Describe which group is in which shift each day.
Shift	Describe started time and ended time of each shift group.
RackOfCustomer	Describe all racks which was rent by customer.
Notification	Describe all notification information.
Task	Describe all contents of each task.

Table 54 : Entity dictionary

Data Detail Dictionary: Please refer full document in CD.

7. Algorithms

7.1 Generate AssignedShift

7.1.1. Problem definition

- User need to know which group will work on which shift. Therefore, the system must save list Assigned Shift. Every 24 hours, the system will check once and generate AssignedShift if necessary.

7.1.2. Attribute definition

- AssignedShift: includes list of Assigned Shift Information; Shift: includes list of Shifts in 1 day; Group: includes list of Groups in datacenter
- Each Assigned Shift in list AssignedShift includes attributes: ShiftCode, GroupCode, StartTime, EndTime.

7.1.3. Solution

- Step 1: Every 24 hours, system will check once to generate.
Get LastDate = AssignedShift[LastIndex].StartTime.Date

- Step 2: If LastDate in table AssignedShift of database minus today < 3, system will generate for next 28 days from the day after LastDate 1 day.
- Step 3: Add list into AssignedShift of database.

7.1.4. Complexity

- The complexity of this algorithm is define the lastDate and lastGroup in database which were generated at previous time to continue generating.

7.1.5. Flowchart

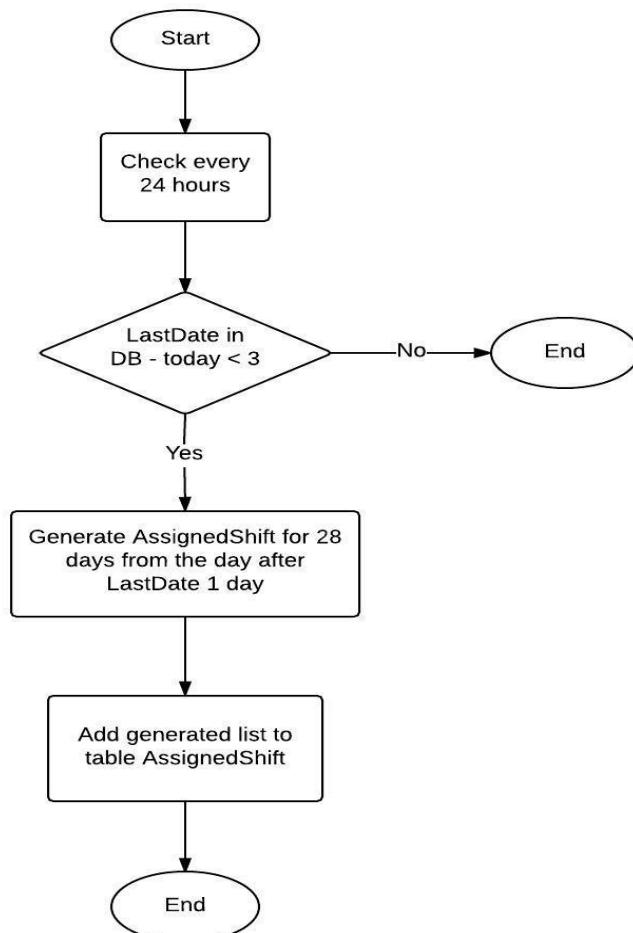


Figure 70: Flowchart of Generate IP Address Range

7.2 Generate IP Address Range

7.2.1. Problem definition

- User request to add new IP Address Range. After user inputs information include: IP Address in a range, netmask of that range, the condition for gateway; the system will generate new IP Address Range automatically and add into IPAddressPool.

7.2.2. Attribute definition

- IPAddressPool: includes list of IP Addresses in datacenter
- Each IP Address of list IP Addresses include attributes: IPAddress, Gateway, NetworkIP, Subnetmask, Staff, RegisteredDate, StatusCode, IsDefault

7.2.3. Solution

- Step 1: By the Netmask, find out the Subnetmask of Range.
- Step 2: With inputted Netmask, find the number of ranges and base number of head IP Addresses.
- Step 3: Find all head IP Addresses of all ranges.

$$\text{headIP}[i] = \text{base number} * i \quad (0 \leq i < \text{number of ranges})$$

- Step 4: Base on inputted IP Address, find out the head IP Address of this range.
- Step 5: From the head IP Address of range, define all IP Addresses of this range.
- Step 6: From list of IP Addresses, define Gateway following condition and define NetworkIP.
- Step 7: Add list IP Addresses to IPAddressPool.

7.2.4. Complexity

- The complexity of this algorithm is define the head IP Address of range which user want to generate because for each netmask may have one or more range.

7.2.5. Flowchart

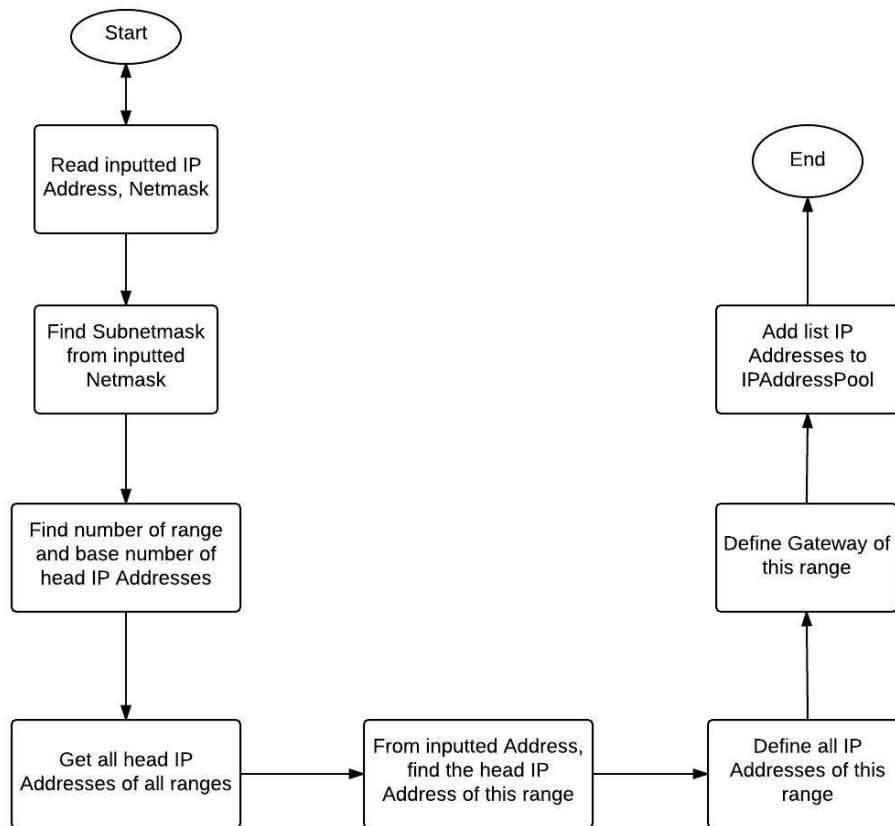


Figure 71: Flowchart of Generate IP Address Range

7.3 Find list of available Racks

7.3.1. Problem definition

- When user want to assign location for new server or change location of server, the system will show list of available racks for user select location.

7.3.2. Attribute definition

- AvailableLocation: includes list locations of available racks.
- Each Location of list AvailableLocation include attributes: LocationCode, RackName, RackUnit, ServerCode.

7.3.3. Solution

- Step 1: Get list location of each rack
- Step 2: Calculate sum of the power which was used in rack
- Step 3: Find racks which have $(\text{rack power} - \text{sum used power}) > \text{server power}$
- Step 4: From list available racks about power, find the max size of blank space of each rack.
- Step 6: Find list racks which have max size $>$ size of server
- Step 7: Get list locations of available racks.

7.3.4. Complexity

- The complexity of this algorithm is define racks which have size of blank space bigger than size of server.

7.3.5. Flowchart

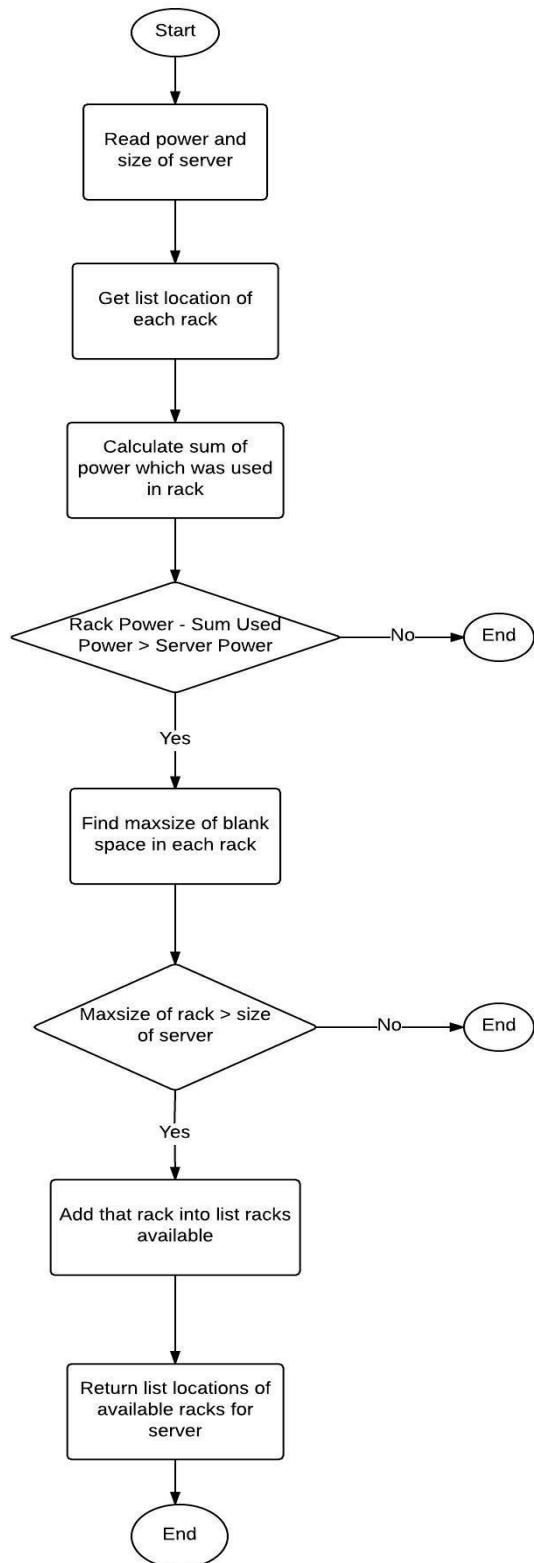


Figure 72: Flowchart of Find list of available Racks

7.4 State machine diagram for Request Offline Status

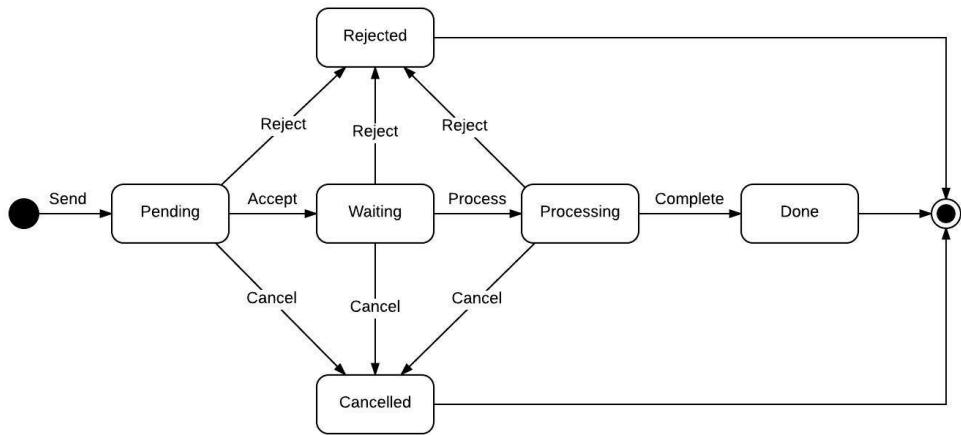


Figure 73: State Machine Diagram for Request Offline Status

7.5 State machine diagram for Request Online Status

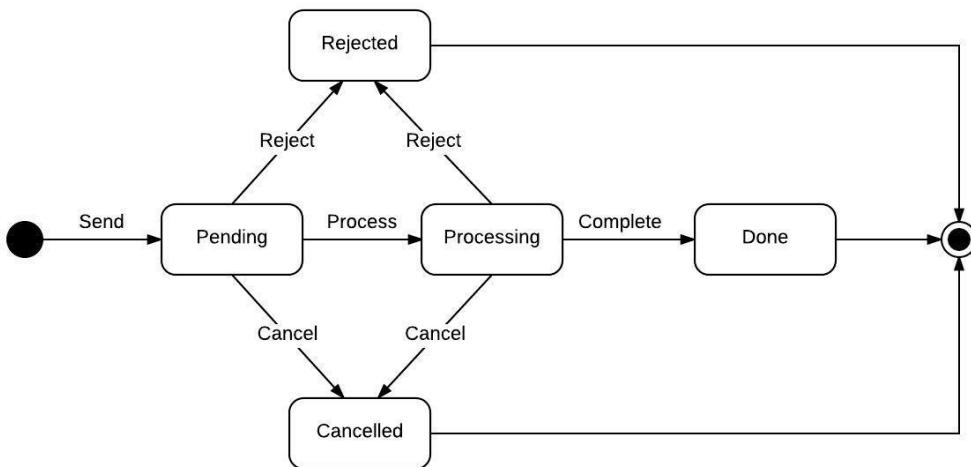


Figure 74: State Machine Diagram for Request Online Status

7.6 State machine diagram for Task Status

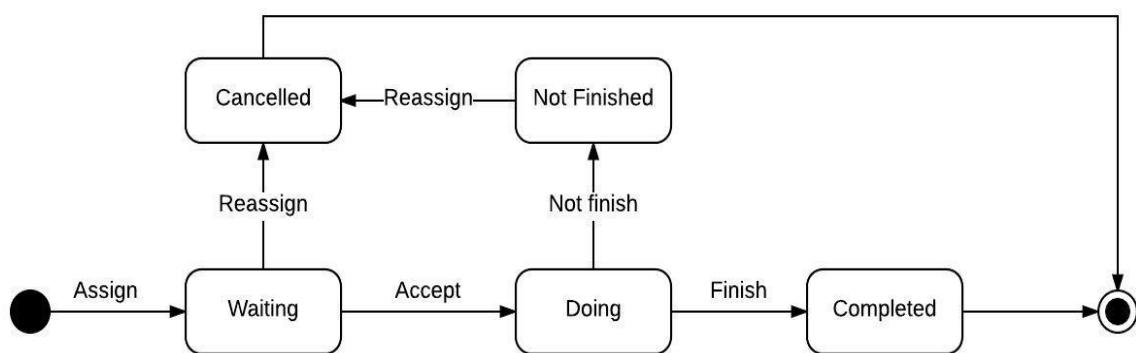


Figure 75: State Machine Diagram for Staff Status

7.7 State machine diagram for Server Status

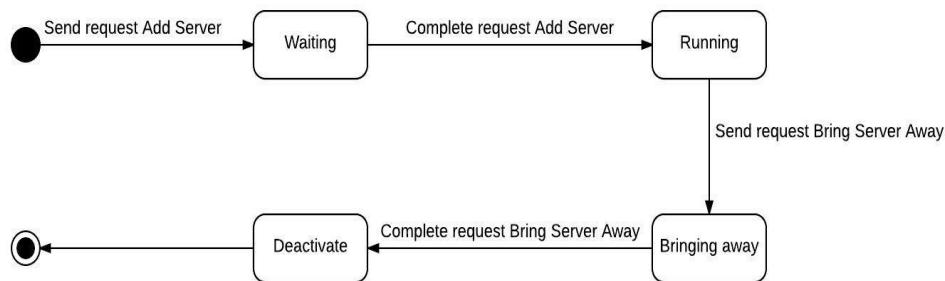


Figure 76: State Machine Diagram for Server Status

E. 番 5 のレポート。システムの展開とテスト

1. はじめに

1.1 概要

このセクションでは、データベースの詳細と記述が提供されています。その上で、IMS のパフォーマンス対策やテストプランやシステムテストのテストケースも記載せています。

1.2 テストアプローチ

- ゴール: 要件を満たして、すべてのシステムが正常に実行できるのを確保します。
- 方法: システムテスト, ブラックボックステスト。

2. データベース関係ダイアグラム

2.1 ウェブアプリケーション物理的なダイアグラム

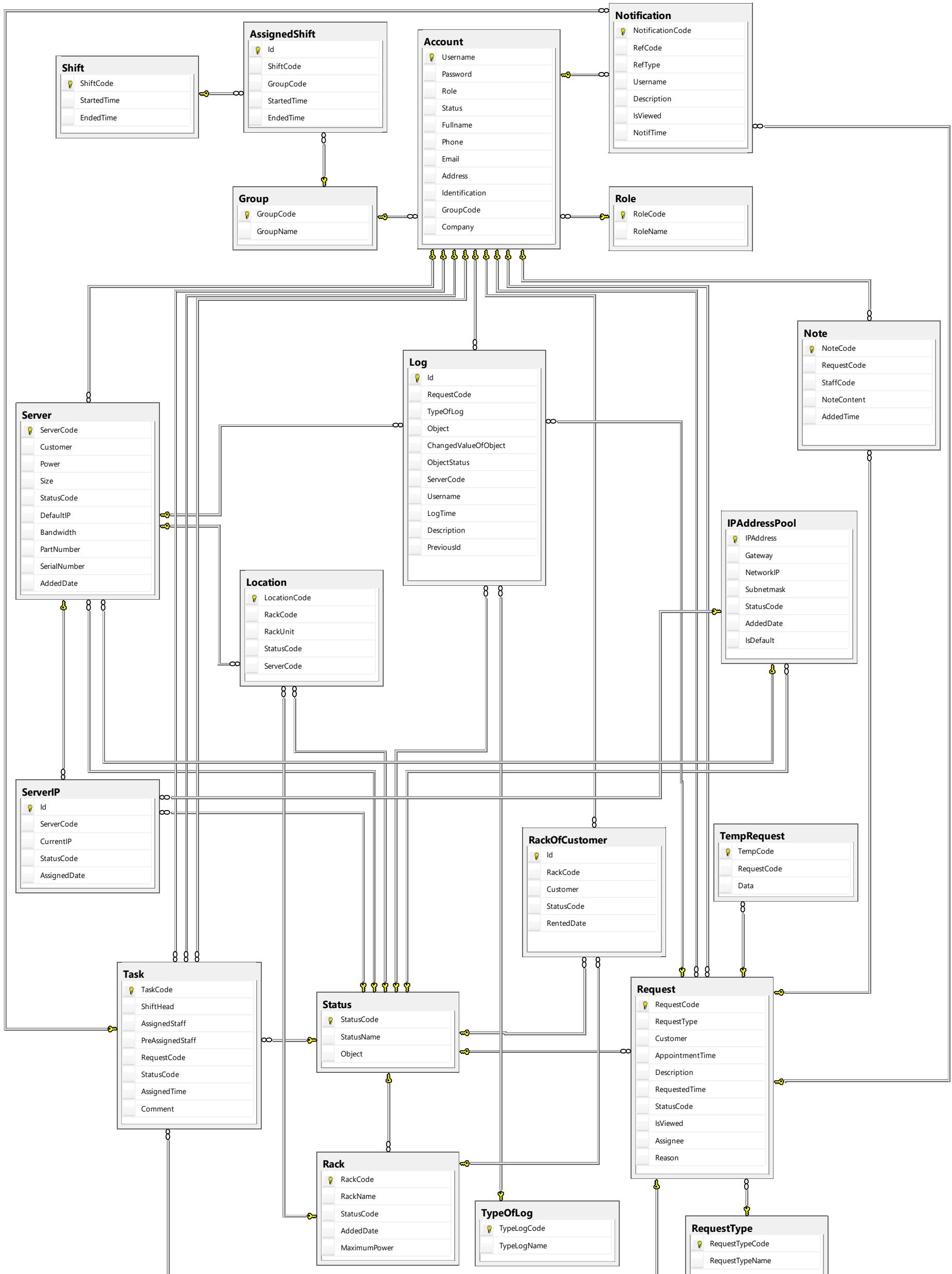


Figure 77: ウェブサイトアプリケーション物理的なダイアグラム

2.2 ウェブアプリケーションデータ辞書

Entity Data Dictionary: describe content of all entities		
数字	実体名	記述
01	Server	データセンターでのサーバーを含有しています
02	Status	システムでのオブジェクトの状態を含有しています
03	Location	システムでのロケーションを含有しています
04	Rack	システムに置いているラックを含有しています
05	Role	システムで役を含有しています
06	Log	何かが変更されたときの履歴を含有しています
07	ServerIP	システムでメンバーを含有しています
08	Request	お客様が送ったリクエストの情報を含有しています
09	Account	システムのユーザーの情報を含有しています
10	Note	次のシフトに前のシフトが書いたノートを含有しています
11	TempRequest	リクエストの一時データを含有しています
12	IPAddressPool	データセンターの IP アドレスを含有しています
13	RequestType	リクエストのタイプを含有しています
14	TypeOfLog	ログのタイプを含有しています
15	Group	データセンターでのグループを含有しています
16	AssignedShift	グループとシフトについての毎日の情報を含有しています
17	Shift	シフトの始まる時間と終了時間を含有しています
18	RackOfCustomer	お客様が借りたラックを含有しています
19	Notification	通知情報を含有しています
20	Task	タスクの情報を含有しています

Table 55 : ウェブデータ・ディクショナリ

エンティティ名	属性	記述	ドメイン	ヌル
Role	Id	役割の一意の識別子、自動的に増加	int	No
	RoleName{PK}	役割名、役割の一意の識別子	varchar(10)	No
Account	Id	アカウントの一意の識別子、自動的に増加	int	No

	Username{PK}	アカウントのユーザ名、アカウントの一意の識別子	varchar(30)	No
	Password	アカウントのパスワード	varchar(20)	No
	Role{FK}	アカウントの役割名	varchar(10)	No
	Email	ユーザーのメール	varchar(50)	No
	Fullscreen	ユーザーのフルネーム	nvarchar(150)	No
	Phone	ユーザーの電話番号	varchar(50)	No
	GroupCode{FK}	ユーザーのグループ	nvarchar(50)	No
	Company	カスタマーの会社	nvarchar(MAX)	Yes
	Address	ユーザーの住所	nvarchar(150)	No
	Identification	ユーザーの識別番号	varchar(50)	No
	Status{FK}	アカウントの状態	bit	No
Server	Id	サーバーの一意の識別子、自動的に増加	int	No
	ServerCode{PK}	サーバーのコード、サーバーの一意の識別子	nvarchar(50)	No
	Customer{FK}	サーバーを持って来たカスタマー	nvarchar(50)	No
	Maker	サーバーのメーカー	nvarchar(50)	No
	Model	サーバーのモデル	nvarchar(50)	No
	Power	サーバーのパワー	int	No
	Size	サーバーのサイズ (1U, 2U, 4U)	int	No
	StatusCode{FK}	サーバーの現在の状態	varchar(50)	No
	Bandwidth	サーバーの帯域幅	varchar(50)	No
	DefaultIP{FK}	サーバーのデフォルト IP	int	Yes
	AddedDate	サーバーが追加された時間	datetime	No
	SerialNumber	サーバーのシリアルナンバー	nvarchar(MAX)	Yes
	PartNumber	サーバーのパートナンバー	nvarchar(MAX)	Yes
Note	Id	ノートの一意の識別子、自動的に増加	int	No
	NoteCode{PK}	ノートのコード、ノートの一意の識別子	nvarchar(50)	No

	RequestCode{FK}	リクエストのコード	nvarchar(50)	No
	StaffCode{FK}	ノートを追加したスタッフのコード	nvarchar(50)	No
	NoteContent	ノートの情報	nvarchar(MAX)	No
	AddedTime	ノートが追加された時間	datetime	No
Log	Id	ログの一意の識別子、自動的に増加	int	No
	RequestCode{FK}	ログされたリクエストのコード	nvarchar(50)	Yes
	TypeOfLog{FK}	ログのタイプ	nvarchar(50)	No
	Object	ログされたオブジェクト	nvarchar(50)	No
	LogTime	ログされた時間	datetime	No
	ObjectStatus{FK}	ログされたオブジェクトの状態	nvarchar(50)	No
	ServerCode{FK}	ログされたサーバーのコード	nvarchar(50)	Yes
	Username{FK}	ログしたユーザーのユーザ名	nvarchar(50)	No
	Description	ログの説明	nvarchar(MAX)	Yes
	PreviousId	関連する以前のログの ID	int	Yes
	ChangedValueOfObject	オブジェクトの変更情報	nvarchar(50)	No
ServerIP	Id	ServerIP の一意の識別子、自動的に増加	int	No
	ServerCode{FK}	サーバーのコード	nvarchar(50)	No
	CurrentIP{FK}	サーバーの現在の IP	nvarchar(50)	No
	StatusCode{FK}	ServerIP の状態	nvarchar(50)	No
	AssignedDate	IP アドレスがサーバーに割り当てられた時間	datetime	No
IPAddressPool	Id	IP アドレスの一意の識別子、自動的に増加	int	No
	IPAddress{PK}	データセンターの IP アドレス、IP アドレスの一意の識別子	nvarchar(50)	No
	StatusCode{FK}	IP アドレスの現在の状態	nvarchar(50)	No
	Gateway	IP アドレスのゲートウェイ	nvarchar(50)	No

	NetworkIP	IP アドレスのネットワーク IP	nvarchar(50)	No
	Subnetmask	IP アドレスのサブネットマスク	nvarchar(50)	No
	IsDefault	IP アドレスはデフォルト IP ですか？ デフォルト IP ではありませんか？	bit	No
	AddedDate	IP アドレスが追加された時間	datetime	No
RequestType	Id	リクエストのタイプの一意の識別子、自動的に増加	int	No
	RequestTypeCode{PK}	リクエストのタイプのコード、リクエストのタイプの一意の識別子	nvarchar(50)	No
	RequestTypeName	リクエストのタイプの名	nvarchar(50)	No
RackOfCustomer	Id	RackOfCustomer の一意の識別子、自動的に増加	int	No
	RackCode{FK}	ラックのコード	nvarchar(50)	No
	Customer{FK}	ラックを借りたカスタマー	nvarchar(50)	No
	StatusCode{FK}	RackOfCustomer の状態	nvarchar(50)	No
	RentedDate	カスタマーがラックを借りた時間	datetime	No
Notification	Id	通知の一意の識別子、自動的に増加	int	No
	NotificationCode{PK}	通知のコード、通知の一意の識別子	nvarchar(50)	No
	RefCode{FK}	通知があるオブジェクトのコード	nvarchar(50)	No
	RefType	通知があるオブジェクトのタイプ	nvarchar(50)	No
	Username{FK}	通知をもらうユーザー	nvarchar(50)	No
	IsViewed	通知は見られましたか？ 見られませんでしたか？	bit	No

	NotifTime	通知が送られた時間	datetime	No
	Description	通知の説明	nvarchar(MAX)	No
TempRequest	Id	TempRequest の一意の識別子、自動的に増加	int	No
	TempCode{PK}	TempRequest のコード、TempRequest の一意の識別子	nvarchar(50)	No
	RequestCode{FK}	TempData が保存されたリクエストのコード	nvarchar(50)	No
	Data	リクエストの一時のデータ	nvarchar(MAX)	No
Location	Id	ロケーションの一意の識別子、自動的に増加	int	No
	LocationCode{PK}	ロケーションのコード、ロケーションの一意の識別子	nvarchar(50)	No
	RackCode{FK}	ラックのコード	nvarchar(50)	No
	StatusCode{FK}	ロケーションの状態	nvarchar(50)	No
	ServerCode{FK}	ロケーションに置いているサーバーのコード	nvarchar(50)	Yes
	RackUnit	ロケーションのラックユニット	int	No
Status	Id	状態の一意の識別子、自動的に増加	int	No
	StatusCode{PK}	状態のコード、状態の一意の識別子	nvarchar(50)	No
	StatusName	オブジェクトの状態名	nvarchar(50)	No
	Object	システムのオブジェクト	nvarchar(50)	No
Request	Id	リクエストの一意の識別子、自動的に増加	int	No
	RequestCode{PK}	リクエストのコード	nvarchar(50)	No
	RequestType{FK}	リクエストのタイプ	nvarchar(50)	No
	Customer{FK}	リクエストを送ったカスタマー	nvarchar(50)	No
	AppointmentTime	カスタマーがデータセンターに来る時間	datetime	Yes

	Description	リクエストの説明	nvarchar(MAX)	Yes
	StatusCode{FK}	リクエストの現在の状態	nvarchar(50)	No
	Assignee{FK}	割り当てられたスタッフ	nvarchar(50)	No
	RejectedReason	リクエストを拒否した理由	nvarchar(MAX)	Yes
	RequestedTime	リクエストが送られた時間	datetime	No
Rack	Id	ラックの一意の識別子、自動的に増加	int	No
	RackCode{PK}	ラックのコード	nvarchar(50)	No
	RackName	ラックの名	nvarchar(50)	No
	StatusCode{FK}	ラックの現在の状態	nvarchar(50)	No
	AddedDate	ラックが追加された時間	datetime	No
	MaximumPower	ラックのパワー	int	No
Task	Id	タスクの一意の識別子、自動的に増加	int	No
	TaskCode{PK}	タスクのコード	nvarchar(50)	No
	ShiftHead{FK}	タスクを割り当てた人	nvarchar(50)	No
	AssignedStaff{FK}	タスクを割り当てられたスタッフ	nvarchar(50)	No
	RequestCode{FK}	リクエストのコード	nvarchar(50)	No
	StatusCode{FK}	タスクの現在の状態	nvarchar(50)	No
	Reason	完成しなかったタスクの理由	nvarchar(MAX)	Yes
	AssignedTime	タスクが割り当てられた時間	datetime	No
	PreAssignedStaff{FK}	以前に割り当てられたスタッフ	nvarchar(50)	Yes
AssignedShift	Id	AssignedShiftの一意の識別子、自動的に増加	int	No
	ShiftCode{FK}	シフトのコード	nvarchar(50)	No
	GroupCode{FK}	グループのコード	nvarchar(50)	No
	StartTime	シフトの始まる時間	datetime	No
	EndTime	シフトの終了時間	datetime	No

Group	Id	グループの一意の識別子、自動的に増加	int	No
	GroupCode{PK}	グループのコード	nvarchar(50)	No
Shift	Id	シフトの一意の識別子、自動的に増加	int	No
	ShiftCode{PK}	シフトのコード、シフトの一意の識別子	nvarchar(50)	No
	StartTime	シフトの始まる時間	datetime	No
	EndTime	シフトの終了時間	datetime	No
TypeOfLog	Id	TypeOfLog の一意の識別子、自動的に増加	int	No
	TypeCode{PK}	ログのタイプのコード	nvarchar(50)	No
	TypeName	ログのタイプの名	nvarchar(50)	No

Table 56: ウエブ属性データディクショナリ

3. パフォーマンス対策

パフォーマンスを測定するために、デプロイとともに azure ホスティングでテストして、予測を行いました。

3.1 情報検索のパフォーマンス

一般的に、ユーザが検索を提出した後、2 秒未満で現されます。

3.2 メールを送信するパフォーマンス

一般的に、メールを作成し、メールを送信するための合計時間はメールごとに 7 秒未満です。

3.3 IPアドレスを生成するパフォーマンス

一般的に、“Add new IP”というボタンをクリックしてから、システムは 3 秒未満で IP アドレスが生成されます。

4. テスト計画

4.1 テストする機能

システムテストはコアワークフローに基づいて行われています。

テストする機能:

- ユーザログイン
- カスタマー
 - 新しいサーバーを追加するリクエスト送信
 - IP アドレスを割り当てるリクエスト送信
 - IP アドレスを変更するリクエスト送信
 - IP アドレスを復帰するリクエスト送信
 - サーバーを離れて持っていくリクエスト送信
 - ラックを借りるリクエスト送信
 - ラックを復帰するリクエスト送信
 - 新しいサーバーを追加するリクエストをキャンセル
 - IP アドレスを割り当てるリクエストをキャンセル
 - IP アドレスを変更するリクエストをキャンセル
 - IP アドレスを復帰するリクエストをキャンセル
 - サーバーを離れて持っていくリクエストをキャンセル
 - ラックを借りるリクエストをキャンセル
 - ラックを復帰するリクエストをキャンセル
- 人員
 - 新しい IP アドレスを追加
 - 新しいラックを追加
 - サーバーの位置を変更
 - タスクを割り当て
 - 新しいサーバーを追加するリクエストを承認
 - IP アドレスを割り当てるリクエストを承認
 - IP アドレスを変更するリクエストを承認
 - IP アドレスを復帰するリクエストを承認
 - サーバーを離れて持っていくリクエストを承認
 - ラックを借りるリクエストを承認

- ラックを復帰するリクエストを承認
- 新しいサーバーを追加するリクエストを拒否
- IP アドレスを割り当てるリクエストを拒否
- IP アドレスを変更するリクエストを拒否
- IP アドレスを復帰するリクエストを拒否
- サーバーを離れて持っていくリクエストを拒否
- ラックを借りるリクエストを拒否
- ラックを復帰するリクエストを拒否
- ノートを追加
- 管理
 - 新しいユーザーを追加
 - ユーザーの情報を編集
 - ユーザーを無効化

4.2 テストされない機能

- ログアウト
- プロフィールを編集
- パスワードを変更
- パスワードを再設定
- IP アドレスを無効化
- IP アドレスをブロック
- IP ブロックを解除
- エクスポート手順
- カスタマー管理

5. システムテストのテストケース

5.1 ウェブシステムのテストケース

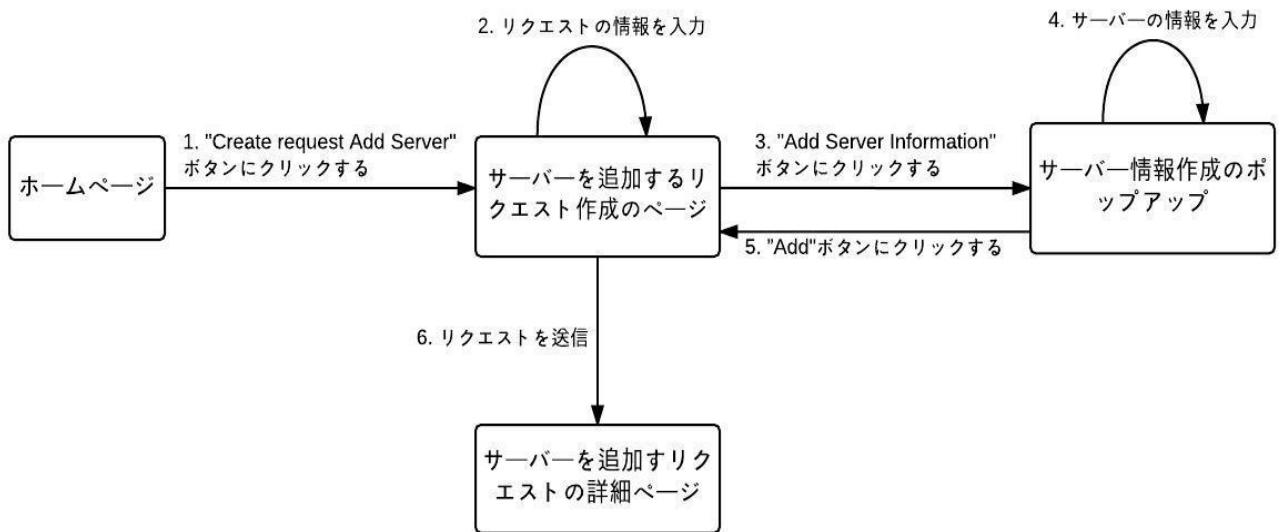


Figure 78: 「カスタマー」/新しいサーバーを追加するリクエスト送信

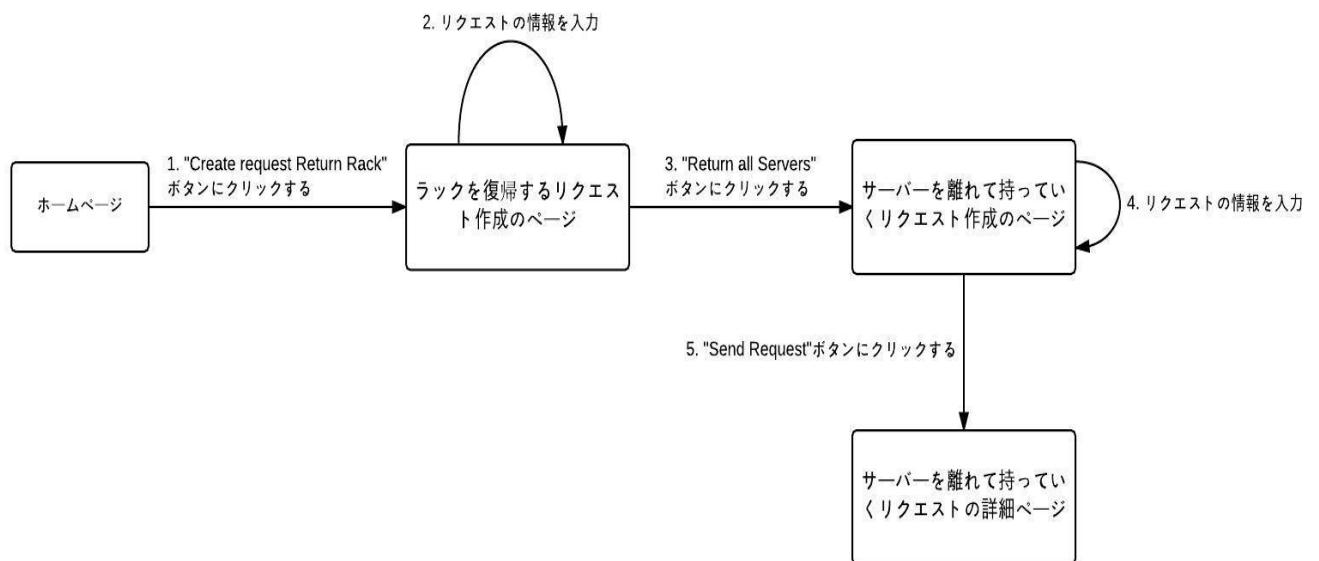


Figure 79: 「カスタマー」/ラックを復帰するリクエスト送信

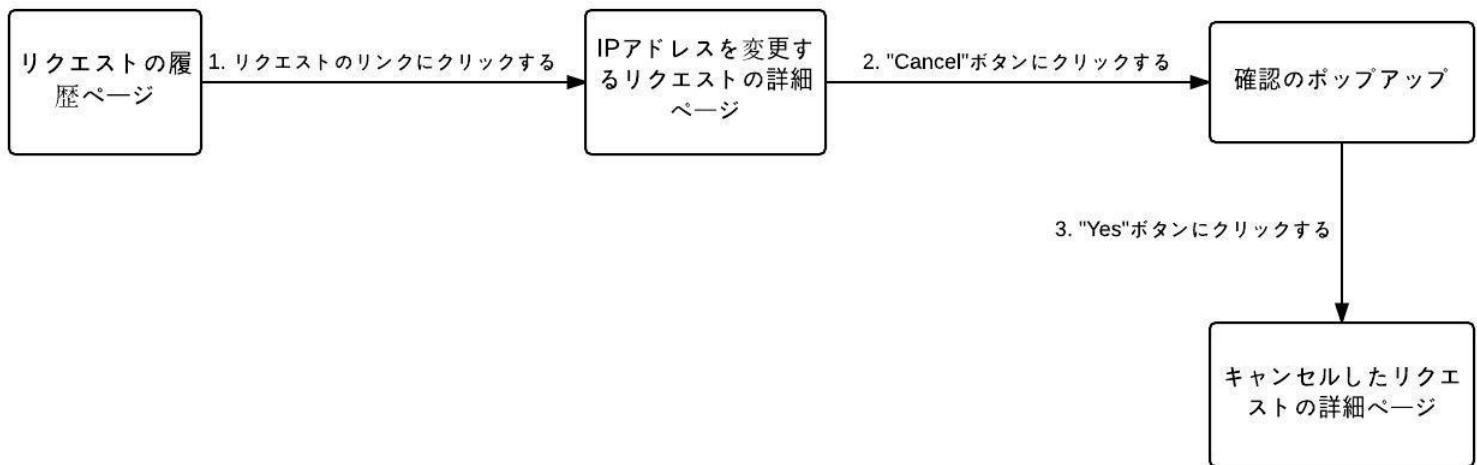


Figure 80: 「カスタマー」/IP アドレスを変更するリクエストをキャンセル

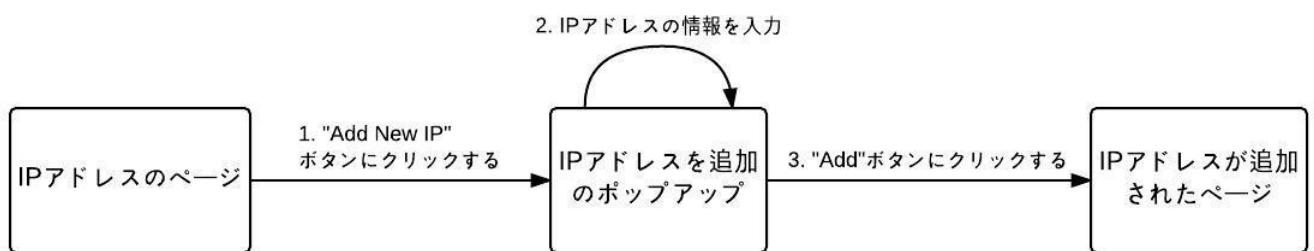


Figure 81: 「人員」/新しいIP アドレスを追加

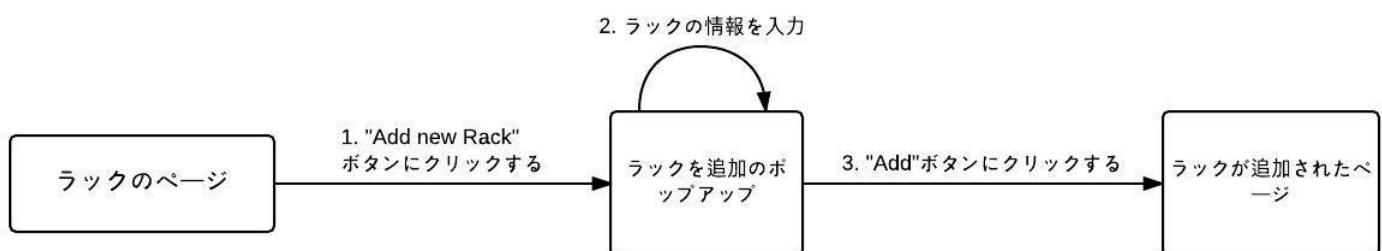


Figure 82: 「人員」/新しいラックを追加

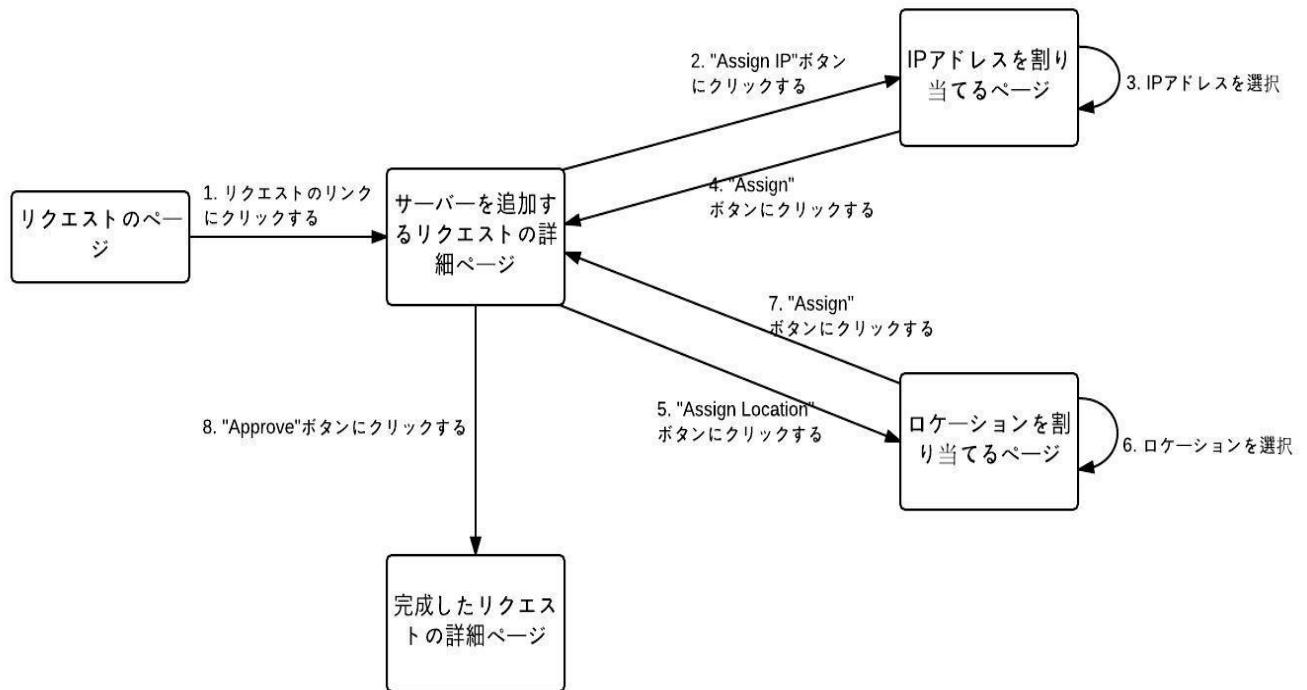


Figure 83: 「人員」/新しいサーバーを追加するリクエストを承認

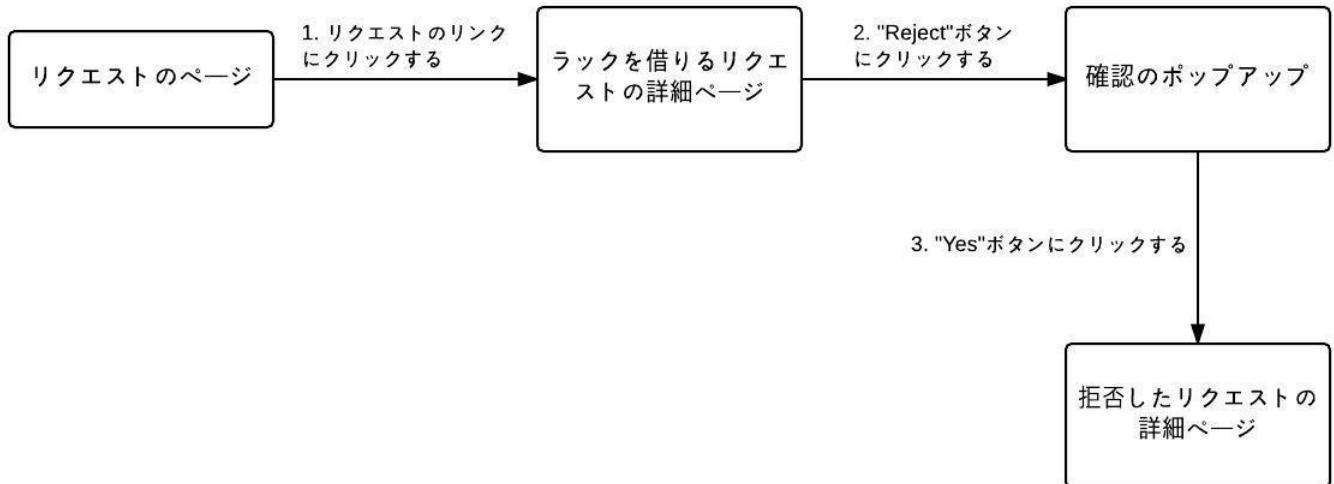


Figure 84: 「人員」/ラックを借りるリクエストを拒否

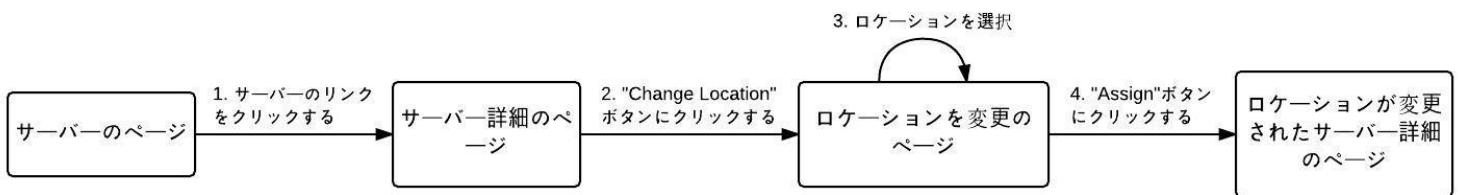


Figure 85: 「人員」/サーバーの位置を変更

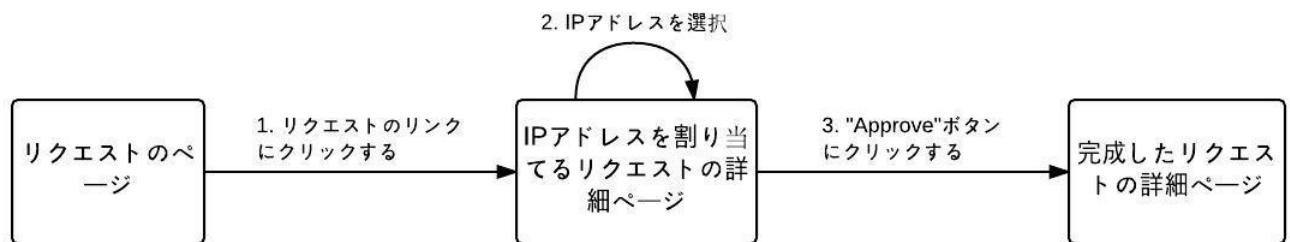


Figure 86: 「人員」/IP アドレスを割り当てるリクエストを承認

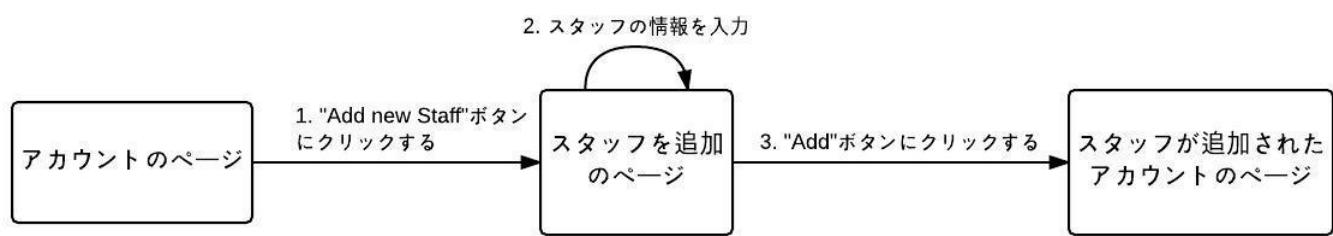


Figure 87: 「管理」/新しいスタッフを追加

5.1.1 ユーザログイン

ID	説明	テストケース順序	出力	インターテストケース依存性	結果	テスト期日	注釈
L01	ユーザ名が違う	1. ユーザは「Login」ボタンをクリックする。 2. ユーザ名 : annd パスワード : 123456 3. ユーザは「Login」ボタンをクリックする。	ステップ 3 には、ログインページは再びロードされる。全部のフィールドはリセットされる。	なし	合格	01/04/2016	なし
L02	パスワードが違う	1. ユーザは「Login」ボタンをクリックする。 2. ユーザ名 : anndh パスワード : 1234 3. ユーザは「Login」ボタンをクリックする。	ステップ 3 には、ログインページは再びロードされる。全部のフィールドはリセットされる。	なし	合格	01/04/2016	なし
L03	カスタマーはログインする	1. ユーザは「Login」ボタンをクリックする。 2. ユーザ名 : manhnhanh パスワード : 123456 3. ユーザは「Login」ボタンをクリックする。	ステップ 3 には、システムにカスタマー同上のユーザ名をログインする。	なし	合格	01/04/2016	なし

L04	人員はログインする	1. ユーザは「Login」ボタンをクリックする。 2. ユーザ名 : haltt パスワード : 123456 3. ユーザは「Login」ボタンをクリックする。	ステップ 3 には、システムに人員同上のユーザ名をログインする。	なし	合格	01/04/2016	なし
L05	管理はログインする	1. ユーザは「Login」ボタンをクリックする。 2. ユーザ名 : anndh パスワード : 123456 3. ユーザは「Login」ボタンをクリックする。	ステップ 3 には、システムに管理のユーザ名をログインする。	なし	合格	01/04/2016	なし

5.1.2 「カスタマー」新しいサーバーを追加するリクエスト送信

ID	説明	テストケース順序	出力	インター テストケース 依存性	結果	テスト期日	注釈
CRAS01	予定の時間とサーバーの情報は空白	1 . 「 Create request Add Server」ボタンをクリックして 2 . 「 Send Request」ボタンをクリックする	ステップ 1 には、サーバーを追加するリクエストのページは現れる ステップ 2 には、誤差「 The Appointment Time is required」と「No server added」を通知する	L03	合格	01/04/2016	なし

CRAS02	予定の時間は現在の前	<p>1 . 「Create request Add Server」ボタンをクリックして</p> <p>2 . Appointment Time : 30/03/2016</p> <p>3 . 「Send Request」ボタンをクリックする</p>	<p>ステップ 1 には、サーバーを追加するリクエストのページは現れる</p> <p>ステップ 3 には、Appointment Time のフィールドはリセットされる。誤差「The Appointment Time is required」と「No server added」を通知する</p>	L03	合格	01/04/2016	なし
CRAS03	サーバーの情報を取り込む	<p>1 . 「Create request Add Server」ボタンをクリックして</p> <p>2 . Appointment Time : 02/04/2016</p> <p>3 . 「Add Server Information」ボタンをクリックする Power: 400 Size: 1 Serial Number: 123123 Part Number: 3232131 Bandwidth: 100Mbps</p> <p>4 . 「Add」ボタンにクリックする</p>	<p>ステップ 1 には、サーバーを追加するリクエストのページは現れる</p> <p>ステップ 3 には、サーバーの情報を入力のポップアップが現れる。</p> <p>ステップ 4 には、サーバーを追加するリクエストページを</p>	L03	合格	01/04/2016	なし

		5 . 「Send Request」ボタンにクリックする	戻って、テーブルにサーバーの情報が追加された。ステップ 5 には、サーバーを追加するクリエイトの詳細ページが現れて、状態は“Pending”だ。				
CRAS04	サーバーの情報を変更する	1 . 「Create request Add Server」ボタンをクリックして 2 . Appointment Time : 02/04/2016 3 . 「Add Server Information」ボタンをクリックする Power: 400 Size: 1 Serial Number: 123123 Part Number: 3232131 Bandwidth: 100Mbps 4 . 「Add」ボタンにクリックする 5 . 「Edit」ボタンにクリックする Power: 500 6 . 「Update」ボタンにクリックする	ステップ 1 には、サーバーを追加するリクエストのページは現れる ステップ 3 には、サーバーの情報を入力のポップアップが現れる。 ステップ 4 には、サーバーを追加するリクエストページを戻って、テーブルにサーバーの情報が追加された。 ステップ 5 には、サーバーの情報を変更のポップアップが現れる。 ステップ 6 には、サーバーを追加するリクエストページを	L03	合格	01/04/2016	なし

		7 . 「Send Request」ボタンにクリックする	戻って、テーブルにサーバーの情報が変更された。 ステップ 7 には、サーバーを追加するクリエイトの詳細ページが現れて、状態は“Pending”だ。				
CRAS05	サーバーの情報解消する	1 . 「Create request Add Server」ボタンをクリックして 2 . Appointment Time : 02/04/2016 3 . 「Add Server Information」ボタンをクリックする Power: 400 Size: 1 Serial Number: 123123 Part Number: 3232131 Bandwidth: 100Mbps 4 . 「Add」ボタンにクリックする 5 . 「Add Server Information」ボタンをクリックする Power: 500 Size: 2 Serial Number: 5678909	ステップ 1 には、サーバーを追加するリクエストのページは現れる ステップ 3 には、サーバーの情報を入力のポップアップが現れる。 ステップ 4 には、サーバーを追加するリクエストページを戻って、テーブルにサーバーの情報が追加された。 ステップ 5 には、サーバーの情報を入力のポップアップが現れる。	L03	合格	01/04/2016	なし

	<p>Part Number: 6789981 Bandwidth: 100Mbps</p> <p>6. 「Add」ボタンにクリックする</p> <p>7. 「Delete」ボタンにクリックする</p> <p>8. 「OK」ボタンにクリックする</p> <p>9. 「Send Request」ボタンにクリックする</p>	<p>ステップ 6 には、サーバーを追加するリクエストページに戻って、テーブルにサーバーの情報が追加された。</p> <p>ステップ 7 には、確認のポップアップが現れる。</p> <p>ステップ 8 には、サーバーを追加するリクエストページに戻って、そのサーバーが解消された。</p> <p>ステップ 9 には、サーバーを追加するクリエイトの詳細ページが現れて、状態は“Pending”だ。</p>			
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5.1.3 「カスタマー」ラックを復帰するリクエスト送信

ID	説明	テストケース順序	出力	インターテストケース依存性	結果	テスト期日	注釈

CRRR01	ラックを選択しない	1 . 「Create request Return Rack」ボタンをクリックして 2 . 「Send Request」ボタンをクリックする	ステップ 1 には、ラックを復帰するリクエストのページは現れる ステップ 2 には、誤差「Select at least one rack」を通知する	L03	合格	01/04/2016	なし
CRRR02	サーバーがないラックを選択する	1 . 「Create request Return Rack」ボタンをクリックして 2 . サーバーがないラックを選択する 3 . 「Send Request」ボタンをクリックする	ステップ 1 には、ラックを復帰するリクエストのページは現れる ステップ 3 には、ラックを復帰するリクエストの詳細ページが現れて、状態は“Pending”だ。	L03	合格	01/04/2016	なし
CRRR03	サーバーがあるラックの場合	1 . 「Create request Return Rack」ボタンをクリックして 2 . 「Return all servers」リンクにクリックする	ステップ 1 には、ラックを復帰するリクエストのページは現れる ステップ 2 には、サーバーを離れて持っていくリクエストのページが現れる。	L03	合格	01/04/2016	なし

5.1.4 「カスタマー」IP アドレスを変更するリクエストをキャンセル

ID	説明	テストケース順序	出力	インターテストケース依存性	結果	テスト期日	注釈

CRCI01	IP アドレスを変更するリクエストをキャンセル	1. IP アドレスを変更するリクエストのリンクにクリックする 2. 「Cancel」ボタンにクリックする	ステップ 1 には、IP アドレスを変更するリクエストの詳細ページが現れて、「Cancel」ボタンがある。 ステップ 2 には、IP アドレスを変更するリクエストの詳細ページに戻って、状態は「Cancelled」だ。	L03	合格	01/04/2016	なし
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5.1.5 「人員」新しい IP アドレスを追加

ID	説明	テストケース順序	出力	インターテストケース依存性	結果	テスト期日	注釈
AI01	ゲートウェイのタイプと IP アドレスのフィールドは空白	1. 「Add new IP」ボタンにクリックする 2. 「Add」ボタンにクリックする	ステップ 1 には、IP アドレスを追加のポップアップが現れます。 ステップ 2 には、誤差「Please input Network Address!」と「Please select type of Gateway!」を通知する	L04	合格	01/04/2016	なし
AI02	ゲートウェイのタイプは空白、IP アドレスのフォーマットは違う	1. 「Add new IP」ボタンにクリックする 2. . Address: 278.1.1.1 3. 「Add」ボタンにクリックする	ステップ 1 には、IP アドレスを追加のポップアップが現れます。 ステップ 3 には誤差「Wrong format of Network Address!」	L04	合格	01/04/2016	なし

			Try again!」と「Please select type of Gateway!」を通知する				
AI03	最初の IP アドレスの後のゲートウェイを選択する	1. 「Add new IP」ボタンにクリックする 2. Address: 278.1.1.1 Gateway: 「After first IP Address」を選択 3. 「Add」ボタンにクリックする。	ステップ 1 には、IP アドレスを追加のポップアップが現れます。 ステップ 3 には、IP アドレスのページに戻って、IP アドレスの範囲が追加されて、ゲートウェイは最初の IP アドレスの後だ。	L04	合格	01/04/2016	なし
AI04	最後の IP アドレスの前のゲートウェイを選択する	1. 「Add new IP」ボタンにクリックする 2. Address: 278.1.1.2 Gateway: 「Before last IP Address」を選択 3. 「Add」ボタンにクリックする。	ステップ 1 には、IP アドレスを追加のポップアップが現れます。 ステップ 3 には、IP アドレスのページに戻って、IP アドレスの範囲が追加されて、ゲートウェイは最後の IP アドレスの前だ。	L04	合格	01/04/2016	なし

AI05	IP アドレスはシステムで存在した	1. 「Add new IP」ボタンにクリックする 2. Address: 278.1.1.2 Gateway: 「Before last IP Address」を選択 3. 「Add」ボタンにクリックする。	ステップ 1 には、IP アドレスを追加のポップアップが現れます。 ステップ 3 には、誤差「IP Address is existed!」を通知する	L04, AI04	合格	01/04/2016	なし
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5.1.6 「人員」新しいラックを追加

ID	説明	テストケース順序	出力	インターテストケース依存性	結果	テスト期日	注釈
AR01	ラック名のフィールドは空白	1. 「Add new rack」ボタンにクリックする 2. 「Add」ボタンにクリックする	ステップ 1 には、ラックを追加のポップアップが現れます ステップ 2 には、誤差「Please input Rack Name!」を通知する	L04	合格	01/04/2016	なし
AR02	ラック名のフォーマットは違う	1. 「Add new rack」ボタンにクリックする 2. Rack Name: AB 3. 「Add」ボタンにクリックする	ステップ 1 には、ラックを追加のポップアップが現れます ステップ 3 には、誤差「Wrong format of Rack Name! Try again!」を通知する	L04	合格	01/04/2016	なし

AR03	新しいラックは追加される	1. 「Add new rack」ボタンにクリックする 2. Rack Name: A4 3. 「Add」ボタンにクリックする	ステップ 1 には、ラックを追加のポップアップが現れます ステップ 3 には、ラックのページに戻って、新しいラック 42 の新しいロケーションがテーブルに追加された	L04	合格	01/04/2016	なし
AR04	ラック名はシステムで存在した	1. 「Add new rack」ボタンにクリックする 2. Rack Name: A4 3. 「Add」ボタンにクリックする	ステップ 1 には、ラックを追加のポップアップが現れます ステップ 3 には、誤差「Rack Name is existed!」を通知する	L04	合格	01/04/2016	なし

5.1.7 「人員」新しいサーバーを追加するリクエストを承認

ID	説明	テストケース順序	出力	インター テストケース 依存性	結果	テスト期日	注釈
ARAS01	IP アドレスとロケーションがないサーバーのリクエストを承認する	1. 新しいサーバーを追加するリクエストのリンクにクリックする 2. 「Approve」ボタンにクリックする	ステップ 1 には、新しいサーバーを追加するリクエストの詳細ページが現れて、「Approve」と「Reject」ボタンがある。 ステップ 2 には、「Please select DefaultIP and	L04, CRAS03	合格	01/04/2016	なし

			Location for server!」というエラーメッセージが現れる				
ARAS02	「AssignIP」ページで IP アドレスが何も選択しない	1. 新しいサーバーを追加するリクエストのリンクにクリックする 2. 「Assign Default IP」リンクにクリックする 3. 「Assign」ボタンにクリックする	ステップ 1 には、新しいサーバーを追加するリクエストの詳細ページが現れて、「Approve」と「Reject」ボタンがある。 ステップ 2 には、「AssignIP」ページが現れる ステップ 3 には、「Select IP Address to assign!」というエラーメッセージが現れる	UL04, CRAS03	合格	01/04/2016	なし
ARAS03	「AssignLocation」ページでロケーションが何も選択しない	1. 新しいサーバーを追加するリクエストのリンクにクリックする 2. 「Assign Location」リンクにクリックする 3. 「Assign」ボタンにクリックする	ステップ 1 には、新しいサーバーを追加するリクエストの詳細ページが現れて、「Approve」と「Reject」ボタンがある。 ステップ 2 には、「AssignLocation」ページが現れる ステップ 3 には、「Select location to assign!」というエラーメッセージが現れる	UL04, CRAS03	合格	01/04/2016	なし

ARAS04	サーバーの IP アドレスを変更する	<p>1. 新しいサーバーを追加するリクエストのリンクにクリックする</p> <p>2. 「Assign Default IP」リンクにクリックする</p> <p>3. IP アドレスを一つ選択する</p> <p>4. 「Assign」ボタンにクリックする</p> <p>5. 「Assign Default IP」リンクにまたクリックする</p> <p>6. 他の IP アドレスを一つ選択する</p> <p>7. 「Assign」ボタンにクリックする</p>	<p>ステップ 1 には、新しいサーバーを追加するリクエストの詳細ページが現れて、「Approve」と「Reject」ボタンがある。</p> <p>ステップ 2 には、「AssignIP」ページが現れる。</p> <p>ステップ 4 には、新しいサーバーを追加するリクエストのページを戻って、選択した IP アドレスはテーブルにある。</p> <p>ステップ 5 には、「AssignIP」ページが現れる。</p> <p>ステップ 7 には、新しいサーバーを追加するリクエストのページを戻って、IP アドレスが変更された。</p>	L04, CRAS03	合格	02/04/2016	なし
ARAS05	サーバーのロケーションを変更する	<p>1. 新しいサーバーを追加するリクエストの詳細ページ</p>	<p>ステップ 1 には、新しいサーバーを追加するリクエストの詳細ページ</p>	L04, CRAS03	合格	02/04/2016	なし

		<p>トのリンクにクリックする</p> <p>2 . 「 Assign Location」リンクにクリックする</p> <p>3 . 適当なロケーションを選択する</p> <p>4 . 「Assign」ボタンにクリックする</p> <p>5 . 「 Assign Location」リンクにまたクリックする</p> <p>6 . 他のロケーションを選択する</p> <p>7 . 「Assign」ボタンにクリックする</p>	<p>ジ が 現 れ て 、 「 Approve 」 と 「Reject」ボタンがあ る。</p> <p>ステップ 2 には 、 「AssignLocation」ペ ージが現れる。</p> <p>ステップ 4 には、新し いサーバーを追加する リクエストのページを 戻って、選択したロケ ーションはテーブルにあ る。</p> <p>ステップ 5 には 、 「AssignLocation」ペ ージが現れる。</p> <p>ステップ 7 には、新し いサーバーを追加する リクエストのページを 戻って、ロケーションが 変更された。</p>				
ARAS06	成功に新しいサー バーを追加するリク エストを承認する	1 . 新しいサーバー を追加するリクエス トのリンクにクリック する	ステップ 1 には、新し いサーバーを追加する リクエストの詳細ペ ージ が 現 れ て 、 「 Approve 」 と	L04, CRAS03	合格	02/04/2016	なし

		<p>2 . 「 Assign Default IP」リンクにクリックする</p> <p>3 . IP アドレスを一つ選択する</p> <p>4 . 「Assign」ボタンにクリックする</p> <p>5 . 「 Assign Location」リンクにまたクリックする</p> <p>6 . 適当なロケーションを選択する</p> <p>7 . 「Assign」ボタンにクリックする</p> <p>8 . 「Approve」ボタンにクリックする</p>	<p>「Reject」ボタンがある。</p> <p>ステップ 2 には、「AssignIP」ページが現れる。</p> <p>ステップ 4 には、新しいサーバーを追加するリクエストのページを戻って、選択した IP アドレスはテーブルにある。</p> <p>ステップ 5 には、「AssignLocation」ページが現れる。</p> <p>ステップ 7 には、新しいサーバーを追加するリクエストのページを戻って、テーブルに選択したロケーションがある。</p> <p>ステップ 8 には、新しいサーバーを追加するリクエストの詳細ページが現れて、リクエストの状態は完了だ。</p>			
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5.1.8 「人員」ラックを借りるリクエストを拒否

ID	説明	テストケース順序	出力	インターテストケース依存性	結果	テスト期日	注釈
RRRR01	ラックを借りるリクエストをキャンセル	1. ラックを借りるリクエストのリンクにクリックする 2. 「Cancel」ボタンにクリックする	ステップ 1 には、ラックを借りるリクエストの詳細ページが現れて、「Reject」ボタンがある。 ステップ 2 には、ラックを借りるリクエストの詳細ページに戻って、状態は「Rejected」だ。	L04	合格	02/04/2016	なし

5.1.9 「人員」IP アドレスを割り当てるリクエストを承認

CD に完全なドキュメントを参照してください。

5.1.10 「管理」新しいスタッフを追加

ID	説明	テストケース順序	出力	インターテストケース依存性	結果	テスト期日	注釈
ANS01	全てのフィールドは空白	1. 「Add new Staff」ボタンにクリックする 2. 「Add」ボタンにクリックする	ステップ 1 には、新しいスタッフのページが現れる。 ステップ 2 には、誤差「Username is required」、「Group is required」、「Role is required」、「Fullname is required」、「Phone	L05	合格	02/04/2016	なし

			is required」、「Email is required」、「Address is required」、「Identification is required」を通知する				
ANS02	メールのフォーマットは違う	1. 「Add new Staff」ボタンにクリックする 2. Fullname: huongnt Group: Group 2 Role: Staff Fullname: Nguyễn Thị Hương Phone: 092323232 Email: huonghuong Address: 18 Dinh Tien Hoang, District 1 Identification: 5623682131 3. 「Add」ボタンにクリックする	ステップ 1 には、新しいスタッフのページが現れる。 ステップ 3 には、誤差「Email is not valid」を通知する	L05	合格	02/04/2016	なし
ANS03	電話番号のフォーマットは違う	1. 「Add new Staff」ボタンにクリックする 2. Fullname: huongnt Group: Group 2 Role: Staff Fullname: Nguyễn Thị Hương Phone: adfsdfsdf	ステップ 1 には、新しいスタッフのページが現れる。	L05	合格	02/04/2016	なし

		<p>Email: huongnt@gmail.com</p> <p>Address: 18 Dinh Tien Hoang, District 1</p> <p>Identification: 5623682131</p> <p>3. 「Add」ボタンにク リックする</p>	ステップ 3 には、誤差 「Phone must be number」を通知する			
ANS04	識別番号の フォーマット は違う	<p>1. 「Add new Staff」 ボタンにクリックする</p> <p>2. Fullname: huongnt Group: Group 2 Role: Staff Fullname: Nguyễn Thị Hương Phone: 092323223 Email: huongnt@gmail.com</p> <p>Address: 18 Dinh Tien Hoang, District 1</p> <p>Identification: erwer</p> <p>3. 「Add」ボタンにク リックする</p>	<p>ステップ 1 には、新しい スタッフのページが現れ る。</p> <p>ステップ 3 には、誤差 「Identification must be number」を通知す る</p>	L05	合格	02/04/2016
ANS05	ユーザー名は システムで 存在した	<p>1. 「Add new Staff」 ボタンにクリックする</p> <p>2. Fullname: nhink Group: Group 2 Role: Staff Fullname: Nguyễn Khả Nhi</p>	<p>ステップ 1 には、新しい スタッフのページが現れ る。</p>	L05	合格	02/04/2016

		<p>Phone: 092323223 Email: nhink@gmail.com Address: 18 Dinh Tien Hoang, District 1 Identification: 0231213223</p> <p>3. 「Add」ボタンにク リックする</p>	<p>ステップ 3 には、誤差 「 Username is existed」を通知する</p>				
ANS06	成功に新しいスタッフが追加される	<p>1. 「Add new Staff」 ボタンにクリックする</p> <p>2.</p> <p>Fullname: huongnt Group: Group 2 Role: Staff Fullname: Nguyễn Thị Hương Phone: 094342324 Email: huongnt@gmail.com Address: 18 Dinh Tien Hoang, District 1 Identification: 5623682131</p> <p>3. 「Add」ボタンにク リックする</p>	<p>ステップ 1 には、新しい スタッフのページが現れ る。</p> <p>ステップ 3 には、アカウ ントのページに戻って、 テーブルに新しいスタッ フが追加された。</p>	L05	合格	02/04/2016	なし
ANS07	有効なスタッフがデータセンターで十分です	1. アカウントのページに来る	ステップ 1 には、アカウントのページで「Add new Staff」ボタンが現れない。	L05	合格	02/04/2016	なし

F. 番 6 のレポート。ソフトウェアユーザーズマニュアル

1. インストレーションガイド

1.1. サーバ側で環境を設定

このソフトウェアが以下のサーバーマシンにインストールされなければならない。

1.1.1. ハードウェア要件

最小構成で開発するためのパーソナルコンピュータ：

- プロセッサ：「Core 2 Duo 2.0 GHz」以上。
- メモリ：「2GB RAM」以上。
- 使用可能なディスク領域：「30GB」ハードディスク以上。
- インターネット：スピード「10Mbps」以上。

1.1.2. ソフトウェア要件

- ウェブサーバ：「Internet Information System – IIS 7」。
- 「OS」:「Microsoft Windows Server 2008」
- 「SQL Server 2012」：ウェブアプリケーション用のデータベースを作成および管理するために使用します。

1.2. サーバ側で展開

1.2.1. 展開のパッケージを準備

サーバのフォルダにデプロイメントパッケージを抽出.

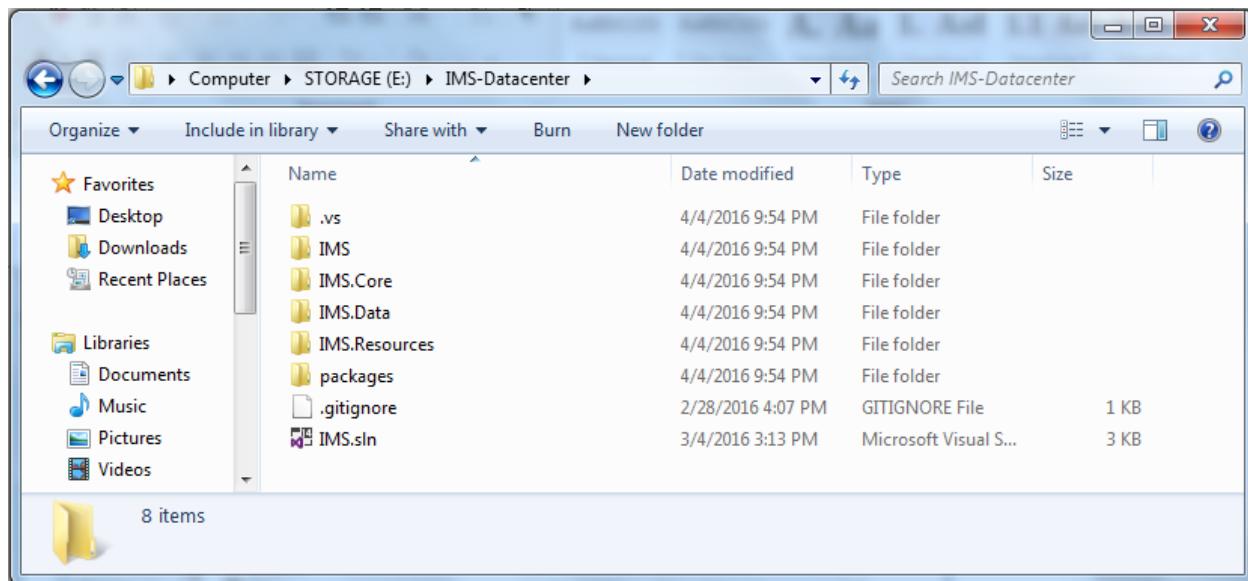


Figure 88: デプロイメントパッケージの準備

1.2.2. 展開の前に、サーバを設定

/Internet Information System Manager/を開きます。

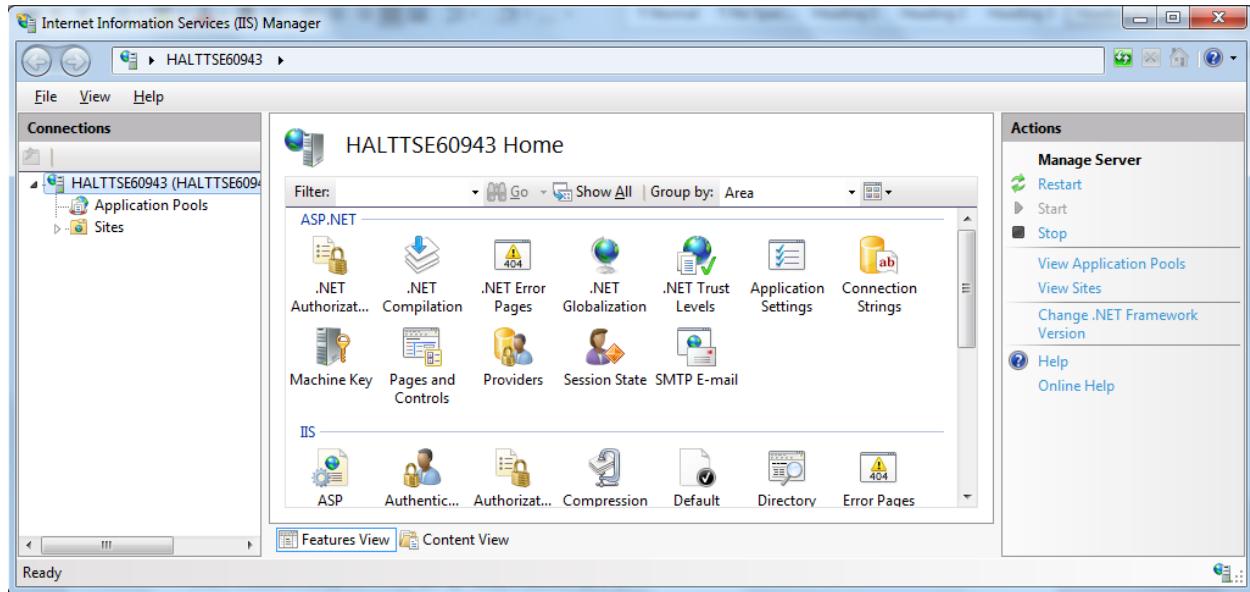


Figure 89: /Internet Information System/ 1

/.NET Framework/のバージョンを「4.0」に変更します。

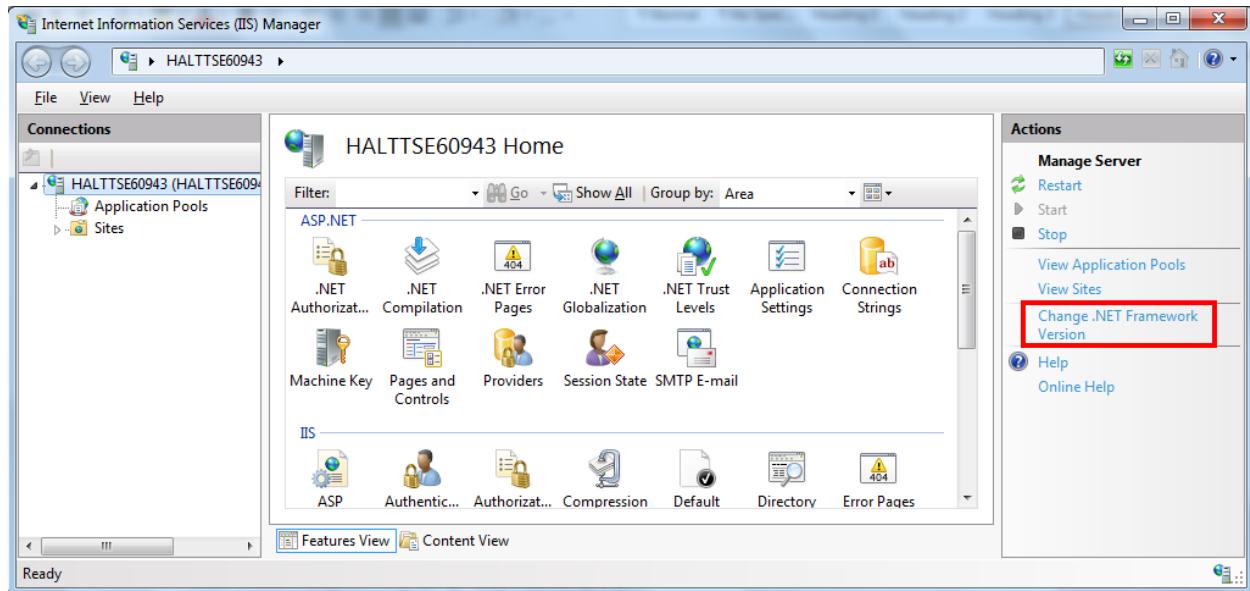


Figure 90: /Internet Information System/ 2



Figure 91: /Internet Information System/_3

/NET Framework/のバージョンを「4.0.30319」に変更します。

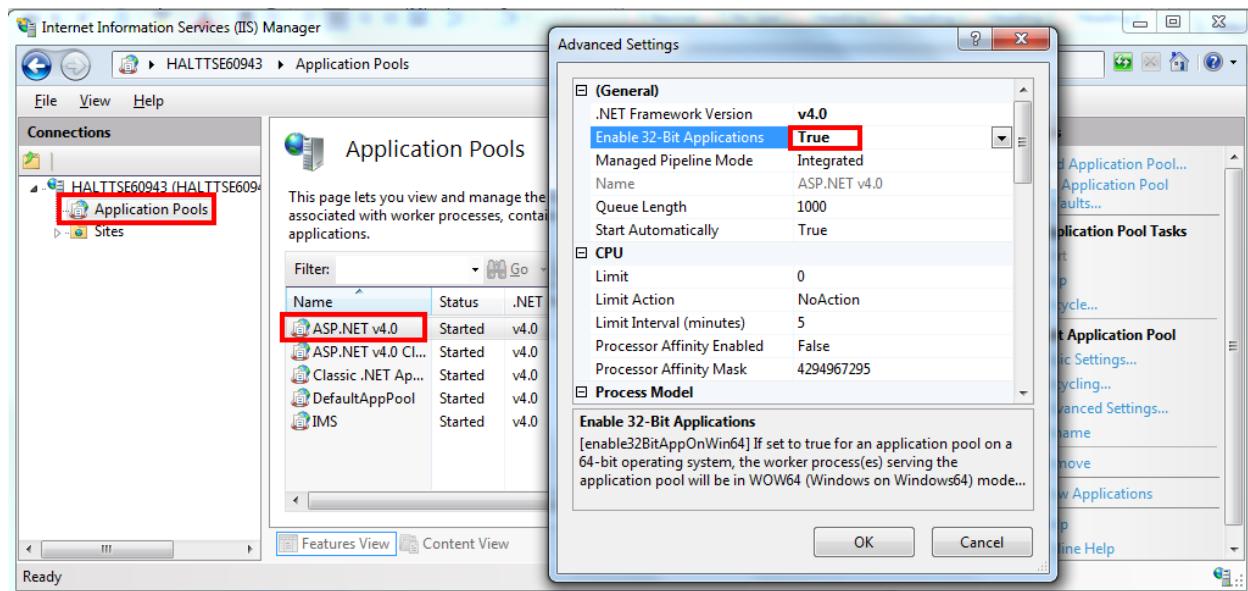


Figure 92: /Internet Information System/_4

左画面の「Application Pools」にクリックします。

「ASP.NET 4.0」に右クリック、「Advance Settings」を選択します。

「Enable 32-bit Applications」を「True」に設定。

1.2.3. サーバでウェブアプリケーションを展開

「Web.config」にある接続文字列を変更します

「data source」をあなた自身ユーザー名とパスワードと入力します。

```
<connectionStrings>
  <add name="IMSContext" connectionString="data source=.;initial catalog=IMS;integrated security=True;
    MultipleActiveResultSets=True;App=EntityFramework" providerName="System.Data.SqlClient" />
</connectionStrings>
```

Figure 93: サーバのウェブアプリケーションをデプロイ。

「Internet Information System Manager」の「Sites」に右クリックして、「Add Web Site」を選択します

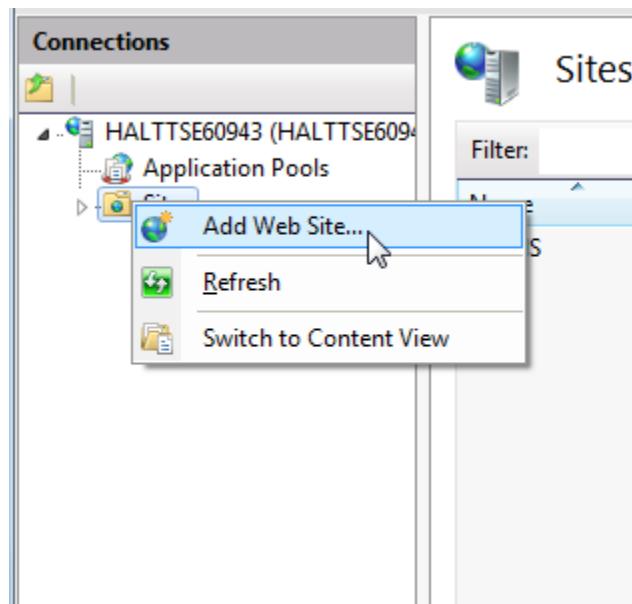


Figure 94: 「Add Website」 1

サイトの名を入力して、アプリケーションプールを「ASP.NET 4.0」に変更します。

物理パスを選択して、「80」ポートと異なるポートを記載します。

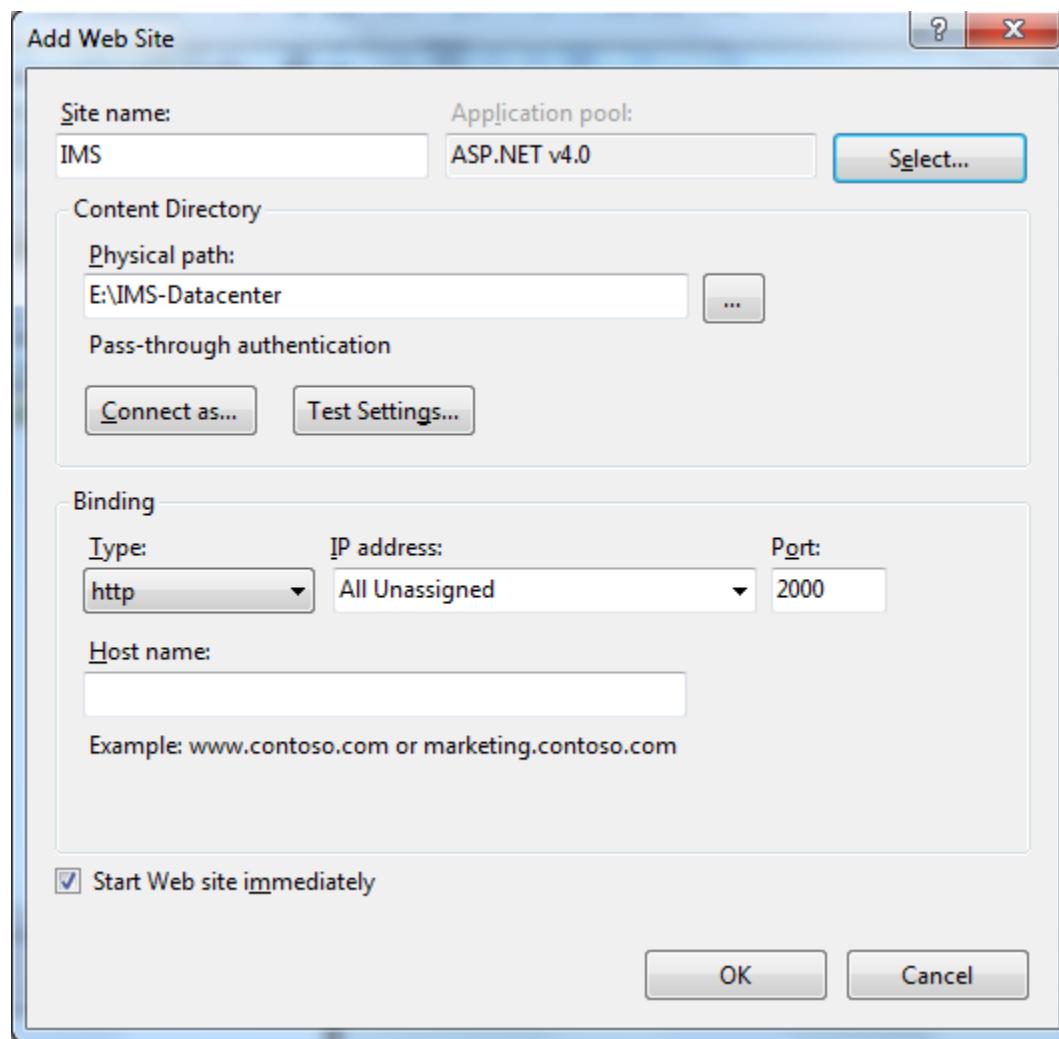


Figure 95: 「Add Website」2

「OK」をクリックし、プロセスが完了します。

2. ユーザーガイド

2.1. “Add Server”のリクエストを作成する

The screenshot shows the 'Request Add Server' page. On the left, there's a sidebar with a user profile (Hello, Nhi - Online), navigation links (Request History, Server, Rack), and a 'Create request' section with a dropdown menu. The main content area is titled 'Request Add Server'. It includes fields for 'AppointmentTime' (with a red box around the number 2), a table for 'Servers' (with a red box around the table), a 'Description' input field (with a red box around the number 5), and a 'Send Request' button (with a red box around the number 6).

Figure 96: “Add Server”のリクエストを作成する

ステップ	説明
1	“Add New Server”をクリックしてふさわしいリクエストのページがでます
2	お客様は約束時間を選択します
3	センターに預けたいサーバの情報はテーブルに表せます
4	“Add Server Information”のボタンをクリックすると新しいサーバの情報が追加できるポップアップが出ます。
5	別な注意など書いておきます
6	“Send Request”のボタンをクリックするとリクエストを送信します

2.2. “Add Server”のリクエストをプロセスする

The screenshot shows the IMS application's 'Add Server' screen. On the left is a sidebar with a user profile (Hello, Bich), navigation links (Schedule, Request, Server, Location, IP Address, Account, Report), and a dropdown for 'Trần Thị Bích'. The main area has a title 'Add Server' and three red-highlighted sections: 'Request Status' (Processing, 1), 'Customer' (Nguyễn Khả Nhi, Phone: 0974456331, 2), and 'Assignor' (Trần Thị Bich, Assignee: Trần Thị Bich [Reassign Task], 3). Below these is a table titled 'Servers' with two rows of data (No, Power, Size, Bandwidth, Serial Number, Part Number, Default IP, Location). Buttons 'Assign Default IP' (4) and 'Assign Location' (5) are also highlighted. At the bottom are 'Complete' (6) and 'Reject' (7) buttons.

Figure 97: “Add Server”のリクエストをプロセスする

ステップ	説明
1	リクエストの一般的な内容
2	リクエストを作成したお客様
3	リクエストを担当している人と管理人
4	Default IP Address の割り当てのため、クリックするとふさわしいページにリダイレクトされます
5	サーバの位置の割り当てのため、クリックするとふさわしいページにリダイレクトされます
6	いろいろ操作をしてから、“Complete”のボタンをクリックしたらリクエストが完了します
7	操作中、何か問題があったら、処理し続けるのは無理になる場合は、“Reject”のボタンをクリックします。

2.3. IP アドレスを割り当てる

Available IP Addresses

IP Address	Gateway	Subnet mask	
116.193.73.3	116.193.73.254	255.255.255.0	<input type="checkbox"/>
116.193.73.9	116.193.73.254	255.255.255.0	<input checked="" type="checkbox"/>
116.193.73.10	116.193.73.254	255.255.255.0	<input type="checkbox"/>
116.193.73.11	116.193.73.254	255.255.255.0	<input type="checkbox"/>
116.193.73.12	116.193.73.254	255.255.255.0	<input type="checkbox"/>
116.193.73.14	116.193.73.254	255.255.255.0	<input type="checkbox"/>
116.193.73.15	116.193.73.254	255.255.255.0	<input type="checkbox"/>
116.193.73.16	116.193.73.254	255.255.255.0	<input type="checkbox"/>
116.193.73.17	116.193.73.254	255.255.255.0	<input type="checkbox"/>

Figure 98: IP アドレスを割り当てる

ステップ	説明
1	Network IP Address で検索ができます
2	各行をクリックすると IP Address が選択されます

2.4. 位置を割り当てる

Available Locations

Rack Name	Rack Unit	Server Code
C1	42	<input checked="" type="checkbox"/>
C1	41	<input checked="" type="checkbox"/>
C1	40	S128314828
C1	39	
C1	38	S081010130
C1	37	
C1	36	
C1	35	
C1	34	

Figure 99: 位置を割り当てる

ステップ	説明
1	ラックの名前で検索ができます
2	サーバによって、サイズは 1 か 2 か 4 あります。
3	位置を割り当てたいサーバのサイズに応じて、テーブルをクリックしたら自動的に選択されます
4	青い色でハイライトされる行は選択された位置です。それが選択できません

2.5. 手作りをエクスポートする

CD に完全なドキュメントを参照してください。

2.6. スタッフにタスクを割り当てる

Figure 100: スタッフにタスクを割り当てる

ステップ	説明
1	担当者を選択します。もともとは Shift Head という役は選択されます
2	“Accept”のボタンをクリックすると選択された人だけでこのリクエストを処理することになります。リクエストの状態は“Processing”になります
3	“Reject”のボタンをクリックすると、担当者はクリックした人にログされ、リクエストの状態は“Rejected”になります

2.7. タスクを再割り当てる

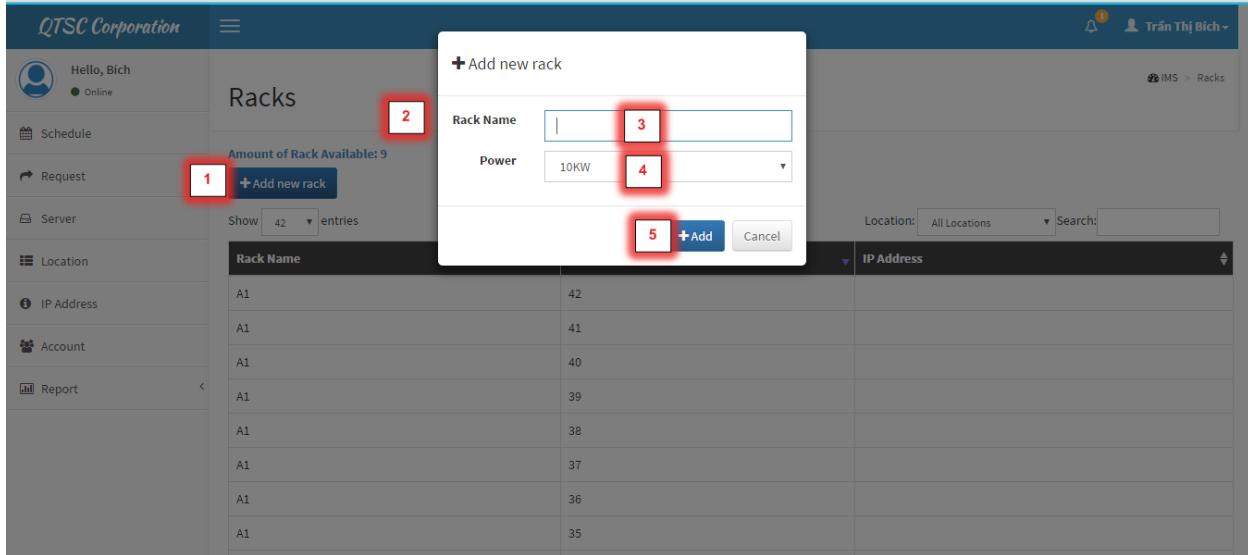


Figure 101: ラックを追加する

ステップ	説明
1	“Add Rack”のボタンをクリックすると、ポップアップが出ます
2	ラックを追加するためのポップアップ
3	ラックの名前を入力する
4	そのラックのパワーを選択する
5	“Add”のボタンをクリックすると新しいラックを追加します

2.8. IPアドレスを追加する

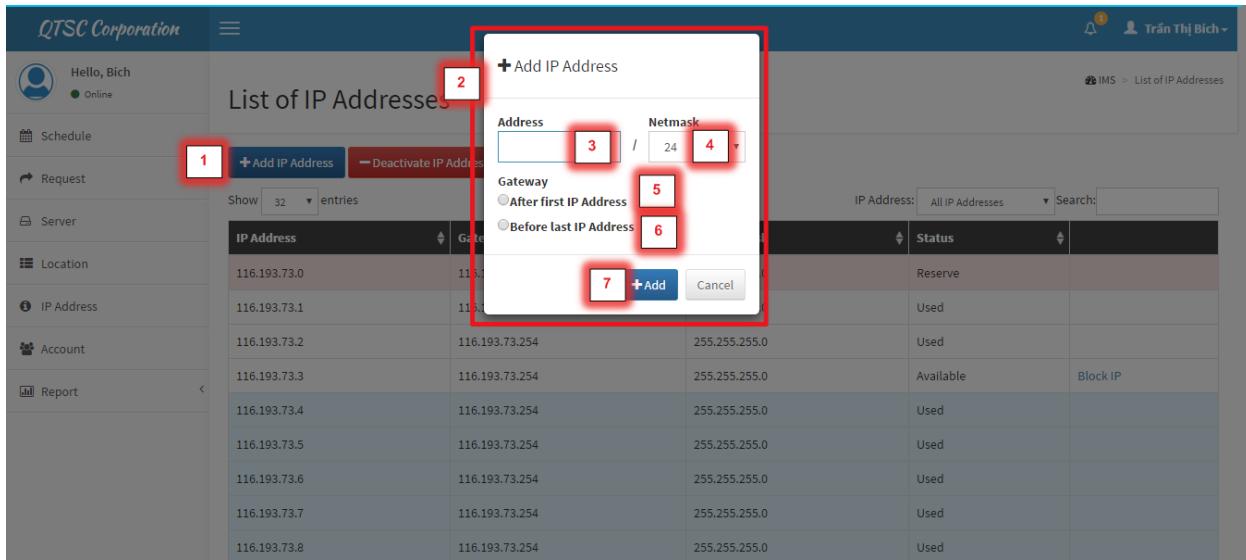


Figure 102: IP アドレスを追加する

ステップ	説明
1	“Add IP Address”のボタンをクリックするとポップアップが出ます
2	IP Address を追加するためのポップアップ
3	IP Address を入力する
4	Net mask を選択する
5	Gateway は初めから 2 位置の IP Address にします
6	Gateway は最終の IP Address に比べて、すぐ前の IP Address にします
7	“Add”のボタンをクリックすると新しい IP Address が保存されます

2.9. IPアドレスをブロックする

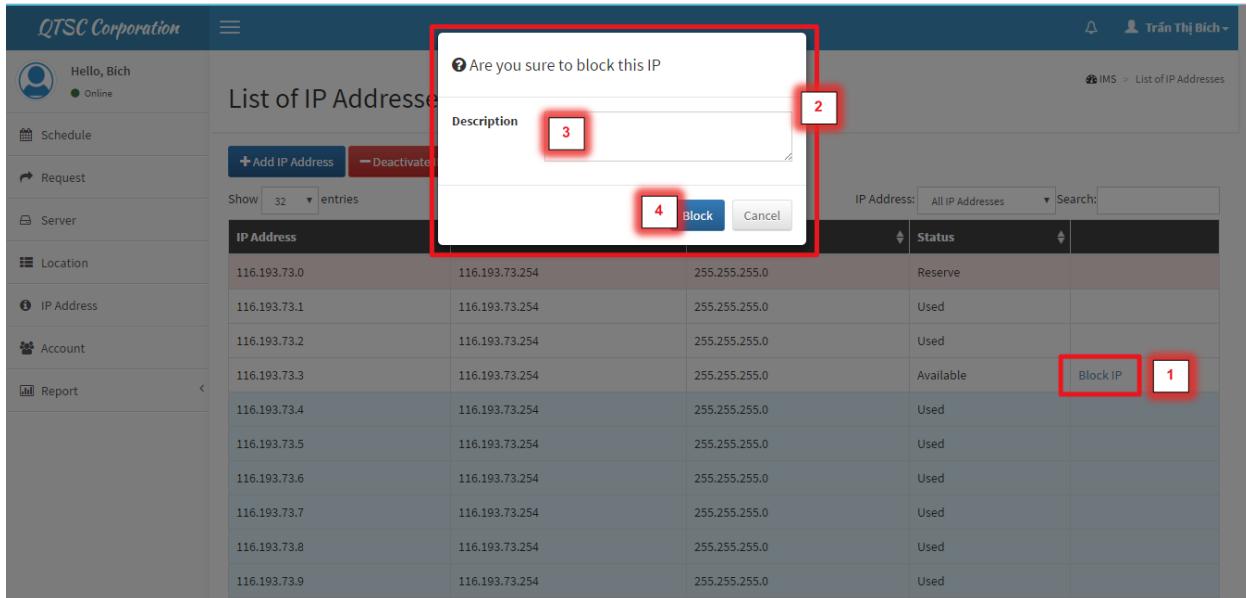


Figure 103: IP アドレスをブロックする

ステップ	説明
1	Available という状態になるリクエストには、“Block IP”のリンクが表示します
2	“Block IP”をクリックしたらポップアップが出ます
3	ブロックする原因が書けます
4	“Block”のボタンをクリックするとその IP Address はブロックされる状態になります

2.10. ブロックしたIPアドレスのレポートを見る

Figure 104: ブロックした IP アドレスのレポートを見る

ステップ	説明
1	今までのブロックされた IP Address
2	期間でブロックされた IP Address が検索できます
3	ブロックされた IP Address が表示します
4	その IP Address がブロックされた時点が表示します
5	ブロックされている状態はそのままになったら、“...”が表示します。また、今ではブロックされなかった状態になったら、ブロックが完了した時点が表示します
6	ブロックされた原因が表示します
7	もうブロックされない IP Address はブロックされた期間が表示します。またブロックされている IP Address は“...”が表示します
8	まだブロックされている IP Address はハイライトされます

2.11. スケジュールを見る

Figure 105: スケジュールを見る

ステップ	説明
1	年月日を表示する
2	お客様の約束は上のスケジュールで表します。待ち合わせの時間やお客様の名前やリクエストの状態まで表示します

3	プラスのようなシンボルをクリックすると現在のシフトにくるリクエストについてノートが書けます
4	格リクエストのノートでは、一番上のリンクにクリックしたら、ふさわしいページにリダイレクトします
5	リクエストに関わる注意などノートします
6	“Send”のボタンをクリックするとそのノートが保存されます

2.12. 通知が出る

Please refer full document in CD.

G. Appendix

1. **UI for business web applications - Janko Jovanovic**
<https://www.smashingmagazine.com/2010/02/designing-user-interfaces-for-business-web-applications/>
2. **Ten principles of effective web design – Vitaly Friedman**
<https://www.smashingmagazine.com/2008/01/10-principles-of-effective-web-design/>
3. **Coding convention**
<https://msdn.microsoft.com/en-us/library/ff926074.aspx>