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Appendix A

User Manual

The following are the screen snap shots taken from Network Monitoring System. This will explain how user can logon and use the Network Monitoring System.



Figure A-1 : NMS Main page

Then user will get the figure A-2

the state of the state of the		LOGIN		
USERNAME	:	I		
PASSWORD	:			
			RESET	SUBMIT

Figure A-2 : User Login page

Figure. A-3 : NMS Main Menu

Then click on Data Link Monitoring user can monitor the Data links status from following page in figure A-3.

OVERRALL MONITORING - Mozilla Firefox		🖉 Microphone 👰 Tools 💲
C C X (c) http://localho	p ost/NMS/Network/overrali_monitering.php	☆ · 🍕 · Souds
Most Visited 🏟 Getting Started 🚵 Latest Headlines		
OVERRALL MONITORING		
NETWORK MONITORING	g System	
HOME	OVE	RRALL MONITORING
CONFIGURATIONS	BRANCH	;
ADMINISTRATION	PRIMARY LINK	1
	SECONDARY LINK	;
Network Device		
Branch Report		
Overall Monitoring		
<		
Done		

Figure. A-3- NMS Main Menu

Figure Data Links status branch wise) page Electronic Theses & Dissertations

Selecting required branch bit red indicate branch then page in figure A-4 will display with service providers.

alhost/NMS/Network/Neywork	Device.php				
				Er · Mariate	¥
nes					
NG SYSTEM		10			[<u>admin</u>] [<u>Loqoff</u>]
		NETWORK	DEVICES	a descent of the second	1
Branch Code :	- SELECT -	¥	Name :		
			Wan1 IP :		
			Wan2 IP :		
	SLT DSU		Item :		
			Status :		
	S/D MUX		Data Rates		
	ROUTER		In Coming Rate		
	SWITCH		Out Going Rate	1	
				RESET	
				TRUE I	1
	Branch Code	NG SYSTEM Brench Code : -SELECT- SLT DSU S/D MUX ROUTER SWITCH	NG SYSTEM Network Branch Code : -SELECT-	NG SYSTEM	NG SYSTEM NETWORK DEVICES Brench Code : -SELECT- Wan1 IP : Wan2 IP : SLT DSU Item : S/D MUX Status : S/D MUX Data Rates ROUTER In Coming Rate : SWITCH Out Going Rate : PESET

Figure. A-4 - Data Links status

Figure. A-5 : Data Links status for selected branch

The click on Network desice but of RoonaMana Mais Mehanka.

NETWORK DEVICES	st Headlines					
IETWORK MONITO	DRING SYSTEM					[<u>admin</u>] [<u>Loqoff</u>]
HOME			NETWORK	DEVICES		
CONFIGURATIONS ADMINISTRATION	Branch Code :	- SELECT -	×	Name : Wan1 IP : Wan2 IP :		
Network Device		SLT DSU		Item : Status :		
Qverall Menitorina		ROUTER		Data Rates In Coming Rate Out Going Rate	1	
					RESET	

Figure. A-5 - Device Status

Figure. A-6 : Add branch to the System

Selecting the Add branch option then page in Fig A-6 will be displayed.

- C × @ 1 http:	//localhost/NMS/Configurations/AddBranches.php			🕼 •] 🚷 • 10049	
Most Visited 🏶 Getting Started 🔊 Latest H	eadlines				
ADD NEW DEVICE	4				
ETWORK MONITOR	RING SYSTEM				LUN [Logoff
HOME		•	DD BRANCH		
NETWORK DETAILS	Branch Code	:	OD DRANCH		
ADMINISTRATION	Name	:			
	Branch Type	:	- SELECT -	×	
	Ethernet IP	:			
Add Branches	Wan1 IP	:			
	Wan1 IP Status	:	UP	×	
	Wan2 IP	:			
	Wan2 IP Status	:	UP	*	
			RESET	T SUBMIT	
		ang ang grand ang			
and a set of the set of the set of the					

Figure. A-6 : Add branch to the System

Figure. A-7 : Error checking

The click on Add Network Device button from NMS Main Menu Then the following page will appear as in figure A-7.

ADD HAVEN CITY OF THE AND THE	ersity of Moratu fonic Theses & I flib.mrt.ac.lk	wa, Si Dissei	ri Lanka rtations	inghwa Dinte :	
HOME		ADD ROUTER/	DEVICE		28
INETWORK DETAILS	Description	:			
ADMINISTRATION	Hostname	:			
	Host Template	:	- SELECT -	2	
Add Device	Notes	:			
	Disable Host	:	O Disable C	Active	
	Downed Device Detection	:	- SELECT -	*	
	Ping Timeout Value	:			
	Ping Retry Count	:			
	SNMP Version	:	- SELECT -	~	
	SNMP Community	:			
	SNMP Port	:			
	SNMP Timeout	:			
	Minimum OID's per Request	;			

Figure. A-7 : Error checking

Figure. A-8- Network Device Status

When entered the required branch code, user can Monitor the Network Device Status from following page A-8

🙂 BRANCH REPORT - Mozilla Firefox		e e M	krophone 🕼 Tools 🗧	
Elle Edit Yew History Bookmarks	Iools Help			
C X O U	http://localhost/NMS/Network/Branch_Report.php		G · M· Carp	P
Most Visited 🏶 Getting Started 🔊 Lake	est Headlines			
BRANCH REPORT	*	the selection of the second		-
NETWORK MONIT	ORING SYSTEM			[<u>admin</u>] [<u>Logoff</u>]
HOME	BRAN	CH REPORT		
CONFIGURATIONS	Branch Code : - SELECT -	Name :		
		Wan1 IP :		
Contraction of the second second		Wan2 IP :		
Sertoveck Device Branch Report Data Transfer Rate Overall Menitoring	Critical Traffic Branch Report Branch history report Branch Prediction Report Hardware Prediction Report	Draft		
Done				
Un: Ele Figure. A-8- N WW	iversity of Moratuwa, ctronic Theses & Diss etwork Device Status w.110.mrt.ac.lk	Sri Lanka. ertations		

Figure. A-9 : Traffic Monitoring

If the user selects Data Transfer Rate then page in figure A-9 will display with data transfer rates.

DATA TRANSFER RATE - Mozilla F Ele E Hstory Bookmarks	refox Iools Help			A Microphone 😡 Tools 💈	
3 × 2 0 0	http://localhost/NMS/Network/data_transfer_rate.php			\$2 · 3.	,
🗿 Most Visited 🏶 Getting Started 🔬 Lati	est Headlines				
DATA TRANSFER RATE					
NETWORK MONIT	DRING SYSTEM				[<u>admin</u>] [<u>Loqoff</u>]
HOME		DATA	RANSFER RATE		
CONFIGURATIONS	Branch Code	:	code	~	
ADMINISTRATION	Name	8			
	Wan1 IP	3			
	Wan2 IP	3			
Branch Roport	Input Data Rate	3			
Data Transfer Rate	Output Data Rate	3			
Overall Monitoring	LAN Data Rate	3			
				RESET	

Figure. A-9 - Traffic Monitoring

Figure. A 10 : General User Management Menu University of Moratuwa, Sri Lanka.

Then selection Used cotoroation Theo page on figures or that will display on the screen.

ADD NE	www.lib.	mrt.ac.l	k		d Microphone 😨 Tools	-	
G C X D	http://localhost/NMS/Administr	ation/EditUser.php			· 생.		P
Most Visited P Getting Started	Latest Headlines						
ADD NEW USER	(*)						-
NETWORK MONI	TORING SYST	EM				Ũ	[<u>admin</u>] [<u>Loqoff</u>]
# HOME			EI	DIT USER			
INETWORK DETAILS	US	ER	:	ADMIN	*		
CONFIGURATIONS	FU	LL NAME	:	ADMIN			
	DE	SCRIPTION	:				
Add User	AC	COUNT STATUS	:	Enable 🛞	Disable C		
Edit User Edit Privileges				RE	SET SAVE		
Done							~

Figure. A-10 – User Management

Figure. A-11 : User ID creation

If user selects Edit user privileges in figure A-11 will display on the screen.



Figure. A-UnEdit user privileges ratuwa, Sri Lanka. Electronic Theses & Dissertations

www.lib.mrt.ac.lk

Appendix B

Graphical output of Traffic







Figure. B-2 - WAN 1 Rx Traffic









FastEthernet0 Rx Tra... Kbps - Min: 0.12 Max: 6.88 Avg: 0.91 95thPercentile Avg: 0.72
 Serial0 Rx Traffic Kbps - Min: 0.34 Max: 62.95 Avg: 2.17 95thPercentile Avg: 0.45
 Serial1 Rx Traffic Kbps - Min: 0.16 Max: 62.94 Avg: 5.03 95thPercentile Avg: 2.23
 Nullo Rx Traffic bps - Min: 0.0 Max: 0.0 Avg: 0.0 95thPercentile Avg: 0.0

Figure. B-4 - Interface Traffic

Interface Rx Traffic – Union Place branch



Serial0 Tx Traffic - Min: 168.0 Max: 3440.0 Avg: 288.59 95thPercentile Avg: 225.53



SLT WAN Tx Traffic – Union Place branch



Figure. B-6-WAN Tx Traffic

Appendix C

NMS Main Screen

```
<?php
       require once ('Class/DataBase.class.php');
       require once ('Class/Authentication.class.php');
       session start();
       $dbcon = new DataBase();
       $auth = new Authentication(false);
       module_id = -1;
?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
       <meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
       stitle>Network Monitoring System (NMS) stitle>nka.
  Electronic Theses & Dissertationsstylesheet", href="StyleSheets/Main.css" type="text/css" />
  kref="stylesheet" href="StyleSheets/AlertBox.css" type="text/css" />
       <script src="JavaScript/Environment.js" type="text/javascript"
language="JavaScript"></script>
  <script src="JavaScript/Controls.js" type="text/javascript"
language="JavaScript"></script>
       <script src="JavaScript/Main.js" type="text/javascript"
language="JavaScript"></script>
</head>
<body>
<?php require once('Data/TemplateTop.php'); ?>
<img src="Images/UI/home.png" align="middle" />
<?php require once('Data/TemplateBottom.php'); ?>
</body>
</html>
```

Login Page

Pseudo Code & Relate Coding

• User logon to the system

If User name incorrect

"Display Error message"

else

"Go to menu"

```
<?php
require_once ('Class/DataBase.class.php');
require_once ('Class/Authentication.class.php');
session_start();
$dbcon = new DataBase();
$auth = new Authentication(false);
$module_id = -1;
university of Moratuwa, Sri Lanka.
sredirect =
(isset($_REOUEST['fedirect']))?$_REQUEST['fedirect']!'index.php';
www.lib.mrt.ac.lk
$errorList = array();
if(isset($_POST['op'])){
$Username = trim($_POST['username']);
$Password = trim($_POST['password']);
try{
```



<meta http-equiv="Content-Type" content="text/html; charset=utf-8" /> <title>Login</title> k rel="stylesheet" href="StyleSheets/Main.css" type="text/css" /> k rel="stylesheet" href="StyleSheets/AlertBox.css" type="text/css" /> k rel="stylesheet" href="StyleSheets/TableStyle.css" type="text/css" /> k rel="stylesheet" href="StyleSheets/DropShadow.css" type="text/css" /> <script src="JavaScript/Environment.js" type="text/javascript" language="JavaScript"></script> <script src="JavaScript/Controls.js" type="text/javascript" language="JavaScript"></script> <script src="JavaScript/Main.js" type="text/javascript" language="JavaScript"></script> <script src="JavaScript/PasswordMeter.js" type="text/javascript" language="JavaScript"></script> <script src="JavaScript/Ajax.js" type="text/javascript" language="JavaScript"></script> <script src="js/Login.js" type="text/javascript" language="JavaScript"><</script> </head> <body> <?php require_once('Data/TemplateTop.php'); ?> <div align="center">IVVERSILY OF MORATUWA, Sri Lanka. **Electronic Theses & Dissertations**

 www.lib.mrt.ac.lk


```
<br />
  <br />
  <hr />
  <br />
  <br />
<?php
      if (sizeof($errorList) > 0)
      {
             $error message = '<font color="#FF0000">';
             foreach ($errorList as $error) $error message .= ''. $error.
'';
             $error message .= '</font>';
             echo '<script type="text/javascript" language="JavaScript">';
             echo "Cnt.AlertBox('WARNING MESSAGE', '$error', null,
'Warning')";
             echo '</script>';
      }
?>
      <br />
 <div id="shadow-container" style="width:500px;">
  <div class="shadow.1">
   <div class="shadow295sity of Moratuwa, Sri Lanka.
    <div class="shadow80% ic Theses & Dissertations
     <div class="shadow4">mrt.ac.lk
<div class="container">
       <form name="frm" action="<?php echo $ SERVER['PHP SELF'] ?>"
method="post">
        <input type="hidden" name="redirect" value="<?php echo $redirect ?>"
/>
        <input type="hidden" name="op" value="ds" />
        <table align="center" width="100%" class="table style1" border="0"
cellspacing="0">
         <thead>
          User Login
          </thead>
```

```
name="username" value="<?php echo $Username ?>" />
          <strong>Password</strong>
          <strong>:</strong>
           <input type="password" class="textbox"
name="password" maxlength="16" />
          <tfoot>
          <input type="button"
onclick="submitForm(this)" class="button" value="Login" />
           <input type="button" onclick="resetForm(this)" class="button"
value="Reset" />
         </tfoot>
       </form>
     </div>
    </div>
   </div>
  </div>
             University of Moratuwa, Sri Lanka.
 </div>
             Electronic Theses & Dissertations
 </div>
</div>
</div> <a>www.lib.mrt.ac.lk</a>
?php require_once('Data/TemplateBottom.php'); ?>
</body>
</html>
```

```
<?php
```

```
require_once ('../Class/DataBase.class.php');
require_once ('../Class/Authentication.class.php');
```

session_start();
\$dbcon = new DataBase();
\$auth = new Authentication(true);

\$auth->checkAccess(11, \$dbcon);

module id = 9;

\$errorList = array();
\$hasErrors = false;

?>

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
```

<title>Branch Report</title>

```
k rel="stylesheet" href="./StyleSheets/Main.css" type="text/css" />k rel="stylesheet" href="./StyleSheets/AlertBox.css" type="text/css" />k rel="stylesheet" href="./StyleSheets/TableStyle.css" type="text/css" />k rel="stylesheet" href="./StyleSheets/DropShadow.css" type="text/css" />
```

```
<script src="../JavaScript/Environment.js" type="text/javascript"
language="JavaScript"></script>
```

```
<script src="../JavaScript/Controls.js" type="text/javascript"
language="JavaScript"></script>
```

```
<script src="../JavaScript/Main.js" type="text/javascript"
language="JavaScript"></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></scrip
```

```
<script src="../JavaScript/Ajax.js" type="text/javascript"
language="JavaScript"></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script></script>
```

```
<script src="js/Branch_Report.js" type="text/javascript"
language="JavaScript"></script>
</head>
```

∽neau>

<body>

```
<?php require once('../Data/TemplateTop.php'); ?>
<div align="center">
      <hr />
      <br />
      <div id="shadow-container" style="width:845px;">
    <div class="shadow1">
    <div class="shadow2">
    <div class="shadow3">
    <div class="shadow4">
    <div class="container">
      <form name="frm" action="<?php echo $ SERVER['PHP SELF'] ?>"
method="post">
      <table width="800" border="1" align="center" cellpadding="0"
cellspacing="0" class="table style1">
        <thead>
          Branch Report
          </thead>
        <strong>Branch Code</strong>
           <strong>:</strong>
f Moratuwa, Sri Lanka.
               Electronic Theses & Dissested class="dropdown"
name="type" id="type" onchange="loadBranch(this);" >
                                                 <option value="0">-
SELECT -</option>
                                                 <?php
                                                        sal =
"SELECT BRANCH_CODE FROM BRANCHES WHERE STATUS = 1";
                                                        sresult =
$dbcon->executeQuery($sql);
                                                        while($row =
mysql fetch array($result)){
      echo("<option value=" . $row['BRANCH CODE'] . ">" .
$row['BRANCH CODE'] . "</option>");
                                                        }
                                                 2>
                                           </select>
```

Name : <input type="text" class="textbox" id="brnch name" disabled="disabled" /> <td colspan="3" rowspan="2" align="center" style="paddingtop:20px;"> <input type="button" class="button" name="cbtr" id="cbtr" value="Critical Branch Traffic Report" onclick="loadValues(document.getElementById('brnch_name').value,this);" style="width:250px; font-weight:bolder; background-image:none; border:1px solid #900:" /> Wan1 IP : <input type="text" class="textbox" id="Wan1 IP" disabled="disabled" /> Wah211Pk/td>a, Sri Lanka. Electronic Theses & to align="center">; <input type="text" class="textbox" id="Wan2 IP" disabled="disabled" /> <table width="800" border="0" cellspacing="0" cellpadding="0"> <table width="800" border="0" cellspacing="0" cellpadding="0"> <input type="button" class="button" name="btn1" id="btn1" value="Branch Traffic Report" onclick="loadValues(document.getElementById('brnch_name').value,this);" style="width:190px; font-weight:normal; background-image:none; border:1px solid

Detect Data Transfer Rate

```
<?php
       require once ('../Class/DataBase.class.php');
       require once ('../Class/Authentication.class.php');
       session start();
       $dbcon = new DataBase();
       $auth = new Authentication(true);
       $auth->checkAccess(12, $dbcon);
       module id = 9;
       errorList = array();
       $hasErrors = false;
?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
<title>Data Transfer Rate</title>
                   Iniversity of Moratuwa, Sri Lanka.
  ktel="stylesheet" href=".7StyleSheets/Main.css" type="text/css" />
  k rel="stylesheet" href="../StyleSheets/AlertBox.css" type="text/css" />k rel="stylesheet" href="../StyleSheets/TableStyle.css" type="text/css" />
  k rel="stylesheet" href="../StyleSheets/DropShadow.css" type="text/css" />
       <script src="../JavaScript/Environment.js" type="text/javascript"
language="JavaScript"></script>
  <script src="../JavaScript/Controls.js" type="text/javascript"
language="JavaScript"></script>
       <script src="../JavaScript/Main.js" type="text/javascript"
language="JavaScript"></script>
  <script src="../JavaScript/Ajax.js" type="text/javascript"
language="JavaScript"></script>
       <script src="js/data transfer rate.js" type="text/javascript"
language="JavaScript"></script>
</head>
<body>
<?php require once('../Data/TemplateTop.php'); ?>
<div align="center">
```

```
<br />
     <br />
<div id="shadow-container" style="width:700px;">
 <div class="shadow1">
  <div class="shadow2">
   <div class="shadow3">
    <div class="shadow4">
     <div class="container">
      <form name="frm" action="<?php echo $_SERVER['PHP_SELF'] ?>"
method="post">
       <table align="center" width="100%" class="table style1" border="1"
cellspacing="0">
        <thead>
         Data Transfer Rate
         </thead>
        <strong>Branch Code</strong>
          <strong>:</strong>
           <select class="dropdown" name="type"
onchange load Branch (this): 1/>of Moratuwa, Sri Lanka.
            <option value="0">SELECTD</option>ions
            <?php
             www.lib.mrt.ac.lk
                                                 sql =
"SELECT BRANCH_CODE FROM BRANCHES WHERE STATUS = 1";
                                                 $result =
$dbcon->executeQuery($sql);
                                                 while($row =
mysql fetch array($result)){
     echo("<option value=" . $row['BRANCH_CODE'] . ">" .
$row['BRANCH CODE'] . "</option>");
                                                 }
                                            ?>
           </select> 
         Name
          :
           <input type="text" class="textbox"
id="brnch_name"
```


value="Reset" /> </tfoot> </form> </div> </div> </div> </div> </div> </div> </div> <?php require once('../Data/TemplateBottom.php'); ?> </body> </html>

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Overall Monitoring

```
<?php
```

require_once ('../Class/DataBase.class.php');
require_once ('../Class/Authentication.class.php');

session_start(); \$dbcon = new DataBase(); \$auth = new Authentication(true);

\$auth->checkAccess(13, \$dbcon);

\$module_id = 9;

\$errorList = array();
\$hasErrors = false;

?>

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" /> <title>Overall Monitoring4/title> Moratuwa, Sri Lanka.

Electronic Theses & Dissertations
<link ret="stylesheet" href=",./StyleSheets/Main.css" type="text/css" />
<link ret="stylesheet" href="../StyleSheets/AlertBox.css" type="text/css" />

  k rel="stylesheet" href="../StyleSheets/TableStyle.css" type="text/css" />
  k rel="stylesheet" href="../StyleSheets/DropShadow.css" type="text/css" />
        <script src="../JavaScript/Environment.js" type="text/javascript"
language="JavaScript"></script>
  <script src="../JavaScript/Controls.js" type="text/javascript"
language="JavaScript"></script>
        <script src="../JavaScript/Main.js" type="text/javascript"
language="JavaScript"></script>
  <script src="../JavaScript/Ajax.js" type="text/javascript"
language="JavaScript"></script>
        <script src="js/data transfer rate.js" type="text/javascript"
language="JavaScript"></script>
        <script type="text/javascript" language="javascript">
```

```
\parallel
            }
            else{
                  echo("<div class=down
onmousemove='show alert(\"".$row['NAME']."\",\"1\")'>Down</div>");
            }
            if($row['WAN2 IP STATUS'] == 1){
                  echo("<div class=up>Up</div>");
            }
            else{
                  echo("<div class=down
onmousemove='show alert(\"".$row['NAME']."\",\"1\")'>Down</div>");
            }
            echo ("");
      }
?>
        </form>
      </div>
     </div>
    </div>
   </div>
  </div>
             University of Moratuwa, Sri Lanka.
 </div>
</div
            Electronic Theses & Dissertations
<?php require_once(',/Data/TemplateBottom.php'); ?>
</body>
</html>
<script type="text/javascript" language="javascript">
      setTimeout(function(){location.href="overrall_monitering.php"},10000);
</script>
```

Network Devices

Alert System

If database input Zero

"Generate warring message"

Else

"No message

<?php

```
require_once ('../Class/DataBase.class.php');
require_once ('../Class/Authentication.class.php');
```

session_start(); \$dbcon = new DataBase(); \$auth = new Authentication(true);

\$auth->checkAccess(10, \$dbcon);

\$module_id = 9;

\$errorList = array();
\$hasErrors = false;

University of Moratuwa, Sri Lanka.

?>
<!DOCTYPE html POBLIC'C//W3C//DTD XHTPML'1:0 Fransitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
</html xmlns="http://www.w3.org/1999/xhtml]</html xmlns="http://www.w3.org/1999/xhtml]</html xmlns="http://www.w3.org/1999/xhtml]</html xmlns="http://www.w3.org/1999/xhtml]</html xmlns="http://www.w3.org/1999/xhtml]</html xmlns="http://www.w3.org/1999/xhtml]</html xmlns="http://www.w3.org/1999/xhtml]</html xmlns="http://www.w3.

<title>Network Devices</title>

k rel="stylesheet" href="../StyleSheets/Main.css" type="text/css" /> k rel="stylesheet" href="../StyleSheets/AlertBox.css" type="text/css" /> k rel="stylesheet" href="../StyleSheets/TableStyle.css" type="text/css" /> k rel="stylesheet" href="../StyleSheets/DropShadow.css" type="text/css" />

```
<script src="../JavaScript/Environment.js" type="text/javascript"
language="JavaScript"></script>
<script src="../JavaScript/Controls.js" type="text/javascript"
language="JavaScript"></script>
<script src="../JavaScript/Main.js" type="text/javascript"
language="JavaScript"></script>
<script src="../JavaScript/Main.js" type="text/javascript"
language="JavaScript"></script>
</script src="../JavaScript/Main.js" type="text/javascript"</pre>
```

<script src="../JavaScript/Ajax.js" type="text/javascript" language="JavaScript"></script>

<script src="js/Network Device.js" type="text/javascript"</pre>

```
<div align="center">
      <br />
      <br />
 <div id="shadow-container" style="width:700px;">
  <div class="shadow1">
   <div class="shadow2">
    <div class="shadow3">
     <div class="shadow4">
      <div class="container">
       <form name="frm" action="<?php echo $ SERVER['PHP SELF'] ?>"
method="post">
        <table align="center" width="100%" class="table style1" border="1"
cellspacing="0">
         <thead>
          Network Devices
          </thead>
         <td_align="left"><strong>Branch Code</strong>
           <strong>:</strong>?/td>allKa.
           <select class #'dropdown'name="type"
onchange="loadBranch(this);">rt ac.1k
<option value="0">- Select -</option>
             <?php
                                                     $sql = "select
BRANCH CODE from BRANCHES where STATUS = 1";
                                                     sresult =
$dbcon->executeQuery($sql);
                                                     while($row =
mysql_fetch_array($result)){
     echo("<option value=" . $row['BRANCH CODE'] . ">" .
$row['BRANCH_CODE'] . "</option>");
                                                     }
                                               ?>
            </select> 
           Name
           :
            <input type="text" class="textbox"
```



```
name="btnSwitch" value="SWITCH" onclick="loadValues(this);" />
         <table border="1"
width="100%">
        Item
        :
         <input type="text" class="textbox"
id="txtValue" readonly="readonly" style="width:100px;" />
        Status
        :
         <input type="text" class="textbox"
id="txtStatus" readonly="readonly" style="width:100px;" />
        Effectronic Theses & Dissertations
        In Coming Rate
        :
         <input type="text" class="textbox"
id="txtIn rate" readonly="readonly" style="width:100px;" />
        Out Going Rate
        :
         <input type="text" class="textbox"
id="txtOut rate" readonly="readonly" style="width:100px;" />
```

```
<tfoot>
          <input type="reset" class="button"
value="RESET" onclick="resetForm();" />
          </tfoot>
       </form>
     </div>
    </div>
   </div>
  </div>
 </div>
</div>
</div>
<?php require_once('../Data/TemplateBottom.php'); ?>
</body>
</html>
```


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NMS- Uptime Monitor (To send SMS)

```
!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
<title>NMS Uptime Monitor</title>
<script language="JavaScript" type="text/javascript">
// CONFIGURATION STARTS HERE
// Configure refresh interval (in seconds)
var refreshinterval=30
// Shall the coundown be displayed inside your status bar? Say "yes" or "no"
below:
var displaycountdown="yes"
// CONFIGURATION ENDS HERE
// Do not edit the code below
var starttime
              University of Moratuwa, Sri Lanka.
var nowtime
var reloadseconds=bectronic Theses & Dissertations
var secondssinceloaded=0ib.mrt.ac.lk
function starttime() {
      starttime=new Date()
      starttime=starttime.getTime()
  countdown()
}
function countdown() {
      nowtime= new Date()
      nowtime=nowtime.getTime()
      secondssinceloaded=(nowtime-starttime)/1000
      reloadseconds=Math.round(refreshinterval-secondssinceloaded)
      if (refreshinterval>=secondssinceloaded) {
    var timer=setTimeout("countdown()",1000)
            if (displaycountdown=="yes") {
                   window.status="Page refreshing in "+reloadseconds+ "
seconds"
            }
```

}

```
clearTimeout(timer)
             window.location.reload(true)
  }
}
window.onload=starttime
</script>
<style type="text/css">
<!--
.style1 {
      color: #003399;
      font-weight: bold;
      font-size: 24px;
}
.style3 {color: #003399; }
.style4 {color: #666600}
.style7 {color: #990000}
.style8 {
      color: #006600;
      font-weight: bold;
}
.style11 {
      color: #003399;
      font-weightnboldrsity of Moratuwa, Sri Lanka.
      font-style Eitalic: onic Theses & Dissertations
      font-size: 12px;
www.lib.mrt.ac.lk
}
.style13 {color: #990033; font-weight: bold; }
-->
</style>
</head>
<body>
<?PHP
      require('conn.php');
?>
<h2>&nbsp;</h2>
 
<table width="872" height="260" border="0" align="center"
bordercolor="#FFFFFF" bgcolor="#FFFFFF">
 <h2 class="style1">NMS Uptime
Monitor</h2>
```

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<h3 class="style3">Current Configurations </h3> Last Refresh Time <?php echo date('d-m-y H:i:s')."
"; ?> Alerts Destinaton <?php echo \$pno: ?> Top Level Alert Destination <?php echo \$TLApno; ?> Alert will be sent to a pre-defined top level Manager after a 4 hours of delay : try of Moratuwa, Sri Lanka. Branches in unreachable state <?php echo " "; //echo date('l jS \of F Y h:i:s A'); \$sql="SELECT * FROM branches WHERE WAN1 IP STATUS='0' OR WAN2 IP STATUS='0' ORDER BY WAN1 IP STATUS"; \$result=mysql query(\$sql); while(\$row=mysql fetch array(\$result)){ if(\$row['ALERT_STATUS'] == 0) { \$node = ": \$type = ": if (srow['WAN2 IP STATUS'] == 0)\$node = "WAN2"; } else {


```
<span
class="style8">Branches recovered recently</span>
          <?php
          $recSql="SELECT * FROM branches WHERE
RECOVERY STATUS = '1'";
          $recResult=mysql guery($recSql);
          //echo $recSql;
          while($row=mysql fetch array($recResult)){
                if($row['WAN2 IP STATUS'] == 1 &&
$row['WAN1 IP STATUS'] == 1) {
                     $updateRecSql="UPDATE branches SET
ALERT_STATUS = 0, ALERT_TIME = null, RECOVERY_STATUS = 0,
RECOVERY TIME = null WHERE BRANCH ID = ".$row['BRANCH ID']."";
                     $result00=mysql query($updateRecSql);
                } else {
                     $updateRecSql="UPDATE branches SET
RECOVERY STATUS = 0, RECOVERY TIME = "WHERE BRANCH_ID =
".$row['BRANCH ID']."";
                     $result00=mysql query($updateRecSql);
                }
                ?>
            University of Moratuwa, Sri Lanka.
            Electronistd height="28" class="style4"><?php echo
            ?>
$row['NAME'];
                          if($row['WAN1 IP_STATUS'] == 0){ echo
"WAN1"; } else { echo "WAN2"; }?>
          <?php echo
$row['RECOVERY_TIME']; ?>
                <?php
          }
?>
 
</body>
</html>
```

Appendix D

Test Cases

The test cases used and the results are given below.

Test cases for user login authentication.

	Description	Expected output	System created	Status
Test			output	
case				
No.				
1	User login with valid	Display the NMS	Display the NMS	Success
	user id & password	Main Menu	Main Menu	
2	Enter valid user id with	"Invalid	"Invalid password"	Success
	invalid password	password"	message prompt for	
		message prompt	the user login again	
		for the user login	_	
		again		
3	Enter Invalid user id	"Invalid user id"	"Invalid user id"	Success
	with valid password	message prompt	message prompt for	
		for the user login	the user login again	
	🕼 University	again/loratuwa	Sri Lanka	
4	Enter Invalid user id	"Invalid user id"	"Invalid user id"	Success
	with Invalid password	message prompt SS	message prompt for	
	www.lib.n	for the user login	the user login again	
		again		
5	Press the login button	"Invalid user id"	"Invalid user id"	Success
	without any values.	message prompt	message prompt for	
		for the user login	the user login again	
		again		

Table D.1 - Test cases for user login authentication

Test cases for Tracing the Route.

Test case No.	Description	Expected output	System created output	Status
1	Enter Invalid IP	"Invalid IP" message prompt for the Tracing the Route again	"Invalid IP" message prompt for the Tracing the Route again	Success
2	Enter Blank	"Invalid IP" message prompt for the Tracing the Route again	"Invalid IP" message prompt for the Tracing the Route again	Success
3	Enter non existing IP	Tracing the hop by hop and cannot trace the IP	Tracing the hop by hop and cannot trace the IP	Success
4	Enter valid existing IP	Tracing the hop by hop and trace the particular IP	Tracing the hop by hop and trace the particular IP	Success

Table D-2 - Test cases for Tracing the Route.

Test cases for Error checking.

Test	Description	Expected output	System created output	Status
case				
No.	📃 Univ	ersity of Moratuwa	, Sri Lanka.	
1	Enter Invalid	"Invalid Branch" & Die	"Invalid Branch"	Success
	Branch code	message prompt for the	message prompt for the	
	www	Error checking again	Error checking again	
2	Enter Blank	"Invalid Branch"	"Invalid Branch"	Success
		message prompt for the	message prompt for the	
		Error checking again	Error checking again	
3	Enter valid	Display the errors for	Display the errors for	Success
1	existing Branch	given Branch	given Branch	
	code	-	_	

Table – D-3- Test Cases for Error Checking

Test cases for Network Device Status.

Test case No.	Description	Expected output	System created output	Status
1	Enter Invalid Branch code	"Invalid Branch" message prompt for the Network device status again	"Invalid Branch" message prompt for the Network device status again	Success
2	Enter Blank	"Invalid Branch" message prompt for the Network device status again	"Invalid Branch" message prompt for the Network device status again	Success
3	Enter valid existing Branch code	Display the Network Device Status for given Branch	Display the Network Device Status for given Branch	Success

Table D-4 - Test cases for Network Device Status

Test cases for Configuration Management.

•

Test	Description	Expected output	System created	Status
case			output	
No.				
1	Enter Invalid	"Invalid Branch" message	"Invalid Branch"	Success
	Branch code ni	prompt for the loratuwa.	message prompt for	
	(I) Fla	configuration management	the configuration	
	LIC	again	management again	
2	Enter BlankVW	Winvalid Branch' message	"Invalid Branch"	Success
		prompt for the	message prompt for	
		configuration management	the configuration	
		again	management again	
3	Enter valid	Display the existing	Display the existing	Success
	existing	Maximum values for given	Maximum values for	
	Branch code	Branch	given Branch	

Table D-5 - Test cases for Configuration Management

Test cases for Data Transfer Rate.

Test case No.	Description	Expected output	System created output	Status
1	Enter Invalid Branch code	"Invalid Branch" message prompt for the Data Transfer Rate again	"Invalid Branch" message prompt for the Data Transfer Rate again	Success
2	Enter Blank	"Invalid Branch" message prompt for the Data Transfer Rate again	"Invalid Branch" message prompt for the Data Transfer Rate again	Success
3	Enter valid existing Branch code	Display the last five minutes input, output and LAN Data Rates for given Branch	Display the last five minutes input, output and LAN Data Rates for given Branch	Success

Table D-6 - Test cases for Data Transfer Rate

Save test procedures were carried out for the user and other form submitting interfaces and all the test cases were successful. Normal user interfaces tested by Data centre staff and required output given by the system. Administrative interfaces tested University of Moratuwa, Sri Lanka. by myself the test data and user acceptance test results as follows Electronic Theses & Dissertations www.lib.mrt.ac.lk

Test Cases

The interface used to logon to the system

Test Case	Input Data	Expected Result	Output Result
Login with	Xyz	User not exists	User not exists
incorrect user id		message display	message display
Login with	Abcde	Incorrect user	Incorrect user
incorrect		name or password	name or password
password			
Login with	xyz	Load NMS Main	Load NMS Main
correct user id	xyz123	menu	menu
and password			

Table D-7 - Test Results of the Login Form

Tracing the Route used for Troubleshooting

Test Case	Input Data	Expected Result	Output Result
Enter Invalid IP	12.35.2 or 123.5.6 or 12.267.6.5	"Invalid IP" message display	"Invalid IP" message display
Enter Blank		"Invalid IP" message display	"Invalid IP" message display
Enter non existing IP	15.47.7.1	Tracing the hop by hop and cannot trace the IP	Tracing the hop by hop and cannot trace the IP
Enter valid existing IP	15.2.4.1	Tracing the hop by hop and trace the particular IP	Tracing the hop by hop and trace the particular IP

	Table D-8 -	Test Results	of the Trace	route Form
--	-------------	---------------------	--------------	------------

Error checking form

(

Test Case	Input Data (Expected Result, Sri La	Output Result
	lectronic 7	Theses & Dissertation	ns
Enter Invalid	A250	"Invalid Branch code"	"Invalid Branch code"
Branch code	ww.116.mi	message display	message display
Enter Blank		"Invalid Branch code"	"Invalid Branch code"
		message display	message display
Enter non existing	6785	"Invalid Branch code"	"Invalid Branch code"
Branch code		message display	message display
Enter valid	225	Display the Errors for	Display the Errors for
Branch code		given branch	given branch

Table D-9 - Error checking form

Test Results of the Error Checking Form Network Device Status form

Test Case	Input Data	Expected Result	Output Result
Enter Invalid Branch code	A250	"Invalid Branch code" message display	"Invalid Branch code" message display
Enter Blank		"Invalid Branch code" message display	"Invalid Branch code" message display
Enter non existing Branch code	6785	"Invalid Branch code" message display	"Invalid Branch code" message display
Enter valid Branch code	225	Display the Network Device Status given branch	Display the Network Device Status given branch

Table D-10 Network Device Status form

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