

Versie: 0.6 (Concept)

Technisch Ontwerp V.0.6

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# Introduction

In this document you will find all technical information regarding the installation of how to make a captive portal.  
  
All the devices will be placed inside a Corendon-owned Boeing 737-800.  
  
The following information will be discussed in this document:

* Raspberry pi specification and installation
* Device quantity
* Access point location/placement
* SSID name
* Servlet and servlet code
* Ip tables
* Tomcat installation
* Html page layout and code

## Revisions

22-10-2014

* Added revisions table
* Changed database from physical objects to the configuration of the tomcat side
* Information added to device specifications table
* Subject “captive portal” added
* *To-do: change database from physical to digital (tomcat specifications)*

19-11-2014

* Subject protocols removed: *no content*
* Subject Database removed: *no content*

16-12-2014

* Expending information
* Pictures updated
* Combining the old TD from Jasper with the new TD

## Scope delineation Inside the scope

* Corendon zal een Captive Portal hebben, zodat een gebruiker kan inloggen.
* Instaleren en configureren van Debian
* WiFi configureren
* Switch configureren
* Captive Portal configureren
* Firewall configureren
* Access point configureren

## Outside the scope

* Wiring
* Connecting the airplane to the internet

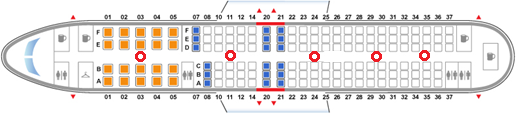
## Project specifications

### Devices

|  |  |
| --- | --- |
| Model | Raspberry pi B |
| Quantity | 5 |
| OS | Raspbian Wheezy |
| Storage | Minimal 4GB |
| Processor | 700MHZ ARM-processor |
| Hdmi port | 1x Hdmi 1080p |
| Ram | 512Mb |
| Usb ports | 2x USB 2.0 |

|  |  |
| --- | --- |
| Wi-Fi receiver/transmitter | Edimax EW-7811Un Wireless-N |
| Wi-Fi receiver/transmitter speed | 150Mbps |
| Wireless | 802.11b/g/n standaard |
|  | 64/128-bits WEP, WPA, WPA2 encryption and WPS |

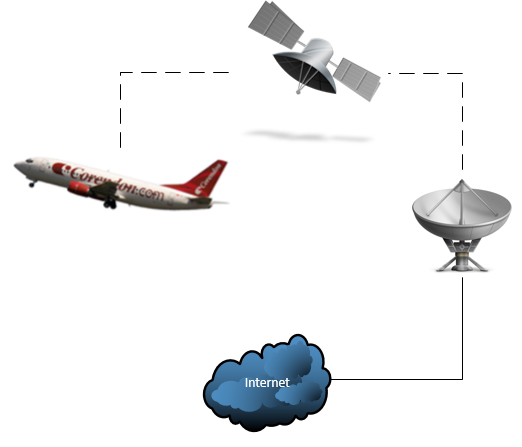
### Placement



The devices shall be spread throughout the plane as to make sure that every location within the plane has a good connection for the entire flight. The wireless access point will be called ‘Corendon airlines’ and will start off with a captive portal.

|  |  |
| --- | --- |
| Wireless connection name (SSID) | Corendon Airlines |
| Amount of connection points through plane | 5 |

## Network design

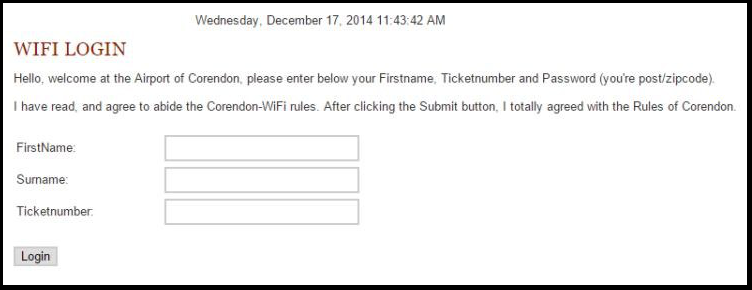
  
In the picture above, you will see the network drawing of this project.  
  
Now follows a short explanation of the network:  
  
Inside the airplane (Boeing 737-800) we’ll place four Raspberry pi’s.  
We have chosen for four Raspberry pi’s, so that all the users have perfect signal strength.   
These Raspberry Pi’s will broadcast a Wireless signal (SSID: Corendon Air), of which the user can connect too. The user needs to fill in his boarding number and surname to get access to the internet. If this information is not correct the user gets an error, which will tell the user to try again.

Raspberry  
  
We use the following OS for the Raspbarry Pi:  
  
Raspbian  
Debian Wheezy  
Version: September 2014  
Release date: 2014-09-09  
Default login: pi / raspberry  
Kernel version: 3.12  
  
The ISO file is available at the following link:  
<http://www.raspberrypi.org/downloads/>

When the ISO file is downloaded, you need to place it on a SD card.  
You can use the following program to accomplish this.  
  
-Win32 DiskImager  
  
Win32 DiskImager is available at the following link:  
<http://sourceforge.net/projects/win32diskimager/>  
(There are also other programs that you can use to put the ISO file onto the SD card)  
  
When the ISO file is placed on the SD card you need to follow the following tasks:  
  
-Disconnect the SD card from your laptop  
-Put the SD card into your Raspberry Pi  
-Connect your Raspberry Pi to your television (use a Hdmi cable)  
-Plug the power supply into a power outlet  
  
You will see that the Raspberry PI will boor into a configuration page.  
  
Make sure that “SSH connection” is enabled.  
  
Finish the configuration.  
  
When the Raspberry is rebooted, you can use Putty to connect remotely to your Raspberry Pi.  
(Use your ip address, which you can find with the following command: “ifconfig”)  
  
When you are connected to your Raspberry pi, you want to enter the commands below.  
These commands will get your software up to date.

|  |
| --- |
|  |
| apt-get update |

|  |
| --- |
|  |
| apt-get upgrade |

Captive portal  
  
In the picture below you will see an example of the captive portal.   
  
This is what the user sees when the connection with the access point is established.   
The URL in the picture is set to ‘192.168.42.1:8080’, which is the default gateway.  
  
As you can see in the picture above is that no matter which URL the users enters, he will be forwarded to the captive portal.  
  
The IP tables make an exception when the user clicks on the “Submit” button.  
This allows the user to reach other websites.

Tomcat installation:

To install Tomcat server seven, type in the command below:

|  |
| --- |
|  |
| *sudo apt-get install tomcat7* |

We also want an example, for the default page.

|  |
| --- |
|  |
| *sudo apt-get install tomcat7-docs tomcat7-admin tomcat7-examples* |

Of course we also want an interface for our server:

|  |
| --- |
|  |
| *sudo apt-get install default-jdk* |
| *sudo apt-get install ant git* |

Now you want to add an user too your Tomcat server, you can use the command below:

|  |
| --- |
|  |
| *sudo nano /etc/tomcat7/tomcat-users.xml* |

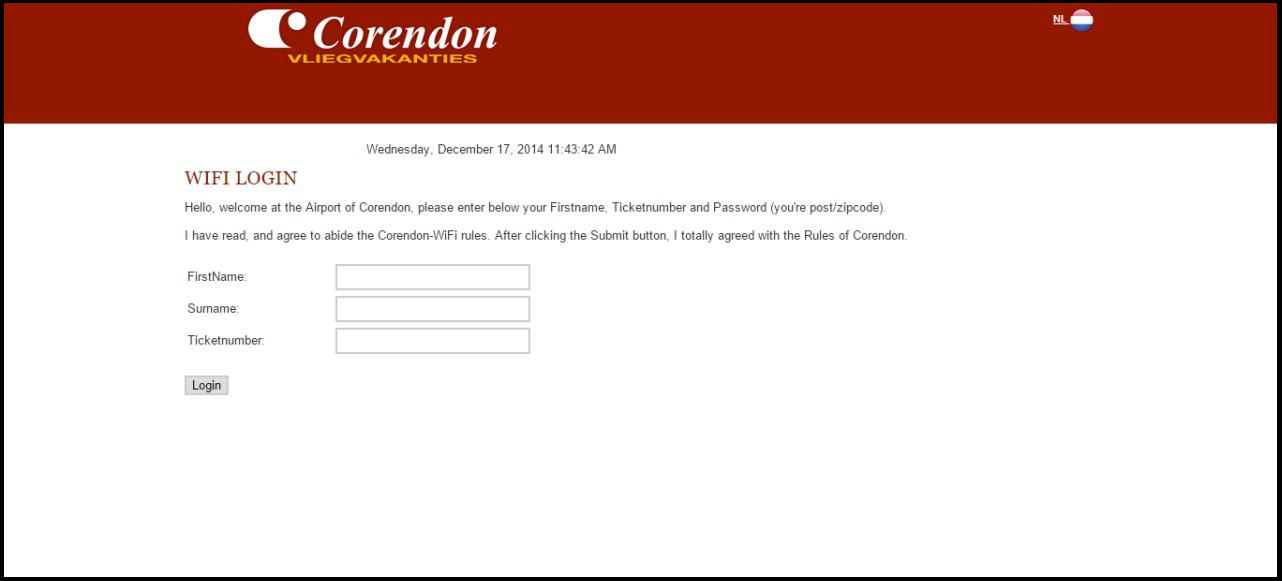
*If everything above has gone correctly, you want to restart your tomcat server.  
You can do this with the line below:*

|  |
| --- |
|  |
| *service tomcat7 restart* |

If everything went correctly; you will now have a working Tomcat server.

## 

## HTML page



The following points have been added to the HTML page:

|  |
| --- |
|  |
| Date and time |
| English & Dutch interface |
| First Name field |
| Surname field |
| Ticket number field |
| Login button |

The following items will be added later on:

|  |
| --- |
|  |
| Weather |
| Photo slide |

The following code is used for the HTML page:

|  |
| --- |
|  |
| <!DOCTYPE html>  <!-- saved from url=(0038)http://www.corendon.nl/mybooking/login -->  <html xmlns="http://www.w3.org/1999/xhtml"><head><meta http-equiv="Content-Type" content="text/html; charset=UTF-8">    <title>Mijn Boeking</title>  <link href="./css/styles.css" rel="stylesheet" type="text/css">  <link href="./css/styles.css" rel="stylesheet" type="text/css">  <div class="page-content">  <div class="col1">  &nbsp;  </div>  <script type="text/javascript">  tday=new Array("Sunday","Monday","Tuesday","Wednesday","Thursday","Friday","Saturday");  tmonth=new Array("January","February","March","April","May","June","July","August","September","October","November","December");  function GetClock(){  var d=new Date();  var nday=d.getDay(),nmonth=d.getMonth(),ndate=d.getDate(),nyear=d.getYear(),nhour=d.getHours(),nmin=d.getMinutes(),nsec=d.getSeconds(),ap;  if(nhour==0){ap=" AM";nhour=12;}  else if(nhour<12){ap=" AM";}  else if(nhour==12){ap=" PM";}  else if(nhour>12){ap=" PM";nhour-=12;}  if(nyear<1000) nyear+=1900;  if(nmin<=9) nmin="0"+nmin;  if(nsec<=9) nsec="0"+nsec;  document.getElementById('clockbox').innerHTML=""+tday[nday]+", "+tmonth[nmonth]+" "+ndate+", "+nyear+" "+nhour+":"+nmin+":"+nsec+ap+"";  }  window.onload=function(){  GetClock();  setInterval(GetClock,1000);  }  </script>  <div id="clockbox"></div>  <div class="col4">  <h1>WiFi Login</h1>    <p>Hello, welcome at the Airport of Corendon, please enter below your Firstname, Ticketnumber and Password (you're post/zipcode).</p>  I have read, and agree to abide the Corendon-WiFi rules. After clicking the Submit button, I totally agreed with the Rules of Corendon.    <form action="" name="loginform" id="loginform">  <form method="post" id="loginform">  <table>  <tbody>  <tr>  <td class="label">FirstName:  </td>  <td>  <input id="FirstName" name="FirstName" type="text" value="">  </td>  </tr>  <tr>  <td class="label">Surname:  </td>  <td>  <input id="SurName" name="SurName" type="text" value="">  </td>  </tr>    <tr>  <td class="label">Ticketnumber:  </td>  <td>  <input id="TickerNr" name="TickerNr" type="text" value="">  </td>  </tr>  </tr>  </tbody>  </table>  </form>  <form action="succeseng.html"><div><input type="submit" value="Login" ></div></form>  </form>  </div>  </div>  </div>  <div class="page-header">  <div>    <div class="logo">  <a href="http://www.corendon.nl/" title="Corendon Vliegvakanties"></a>  </div>  <IMG SRC="Corendon\_Logo.png" ALT="Corendon" ALIGN=LEFT>  <div class="mycorendon">  <a href="indexnl.html">  <span id="HistorySavedCount">NL <img src="nl.png" alt="" height="27" width="27"></span>  </a>    </div> |

## Ip Tables

The following commands were used for the changes of the ip tables:

|  |
| --- |
|  |
| sudo iptables –A PREROUTING –t nat –p tcp –dport 80 –j REDIRECT --to-port 8080 |

The command above redirects all the traffic that is normally on port 80 to port 8080, which is the port our tomcat server uses.  
(Port 80 is used for http session)

|  |
| --- |
|  |
| sudo iptables –A PREROUTING –t nat –p tcp –dport 443 –j REDIRECT --to-port 8080 |

The command above redirects all the traffic that is normally on port 443 to port 8080.  
(Port 443 is used for https sessions)  
  
You must enter the command below to save your ip tables.

|  |
| --- |
|  |
| sudo iptables-save > /etc/iptables.ipv4.nat |

You can show your running ip tables with the following command:

|  |
| --- |
|  |
| Iptables –L |

## Tomcat (7) default page

To change the default tomcat page you need to do the follow:  
  
Change the default tomcat page with the following command:

|  |
| --- |
|  |
| nano /var/lib/tomcat7/webapps/ROOT/index.html |

In this file you will add the following code:

|  |
| --- |
|  |
| <script language=”javascript”> window.location.href = “/SampleServlet/formpage.html”  </script> |

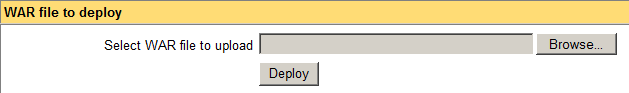
You must place this code between the <head> and the </head>.  
Now when you save the file, the tomcat default page will be redirected to formage.html.

## Servlets

We make use of servlets to process the user input. We need this to check if the user has agreed to the “End-user license agreement” (EULA).  
  
We programmed the code in the following program:  
- Eclipse Luna  
  
You can find the software on the following website: <https://eclipse.org/>

Code:

|  |
| --- |
|  |
| package net.codejava.servlet;  import java.io.IOException;  import java.io.PrintWriter;  import javax.servlet.ServletException;  import javax.servlet.annotation.WebServlet;  import javax.servlet.http.HttpServlet;  import javax.servlet.http.HttpServletRequest;  import javax.servlet.http.HttpServletResponse;  @WebServlet("/loginServlet")  public class LoginServlet extends HttpServlet {  private static final long serialVersionUID = 1L;  protected void doPost(HttpServletRequest request,  HttpServletResponse response) throws ServletException, IOException {    // read form fields  String username = request.getParameter("username");  String password = request.getParameter("password");  String ticketnumber = request.getParameter("ticketnumber");    System.out.println("username: " + username);  System.out.println("password: " + password);  System.out.println("ticketnumber: " + ticketnumber);  // do some processing here...    // get response writer  PrintWriter writer = response.getWriter();    // build HTML code  String htmlRespone = "<html>";  htmlRespone += "<h2>Your username is: " + username + "<br/>";  htmlRespone += "Your password is: " + password + "<br/>";  htmlRespone += "Your ticketnumber is: " + ticketnumber + "</h2>";  htmlRespone += "</html>";    // return response  writer.println(htmlRespone);    }  } |

When you’re finished with the code, you want to Export the project to a “.War” file.  
We need to export this to a “.war” file so we can upload it into our Tomcat server.  
  
See the example below:  
  
  
Now that we have the servlet uploaded in our Tomcat server, it’s time to change our default page to our servlet.

## Database

We first need to Install Mysql server before we can even make the Database:

|  |
| --- |
|  |
| apt-get install mysql-server |

To run “Mysql” as root, we will use the command below:

|  |
| --- |
|  |
| mysql -u root |

The first thing we want to do is to make our Database:

|  |
| --- |
|  |
| create database Corendon; |

To make chances onto our Database, we will use the following command:

|  |
| --- |
|  |
| use Corendon; |

Inside our Database we want to make a table with information inside:

|  |
| --- |
|  |
| create table Passengers ( |
| lastname char(30), |
| firstname char(20), |
| primary key(boardingnumber) ) |
| ; |

Note: each field is a different command!  
  
To show your tables inside your database:

|  |
| --- |
|  |
| show tables; |

## DHCP & DNS

|  |  |
| --- | --- |
|  |  |
| 192.168.42.2 t/m 192.168.42.190 | For all passengers one. |

## Sources

*raspberry*<http://www.kiwi-electronics.nl/raspberry-pi-512mb>[*http://elinux.org/RPI-Wireless-Hotspot*](http://elinux.org/RPI-Wireless-Hotspot)

*wifi*<http://www.hardwarewebwinkel.nl/netwerk/netwerk-adapters/netwerk-adapters-wireless/wireless-adapters-usb/edimax-ew-7811un-wireless-n-nano-adapter-150mbps-usb.html?utm_source=tweakers&utm_medium=cpc&utm_content=textlink&utm_campaign=pricecompare>

*acces point*[*http://www.staples.nl/wifi-access-point-wap300n/cbs/5887403.html?price=incvat&cm\_mmc=SEM\_PLA-\_-google-\_-feedgoogle&gclid=CjwKEAjwqamhBRDeyKKuuYztxwQSJAA1luvGocuV0Wz6\_k4zuXQUgM9fWKpYrX2m7tl\_por06jpothoCwdjw\_wcB*](http://www.staples.nl/wifi-access-point-wap300n/cbs/5887403.html?price=incvat&cm_mmc=SEM_PLA-_-google-_-feedgoogle&gclid=CjwKEAjwqamhBRDeyKKuuYztxwQSJAA1luvGocuV0Wz6_k4zuXQUgM9fWKpYrX2m7tl_por06jpothoCwdjw_wcB)

*Switch*<https://www.google.nl/shopping/product/11932336231812621196/specs?q=beheerder+switch&espv=2&biw=1448&bih=785&bav=on.2,or.r_cp.r_qf.&bvm=bv.76477589,d.ZWU&ion=1&tch=1&ech=1&psi=otcrVLjPAc7YPMbxgdgI.1412159394693.5&sa=X&ei=B9grVNPvGcvtO9r3gMAC&ved=0CFUQ6iQ>