**Software Architecture Document**

**Internet provider “Wind”**

**Solution Information**

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| --- | --- |
|  | Information |
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Definitions, Acronyms and Abbreviations

**UML:** Unified Modeling Language

**SI:** Service Instance

**SL**:Service Location

**RI:** Resource Inventory

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# Purpose

The purpose of this document is to define the detailed Solution Architecture for “WindBoreas”. This system provide ability full-cycle service provisioning with the usage of self-service portal. The document ensures that the Solution Architecture is in compliance with enterprise application architecture principles, best practices, and conceptual target application architectures.

# Solution Overview

The system is solution for internet providers. The system allows you to arrange a convenient interface between you and your customers, have a pleasant and intuitive interface, which allows ordinary Internet users to take advantage of your services. You can provide information on the tariff plan, quickly implement an internet connection to your customers, establish a feedback from them, organize technical support. This will allow your customers receive the highest level of service. You can receive automatically generated reports on the state of the system . This is a good tool for the successful organization and business automation. In the system can exist 5 roles: Administrator, Customer Support Engineer, Provisioning Engineer, Installation Engineer, Customer User. Basic operation items are Service Instance, Service Order and Quote.

# Architectural Goals and Constraints

This section describes the software requirements and objectives that have some significant impact on the architecture.

Technical Platform:

|  |  |  |
| --- | --- | --- |
| Name | Solution | Description |
| Server | GlassFish 4.0 | GlassFish Server is the world's first implementation of the Java Platform, Enterprise Edition (Java EE).  Built using the GlassFish Server Open Source Edition, GlassFish Server delivers a flexible, lightweight, and production-ready Java EE 6 application server. |
| Databases | OracleXE 10g | Oracle Database 10g Express Edition (Oracle Database XE) is an entry-level, small-footprint database.  It's free to develop, deploy, and distribute; fast to download; and simple to administer. |
| Technologies | Servlet | Servlets used to extend the applications hosted by web servers, so they can be thought of as Java applets that run on servers instead of in web browsers. |
| JavaMail API + Apache James | The JavaMail API provides a platform-independent and protocol-independent framework to build mail and messaging applications.  Apache James is an open source SMTP and POP3 mail transfer agent and NNTP news server written entirely in Java. |
| JAAS | Java Authentication and Authorization Service, or JAAS, is the Java implementation of the standard Pluggable Authentication Module (PAM) information security framework. The main goal of JAAS is to separate the concerns of user authentication so that they may be managed independently. |
| **jXLS** | jXLS is a small and easy-to-use Java library for writing Excel files using XLS templates and reading data from Excel into Java objects using XML configuration. |
| Additional APIs | Google Maps API | The Google Maps API is free for commercial use, provided that the site on which it is being used is publicly accessible and does not charge for access, and is not generating more than 25 000 map accesses a day. |

# Application Architecture

## 3.1 Logical View

The application is divided into layers based on the N-tier architecture



This strategy improves system development and maintenance.

## 3.2 User Interface

## 3.3 Supported Business Processes

### 3.3.1 Creating Employee Account

Flow diagram



Figure 1─ Creating Customer Account Flow Diagram

### Creating Customer Accounts

Flow diagram



Figure 2─ Creating Customer Account Flow Diagram

### 3.3.3 Blocking Accounts

Flow diagram



Figure 3─ Blocking Accounts Flow Diagram

### 3.3.4 Changing Customer Password

Flow diagram



Figure 4─ Changing Customer Password Flow Diagram

### 3.3.5 Review Service Instance

Flow diagram



Figure 5─ Review Service Instance Flow Diagram

### 3.3.6 Review Service Order

Flow diagram



Figure 6─ Review Service Order Flow Diagram

### 3.3.7 Creating Service Order

Flow diagram



Figure 7─ Creating Customer Account Flow Diagram

### 3.3.8 Creating New Router in System

Flow diagram



Figure 8─ Creating New Router in System Flow Diagram

### Creating New Circuit in System

Flow diagram



Figure 9 ─ Creating New Circuit in System Flow Diagram

### 3.3.10 Removing the Circuit in System

Flow diagram



Figure 10 ─ Creating New Circuit in System Flow Diagram

### 3.3.11 Bill Sending

Flow diagram



Figure 11 ─ Bill Sending in System Flow Diagram

### 3.3.12 Creating Service Instance

Flow diagram



Figure 12 ─ Creating Service Instance Flow Diagram

### 3.3.13 Modifying Parameters for Service Instance

Flow diagram



Figure 13 ─ Modifying Parameters for Service Instance Flow Diagram

### 3.3.14 Disconnect for Existing Service Instance

Flow diagram



Figure 14 ─ Disconnect for Existing Service InstanceFlow Diagram

### 3.3.15 E-mail Notification

Flow diagram



Figure 15 ─ E-mail Notification Flow Diagram

### 3.3.16 Creating RI Reports

Flow diagram



Figure 16 ─ Creating RI Reports Flow Diagram

### 3.3.17 Creating SI Reports

Flow diagram



Figure 17 ─ Creating SI Reports Flow Diagram

### 3.3.18 Creating CIA Reports

Flow diagram



Figure 18 ─ Creating CIA Reports Flow Diagram

### 3.3.19 Exporting Reports

Flow diagram



Figure 19 ─ Exporting Reports Flow Diagram

## 3.4 Sequences

## 3.5 ER-diagram

## C:\Users\Anatolii\Documents\NetBeansProjects\InternetProviderWind\Docs\ER-diagram\er-beta-0.4-scaled-up-size.png

## Security Architecture

The system allows to adjust the rights and roles to the user. Depending on the role, the system provides a different user interface and different rights.

Any user from internet can register in system as Customer User. Only Administrator can create employee accounts such as Administrator, Customer Support Engineer, Provisioning Engineer, Installation Engineer. Only provider employee can perform administrative task.

Security matrix:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Roles  Rights | Administrator | Customer Support Engineer | Provisioning Engineer | Installation Engineer | Customer User |
| Can create employee accounts | Yes | No | No | No | No |
| Can register in system himself | No | No | No | No | Yes |
| Can block other accounts | Yes | No | No | No | No |
| Can select services based on SL | No | Yes | No | No | Yes |
| Can review own SI | No | No | No |  | Yes |
| Can disconnect existing SI | No | No | No |  | Yes |
| Can create new SO | No | No | No |  | Yes |
| Can creatie Devices, Ports and Cables in the system | No | No | No | Yes | No |
| Can assign the port of the router and create the circuit and refer the assigned port to Service Instance | No | No | Yes | No | No |
| Can modify some parameters for particular SI | No | No | Yes | No | No |
| Can generate RI reports | No | No |  |  |  |
| Can generate SI reports | No | No |  |  |  |
| Can generate CIA reports | No | No |  |  |  |

Security for Internet provider “Wind” integrated with existing security mechanism JavaSecurity and GlassFish Security.

# Reporting and search profile

The system provide a possibility to generate and to export reports to Excel, CSV format.

The system can generate:

1. RI reports:   
   - Routers utilization and capacity %  
   - Most profitable router  
   Reports are available to restricted user groups.
2. SI reports  
   - New orders per period  
   - Profitability by month  
   - Disconnect orders per period
3. CIA report  
   - Impact Propagation Tree

# Resource Inventory

Resource Inventory includes resource topology, configuration, status, connectivity, and other information about it in a centralized store. Resource Inventory includes Physical and Logical Inventory, that provides modeling and management capabilities. The system can store information about devices, connected cables, installed ports, circiouts and their location. It is possible to add new devices.