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| **HCL Technologies Limited** |
| OQS SimLog  System Overview & Support |
| [Version No.2.1] |
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| **Date: 01/23/2012** |

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| Revision History |

|  |  |  |  |
| --- | --- | --- | --- |
| Version No. | Date | Prepared by / Modified by | Significant Changes |
| 1.0 | 1/25/2012 | Ajay Yadav, Preeti Rathore Garishta Madan | Released Version |
|  | 2/16/2012 | Rosa Rinaldi; Sri Kallu; Achala Deshpande | Made revisions and provided suggestions for changes |
|  |  | Ajay Yadav | Updated based on reviews |
| 2.0 | March 1, 2012 | Rosa Rinaldi | Accepted all previous revisions; made additional revisions and provided additional suggestions. For minor revisions, change tracking was turned off. |
| 2.1 | March 28, 2012 | Rosa Rinaldi | Final review – made some minor revisions without turning on change tracking. Turned on change tracking only for a few changes that were more than minor corrections. |

Table of Contents

[Introduction 3](#_Toc318367117)

[1.1 Document Purpose 3](#_Toc318367118)

[1.2 Scope 3](#_Toc318367119)

[1.3 Audience 3](#_Toc318367120)

[1.4 Documents Referred 3](#_Toc318367121)

[1.5 Glossary 4](#_Toc318367122)

[Overview 5](#_Toc318367123)

[1.6 Users 8](#_Toc318367124)

[System Context 10](#_Toc318367125)

[1.7 System Perspective and Function 10](#_Toc318367126)

[1.7.1 System Overview & Context Diagram 10](#_Toc318367127)

[1.7.2 Criticality of the System 16](#_Toc318367128)

[1.7.3 OQS-SimLog application is defined as “critical to business”. It is used to manage all Training Devices. 16](#_Toc318367129)

[1.7.4 Hours of Support and Usage 16](#_Toc318367130)

[1.7.5 Users of the Systems 16](#_Toc318367131)

[2 Technical components detail 17](#_Toc318367132)

[2.1 Technical architecture (physical) 17](#_Toc318367133)

[2.2 Batch Process: 20](#_Toc318367134)

[3 Technical Environment 21](#_Toc318367135)

[3.1 System Production Environment & Technical Diagram 21](#_Toc318367136)

[3.2 Development & Testing Environment: 21](#_Toc318367137)

[4 Offshore requirements 23](#_Toc318367138)

[4.1 IT infrastructure required including development tools 23](#_Toc318367139)

[4.2 Team skills and support hours 23](#_Toc318367140)

[5 Support Operational Details 23](#_Toc318367141)

[5.1 History of tickets 23](#_Toc318367142)

[5.2 Support of Interfaces 23](#_Toc318367143)

[5.3 Other relevant information 24](#_Toc318367144)

# Introduction

## Document Purpose

The purpose of this document is to provide an overview of the OQS SimLog application. It will be a common document used by both system support and system development. In particular, it will provide a quick start to new joiners in system maintenance and system delivery, hence minimizing training effort.

## Scope

The aim of this document is to cover top level functional and technical architecture view of the system so that it can be used by the technical support team and business analysts to better understand the functioning of the system. It would also provide a picture of the size, importance and complexity of the system.

## Audience

This overview document is to be used by management, business analysts, developers, testers, support personnel and anyone who needs a top level overview of Operations Qualification System OQS SimLog application. In particular, it will serve as a baseline for anyone joining the Operations Qualification System Support team.

## Documents Referred

|  |  |  |  |
| --- | --- | --- | --- |
| **Document Name** | **Description** | **Location** | **Version** |
| OQS Technical WIKI | Contains the technical overview and system setup information | https://wiki.swacorp.com/twiki/bin/view/Tech/OqsTeam |  |
| OQS HL Business Process Flow 1-24-07.vsd | Application Process Flow | Clearcase location  Ifo/OQS/Documents/3.0 Design/Architecture |  |
| OQS App Support Documents | System Interface with other applications and information flow | \\disk24\technology-shared\AMS Documentation\AOM\Crew Mgmt\OQS-SimLog\ |  |
| Environment Info.xlsx | Environment, Servers, Build and Deployment information | ifo/OQS/Documents/Support |  |

## Glossary

|  |  |
| --- | --- |
| **Term** | **Description** |
| Discrepancy | Any defect that is identified in the hardware or the software area of a Simulator or other training device is entered into OQS SimLog as a discrepancy. |
| Preflight | A daily check that is recorded in OQS SimLog to indicate that the Simulator has passed the daily preflight check and is ready to be used for training.  Not all training devices require a daily preflight. The system allows the technical team to define whether a preflight is required and also to specify the frequency (e.g. daily, or weekly). |
| Device Status | This indicates the status of the device i.e. UP or Down and is displayed by the bordering color code on the home screen (red for DOWN, green for UP). If a device status is down, it cannot be used for training.  If a device is due for a preflight, the border is yellow.. |
| Time Log | This is a record of the details entered for any training conducted on the Training devices. For example, the names of the Instructor and Pilot Trainees in Simulator 1, in Time Period A (0700 – 1100) are captured in the Time Log screen. |

# Overview

Figure 1 provides the complete overview of Operations Qualification System SimLog application. Level 2 identifies the system’s major components and each of them is distributed into processes which are defined in Level 3.

The processes are defined as a top-down approach where big blocks are its major processes and the rest of the levels are broken down into details.

**Figure 1**

The main purpose of the system is to maintain records for the training devices, such as defects in the devices, who are the users, when and which devices are used and what was the status of the Device on the specific time.

This will help manage the training devices in a more efficient way and help to provide better availability of the training devices.

Main uses of the application are as below:

**Record Discrepancies:** Sim Techs & Instructors can enter a discrepancy for any device if they find any deviation in the normal operations of a device.

**Complete Preflight:** Sim Techs complete a daily preflight check of Flight Ops training devices defined to require a daily preflight between 4 AM and 6 AM daily to confirm that the devices are performing per the standards and guidelines provided by the FAA. After they perform their preflight checklist, they update the Preflight status to Complete in OQS SimLog to indicate that the device is ready for training for the day.

**Enter Time Log:**  Instructors and Check Pilots enter information in OQS SimLog System to track the training conducted in the simulators.

**Manage Training Device Status:**  Device status displays the status of the device i.e. UP or Down.

**Manage Inventory:**  This functionality helps the Sim Techs maintain an inventory of the parts used on the training devices..

**Generate Reports :** We have two types of reports as detailed in the figure below:

* Device/Training Resource-related Reports
* Inventory related reports



**ATOM** **Feature** : After the merger with AirTran, there were new requirements for adding class plans. ATOM, the application used to manage existing class plans was not designed to support the addition of new class plans. Instead of trying to implement the new functionality into ATOM, which uses outdated and unsupported technology, it was decided to add the new class plan functionality to OQS SimLog.

## Users

As shown in Figure 2, some of the main users of this application are Simulator Technicians (also known as Sim Techs), FO Sim Instructor, Check Pilots, FO Ttraining Managers , FAA Instructors, Inflight Users, and System Admin users.

**Simulator Technician (Sim Techs)**:

1. Logging and Managing of discrepancies for devices
2. Completing Preflight
3. Adding/Updating the corrective actions on a discrepancy.
4. Managing parts and components
5. Sending the device components for repair

**FO Sim Instructor and Check Pilots:**

1. Adding Discrepancies
2. Reviewing discrepancies before they conduct training in the device
3. Adding Time Log for each of the completed training

**FO Training Managers:** They can add, extend and modify discrepancies.

**FAA Instructors:** They can add discrepancies which they may identify when they observe or conduct training. Also, they are required to review open discrepancies before they conduct training in that device.

**In-flight Users:**  They are mostly responsible for managing discrepancies in in-flight training devices. Their main responsibilities are adding the discrepancies and entering corrective action for open discrepancies. Currently, Flight Ops Simulator Technicians work on discrepancies for In-flight Devices here at Headquarters.

**Coordinator:** The main job of the coordinator is to send the damaged parts to actual vendors for repairing. They are also responsible for Vendor Management.

**ATOM Users:** They can add/update the Class plan and roster. There are basically two levels of access in the ATOM-related functionality:

* Supervisor Training Scheduler role: Can edit the class type, class plan, and class roster.
* Training Scheduler role: Can view the class type, class plan, and class roster

**Figure 2**

# System Context

## System Perspective and Function

### System Overview & Context Diagram

This section gives a high level overview of Operations Qualification System SimLog, its underlying business processes and the data elements that these processes contain. The following diagram represents the system interface and interactions:

OQS performs various operations under four different functional elements:

* Training Resource
* Admin
* Inventory
* ATOM

#### 3.1.1.1 Training Resource:

**Training Resource**: The training resource category includes functions such as those displayed in the following diagram:

**Managing Discrepancies**: This entails adding, updating, searching or in some cases extending the discrepancies. The numbers (shown only for SimTechs) below each device displays the number of open discrepancies for the device. The first number displays the number of new discrepancies entered within the 24 hour cycle. The second number displays total open.

**Types of Discrepancies** :

**Functional**: If a Training device is not working as expected, then it is entered as a functional Discrepancy that should be reviewed by the Instructors to make sure that the impact is not too much to continue the training in Simulators.

**Maintenance**: These are problems with the training device that do not impact training, and/or regular maintenance activities relevant to the Simulator Technicians only. These discrepancies are not visible to instructors.

**Modification**: If there is a need to change the device from the original specifications, these are entered as Modifications.

**Originators of Discrepancies** :

**Routine**: These are discrepancies identified by Sim Instructors, Check Pilots, and Sim Techs.

**SQAT**: These are discrepancies identified by the members of the Simulator Quality Assurance Team (SQAT) during their regularly scheduled inspections.

**FAA-OTHER**: These are discrepancies identified by FAA Inspectors during their training or while they are observing training.

**FAA-NSP:** These are discrepancies identified by the national FAA inspectors during their regularly scheduled inspections.

**FAA-CMO:** These are discrepancies identified by the local FAA inspectors during their regularly scheduled inspections.

**Adding Discrepancies**: This involves creating discrepancies by adding details on originator, type,sim period and employee details, as well as a description.

**Managing Device Status**: These are details on the status of the device i.e. UP to Down or Down to Up, or updating Expected Time Up.

The color code for the border of the device icons along with the user action and result are as follows:

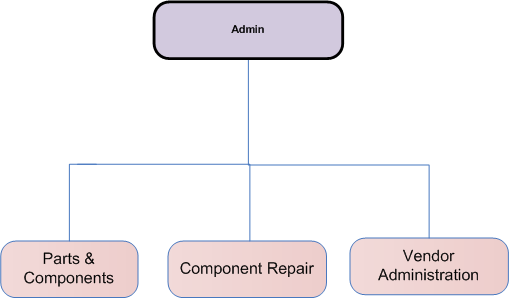
1. When the border of a device icon is RED and preflight is due, this indicates that the device is down. If a Sim Tech selects “Complete Preflight “, a system error message is displayed, because a preflight cannot be completed if a device status is Down. .
2. When the border of a device icon is YELLOW and a preflight is due, this indicates that the device requires a preflight.. If a Sim Tech selects “Complete PreFlight“, the border of the device icon changes to green .
3. When the border of a device icon is YELLOW and a preflight is due , this indicates that the device requires a preflight. If the user changes the device status to DOWN then the border of the device icon changes to RED .
4. When the border of a device icon is RED and a preflight is not due, this indiicates that the device is down. If the user changes the device status to UP then the border of the device icon changes to GREEN.
5. When the border of a device icon is GREEN and preflight is not due, this indicates that the device is UP. If the user changes the device status to DOWN then the border of device icon changes to RED .

**Completing Preflight** : This indicates that the device is ready for training.

**Managing Time Log**: This includes time entries for the training conducted in the simulators.

#### 3.1.1.2 Admin

This menu item has three subfunctions, as listed in the following diagram. The Admin menu item is displayed only for roles that have the security to one or more of these subfunctions.



**Parts & Components**: Roles with the security to access this function have the ability/responsibility to search and maintain (view/add/update/delete) the device parts. They can perform all required actions to manage these parts/inventory. Roles with this security include Simulator Technicians, Coordinator, as well as some of the Manager roles,

**Component Repair :** Roles with the security to access this function can send device parts for repairs to vendor/maintenance from their respective staging area and receive components after repair from vendor/maintenance.

**Vendor Administration :**  Roles with the security to access this function can manage the vendors by adding /deleting /updating**.**

#### 3.1.1.3 Inventory

This functionality helps to maintain the proper inventory of the training devices. Roles with the security to access this function can control the inventory in an efficient way and can make proper purchase forecast.

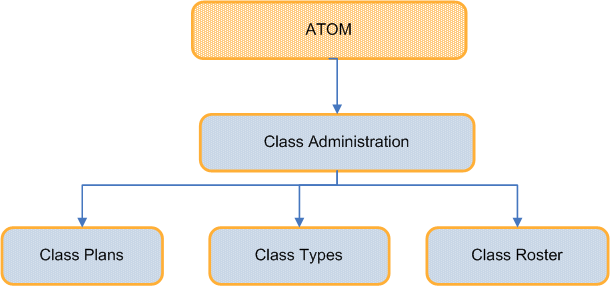
**Manage Parts:** User can search for parts and can maintain (add/update/delete) the parts in inventory. .

**Sending The Parts For Repairing:** This function is used for parts that are classified as FSTD (Flight Simulator Training Device) Repairable parts. These are parts designed specifically for simulators, and that can be sent to a vendor for repair. When such a part needs to be sent to a vendor for repair, the Sim Techs take the part out of the Simulator and put it in a temporary location until the Coordinator can arrange to send it to the vendor. In OQS SimLog, the Sim Tech or the Coordinator can set the location of this device to a “virtual” location of “Send for Repair Staging” to indicate that it is in a temporary location until it can be sent to the vendor. When the Coordinator sends the part to the vendor or receives the part from the vendor, the Coordinator updates the information in OQS SimLog. The Sim Techs move the received part to the appropriate location, for example, they put it back on a Simulator or put it in the stock room, and they update OQS SimLog accordingly.

Aircraft Rotable parts are those parts that can be “rotatated” from an Aircraft to a Simulator and vice versa. When these parts need to be repaired, they are taken to the Maintenance Hanger to be repaired by the Aircraft Mechanics. The Location in OQS SimLog is changed to Maintenance. If the part is received back from Maintenance, the location is changed accordingly.

**Vendor Management :** User can add/Update the Vendors, they can modify their details also.

#### 3.1.1.3 ATOM ADMINISTRATION



**Class Administration -** Training class management is handled via class administration under ATOM. Roles with the security to access this function can create and edit class types, class plans and class rosters.

**Class Plans –** In Class Plan users with the appropriate role can update class plans.

**Class Types –** In Class Types, users with the appropriate role can create new class types, for example new hire classes, upgrade classes, classes to convert AirTran 737 Pilots and so forth.

**Class Roster –** In Class Roster users with the appropriate role can create class roster for Training classes

### Criticality of the System

### OQS-SimLog application is defined as “critical to business”. It is used to manage all Training Devices.

### Hours of Support and Usage

OQS SimLog is supported 24 hours a day, seven days a week. as we have daily 24 hr Training cycle. Simulators are used for training primarily from 7 a.m. to 11 p.m. The Simulator Technicians perform their maintenance activities primarily from midnight to 6 a.m. They complete preflights between 4 a.m. and 6 a.m.

### Users of the Systems

|  |  |  |
| --- | --- | --- |
| **User Groups** | **Number of Customers** | **Concurrent Users** |
| Sim Techs | 22 | 10 – 15 |
| Sim Instructors | 100 | 10 (mostly while conducting training at Sim Bays) |
| Check Pilots | 150 | 10 (while conducting training at Sim Bays) |
| Training Schedulers | 12 | 1 |
| Inflight Training Managers and Supervisors | 35 | 10 (at HDQ and Inflight Bases) |
| Mechanics | 20 | Fewer than 10 |
| Training Schedulers | 20 | 10 |

# Technical components detail

## Technical architecture (physical)



**Figure 19**

A User logging into SimLog application is authenticated using an interface between webgate and LDAP . The client part of SimLog application consists of Flex classes (e.g. ActionScript classes) that are bundled into the OQSSimLogWeb project and deployed to the WebSphere server.OQS SimLog Client forwards user requests to the server. Blaze DS will convert the remote request from binary to ascii format ,then the request is forwarded to Java Pojo classes running on the application server.

OQS SimLog application provides up-to-date status of training devices to the Video displays located in Flight Ops training building through interface between application and video display devices. OQS SimLog application will interact with business objects (i.e. Crystal Reports) for generating SimLog reports.

Interface between application client and server is used for retrieving backend component interfaces in order to call backend methods. Tibco queue listener running on the application server listens for any messages that the server has put in the Tibco queue. Batch processes run every day (for example Preflight batch job) by interacting with the Entity components running on the server side.

Process, Entity and Utility components interact with the OQS database . SimLogManager process component interacts with ATOM for retrieving TimeLog entries for Crewmembers who are scheduled to use simulators.OQS SimLog interacts with AOS for retrieving airport station and runway data from AOS that is populated with Jeppesen data.

**OQS SimLog Structure**

OQS SimLog is integrated with the OQS framework . The OQS server side logic consists of following components :-

1. Process components
2. Entity components
3. Utility components

**OQS Process**

It consists of OQS process components. SimLog uses two existing OQS process components: PersonManager and ScheduleManager. A new process component, SimLogManager has been added.

**1 SimLogManager**

SimLogManager is the main process component for the SimLog application. SimLog Manager communicates with the User Interface client via SimLog POJO and uses service entity components .

**OQS Entity**

These components focus mainly on the individual business entities and further interact with the lower level utility components to process requests corresponding to the business entity .Business entity are :-

**1 Resource –**It involves all functionality related to displaying, creating and updating Training Resources . This includes changing device status, certifying Preflight etc

**2 Person Component -** The Person component is an existing component used by the OQS Recordkeeping application that deals with functionality associated with a Crewmember and his positions

**3** **Atom –** It communicates with the current Scheduling application (called ATOM). SimLog uses this component to interact with the scheduling application to retrieve Crewmembers scheduled for trainings in a device. This information is used for the Time Log functionality.

**OQS Utility**

It belongs to the lowest layer of the component model. Components in this layer do not interact with other components and can function independently.

**1 Department**

This component performs all functionsrelated to creating and managing departments, applications, configuration values, asynchronous jobs, and equipment.

**2 Security**

Security component serves several main purposes such as managing system users and their permissions, authenticating system user when the user logs into the application and managing Flight in Trouble functionality .

**DATABASES**

1 OQS database

The OQS database contains all the tables required to maintain the SimLog. It contains tables required for handling SimLog and Recordkeeping applications .

2 ATOM database

This contains tables for handling the Scheduling application. OQS applications (SimLog and Recordkeeping) interact with these tables in order to serve some of the requests from the SimLog application (e.g. Retrieving TimeLog for scheduled Crewmembers)

**OQS SimLog Client –**

The OQS SimLog client resides on WebSphere 6.1. The client part of SimLog application consist of Flex classes (e.g. ActionScript classes) that is bundled into the OQSSimLogWeb project and deployed to the WebSphere server. Proper security roles are set up in LDAP for accessing the SimLog application.

## Batch Process:

OQS SimLog has two daily batch jobs(12:05 AM and 04:05 AM).

**Update Resource Status:** Every Midnight (12:05 AM), System update the device status as down if there is any past due date for any open discrepancy.

**Update Preflight :**  Every Early Morning (04:05 AM), System changes the status of all the training device status as “Ready for Preflight”(Yellow) , if Device status is UP (Green)

# Technical Environment

## System Production Environment & Technical Diagram

|  |  |
| --- | --- |
| **ENVIRONMENT** | **SPECIFICATION** |
| **Production** | JRE 1.5 or higher  Frontend : Flex  Web Sphere Server : xlpwas07/08/09  Mule Server: xspsvc21,xspsvc22  Web Servers :xspweb09/10  OQS Data Base Schema :SHRTFRP  OQS Data Base Server : xlprac11,xlprac12  Databases : ORACLE 10g  Batch Servers: xspbat01/02  Please refer to following document in clearcase for the most current information:ifo/OQS/Documents/Support/Environment Info.xlsx |

## Development & Testing Environment:

|  |  |
| --- | --- |
| **ENVIRONMENT** | **SPECIFICATION** |
| Development | JRE 1.5 or higher  Frontend : Flex  Web Sphere Server : xldwas06  Mule Server: xsdsvc 06  Web Servers :xsdweb01  OQS SimLog Data Base Schema : SHRTFRD  OQS SimLog Data Base Server : xldodb01,xldodb02,xldodb03,xldodb04  Databases : ORACLE 10g |
| QA | JRE 1.5 or higher  Frontend : Flex  Web Sphere Server : xlqwas03/04  Mule Server: xsqsvc07,xsqsvc08  Web Servers : xsqweb11/12  OQS SimLog Data Base Schema : SHRTFRQ  OQS SimLog Data Base Server : xlqodb05,xlqodb06  Databases : ORACLE 10g  Batch Servers: xsqsvc01/02  Please refer to following document in clearcase for the most current information:ifo/OQS/Documents/Support/Environment Info.xlsx |
| ITEST | JRE 1.5 or higher  Frontend : Flex  Web Sphere Server : xltwas03/04  Mule Server: xstsvc01,xstsvc02  Web Servers : xstweb15  OQS SimLog Data Base Schema : SHRTFRD  OQS SimLog Data Base Server : xldodb01,xldodb02,xldodb03,xldodb04  Databases : ORACLE 10g  Please refer to following document in clearcase for the most current information:ifo/OQS/Documents/Support/Environment Info.xlsx |

# Offshore requirements

## IT infrastructure required including development tools

|  |  |  |  |
| --- | --- | --- | --- |
| **Machine Configuration** | **No. of machine** | **VPN Connectivity** | **Software Tools** |
| Intel based P-IV 2Gzh./2GB RAM | 1 | Yes | Active MQ, Hypersonic, Mule, SQL developer, Eclipse 3.22, Freemarker, Ant, Quickbase, Buildforge,clearcase |

## Team skills and support hours

|  |  |  |
| --- | --- | --- |
| **Skill Set** | **Resource profile** | **Support Hours** |
| Java/J2ee | Developer | As per SLA agreement |

# Support Operational Details

## History of tickets

Tickets reported in the year 2010.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Urgent** | **High** | **Medium** | **Low** |
| Yearly Ticket  (Based on 2010) | 0 | 11 | 4 | 11 |

* Queue Name – OQS Support
* Majority of Tickets are from iTops Monitoring system.

URGENT/HIGH/MEDIUM tickets are paged and LOW tickets are emailed

## Support of Interfaces

1. Please refer SLA Management Process and Procedure manual for SLA details.

2. If support needed for external interfaces then OQS support team will raise the incident or change request in remedy.

## Other relevant information

We will use a separate branch for AMS use (Bug fix & Enchantment ) .