XQTING

InnoStats

Manual

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Table of Contents

Document history

Version	Date	Comment
2.0	20.05.2018	Initial version
2.01	26.06.2018	Added: prerequisites: supported operating system(s) Changed: some of the screenshots
2.02	10.08.2018	InnoStats interface is next to English available in 3 additional languages: German, French and Dutch.

Introduction

InnoStats is a web based software that provides extended reporting capabilities for an Innovaphone PBX. Innovaphone (https://www.innovaphone.com/en/) is a German, privately held company, specialized in VoIP telephone systems for use in professional business environment. InnoStats support both the Innovaphone hardware based PBX and the virtual appliance (IPVA).

Each Innovaphone PBX is configured by means of a web application. Browsing to the IP address of the PBX shows this application. Throughout this document we will refer to this as the "Innovaphone PBX web application".

Setting up the call handling and routing logic within the PBX is done by means of so called "Objects". Example Objects are "User", "Voice Mail", "Conference", "Call Broadcast", "Waiting Queue"…

Our particular interest goes to the "Waiting Queue" object, because this is where InnoStats reports on. A Waiting Queue object in the context of Innovaphone is used for different purposes:

- As a groups object with queueing functionality: the Waiting Queue object will gather all the calls and deliver them one by one to an available operator. ('First in First Out' principle).
- To play a message ("Please hold on, you will be served as soon as possible"…).
- To enable an IVR ("Interactive Voice Response"): "Welcome to company X; press one for …".
- Or as a combination of the 3 options mentioned above.

When a call arrives in the Innovaphone PBX, it can travel through multiple Waiting Queue objects of different types. E.g. welcome message, check opening hours, IVR to select a service, waiting in a queue to be served by an operator.

Throughout the manual, we'll refer to Message objects (= Waiting Queue object used to play a message), IVR objects (= Waiting Queue object configured for getting DTMF input), Queue objects (or short "queue") (= Waiting Queue object to route the call to an operator) and Waiting Queue object if we want to refer to all of them together.

Reporting on individual extensions within the PBX is currently not supported.

InnoStats is licenses on a per PBX base. A network of PBX's requires a license for each of the PBX's in order to run the program.

InnoStats consists of 4 modules/services as shown in the below figure.
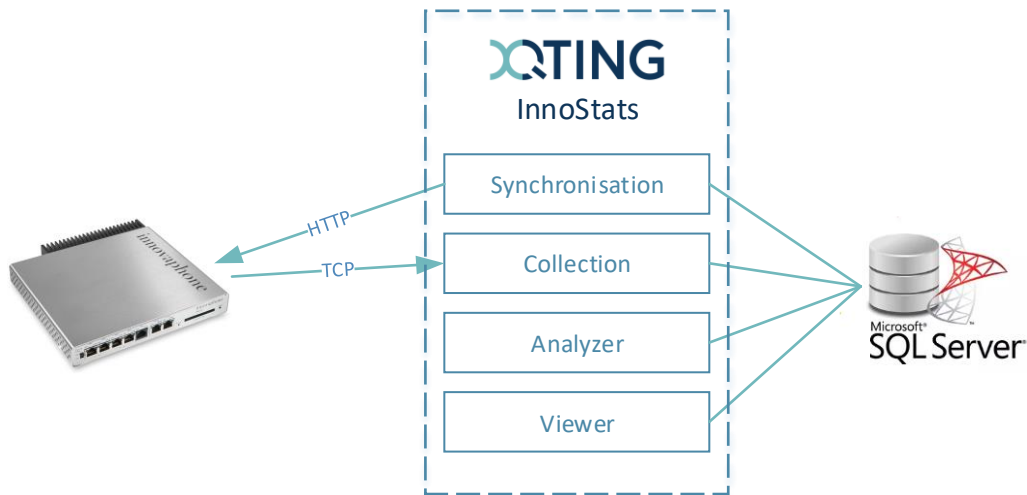
Figure 1 InnoStats modules

The synchronizer gets information about the Waiting Queue objects as defined in the PBX. The process runs continuously to make sure that the making of new objects in the Innovaphone PBX web application is reported to InnoStats.

The collector gathers all Call Data Records (CDR) from the PBX.

The analyzer analyses all CDRs and prepares the information that is suitable for presenting to the user. Multiple CDRs need typically to be combined in order to present one call.

The Viewer is the user interface that is explained throughout this manual and that presents the information to the users of InnoStats

THIS MANUAL COVERS INNOSTATS VERSION 2.0.

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Prerequisites

Operating system

InnoStats runs on Microsoft Windows Server 2012R2 or later.

.NET 4.7.1

InnoStats is written for the .NET framework and therefore executes in a software environment named Common Language Runtime (CLR), an application virtual machine that provides services such as security, memory management, and exception handling.

As a result, you'll need to install the .net framework on the server that is running InnoStats. You can download it from the Microsoft website (https://www.microsoft.com/net/download/dotnet-framework-runtime).

InnoStats license file

In order to run InnoStats, you need a valid license file. This file has extension .xqlic and contains an encrypted key that is based on one or more MAC addresses (one for each Innovaphone you want to run InnoStats on). The Media Access Control (MAC) address is a unique identifier assigned to network interface controllers.

HOW TO GET A VALID INNOSTATS LICENSE FILE? PLEASE CONTACT YOUR LOCAL INNOVAPHONE PARTNER OR CONTACT XQTING VIA THE WEBSITE: WWW.XQTING.COM.

When opening the license file with Notepad(++), you get following information:

Order: reference to the purchase order as a result of which the license was issued

Product: name of the product; in this case "InnoStats"

Version: version of the software; in this case "2.0"

Issued to: the name of the end user for which this license file is registered

Created: date & time the license file was created

Expires: expiry date of the license file. InnoStats stops running after this date. Changing the date manually in this file does not extend the working of the software

Features: supported options, if any

Gateways: the MAC address(es) of the Innovaphone PBX(s) for which InnoStats provides reports. You have to provide this/these MAC ID(s) when ordering the software.

License file: the long character string is the encrypted license key.

Do not change the content of the file; it will become invalid!

Innovaphone PBX

InnoStats provides reporting on Innovaphone queues. Needless to say that having an Innovaphone PBX is a requirement for running InnoStats. Make sure you have access to the Innovaphone PBX web application, before you start the installation process of InnoStats. During the setup process, the bootstrap wizard will ask for certain PBX settings.

SQL Server 2008R2 Express

InnoStats requires a Microsoft SQL Server 2008R2 Express database (or better). This is relational database management system that is free to download, distribute and use. The size of an Express database is limited to 10 GB (version 2016). Refer to https://www.microsoft.com/en-us/sql-server/sql-server-editions-express

Please make sure you have credentials (login & password) that allow you to create a database. This is typical the "sa" (System Administrator) account or an account with similar rights.

Firewall settings

In order not to block the communication flow between the InnoStats server and the Innovaphone PBX, you need to take some precautions in your firewall settings. Make sure you open up following ports:

- Server Outbound: 443 TCP (HTTPS-port of the PBX)
- Server Inbound: 8810 TCP (Collector-Port)
- Server Inbound: 8080 TCP (Viewer-Port)

InnoStats Setup

There are 4 InnoStats installation packages available; one for each supported language. The suffix "en" stands for English, "de" for German, "fr" for French and "nl" for Dutch.

Once you have downloaded the InnoStats installation package from the website, you can run the setup. During the setup process, the software is being prepared for the first usage. A wizard helps you in a couple of steps through the process.

The first step is to accept the InnoStats license agreement. After reading the conditions, you can mark the check box and press the "Install" button.
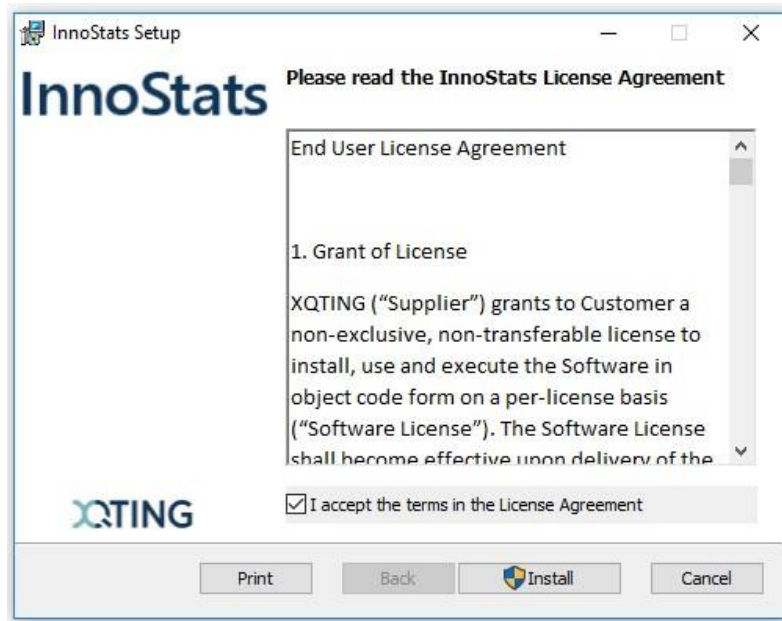

Figure 2 Setup – step 1

Windows account control will now ask whether it's OK to execute this setup. After having confirmed, a new window with a progress bar appears. Behind the scenes, files are copied and put in the right folders.
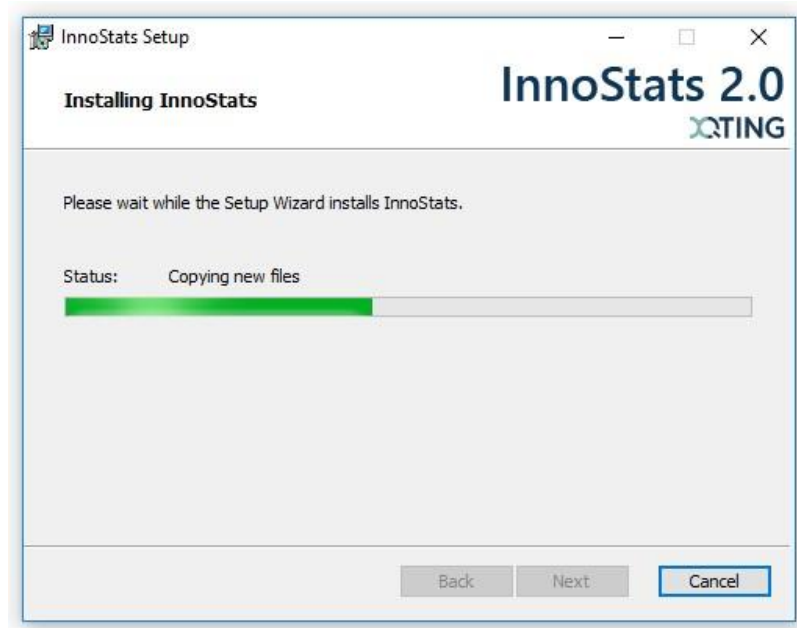
Figure 3 Setup – step 2

The setup is completed; InnoStats is now ready for use. There are 2 options now:

- Configure InnoStats manually
  In this case, you have to follow all steps as explained in Manual configuration from page 20 onwards.
- Let the bootstrap wizard guide you through this configuration process (recommended).

WE RECOMMEND TO USE THE 2ND OPTION, SO MAKE SURE YOU MARK THE "LAUNCH INNOSTATS APPLICATION" CHECK BOX BEFORE CLICKING THE "FINISH" BUTTON.

Figure 4 Setup – step 3

Bootstrap wizard

InnoStats has been installed in the previous section (InnoStats Setup on page 11).

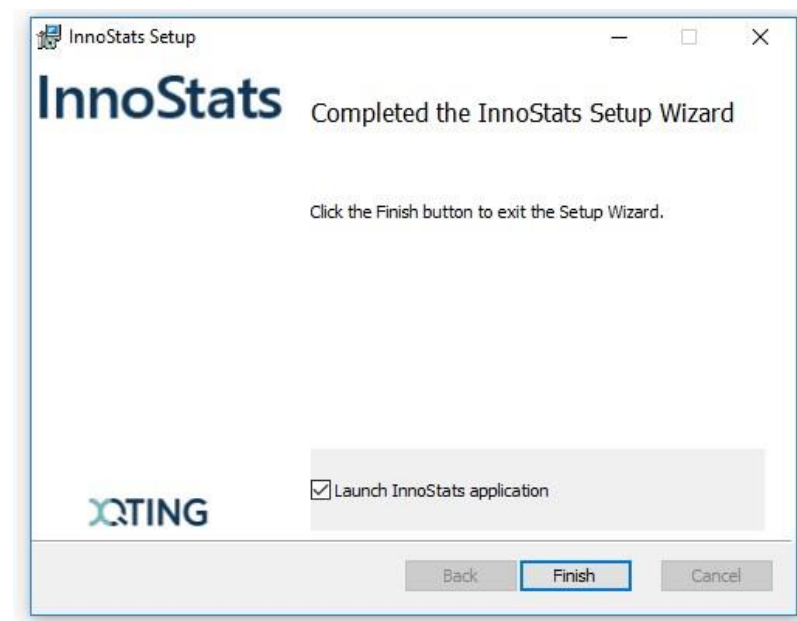The setup or bootstrap wizard finalizes the installation procedure. During this process, you will be prompted to enter some initial parameter values that help you to get started. These values can be changed later on in the configuration section (refer to Manual configuration from page 20 onwards).
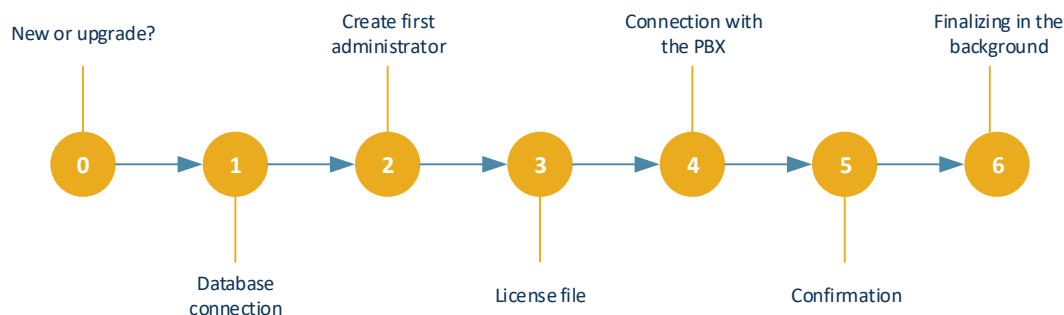

Figure 5 Bootstrap wizard steps

Preparation

The setup wizard depends on some settings in the PBX. Make sure you follow the below guidelines before moving on with the wizard.

In Step 4, you'll need to provide the Port on which you can connect to the PBX. You find this setting in Services → HTTP → Server: HTTPS-Port (443 in the below example).
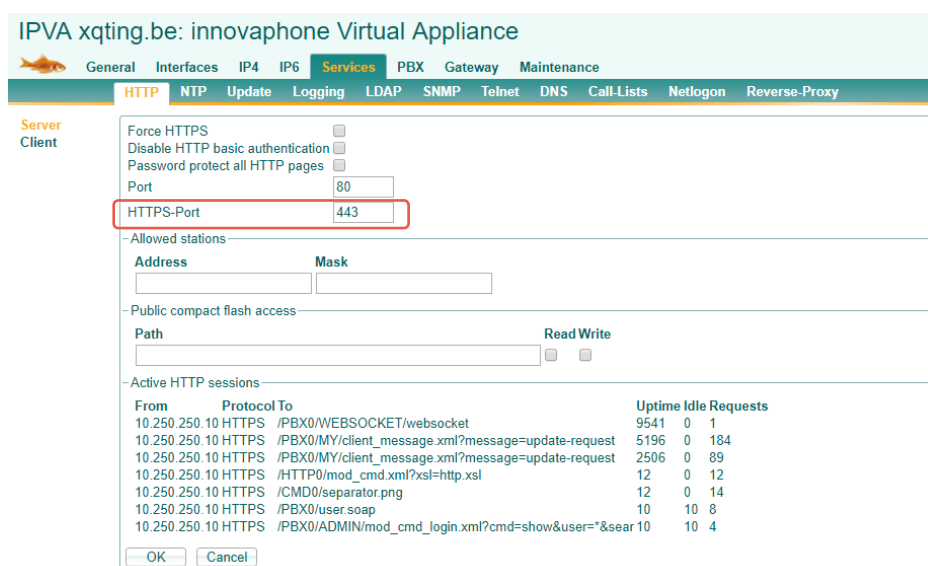
Figure 6 Innovaphone – Services – HTTP

Also in Step 4, the wizard asks for a Username and Password for accessing the PBX information. This needs to be created first.

Go to General → Admin and within the "Additional Administrator Accounts", add an extra user. The example screen shot defines "cdrLogger" as the extra user (it's a good idea to use this user name to distinguish from other administrative users). Enter a password (twice) and select a type. You need to

select "Administrator" from the drop-down list (default value). The "Viewer" type does not have rights to send the CDRs.

Figure 7 Add user

InnoStats gets is input from the PBX via CDRs (Call Data Records). You have to enable the making of CDRs in PBX → Config → General → Generate CDRs

Figure 8 Activate CDRs

CDRs are enabled now. But where should the PBX send them to? Go to Gateway → CDR0 or CDR1 (whichever is available/not used) and define in Address the IP address on which (the) InnoStats (collector service) runs.

Figure 9 InnoStats IP address

Step 0

The setup starts the installation wizard automatically, provided that you clicked the "Launch InnoStats application" checkbox. If not, you'll have to configure InnoStats manually (refer to Manual configuration from page 20 onwards).

You can change the language in which the wizard continues, using the dropdown at the top of the page, as shown in the below figure:

Figure 10 Install wizard – getting started

The wizard automatically detects whether InnoStats has been installed on the server previously or not. It not, we consider it as a new installation. In the other case, we talk about an upgrade.

In case of an upgrade, the wizard moves immediately to step 5.

Step 1. Connection DB

Remember that InnoStats requires a Microsoft SQL Server 2008R2 Express (or better) database. Make sure this software has been installed before you run this bootstrap wizard.

Figure 11 Install wizard –connection DB

Server and instance:	When connecting to an instance of the Database Engine you must specify the name of the instance of SQL Server. If the instance of SQL Server is the default instance (an unnamed instance), then specify the name of the computer where SQL Server is installed, or the IP address of the computer. If the instance of SQL Server is a named instance (such as SQLEXPRESS), then specify the name of the computer where SQL Server is installed, or the IP address of the computer, and add a slash and the instance name.
Username: Password:	InnoStats requires SQL server authentication. Therefore, you need to enter both username and password. If you don't know these credentials, please contact your database system administrator.

When pressing the "Next" button, the wizard checks if the provided credentials allow you to access the database. If successful, you move to the next step. If not, you'll get one of the following error messages:

- "A network-related or instance-specific error occurred while establishing a connection to SQL Server. The server was not found or was not accessible. Verify that the instance name is correct and that SQL server is configured to allow remote connections."
- "Login failed for user …": invalid combination of user name and password
- "User must have SysAdmin rights!"

Step 2. Administrator

InnoStats comes with a default user that has full rights; the so-called super administrator ("administrator@administrator.com"). This administrator has a default password ("changeme"). The wizard now prompts for new administrator credentials. Enter a valid email address, two times a strong password and your first name and last name.

Figure 12 Install wizard – administrator

A valid email address has the following layout: name @ second-level domain . top-level domain

The wizard only checks whether your input follows this structure: something@something.something works. It does not send an email to check whether this address really exists.

There are no restrictions on the password; it's up to you to decide whether you define a strong password or not.

When you entered a valid email address, the same password twice and your first and last name, you move to the next step.

Step 3. License file

InnoStats comes with a license file. I.e. the software is protected by a license file. Without such license file, the software does not run. In this step, you need to upload the file. Click on the "Choose file" button and search for your license file in the folders of the server. A license file of XQTING has an extension ".xqlic". Select the file and click "OK".

Figure 13 Install wizard – license file

When you click the "Next" button, the wizard checks the validity of the license file. If it's correct, you move to the next step.

Step 4. Gateway information

We're almost there! The final step is to enter the Innovaphone PBX information.
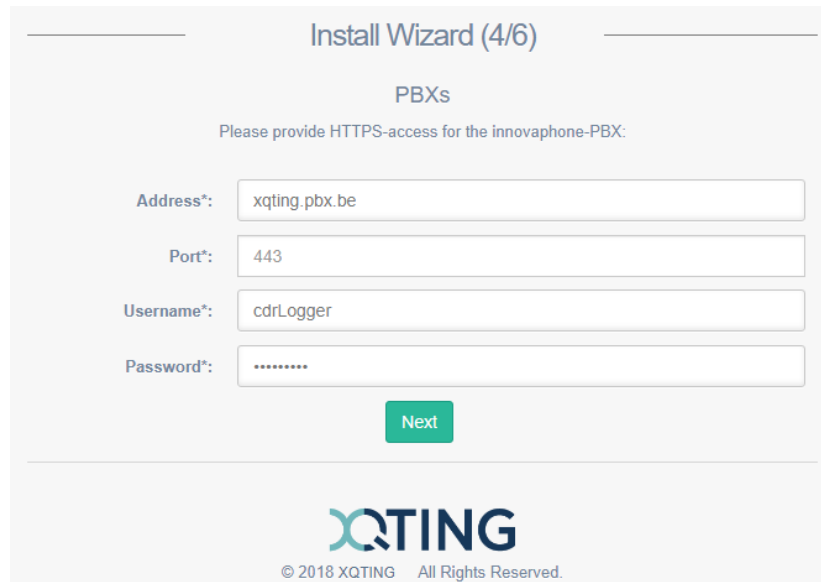
Figure 14 Gateway information

InnoStats can deliver reports for one or more (related) PBXs. For each of them, you need to enter the following information:

Address:	In the address field you define how the Innovaphone PBX can be reached. This can be an internal IP address, an external IP address or a DNS. It corresponds with the address on which you have access to the Innovaphone PBX web application.
Port:	The Port needs to correspond with the port that is defined in the Innovaphone PBX web application (refer to Preparation on page 13).
Login:	The same login as you just defined in the Innovaphone PBX web application (refer to Preparation on page 13).
Password:	The same password as you just defined in the Innovaphone PBX web application (refer to Preparation on page 13).

When pressing the "Next" button, the wizard checks the connection with the PBX(s).

Step 5. Confirmation

If all went well, the wizard now shows an overview of the data it gathered during the process.
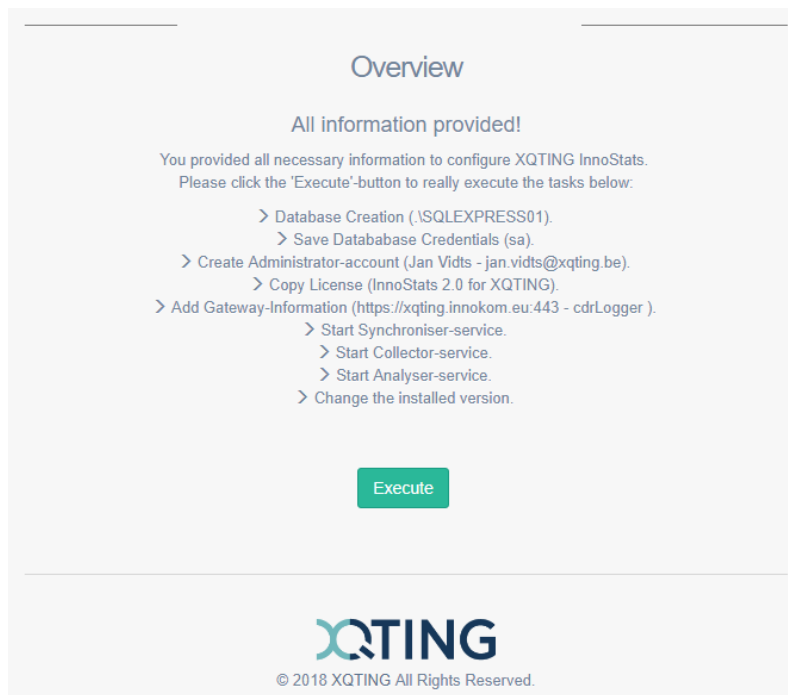
Figure 15 Confirmation

Step 6. Finalizing

This is the final step. The wizard now prepares everything in the background and makes InnoStats ready for use.
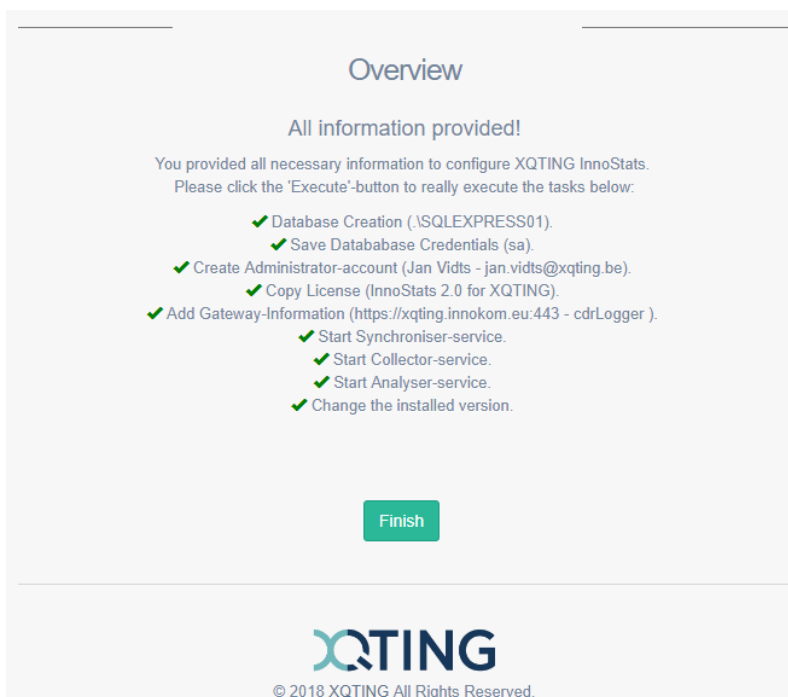
Figure 16 Finalizing setup

The wizard finishes and shows the logon screen for InnoStats. You can logon, using the credentials you provided in Step 2 of this wizard.

Manual configuration

If for some reason you did not use the bootstrap/installation wizard you have to manually configure InnoStats. Same applies when you want to change some settings after having used the system for a while.

In the configuration section, you can manage the users of the InnoStats software, define and configure the gateways, change global settings and the settings for the 4 different services that make up InnoStats.

First Logon

InnoStats comes with a default user that has full rights; the so-called super administrator ("administrator@administrator.com"). This administrator has a default password ("changeme").

After the initial setup, the first step is to create a new System Administrator user.

To access the system, enter the URL on which InnoStats can be reached. The log on screen will appear:
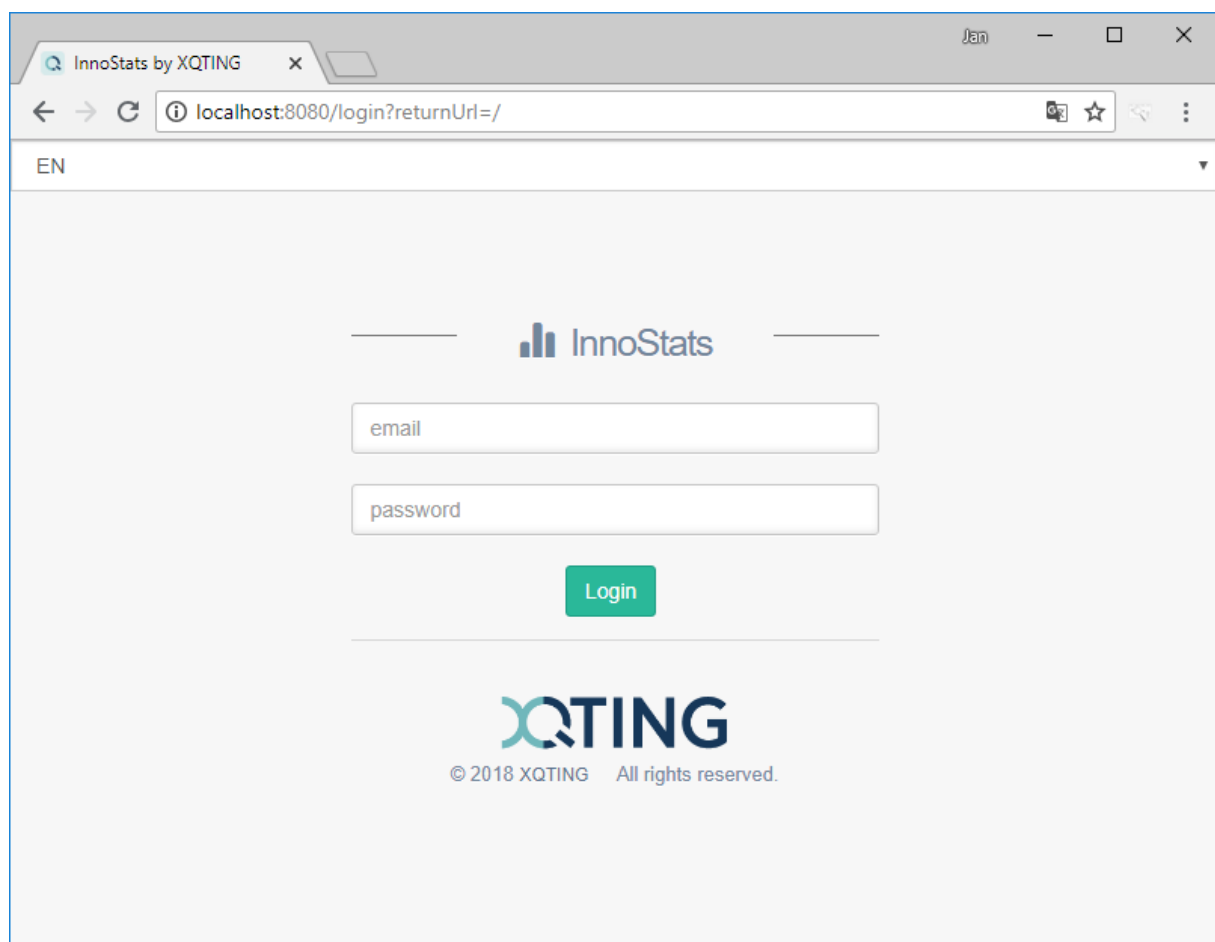
Figure 17 Logging on

Select the language in which you want to use the user interface from the drop-down list on the top of the page. Your selection is saved in the general settings.

Enter the super administrator email and password. The successful combination takes you to the home page of InnoStats. The home page of a newly installed system is empty. To get an idea on how it looks like when data has been processed, please refer to Home page information on page 67.
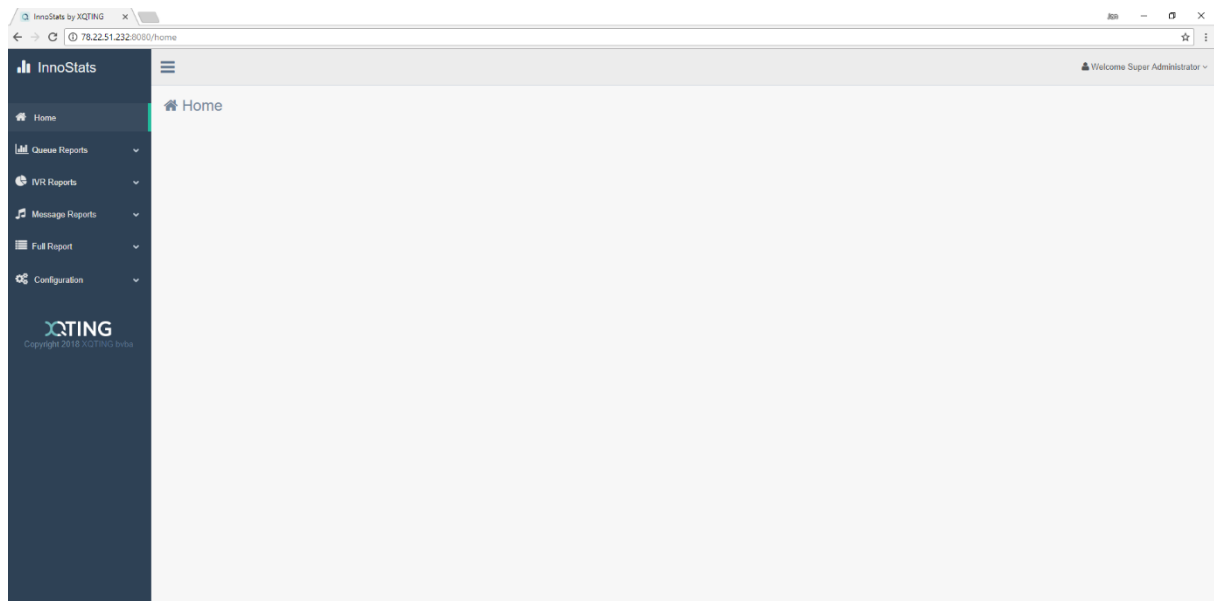
Figure 18 Initial home page

User management can be found in the Configuration section of InnoStats. The page shows all users that are currently configured. After the initial setup, this page is empty. To add a user, click on the "Add User" button.
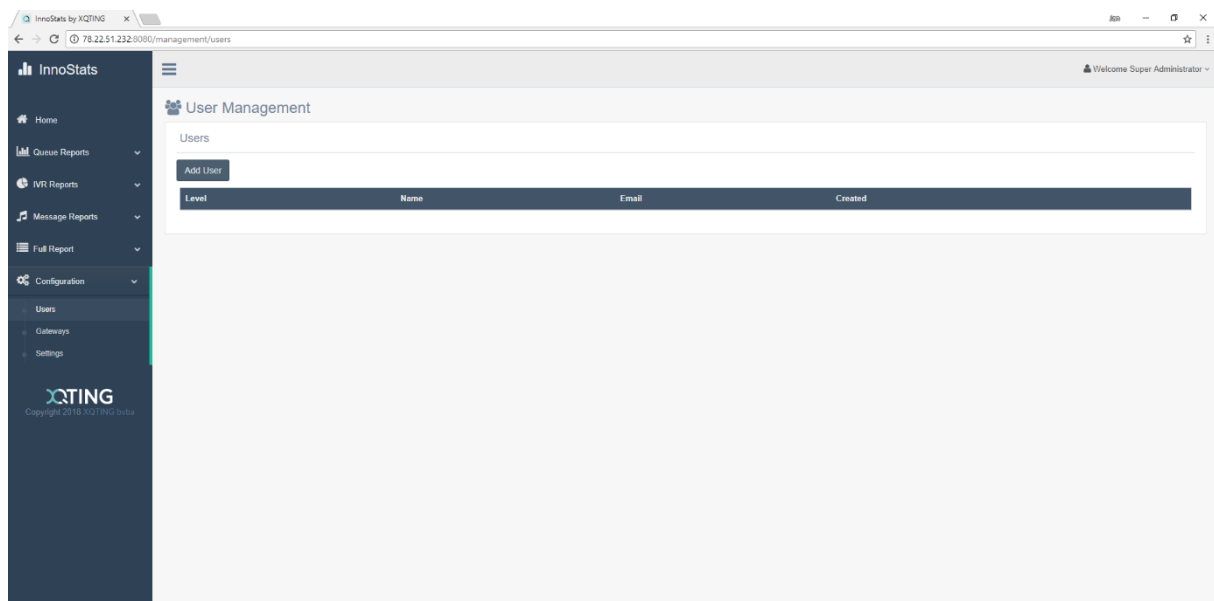
Figure 19 User Management

The first 4 fields (Email, Password, First Name and Last Name) are mandatory.

3 user levels are available:

- System Administrator: has access to all settings and functions within InnoStats

- Manager: same rights as the System Administrator, but no access to Configuration →
  Gateways and Settings
- Viewer: standard user having access to all reports, no access to Configuration

The default level is "Viewer". Change this to "System Administrator" and press the Submit button.

From this moment onwards, the initial super administrator credentials will no longer be valid (after closing your current session).

Users

When clicking Configuration → Users, InnoStats shows a page with all users. Click the delete icon at the right if you want to remove the user.

IF, BY ACCIDENT, THE ONLY USER IS DELETED FROM THE SYSTEM, THE ORIGINAL COMBINATION OF EMAIL AND PASSWORD ARE AGAIN VALID (REFER TO FIRST LOGON ON PAGE 20).

Click the Edit icon if you want to change user settings. There are no restrictions on the password; it's up to you to decide whether you define a strong password or not. Refer to page 21 for the definition of the 3 available user levels.

Gateways

In this section, the System Administrator (only) defines the link with the PBX.

Figure 20 Configuration - Gateways

Mark the HTTPS check box if the connection to your PBX is secured (recommended). In the address field you define how the Innovaphone PBX can be reached. This can be an internal IP address, an external IP address or a DNS. It corresponds with the address on which you have access to the Innovaphone PBX web application.

Figure 21 Innovaphone – Services - HTTP

The Port needs to correspond with the port that is defined in the Innovaphone PBX web application. You find this setting in Services → HTTP → Server: HTTPS-Port.

Before entering the Login and Password fields in InnoStats, you first need to add a user to the Innovaphone configuration.

Go to General → Admin and within the "Additional Administrator Accounts", add an extra user. The example screen shot defines "cdrLogger" as the extra user (it's a good idea to use this user name to distinguish from other administrative users). Enter a password (twice) and select a type. You need to select "Administrator" from the drop-down list (default value). The "Viewer" type does not have rights to send the CDRs.

Figure 22 Innovaphone – General - Admin

Click the "Submit" button. InnoStats now tries to make a connection with the PBX. If successful, the gateway is added to the list. At the same time, InnoStats retrieves information from the PBX and shows it in the "Gateway Information" section:

Figure 23 Gateway details

- Harware ID: refers to the type of Innovaphone PBX (e.g. IP3010, IPVA…)
- Serial: corresponds with the SerialNo in the Innovaphone PBX web application → General → Info
- Gateway Type: provides the type of your Innovaphone PBX. Possible values are "IPVA" (if you have a virtual appliance), IP800…
- PBX Type: in most cases this will be "master". It will show the alternative "slave" in case the PBX is part of a network (and depending on another master PBX)
- System: equals the System Name in Innovaphone PBX web application → PBX → Config → General
- Location: the PBX Name in Innovaphone PBX web application → PBX → Config → General

Figure 24 Innovaphone – PBX - Config

The Gateway Management page now shows the PBX from which Innostats will get and process the CDRs. You can define multiple PBX's following the same steps.

NOTE THAT FOR EACH PBX YOU DEFINE IN THE INNOSTATS GATEWAY MANAGEMENT PAGE, YOU NEED A VALID INNOSTATS LICENSE KEY.

In "Created", you learn when the link to the PBX was defined. The "Last Synced" field shows on which timestamp the most recent synchronization took place. By default, InnoStats synchronises every 15 minutes (900 seconds). This setting can be adapted in Configuration → Settings → Synchroniser; field "PBX Sync Relax Time".

Figure 25 Gateway summary

Click the Edit button if you want to change the settings for a PBX. The fields shown with grey background cannot be changed. Moving the PBX to a new location (i.e. PBX gets a new IP address) is an example (and seldom) occasion on which you need to use this edit function.

Settings

In Configuration → Settings, 8 sections are defined: General, Backup, Database, Collector, Synchroniser, Analyser, Viewer and Debug.

The Backup, Database, Collector, Synchroniser, Analyser and Viewer section all have a Logging subdivision in common. 3 fields are shown: Filename, Layout and Level. Filename and Layout contain predefined values that cannot be changed (they have a grey background). Only the Logging level can be changed. Default value is "Info". Logging is there to help debugging the program in case of errors or unexpected behavior, and therefore only useful for the support and development engineers of InnoStats. They might ask you (when treating a support case) to switch the Level to another of the available values (Debug, Trace, Warn, Error, Fatal).

General

This page contains 2 settings:

- "Application folder": this is the folder in which the services are installed and where you'll find the backup and logging files (explained in the previous paragraph). This folder is defined during the installation procedure, and cannot be changed (field is marked grey).
- "Language": InnoStats GUI language. Possible values are "EN" (English), "DE" (German), "FR" (French) and "NL" (Dutch)
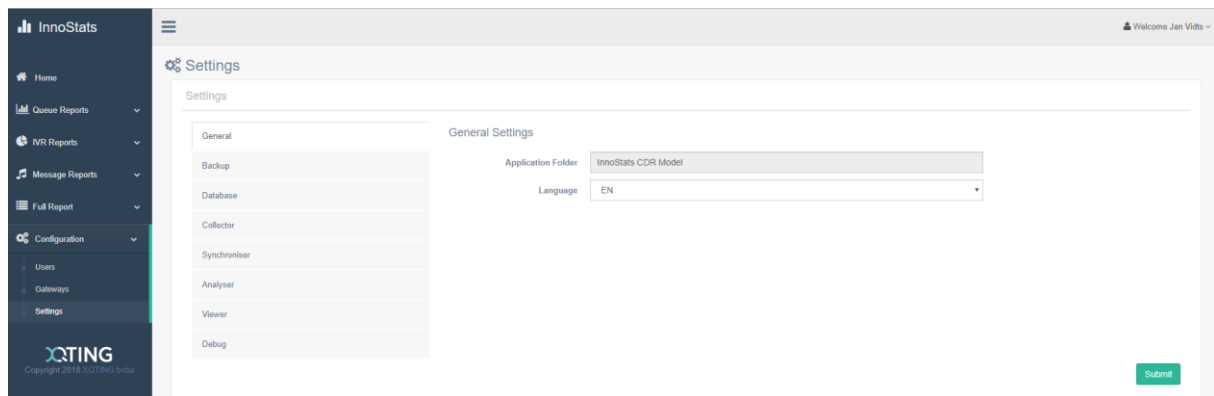
Figure 26 Configuration - Settings - General

Backup

In this section "Backup" refers to the backup of the connection string and the (PBX and Gateway) CDRs that are received from the PBX. It allows you to define what will be stored and for how long.

- Backup Connection: when put to "Yes", the connection string will be stored in the folder. The connection string contains e.g. the MAC ID and the firmware version of the PBX
- Backup PBX CDR: if you want to have a backup (outside of the database) of all CDRs received from the PBX, you must put this field to "Yes" (recommended)
- Backup Gateway CDR: put this value to "No" as this refers to another type of CDRs that is not supported in this version of InnoStat
- Max Archive Files: CDRs for one day are stored in one file. This value defines the number of days, the system will keep the CDR backups. The default value is 30, meaning that InnoStats keeps CDRs during 30 days. On the 31st day, it will 'overwrite' the oldest file. This parameter is to avoid hard disks running full.
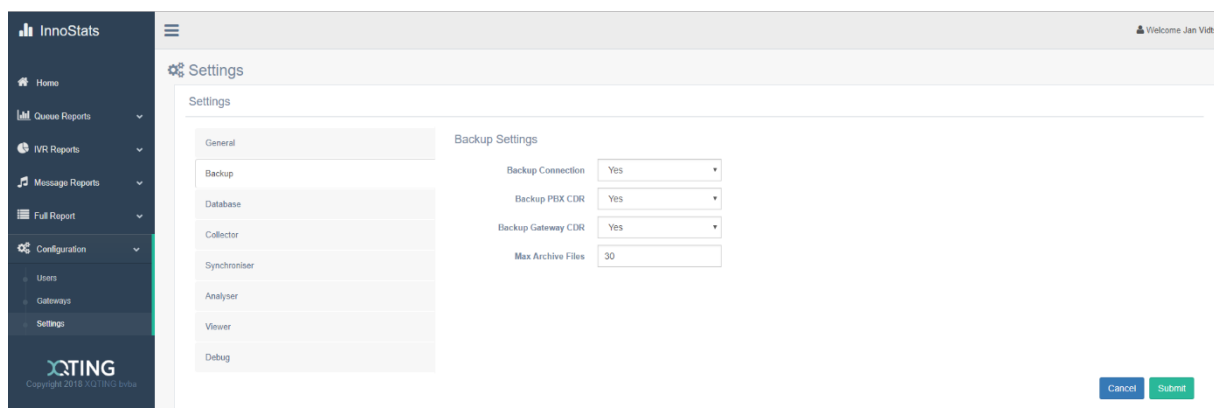
Figure 27 Configuration – Settings - Backup

Database

The database settings are stored during the installation procedure. Available fields are:

- Enabled: should be "Yes" if you want InnoStats to provide reporting (and that's the whole idea). If put to "No", and Backup PBX CDR (in the Backup section) is configured as "Yes", you can use InnoStats to only backup the CDRs.
- Server: name of the MS SQL server (refer also to prerequisites)
- Database: name of the database within the MS SQL server

- Username and Password: user credentials for accessing the database

Figure 28 Configuration – Settings - Database

Collector

The collector services of InnoStats gathers all Call Data Records (CDR) from the PBX.

Before explaining the different fields on this page, we first launch the CDR writing process on the PBX:

Step 1.

In the Innovaphone PBX web application go to PBX → Config → General. Mark the Generate CDRs check box.

Step 2.

In the Innovaphone PBX web application go to Gateway → CDR0 or CDR1 (whichever is available/not used) and define the log server:

- Type: TCP (mandatory)
- Address: provide the IP address of the server on which the InnoStats collector service runs
- Port: 8810 (fixed value)

Don't forget to click the "OK" button.

Figure 29 Innovaphone – Gateway - CDRx

Let's now go back to our parameter settings in InnoStats:

- Port: 8810 (fixed value)
- Connection TimeOut: the TCP connection on which the CDRs are exchanged is built up by the PBX. If after the number of defined seconds in this field, InnoStats receives no information

from the PBX, InnoStats kills the connection. The PBX will then automatically setup a new connection, to continue operations.

- Purging Time: killing the connection (refer to setting above) does not remove it from the system. This setting defines the number of seconds after which InnoStats also removes/purges the old connections.
- Collect Gateway CDR's: since InnoStats does not treat gateway CDRs (it only processes PBX CDRs), this value should be put to "No".
- Only Billing Gateway CDR's: relates to the previous setting and has no meaning as long as "Collect Gateway CDRs" is put to "No"
- Collect PBX CDR: should be "Yes"; otherwise InnoStats will have nothing to report about

Figure 30 Configuration – Settings - Collector

Synchroniser

The synchronizer service within InnoStats gets information about the Waiting Queue objects as defined in the PBX.

- PBX sync Relax Time: the number of seconds after which InnoStats synchronizes with the PBX to exchange information about newly defined waiting queues
- Operator Sync Relax Time: not used.

Figure 31 Configuration – Settings - Synchroniser

Analyser

The analyzer service within InnoStats analyses all CDRs and prepares the information that is suitable for presenting to the user.

- Relax Time: the analyzing process does not run continuously. This field defines the interval in seconds between each run of the process
- Delay Time: the analyzer only takes CDRs that are older than the number of seconds defined in this field

Figure 32 Configuration – Settings - Analyser

Viewer

The Viewer service within InnoStats reports on the traffic within the Innovaphone PBX and is based on the CDRs gathered by the Collector and processed by the Analyser.

Port: fixed to value 8080 and since it's greyed out, cannot be changed

Figure 33 Configuration – Settings - Viewer

Debug

Colored Console: for advanced users and debug purposes only! This option allows to run the 4 services of InnoStats (Synchroniser, Collector, Analyzer and Viewer) as console application at the command prompt. The level of information you get in this console mode is defined by the Level field.

NOTE THAT YOU FIRST HAVE TO STOP THE WINDOWS OPERATION MODE BEFORE YOU CAN USE THE CONSOLE MODE.
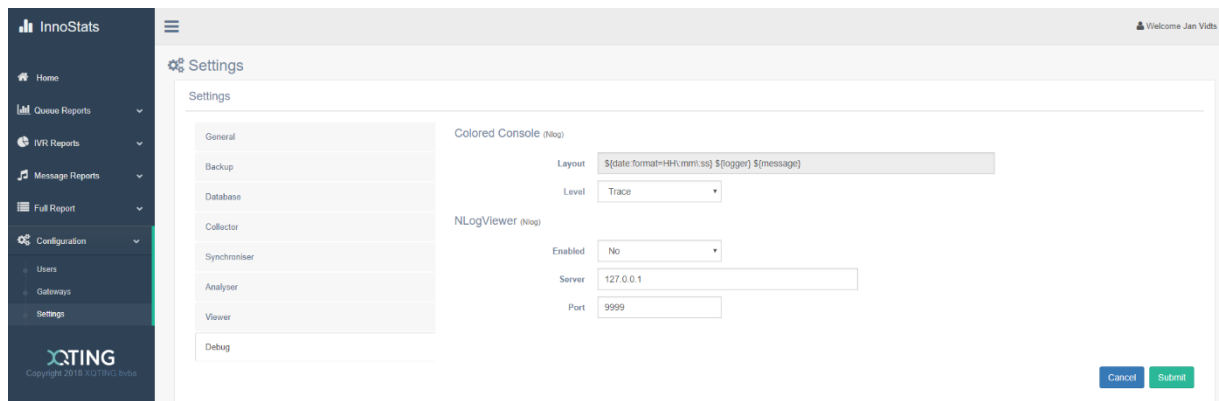
Figure 34 Configuration – Settings - Debug

Understanding PBX operations

Before we start looking at the different report sections, we spend some time in explaining Innovaphone PBX basics and naming. Please read this part carefully. In order to interpret the reports in a correct way, it's important that you fully understand the PBX terminilogy.

Queues

As discussed during introduction, an Innovaphone Waiting Queue object serves multiple purposes: it can play a message (Message object), ask DTMF input (IVR object) and act as an answering queue for which one or more operators log on (Queue object).

A combination of these objects define the call flow and the behavior of your PBX. You can only benefit from InnoStats, if you understand the way your PBX has been setup.

An example flow could look as follows:
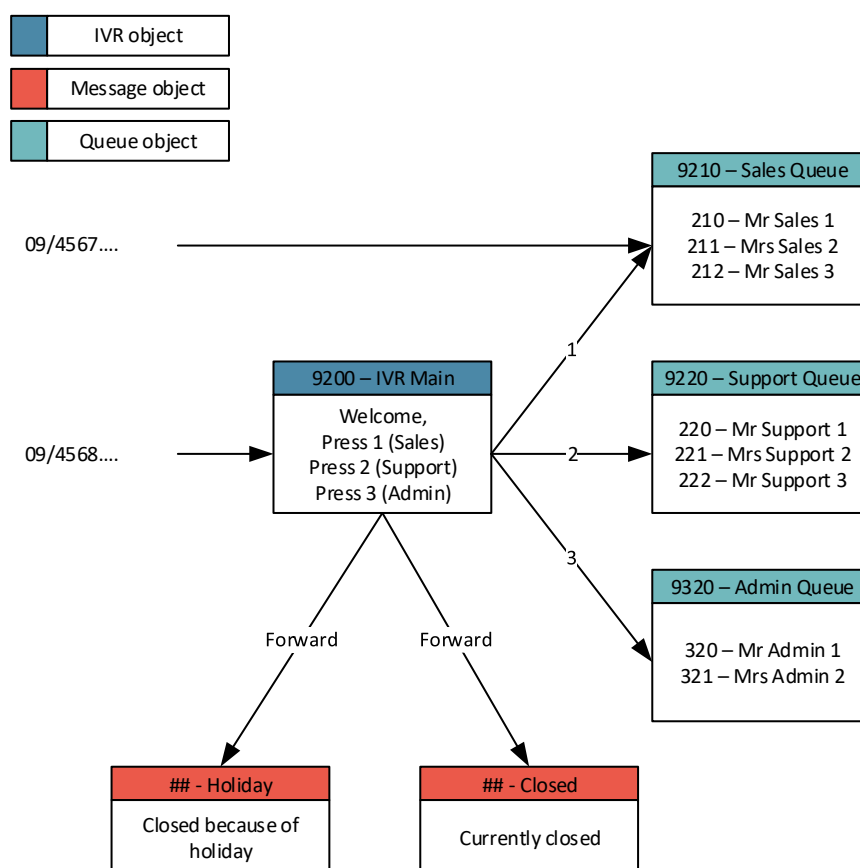
Figure 35 Example flow incoming calls

The example shows one IVR object, 2 Message objects and 3 Queue objects (with 3, 3 and 2 operators assigned). A call on the main number arrives in the IVR object. Outside office hours, the call moves to the message object "Closed". When the caller presses 3, the call moves to the Admin Queue object.

InnoStats provides reports on all of these individual queues.

Queue object call timers

This paragraph explains the lifecycle of a call in a Queue object. Assumption is made that the call is taken by an operator.
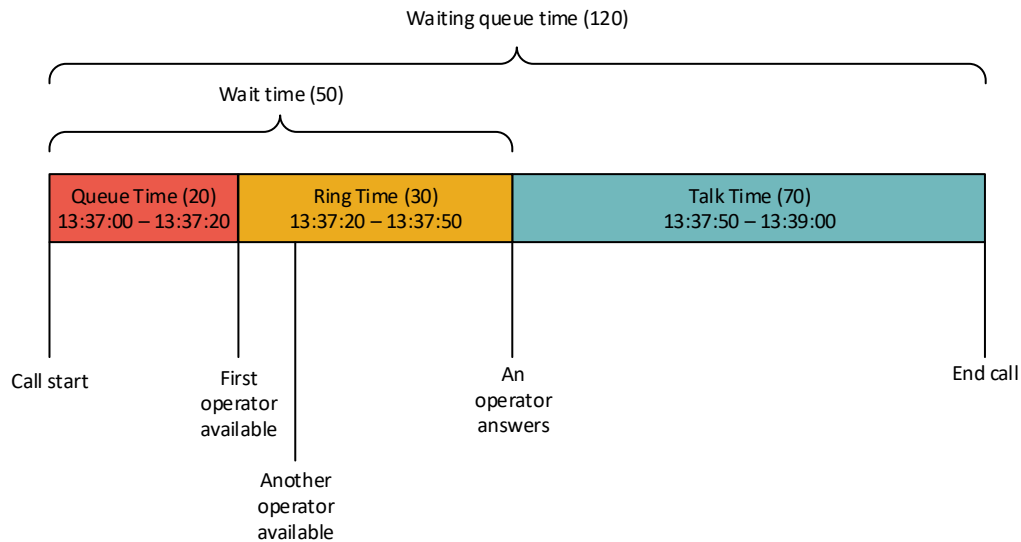
Figure 36 Queue timers

Call Start: the call arrives at the queue and waits for an operator to be handled. As long as there is no agent available, no telephone set will ring. When a first operator becomes available (First Agent Available), his/her telephone starts ringing. The time between Call Start and this event is called the Queue time. In the example, the call stayed 20 seconds in the queue. As long as the first free operator did not pick up the call, more agents may become available. Remember, the first operator's telephone set is still ringing. The time between First Agent Available and an operator picking up the phone is called the Ring Time (30" in the example). Some operators may 'refuse' the call; but this has no impact on the Ring Time; it runs until an operator picks up the phone. The Wait Time is the total time the caller had to wait before an operator answered the call, and is the sum of the Queue Time and the Ring Time.

Once connected to an operator, the Talk Time starts. In the example, the caller talked 70" with the operator before the call is "ended".

NOTE: ALTHOUGH THE CALL IS ENDED IN THE CONTEXT OF THIS QUEUE, THE CALL MIGHT SURVIVE BECAUSE MAYBE THE OPERATOR TRANSFERRED THE CALL TO ANOTHER OPERATOR IN THE SAME OR DIFFERENT QUEUE. INNOSTATS TREATS THIS AS A SECOND CALL.

The Waiting Queue Time is the sum of the Wait Time, the Ring Time and the Talk Time.

Abandoned and missed calls

Throughout the document, we'll talk about abandoned calls and missed calls. It's important to understand the difference between both. Refer to the figure in Queue object call timers on page 32.

- Abandoned call: the caller went on-hook during the Queue Time; that's before a first operator became available for taking the call in that specific queue

- Missed call: the caller went on-hook during the Ring Time; one or more operators were assigned, but did not take the call

Transferring and forwarding

Calls move from one state to another, from one queue to another. In the remainder of this manual, we'll talk about transferring and forwarding. Both refer to a call moving to a next state. The difference between both expressions is:

- A transfer is done by a human being (= operator); i.e. the operator transfers a call to a colleague, to another queue, to the voice mail…

  There are 3 types of transfers:
  - Cold transfer (sometimes referred as "blind" transfer): the operator dials the extension and goes on-hook (the call is transferred without knowing whether the other operator is available or not)
  - Warm transfer (sometimes referred to as "supervised" transfer): the operator takes a second line and dials the extension. After having talked to the other operator, he transfers the call (in fact the incoming leg and the outgoing leg are connected; as a result the caller now talks to the other operator)
  - Redirect: resembles a cold transfer, but no 2nd line is used and the initial call is not put on hold. The difference is clearly pure technical, but since the redirect is supported, it will also show in the reporting.

- A forward is initiated by the machine (= PBX)

  There are 2 types:
  - Direct forwarding
  - Delayed forwarding

  Let's have a look at an example to explain the forward principle.

  When defining a queue, one can set different call forwarding rules. The first one is called CFU (Call Forwarding Unconditional). If e.g. a call is moved to an "office closed" Message object, the call did not reside in the Queue. This action is referred to as a "direct forward".

  CFB (Call Forward Busy) is another queue setting and can be used in 2 different ways:

- Max number of calls: if you put 2 as a maximum number of calls in the queue, a 3rd call will be forwarded to whatever you have configured
- % on the number of operators: let's say, you put 200% and there are 2 operators. The CFB will be activated for the 5th call

In both scenario's, this is called a "direct forward", because the call did not stay in the queue.

CFNR finally stands for Call Forward No Response. This event is triggered when no operators are available in the queue for taking the call. If this happens from the start (arrival of the call), this will lead to a direct forward. If this happens while waiting (i.e. the last operator logs off from the queue), the call will be forwarded, but with a delay. The call did stay in the queue, hence we refer to this event as a "delayed forward".

Alert timeout

If you want to play a message in a queue, you can decide to not play it immediately. An alert timeout of 10" in the Innovaphone PBX will delay the start of the message with 10 seconds.
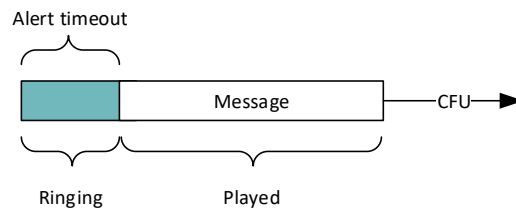
Figure 37 Alert timeout

Depending on where you are in the timeline, the Call Forward will give a different result in the reports: "Ringing" (or "Alerting") and "Played".

Reports introduction

Using the main menu

The InnoStats menu at the left can be used in 2 ways:

- <u>Full width</u>, with submenus below the menu items (left screenshot) and
- <u>Reduced width</u>, whereby the submenus appear when clicking on the menu icons (right screenshot)
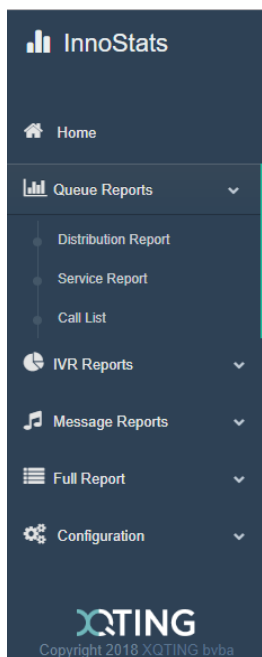
Figure 38 Main menu – full width
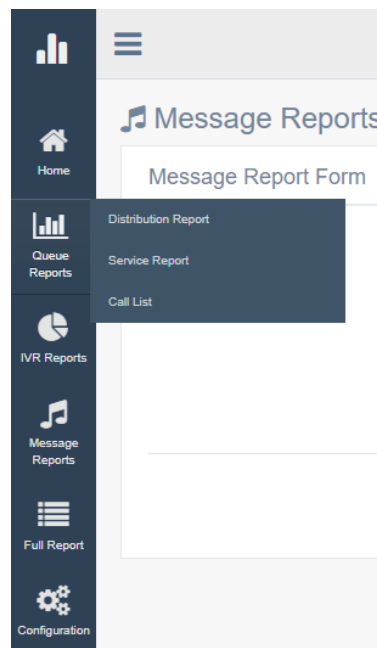
Figure 39 Main menu – reduced width

You can toggle between the 2 modes, by pressing the icon.

Types of report

The InnoStats main menu shows 4 Report section, one for each Waiting Queue type (Message, IVR and Queue objects) and one that combines the 3.

Depending on the section, 1, 2 or 3 types of report presentations are available: Call List, Distribution Report and Service Report.

	Call List	Distribution Report	Service Report
Message	v		
IVR	v	v	
Waiting	v	v	v
Full	v		

Call List: A straightforward list of calls with call details depending on which type of report (start call timestamp, Caller ID, Ring Time, Talk Time…). The Call list does not contain graphics/charts.

Distribution Report:	For an IVR object, this provides information on how many times a particular choice was made in the menu. It provides insights on usage of the IVR objects. For Queue objects, this report gives statistics about how many calls remained unanswered, the total talk time…
Service Report:	Available for Queue objects only. Provides information that allows you to check whether SLAs (Service Level Agreement) were met: e.g. how many calls were answered within 15", within 30"…

Common Parts

For each type of report, Innostats presents the below interface.

"Type" acts as a placeholder in the screenshot below, and is replaced by "Message(s)*", "IVR(s)*, "Waiting Queue(s)*" and "Waiting Queue(s) / IVR(s) / Message(s)*" according to the selected report section.

THE STAR BEYOND THE NAME OF THE FIELD INDICATES THAT THE FIELDS ARE MANDATORY.

In some cases (and we'll discuss them in the following paragraphs, additional fields are added.
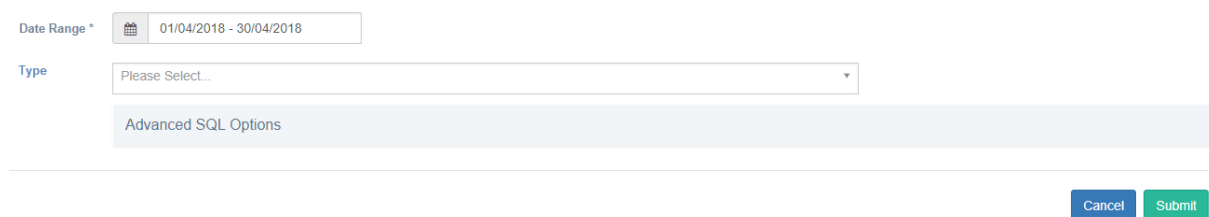
Figure 40 Report default input fields

Date Range

In the Date Range field, select the period for which you want to run the report. Default is the current month. Click in the Date Range field and a drop down list will appear:

Figure 41 Date Range field

All options are self-explanatory.

Remarks:

- "Today" is included when you select "Last 7 Days" and "Last 30 days"
- "This Month" includes all days of the current month – also the ones in the future!

Selecting "Custom" results in showing 2 date pickers:
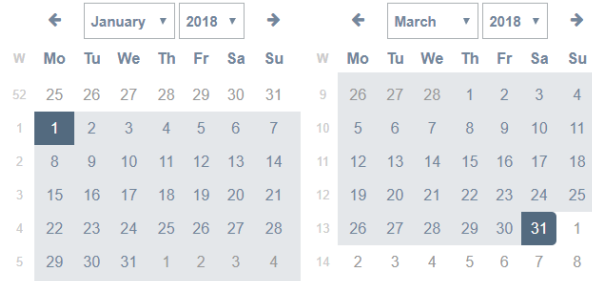
Figure 42 Date picker

Pick the From date and the To date and press the "Submit" button. As an alternative, you can enter the dates manually in the "FROM" and "TO" field at the bottom of the drop down list. Don't forget to confirm by pressing the "Submit" button.

"Type"

Remember, this is a placeholder for the different Waiting Queue object types.

In the "Type" field, you can select the Message(s) / IVR(s) / Waiting Queue(s) (or all) for which you want to run the report. Click on "Please Select" and a drop down list appears with all objects of that particular type defined in the PBX. You can Select all or select individual items. The below screenshot shows a drop down list for "Message(s)":
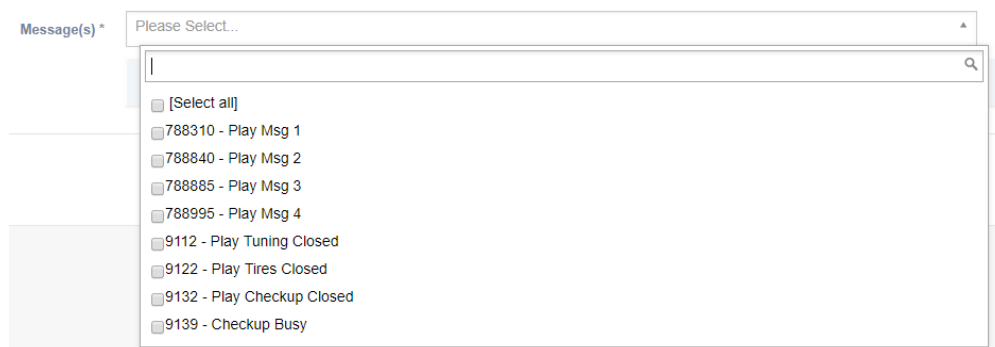
Figure 43 "Type" drop down list

You can quickly reduce the (sometimes) long list by typing in the entry field. The example gives all messages containing "88" in the name. By pressing "[Select all]", the 4 messages are selected. In order for this approach to work, you need to introduce some logic in naming of the queues.
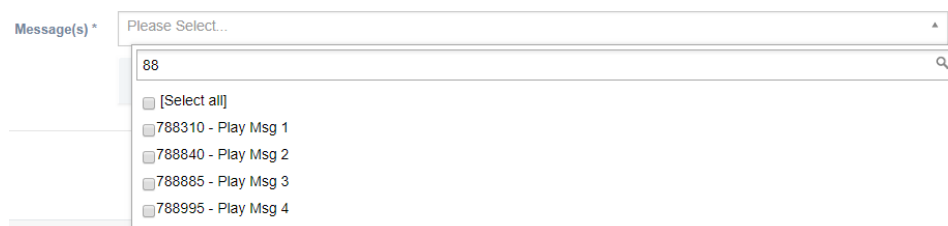
Figure 44 Reducing the number of items in the drop down list

Advanced SQL Options

A 3rd field is greyed out and is called "Advanced SQL Options". In this section you can refine your criteria and make an extra selection in the call list, distribution or service report.

This function is further discussed in Reports - advanced from page 42 onwards.

Report summary

The Date Range and "Type" are mandatory fields; as indicated by the star (*). Pressing the "Submit" button will result in a report of the selected type (Call List, Distribution Report or Service Report).

Each report in InnoStats starts with the same header:

- Report Summary: provides an overview of the input parameters that you have selected and entered previously (e.g. period and selection of messages). Although you did not enter advanced SQL, the Report Summary shows a condition (Waiting Queue object type – in this example "Message") that is used in the SQL command resulting in this report. This is for information only.

Figure 45 Report Summary

- Call Summary: totals on the calls that make a the report

  Example:

Figure 46 Call Summary

The Call Summary is explained for each report individually.

Report result

Finally, the result (Call List, Distribution Report or Service Report) is shown.

A Call List looks as follows:

Figure 47 Example Call List

The number of calls that match the selection criteria is mentioned at the bottom left. You can change the number of items that are shown on a page at the top left. Default value is 10; other values are 25, 50 and 100. Moving to the previous/next page in the list is done via the buttons at the bottom right.

A Distribution Report looks as follows:
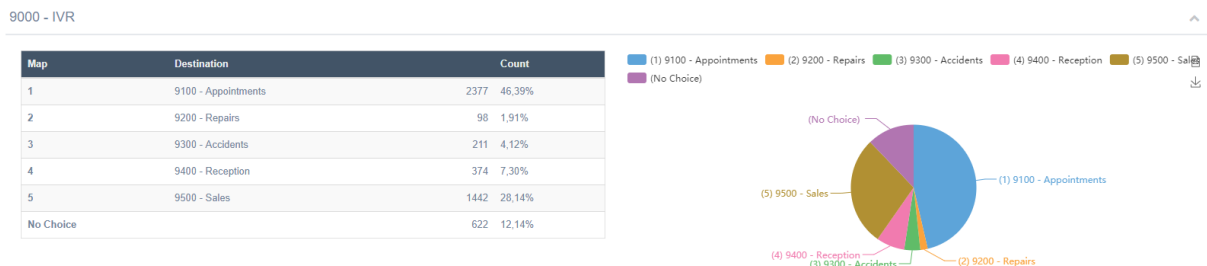
Figure 48 Example Distribution Report

The Pie chart gives a quick view on the selections made within an IVR object report.

A Service Report has a different look:

Figure 49 Example Service Report

It provides information on answering times of calls (refer to the SLA within your organization).

Each of these types will be discussed in full detail.

Tools

Within a report, at the right hand side of the screen, actions buttons might appear:

Figure 50 Gaph action buttons

Theses buttons have the following meaning:

📄	Raw data	shows the data values that build up the graph
📊	Bar chart	shows the data in a bar chart (default presentation)
〰	Line chart	same data, but presented in a line chart
🔷	Stacked	(works for both bar and line chart) shows the number of CDRs and number of calls on top of each other
⊞	Tiled	same as stacked, but values are next to each other
🔄	Restore	same as pressing the Home button at the top left: restores all default settings and presentation
⬇	Save as image	by clicking this button, you save the graph as an image, so that you can use it e.g. in a PowerPoint presentation A .png (Portable Network Graphics) file is generated and is available in the download folder of your workstation.

Graph manipulation

In the IVR Distribution Report, one or more pie charts are shown.
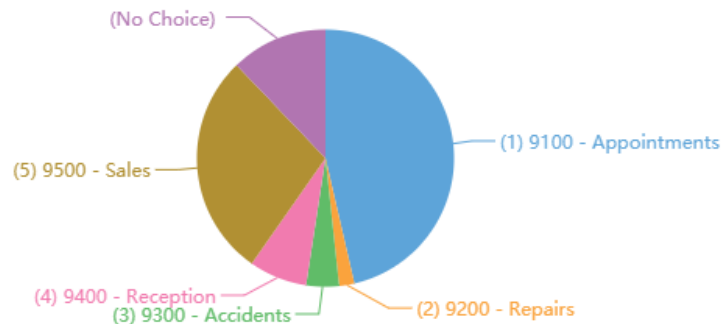
Figure 51 Pie chart

By pressing the colored buttons in front of the labels, you can add or delete the option from the pie chart. As an example, let's remove the "No choice" options from the chart. The result is a new chart with recalculation of the percentages.
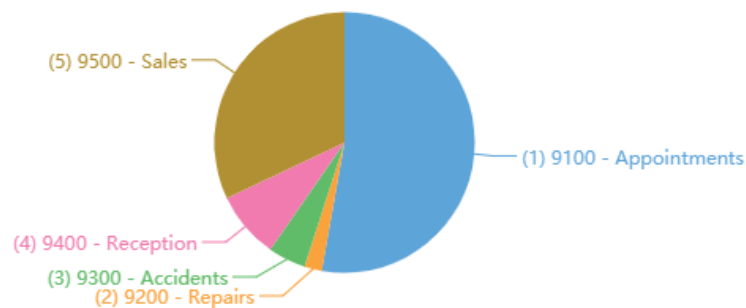
Figure 52 Pie chart: remove entry

The result is a distribution of the selections made in the main IVR menu – but not counting the calls in which no selection was made. By pressing the grey button in front of the "(No Choice)" label, you restore the situation.

Reports - advanced

Advanced SQL Options

As stated before, the Advanced SQL Options field allows you to refine your criteria and make an extra selection in the report. An example of when you would use this extra SQL option: you want to check whether a particular person (based on his/her CLIP) has called and received an "office closed" message.

Each condition consists of 3 parts:

- A parameter
- An operator
- A value

Parameter	Operator	Value
Call Type	Equal	Internal
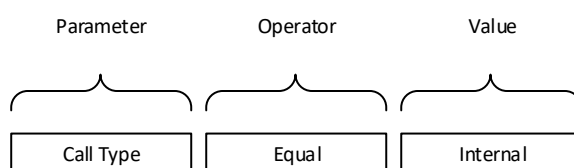
Figure 53 Advanced SQL – 3 parts

Or sometimes 4 parts:

Parameter	Operator	Value	Value
Message Time - Total	between	10	40
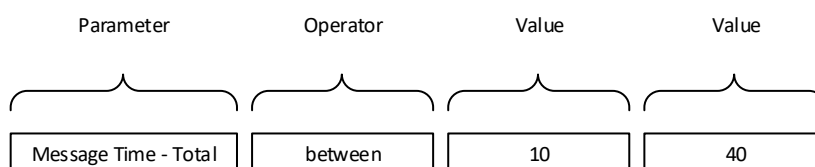
Figure 54 Advanced SQL – 4 parts

Parameters are different per type of report. They will be listed and discussed in the respective chapters.

The operators are listed below. The number and type of Operators are depending on the type of Parameter. E.g. for "Call Type" there are only 2 operators: "Equal" or "Not equal".

- Equal
- Not equal
- In
- Not in
- Begins with
- Doesn't begin with
- Contains
- Doesn't contain
- Ends with
- Doesn't end with
- Is empty
- Is not empty

- Is null
- Is not null
- Less
- Less or equal
- Greater
- Greater or equal
- Between
- Not between

The Value can be predefined or free to enter, and again, is depending on the type of parameter. E.g. for Call Type, the predefined values are "Internal" and "External". If you want information about calls coming from a specific caller, you select "Caller Number (E164)" as parameter, "equal" or "contains" as operator and enter the CLIP of the caller.

Figure 55 Advanced SQL Options

Add Rule / Add group

One can make complex conditions using the Advanced SQL interface. You start with a first condition:

Figure 56 Advanced SQL – first condition

By selecting "Caller – Type" and make it equal to "Internal", InnoStats will only take internal calls into account when preparing the report.

When clicking the "Add rule" button, an extra line is added to the SQL command. The example looks for calls where somebody pressed 1 in the particular IVR.

Figure 57 Advanced SQL – add rule

Because the "AND" button (top left) is selected, only calls that comply with the 2 conditions, will be selected. In this example it means: restrict to those internal calls that pressed 1 in the selected IVR. When selecting the "OR" button, all calls that comply with one (or both) of the 2 conditions are taken into consideration. In this example, selecting the "OR" would not make much sense; but in other situations, this might become very helpful.

It's possible to make the queries even more complex, by adding a new group of SQL conditions:

Figure 58 Advanced SQL – add group

And within each group, you can add rules. Be careful with this, because this can become rather complex. In the example, calls will be selected where the caller pressed 1 in the first IVR and pressed 2 in the second; i.e. it's possible to get a list of calls that followed a certain path within the flow of your PBX.

Message Reports

There is only one type of report available ("Call List") in the Message Report section. This list provides information on Message objects; e.g. the number of times a specific message has been plaid/listen to.

Figure 59 Message Reports

Call Summary

The Call summary for the Message Reports looks as:

Figure 60 Message Reports – Call Summary

The example states there were 2400 calls to the message queues. Note that in case the report runs over multiple message queues, this total does not provide much information, since it does not say anything about the individual message queues.

In all calls, the message was played. In almost 51% of the cases, after having played the message, the call was forwarded, e.g. to another Message object. In 49% of the cases the call ended after having played the message (e.g. office closed message followed by an on-hook by the PBX).

None of the calls were directly forwarded. An example case in which this value would be different from zero is when a CFU (Call Forwarding Unconditional) is activated.

Call List

Standard

An example Call List for the Message object looks like this:

Calls Overview

Show 10 entries

Date Time	Caller	Message	Ring Time	Connected Time	Message Time	Type	Result	Action	Action Destination	Action Result	Data
2018-03-01 08:11:26	004773077xx	9112 - Play Tuning Closed	0	15	15	Message	Played	Delayed Forward	77 - Voicemail	Connected	Q View
2018-03-01 08:58:01	004849480xx	9112 - Play Tuning Closed	0	15	15	Message	Played	Delayed Forward	77 - Voicemail	Connected	Q View
2018-03-01 11:01:58	86xx - Extension 86xx	788310 - Play Msg 1	0	5	5	Message	Played				Q View
2018-03-01 13:29:32	86xx - Extension 86xx	9139 - Checkup Busy	0	9	9	Message	Played	Delayed Forward	77 - Voicemail	Connected	Q View
2018-03-01 17:21:49	004798651xx	788310 - Play Msg 1	0	34	34	Message	Played				Q View
2018-03-01 18:18:17	00472xx45xx	9122 - Play Tires Closed	0	9	9	Message	Played				Q View
2018-03-01 18:20:48	004789053xx	9112 - Play Tuning Closed	0	6	6	Message	Played				Q View
2018-03-01 18:41:14	004782688xx	9122 - Play Tires Closed	0	6	6	Message	Played				Q View
2018-03-01 18:49:53	004723798xx	9112 - Play Tuning Closed	0	15	15	Message	Played	Delayed Forward	77 - Voicemail	Connected	Q View
2018-03-01 19:24:06	004872880xx	9112 - Play Tuning Closed	0	8	8	Message	Played				Q View

Showing 1 to 10 of 2,466 entries

Previous 1 2 3 4 5 … 247 Next

Figure 61 Message Reports – Call List

The resulting columns are:

REFER TO UNDERSTANDING PBX OPERATIONS ON PAGE 31 FOR TERMINOLOGY CLARIFICATION.

Date Time: timestamp on which the call enters the message queue

Caller: CLIP of the caller

Message: Number and name of the message, as defined in the PBX

Ring Time: if not zero, corresponds with the alert timeout

Connected Time: time the call was connected to the message queue

Message Time: time it took for the caller to listen to the message (equals the Connected Time)

Type: type of object ("Message")

Result: "Played"
                    "Ringing"
                    "Direct Forward"

Action: "Direct Forward"
                    "Delayed Forward"

Action Destination: destination of the forward action (e.g. queue, external number, voice mail…)

Action Result: result of the forward action
                    "Connected":
                    "Alerting": call was forwarded, it started to ring, but the call was not taken

Data: all CDRs linked to the call for this queue

Advanced SQL Options

Refer to Reports - advanced from page 42 onwards for more information on this advanced option.

Figure 62 Message Reports – Advanced SQL

Below is the list of parameters, operators and predefined values. If "Value(s) – predefined" is empty, you have to enter a value yourself (e.g. a CLIP).

Parameter	Operator(s)	Value(s) – predefined
Call – Type (preset & fixed)	equal	Message
Caller - Type	equal not equal	Internal External
Caller – Number (E164) Caller – Name (H323) Message – Number (E164) Message – Name (H323) Message – Name (CN)	equal not equal in not in begins with doesn't begin with contains doesn't contain ends with doesn't end with is empty is not empty is null is not null	
Message Time – Total Message Time – Alerting Message Time – Connected (Message Played)	equal not equal in not in less less or equal greater greater or equal between not between is null is not null	
Forward Destination – Type	equal not equal	Internal External
Forward Destination – Number (E164) Forward Destination – Name (H323)	equal not equal in not in	

	begins with doesn't begin with contains doesn't contain ends with doesn't end with is empty is not empty is null is not null	
Forward Destination – Result	equal not equal	Answered UnAnswered

IVR Reports

In the IVR Reports section, two options are available: "Call List" and "Distribution Report":
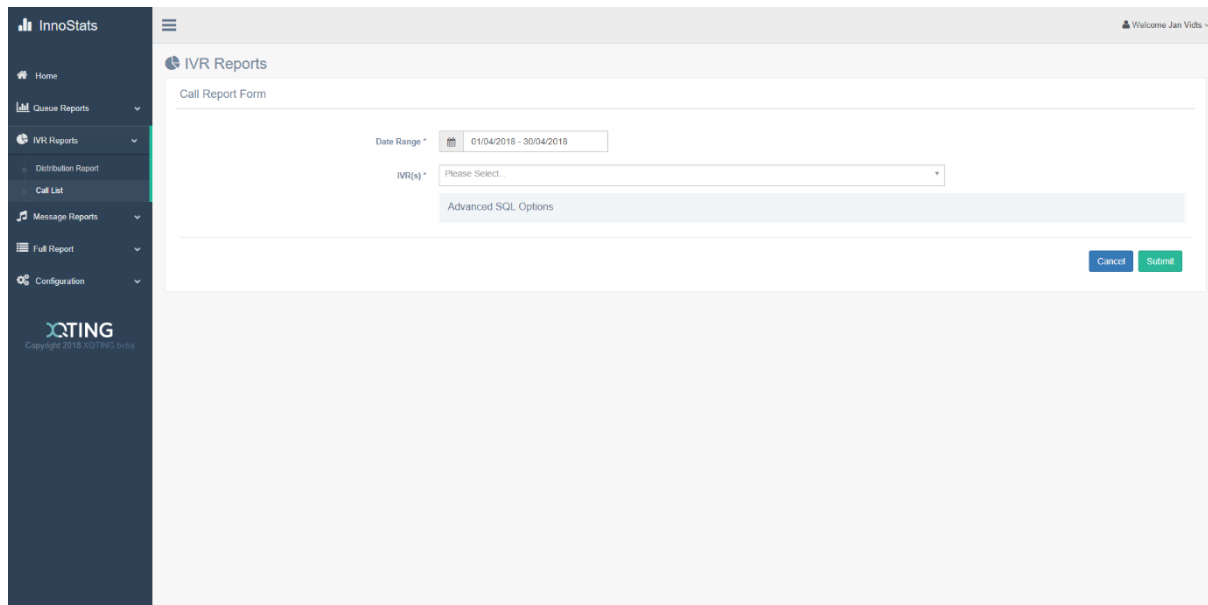
Figure 63 IVR Reports

Call Summary

The Call Summary header for the IVR Reports looks as follows:

Figure 64 IVR Reports – Call Summary

This example shows there were 33.957 calls to the IVR(s). In 90,97% of the calls, the caller entered a DTMF choice. In the 3.067 remaining calls, there was "no action" from the caller, nor from the PBX. Possible PBX actions are "Forwarded (No choice)" and Direct Forward. In this example no forward events were triggered for the calls processed in this report.

Call List

Standard

An example Call List for Messages looks like this:

Calls Overview

Date Time	Caller	IVR	Ring Time	Connected Time	IVR Time	Type	Result	Action	Action Destination	Action Result	Data
2018-03-01 06:47:04	004754557xx	9000 - IVR	0	18	18	IVR	DTMF	DTMF 3	9300 - Accidents	IVR-Transferred	🔍 View
2018-03-01 06:52:11	Restrictxx	9000 - IVR	0	20	20	IVR	DTMF	DTMF 3	9300 - Accidents	IVR-Transferred	🔍 View
2018-03-01 07:21:44	004754557xx	9000 - IVR	0	7	7	IVR	DTMF	DTMF 3	9300 - Accidents	IVR-Transferred	🔍 View
2018-03-01 07:42:38	00682505xx	9000 - IVR	0	15	15	IVR	DTMF	DTMF 3	9300 - Accidents	IVR-Transferred	🔍 View
2018-03-01 08:08:44	85xx - Extension 85xx	9402 - Play Reception Closed	0	3	3	IVR	Abandoned				🔍 View
2018-03-01 08:24:45	004849235xx	9000 - IVR	0	19	19	IVR	DTMF	DTMF 3	9300 - Accidents	IVR-Transferred	🔍 View
2018-03-01 08:54:33	004754557xx	9000 - IVR	0	8	8	IVR	DTMF	DTMF 3	9300 - Accidents	IVR-Transferred	🔍 View
2018-03-01 09:08:38	004767039xx	9000 - IVR	0	11	11	IVR	DTMF	DTMF 1	9100 - Appointments	IVR-Transferred	🔍 View
2018-03-01 09:08:49	004767039xx	9100 - Appointments	0	31	31	IVR	DTMF	DTMF 2	9120 - Tires	IVR-Transferred	🔍 View
2018-03-01 09:11:55	004835992xx	9000 - IVR	0	11	11	IVR	DTMF	DTMF 1	9100 - Appointments	IVR-Transferred	🔍 View

Showing 1 to 10 of 36,875 entries

Previous 1 2 3 4 5 … 3688 Next

Figure 65 IVR Reports – Call List

The resulting columns are:

REFER TO UNDERSTANDING PBX OPERATIONS ON PAGE 31 FOR TERMINOLOGY CLARIFICATION.

Date Time:	timestamp on which the call enters the message queue
Caller:	CLIP of the caller
IVR:	Number and name of the IVR, as defined in the PBX
Ring Time:	if not zero, corresponds with the alert timeout
Connected Time:	time the call was connected to the IVR object
IVR Time:	time it took for the caller to listen to the message (equals the Connected Time)
Type:	type of queue ("IVR")
Result:	"DTMF": the caller entered a DTMF "Direct Forward": "Delayed Forward": "Abandoned": caller went on-hook during the IVR
Action:	"DTMFxx" which option was selected by the caller (via DTMF input)
Action Destination:	destination of the forward action, this can be another IVR object, or a Queue object…
Action Result:	result of the forward action "IVR transferred":
Data:	all CDRs linked to the call for this queue

Advanced SQL Options

Refer to Reports - advanced from page 42 onwards for more information on this advanced option.
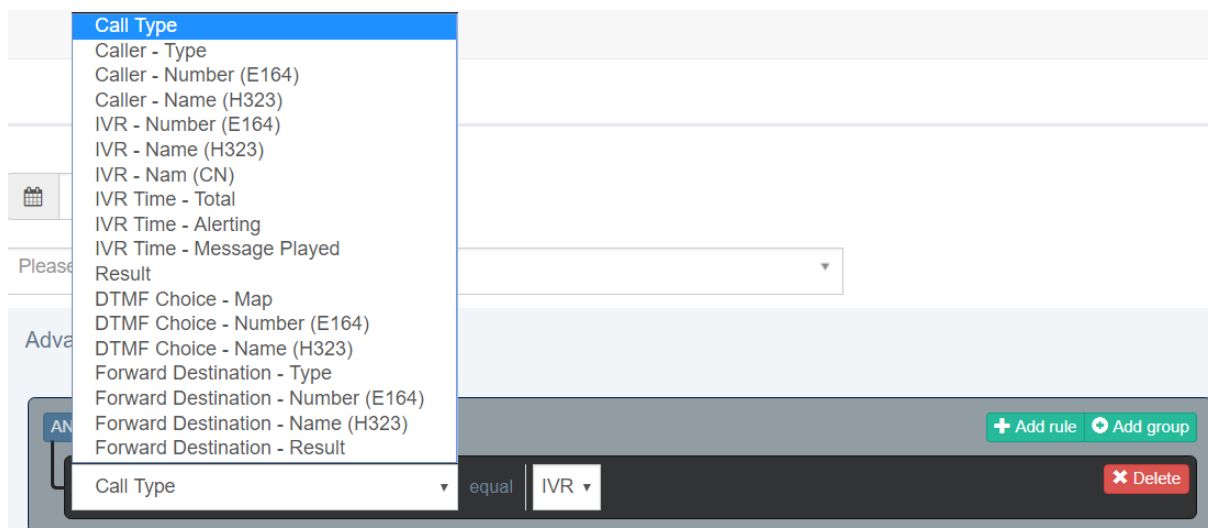
Figure 66 IVR Reports – Advanced SQL

Below is the list of parameters, operators and predefined values.

Parameter	Operator(s)	Value(s) – predefined
Call – Type (preset & fixed)	equal	IVR
Caller - Type	equal not equal	Internal External
Caller – Number (E164) Caller – Name (H323) IVR – Number (E164) IVR – Name (H323) IVR – Name (CN)	equal not equal in not in begins with doesn't begin with contains doesn't contain ends with doesn't end with is empty is not empty is null is not null	
IVR Time – Total IVR Time – Alerting IVR Time – Message Played	equal not equal in not in less less or equal greater greater or equal between not between is null is not null	
Result	equal not equal is empty is not empty is null is not null	User Selection User Abandoned Direct Forward by PBX Delayed Forward by PBX
DTMF Choice – Map DTMF Choice – Number (E164) DTMF Choice – Name (H323)	equal not equal in not in	

	begins with doesn't begin with contains doesn't contain ends with doesn't end with is empty is not empty is null is not null	
Forward Destination – Type	equal not equal	Internal External
Forward Destination – Number (E164) Forward Destination – Name (H323)	equal not equal in not in begins with doesn't begin with contains doesn't contain ends with doesn't end with is empty is not empty is null is not null	
Forward Destination – Result	equal not equal	Answered UnAnswered

Distribution Report

Standard

An example Distribution Report for IVR(s) looks like this:
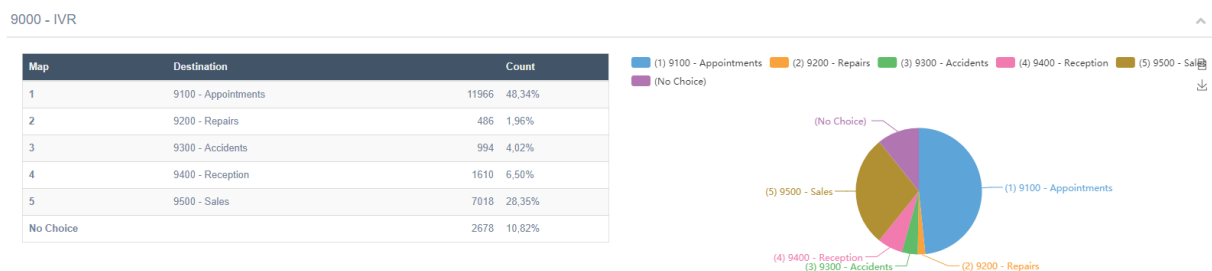
Figure 67 IVR Reports – Distribution Report

If you selected more than one IVR in the IVR(s) drop down list, the above figure is repeated for each IVR. The presented information is linked to the content of the IVR object and corresponds with the available valid DTMF choices a caller can make.

Advanced SQL Options

The Advanced SQL Options are the same as for the IVR Reports - Call List (refer to page 50).

Queue Reports

In Queue Reports, 3 types can be selected: Call List, Distribution Report and Service Report.

Figure 68 Queue Reports

Call Summary

The Call Summary header for the Queue Reports looks as follows:

Call Summary				
Inbound Calls	**61605**	**100,00%**		
Answered Calls	**41902**	**68,02%**	**100,00%**	
No Transfer	33834		80,75%	
Transfer	8068		19,25%	*100,00%*
Blind Transfer	*6693*			*82,96%*
Warm Transfer	*776*			*9,62%*
Redirect	*599*			*7,42%*
Unanswered Calls	**11183**	**18,15%**	**100,00%**	
Abandoned	7184		64,24%	
Missed	3999		35,76%	*100,00%*
Not Forwarded	*2693*			*67,34%*
Forwarded	*1306*			*32,66%*
Direct Forwarded Calls	**8520**	**13,83%**		

Figure 69 Queue Reports – Call Summary

There were 61.605 calls to Queue(s) over the selected period:

- 41.902 calls were answered
  - 80,75% of the answered calls were treated (& finished) by the first operator
  - In 19,25% of the cases, the operator transferred the call
    - In 6.693 cases (= 82,96%), it was a blind transfer
    - 776 times the operator initiated a warm transfer
    - In the remaining 599 cases (7,42%), the call was redirected
- 11.183 calls remained unanswered
  - In 64,24% of the cases the call was abandoned by the caller (the caller went on-hook before the first operator became available for taking the call)
  - In 3.999 cases, the call was registered as "missed" (i.e. the caller went on-hook during the Ring Time; one or more operators were assigned, but did not take the call)
    - Out of the 3.999 calls, 1.306 were forwarded (32,66%)
    - While the remaining part was not forwarded
- In 13,83% of the cases (8.520 calls), the PBX did a direct forward (e.g. a call outside the office hours is typically forwarded to a message object)

Call List

Standard

An example Call List for Queue(s) looks like this:

Calls Overview

Show 10 entries

Date Time	Caller	Waiting Queue	Agent	Queue Time	Ring Time	Wait Time	Talk Time	WQ Time	Answered	Result	Action	Action Destination	Action Result	Data
2018-03-01 03:08:50	88xx - Extension 88xx	9208 - Repairs closed	8554 - Repairs 4	0	9	10	11	21	true	Operator				Q View
2018-03-01 04:12:40	88xx - Extension 88xx	9208 - Repairs closed	8554 - Repairs 4	0	20	21	10	31	true	Operator				Q View
2018-03-01 04:36:54	85xx - Extension 85xx	9208 - Repairs closed	8554 - Repairs 4	0	8	9	35	44	true	Operator				Q View
2018-03-01 05:34:55	004772703xx	9300 - Accidents	8600 - Accidents 1	0	5	5	62	67	true	Operator				Q View
2018-03-01 05:45:34	00224397xx	9300 - Accidents	8600 - Accidents 1	0	5	5	12	17	true	Operator				Q View
2018-03-01 05:50:48	004772703xx	9300 - Accidents	8600 - Accidents 1	0	4	4	19	23	true	Operator				Q View
2018-03-01 06:19:38	004772703xx	9300 - Accidents	8600 - Accidents 1	0	5	5	39	44	true	Operator				Q View
2018-03-01 06:47:22	004754557xx	9300 - Accidents	8608 - Accidents 3	0	27	27	93	120	true	Operator				Q View
2018-03-01 06:52:31	Restrictxx	9300 - Accidents	8608 - Accidents 3	0	21	21	40	61	true	Operator				Q View
2018-03-01 07:21:51	004754557xx	9300 - Accidents	8600 - Accidents 1	0	15	15	111	126	true	Operator				Q View

Showing 1 to 10 of 67,587 entries

Previous 1 2 3 4 5 … 6759 Next

Figure 70 Queue Reports – Call List

The resulting columns are:

REFER TO UNDERSTANDING PBX OPERATIONS ON PAGE 31 FOR TERMINOLOGY CLARIFICATION.

Date Time: timestamp on which the call enters the message queue

Caller: CLIP of the caller

Waiting Queue: Number and name of the Queue object, as defined in the PBX

Agent: Number and name of the operator who answered the call

Queue Time:	Time the caller had to wait before the first operator became available to take the call
Ring Time:	Time between the first operator becoming available and an operator answering the call
Wait Time:	Queue Time + Ring Time
Talk Time:	Time the caller was talking to the operator
WQ Time:	Sum of Wait Time and Talk Time
Answered:	"True" "False"
Result:	"Operator": an operator took the call "Pickup": telephone set of the operator was ringing, but somebody else took the call "Missed": "Abandoned": "Direct Forward":
Action:	"Cold Transfer" "Warm Transfer" "Redirect" "Direct Forward" "Delayed Forward"
Action Destination:	destination of the forward action (e.g. queue, external number, voice mail…)
Action Result:	"Alerting" "Connected" "Returned": call is returned to the originator because it was not answered in time (recall timeout setting)
Data:	all CDRs linked to the call for this queue

Advanced SQL Options

Refer to Reports - advanced from page 42 onwards for more information on this advanced option.
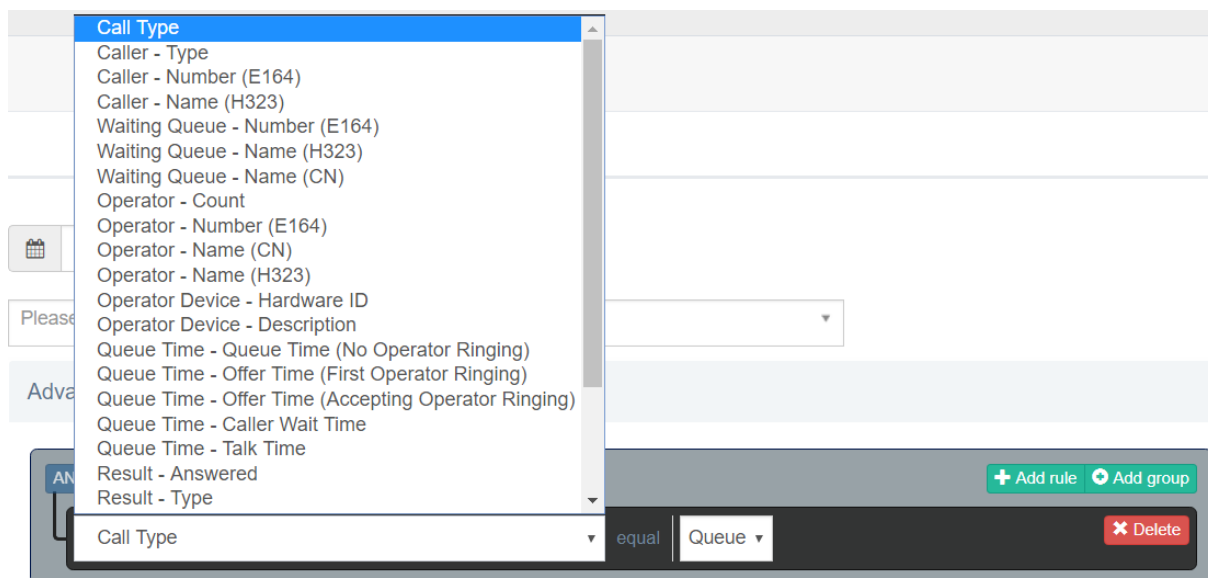
Figure 71 Queue Reports – Advanced SQL

Below is the list of parameters, operators and predefined values.

Parameter	Operator(s)	Value(s) – predefined
Call – Type (preset & fixed)	equal	Queue
Caller - Type	equal not equal	Internal External
Caller – Number (E164) Caller – Name (H323) Waiting Queue – Number (E164) Waiting Queue – Name (H323) Waiting Queue – Name (CN)	equal not equal in not in begins with doesn't begin with contains doesn't contain ends with doesn't end with is empty is not empty is null is not null	
Operator – Count	equal not equal in not in less less or equal greater greater or equal between not between is null is not null	
Operator – Number (E164) Operator – Name (CN) Operator – Name (H323) Operator Device – Hardware ID Operator Device – Description	equal not equal in not in begins with doesn't begin with contains doesn't contain	

	ends with doesn't end with is empty is not empty is null is not null	
Queue Time – Queue Time (No Operator Ringing) Queue Time – Offer Time (First Operator Ringing) Queue Time – Offer Time (Accepting Operator Ringing) Queue Time – Caller Wait Time Queue Time – Talk Time	equal not equal in not in less less or equal greater greater or equal between not between is null is not null	
Result – Answered	equal not equal	Answered Unanswered
Result - Type	equal not equal	Answered by Agent Answered by Pickup Abandoned (No Agent available) Missed Answered
Action – Category	equal not equal is empty is not empty is null is not null	Transfer Forward
Action – Type	equal not equal is empty is not empty is null is not null	Blind Transfer Warm Transfer Redirect Direct Forward Delayed Forward
Action – Destination – Type	equal not equal	Internal External
Action – Destination – Number (E164) Action – Destination – Name (H323)	equal not equal in not in begins with doesn't begin with contains doesn't contain ends with doesn't end with is empty is not empty is null is not null	
Action – Result	equal not equal	Unanswered – Alerting Unanswered – Returned Answered

Distribution Report

Standard

To prepare this report, you need to enter a value for an additional field: "Parts". The predefined values are:

- By Queue
- By Month
- By Week
- By Day
- By Hour
- By Day Of Week
- Total (always marked yes)

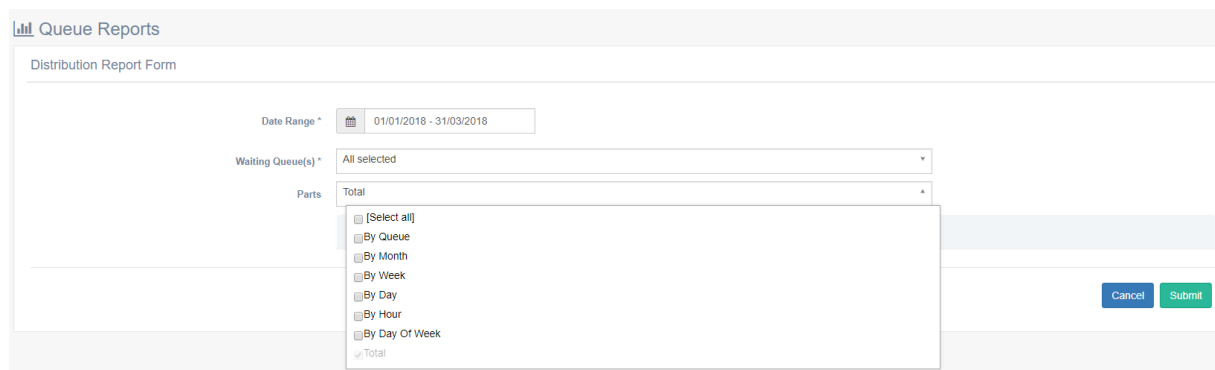The [Select all] marks all choices by one click.

Figure 72 Queue Reports – Distribution Report – extra fields

The meaning of this Parts parameters becomes clear when showing the examples.

As "Total" is always marked, InnoStats first shows the total number of calls followed by a subdivision according to how the call was treated. A call is answered, remains unanswered or is immediately forwarded. For each category, InnoStats shows numbers and percentages.

- Answered: the call was answered by an operator
  - No transfer: call was ended by operator or caller
  - Transfer: operator transferred the call to another operator, a queue…
- Unanswered: call did not reach an operator
  - Abandoned: the caller went on-hook during the Queue Time; that's before a first operator became available for taking the call in that specific queue
  - Missed: the caller went on-hook during the Ring Time; one or more operators were assigned, but did not take the call
- Direct Forward: PBX has forwarded the call (e.g. to a message object because the call was outside office hours)
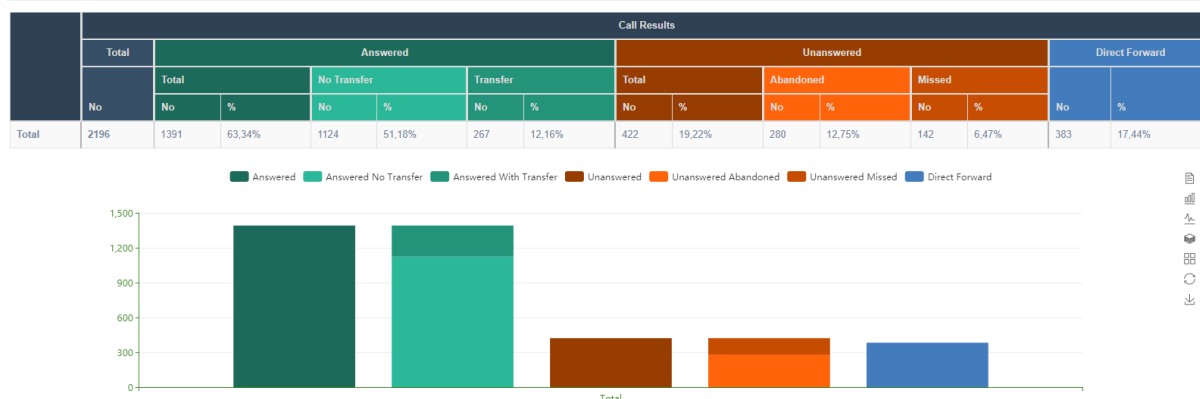
Total - Calls

	Call Results													
	Total	Answered						Unanswered						Direct Forward
		Total		No Transfer		Transfer		Total		Abandoned		Missed		
	No	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Total	2196	1391	63,34%	1124	51,18%	267	12,16%	422	19,22%	280	12,75%	142	6,47%	383	17,44%

Figure 73 Queue Reports – Distribution Report – Calls

The second graph shows information about "times": what is the total time callers had to wait, or maybe more useful: what is the average time callers had to wait in a particular queue.

4 timers are shown: Queue Time, Ring Time, Wait Time, Talk Time. Refer to Queue object call timers on page 32 for an explanation on these timers.

ACCORDING TO THE DEFINITION, WAIT TIME SHOULD BE THE SUM OF QUEUE TIME AND RING TIME. THIS IS NOT THE CASE IN THE BELOW EXAMPLE AND IS MERELY DUE TO ROUNDING ERRORS.
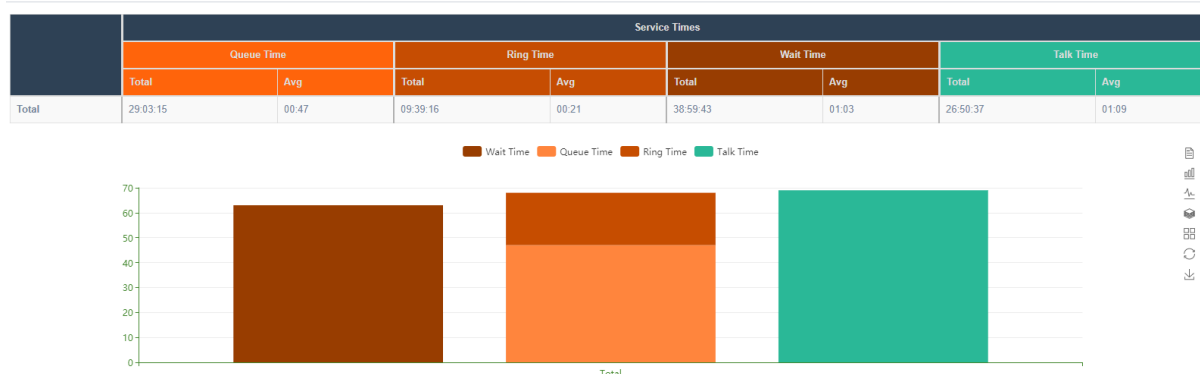
Total - Service Times

	Service Times							
	Queue Time		Ring Time		Wait Time		Talk Time	
	Total	Avg	Total	Avg	Total	Avg	Total	Avg
Total	29:03:15	00:47	09:39:16	00:21	38:59:43	01:03	26:50:37	01:09

Figure 74 Queue Reports – Distribution Report – Service Times

Coming back now to the "Parts" parameter. These 2 sections ("Total – Calls" and "Total – Service Times" are repeated for each value that you have selected.

"By Month" results in the below graph. 3 months were selected in the "Date Range"; the results shows 3 lines, one for each month ("January 2018", "February 2018" and "March 2018"). In the lower part, the bar charts are repeated for each month. Note that in the below example the "Answered" column is not shown but a stacked "Answered No Transfer" with "Answered With Transfer" as this gives the same total. Same applies for "Unanswered".

By Month - Calls

	Call Results													
	Total	Answered						Unanswered					Direct Forward	
		Total		No Transfer		Transfer		Total		Abandoned		Missed			
Month	No	No	%	No	%	No	%	No	%	No	%	No	%	No	%
January 2018	25105	17400	69,31%	14089	56,12%	3311	13,19%	4392	17,49%	2848	11,34%	1544	6,15%	3313	13,20%
February 2018	22630	15043	66,47%	12184	53,84%	2859	12,63%	4383	19,37%	2843	12,56%	1540	6,81%	3204	14,16%
March 2018	13870	9459	68,20%	7561	54,51%	1898	13,68%	2408	17,36%	1493	10,76%	915	6,60%	2003	14,44%
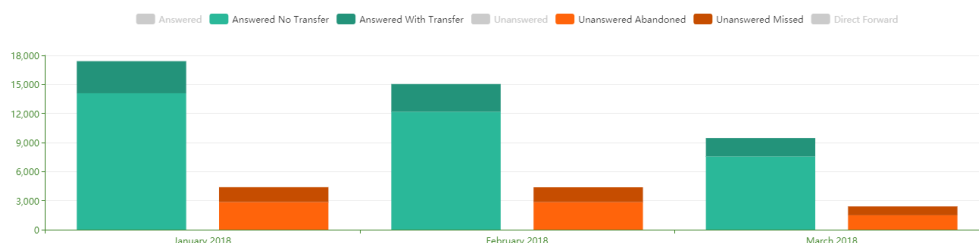
Figure 75 Queue Reports – Disribution Report – By month

The remaining Parts values "By Queue", "By Week", "By Day", "By Hour" (shows 24 lines for each hour of the day, allowing to look for peak moments) and "By Day of Week" result in similar presentations.

Advanced SQL Options

The Advanced SQL Options are the same as for the IVR Reports - Call List (refer to page 55).

Service Report

Standard

The Service Report on Waiting Queues needs 3 additional parameters.

Figure 76 Queue Reports – Service Report – extra fields

"Report Parts": possible values: "Queue Time", "Ring Time", "Wait Time" and "Talk Time". Interpretation of the data for each of these parts is explained below.

"Service Interval (Sec)": default 15" – the report shows how many calls were answered within 15", within 30" (2 x 15"), within 45" (3 x 15") etc

"Service Interval (Count)": default 12 – this defines the number of lines in the report. With a Service Interval of 15", the last line will be "within 180 sec" (180" = 15" x 12). In fact, it's not the last line because the report is closed by a "Longer" line, gathering all calls that are not in one of the above intervals.

Let's start with looking at the Wait Time data. Remember, the Wait Time equals Queue Time + Ring Time (Refer to Figure 36 Queue timers on page 32). Or in other words, the total time a caller waits before getting in touch with an operator.

Wait Time

Interval	Delta						Count					
	All		Answered		UnAnswered		All		Answered		Unanswered	
	No	%	No	%	No	%	No	%	No	%	No	%
Within 15 sec	9435	30,66%	6314	66,92%	3121	33,08%	9435	30,66%	6314	66,92%	3121	33,08%
Within 30 sec	4773	15,51%	2660	55,73%	2113	44,27%	14208	46,17%	8974	63,16%	5234	36,84%
Within 45 sec	2428	7,89%	1913	78,79%	515	21,21%	16636	54,06%	10887	65,44%	5749	34,56%
Within 60 sec	1791	5,82%	1579	88,16%	212	11,84%	18427	59,88%	12466	67,65%	5961	32,35%
Within 75 sec	1534	4,98%	1309	85,33%	225	14,67%	19961	64,86%	13775	69,01%	6186	30,99%
Within 90 sec	1177	3,82%	1074	91,25%	103	8,75%	21138	68,69%	14849	70,25%	6289	29,75%
Within 105 sec	1117	3,63%	997	89,26%	120	10,74%	22255	72,32%	15846	71,20%	6409	28,80%
Within 120 sec	823	2,67%	763	92,71%	60	7,29%	23078	74,99%	16609	71,97%	6469	28,03%
Within 135 sec	793	2,58%	698	88,02%	95	11,98%	23871	77,57%	17307	72,50%	6564	27,50%
Within 150 sec	703	2,28%	642	91,32%	61	8,68%	24574	79,85%	17949	73,04%	6625	26,96%
Within 165 sec	590	1,92%	549	93,05%	41	6,95%	25164	81,77%	18498	73,51%	6666	26,49%
Within 180 sec	585	1,90%	497	84,96%	88	15,04%	25749	83,67%	18995	73,77%	6754	26,23%
Longer	5026	16,33%	4210	83,76%	816	16,24%	30775	100,00%	23205	75,40%	7570	24,60%

Figure 77 Queue Reports – Service Report – Wait Time

There are 2 parts in the report: in the "Count" part, values from the "Delta" part are accumulated. The "Within 45 sec" line in "Delta" shows the number of calls that were answered/unanswered between 30" and 45", while in "Count" it shows the number of calls that were answered/unanswered between 0" and 45".

Unanswered within 15" sounds a little strange, but it represents the calls that were abandoned or missed (refer to the Waiting Queue Distribution Report).

The table with data is followed by a graph. The graph shows the values in the "Delta" section.
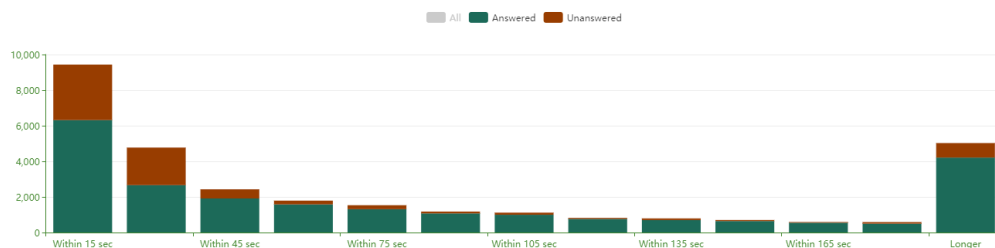
Chart

Figure 78 Queue Reports – Service Report – Wait Time – graph

Interpretation of the data in the other section is different. The line "Within 15 sec" shows:

- in "Queue Time": the number of calls for which an operator became available within 15". This however does not mean that the call was answered by an operator within 15". Calls for which the Queue Time is zero, are not counted.
- in "Ring Time": the number of calls for which the time between the first operator becoming available and the effective answering of the call is below 15"
- in "Talk Time": the number of calls where the Talk Time (i.e. the time of interaction between operator and caller) is below 15"

Advanced SQL Options

The Advanced SQL Options are the same as for the IVR Reports - Call List (refer to page 55).

Full Report

Finally, the Full Report section contains only one report: the Call List.

Figure 79 Full Report

Call Summary

The Call Summary for the Full Report is equal to the one for the Queue Reports. For explanation on the different entries, please refer to Call Summary on page 53.

Call Summary

Inbound Calls	**61605**	**100,00%**		
Answered Calls	**41902**	**68,02%**	**100,00%**	
No Transfer	33834		80,75%	
Transfer	8068		19,25%	100,00%
Blind Transfer	*6693*			*82,96%*
Warm Transfer	*776*			*9,62%*
Redirect	*599*			*7,42%*
Unanswered Calls	**11183**	**18,15%**	**100,00%**	
Abandoned	7184		64,24%	
Missed	3999		35,76%	100,00%
Not Forwarded	*2693*			*67,34%*
Forwarded	*1306*			*32,66%*
Direct Forwarded Calls	**8520**	**13,83%**		

Figure 80 Full Report – Call Summary

Call List

In the Waiting Queue(s) / IVR(s) / Message(s) field, you can make a selection in all available objects. If in this field, you only select the IVR objects, you'll get the same result as the IVR Call List Report.

Standard

The report looks as follows:

Figure 81 Full Report – Call List

The resulting columns are:

REFER TO UNDERSTANDING PBX OPERATIONS ON PAGE 31 FOR TERMINOLOGY CLARIFICATION.

Date Time:	timestamp on which the call enters the Queue, IVR or Message object
Caller:	CLIP of the caller
Waiting Queue:	Number and name of the Queue, IVR or Message object, as defined in the PBX
Agent:	Number and name of the operator who answered the call
Queue Time:	Time the caller had to wait before an operator became available to take the call
Ring Time:	Time between the first operator becoming available and an operator answering the call
Wait Time:	Queue Time + Ring Time
Talk Time:	Time the caller was talking to the operator
WQ Time:	Sum of Wait Time and Talk Time
Type:	type of object ("Queue" or "IVR" or "Message")
Answered:	"True" "False"

Result: "Played"
                "Ringing"
                "Direct Forward"
                "Delayed Forward"
                "DTMF"
                "Abandoned"
                "Operator"
                "Pickup"
                "Missed"

Action: "Direct Forward"
                "Delayed Forward"
                "DTMF xx"
                "Cold Transfer"
                "Warm Transfer"
                "Redirect"

Action Destination: destination of the forward action (e.g. queue, external number, voice mail…)

Action Result: "Connected"
                "Alerting"
                "IVR-transferred"
                "Returned"

Data: all CDRs linked to the call for this queue

Advanced SQL Options
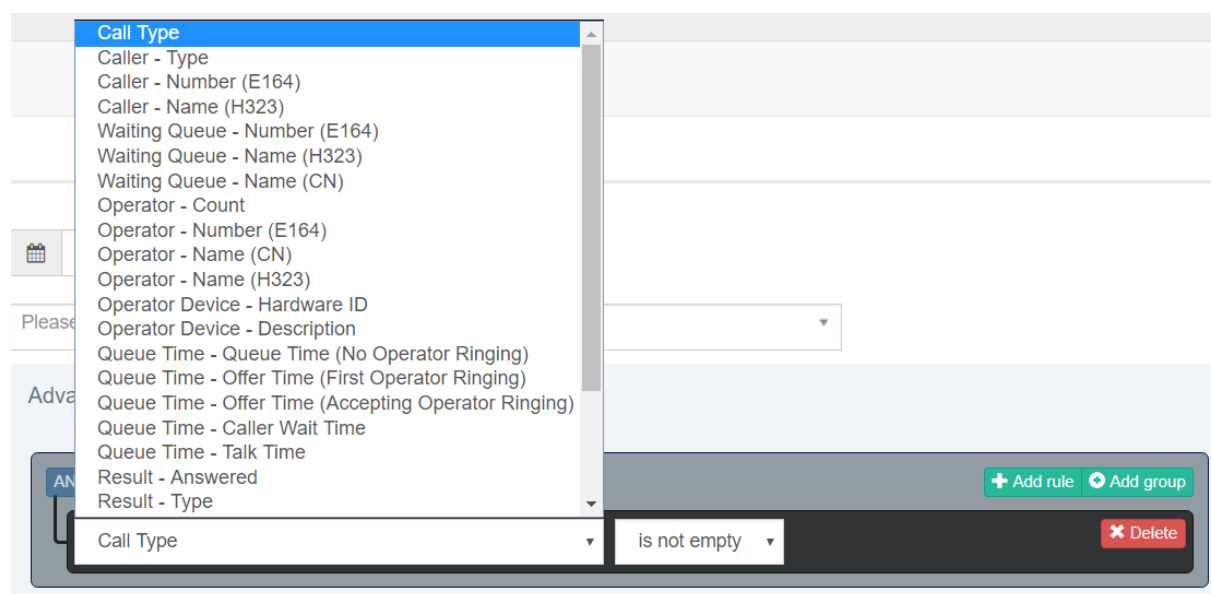
Figure 82 Full Report – Advanced SQL

Below is the list of parameters, operators and predefined values.

Parameter	Operator(s)	Value(s) – predefined
Call – Type (preset & fixed)	equal	Queue
Caller - Type	equal	Internal

	not equal	External
Caller – Number (E164) Caller – Name (H323) Waiting Queue – Number (E164) Waiting Queue – Name (H323) Waiting Queue – Name (CN)	equal not equal in not in begins with doesn't begin with contains doesn't contain ends with doesn't end with is empty is not empty is null is not null	
Operator – Count	equal not equal in not in less less or equal greater greater or equal between not between is null is not null	
Operator – Number (E164) Operator – Name (CN) Operator – Name (H323) Operator Device – Hardware ID Operator Device – Description	equal not equal in not in begins with doesn't begin with contains doesn't contain ends with doesn't end with is empty is not empty is null is not null	
Queue Time – Queue Time (No Operator Ringing) Queue Time – Offer Time (First Operator Ringing) Queue Time – Offer Time (Accepting Operator Ringing) Queue Time – Caller Wait Time Queue Time – Talk Time	equal not equal in not in less less or equal greater greater or equal between not between is null is not null	
Result – Answered	equal not equal	Answered Unanswered
Result - Type	equal not equal	Answered by Agent Answered by Pickup Abandoned (No Agent available) Missed Answered
Action – Category	equal not equal	Transfer Forward

	is empty is not empty is null is not null	
Action – Type	equal not equal is empty is not empty is null is not null	Blind Transfer Warm Transfer Redirect Direct Forward Delayed Forward
Action – Destination – Type	equal not equal	Internal External
Action – Destination – Number (E164) Action – Destination – Name (H323)	equal not equal in not in begins with doesn't begin with contains doesn't contain ends with doesn't end with is empty is not empty is null is not null	
Action – Result	equal not equal	Unanswered – Alerting Unanswered – Returned Answered

Home page information

Once InnoStats is operational, the home page will show operational data. This has nothing to do with the reporting on objects in the Innovaphone PBX, but it shows how many CDRs were processed "in the background".
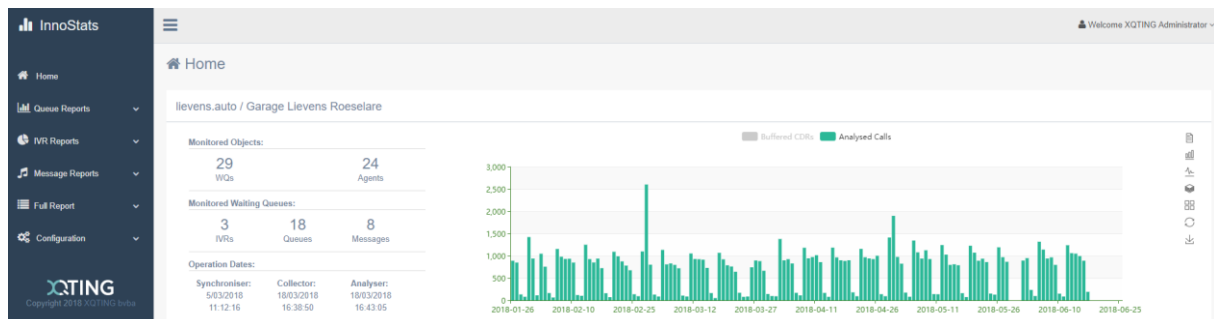
Figure 83 InnoStats home page

The first part shows information about the queues Innostat is monitoring. The example shows:

- 8 message queues
- 3 IVR queueus
- 18 waiting queues (for which 24 agents are involved)
- Total 29 queues

Figure 84 Home - summary

The lower part shows the timestamp on which the 3 services within InnoStats ran for the last time.

The graph shows the number of buffered CDRs and the number of Analysed calls over the past 150 days.
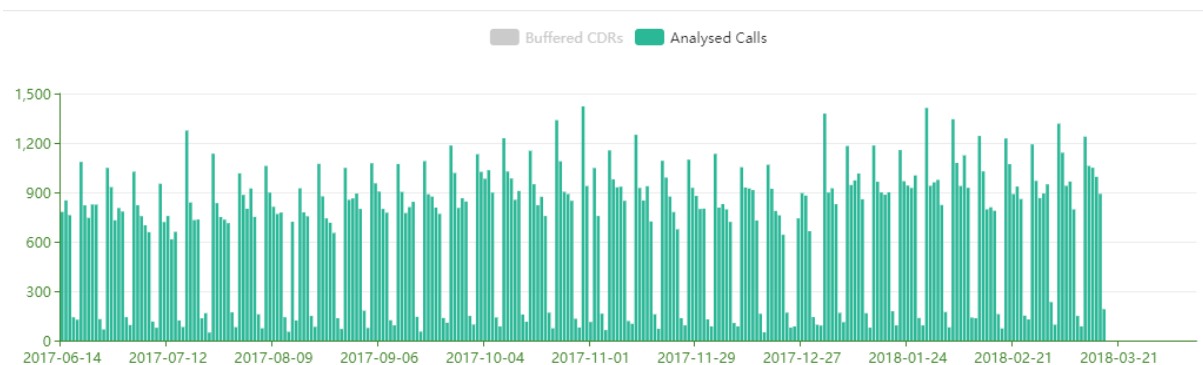
Figure 85 Home - graph

Hoovering over the graph shows the data values for that particular day.

The above screen shot does not show the buffered CDRs. You can enable this by pressing the grey button in front of the text. You'll notice that the number of CDRs is much higher than the number of calls, because each call generates multiple CDRs.

Table of figures