Instructions for Use
OtoAccess®

Worklist HL7
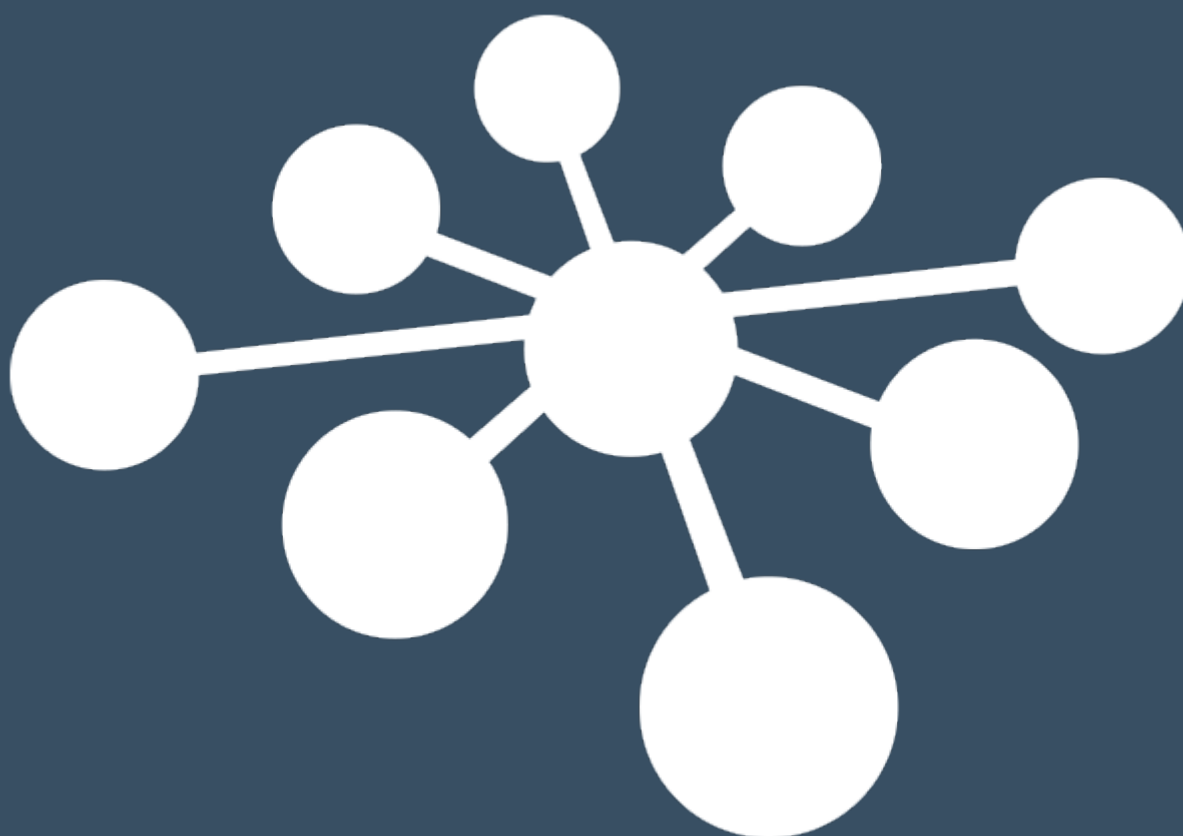
Contents

1 Introduction

1.1 About this manual

This manual is valid for OtoAccess® Worklist HL7. The product is manufactured by:

> OtoAccess A/S
> Audiometer Allé 1
> 5500 Middelfart
> Denmark

Thank you for purchasing OtoAccess® Worklist HL7. OtoAccess® Worklist HL7 is an application for easy management of patient consultation result data in conjunction with HL7 v2.x capable EMR/EHR systems.

OtoAccess® Worklist HL7 is an add-on to OtoAccess® Database. OtoAccess® Database is required to use this product.

Disclaimer: All data used in this manual is randomly generated demo data.

1.2 Intended use of OtoAccess® Worklist HL7

Having the EMR/EHR system as the data owner, OtoAccess® Worklist HL7 is the program that the clinician uses to conduct tests on supported audiological and balance equipment.

OtoAccess® Worklist HL7 displays the patients scheduled for visits in the clinic. This information is seamlessly received in the form of HL7 messages from the EMR/EHR system.

The clinician chooses the relevant patient and performs the required measurements. With a few clicks, results are returned to the EMR/EHR system fast and with minimal risk of human error.

The administrative part of this workflow is optimized to a minimum.

Historical visit data is stored in OtoAccess® Worklist HL7 but measurement and patients can also be viewed in OtoAccess® Database from where the clinician can work with the tested data in detail.

2 Precautions

Follow these precautions to handle patient data correctly.

NOTICE   To avoid client information being captured during network transmission, the communication to the SQL database must be secure (encrypted).

Store backups of client data in a safe manner.

Create backups of patient data regularly (for example daily).

Encrypt data to avoid misuse in case of unauthorized access.

To avoid unwanted data transfer from your PC to your network, make sure that an appropriate virus and spyware scanner is installed and fully up to date. Please contact your local administrator for help and guidance.

All users must have their own login to the solution to ensure traceability and identification of data updated or deleted from the database.

2.1 General functions setup

General setup such as users, groups, security, database and backup are done in OtoAccess® Database. Please refer to the OtoAccess® Database manual.

2.2 Secure communication

OtoAccess® Worklist HL7 is installed as a client server environment where the data to and from the database is transmitted over a network.

To avoid client information being captured during network transmission, the communication to the SQL database must be secure (encrypted). See section 4.4.3.

2.3 Databases and backup

The solution utilizes two databases. OtoAccess® Database (MS SQL or SQL Express) stores patient and measurement data while OtoAccess® Worklist HL7 uses a file-based SQL CE database, which is in the OtoAccess® Worklist HL7 server installation folder for storing HL7 order related data. See Figure 1.

OtoAccess® Database can automatically create a backup of the database – the schedule and retention of the backups can be customized according to need and preference.

Backups must be copied to a second secure location to prevent the loss of data, for instance in case of hardware failure.

You may also want to back up the OtoAccess® Worklist HL7 SQL CE database to keep the transaction history. See section 4.4 for more information.

To prevent the misuse of data, we recommend that backups are password protected or stored on encrypted volumes.

These backups are not essential for OtoAccess® Worklist HL7, as the data owner is the EMR/EHR system, but local backups will be an advantage if clinicians choose to use OtoAccess® Database and the transaction history in OtoAccess® Worklist HL7 in their daily work. These backups will allow the OtoAccess® setup to be restored with historic data if needed.
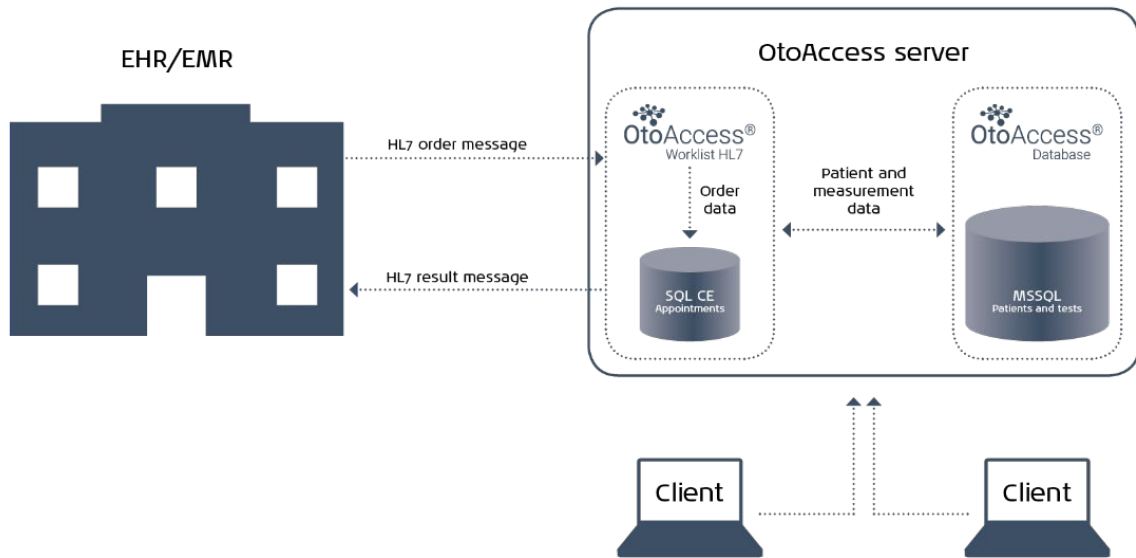
Figure 1

3 Hardware and software requirements

3.1 OtoAccess® Database – IMPORTANT

OtoAccess® Database version 2.0 or newer must be running in an OtoAccess® Database installation for OtoAccess® Worklist HL7 to function.

All OtoAccess® Worklist HL7 client computers must have an OtoAccess® Database client installed. Please refer to the OtoAccess® Database manual to set up a client-server or a standalone OtoAccess® Database installation, according to need.

3.2 .NET Framework

.NET 4.7.2 is required.

3.3 Hard disc

Disc space requirements will vary with the installation option.

The product requires 4 GB or more of available hard-disc space.

3.4 Monitor

The minimum resolution supported is WXGA (1280x768).

OtoAccess® products are recommended to run on a full HD 1080p or higher resolution monitor.

3.5 Memory

Minimum 512 MB of memory, recommended 4 GB.

3.6 Processor speed

Minimum x86 Processor 1.0 GHz, recommended Intel i5 or AMD A8 or greater.

Minimum x64 Processor 1.4 GHz, recommended Intel i5 or AMD A8 or greater.

Processor Type x64: AMD Opteron, AMD Athlon 64, Intel Xeon with Intel EM64T support, Intel Pentium IV with EM64T support (or newer).

Processor Type x86: Pentium III-compatible processor or faster.

3.7 Operating system support

Windows 7 SP1 or newer.

Windows 8.1 or newer.

Windows 10 or newer.

4 Installation instructions

4.1 Server or client
The installation folder contains two folders:

1. WorklistClient setup
2. WorklistServer setup

OtoAccess® Worklist HL7 is a server-client setup, where one server installation is needed, and multiple clients can be added.
All configuration is done on the server, no configuration is needed on the clients.

4.1.1 Typical setup
A typical setup contains a server running the OtoAccess® Worklist HL7 and OtoAccess® Database servers. Configuration and backup will be managed from here. Communication to the EMR/EHR system is set up and will run through this server.

In addition, there are several client computers where the OtoAccess® Worklist HL7 and OtoAccess® Database clients are installed. These client computers must have the supported measurement software and instruments installed.

4.2 Server installation
Note: *OtoAccess® Database will need to be installed on the server for OtoAccess® Worklist HL7 to work, please refer to the OtoAccess® Database manual.*

To install the OtoAccess® Worklist HL7 server, please open the 'WorklistServer Setup' folder on the installation media and run 'OtoAccess Worklist HL7 Server Setup.exe'.

Figure 2

Carefully read the license agreement and tick off 'I agree to the license terms and conditions' before continuing.

Note: *If you do not agree to the license terms, press 'x' in the top right corner, which will close the application.*

To change the installation path, click 'Options'.

Press 'Install' to start the installation. If needed, the installer will install Microsoft .Net Framework 4.7.2, which will take a few minutes.

Accept the Windows popup 'Do you want to allow this app to make changes to your device' if it appears.

4.3   Licensing

To apply the product license, you must start the OtoAccess® Worklist HL7 server in console mode, see 4.2.2.2. There is a 30-day trial period to activate the software.

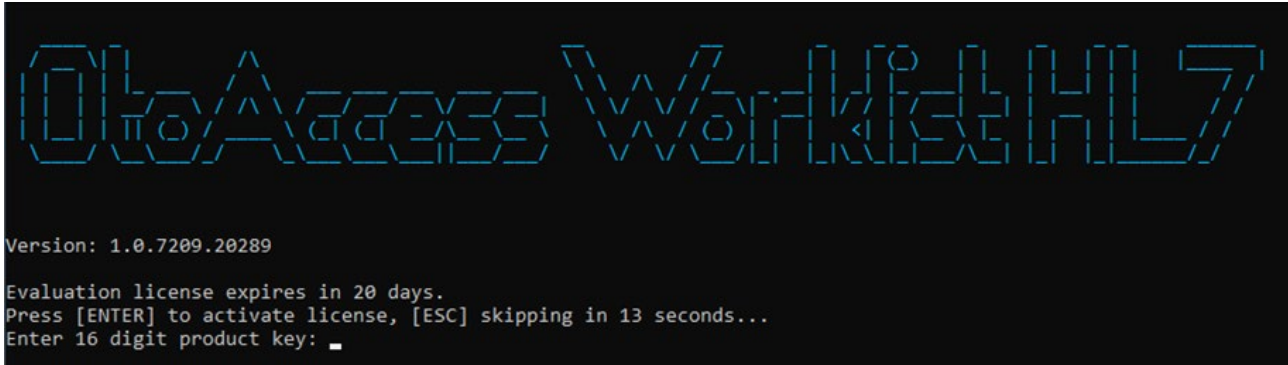If the product isn't activated it will cease to function.

Figure 3

Enter your product key in the console.

4.3.1   With internet access

The license will be validated online and there's no need for further action.

4.3.2   Without internet access

Without internet access, the product key cannot be validated, therefore you must go through these steps (will also be shown in the console):

1. Run the server in console mode, see 4.4.2.
2. Type in your license key.
3. Because of no internet access, there will be placed a license activation file (LicenseActivation.laf) in the OtoAccess® Worklist HL7 server folder.
4. Copy this file to a computer with internet connection.
5. Go to otoaccess.com and choose to activate a license.
6. Create an account and follow the activation procedure on the website.
    a. After activation on the website you will receive a license file (license.license). Copy this file to the OtoAccess® Worklist HL7 server installation folder.
7. OtoAccess® Worklist HL7 is now licensed.

4.4   Running modes

4.4.1   Windows service

The OtoAccess® Worklist HL7 server is installed as a Windows service and this running mode is default. If you want to check server logs, they can be found in 'EventViewer'. Open 'Applications and Services Logs'>OtoAccess or in some cases 'Windows Logs'>Application/System.

Be aware that upon initial installation the service will not start automatically, to allow for configuration and debug/test mode.

4.4.2   Console – debug ready

To run the service in console mode, stop the 'OtoAccess® Worklist HL7 Server' service in the Services console. Open the OtoAccess Worklist HL7 server installation folder (default is C:\Program Files (x86)\OtoAccess\Worklist\Server) and run 'OtoAccess.WorklistHL7Server.exe' from the console with admin rights.

In console mode you have the option to send a default test message to your endpoint for test purposes, by pressing ALT+S.

Note: The Event log will not collect logs in console mode. All logging will be visible in the console.

4.4.3 Secure transmission

OtoAccess® Worklist HL7 utilizes the communication protocol TLS 1.2 with basic HTTP authentication (shared key) in the communication between the OtoAccess® Worklist HL7 server and the OtoAccess® Worklist HL7 clients.

4.5 Client installation

To install the client, please open the 'WorklistClient Setup' folder on the installation media and run 'OtoAccess® Worklist HL7 Setup.exe'.

Figure 4

Carefully read the license agreement and tick off 'I agree to the license terms and conditions' before continuing.

Note: If you do not agree to the license terms, press 'x' in the top right corner, which will close the application.

To change the installation path, click 'Options'.

Press 'Install' to start the installation. If needed, the installer will install Microsoft .Net Framework 4.7.2, which will take a few minutes.

Accept 'Do you want to allow this app to make changes to your device' if it pops up.

Note: OtoAccess® Database, either client or server, must be installed on the client system. Please refer to the OtoAccess® Database manual.

The client requires no further setup, as it will import setup information from the OtoAccess® Worklist HL7 server automatically, provided that the OtoAccess® Database is set up correctly.

After the installation, you can run the program by using the OtoAccess® Worklist HL7 icon on the desktop or the link in the start menu.

4.6   Server configuration

To complete the server installation, please navigate to the installation folder.

Note: The Database.sdf file and XML files are automatically generated on the first startup of the server service. If the files aren't present, please start the service 'OtoAccess Worklist HL7 Server' in Windows Services.
This service needs to be restarted for configuration changes to take effect.

Please open 'Configuration.xml' in your preferred XML editor. Notepad is also a possibility.
Fields marked with blue are mandatory to configure.

```xml
<?xml version="1.0"?>

<Configuration xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
Version="1">
  <Incoming Endpoint="127.0.0.1:11000" TimeoutInMilliseconds="30001" />
  <Outgoing Endpoint="127.0.0.1:11011" TimeoutInMilliseconds="30001" />
  <Server Endpoint="127.0.0.1:47297" />
  <Database ConnectionString="Data Source=Database.sdf; Password=Ney1reUr2yf8NqUTE90452YnocqsGMpOQLzMqphk; Max Database
Size=4091" />
  <Labels>
    <Category1>Department</Category1>
    <Category2>Modality</Category2>
  </Labels>
  <Policies>
    <ExpectAckWhenSendingResult IsEnabled="yes"/>
    <PreventResendingResults IsEnabled="no"/>
    <PreventMultipleResults IsEnabled="no"/>
  </Policies>
</Configuration>
```

The configuration file is generated on the first *Worklist server* run. If it already exists, the file generation is skipped to prevent overwriting the already existing configuration file. It is placed in the same folder as the *Worklist server*, **Configuration.xml** (default is C:\Program Files (x86)\OtoAccess\Worklist\Server). There is a set of options to configure: IP addresses, ports and timeouts.

4.6.1   IP-addresses, ports and timeouts

Incoming Endpoint - address of the Worklist server machine. It is a destination endpoint to which EMR/EHR will send messages. The default is 127.0.0.1.

Number - The default is 11000.

TimeoutInMilliseconds - If timeout is reached, an exception will be thrown. The default is 30001 milliseconds.

OutgoingIpAddress – the IP address of the receiving EMR/EHR system. The default is 127.0.0.1.

OutgoingPortNumber - The default is 11011.

TimeoutInMilliseconds - If timeout is reached, an exception will be thrown. The default is 30001 milliseconds.

Server Endpoint - the IP for the Worklist server. The default is http://127.0.0.1:47297/.

4.6.2   Category fields

The Category fields are sorting fields for the user interface. These fields can be named freely in the Configuration.xml file, to accommodate the needs the clinicians have for sorting messages.

Category1 is by default linked to OBR-4-2
Category2 is by default linked to OBR-3

Note: a value sent in one of these fields will automatically be created as a search field in the Worklist HL7 user interface, so take care to use these fields for something meaningful, e.g. department, filler. modality etc.

4.6.3 Message policies

There are three policies to configure setup towards an EMR/EHR system.

```
<Policies>
    <ExpectAckWhenSendingResult IsEnabled="yes"/>
    <PreventResendingResults IsEnabled="no"/>
    <PreventMultipleResults IsEnabled="no"/>
  </Policies>
```

ExpectAckWhenSendingResult defines whether the Worklist server should expect an ACK message after sending a result to the EMR/EHR system or not. Default value is Yes.

PreventResendingResults defines whether the clinician is prevented to resend an already sent result. The default is No.

PreventMultipleResults defines whether the clinician is prevented in creating more than one test result on an order. If not, the clinician can send multiple results on the same order. The default is No.

4.6.4 Location of Orders database

Orders are stored in the file-based SQLServerCE database. It is generated on the first *Worklist server* run. If it already exists, the file generation is skipped to prevent overwriting the already existing database. The connection string is in the **Configuration.xml** file, under the ConnectionString node.

```
<ConnectionString>Data Source=Database.sdf; Password=PASSWORD; Max Database Size=4091</ConnectionString>
```

Please consider performing frequent backups of the SQLServerCE database, as this is not included in the OtoAccess® Database backup. This is done by making backups of the Database.sdf file in the OtoAccess® Worklist HL7 server installation folder.

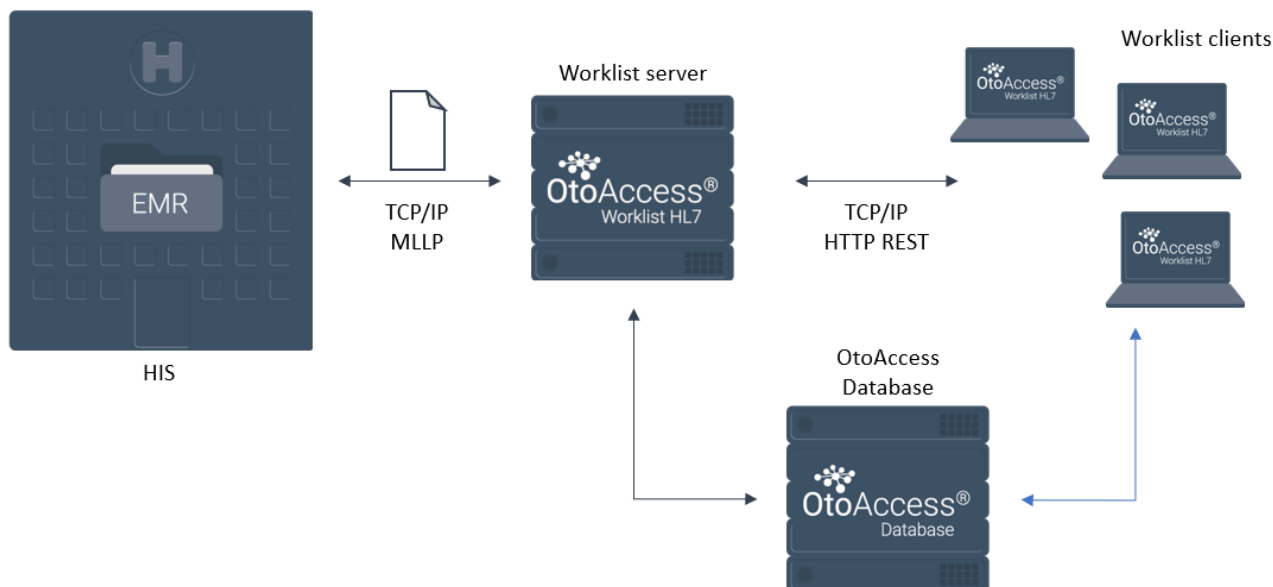# 5 HL7 communication and message setup

5.1   Communication diagram

Figure 5

Note: *the OtoAccess® Database and OtoAccess® Worklist HL7 servers can be on the same server. The above illustration just outlines the communication between the programs.*

5.2   Workflow description

HL7 orders are sent from the EMR/EHR system to the Worklist server via TCP/IP communication using the MLLP protocol. The OtoAccess® Worklist HL7 server stores the orders and updates the OtoAccess® Database patient database with the attached patient information.

HL7 ADT messages are processed and the database is updated in a similar way.

Using the OtoAccess® Worklist HL7 client, the clinician retrieves a list of orders from the OtoAccess® Worklist HL7 server. An order will typically contain information about the patient and required tests.

The appropriate measurement application can be activated directly from the OtoAccess® Worklist HL7 client, and test results will automatically be stored on the selected patient.

When measurements are completed the clinician will send results via the OtoAccess® Worklist HL7 client. The OtoAccess® Worklist HL7 server receives the appropriate data, composes it and sends a HL7 result message to the EMR/EHR system. The result image or report can be appended to the message or placed in a designated folder.

For detailed end-user workflow, please refer to chapter 6.

5.3   Application log

If you notice unexpected behavior or if an error occurs, please check the log file. Open C:\ProgramData\OtoAccess\Worklist\.log.txt.

5.4   MessageFormats

In the OtoAccess® Worklist HL7 server installation folder, the file 'MessageFormats.xml' describes how the OtoAccess® Worklist HL7 server interprets incoming HL7 messages and defines output messages. This file allows for flexible setup to integrate with existing solutions. This file handles all message configuration.

'MessageFormats.xml' is generated on the first Worklist server run. If it already exists, the file generation is skipped.

It contains two sections: Incoming and Outgoing.

By editing this file, almost any HL7 v2.x order file can be mapped to the OtoAccess® Worklist HL7 setup, by doing field to field mapping.

5.5   Incoming message setup

This section describes how the OtoAccess® Worklist server interprets incoming HL7 messages.

5.5.1   Supported transactions

The supported transaction types:

- **AddOrder**. The transaction adds an order to the Worklist server database. If the patient does not exist in OtoAccess® Database, it will automatically be added. If the patient already exists, the Worklist server will update the patient if there are changes.

- **UpdateOrder**. Updates a previously added order. If the patient exists in the incoming HL7 message, the Worklist server will update the patient if there are changes.

- **AddOrUpdateOrder**. If an order exists in the Worklist HL7 database, this transaction will update it. Otherwise, the order will be created.

- **DeleteOrder**. To delete an order, the Worklist server only requires the order number. It will also remove the history of the given order.

- **AddPatient**. You can add a patient to OtoAccess® Database using this transaction.

- **UpdatePatient**. Patient information will be updated in OtoAccess® Database.

- **DeletePatient**. Using this transaction, the Worklist server will remove the patient from OtoAccess® Database and remove the patient's orders from Worklist.

5.5.2   Filters – TransactionType, Conditions and Maps

When the OtoAccess® Worklist server receives messages, they must be navigated to the proper action. Filters are used for this purpose. Filters contain: TransactionType, Conditions and Maps.

5.5.2.1   TransactionTypes

The transactions, as described in section 5.5.1, define what type of functionality the message delivers.

For example:

```
<Filter TransactionType="AddOrder">
```

5.5.2.2 Conditions

Filter conditions must be met to process the incoming message.

For example:

```
        <Conditions>
          <Condition Field="MSH-3-1" Value="HIS" />
          <Condition Field="MSH-4-1" Value="ADM" />
          <Condition Field="MSH-5-1" Value="OTO" />
          <Condition Field="MSH-9-1" Value="ORM" />
          <Condition Field="MSH-9-2" Value="O01" />
          <Condition Field="ORC-1" Value="NW" />
        </Conditions>
```

The values are configurable to accommodate the naming and message formats you need. In the above example, an ORM^O01 message is used. If ADT messages are used instead, this can be changed without consequence, provided the message is matched to your setup.

5.5.2.3 Maps

The maps are for translating HL7 fields with properties that the Worklist server exhibits. *For more information, refer to section 5.7.1: Map properties.*

For example:

```
<Maps>
    <IncomingMap SourceField="PID-3-1" DestinationProperty="Patient.PatientId" />
    <IncomingMap SourceField="PID-5-1" DestinationProperty="Patient.LastName" />
    <IncomingMap SourceField="PID-5-2" DestinationProperty="Patient.FirstName" />
    <IncomingMap SourceField="PID-7-1" DestinationProperty="Patient.BirthDate:yyyyMMdd" />
    <IncomingMap SourceField="OBR-2-1" DestinationProperty="Order.OrderNumber" />
    <IncomingMap SourceField="OBR-4-2" DestinationProperty="Order.Category1" />
    <IncomingMap SourceField="ORC-7-4" DestinationProperty="Order.ScheduledDate:yyyyMMddHHmm" />
    <IncomingMap SourceField="PID-3-1" DestinationProperty="Order.PatientId" />
    <IncomingMap SourceField="PV1-19" DestinationProperty="Order.Text2" />
    <IncomingMap SourceField="OBR-2" DestinationProperty="Order.Text1" />
    <IncomingMap SourceField="OBR-3" DestinationProperty="Order.Category2" />
</Maps>
```

5.6 Outgoing

This section describes how the OtoAccess® Worklist HL7 server formulates outgoing HL7 messages, which will be sent to the EMR/EHR system.

5.6.1 Template

As an EMR/EHR administrator, you know what message you expect to receive, e.g. if the OBX segment should be used or not; which versions of the HL7 standard you support, where to place the result etc. The Worklist server enables a way of constructing outgoing messages that is very flexible and that should fit most requirements.

We use Maps to map Worklist's properties to the appropriate HL7 fields. The same as filters, but used to convert back from properties to fields.

For example:

```
<Template Name="Result">
      <Maps>
         <OutgoingMap DestinationField="MSH-1" SourceProperty="|" />
         <OutgoingMap DestinationField="MSH-2" SourceProperty="^~\&amp;" />
         <OutgoingMap DestinationField="MSH-3-1" SourceProperty="Worklist" />
         <OutgoingMap DestinationField="MSH-5-1" SourceProperty="HIS" />
         <OutgoingMap DestinationField="MSH-7-1" SourceProperty="$(Environment.Timestamp:yyyyMMddhhmmss)" />
         <OutgoingMap DestinationField="MSH-9-1" SourceProperty="ORU" />
         <OutgoingMap DestinationField="MSH-9-2" SourceProperty="R01" />
         <OutgoingMap DestinationField="MSH-10" SourceProperty="MSG-$(Environment.Timestamp:yyMMdd)-
$(Environment.Timestamp:ss)" />
         <OutgoingMap DestinationField="MSH-11-1" SourceProperty="D" />
         <OutgoingMap DestinationField="MSH-12-1" SourceProperty="2.3.1" />
         <OutgoingMap DestinationField="PID-3-1" SourceProperty="$(Patient.PatientId)" />
         <OutgoingMap DestinationField="PID-5-1-1" SourceProperty="$(Patient.LastName)" />
         <OutgoingMap DestinationField="PID-5-2" SourceProperty="$(Patient.FirstName)" />
         <OutgoingMap DestinationField="PID-7-1" SourceProperty="$(Patient.BirthDate)" />
         <OutgoingMap DestinationField="PV1-19-1" SourceProperty="$(Order.Text2)" />
         <OutgoingMap DestinationField="OBR-3-1" SourceProperty="$(Order.Category2)" />
         <OutgoingMap DestinationField="OBR-34-1-1" SourceProperty="$(Result.Examiner)" />
         <OutgoingMap DestinationField="OBX-1" SourceProperty="1" />
         <OutgoingMap DestinationField="OBX-2" SourceProperty="ED" />
         <OutgoingMap DestinationField="OBX-4" SourceProperty="RTXX" />
         <OutgoingMap DestinationField="OBX-5-5" SourceProperty="$(Result.Report)" />
         <OutgoingMap DestinationField="OBX-11" SourceProperty="F" />
      </Maps>
```

For more information, refer to section 5.7.2: Template properties.

5.7   Appendices

5.7.1 Map properties
You can use Order and Patient properties to create filter maps.

Order

• OrderNumber
• PatientId
• Category1
• Category2
• ScheduledDate

Patient

• PatientId
• BirthDate
• ExpectedBirthDate
• FirstName
• LastName
• Address
• Address2
• City
• ZipCode
• County
• Physician
• Mobile
• Telephone
• Email
• Insurer
• InsuranceNumber

- IsInsured
- ReferredBy
- Initials
- Municipal
- State
- CountryLCID
- Fax
- MothersName
- Occupation
- Remarks
- BillingNumber

*For dates, you can use specific formats by using colon:

For example:

```
<Map Field="ORC-7-4" Property="Order.ScheduledDate:yyyyMMddHHmm" />
```

**It is Boolean, only true/false values are allowed.

5.7.2 Template properties

You can use Order, Patient, Result and Environment properties for creating template maps.

Order

The same as in section 5.7.1.

Patient

The same as in section 5.7.1.

Environment

- Timestamp

e.g.

```
<IncomingMap SourceField="PID-7-1" DestinationProperty="Patient.BirthDate:yyyyMMdd" />
```

5.7.3 Result

- Examiner
- Report
- Image
- Module
- ApplicationId
- ModuleId
- CreateDate
- UpdateDate
- Comments

*You can choose **pdf** format of Report/Image by specifying it after colon (default is **xps**). In this case, the result will be appended to the outgoing HL7 message Base 64 encoded.

```
<OutgoingMap DestinationField="OBX-5-5" SourceProperty="$(Result.Report:pdf)" />

<OutgoingMap DestinationField="OBX-5-5" SourceProperty="$(Result.Image)" />
```

5.7.3.1 Result delivered to file share

As an addition or alternative to having the result appended to the result message, the result can be placed in a file share.

```
<FileDrops>
    <FileDrop Path="c:\temp\Report $(Patient.PatientId).pdf" Content="$(Result.Report:pdf)" />
</FileDrops>
```

In the above example, the file will be 'Result PatientID.pdf' e.g. 'Report 6392936.pdf'.

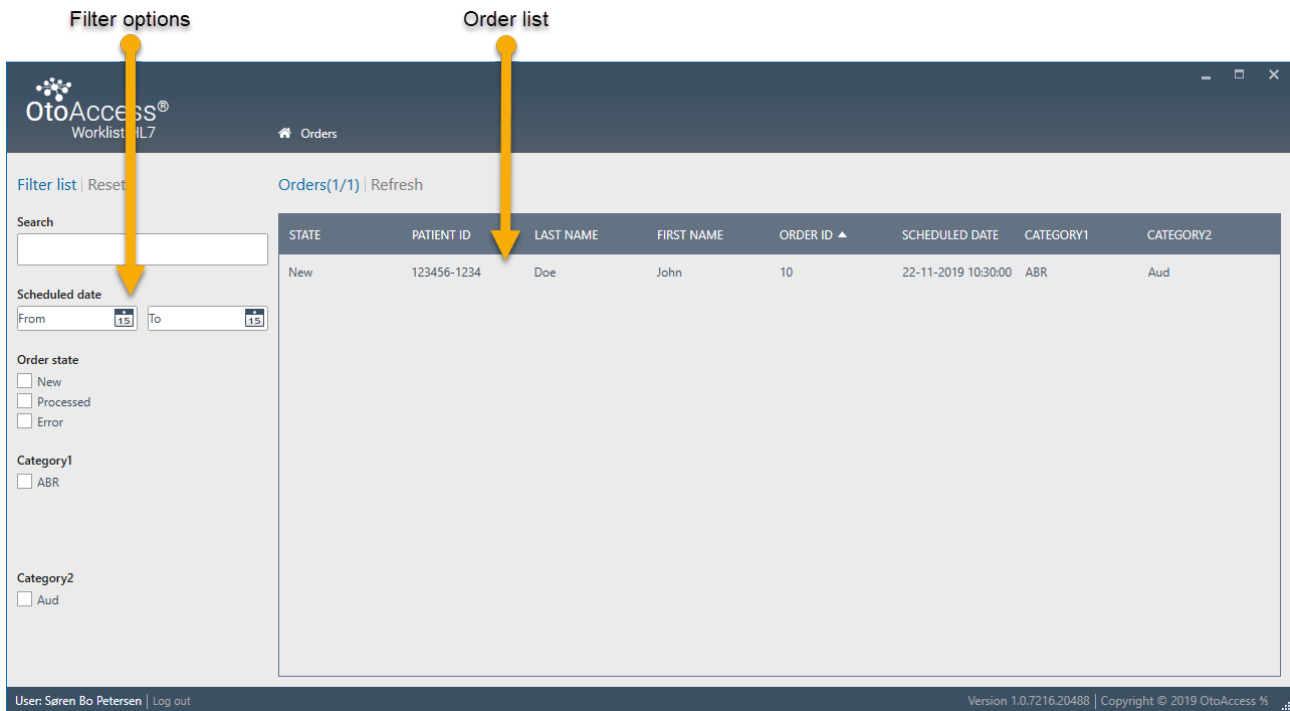You have full flexibility in setting up the naming using standard XML syntax.

6 OtoAccess® Worklist HL7 user manual

6.1 User management

When starting the OtoAccess® Worklist HL7 desktop app, it will prompt for username and password. Users must be created using the OtoAccess® Database users and groups, please refer to the OtoAccess® Database manual.

6.2 User interface

The main screen displays the filter options and order list.

Figure 6

Note: *Upon first installation, the orders and Category1 and Category2 lists are empty. The names of the Category search fields can be customized in the configuration, see section 4.6.2.*
Category1 and Category2 filter options are automatically added when new values are added through order messages.

6.3 Filter options

All patients new or old are displayed in the Orders view. You can use the filter options to narrow down the displayed patients.

You can filter orders to your needs, e.g. only show new orders, orders scheduled for today or orders containing specific tests. You can search on names, patient ID and order ID.

Pressing the reset button will clear the filters.

Filter descriptions

Search	Active search field, automatically narrows down orders to fit search criteria.
Scheduled data	Select time interval to monitor. Choosing today's date in to and from will display orders scheduled for today.
Order state	New – Orders that have not been sent yet. Processed – Orders where one or more sessions have been sent. Error – Orders where the send operation has failed.
Categoty1	Filter field; can be named as needed. E.g. modality, department, filler etc.
Category2	Filter field; can be named as needed. E.g. modality, department, filler etc.

6.4   Order handling and result delivery to EMR/EHR systems

An order is an appointment for one patient. A patient can have several orders with different schedules, tests, fillers, states etc.

When an appointment is created in an EMR/EHR system, the EMR/EHR system must generate an order that is sent to OtoAccess® Worklist HL7.

The Orders view in OtoAccess® Worklist HL7 is then populated with the received orders. In Figure 5, you can see an order example.

The order contains the relevant information needed to process the appointment, see Figure 6. But, depending on the implemented setup, some of the default field may be empty. Only the Order ID and Patient ID fields are mandatory.

STATE	PATIENT ID	LAST NAME	FIRST NAME	ORDER ID ▲	SCHEDULED DATE	TEST	EXAMINER
New	123456-1234	Doe	John	1	01-05-2019 08:30:00	AUD	Dr. Demant

Figure 7

6.4.1   Choose order to process

To choose a patient, simply click on the relevant order line and you will automatically be presented with the Order Details view.
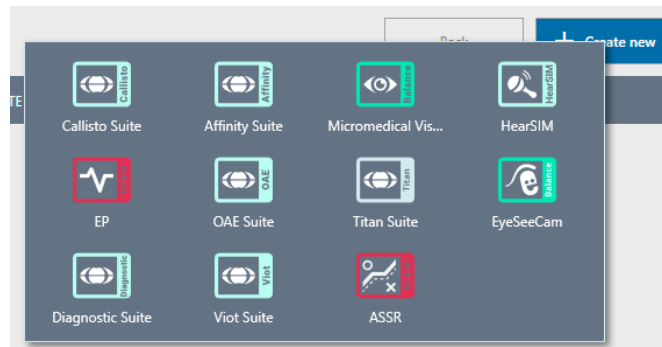*To find the relevant order, use the search and filter options.*

Figure 8

Figure 9 – When clicking 'Create new', it shows all the supported solutions that are available on the computer (only a limited selection shown in this example).

6.4.2 Perform test

To perform a test on the selected patient, click the blue 'Create new' button in the upper right corner of the OtoAccess® Worklist HL7 interface. It will display the installed, compatible and available testing solutions *(Figure 9)*. By clicking the required solution, the software is launched, and you can perform the test.

When the test has been performed, you have created a new result (Figure 10). The Order Details view will display 'State', 'Module', 'Create Date', 'Update Date' and 'Examiner'.

'State' shows whether the result has been sent to the EMR/EHR system or not. The state can be:

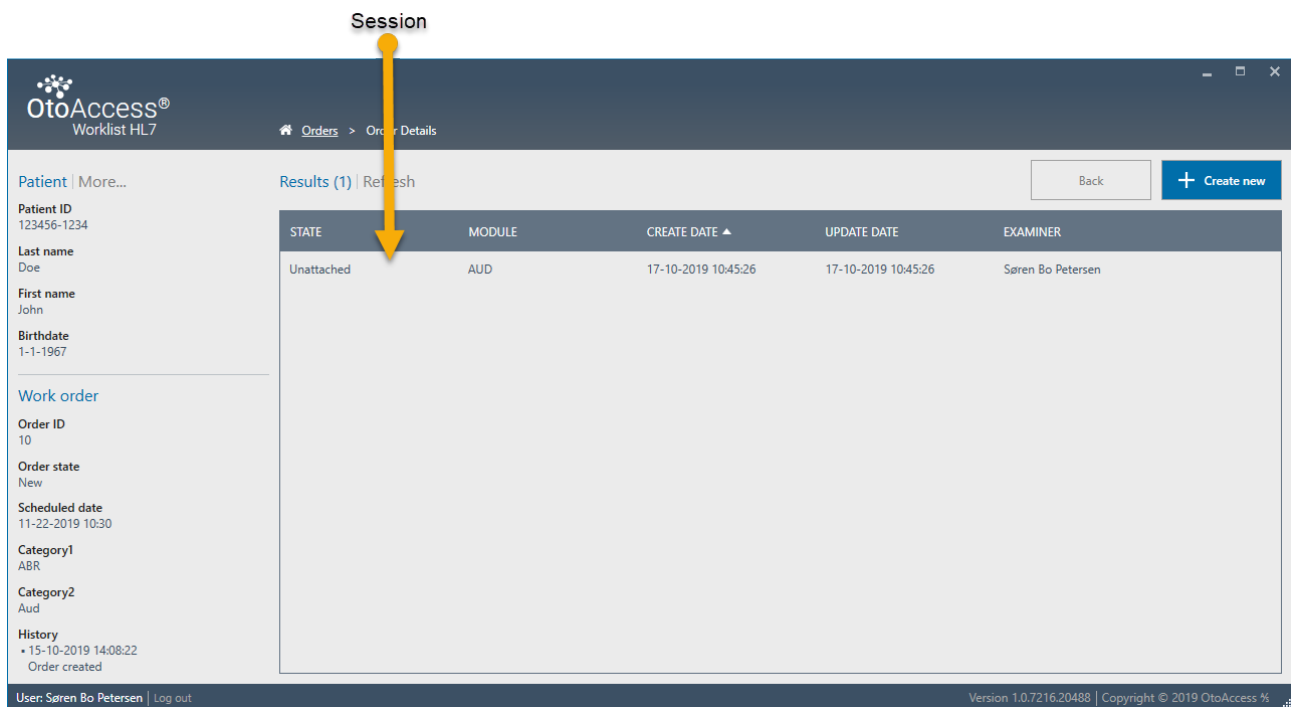| Unattached	The result has been created but not sent.
Sent	The result has been successfully delivered to the EMR/EHR system.
Error	Transmission to the EMR/EHR system has failed, check communications and setup. This typically occurs if the EMR/EHR system is not ready to receive.

Figure 10

6.4.3 Send performed test to EMR/EHR system

Simply click on the result that must be sent. This will take you to the Result Details view, where you will see a result preview of the performed test (Figure 11).
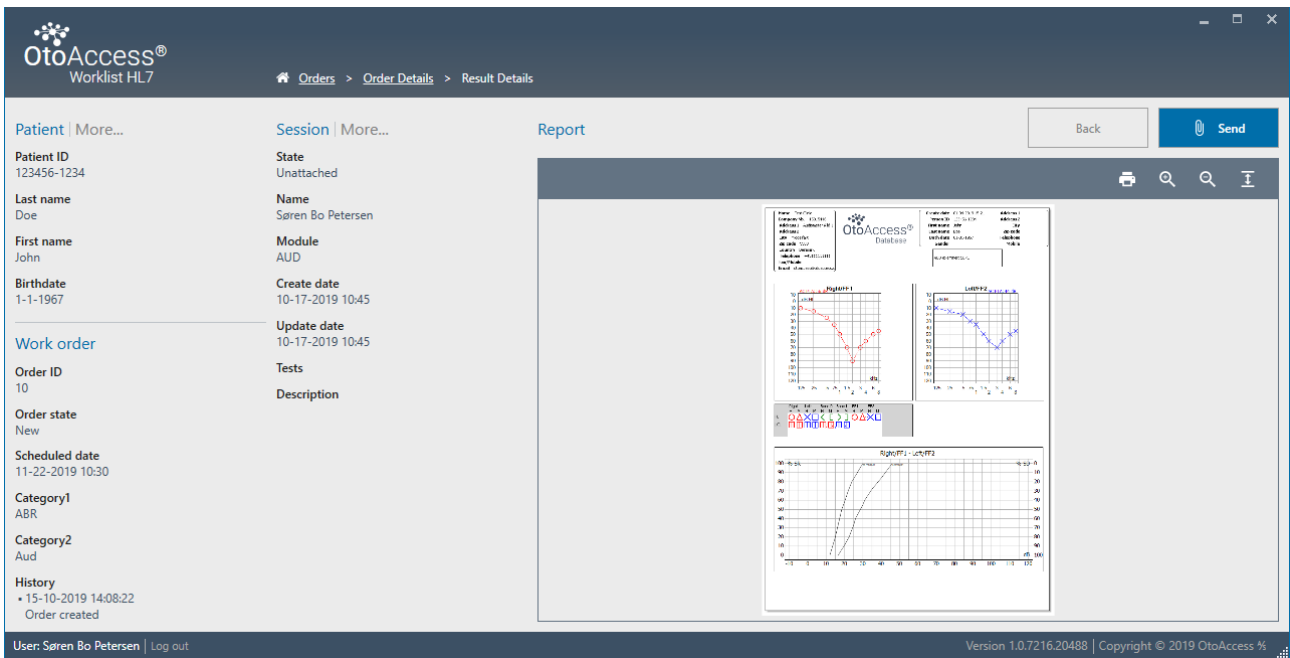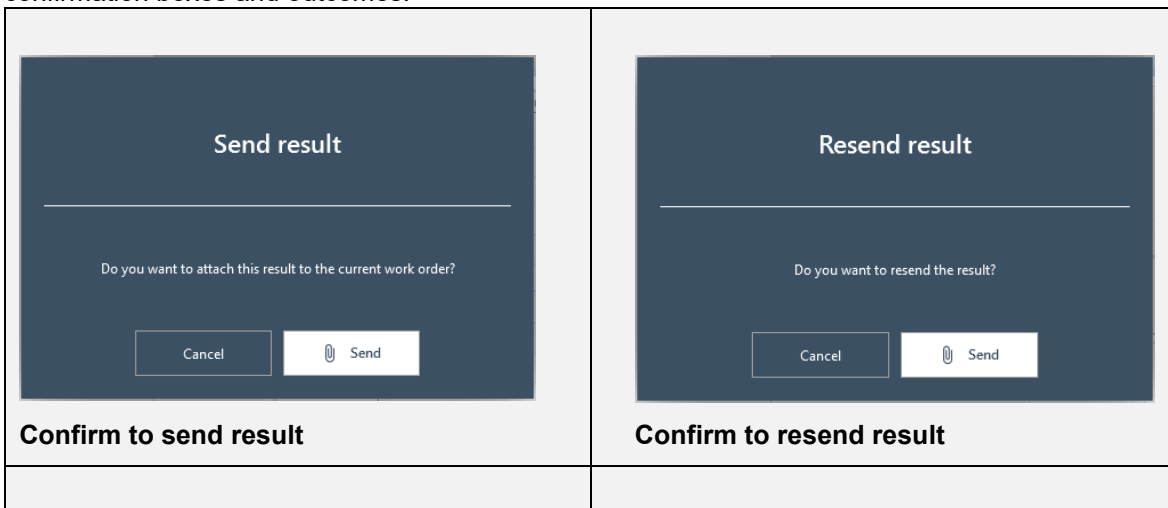

Figure 11

When the patient and results have been validated, press 'Send' to deliver the result to the EMR/EHR system.

When sending, the clinician will be presented with an option to send or cancel. See *Figure 12* for confirmation boxes and outcomes.

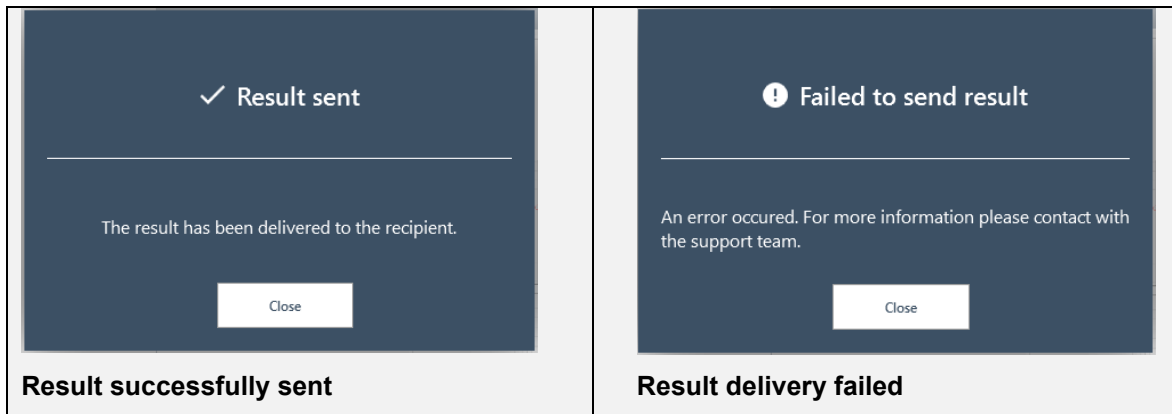**Confirm to send result**

Confirm to resend result

Figure 12

7 Troubleshooting

7.1 Network connection problems

In the event of any problems during the use of OtoAccess® Worklist HL7, the following checklist may help to indicate initial areas to consider/initial steps to take:

- Check the internet connection and verify a proper connection
- Verify that the Site Code and the Manufacturer Id are correct
- Verify that the Server URL is correct
- Check that security programs (Firewall, anti-spyware software, antivirus, etc.) are running and if they are blocking the connection to the OtoAccess® servers
  - o If you are uncertain whether any security programs are running on your computer, please contact your local IT support
- Verify that the server connection is stable and responding. If not, please get in touch with your service contact

7.2 Logging

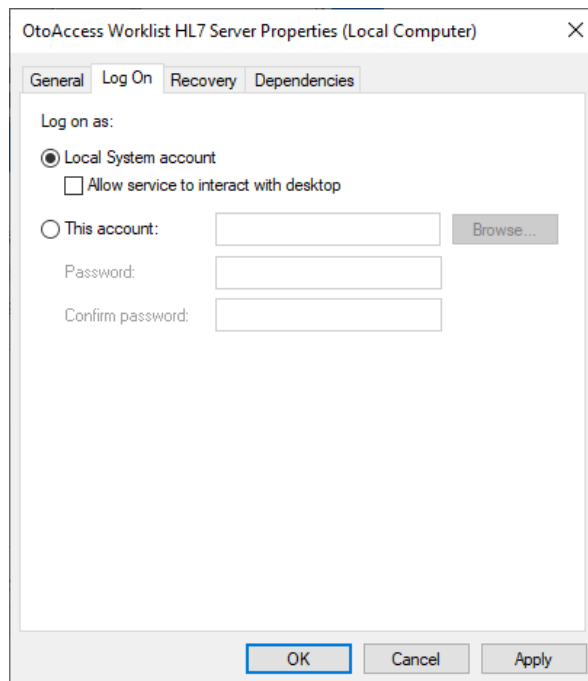Make sure the Worklist server's service has **unchecked** 'Allow service to interact with desktop'.

Figure 13