Add-On Products

RealTime Service

User Guide

Version: 6.6

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CHAPTER 1.

Introduction

This document provides a detailed guide for using and configuring the RealTime Service.

The RealTime Manager is designed to configure and manage the RealTime Service – a solution aimed at collecting data from an Exchange server and storing it in specific destinations.

The RealTime Service User Guide is intended for IT administrators and describes how to configure the RealTime Service with the help of the RealTime Manager's features. This document also includes the description of RealTime Service post-installation operations that must be performed in the RealTime Manager interface.

Definitions, Acronyms and Abbreviations

Term	Definition
AD (Active Directory)	Service that provides the means to manage identities and relationships that make up network environments.
Group or distribution list	List of e-mail addresses given one collective name. By referring to the list name internet, users can refer to all addresses on the list simultaneously.
Microsoft .NET Framework	A set of Microsoft software technologies for connecting information, people, systems, and devices. It enables a high level of software integration using Web services: small, discrete, building-block applications that connect to each other as well as to other, larger applications over the Internet.
Microsoft Exchange Server	The messaging platform that provides e-mail, scheduling, online forms, and the tools for custom collaboration and messaging-service applications.
RealTime Manager (RTM)	Windows application designed to configure and manage the RealTime Service
RealTime Service (RTS)	Window Service is designed to collect data from the Exchange Server and store it in a specific destination.
UTC (Coordinated Universal Time)	Equivalent to mean solar time at the prime meridian, formerly expressed in GMT.

RealTime Service Overview

The main purpose of the RealTime Service is to track the creation, deletion, modification of items from the Exchange Server and update.

The basic RTS components are:

- The RealTime Manager – it is an administrative program for managing the Configuration Information.
- The RealTime Service – it is a Windows service used for real-time synchronization of Exchange items to one of the destinations set up in the RealTime Manager application. This service also manages the license.

The RealTime Service collects data from the Exchange Server and stores it in specified destinations. In fact, synchronization happens when the service receives notifications from the Exchange Server in real time or whenever it is requested. The RealTime Service can perform full synchronization: all data is replicated from the Exchange server and from Active Directory.

The RealTime Manager provides options for saving the configuration of the connecting information, destination store, filtering output data and logging.

Also, the RTS tracks changes in distribution lists (groups) and user changes in these groups from Active Directory. The program must have access to Active Directory to perform these operations.

RealTime Manager Overview

The RealTime Manager (RTM) is primarily used to configure the RealTime Service. With the help of this application a user can set options for tracking user groups on the Active Directory which must be tracked and perform manual synchronization.

The RealTime Manager provides the ability to configure synchronization settings for a particular destination. Likewise, it can be used for specifying common settings applied to the RealTime Service.

The RealTime Manager includes options for selecting and managing user groups and specifying which user group is to be used in synchronization.

These mentioned above configurations are all stored in the RTS Database.

CHAPTER 2.
Using RealTime Manager

Connect to the service.

The first time you run the RTM, you will see its window which will look like in the picture below.

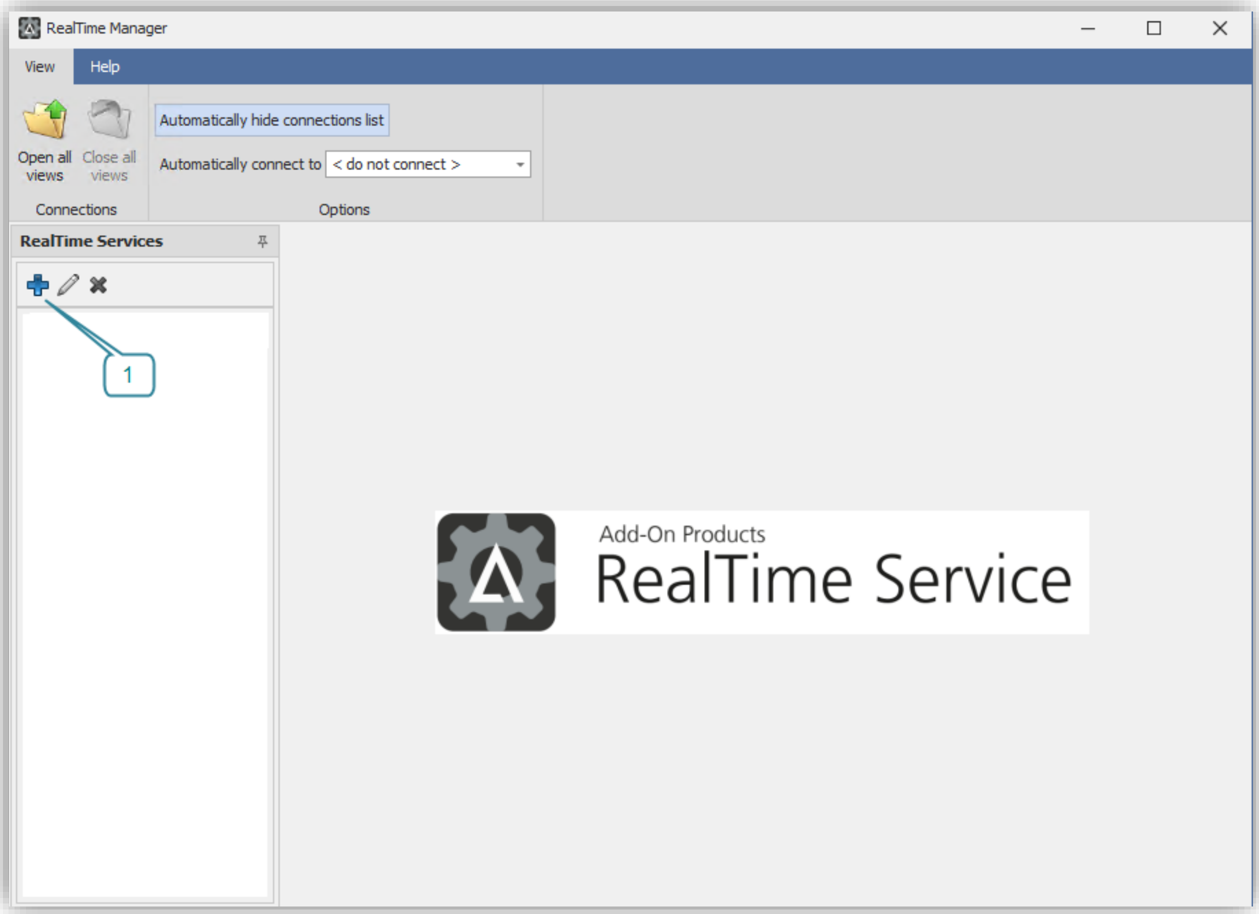


Figure 1. RealTime Manager initial screen

The first action, you should do, is to create the connection to the RealTime Server. For that, press the icon marked with flag 1 on the picture above. The following window will appear:

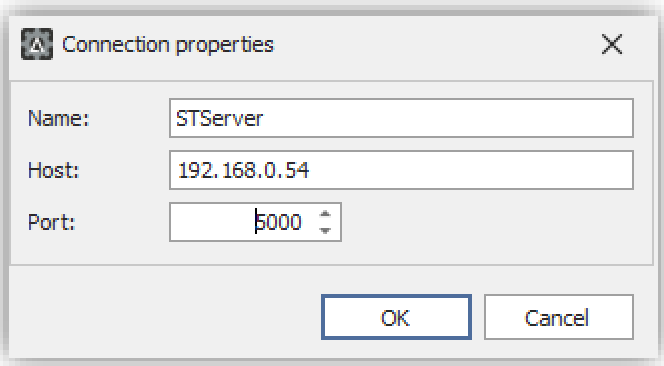


Figure 2. Connection properties

Name the server, as you need, and enter its IP address in the correspondent fields. Right after you click [**OK**], you will see the message, like on the picture below. Read it carefully and select the required option.

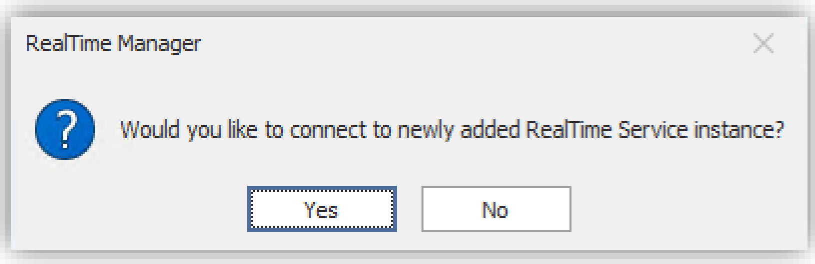


Figure 3. Confirm connection

If you press [**Yes**], the main window will look like below.

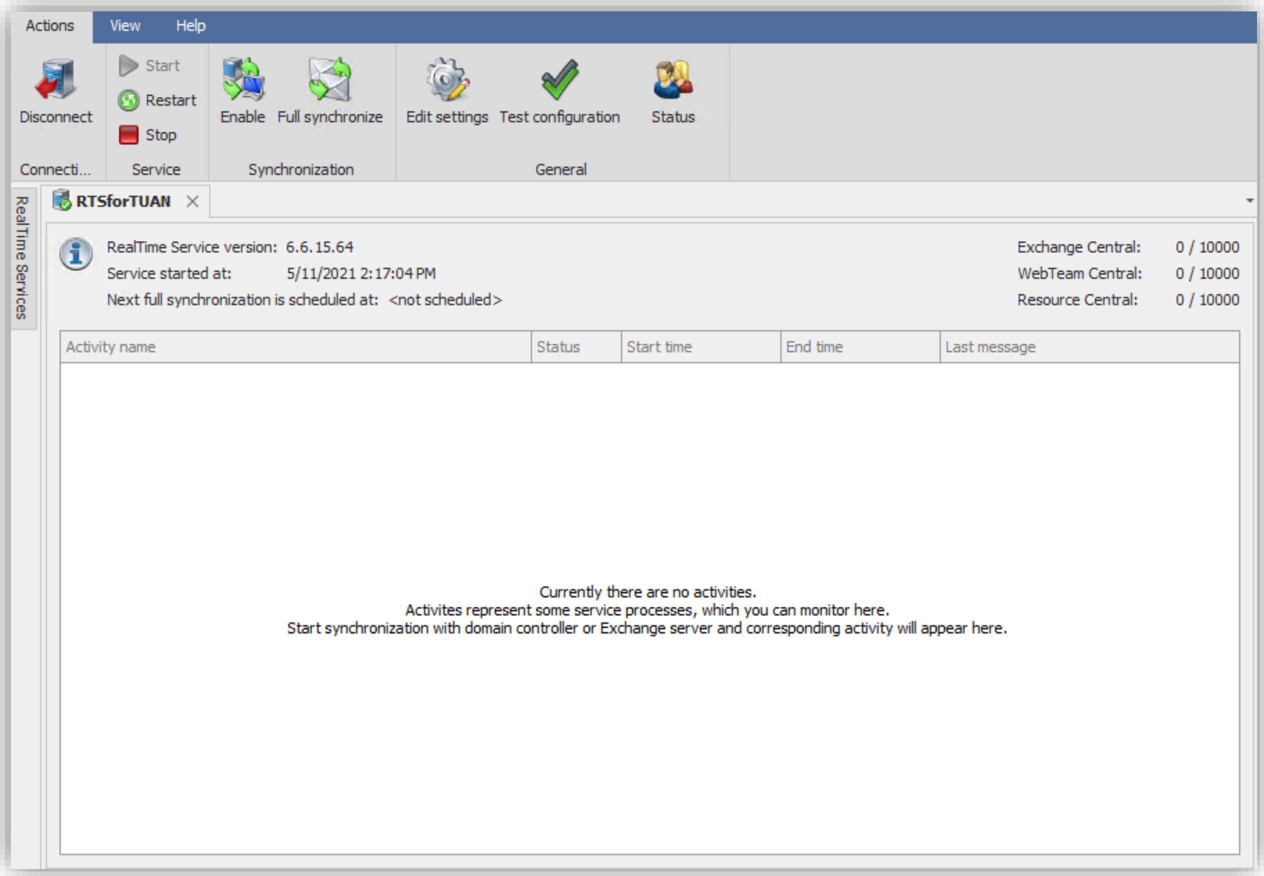


Figure 4. RealTime Manager main window

When you run the RTM next time, services will be disconnected by default. To connect to the needed service, you just have to select it in the list and right click. Then choose the correspondent option in the appeared context menu (see the picture).

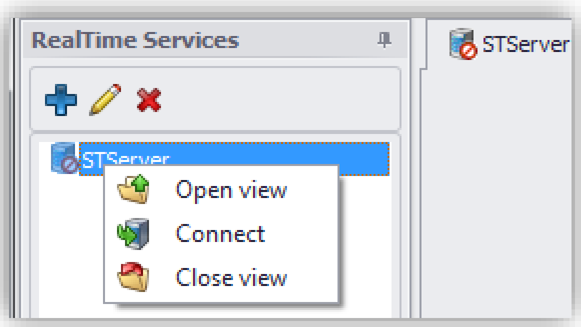


Figure 5. Select needed service

User Interface

Flexibility

The first thing you must know is that the interface of the application is very flexible. You can press the header of a certain area and drag it to any place in the application window. The process of interface “reconstruction” looks like on the picture below.

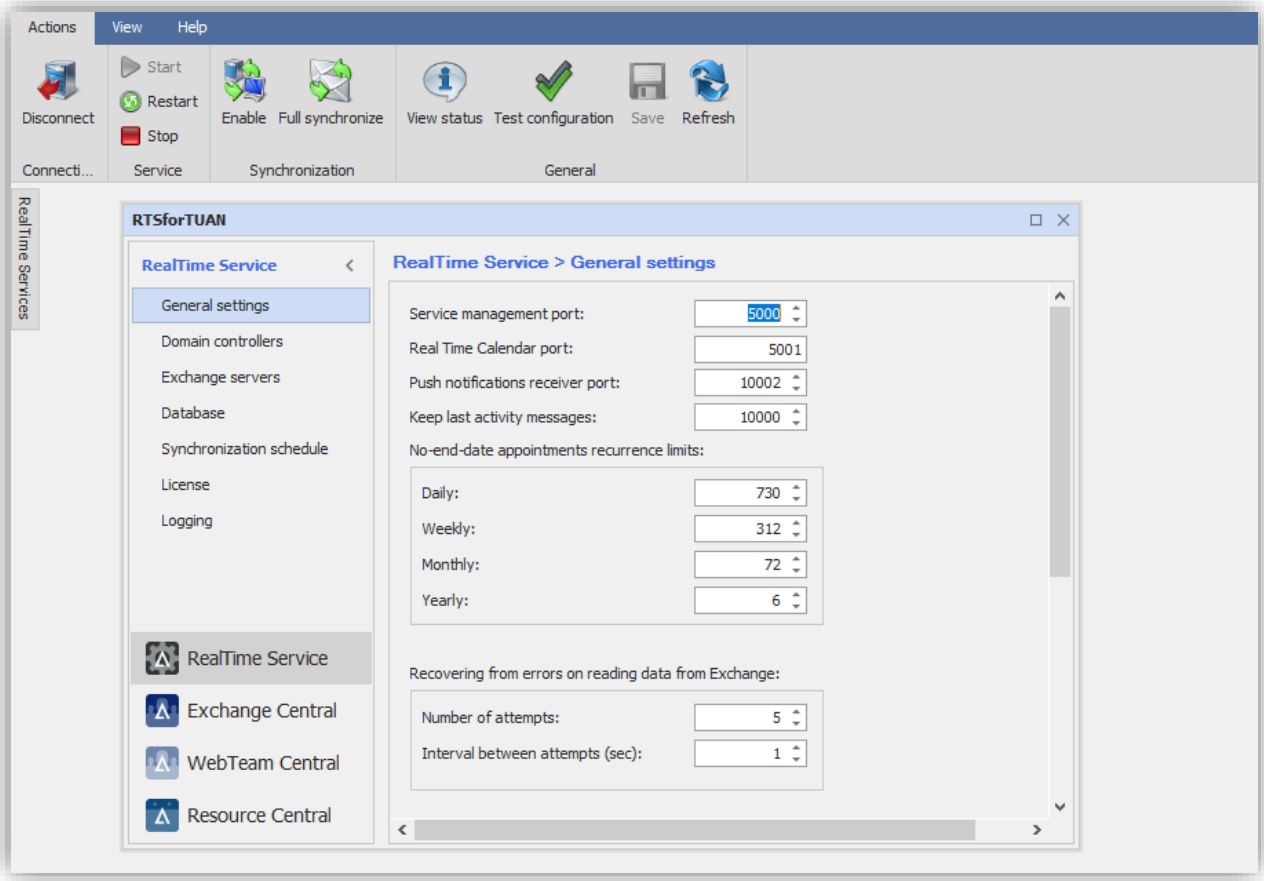


Figure 6. RTM interface

Thus, you can organize the application’s interface as it is most comfortable for you.

Notice that in this document the default interface is described and used for making screenshots.

Toolbar

As you can see, the interface of the RTM may be visually divided into three parts:

- Toolbar
- Service list
- Views area

The Service list contains the list of connections; the Views area contains views of connections correspondingly.

The toolbar has three tabs:

- Actions
- View
- Help

Actions

The ***"Actions"*** tab of the RealTime Manager toolbar contains buttons to do the main functions of the application. See these buttons and their descriptions in the table below.

Button	Description
Disconnect	Press this button to disconnect from the current connection.
Start	Click the Start button to start the RealTime Service. This button is only visible when RealTime Service is stopped.
Restart	The Restart button appears when the RealTime Service is running. Its function is to restart the service.
Stop	Click the Stop Service button to stop the RealTime Service. This button is only enabled when the service is running.
Enable	This button starts regular activities.
Full synchronize	Click this button to immediately call appointment synchronization from the Exchange server to the Destination store.
View status	Shows status of processes running in the service like status of synchronization with the Exchange Server, status of databases.
Test configuration	With the help of this button, you can check if all your settings are correctly changed or configured.
Status	Open dialog with statuses of all users.

Filter	Click this button to enable filtering users.
Save	Click this button to save changes on the current tab or window.
Refresh	Use this button to refresh the displayed view.
Test	This button is used to check the connection to the database.
Create	Click this button to create a database if there is no existing database for data synchronization or re-creates a new one instead of the old DB.
Clear	Click this button to clear appointments in the database.
Load from file	Click this button to browse to and load the license file (see more details in the “License” section).
Edit license	This button is intended for manual license editing.
Edit settings	This button opens the section of settings and allows editing them.

View

This tab contains only two secondary icons with the help of which you can open all connection views or close all of them as well.

See description of both icons in the table below.

Button	Description
Open all views	This icon, if pressed, opens views of all connections.
Close all views	This icon, if pressed, closes views of all connections.

Help

This tab contains also just two icons described in the table below.

Button	Description
	This button shows information about the application and its producer.
	This icon, if pressed, leads to the User Guide file.

When you press the ***"About"*** button, you will see the informational window like on the picture below:

Figure 7. RealTime Manager - About

Settings

When you press the ***"Edit settings"*** icon for a connection (highlighted in the picture below), you will navigate to the correspondent application section.

Figure 8. RealTime Manager interface

Settings are also divided into groups according to their functions:

- RealTime Service
- Exchange Central
- WebTeam Central
- Resource Central

See all these groups in the lower part of the picture below.

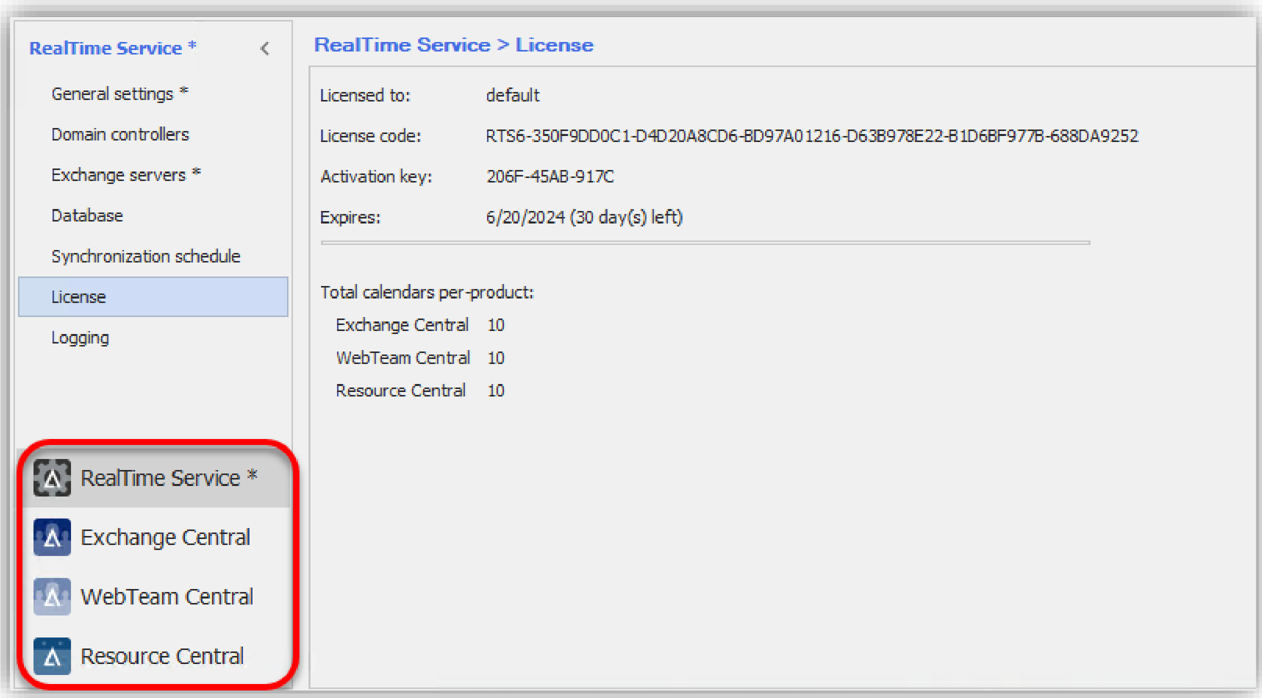


Figure 9. Setting groups

By selecting one of these groups, you can configure its settings.

RealTime Service settings

Here you can configure RTS settings obviously.

General Settings

In this settings section you can set up ports shown in the picture below. Default values of ***"Service management port"*** and ***"Real Time Calendar port"*** are 5000 and 5001, respectively.

Also, here you should set the number of last activity messages (flag 1 below) – records of the process log which will be kept in the server's memory. It is useful, for example, for the status of DBs – you can see in activity messages what data is written to the database and what is moved to the queue.

For No-end-date recurrence appointments, the RTS will synchronize only a certain number of records to the database. By default, these numbers of records are:

- For appointment recurrence daily: 730 records.
- For appointment recurrence weekly: 312 records.
- For appointment recurrence monthly: 72 records.
- For appointment recurrence yearly: 6 records.

Under flag 2 on the picture below, you can find the group of settings responsible for the number of attempts to send requests to the Exchange server. It touches almost all operations.

These settings work in the next way: if an attempt of sending request to the Exchange server is unsuccessful because of some reason (interrupted connection or overloaded server) then requests are repeated with the period indicated in the ***"Interval between attempts"*** field until the request passes through or the number of attempts reaches the limit set in the ***"Number of attempts"*** field.

Also, an important condition – attempts to send requests are repeated, only when the error which happened during the first attempt is recoverable i.e., can be fixed in some time (like mentioned network interruption or server overloading). In other cases, attempts to send requests are not repeated.

To sum it up - in case of recoverable request error, the warning is written into the log and attempts of request are repeated; if unrecoverable error happened, the error is written into the log and requests are not repeated.

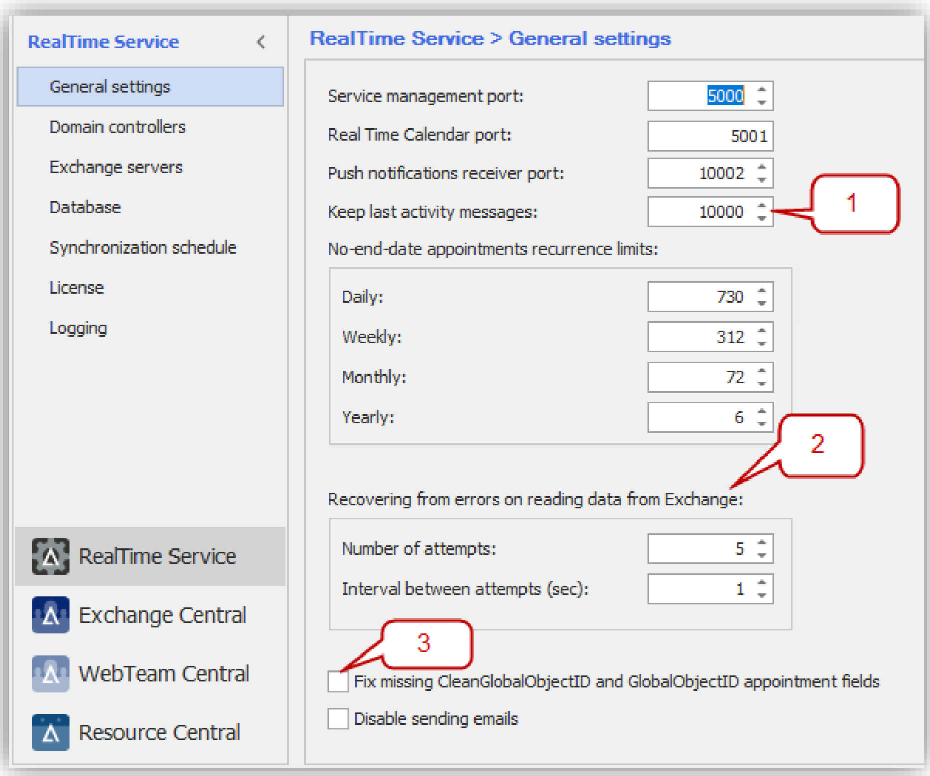


Figure 10. General Settings

Under flag 3 on the picture above you can find the ***"Fix missing CleanGlobalObjectID and GlobalObjectID appointment fields"*** checkbox. As it turns on writing to the Exchange server, it is unchecked by default and a user should switch it manually to use the correspondent option. Its function is the following: for some reason, appointments may not contain "CleanGlobalObjectID" and "GlobalObjectID" fields; the mentioned option finds the lack of these fields (or one of them) and creates a missing field (or both) in an appointment. This works for real-time appointments processing as well as for the full synchronization.

NOTE: For Resource Central application, appointments are not processed without "CleanGlobalObjectID" and "GlobalObjectID" fields, as these fields are the main for the Resource Central database. So, to correct work with Resource Central, the correspondent checkbox must be marked.

If you check on the option "**Disable sending emails**" then the function SendEmail is stopped, and no emails are sent.

To provide security connection between client application and Public RTS API across domain, RTS provides CLIENT ID and KEY, which must be used in client to help client authenticate connection with RTS service.

For security connection, there are 2 options:

1. Use default RTS certificate (option “specify certificate” is unchecked)

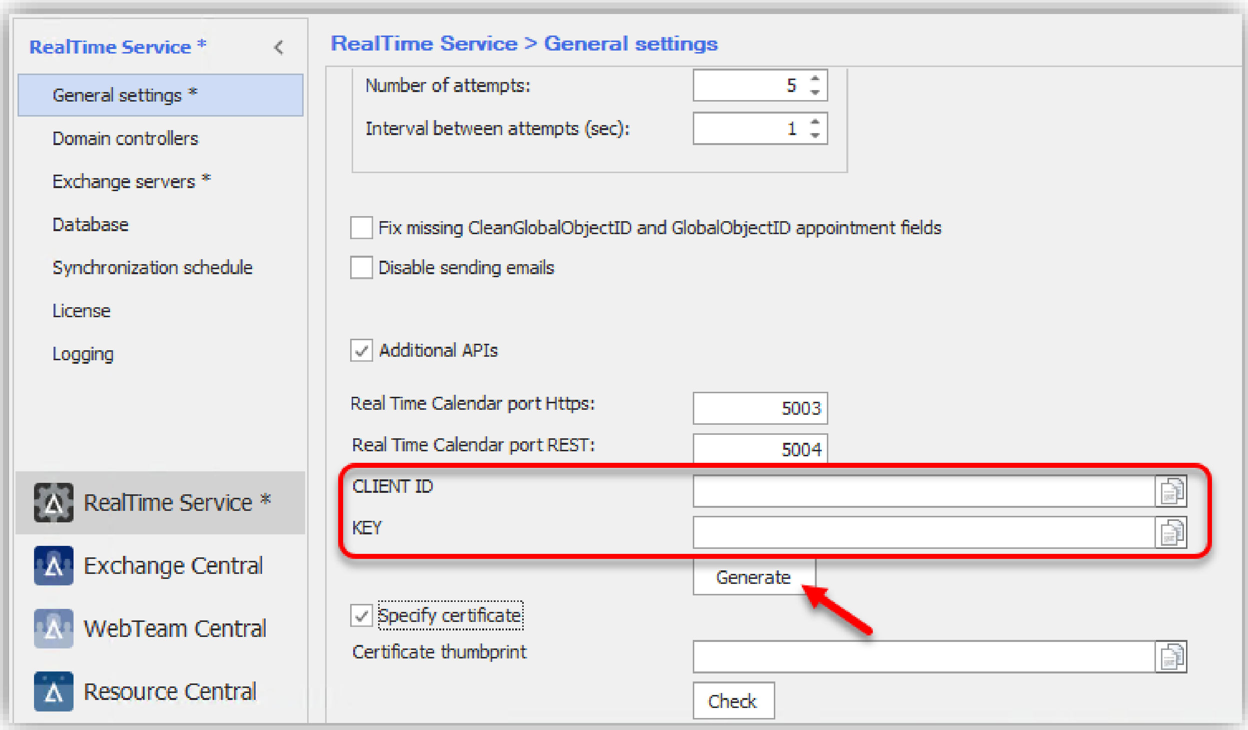


Figure 11. **RTS Manager – General settings**

Check on ‘*Additional APIs*’, then click [**Generate**]. After that, you can have the ID and the key as highlighted in the above figure.

Save this information and pass it into the client application. Client application must use CLIENT ID and KEY as UserName and Password connection parameters to RTS service.

2. Use concrete/user specific certificate from Windows certificate storage.

In this case you must specify the certificate thumbprint in the text “Certification thumbprint”.

Check on **Specify certificate** when you want to specify a valid certificate on server based on the thumbprint. Copy the thumbprint of certificate and paste it into the text field. Click [**Check**] to verify this certificate.

Domain controllers

In this settings section you should define domain controllers. Right after you enter the section you will see links like in the picture below.

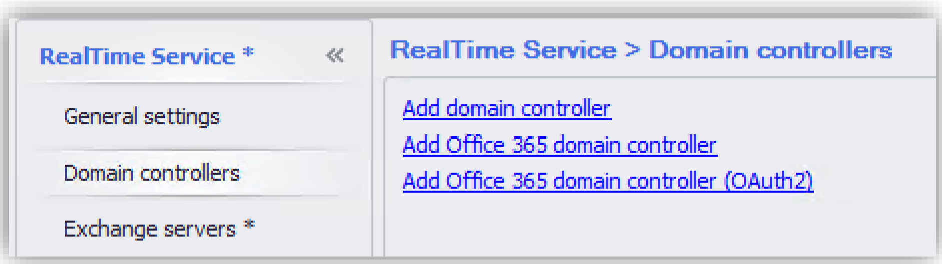


Figure 12. **Domain Controllers**

Depending on the domain controller type you are adding you will see different controls for editing entry properties.

You can add several domains in this way. To delete a domain, use the correspondent icon.

Do not forget to save changes.

On-premises domains

You should enter the name of the domain you want to add, at the top. For that, click twice on the text marked with flag 1 below.

After that, enter the domain user credentials into correspondent fields.

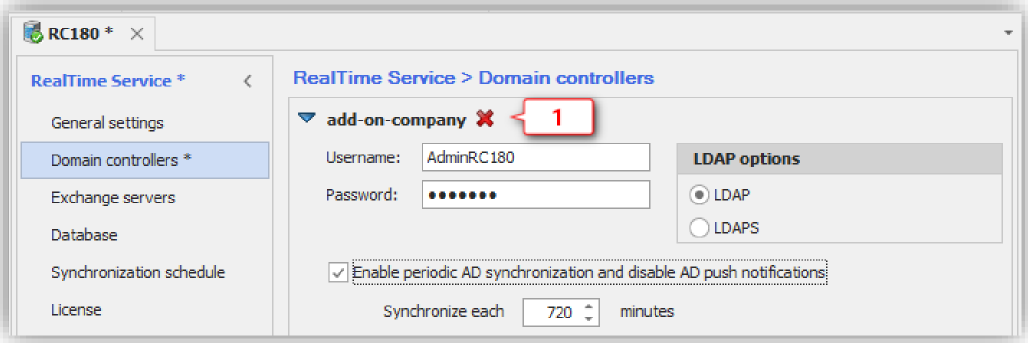
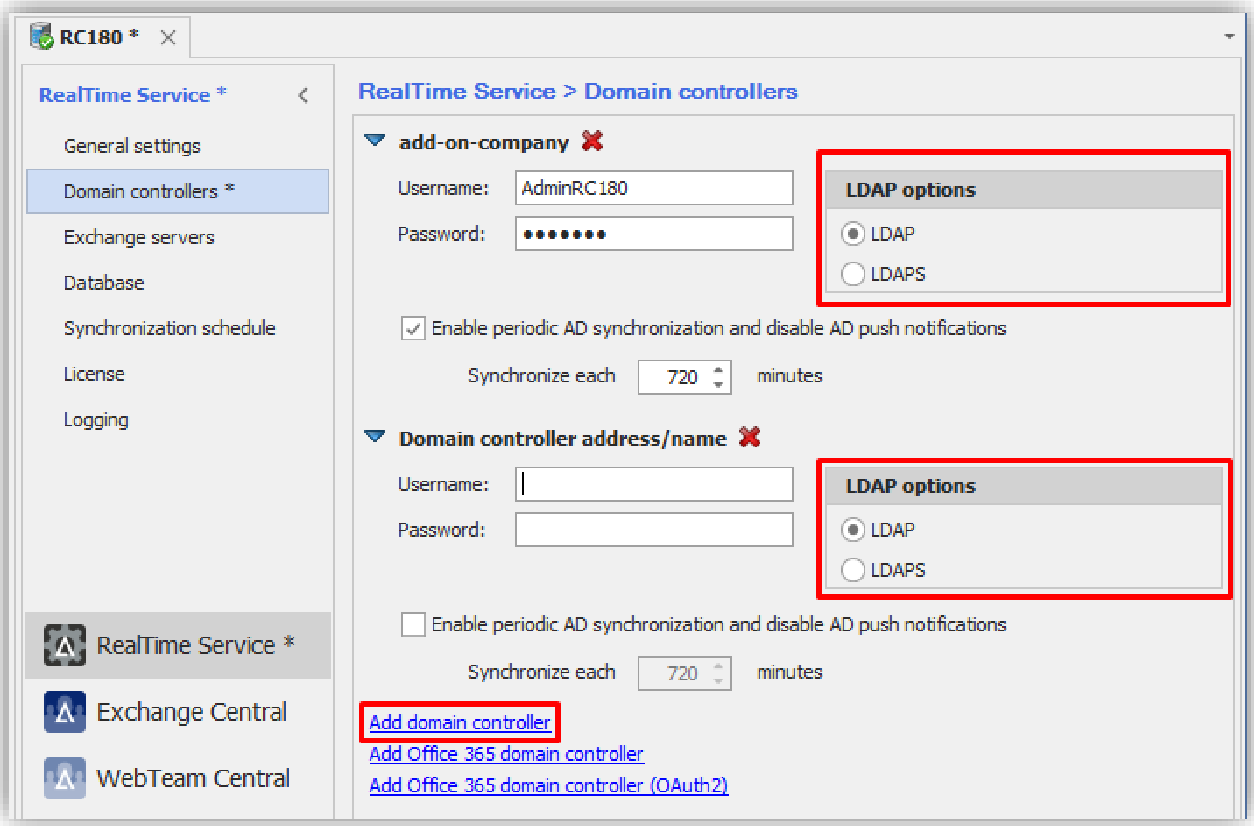


Figure 13. Domain Controller – On-premises domains

You can optionally check on "***Enable periodic AD synchronization and disable AD push notifications***" and input time for the cycle of regular full sync.

In addition, you can select either **LDAP options**:



- **LDAPS**: It can only be used with On-premises domains. This option will make RTS work with LDAPS to communicate with domain controllers.
- **LDAP**: It is similar to LDAPS. This option can be used when LDAPS is not applicable.

NOTE: You need to import certificate on the device that installed RTS in order to use LDAP options.

Office 365 domains

You should enter your cloud tenant's name (e.g. yourdomain.onmicrosoft.com). For that, click twice on the text marked with flag 1 below.

After that you should specify the application for your service principal and its password in corresponding fields if you already have one.

You may use "Create / Update" button to create new or update existing service principal in your cloud organization. This is a recommended approach. You will be prompted for your cloud organization credentials and RTS will try to create service principal and assign it necessary rights.

NOTE: Service principals created in Windows Azure AD may not be available right away.

Polling interval is the interval in seconds used to poll Office 365 Active Directory for changes.

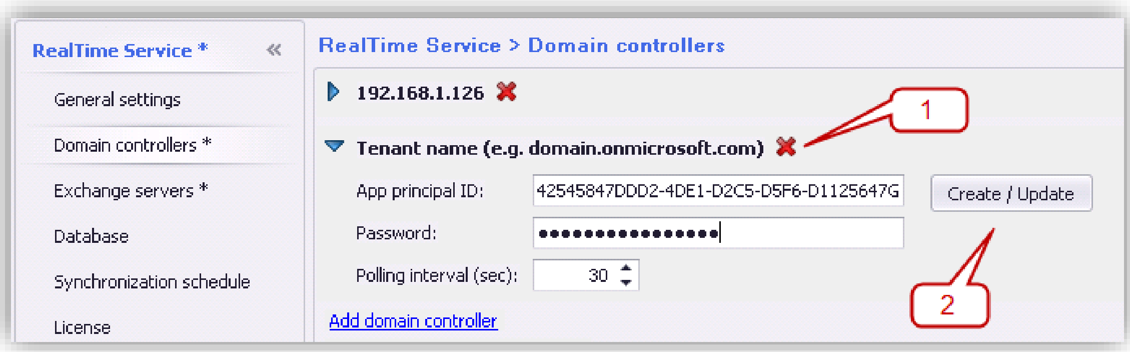


Figure 14. Domain Controller – Office 365 domains

NOTE: If you want to know more about the Global admin role requirement to ensure that the credentials has sufficient access rights, please refer to this KB: Register service principal in Azure AD when used with Office 365.

Office 365 domains (OAuth2)

You should enter your cloud tenant's name (e.g., yourdomain.onmicrosoft.com). For that, click twice on the text marked with flag 1 below.

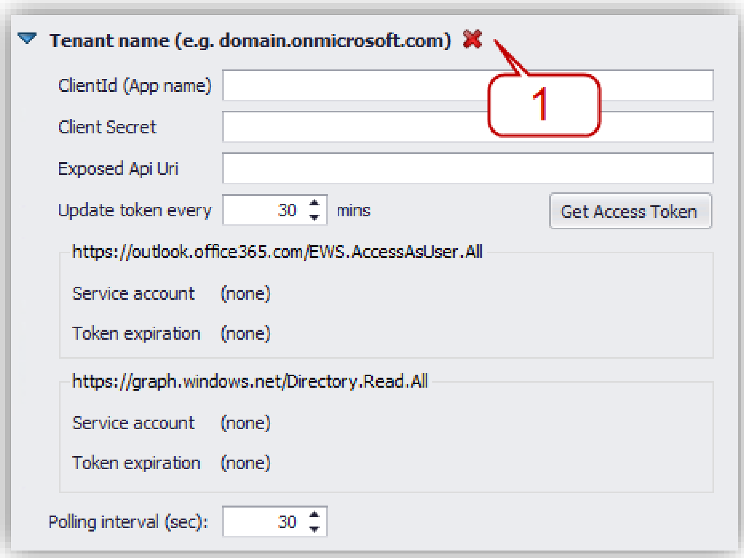


Figure 15. Domain Controller - O365 domains (OAuth2)

Details including **ClientId (App name), Client Secret, Exposed Api Uri** must be achieved in the process of creating an app in Azure portal. Please refer to this Knowledge Base Article for more details.

After filling in necessary details, clicking [**Get Access Token**] will populate data to 2 panels underneath.

Polling interval is the interval in seconds used to poll Office 365 Active Directory for changes.

Exchange servers

The ***"Exchange Servers"*** tab is used to configure the Exchange server that the program will work with and credentials to log on to the server with.

Add Exchange Server

Right after you enter the correspondent settings section, you will see the link ***"Add Exchange server"***, like on the picture below.

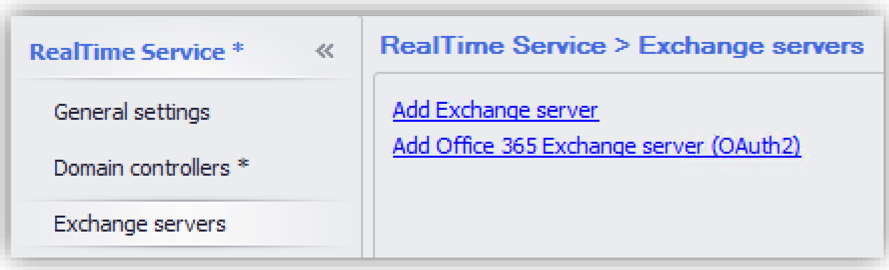


Figure 16. Exchange servers

After you click that link, you will see the dialog which allows adding Exchange servers (it is shown below).

Enter the name of your Exchange server at the top by clicking twice the text next to ✖ icon. Right after you enter it, the next field ***"EWS URL"*** will be filled automatically, if it was empty before. There will be the link to the Exchange Web Services.

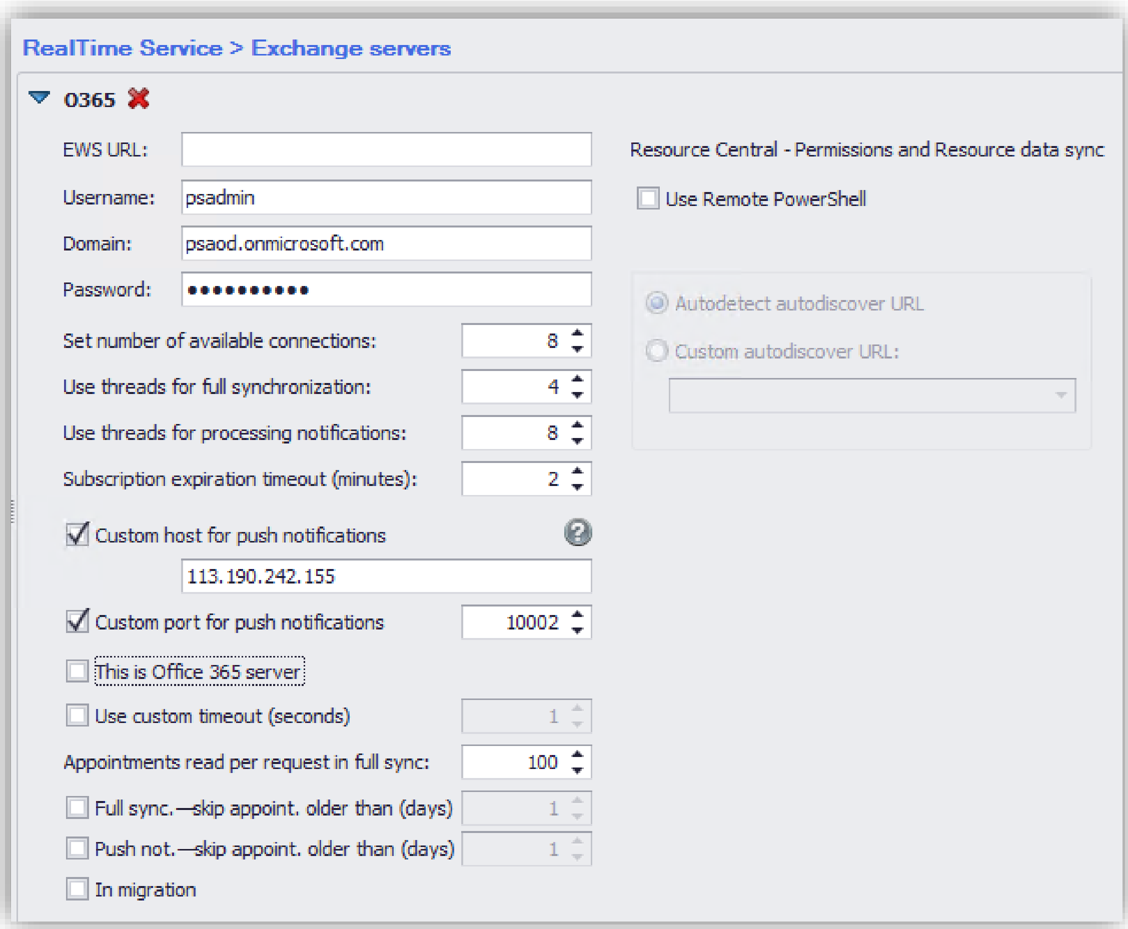


Figure 17. Settings for Exchange servers

When the RealTime Service is located behind the NAT, it may not be possible for the Exchange Server to contact it directly over the network. Here you can specify a custom host and a port through which the Exchange Server will send push notifications. Usually, the host here is the address or hostname of the NAT box and the port is a port number which you map in the NAT box firewall for the RealTime Service.

Then specify the username, the user's domain and the password of the administrator or the credentials of another account, which has permission to read/write each person's mailbox and calendar folder.

The ***"Set number of available connections"*** determines the max connections to Exchange server. This number should not exceed 26.

The ***"Use threads…"*** fields contain numbers of threads used for full synchronization and for processing notifications from the Exchange server.

The ***"Subscription expiration timeout"*** field contains the number of minutes in which a subscription for Exchange server notifications expires and is recreated.

Setting of connections and threads

Setting the number of threads and connections correctly is important for the system performance of the push notifications and full sync processing. Connections and threads should be a fitted according to the CPU core count of the server and not higher.

Example:

CPU core count of

- 8 Logical = 8 connections

Or

- 8 Physical (single core) = 8 connections

Setting threads for processing notifications and full synchronization should follow the overall rule of thumb:

- X connection = X push threads and X/2 full sync
- 8 connection = 8 push threads and 4 full sync

Setting processing notifications and full synchronization like above will compete for the available connections. If you schedule full sync. during low peak, it should not affect push notifications or prolong the full sync process. If you want the full sync to be able to run together with many push notifications coming in, then you can set threads for processing notifications 1-2 counts lower than available connections, in this way there will always be free threads for full sync. However, this can also be a downside, as you would not take full advantage of all connections for push notifications when full sync. process is not running.

Please be aware that the description above is based on RTS running as the only application using the CPU. If you have multiple applications competing for the connections, the correct configuration and best performance of RTS will be affected by these.

NOTE:

Connections can also be set a bit higher as some of the connections might be waiting for a thread processing and therefore not affecting the server's CPU.

If your server is suffering from slow network responses, increasing thread count above the max available connections could help as well as CPU is not utilized will waiting for response.

However, in both cases stated above it is hard to give any rule of thumb in such case.

Furthermore, setting to high values of e.g. threads can have a negative effect on the CPU usage and affect performance of server. Having too many waiting threads and CPU will have to switch between threads and that is performance heavy. Also, it can increase the number of threads waiting for available connections which will consume a lot of memory of the machine.

To add Office 365 Exchange server, consider the following approach.

Option ***"This is Office 365 server"*** must be checked, this will disable EWS URL field, which is not used in this case.

"Domain" field must contain the name of your Office 365 domain (e.g. myoffice365domain.onmicrosoft.com). ***"User"*** and ***"Password"*** should contain credentials of account within your cloud organization.

Also, when you check on ***"This is Office 365 server"*** option, it is possible to set a custom autodiscover URL with (autodiscover-s.outlook.com), (autodiscover-s.outlook.de) or (autodiscover-s.partner.outlook.cn).

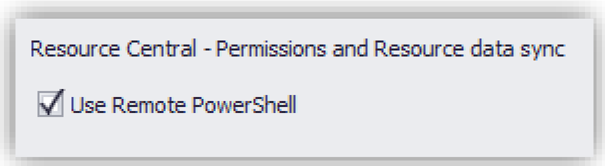
NOTE: You must open the corresponding TCP port to allow connections from external networks. Also, if you are installing RTS not on Internet facing server you must map port on your NAT box to RTS incoming notifications port on its server and enter correct data in ***"Custom host for push notifications"*** and ***"Custom port for push notifications"*** fields.
Checking on ***"Use custom timeout"*** allows you to configure timeout (in seconds) of exchange operations. This field can be put in use sometimes for situations in which the default timeout is not enough and the program might encounter errors.

You can also configure the number of appointments loaded in one batch by selecting from dropdown list or entering a number to **"*Appointments read per request in full sync*"** field. The default value is 100 (appointments).

By selecting ***"Full sync.–skip appointments older than (days)"*** and ***"Push not.–skip appointments older than (days)"*** options and selecting the number of day(s) from the dropdown list, you can limit the number of appointments read per request in full sync. This option is subsidiary to **"*Appointments read per request in full sync*"** field. Do not forget to save changes.

When your organization is in the stage of migration from Active Directory on premise to Windows Azure, it is required that option ***"In migration"*** is checked.

On the right side of the panel, there is a section for Permissions and Resource Data synch:



If you uncheck the option '**Use Remote PowerShell**', 2 features Group synch and Resource Data synch will be disabled.

Add Office 365 Exchange Server (OAuth2)

Under the link ***"Add Exchange server"***, you can see the link Add Office 365 Exchange Server (OAuth2). Click that link, you will see the dialog which allows adding Office 365 Exchange servers.

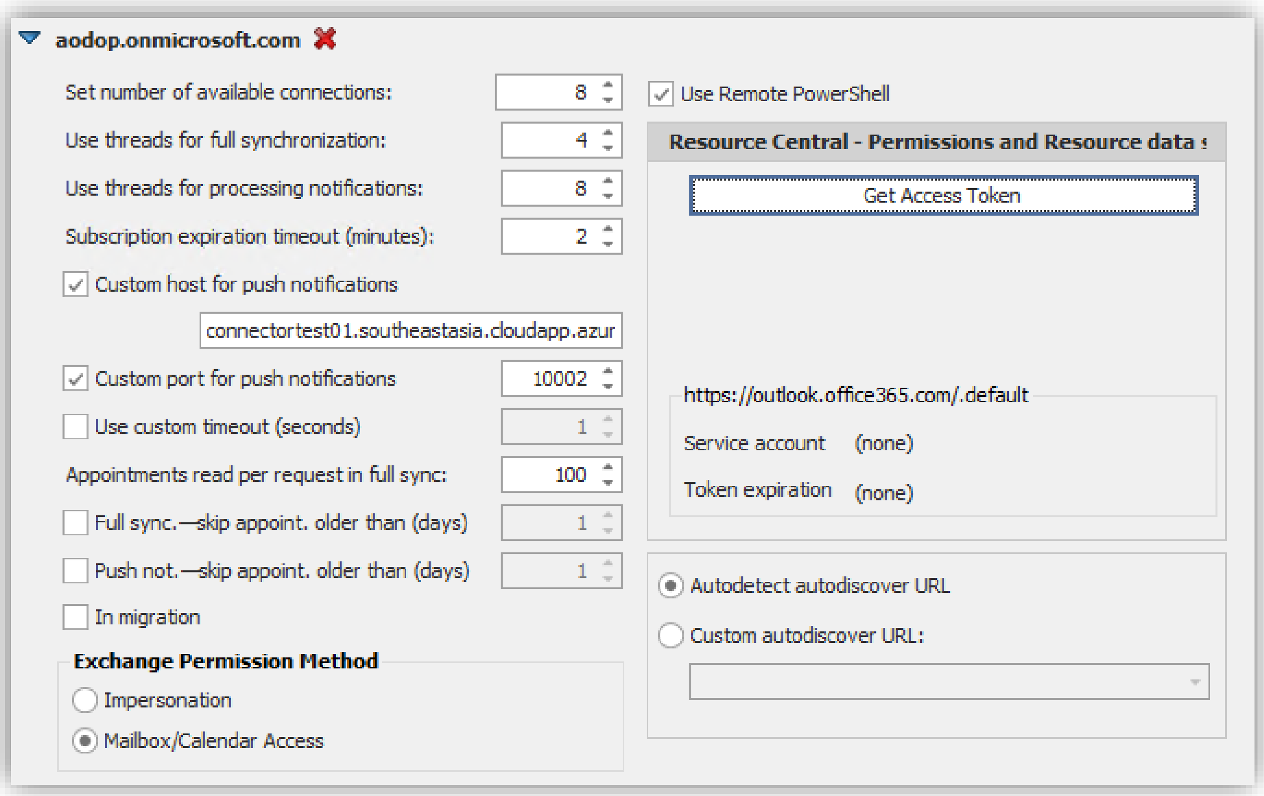


Figure 18. Settings for Add Office 365 Exchange Server (OAuth2)

Some fields on the left panel are already described in the previous section.

Exchange Permission Method

Impersonation

In order for the program to be able to run and to get proper access to calendars information on the Exchange Server, Exchange Impersonation can be used. You can read how to configure it following the next link:

- Exchange Online | Exchange Server 2013, 2016, 2019 | Office 365
  http://msdn.microsoft.com/en-us/library/office/dn722376(v=exchg.150).aspx

You can test the correctness of the specified access parameters by clicking the ***"Test configuration"*** button. If the setting is incorrect, the RealTime Manager will show you some messages containing recommendations to check what value is wrong.

NOTE: The Exchange Impersonation is no longer supported for new service accounts signed in RTM as Microsoft begins blocking the assignment of the Impersonation role in Exchange Online to accounts starting in May 2024, and in the near future, this role and its feature set will be completely removed from Exchange Online. Note that Impersonation is still active for service accounts that were granted it prior to this period.

Mailbox/Calendar Access

With the termination of Impersonation, the Service Account must be granted the following permissions in order for the program to be able to run and to get proper access to mailbox/calendar information of the resources on the Exchange Server:

- Full Access + Send As permissions on the resources added in RTS.
  -OR-
- Calendar Editor permission on the organizer who books meetings on Booking Manager.

Read the following links for how to configure necessary permission(s):

- Configure Full Access and Send As permissions on Exchange Management Shell: Manage permissions for recipients | Microsoft Learn (Exchange Online | Exchange Server 2010, 2013, 2016, 2019 | Office 365)
- Configure Full Access and Send As permissions on Exchange Online: Refer to Appendix C for more information.
- Configure Calendar Editor permission on Exchange Management Shell: Add Mailbox Folder Permission (Exchange Online | Exchange Server 2010, 2013, 2016, 2019 | Office 365)

On the right panel, if you uncheck the option '**Use Remote PowerShell**', 2 features Group synch and Resource Data synch will be disabled. If you check on '**Use Remote PowerShell**', the dialog under it will be available.

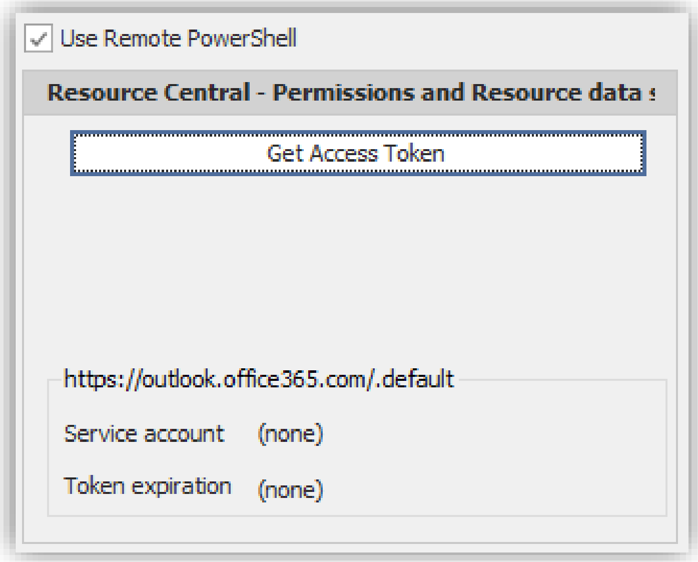


Figure 19. Use Remote PowerShell enabled

Click [**Get Access Token For Remote Session**], and a pop-up window will appear to require you to input the credentials of the service account.

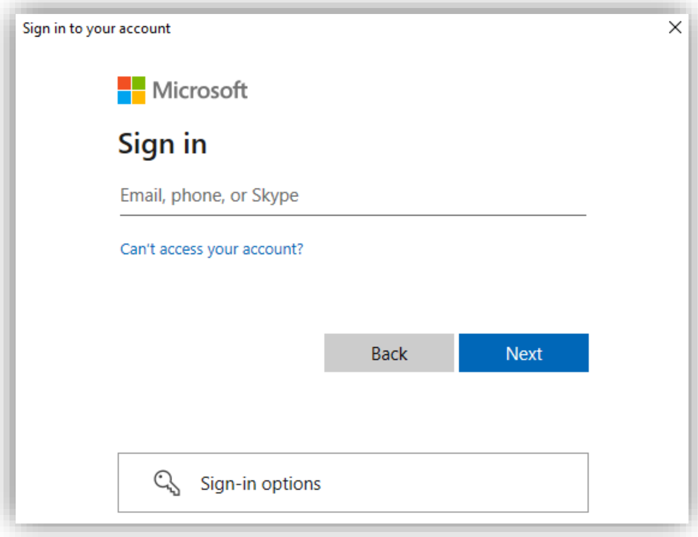


Figure 20. Sign in to get access token

Click [**Sign in**] and the information on RootRemoteExchangeAPI will be populated:

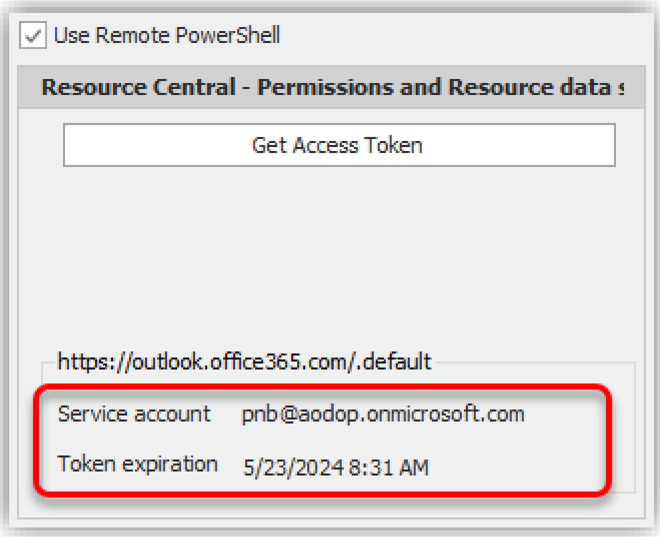


Figure 21. Get Access token successfully

NOTE:

- The **Exchange Servers** and **Domain Controllers** tabs must use the same service account to get access token.
- In case you update a different service account to get access token in ***either of the 2 mentioned tabs***, you only need to click on ***the remaining tab*** to automatically apply that new service account credentials to that tab. Following that, the new access token for that tab will be produced automatically.

Database

Here you can create a RealTime Service database connection. Right after you enter this section, you will see the dialog like on the figure below.

In the ***"SQL Server"*** field, enter the name of an SQL server available in your LAN or choose one in the drop-down list.

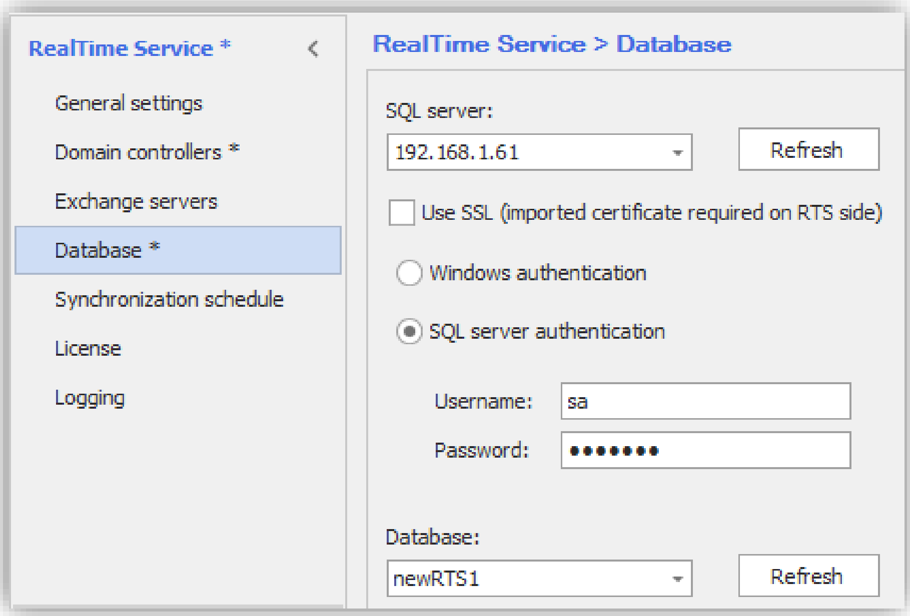


Figure 22. Database

Enter the information to log on to the database: choose between the ***"Windows Authentication"*** option (domain credentials will be used to log on to the SQL server) and the ***"SQL server authentication"*** - enter a specific username and password in this case.

If there is no RealTime Service database on the specified SQL server, the RealTime Service would create one. Otherwise, you can choose to use the existing database or delete its content to have a new blank one. Use buttons of database management on the RTM toolbar for that.

Use the ***"Refresh"*** buttons in the dialog to renew values of correspondent dropdown lists.

In addition, you can check on ***"Use SSL (imported certificate required on RTS side)"*** option to use SSL to connect with SQL (make sure that you have imported certificate on the device that installed RTS).

Do not forget to save performed changes.

By doing the above steps, a configuration file (Settings.xml) will be created and stored in the RealTime Service folder (default folder is \ProgramData\Add-On Products\RealTime Service 6\). The file contains the specified connection string to the configuration database.

Synchronization schedule

Here you can set intervals of constant synchronization.

Right after you enter this settings section, you will see the dialog as follows.

First, mark the ***"Enable periodic full synchronization"*** to make its settings active.

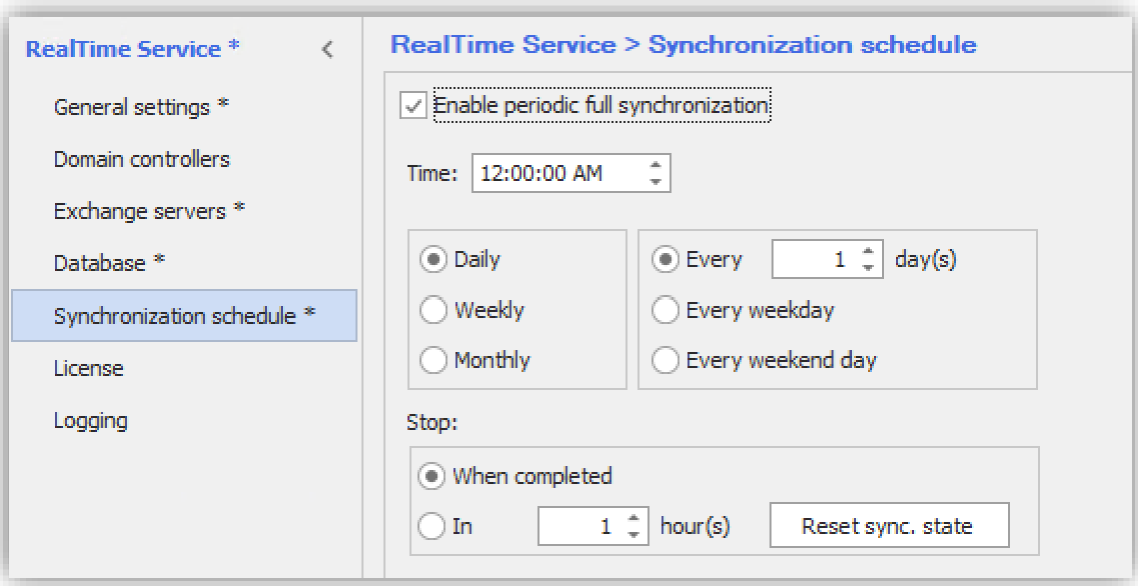


Figure 23. Synchronization schedule

In the ***"Time"*** field set the time when the synchronization will be performed. After that, select the period of synchronization itself.
There are three kinds of periods, as you can see on the picture above:

- Daily
- Weekly
- Monthly

The ***"Daily"*** settings are shown on the previous figure.
On the figure below you can see ***"Weekly"*** settings.

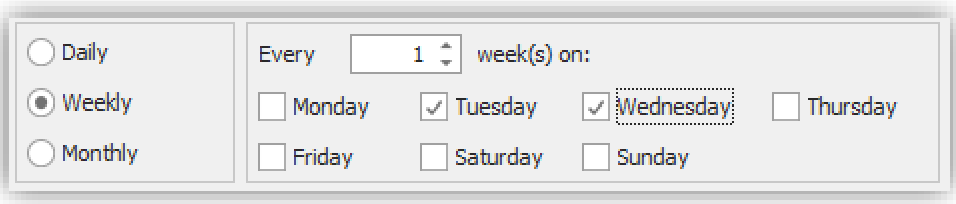


Figure 24. Synchronization circle settings

And on the following picture you can see ***"Monthly"*** options.

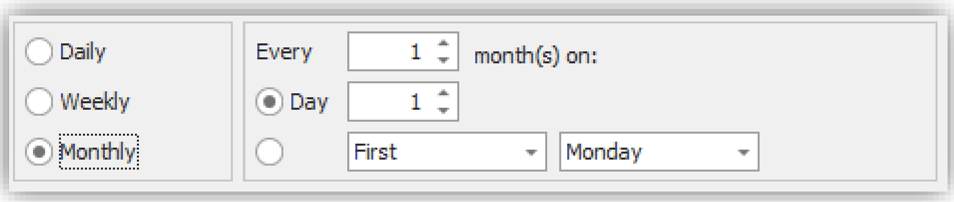


Figure 25. Synchronization circle settings

You can set the time when the synchronization is automatically stops by selecting either:

- When completed
- In … hour(s)

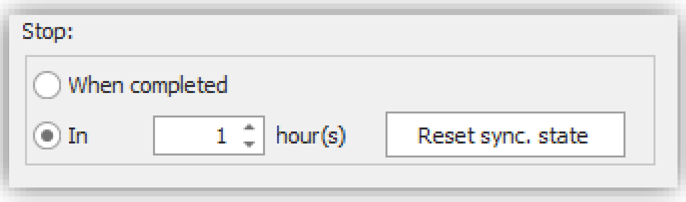


Figure 26. Stop schedule

Press [**Reset sync. state**] to clear the synchronization state in previous time.
All these settings are rather simple and intuitive.

License

From the moment of the first installation of the RealTime Service, RTS works in the demo mode. The demo license is valid for one day only and works with 10 calendars for each product maximum. The message, like below, will be shown every time you connect to the RealTime Service which is working in the demo mode.

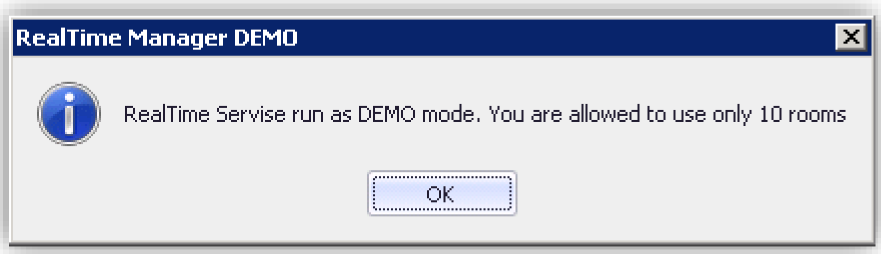


Figure 27. License notice

If you have a valid license, you can enter it any time.

Enter license

Go to the ***"License"*** settings section, as it is recommended in the message above. There you can use options ***"Edit license"*** (flag 1) and ***"Load from file"*** (flag 2) to set the license – find the correspondent buttons on the toolbar (see flags on the picture below).

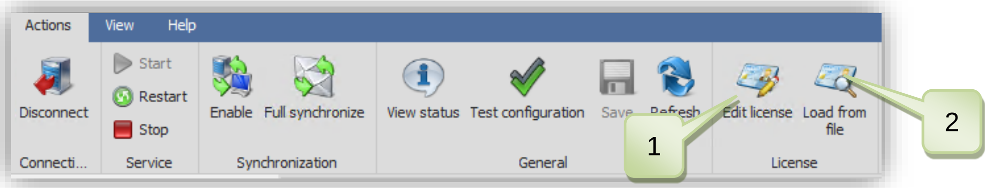


Figure 28. Enter license

If you press the ***"Edit license"*** icon, you will see the following picture:

- The ***"Edit license"*** button turned to the ***"Cancel edit license"*** button (flag 1 below).
- The fields under flag 2, 3 and 4 on the picture below became active – there you can manually insert the license name and the license key correspondently.
- The information about an expiration date and the number of licensed calendars for each product can also be found there.

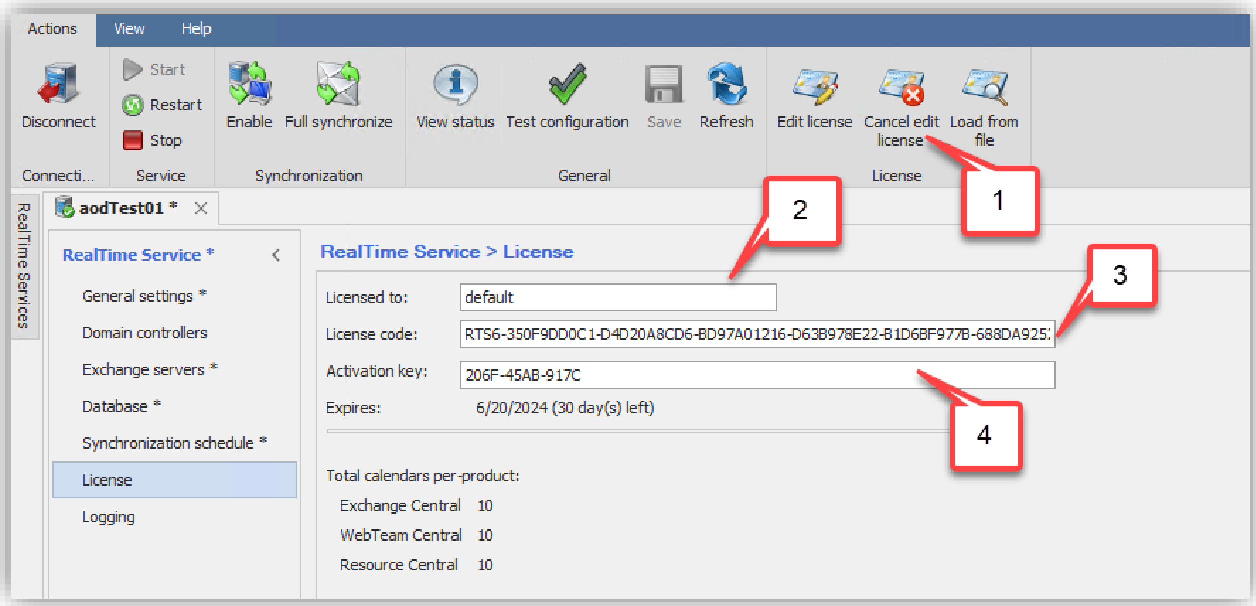


Figure 29. License section

If you use the ***"Load from file"*** option to install the license, you should browse for the valid license file and open it. In this case all data will be entered automatically, and you will see the message, like below.

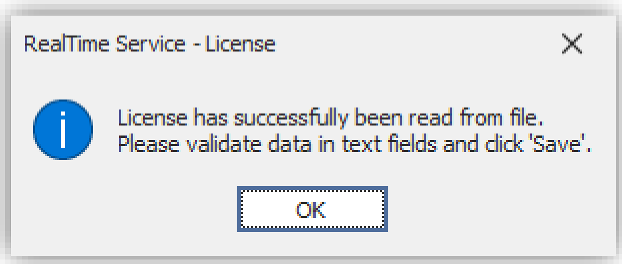


Figure 30. License notice

Do not forget to save changes in this settings section.

License expired

If the license is expired, you will get the message about that, when you connect to the server – see the figure below.

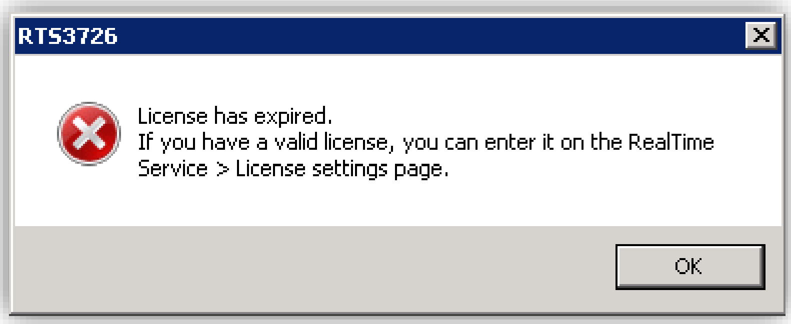


Figure 31. License notice

Even, when your license is expired, the RealTime Manager, as well as the RealTime Service, will still work. But in the RTM the settings for the product with expired license will not be available and the RTS will not write correspondent data connected to such product into the database.

If some product is not licensed, it will not be listed in the list ***"Total calendars per-product"*** of the ***"License"*** section; its settings, as it was mentioned, will be blocked (see flag 1 below) in the RTM and, when you try to open them, you will get the message like on the following picture.

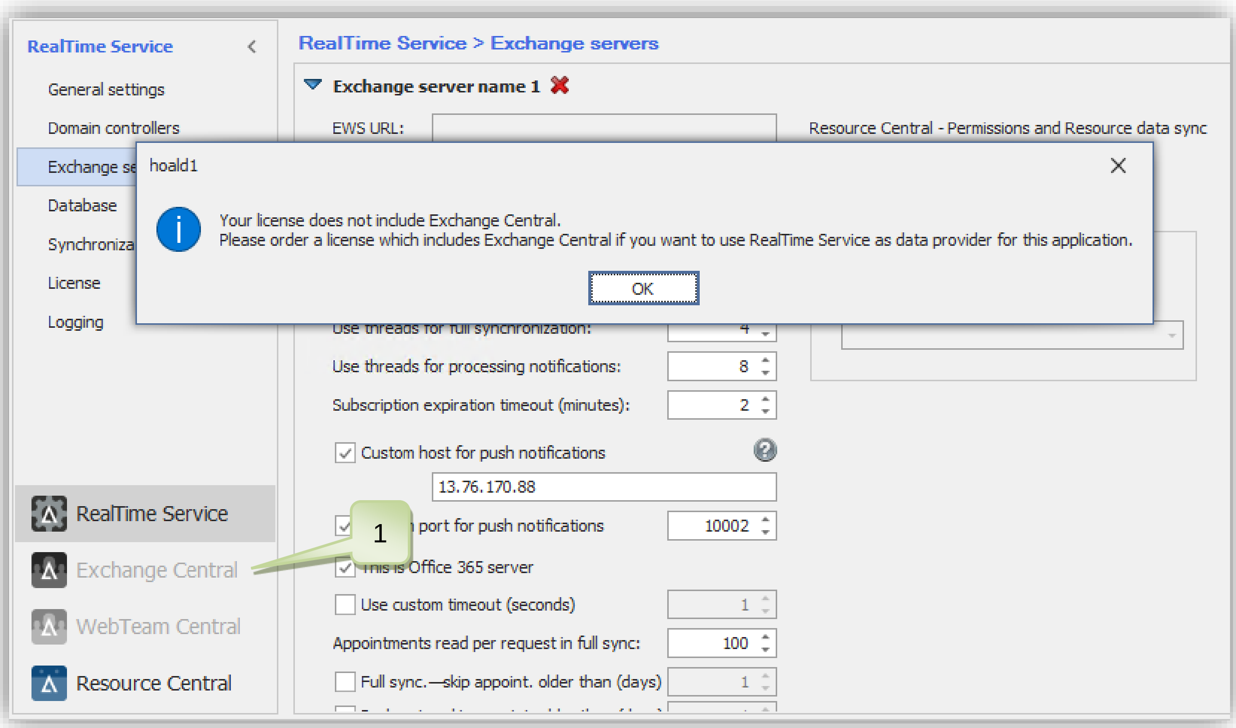


Figure 32. Message from the system

If the limit of licensed calendars is exceeded for some product, it will be indicated on the ***"Status"*** page and the work will be continued only with the licensed number of calendars – the over-limit ones will be ignored.

See on the picture below the ***"Status"*** page and under flag 1 there are numbers of calendars: red – over-limit calendars, black – licensed limits.

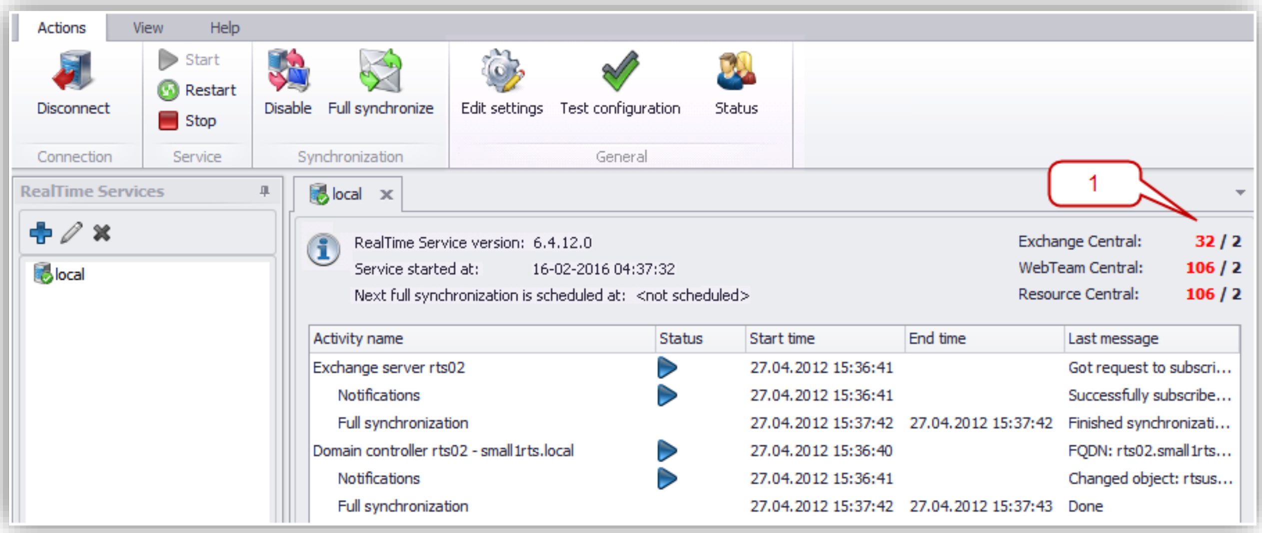


Figure 33. Status page

Logging

Errors and (or) events of the RealTime Manager and the RealTime Service can be logged for using in case of troubles by problem possible cause detection. The ***"Logging"*** settings section is intended for managing logging options.

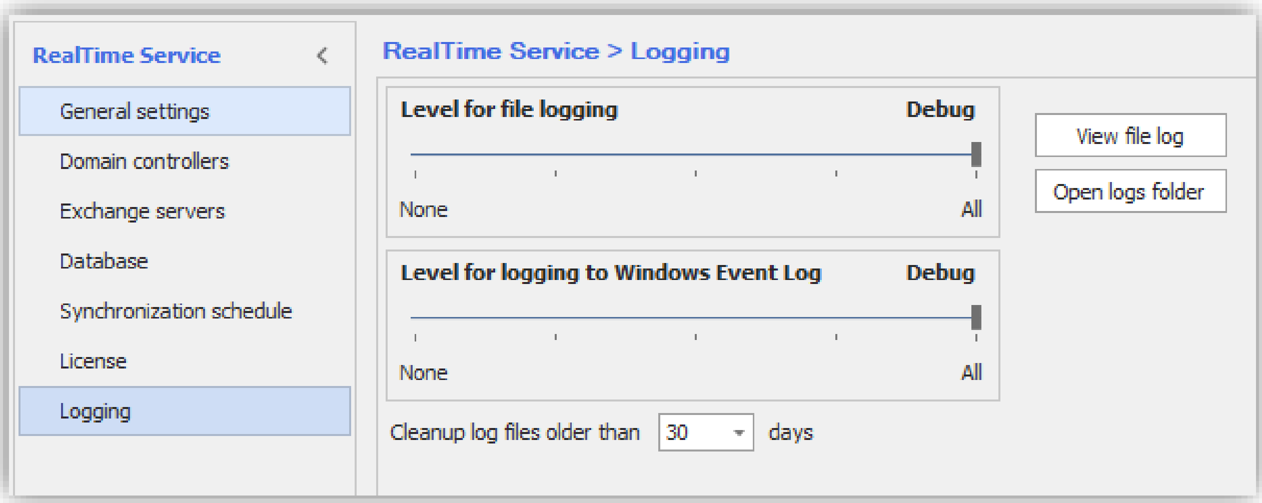


Figure 34. Logging

There are 2 scrolls in the **Logging** section:

- *Level for file logging*
- *Level for logging to Windows Event Log*

These levels indicate the depth of logging.

Levels of file logging can be the following:

- None
- Errors
- Warning

- Info
- Debug

Levels of logging to Windows Event Log are the same as file logging.

Select the ***"None"*** level to disable logging.

Also, there are two buttons in the ***"Logging"*** settings section. They are ***"View file log"*** and ***"Open logs folder"***. With their help you can perform correspondent actions.

Log files are named as it is described in the table below:

	RealTime Service
For current date	RTS.log
For other date	RTS.log-<date> For example: RTS.log-2021-08-01

The log file of the current date will always be RTS.log. When a day passes, the log file of the day will be changed to the second format which is RTS.log-<date>. When a log size reaches 30 Mb it changes the name according to the format RTS.log-<date>.<counter>. There can be a few such files per day.

Errors and events will be stored in the Windows Event Log. Logging data can be viewed in the standard Windows feature – the Event Viewer. To launch the Event Viewer, click Start, Settings, Control Panel, Administrative Tools, Event Viewer.

Also, "***Cleanup log files older than***" is a feature that allows you to delete log files older than a number of days. The number of days that can be selected from the dropdown list include **3, 7, 14, 30** days.

NOTE: The "***Cleanup log files older than***" function can only be applied to file logging, not event logging.

Exchange Central, WebTeam Central and Resource Central Settings

The work with settings of the Exchange Central, the WebTeam Central and the Resource Central is similar, so the explanations are gathered in one chapter.

The Exchange Central is a Windows based application used for groups scheduling.

The WebTeam Central is a browser-based group/team calendar that makes it possible to view and manage as many calendars as needed in one view.

The Resource Central is the complete meeting and conference planning tool for internal and external events.

General

First you have to go to the ***"General"*** section and mark the ***'Enable output for this product'*** checkbox to make the data transferring to this application's database possible.

Right after that, the dropdown list below will become active, and there you will have the possibility to select the time zone which will be used for storing dates in the application's database.

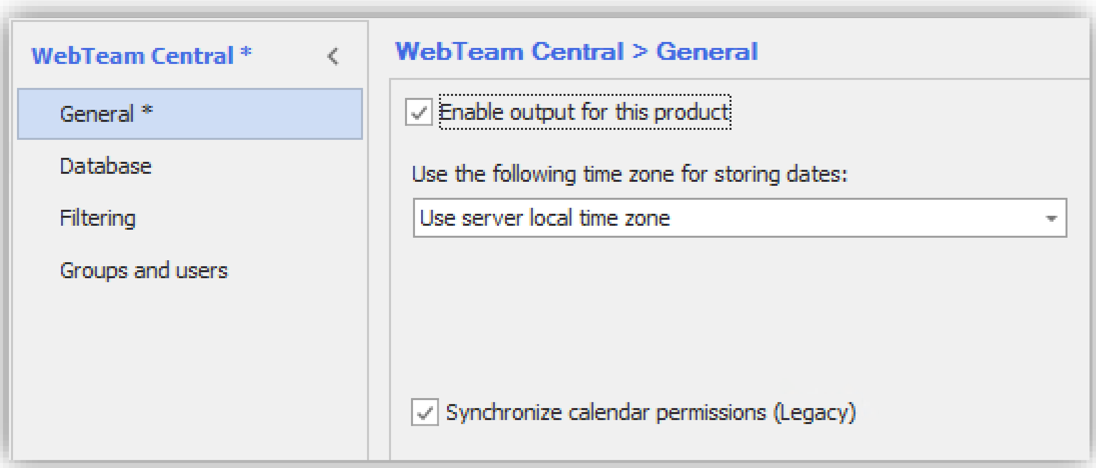


Figure 35. Settings for WebTeam Central – General

In the lower part of the figure above, you can find the ***'Synchronize calendar permissions'*** checkbox. It turns on/off access rights synchronization for a certain database. If the option is turned off, the access rights are not read from Exchange and, as a result, are not written into the database.

This option is available only for the WebTeam Central and the Resource Central and turned on by default. It may be useful in the following situation: for example, the use of calendar access permissions may be not enabled in Resource Central, so there is no need to read the rights from the Exchange and synchronize them - as a result, the mentioned option can be turned off for time economy.

One more synchronization option is available for the Resource Central only and is shown in the following section.

Deletion events processing delay

In the Resource Central general settings, there is one additional option called ***'Deletion events processing delay'***.

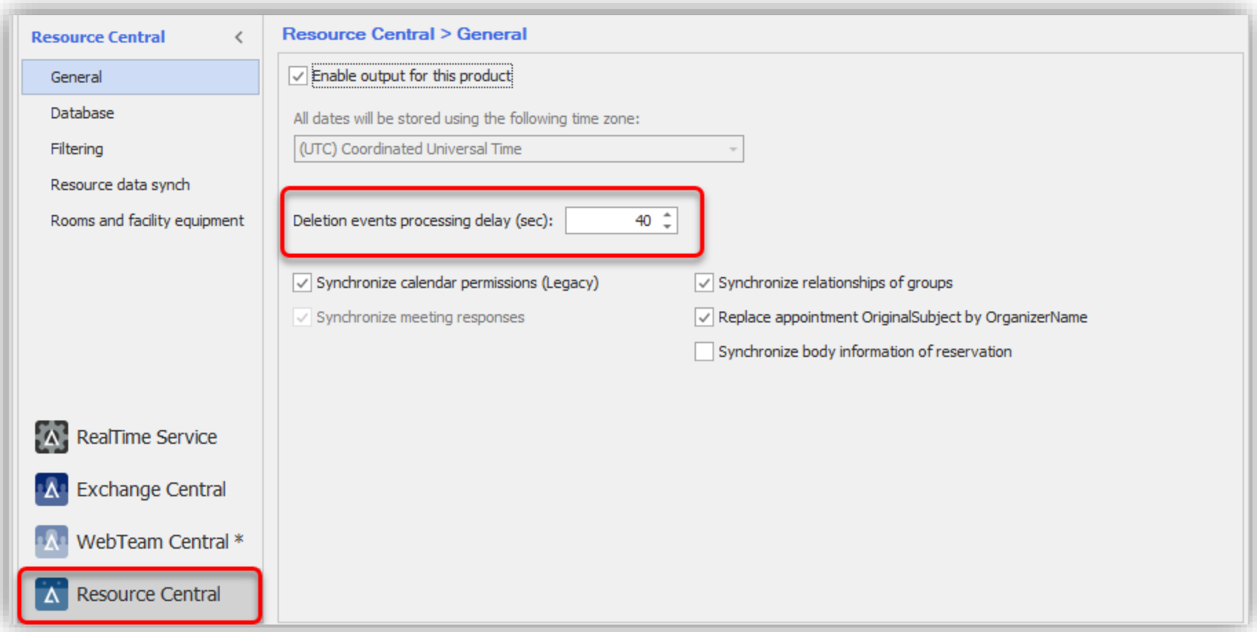


Figure 36. Settings for Resource Central - General

To describe the function, first, it is necessary to describe the situation in which this function is used.

The RTS receives push-notifications from the Exchange server about different changes in appointments. If a meeting (appointment assigned to a few users) is changed, the Exchange server re-creates the whole appointment (deletes an old one and creates new with changes). As a result, the RTS receives 2 push-notifications: one about event deletion, and one about creation. These push-notifications can be sent by the Exchange in different messages, or in the one.

If the mentioned push-notifications are received in one message, they can be filtered because it's obvious, that, in fact, a change happened to the same appointment. If those push-notifications are received in different messages, it cannot be differed, the real deletion happened or the appointment deletion with re-creation.

So, the ***"Deletion events processing delay"*** option lets to set the timeout between receiving deletion message and its processing with the correspondent database record. This means that, if you set the timeout in 30 sec, the RTS will wait 30 seconds after receiving such message before it will be processed and this fact - written to the database. If during the timeout, the message about appointment re-creation is received, the deletion message will be ignored, and the correspondent change will be written to the database.

Notice that messages about real deletions made by users will also be delayed during the set timeout.

The optimal timeout should be chosen for each system individually depending on the system's parameters. The default value here is 40 seconds.

There is one more checkbox comparing with the WebTeam general settings - ***"Synchronize meeting responses"***. For some rooms which automatically accept/reject meeting it was impossible to read response - accept or reject - because the appointment was deleted and moved from calendar folder to deleted folder. As a result, usp_NotifyMeetingResponse was not called.

In order to solve this issue, this checkbox was added.

When it's checked, the application treats deleted appointments (which are in deleted folder) as valid responses and uses ResponseType property from it as a parameter in usp_NotifyMeetingResponse. The only thing in database which you can see is that - usp_NotifyMeetingResponse has been called for automatically accepted/rejected meeting as it is required.

NOTE: The option ***"Synchronize meeting responses"*** is available only for the Resource Central.

Replace appointment's OriginalSubject with OrganizerName

In the Resource Central general settings, there is another option called ***'Replace appointment OriginalSubject with OrganizerName'***.

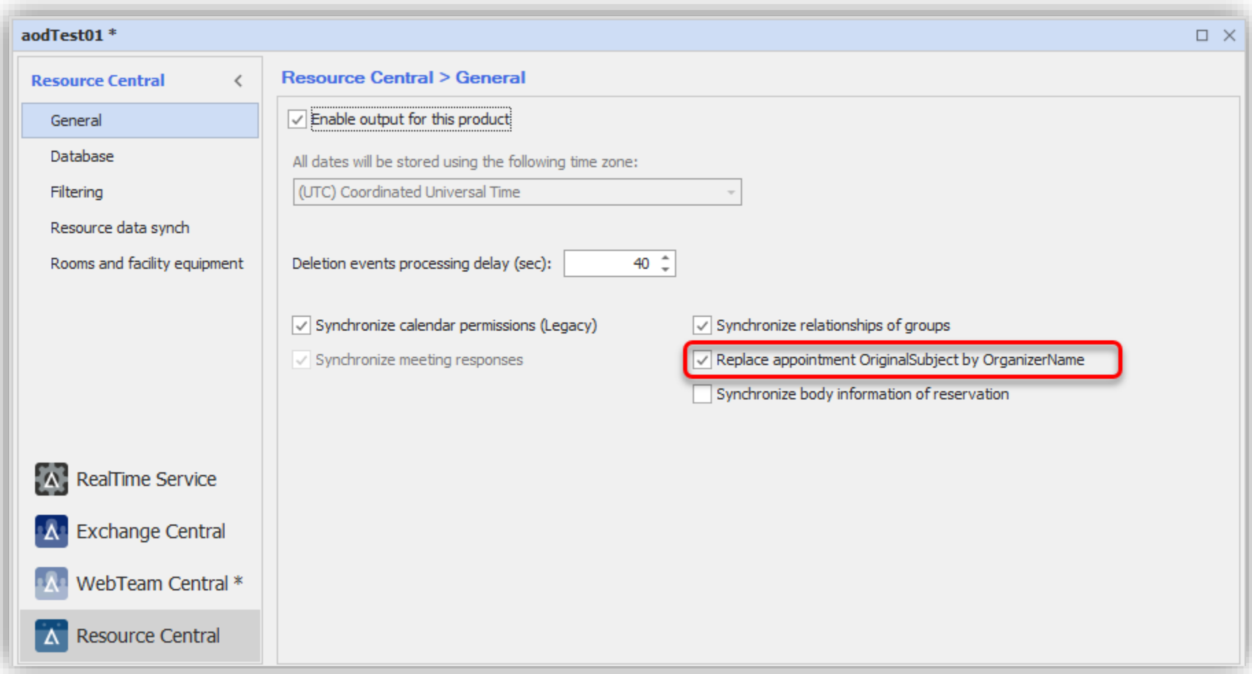


Figure 37. Replace appointment OriginalSubject by OrganizerName

In some cases, you may not want meeting subjects to be seen by other people and you would set up Exchange to replace the subject with the Organizer's name. However, the Orginal subject, initially created in Exchange before reservation is sent to the resource Calendar and replaced, remains. This option can provide this privacy by replacing the Original Subject of reservation with the organizer's name before sending the information to Resource Central Database.

NOTE: When you enable this option, it will only apply to new reservations. Old reservations (which are already booked before) will still show their original subject.

Active Directory group relationship sync

If you check on option '**Sync relationships of groups**', the feature of synchronizing all Active Directory relationships of group is enabled, and relationship data of distribution lists (which are added to resources' policy and their child groups) will be passed to RC. If not checked, Resource Central will only be able to use user email addresses assigned to Exchange policies and permissions.

NOTE: In order to get Groups and hidden Groups it is a requirement that the service account must be given the following Exchange role ***View-Only Recipients*** (refer to Appendix D for more details)

Enabling this feature will require a full synchronization and depending on your number of resources, groups, and the complexity of the structure of the groups this can be time consuming and increase the load on the application when processing the data for the first time or when doing a full sync. So, it is recommended to set up the feature during off-hours or low peak periods.

Synchronizing body information of reservation

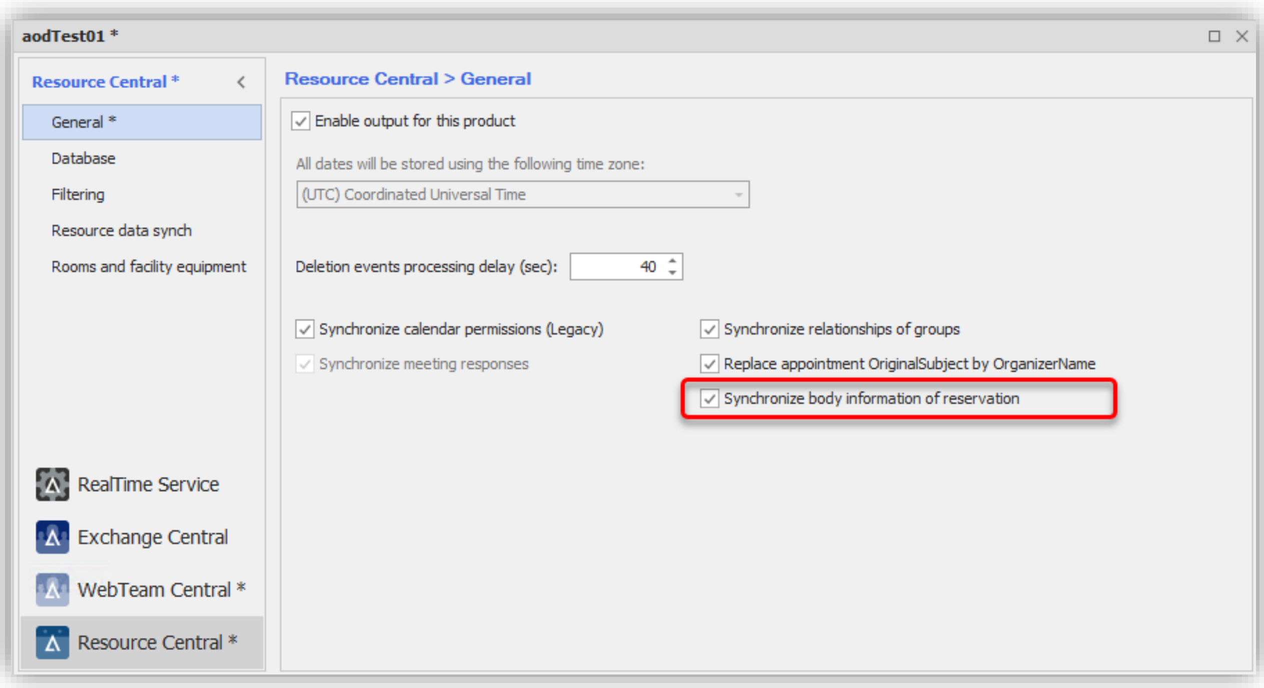


Figure 38. Sync body information of reservation

Enabling this feature will allow Resource Central to get information of the external organizers, including:

- Name
- Email
- Phone number

NOTE: RC 4.3 RTM or higher is required to run this function.

Database

Here you can create an application's database connection. Right after you enter this section, you will see the dialog like on the figure below.

In the ***"SQL Server"*** field, enter the name of an SQL server available in your LAN or choose one in the drop-down list.

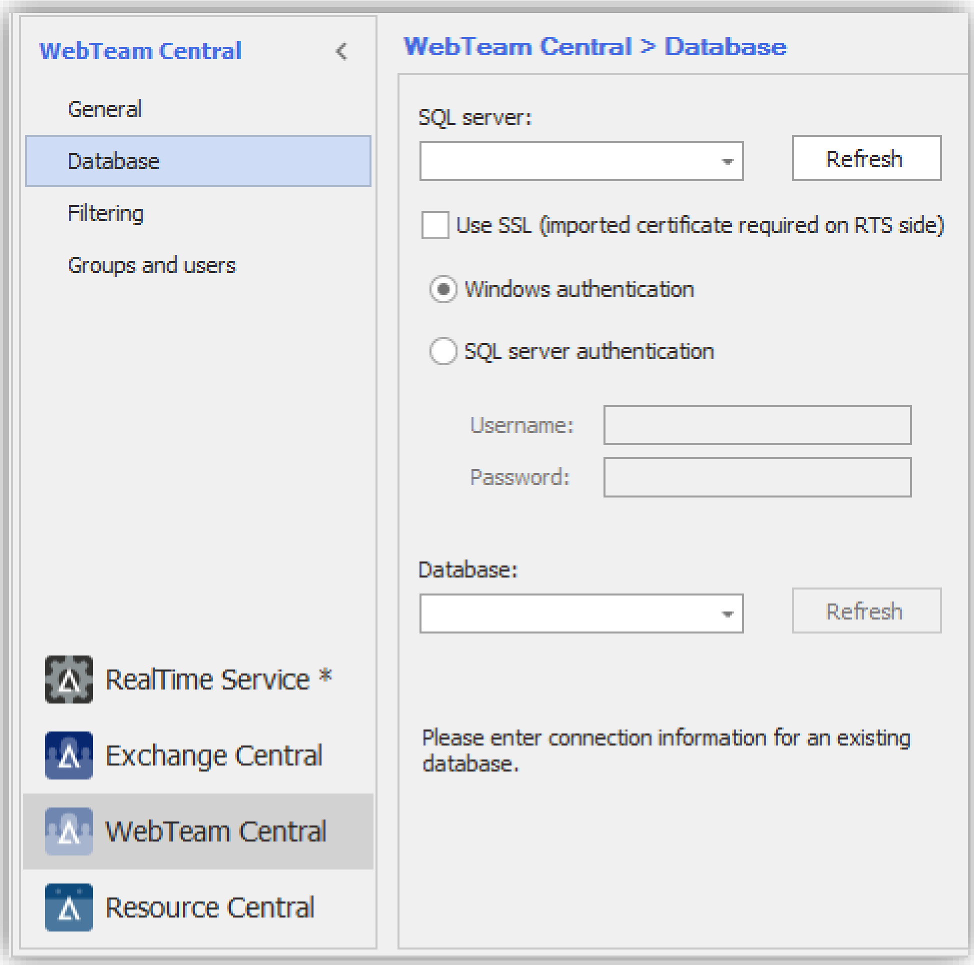


Figure 39. WebTeam Central Settings - Database

Enter the information to log on to the database: choose between the ***"Windows Authentication"*** option (domain credentials will be used to log on to the SQL server) and the ***"Use SQL server authentication"*** - enter a specific username and password in this case.

You can choose to use the existing database or delete its content to have a new blank one. Use buttons of database management on the RTM toolbar for that.

Use the ***"Refresh"*** buttons in the dialog to renew values of correspondent dropdown lists.
Do not forget to save performed changes.

Also similar to RTS's Database, you can check on ***"Use SSL (imported certificate required on RTS side)"*** option (make sure that you have imported certificate on the device that installed RTS).

Filtering

RealTime Manager features a filtering function for synchronizing only the necessary data. The ***"Filtering"*** section is featured in each application section.

First, mark the ***"Enable filtering"*** checkbox to activate the option of filtering for the database.

The ***"Filtering"*** section features the following aspects:

- Older than (days). The default value is 31.

- Newer than (days). The default value is 1825.

Adjust these two elements above to define the date range. Only the items within the specified date range will be processed.

You can also select to apply the filtering only for full synchronization.

See this in the picture below.

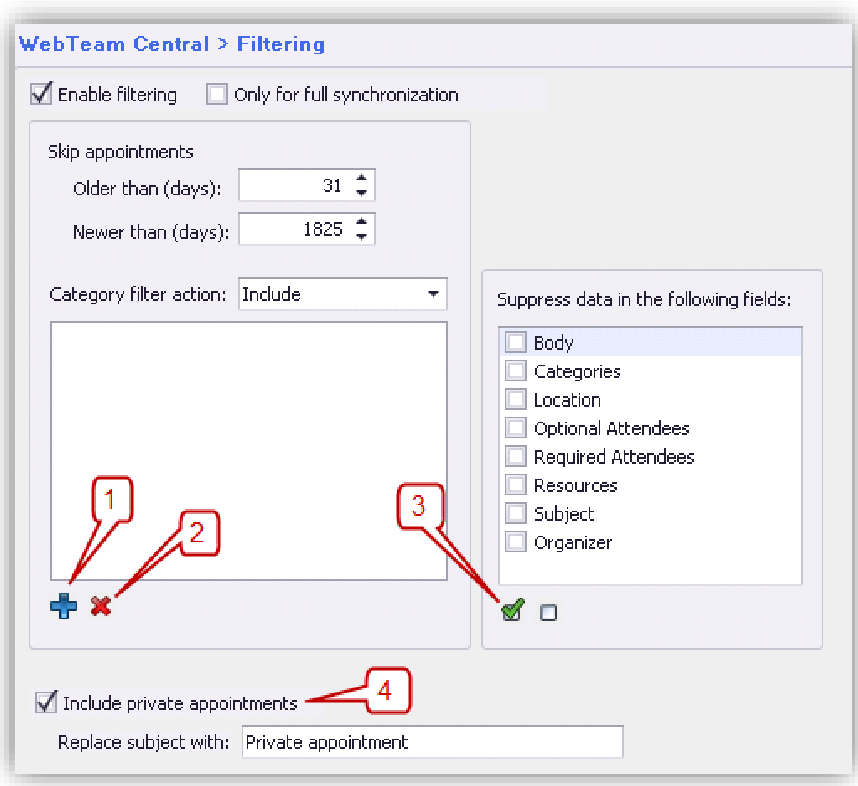


Figure 40. Filtering in WebTeam Central

Only appointment start date (including start time) is considered during processing. To add a new category to the list, do the following:

1. Click the ***"Add"*** button (flag 1 on the figure above). The **"New Category"** line will become available for editing.
2. Type in the category name you need.
3. To remove a category, select the category you want to delete and click the ***"Remove"*** button (flag 2).

The ***"Suppress data in the following fields"*** area contains the list of appointment fields which, if marked, will not be synchronized (i.e., will be marked as empty in the database). You can mark or unmark them all using icons under flag 3 on the figure above.

The ***"Include private appointment"*** checkbox (flag 4), if marked, allows the RTS synchronize private appointments.

For these appointments, RTS collects only time and date information, leaving all text fields empty. The ***"Replace subject with"*** field under this checkbox would be enabled to enter a subject value, which will be used to replace the subject line of private appointments prior to storing them to the database.

Filtering mechanism

The filtering mechanism in RTS includes Exchange filter (established in Exchange servers' section) and product filter (in each application: WebTeam Central, Exchange Central or Resource Central). The first filter involves Exchange filter. After that, product filter is involved.

1. Exchange filter
   - First, the server loads **IDs** and **Start dates** of appointments. It ignores normal appointments if their start date is older than the days specified by Exchange filter.
   - Together with normal appointments, master recurring appointments are also loaded.
   - After that, the server loads all occurrences for these recurring masters and does not filter them.
2. Product filter
   - All appointments are passed to the database.
   - Now the product filter is involved. It also filters occurrences of recurring appointments.

So, the filtering mechanism can be illustrated by the following example:

- If the exchange days filter is **3** and product is **10**, then appointments older than **3** days will not be loaded.
- If Exchange days filter is **15** and product is **10** then appointments older than **10** days will not be loaded.

Resource data synch

This function is only available for Resource Central. The configuration made in this section will decide which fields can be selected for each category (*Active Directory Properties, Mailbox properties, Mailbox Calendar Configuration* or *Mailbox Regional Configuration*) in Resource Central backend for the purpose of synchronizing resource data from Exchange and Active Directory.

NOTES:

- This function only works if the parameter **RC.ResourceDataSynch.Enable** is turned on in Resource Central. Please refer to the ***Resource Central Parameter Guide*** for more details about this parameter.
- Real-time update (push) only works for **Active Directory** properties and **Mailbox Regional** properties.

Clicking on Resource data synch, the following panel will be displayed:

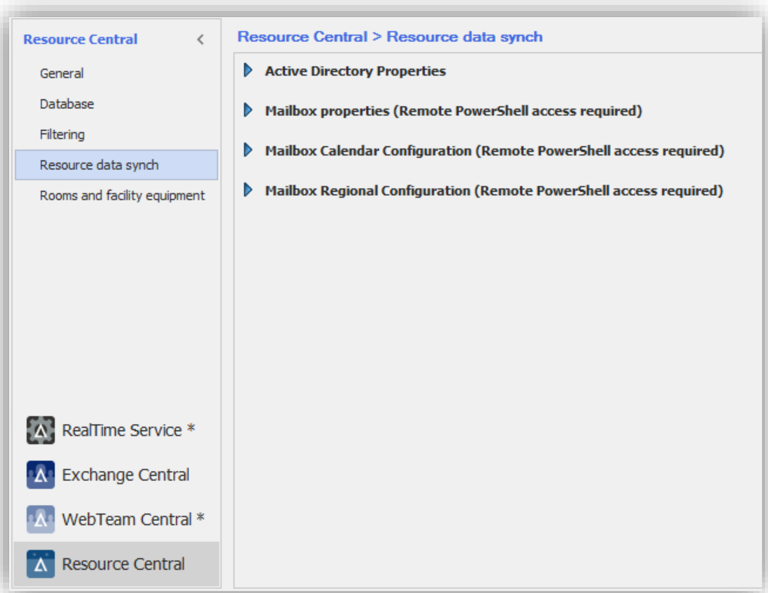


Figure 41. Resource data synch

In this panel, you have 4 sections of data properties. Click one or more of these to make necessary configuration using the arrows (> and <):

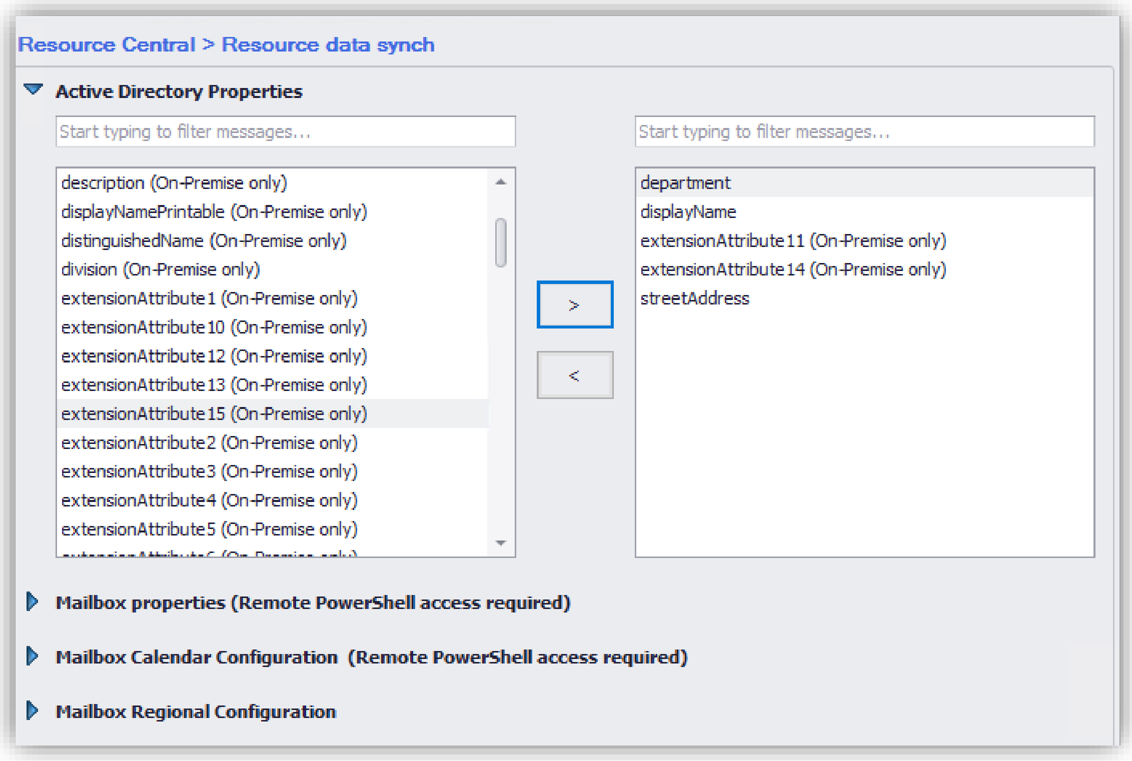


Figure 42. Select properties

What you select for the right column will be inserted into Resource Data Synch section in Resource Central backend. These properties are categorized accordingly, so that the selection can be conveniently made. The properties with no “On-Premise only” text in their names can be used for both Online and On-Premise environment.

NOTES:

- For Exchange Online:
  - If the service account has ***Impersonation*** right and ***View-Only Recipients*** role, RTS gets all data of all groups.
  - If the service account has ***Full Access*** right and ***View-Only Recipients*** role, RTS gets all data of all groups.

- For Exchange On-Premise:
  - If service account has ***Impersonation*** right and ***View-Only Recipients*** role, RTS gets all data of all groups.

(Refer to Appendix D for more details on how to assign ***View-Only Recipients*** role to service account)

Groups and users

The RealTime Manager provides an interface to manage user groups and users which will be synchronized in the ***“Groups and users”*** settings section.

NOTE: For the Resource Central the **“Groups and users”** section is called **“Rooms and facility equipment”**.

On the picture below you can see how it looks. Groups and correspondent users are on the right side of the panel.

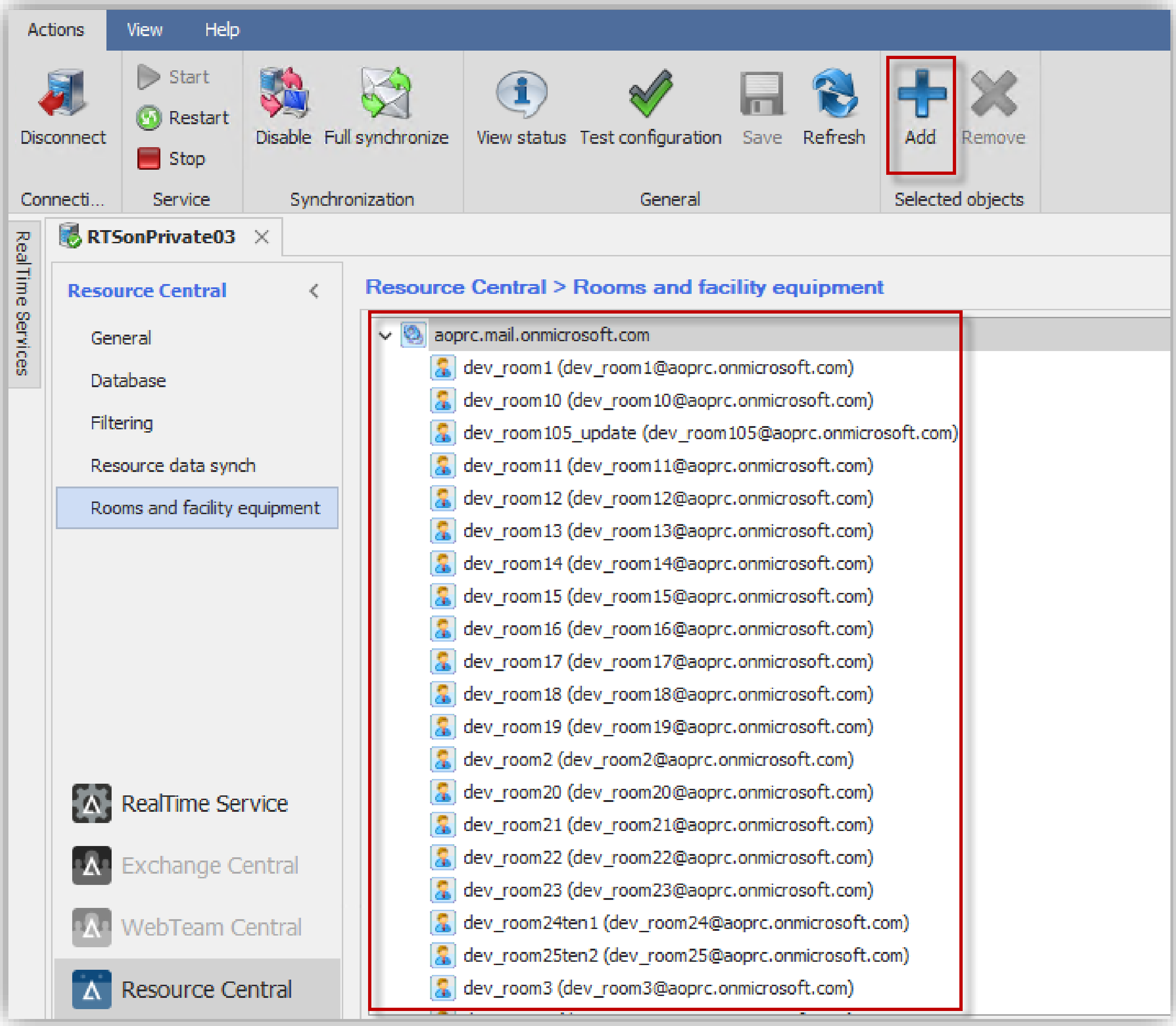


Figure 43. **Rooms and facility equipment for Resource Central**

On the Toolbar, click the **"Add"** button to add a user group or users.

NOTE: For Resource Central you can also add groups and users for synchronization, but the server will take only Room/Equipment mailboxes, user mailboxes will be ignored.

The following dialog box will appear when you add groups or users:

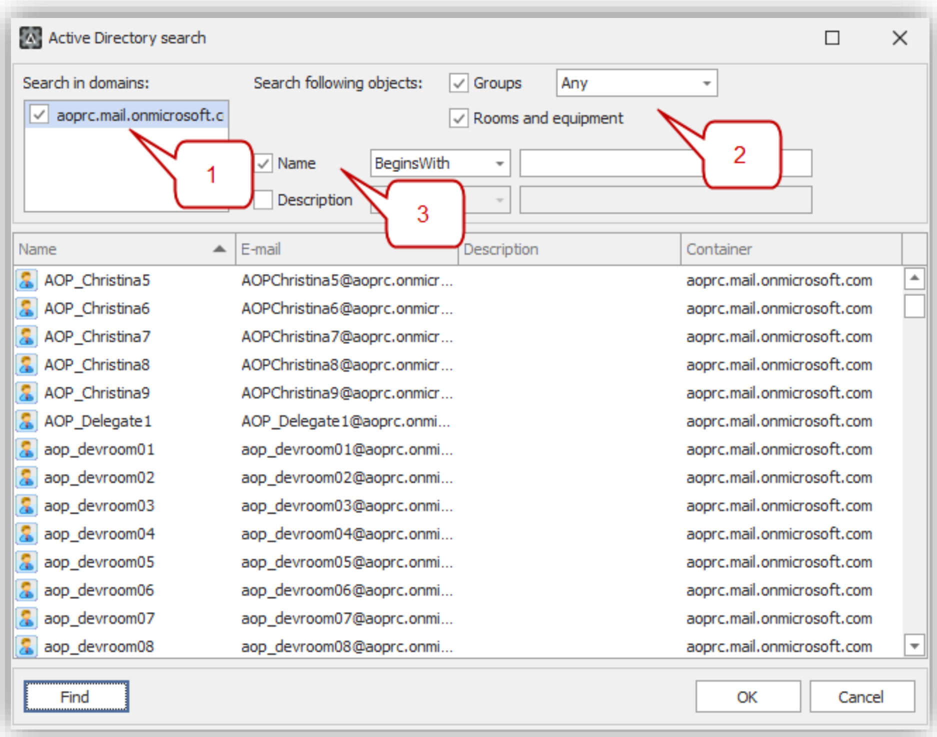


Figure 44. Search group and users

In this dialog box, choose the domain (flag 1) on which you want to select groups or users. Then specify the search objects – use checkboxes and a field under flag 2 for that.

NOTE: for the Resource Central the **"Users"** checkbox is renamed to **"Rooms and equipment"** and during searching process only Room/Equipment mailboxes are found.

Also, you can filter search results by adding conditions to names and descriptions of groups and users – see flag 3 on the picture above.

Speaking about conditions which you can add – see them in the picture below.

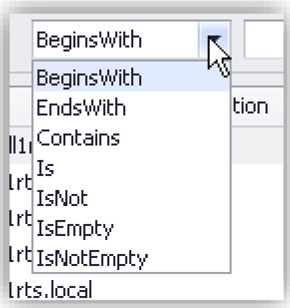


Figure 45. Conditions

After you find needed groups or users, select them and click ***"OK"***. They will be added after that.

NOTE: the number of calendars for your license is recalculated when settings for user calendar are changed. When the limit is exceeded, extra calendars will be marked as selected still, but not synchronized.

You can also remove groups and users using the correspondent button on the toolbar.
Do not forget to save performed changes.

Status

The **"Status"** table illustrates information on synchronization details.

To view the status, click the ***"Status"*** button on the toolbar.

The window, listing currently processed activities, will be displayed in the connection view, like it is shown on the picture below.

The number of used licenses for products and correspondent limits are also shown in this window (see flag 1).

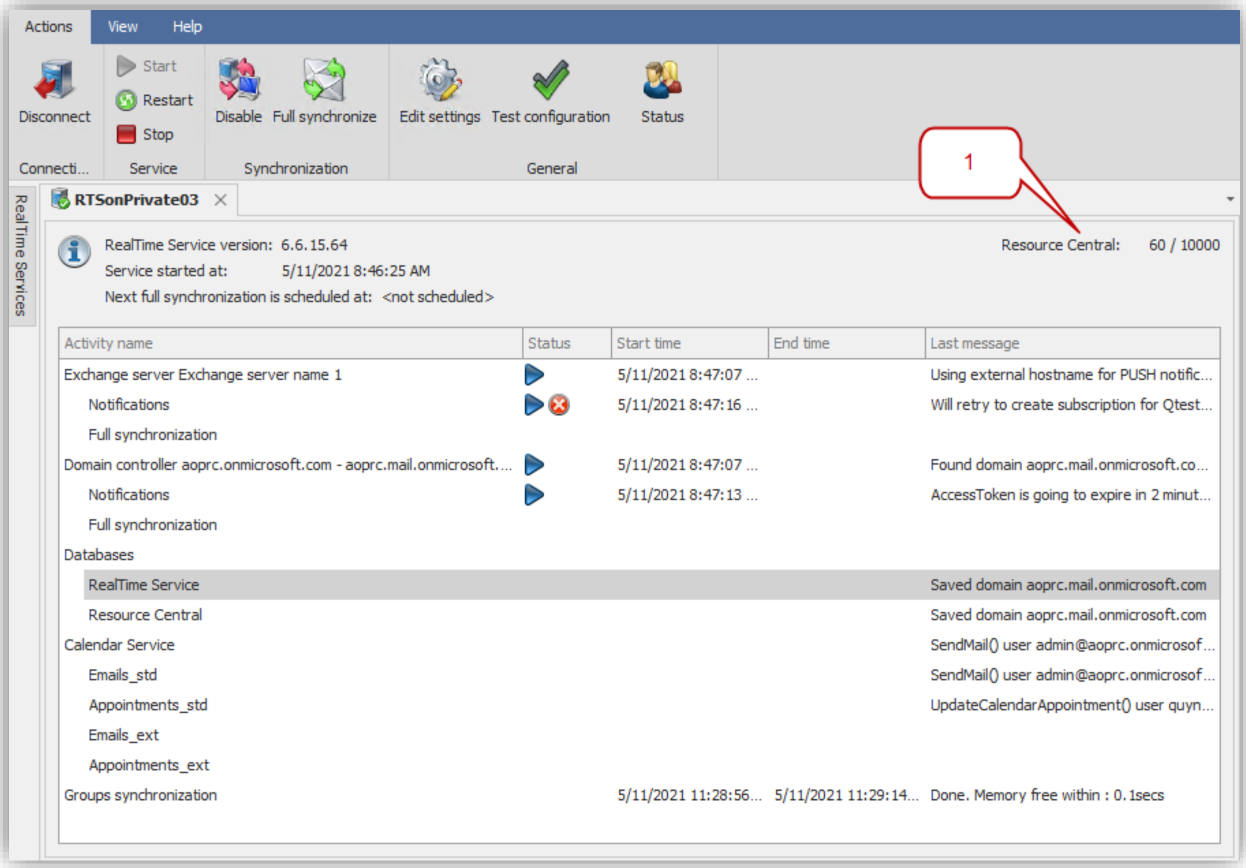


Figure 46. Status section

The table displays activities running currently.

There are five columns in the table providing general user data:

- ***"Activity name"*** – shows the name of an activity and the server or the domain to which this activity is connected.
- ***"Status"*** – indicates whether an activity is running or is disabled, also the percentage of completion may be shown.
- ***"Start time"*** and ***"End time"*** columns are intuitive.
- ***"Last message"*** – shows the last synchronized record.

You can run or stop any running activity separately using the right click menu – see its options on the picture below.

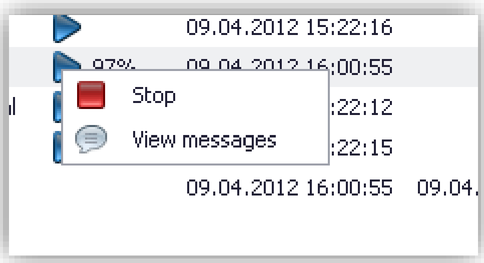


Figure 47. Options for activities

If you want to view messages, select the correspondent option in the context menu, then you will see the picture as follows. You can filter messages using the search field (flag 1 in the picture below).

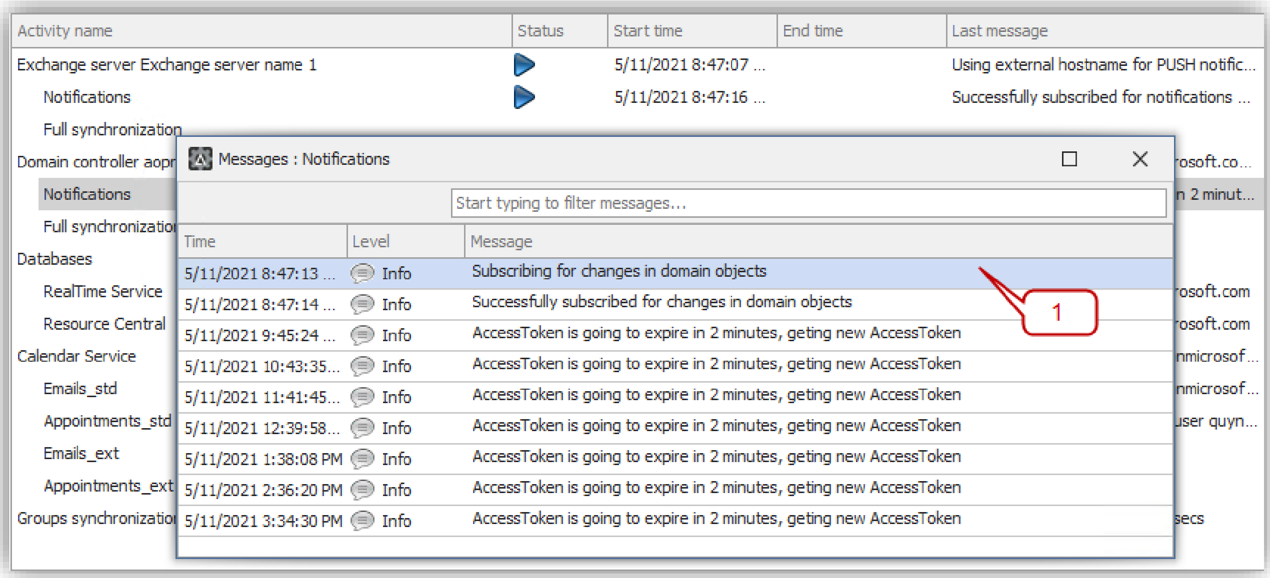


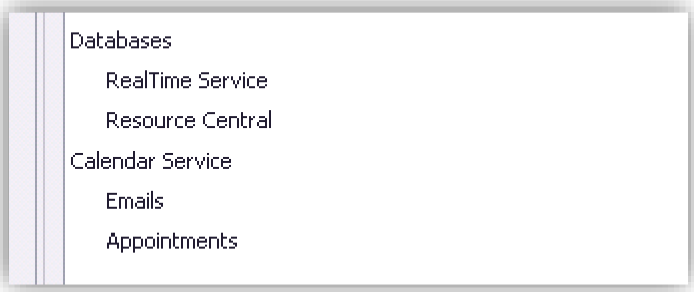
Figure 48. Message: Notifications

To disable all running activities, press the correspondent button on the toolbar.

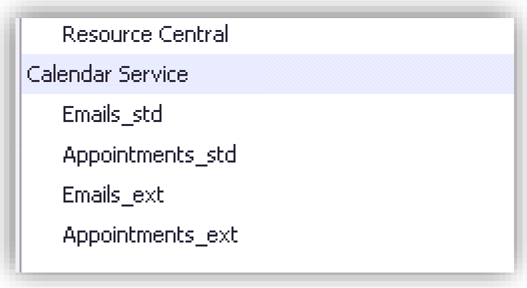
If you perform full synchronization, its status is also shown in the ***"Status"*** table, and it can also be stopped with the correspondent button on the toolbar.

NOTE: For calendar service logging, based on what is displayed in this section we can distinguish among types of licenses:

- If only "private" license is available, only "Emails" and "Appointments" are displayed.



- If "private and public" are both available, they are distinguished with the suffix:



For private:
Emails_std
Appointments_std

For public:
Emails_ext
Appointments_ext

User statuses

If you click an icon in the General section on the toolbar (picture below), the dialog with statuses of all users will appear.

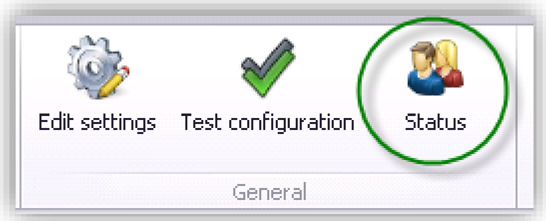


Figure 49. User status

You can select a few users there and perform some actions on them. See what actions exactly, in the picture below.

The ***"Synchronize"*** action means full synchronization; the ***"Stop synchronization"*** stops it correspondently.

The ***"Clear Watermark"*** action clears all watermarks sent by the Exchange server and initiates immediate recreation of all subscriptions. This function may be very useful if the server works incorrectly for some time.

Just as a note, the watermark - is a special type of mark used for tracking changes in calendars. A watermark is sent by the Exchange server every time when some changes happen in a calendar.
On the table below you can see what user info is represented and how it looks.

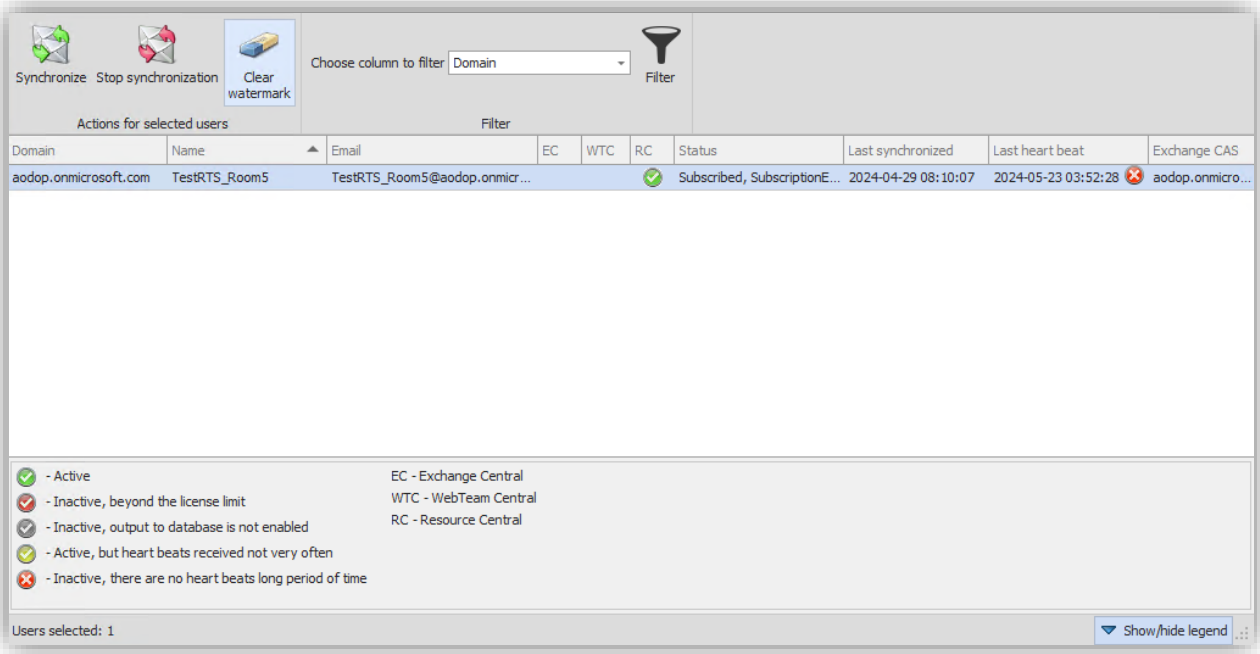


Figure 50. Status of users

Here is the list of possible user statuses:

- NoCAS
- NoMailboxServer
- QueuedForSubscription
- Subscribing
- Subscribed
- SubscriptionError
- QueuedForSynchronization
- Synchronizing
- SynchronizationError

Search/filter function

With this function, you can look for the resource calendar(s) as you wish.
There are 2 ways to utilize this feature after clicking the [**Filter**] button:

Enter the search criteria into the corresponding column

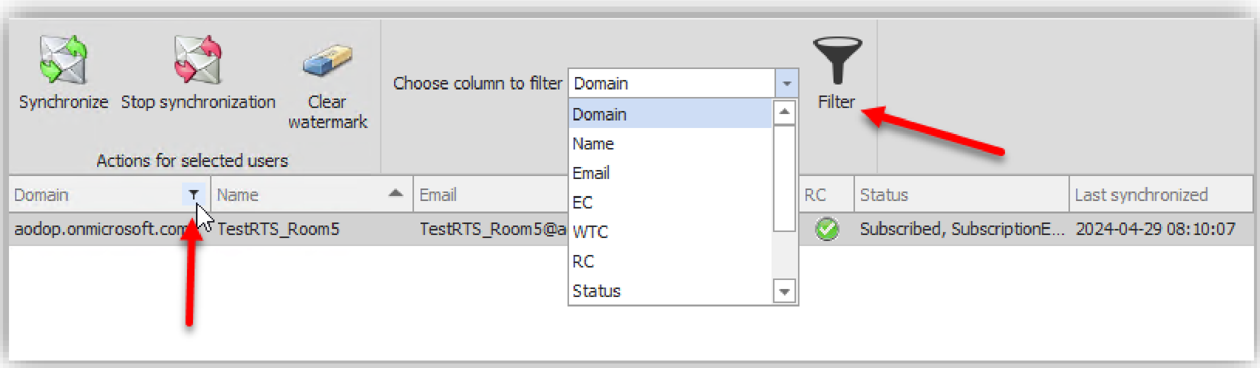


Figure 51. Search by entering criteria to the corresponding column

You can choose a column to filter or click directly on the filter icon on the right side of the column, a filter table will appear. By inputting the search criteria into the corresponding column names, you can filter the results as your wish.

Use Filter Editor

You can also click [**Edit Filter**] button to open “Filter Editor” dialog:

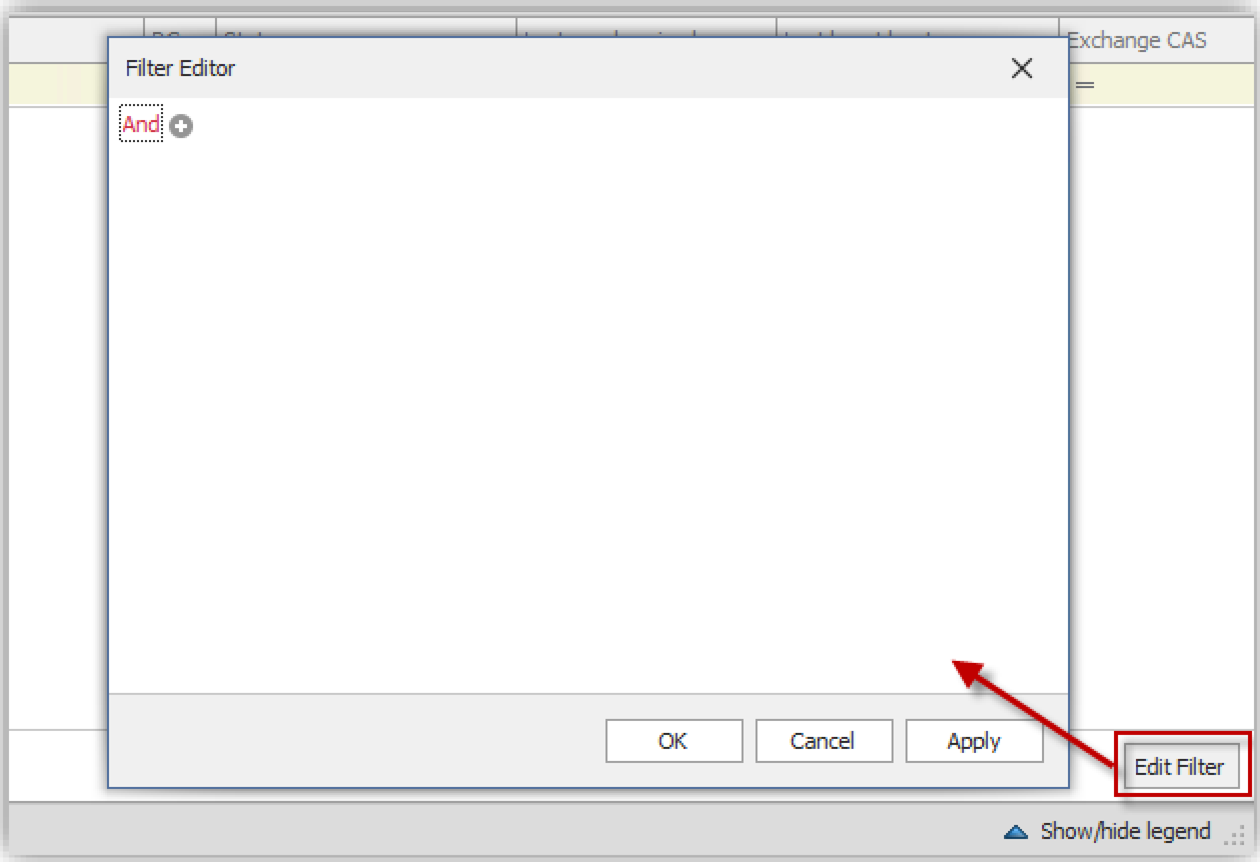
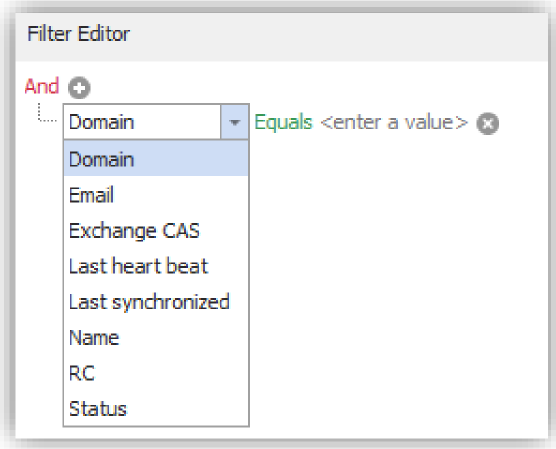


Figure 52. Open Filter Editor dialog box

In the “Filter Editor” dialog you can enter criteria by clicking on plus symbol and select the appropriate conditions for your search:



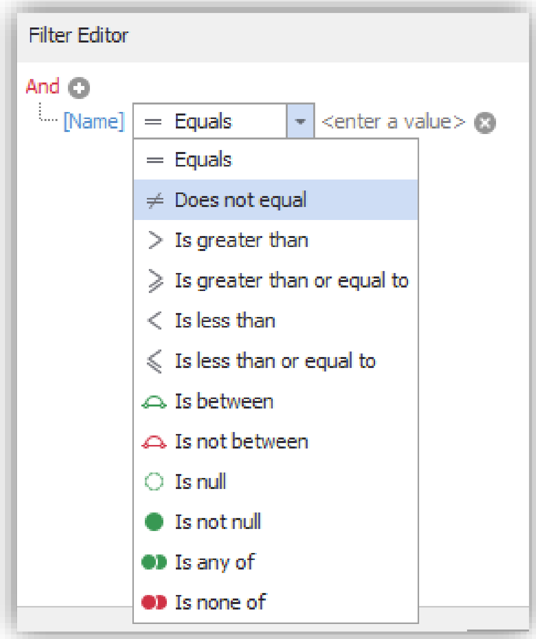
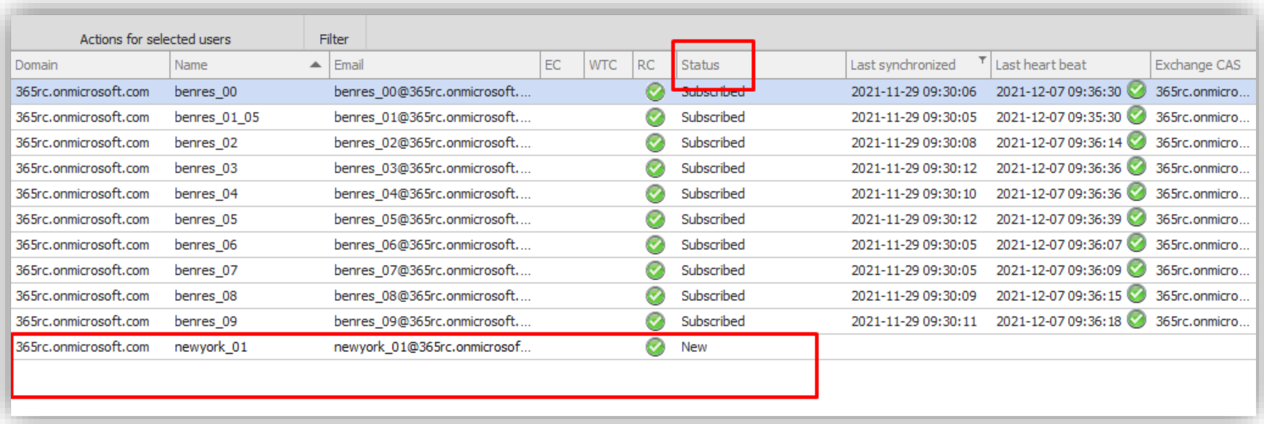


Figure 53. **Search conditions**

After that, click [**OK**] to apply the input conditions and the result shows up.

Handling of newly assigned resource

When a new resource is added in RTS yet not in Resource Central, its Status will be shown as "New":



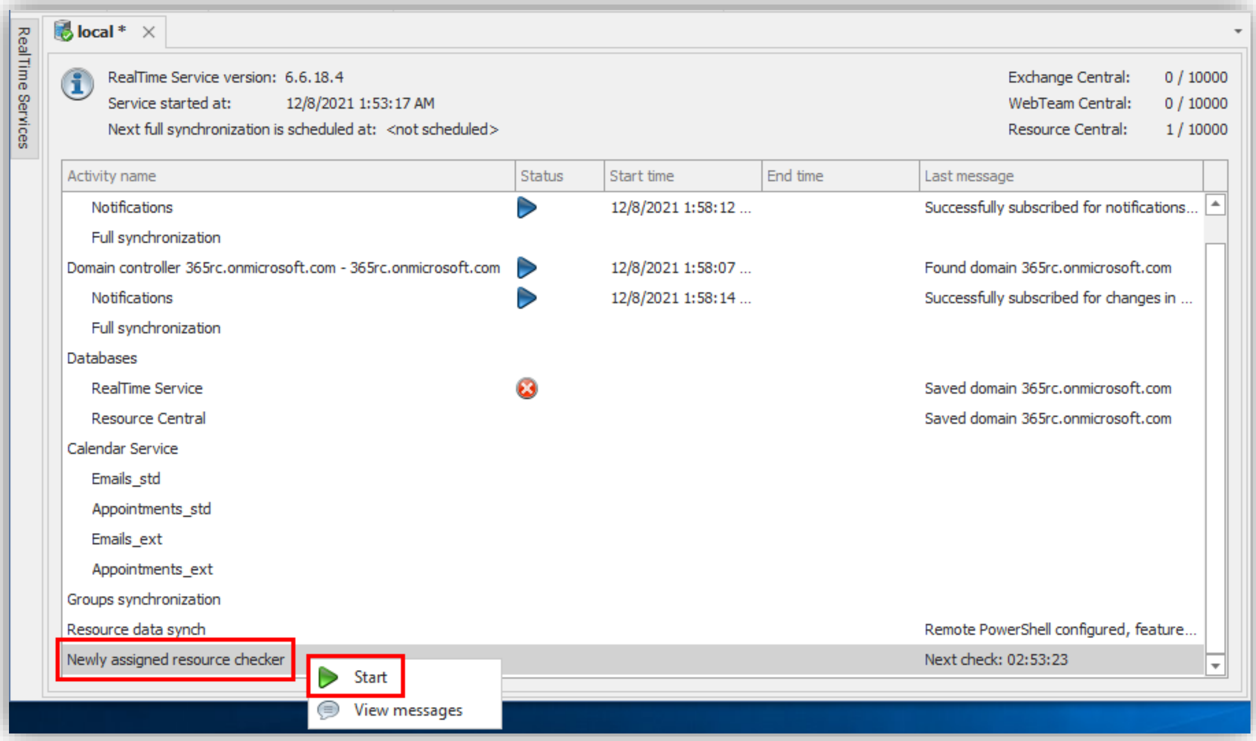
Resource with "New" status will not be able to synchronize data until its Status changed to Subscribed. You can still perform full synchronize, group synchronize, and resource data synchronize when there is resource(s) with "New" status. However, only resources with "Subscribed" will synchronize data.

To change a resource's Status from "New" to "Subscribed", make sure that you have added it to Resource Central. Then you can either:

- Wait for RTS to automatically check Status every 60 minutes. If the new resource is added to Resource Central, RTS will automatically change that resource's status to "Subscribed" and synchronize the new resource.

-OR-

- Go to RTM interface and look for the final line *"Newly assigned resource checker"*. Then right-click on it and select [**Start**].



In case a resource is removed from RTS yet still exists in Resource Central, that resource will not be able to synchronize data to the database. But if the resource is added back to RTS, its Status will become "Subscribed" and it will start synchronizing data again.

NOTE: **Handling of newly added resource** is only applicable for Resource Central, not Exchange Central and WebTeam Central.

Saving Configuration

To apply the changes made to parameters in RealTime Service, you have to save them by clicking the ***"Save"*** button on the toolbar.

Before saving, RealTime Manager will check if settings are correct. If settings are incorrect (for example: the Exchange Server's name is wrong), the RealTime Service cannot connect to the Exchange server and then there will be a message informing a user about that and the setting itself will not be saved.

NOTE: The **"Save"** button is only enabled, if there are changes in the settings.

CHAPTER 3.

Appendixes

Appendix A – Access Control List synchronization

In this chapter the Access Control List synchronization is described.

Access Control List (ACL) is a list of security protections that applies to an object (file, process, event, or anything else having a security description).

The RealTime Service collects the permission settings (ACL) during synchronization on each calendar folder in order to avoid possible problems with synchronized user or group folder permissions. Without this function, it may happen so that a certain user or group folder restricted for updating will be still updated by the WebTeam Central.

The Calendar folder is set permission as depicted in the picture below:

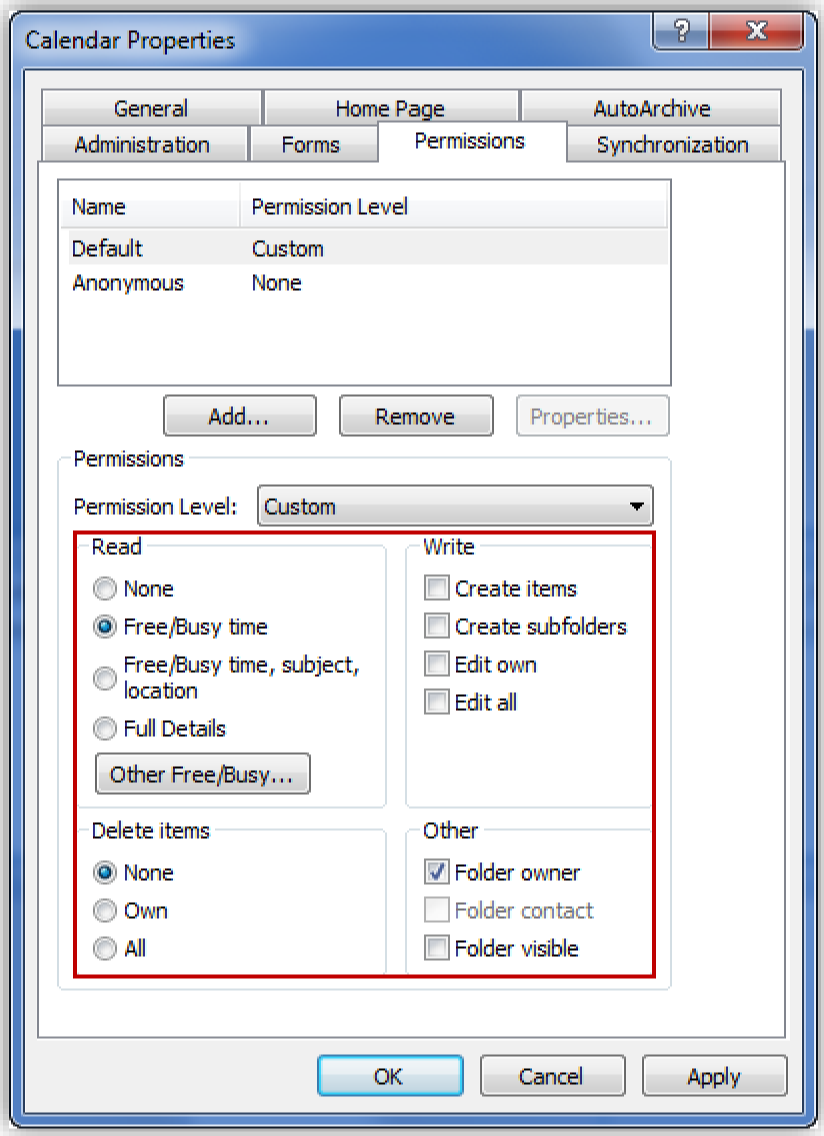


Figure 54. Calendar Properties

The tables below illustrate how the Permissions for calendar folder in Outlook would be synchronized to the database.

Read permission:

Outlook permission		**Permission Synchronized to Database**
Read	**Other**	**Read**
None	null	0
Free/Busy time	null	0
Free/Busy time, Subject, location	null	0
Full Details	Folder Visible = true	1

Create and Edit permissions:

Outlook permission		**Permission Synchronized to Database**
Write	**Create**	**Edit**
null	0	0
Create Items = true	1	0
Create Subfolders = true	1	0
Edit Own = true	0	1
Edit Own = true Edit All = true	0	2

Delete permission:

Outlook permission	**Permission Synchronized to Database**
Delete Item	**Delete**
None	0
Own	1
All	2

Special case: if both the ***"Folder Visible"*** and the ***"Folder Owner"*** checkboxes are selected, then the permission synchronized to the database would be as below regardless of other outlook permissions' values.

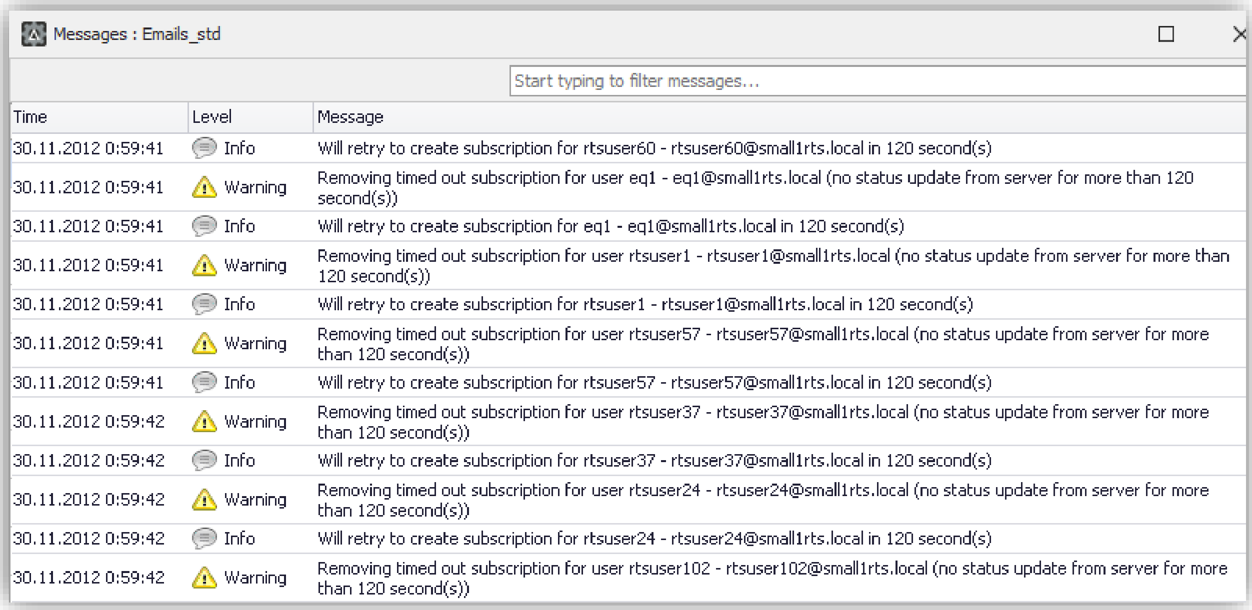
Outlook permission	**Permission Synchronized to Database**			
Other	**Read**	**Create**	**Edit**	**Delete**
Folder Owner = true	1	1	2	2

Appendix B – Notifications do not work

The troubleshooting of the problem of non-working notifications is described in this appendix.

How this problem can be defined:

- RTS does not reflect changes in calendars.
- Constant warnings about recreated subscriptions for all users (see an example in the picture below).


Messages : Emails_std

Start typing to filter messages...

Time	Level	Message
30.11.2012 0:59:41	Info	Will retry to create subscription for rtsuser60 - rtsuser60@small1rts.local in 120 second(s)
30.11.2012 0:59:41	Warning	Removing timed out subscription for user eq1 - eq1@small1rts.local (no status update from server for more than 120 second(s))
30.11.2012 0:59:41	Info	Will retry to create subscription for eq1 - eq1@small1rts.local in 120 second(s)
30.11.2012 0:59:41	Warning	Removing timed out subscription for user rtsuser1 - rtsuser1@small1rts.local (no status update from server for more than 120 second(s))
30.11.2012 0:59:41	Info	Will retry to create subscription for rtsuser1 - rtsuser1@small1rts.local in 120 second(s)
30.11.2012 0:59:41	Warning	Removing timed out subscription for user rtsuser57 - rtsuser57@small1rts.local (no status update from server for more than 120 second(s))
30.11.2012 0:59:41	Info	Will retry to create subscription for rtsuser57 - rtsuser57@small1rts.local in 120 second(s)
30.11.2012 0:59:42	Warning	Removing timed out subscription for user rtsuser37 - rtsuser37@small1rts.local (no status update from server for more than 120 second(s))
30.11.2012 0:59:42	Info	Will retry to create subscription for rtsuser37 - rtsuser37@small1rts.local in 120 second(s)
30.11.2012 0:59:42	Warning	Removing timed out subscription for user rtsuser24 - rtsuser24@small1rts.local (no status update from server for more than 120 second(s))
30.11.2012 0:59:42	Info	Will retry to create subscription for rtsuser24 - rtsuser24@small1rts.local in 120 second(s)
30.11.2012 0:59:42	Warning	Removing timed out subscription for user rtsuser102 - rtsuser102@small1rts.local (no status update from server for more than 120 second(s))

Figure 55. RTS logs

When you meet the mentioned symptoms, it means that the Exchange CAS can't connect to the Push notifications receiver port set in the General settings and, in fact, real-time synchronization doesn't work.

There are several reasons why the mentioned problem can happen. Read about them below.

The firewall on the server, where the RTS is installed, blocks incoming connections; to fix this – either turn off the firewall or allow TCP connection to the Push notifications receiver port.

By default, the RTS sends the host name to the Exchange server (if the Custom host for push notifications option isn't set for the Exchange server) and it can be that this host name cannot be resolved to IP address from the system that Exchange CAS is running on. To resolve this, just turn on the Custom host for push notifications option and input the IP address of the RTS server manually.

The RTS is beyond the NAT. In this case you should turn on the Custom host for push notifications and the Custom port for push notifications options and set the NAT server address (name or IP) and the port on the NAT server that is mapped to address/port of RTS into correspondent fields.

Other problems also may happen, but they should be diagnosed in a certain environment and as a result do not have any common solution.

Here is one more tip – to ensure that the RTS port is accessible from the CAS server, you should run the following command on the system which the CAS is running on:

```
telnet  RTS_SERVER_NAME_OR_IP  RTS_PUSH_PORT
```

If the connection is successful, this command will clear the console and will be waiting for input. If an attempt to connect is unsuccessful, an error will appear.

Appendix C – Mailbox and calendar right assignment to Service Account

With Full Access right, the service account will have proper access to get calendars information and mailbox of a resource on Exchange.
Open the browser and navigate to the address where Exchange admin center is hosted. On the side bar, clicking on “Resources” under **Recipients** tree will open a list of resources. Select a resource and turn to tab ‘Delegation’ on its details window. There are three permissions listed here, but only ***Send as*** and ***Read and Manage (Full Access)*** are necessary for the service account.

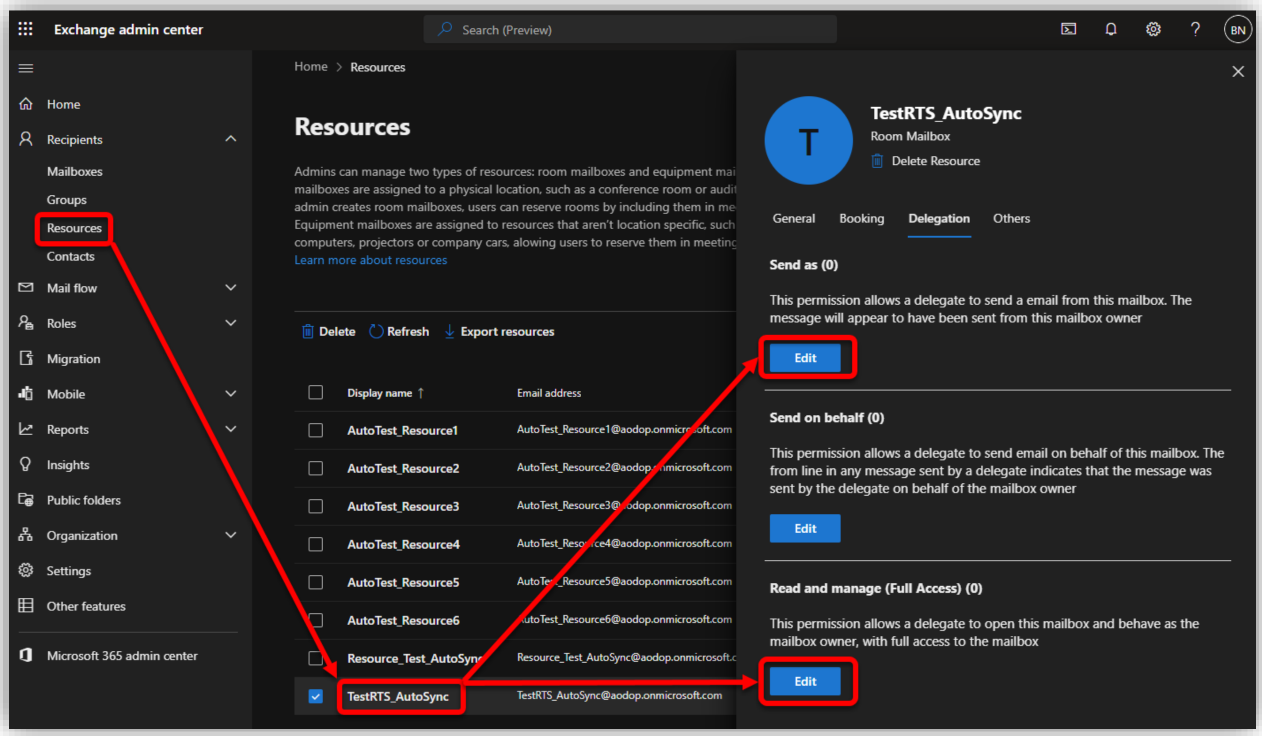
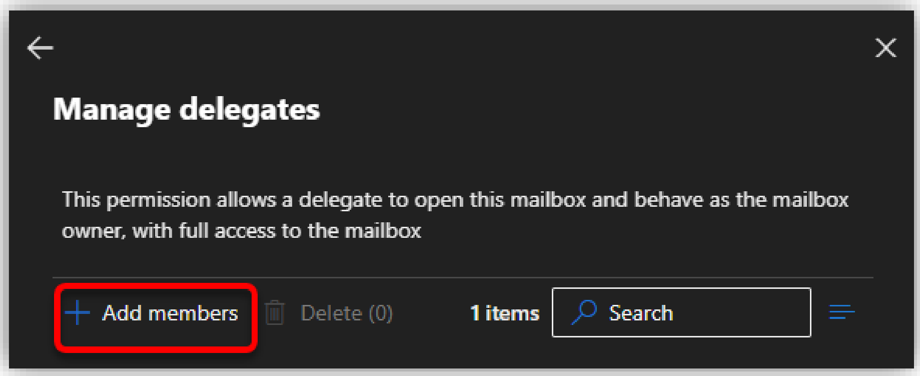


Figure 56. **Exchange admin center → Resource → Delegation**

In the "Read and message (Full Access)" area, click [**Edit**], and the “Manage delegates” box opens as follows:



Continue to click [**Add members**], and the next screen will display. Search for and add the service account to which you wish to grant ***Read and Manage (Full Access)*** permission to access this resource. This account would be the one utilized to obtain Access Token.

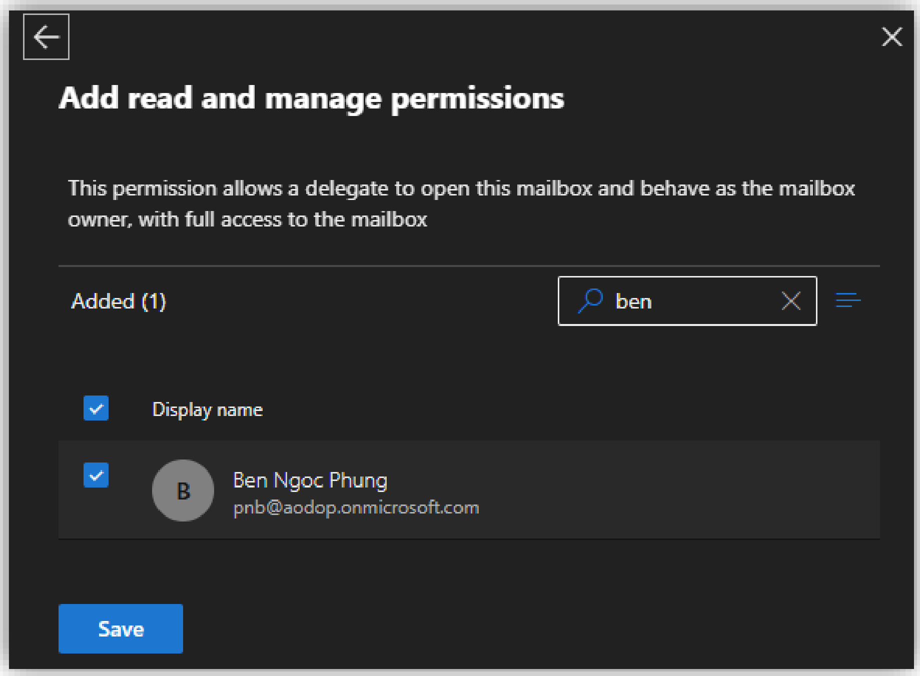


Figure 57. Add members with full access to the mailbox

To complete, click [**Save**] then [**Confirm**].

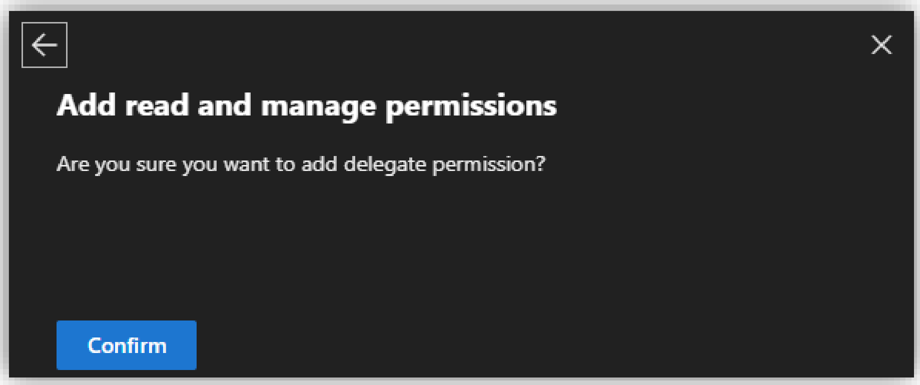


Figure 58. Add permission confirmation

If the permission is added successfully, you will meet the below notification:

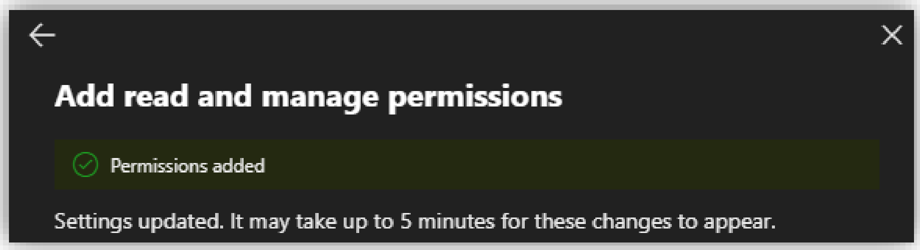


Figure 59. Add permission successfully

Repeat the same procedure to add ***Send as*** permission.

After adding above permissions to a service account, that account now has proper access to get calendars information and mailbox of the selected resource on the Exchange Server.

Appendix D – View-Only Recipients role assignment to Service Account

The ***View-Only Recipients*** role enables administrator (Service Account) to view the configuration of recipients, such as mailboxes, mail users, mail contacts, distribution groups, and dynamic distribution groups. This appendix specifies procedures on how to assign ***View-Only Recipients*** role to service account on both Exchange Online and Exchange On-premises:

On Exchange Online

Open the browser and navigate to the address where [Exchange admin center]() is hosted. On the side bar, clicking on "Admin roles" under **Roles** tree will open a list of role groups:

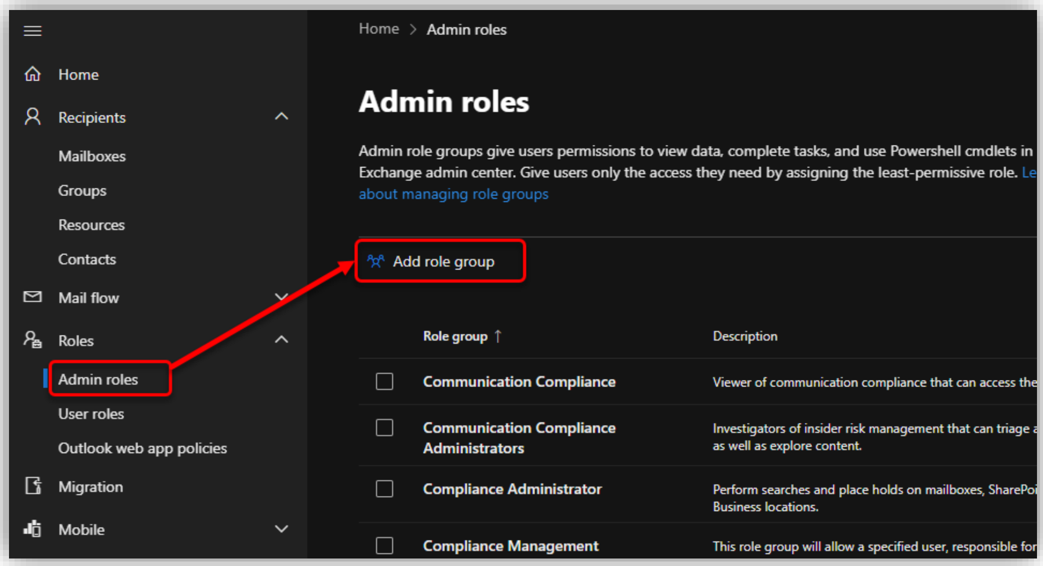


Figure 60. Add role group

Click [**Add role group**] and follow these steps to set up role group:

Step 1: Set up the basics
In this step, name the new role group and select 'Default' in **Write scope** field:

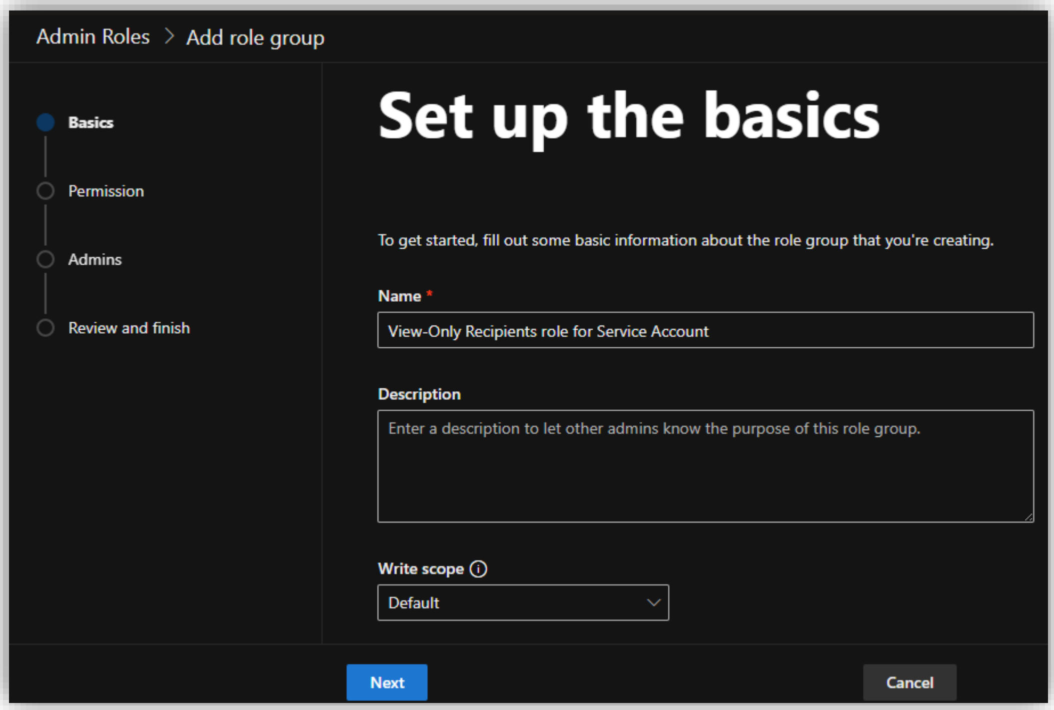


Figure 61. Set up the basics

Step 2: Add permissions

Search and select role ***View-Only Recipients***. Click [**Next**] to proceed.

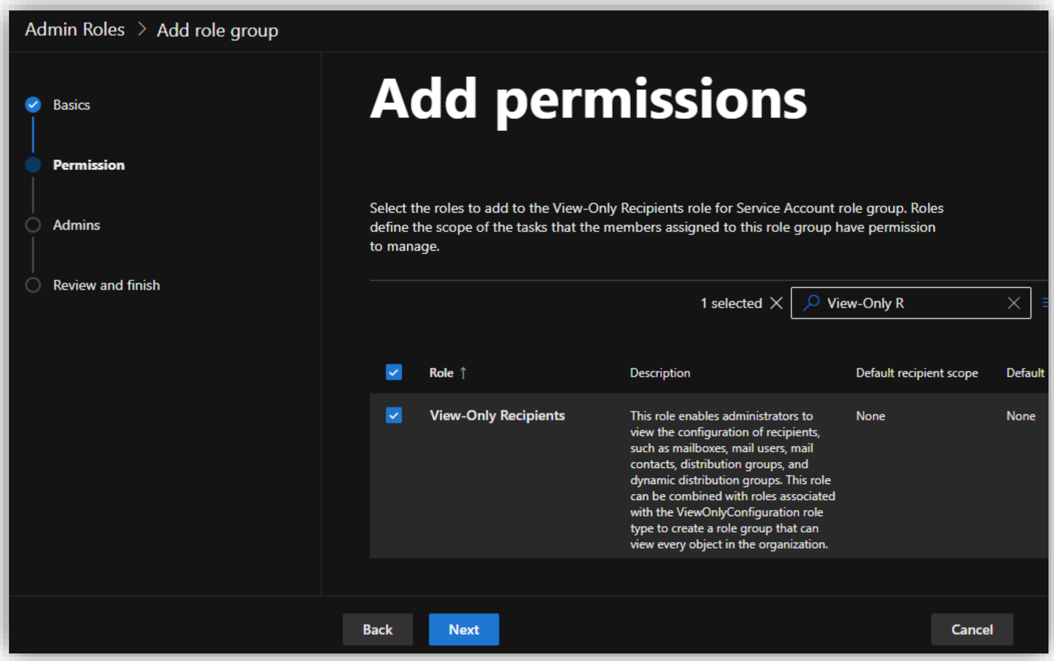


Figure 62. Add role

Step 3: Assign admins

This step allows you to search and select the service account to which permissions to manage the ***View-Only Recipients*** role are assigned. You can search the service account by its name or email address:

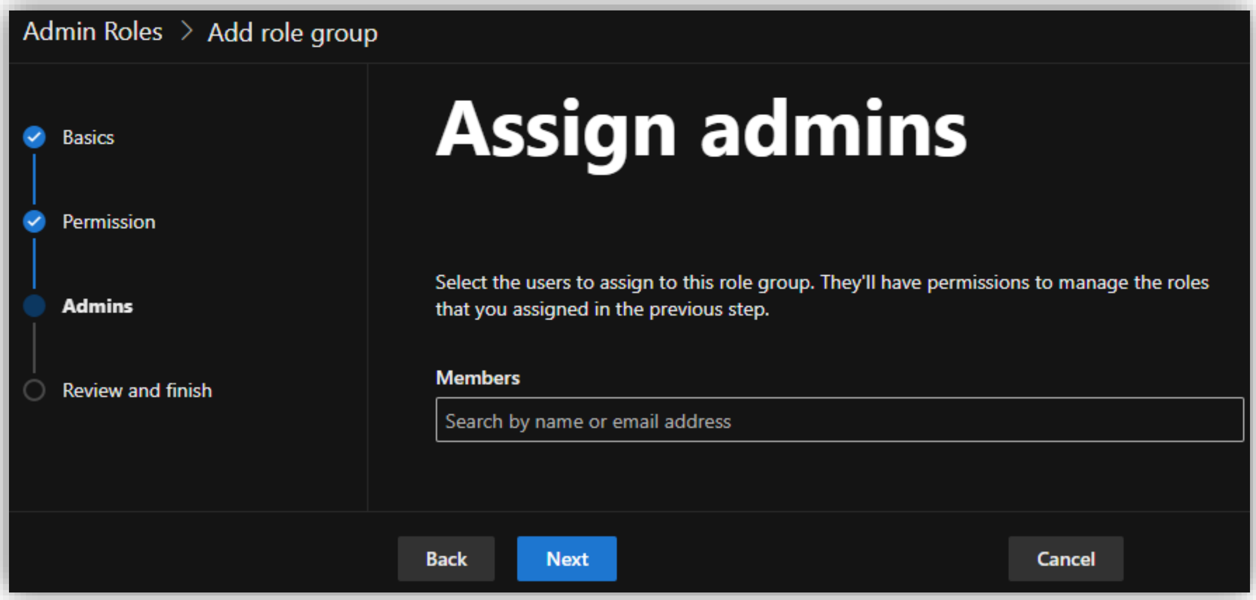


Figure 63. Assign admins

Click [**Next**] to switch to the final step.

Step 4: Review role group and finish

In this screen, you can review the information imported previously. If you want to edit, click [**Back**] to go to the previous steps.

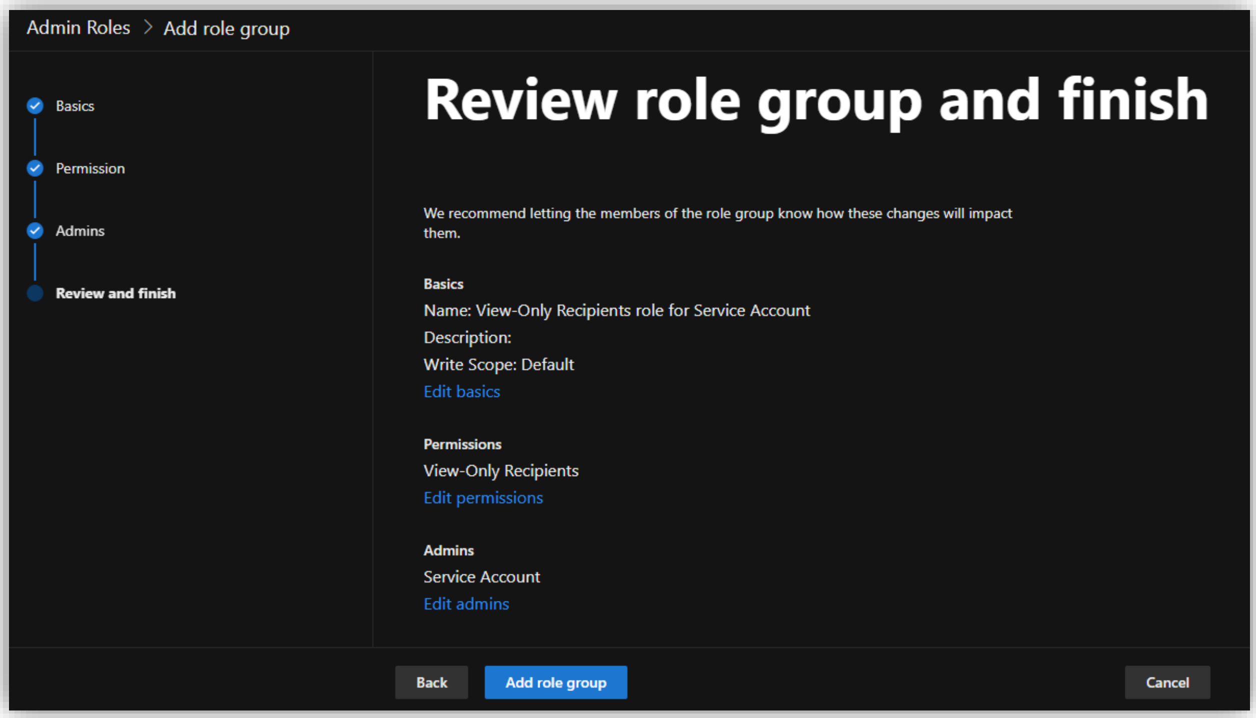
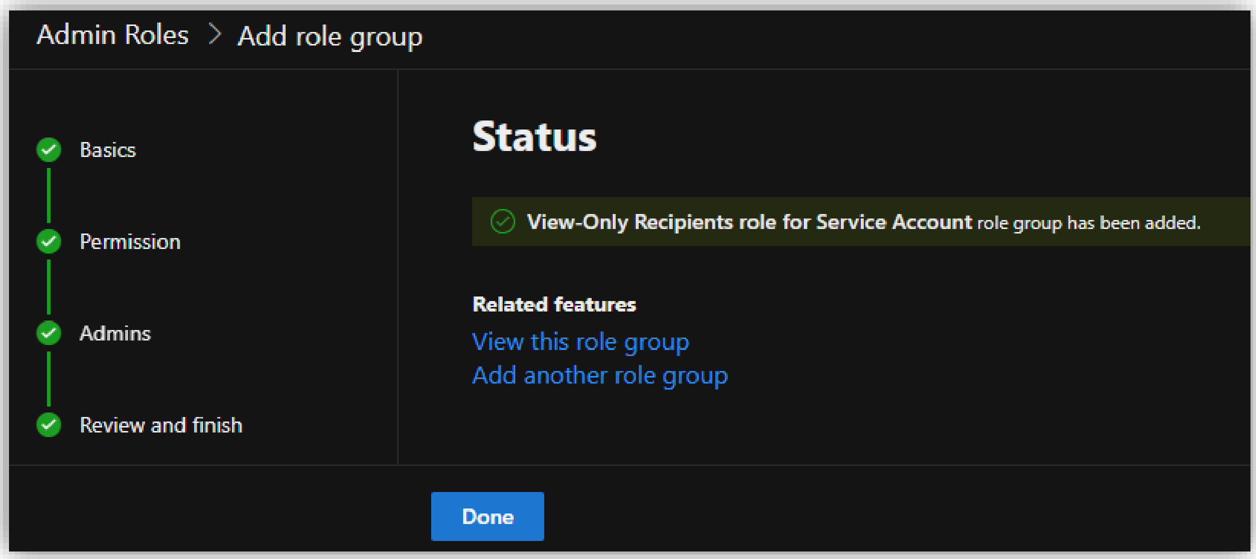


Figure 64. Review role group and finish

When complete, click [**Add role group**]. When the role group is created successfully as the below figure, click [**Done**] to finish.



On Exchange On-premises

Open the browser and navigate to the address where Exchange On-premises is hosted. To begin configuring the ***View-Only Recipients*** role for the service account, you need to create a new role group by clicking on "admin roles" and then 'permissions' in the sidebar.

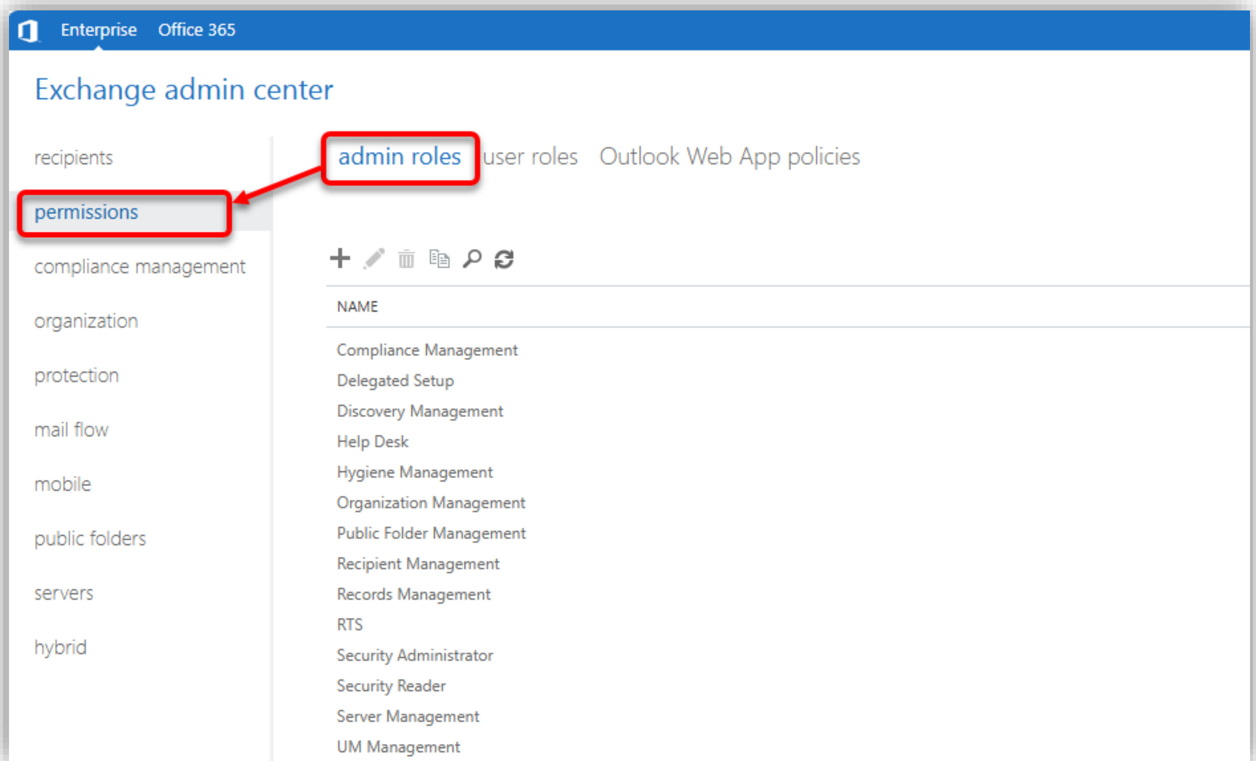


Figure 65. **Add new role group**

Click + to open 'new role group' panel:

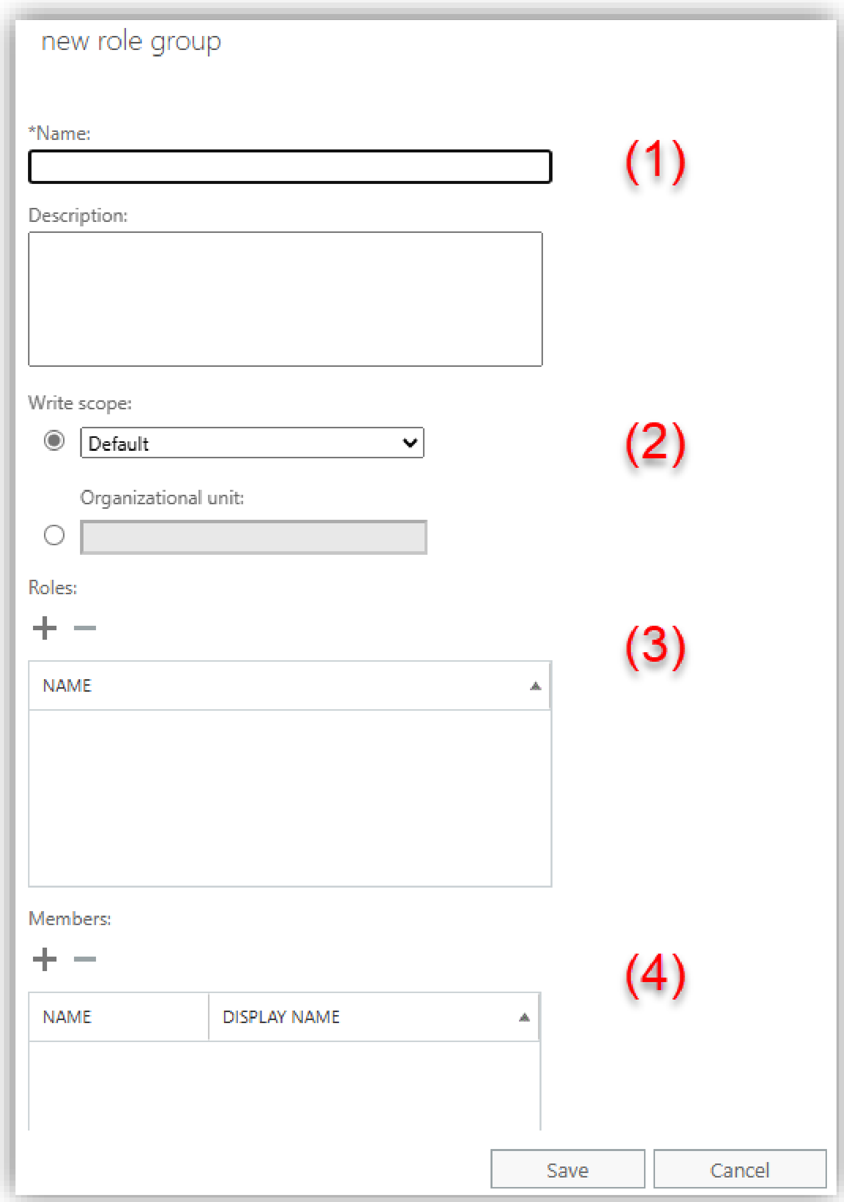


Figure 66. New role group panel

Follow the steps to add ***View-Only Recipients*** role to your service account:

Step 1: Name the new role.

Step 2: For ‘Write scope’ section, select [**Default**].

Step 3: In the 'Roles' section, click + to pick the role you wish to assign to the service account.

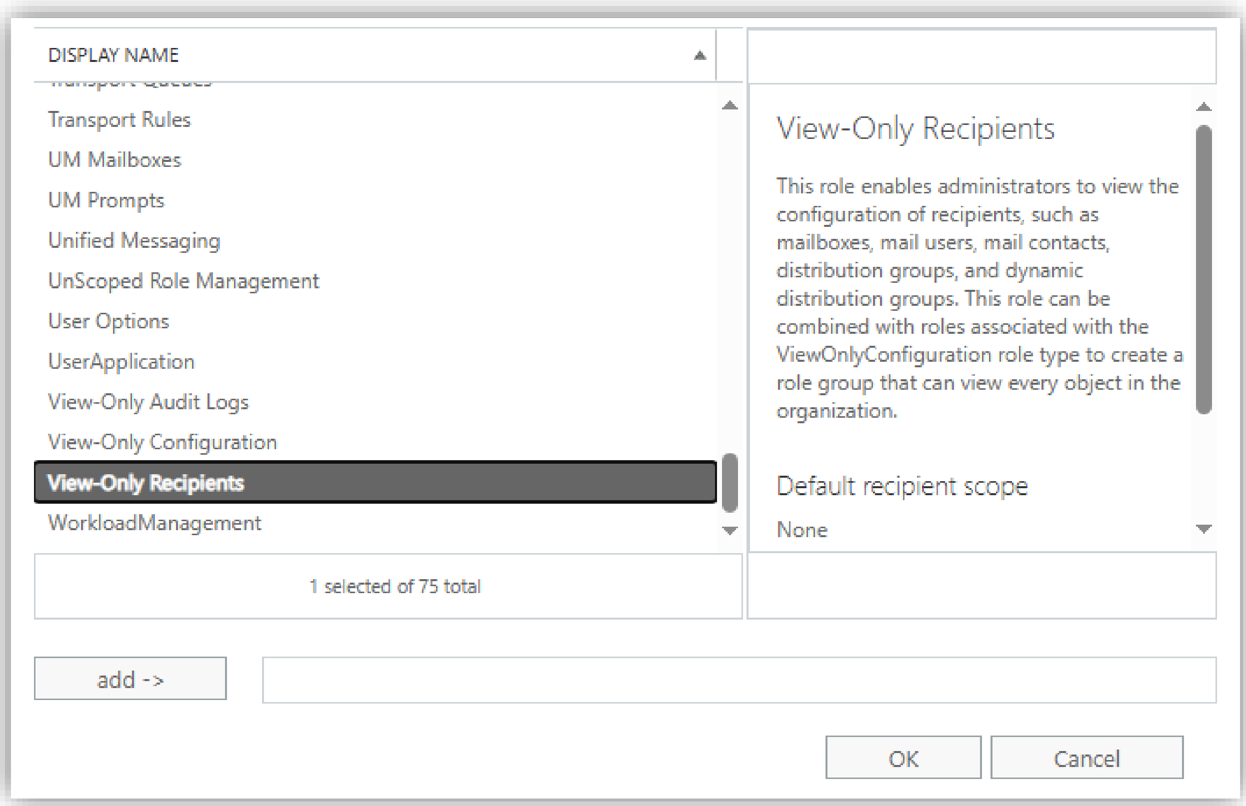


Figure 67. **Add role**

Step 4: In the ‘Members’ section, click + to select the service account to whom ***View-Only Recipients*** role is assigned.

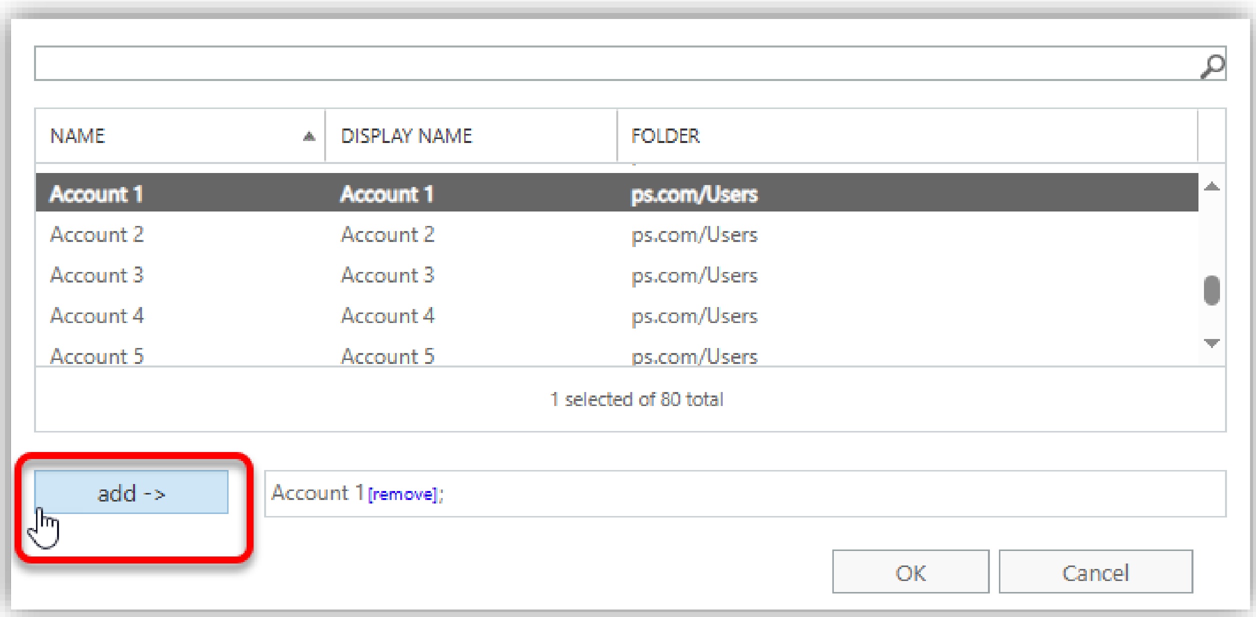
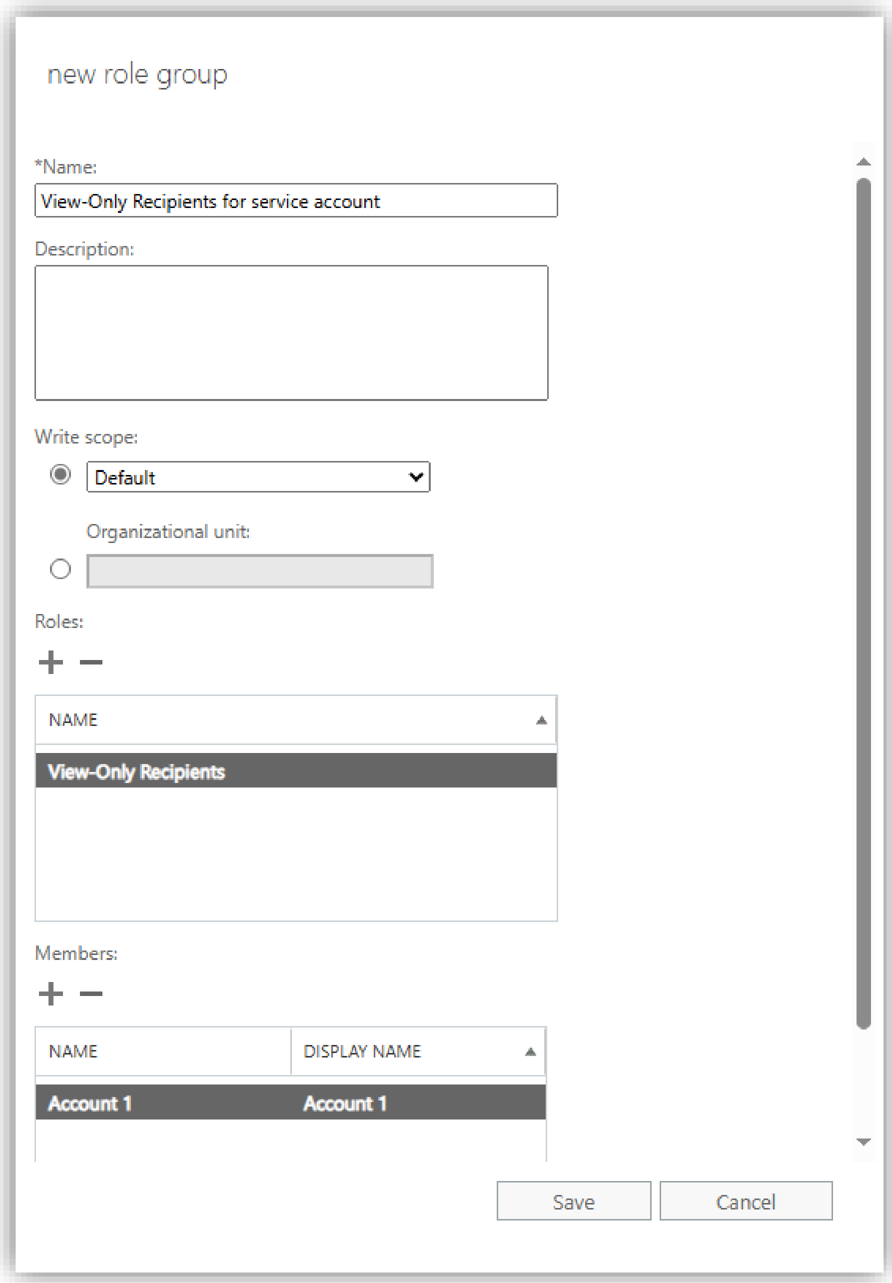
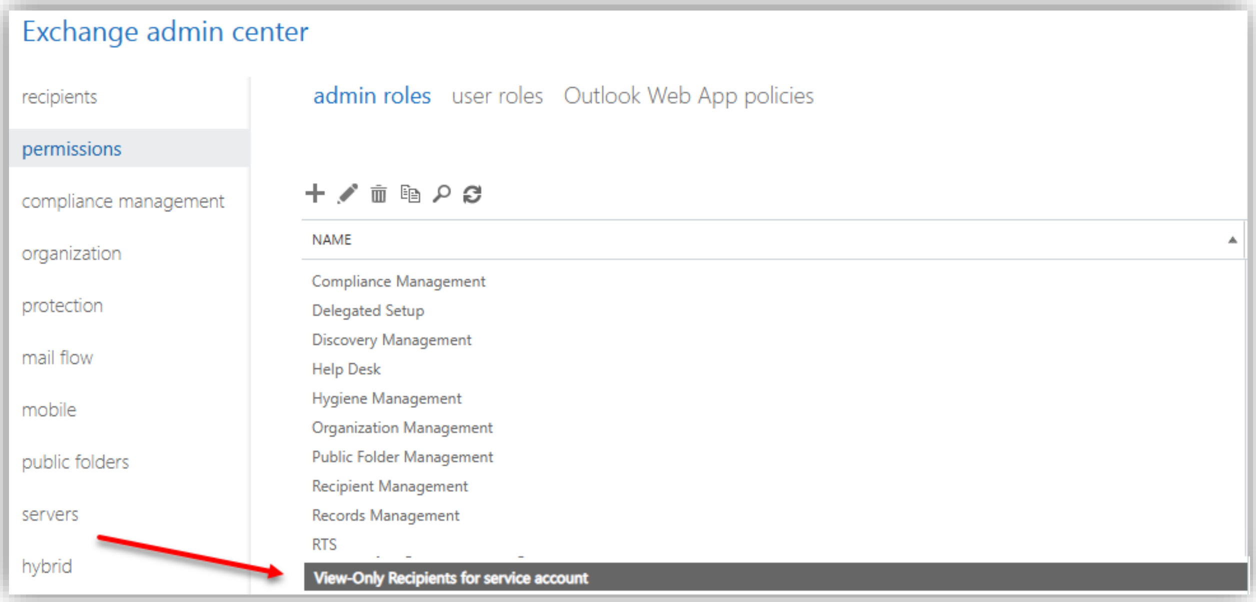


Figure 68. **Add service account**

You can look for that service account by entering its name in the Search box. Select it and press [**add**] button to insert that service account. Click [**OK**] to return to the main panel to review your selections. To re-select the service account, click — and then pick a different service account.



Click [**Save**] to finish. Your new role group is now listed on the admin roles list:


Exchange admin center
recipients
permissions
compliance management
organization
protection
mail flow
mobile
public folders
servers
hybrid
admin roles
user roles
Outlook Web App policies
NAME
Compliance Management
Delegated Setup
Discovery Management
Help Desk
Hygiene Management
Organization Management
Public Folder Management
Recipient Management
Records Management
RTS
View-Only Recipients for service account