Ansys GRANTA MI 2021 R1

MI:Workflow Configuration Guide

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1   System components

MI:Workflow server

The Workflow server manages and monitors the state of tasks and activities in a workflow.

It includes a **MI:Workflow Configuration** tool used to set application authentication, integration, and database connection settings.

Workflow Manager web application

A web application for interacting with active workflows: viewing task lists, starting workflows and carrying out workflow tasks.

Workflow Manager is an embedded web app installed with, and acceesed from, the GRANTA MI web application ("One MI").

Workflow Designer client application

A standalone client application for developing workflows "offline" and then uploading them to the Workflow server.

Workflow configuration database (MIWorkflow2)

Stores configuration information for MI:Workflow.

1.1   MI:Workflow editions

MI:Workflow is offered in three editions, *Basics*, *Advanced* and *Enterprise*. The edition you have licensed will define:

- The number of workflows you are entitled to deploy.
- The complexity of workflow you are entitled to create, measured by the number of activities in a workflow, and the ability to run Python as part of a workflow.

2   Installation and setup

MI:Workflow components are all installed using the MI Installation Manager.

MI:Workflow server must be installed on the same computer as the Settings Service, Service Layer, One MI, and MI:Viewer applications.
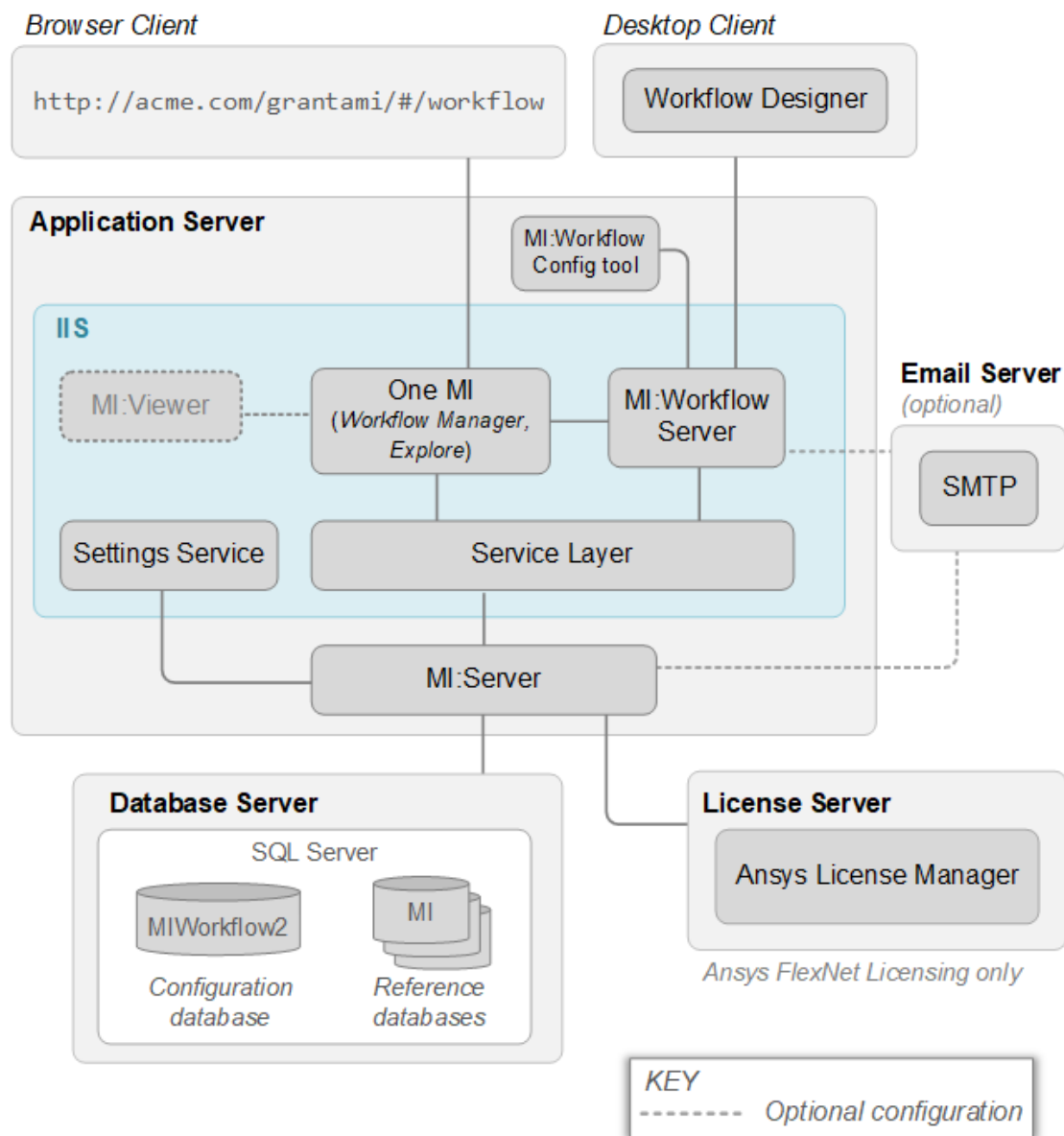
Workflow Designer must be installed on a client PC and not on the Workflow application server. A license is not required to install the Workflow Designer, and it may be installed on as many different machines as you need. The Workflow Designer needs to communicate with your Workflow server only when validating, publishing, downloading, deleting, or deprecating workflows. The connection information (Workflow server address and the authentication method used for the connection) are

specified during installation, and can be changed after that from within the Workflow Designer (via **Settings** on the toolbar; note that you need to be running the Designer application as an Administrator in order to be able to change these settings).

2.1   Requirements

Table 1. Workflow Server requirements

Product	Version
GRANTA MI	Version 12 or later
Service Layer	Version 44.x.x.1610 or later
Python	(*Advanced Edition and higher only*)
	If any workflows run Python scripts, Python Version 2 or later must be installed on the Workflow server with the "Install for all users" option. By default, Workflow assumes that the file path to the Python executable is set on the PATH environment variable. (You can override this in the web config if you want to use a fully-defined file path instead.)

Table 2. Workflow client requirements

Product	Version
Browser	The Workflow Manager application can be used on current and recent major releases of Microsoft Edge, Firefox, and Google Chrome.

2.2   Installation

Refer to the *GRANTA MI Installation Guide* for information on installing MI:Workflow components.

Workflow server components are installed into this IIS folder on the server by default:

C:\inetpub\wwwroot\mi_workflow_2

Workflow definition files and Workflow server logs are located in:

C:\ProgramData\Granta\GRANTA MI\Workflow 2

Note that MI:Workflow 2021 R1 is installed without overwriting any existing Workflow v1 software or files, ensuring that any critical business processes which depend on workflows created in older versions of MI:Workflow are not affected; see Section 2.5 for further information.

2.3   Opening the Workflow Manager application

The Workflow Manager application may be accessed by entering the app URL in a brower as follows:

http://*my_app_server*/grantami/#/workflow

It can also be added to the One MI application menu; see Section 2.4 below.

2.4   Adding Workflow Manager to the menu in One MI

The Workflow Manager application is one of several embedded apps within the GRANTA MI web application (One MI). The One MI application menu, accessed by clicking the "MI" logo in the upper left corner of the One MI window, provides quick access to different GRANTA MI applications for example:
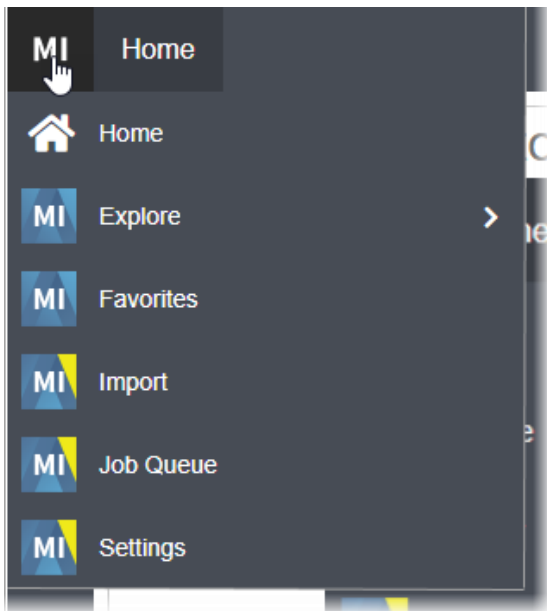
By default, Workflow Manager is not included on this menu. To add it, you will need to edit the One MI menu definition in the Settings Service. The menu is defined in **settings.one-mi.json**.

For each GRANTA MI system security role (Admin, Grant, Write, etc), the apps that are available on the menu to users with that role are specified in **settings.one-mi.json** as a list of *appKeys* as follows:

```
{
    "rolename": {
        "apps": [
            {"appKey": "value"},
            {"appKey": "value"},
            ...
        ]
    },
```

For example:

```
{
  "admin": {
    "apps": [
      {
        "appKey": "homePage"
      },
      {
        "appKey": "explore"
      },
      {
        "appKey": "favorites"
      },
      {
        "appKey": "import"
      },
      {
        "appKey": "jobQueue"
      },
      {
        "appKey": "settings"
      }
    ]
  },
  "grant": {
    "apps": [
      {
        "appKey": "homePage"
      },
      {
        "appKey": "explore"
```

To add a menu item for Workflow Manager, you need to add this item to the list of apps for all roles that require access to the Workflow Manager:

```
{"appKey": "workflow"},
```

Procedure

1. Open the Settings app from the One MI application menu, or by browsing to the Settings app directly (e.g. http://appservername/grantami/#/settings).
2. Double-click on the **settings.one-mi.json** key.
3. For each role, add a workflow item as shown here:
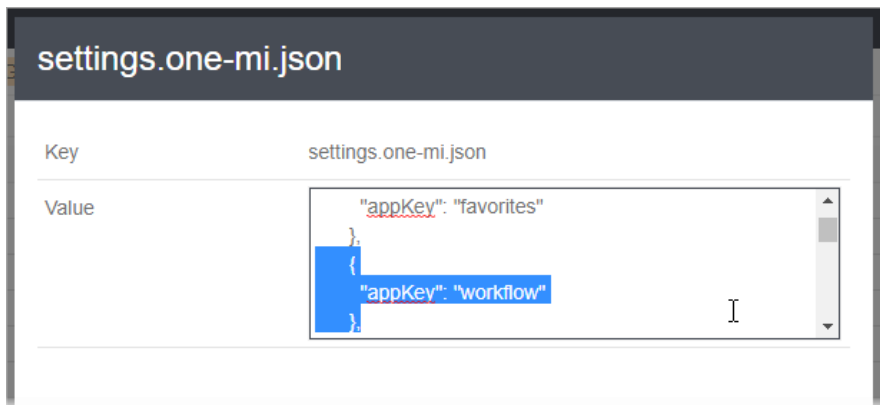
You may find it easier to copy the whole menu definition to a text file, edit the content there, and then copy/paste the definition back into the *Value* field.

4. Save the changes.

5. Refresh your browser and you should see the new menu item.

For example:

```
"admin": {
  "apps": [
    {
      "appKey": "homePage"
    },
    {
      "appKey": "explore"
    },
    {
      "appKey": "favorites"
    },
    {
      "appKey": "workflow"
    },
    {
      "appKey": "import"
    },
    {
      "appKey": "jobQueue"
    },
    {
      "appKey": "settings"
    }
  ]
},
```
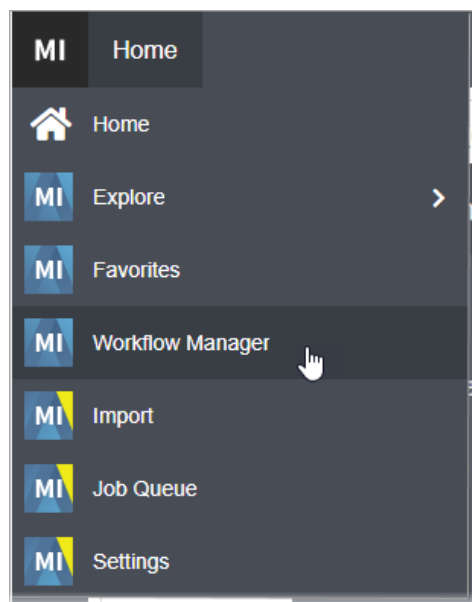
2.5 Integration with other GRANTA MI applications

The location of the MI:Workflow server is registered with the Settings Service during installation, and stored in the **Default.Workflow.InternalAddress** key.

This enables the MI:Viewer and Explore applications to pass lists of records to the Workflow server, and provides a **Workflow/Workflows** menu option in MI:Viewer and Explore, where users can select records then open the Workflow Manager to see active workflow tasks for those records:
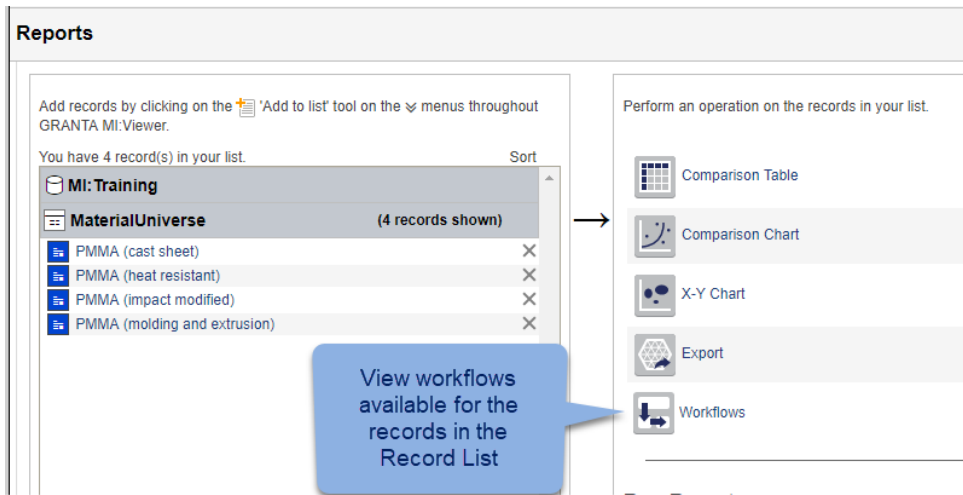
Accessing workflows for a set of records in MI:Viewer
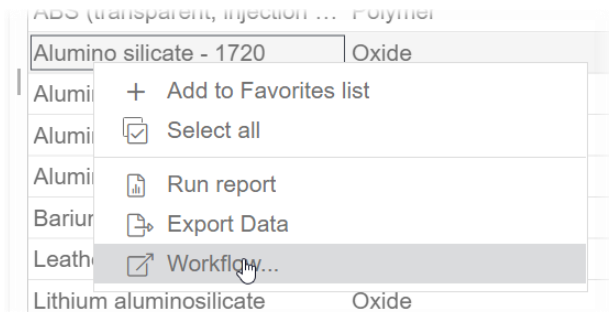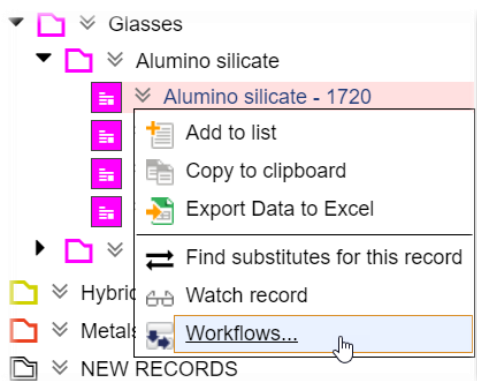
Workflow option for a selected record in the Explore app

Accessing workflows for a single record in MI:Viewer

3   Support for legacy versions

Workflow v1 installations will not be upgraded when installing MI:Workflow 2021 R1. This ensures that any critical business processes which depend on workflows created in v1 will not be affected, and allows a managed transition from a running v1 environment to the latest version.

MI:Workflow 2021 R1 and MI:Workflow v1 can be run in parallel as long as necessary.
- You can continue using your v1 workflows on your v1 server. You can edit v1 workflows using the v1 Workflow Designer, and publish them to the v1 server.
- You can turn on Workflow v1 integration in the MI:Workflow Configuration tool to allow existing v1 workflow definitions to be progressed in your 2021 R1 Workflow server, alongside 2021 R1 workflows:

To take advantage of all the new features available in the latest version of MI:Workflow, we recommend that you upgrade your v1 workflows to the current version when practicable by following these steps:
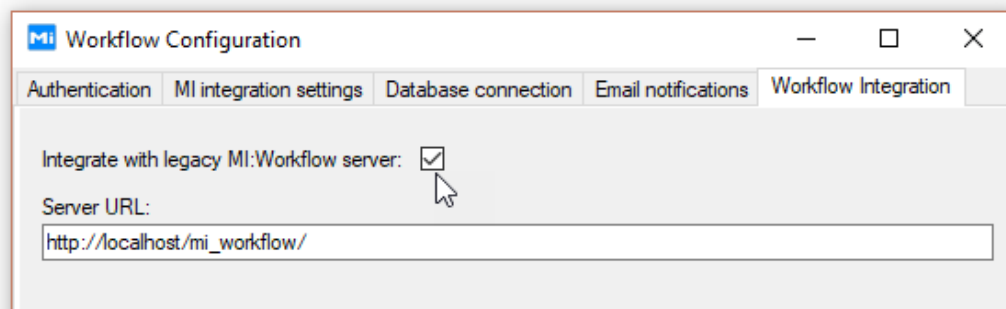
1. Install MI:Workflow 2021 R1.

2. Open the Workflow Configuration tool and, on the **Workflow Integration** tab, select the **Integrate…** option and enter your v1 Workflow server URL as shown in the example screenshot above.

3. In your v1 Workflow Designer, deprecate your v1 workflow definitions (.xamlx) so that no new workflows can be created.

4. In the 2021 R1Workflow Designer, load and upgrade your v1 workflow definitions (**Workflow > Upgrade**), validate them, and then publish them on your 2021 R1 Workflow server so that new workflows are created using the new version.

5. The active items started in v1 will still be visible in 2021 R1 and can be finished there.

6. When there are no active v1 workflows, uninstall v1.

Note that:

- XAMLX workflow definitions created in MI:Workflow versions 1 – 1.3 can be opened in the 2021 R1 Workflow Designer, but only for viewing; they cannot be validated or published.

- WFX workflow definitions created in the 2021 R1 Workflow Designer cannot be opened with older versions of the Workflow Designer.

4   *MI:Workflow Configuration tool*

The MI:Workflow Configuration tool allows you to configure a number of application configuration settings. The configuration tool is launched automatically from within the MI Installation Manager after MI:Workflow is installed in order to allow the MI integration settings to be configured, and it may be launched manually from the application server desktop at any time after installation via the Start menu.

4.1   Authentication

4.1.1   System Security Mode

Option	Description
Windows Authentication / Windows authorization	By default, Windows Active Directory is used for both user authentication and user authorization. Users log in to MI:Workflow using their Windows credentials, and their Windows group membership determines what they can do and the resources they can access. Authentication security is managed using SSPI.
Windows Authentication / User Manager authorization	Authentication is managed by Windows AD, while user authorization is handled by User Manager, the GRANTA MI user management application. Users log in to the system using their Windows credentials, and their membership of User Manager roles determines what resources they see and what they can do in MI:Workflow.
User Manager authentication / User Manager authorization	In this mode, User Manager is used for both authentication and authorization. Users log in using a GRANTA MI account that is defined and managed in User Manager; membership of roles and groups defined and managed in User Manager determines what users can see and do within the system.

4.1.2   Access control roles

You can assign user groups to specific roles within the Workflow system. We recommend that you discuss with your GRANTA MI administrator which groups should be assigned to these roles.

Table 3. Access control role options

Option	Description
Workflow admin roles	A comma-separated list specifying the groups or roles whose members have an administrative role in the Workflow system; i.e. can upload and download workflows and view logs. For example:
	MYDOMAIN\WF_Admins, MYDOMAIN\MI_ADMIN
	The groups or roles specified here may include GRANTA MI system security groups, and/or groups that have been created specifically for use in the Workflow application.
Workflow user roles	A comma-separated list specifying the groups or roles whose members can open the Workflow Manager application. For example:
	MYDOMAIN\WF_Users, MYDOMAIN\WF_Admins, MYDOMAIN\MI_WRITE, MYDOMAIN\MI_POWERUSER, MYDOMAIN\MI_GRANT, MYDOMAIN\MI_ADMIN
	Note that a user's ability to see, start, and progress workflows in Workflow Manager are determined by the access control settings specified on the individual workflow activities.

Note that role hierarchy (where a user who is a member of a higher group inherits all privileges from less privileged roles) does not apply in MI:Workflow. Therefore groups or roles included in the **Workflow admin role** must be also be added to the **Workflow user role**, if their members will need to interact with workflows in Workflow Manager.

4.2   MI Integration Settings

| Option	Description
MI:Settings Service URL	The Workflow Server accesses other GRANTA MI application via the Settings Service, which provides centralized storage of integration settings for interdependent GRANTA MI applications. Example:
	http://*my_appserver*/mi_settings
	Click **Test connection** and enter credentials to verify that MI:Workflow can connect to the Settings Service at this URL.
MI:Service Layer request timeout	Timeout setting for connecting to the Service Layer. Default is 120s

4.3   Database Connection

This tab specifies the account credentials used by MI:Workflow to connect to the Workflow configuration database on your SQL Server instance. Note that this account must have db_owner role on the Workflow configuration database in SQL Server.

Table 4. Database connection settings

| Option	Description
SQL Server name	The name of the SQL Server instance where the MI:Workflow configuration database is installed.
Database name	The name of the MI:Workflow configuration database; by default, this database is *MIWorkflow2*. For Workflow 2021 R1, you <u>must</u> use the *MIWorkflow2* database and not a Workflow configuration database from an earlier release, as this will not be compatible with the version 2021 R1 software.
Authentication	The type of authentication: • Windows Authentication (default). See *Windows Authentication login* below. • SQL Server Authentication: this must be a SQL Server account created in the SQL Server instance.
Advanced	Click to specify optional, additional SQL Server connection parameters, delimited by a semicolon (;). For example, to increase the connection timeout to 120 seconds, and to specify a machine to use as a SQL Server failover partner server where database mirroring is enabled: `Failover Partner=MACHINENAME;Connect Timeout=120`

Windows Authentication login

If IIS and SQL Server are on the same machine, the built-in IIS application pool identity, **IIS AppPool\MIWorkflow2AppPool** can be used to authenticate to SQL Server. A login for this account must be created on the SQL Server, and this login must have db_owner role on the MI:Workflow configuration database:
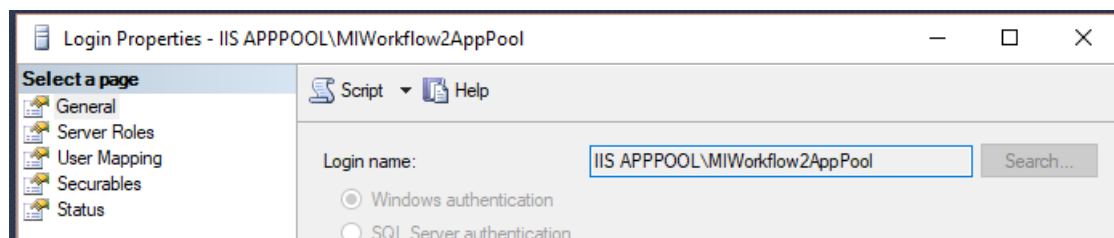
If IIS and SQL Server are on different machines, the machine account of the IIS server can be used. A login for this account must be created on the SQL Server, and given db_owner role on the MI:Workflow configuration database. The machine account login name is specified in this format:

> <domain>\<computername>$

For example:
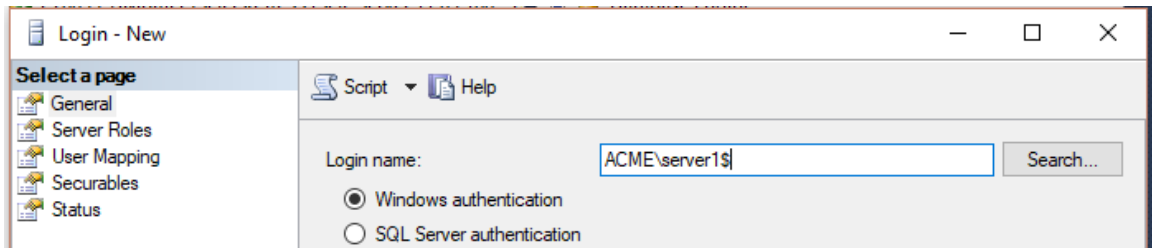
If the MI:Server service in your GRANTA MI environment is running under a service account, you could consider using the same service account for the Workflow application. To do this, you will need to configure the **MIWorkflow2AppPool** application pool in the IIS management console to specify the MI:Server service account as the Application Pool Identity, for example:
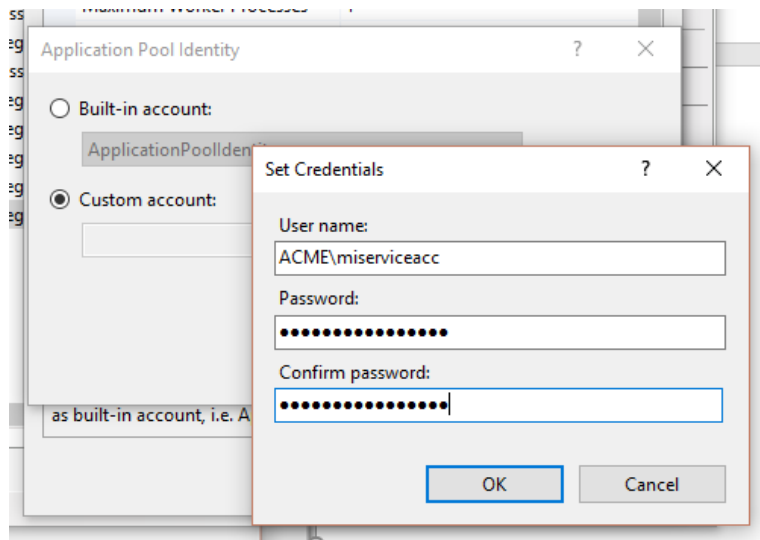
4.4   Email Notifications

Optionally, you can specify the settings required to enable emails to be sent from the Workflow system to your company's SMTP email server for relaying. These options only need to be configured if email notifications will be part of any of the workflows implemented with MI:Workflow.

Table 5. Email notification settings

Option	Description
SMTP Server	This can be a name or an IP address.
Port	Email server port. The default setting is 25.
Use SSL	Send emails through an encrypted connection using Explicit SSL
Use authentication	If selected, the specified user should have permission to send email. This user need not have privileges for GRANTA MI i.e. they need not be a member of a GRANTA MI system security group.
From address	Notification emails will come from this sender.

Note: Workflow email notifications are independent of the GRANTA MI email notification feature, which is used to send email notifications to GRANTA MI users about changes to database records of interest ("watch notifications"), and/or User Manager Welcome and password reset emails.

4.5   Legacy system integration

To run the current version of MI:Workflow alongside an older version of the software, you need to specify the URL for your legacy Workflow server: on the **Workflow Integration** tab, select the check box and then enter the URL.
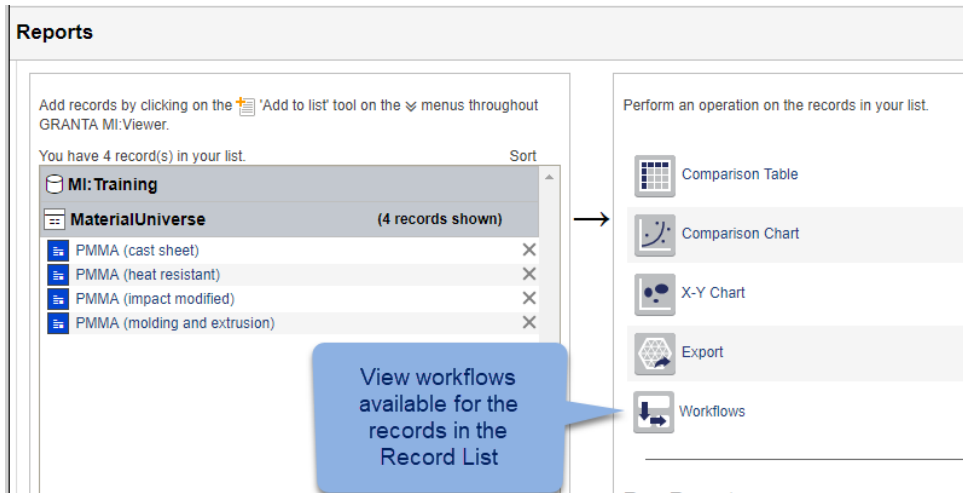
Click **Test connection** to verify that the specified legacy Workflow server can be contacted.

See Section *2.5, Integration with other GRANTA* MI applications

The location of the MI:Workflow server is registered with the Settings Service during installation, and stored in the **Default.Workflow.InternalAddress** key.

This enables the MI:Viewer and Explore applications to pass lists of records to the Workflow server, and provides a **Workflow/Workflows** menu option in MI:Viewer and Explore, where users can select records then open the Workflow Manager to see active workflow tasks for those records:

Accessing workflows for a set of records in MI:Viewer

Accessing workflows for a single record in MI:Viewer

Workflow option for a selected record in the Explore app

5   Support for legacy versions

, for more information.

6   Troubleshooting

6.1   MI:Workflow status

Users who are members of the Workflow Admin role can view application status information by entering this URL in a browser:

http://*my_app_server*/mi_workflow_2/api/status

The report includes information about the Workflow server software version, database and Service Layer connection status, and whether or not integration with legacy MI:Workflow products is enabled.

6.2   MI:Workflow application logs

Users who are members of the Workflow Admin role can view application log information by entering this URL in a browser:

http://*my_app_server*/mi_workflow_2/api/logs

The Workflow Designer has a separate log file located in the user profile AppData folder, for example:

%LOCALAPPDATA%\Granta Design\MI\logs\MIWorkflowDesigner.log

6.3   Viewing user information

Users can check their authentication and authorization details with this URL:

http://*my_app_server*/mi_workflow_2/api/whoami

For example:

```
Details for the current user
----------------------------
Username: ACME\MI_USER_1
Authentication type: Negotiate
This user is authenticated

Workflow group membership
-------------------------
Workflow Admin: True
Workflow User:  True
```

6.4   Database connection issues

Different options for how MI:Workflow authenticates to the configuration database on SQL Server are covered in detail in Section *4.3, Database Connection* .

A problem connecting to the Workflow configuration database may present in the following ways:

- In Workflow Manager, on the **My Items** page, user sees see the text "An error has occurred" instead of "You have no active items".

- In Workflow Designer, on selecting the **Workflow > Publish...** menu item, user sees a red error message "Unable to get workflow list from server".

If users report seeing these messages, and IIS and SQL Server are running on the same machine, check that a login for the IIS application pool identity, IIS AppPool\MIWorkflow2AppPool, has been created on the SQL Server instance, **and** that this login has db_owner role on the MI:Workflow configuration database.

7   *Workflow glossary*

The following terms are used in the MI:Workflow documentation.

Term	Definition
activity	A piece of work that forms one logical step within a workflow. Single activities can be composed together into more complex activities.
instance	A running instance of a workflow definition. Workflow instances may be monitored in the Workflow Manager.
sequence	A model where activities in a workflow are linked together in a structured series of steps where one activity leads to another, in order, until end of the workflow is reached.
state machine	A model where activities in a workflow are linked together with event-driven state transitions.
transition	Transitions provide the links between activities and dictate the order in which activities will be executed.
validation	Workflow validation examines different characteristics of a workflow to identify issues that might cause the workflow to fail.
WFX	A workflow definition file; includes the workflow metadata file (metaData.json) and the activity definition (.XAMLX) file; may also include additional files such as scripts called in the workflow.
workflow definition	A collection of interrelated workflow activities, used to create new workflow instances.
Workflow Designer	A tool for designing and configuring workflows for GRANTA MI.
Workflow Engine	A Granta software service that manages and monitors the state of activities in a workflow, and determines when to transition activities in running workflows. It communicates with GRANTA MI via the Service Layer.
workflow instance	A running instance of a workflow definition. Workflow instances may be monitored in the Workflow Manager.
Workflow Manager	The web application for starting workflows and carrying out workflow tasks. It includes built-in forms that enable users to carry out workflow steps, such as assigning a test to a lab, or approving a request.