

# MATLAB<sup>®</sup> Production Server<sup>™</sup>

## Excel<sup>®</sup> Client Guide



# MATLAB<sup>®</sup>

R2022b



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*MATLAB® Production Server™ Excel® Client Guide*

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# Integrating With MATLAB Production Server

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## Create and Install a Deployable Archive with Excel Integration for MATLAB Production Server

**Supported Platform:** Microsoft® Windows® only.

This example shows how to create a deployable archive with Excel integration using a MATLAB function. You can then deploy the generated archive on MATLAB Production Server.

### Prerequisites

MATLAB Compiler SDK™ requires .NET framework 4.0 or later to build Excel add-ins for MATLAB Production Server.

To generate the Excel add-in file (.xla), enable **Trust access to the VBA project object model** in Excel. If you do not do this, you can manually create the add-in by importing the .bas file into Excel.

### Create Function in MATLAB

In MATLAB, examine the MATLAB program that you want to package.

For this example, write a function `mymagic.m` as follows.

```
function y = mymagic(x)
y = magic(x);
```

At the MATLAB command prompt, enter `mymagic(3)`.

The output is:

```
ans =
     8     1     6
     3     5     7
     4     9     2
```


### Create Deployable Archive with Excel Integration Using Production Server Compiler App

Package the function into a deployable archive with Excel integration using the Production Server Compiler app. Alternatively, if you want to create a deployable archive from the MATLAB command window using a programmatic approach, see “Create Deployable Archive with Excel Integration Using `compiler.build.excelClientForProductionServer`” (MATLAB Compiler SDK).

- 1 To open the **Production Server Compiler** app, type `productionServerCompiler` at the MATLAB prompt.

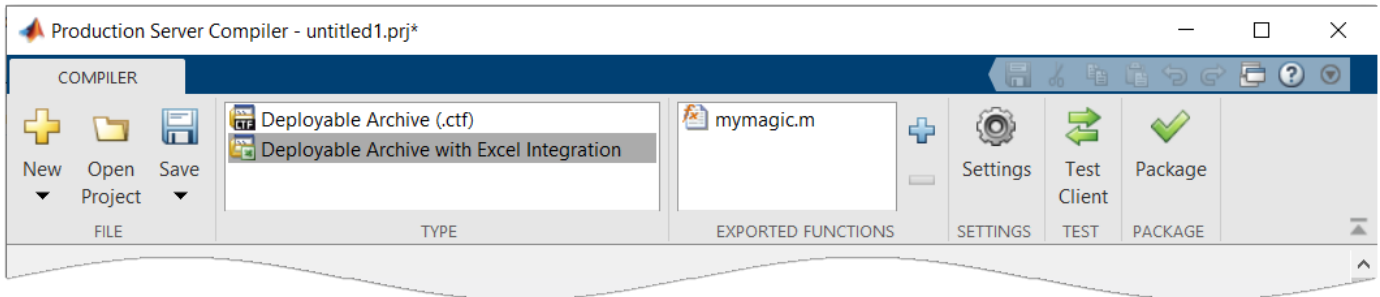
Alternatively, on the **MATLAB Apps** tab, on the far right of the **Apps** section, click the arrow. In **Application Deployment**, click **Production Server Compiler**. In the **Production Server Compiler** project window, click **Deployable Archive with Excel integration**.

- 2 In the **Production Server Compiler** project window, specify the main file of the MATLAB application that you want to deploy.

- 1 In the **Exported Functions** section, click .
- 2 In the **Add Files** window, browse to the example folder, and select the function you want to package.

Click **Open**.

Doing so adds the function `mymagic.m` to the list of main files.



## Customize the Application and Its Appearance

Customize your deployable archive with Excel integration and add more information about the application.

- **Archive information** — Editable information about the deployed archive with Excel integration.
- **Client configuration** — Configure the MATLAB Production Server client. Select the **Default Server URL**, decide wait time-out, and maximum size of response for the client, and provide an optional self-signed certificate for https.
- **Additional files required for your archive to run** — Additional files required by the generated archive to run. These files are included in the generated archive installer. See “Manage Required Files in Compiler Project” (MATLAB Compiler SDK).
- **Files installed with your archive** — Files that are installed with your archive on the client and server. The files installed on the server include:
  - Generated deployable archive (CTF file)
  - Generated `readme.txt`

The files installed on the client include:

- `mymagic.bas`
- `mymagic.dll`
- `mymagic.xla`
- `readme.txt`
- `ServerConfig.dll`

See “Specify Files to Install with Application” (MATLAB Compiler SDK).

- **Options** — The option **Register the resulting component for you only on the development machine** exclusively registers the packaged component for one user on the development machine.

**Archive information**

mymagic 1.0

Class Name	Method Name	
Class1	[y] = mymagic (x)	+

**Client configuration**

**Default Server URL**

None

MATLAB Production Server URL: Protocol:  Host:  Port:

Provide your own URL:

**Advanced Options**

Time the client waits before it times out:  Seconds

Maximum size of the response the client accepts:  MB

Provide an optional self-signed certificate for https:

**Additional files required for your archive to run (Server only)**

+

**Files installed with your archive**

**Server**

mymagic.ctf
 readme.txt
+

**Client**

mymagic.bas
 mymagic.dll
 mymagic.xla
 readme.txt
 ServerConfig.dll
+

**Options**

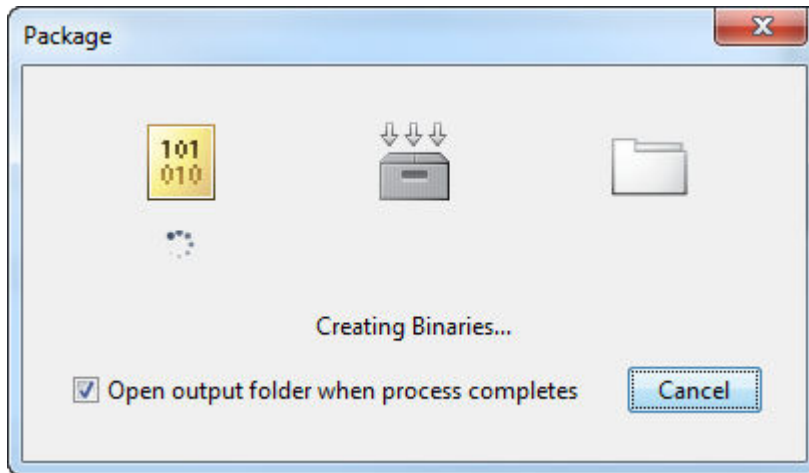
Register the resulting component for you only on the development machine

## Package the Application

- 1 To generate the packaged application, click **Package**.

In the Save Project dialog box, specify the location to save the project.





- 2 In the **Package** dialog box, verify that **Open output folder when process completes** is selected.

When the deployment process is complete, examine the generated output.

- `for_redistribution` — Folder containing the installer to distribute the archive on the MATLAB Production Server client and server
- `for_redistribution_files_only` — Folder containing the files required for redistributing the application on the MATLAB Production Server client and server
- `for_testing` — Folder containing the raw generated files to create the installer
- `PackagingLog.html` — Log file generated by MATLAB Compiler SDK

## Create Deployable Archive with Excel Integration Using `compiler.build.excelClientForProductionServer`

As an alternative to the **Production Server Compiler** app, you can create a deployable archive with Excel integration using a programmatic approach.

- 1 Create a production server archive using `mymagic.m` and save the build results to a `compiler.build.Results` object.

```
buildResults = compiler.build.productionServerArchive('mymagic.m');
```

- 2 Build the deployable archive with Excel integration using the `compiler.build.excelClientForProductionServer` function.

```
mpxlResults = compiler.build.excelClientForProductionServer(buildResults, ...
'Verbose','on');
```

You can specify additional options in the `compiler.build` command by using name-value arguments. For details, see `compiler.build.excelClientForProductionServer`.

The `compiler.build.Results` object `buildResults` contains information on the build type, generated files, included support packages, and build options.

The function generates the following files within a folder named `mymagicexcelClientForProductionServer` in your current working directory:

- `includedSupportPackages.txt` — Text file that lists all support files included in the assembly.

- `mymagic.bas` — VBA module file that can be imported into a VBA project.
- `mymagic.dll` — Dynamic library required by the Excel add-in.
- `mymagic.reg` — Text file that contains information on unresolved symbols.
- `mymagic.xla` — Excel add-in that can be installed directly in Excel.
- `mymagicClass.cs` — Text file that contains information on unresolved symbols.
- `mccExcludedFiles.log` — Log file that contains a list of any toolbox functions that were not included in the application. For information on non-supported functions, see MATLAB Compiler Limitations (MATLAB Compiler).
- `readme.txt` — Text file that contains packaging and deployment information.
- `requiredMCRProducts.txt` — Text file that contains product IDs of products required by MATLAB Runtime to run the application.

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**Note** The generated Excel add-in does not include MATLAB Runtime or an installer. To create an installer using the `buildResults` object, see `compiler.package.installer`.

---

## Install the Deployable Archive with Excel Integration

You must deploy the archive to a MATLAB Production Server instance before you can use the add-in in Excel.

To install the deployable archive on a server instance:

- 1 Locate the archive in the `for_redistribution_files_only\server\` folder if you used the Production Server Compiler, or the `addmatrixproductionServerArchive` folder if you used the `compiler.build.productionServerArchive` function.

For this example, the file name is `mymagic.ctf`.

- 2 Copy the archive file to the `auto_deploy` folder of the server instance. The server instance automatically deploys it and makes it available to interested clients.

## See Also

`productionServerCompiler` | `mcc`

## Install the Excel Add-In

The **Production Server Compiler** app is used to “Create and Install a Deployable Archive with Excel Integration for MATLAB Production Server” on page 1-2. You can install the add-in and configure it to connect to a MATLAB Production Server instance using the generated installer or raw files.

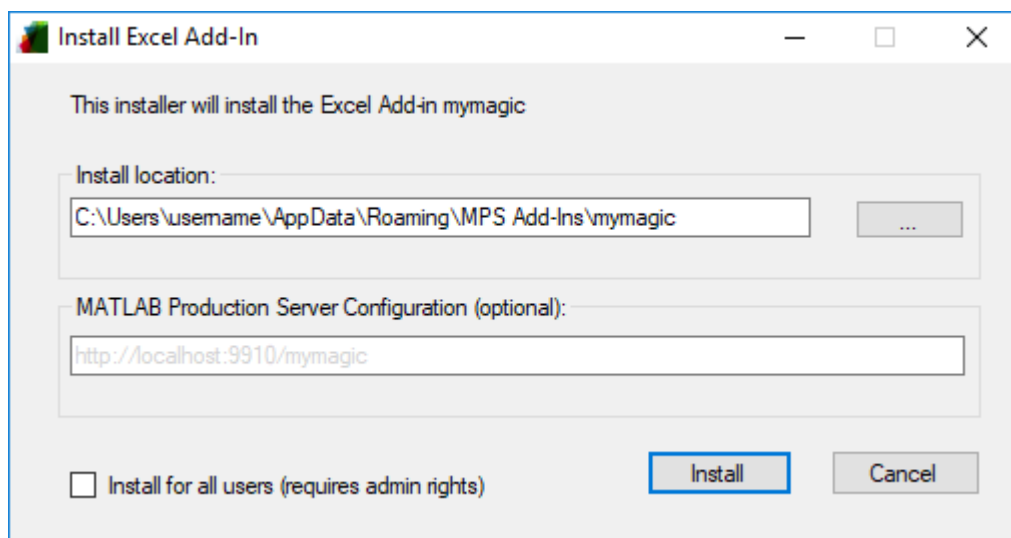
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**Note** The client installer installs under user's local profile, which does not require administrative privileges.

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### Install with the Generated Installer

- 1 Double-click the installer in the `for_redistribution\client` folder.



- 2 In the **Install location** field, enter the location where the Excel add-in is installed.
- 3 In the **MATLAB Production Server Configuration** field, specify the URL of the deployable archive that contains the Excel add-in.

Click **Install**.

### Install with the Raw Files

In the `client\for_redistribution_files_only` folder, you find the following files:

- `projName.dll`— Dynamic library required by the add-in
- `projName.bas` — VBA module file created for the add-in
- `serverconfig.dll`- Excel add-in that manages the server configuration
- `projName.xla` — Excel add-in file

---

**Note** The compiler might not generate the `projName.xla` file for various reasons, including that Excel is not configured to trust access to the VBA project object model.

When this happens, you can install the add-in by importing the `projName.bas` file into the Visual Basic project of the workbook.

---

On the machine running the add-in, you must register the following DLLs with the `regasm /codebase` command:

- `mymagic.dll`
- `serverconfig.dll`

If `mymagic.xla` is generated, install the add-in into Excel. If not, import `mymagic.bas` to the Visual Basic project of the workbook.

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**Note** If you do not have administrative privileges on the machine, you can run `regasm` with the `/regfile` option.

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## See Also

### More About

- “Create and Install a Deployable Archive with Excel Integration for MATLAB Production Server” on page 1-2

## Data Marshaling Rules

### In this section...

“Default Marshaling Rules” on page 1-9

“Change Rules for Marshaling Data into MATLAB” on page 1-9

“Change Rules for Marshaling Data into Excel” on page 1-9

### Default Marshaling Rules

These types of data do not have natural mappings between MATLAB and Excel:

- Dates: Excel has a special data type for dates, and MATLAB does not.
- Blank cells: MATLAB has no equivalent construct for a blank cell in an Excel spread sheet.

If you do not change the marshaling rules when compiling the add-in, the rules for marshaling Excel data into MATLAB are:

- Excel dates are marshaled into MATLAB doubles.
- Empty cells are marshaled into zeros.

If you do not change the marshaling rules when compiling the add-in, the rules for marshaling MATLAB data into Excel are:

- MATLAB NaNs are marshaled into Visual Basic® #QNANs.
- MATLAB does not return any Excel dates.

### Change Rules for Marshaling Data into MATLAB

You can change how dates and empty cells are marshaled into MATLAB when compiling the add-in:

- Excel dates can be marshaled as MATLAB character arrays.
- Empty cells can be marshaled as MATLAB NaNs.

To change the marshaling rules:

- 1** In the class mapper portion of the **MATLAB Compiler** project window, select the signature of the function you want to modify.
- 2** Select **Data Conversion Properties** from the context menu.
- 3** Select the input argument rules to change.
- 4** Click outside of the dialog box to close it.

### Change Rules for Marshaling Data into Excel

You can change how dates and NaNs are marshaled into Excel when compiling the add-in:

- MATLAB NaNs can be converted into zeros.
- MATLAB numeric values can be converted into Excel dates.

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**Note** To see a date in the expected format, ensure that the Excel cell is formatted to display its contents in a date format.

---

To change the marshaling rules:

- 1 In the class mapper portion of the **MATLAB Compiler** project window, select the signature of the function you want to modify.
- 2 Select **Data Conversion Properties** from the context menu.
- 3 Select the output argument rules to change.
- 4 Click outside of the dialog box to close it.

## See Also

### More About

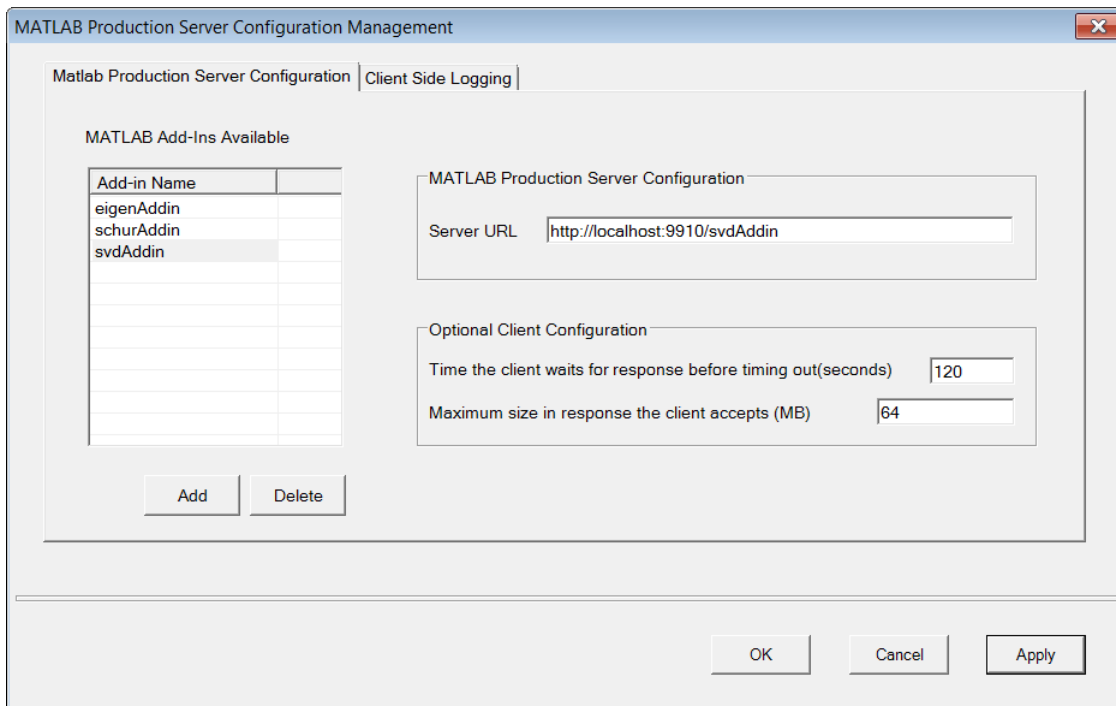
- “Install the Excel Add-In” on page 1-7

## Change the Server Configuration

Before you can run an Excel add-in on a MATLAB Production Server instance, you must configure it.

To configure the server information for an add-in:

- 1 In Excel, select **Add-Ins > Configure MATLAB Production Server**.



- 2 Select the **MATLAB Production Server Configuration** tab.
- 3 Select the add-in to configure. The server URL corresponding to the add-in displays in the **Server URL** field.

If the add-in is not listed, click **Add** under the **MATLAB Add-ins Available** table. Enter the name of the add-in, and click **OK**.

- 4 If the **Server URL** field is empty, enter the URL based on the application protocol you want to use: HTTP or HTTPS. A server certificate must be installed in the certificate store of the client or local machine running the Excel add-in when using HTTPS.

Protocol	URL	Default Port Number
HTTP	http://<HostName>:<PortNumber>/ctfArchiveName	9910
HTTPS	https://<HostName>:<PortNumber>/ctfArchiveName	9920

- 5 Modify the **Optional Client Configuration** options if necessary.
- 6 Click **OK**.

## **See Also**

### **More About**

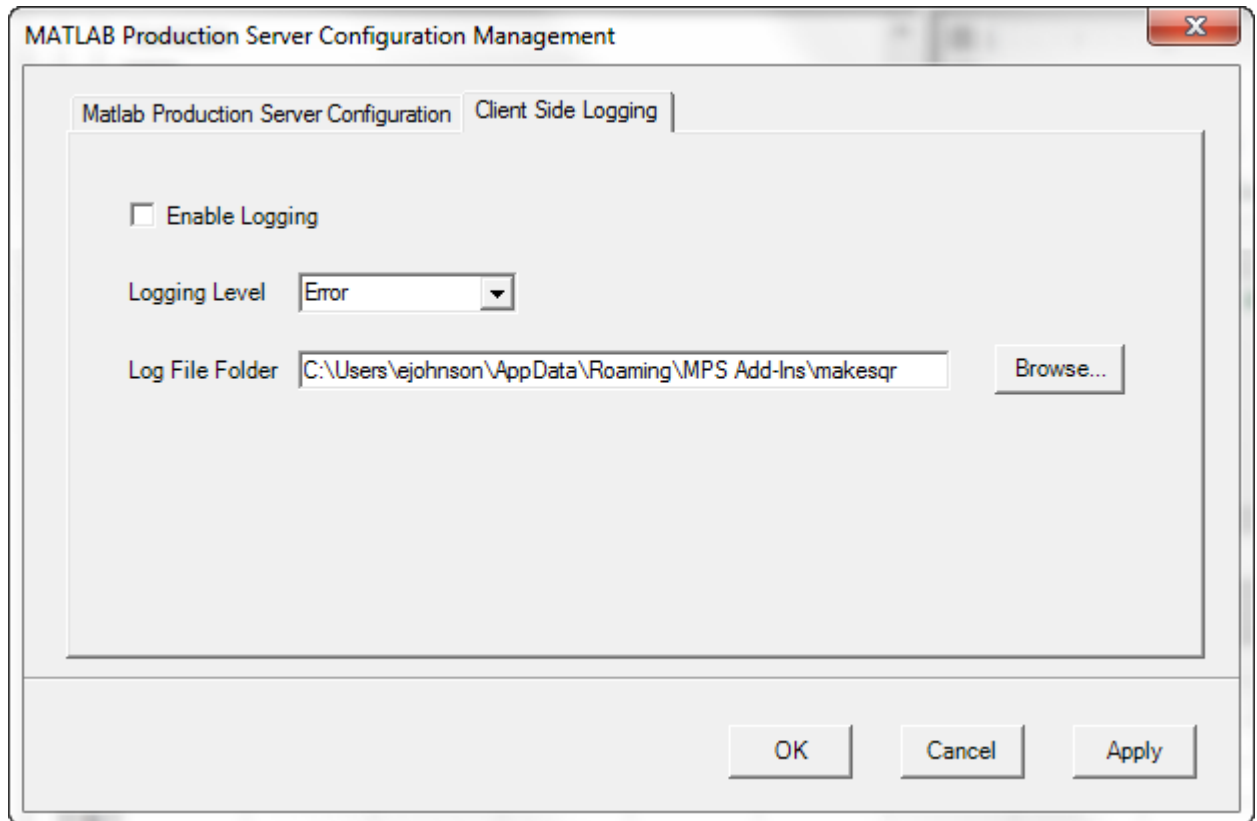
- “Install the Excel Add-In” on page 1-7



## Enable Client Logging

Client logging writes messages to a persistent log file. The messages are useful for debugging issues with the add-in. Client logging is disabled by default. To activate it:

- 1 In Excel, select **Add-Ins > Configure MATLAB Production Server**.



- 2 Select the **Client Side Logging** tab.
- 3 Check the **Enable Logging** box.
- 4 Select the logging level from the **Logging Level** drop-down list.
  - **Error** — Log error messages.
  - **Information** — Log information about server interactions in addition to error messages.
  - **Verbose** — Log everything.
- 5 In the **Log File Folder** box, enter the folder into which log files are written.

When client logging is enabled, all registered MATLAB Production Server add-ins generate log files. The files follow the naming convention *logFolder\addinName-date.log*.

