



R Scripts



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Chapter 1

Overview

Topics:

- [Overview of the R Script Module](#)
- [Access an R Script](#)
- [R Script Workflow](#)

Overview of the R Script Module

The R script tool in GE Digital APM provides a way for you to utilize the R programming language to create scripts that can receive data from inputs, make calculations, and then return one or more outputs. These R scripts can then be used within Policy Designer to expand the functionality of policies.

R scripts can be as simple or as complex as you need them to be, depending on the data that you want the script to calculate. For instance, a simple R script may calculate and return a value based only on two inputs. A more complex R script might utilize ten inputs, and have ten different output values. This documentation does not cover the process of developing R code.

R Scripts in Policies

R scripts can be used within Policy Designer to expand the functionality of policies. After you create and save an R script, you can use the R Script nodes in Policy Designer to pass values into the R script, and receive calculated values out of the R script.

The parameters that you define in the R script determine how the R Script node in Policy Designer will behave. Each parameter that you specify as an input appears as a field in the **Properties** window for the R Script node. You can then use standard policy options to provide values to the parameters in the R script. Each parameter that you specify as an output determines what values subsequent nodes in the policy model can use for additional calculations or actions.

Note: Before you can execute or validate a policy that includes an R node, you must [complete the R server installation and configuration steps](#).

Access an R Script


Procedure

1. In the module navigation menu, select **Tools > R Scripts**.

The **R Scripts** page appears.

R Scripts

[Browse](#)[Create New](#)



| NAME | PATH | CREATOR | DATE |
|---------------------------------|--|-----------------------|----------------------------------|
| Generic Failure Frequency | Public\Meridium\Modules\Generation Mana... | Super User, Baseline | Monday, August 26, 2019 2:27 AM |
| RScript - DateTime VectorPro... | Public\Meridium\Modules\Generation Mana... | Super User, Baseline | Monday, August 26, 2019 2:26 AM |
| CreateRScriptWithDFInputs | Public\Meridium\Modules\Generation Mana... | Super User, Baseline | Monday, January 07, 2019 3:02 AM |
| RScript-DF as input and output | Public\Meridium\Modules\Generation Mana... | Super User, Baseline | Monday, January 07, 2019 3:05 AM |
| CalculatePerformance | Public\Meridium\Modules\Generation Mana... | Administrator, Mer... | Monday, August 28, 2017 4:12 PM |

Rows per page 50 200 500


1 - 5 of 5 Results  

Note: Only R scripts created or accessed from the **R Scripts** page appear in this list. The 25 most recently accessed R scripts will appear in the list.

2. Choose one of the following:

- Select an R script from the grid.
- Browse the Catalog to select an R Script. To do so:
 - a. Select **Browse**.
The **Select a rscript from the catalog** window appears.
 - b. Select an R script.
 - c. Select **Open**.

A new page appears, displaying the selected R script.

Tip: If you want to modify the script, make any required changes, including updating the values in the **Parameters** pane, and then select .

R Script Workflow

This workflow provides the basic, high-level steps for using this module. The steps and links in this workflow do not reference every possible procedure.

1. [Create a new R script](#).
2. Enter R code in the R script editor.
3. [Define each parameter in the R script](#).
4. Save the R script.
5. Create a policy containing the R Script node in order to execute the R script.

Chapter 2

Manage R Scripts

Topics:

- [Create an R Script](#)
- [Define Parameters in R Scripts](#)
- [Delete Parameters in R Scripts](#)
- [Delete an R Script](#)

Create an R Script

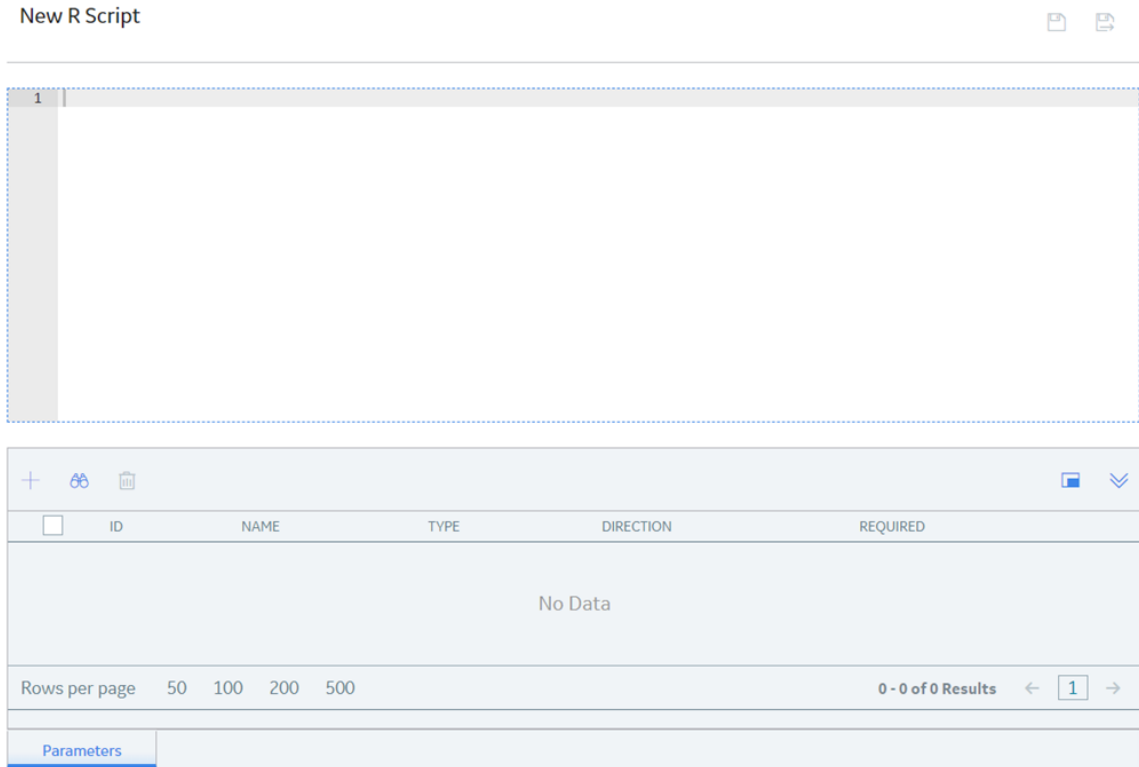
Procedure

1. On the left navigation menu, select **Tools**, and then select **R Scripts**.
The **R Scripts** page appears.

The screenshot shows the 'R Scripts' page interface. At the top right, there are two buttons: 'Browse' and 'Create New'. Below the title is a search icon. A table lists five existing R scripts with columns for NAME, PATH, CREATOR, and DATE. At the bottom, there is a pagination control showing 'Rows per page' with options 50, 100 (selected), 200, and 500. To the right of the pagination, it says '1 - 5 of 5 Results' with navigation arrows and a page number '1'.


| NAME | PATH | CREATOR | DATE |
|---------------------------------|--|-----------------------|----------------------------------|
| Generic Failure Frequency | Public\Meridium\Modules\Generation Mana... | Super User, Baseline | Monday, August 26, 2019 2:27 AM |
| RScript - DateTime VectorPro... | Public\Meridium\Modules\Generation Mana... | Super User, Baseline | Monday, August 26, 2019 2:26 AM |
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| CalculatePerformance | Public\Meridium\Modules\Generation Mana... | Administrator, Mer... | Monday, August 28, 2017 4:12 PM |

2. Select **Create New**.
The **New R Script** page appears, which contains the script editor.



3. In the editor, enter your R code.

Note: When you use R scripts with policies, the policy execution engine sends date inputs to the R script in UTC. If your R script performs any calculations based on dates, the date output must also be in UTC and use the standard date format yyyy-MM-dd hh:mm:ss.fff.

4. [Define each parameter](#) in the R script using the **Parameters** pane.
5. Select .
The **Save As** window appears.
6. In the **Catalog** pane, navigate to the location at which you want to save the R script.
7. Enter values in the **Name**, **Caption**, **Description**, and **Of type** boxes.
8. Select **Save**.
The R script has been saved.

Define Parameters in R Scripts

About This Task

When you define a parameter, you are specifying whether each parameter in the R script is an input or output parameter, whether it is required, and what type of data it requires.

Procedure

1. [Access the R script](#) for which you want to define parameters.
2. At the bottom of the page, select **Parameters**.
The **Parameters** pane appears.



```

1 Unit_Data <- ip_Unit_Data
2 Event_Data <- ip_Event_Data
3 Performance_Key <- ip_Performance_Summary_Key
4 Performance_Indexes_Data <- ip_Performance_Indexes_Data
5
6 Num_Of_Units = nrow(Unit_Data)
7 Performance_list <- vector("list", Num_Of_Units)
8
9 Performance_Key_NMC <- c(-1)
10 Performance_Key_GMC <- c(-1)
11 Performance_Key_NDC <- c(-1)
12
13 CreateEmptyPerformanceDataFrameFN <- function()
14 {
15   return(data.frame())
16 }
17
18 Performance_Summary <- CreateEmptyPerformanceDataFrameFN()
19 Performance_Indexes <- CreateEmptyPerformanceDataFrameFN()
20
21
22 # CalculateFactorsFN function - Time and Energy Factors
23 CalculateFactorsFN <- function(numerator, denominator)
24

```


| ID | NAME | TYPE | DIRECTION | REQUIRED |
|--------------------------|---------------------|------------|-----------|-------------------------------------|
| <input type="checkbox"/> | ip_Unit_Data | Data Frame | Input | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | ip_Event_Data | Data Frame | Input | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | Performance_Summary | Data Frame | Output | <input type="checkbox"/> |

Parameters

- Select . A new row is added to the grid.
- In the **ID** cell, enter the parameter ID exactly as it appears in the R script.
- In the **Name** cell, enter a name for the parameter as you want it to appear to the Policy Designer user.
- In the **Type** list, select the data type of the parameter.
- In the **Direction** list, specify whether the parameter represents an input or an output to the R script.
- If the parameter is an input and is required, select the **Required** check box.
- For each parameter in the R script, repeat steps 3 through 8.
- Select . The R script parameters are defined.

Delete Parameters in R Scripts


Procedure

- Access the R script containing the parameter that you want to delete.
- At the bottom of the page, select the **Parameters** tab. The **Parameters** pane appears.
- On the left side of the **Parameters** pane, select the check boxes in the rows for the parameters you want to delete.
- In the upper-left corner of the pane, select . The parameter is removed from the **Parameters** pane.

5. Select .
The R script parameters are deleted.

Delete an R Script

Procedure

1. Access the **Catalog** page for the folder that contains the R script that you want to delete.
2. Select the check box that corresponds to the R script that you want to delete.
3. In the upper-right corner of the page, select .
A confirmation message appears, asking if you really want to delete the R script.
4. Select **OK**.
The R script is deleted.

Chapter 3

Deployment

Topics:

- [Deploy R Scripts for the First Time](#)
- [Upgrade or Update R Scripts to V4.5.0.0.0](#)
- [Upgrade R Script Metadata](#)
- [Specify R Server Credentials](#)

Deploy R Scripts for the First Time

Before You Begin

The following table outlines the steps that you must complete to deploy and configure this module for the first time. These instructions assume that you have completed the steps for deploying the basic system architecture.

These tasks may be completed by multiple people in your organization. GE Digital recommends, however, that the tasks be completed in the order in which they are listed.

If you are deploying this module in APM Now, before you begin completing these tasks, review the system requirements for this module to identify the supported features for this module in APM Now. Unless noted, all deployment tasks in the following table are applicable for the deployment of this module in APM Now.

Results

| Step | Task | Notes |
|------|---|------------------------|
| 1 | Ensure that your R Server is configured according to the R Scripts system requirements. For more information, refer to the APM System Requirements documentation. | This step is required. |
| 2 | In GE Digital APM, specify the R Server credentials . | This step is required. |

Upgrade or Update R Scripts to V4.5.0.0.0

Before You Begin

The following tables outline the steps that you must complete to upgrade this module to V4.5.0.0.0. These instructions assume that you have completed the steps for upgrading the basic GE Digital APM system architecture.

These tasks may be completed by multiple people in your organization. We recommend, however, that the tasks be completed in the order in which they are listed.

Procedure

- Upgrade from any version V4.4.0.0.0 through V4.4.0.0.4
This module will be updated to V4.5.0.0.0 automatically when you update the components in the basic GE Digital APM system architecture. No additional steps are required.
- Upgrade from any version V4.3.0.0.0 through V4.3.1.0.6
This module will be updated to V4.5.0.0.0 automatically when you update the components in the basic GE Digital APM system architecture. No additional steps are required.
- Upgrade from any version V4.2.0.0 through V4.2.0.9.4

| Step | Task | Notes |
|------|---|------------------------|
| 1. | Ensure that your R Server is configured according to the R Scripts system requirements. For more information, refer to the APM System Requirements documentation. | This step is required. |
| 2. | In GE Digital APM, specify the R Server credentials . | This step is required. |

- Upgrade from any version V4.1.0.0 through V4.1.7.4.0

| Step | Task | Notes |
|------|--|------------------------|
| 1. | Ensure that your R Server is configured according to the R scripts system requirements . | This step is required. |
| 2. | In GE Digital APM, specify the R Server credentials . | This step is required. |

- Upgrade from any version V4.0.0.0 through V4.0.1.0

| Step | Task | Notes |
|------|--|------------------------|
| 1. | Ensure that your R Server is configured according to the R scripts system requirements . | This step is required. |
| 2. | In GE Digital APM, specify the R Server credentials . | This step is required. |

- Upgrade from any version V3.6.1.0.0 through V3.6.1.7.5

| Step | Task | Notes |
|------|--|------------------------|
| 1. | Ensure that your R Server is configured according to the R scripts system requirements . | This step is required. |
| 2. | In GE Digital APM, specify the R Server credentials . | This step is required. |

- Upgrade from any version V3.6.0.0.0 through V3.6.0.12.9

| Step | Task | Notes |
|------|---|--|
| 1. | If you are upgrading directly from V3.6.0.8.0, run a script in order to upgrade R script metadata . | This step is required only if you are upgrading from V3.6.0.8.0. This step is not required if you are upgrading from any V3.x version that is covered by this section. |
| 2. | Ensure that your R Server is configured according to the R scripts system requirements . | This step is required. |
| 3. | In GE Digital APM, specify the R Server credentials . | This step is required. |

Upgrade R Script Metadata

About This Task

If you are upgrading directly from V3.6.0.8.0, after upgrading your database to V4.5.0.0.0, you must run a script in order to upgrade existing R script metadata. This step is not required if you are upgrading from any V3.x version other than V3.6.0.8.0.

Note: If you are unsure whether you need to complete this step, or if you would like assistance, please contact [GE Digital Support](#).

Procedure

1. Copy the script corresponding to your type of database.

Oracle

```
-- select * from dbo.[MI_CTIT_RSCRIPTS]
UPDATE MI_CTIT_RSCRIPTS
SET CTIT_RSCR_DEFN_MEM =
REPLACE (CTIT_RSCR_DEFN_MEM, '"DataType":"n"', '"DataType":"N"');
UPDATE MI_CTIT_RSCRIPTS
SET CTIT_RSCR_DEFN_MEM =
REPLACE (CTIT_RSCR_DEFN_MEM, '"DataType":"c"', '"DataType":"C"');
UPDATE MI_CTIT_RSCRIPTS
SET CTIT_RSCR_DEFN_MEM =
REPLACE (CTIT_RSCR_DEFN_MEM, '"DataType":"d"', '"DataType":"D"');
UPDATE MI_CTIT_RSCRIPTS
SET CTIT_RSCR_DEFN_MEM =
REPLACE (CTIT_RSCR_DEFN_MEM, '"DataType":"l"', '"DataType":"L"');
```

SQL

```
-- select * from dbo.[MI_CTIT_RSCRIPTS]
UPDATE dbo.[MI_CTIT_RSCRIPTS]
SET CTIT_RSCR_DEFN_MEM =
CAST (REPLACE (CAST (CTIT_RSCR_DEFN_MEM as
Nvarchar (MAX) ), '"DataType":"n"', '"DataType":"N"') AS NText)
UPDATE dbo.[MI_CTIT_RSCRIPTS]
SET CTIT_RSCR_DEFN_MEM =
CAST (REPLACE (CAST (CTIT_RSCR_DEFN_MEM as
Nvarchar (MAX) ), '"DataType":"c"', '"DataType":"C"') AS NText)
UPDATE dbo.[MI_CTIT_RSCRIPTS]
SET CTIT_RSCR_DEFN_MEM =
CAST (REPLACE (CAST (CTIT_RSCR_DEFN_MEM as
Nvarchar (MAX) ), '"DataType":"d"', '"DataType":"D"') AS NText)
UPDATE dbo.[MI_CTIT_RSCRIPTS]
SET CTIT_RSCR_DEFN_MEM =
CAST (REPLACE (CAST (CTIT_RSCR_DEFN_MEM as
Nvarchar (MAX) ), '"DataType":"l"', '"DataType":"L"') AS NText)
```

2. Using SQL Server Management Studio (for SQL) or SQL Developer (for Oracle), run the script.

The R script metadata is upgraded.

Specify R Server Credentials

Before You Begin

You must be a Super User or member of the MI Configuration Role security group to modify the R Server credentials.

Procedure

1. In the module navigation menu, select **Admin > Operations Manager > Connections**. The **Connections** page appears.
2. Select **R Server**. The **R Server** workspace appears.

The screenshot shows the 'R Server' configuration page. On the left is a navigation menu with 'R Server' selected. The main area contains the following fields:

- R Server Version:** A dropdown menu with 'DeployR 8.0.0' selected.
- Server Address:** A text input field containing 'http://'.
- User Name:** A text input field containing 'testuser'.
- Password:** A password input field with masked characters.

At the top right of the main area are two buttons: 'Perform Connection Test' and 'Save'.

3. In the **R Server Version** box, specify the version of R Server.
4. In the **Server Address** box, enter the URL of the R Server (for example, `http://MyRServer:7400/deployr`).
5. In the **User Name** and **Password** boxes, enter the DeployR user name and password that you want to use for the connection.
6. Select **Save**. The R Server credentials are saved.
7. Select **Perform Connection Test** to confirm that the connection is valid.