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## Notifications

Notifications messages may be static or responsive. Responsive messages change depending on the user's installation, settings and content. For example, if the user's Update Mode is set to Stable, then a message intended to announce updates will report new updates for the Stable Version but not for the Testing Version.

## Privacy

Notifications are fetched from the Open Rails web server<sup>1</sup> and all users get the same notifications. They are just presented differently depending on the user's settings.

Privacy Note: No information is returned to the Open Rails web server.

---

<sup>1</sup> <https://static.openrails.org/api/notifications/menu.json>

## Static Notifications

A notification which is static might be used to convey a simple message for all users, such as:

**Notification 1/1: 2023-08-31 - UK Train Sim closes**

**UK Train Sim**

After many years of providing UK-based content, UK Train Sim has closed.

The extensive file library has been stored on-line by the Internet Archive.

Files are saved in batches of 1000 files, starting here:

(Toggle icon to hide these notifications.)

The JSON must specify a date<sup>2</sup> and title which appears in the top line.

The “comment” is optional.

The “itemList” section is required and provides a list of items of several possible types which are specified in their initial “\$type” field. The construction “ORTS.<ClassName>, Menu” is recognised by the Newtonsoft JSON reader as a class in the Menu executable.

This example makes use of Heading, Text and Link classes. The Link class provides a button which launches the default browser and opens it at the given URL.

The “\$type” property must come first in the list of properties.

---

<sup>2</sup> The date must be in ISO format (YYYY-MM-DD) so that dates can be sorted.

```
"date": "2023-08-31",
"title": "UK Train Sim closes",
"comment": "Announcement of general interest",
"itemList": [
  {
    "$type": "ORTS.Heading, Menu",
    "label": "UK Train Sim"
  },
  {
    "$type": "ORTS.Text, Menu",
    "label": "After many years of providing UK-based content, UK Train Sim has closed."
  },
  {
    "$type": "ORTS.Text, Menu",
    "label": "The extensive file library has been stored on-line by the Internet Archive."
  },
  {
    "$type": "ORTS.Record, Menu",
    "label": "Archive",
    "value": "Files are saved in batches of 1000 files, starting here:",
    "url": "https://archive.org/details/ukts-archive-files-1-1000"
  }
]
```

Items may also be of type “Record” and type “Update” as described below. There are optional fields for font color and for indent from the left.

## Responsive Notifications

An example of a responsive notification is one that announces news about a route that the user already has installed.

If the user has the Demo Route 1 installed (as an installation profile), then he is shown this notification:

**Notification 1/1: 2024-05-26 - Demo Model 1 Upgrade**

**Upgrades to graphics in Demo Model 1**

Demo Model 1 has been re-issued with rolling stock that uses physically based rendering (PBR).

<input type="button" value="Download"/>	The old web address now provides the new version here.
<input type="button" value="Download"/>	The previous version is still available here.

(Toggle icon to hide these notifications.)

But if he hasn't, then he is shown a different one:

**Notification 1/1: 2024-05-26 - Demo Model 1 Upgrade**

**Upgrades to graphics in Demo Model 1**

Demo Model 1 has been re-issued with rolling stock that uses physically based rendering (PBR).

**Demo Model 1 Not Installed**

Demo Model 1 is a great route to get started with Open Rails.

<input type="button" value="Download"/>	You can install it from here.
---	-------------------------------

(Toggle icon to hide these notifications.)

## Parameters

The different behaviour is achieved by testing whether the parameter “`{{installed_routes}}`” includes the route folder “SCE” – as used by Demo Model 1.

“`{{installed_routes}}`” is recognised as a parameter because it is enclosed by “`{{ . . }}`”. Parameters are converted into current values automatically. The “`installed_routes`” parameter is converted into a string of route folders, which will contain “SCE” if the user has installed Demo Route 1.

This behaviour is achieved with the following JSON:

```
"notificationList": [
  {
    "date": "2024-05-26",
    "title": "Demo Model 1 Upgrade",
    "comment": "Announcement of changes to Demo Model 1",
    "itemList": [
      {
        "$type": "ORTS.Heading, Menu",
        "label": "Upgrades to graphics in Demo Model 1"
      },
      {
        "$type": "ORTS.Text, Menu",
        "label": "Demo Model 1 has been re-issued with rolling stock that uses physically-based rendering (PBR).\"
      },
      {
        \"$type\": \"ORTS.Link, Menu\",
        \"includeIf\": [\"demo_model_1_route_installed\"],
        \"label\": \"Download\",
        \"value\": \"The old web address now provides the new version here:\",
        \"url\": \"https://static.openrails.org/files/DemoModel1.zip\"
      },
      {
        \"$type\": \"ORTS.Link, Menu\",
        \"includeIf\": [\"demo_model_1_route_installed\"],
        \"label\": \"Download\",
        \"value\": \"The previous version is still available here:\",
        \"url\": \"https://static.openrails.org/files/DemoModel1_original.zip\"
      },
      {
        \"$type\": \"ORTS.Heading, Menu\",
        \"includeIfNot\": [\"demo_model_1_route_installed\"],
        \"label\": \"Demo Model 1 Not Installed\",
        \"color\": \"red\"
      },
      {
        \"$type\": \"ORTS.Text, Menu\",
        \"includeIfNot\": [\"demo_model_1_route_installed\"],
        \"label\": \"Demo Model 1 is a great route to get started with Open Rails.\"
      },
      {
        \"$type\": \"ORTS.Link, Menu\",
        \"includeIfNot\": [\"demo_model_1_route_installed\"],
        \"label\": \"Download\",
        \"value\": \"You can install it from here:\",
        \"url\": \"https://static.openrails.org/files/DemoModel1.zip\"
      }
    ]
  }
],
"checkList": [
  {
    "id": "demo_model_1_route_installed",
    "comment": "Include if installed_routes.Coontains('SCE'), i.e. folder named for 'Scottish Capitals Express\",
    "anyOfList": [
      {
        "allofList": [
          {
            "$type": "ORTS.Contains, Menu",
            "property": "{{installed_routes}}\",
            "value": "SCE\"
          }
        ]
      }
    ]
  }
]
]
```

In the "itemList" we have a "Heading" item and a "Text" item followed by a "Link" item. This has a field "IncludeIf" which is used to show or to hide the item.

The array of values which the "IncludeIf" provides names of one or more checks that all must succeed before the item will be shown. Otherwise, it will be hidden.

There are 3 more items in the "itemList" which have the opposite field "includeIfNot". These items are shown if all of the checks in the array of values fail.

Note that an optional field has been used in one of the items to set the Heading color to "red". All the Windows system colors are recognised<sup>3</sup>.

### **checkList**

The "notificationList" is followed by a "checkList" to define the criteria for each of these checks.

Each check in the "checkList" has a string "id" which is matched to the values in the "includeIf" and "includeIfNot" array values.

The "comment" in checkList is optional.

"anyOfList" allows a check to consider multiple tests. Once a test succeeds, the check has succeeded. This implements a logical OR operation.

The "anyOfList" contains an array of one or more "allOfList". Each "allOfList" is an array of criteria and all of these must succeed if the test is to succeed. This implements a logical AND operation.

In this example, there is only one constraint - "ORTS.Contains, Menu". This constraint requires that "{{installed\_routes}}" contains "SCE".

As noted in the "comment" field, "SCE" is the name of the folder containing the route "Scottish Central Express". "{{installed\_routes}}" is a parameter which is converted to a string containing all the route folder names in the installation profiles.

The "Contains" operator is not case-sensitive.

A "ORTS.NotContains, Menu" alternative is also supported.

---

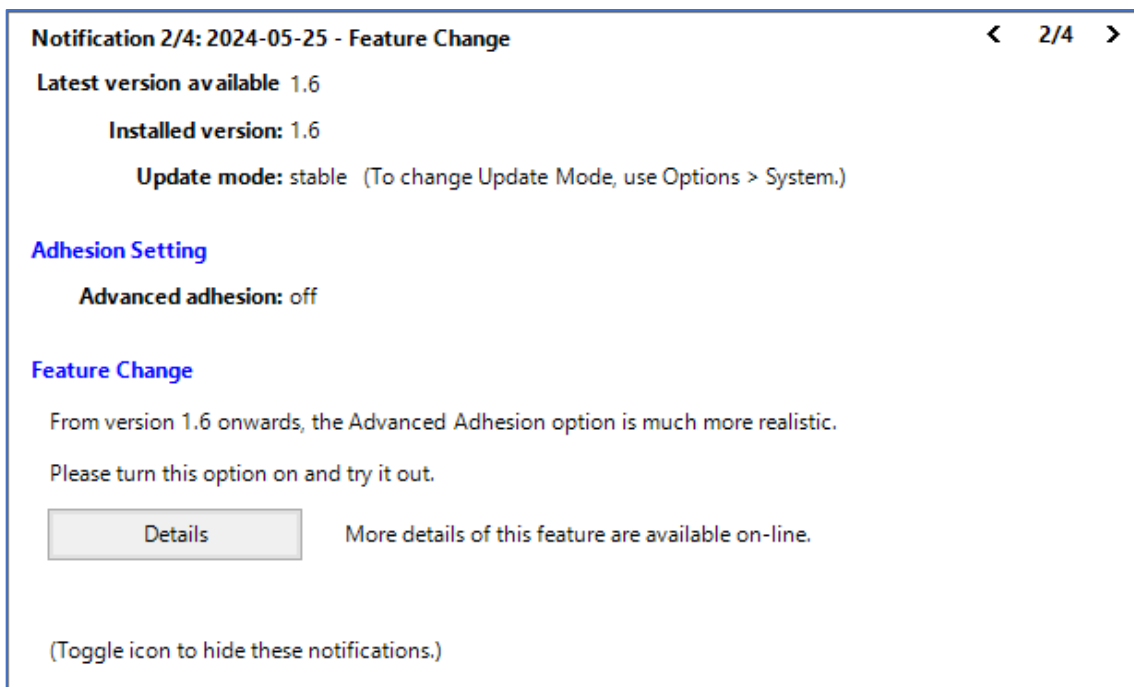
<sup>3</sup> <https://learn.microsoft.com/en-us/dotnet/api/system.windows.media.colors?view=windowsdesktop-8.0>

## Sample Uses

### User Settings

Notifications can also change behaviour based on the settings which a user chooses in the “Options” menu. In this example, we are assuming that adhesion has been greatly improved in Stable Version 1.6 and this notification is prompting users to try it out.

Only users who have the setting Advanced Adhesion turned off will see this notification. The notification has been configured so that users with Advanced Adhesion turned on will see no notification at all.



Pressing the “Details” button launches the user’s browser to show the specified webpage.

In this JSON, the parameter “`{{Settings.UseAdvancedAdhesion}}`” appears twice; once as a confirmation to the user of its current value - “off” and again in the “checkList”. If the check fails, then the notification is not shown at all. This behaviour is specified by the “includeIf” in the notification itself. An “includeIfNot” is also available.

In this example, the check is for 2 conditions, that the setting is “off” and also that the “`{{installed_version}}`” contains the value “1.6”. This notification will not be shown while the user stays at version 1.5 and will disappear again once the user upgrades to version 1.7.

As mentioned earlier, the JSON element “allOfList” indicates a logical AND, so that this notification will only be shown if all the properties have the correct values.

```

"notificationList": [
  {
    "date": "2024-05-26",
    "title": "Feature Change",
    "includeIf": ["Using_1.6_but_not_advanced_adhesion"],
    "comment": "Improved advanced adhesion",
    "itemList": [
      {
        "$type": "ORTS.Record, Menu",
        "label": "Latest version available",
        "value": "{{latest_version}}"
      },
      {
        "$type": "ORTS.Record, Menu",
        "label": "Installed version",
        "value": "{{installed_version}}"
      },
      {
        "$type": "ORTS.Record, Menu",
        "label": "Update mode",
        "value": "{{update_mode}} (To change Update Mode, use Options > System.)"
      },
      {
        "$type": "ORTS.Heading, Menu",
        "label": "Adhesion Setting"
      },
      {
        "$type": "ORTS.Record, Menu",
        "label": "Advanced adhesion",
        "value": "{{Settings.UseAdvancedAdhesion}}"
      },
      {
        "$type": "ORTS.Heading, Menu",
        "label": "Feature Change"
      },
      {
        "$type": "ORTS.Text, Menu",
        "label": "From version 6.0 onwards, the Advanced Adhesion option is much more realistic."
      },
      {
        "$type": "ORTS.Text, Menu",
        "label": "Please turn this option on and try it out."
      },
      {
        "$type": "ORTS.Link, Menu",
        "label": "Details",
        "value": "More details of this feature are available on-line.",
        "url": "https://www.openrails.org/discover/advanced_adhesion"
      }
    ]
  }
],
"checkList": [
  {
    "id": "Using_1.6_but_not_advanced_adhesion",
    "comment": "Include if installed_version.Contains('1.6') and Settings.UseAdvancedAdhesion.Contains('off')",
    "anyOfList": [
      {
        "allofList": [
          {
            "$type": "ORTS.Contains, Menu",
            "property": "{{installed_version}}",
            "value": "1.6"
          },
          {
            "$type": "ORTS.Contains, Menu",
            "property": "{{Settings.UseAdvancedAdhesion}}",
            "value": "off"
          }
        ]
      }
    ]
  }
]
]

```



This example also introduces the type “ORTS.Record, Menu” which is used to set out individual records aligned as in a table format.

Note: the parameter for user settings is case-sensitive (in Pascal case) and the possible names are listed in

<https://github.com/openrails/openrails/blob/master/Source/ORTS.Settings/UserSettings.cs>

The other parameters are not case-sensitive and a full list is appended.

## Update Version

Notifications are also used to advise that a new version is available. If a new version is available, then the notification might be shown as:

**Notification 1/1: none - Updates for Open Rails**

**Latest version available** 1.6

**Installed version:** 1.5

**Update mode:** stable (To change Update Mode, use Options > System.)

**New version available**

<input type="button" value="What's new"/>	Find out on-line what's new in this version.
<input type="button" value="Install"/>	Install the latest Stable version

(Toggle icon to hide these notifications.)

Once the user has upgraded, this is no longer appropriate and the notification is shown as:

**Notification 1/1: none - Updates for Open Rails**

**Latest version available** 1.6

**Installed version:** 1.6

**Update mode:** stable (To change Update Mode, use Options > System.)

<input type="button" value="What's new"/>	Find out on-line what was new in your installed version.
---	--

(Toggle icon to hide these notifications.)

This example introduces a new JSON element “ORTS.Update, Menu” which is used here to provide the button “Install” and its action.

The link items include 3 URL elements, and the program uses the one appropriate to the update mode that the user has chosen – stable, testing or unstable.

The check with id=”ready\_to\_update” makes use of the “NotContains” condition, so that an update button is offered only if both the version installed is not the same as the latest version available and also the update mode is not “none”.

```

"notificationList": [
  {
    "date": "{{release_date}}",
    "title": "Updates for Open Rails",
    "comment": "Checks ready_to_update",
    "itemList": [
      {
        "$type": "ORTS.Record, Menu",
        "label": "Latest version available",
        "value": "{{latest_version}}"
      },
      {
        "$type": "ORTS.Record, Menu",
        "label": "Installed version",
        "value": "{{installed_version}}"
      },
      {
        "$type": "ORTS.Record, Menu",
        "label": "Update mode",
        "value": "{{update_mode}} (To change Update Mode, use Options > System.)"
      },
      {
        "$type": "ORTS.Link, Menu",
        "includeIf": ["ready_to_update"],
        "label": "What's new",
        "value": "Find out on-line what's new in this version.",
        "stableUrl": "https://www.openrails.org/discover/latest_stable_version",
        "testingUrl": "https://www.openrails.org/download/changes/",
        "unstableUrl": "https://james-ross.co.uk/projects/or"
      },
      {
        "$type": "ORTS.Update, Menu",
        "includeIf": ["ready_to_update"],
        "label": "Install",
        "value": "Install the latest version"
      },
      {
        "$type": "ORTS.Link, Menu",
        "includeIfNot": ["ready_to_update"],
        "value": "Find out on-line what was new in your installed version.",
        "stableUrl": "https://www.openrails.org/discover/latest_stable_version",
        "testingUrl": "https://www.openrails.org/download/changes/",
        "unstableUrl": "https://james-ross.co.uk/projects/or",
        "label": "What was new"
      }
    ]
  }
],
"checkList": [
  {
    "id": "ready_to_update",
    "comment": "Include if latest_version != installed_version && update_mode != 'none'",
    "anyOfList": [
      {
        "allofList": [
          {
            "$type": "ORTS.NotContains, Menu",
            "property": "installed_version",
            "value": "{{latest_version}}"
          },
          {
            "$type": "ORTS.NotContains, Menu",
            "property": "update_mode",
            "value": "none"
          }
        ]
      }
    ]
  }
]
]

```

For the "ORTS.Link, Menu", "url" overrides "stableUrl" and the other 2 URL properties. If the user has chosen Update Mode = "none", then the url used will be the same as "stableUrl".

## Compatibility Testing

An upgrade which includes the Physics Based Rendering (PBR) provided by the Graphics Library Transission Format (gITF) requires hardware that supports Direct3D version 10.0 or greater. Previously Open Rails has only required Direct3D version 9.3.

By adding a second check, the notification of a new version can also indicate that an upgrade of the system is required, such as:

**Notification 1/1: 25-May-24 - Updates for Open Rails**

**Latest version available** 1.7

**Installed version:** 1.6

**Update mode:** stable (To change Update Mode, use Options > System.)

**Install not available.**

This version cannot be installed on your system until the graphics card has been upgraded.

Find out on-line about graphics card needed.

(Toggle icon to hide these notifications.)

This example is very similar to the previous one, but there are now 4 check ids listed in the “checkIdList” of the notification, one for the update, two for the version and one for the system information Direct3D.

The example represents the situation where the Stable Version does not support PBR or require Direct3D v10.0. However, we assume that the Testing and Unstable Versions have been improved to support PBR, so are ahead of the Stable Version and require Direct3D v10.0.

The item “\$type: ORTS.Update, Menu” which provides the install button needs 2 checks for the Stable Version:

```
"includeIf": ["ready_to_update", "is_stable"]
```

However the item for the Testing or “Unstable Versions needs 3 checks:

```
"includeIf": ["ready_to_update", "is_testing_or_unstable", "pbr_compatible"]
```

A red message “Install not available” is shown when all the following checks succeed:

```
"includeIf": ["ready_to_update", "is_testing_or_unstable"],  
"includeIfNot": ["pbr_compatible"],
```

These conditions are ANDed together as:

ready\_to\_update AND is\_testing\_or\_unstable AND NOT pbr\_compatible

```

"notificationList": [
  {
    "date": "{{release_date}}",
    "title": "Updates for Open Rails",
    "comment": "Checks ready_to_update and pbr_compatible",
    "itemList": [
      {
        "$type": "ORTS.Record, Menu",
        "label": "Latest version available",
        "value": "{{latest_version}}"
      },
      {
        "$type": "ORTS.Record, Menu",
        "label": "Installed version",
        "value": "{{installed_version}}"
      },
      {
        "$type": "ORTS.Record, Menu",
        "label": "Update mode",
        "value": "{{update_mode}} (To change Update Mode, use Options > System.)"
      },
      {
        "$type": "ORTS.Link, Menu",
        "includeIf": ["ready_to_update"],
        "label": "What's new",
        "value": "Find out on-line what's new in this version.",
        "stableUrl": "https://www.openrails.org/discover/latest_stable_version",
        "testingUrl": "https://www.openrails.org/download/changes/",
        "unstableUrl": "https://james-ross.co.uk/projects/or"
      },
      {
        "$type": "ORTS.Update, Menu",
        "includeIf": ["ready_to_update", "is_stable"],
        "label": "Install",
        "value": "Install the latest Stable version"
      },
      {
        "$type": "ORTS.Update, Menu",
        "includeIf": ["ready_to_update", "is_testing_or_unstable", "pbr_compatible"],
        "label": "Install",
        "value": "Install the latest version"
      },
      {
        "$type": "ORTS.Link, Menu",
        "includeIfNot": ["ready_to_update"],
        "value": "Find out on-line what was new in your installed version.",
        "stableUrl": "https://www.openrails.org/discover/latest_stable_version",
        "testingUrl": "https://www.openrails.org/download/changes/",
        "unstableUrl": "https://james-ross.co.uk/projects/or",
        "label": "What was new"
      },
      {
        "$type": "ORTS.Heading, Menu",
        "includeIf": ["ready_to_update", "is_testing_or_unstable"],
        "includeIfNot": ["pbr_compatible"],
        "label": "Install not available.",
        "color": "red"
      },
      {
        "$type": "ORTS.Text, Menu",
        "includeIf": ["ready_to_update", "is_testing_or_unstable"],
        "includeIfNot": ["pbr_compatible"],
        "label": "This version cannot be installed on your system until the graphics card has been upgraded."
      },
      {
        "$type": "ORTS.Link, Menu",
        "includeIf": ["ready_to_update", "is_testing_or_unstable"],
        "includeIfNot": ["pbr_compatible"],
        "value": "Find out on-line about graphics card needed.",
        "url": "https://www.openrails.org/learn/faq/#hardware_requirements",
        "label": "Graphics card"
      }
    ]
  }
],

```

```

"checkList": [
  {
    "id": "is_stable",
    "comment": "Update mode",
    "anyOfList": [
      {
        "allofList": [
          {
            "$type": "ORTS.Contains, Menu",
            "property": "stable",
            "value": "{{update_mode}}"
          },
          {
            "$type": "ORTS.NotContains, Menu",
            "property": "unstable",
            "value": "{{update_mode}}"
          }
        ]
      }
    ]
  },
  {
    "id": "is_testing_or_unstable",
    "comment": "Update mode",
    "anyOfList": [
      {
        "allofList": [
          {
            "$type": "ORTS.Contains, Menu",
            "property": "testing",
            "value": "{{update_mode}}"
          }
        ]
      },
      {
        "allofList": [
          {
            "$type": "ORTS.Contains, Menu",
            "property": "unstable",
            "value": "{{update_mode}}"
          }
        ]
      }
    ]
  },
  {
    "id": "pbr_compatible",
    "comment": "Windows 7 onwards have software but may lack hardware for Direct3D v10.0. Note: This may apply to the Testing V",
    "anyOfList": [
      {
        "allofList": [
          {
            "$type": "ORTS.Contains, Menu",
            "property": "direct3d",
            "value": "10_0"
          }
        ]
      }
    ]
  },
  {
    "id": "ready_to_update",
    "comment": "Include if latest_version != installed_version && update_mode != 'none'",
    "anyOfList": [
      {
        "allofList": [
          {
            "$type": "ORTS.NotContains, Menu",
            "property": "installed_version",
            "value": "{{latest_version}}"
          },
          {
            "$type": "ORTS.NotContains, Menu",
            "property": "update_mode",
            "value": "none"
          }
        ]
      }
    ]
  }
]

```

## Publishing Notifications

Changes to menu.json can be submitted as a Pull Request to the repository [openrails/notifications](https://github.com/openrails/notifications)<sup>4</sup> on GitHub.

Please note that notifications are intended to be short, so there is no provision for scrolling lengthy text. There is no provision either for images. More detail can be provided by including a link to a webpage along with an incentive for clicking the link.

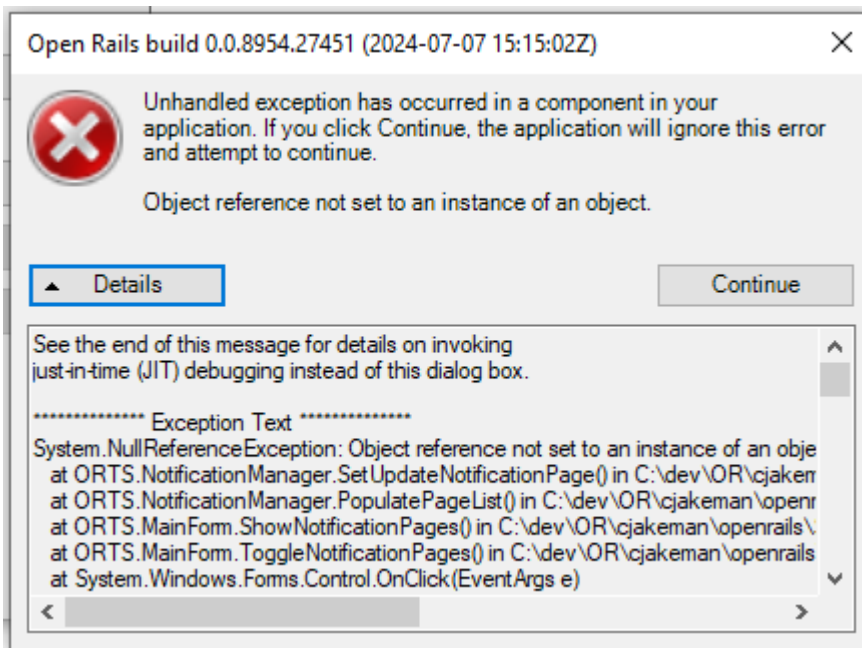
## Validating menu.json

A schema file is provided at

<https://static.openrails.org/api/notifications/schema.json> which can be used to validate the menu.json file before publishing a new version.

Validation is offered automatically when editing JSON using Visual Studio Code or can be done on-line using tools such as <https://www.liquid-technologies.com/online-json-schema-validator>

The menu.json file is not validated at run-time by Menu.exe, so any errors will lead to an exception such as:



---

<sup>4</sup> <https://github.com/openrails/notifications>



## Trialling menu.json

The “notificationList” is downloaded and extracted from the JSON file at <https://static.openrails.org/api/notifications/menu.json>

In order to test new versions of this file, the Notifications code will first look for a file in the Program folder of Open Rails – Program\notifications\_trial.json

If this exists, then it will be used instead of the published file.

As part of trialling new version of this file, it may be helpful to simulate system information or user settings or installed routes that do not exist on the trial system. Another JSON file can be added to the Open Rails Program folder to simulate these.

This file is named Program\notifications\_trial\_parameters.json and contains a list of parameters and values. The following example was used to produce the previous notification image.

```
{
  "parameterValueList":
  [
    {
      "parameter": "update_mode",
      "value": "stable"
    },
    {
      "parameter": "installed_version",
      "value": "1.6"
    },
    {
      "parameter": "latest_version",
      "value": "1.7"
    },
    {
      "parameter": "direct3d",
      "value": "9_3"
    }
  ]
}
```

## Log File

If the file Program\notifications\_trial.json exists, then a log file will be generated also in the folder - Program\notifications\_trial\_log.txt

For example:

---

Parameters overridden:

```
update_mode = stable
installed_version = 1.6
latest_version = 1.7
direct3d = 9_3
```

Parameters used:

```
update_mode = stable
installed_version = 1.6
latest_version = 1.7
direct3d = 9_3
release_date = none
```

Notification: Updates for Open Rails

CheckId: not\_updated

Check: '1.7' contained in '1.6' = False

Check: 'none' contained in 'stable' = False

CheckId: direct3d\_10\_0

Check: '10\_0' contained in '9\_3' = False

---

# Appendix

## List of System Information

This is similar to the list of system information that appears at the top of OpenRailsLog.txt:

- installed\_version
- runtime
- system
- memory
- cpu
- gpu
- direct3d

OpenRailsLog.txt sample:

---

```
This is a log file for Open Rails. Please include this file in bug reports.
-----
Date/time      = 25/05/2024 16:11:20 (2024-05-25 15:11:20Z)
Application    = Open Rails 0.0.8902.26933 (2024-05-16 14:57:46Z) (X64)
Runtime       = .NET Framework 4.8.9195.0
System        = Microsoft Windows 10 Home 10.0.19045 (X64; en-GB; en-GB,en-US)
Memory        = 32,714 MB
CPU           = AMD Ryzen 5 3600X 6-Core Processor (AuthenticAMD; 12 threads; 3,793 MHz)
GPU           = Radeon RX 5500 XT (Advanced Micro Devices, Inc.; 4,055 MB)
Direct3D      = 12_1,12_0,11_1,11_0,10_1,10_0,9_3,9_2,9_1
```

