About IBM Marketing Platform version 9.1.1

This document describes the new features and changes introduced in the 9.1.1 version of Marketing Platform and earlier versions in the 9.1.x line.

System requirements and compatibility

This section provides information on where to find system requirement and compatibility information for this release of IBM® Marketing Platform.

Where to find complete system requirement and compatibility information

For a list of IBM EMM product versions compatible with this product and a list of third-party requirements for this product, see the **Recommended Software Environments and Minimum System Requirements** document. This document is posted under Detailed System Requirements on the IBM Support Portal website: (http://support.ibm.com).

**Note:** To access the IBM EMM documentation from the Support Portal, you must log in with an IBM account. This account must be linked to your IBM customer number. To learn more about associating your account with your IBM customer number, see **Support Resources > Entitled Software Support** on the Support Portal.

You can also access this document by selecting **Help > Product documentation** when you are logged in to IBM EMM.

New features and changes in version 9.1.1

This section describes the new features and changes introduced in the 9.1.1 version of Marketing Platform. For complete details on new features, see the **IBM Marketing Platform 9.1.1 Administrator’s Guide**.

**Support added for SAML 2.0 based federated authentication**

Marketing Platform supports SAML (Security Assertion Markup Language) 2.0 federated authentication, which enables single sign-on access among diverse applications.

You can use federated authentication to implement single sign-on between IBM EMM applications and other IBM applications or third-party applications.

The Marketing Platform installation includes the following components that support federated authentication.

- An identity provider server
- A client JAR file that you can use with Java applications to generate and parse SAML 2.0 assertions. The Java products that you integrate with IBM EMM use the assertions to communicate with the identity provider server.

Contact your IBM representative to learn more about this feature.
Audit event tracking and reporting

A new Audit Events report is introduced with the 9.1.1 release of Marketing Platform. You can configure which audit events are tracked and assign a severity level to each tracked event.

The Audit Events report provides a convenient way to view the tracked events. You can configure the content of the report, filter the information shown in the report, and export report data.

Two kinds of audit events are tracked:
- Security related events such as changes to user status, group memberships, and permissions
- Changes to IBM EMM configuration properties that are managed on the Settings > Configuration page

You must have the AdminRole or PlatformAdminRole role in Marketing Platform to configure the Audit Events report and audit backups or to view the report.

Data filter enhancement

The data filter feature has been enhanced to make it easier to configure data filters based on user logins.

When you have a filter based on user logins, you can now use the #user_login# wildcard to assign data filters to users or groups of users. At run time, the wildcard value is replaced by the current user’s login. This eliminates the step of creating one filter for each user.

Here is an example of the XML you would create to add all members of the FieldMarketers group to a data filter.

```
<DataFilter>
    <configId>1</configId>
    <id>1</id>
    <fieldConstraints>
        <FieldConstraint>
            <logicalFieldId>3</logicalFieldId>
            <expression>#{user_login#}</expression>
            <!-- This is the wild card. -->
        </FieldConstraint>
    </fieldConstraints>
</DataFilter>

<AssignmentByName>
    <namespaceId>1</namespaceId>
    <dataObjectId>1</dataObjectId>
    <!-- This is a reference to the filter. -->
    <principalType>2</principalType>
    <!-- This is the type of assignment: 1 is for assigning to a user, 2 is for assigning to a group of users. -->
    <principalName>FieldMarketers</principalName>
    <!-- This is the name of the group to which you assign the filter. -->
</AssignmentByName>
```

Note that you still have to create the XML to set up the data filters themselves, as described in the IBM Marketing Platform Administrator’s Guide.
**Interaction History and Attribution Modeler are not supported**

Interaction History and Attribution Modeler are not available for version 9.1.1. Enterprise Marketing Management products on version 9.1.1 do not support integrations with version 9.1.0 of Interaction History and Attribution Modeler.

**IBM ExperienceOne Knowledge Center**

Starting with version 9.1.1, you can view product documentation in IBM ExperienceOne Knowledge Center, which includes documentation for all of the products in the ExperienceOne family. Use IBM ExperienceOne Knowledge Center to:

- search across all documentation for a particular product.
- search across all of the products in the suite.
- bookmark topics.
- share links to specific topics.
- access IBM support and educational resources.

You can view common tasks, troubleshooting, and support documentation the same way you have in prior releases by using the Help menu in each product, including Help > Product documentation or Help > Help for this page. To get documentation on all other IBM products, use the IBM Knowledge Center at http://www.ibm.com/support/knowledgecenter/.

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**New features and changes in version 9.1.0**

This section describes the new features and changes introduced in the 9.1.0 version of Marketing Platform. For complete details on new features, see the IBM Marketing Platform 9.1.0 Administrator’s Guide.

**The IBM EMM Scheduler has been enhanced**

The following enhancements are added for the IBM EMM Scheduler.

- Scheduler management pages now display additional information.
  
  On the Schedule Definitions page, you can find scheduled items and use links to navigate to them.

  A new column on the Schedule Definitions page lists the last two runs and the next run of recurring schedules. (ENH18928, ENH18914)

  Additional details about individual runs have been added on the Scheduled Runs page, and you can also cancel selected runs on this page.

- A new configuration property, **Platform > Scheduler > Enable Scheduler**, allows you to disable the scheduler if your organization does not use it.

  Disabling the scheduler frees additional system resources and can improve performance.

- A new configuration property, **Platform > Scheduler > Maximum Unknown Status Polling Count** allows you to specify the number of times the scheduler checks the status of a scheduled run for which the status cannot be determined.

  After this limit is reached, the run status is listed as **Unknown** on the Settings > Scheduled Tasks page. This can help administrators identify runs that are having problems.
Notifications are available for the IBM EMM Scheduler

Administrators and users who create schedules can now set up notifications, to monitor the status of scheduled runs. Notifications can be sent to the user's email or system in box.

Users with Administrator permissions in Marketing Platform can set up groups of users to whom schedule notifications are sent.

Support for clustering has been added

Marketing Platform, including the IBM EMM Scheduler, now supports clustering.

A new configuration property, Platform | Is this deployment clustered, has been added as part of this support. This property must be set to True for a clustered environment.

In this release, Marketing Platform is supported for a clustered environment, but eMessage is not supported.

In this release, clustering is supported only when Marketing Platform is deployed on WebSphere®. (RTC8834)

The configTool utility has a new option for manual upgrades

A new -vp command in the configTool utility has been introduced. It is used mainly in manual upgrades, to import configuration properties. If you applied a fix pack that contains a new configuration property, and you then upgrade, importing a configuration file as part of a manual upgrade process can override values that were set when the fix pack was applied. The -vp command ensures that the import does not override previously set configuration values.

When you use -d with the -vp command, the configTool deletes any child nodes in the path you specify if those nodes are not included in the XML file you specify.

See the IBM Marketing Platform Administrator’s Guide for complete details on the configTool utility.

Sorting performance has improved for alerts, notification, and scheduler pages

Server side sorting has been implemented for the column sort feature to improve performance on the alerts, notification, and scheduler pages. This is especially noticeable when you use the column sort feature on a large number of records.

Single sign-on is enabled with IBM SPSS® Modeler Advantage Enterprise Marketing Management Edition

If your organization uses IBM SPSS Modeler Advantage Enterprise Marketing Management Edition, you can enable single sign-on with IBM EMM. Single sign-on allows users to navigate to IBM SPSS Modeler Advantage Marketing Edition from within the IBM EMM user interface without being prompted to log in.

See the IBM Marketing Platform Administrator’s Guide for instructions on configuring single sign-on.
**IBM EMM installation and upgrade improvements**

The improvements to the installation and upgrade process include:

- Installation guides for all products have been rewritten and reorganized into separate installation and upgrade guides, to make information easier to find and use.
- The installers have been enhanced to include better descriptions of the information you need to enter and to clarify what steps to take during each stage of the installation.
- Each installer now provides links directly to the product’s installation and upgrade guides, in either PDF or HTML formats.

**Browser behavior in IBM EMM products**

IBM EMM products have certain browser restrictions and requirements.

**Supported browsers**

For a list of supported browsers, see the *IBM Enterprise Marketing Management Recommended Software Environments and Minimum System Requirements* for version 9.1.0.

**Pop-up blockers**

You must disable any pop-up blockers in your browser or browser add-ons, such as toolbars. Pop-up blockers prevent the flowchart window from opening.

**Navigation methods**

Do not use the browser controls to navigate. For example, avoid using the browser’s Back and Forward buttons. Instead, use the controls supplied in the IBM EMM user interface.

**Using multiple browser windows in Internet Explorer**

This restriction applies to using Internet Explorer (IE) with IBM Campaign or any module that uses Campaign flowcharts (eMessage, Contact Optimization, Interact, Distributed Marketing).

To log in multiple times to view side-by-side information, you must open IE and log in to IBM EMM. Then select File > New Session in the IE menu bar. In the new IE browser window, log in to IBM EMM as the same or a different user.

**Important:** Do not use any other method to open multiple sessions. For example, do not open a new tab; do not open another browser session from the Start menu or desktop icon; and do not use File > New Window in IE. These methods can corrupt information that is shown in the application.

For details, see the *IBM Campaign User’s Guide.*
Fixed defects

This section describes the fixed defects in the 9.1.1 version of Marketing Platform.

<table>
<thead>
<tr>
<th>RTC</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>66262</td>
<td>When you performed an operation that required a page refresh on the Schedule Definitions or the Scheduled Runs page, an error occurred if the session had timed out. This has been fixed. If the session times out, the user is returned to the login page.</td>
</tr>
<tr>
<td>107066</td>
<td>In previous versions of Marketing Platform, Thai and Chinese (Taiwan) were locale options, but these locales are not supported. These locales have been removed from the 9.1.0 version and subsequent versions of Marketing Platform. If a user was assigned this locale, an administrator must assign a new locale to that user.</td>
</tr>
</tbody>
</table>

Known issues

This section describes the known issues in the 9.1.1 version of Marketing Platform.

<p>| Location of installer logs is incorrectly displayed for AIX® | RTC 7408, RTC 178861 | The location of the installer logs stdout and stderr is incorrectly displayed in the installer wizards when the home directory of user is set to /, which is the case for the root user on AIX. It is not a requirement to run the IBM EMM installers as root. If you do run the installers as root on an AIX system, you can find the logs in the // directory. |
| In a clustered environment, manual LDAP synchronization fails if the active node goes down | RTC 23676, RTC 178856 | In a clustered installation, if you synchronize LDAP users manually, one of the nodes in the cluster connects with the LDAP server to perform the synchronization. If the node that is performing the synchronization goes down before the synchronization is completed, an error occurs, and you cannot restart the manual synchronization until the process times out. The default value for this timeout is set to 600 minutes in the Platform | Security | Login method details | LDAP synchronization | LDAP sync timeout configuration property. You can set this value to a lower number. |
| IBM SPSS Modeler Advantage Marketing Edition session persists across single sign-on users | RTC 67409 | If you access IBM SPSS Modeler Advantage Marketing Edition through Marketing Platform using an account enabled for single sign-on, and you close the IBM SPSS Modeler Advantage Marketing Edition browser window without logging out, any other users who log in from the same browser to IBM SPSS Modeler Advantage Marketing Edition using single sign-on are logged in with the first user’s session. If you share a computer and browser with another EMM user where both you and the other user access IBM SPSS Modeler Advantage Marketing Edition using single sign-on, you must log out of IBM SPSS Modeler Advantage Marketing Edition before you close any modeling stream window. This prevents anyone else who uses the same browser to access IBM SPSS Modeler Advantage Marketing Edition from using your IBM SPSS Modeler Advantage Marketing Edition credentials. |</p>
<table>
<thead>
<tr>
<th>Schedule fails when non-ASCII characters are used in scheduled objects</th>
<th>RTC 72022, DEF 063677</th>
<th>If you configure a scheduled run for a Campaign flowchart or other object that was created using non-ASCII characters (such as Chinese), the schedule fails.</th>
</tr>
</thead>
</table>
| When you install the report component, the Marketing Platform installer is sometimes unable to create some required directories on the Cognos® machine | RTC 72226, RTC 95402 | The account used to run the installer should have permissions to write in the following folders under the Cognos installation. *
- configuration *
- webapps\p2pd\WEB-INF\AAA\lib *
- templates\ps *
- webcontent\schemas *
- bin *

If the installation was run with an account that does not have these permissions, after installation, you can log in to the Cognos machine with an account that does have the required permissions, and then run the copyCognosFiles.bat script, which is located in the tools\cognos10 directory under the Marketing Platform installation. |
| Text in the Detail column on the Scheduled Runs page is not translated | RTC 73856 | On the Scheduled Runs page, the content in the Details column is not translated. |
| When you use the browser's Back button to navigate in IBM EMM products, the UI can be distorted | RTC 75262 | You should use links within the products to navigate in IBM EMM products, rather than the browser's Back button. |
| Marketing Platform upgrade from 8.5 to 9.1 completes with errors in the installation log | RTC 103371 | The upgrade from Marketing Platform version 8.5 to version 9.1.0 may complete with the following message in the installer log.

The DELETE statement conflicted with the REFERENCE constraint "FK_USM_RPM_ROLE". The conflict occurred in database database_name, table "dbo.USM_ROLE_PERMISSION_MAP", column 'ROLE_ID'.

If this error occurs after you have run the installers as described in the Marketing Platform 9.1.0 Installation Guide, perform the following step to resolve the issue.

Run the following SQL statement against your Marketing Platform system table database.

```
DELETE FROM USM_ROLE_PERMISSION_MAP
WHERE ROLE_ID IN (SELECT ID from USM_ROLE
WHERE APPLICATION=(SELECT APP_ID from USM_APPLICATION WHERE APP_ID=106));
DELETE FROM USM_ROLE WHERE APPLICATION = 106;
``` |
If you change the time zone in an existing reoccurring scheduled task, the CRON expression is not updated

RTC 121378

When you set up a recurring scheduled task in the IBM EMM Scheduler, the CRON expression for that task reflects the specified time relative to the time zone of the Marketing Platform server. If you later change the time zone setting on the scheduled task, the CRON expression does not adjust the time to reflect the specified time zone relative to the time zone of the Marketing Platform server.

For example, suppose EDT is the time zone of the Marketing Platform server. If you set up a recurring task to start on some date at 11:30:00 am in the EDT time zone, the CRON expression reflects an hour/minute/second of 11:30:00 am. If you set up a recurring task to start on some date at 11:30:00 am in the GMT time zone, the CRON expression reflects an hour/minute/second of 6:30:00 am because the Marketing Platform server timezone is EDT and GMT is 5 hours earlier than EDT.

Using the above example, if you modify an existing scheduled task specify a different time zone, the CRON expression defined for that task does not adjust to the new time zone. For example, if you change an existing task set up for 11:30:00 am on EDT to 11:30:00 am GMT, the task still shows a CRON expression of 11:30:00 am for hour/min/second, where it should show 6:30:00 am.

You can use either of the following workarounds to resolve this issue.

• Delete the existing recurring scheduled task and recreate a new one with the new time zone.
• When you update an existing recurring scheduled task that needs a time zone change, modify the time zone but then re-enter the recurrence pattern and save the task. This should update the CRON expression.

Users can not log out from Campaign or Marketing Platform pages

RTC 121489

When Campaign is installed with any other IBM EMM products, you can not log out from Campaign or Marketing Platform pages. The work around is to go to any product page other than Campaign or Marketing Platform pages, and log out from there.

Users with non-ASCII characters in their user name can not log in to IBM SPSS Modeler Advantage Marketing Edition using single sign-on

RTC 131626

There is no workaround for this issue at this time.

A javascript error may occur when you edit a scheduled task.

RTC 176909

When you edit a scheduled task on the Schedule Definitions page, a javascript error may be displayed in a popup window when you click Save Changes. This issue occurs only when the Display a notification about every script error option is set in Internet Explorer. Your changes are saved despite this error.
During the uninstall process, the installer does not perform data backup when the operating system uses the Japanese locale.

RTC 177516 When you choose to back up data during the uninstall process on a Japanese operating system, the backup fails with the following error message: The garbage characters are logged in `product_uninstall_stderr.log`.

The workaround is to perform a manual backup before starting the uninstall process.

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## Known limitations

This section describes the known limitations in the 9.1.1 version of Marketing Platform.

<table>
<thead>
<tr>
<th>Description</th>
<th>Code</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reports folder permissions are synchronized across partitions</td>
<td>DEF 045222</td>
<td>In a multi-partition environment, if you synchronize reports folder permissions in one partition, the folder permissions for other partitions are also added to that partition. The synchronization of folders that do not belong to the current partition does not cause any authorization problems.</td>
</tr>
<tr>
<td>Deleting an LDAP group mapping does not remove users from the mapped group</td>
<td>DEF 047290</td>
<td>When you delete an LDAP group mapping on the Configuration page, users that were imported into the mapped group are not removed from that group. You should remove the users from the group manually.</td>
</tr>
</tbody>
</table>
| Some Campaign configuration properties are incorrect after upgrade         | DEF 045746 | After you upgrade Campaign from version 7.x to 8.1.0, some configuration properties are incorrect.  
  - "Affinium" appears in some property display names. This naming inconsistency does not affect functionality.  
  - Under the Campaign category, the `unicaUdiSvr` category and its properties appear, although they are not used in Campaign 8.1.0.  

You can use the `configTool` utility to remove "Affinium" from display names or remove the `unicaUdiSvr` category. Here is an example of how you would do this:  
- Open a command window in the `tools/bin` directory under your Marketing Platform installation.  
- Use `configTool` to export all the Campaign properties to a file. The following example command exports the properties to a file named `campaignProperties.xml` in the `tools/bin` directory.  
  ```bash  
  configTool -x -p "Affinium|Campaign" -f campaignProperties.xml  
  ```  
  - Edit the exported file in a text or XML editor.  
  - Use `configTool` to import the revised file, using the overwrite option. For example:  
  ```bash  
  configTool -i -p "Affinium" -f campaignProperties.xml -o  
  ```
<p>| Partition memberships are lost during 7.2.x to 7.5.x upgrade | DEF046155, DEF046162 | If your version of Affinium Manager is earlier than 7.5.x, you must upgrade to 7.5.1 before you upgrade to Marketing Platform version 8.x. The upgrade scripts for Affinium Manager 7.5.1 do not automatically preserve partition membership. Instead, you must manually restore partition membership before you upgrade to Marketing Platform 8.x. This process is described in the Marketing Platform Installation Guide. |
| Active Directory users cannot log in to NetInsight or Customer Insight | DEF 046778 | When Marketing Platform is integrated with Active Directory, a user synchronized from Active Directory or an LDAP server cannot log in to Digital Analytics for On Premises or CustomerInsight. |
| Uninstalling an IBM EMM application does not remove its menu items | DEF047048 | If you uninstall an IBM EMM application, the menu items for that application remain on the Configuration page. You can remove them by going to the Configuration page, locating the appropriate menu settings under the Platform | Platform-wide navigation category, and clicking Delete category. |
| An error occurs when you cancel a report run | DEF047550 | When you cancel a running report and then try to run another report, an error message is displayed. You should select the Analytics menu and run the report again. |
| Uninformative error message appears when you enter a role name that exceeds length limit | DEF047639 | When you enter a role name longer than 120 characters (the length limit), the error that appears reads &quot;Error 500-Internal Server Error.&quot; The message should indicate the length limit. |
| Logout link is redundant with Windows integrated login | DEF047870 | When Marketing Platform is integrated with Windows Active Directory and Windows integrated login is enabled, you can not log out using the Log Out link. When you click Log Out, your browser session ends and it appears that you are logged out of IBM EMM, but then you are automatically logged in again. You should close your browser when you log out of IBM EMM. |
| When you use Edit Preferences to set a Start page, you cannot use an IBM EMM URL | DEF050523 | If you set a Start page for a user using the Edit Preferences page for that user, you should not use the initial IBM EMM login URL (<a href="http://host:port/unica">http://host:port/unica</a>), or you will encounter problems. |
| Non-ASCII characters not allowed in throttling group names | DEF050689 | When you create a throttling group for the scheduler, an error message appears if you use non-ASCII characters. Use only ASCII characters in throttling group names. |</p>
<table>
<thead>
<tr>
<th><strong>Errors occur during upgrade from 7.5.x to 8.x</strong></th>
<th>DEF050735</th>
</tr>
</thead>
<tbody>
<tr>
<td>When you upgrade from Affinium Manager 7.5.x to Marketing Platform 8.x, the data source keys stored in your existing Manager system tables must be un-encrypted and then re-encrypted to be stored in the database for 8.x.</td>
<td></td>
</tr>
<tr>
<td>If you have changed your keystore password in 7.5.x using (encryptPasswords -k), and if Platform is not installed on AIX, you can use the following procedure to correct the problem.</td>
<td></td>
</tr>
<tr>
<td>Note that this workaround does not apply when the Platform is installed on AIX. In that case, you must log in to IBM EMM and change data source passwords manually.</td>
<td></td>
</tr>
<tr>
<td>This procedure ensures that you have the latest Java™ Cryptography Extension (JCE) Unlimited Strength Jurisdiction Policy Files 5.0.</td>
<td></td>
</tr>
<tr>
<td>Download these files here: <a href="http://java.sun.com/javase/downloads/index_jdk5.jsp">http://java.sun.com/javase/downloads/index_jdk5.jsp</a></td>
<td></td>
</tr>
<tr>
<td>Scroll to Java Cryptography Extension (JCE) Unlimited Strength Jurisdiction Policy Files 5.0 and do the following.</td>
<td></td>
</tr>
<tr>
<td>1. Ensure that the JRE in your Manager 7.5.x installation has the updated JCE Unlimited Strength Jurisdiction files. Follow instructions in the download to copy the local_policy.jar and US_export_policy.jar to the jre/lib/security directory.</td>
<td></td>
</tr>
<tr>
<td>2. Use encryptPasswords -k to encrypt your keystore password again.</td>
<td></td>
</tr>
<tr>
<td>3. If you are NOT using the JRE provided in the Platform installer, also update the JCE Unlimited Strength Jurisdiction files for the JRE you intend to use.</td>
<td></td>
</tr>
<tr>
<td>4. Run the Platform installer and your keys will be migrated to 8.x.</td>
<td></td>
</tr>
<tr>
<td>If the JCE updates are not made, or if you were unable to use the workaround because your Platform system table database is AIX, you may see these errors:</td>
<td></td>
</tr>
<tr>
<td>Cannot retrieve the key from the file [{INSTALL_DIR}\Affinium\Manager\conf\kfile], cause: Illegal key size</td>
<td></td>
</tr>
<tr>
<td>javax.crypto.BadPaddingException: pad block corrupted</td>
<td></td>
</tr>
<tr>
<td>If these errors occur, log in to IBM EMM and change data source passwords manually.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>User names cannot contain spaces or punctuation characters</strong></th>
<th>DEF051877</th>
</tr>
</thead>
<tbody>
<tr>
<td>If a user’s login name contains a space or punctuation character, a JavaScript error appears on every page, although the user can navigate and use IBM EMM normally. Do not include spaces or punctuation characters in login names of user accounts.</td>
<td></td>
</tr>
</tbody>
</table>
Non-ASCII characters are not supported for group, role, and policy names

| DEF051431 | If you attempt to use non-ASCII characters in group, role, or policy name, you see the following error message: Please use only alphanumeric characters. You should not use non-ASCII characters in these names. |
|-----------------------------------------------|

Duplicate role names are not allowed

| DEF051895 | In Affinium Manager 7.5.x, duplicate role names were allowed. Starting with Marketing Platform 8.0.0, duplicate role names are not allowed. If you upgrade from 7.x to 8.x, and you have multiple roles with the same name, you should rename roles so that no duplicates exist before you upgrade. |
|-----------------------------------------------|

Installer message for directory to upgrade Platform 7.5.x is confusing

| DEF051952 | When you upgrade Marketing Platform 7.5.x to 8.1.0, the installer prompts you to specify the directory where the 7.5.x version is installed. If the installer cannot find the installation registry in that directory, it displays the following message: Manager upgrade directory specified [directory] was not found by the installer. If you see this message during upgrade, you should verify that the specified directory is the correct one, and then proceed with the upgrade. |
|-----------------------------------------------|

## Issues related to third-party software

This section describes the issues in the 9.1.1 version of Marketing Platform that are related to third-party software.

**The uninstall process does not remove all of the directories created by the installer**

| RTC 8616, RTC 64640 | The Marketing Platform un-installation process should remove all the directories created by the Marketing Platform installer. A fix has been requested from InstallAnywhere. |
|-----------------------------------------------|

**You can not schedule an IBM EMM Scheduler task with an interval greater than 60 minutes**

| RTC 130030 | With CRON expressions, it is not possible to construct intervals longer than 59 minutes, because 60 minutes would change the hour. Similarly, it is not possible to specify 70 minutes, or 74 minutes for recurring tasks. The workaround is to specify two schedules for the same object, with staggered start times.  
For example, suppose you want to specify a 90 minute interval between runs of a flowchart. You could set up two recurring schedules as follows.  
• Schedule A  
  – Start time: 7 am  
  – Interval: 3 hours  
  This schedule causes the flowchart to run at 7 am, 10 am, and so on.  
• Schedule B  
  – Start time: 8:30 am  
  – Interval: 3 hours  
  This schedule causes the flowchart to run at 8:30 am, 11:30 am, and so on. |
|-----------------------------------------------|
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