Application configuration

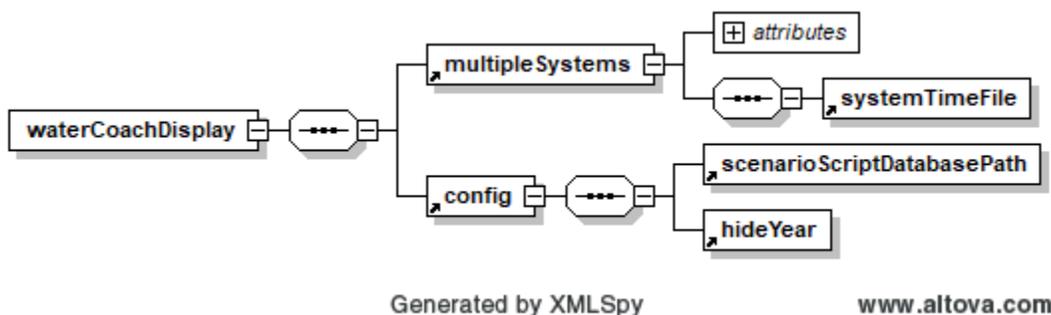## WaterCoach Display configuration

What	waterCoachDisplay.xml
Description	Configuration of the WaterCoach Display Some changes to the Delft-FEWS configuration are required.
schema location	http://fews.wldelft.nl/schemas/version1.0/waterCoachDisplay.xsd

WaterCoach Display configuration

The WaterCoach Display configuration for the embedded WaterCoach replaces the application configuration of the Stand Alone WaterCoach configuration. In it, global settings for the WaterCoach can be specified, which are valid for all scenarios/scripts. This display is part of the is part of the Delft-FEWS configuration , and as such needs to be declared in the Delft-FEWS configuration.

Schema definition

The structure of the XML-schema for the WaterCoach Display configuration is as shown on the right. To connect multiple applications for a combined training in WaterCoach the multipleSystems element (see below) has to be configured in the waterCoachDisplay before config (see on the right). An XML-schema for the waterCoachDisplay and multipleSystems is shown below.

Generated by XMLSpy   www.altova.com

Explanation

The waterCoachDisplay XML schema is divided into two parts. The multipleSystems element and the config element. The keys for both elements are explained below.

multipleSystems

- Multiple applications can be connected with each other in WaterCoach by enabling the `multipleSystems` attribute.
- When enabled, you need to is possible to specify a path and file name for the `systemTimeFile`. This is a NetCDF file containing the in-training time in milliseconds since 1 Jan 1977, that will be written by the leader and read by the follower(s). There is no difference in the configuration between the leader and follower applications, which is which is determined by the user at start-up (see User Guide).

See for more details on multiple systems below.

config

The keys in the XML-schema are explained in the figure on the right. Some of the keys are explained in more detail here.

- Scenarios/scripts that can be played with the WaterCoach must be part of a scenario/script database. The key `scenarioScriptDatabasePath` contains the (absolute or relative) path to the scenario/script database.
- Historical scenarios/scripts may be familiar to players of the game. Therefore it is possible to hide the year of the scenario/script in the WaterCoach by setting the flag `hideYear` to true. Note that for the WaterCoach a copy of the operational system should be used since some changes in the FEWS configuration are required; see below. A better option for misleading players is to overrule the date/time of the historical scenario by explicitly setting the in-game time in the script configuration.
- Events in a script can be associated with a file that is executed during the game. For example, a pdf-file can be associated with an event to simulate an incoming e-mail or an mp3-file to simulate telephone calls. Using the key `fileAssociation`, programs can be specified with which files with indicated extensions must be processed. Default file associations are used if nothing is specified here.
- In the section `timeControl`, the presence of buttons for time control during the game can be configured, namely a `pause/play` button, a `next` button for jumping to the next scheduled event in the script, `fast Forward/Backward` buttons for speeding up/down time, and a `set` button for adjusting the time manually.
- Section `experienceLevel` contains configuration of experience levels in the game. With the key `levels`, the actual experience levels are defined, separated by semi-colons, e.g. "Beginner;Intermediate;Expert". In the script configuration, events can be defined for each of these experience levels. The flag `adjustLevel` indicates that the experience level can be adjusted during the game.
- The key `fewsLogEventCodes` accepts a list (separated by semi-colons) of event codes from FEWS that have to be logged in the WaterCoach log, e.g. "Info;ManualForecast.started".
- The WaterCoach can be played combined with the so-called "procedure game", developed for the Dutch Water Service (Waterdienst). In such a combined setting, the hostname and the port number for connecting to the combined game must be specified in `serverHostName` and `serverPort`, respectively. Furthermore, forecasts must be published to a file in so-called PI-format. This can be accomplished by setting the key `writePiOutput` to true (defaults to false).
- `showVisualizeScriptButton` is deprecated.
- The option `copyLocalDataStore` has been added to aid the script configurator. If you are working on the script for one scenario, you can turn of the copying of the localDataStore at the start-up of the WaterCoach by temporarily setting this keyword to false. Note: this option has no effect in an application that is configured as participant.
- Some default values can be entered (useful when developing a game): defaultUserName, defaultScenario and defaultScript.
- log4jConfigPath and logPath are deprecated.

- The keyword scriptLogPath can be set to overrule the default locations of the watercoach log file. In this file, all actions within the WaterCoach display are logged, and thus can be used for after action review or feedback.
- Keyword displayConfirm controls the presence of "Are you sure?" confirmation buttons.
- Keyword clientConfigExportURL defines whereto the clientConfig.xml is exported to. This can be used when the WaterCoach is used in Participant mode. The Master application can export the clientConfig.xml to this location. This file can be used by the Participant applications(s) to connect to the Master localDataStore.
- The keyword participant is deprecated. See below on how to activate participant mode.

Meta-application, or combining multiple Scenario Script Databases (SSD)

You can combine multiple SSD for a single WaterCoach application, see for more information Scenario and Script database (SSD) #SSDfolderstructurefordifferent(older)versionsofaDelft-FEWSapplication(akaWaterCoachmeta-application)

fews:WaterCoachDisplayComplexType

fews:configType

fews:scenarioScriptDatabasePath

Path (absolute or relative) to scenario/script database.

fews:hideYear

Flag indicating whether the year must be hidden.

fews:fileAssociation ⊞

0..∞

Path (absolute or relative) to application used for opening file with indicated extension.

fews:timeControl ⊞

Specify which buttons for time control must be available for the user.

fews:experienceLevel ⊞

Specify experience levels separated by semi-colon (;).

fews:fewsLogEventCodes

List of event codes, separated by semi-colon (;), transferred from FEWS log to Water Coach log.

fews:serverHostName

Host name of game engine (n/a for stand-alone game).

fews:serverPort

Port number of game engine (n/a for stand-alone game).

fews:writePiOutput

Option whether to write output in PI format (default: false).

fews:showVisualizeScriptButton

Option whether to show Visualize Script button (default: true).

waterCoachDisplay

fews:config

1..∞

fews:participant

Option whether to play the game stand-alone or in participant mode. (default: false)

fews:copyLocalDataStore

Developer option whether to copy the local datastore or not. (default: true)

fews:defaultUserName

User name that is automatically put into the user name field in the start-up screen.

fews:defaultScenario

Scenario name that is automatically put into the scenario drop down box in the start-up screen.

fews:defaultScript

Script name that is automatically put into the script drop down box in the start-up screen.

fews:log4jConfigPath

Path to the log4j config xml file. Default value is log4jConfig.xml in the current working directory.

fews:logPath

Path to the file that should contain the log4j output. Default value is log.txt in the current working directory.

fews:scriptLogPath

Path to the directory that should contain the script log output. Default value is "scenarioScriptDatabasePath /log/".

fews:displayConfirm

Indicates whether "Are you sure?" confirmation messages should be displayed or not (defaults to yes).

Delft-FEWS configuration

It is advisable to use a Stand Alone application for the WaterCoach, to prevent any possible obstructions to operational activities. Also, some minor changes are needed in the FEWS configuration in order to use it with the WaterCoach. These changes can be made to the live system as well, without much consequences.
Note: for a more detailed description of the FEWS configuration files, please refer to the wiki pages of the [Delft FEWS Configuration Guide](#) .

1. FEWS configuration file `Explorer.xml` in the directory `SystemConfigFiles`
    a. the `dateTime` section
        i. In order to hide the year within FEWS, the `dateTimeFormat` must be configured accordingly.
        ii. The element `adjustSystemTimeAutomatically` should be set to 'true' (default for a Stand Alone is false), otherwise it will not be possible for the WaterCoach to alter the systemTime during the game. (Also make sure that you don't have a T0 configured in the global.properties file).
    b. To have a [pop-up](#) appear with new messages, `vjdbcServicePortRange` needs to be configured in `Explorer.xml`. This same service is also required for the [participant mode](#), and should only be configured for a Stand Alone or a Master application. Note: by specifying this range the vjdbc service is started. This part of the configuration can be kept the same in the live system, but be aware that this means that this service will be started in the live system as well.

```
<vjdbcServicePortRange start="40402" end="40402"/>
```

    c. Note: this change is no longer required with the embedded WaterCoach: The port number `fewsPiPortNumber` for the FEWS PI service has to be in the range of port numbers that must be specified in `Explorer.xml` . Note: by specifying this range the PI service is started. This part of the configuration can be kept the same in the live system, but be aware that this means that the PI service will be started in the live system as well.

```
        <piServicePortRange start="50505" end="50505"/>
```

2. Note: with some configurations at the start-up of fews via the WaterCoach, the error message 'Fault occurred' may occur. This message can be ignored.
3. Changes to the global.properties
   a. add key WATERCOACH_SCENARIO_DATABASE_PATH=%REGION_HOME%/WaterCoach
      Note, this is optional, you could also define this location directly in waterCoachDisplay.xml
   b. configure localDatastoreFormat=firebird, since the default 2016.01 database is Dirby

   > ⓘ   Note: the shared database approach for the participant mode is only supported for Firebird at the moment

4. Create <My_WaterCoachDisplay>.xml in <root_folder>\Config\DisplayConfigFiles\, see configuration example
   If you have an existing application_config.xml, make the following changes:
   a. move file to <root_folder>\Config\DisplayConfigFiles\ and rename if you like
   b. replace root element `config` with root element `waterCoachDisplay`
   c. add element `config`
   d. remove elements
      i. `locale`,
      ii. `fewsExecutable`,
      iii. `fewsRegionDir`,
      iv. fewsPiPortNumber
   e. move element `hideYear` under the element `scenarioScriptDatabasePath`
   f. use key from global.properties to configure `scenarioScriptDatabasePath`
   g. add element `/waterCoachDisplay` to the end of the file
5. FEWS configuration file `Explorer.xml` in the directory `SystemConfigFiles`
   a. Add WaterCoach plugin to Explorer.xml, see the configuration example (Only for the embedded WaterCoach, Delft-FEWS 2016.01 and up).

   > ⓘ   **loadAtStartup with embedded WaterCoach (Delft-FEWS 2016.01 and up)**
   >
   > Note: with the embedded WaterCoach (Delft-FEWS 2016.01 and up), it is recommended to use the option loadAtStartup in Explorer.xml set to true, when the script_config.xml makes use of the option dataStart . This is because to be able to change the time in the GUI Delft-FEWS needs to restart. After the restart, only those tasks in Explorer.xml with loadAtStartup=true are started. If this option is set to false for the WaterCoachDisplay, the user will have to manually restart the display, just after she started the WaterCoach mode the first time, which can be confusing.

6. Optional: Modifiy Delft-Fews layout to start with WaterCoach plugin in the front

   a. Make sure you have configured the WaterCoach plugin in Explorer.xml to `loadAtStartup` is true (see previous step)
   b. Start Delft-FEWS
   c. Bring WaterCoach plugin window to the front and
   d. select menu -> File -> Save Layout
7. Managing of the logging from WaterCoach

   a. User category name `nl.wldelft.fews.gui.plugin.watercoach` in Log4jConfig.xml to enter specific rules for logging from WaterCoach.
      See configuration example , in which all debug messages in WaterCoach are suppressed.
8. Disable view permissions (optional). Useful in case the WaterCoach application can be accessed on home computers, or other locations where you don't know the user name people will use.
   a. Remove (or rename) the files UserGroups.xml and Permissions.xml
      This will result in warning messages for every viewPermission that has been configured, but will give any user full viewing permissions.
      See also 07 Permissions

Delay visibility of forecasts

When Fews is used in combination with the WaterCoach, automatically forecast made in "the future" are invisible, both in the displays as in the forecast manager. Forecasts that where current in the past at the system time are made current again.

In practice, forecasts often come available with a certain delay. To take this into account, a delay can be specified.

- Simulated forecasts are linked to a workflow, which can be delayed in the WorkflowDescriptors xml file.

```
        <workflowDescriptor id="exampleWorkFlow" visible="true" forecast="true">
                <waterCoachDelay unit="hour" multiplier="4"/>
        </workflowDescriptor>
```

- External forecasts can have a delay configured for each seperate moduleInstance in the ModuleInstanceDescriptors xml file.

```
    <moduleInstanceDescriptor id="ImportECMWF">
        <waterCoachExternalForecastDelay unit="hour" multiplier="6"/>
    </moduleInstanceDescriptor>
```

Show specific external historical timeseries in the future (e.g. astronomical tide forecast or climatological data)

Astronomical tide is often imported once a year into the system as an external historical, even though it's in fact a forecast. Default the WaterCoach mode won't show future values of external historical timeseries. To be able to show the tide "forecast", an exception has been made for external historical timeseries with synchlevel=4. This same synchlevel also for proper synchronisation of this data to the OC in a live system (see B Enumerations#A. 5SynchronisationLevels). Note that the synchLevel=4 should explicitly be specified also in the display configuration files (e.g. Filter.xml, etc) in order for the future values of the timeseries to be visible in WaterCoach.

Participant mode

> ⓘ **Note on shared database approach**
>
> The shared database approach for the participant mode is only supported for Firebird at the moment

The WaterCoach can be used in the so called participant mode. This is used with a single Delft-FEWS application, when multiple "operator clients" need to work together. This mode is an approximation of the live operational system, in which multiple operators can work in their own OC and in that way share the workload. In participant mode there is one "master" WaterCoach session, which controls the LocalDataStore as used by Delft-FEWS. The other students start up the WaterCoach and make a connection to this same LocalDataStore. For this the shared LocalDataStore should be available to all students (e.g. network, citrix, internet). Also, some actions are necessary:

- Master WaterCoach:
    - The vjdbcServicePortRange is configured in SystemConfigFiles/Explorer.xml to a specific port, e.g.: <vjdbcServicePortRange start=" 40402" end="40402"/>, (01 FEWS Explorer).
        - Note: this addition should be **only** made in the master WaterCoach configuration, and should not be included in the configuration of the participant WaterCoach sessions.
    - Needs access to the ScenarioScriptDatabase (SSD), to load the scenario as well as the script.
- Particpant WaterCoach(es):
    - Should link to the embeded vjdbc server run by the Master. This is configured in the clientConfig.xml of the Delft-FEWS application, see configuration example.
        - If the url can not be pre-configured (e.g. in a VM environment), you can generate this file from the Master application at the start of the exercise and export it to a location (see WaterCoachDisplay.xml), where it can be picked up for use in the Participant applications.
    - Should **not** have the vdjbc server configured in the Explorer.xml
    - Also need access to the ScenarioScriptDatabase (SSD), to make use of the script and to generate messages. If the SSD is not available, the WaterCoach Display will no start up properly.

Multiple system mode

It is possible to connect two or more Delft-FEWS applications for a combined training with WaterCoach with the `multipleSystems` option. This functionality allows to reproduce the behaviour of operational systems that share data with each other. This mode is enabled in the WaterCoach application (see below). The combining of multiple systems is is different from participant mode in that we now connect different Delft-FEWS applications in a single combined WaterCoach training. Within each Delft-FEWS application, you can also make use of the "participant mode", allowing multiple operators working on the same system at the same time.

The connection of multiple systems allows for:

- Time synchronisation: The "leader" system writes the `systemTimeFile`, the following system(s) read the `systemTimeFile` and change their system time accordingly. The applications will then by synchronized via the system time. See config example below.
- Data sharing: Create export and import workflows for data that is shared between the systems in normal operations. This will work even if the underlying Scenarios of the different systems have different dataStart, since the data is shared based on the synchronised (in-training) systemTime related to displayStart. The data is shared through files on a folder all applications have access to. Schedule these workflows to run automatically in the script (see Script configuration (scheduling workflows)).

For leader and followers the following should be configured in the `WaterCoachDisplay.xml` (see config example below):

- Enable the `multipleSystems` functionality in the Application configuaration file, see example config below.
- In this example the path and file name for the `systemTimeFile` is specified with the property WATERCOACH_SYSTEM_TIME_PATH, which in turn is defined in the rootConfigFile global.properties, eg as D:\WaterCoach\TimeKeeping\time.nc. This path and file name is the location where the NetCDF `systemTimeFile` will be written and read. Note, it is important that both the leader and follower of the WaterCoach session have access and read and write permissions for this path.
- When the application is configured correctly a new element will appear in the docked window of WaterCoach called "Multiple systems mode is active" with a check box to identify the application as a follower that will "Synchronize time with training lead" (see User Guide).

Note: If data created or modified during the training needs to be shared between the Delft-FEWS applications, check out the topic on scheduled workflows at Script configuration

Examples

Example of clientConfig configuration (Participant)

```
<clientConfiguration xmlns="http://www.wldelft.nl/fews" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.wldelft.nl/fews http://fews.wldelft.nl/schemas/version1.0/clientConfig.xsd">
    <databaseServer>
    <url>jdbc:vjdbc:rmi://<host>:<port>/VJdbc,FewsDatabase</url>
<!-- replace <host> with the correct host (e.g. localhost if both applications are run on the same pc, the Ip
address of the pc, or a network location) -->
<!-- replace <port> according to the port configuration in Explorer.xml in the Master FEWS configurations (e.g.
40404 according to the example on this wiki) -->
    </databaseServer>
    <localCacheSizeMB>500</localCacheSizeMB>
</clientConfiguration>
```

Example of application configuration (Stand Alone WaterCoach)

```
   <config xmlns="http://www.wldelft.nl/fews" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:
schemaLocation="http://www.wldelft.nl/fews http://fews.wldelft.nl/schemas/version1.0/application_config.xsd">
      <name>Example of application configuration</name>
      <locale>EN</locale>
      <hideYear>false</hideYear>
      <fewsExecutable>..\FEWS_WaterCoach\bin\Fews_WC.exe</fewsExecutable>
      <fewsRegionDir>..\FEWS_WaterCoach\Fews_WC</fewsRegionDir>
      <scenarioScriptDatabasePath>ScenarioScriptDatabase\Fews_WC</scenarioScriptDatabasePath>
      <fileAssociation extension="pdf">C:\Program Files\Adobe\Reader 9.0\Reader\AcroRd32.exe</fileAssociation>
      <fileAssociation extension="jpg">C:\WINDOWS\system32\mspaint.exe</fileAssociation>
      <timeControl>
         <pause>true</pause>
         <next>false</next>
         <set>false</set>
         <fastForwardBackward>true</fastForwardBackward>
      </timeControl>
      <experienceLevel>
         <levels>Beginner;Expert</levels>
         <adjustLevel>false</adjustLevel>
      </experienceLevel>
      <fewsPiPortNumber>50505</fewsPiPortNumber>
      <showVisualizeScriptButton>true</showVisualizeScriptButton>
      <! participant keyword is deprecated since 2016.01. This has to be configured in the clientConfig file. !>
          <participant>false</participant>
      <!-- option for developer, useful when you are working on the same scenario -->
      <copyLocalDataStore>false</copyLocalDataStore>
   </config>
```

Example of waterCoachDisplay configuration (multipleSystems)

```
<waterCoachDisplay>
 <multipleSystems enabled="true">
            <systemTimeFile>$WATERCOACH_SYSTEM_TIME_PATH$</systemTimeFile>
        </multipleSystems>
        <config>
                ...
        </config>
</waterCoachDisplay>
```

Example of meta-application configuration

```
   <configList xmlns="http://www.wldelft.nl/fews" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:
schemaLocation="http://www.wldelft.nl/fews http://fews.wldelft.nl/watercoachschemas/version1.0
/application_config.xsd">
      <configPath>C:\path\to\application\configuration\application_configuration.xml</configPath>
      <configPath>C:\some\other\path\to\application\configuration\application_configuration.xml</configPath>
   </configList>
```

Example of display configuration (Embedded WaterCoach, 2016.01 and up)

```
   <waterCoachDisplay xmlns="http://www.wldelft.nl/fews" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.wldelft.nl/fews http://fews.wldelft.nl/schemas/version1.0/waterCoachDisplay.xsd">
<config>
      <scenarioScriptDatabasePath>ScenarioScriptDatabase\Fews_WC</scenarioScriptDatabasePath>
      <hideYear>false</hideYear>
      <fileAssociation extension="pdf">C:\Program Files\Adobe\Reader 9.0\Reader\AcroRd32.exe</fileAssociation>
      <fileAssociation extension="jpg">C:\WINDOWS\system32\mspaint.exe</fileAssociation>
      <timeControl>
         <pause>true</pause>
         <next>false</next>
         <set>false</set>
         <fastForwardBackward>true</fastForwardBackward>
      </timeControl>
      <experienceLevel>
         <levels>Beginner;Expert</levels>
         <adjustLevel>false</adjustLevel>
      </experienceLevel>
          <fewsLogEventCodes>*</fewsLogEventCodes>
          <!-- option for developer, useful when you are working on the same scenario -->
      <copyLocalDataStore>false</copyLocalDataStore>
      <defaultUserName>defaultUserName</defaultUserName>
      <defaultScenario>defaultScenario</defaultScenario>
      <defaultScript>defaultScript</defaultScript>
      <scriptLogPath>%REGION_HOME%/WaterCoach_log</scriptLogPath>
      <displayConfirm>false</displayConfirm>
</config>
</waterCoachDisplay>
```

Example of WaterCoach plugin configuration in Explorer.xml (Embedded WaterCoach, 2016.01 and up)

```
  <explorerTask name="WaterCoach">
    <displayConfigFileName>My_WC_Display_Config_File</displayConfigFileName>
    <toolbarTask>false</toolbarTask>
    <menubarTask>false</menubarTask>
    <allowMultipleInstances>false</allowMultipleInstances>
    <toolWindow>true</toolWindow>
    <loadAtStartup>true</loadAtStartup> <!-- select true if configuration will only be used in WaterCoach mode
__>
                                                                  <!-- and/or dataStart is used
in script_config.xml -->
</explorerTask>
```

Example of logging configuration for category nl.wldelft.fews.gui.plugin.watercoach (Embedded WaterCoach, 2016.01 and up)

```
 <category name="nl.wldelft.fews.gui.plugin.watercoach" additivity="false">
               <priority value="INFO"/> <!--If another level is used, the WC script messages won't become
visible in Delft-FEWS-->
                               <appender-ref ref="dataStoreLogEntriesTable"/>
               <appender-ref ref="defaultLogFile"/>
```

```
                <appender-ref ref="explorerLogPanel"/>
    </category>
```

Example of display configuration with multipleSystems (Embedded WaterCoach, 2016.01 and up)

```
<waterCoachDisplay xmlns="http://www.wldelft.nl/fews" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:
schemaLocation="http://www.wldelft.nl/fews http://fews.wldelft.nl/schemas/version1.0/waterCoachDisplay.xsd">
        <multipleSystems enabled="true">
            <systemTimeFile>$WATERCOACH_SYSTEM_TIME_PATH$</systemTimeFile>
        </multipleSystems>
        <config>
                <scenarioScriptDatabasePath>$WATERCOACH_SCENARIO_DATABASE_PATH$</scenarioScriptDatabasePath>
                <hideYear>false</hideYear>
                <timeControl>
                        <pause>true</pause>
                        <next>true</next>
                        <set>true</set>
                        <fastForwardBackward>true</fastForwardBackward>
                </timeControl>
                <experienceLevel>
                        <levels>Beginner;Intermediate;Expert</levels>
                        <adjustLevel>false</adjustLevel>
                </experienceLevel>
                <fewsLogEventCodes>Manual.*</fewsLogEventCodes>
                <!-- option for developer, useful when you are working on the same scenario -->
                <copyLocalDataStore>true</copyLocalDataStore>
                <defaultUserName>defaultUserName</defaultUserName>
                <scriptLogPath>%REGION_HOME%/WaterCoachLog/</scriptLogPath>
                <displayConfirm>false</displayConfirm>
        </config>
</waterCoachDisplay>
```