FrontFace Plugin

Event Source Plugin

Calendar Trigger

The digital signage & kiosk software **FrontFace** can be extended by plugins that add additional functionality. This way you can e.g., display special content types, integrate external data sources or systems, and add entirely new features to the software.

Description:

The Event Source Plugin *"Calendar Trigger"* allows you to start playlists by calendar-based appointments. The data for the plugin can be provided by one of the following data source types:

- **Excel file** (version 2007 or higher)
- **Exchange calendar** (via EWS = Exchange Web Services)
- **Office 365 / Exchange Online** (via Microsoft Graph API)
- **Lotus Notes database** (via Lotus Domino server using Domino XML - DXL)
- **iCalendar / ICS format** (e.g., from Google Calendar)
- **SharePoint** (On Premises or Share Point Online / Office 365)

The *FrontFace Player Application* automatically starts a playlist once an appointment (e.g., created with Outlook, Lotus Notes, Google Calendar, SharePoint or Excel) becomes due. Furthermore, you can also assign placeholder texts with an appointment which allows to easily implement a personalized welcome board for visitors of an organization.

Notice: This plugin is NOT for displaying appointments from an external calendar! If you want to display appointments in a table form, please use the content plugin „Calendar" which is available separately.

Installation:

Please refer to the user manual of *FrontFace* on detailed information on how to install a plugin in *FrontFace*.

> **Notice:** If you have previously downloaded and installed the trial version of the Calendar Trigger Plugin, you must install the full version over the existing trial version in order to get the full version running. The procedure is exactly the same as for installing a new plugin. If you already used the trial version of the plugin in your project, all settings will remain after installing the full version!

> **Update from a previous version:** If you are using a previous version of the Calendar Trigger plugin, you can simply install the new version "over" the existing version in your project. Please

> note, however, that all settings for the plugin will be lost. You will have to redefine the settings (data source, etc.) after installing the new version!

Setup and Usage:

After you have installed the plugin in your project, you must add a new event source of the type *"Calendar Trigger"* in the *FrontFace Assistant* under *"Scheduling"* to the list of *"Event Sources"* (the *"Advanced Scheduling"* must be activated!). After adding the event source, select the **playlist** that is supposed to be started by a calendar event.

Then, you must select the desired data source where the calendar data is obtained from. You can also define how often the data source should be queried and checked for changes.

In addition to that, you can also define a so-called pre-run time in minutes. For example, if you have set a pre-run time of 15 minutes, an appointment triggers the start of your playlist 15 minutes before the actual start time of the appointment. This can be helpful e.g., when implementing a reception screen.

The display duration of the playlist can be set as well: On the one hand, the original duration of the respective appointment can be used, or a fixed duration for all events may be used. Alternatively, you can also define a post-run time. In the case, the specified duration in minutes is added to the end time of the appointment. The value can be positive or negative but must not reduce the duration of the appointment to less than 1 minute (if a negative value is specified).

For configuration details on the specific data sources, please see below:

► *Excel File*

In case of using an Excel file, it is recommended to provide the UNC file name (e.g., `"\\SOMESEREVER\folder\my-excel-file.xlsx"`) so that both the player PC as well as your local PC can access the file on the same location with the same (!) name. With the Android version of *FrontFace*, the path to the file cannot be specified as a UNC path! Alternatively, you can also specify an HTTP(S) URL or refer to the "\Media\Static\" directory of your *FrontFace* project using the placeholder `${F_STATIC}` if you transfer the Excel file to the player when you publish it want.

The Excel file must contain a worksheet in which you enter the appointments line by line, whereby the first line contains the column headings and is ignored on parsing. In addition to the index of the worksheet within the workbook, you must assign the respective column numbers in the settings dialog of the Calendar Plugin for each field (subject, location, start time, end time, etc.) so that the appointments can be read correctly from the Excel file.

You must make sure that all date-related fields are formatted as "Date" while all time-related fields are formatted as "Time"; otherwise, the plugin is not able to parse the data correctly.

You can design the Excel file freely according to the above specifications, but there is also a ready-to-use sample file that you can access from the plugin's settings dialog by clicking on the **"Other Files"** link.

The update interval is used to determine how often the file should be queried for changes. This setting only affects the plugin "Calendar" (not the plugin "Calendar Trigger") and is only relevant if you display the calendar for longer period of time or even permanently on the screen. Otherwise, a refresh always takes place automatically as soon as the Calendar Plugin is displayed on the screen.

► *Exchange Calendar (via EWS)*

Please make sure that *EWS (Exchange Web Services)* is enabled on your Exchange server since it serves as interface for the plugin.

> **Notice:** The **EWS (Exchange Web Services)** should *__not__* be confused with the **OWA (Outlook Web Access)**. You must enter the URL of your EWS here!

Please enter login, password, and domain (optional) for the Exchange user in the plugin's settings dialog. If you leave the credentials empty, the default credentials of the currently signed-in Windows account will be used (only supported for on-premises Exchange

servers). In case your server does not support "autodiscover", please also enter the full URL to the EWS (Exchange Web Services) end point.

You will also have to specify the Exchange server version you are using (e.g. "Exchange Server 2013").

If you are using Exchange Server 2013 or older and experience a problem retrieving appointments, please activate (but only in this case) the checkbox "Use compatibility mode".

• **Calendar in the user's mailbox:**

By default, the main calendar of the user whose credentials you entered will be queried.

In order to use a different calendar from the user's mailbox, please enter the path to the calendar. E.g., if the calendar you want to display is located in Outlook under "**My Caldendars\My Cool Calendar**", you have to enter:

> **My Calendars\My Cool Calendar**
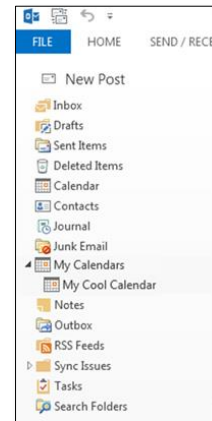
• **Calendar in a Public Folder:**

In order to access a calendar that is stored in a *public folder*, you have to enter the path to the calendar with the **$PublicFoldersRoot** prefix. E.g. if the calendar you want to display is located in Outlook under "**All Public Folders\My Public Folder\My Cool Calendar**" you have to enter this path:

> **$PublicFoldersRoot\My Public Folder\My Cool Calendar**

• **Calendar from a Resource:**

To directly access a "resource" (e.g., the calendar of a room) which is not implemented as *public folder* but as a separate mailbox without a login, simply enter the e-mail address of the resource as "path to the calendar". Please also make sure that you set the appropriate access rights for the user with which you connect to the Exchange server and that this user has been added as "delegate user" for the resource (see Microsoft TechNet for details).

> **Notice:** In case you are getting the error message *„Fatal error while loading Exchange data! The request failed. Could not establish a trust relationship for the SSL/TLS secure channel."* you have to make sure that your player PC trusts the SSL certificate of the Exchange server. Please open the EWS URL in the Internet Explorer on the player PC. You will get a warning message telling you that there is a problem with the Web page. Click on "continue" to show the Web page. In the address bar of the Internet Explorer a problem with the SSL certificate is now indicated by a red shield icon. You now have to add the certificate of that site to the list of trusted certificates on the player PC. When

you afterwards access the EWS URL once again in the Internet Explorer, no warning message will appear and also the *FrontFace* Player App will be able to successfully connect to the Exchange server using EWS.

You can also specify more than one calendar (e.g., for different rooms) as long as these reside on the same server and can be accessed with the given credentials. In this case, the appointments from all calendars are merged for display.

If you want to integrate the main calendar from the user's mailbox as well as other calendars from that mailbox, you must enter a period (".") as "path" for the user's main calendar.

The update interval is used to determine how often the calendar(s) are queried for changes. This setting only affects the plugin "Calendar" (not the plugin "Calendar Trigger") and is only relevant if you display the calendar for longer period of time or even permanently on the screen. Otherwise, a refresh always takes place automatically as soon as the Calendar Plugin is displayed on the screen.

► Office 365 (Graph API)

In addition to accessing Exchange Online (Office 365) via EWS (see above), it is also possible to use the newer Graph API by Microsoft. In order to be able to use this interface, some adjustments and setup steps are required to your Office 365 account.

In the settings dialog of the plugin, you have to enter the tenant ID, the client ID and the client secret as well as the email address of the user whose calendar you want to access. You can also specify more than one calendar (e.g., for different rooms). In this case, the appointments from all selected calendars are merged for display.

The following, the setup steps that are required are described so that you can access the Graph API of your Office 365 tenant with the Calendar Plugin:

Registering a New Application in the Azure Portal:

1. First, you must register the plugin as "app" to your Azure Active Directory (AD). Sign in with your business, school or university account or using your personal Microsoft account at the Azure Portal.
2. In case you can access multiple tenants with your account, click on your account in the upper right corner of the screen to set your current session for the intended Azure AD tenant.
3. Select from the navigation pane on the right the service **Azure Active Directory** and then go to **App registrations > New registration**.
4. On the **"Register an application"** page, please enter the registration information for the Calendar Plugin. Enter a name like e.g., *"FrontFace Calendar Plugin"* and make sure you select **"Accounts in this organizational directory only"**.
5. Click on **Register**.
6. A **Redirect URI** is not required in this case!

Creating a Client Secret:

1. The **Client Secret** is a static password, which grants the plugin access to Office 365. Go to **Certificates & secrets** and then add a **new client secret**. Write down the client secret.

Setting the Required Authorizations:

1. Click on the newly created **"FrontFace Calendar Plugin"** and then click on auf **"View API Permissions"**.
2. Select the **Calendars.Read** permission from the **API "Microsoft Graph"**. This may not be a delegated permission. You have to create an application permission here!
   NOTICE: This permission requires a so called admin consent since this permission, by default grants access to all calendars of the tenant! This can, however, be narrowed to a specific user with the help of a PowerShell CMDlet (see below).

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Build more powerful apps with rich user and business data from Microsoft services and your own company's data sources.

View API Permissions

3. **Granting Admin Consent**:

Restrict Authorization to a Specific User:

By default, a newly registered app has access to ALL mailboxes in an Office 365 tenant. To limit this, a so-called application access policy must be configured, as described below. You can find more about this here: https://learn.microsoft.com/en-us/graph/auth-limit-mailbox-access

1. Open this page in your Web browser:
   https://www.powershellgallery.com/packages/ExchangeOnlineManagement/
2. On that page you will find the command to install **ExchangeOnlinePowerShell** The command should look like this:
   ```
   Install-Module -Name ExchangeOnlineManagement
   ```
3. Open up PowerShell (as administrator) and execute the above command. Please confirm any queries that may appear (the module **ExchangeOnlineManagment** needs to be installed so that you can sign on to Azure Exchange PowerShell!).
4. Now import the module using the following command:
   ```
   Import-Module ExchangeOnlineManagement
   ```
5. Establish a connection with Exchange Online:
   ```
   Connect-ExchangeOnline
   ```
6. To restrict the policy, you need the client ID that you have used for registering the application in the previous step.
7. Now execute the following PowerShell command:
   ```
   New-ApplicationAccessPolicy -AppId YOUR_APP_ID
   -PolicyScopeGroupId YOUR_MAIL_ADDR -AccessRight RestrictAccess
   -Description "Restrict this app to a given user"
   ```

   Replace `YOUR_APP_ID` and `YOUR_MAIL_ADDR` with the actual data. The processing of this command may take a while. If you want to restrict access to more than one mailbox, instead of `YOUR_MAIL_ADDR` you can also enter the e-mail address of a mail-enabled security group previously created in Azure, which contains the authorized mailboxes. Finally, you can use this command to test if everything has run through correctly:

   ```
   Test-ApplicationAccessPolicy -Identity YOUR_MAIL_ADDR -AppId
   YOUR_APP_ID
   ```

   To obtain a list of all existing application access policies, run this command:

   ```
   Get-ApplicationAccessPolicy
   ```

Finally, you must note the **client ID**, the **tenant ID** and the **client secret** and enter these in the plugin's settings dialog. The **e-mail address** you enter is used to determine which mailbox you want to access. If you do not enter a **calendar name**, the mailbox's standard calendar is used. Alternatively, you can specify the **calendars** in the mailbox. The syntax is: **calendar group\calendar name**

It is recommended, however, not to add the calendar(s) manually, but to use the **"Check connection and select calendar..."** button. A connection to Office 365 is then established (with this you can also test whether the given credentials are correct!) and a list of all available calendar groups and calendars is displayed. Then select the calendar(s) you want to add to the list.

The update interval is used to determine how often the calendar(s) are queried for changes. This setting only affects the plugin "Calendar" (not the plugin "Calendar Trigger") and is only relevant if you display the calendar for longer period of time or even permanently on the screen. Otherwise, a refresh always takes place automatically as soon as the Calendar Plugin is displayed on the screen.

Notice: When accessing an Office 365 room calendar mailbox (aka resource), by default, the room calendar shows only a busy status. But in most cases, you want to see the organizer of the meeting and also the subject. To see these room details in an Office 365 room calendar, you need to apply the following settings for the resource (in this example it is named "Meetingroom"):

1. Connect to your Exchange Online with PowerShell.
2. Give all the users limited access to the calendar:
   `Set-MailboxFolderPermission -Identity Meetingroom:\calendar -User default -AccessRights LimitedDetails`
3. Make the subject and organizer of the meeting visible:
   `Set-CalendarProcessing -Identity Meetingroom -AddOrganizerToSubject $true -DeleteComments $false -DeleteSubject $false`

Using Office 365 on Android: Due to technical reasons, the Android version of the plugin uses a different method to authenticate against Office 365 which is called "device authentication flow". To activate this method, open the **Authentication** menu of the **App registration** in the Azure AD portal and make sure **Allow public client flows** is enabled. When you publish to an Android Player, and the Calendar Plugin appears on the screen for the first time, a code is shown which needs to be entered on the Website http://mircosoft.com/devicelogin on ad different device in order to authenticate the Android device. The authentication remains active for 90 days (if not being used) and renews itself automatically every time the date source is accessed.

► *Lotus Domino Calendar (via XML)*

A Notes database on a Lotus Domino Server (Domino 5 or higher) which can be accessed using Domino XML (DXL) over HTTP is required. The user account that is used to access the database needs to have a HTTP password in the Domino Person document. If possible, you should activate HTTP basic authentication. The plugin also supports the session-based authentication with cookies that is used by the Domino Web Access but generally it is recommended to use basic authentication in combination with this plugin.

In addition to the authentication method, you also have to enter your username and password.

If you want to access the personal calendar in the mailbox of a Notes user, the Domino Server URL ("URL to Lotus Domino Server") which you have to provide in the plugin configuration dialog is:

```
http(s)://server-name/mail/username.nsf
```

You must also provide the name (s) of the Domino object (s) in the database that you want to retrieve. If you do not specify anything, the Calendar object is retrieved by default. In some cases, it may be required to prefix the object name with a "$" sign. You can also enter several Domino objects (= calendars, e.g., calendars for different rooms) if they are on the same server. All appointments from those calendars are then merged for display.

Generally, any Notes database that contains appointment data can be integrated since the required fields for "start date/time", "end date/time", "subject" and "location" can be configured individually. You must provide the XPath expressions that refer to the fields in the `ViewEntry` elements of the DXL `ReadViewEntries` method (see http://www.ibm.com/developerworks/lotus/library/ls-Domino_URL_cheat_sheet/ for details).

For the personal calendar of a user's mailbox, these are default XPath expressions:

Feld	XPath-Ausdruck
ViewEntry Field StartDateTime	entrydata[@name='$134']
ViewEntry Field EndDateTime	entrydata[@name='$146']
ViewEntry Field Subject	(entrydata[@name='$147']//text)[1]
ViewEntry Field Location	(entrydata[@name='$147']//text)[2]
ViewEntry Field Additional	
ViewEntry Field Logo	

Hint: To view the XML document to which these XPath expressions refer to, you can simulate the HTTP request that is performed by the plugin by entering the following URL in your browser:

```
https://server-name/mail/username.nsf/$Calendar?ReadViewEntries
```

The update interval is used to determine how often the Notes database(s) are queried for changes. This setting only affects the plugin "Calendar" (not the plugin "Calendar Trigger") and is only relevant if you display the calendar for longer period of time or even permanently on the screen. Otherwise, a refresh always takes place automatically as soon as the Calendar Plugin is displayed on the screen.

► *iCalendar (ICS-Format)*

The iCalendar format (ICal) is a standardized format for the exchange of appointment and calendar data which is supported by many systems and applications. You can either provide a path (local path or an UNC network path) or a URL (http:// or https://) to an ICS file. With the Android version of *FrontFace*, the path to the file cannot be specified as a UNC path! Alternatively, you can refer to the "\Media\Static\" directory of your *FrontFace* project using the placeholder `${F_STATIC}` if you want to transfer the ICS file to the player when publishing.

If you want to use a Google Calendar, you first have to make the calendar "public" (see http://support.google.com/calendar/answer/37083 for details) and then request the ICAL-URL which you can then enter in the settings dialog of the plugin.

The update interval is used to define how often the ICS file is queried for changes. This setting only affects the plugin "Calendar" (not the plugin "Calendar Trigger") and is only relevant if you display the calendar for longer period of time or even permanently on the screen. Otherwise, a refresh always takes place automatically as soon as the Calendar Plugin is displayed on the screen.

► *SharePoint*

You can integrate both appointment lists (lists of type "Calendar") from local SharePoint installations (On Premises) or SharePoint Online (Office 365). You have to enter the URL to your SharePoint Website (e.g., TeamSite) and the name of the calendar list. For example:

`https://your-name.sharepoint.com/TeamSite/Lists/Team%20Calendar/calendar.aspx`

...enter as server/Website URL: `https://your-name.sharepoint.com/TeamSite/`

...and as list/calendar name: `Team Calendar`

You can also enter several calendar lists with separate URLs (e.g., calendars for different rooms) if these are on the same server and can be accessed with the same credentials. All appointments from all calendars are then merged for display.

In addition to that the login (e.g., e-mail address) and the password are required.

The update interval is used to determine how often the SharePoint lists are queried for changes. This setting only affects the plugin "Calendar" (not the plugin "Calendar Trigger") and is only relevant if you display the calendar for longer period of time or even permanently on the screen. Otherwise, a refresh always takes place automatically as soon as the Calendar Plugin is displayed on the screen.

Functionality:

After publishing, the plugin on the player continuously polls the external calendar at the specified interval. As soon as an appointment occurs (the start time of an appointment corresponds to the current date/time plus any lead time), the configured playlist is started and displayed for the duration of the appointment. After that, the player switches back and shows the original playlist again.

Error Diagnosis and Troubleshooting:

Because this plugin is an event source plugin, there is no screen output at runtime. Thus, for example, configuration errors (wrong server/file name, invalid username, etc.) cannot be recognized directly, except for the fact that the plugin does not generate any events when an appointment in the calendar is due.

> **Note:** By activating the option "Display error messages on screen (for diagnostics)" in the settings dialog of the plugin, corresponding error messages are also shown on the screen in case of errors, e.g., when accessing the data source. This option should only be enabled in testing mode and not in productive mode.

However, you can also view the player's log file on the player PC and thus determine possible problems and their causes. You can find the log file on the player PC under the following path:

`C:\ProgramData\mirabyte\FrontFace\Logs\FrontFace Player.log.txt`

After setting up the plugin, you should check the log file to make sure everything is ok.

Please also note that an event only occurs when the corresponding point in time has been reached. This means that an appointment that starts at 09:00 will no longer be triggered on the player PC if you start the player PC at 09:05. In this context, also remember that the system clock of the player PC must be set correctly (date & time).

Using Placeholders:

In case a playlist uses text elements, you can define placeholders that are being filled with custom text by an appointment.

The following predefined placeholders of a default calendar item can be used:

Placeholder	Corresponding Outlook Appointment Field
`${SUBJECT}`	`Subject`
`${LOCATION}`	`Location`
`${START_DATE}`	`Start date`
`${START_TIME}`	`Start time`
`${END_DATE}`	`End date`
`${END_TIME}`	`End time`
`${ADDITIONAL}`	`Free text field (also multi-line!)`
`${F_CURRENT_DATE}`	`Current date`
`${DURATION}`	`Duration of the appointment (in minutes)`
`${ORGANIZER}`	`Organizer (name) of the appointment`

Alternatively, you can also define your own, custom placeholders in the body text field of the appointment element in Outlook by using the following syntax:

`${MY PLACEHOLDER}=Text that is to be shown`

Multiple custom placeholders can be entered line by line.

If a custom placeholder is supposed to have a multi-line text, please use a | (pipe) to mask the line breaks, e.g., `${MY PLACEHOLDER}=Line1|Line2|Line3`

In the case of the "Excel File" data source, you can easily integrate user-defined placeholders with additional columns in your table. The first row contains the placeholder's name and the following lines contain the values for each appointment. So, if you have added an "ExtraText" column in the table, you can access the value with the placeholder `${ExtraText}`. Please note that you must specify all columns to be used for custom placeholders in the data source settings dialog (e.g., "K", "K-P" or "K, M-O", etc.).

Using Images (Logo):

Placeholders may contain, apart from text, also URLs or filenames of images. A typical use case is a welcome board where the visitor is welcomed by a personalized message like *"Welcome Mr. Miller!"* and at the same time also the logo of Mr. Millers company is shown.

You have to add a media object of type "image" to your playlist page and enter the URL or network path to the image file which contains the logo. Then, replace a part of it with the placeholder `${LOGO}`:

```
\\SERVER\files\logos\${LOGO}.png  or http://www.myserver.com/logos/${LOGO}.png
```

In your data source (Microsoft Exchange Server, Lotus Domino Server (Notes), iCalendar (ICS) or SharePoint) where you define the appointment you have to assign a value to this placeholder by adding the following line to the body text field:

```
${LOGO}=miller
```

FrontFace will then try to display the following file: "\\SERVER\files\logos\miller.png".

The advantage of this approach is that you do not have to enter the full path into the appointment every time but only the filename (without file extension).

When using Excel as a data source, replace the entire path of an *"image"* media object with the placeholder `${LOGO}`. Then, fill in the path/URL to image file in the column *"Logo"* of your Excel spreadsheet.

Please make sure that the player has access to the final URL / file path!

Behavior for Multiple Appointments at the Same Time:

If a calendar contains two or more appointments that start at the same point of time, the Event Source Plugin will only fire a single event. However, in this case the values of the placeholders for this event contain the merged values of the appointments that are due at the same time. In the settings dialog, you can configure the string *"Field Delimiter for Multi-Events"* that is used to concatenate the placeholder values. By default, the string is ", ". E.g., the `${EVENT_SUBJECT}` placeholder will contain the value *"Appointment 1, Appointment 2"* in case you have two appointments in the calendar with the subjects *"Appointment 1"* and *"Appointment 2"*. The same logic is also applied for custom, user-defined placeholders. The end time and the duration of the merged appointment originates from the appointment that lasts the longest.

Help and Support:

If you need help or technical support when using this plugin or the *FrontFace* software, you can contact our support. For more information, please visit: https://www.mirabyte.com/en/support/