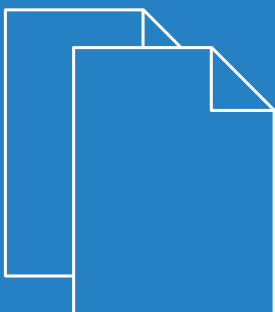


LANCOM Wireless ePaper Server

Integration MS Exchange



04/2019

Contents

- 1 Objectives and requirements.....4**
 - 1.1 Objectives.....4
 - 1.2 Requirements.....4
- 2 Adjustments in Microsoft Exchange.....5**
- 3 Script and configuration file.....7**
 - 3.1 Explanation of the script file7
 - 3.2 Example of a configuration file.....7
- 4 Starting the update process.....9**
- 5 Template for room signage.....11**
 - 5.1 Example of a template.....11
 - 5.2 Explanations of individual sections of code.....12
 - 5.3 Interaction between template, XML information and Wireless ePaper Displays.....13

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1 Objectives and requirements



The instructions listed here are intended exclusively for experts! They also describe systems of a software version and are therefore for illustration purposes only.

1.1 Objectives

The objective of this document is to demonstrate how to successfully integrate the LANCOM Wireless ePaper solutions into a network with Microsoft Exchange. This is achieved with an IronPython script file, a configuration file, and an XSL template.

The code shown in the script file, configuration file and template are examples, which are intended to simplify the creation of your own files. If this code is to be used productively, then the information in the configuration file need to be adjusted accordingly. Further templates can be created and used to optimize the adjustment to your intended usage. Furthermore the script file can be edited or rewritten if it does not meet your needs.

1.2 Requirements

The successful integration of the LANCOM Wireless ePaper Solutions into a Microsoft Exchange environment requires certain conditions to be met with regard to the available software and the adjustments made to it. All three components run separately, but they do not necessarily need to be installed on different network resources. However, in the interests of system latency, the Wireless ePaper Server and the E-series access points should be connected over the same local network.

1. Script

The following software is required on the computer running the script:

- Microsoft Windows 7, Windows 8, Windows 8.1, Windows Server 2008 R2, Windows Server 2012
- IronPython version 2.7.4
- Exchange Web Services Managed API version 2.2
- .NET Framework 3.5 or higher
- The path to the installed DLL for the Microsoft Web Services Managed API needs to be specified in the environment variable IRONPYTHONPATH. Create the environment variable if one does not exist already.

2. Microsoft Exchange

Microsoft Exchange must already be set up to manage the resource booking (meeting rooms). Supported are: Microsoft Exchange 2007 SP1, 2010, 2010 SP1, 2010 SP2, 2013, and 2013 SP1

3. LANCOM Wireless ePaper Server

The LANCOM Wireless ePaper Server needs to meet the following requirements:

- The template must be stored under \\<installation-directory>\data\templates\.
- Images referenced in the template must be stored under \\<installation-directory>\data\images\.

2 Adjustments in Microsoft Exchange

Meeting rooms have their own mailboxes in Microsoft Exchange, and the invitations to meetings arrive here. In order for the script to have access to these, a user with access to these mailboxes must be set up on the Exchange Server. This user can be specified as a Delegate on the **Resource Policy** tab for the individual mailboxes.

Conference Room 1 Properties

General | User Information | Address and Phone | Organization | Account

Member Of | E-Mail Addresses | Mailbox Settings | Mail Flow Settings

Resource In-Policy Requests | Resource Out-of-Policy Requests

Mailbox Features | Resource General | Resource Policy | Resource Information

Specify when the resource mailbox can be scheduled:

- ☐ Allow conflicting meeting requests
- ☒ Allow repeating meetings
- ☐ Allow scheduling only during working hours
- ☒ Reject repeating meetings that have an end date beyond the booking window

Booking window (days):

Maximum duration (minutes):

Maximum conflict instances:

Conflict percentage allowed:

Specify delegates of this mailbox:

Add...

Name	Organizational Unit

☒ Forward meeting requests to delegates

Additionally on the **Resource Information** tab, the checkmarks need to be removed from options **Delete the subject** and **Add the organizer's name to the subject**. Otherwise the script cannot query the reservation correctly.

Conference Room D Properties

General | User Information | Address and Phone | Organization | Account

Member Of | E-Mail Addresses | Mailbox Settings | Mail Flow Settings

Resource In-Policy Requests | Resource Out-of-Policy Requests

Mailbox Features | Resource General | Resource Policy | Resource Information

Specify what meeting information will be visible on the resource's calendar:

- ☒ Delete attachments
- ☒ Delete comments
- ☐ Delete the subject
- ☒ Delete non-calendar items
- ☐ Add the organizer's name to the subject
- ☒ Remove the private flag on an accepted meeting
- ☒ Send organizer information when a meeting request is declined because of conflicts

Customize the response message that the meeting organizer will receive:

☐ Add additional text

Additional text:

☒ Mark pending requests as Tentative on the calendar

OK Cancel Apply Help

2 Adjustments in Microsoft Exchange



The graphical user interface of Microsoft Exchange 2013 does not feature the options **Delete the subject** and **Add the organizer's name to the subject**. To change these settings, using the identity **boardroom** as an example you run the following command on the Exchange Server command line:

```
Set-CalendarProcessing -identity boardroom -AddOrganizerToSubject  
$false -DeleteSubject $false.
```

3 Script and configuration file

The script and configuration file are a single logical entity, where the script file contains the program code and the configuration file specifies the parameters that vary from installation to installation.

3.1 Explanation of the script file

The script file `exchange_display_updater.py` contains the code that queries the relevant information from the Exchange server, processes it and, if necessary, sends an update to the LANCOM Wireless ePaper Server. The script file can be found on the [LANCOM Homepage](#) in the product area of the LANCOM Wireless ePaper Displays for download. No detailed explanation of the code is provided here, because all of the changes necessary for an integration are made to the configuration file.

3.2 Example of a configuration file

The configuration file `config.json` (any file name can be used) contains information about the LANCOM Wireless ePaper Server, the Microsoft Exchange Server, the template, and the Displays. It contains code in JSON notation and must be formatted as UTF-8 without BOM. Below is an example of a configuration file with comments to the individual entries.

```
{
  "wireless_display_server": {
    "address": "wds.sbstest.local",
    "port": 8001
  },
  "exchange_server": {
    "version": "Exchange2010_SP1",
    "default_credentials": false,
    "user": "exchangeconnector",
    "password": "secret2011!",
    "domain": "sbstest.local",
    "autodiscover_url_from_email": true,
    "autodiscover_email": "exchangeconnector@sbstest.local",
    "url": "https://sbs2011.sbstest.local/EWS/Exchange.asmx"
  },
  "conference_label": {
    "template": "lcsconference_landscape.xsl",
    "no_new_data_message": "No reservations"
  },
  "displays" : [
    {
      "exchange_room_mailbox": "Room1@sbstest.local",
      "display_id": "D1002DE2",
      "display_name": "Meeting room 1"
    },
    {
      "exchange_room_mailbox": "Room2@sbstest.local",
      "display_id": "D1002FED",
      "display_name": "Meeting room 2"
    }
  ]
}
```

```
]
}
```

wireless_display_server

Specifies the LANCOM Wireless ePaper Server. All you need to enter here is the address in the LAN or localhost if the server runs on the same system.

exchange_server

Specifies the Microsoft Exchange Server.

version

Specified the version. This is important for the API. You can select from:

- > Exchange2007_SP1
- > Exchange2010
- > Exchange2010_SP1
- > Exchange2010_SP2
- > Exchange2013
- > Exchange2013_SP1

default_credentials

If this entry is set with the value `true`, the credentials of the current Windows user are taken for accessing the meeting-room mailboxes. If set to `false`, the values required are `user`, `password`, and `domain`.



The sample code presented here relies on the assumption that server communications take place either locally or on a trusted network. The network communication/access data are not especially protected.

autodiscover_url_from_email

If this entry is set to `true`, an email address from the domain can be used to find the Exchange Server. The email address is specified using `autodiscover_email`. If set to `false`, the Exchange service needs to be specified precisely by means of a URL.

conference_label

Specifies the basic properties of the meeting room signage.

template

Specifies the XSL template from the template folder.

no_new_data_message

Appears when there are no more reservations for the current day.

displays

Specifies the Wireless ePaper Displays being used. These are specified by means of a list of the individual Display objects. They have the following properties:

exchange_room_mailbox

The e-mail address of the meeting room mailbox

display_id

The display of ID (usually 8 digits in hexadecimal)

display_name

For the room name. This is fixed and is not affected by the room reservations.

4 Starting the update process

To start the update process, the script is started either from the command line, by batch file, or by service. The syntax for this is:

```
ipy.exe exchange_display_updater.py [-h] [-i <interval>] [-f] [-u (always|newdata|required)]  
[-d (debug|info|warning|error|critical)] <configfile>
```

What do these individual arguments mean?

-h

Displays help on the script and its arguments.

-i <interval>

Specifies the time interval between the individual checks in minutes.

-f

The first check will take place at the next full hour.

-u (always|newdata|required)

Specifies how the updates are carried out:

always

Every check sends an update to the Wireless ePaper Server in order to update the Displays. This should be used only for testing or with very long intervals to avoid unnecessary load on the Display batteries.

newdata

An update of the Displays via the Wireless ePaper Server is only triggered when the new data differs from that already on show.

required

Updates are similar to those triggered by **newdata**, except that the update takes place if the last update did not reach the SUCCESSFUL state. This setting is recommended if Displays are located at the edge of AP coverage.

-d (debug|info|warning|error|critical)

Specifies the debug level for internal logging. The default is **warning**: There is no output of the internal logging, except for the update activities.

-q

Disables the console output (quiet mode).

<configfile>

Specifies the configuration file (UTF-8 without BOM).

Example:

```
ipy.exe exchange_display_updater.py config_example.json -i 5 -u required
```

When the IronPython script starts, it first outputs the Exchange Server. From then on it continuously executes a loop that queries the Exchange Server for the meeting-room information. This is used to generate the content of the Displays, which is then sent to the Wireless ePaper Server depending on the selected update method.

4 Starting the update process

Updates are interrupted with CTRL + C and a set of statistics is output to the console. The following is an example with an explanation for each item:

```
updates (new)           :      2
updates (repeated)      :      3
updates finished successfully :    2
skipped                 :    11
```

updates (new)

Updates with new information sent to the Wireless ePaper Server.

updates (repeated)

Repeated updates sent to the Wireless ePaper Server after the previous update was not successful (only if the argument `-u required` is set).

updates finished successfully

Updates confirmed as successful (only if the argument `-u required` is set).

skipped

The update was skipped because of a lack of new information or the ongoing update still had the status WAITING.

5 Template for room signage

The template is stored on the Wireless ePaper Server as an XSL file. It specifies the format in which the Wireless ePaper Server renders the updates sent by the script library. The resulting image is then delivered to the corresponding Wireless ePaper Displays.

5.1 Example of a template

This XSL template is based on a potential meeting-room signage concept xml:lang="en" for the LANCOM Systems GmbH. Line numbering is not a part of the code and is for purposes of clarity only.

```

001 <?xml version="1.0" encoding="UTF-8"?>
002 <!--The template is provided for 7.4" Displays mounted in the landscape orientation.-->
003 <xsl:stylesheet xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
004
005 <xsl:template match="Record">
006
007 <!-- Rendering information for 7.4" Displays -->
008 <image height="480" width="800" rotation="90" font-family="Verdana">
009
010 <!-- Room -->
011 <field height="108" width="780" x="10" y="20">
012 <text align="center" font-size="40" font-weight="bold">
013 <utils method="toUpperCase">
014 <xsl:value-of select="room/@roomName"/>
015 </utils>
016 </text>
017
018 <!-- Date -->
019 <text align="center" font-size="35" font-weight="bold" padding-top="10">
020 <xsl:value-of select="room/field[@key='date']/@value"/>
021 </text>
022 </field>
023
024 <line thickness="2" x-from="0" x-to="800" y-from="130" y-to="130"/>
025
026 <!-- Time1 -->
027 <field height="50" width="780" x="20" y="150">
028 <text align="left" font-weight="bold" font-size="40">
029 <xsl:value-of select="room/field[@key='time1']/@value"/>
030 </text>
031 </field>
032
033 <!-- Purposel -->
034 <field height="50" width="780" x="20" y="200">
035 <text align="left" font-size="40" condense="1, 0.8, 0.6, 0.5">
036 <xsl:value-of select="room/field[@key='purposel']/@value"/>
037 </text>
038 </field>
039
040 <!-- Chair1 -->
041 <field height="40" width="770" x="20" y="250">
042 <text align="left" font-weight="bold" font-size="30">
043 <xsl:value-of select="room/field[@key='chair1']/@value"/>
044 </text>
045 </field>

```

5 Template for room signage

```

046
047 <!-- Time2 -->
048 <field height="35" width="780" x="20" y="320">
049 <text align="left" font-size="28">
050 <xsl:value-of select="room/field[@key='time2']/@value"/>
051 </text>
052 </field>
053
054 <!-- Purpose2 -->
055 <field height="35" width="780" x="20" y="355">
056 <text align="left" font-size="28" condense="1, 0.8, 0.6, 0.5">
057 <xsl:value-of select="room/field[@key='purpose2']/@value"/>
058 </text>
059 </field>
060
061 <!-- Chair2 -->
062 <field height="30" width="770" x="20" y="390">
063 <text align="left" font-size="20">
064 <xsl:value-of select="room/field[@key='chair2']/@value"/>
065 </text>
066 </field>
067
068 <!-- LANCOM Logo -->
069 <field align="right" height="60" width="780" x="10" y="410">
070 </img>
071 </field>
072 </image>
073 </xsl:template>
074 </xsl:stylesheet>

```

5.2 Explanations of individual sections of code

This chapter explains the various sections of code in the example XSL template.

Display information

```

007 <!-- Rendering information for 7.4" Displays -->
008 <image height="480" width="800" rotation="90" font-family="Verdana">

```

This section specifies which Wireless ePaper Display the following code applies to. In this case, it is a 7.4" Display with a resolution of 800 x 480 pixels.

`height` specifies the height of the image in pixels.

`width` specifies the width of the image in pixels.

`rotation` specifies the rotation of the image in degrees. 0 corresponds to vertically mounted Displays and 90 to horizontally mounted Displays.

`font-family` specifies the font to be used.

Definition of text fields

```

010 <!-- Room -->
011 <field height="108" width="780" x="10" y="20">
012 <text align="center" font-size="40" font-weight="bold">
013 <utils method="toUpperCase">
014 <xsl:value-of select="room/@roomName"/>
015 </utils>
016 </text>
017

```

```

018 <!-- Date -->
019 <text align="center" font-size="35" font-weight="bold" padding-top="10">
020 <xsl:value-of select="room/field[@key='date']/@value"/>
021 </text>
022 </field>

```

This area specifies the position of the room name and date.

First, a field is defined that specifies the height, width and position on the Display:

```
<field height="108" width="780" x="10" y="20">.
```

`height` specifies the height of the field in pixels.

`width` specifies the width of the field in pixels.

`x` specifies the distance from the left edge of the Display in pixels.

`y` specifies the distance from the top edge of the Display in pixels.

The layout of the various texts is defined in this field:

```
<text align="center" font-size="40" font-weight="bold">
```

`align` specifies how the text is justified (e.g., center, left, right).

`font-size` specifies the font size.

`font-weight` specifies the font style (e.g., bold, italic).

```
<utils method="toUpperCase">
```

Invoking this method forces the text to appear in the uppercase.

```
<xsl:value-of select="room/@roomName"/>
```

Here, the XML information provided by the script library is accessed and the text is inserted at the appropriate position. So far, the definitions have only set out the layout.

The next step uses the same principle to specify the text that shows the transmitted date. Additional fields contain the layout for the rest of the information that relates to the individual meetings.

Integration of graphics

```

068 <!-- LANCOM Logo -->
069 <field align="right" height="60" width="780" x="10" y="410">
070 </img>
071 </field>

```

In addition to text fields, images can be integrated too. Similar to the above, a field is specified that sets the position of the image.

```
</img>
```

The storage location and the name of the image file is specified here.

5.3 Interaction between template, XML information and Wireless ePaper Displays

This chapter uses an example to describe the interaction between the template, XML information and the actual representation on the Wireless ePaper Display.

5 Template for room signage

Step 1:

When an update is triggered by the Notes agent, the Wireless ePaper Server receives XML information with the following content: (Line numbering is not a part of the code and is for purposes of clarity only.)

```
001 <?xml version="1.0" encoding="UTF-8" standalone="yes"?>
002 <TaskOrder title="Refresh D1001BF6 for Aachen B2.100">
003   <TemplateTask xml:lang="en" labelId="D1001BF6" externalId="4711"
004     template="lcsconference_landscape.xsl">
005     <room roomName="Aachen B2.100">
006       <field key="date" value="16.09.2014"/>
007       <field key="time1" value="10:00 - 11:30"/>
008       <field key="purpose1" value="Marketing Project Coordination"/>
009       <field key="chair1" value="Alec Coad"/>
010       <field key="time2" value="11:30 - 13.00"/>
011       <field key="purpose2" value="Team Meeting Controlling"/>
012       <field key="chair2" value="Emily Kirby"/>
013     </room>
014   </TemplateTask>
015 </TaskOrder>
```

Step 2:

The Wireless ePaper Server processes the received information line by line. This sets the relevant Display and the template required. Based on the template, the Server now creates the data set used to render the image. The layout is set according to the template and then the information from the XML is inserted.

Two content elements are described here for illustrative purposes: The chairperson of the next meeting and the company logo.

The chairperson for the subsequent meeting is formatted according to the template as follows:

```
061 <!-- Chair2 -->
062 <field height="30" width="770" x="20" y="390">
063   <text align="left" font-size="20">
064     <xsl:value-of select="room/field[@key='chair2']/@value"/>
065   </text>
066 </field>
```

The information necessary for the representation can be seen in the XML below:

```
011   <field key="chair2" value="Emily Kirby"/>
```

Access to the image specified in the template does not require access to the XML information. The path is evaluated instead.

```
068 <!-- LANCOM Logo -->
069 <field align="right" height="60" width="780" x="10" y="410">
070   </img>
071 </field>
```

Step 3:

The image is rendered and sent to the Wireless ePaper Display. The Display appears as shown below. The chairperson of the subsequent meeting **(1)** and the image **(2)** are highlighted in color.

