WINDEV Mobile - Concepts
Version 23 - (1) 04-2018

In which order should these guides be read?

WINDEV Mobile is a powerful tool used to develop applications for Android, iPhone and iPad, Universal Windows 10 (phone, tablets and PC) and Windows Mobile ; it is supplied with all the tools required for creating and implementing applications.

To quickly and efficiently learn how to use WINDEV Mobile, we advise you to work in the following order:

1 Reading the "Concepts".
This guide presents the main concepts required for creating a WINDEV Mobile application.

2 "Tutorial" (guide + exercises)
The tutorial provides a first "hands-on" approach to WINDEV Mobile. It allows you to familiarize yourself with the main editors of WINDEV Mobile.

3 Test of examples
Run the test of the examples supplied with WINDEV Mobile in the fields you are interested in.

The online help, accessible by Internet from http://doc.windev.com or installed with WINDEV Mobile, allows you to quickly find the syntax of a WLanguage function, to get help about the interface... For each programming theme, you will find a description of the associated feature and the list of corresponding WLanguage functions.

Note: If a difference exists between the guides and the online help, follow the instructions given in the online help.

We hope you enjoy getting started with WINDEV Mobile.

Summary

DEVELOP 10 TIMES FASTER

PART 1

Basic concepts

Project and Analysis

The development of a mobile **Application** (Android, iOS, ...) with WINDEV Mobile is based on two main elements: the Project and the Analysis.

A **WINDEV Mobile project** is a set of elements: windows, controls, classes, components, ... whose combination is used to develop an application.

A **WINDEV Mobile analysis** groups the description of the data files found in the application.

An application is built from a project.
In most cases, a project is associated with an analysis.
An analysis can be associated with one or more projects.
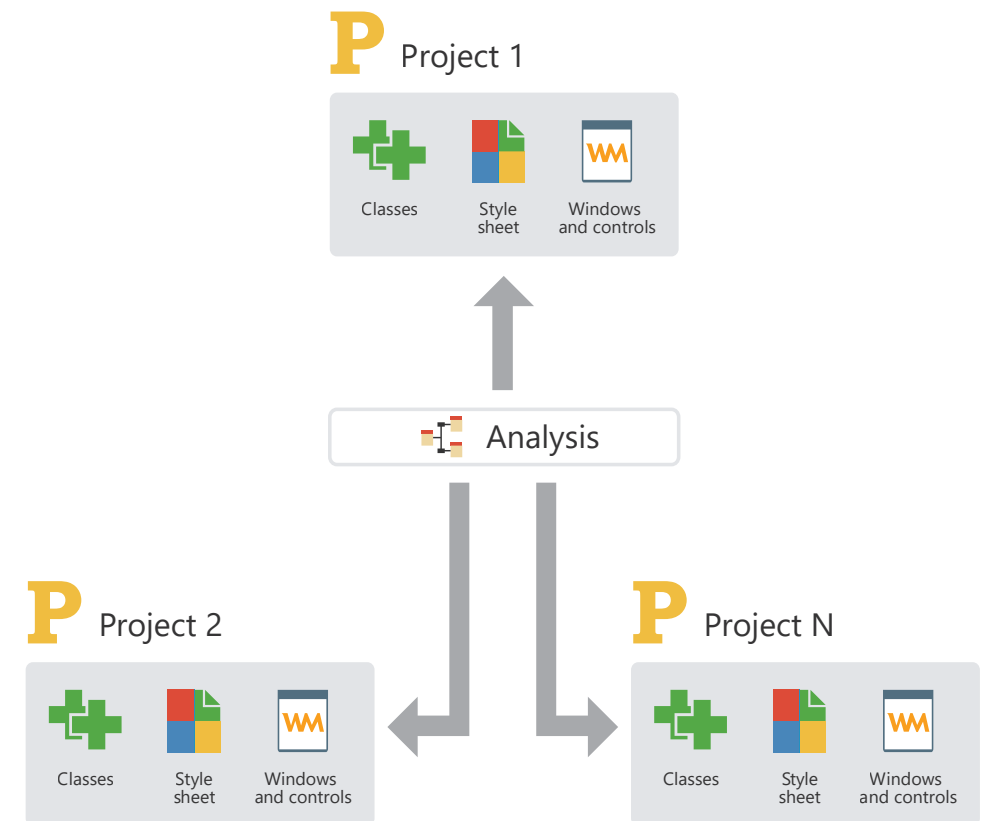
Development cycle of an application

WINDEV Mobile covers the entire development cycle of an application:
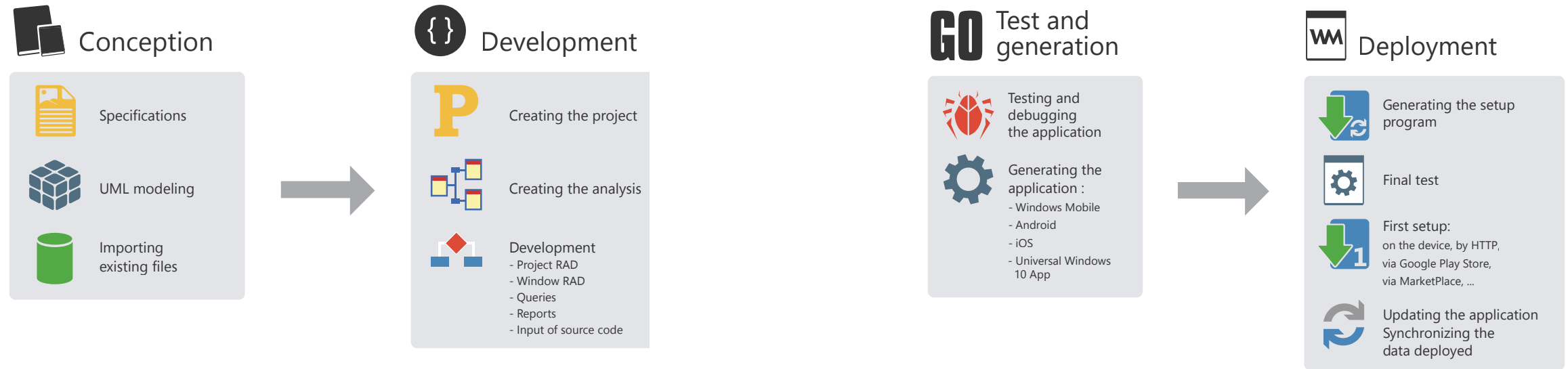
Details of different steps:

Design step: An application can be designed from specific requirements, from UML modeling of processes or even from existing data files.

Development step: The creation of the project and analysis is performed via very extensive wizards. The development can be done in RAD mode (Rapid Development Application) with automatic generation of the code and GUI or it can result from the manual creation of project elements.

Test and generation step: WINDEV Mobile proposes several automatic test tools to guarantee the reliability of applications and to make sure that no regression occurs between the development steps.

Deployment step: Deploying a WINDEV Mobile application can be done according to several methods: on Mobile directly, by download, via Play Store, MarketPlace, App Store or Windows Store. In any case, the HFSQL data files (if they exist) will be automatically updated according to the evolutions made in the application.

WINDEV Mobile: Android, iOS, UWP, ...

The applications developed with WINDEV Mobile can operate on the following platforms:

- Windows Mobile 2003/2003 SE (VGA) and Windows CE 4.0 for Pocket PC and for Smartphone.

- Windows Mobile 5.0 for Pocket PC and for Smartphone.

- Windows Mobile 6.0 to 6.5 for Pocket PC and for Smartphone.

- Universal Windows Platform apps.

- Android version 4 and later.

- iOS version 8 and later.

The following processors are supported for the WINDEV Mobile platforms:

- **ARM and compatible** (Strong ARM, XScale, Samsung, Texas Instrument, ...).

- **ARM v4T and compatible** (XScale, ...).

The Android, iOS and Mobile windows, ...

The windows are the foundation of the GUI (Graphical User Interface) of an application.

WINDEV Mobile includes an advanced window editor allowing you to easily and quickly create all possible types of GUI, for all types of platforms.

Several features enable you to easily obtain intuitive and user-friendly applications among which:
- powerful controls.
- an anchoring mechanism allowing the GUI to automatically adapt to the size of the display. This mechanism is useful when developing mobile applications because it is used to adapt to the different resolutions of the devices.
- a GUI compilation system with detection of errors (empty titles, untranslated captions, overlap, etc.).
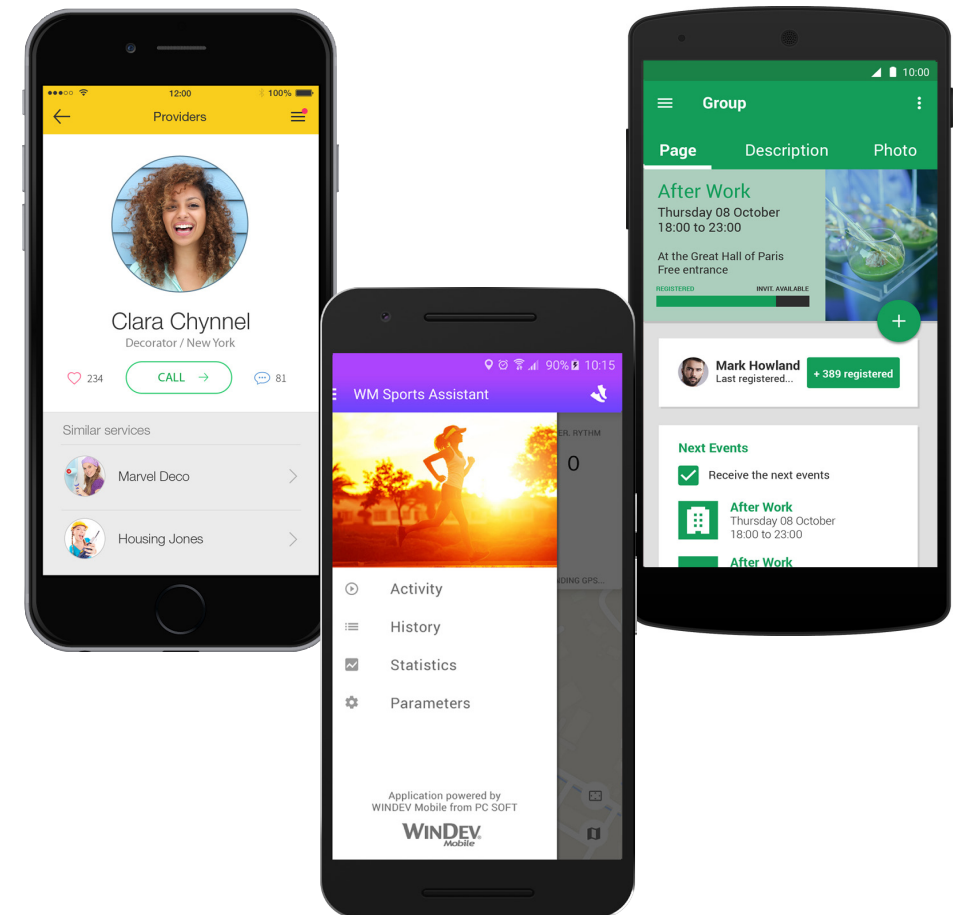
Android and iOS windows... Characteristics

WINDEV Mobile gives you the ability to configure the characteristics of windows. The available characteristics depend on the platform used. Some examples:
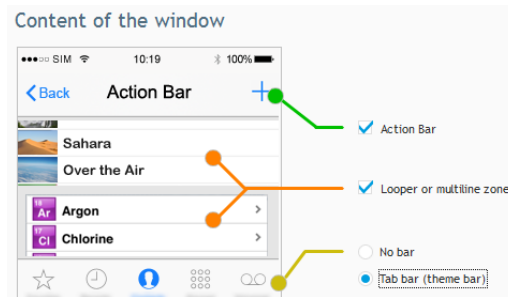
iPhone/iPad
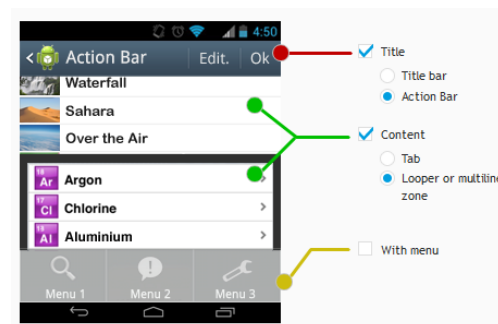
Android

Managing the display resolution

The windows created with WINDEV Mobile for the Android applications automatically adapt to the screen resolution of devices at run time.

The layouts

The anchors are used to easily manage the change of orientation for a Mobile application or the transfer of an application from a phone to a tablet.

However, in some cases, the interface must be entirely modified: the positioning of controls must be different.

The layout is used to define several views of a window in the same project without duplicating this window. This gives you the ability to define:

• a specific view for the portrait mode,
• a specific view for the landscape mode,
• a view specific to the phone,
• a view specific to the tablet, ...
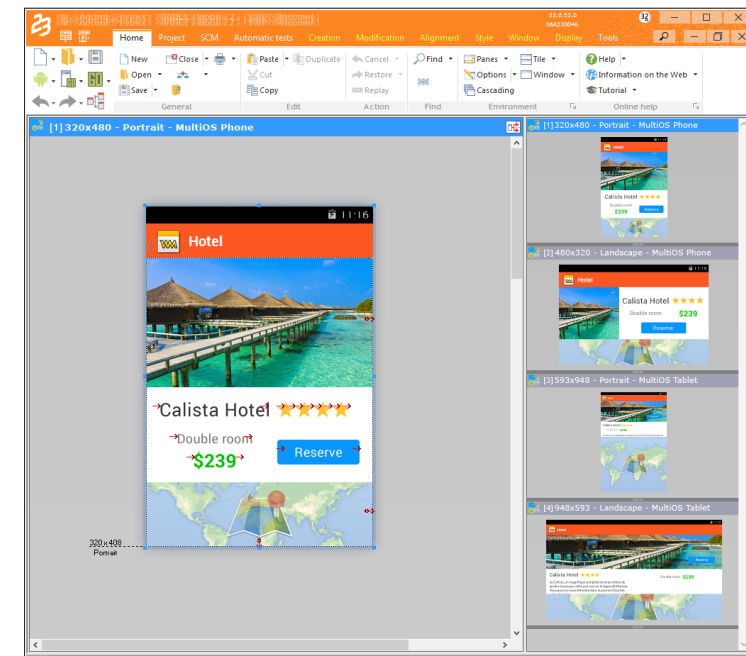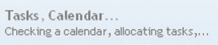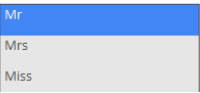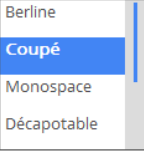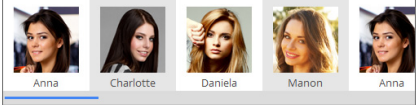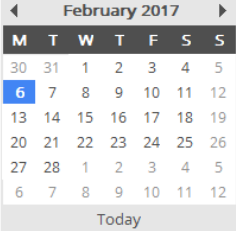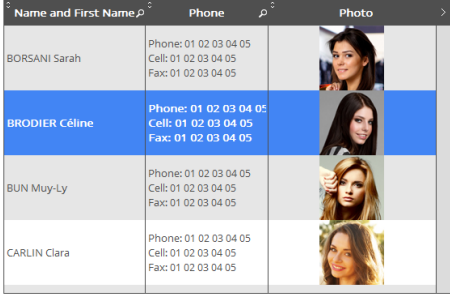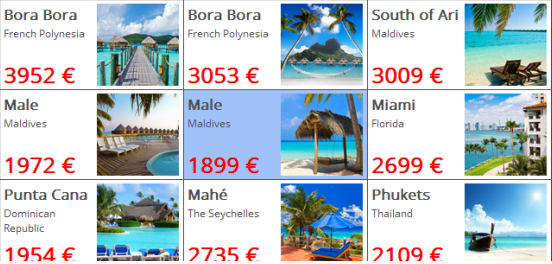
To create a layout, on the "Window" pane, in the "Layouts" group, expand "Layouts" and select "Add layouts". The wizard for layout creation starts and it asks you several questions in order to create the necessary number of layouts. When the different layouts are created, you have the ability to change the positioning of controls on one or more layouts in order to get the requested interface.
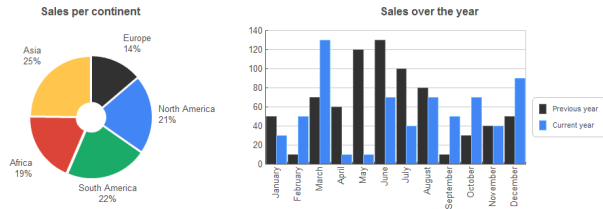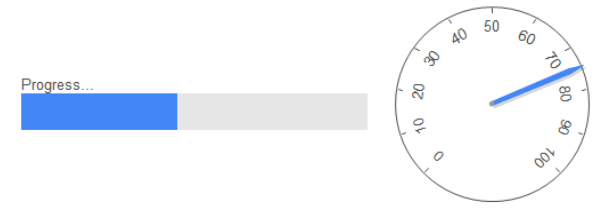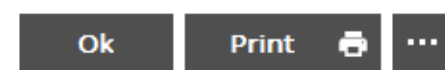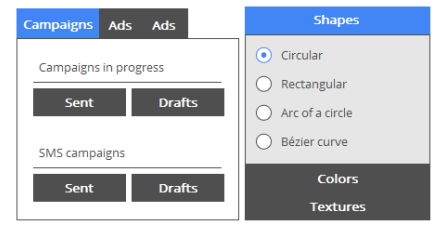
At run time, the initial layout is automatically chosen according to the platform, the orientation and the size of screen. The layout is automatically modified when the device switches from portrait mode to landscape mode for example.

Available controls in a window

Several controls are available in WINDEV Mobile:

You want to ...	Use a control of the following type
Display a text, a title, ... Tasks, Calendar... Checking a calendar, allocating tasks,...	Static
Type information Email: mike.durand@mail.com	Edit control
Select a value from a list (country, city, currency, ...) Title: ○ Mr ○ Mrs ○ Miss Title: Mr Title: Mr / Mrs / Miss	Radio button, Combo box, List box
Select several values from a list Bodywork: Berline / Coupé / Monospace / Décapotable Bodywork: ☐ Hatchback ☐ MPV ☐ Convertible ☑ Cup ☐ Motor-home ☐ 4x4 ☐ Break	Check box, List box
Select one or more values from a listview (picture directory, ...) Anna / Charlotte / Daniela / Manon / Anna	ListView
Display a graphic image (photo, statistics, chart, ...)	Image

Display a video, an animation	Multimedia, Image
Type a date in a calendar February 2017	Calendar
Display the file content in a table (list of customers, order details, ...) Name and First Name / Phone / Photo	Memory table or browsing table
Repeat controls in a window (product catalog with photo, ...) Bora Bora / South of Ari / Male / Miami / Punta Cana / Mahé / Phukets	Looper

Display a column chart, a line chart, a pie chart	Chart
Display a progress	Progress bar
Program an action in a window (display another window, start a print, ...)	Button
Group the controls by theme and display the themes one by one	Tab, Toolbox

Menus of applications

Android/iOS

In Android and iOS, the menus are displayed in the Action Bar.
Different buttons correspond to the available actions.
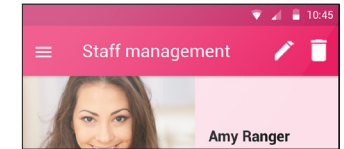
The menus can also be presented in a sliding window.
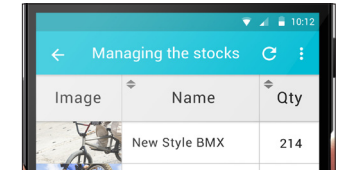
Windows Mobile

The menus are displayed at the bottom of the window.
The menu options can easily be selected with the stylus of the device or with a finger.
To create the main menu, on the "Windows" pane, in the "Bars and menus" group, expand "Main menu" and select "Add the main menu".
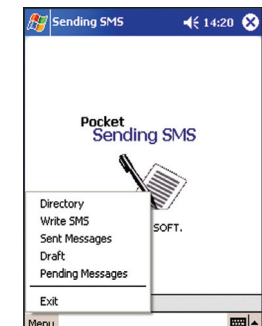
Internal window

The Internal Window control is used to include a window (and its code) in another window. At run time, the window to merge will be dynamically merged to the host window.

1. Creating an internal window

An internal window can be created via [ ] found among the quick access buttons. In the window for creating a new element, click "Window" then "Internal window".

An internal window is a specific window that contains no title bar and no menu.
All types of controls can be used in this window.

2. Using an internal window.

To use an internal window, you must:

- create an Internal Window control.
- in the control description, select the internal window to use and validate.
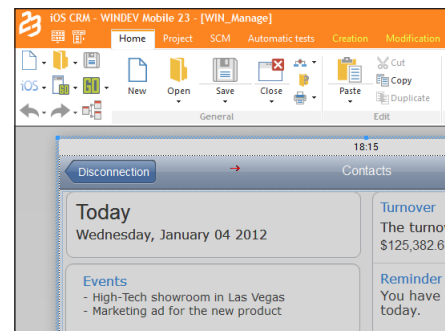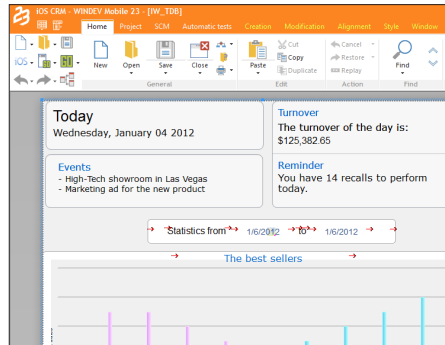
Notes:
- The internal window used in the "Internal window" control can be modified by programming.
- Limitations: The host area is rectangular and no overload is allowed. To perform overloads, we recommend that you use control templates.

Window templates

WINDEV Mobile allows you to create window templates. These templates contain all the graphic elements common to all the windows of your application.
The modifications performed in a window template are automatically applied to all the windows that use this template.
A window template allows you to comply with the style book defined for an application.
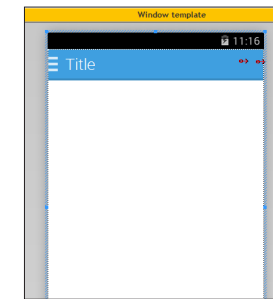
Defining a window template.
The template is bordered by an orange line in the editor.
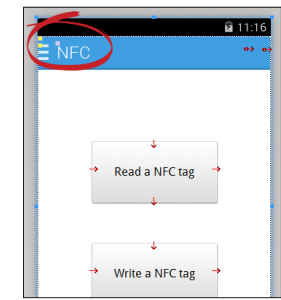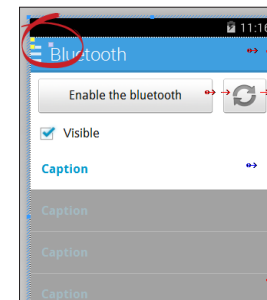
Using the template in several windows.
The elements belonging to the template are identified by a yellow square.

A window template can be created:

- via [ ] found among the quick access buttons. In the window for creating a new element, click "Window" then "Window template".
- from the current window (on the "Home" pane, in the "General" group, expand "Save" and select "Save as a template").

To create a window based on a template, select the template that will be used during the window creation.

The characteristics of elements can be dissociated from the template. For example, dissociating the position of a template control to position the control somewhere else while keeping the other evolutions performed on the control (code, style, ...). We talk of **control inheritance**. In this case, the elements are identified by a blue square.

Control templates

WINDEV Mobile allows you to create control templates. A control template is a set of controls that can be re-used in several windows.

The modifications performed in a control template are automatically applied to all the windows that use this template.

A control template is used to:

- group a set of controls for a specific purpose.
- make the controls independent of the window that hosts them.
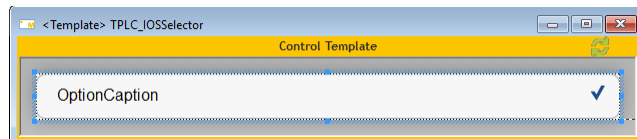
Defining a control template.
The template is bordered by an orange line in the editor.
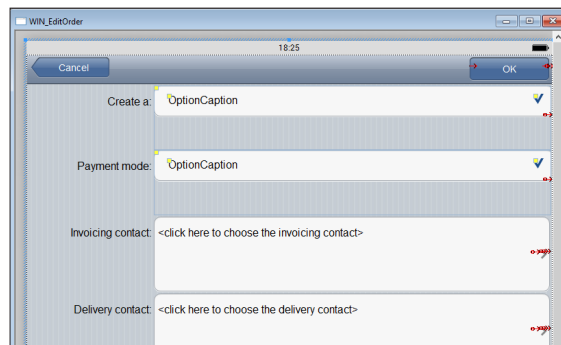
Using the template in a window.
The elements belonging to the template are bordered by a blue line and identified by a yellow square.

A control template can be created:

- via ⬚ found among the quick access buttons. In the window for creating a new element, click "Window" then "Control template".
- from the controls found in the window (select the controls then in the popup menu, select the "Control .. Refactoring .. Create a control template from the selection" option).

To create a window based on a control template, create a "Control template" control.

The characteristics of elements can be dissociated from the template. For example, dissociating the position of a template control to position the control somewhere else while keeping the other evolutions performed on the control (code, style, ...). We talk of **control inheritance**. In this case, the elements are identified by a blue square.

Reports

WINDEV Mobile allows you to easily create and print all types of reports with the report editor.
In Windows Mobile, the generated reports can be printed in PCL format (".PCL" file or print on a PCL printer).
In the iOS applications, the generated reports can be printed in PDF format.

A report can be used to summarize and synthesize the data.
You can:

- group data.
- sort data according to any criterion.
- perform calculations (means, statistics) or create charts.

The diagram below presents a simplified definition of a report:

- the data to print comes from a data source (data file described in an analysis, HFSQL view, query, memory zone or text file).
- the report groups, sorts and formats the data.
- the report execution can be performed on a PCL printer or in a PCL file.
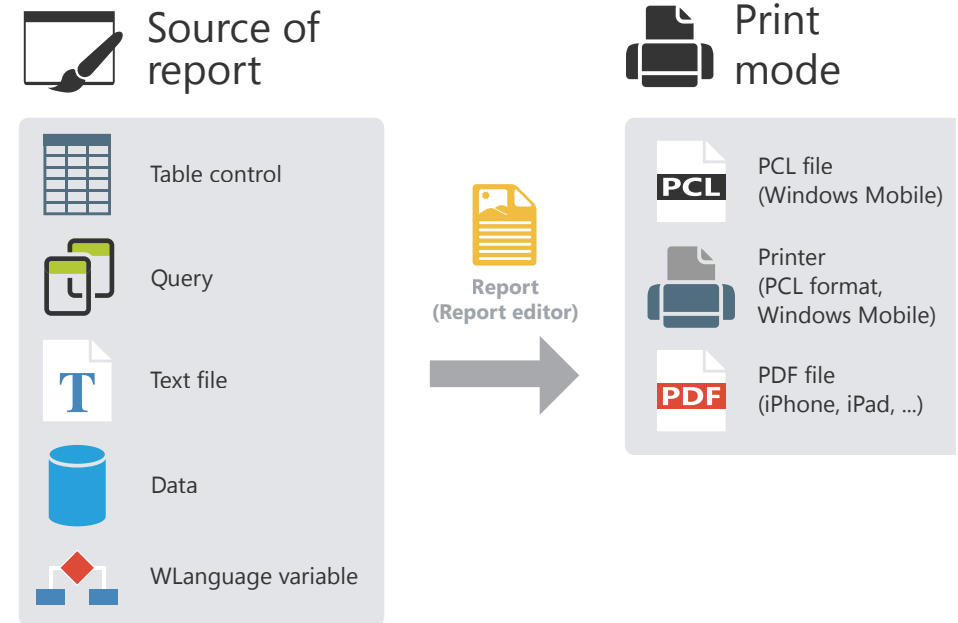
Other print modes
WINDEV Mobile also gives you the ability to print in WLanguage (iXXX functions).

Report templates

Most of the time, the prints use a standardized appearance and layout: date in the top right corner in a specific format, page footer with print time and file name, logo in the top left corner, ...
The report templates are used to easily standardize the layout of your reports.
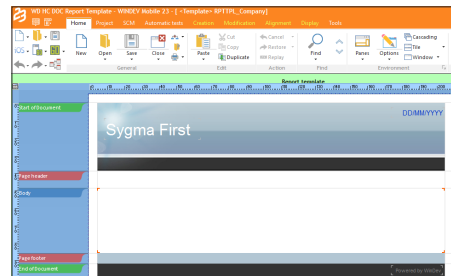
Defining a report template in the report editor.
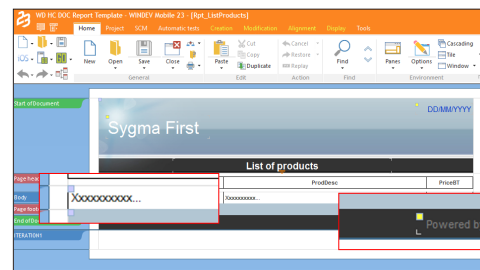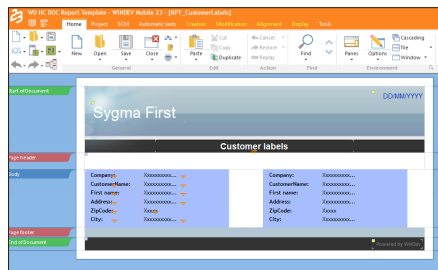
Using the template in different reports.
The elements belonging to the template are identified by a yellow square.
The overloaded template elements are identified by a blue square.

A report template can be created:

- via [icon] found among the quick access buttons. In the window for creating a new element, click "Window" then "Report template".
- from the current report (on the "Home" pane, in the "General" group, expand "Save" and select "Save as a template").

To create a report based on a template, select the template that will be used during the report creation.

The characteristics of elements can be dissociated from the template. For example, dissociating the position of a template control to position the control somewhere else while keeping the other evolutions performed on the control (code, style, ...). We talk of **inheritance**. In this case, the elements are identified by a blue square.

PART 2

Development environment

Project dashboard

The project dashboard is a main element for managing the WINDEV Mobile projects. The project dashboard gives an overall view of the progress status of a project.

The project dashboard includes several indicators about the project content:
- statistics about the project,
- incidents,
- tasks,
- status of automatic tests,
- result of audits,
- list of elements checked out from SCM (Source Code Manager),
- result of action planes (continuous integration), ...
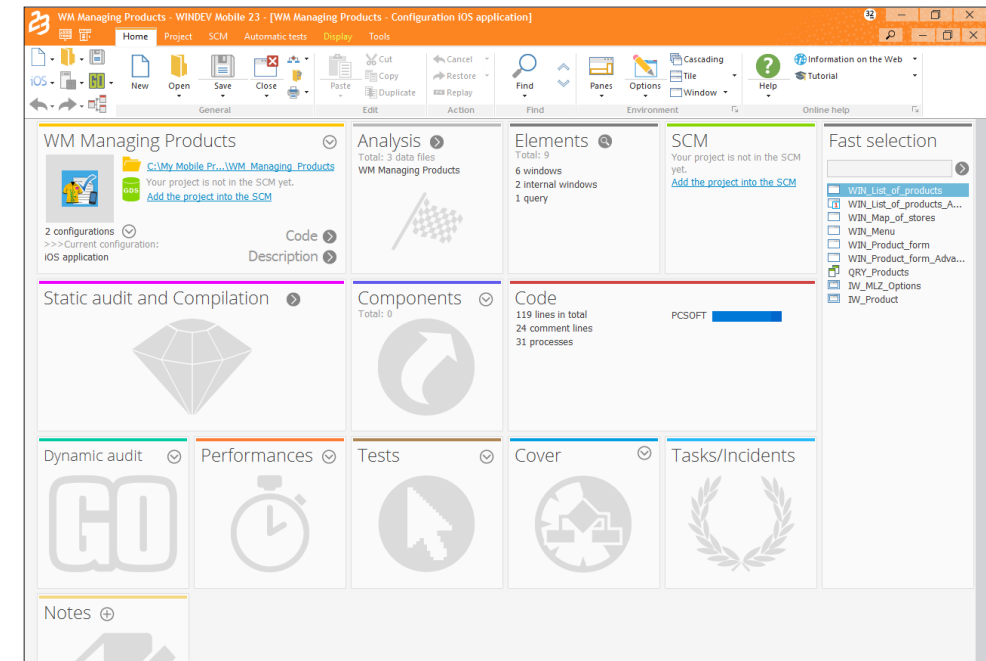
The elements found in this dashboard are presented in Widget format. These Widgets can be configured, moved, enabled, disabled, ... You have the ability to add new indicators.

The dashboard configuration is saved for each user. The dashboard configuration is the same for all the projects that belong to the same user.

WINDEV, WEBDEV, WINDEV Mobile: a 100% compatible format

The created projects are often multi-target projects.

For example, for an ERP system intended to operate in Windows, it is very likely that beside the main application, which will be the backbone of the solution, there will be sales people equipped with PDAs or Smartphones, stores that will use mobile devices to manage inventories and that Intranet and Internet sites will be implemented.

All the elements, except for the GUI (pages and windows), are 100% compatible and sharable between the WINDEV, WEBDEV and WINDEV Mobile projects.

Indeed, the sets of procedures or the classes can be shared between several projects for example.

Regardless of the product used to create a project, the project can be opened by the other products.
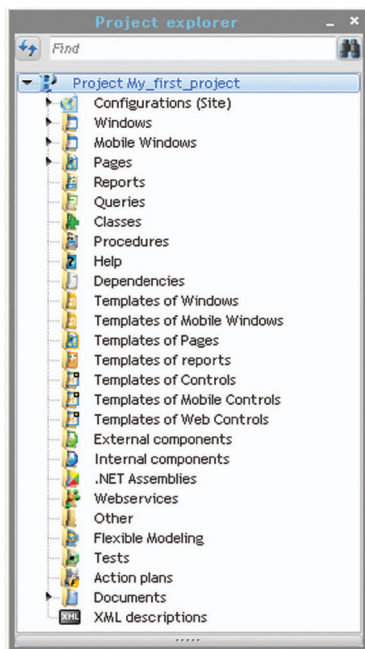
When a project is opened in a product other than the one that was used to create it, a wizard is displayed, allowing you to create a **project configuration** specific to the product used.

For example, if a WINDEV project is opened by WEBDEV, you will have the ability to create a project configuration named "Site", used to group all the elements required by the WEBDEV site.

You now have the ability to view the elements of each target from each environment. A project in WINDEV displays the thumbnails of the WEBDEV pages and the WINDEV Mobile windows for example. Clicking a WEBDEV page from the WINDEV project editor opens the WEBDEV page (WEBDEV must be installed on the computer).

Note: If you own WINDEV and WINDEV Mobile, you have the ability to handle the WINDEV Mobile configurations in WINDEV directly. You can open the mobile windows, modify them, run their test, ...

Project configuration

The project configurations are used to create several "targets" from the same project. From the same project, you have the ability to create:
- executables that do not contain the same elements, with different names, ...
- different external or internal components,
- multi-platform executables.

You have the ability to work on a specific configuration at any time: the elements that do not belong to this configuration are grayed in the project graph.
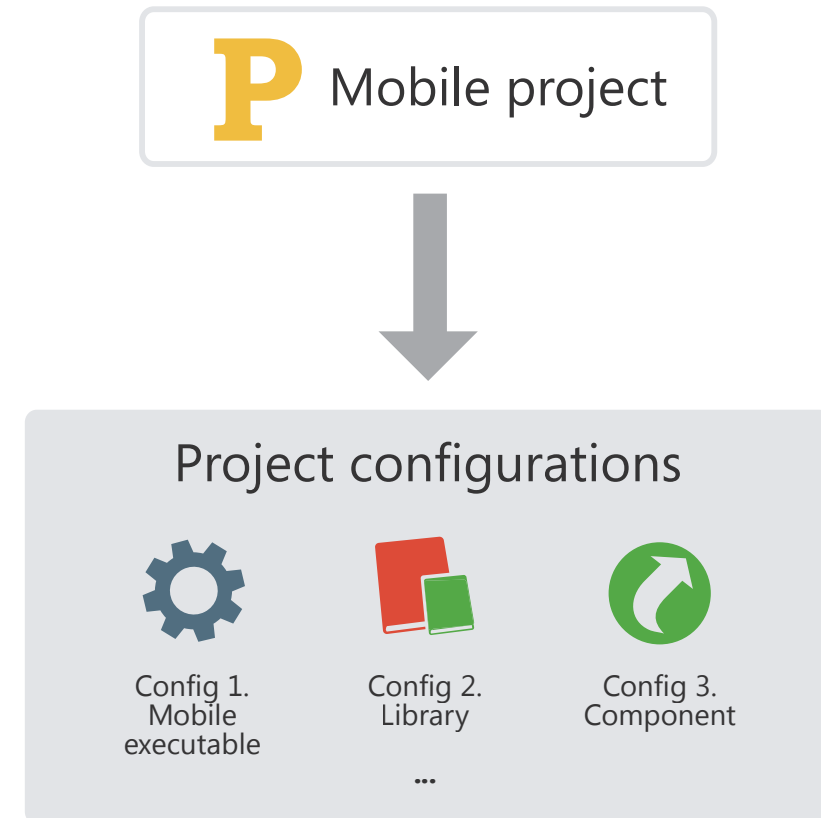
The multiple generation allows you to generate all the project configurations (or some of them) in a single operation.

Multiple generation

The project configurations are used to easily define the different "targets" of your project. Several executables, several components and several libraries can be defined for the same project.

To generate the result of each configuration, you can select each configuration one by one and generate the corresponding program.

Another faster method is available: the **multiple generation**. The configurations to generate are selected in a single operation and the result is immediate.
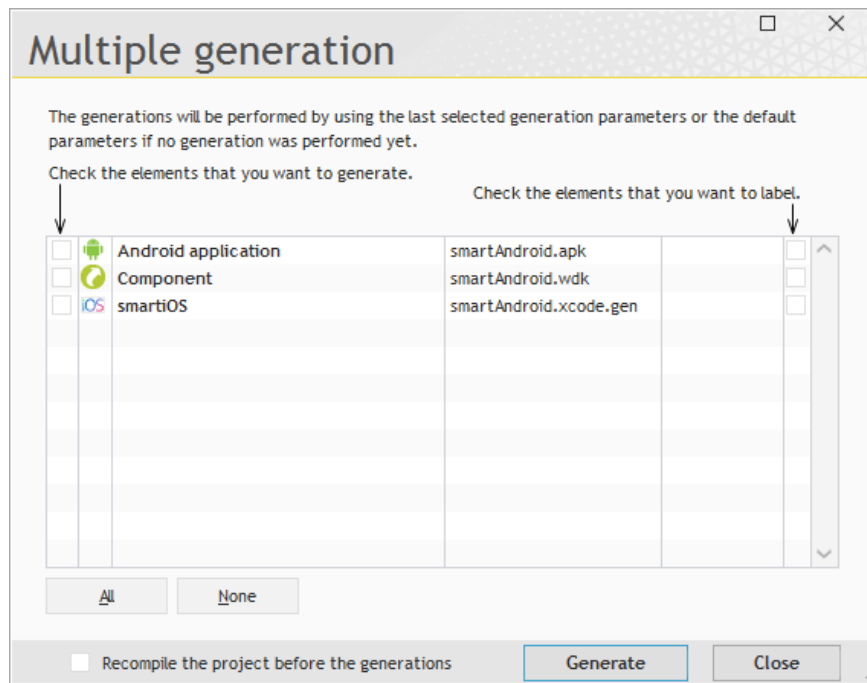
To start a multiple generation, on the "Project" pane, in the "Generation" group, click "Multiple generation".

Custom-folders: Organize your project

All the elements included in a project are listed in the "Project explorer" pane. By default, the elements are organized according to their type: windows, reports, classes...
In huge projects, it is often more relevant to group the elements that relate to the same feature: stock management or order management for example.
To do so, create the "custom-folders" in the tree structure of the project explorer and drag the different elements into these folders.
Some elements can be common to several "custom-folders".
It makes it easier to work on part of the application.

Content of Customer custom-folder

Content of Orders custom-folder

Windows, reports, queries specific to the management of customers

Windows, reports, queries specific to the management of orders
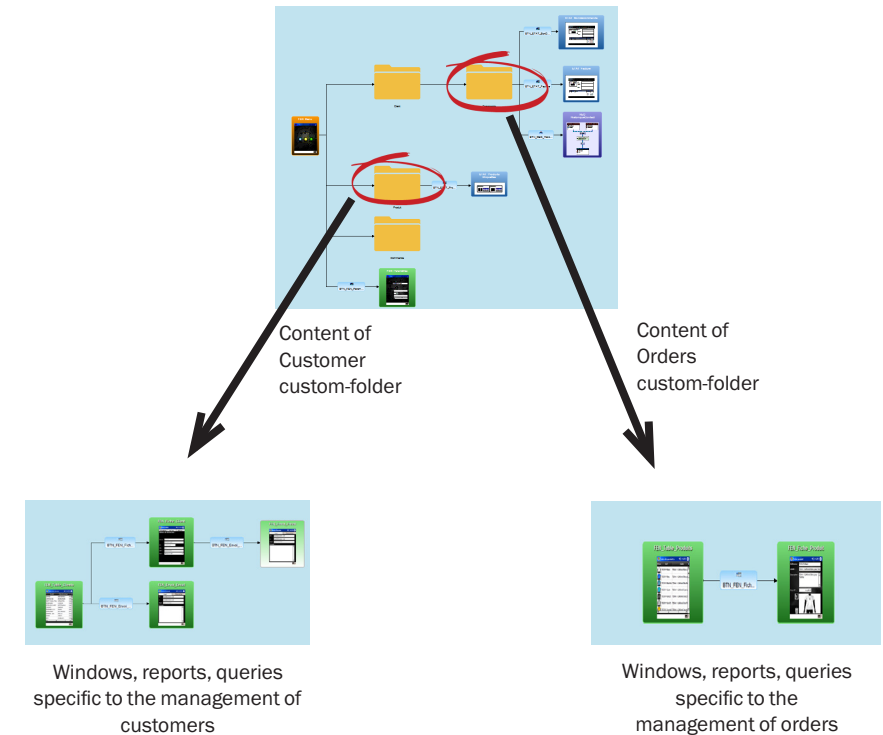
Notes:
- To organize your projects while sharing a set of elements between different projects, WINDEV Mobile also proposes the internal components.
- The "custom-folders" are displayed in the project explorer and in the project graph.

Source Code Manager (SCM)

Overview

To simplify teamwork, a Source Code Manager is available in WINDEV Mobile. This Source Code Manager allows several developers to work together on the same project at the same time and to share elements between several projects.

SCM
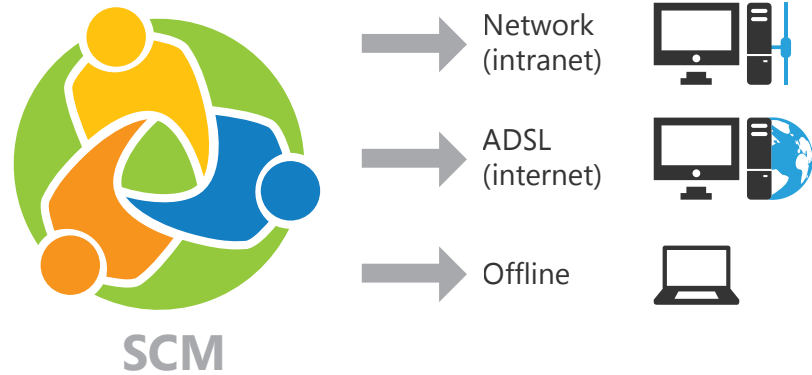
A database groups the project elements, each computer has a local copy of the elements required for the development

The elements found in the SCM can be shared:

- via a network,
- via Internet,
- via the Cloud,
- in offline mode. In this case, the elements that require specific attention will be checked out from SCM when the laptop is connected to the main system for example.

Operating mode of Source Code Manager

The following example presents the Source Code Manager:
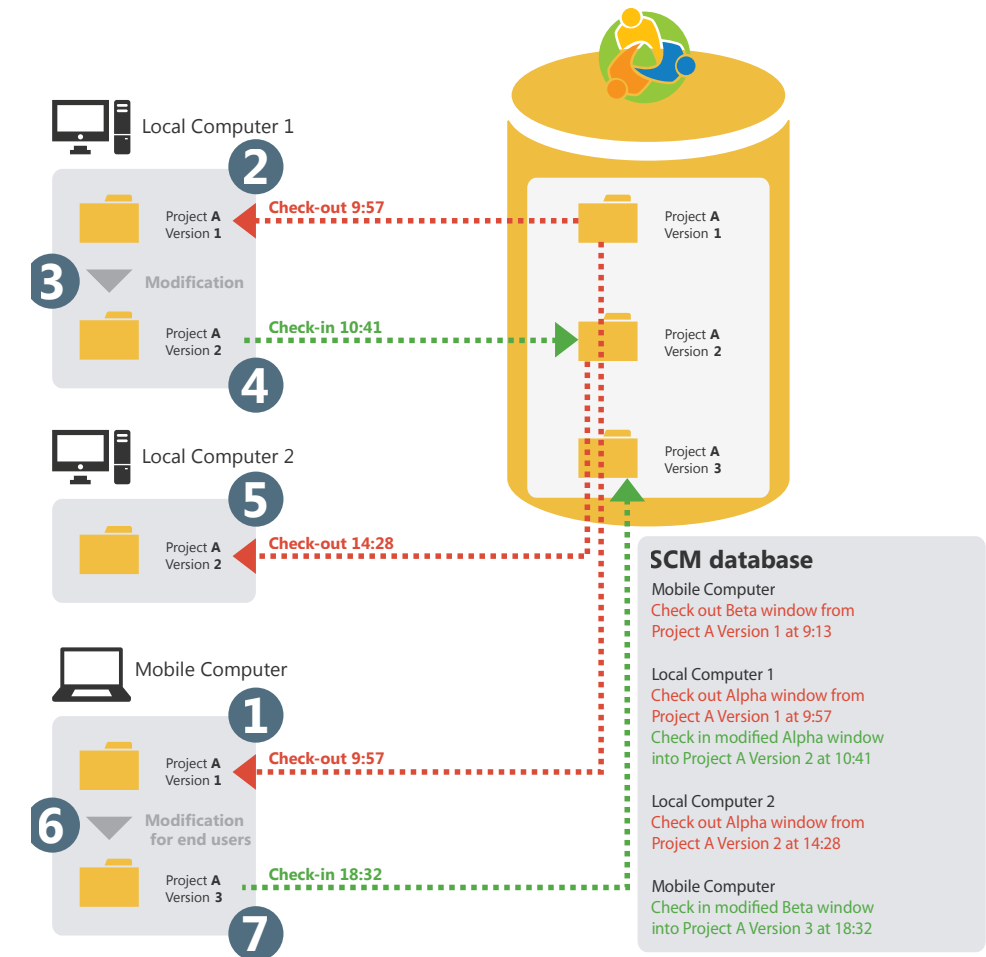
If a project element (window, report, ...) is checked out, this element cannot be checked out twice.

Once the checked-out elements are modified, these elements must be checked back in so that these modifications can be taken into account by the source project. Indeed, the SCM database stores a history of all the project elements since their creation.

Whenever an element is checked back in, the version number of the source project is incremented by 1.

Internal component

An internal component is a group of project elements. This grouping is used to:
- Organize a project: you have the ability to create internal components in order to group the project elements, by feature for example.
- Share elements between several projects, via the SCM.
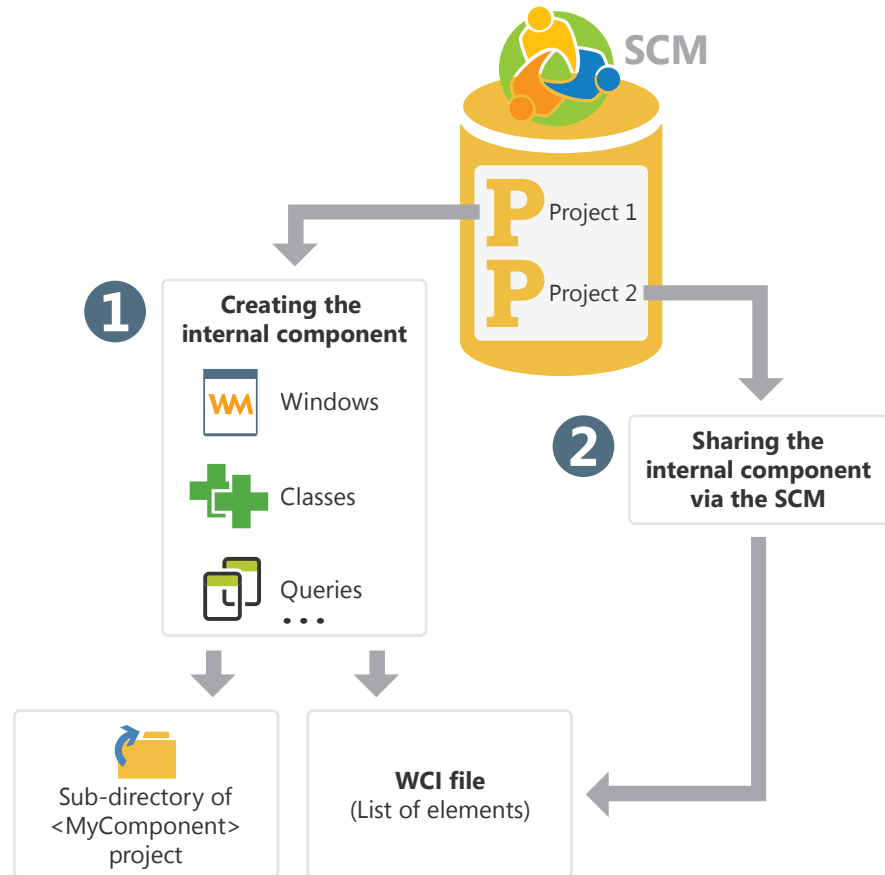
The elements found in an internal component can be private or public:
- The private elements can be handled by the other elements of the component.
- The public elements can be handled by the elements of the project that is using the internal component.

External component

An external component is a set of WINDEV Mobile elements: windows, reports, analysis, ... This set of elements performs a specific feature. For example, an external component can correspond to one of the following features:
- Sending SMS,
- Sending emails,
- ...

An external component can be distributed to other WINDEV Mobile developers (for free or at a cost). These developers will be able to easily include the feature proposed by the external component in their application. The external component will be included in the application and distributed along with it.

Generation modes

WINDEV Mobile allows you to generate several other types of projects.

Windows Mobile/CE/Embedded Compact applications

The applications are the most common generation mode. The applications developed with WINDEV Mobile can be run on Windows Mobile (version 2003, 5.0, 6.0 and 6.5) and they support the ARM and ARM4T processors.

Android applications

WINDEV Mobile allows you to generate applications for the Android platform. These applications will be able to run on smartphones or tablets running this operating system (from version 4.0). These applications can also be distributed on Play Store for example.

iOS applications

WINDEV Mobile allows you to generate applications for the iPhone and iPad platform (from iOS 8). These applications will be able to run on iPhone and iPad devices. These applications can also be distributed on the Apple Store for example.

Universal Windows 10 App

WINDEV Mobile allows you to generate applications for the tablets and phones running Windows 10.
These applications can be started in tile mode on the Windows 10. tablets These applications can also be distributed on Windows Store for example.

Libraries and patches

A library is a unique file that groups several elements of a WINDEV Mobile project: windows, reports, etc. You have the ability to generate stand-alone libraries that can be used by other applications as well as corrective patches for an application that is already deployed ; this allows you not to have to reinstall the full application for a minor correction.

External components

The external components are application bricks allowing you to share one or more specific features between several applications. A component generated by WINDEV can also be used in a WEBDEV or WINDEV Mobile project.

Project Monitoring Center

To optimize the management of your development projects, WINDEV Mobile gives you the ability to use Project Monitoring Center. The Project Monitoring Center is used to:

- Manage the project requirements,
- Manage the monitoring of a project (schedule of tasks to perform),
- Manage the bugs and evolutions signaled on a project.

The Project Monitoring Center is using a HFSQL Classic or Client/Server database: the database of Control Centers. This database is shared between the different tools available in WINDEV Mobile:

- Tasks
- Requirements
- Quality

Project Monitoring Center

Database of Control Centers

Login window of WINDEV Mobile

Business Rules

Stand-alone messaging (WDBAL)

Automatic tests

Image catalog (custom images)
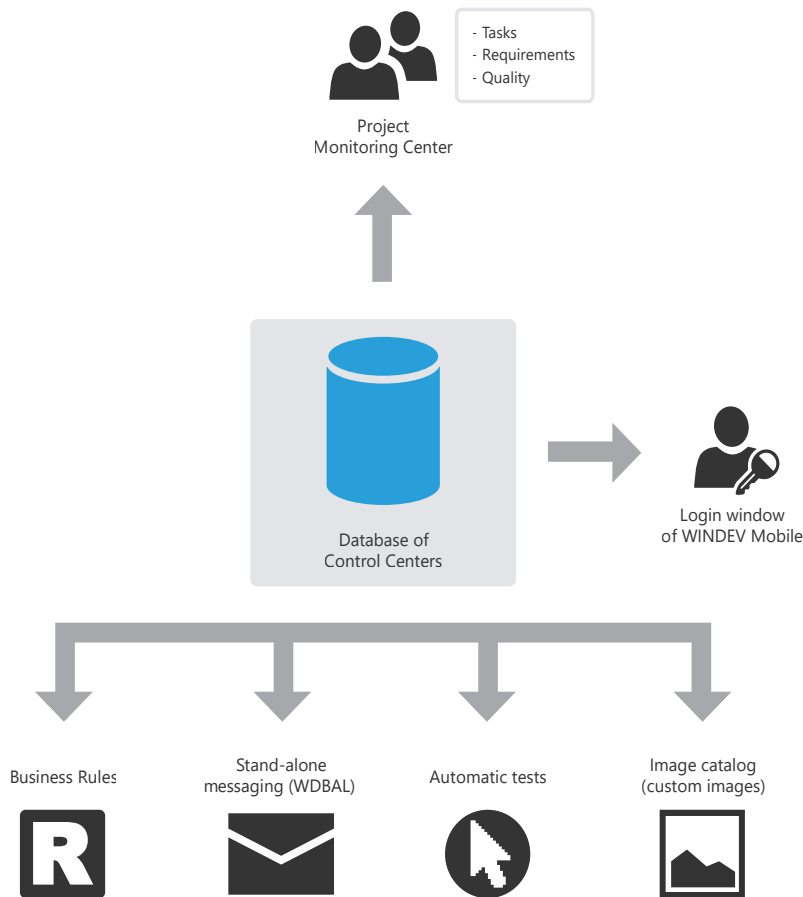
Note: When installing WINDEV Mobile, the setup program proposes:

- to create the database of Control Centers (database of Project Monitoring Center). This database will be automatically created in HFSQL Classic format in the specified directory.
- to share an existing database of Control Centers.

Managing requirements

The Project Monitoring Center allows the project manager to manage a development project. To do so, you must:

- define the different project contributors.
- define the requirements (with the different elements associated with them).

Each developer performs the different tasks assigned to him.

The project manager can follow the progress status of project at any time.

Project Manager

Developer

1 Creating requirements made of:
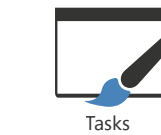
Tasks

Incidents

Business Rules

2 Performing the requirements:

Project Monitoring Center

Pane of Business Rules

3 Monitoring requirements (Project Monitoring Center):

Managing the requirements

Managing tasks

The Project Monitoring Center allows the project contributors to manage their task schedule. These tasks can be linked to requirements and they can correspond to several projects.
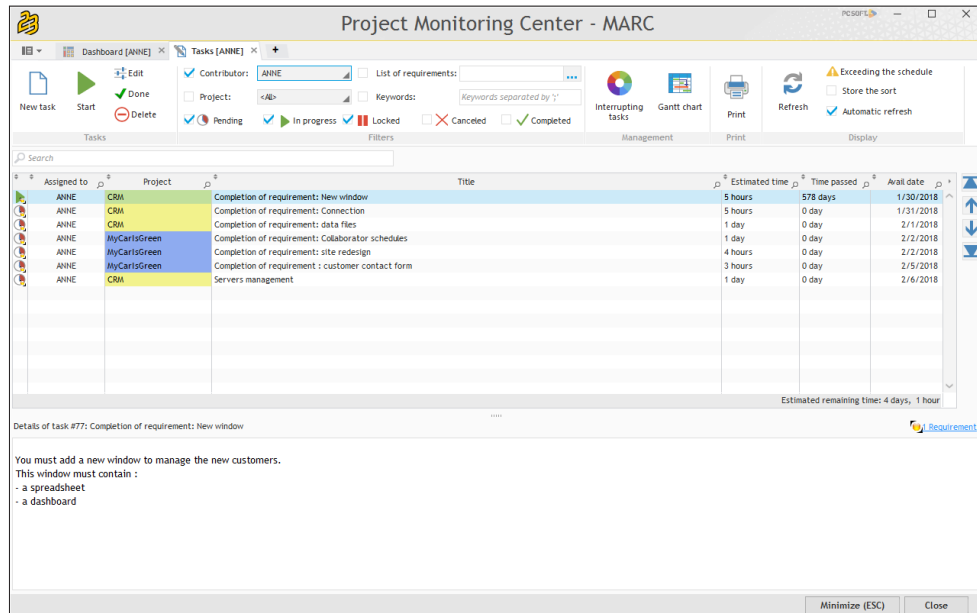
Once all the project tasks have been defined, the Project Monitoring Center takes care of everything. Entering the time spent on a task is almost automatic, it requires no specific action and it generates no particular constraint.

When the relevant project is opened, the Project Monitoring Center requests or indicates the current task. As soon as a task is completed, all you have to do is indicate that this task is over and specify the new task.

A task can be linked to a project element (window, report, ...). Whenever the relevant element is opened, the time spent on this element is counted and stored in the Project Monitoring Center. Conversely, the element corresponding to the task that you want to perform can be automatically opened from the task list.
Each developer can also see his own task list in the "Project Monitoring Center" pane found in the editor.

Managing business rules

WINDEV Mobile allows to manage the business rules. A business rule is used to define a specific operating mode or to specify a particular process. For example: calculating a specific VAT rate, the rules for changing customer status, the formula for calculating shipping costs, a sales commission, a discount rate, a decay coefficient, ...
A business rule can be simple or complex.
The business rules can come from the specifications (corresponding to the requirements).

PART 3

Databases

Analysis: Database structure

When a WINDEV, WEBDEV or WINDEV Mobile project is using data files, this project must be associated with an analysis. An analysis allows you to describe the structures of data (files, items, ...) used in your project.

The data model editor is used to easily create an analysis.
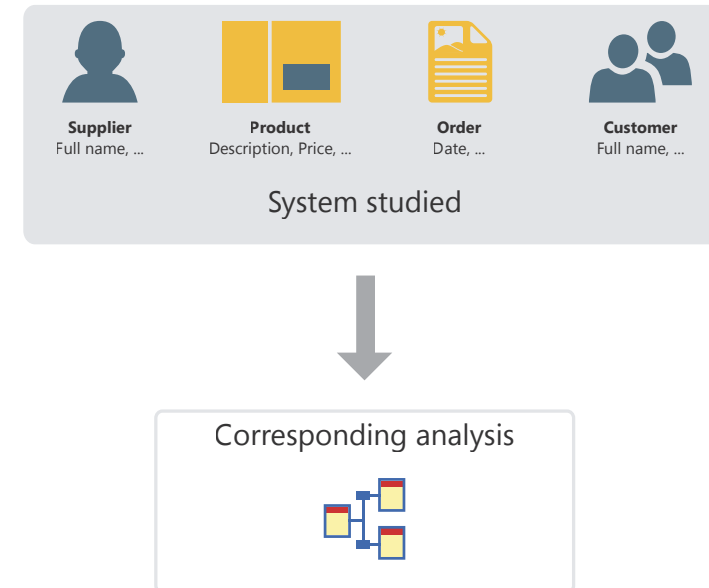
The analysis of a WINDEV Mobile project corresponds to the LDM (Logical Data Model). The entire structure and data organization are described: the data is grouped by file. Each file contains several data called item.

In the analysis, the description of a data file can be linked to a type of file (HFSQL Mobile, HFSQL Client/Server, SQLite, ...).

The different types of accessible files

WEBDEV, WINDEV and WINDEV Mobile propose a simple access to most of the databases available on the market.

Applications and sites

WINDEV   **WEBDEV**

Universal Data Connector
(HReadSeek, HExecuteQuery, File, Item,
Automatic File Link, Databinding, Replication, SQLExec...)

Unlimited deployment, free

HFSQL Native HFSQL
Powerful SQL database
Windows - Linux - Android - iOS

HFSQL Cloud
for PC SOFT applications

HFSQL Client/Server
Windows, Linux, Docker
32 & 64 bits

HFSQL Cluster
Windows
32 & 64 bits

HFSQL Embedded Classic
(Local, network)
32 & 64 bits

HFSQL Mobile
Windows CE/ioT,
UWP, iOS (iPhone,
iPad), Android, ...

Full compatibility

WINDEV Mobile

Native Oracle Connector
32 & 64 bits

Native MySQL Connector
32 & 64 bits

Native SQL Server Connector
32 & 64 bits

Native DB2 Connector
32 & 64 bits

Native AS/400 Connector

Native XML Connector

Native Progress Connector

Native Sybase Connector

Native PostgreSQL Connector
32 & 64 bits

Native Informix Connector
32 & 64 bits

Native SQLite Connector
32 & 64 bits

Native Azure Connector

Native MariaDB Connector
32 & 64 bits

Native applicative Connector
- Webservice SOAP/REST
- SAP R/3
- Lotus Notes
- Outlook
- LDAP
- MATLAB
- XML
- JSON
- Google
- RSS
- SalesForce
- XLS/XLSX
- iCalendar
- MQTT
- ...

BIG DATA
- Hadoop
- HBase
- HDFS
- Memcached
- Hive
- Riak
- MongoDB
- ...

ODBC
32 & 64 bits
Windows et Linux

OLE DB
32 & 64 bits

Data handled by a WINDEV Mobile application

The data handled by a WINDEV Mobile application can come from:

- a HFSQL Classic or HFSQL Client/Server database (".Fic" files).
- a third-party AS/400 database (Windows Mobile only).
- a CEDB database (".cdb" files) (Windows Mobile only).
- ".INI" files.
- text files (in ANSI or UNICODE format).
- the registry (Windows Mobile only).

Mobile device

HFSQL Classic	HFSQL Client/ Server	AS/400	Tasks Notes Contacts... .cdb		
Databases				Text files	Registry
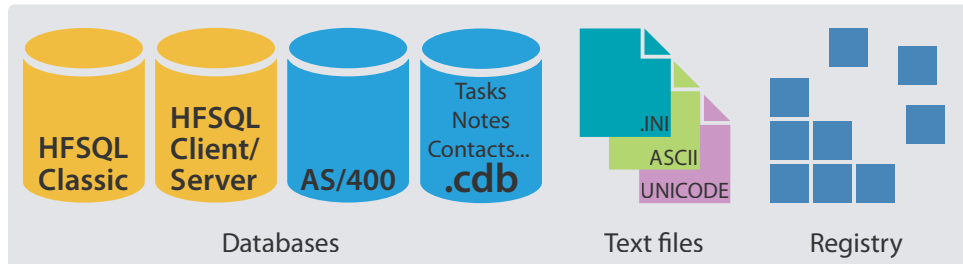
HFSQL Classic

The HFSQL Classic format (also called HFSQL Mobile) is the database format supplied with WINDEV Mobile. This database format is compatible with WINDEV, WINDEV Mobile and WEBDEV.
It is a freely distributable Relational DBMS.
This format can be used on the following platforms: Windows Mobile, iPhone, iPad, Android and Universal Windows 10 App.

This format is identical to the HFSQL Classic format of WINDEV and WEBDEV (".WDD" file, data files, ...).
However, the available size being limited on the mobile devices, the following features are not supported by HFSQL Classic on mobile:

- the transactions.
- the log process.
- the management of locks for files and records.
- the management of files in Hyper File 5.5 format.

Handling a HFSQL Classic database from the mobile device

A HFSQL Classic database corresponds to a set of ".FIC", ".NDX", and ".MMO" files.
Each data file can be handled by a WINDEV Mobile application. These operations are performed via HFSQL functions (*Hxxx* functions).

Mobile device

Hxxx functions, (read, write...)

Database

HFSQL Mobile

HFSQL Client/Server

A WINDEV Mobile HFSQL application can also operate in Client/Server mode.

The characteristics of the Client/Server mode are as follows:
• A HFSQL Client/Server application is run on different mobile devices (called client computers).
• The data files are found on a server. Only the server physically accesses the data files.
• All the processes (query, read/write operation in a data file, ...) are performed on the server.
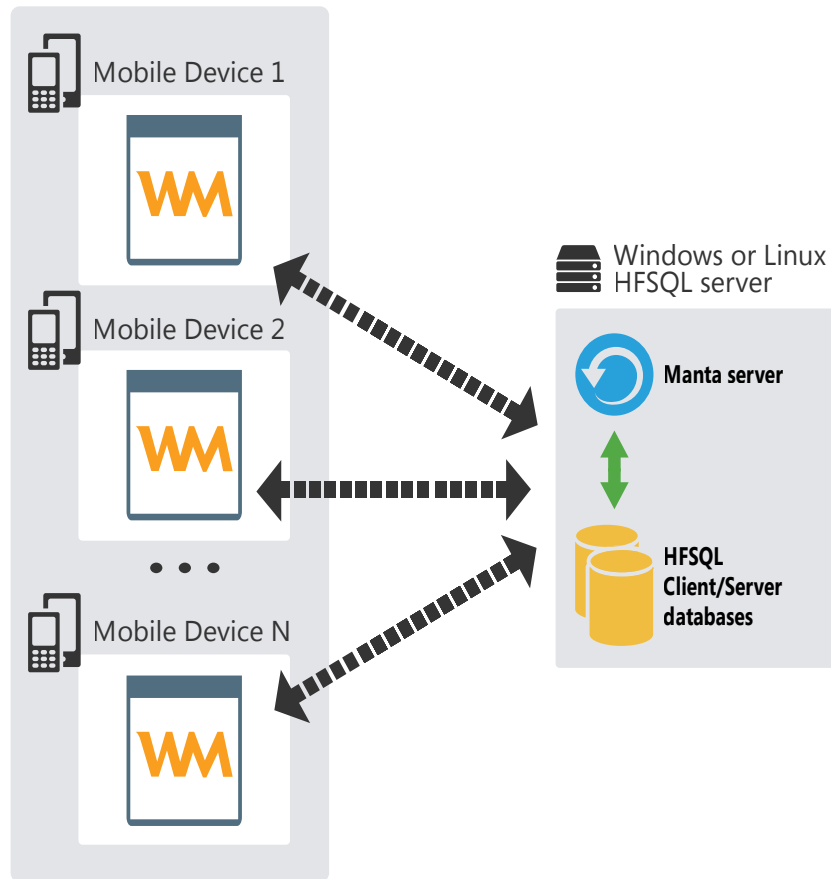
HFSQL Client/Server can be used on the Windows Mobile, iPhone, iPad, Android and Universal Windows 10 platforms.

HFSQL Cluster

HFSQL Cluster is an extension of the database model of HFSQL Client/Server. In a database cluster, all HFSQL servers contain a copy of databases and they are synchronized in real time.
• The read load can be balanced between the different servers.
• The physical configuration can evolve without any interruption for the client computers.
• If one of the servers crashes, the client is automatically redirected to an operating server.
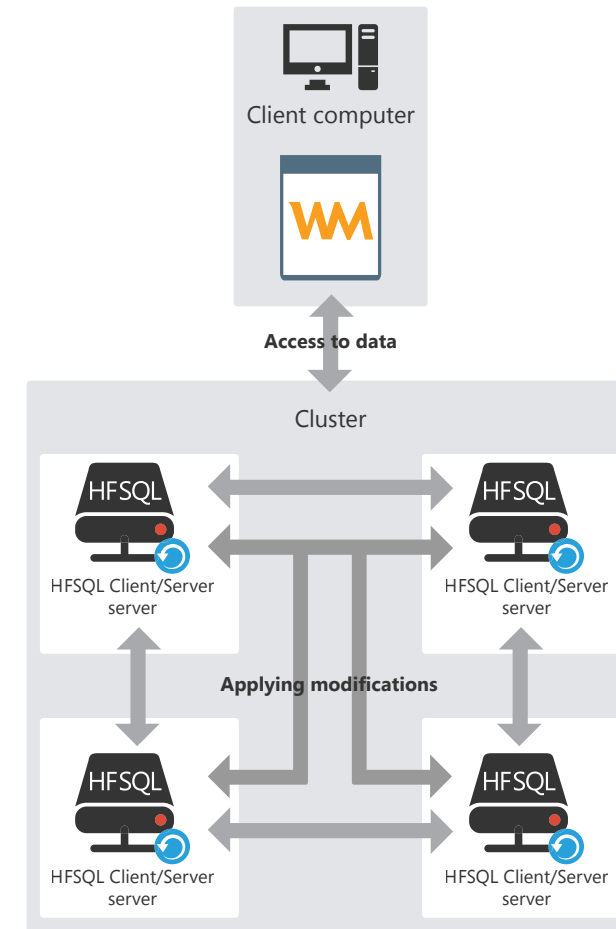
HFSQL Cluster can be used from the Windows Mobile, iPhone, iPad and Android platforms, ...

Creating HFSQL files: the physically created files

The data model editor is used to describe the structure of data files.

Depending on the information typed in the data model editor, different files are physically created.

Characteristics of the file (Analysis)	Files physically created
HFSQL Classic or Client/Server file	".fic" file — Data file
One or more search keys (unique or with duplicates)	".ndx" file — Index file
One or more full-text indexes	".ftx" file — Full-text index file
One or more "Memo" items	".mmo" file — Memo file
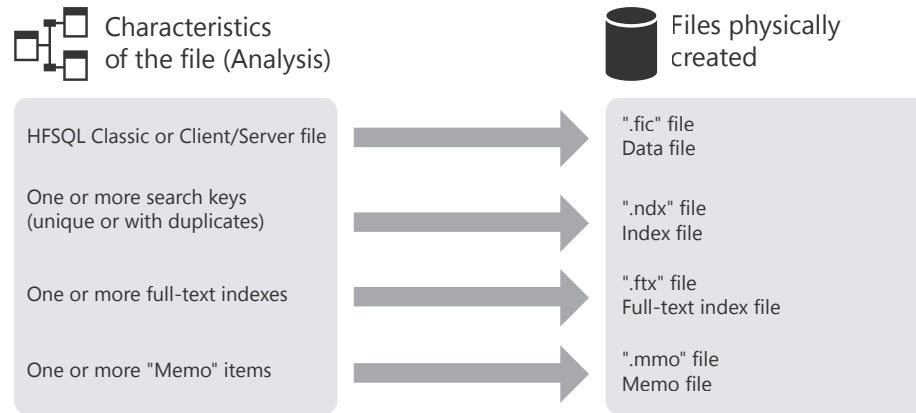
Associating controls with data

A window can display information coming from:
• a database: the controls are directly linked to the items of data files or queries available in the database.
• variables found in the application code (variables global to the window or to the project or parameters passed to the window).

To display this information in a window, the controls of this window must be linked to:
• the different database items.
• the available WLanguage variables.

The method for displaying and retrieving information is straightforward:
• The link between a control and an item or between a control and a variable is defined in the window editor when describing the control ("Link" tab).
• *ScreenToFile* is used to update the record or variable with the data displayed on the screen.
• *FileToScreen* is used to update the data displayed on the screen with the information saved in the data file or with the information saved in the variable.

Link between control and item

ScreenToFile   FileToScreen
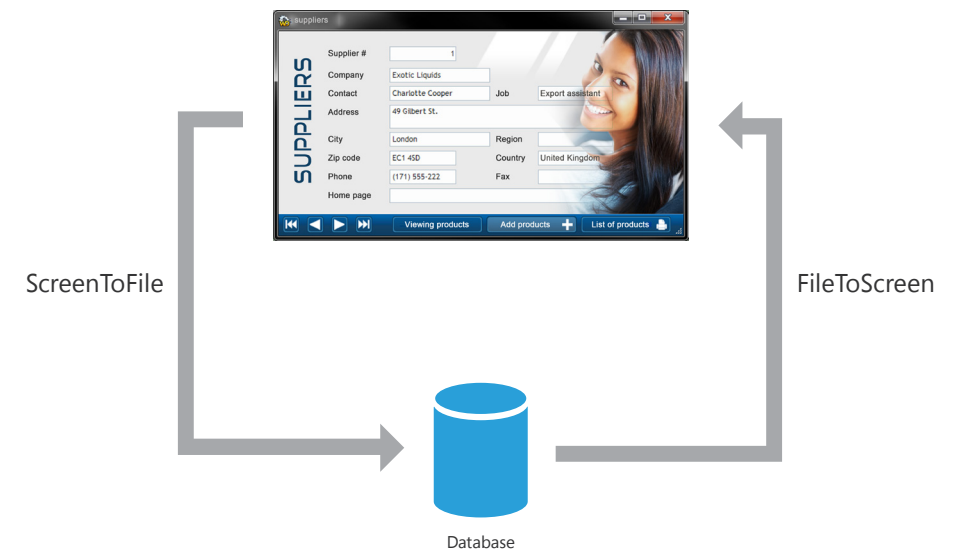
Database

Link between control and variable

ScreenToFile

FileToScreen

Linked variable

Simple control
Link with:
- Simple variable
- Instance of class or structure member
- Property of dynamic object

List box, Table, Combo box, ...
Link with:
- Array of classes or structures
- Advanced types (for example xlsRow, xlsColumn)
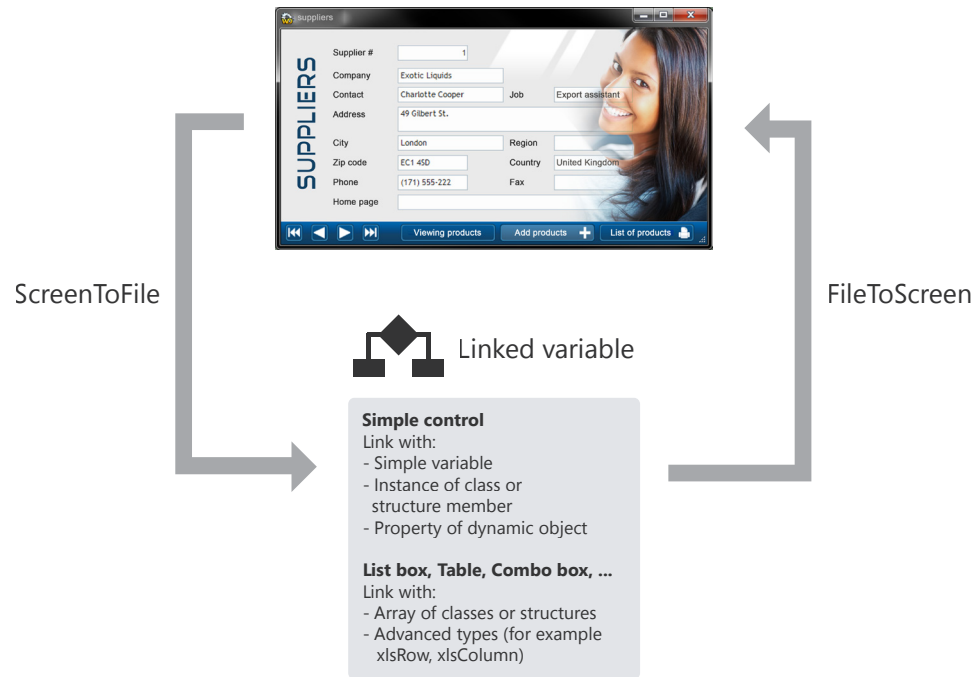
Note: The control/variable link is not available for the Android applications.

The queries

A query is used to interrogate a database to view, insert, modify or delete data. The query structure defines the data used.
A query can interrogate one or more data files.
The query editor allows you to easily create queries without programming.

Sources

Data coming from one or more files (HFSQL, Oracle, ...)

HFSQL

The result of a query can be used like a file

Possible uses

Windows and controls of a window

Reports

Programming (use in the WLanguage functions)
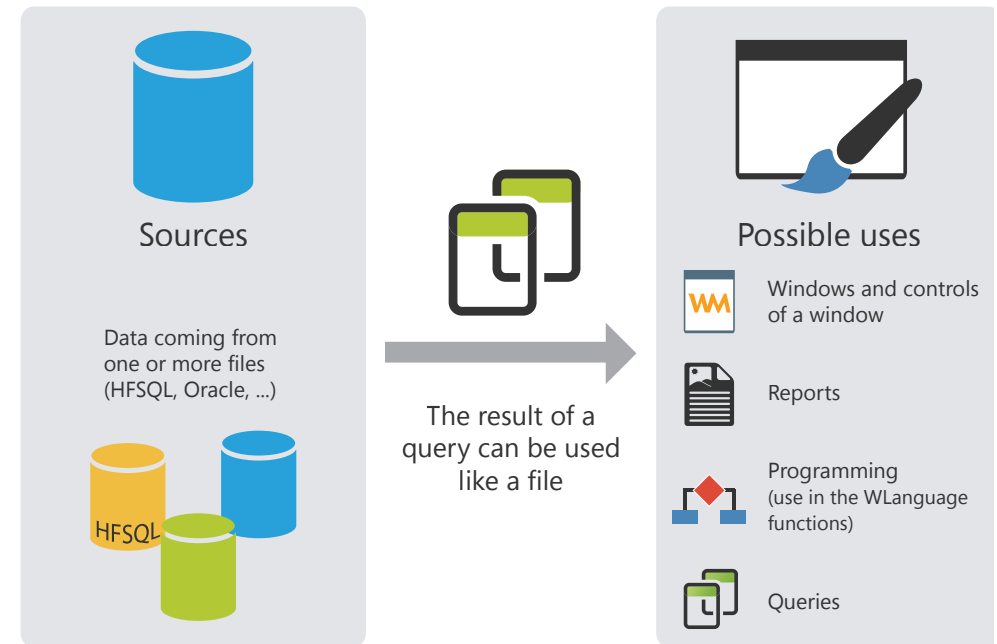
Queries

Note: In programing, a query can be handled like a data file. Especially, it can be associated with a display control (a Table control for example) that will present the data returned by the query.

The embedded queries

The controls found in a window can be linked to a data file or to an existing query, … These controls can also be linked to a query created when building the control.

Embedded query:
MyWindow_1$Query

Embedded query:
MyWindow_2$Query
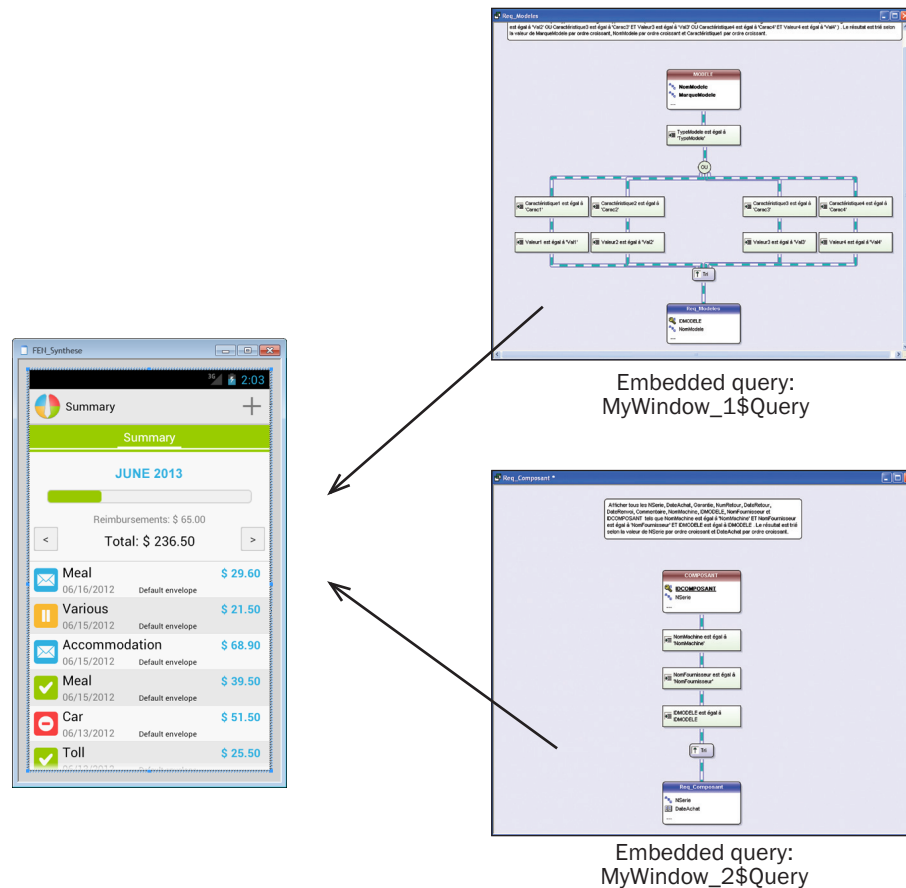
In this case, the query is integrated in the window. It is found in the WDW file corresponding to the window. If the WDW file is copied (into another project for example), the embedded queries used by this window will also be copied.

The Table/Looper controls

The Table/Looper controls can be used to display a set of information (the content of a data file for example). The content of these controls can come from different sources:
• Browsing Table/Looper control with direct access
• Memory Table/Looper control
• Browsing Table/Looper control loaded in memory

Note: These three fill modes will be presented in details for the Table control. The same concepts apply to the Looper control.

Browsing Table control with direct access

A browsing Table control with direct access is used to directly display data coming from a data file, a query or an array variable. Browsing the data file allows you to display data in the Table control. The data file is read for each row displayed: the record read is displayed in a row of Table control.

Customer file
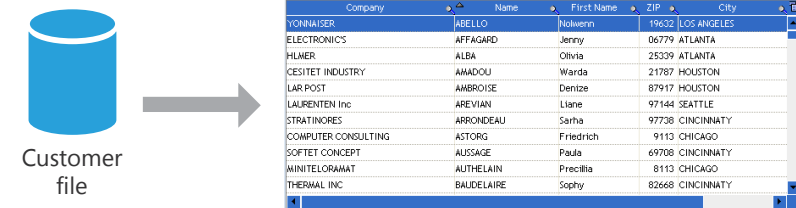
The displayed data that is not linked to the data file is not kept when displaying the row (value of a Check Box column for example).

The WLanguage functions starting with "Table" are used to handle the browsing Table controls with direct access. Adding or deleting a row into/from the Table control triggers the addition or deletion of the record in the linked data file.

Memory Table control

A memory Table control is used to directly display the data loaded in memory. The data is added into the Table control by programming (by *TableAddLine* for example).
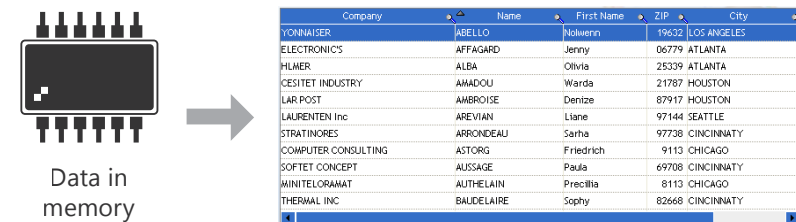
Data in memory

The data being found in memory, the Table control allows you to perform all the operations on the data (sort on any column, search performed in the columns, …).

Browsing Table control loaded in memory

The browsing Table controls loaded in memory combine the benefits of browsing Table controls with the benefits of memory Table controls.

The Table control is linked to the data file but the content of the data file is entirely loaded in memory. The sort and the search are available for all the columns.

The data that is not linked to the data file is kept when handling the scrollbar of the Table control (Check Box column for example).

The records found in the data file being loaded in memory, this type of Table control is recommended for the data files containing less than 100 000 records (to avoid memory overflow).

Customer
file

File loaded
in memory

Company	Name	First Name	ZIP	City
YONNAISER	ABELLO	Nolwenn	19632	LOS ANGELES
ELECTRONIC'S	AFFAGARD	Jenny	06779	ATLANTA
HLMER	ALBA	Olivia	25339	ATLANTA
CESITET INDUSTRY	AMADOU	Warda	21787	HOUSTON
LAR POST	AMBROISE	Denize	87917	HOUSTON
LAURENTEN Inc	AREVIAN	Liane	97144	SEATTLE
STRATINORES	ARRONDEAU	Sarha	97738	CINCINNATY
COMPUTER CONSULTING	ASTORG	Friedrich	9113	CHICAGO
SOFTET CONCEPT	AUSSAGE	Paula	69708	CINCINNATY
MINITELORAMAT	AUTHELAIN	Precillia	8113	CHICAGO
THERMAL INC	BAUDELAIRE	Sophy	82668	CINCINNATY

Notes:
These different fill modes are also available for the List Box and Combo Box controls.

The Table control is not available in the Universal Windows 10 apps applications. Only the Looper control can be used.

Synchronizing data

WINDEV Mobile allows you to synchronize the records used by several applications.

The two applications manage the same data independently of each other. During the synchronization, the modifications performed in the database used by the PC are automatically applied to the mobile device (and conversely).

This synchronization is automatically performed by:
- **ActiveSync** when the Mobile Device (Pocket PC) is connected to the Windows PC (Windows Mobile only). **From Windows Vista**, "ActiveSync" was replaced by the "Manager for Windows Mobile devices".
- the **Universal Replication** when the mobile device is connected (or not) to the Windows PC.

ActiveSync (or the manager for Windows Mobile devices)

ActiveSync allows you to update the databases of same format used both by a WINDEV application and a WINDEV Mobile application.

The synchronization can be adapted to special cases. For example, you have the ability to retrieve the records regarding a specified product or the records created at a given date, manage the conflicts, display a configuration window, ...

These changes must be done by programming in a set of procedures called "WDSynchro. wdg". This set of procedures is supplied in example with WINDEV Mobile.

Note: No programming is required to perform a full synchronization.
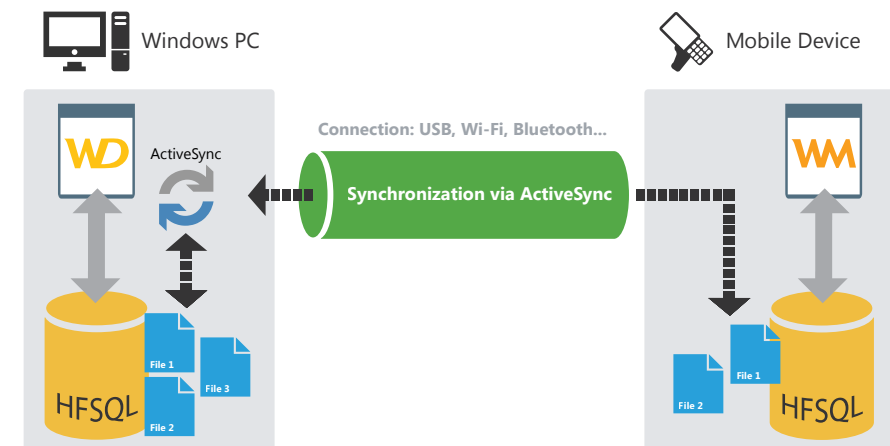
Universal replication

The universal replication is used to update databases (with the same or different formats) used by several applications. You can for example perform a synchronization between a HFSQL Mobile database and an Oracle Lite database.

The universal replication is using a centralized model: all the databases are synchronized with a master database. Then, the master database applies the modifications to the other databases.
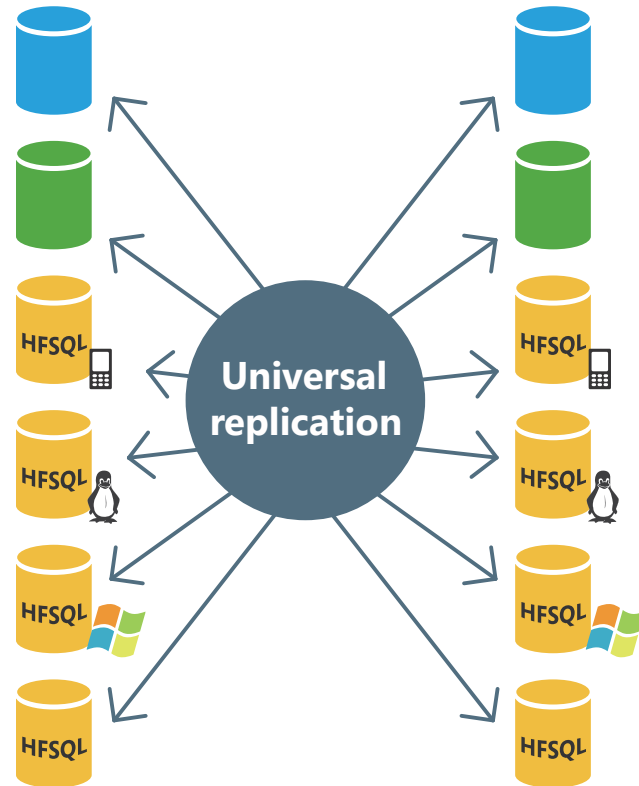
The synchronization can be adapted to special cases. For example, you have the ability to retrieve the records regarding a specified product or the records created at a given date, manage the conflicts, display a configuration window, ...

These changes must be done by programming via *HRplFilterProcedure*.

3-tier

The purpose of 3-tier programming is to separate the 3 standard "layers" of an application: GUI, processes and data.

Therefore, an application will include 3 separate tiers:

- a presenter layer,
- an application layer,
- a layer for data access.

The reason for separating the layers is to simplify the maintenance and the future evolutions of the application. This provides better security because the access to the database is allowed via the processes layer only. It also optimizes the teamwork and the multi-target development.

WINDEV 23
Mobile
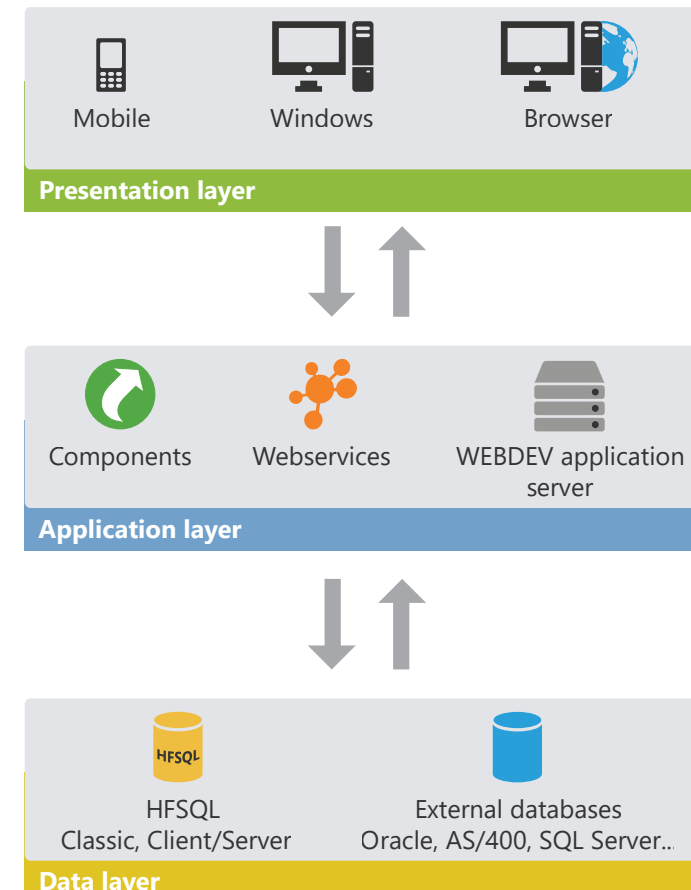
PART 4

Advanced concepts

Windows generated by RAD

The RAD (Rapid Application Development) is used to create windows from:

- the analysis linked to the project,
- skin templates.

The generated windows contain the necessary source code. The test of these windows can be immediately run with the data found on the development computer.
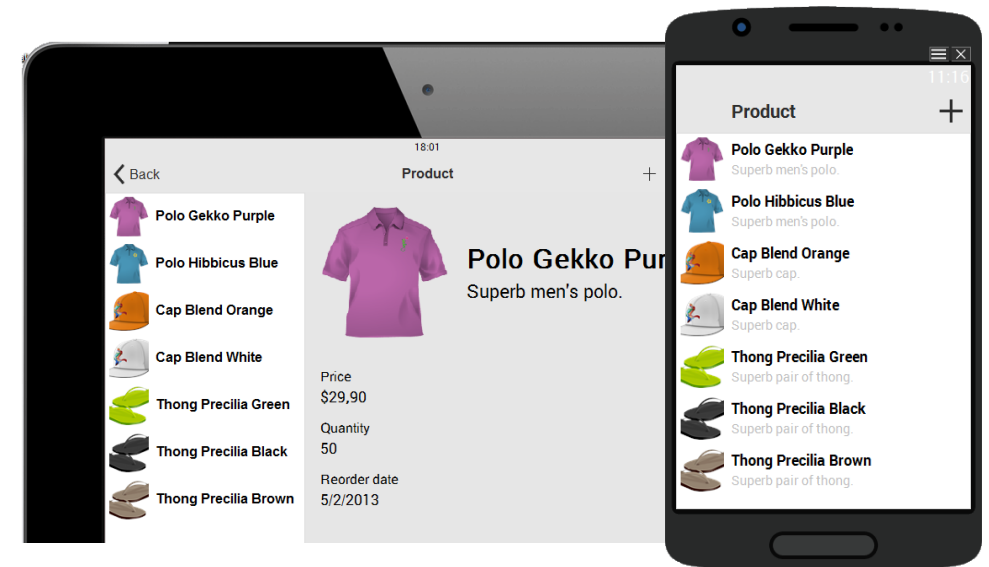
Note: For the Windows Mobile applications, the RAD can be used to entirely create the application (with or without code).

Multilingual application

A multilingual application is an application that can be distributed in several languages. WINDEV Mobile takes into account the different application languages during the entire application development.

The main steps for developing a multilingual application are as follows:

1 Choose the languages

- Project
- Analysis

2 Translate the project elements

- Direct translation
- Translation via WDMSG, WDINT, WDTRAD, ...

3

Programming

- Choose the application language (**Nation** function)
- Choose the character set (**ChangeCharset** function)
- Choose the keyboard language (**ChangeKeyboard** function)

Data files

- Choose the character set (**ChangeCharset** function)
- Take the character set into account when creating the files (**HCreation*** function)
- Take the character set into account when reindexing (**HIndex** function)

4 Executable ⚙

Choose the library languages

5 Setup program

- Available languages
- Translate the setup program

Test of WINDEV Mobile application

The test of the entire project is used to simulate the start of the application by the executable. This allows you to run the test of the entire application, even if its development is not finished yet.

Several types of project tests are available in WINDEV Mobile:

- **Test on the development computer.** This test simulates the mobile device on the development computer. No connection to a device is required during this test. This test allows you to use the debugger. However, this test being run on a PC and not on the real mobile device, some differences regarding the application behavior may be noticed.

- **Direct test on the mobile device connected to the development computer.** In this case, the executable corresponding to the project is created, copied onto Mobile Device (Pocket PC or Android device) and run. When running the program on Mobile Device, the Mobile Device can be disconnected from PC. The debugger is not available.

- **Test on Android emulator.** The Android SDK is supplied with an emulator of Android device. The application test can be run in the emulator. This option does not require a real Android device to run the tests but it provides a more faithful execution than the "simulator" mode.

- **Test on iPhone/iPad simulator.** The test of the iOS application can be directly run on Mac when compiling the project in Xcode. This option does not require a real iPhone or iPad device to run the tests but it provides a more faithful execution than the "simulator" mode.

- **Real test (PC or mobile device).** The test of Universal Windows 10 App application can be run on a Windows 10 computer. This option allows you to run your project in tile mode, from Windows 10. The Universal Windows 10 App application is automatically generated.

- **Test and debug on the Mobile Device (Pocket PC) connected to the development computer.** This test allows you to use the debugger even though it is run on the Mobile Device directly.

Debug modes

Two different modes are available for debugging a WINDEV Mobile application:

Debugging in the simulator

This mode starts the application in a device simulator. However, the application is run by the PC itself in the Windows environment.

This mode is used to quickly debug a new function or to check an algorithm but it presents differences of behavior with the real device:

• the file paths are the ones of Windows,

• the character strings are in ANSI format and not in Unicode format,

• the functions specific to the mobile devices (SMS for example) are not available.

Debugging on the mobile device

This debug mode allows an operating mode of the application that is closer to the real application as the debugger runs the application on the real mobile device. All the specific functions can be used (except for the ones that require digitally signed executables).

This mode is slightly slower than the simulator. Indeed, it adds to the execution a communication phase between the development environment and the debugger found on the device.

This mode requires a mobile device connected to the development computer.

Unit tests

The unit tests (also called automatic tests) are used to run the test of windows, procedures and classes found in an application during the entire development.

To do so, select (or create) the test scenario that will be run.

These scenarios are generated in WLanguage and they can be directly modified.

These scenarios are grouped in the test editor. The test editor examines the result of unit tests and it calculates the validation rate of application.
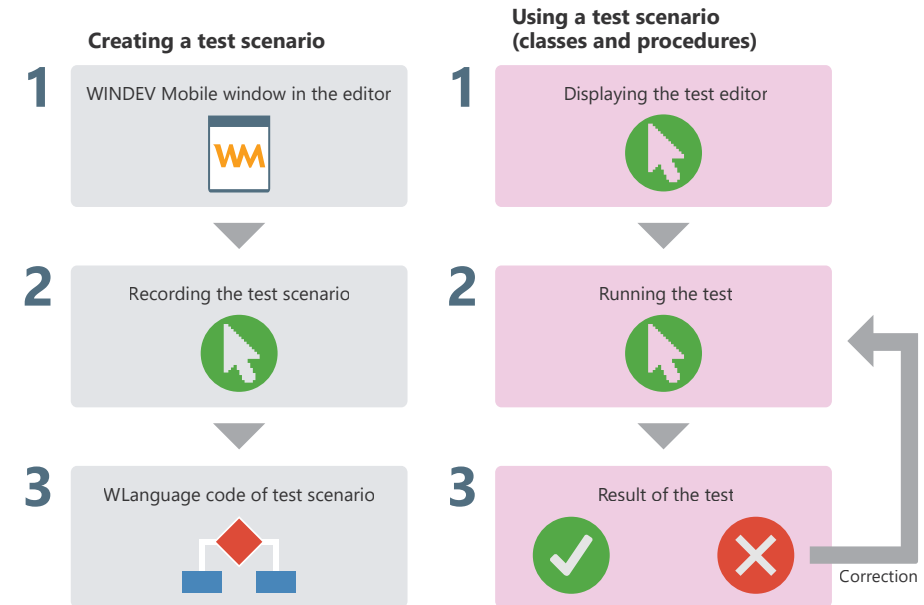
To create a unit test on the current window, on the "Automatic tests" pane, in the "Tests" group, expand "New" and select "Save a new test".

To create a unit test on a procedure or on a class, select this procedure or this class in the "Project explorer" pane and select "Unit tests .. Create a unit test" from the popup menu.

PART 5

WINDEV / WINDEV Mobile Interactions

WLanguage functions

Most of the WLanguage functions found in WINDEV are available in WINDEV Mobile. These functions are common to the two products.

The functions specific to Windows are not available in WINDEV Mobile because of the differences between Windows and the different systems available on the mobile device (Windows Mobile, Android, iOS, ...).

On the contrary, some functions specific to the mobile devices are proposed with WINDEV Mobile only.

The following diagram presents some WLanguage functions that can be used according to the type of application developed:

WINDEV Mobile functions only

Functions that can only be used on Mobile Device (for example, management of SIM card)

Common functions

for example, HReadFirst, FileToScreen, ExtractString...

WINDEV functions for Windows only

Functions not available due to limitations of the Mobile Device
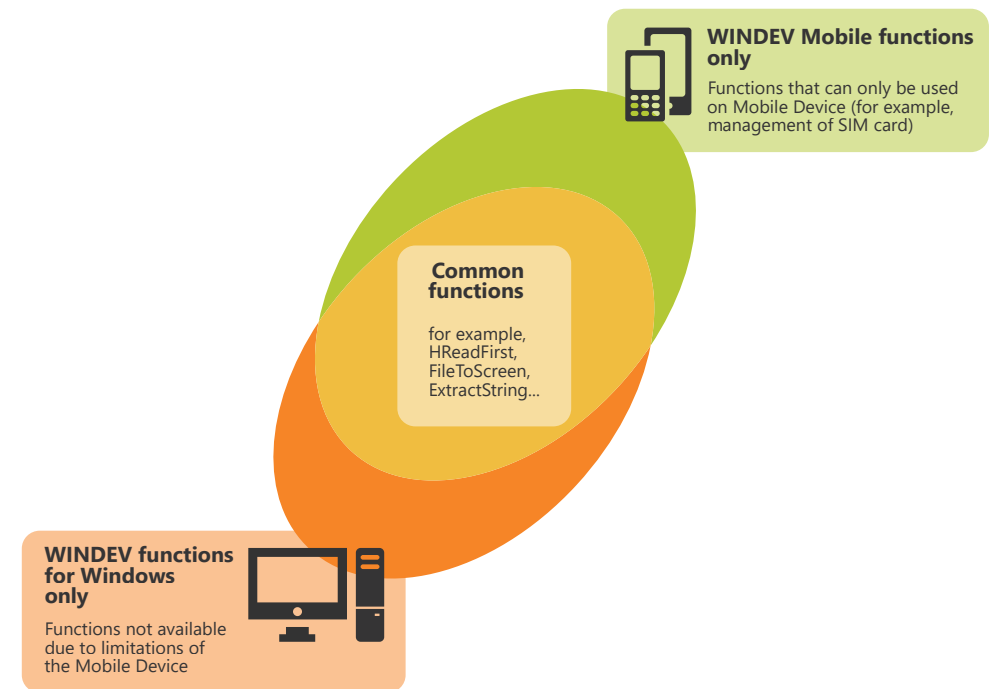
Handling character strings

Different formats of character strings are available:

The UNICODE format is used to describe a very large set of characters by representing each letter on several bytes. All the characters found in the most common character sets can be represented in a single set. Each character includes a unique identifier. This format allows you to simultaneously handle characters coming from different character sets. The "UNICODE" term does not defines the method for coding characters. Several "transformations" are available for encoding the texts among which the most common are UTF-8 and UTF-16.

The ANSI format represents each character on one byte. This format can encode 256 characters in the Indo-European character sets. This format is used to represent all character sets. However, a single character set can be used at a time.

Character strings in Windows Mobile

In most cases, the Windows Mobile applications handle the character strings in UNICODE/UTF-16 format. In this format, each character is encoded on 16 bits (2 bytes).
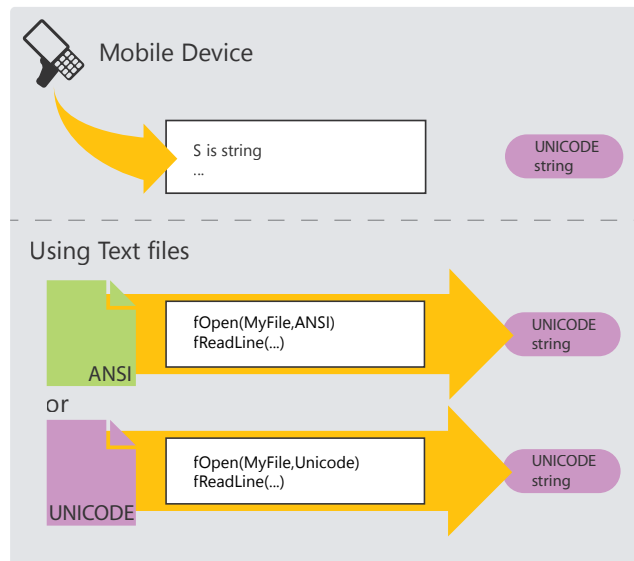
In Windows Mobile, when using text files containing character strings in ANSI format, WINDEV Mobile automatically converts these character strings into UNICODE/UTF-16 format. This conversion is performed even if the opening of this file in ANSI format is explicitly requested.
This conversion is completely transparent.

Character strings in Android

In Android, the character strings are handled in Unicode/UTF-8 format.

Reminder: Character string in Windows PC

The Windows applications for PC handle the character strings in ANSI or UNICODE format. On a PC, the text files can be opened in ANSI format and in UNICODE format. No conversion is performed by default.
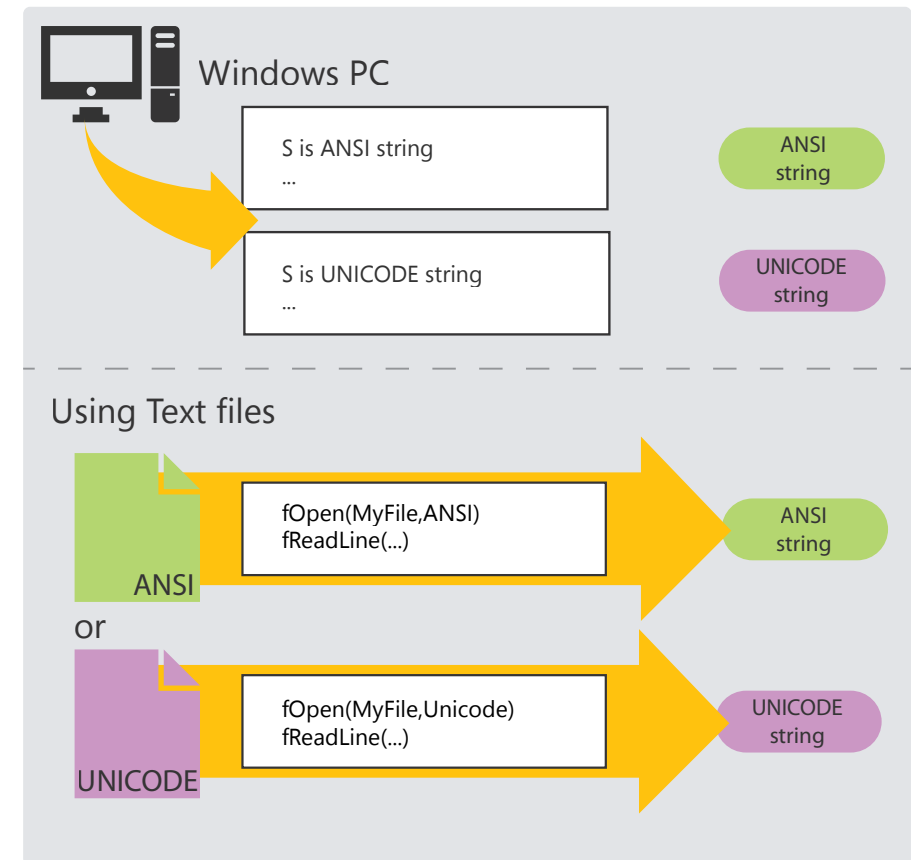
The method for programming the character strings is the same in WINDEV and in WINDEV Mobile (with very few exceptions). WINDEV automatically performs the necessary conversions.

PART 6

Setup

Installing an Android or iOS application

Several methods can be used to install a WINDEV Mobile application:

- **Setup in APK format.** This setup program is run on the Android device.
- **Setup via Play Store**.

- **Compilation in Xcode on Mac.** The compilation in Xcode is used to create the executable application on iPhone or iPad.
- **Setup:**
  - **by App Store**
  - **via an In-House network**
  - **via an Ad-Hoc network**

- **Setup via Windows Store**
- **Direct setup on a phone**
- **Setup on a tablet**

- **Setup in CAB format.** This setup program is run on a Windows Mobile device.
- **Setup in MSI format.** This setup program is run on a PC running Windows connected to a Windows Mobile device.
- **Setup by direct copy** of executable from the PC to the Windows Mobile device.

The different types of setup

Setup in APK format

This setup consists in:
- generating the application on the development computer.
- signing the APK file digitally. a self-signed key can be used.
- copying the APK file onto an Android device.
- running the APK file on the Android device. This action triggers the setup of the application.

To run the application, all you have to do is choose its icon from the "All programs" menu.

Setup via Play Store

Play Store (formerly Android Market) is an application proposed by Google. Play Store presents applications for Android that can be purchased or downloaded from a unique setup interface included in the Android devices.

This setup consists in:
- generating the application on the development computer.
- signing the APK file digitally. For a deployment on Play Store, we recommend that you use a real key signed by a recognized trusted authority.
- uploading the APK file onto the Web site of Play Store. you must register on the site beforehand.
- the users of the application will only have to install the requested application from the "Play Store" application of their Android device.

To run the application, all you have to do is choose its icon from the "All programs" menu.

Setup via App Store

iOS

App Store is an application proposed by Apple. App Store presents applications for iPhone and iPad that can be purchased or downloaded from a unique setup interface and included in the Apple devices.

This setup consists in:
- generating the application on the development computer.
- preparing the images required for the deployment.
- compiling the application in XCode.
- saving the application in "iTunes Connect".
- compiling the application in XCode.
- uploading the application on the App Store.
- the users of the application will only have to install the requested application from the "App Store"application of their Apple device.

To run the application, all you have to do is choose its icon from the "All programs" menu.

Setup by adhoc and in-house

iOS

This type of deployment allows you to distribute your application on an iPhone or iPad device.
Most of the operations will be performed on the Web, then in the "Apple developer center", then in the XCode compiler on a Mac.

Depending on your iOS development license, you will have the ability to perform one of the following setups:
- adhoc, for installing the application on several devices (up to 100).
- in-house, to install an application on all the devices belonging to the company. The application will be distributed either via a private Web server of the company, or by iTunes.

Setup by Windows Store

Windows Store is an application proposed by Microsoft. Windows Store presents Universal Windows 10 App applications that can be purchased or downloaded from a unique setup interface and included in the devices running Windows 10.
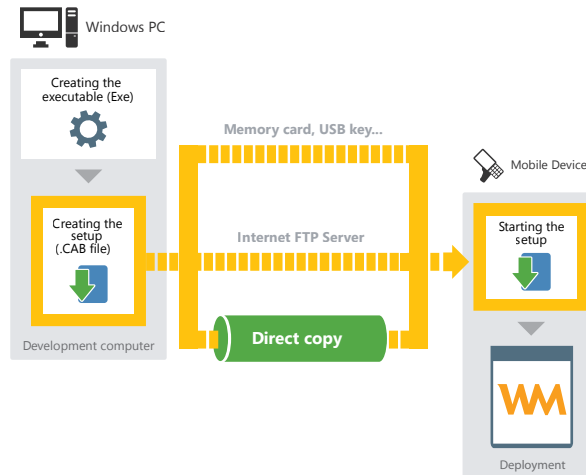
This setup consists in:
- generating the application on the development computer.
- uploading the application on the Web site of Windows Store. you must register on the site beforehand.
- the application users will only have to install the requested application from the "MarketPlace" application of their Windows 10 device (tablet, PC or phone).

To run the application, all you have to do is choose its icon from the menu of applications.

Setup in CAB format

This setup consists in:
- generating the application executable on the development computer via WINDEV Mobile.
- generating the setup program of application on the development computer. This setup program corresponds to a ".CAB" file.
- copying this setup program onto the Windows Mobile devices of end users.

- running this setup program on the Windows Mobile devices. This program installs all the files required by the application.

To use this application, start the application on the Windows Mobile device (via the shortcut created in the "Start" menu).

Setup in MSI format

This setup consists in:
- generating the application executable on the development computer.
- generating the setup program of application on the development computer. This setup program corresponds to a ".MSI" file.
- distributing this setup program to end users.
- running this setup program on PCs. Note: If no Windows Mobile device is connected, the setup will be performed during the next synchronization between the PC and the Windows Mobile device.
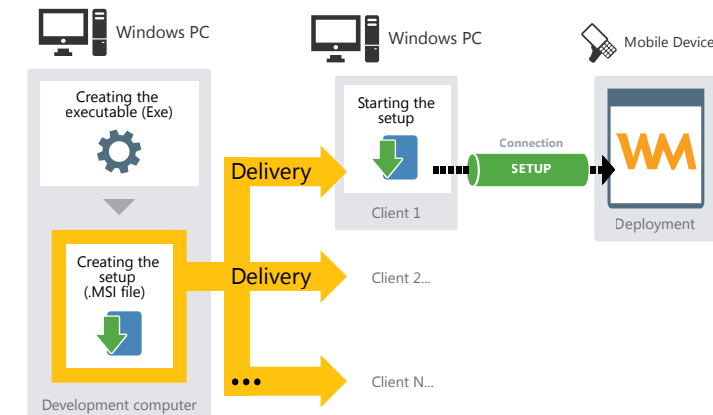
Setup by direct copy

This setup consists in:
- generating the application executable on the development computer.
- copying this executable onto the Windows Mobile device connected to the PC.

To use this application, run this executable on the Mobile Device (double-click the ".EXE" file for example).

DEVELOP 10 TIMES FASTER
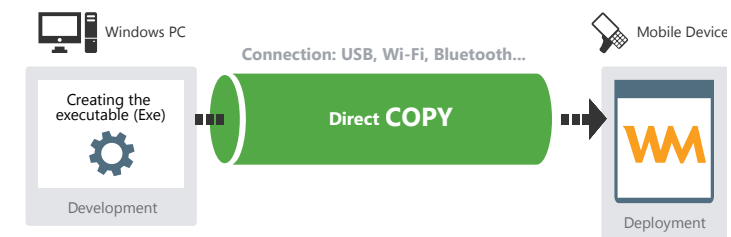
PART 7

Communication

Communication with WINDEV Mobile

WINDEV Mobile proposes several communication functions in several fields. These functions allow you to:
- manage emails (POP3, IMAP and SMTP protocols),
- use FTP (file transfer),
- perform HTTP and HTTPS requests,
- use the telephony,
- perform SOAP queries (to access SOAP, J2EE or.Net Webservices),
- manage SMSs,
- use TCP sockets (with automatic use of the SSL protocol), UDP sockets,
- use Infrared or Bluetooth sockets.

The availability of these functions depends on the features of the device that runs the application.

Some examples

1. Communication by Infrared
Communication by infrared is performed via the Socket functions (*SocketConnectInfrared*, *SocketCreateInfrared*, ...). Therefore, the Windows Mobile devices or the Android devices can communicate with all types of devices.

Mobile Device 1

Mobile Device 2

Contact application

Contact application

Creating the socket
(**SocketCreateInfrared** function)

Connection to the socket
(**SocketConnectInfrared** function)

Communication
by infrared
(**SocketRead, SocketWrite, ...** functions)
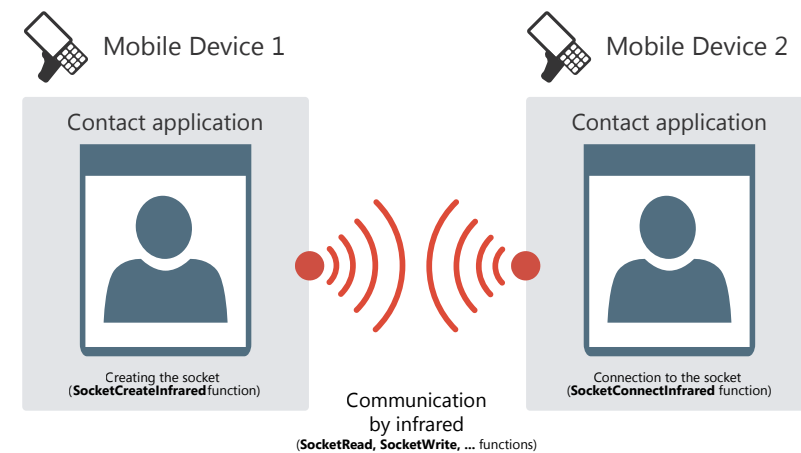
2. Communication by Wi-Fi

The communication by Wi-Fi can be used to transfer files by FTP for example.
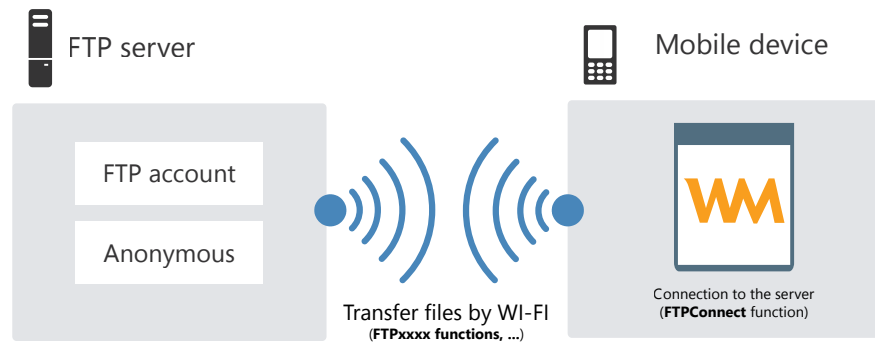
3. Communication by mobile network (3G, ...)

The communication by mobile network can be used to access a remote HFSQL database via Internet for example.
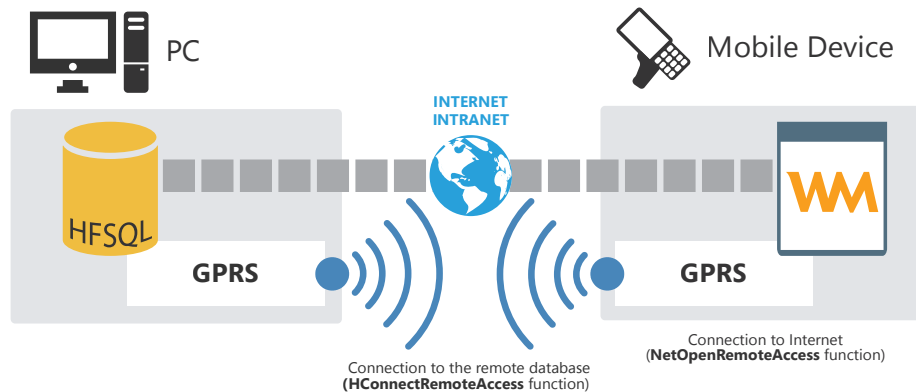
Managing the emails (POP3/IMAP/SMTP)

The POP3/IMAP and SMTP protocols are protocols for email management recognized by all the service providers. These protocols allow you to communicate with the email server available at your ISP.

Notes:
- The POP3 and IMAP protocols are used to receive emails.
- The SMTP protocol is used to send emails.
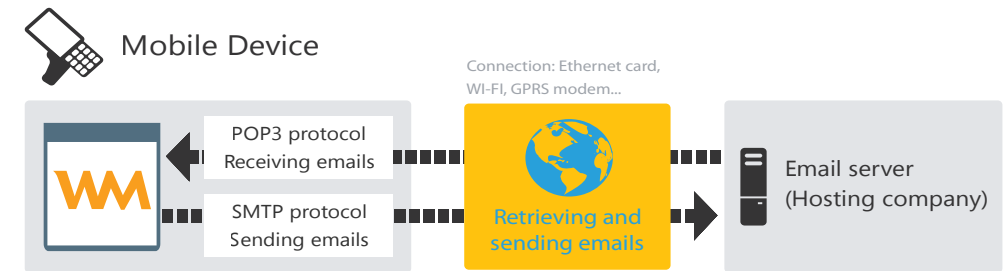
Principle

1. Connect the Windows Mobile device to a PC (required if it is not natively equipped with an Internet access).
2. Connect to the Internet service provider (if necessary).
3. Start an email session with *EmailStartSession*.
4. Send and read the messages.
5. Close the messaging session with *EmailCloseSession*.

Handling files on an FTP server

The FTP (File Transfer Protocol) is a protocol used to transfer files from a site to another remote site. This protocol is used to exchange files by TCP/IP, Internet Wi-Fi or ActiveSync. Several thousands of file servers can be accessed by FTP on Internet. These servers propose shareware or freeware accessible to the public.

Several WLanguage functions allow you to manage files on an FTP server from your WINDEV Mobile applications.

Transferring files by direct link between a Mobile Device and an FTP server by Wi-Fi:

FTP server

Mobile device

FTP account

Anonymous

Transfer files by WI-FI
(**FTPxxxx functions, ...**)

Connection to the server
(**FTPConnect** function)
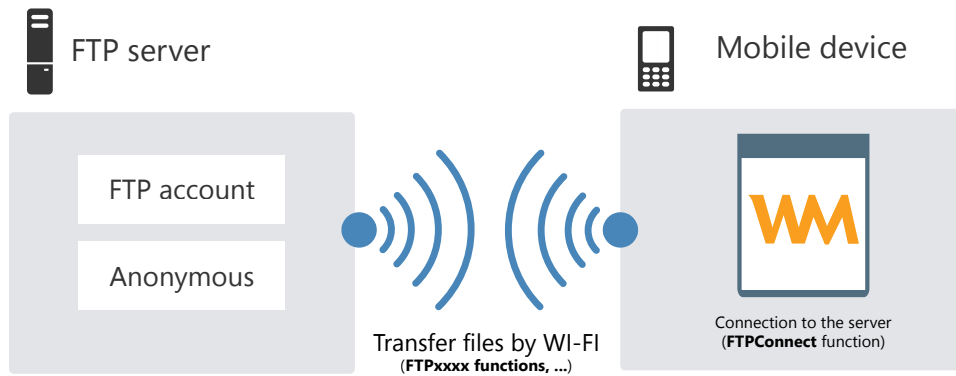
Transferring files by Internet:

FTP server

Mobile device

FTP account

Anonymous

INTERNET INTRANET

PC

Connection: USB, Wi-Fi, Bluetooth...

Retrieving files
FTPGet function
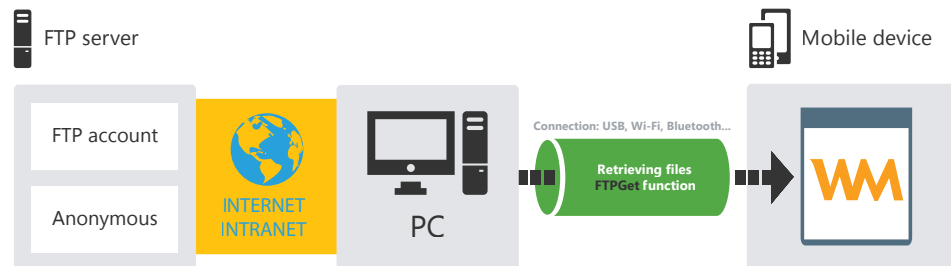
Managing SMSs

With the WLanguage functions, WINDEV Mobile allows you to:
- send SMSs.
- browse the incoming SMSs.
- delete one or more incoming SMSs.

An SMS (Short Message Service) is a text message (up to 160 characters) sent on a cell phone.

To use the SMS functions, the application for Mobile Device (Pocket PC) must be installed:
- on a Mobile Device (Pocket PC) equipped with a phone access (GSM type).
- on a Smartphone.

Mobile device

Cell phone Smartphone, ...

SMS Application

2 Sending the message
(**SMSSend** function)

SMS

1 Creating the message
(SMS structure)

3 Receiving and browsing the messages
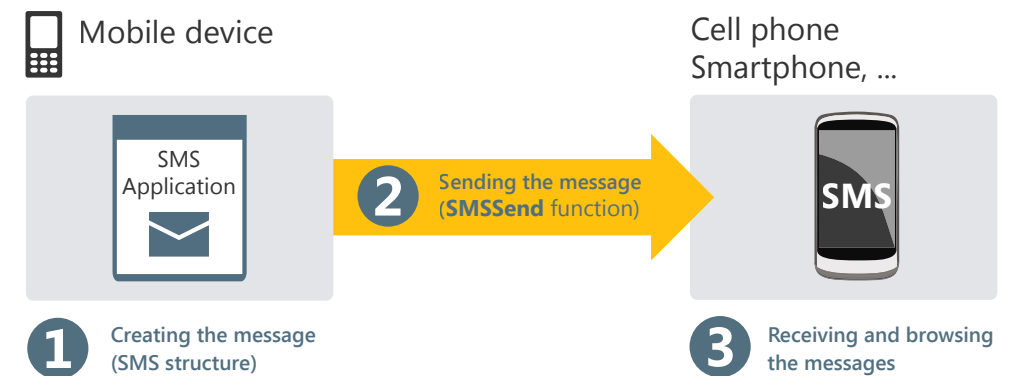
Specific features of Windows Mobile

Managing the keyboard in Windows Mobile

To allow the users of your applications to type data, the keyboard of Mobile device must be used (also called SIP for "Software Input Panel"). This keyboard is used to:

- display a miniature keyboard at the bottom of screen. The user clicks this keyboard with the stylus to type information:

- automatically recognize the different words written on the screen with the stylus (method called "Transcriber").
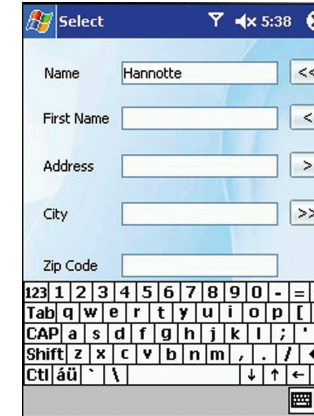
- automatically recognize the letters entered in a specific character set (method called "Letter recognizer"):

- automatically recognize the blocks of words entered in a specific character set (method called "Block recognizer"):
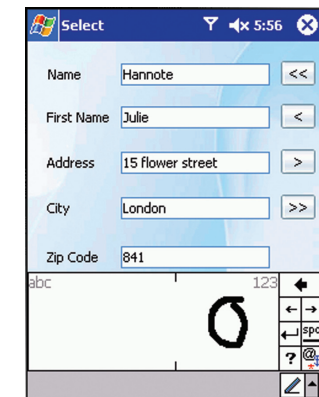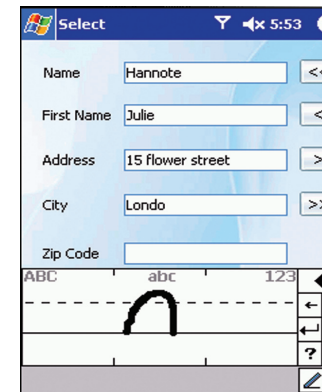
WINDEV Mobile allows you to easily manage this keyboard via the WLanguage functions (*SIPXXX* functions).

File picker in Windows Mobile

File picker

In Windows Mobile, *fSelect* is used to select a file found:
- in the "\My Documents" directory or in one of its sub-directories.
- in a directory found on a storage card.

Picker title   Source directory

Type of files displayed in the file picker

Files present in the source directory

File selected by default
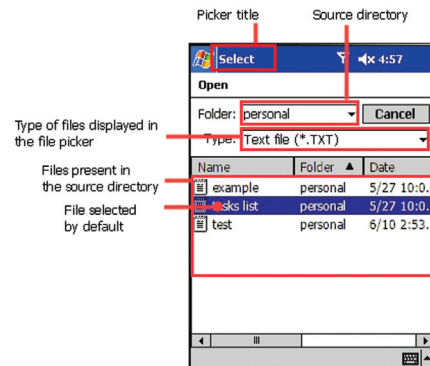
Path of directories and files

The method for managing directories differs on a Windows computer and on a mobile device.
In Windows, the paths have the following format: "C:\My Documents\My File.txt".

In Windows Mobile, the paths have the following format: "\MyDocuments\MyFile.txt". There is a single tree structure and the notion of drive does not exist.
Note: The notion of current directory does not exist in the Windows Mobile operating system. Therefore, functions handling the current directory (*fCurrentDir* for example) are not available in WINDEV Mobile and the file paths must always be absolute paths.

Standard CEDB database

The standard applications

The devices in Windows mobile are supplied with a set of standard applications that handle the standard CEDB databases.

These databases correspond to the databases found by default on the device. These databases contain the "Tasks", "Contacts" and "Calendar" data files, ...

These databases can be handled by a WINDEV Mobile application.

Mobile Device

Databases of standard applications

Calendar   Notes

cdbxxx functions (read, write)
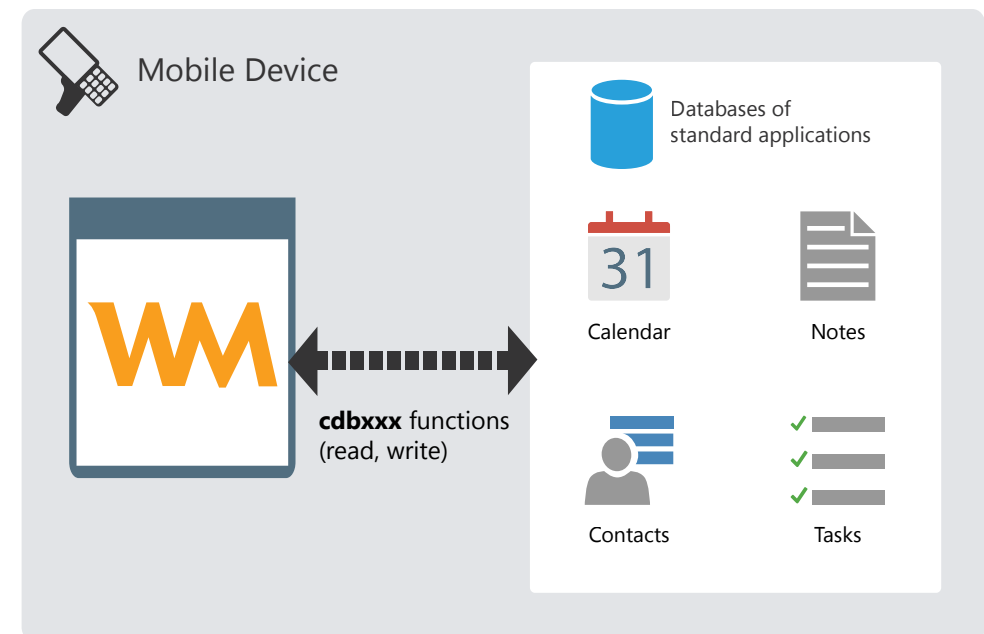
Contacts   Tasks

Handling a standard database found on the Mobile Device (from a PC)

A standard database (containing the data files for managing tasks, contacts, ...) is found on the Mobile Device (Pocket PC). This database can be handled by a WINDEV Mobile application.

If you own WINDEV, you also have the ability to create a WINDEV application used to handle this standard database found on the Mobile Device (Pocket PC).

These operations are performed via the *cdbXXX* functions.

The synchronization between the database found on Mobile Device (Pocket PC) and the data viewed via Outlook is performed by ActiveSync.
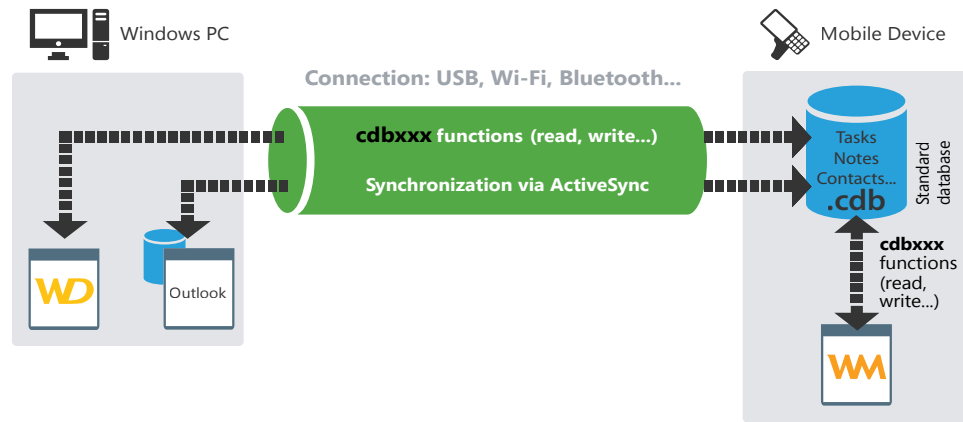
Note: To handle a Mobile Device database (Pocket PC) from a WINDEV application, the Windows PC must be connected to the Mobile Device (*ceConnect* function).

Handling custom CEDB databases

CEDB database

The custom CEDB databases correspond to Access databases (".MDB" file) previously exported from a PC.

When an Access database (".MDB" file) is copied onto a Mobile Device (Pocket PC) from the file explorer, this database is automatically changed into a CEDB database (".CDB" file).

Handling a CEDB database from the Mobile Device (Pocket PC).

A CEDB database can be handled by a WINDEV Mobile application. These operations are performed via the *cdbXXX* functions.

Handling a CEDB database from the Windows PC

If you own WINDEV, you also have the ability to create a WINDEV application used to directly handle a CEDB database found on the Mobile Device (Pocket PC). These operations are also performed via the *cdbXXX* functions.

Note: To handle a database found on a Mobile Device (Pocket PC) from a WINDEV application, the Windows PC must be connected to the Mobile Device (*ceConnect* function).

Synchronizing a CEDB database with an Access database

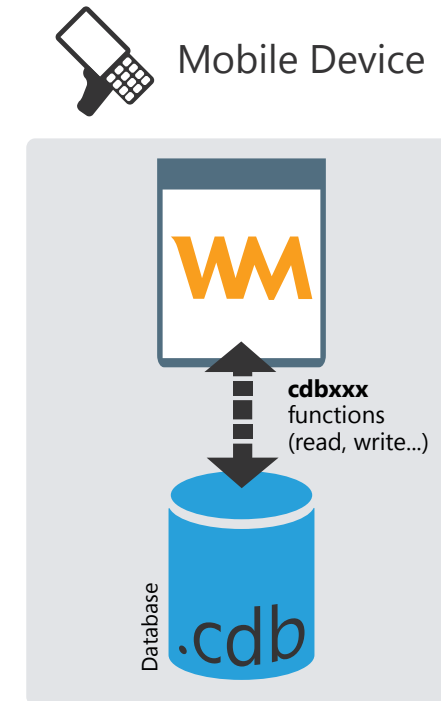An Access database (".MDB" file) is found on the Windows PC. This database is exported to the Mobile Device (Pocket PC): ActiveSync automatically transforms it into a database for Mobile Device (".CDB" file).

This database for Mobile Device (Pocket PC) can be handled by a WINDEV Mobile application.

If you own WINDEV, you also have the ability to create a WINDEV application used to handle the database found on the Mobile Device (Pocket PC).

These operations are performed via the *cdbXXX* functions. The synchronization between the database found on the Mobile Device (Pocket PC) and the Access database is performed by ActiveSync.

Notes:
- To handle a database for Mobile Device (Pocket PC) from a WINDEV application, the Windows PC must be connected to the Mobile Device (*ceConnect*).
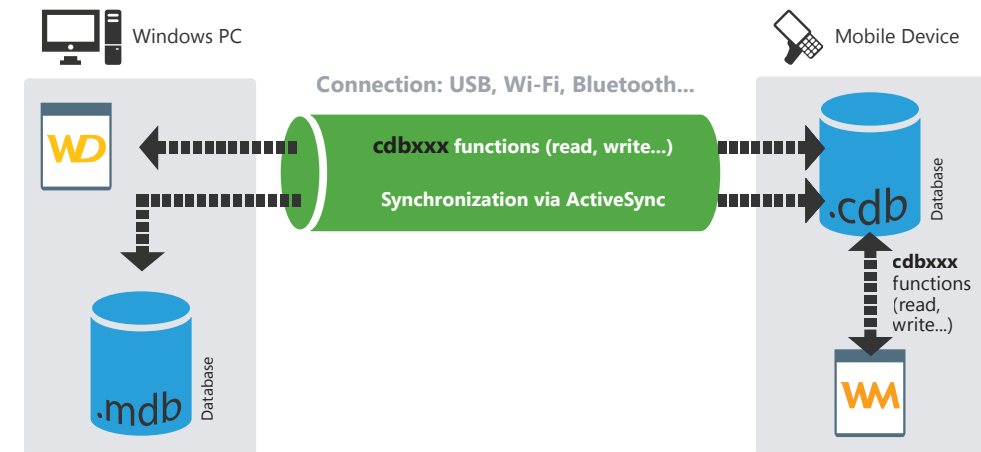- The WINDEV application can also handle the Access database via the Native Access.
- **From Windows Vista**, "ActiveSync" was replaced by the "Manager for Windows Mobile devices".

Comparison between HFSQL and CEDB

To display information coming from a database in a window, the controls of this window must be linked to the different items of the database.
The method for displaying and retrieving information depends on the database used (HFSQL or CEDB).

File link between a window and a HFSQL database

In most cases, the link between a control and an item is defined in the window editor when describing the control ("File" tab). This link allows you to specify the data file item that will be used by *ScreenToFile* and *FileToScreen*.
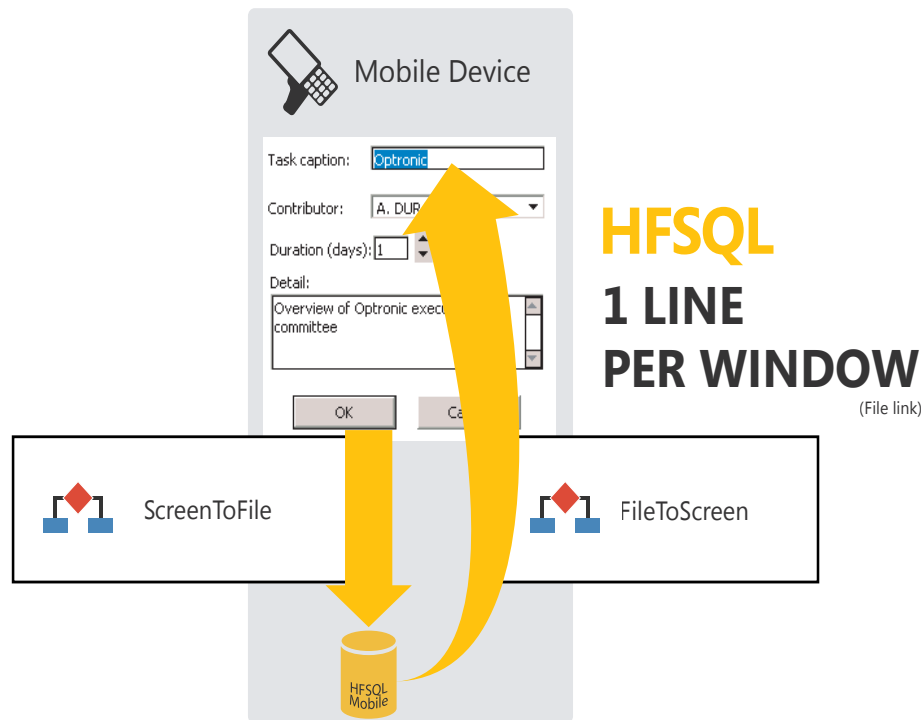
File link between a window and a Pocket PC database (CEDB)

This link must be defined by programming (*cdbXXX* functions).
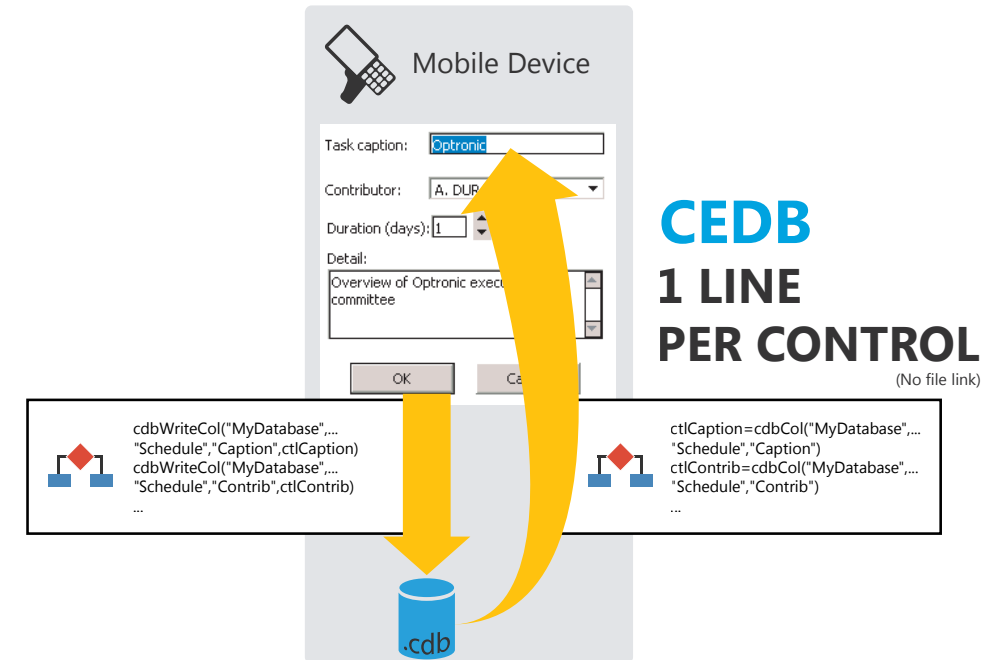
Other differences

The use of HFSQL databases (Classic or Client/Server) allows you to access the following features (non-exhaustive list):

* Speed of the HFSQL database.
* Queries on the HFSQL databases (created with the query editor supplied with the product).
* Fast application development via Full Application RAD.
* Features specific to the HFSQL database (encryption, ...)

Interaction with a WINDEV application

The functions for accessing the Mobile Devices (Pocket PCs) are used to access the Mobile Devices (Pocket PCs) from a WINDEV application.

WINDEV Mobile is supplied with several examples that use the functions for accessing the Mobile Devices:

- PC Registry.
- PC Explorer.

These examples can be used on a PC.

Handling a Windows Mobile device from a WINDEV application

The following WLanguage functions are used to access the Windows Mobile devices connected to a PC from a WINDEV application:

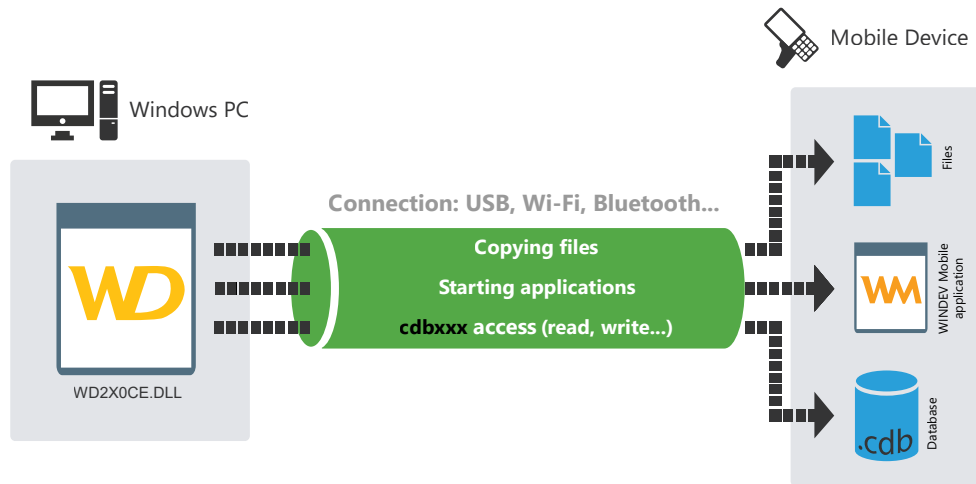|	
ceConnectionStatus	Used to find out the status of the connection between the current computer and a Windows Mobile device
ceConnect	Connects the current computer to a Windows Mobile device.
ceCopyFile	Copies: - a file found on the current computer to the connected Mobile Device. - a file found on the connected Mobile Device to the current computer. - a file found on the connected Mobile Device to another directory in the Mobile Device.
ceCreateShortcut	Creates a shortcut on the device connected to the current computer
ceDeleteFile	Deletes a file from the Windows Mobile device connected to the current computer
ceDeleteShortcut	Deletes a shortcut that was created by ceCreateShortcut
ceDir	Finds a file or a directory on the Windows Mobile device connected to the current computer
ceDisconnect	Closes the connection between the current computer and the device
ceFileDate	Returns or modifies the different dates associated with a file (creation, modification or access)
ceFileExist	Checks the existence of a file
ceFileSize	Returns the size (in bytes) of a file found on the Windows Mobile device connected to the current computer
ceFileTime	Returns or modifies the different times associated with a file (creation, modification or access)
ceListFile	Lists the files found in a directory (and in its sub-directories) and returns the number of listed files
ceMachineName	Returns the name of Windows Mobile device
ceMakeDir	Creates a directory on the Windows Mobile device connected to the current computer
ceOEMInfo	Returns OEM information about the Windows Mobile device: make, model, serial number, ...
cePlatform	Returns the name of platform on the Windows Mobile device

cePowerStatus	Used to get information about the main or secondary battery of Windows Mobile device
ceProcessorType	Returns the type of processor on the Windows Mobile device connected to the current computer
ceRegistryCreateKey	Creates a key in the device registry.
ceRegistryDeleteKey	Deletes a sub-key from the device registry.
ceRegistryDeleteValue	Deletes a value from the device registry.
ceRegistryExist	Checks the existence of a key in the device registry.
ceRegistryFirstSubKey	Identifies the key found after the specified key in the registry of the Windows Mobile device
ceRegistryListValue	Returns the name (and possibly the type) of the values for a registry key of the Windows Mobile device
ceRegistryNextKey	Identifies the key found after the specified key in the device registry.
ceRegistryQueryValue	Reads the value of a register in the device registry.
ceRegistrySetValue	Writes a value into a register of device registry.
ceRegistrySubKey	Identifies the path of the specified Nth sub-key in the registry of the Windows Mobile device
ceRemoveDir	Deletes a directory from the Windows Mobile device connected to the current computer
ceRunExe	Starts the execution of a program (an executable for example) from the current application
ceSysDir	Returns the path of a system directory on the Windows Mobile device connected to the current computer
ceWindowsVersion	Returns information about the Windows version used on the Windows Mobile device connected to the current computer
ceWinEnum	Used to enumerate the Windows windows currently opened on the Windows Mobile device
ceWinTitle	Returns the title of the specified Windows window
ceXRes	Returns the horizontal resolution of the screen on the Windows Mobile device connected to the current computer
ceYRes	Returns the vertical resolution of the screen on the Windows Mobile device connected to the current computer

Note: these functions are **WINDEV** functions and not **WINDEV Mobile** functions.

Synchronization software: ActiveSync, ...

Several programs can be used to synchronize data (WINDEV application, email, calendar, contacts, tasks, notes, ...) between a PC and a Mobile Device (Pocket PC):

- **ActiveSync**, for versions up to Windows XP.
  In most cases, ActiveSync is supplied with the Mobile Device (Pocket PC) but it can also be downloaded from InternetActiveSync is automatically started on PC when connecting the Mobile Device to PC. The data to synchronize is configured in ActiveSync ("Options" icon).
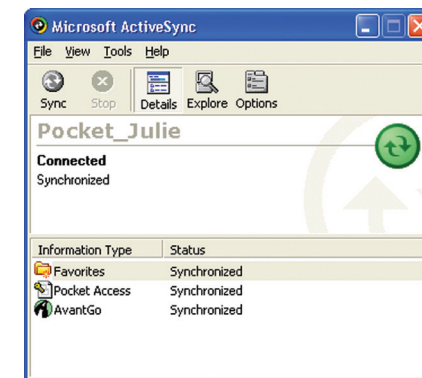
- the "Manager for Windows Mobile devices", available from Windows Vista. This manager is automatically started when connecting the Mobile Device to PC.

Managing emails (CEMAPI)

CEMAPI is an API for email management used by most of the applications for Mobile Device (Pocket PC) to send and receive emails (Pocket Outlook in most cases).

CEMAPI simplifies the management of emails received by the hosting company. When an email is read, it is automatically loaded in the local message box and deleted from the server (at the hosting company).

All the characteristics required to manage the emails (POP3 protocol, SMTP protocol, remote access, etc.) are grouped in the "User Profile".

With the email functions of WLanguage, a WINDEV application can directly handle the emails managed in an application that is using "CEMAPI".

Using the "ActiveSync" user account

A user account defined in Pocket Outlook is required to manage emails via CEMAPI. By default, Pocket Outlook manages the "ActiveSync" user account.
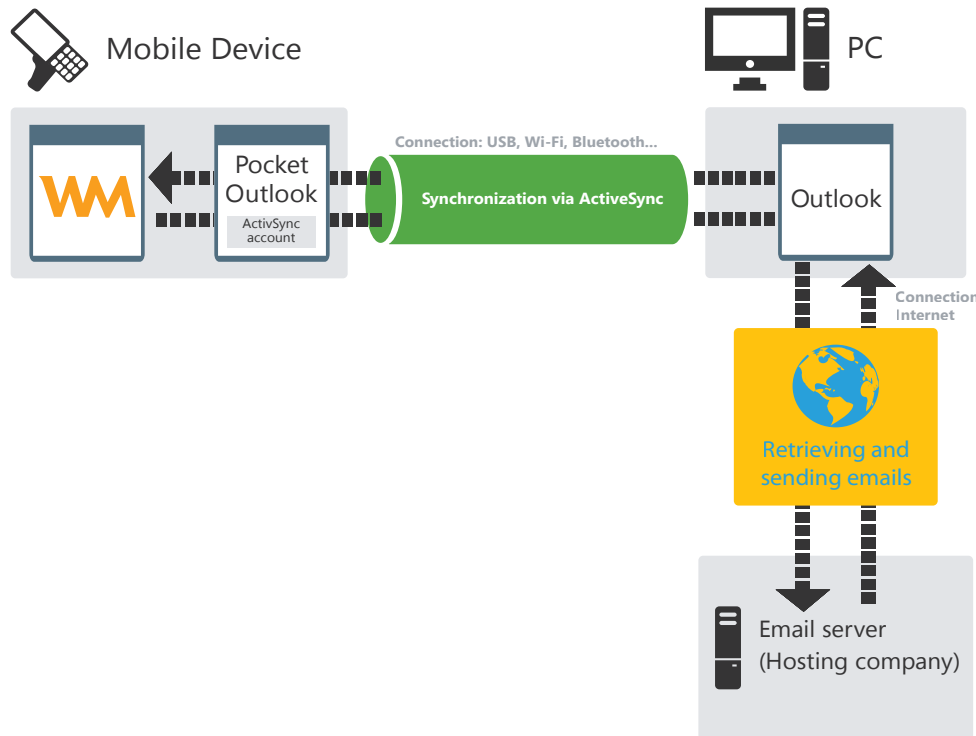
Using a specific user account

To use another user account, you must define one.

If the Mobile Device (Pocket PC) has no direct link to Internet, a synchronization with the PC is required to send and receive the emails.
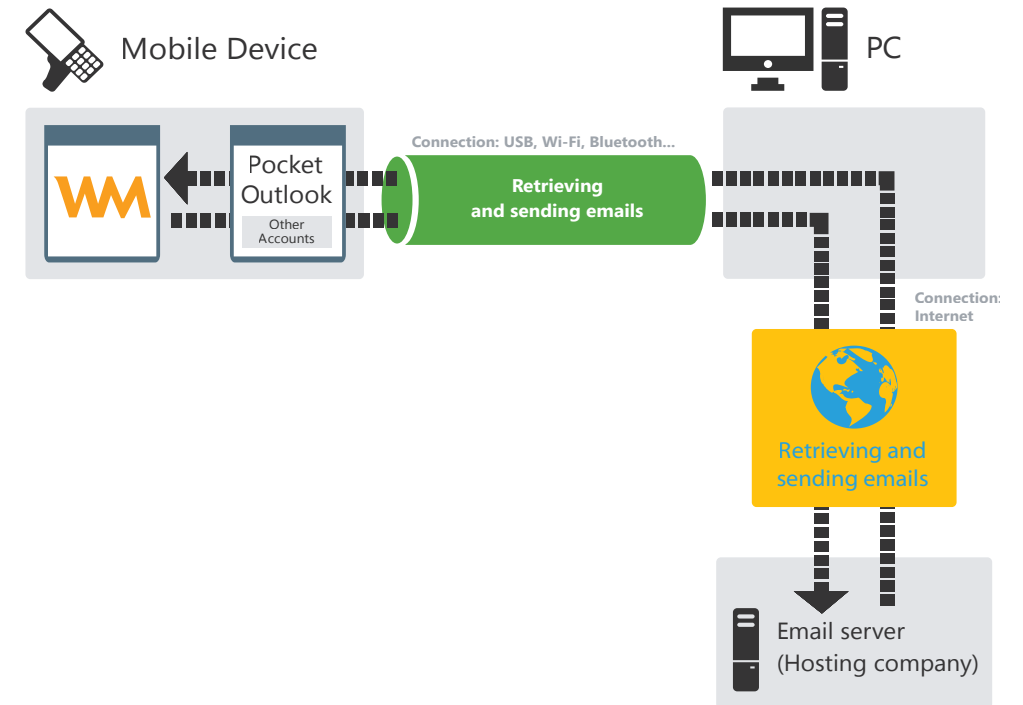
If the Pocket PC has a direct access to Internet (by Wi-Fi, ...), no synchronization with a PC is required.

Tools supplied with WINDEV Mobile

Specific tools are available for handling a Mobile Device (Pocket PC) from a PC:

WDExplorer
Tool used to view the files and directories found on a Mobile Device (Pocket PC), un Smartphone, ...
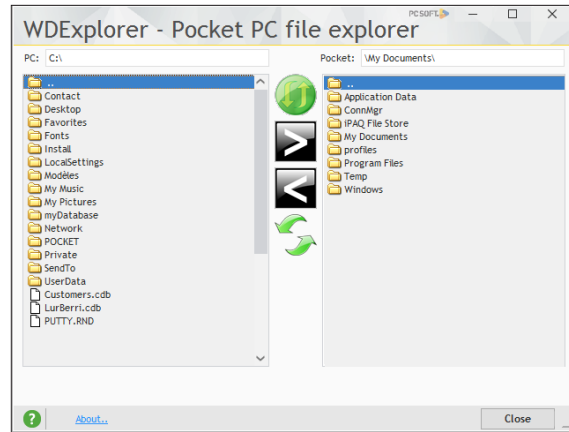
WDRegistry
Tool used to view the registry of a Mobile Device (Pocket PC), Smartphone, ...

Component supplied with WINDEV Mobile

The examples of components supplied with WINDEV Mobile are divided into 2 categories:

- **components that can be used from a WINDEV Mobile application.**
  These components are found in the "Components\Example components\Mobile" sub-directory of setup directory of WINDEV Mobile.

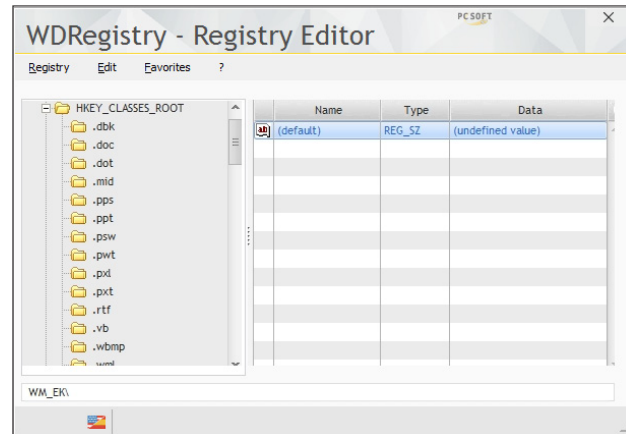| Component name	Description
Pocket Datalogic	Used to access all the features of Pocket PC Datalogic.
Pocket Falcon	Used to access all the features of Pocket PC Falcon.
Pocket GPS	Used to interrogate a GPS to retrieve a longitude, a latitude, a speed, an altitude.
Pocket Intermec	Used to manage an Intermec device. Used to emulate the scanner and the imager (device for image acquisition) of the device
Pocket Limitation	This example explains how to implement a limitation system as well as a system for enabling the software on Mobile Device (Pocket PC).
Pocket Login Management	Manages the identification of users in an application from a login and a password.
Pocket Motorola	Allows you to manage the use of a Motorola device.
Pocket Opticon	Allows you to manage the use of an Opticon device.
Pocket PAXAR	Allows you to use the features of bar code reader and printers of PAXAR industrial terminals.
Pocket Pidion	Used to manage a Pidion device.
Pocket Signature	Used to easily include a ready-to-use "Signature" control.

- **components that can be used from a WINDEV application that handles the files found on Mobile Device (Pocket PC).**
  These components are found in the "Components\Example components\Windows" sub-directory of setup directory of WINDEV Mobile.

Component name	Description
PC Pocket Picker	Directory picker and file picker found on a Mobile Device (Pocket PC) from a WINDEV application.

Additional components can be downloaded from our site (www.windev.com).

Examples supplied with WINDEV Mobile

The examples supplied with WINDEV Mobile are intended to help you learn the features of WINDEV Mobile. Their source code is presented in details.

These examples are found in the "Examples" sub-directory of the setup directory of WINDEV Mobile and they can be opened from the home window of WINDEV Mobile.

Features of some examples supplied with WINDEV Mobile.

Examples that can be used in Android only

Android Explorer	This example is used to list the files and directories found on an Android device.
Android GPS	This example presents the use of the GPS functions of WLanguage in an Android application.
Android Inventory	This application is used to draw up inventories and to save the results in a database.
Android Persistent Notifications	This example is used to create persistent notifications that appear even if the application is not used anymore.
Android Speech Synthesis	This educational example shows how to manage voice recognition and synthesis on Android. The speech synthesis is performed by using either the WLanguage functions, or an external JAR file included in the WINDEV Mobile project.
Android System	This application is an educational example presenting some functions specific to Android.
Android ZIP	This example is used to browse the folders of the Android device to find ZIP archives.

Examples that can be used on iPhone/iPad only

iOS Loan	This example is used to simulate loans.
iOS System	This application is an example explaining how to use the following features: Playing videos, Trace in the logs, Slider, Popup control, Hourglass, ...
iOS Watch	This example explains how to establish a dialog between an Apple Watch application and an iPhone application.

Multi-platform examples (Android and iOS)

Android Push	This example explains how to receive Push notifications on Android.
iOS Push	This example explains how to receive Push notifications on iOS.
WM Bluetooth 4	This example explains how to use the Bluetooth Low Energy functions (Bluetooth LE): BTLExxx. It is an application allowing you to find the nearby BTLE devices, to connect to them and to interact with the proposed services.
WM Click on chart	This example is used to offset the sections of a Pie chart via a simple click.
WM CRM	This example is a CRM application.
WM Expense account	This example is used to enter your expense reports and to take a snapshot in order to follow up.
WM Food	The WM Food example explains how to interact with the OpenFoodFacts database from a WINDEV Mobile application via the webservice proposed by this database.
WM FTP Client	This example is an FTP Client.
WM Geo-localization	This example explains how to manage proximity searches with geo-localization: - search around me - search in a city, at a given address, near an address. The results are displayed in a looper and in a map with markers.
WM Managing Contacts	This example presents the management of contacts for Android and iOS.
WM Managing orders	This example is a simplified management of orders and invoices.
WM Notes	This example is using the drawing functions of WLanguage for Android and iOS. It allows you to draw graphic "notes" and save them.
WM Password	Web sites, bank accounts, ... our life is filled with passwords. With WM Password, no need to store all the passwords of your different accounts.
WM Photos	This example is used to take photos and to save them with a title and keywords. A search can also be performed. The photos are stored in the application directory therefore they are private (not visible by other applications).
WM Poker	This example is a game of poker for Android, iOS and Universal Windows 10 App smartphones.
WM Poll	This examples is used to manage and view polls.

WM Quizz	This application allows you to check your knowledge and competence on WEBDEV. This project explains how to generate an application for different platforms from the same code. This example contains an Android and iOS configuration.
WM Registered	This application is an attendance manager. It is used to identify the people attending a meeting.
WM RSS Reader	This example is a reader of RSS stream for the Android and iOS devices. This application will allows you to follow the news of your favorite streams.
WM Shopping	This option is used to manage several shopping lists.
WM Sports	This example is a sport application used to save your performances.
WM Stocks	This application is used to draw up inventories and to save the results in a database.
WM Tic Tac Toe	This example presents the famous "Tic Tac Toe".
WM ToDo List	This example is a manager of To-Do Lists.

Examples that can be used in UWP only

UWA Notes	Application for managing notes.
UWA Orders	This training example presents, via a management of orders, the proper use of GUI when developing Universal Windows Platform Apps applications.
UWA Password	Application for managing passwords.
UWA Stopwatch	This example explains how to create a stopwatch.

Examples that can be used on a Mobile Device (Pocket PC) only

Pocket _NET	This example uses a Mobile .NET assembly (OpenNETCF.Net) in order to retrieve the list of WIFI network cards available on a PDA and to retrieve connection information about these cards.
Pocket Attendance	This application is an attendance manager. It is used to identify the people attending a meeting.
Pocket Click on Chart	This example proposes a solution used to offset the sections of a Pie chart via a simple click.
Pocket Explorer	This example is a file explorer for Windows CE. You have the ability to list the files and directories found on a Mobile Device (Pocket PC).
Pocket FTPClient	This example is used to view the content of an FTP server. It can also be used to download, rename or delete files.

Pocket Images	This example is used to browse a specific directory to find images.
Pocket Inventory	This example is used to draw up inventories and to save the results in a HFSQL database.
Pocket Loan	This example is used to simulate loans and to view the corresponding amortization tables..
Pocket Managing Contacts	This example presents the management of contacts on Mobile Device (Pocket PC) and it is using the loopers, the queries, the sending of SMSs and emails, the phone call.
Pocket Map	This example is a light version of WDMap. This example is used to view and modify the data files in HFSQL Mobile format on a Mobile Device (Pocket PC) directly.
Pocket Notes	This example is used to draw graphic "notes" and save them. You have the ability to enter keywords to identify your notes.
Pocket Telephony	This example is a telephony application that can be used on a Mobile Device (Pocket PC) equipped with phone access (GSM type).
Pocket Virtual Keyboard	This example proposes virtual keyboards that can be fully customized and certainly smaller than the standard keyboard of Mobile Devices (Pockets PC).
Pocket ZIP	This example is used to create and handle archives (".ZIP" files).

Examples containing a project that can be used on Mobile Device (Pocket PC) and that interacts with a project that can be used on PC

• **Beach Booking** • **"Pocket Beach"** project that can be used on Mobile Device (Pocket PC) • "PC Beach" project that can be used on PC	These examples are used to manage the bookings for private beaches. You have the ability to synchronize the data typed in the two projects.
• **Expense Reports** • "Pocket ExpenseReports" project that can be used on Mobile Device (Pocket PC) • "PC ExpenseReports" project that can be used on PC	These examples are used to manage the expense reports. You have the ability to synchronize the data typed in the two projects.
• **Managing the purchase lists** • "Pocket Managing lists of purchases" project that can be used on Mobile Device (Pocket PC) • "PC Managing lists of purchases" project that can be used on PC	These examples are used to manage a list of stores, departments, products and purchases. You have the ability to synchronize the data typed in the two projects.

• Network tasks • "Pocket Network tasks" project that can be used on Mobile Device (Pocket PC) • "PC Network tasks" project that can be used on PC	The 'PC Network tasks' application is used to create a task list (with management of priorities, deadline, automatic reminder, ...). The "Pocket Network Tasks" application is used to access this task list to specify that a task is in progress or completed.
• Poll • **"Pocket Poll"** project that can be used on Mobile Device (Pocket PC) • "PC Poll" project that can be used on PC	These examples are used to perform polls. You have the ability to synchronize the data typed in the two projects.
• Sending SMS • **"Pocket** Sending SMSs" project that can be used on Mobile Device (Pocket PC) • "PC Sending SMSs" project that can be used on PC	These examples are used to send SMSs.
• Stocks • **"Pocket Stocks"** project that can be used on Mobile Device (Pocket PC) • "PC stocks" that can be used on PC	These examples are used to manage the stocks. You have the ability to synchronize the data typed in the two projects.

Examples that can be used on PC only

PC CDB Browser	This example is used to access the standard databases (.cdb) found on Mobile Device (Pocket PC).
PC Explorer	This example is used to view the files and directories found on Mobile Device (Pocket PC).
PC Photo Album	This example is used to import and/or export the photos found on a Mobile Device (Pocket PC) from a PC.
PC Registry	This example is used to handle the registry of a Mobile Device (Pocket PC) from a PC.

Additional examples can be downloaded from our site (www.windev.com).