

<a href="#"><u>Home</u></a>	Contents	<a href="#"><u>Go!</u></a>
-----------------------------	----------	----------------------------

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## Contents

### [Installation](#)

### [Introduction](#)

### [Step 1: Adding assets and products](#)

### [Step 2: Change project timing](#)

### [Step 3: Adding relations](#)

### [Step 4: Define features](#)

### [Step 5: Define constraints](#)

### [Step 6: Attach files](#)

### [Step 7: Configure your product](#)

### [Step 8: Compile products \(under construction\)](#)

<a href="#"><u>Home</u></a>	<a href="#"><u>Contents</u></a>	<a href="#"><u>Previous</u></a>	<a href="#"><u>Next</u></a>
-----------------------------	---------------------------------	---------------------------------	-----------------------------

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## Installation

### Prerequisites

FOPPS comes in two flavours: Binary and source distribution

The binary one contains only the compiled class files and the needed libraries (jdom and xerces at this time). The source distribution on the other hand contains java sources instead of the class files.

You need [JDK 1.3](#), since V0.18 **JDK 1.4 is mandatory**.

If you are using the source distribution, you also need [ant](#). I'm using 1.5.1, but older versions should also work.

For those who like to play with the test cases: JUnit is not part of the distribution. You have to download it from [junit.org](http://junit.org)

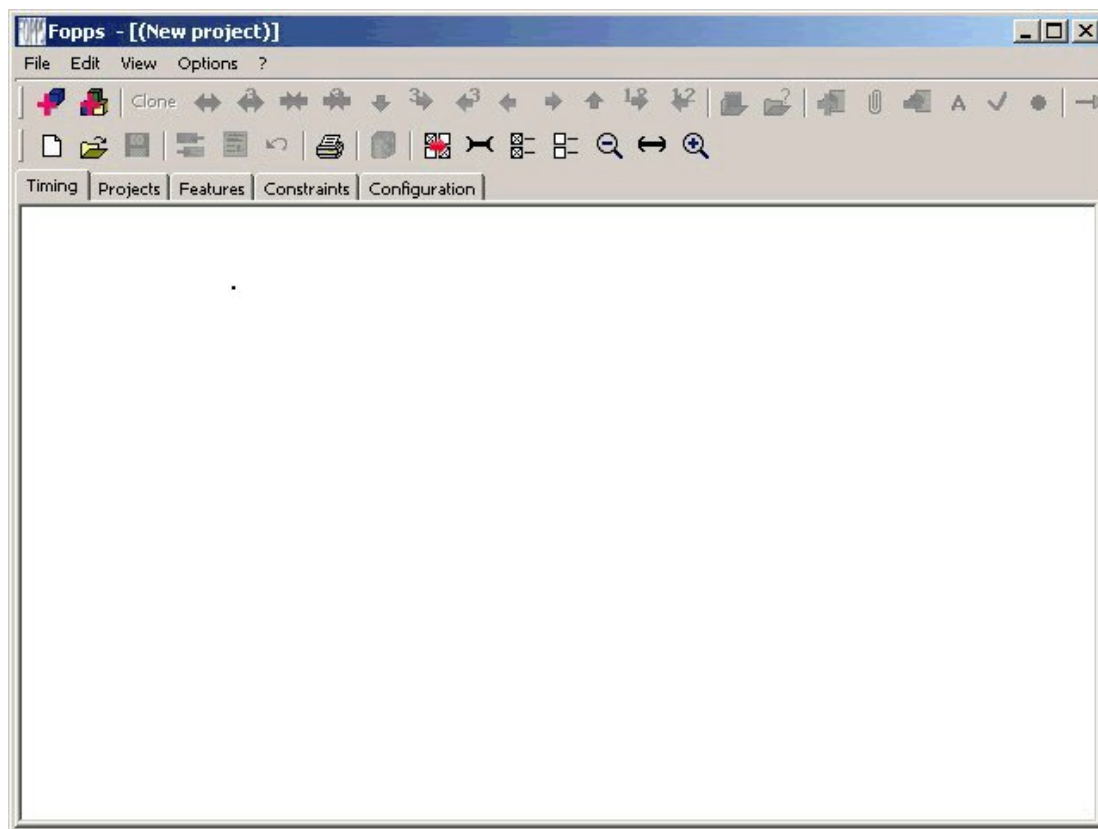
## Installation

### Binary distribution

- Unpack the downloaded ZIP file
- Execute `java - jar fopps.jar` in the installation directory
- Application window should appear (see below)

### Source distribution

- Unpack the downloaded ZIP file
- Execute `ant` in the installation directory
- Windows: Execute `fopps.bat` in the `bin` directory
- Unix: Execute `fopps.sh` in the `bin` directory
- Application window should appear (see below)



FOPPS after startup (Version 0.18)

<a href="#">Home</a>	<a href="#">Contents</a>	<a href="#">Previous</a>	<a href="#">Next</a>
----------------------	--------------------------	--------------------------	----------------------

## Introduction

Before we proceed, I like to explain the entities used in this context.

- An asset is (software) component with provides functions or services used by products.

- A product consists of assets and products specific components. Additional to that a product may succeed another product ("new product generation")
- Each item has at least one root feature
- A feature may have optional, mandatory or mutual exclusive child features (alternative).
- Each feature may have constraints. A feature may require another feature or they may exclude each other.
- Each product can be configured, assets only in cohesion with products
- A configuration is an instance of a valid feature combination (similar to an object-class relation)

You may open the example file [mobile.xml](#) (included in the distribution) via menu `File-Open` or pressing the button with the open folder icon in the toolbar. The example file is located in the `examples` directory. But first we should proceed step by step to give you an idea how to use FOPPS.

<a href="#">Home</a>	<a href="#">Contents</a>	<a href="#">Previous</a>	<a href="#">Next</a>
----------------------	--------------------------	--------------------------	----------------------

## Step 1: Adding assets and products

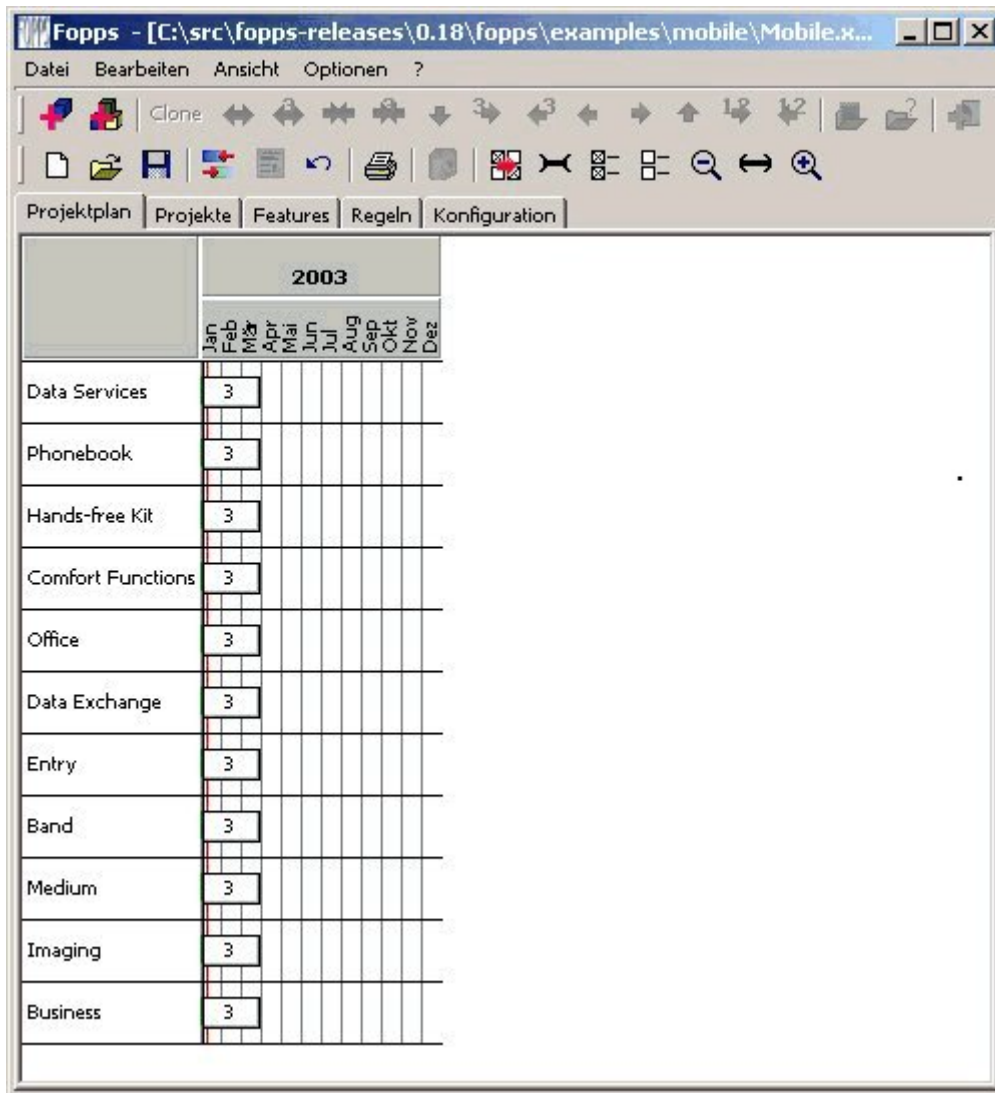
In general there are four opportunities to execute an action

- Via toolbar (if the icons don't give you an idea what it is about, leave the mouse for some seconds above the questionable button, after a while a small window with a brief description should appear)
- Via menu
- Via context menu. To activate the context menu, select an item and click the right mouse button.
- Via accelerator key (only some actions)

Use the 'add' buttons to add new projects to the list (those two with the red cross). Let's take an asset first, so press Shift-A to add an asset.

A dialog comes up to ask you for the properties. You may change the default name and add some text in the description field. The other tabs contains attributes about project related issues (start/end/status). If you added a product, then you will find a third tab where you can specify the target directory (explained later).

In the example we have eight assets and three products with different equipment. First, we have a product 'Entry' which provides only the basic mobile functions. On the other end we have a full featured 'Business' mobile. 'Medium' lays between both.



FOPPS after adding the assets and products from the example

<a href="#">Home</a>	<a href="#">Contents</a>	<a href="#">Previous</a>	<a href="#">Next</a>
----------------------	--------------------------	--------------------------	----------------------

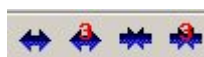
## Step 2: Change project timing

This section will show you how to change the timing of the project. FOPPS allows you to specify start and end month of the project. To move a project, you may

use the arrow buttons in the toolbar



. The button with the right arrow postpones a project by one month. The arrow buttons with the '3' ('12') move a project by 3 months (one year).

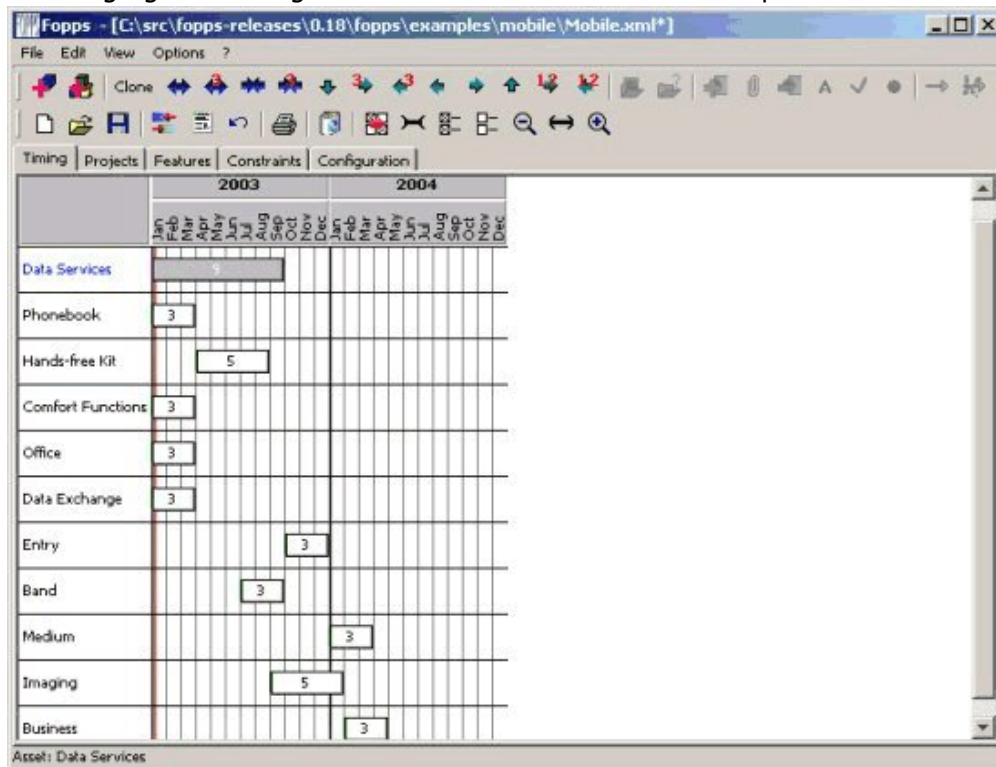


The blue arrows allow you to increase/decrease the project duration by one resp. 3 months. Changing the duration affects only the end date of the project, the start date is kept.

Another opportunity is to change the timing via the property dialog. To invoke it, click with the right mouse button on a project. Go to the project tab, if necessary. Use the combos to select project start and end. Optional you may

change also the status of the project.

After changing the timing FOPPS should look similar to the picture below.




FOPPS after adding the assets and products from the example

<a href="#">Home</a>	<a href="#">Contents</a>	<a href="#">Previous</a>	<a href="#">Next</a>
----------------------	--------------------------	--------------------------	----------------------

## Step 3: Adding relations

FOPPS knows two different kinds of relations.

1. *Project relations* are dependencies between projects. In most cases this relation directs from an asset to a product to indicate that the product **uses** this asset.
2. *Constraints* are dependencies between features. This will be explained in a later section.


In this section we will consider relations between projects. To create a relation between two projects you have to select the two projects (use the `Ctrl` key to keep the existing selection) and click on the 'Create connection' button in the toolbar (the left one in the following picture) .

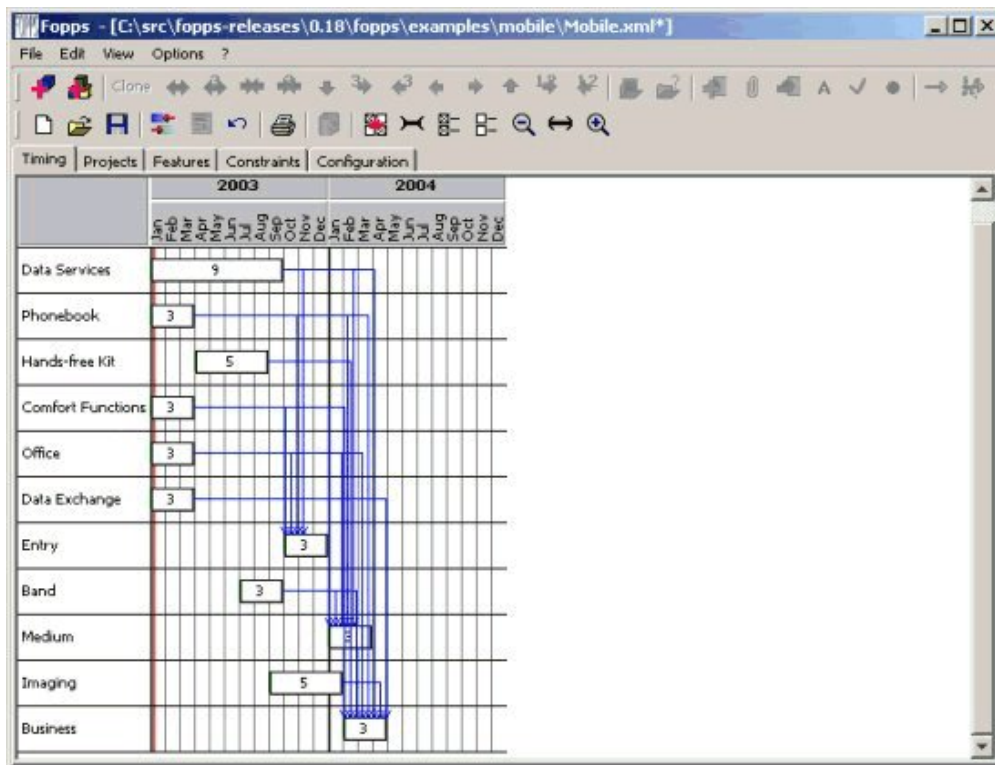
To delete a connection between two projects, select them and press the 'Delete connection' button.

The third button provides a more convenient way to establish a connection between products and its assets. Please select some assets and **finally** a product and press the button in the toolbar. FOPPS has connected all assets with

the product.

The picture at the bottom shows FOPPS after adding the relations from the example.

In this context another function is worth to be mentioned. The 'Fix timing' function  rearranges all projects in a way, that every project do not start until it's predecessors are finished.



FOPPS after adding the relations from the example

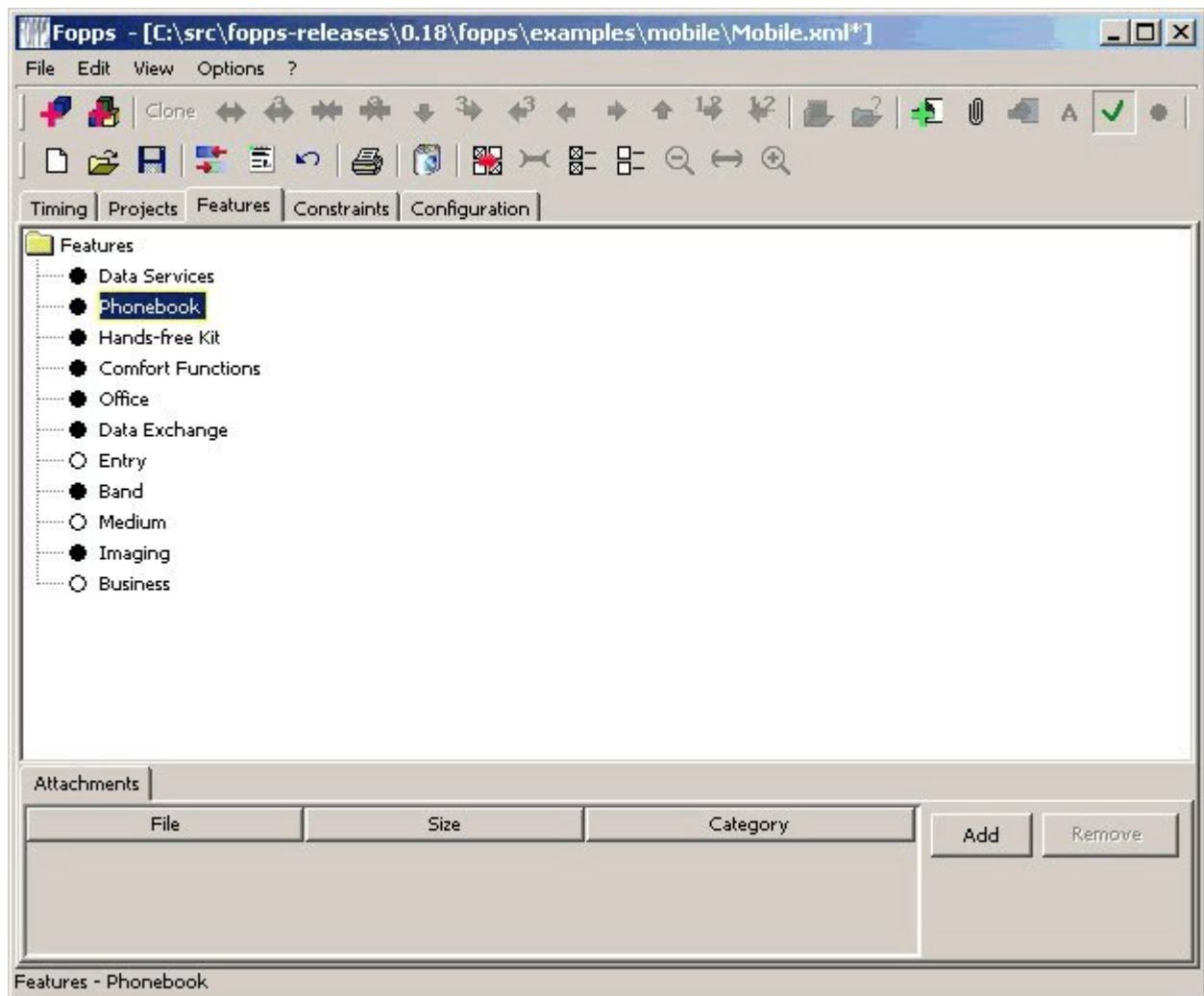
[Home](#)[Contents](#)[Previous](#)[Next](#)

## Step 4: Define features

Before we proceed, some words about features in general. They are

- mandatory, optional or an alternative,
- are hierarchical (feature tree) and
- may have constraints (e. g. an exclude constraint).

Move to the 'Features' tab there you find empty feature trees for each asset and product. An outlined circle indicates a mandatory feature, a filled one an optional feature. Please note, that every asset is optional by default, since they are an optional part of a product. The picture below shows the feature view after step 3



Feature view with empty feature trees

At the bottom you see an empty list with file attachments. Please ignore it, it will be explained in a later section.

To add a feature select one tree item and press the button with the green '+' on it

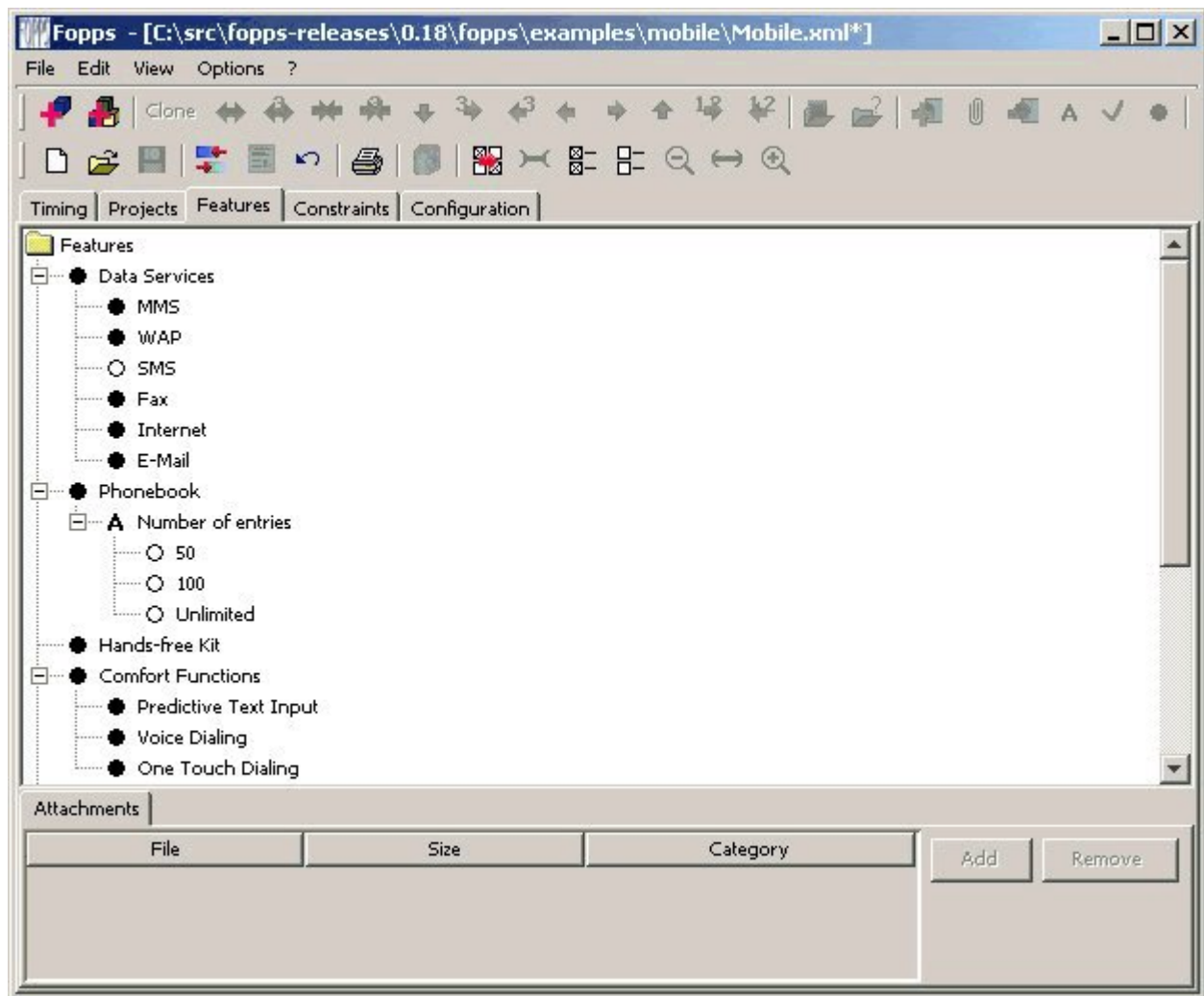


A dialog pops up and asks you for the name of the feature. After the dialog finished, the new feature appears as child node of the previous selected feature. To change it's properties you may invoke the features' property dialog or use the toggle buttons in the tool bar.

- The 'A' button allows you to set the 'alternative' flag of the feature. The selected feature must have 2 or more child nodes.
- The button with the filled circle changes to feature to an optional (or mandatory) feature.
- The third button toggles the 'default' flag of the feature. If set, this feature will be enabled by default (if it is an option)

As you may have noticed, some features are both optional and alternative. They are useful in situations like ('if you select this feature, you have to decide between alternative A or B').

The feature tree of the mobiles example is showed below.



Feature view after adding the features from the example

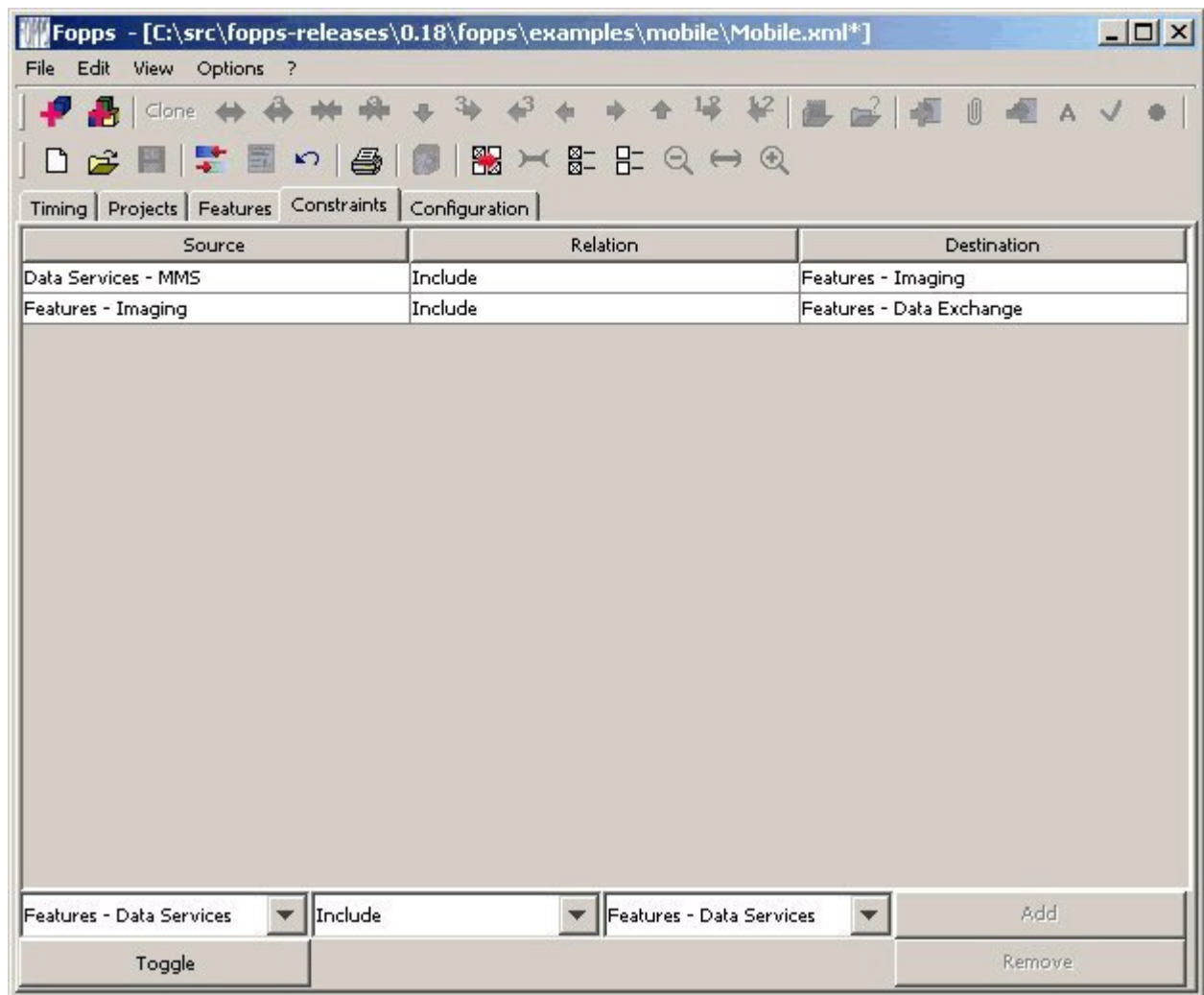
<a href="#">Home</a>	<a href="#">Contents</a>	<a href="#">Previous</a>	<a href="#">Next</a>
----------------------	--------------------------	--------------------------	----------------------

## Step 5: Define constraints

A feature may exclude another or requires another one. FOPPS provides constraints to implement such rules. To add a constraint, select the affected features in the combo boxes and change the constraint type, if necessary. Then press 'add' and the new constraint will appear in the list.

Please note, that constraints are not reflexive, that means 'A exclude B' does not imply 'B exclude A'. In this case you have to define an extra constraint.





Constraints view after adding the constraints

<a href="#">Home</a>	<a href="#">Contents</a>	<a href="#">Previous</a>	<a href="#">Next</a>
----------------------	--------------------------	--------------------------	----------------------

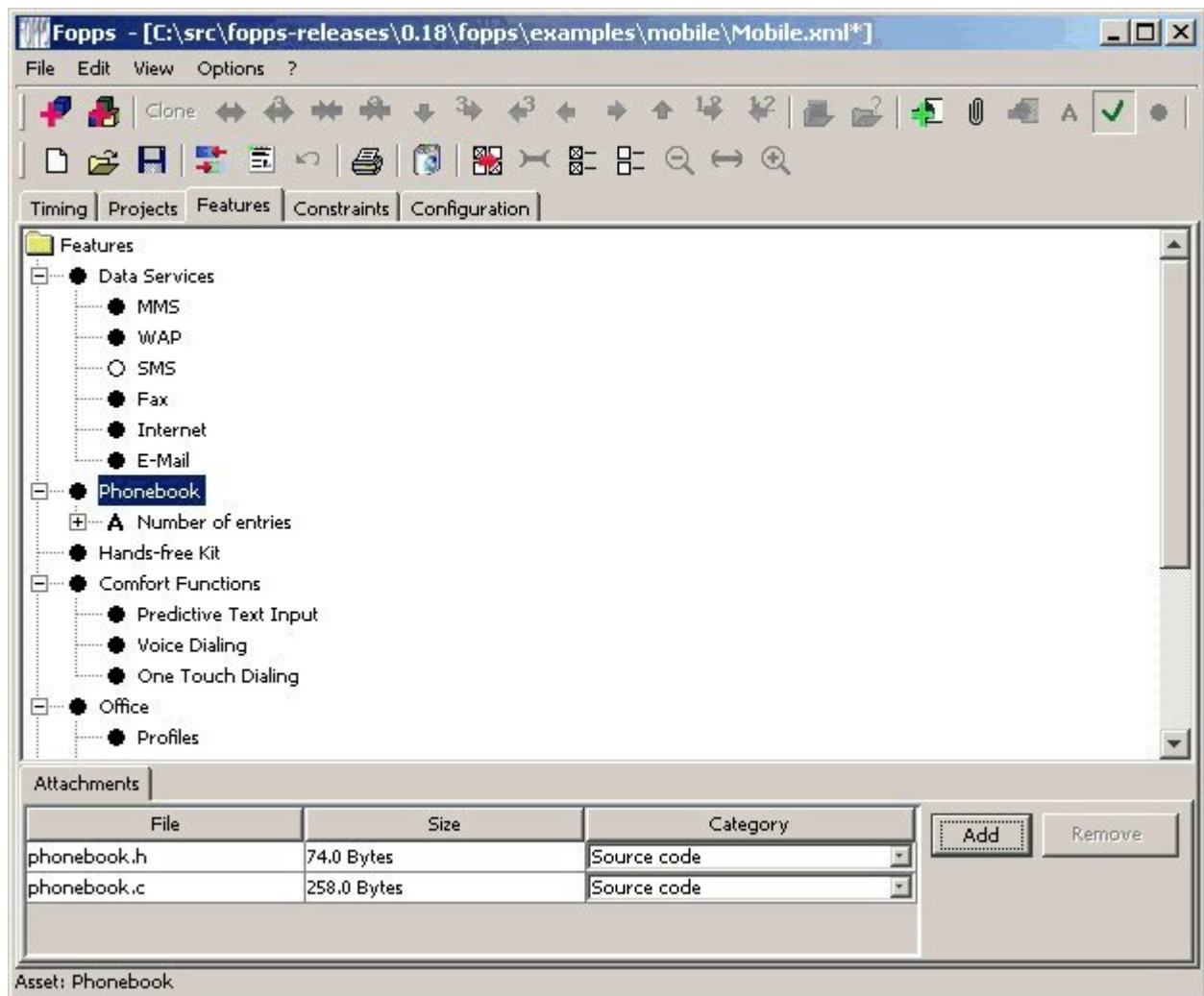
## Step 6: Attach files

In this section we will attach files to features. If a product uses this feature, the attached files will be added to the products' file set.

To attach a file, select a feature and press the button with the paperclip (or the 'add' button right down). Please select the file(s) to add and press 'Ok'. FOPPS uses a search path to find attachments, so you may ask, if the directory of the attached files should be added to the search path.

The selected files should then appear in the list. You can define change the file category, this information will be evaluated during the build process. Source files will be considered in the makefile for example.

Currently the example contains only two source files (`phonebook.c` and `phonebook.h`) which should be attached to the 'Phonebook' feature (see below).



Phonebook feature with file attachments

<a href="#">Home</a>	<a href="#">Contents</a>	<a href="#">Previous</a>	<a href="#">Next</a>
----------------------	--------------------------	--------------------------	----------------------

## Step 7: Configure your product

Now it's time to configure the products, so please move to the 'Configuration' tab. On the left side you find all products. The other side contains all configuration settings of the selected product.

The table contains 4 columns:

- The item's name
- Actual configuration
- The origin of the configuration item
- The variable name (will be used in makefile and other configuration files)

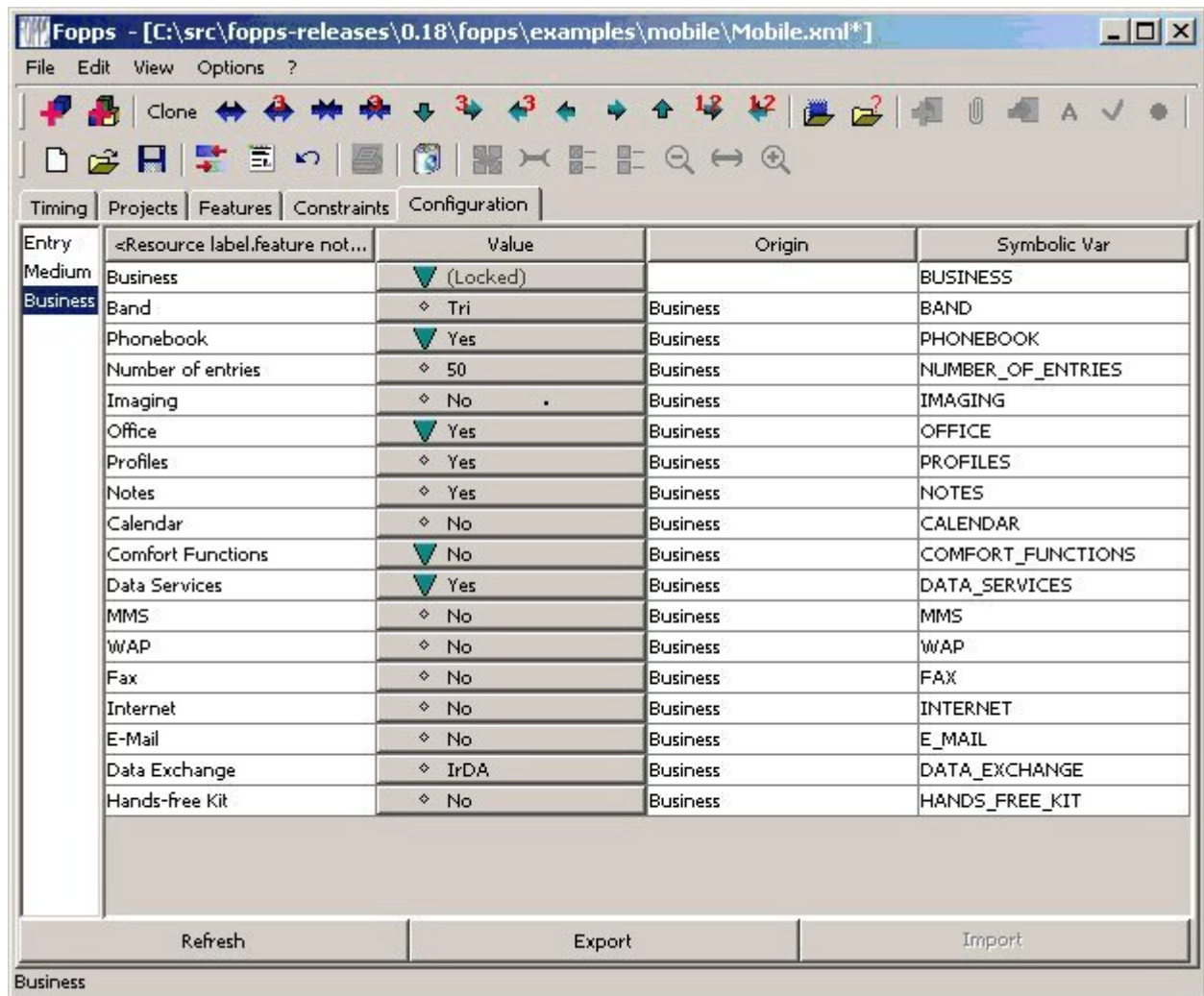
To change a setting, simply click on the button and the setting will be toggled. An option will flip from 'set' to 'not set' and vice versa. Alternatives jump to the next possible alternative.

If the item is locked, this feature cannot be activated. In this case the underlying feature requires another feature, but the needed feature belongs to an asset that is currently not

part of the product.

A red item indicates that a constraint is violated by the current setting. To get more informations, move the mouse to the item and wait for the tool tip window (this will be improved in future).

You may save the product settings now, press the export button. The current settings are stored in a property file.



Configuration of the 'Business' product

<a href="#">Home</a>	<a href="#">Contents</a>	<a href="#">Previous</a>
----------------------	--------------------------	--------------------------

## Step 8: Compile products

**This section is under construction**

Before product compilation can proceed, you should check the target directory. This can be done in the products' property dialog on the product tab.

To compile a product, select one and select 'Compile' in the context menu. FOPPS generates two files `Makefile` and `config.h`, which may be used in the build.

process.

Currently (V0.18) the generation is in a very experimental state and the output may not suit your needs, so please be patient.