Writing rich clients for your web application with PHP-GTK and XML-RPC

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About myself

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- Student at Budapest University of Technology and Economics
- PHP.net Webmasters Team
- PHP Documentation Team [build system, XSLT rendering, CHM format, Hungarian translation]

Session outline

- Rich clients in general
- Examples of rich clients
- A sample web application providing XML-RPC web services
- A sample rich client for those services in PHP-GTK
- Possibilities, future directions

Browser based systems rule

- Most of the applications were converted to webapps in the last decade
- Browser based system advantages
  - Distributed – can be accessed from anywhere
  - No need for installation / upgrade procedures
  - Theoretically operating system / browser independent
  - Secure – cannot write to hard drive for example
  - Easy to implement with today’s visual tools

The negative side of browsers

- Non standard compliant browsers, too many different behaviors to support
- Very limited layout capabilities, even with CSS
- No local function availability, no integration
- Limited form interface (no data grids, trees)
- Badly supported interaction (e.g. drag and drop)
- Permanent storage on server side

➔*Poor performance, high load on the server*

What is a rich client?

- Replacement of or complement to the thin client (browser)
- Most of the time a desktop GUI application connected to a server
- Tries to avoid the weaknesses of the browser and also add some features
- Rich, because it can use GUI features
- Specific clients for specific needs, no general client

Back one step with rich clients?

- No! You can turn all the disadvantages of browser based applications to advantages
- You can choose the language to develop the client
- Rich clients can be cross platform (ex. PHP GTK)
- You are not tied to any browser vendor
- If you use standard protocols for communication, you can rewrite the server and/or client anytime

Problems with rich clients

a) Installation
- Large executable download *or* common runtime needs to be on client machines (ex. PHP[GTK] interpreter)
- Tiring installation procedures
- Interference with other applications (DLL Hell on Windows)

b) Security

c) Upgrade

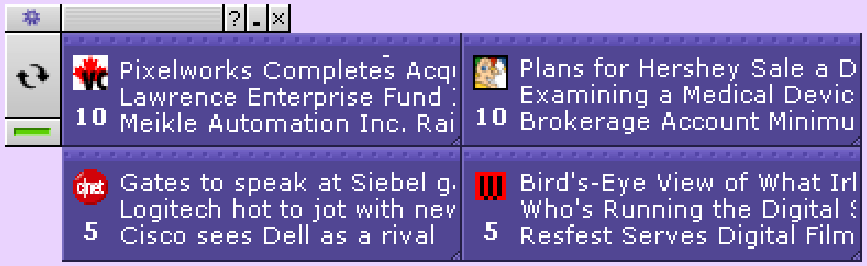
The rich client hype

- Macromedia Flash MX is advertised to be the best tool to author rich clients
- Microsoft .NET is also said to boost rich client authoring
- Java with the Java Web Start feature is now ready for rich client development
- There are many smaller companies / tools
  - Altio, Esual, Curl, Sash, Droplets, REBOL/IOS, XUL/Luxor, Gtk#

Some rich clients

- KlipFolio news reader

  Windows desktop application



Pixelworks Completes Acq
Lawrence Enterprise Fund
10 Meikle Automation Inc. Rai

Plans for Hershey Sale a D
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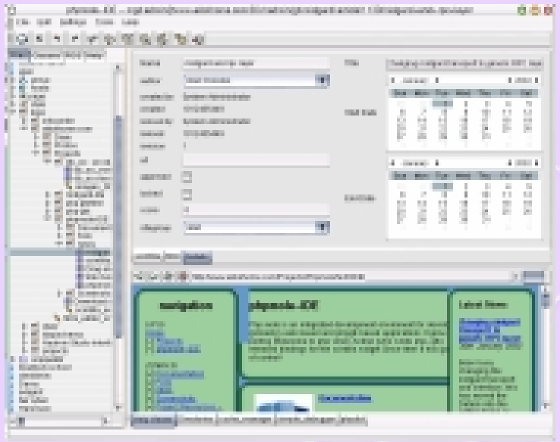
10 Brokerage Account Minimu

Gates to speak at Siebel g
Logitech hot to jot with nev
5 Cisco sees Dell as a rival

Bird's-Eye View of What Irl
Who's Running the Digital
5 Resfest Serves Digital Film

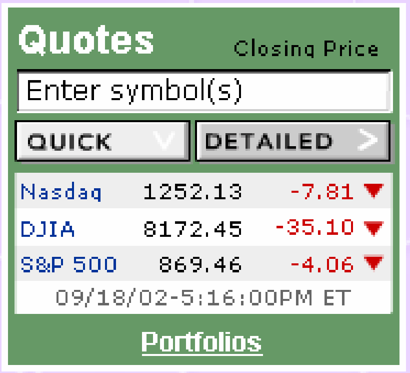
- PHPMole Midgard support

  A PHP IDE written in PHP-GTK with some additional features, including a Midgard CMS client



- E*TRADE quote ticker

  Implemented using Flash, served on the E*TRADE website embedded in HTML



Quotes Closing Price

Enter symbol(s)

QUICK DETAILED

Nasdaq	1252.13	-7.81 ▼
DJIA	8172.45	-35.10 ▼
S&P 500	869.46	-4.06 ▼

09/18/02-5:16:00PM ET

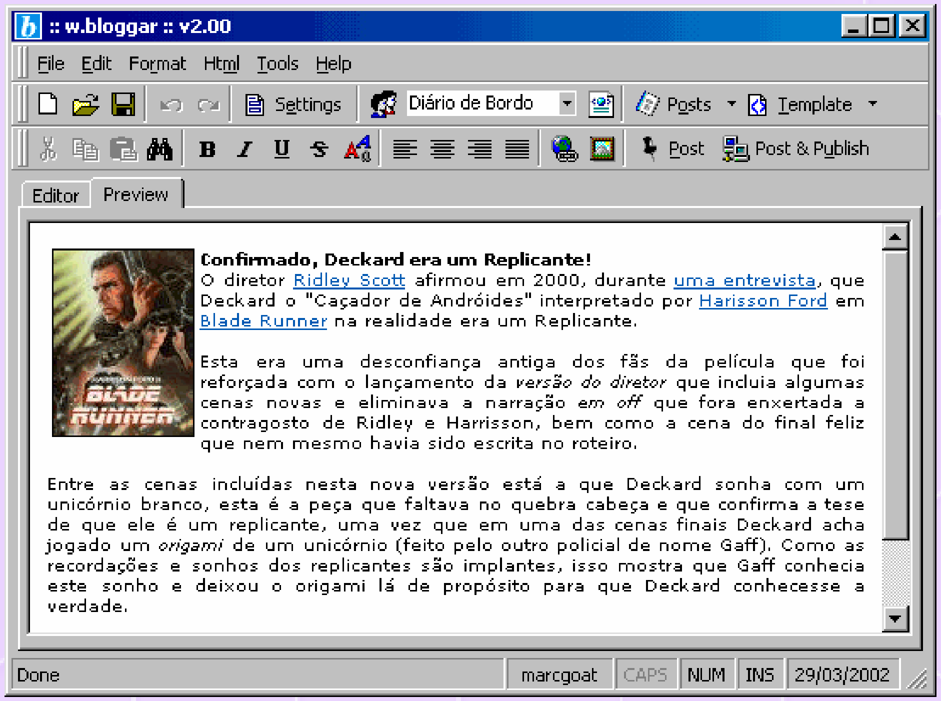
Portfolios

Complete solution example

- Blogger API for blogging sites
- A huge number of supporting websites

  Blogger, MovableType, b2, Nucleus, Drupal, etc.
- w.bloggar is a rich client for this API

  Add, edit, delete blog posts and templates from your desktop
- There are many more clients



Confirmado, Deckard era um Replicante!
O diretor Ridley Scott afirmou em 2000, durante uma entrevista, que Deckard o "Caçador de Andróides" interpretado por Harisson Ford em Blade Runner na realidade era um Replicante.

Esta era uma desconfiança antiga dos fãs da película que foi reforçada com o lançamento da *versão do diretor* que incluia algumas cenas novas e eliminava a narração *em off* que fora enxertada a contragosto de Ridley e Harrisson, bem como a cena do final feliz que nem mesmo havia sido escrita no roteiro.

Entre as cenas incluídas nesta nova versão está a que Deckard sonha com um unicórnio branco, esta é a peça que faltava no quebra cabeça e que confirma a tese de que ele é um replicante, uma vez que em uma das cenas finais Deckard acha jogado um *origami* de um unicórnio (feito pelo outro policial de nome Gaff). Como as recordações e sonhos dos replicantes são implantes, isso mostra que Gaff conhecia este sonho e deixou o origami lá de propósito para que Deckard conhecesse a verdade.

Rich client categorization

- Data source
  - Pulling the data and caching on the client side
  - Working with an online server, no local data
  - Pushed data from a server
- Client interface
  - Standalone desktop application
  - In a browser window (ex. Flash, Java applet)

Rich clients are not ideal

- For many text and multimedia intensive applications
- To serve heavily linked documents
- If a runtime / rich client cannot be installed on target machines (ex. common mobile devices)
- Need a different approach from the client author

Why PHP-GTK?

- ✓ Cross platform, open source
- ✓ Easy to start with for the PHP programmer
- ✓ PHP classes are reusable even across server / client implementations
- ✘ PHP-GTK does not address common rich client problems *currently*
  - ✘ No installation shell program
  - ✘ No common upgrade solution
  - ✘ No security restrictions for downloaded code

Example app. for the session

- Many options considered, including stock monitoring, dictionary lookup…
- A news reader is a “simple” application, and may create a community
- There are many existing news readers to grab ideas from
  - KlipFolio, FeedReader, NewsMonkey
- PHPBee came to existence

Bee - *noun*

1. 4-winged stinging insect, collecting nectar and pollen and producing wax and honey.
2. busy worker.
3. meeting for combined work or amusement.

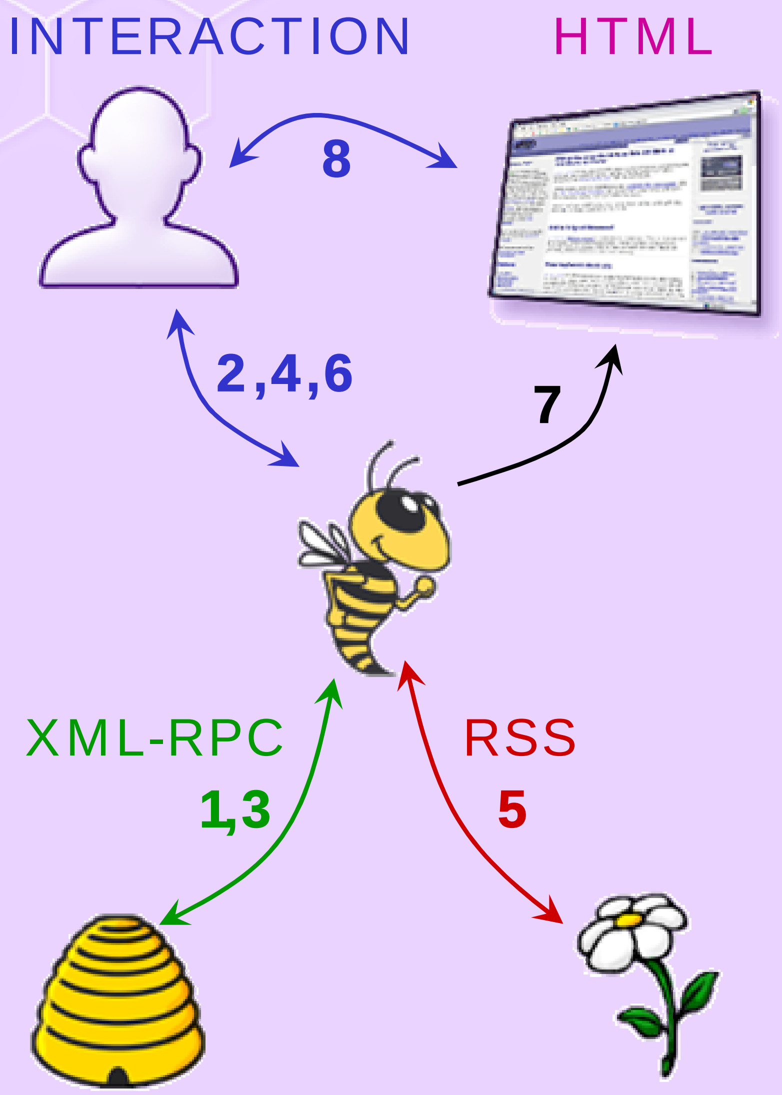
Oxford Paperback Dictionary and Thesaurus

(http://www.askoxford.com/dictionary/bee)

PHPBee

- PHPBee is busy with collecting news from all over the internet and displaying them in an organized form
- Consists of a server application (hive) and a client (bee)
- Bees connect to the hive for information source listings, and gather the feed contents (nectar) from third party sites (flowers)

How does it work?



1. Bee requests and receives the flower map from the hive
2. User selects a category from the map
3. Bee downloads the list of flowers in the selected category
4. User selects one from the list of flowers
5. Bee downloads the flower’s contents (nectar) from the third party site and displays the items in a list
6. User selects a headline from the list
7. Bee opens a new browser window with the selected news item, which displays the item’s HTML page
8. User reads the page in the browser

Hive and bee communication

- Browsers display HTML pages
- HTML is not suitable for communication
- Procedure / function calls (web services)
- HTTP is the common transport protocol for procedure calls
    - HTTP servers are ready and working well
    - Web client libraries are easy to use
    - Proxy / firewall forced limitations
- XML is commonly used on top of it
    - XML-RPC, SOAP

XML-RPC

- A lightweight protocol for communication
- Widely adopted on the internet
- Stable standard
- Server and client libraries available in most of today’s languages

XML-RPC implementation

- Document every piece in server and client classes
- Simple client usage, simple method authoring (PHP native types)
- More options on how a method can be implemented (function, class or object method)
- Support for several standards

Hive XML-RPC methods

- hive.getFlowerMap(*void*)

  Returns an array of categories each with information about it’s name and all their children categories data. No parameter is required. Does not return any flowers data, only the “map” of categories to access flowers.

- hive.getFlowersInCategory(*integer* **id**)

  Returns an array of flowers listed in one category. Nectar source information is returned in an associative array (struct). Requires a category id as parameter.

getFlowersInCategory request

```
<methodCall>
 <methodName>hive.getFlowersInCategory</methodName>
 <params>
  <param>
   <int>14</int>
  </param>
 </params>
</methodCall>
```

getFlowersInCategory response

```
<methodResponse>
 <params><param><array><data>
  <value><struct>
   <member>
    <name>name</name>
    <value><string>PHP.net news</string></value>
   </member>
  . . .
  </struct></value>
 . . .
 </data></array></param></params>
</methodResponse>
```

An indexed array
(all flowers)

An associative array
(info about one flower)

Data access implementation

- Core service in the application [implemented in Bee_DataAccess class]
- Hides data access details
  - Settings data read/write [local file]
  - Flower map and category queries [hive XML-RPC]
  - News feed request and parsing [remote file request and RSS content parsing]
  - Image / icon loading at startup time [local image files]

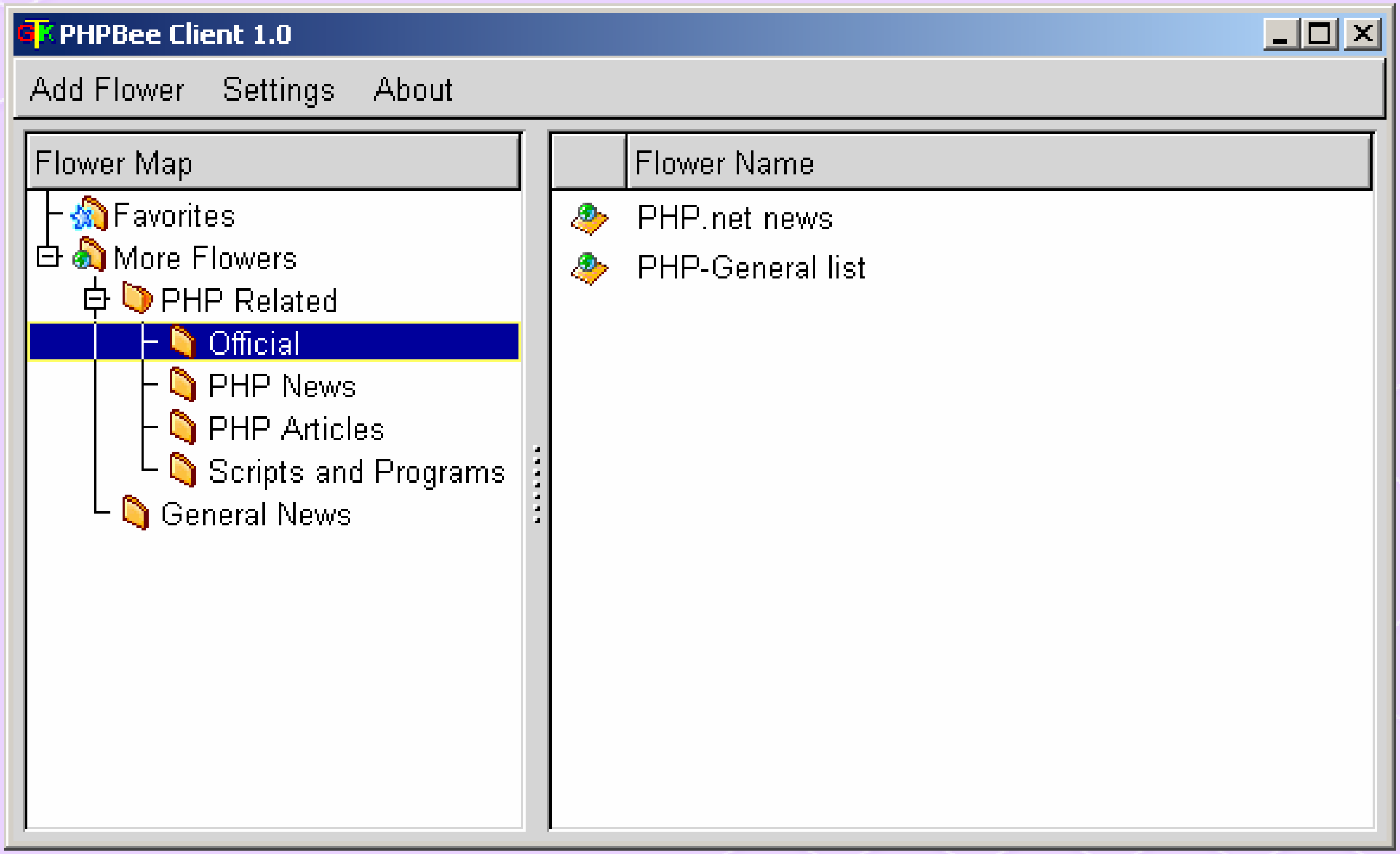
Settings handling

- Bee_Settings provides an interface on top of Bee_DataAccess to manipulate settings
  - Load / save settings
  - Provide hive access data for Bee_DataAccess
  - Check if a nectar source is a favorite
  - Add / remove favorite flower

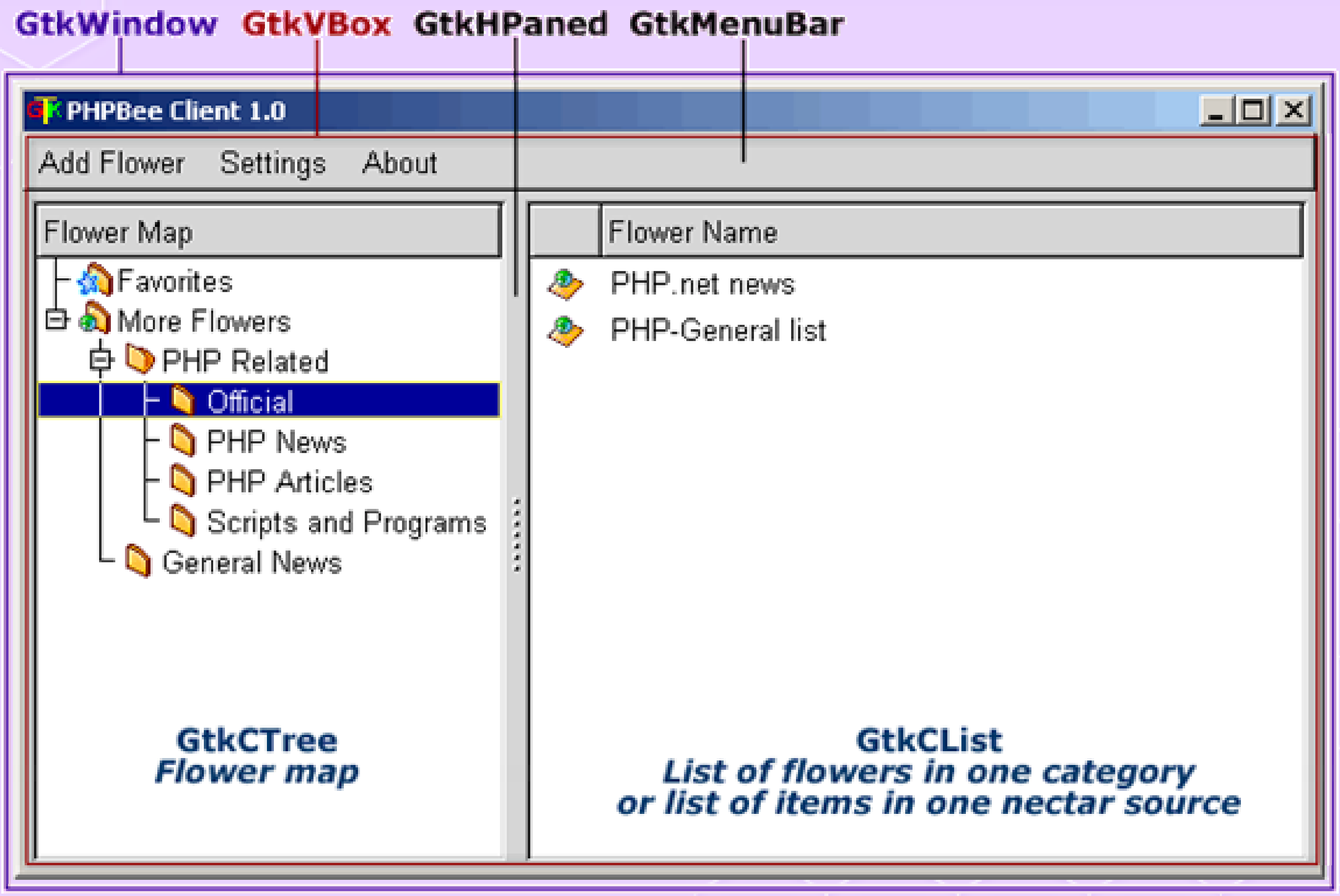
Objects used to display elements

- Main application window and some utilities [Bee_Application]
- Complete category tree [Bee_FlowerMap]
- List of flowers in a category and list of items in a nectar source [Bee_FlowerList and Bee_NectarDisplay]
- Message box display [Bee_MessageBox]

PHPBee client interface



PHPBee client interface



Future directions

- Obviously missing pieces
  - Caching of data on client and server side
  - Editing of flower map data, addition of flowers
  - HTTPS, proxy, authentication support
- Some nice features
  - Set individual options for flowers
  - Support for other interfaces
    - O’Reilly Meerkat, NewsIsFree.com, Moreover.com

Development

- Open source code, documentation and concepts
- Feel free to join to the development team at *phpbee.net*
- Sourceforge services support the process

Questions?