# LINUXVOICE

## TILING WINDOW MANAGERS

# GROUP TEST

**Marco Fioretti** tries a way to handle the windows on your screen that will make you forget you ever had a mouse.

## On Test

### Bluetile

Bluetile
full-featured tiling

**URL** http://bluetile.org
**Version** 0.6
**Licence** BSD
*A reduced, preconfigured version of Xmonad, made for people who want to start tiling as soon as possible.*

### Herbstluftwm

**URL** http://herbstluftwm.org
**Version** 0.6.2
**Licence** BSD
*A semi-manual tiler that's much easier to use than its name would suggest.*

### i3

**URL** http://i3wm.org
**Version** 4.7.2
**Licence** BSD
*A clean window manager with a few little tools that make it quite powerful.*

### Spectrwm
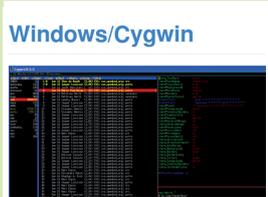
**URL** http://spectrwm.org
**Version** 2.5.0
**Licence** ISC
*Yes, Spectrwm tiles windows in pure UNIX/Linux style even on Windows (and Mac OS).*

### Xmonad
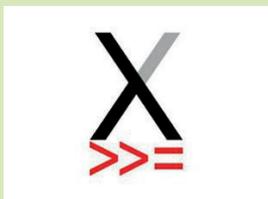
**URL** http://xmonad.org
**Version** 0.11
**Licence** BSD
*The Emacs of tiling window managers. Can do pretty much everything, if you just find the right recipe for it.*

## Tiling window managers

### Reclaim your screen and get more done!

**W**indow Managers (WMs from now on) are those essential components of every desktop computer that control, move and decorate the windows in which all our programs run. In a normal WM, you can spend a significant amount of time just moving and resizing windows. The subjects of this Group Test were invented to avoid such annoyances.

Tiling WMs deal with the windows you need as if they were, you know, tiles – simple! They automatically place and size all the windows in order to always cover all the available screen space, but without any overlap. What really makes a WM a tiling one, however, is the capability to automatically repeat the whole process, all by itself, every time you open or close a window.

Tiling WMs are made to ignore eye candy and save your time: you should be able to focus on getting things done, rather than continuously having to rearrange windows by hand. To work even faster, many operations that traditional WMs attach to icons and menu entries only have keyboard shortcuts here. Add to that the possibility of not using the mouse even on many popular programs, websites and web services, and you can understand why some people prefer this way of working.

The very nature of tiling WMs is also the reason why this may be the Group Test with the ugliest screenshots you'll see for a while, but it's not our fault. These programs want to fill every available pixel with window content, not with panels, menus, icons and real window borders. That leaves very, very little that remains visible in a print-size screenshot. It's not a bug, it's a feature!

> **"Tiling WMs deal with the windows you need as if they were tiles – simple!"**

### THE CRUCIAL CRITERIA

A window manager shapes our interaction with the computer much more than raw processing power, or pleasant wallpapers. A really good WM makes you forget it exists, because it doesn't slow down your CPU and does what you need without you even realising that you asked for it. The same should be true for upgrades: it is unavoidable that you'll spend some time on the initial configuration, but this should really be the last time you spend working on a WM until you decide to change it. That's why we only considered WMs actively maintained and supported WMs, which will install immediately on any distribution.

This time, we deliberately focused on providing a general feeling and an overview of the possibilities of something that is hard to define by comparing lists of features.

# Tiling and window management

## How many ways are there to tile windows?
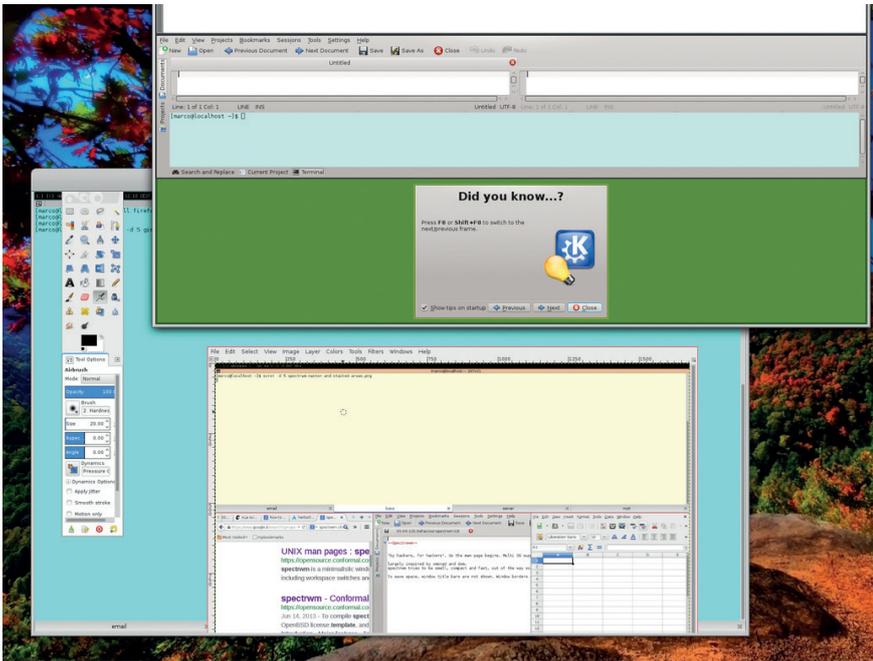


Two general cases of windows tiling (here shown in Herbstluftwm) that may require special care: multi-window programs like Gimp (bottom) and temporary, pop-up windows.

**A**utomatic placement and sizing of windows, so they don't overlap unless you really want them to, is the *raison d'être* of tiling WMs. All our WMs provide at least three different tiling algorithms, as well as ways to add new ones and remap all keyboard shortcuts so they don't interfere with those of your favourite programs.

Some WMs, like Herbsluftwm and i3, leave you more control of windows. Others, like Xmonad and Bluetile, are "auto tilers": they will apply the chosen tiling scheme automatically, while still allowing manual or custom placement. Spectrwm is somewhere in the middle. Our competitors can also show one window at a time, full screen

Multi-window tiling layouts differ in how they partition the screen and in how they decide where the next windows goes: you may have, for example, horizontal or vertical stacks, actual grids with rows and columns, or windows being added in spiral sequences (as happens with Xmonad and Bluetile) or in binary tree structures (herbsluftwm and i3).

Xmonad makes it easy to have a different tiling mode in each workspace. To place windows manually in this WM, press Alt+Left Click and drag them.

In i3, programs are aligned horizontally or vertically, inside several semi-independent containers. Only the focused window in the container is displayed. You get a list of windows at the top of each container. Spectrwm has a top (or left) resizeable master area, reserved for the applications that "currently need most attention". All the other windows go into a separate stack. You can put any window you want in the master area, or in a floating layer, and change stacking mode on the fly. Spectrwm also acknowledges "quirks" – instructions to handle certain programs in special ways. For example, this configuration command:

**Gimp:gimp FLOAT + ANYWHERE**

basically means "let the Gimp application do as it pleases".

Herbstluftwm is based on "frames", which can be empty or contain many windows, and be split into sub-frames. By default, there are nine full-screen workspaces, which you can name however you want.

### VERDICT

| | |
|---|---|
| **Bluetile** | ★★★☆☆ |
| **Herbstluftwm** | ★★★☆☆ |
| **i3** | ★★★★☆ |
| **Spectrwm** | ★★★★☆ |
| **Xmonad** | ★★★★☆ |

# Installation

## At least the installation should be a point-and-click business.

**M**ost distros have binary packages of these WMs, but if yours doesn't you can build your own. Actual installation of any of these WMs should not be a problem at all – unless you happen to use a very old or niche distribution, that is. In all other cases, you should easily find a binary package ready to be installed with a few clicks.

When this is not the case, it should still be possible to install at least Xmonad and Bluetile without really compiling anything. Haskell programs such as these have their own distro-independent online repository, called HackageDB (**https://hackage.haskell.org**).

All the packages you can find there, including those for Bluetile and Xmonad, can be installed with the so-called Haskell Platform. All you need is binary packages, which really should exist for almost any distribution, for that platform and its installer, called cabal. Once you have them, you will also be able to get the two Haskell WMs up and running in ways similar to using **yum** or **apt-get** from the command line with:

```
#> cabal update
#> cabal install xmonad
```
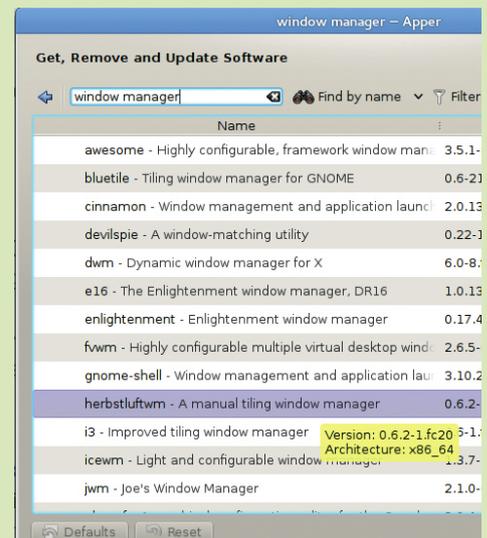


Binary packages for many tiling Wms are available in the standard repositories of most distros.

### VERDICT

| | |
|---|---|
| **Bluetile** | ★★★★★ |
| **Herbstluftwm** | ★★★★☆ |
| **i3** | ★★★★☆ |
| **Spectrwm** | ★★★★☆ |
| **Xmonad** | ★★★★★ |

# Customisation

## Make your WM work for your.

**T**he Xmonad community has already published thousands of lines of code that you can use to customise it, from complex configuration files to third-party extensions and assorted hacks. The "Manage Hooks" mechanism of Xmonad is widely used to define actions to perform automatically on certain windows when, for example, the corresponding programs start.

Testing changes is easy: save the new code and type **xmonad –recompile** to check if it works. If it does, type **xmonad --restart** or press Alt+Q to load the new configuration.

Bluetile is very closely related to Xmonad, but this doesn't mean that it can reuse code or tricks developed for its ancestor. Unlike Xmonad, Bluetile doesn't come with the capability to compile and load new code on the spot.

Spectrwm partially supports the EWMH (Extended Window Manager Hints) standard. Programs like **wmctrl** can use it to control whole workspaces or single windows. You can write simple shell scripts, for example, that move to a different workspace, resize or maximise a specific Spectrwm window, as soon as some condition occurs.

I3 and Herbstluftwm provide similar functionality, but in different ways. The **i3-msg** utility understands the traditional IPC (Inter Process Communication) protocol. Coupled with **i3-nagbar** it can do almost anything.

The **herbstclient** tool, by contrast, passes whatever command you give it from the command line to Herbstluftwm. The actions you can perform in this way include, but are not limited to, workspace reconfiguration and changing the style of the window borders.

Another area in which you can play at will is (dynamic) configuration of mouse focus. Both Xmonad and i3, for example, have settings dedicated to define whether the focus should follow the mouse or not. Disabling this behaviour even temporarily is very useful if you don't want to find yourself suddenly typing in another window of your laptop because you brushed its touchpad by mistake.

| VERDICT | |
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| Bluetile | ★★★★☆ |
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| Spectrwm | ★★★☆☆ |
| Xmonad | ★★★★★ |

# User interface
## User friendliness is a feature.

**A**t first sight, the behaviour of all our tiling window managers is the same: they all completely cover your screen with windows, without any decoration worth mentioning, and let you do everything without even looking at your mouse. The big differences are in the configurability of hotkeys and tiling schemes, and in what you can do with their optional status bars.

Whatever WM you choose, do yourself a favour: before you even get started, change the default terminal to one of those we recently reviewed in LV004.

## Bluetile ★★★☆☆

Bluetile is not an independent WM done from scratch, but is rather a version of Xmonad, tweaked and preconfigured especially for people without much time. It's also set up to integrate well in the traditional Gnome desktop.

This integration with a mainstream desktop environment is enough, in our opinion, to make Bluetile quite different from Xmonad. For example, unlike its ancestor, Bluetile starts up with a friendly taskbar and window title bars with unusual but effective grid menus (see screenshot), and the taskbar has the only built-in "Quit" button you'll see in this Group Test. Other buttons increase or decrease the number of windows in the Bluetile master area. You can also move windows or maximise any of them with the mouse.
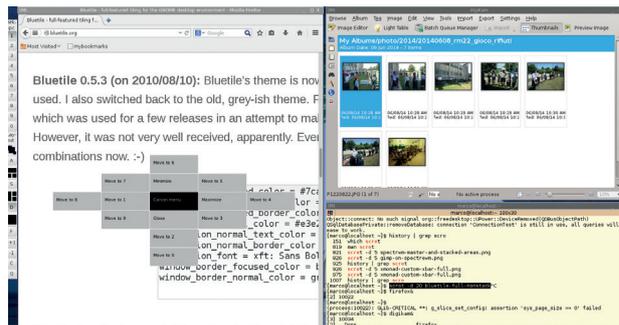


Bluetile is the only WM in this test that by default gives windows a title bar with a pop-up, grid-like menu.

## Herbstluftwm ★★★★☆

Herbstluftwm isn't a random string, but German for "Autumn Air". Its default status bar is the friendlier of the bunch: workspace numbers and the name of the active window on the left, date and time on the right. It is also easy to add gauges and other graphic information with a custom panel. The main shortcut to remember is Alt+Enter, which opens the default terminal. To toggle between all the available tiling schemes on the fly, press Alt+Space. Herbstluftwm is configured by issuing commands with the **herbstclient** utility. This makes it possible, in principle, to change the configuration automatically, depending on the time of the day, system load or any other event that can trigger a script.
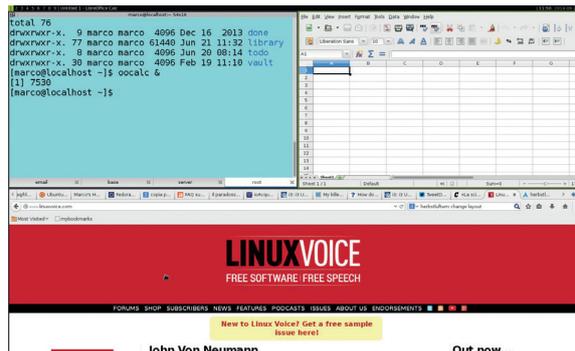


Well done status bar, sensible tiling algorithm. The only really difficult part of Herbstluftwm is its name.

## i3 ★★★★☆

I3 is primarily designed for "advanced users and developers". Working in i3 is also meant to be similar to using the Vi text editor: many keybindings are similar, and there is a mode to resize windows independent from normal operations. In spite of that, this is a WM in which you can just grab and drag the borders of a window with your mouse to resize them.

The status bar is almost invisible with the default settings, even for a WM that's supposed to be frugal with pixels. You can change the workspace names from numbers to anything you want.
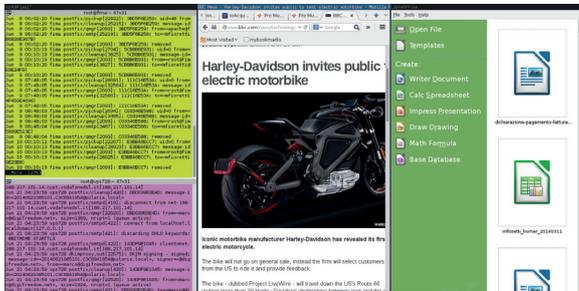


It's hard to see it from this screenshot, but i3 provides both a status bar with workspace buttons, and title bars for each window.

## Spectrwm ★★★☆☆

Spectrwm (originally named "Scrotwm"!), was created "by hackers, for hackers", with ports for Windows and Mac OS X developed to "make those systems useful for Unix people". Talk about attitude!

The interface consists of an adequate status bar on the top, complete with workspace numbers (or names), and is pretty fast and relatively easy to use. We couldn't figure out why, but on the Fedora 20 test box used for this Group Test the Alt+Shift+Enter combination did not start a terminal as the man page says. Thanks to the integration with the dmenu launcher, bound to Alt+P, we had three terminals open in a beat.
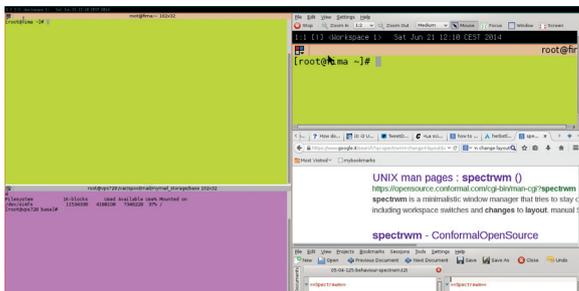


The stacking (on the right) and master areas of Spectrwm.

## Xmonad ★★★★☆

Xmonad has a really bare look – if you can call the absence of practically any visual element in its default configuration a look. Don't let that fool you though. Xmonad is like Emacs: both programs can be customised in endless ways. It is possible to decorate windows, and easy to make them float.

Looks aside, Xmonad can do, or at least emulate in some way, practically everything you are used to do in more popular WMs. The lack of a real button or hot key to minimise a window, for example, is compensated by the possibility to send the same window to a separate workspace.
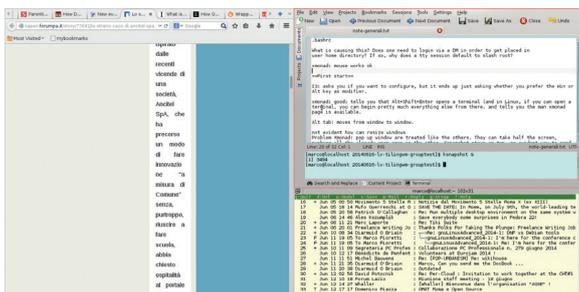


Xmonad really exploits every pixel you give it – no default status bar, no buttons, nothing. However, that's still not enough to make certain websites readable when tiled.

# Accessories

## We all like extras.

**U**sing the whole screen is all good, but sooner or later you'll probably start longing for some status info. Or maybe you think that you would switch to a tiling WM, if only it had menus and launchers.

Don't worry. There's no need to give up these niceties in order to use a tiling WM. It is necessary, however, to install and configure some extra tools manually, in the good old Unix and X-Window tradition. The dzen2 utility, for example, adds a spartan, but effective status bar with customisable icons.

Other common tools that you can bind to dedicated hotkeys are **scrot**, for screenshots, and **xlock** for locking the screen. The **feh** program can add wallpapers.

Recipes in the Xmonad documentation and FAQ explain how to add system trays such as **trayer**, or clipboards like **parcellite**. Then there's **dmenu**, an application launcher that would work in any of our WMs. Once you have installed it, press Alt+P to launch it, type the first letters of the program you want to start and press Enter.

While Xmonad comes out on top in this category, the other WMs aren't far behind. Spectrwm, for example, can get the content of its status bar from any program associated with its **bar_action** option. A very powerful choice, reusable also as input for **xmobar**, is the Conky system monitor: start it in text mode, setting **out_to_x no** and **out_to_console yes**, and it will send any system data it is able to collect to the status bar of your WM.
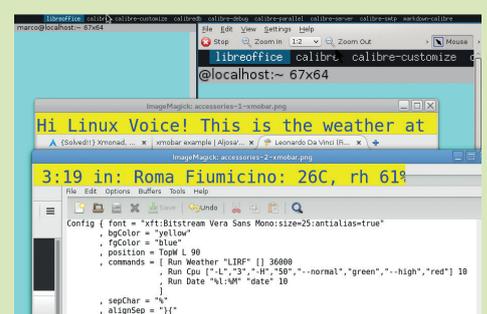


Xmonad status bars (the yellow stripe split in two for convenience) can contain any data you want.

### VERDICT

| | |
|---|---|
| Bluetile | ★★★★☆ |
| Herbstluftwm | ★★★★☆ |
| i3 | ★★★★☆ |
| Spectrwm | ★★★★☆ |
| Xmonad | ★★★★☆ |

# Desktop integration

Keep the rest of the desktop happy.

**W**e're referring to integration with the so-called display managers, and with modern desktops in general. For example, unless you know what you were doing, you might get to the end of your first session in a tiling window manager and wonder how to get out of it (many of us had this same sensation the first time we tried Gnome 3).

Of course, there are keyboard shortcuts for this in all the window managers we're looking at here. However, depending on what distro and WM you're running, the next user may end up staring at a black screen, instead of the normal display Manager, and your programs may want to "restore from crash" at your next login.

The bottom line: to run a tiling WM on a computer shared with Linux novices who won't accept anything different than a vanilla login screen, you will probably need to do a bit of extra work to make them happy.

The reason is that tiling WMs often deal with these issues according to the Linux standard from 10 years ago. For

example, to make sessions start with the right mix of applications, you are supposed to play with **.xsession** files and similar stuff. This isn't rocket science by any means, but it's probably unknown territory for everybody who started using Linux less than a few years ago.

Bluetile is the best from this point of view, since you don't need a dedicated login to use it. This program is specifically designed to integrate with Gnome. You can log in as usual, and

> ### "You will probably need to do a bit of extra work keep novice users happy."

then start it from a terminal. To start it automatically, launch the **gnome-session-properties** tool, and add Bluetile to the list of start-up apps.

If the binary package of a WM includes a **.desktop** configuration file (as those for Fedora 20 do) it should show up without such tricks in the
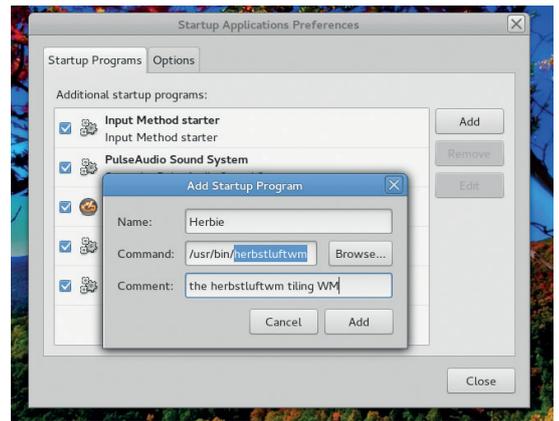


Telling Gnome (or KDE) to start a tiling WM is easy, and makes it fit in better with the rest of the desktop.

sessions list of your display manager. Otherwise, depending on your distribution, you will have to edit one or more of the files called **.session**, **.xinitrc** and **.gnomerc** in your home directory, as explained in the relevant documentation of each WM. Rumour has it that it's faster to edit the **.gnomerc** file, but we couldn't verify it in our tests.

**VERDICT**

| | |
|---|---|
| Bluetile | ★★★★★ |
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# Documentation

Ask and it shall be given, seek and ye shall find…

**W**ith programs like these, the first and possibly the only two pieces of documentation you may need are, without question, a cheatsheet with all the available hot keys, and the instructions to remap those keys to whatever you prefer. There's a good, if incomplete cheatsheet with the main default bindings for Xmonad shown in the screenshot, which you can download at **www.haskell.org/haskellwiki/File:Xmbindings.png**.

Xmonad also has the most documentation and online support. The mandatory starting point is the official Guided Tour (**http://xmonad.org/tour.html**). In addition to that, the website offers many links to guides for pretty much anything you may think of.

There's even a "How to write a config file" page, which gives instructions on how to test new configurations. The official FAQ and wiki are great too. The official blog and Twitter account are dead, but the mailing list, Reddit group and IRC channel (**#xmonad** at **irc.freenode.net**) are active.

The homepage of Bluetile offers just a list of the most used hotkeys. That isn't a problem, as you can reuse most of the XMonad resources to learn how to use and configure Bluetile.

After the Xmonad/Bluetile pair, the best documentation is that of i3: much less than that for the Haskell duo, but more than enough to explain everything you may need. The Spectrwm man page is good, but is pretty much the only official documentation there is.
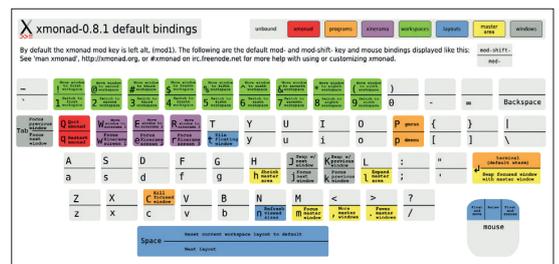


Cheatsheets are an absolute must when using a tiling WM.

Luckily, a great tutorial on the Arch Linux wiki (**https://wiki.archlinux.org/index.php/spectrwm**) fills this void. The two man pages for Herbstluftwm and its valet application, **herbstclient**, remain the primary sources of information for this WM.

**VERDICT**

| | |
|---|---|
| Bluetile | ★★★★★ |
| Herbstluftwm | ★★★★☆ |
| i3 | ★★★★☆ |
| Spectrwm | ★★★☆☆ |
| Xmonad | ★★★★★ |

# OUR VERDICT

## Tiling window managers

**W**e said it right at the beginning: a window manager forces you to reconsider how you use your computer. Therefore, in a Group Test like this, feature lists matter less than helping you to ask yourself the right questions. Can you be more productive with nothing to click on, and windows that keep resizing themselves to completely hide that wonderful wallpaper of your last holiday?

First, a warning: the first time that you're reading a web page and click on "Open Link In New Window"

monitor, before deciding that tiling is not for you.

Herbstluftwm is a worthy effort, but not really ahead of the competition in any field. The same could be said for Spectrwm. Bluetile is good, but, in our opinion, only because it is a (very well done) Xmonad showcase.

We like i3 a lot. It's simple, well designed and documented, and accessories like the **nagbar** and **i3-msg** are very powerful.

Xmonad has been defined by its developers as more of a "library for writing tiling WMs" than an actual,

You can easily complement the Xmonad status bar with a system tray for icons and notifiers of any kind.

> **"Can you really be more productive with windows that keep resizing themselves?"**

you'll find that the page you were just reading suddenly gets four times smaller and flies to another part of the screen. You may find this a little annoying. What's more, several popular websites become completely unusable if the browser window is too narrow. To use such sites in a tiling WM (without having to zoom out so much that it makes your eyes hurt), you must learn to make the browser window float, at least temporarily.

So, be patient! Schedule at least a couple of hours to practise, with a printed cheatsheet right beside your

finished product, and we tend to agree. You can and should build yourself your perfect tiling WM with the components that Xmonad provides. Yes, we know: Haskell looks like some ancient scroll straight from Atlantis but… do you really care? With so many ready configuration files online, and its active community, you just need to ask politely to find out what code (or lines in a configuration file) you need to copy and paste to get Xmonad working right for you.

So Xmonad it is — but you may wish to practise with Bluetile first…

### 1st Xmonad
**Licence** BSD **Version** 0.11

**http://xmonad.org**
The current version of Xmonad is some years old, but that's only because the code is completely mature.

### 2nd i3
**Licence** BSD **Version** 4.7.2

**http://i3wm.org**
I3 is a good match between completeness, ease of use, and very powerful tools to extend it.

### 3rd Spectrwm
**Licence** ISC **Version** 2.5.0

**http://spectrwm.org**
It may take a bit more time to make it work just like you need, but the "quirks" and other features of Spectrwm can do a lot.

### 4th Herbstluftwm
**Licence** BSD **Version** 0.6.2

**http://spectrwm.org**
A great tool, and dynamically reconfigurable with easy shell scripts – it just needs more documentation.

### 5th Bluetile
**Licence** BSD **Version** 0.6

**http://bluetile.org**
Bluetile comes in last only because we wanted to put completely independent projects first – it's still a great WM!

## YOU MAY ALSO WISH TO TRY...

If you've been bitten by the tiling bug you'll find plenty out there to try. Bspwm, for example, does things the old Unix way: it doesn't do much by itself, but you can glue it together with a few small utilities to make it do what you want. Besides, it can split any window in two whenever you feel like it. Then there is Awesome, which has ready shortcuts

for volume control and clipboard, email notification and supports autohiding widgets.

The common ancestor and inspiration for all the current tiling managers for Linux is called Dwm, which is still around. Its main disadvantage is that you have to recompile it to make it load changes in configuration. This isn't really a big deal, but you need to install a

compiler and know how to start it. Alopex and Monsterwm have the same requirement.

Want more? Point your favourite browser to the tiling window manager comparison table at the fantastic Arch Linux wiki (https://wiki.archlinux.org/index.php/Comparison_of_Tiling_Window_Managers#Comparison_table).