xrandr X11 display layout

START HERE

xrandr
List outputs and modes

`xrandr` **`--output`** *`<out>`* **`--primary`**
Make it the main display

`xrandr` **`--output`** *`<out>`* **`--auto`**
Turn an output on

`xrandr` **`--output`** *`<out>`* **`--rotate left`**
Rotate the picture

`xrandr` **`--output`** *`<out>`* **`--off`**
Turn an output off

`xrandr` **`--output`** *`<out>`* **`--mode`** *`<WxH>`*
Pick a resolution

`xrandr` **`--output`** *`<out>`* **`--right-of`** *`<other>`*
Extend to the right

`xrandr` **`--output`** *`<out>`* **`--same-as`** *`<other>`*
Mirror a display

Output HDMI-1, eDP-1 → `--mode` → **Mode** size + rate → `--pos` → **Position** in the screen → `--fb` → **Screen** one big canvas

CONCEPTS

Run plain xrandr first: output names (HDMI-1, eDP-1, ...) differ per driver, and * marks the active mode.

Outputs are placed on one shared canvas (the screen); a position is the output's top-left corner on it.

X11 only. Under Wayland, Xwayland's RandR is read-only; use the compositor's own tool (e.g. wlr-randr, swaymsg output).

Changes last until the X server restarts: put your command in a startup script (.xprofile, i3 config) to keep it.

QUERY

xrandr
Show outputs, modes, active mode

`xrandr` **`--query`**
Same as no arguments

`xrandr` **`--current`**
Show state without re-probing hardware

`xrandr` **`--verbose`**
Detail incl. properties, gamma, transform

QUERY (cont.)

`xrandr` **`--prop`**
Show output properties (EDID, ...)

`xrandr` **`--listmonitors`**
List defined monitors

`xrandr` **`--listactivemonitors`**
List only active monitors

`xrandr` **`--listproviders`**
List GPU providers

`xrandr` **`--dryrun`** *`<options>`*
Check a command without applying it

`xrandr` **`--version`**
Print the server's RandR version
Reports the RandR protocol of the X server, not the xrandr tool version.

ENABLE AND MODE

`xrandr` **`--output`** *`<out>`* **`--auto`**
Enable at its preferred mode

`xrandr` **`--output`** *`<out>`* **`--off`**
Disable the output

`xrandr` **`--output`** *`<out>`* **`--mode`** *`<WxH>`*
Set resolution

`xrandr` **`--output`** *`<out>`* **`--mode`** *`<WxH>`* **`--rate`** *`<Hz>`*
Set resolution and refresh rate

ENABLE AND MODE (cont.)

`xrandr` **`--output`** *`<out>`* **`--preferred`**
Select preferred mode only
Like --auto but does not enable or disable the output.

`xrandr` **`--output`** *`<out>`* **`--primary`**
Make this the primary output

`xrandr` **`--noprimary`**
Clear the primary output

LAYOUT

`xrandr` **`--output`** *`<out>`* **`--pos`** *`<X>`***`x`***`<Y>`*
Place at exact pixel position

`xrandr` **`--output`** *`<out>`* **`--left-of`** *`<other>`*
Put to the left

`xrandr` **`--output`** *`<out>`* **`--right-of`** *`<other>`*
Put to the right

`xrandr` **`--output`** *`<out>`* **`--above`** *`<other>`*
Put above

`xrandr` **`--output`** *`<out>`* **`--below`** *`<other>`*
Put below

`xrandr` **`--output`** *`<out>`* **`--same-as`** *`<other>`*
Mirror another output
Mirroring works best when both use a mode of the same size.

LAYOUT (cont.)

`xrandr` **`--fb`** *`<W>`***`x`***`<H>`*
Set total screen size

`xrandr` **`--output`** *`<a>`* **`--auto`** **`--output`** *`<b>`* **`--auto`** **`--right-of`** *`<a>`*
Configure two outputs in one call

ROTATE, SCALE, TRANSFORM

`xrandr` **`--output`** *`<out>`* **`--rotate normal`**
Reset rotation

`xrandr` **`--output`** *`<out>`* **`--rotate left`**
Rotate counter-clockwise

`xrandr` **`--output`** *`<out>`* **`--rotate right`**
Rotate clockwise

`xrandr` **`--output`** *`<out>`* **`--rotate inverted`**
Rotate 180 degrees

`xrandr` **`--output`** *`<out>`* **`--reflect x`**
Mirror horizontally (x, y or xy)

`xrandr` **`--output`** *`<out>`* **`--scale`** *`<X>`***`x`***`<Y>`*
Scale the output's picture
Values above 1 shrink content (more desktop shown); below 1 zoom in. Often used for HiDPI.

ROTATE, SCALE, TRANSFORM (cont.)

`xrandr` **`--output`** *`<out>`* **`--scale-from`** *`<W>`***`x`***`<H>`*
Show a W x H area of the screen

`xrandr` **`--output`** *`<out>`* **`--filter nearest`**
Pixel-sharp scaling filter

`xrandr` **`--output`** *`<out>`* **`--transform none`**
Remove the transform

`xrandr` **`--dpi`** *`<n>`*
Set reported DPI

COLOUR AND MODES

`xrandr` **`--output`** *`<out>`* **`--brightness`** *`<n>`*
Software brightness (1.0 = normal)
Scales gamma in software only; the backlight is untouched.

`xrandr` **`--output`** *`<out>`* **`--gamma`** *`<R>`***`:`***`<G>`***`:`***`<B>`*
Set gamma per channel

`xrandr` **`--newmode`** **"***`<name>`***"** *`<modeline>`*
Define a custom mode

`xrandr` **`--addmode`** *`<out>`* *`<name>`*
Add a mode to an output

`cvt` *`<W>`* *`<H>`* *`<Hz>`*
Generate a modeline

MONITORS AND PROVIDERS

`xrandr` **`--setmonitor`** *`<name>`* **`auto`** *`<out>`*
Define a monitor for an output

`xrandr` **`--setprovideroutputsource`** *`<prov>`* *`<src>`*
Use another GPU's outputs

RECIPES

Laptop plus external, extended

```
xrandr --output eDP-1 --auto --pos 0x0 \
       --output HDMI-1 --auto --right-of eDP-1 --primary
```

Back to laptop only

```
xrandr --output HDMI-1 --off --output eDP-1 --auto
```

Presentation: mirror at 1920×1080

```
xrandr --output eDP-1 --mode 1920x1080 \
       --output HDMI-1 --mode 1920x1080 --same-as eDP-1
```

Custom mode

```
cvt 1920 1080 60
# paste the Modeline values after the name:
xrandr --newmode "1920x1080_60.00" <modeline values>
xrandr --addmode HDMI-1 1920x1080_60.00
xrandr --output HDMI-1 --mode 1920x1080_60.00
```