xrandr X11 display layout

START HERE

xrandr
List outputs and modes

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

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

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

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

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

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

ENABLE AND MODE (cont.)

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

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

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

xrandr --output *<out>* **--crtc** *<n>*
Force a specific CRTC

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.

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

ROTATE, SCALE, TRANSFORM (cont.)

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.

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** *<a,b,c,d,e,f,g,h,i>*
Apply a 3×3 matrix

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

xrandr --output *<out>* **--panning** *<W>***x***<H>*
Let the view pan over a larger desktop

Combine with --fb so the screen is big enough.

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

xrandr --delmode *<out>* *<name>*
Remove a mode from an output

COLOUR AND MODES (cont.)

xrandr --rmmode *<name>*
Delete an unused mode

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

xrandr --output *<out>* **--set** *<prop>* *<value>*
Set an output property

MONITORS AND PROVIDERS

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

xrandr --setmonitor *<name>* *<W>***/***<mmW>***x***<H>***/***<mmH>***+***<X>***+***<Y>* *<out>*
Define a monitor by geometry

xrandr --delmonitor *<name>*
Remove a defined monitor

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

xrandr --setprovideroffloadsink *<prov>* *<sink>*
Set a render-offload sink

xrandr --nograb ...
Apply without grabbing the server

xrandr --display *<name>* **...**
Talk to another X display

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
```