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
```