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
```