

USB-C / HDMI and USB-tether cast (roadmap D & E)

From USB_HDMI_CAST.md

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Source: USB_HDMI_CAST.md — section links work in PDF viewers that support internal anchors.

Android Cast streams over **Wi-Fi** (UDP/TCP/QUIC). USB-C→HDMI adapters use Android's **wired external display** stack, which is separate from the cast protocol.

Layer model

Layer	Mechanism	This app today
Wired mirror	DisplayManager + HDMI/DP alt mode	Not encoded by us; OS drives the sink
Wi-Fi cast	MediaProjection + CastTransport	Primary product path
USB-tether cast (E)	IP over USB (RNDIS/ADB reverse) + same framing	Stub (usb_tether transport)

Phase D — external display awareness & future capture

Implemented (foundation):

- `WiredDisplayMonitor` — tracks non-default displays (HDMI, presentation, etc.).
- `ExternalDisplayCapturePolicy` — developer preference for future capture routing.
- Developer settings: live wired-display status + capture policy selector.
- `ScreenCastService` registers extended display listener (rotation + hot-plug).

Not implemented yet (post-alpha):

- Capture **secondary display** via `MediaProjection / createVirtualDisplay` on non-default `Display`.
- Android 14+ per-app capture rules and extend-vs-mirror modes.
- Automatic switch to external display when passive/active USB-C adapter works.

User workaround when HDMI dongle fails: LAN cast to a receiver (phone/box) connected to the projector by HDMI or built-in Android on the projector.

Phase E — USB-tether transport

Implemented (foundation):

- `UsbTetherCastTransport` stub implementing `CastTransport`.
- `CastConfig.TRANSPORT_USB_TETHER` — selectable only when **Developer settings** → **USB-tether transport** is on.
- Factory routes to stub; connect/listen throw until RNDIS/ADB tunnel + discovery are wired.

Future work:

- Detect USB tether / ADB TCP forward (`adb reverse`).
- Optional discovery on `127.0.0.1` or tether interface IP.
- Same `CastProtocol` framing as UDP/TCP.

Tablet + adapter checklist (e.g. Doogee Tab G6 Max → HY300)

1. **Settings** → **Display** — does a second screen appear when the dongle is plugged in?
 2. **Passive** adapter: requires USB-C **DisplayPort Alt Mode** on the tablet port.
 3. **Active** adapter: needs a chip/firmware pair the tablet supports (often still DP alt mode internally).
 4. If the OS never sees an external display, **no app feature** can fix the cable path; use Wi-Fi cast or receiver-on-HDMI.
- See ROADMAP.md for alpha and commercial tracks.