

Physical Infrastructure

Physical layer documentation — structured cabling, patch panel, rack, switching hardware, wireless mesh, and server network interfaces.

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Network Closet & Structured Cabling

Overview

The network closet is located in the **Basement Electrical Panel room**, which serves as the central termination point for all Ethernet and Coax runs in the house. This is not yet a finished closet — it is an open area with a floor-standing rack in place. Full rack buildout (patch panel punch-down, cable labelling, power management) is planned for **Summer 2026**.

“ **Status:** Work in progress. All Ethernet runs are currently raw ends. Patch panel is not yet installed.

Rack

Property	Detail
Type	Floor-standing
Size	6U
Status	In place, not fully secured or built out

“ **Note:** 6U is tight at full population. Current planned rack residents: 24-port patch panel (1U), GigaPlus switch (1U), 5-port PoE switch (1U), PDU (1U) — leaves 2U spare. Consider upsizing before finalizing rack procurement.

Patch Panel

Property	Detail
Type	24-port Cat6 keystone
Status	Not yet installed — pending cable labelling
Blocker	All 18 runs require labelling at both ends before punch-down

Ethernet Runs — Full Inventory

18 total runs. All Cat6 runs were self-installed post-purchase. Cat5a runs are builder-installed dual-purpose cable.

#	Room / Zone	Count	Type	Notes
1	Basement Gym	1	Cat6	Single wall plate (unfinished). Feeds Deco AP, TV, PoE injector → Front Yard Camera
2	Living Room	1	Cat6	Self-run through wall. Feeds unmanaged switch → TV + AppleTV
3	Front Yard	2	Cat6	Run 1: from Network Closet → Reolink camera (active). Run 2: from Gym PoE injector → future gas meter camera (Fall 2026)
4	Back Yard	2	Cat6	Run 1: PoE → outdoor Deco X50-Outdoor AP. Run 2: unconnected — reserved for future WAN failover (Starlink or UniFi SIM)
5	Garage	1	Cat6	~50-70ft via conduit. Feeds Deco X50-Outdoor AP (PoE-powered from Closet)
6	Kitchen	2	Cat6	Run 1: Deco BE11000 AP (primary node). Run 2: spare / unconnected

#	Room / Zone	Count	Type	Notes
7	Kitchen	1	Cat5a	Builder run — awkward termination position, unconnected
8	Media Room	1	Cat5a	Single wall drop — daisy-chained switches downstream
9	Guest Bedroom	1	Cat5a	Not directly in use for Ethernet — MoCA adapter at desk end
10	Office	1	Cat5a	Feeds Deco XE75 Pro AP + MokerLink switch → homelab + work desk
11	Master Bedroom	1	Cat5a	PoE — feeds Deco X50-PoE on-wall AP
12	MoCA Network Feed	1	Cat6	Dedicated run from Network Closet to Coax splitter for MoCA/OTA distribution

“ **Labelling status:** Starting from zero. Previous labels have fallen off. Full re-labelling required at both ends of all 18 runs before patch panel work begins.

Coax Infrastructure

A coax network runs in parallel to Ethernet throughout the house, fed from the Network Closet via a coax splitter.

Signal sources at splitter:

- OTA antenna (attic-mounted, amplified)
- MoCA Ethernet bridge (1x adapter at Network Closet end)

Coax-capable rooms:

Room	Active Use
Living Room	Coax present — current use TBD

Room	Active Use
Media Room	Connected to TV (OTA)
Guest Bedroom	MoCA adapter → desk Ethernet
Master Bedroom	Coax present — not actively in use for MoCA

MoCA Adapters:

Location	Role
Network Closet	Coax → Ethernet bridge (network side)
Guest Bedroom	Coax → Ethernet bridge (endpoint)

“ MoCA expansion is possible but unlikely. The Guest Bedroom use case is a unique placement issue where Coax terminated at the right desk location but no Ethernet run was present.

Outstanding Action Items

- ☐ Label all 18 Ethernet runs at both ends (Network Closet + room end)
- ☐ Install 24-port Cat6 keystone patch panel in rack
- ☐ Secure and complete rack buildout
- ☐ Verify IoT network isolation method (see Wireless page)
- ☐ Install gas meter camera on Front Yard Run 2 (Fall 2026)
- ☐ Determine WAN failover solution for Back Yard Run 2 (Starlink vs UniFi SIM)

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Switching & Core Network Hardware

Overview

The core network is built around a **UniFi Cloud Gateway Fiber (Whistler)** as the sole router and firewall. All switching downstream is unmanaged. The Bell Home Hub 3000 remains inline as the Fiber ONT termination point but serves no routing or WiFi function.

WAN & Core Routing

Device	Hostname	Role	Location
Bell Home Hub 3000	—	Fiber ONT + PPPoE upstream passthrough	Basement Electrical Panel
UniFi Cloud Gateway Fiber	Whistler	Sole router, firewall, DHCP, DNS upstream	Basement Electrical Panel / Network Closet

WAN topology:

Bell Fiber (ONT) → HH3000 (PPPoE passthrough, no NAT, WiFi disabled) → UCG Fiber WAN (10GbE) → LAN

“ The HH3000 remains inline rather than bypassed to support troubleshooting and recovery during frequent Bell ISP deprovisioning events. PPPoE credentials are configured directly on the UCG — there is **no double NAT**.

UCG LAN Port Assignments:

Port	Connected To	Speed
WAN	Bell HH3000	10GbE

Port	Connected To	Speed
LAN 1	GigaPlus Switch (SFP+)	10GbE
LAN 2	Emporia Vue (Electrical Panel)	1GbE

Switch Inventory

Switch	Model	Location	Ports	Uplink	Notes
GigaPlus	GigaPlus (unbranded)	Network Closet	2x SFP+ 10GbE, 8x 2.5GbE	UCG LAN1 (SFP+)	Core distribution switch
5-port PoE	Unbranded	Network Closet	5x 1GbE PoE	GigaPlus (2.5GbE)	Powers cameras and PoE Deco APs
MokerLink	MokerLink	Office	8x 2.5GbE	GigaPlus (SFP+)	Homelab + work desk uplink
Media Room #1	Netgear (older)	Media Room	Unknown	Single Cat5a wall drop	Daisy-chains to Media Room #2
Media Room #2	Unbranded	Media Room	Unknown	Media Room #1	AV + gaming devices
Garage	Unbranded	Garage	5x 1GbE	Deco X50-Outdoor LAN port	Non-PoE — uses downstream injector

“ **All switches are unmanaged.** No VLANs or managed switching features are in use at the switch level. IoT and Guest network segmentation is handled at the Deco/UCG layer.

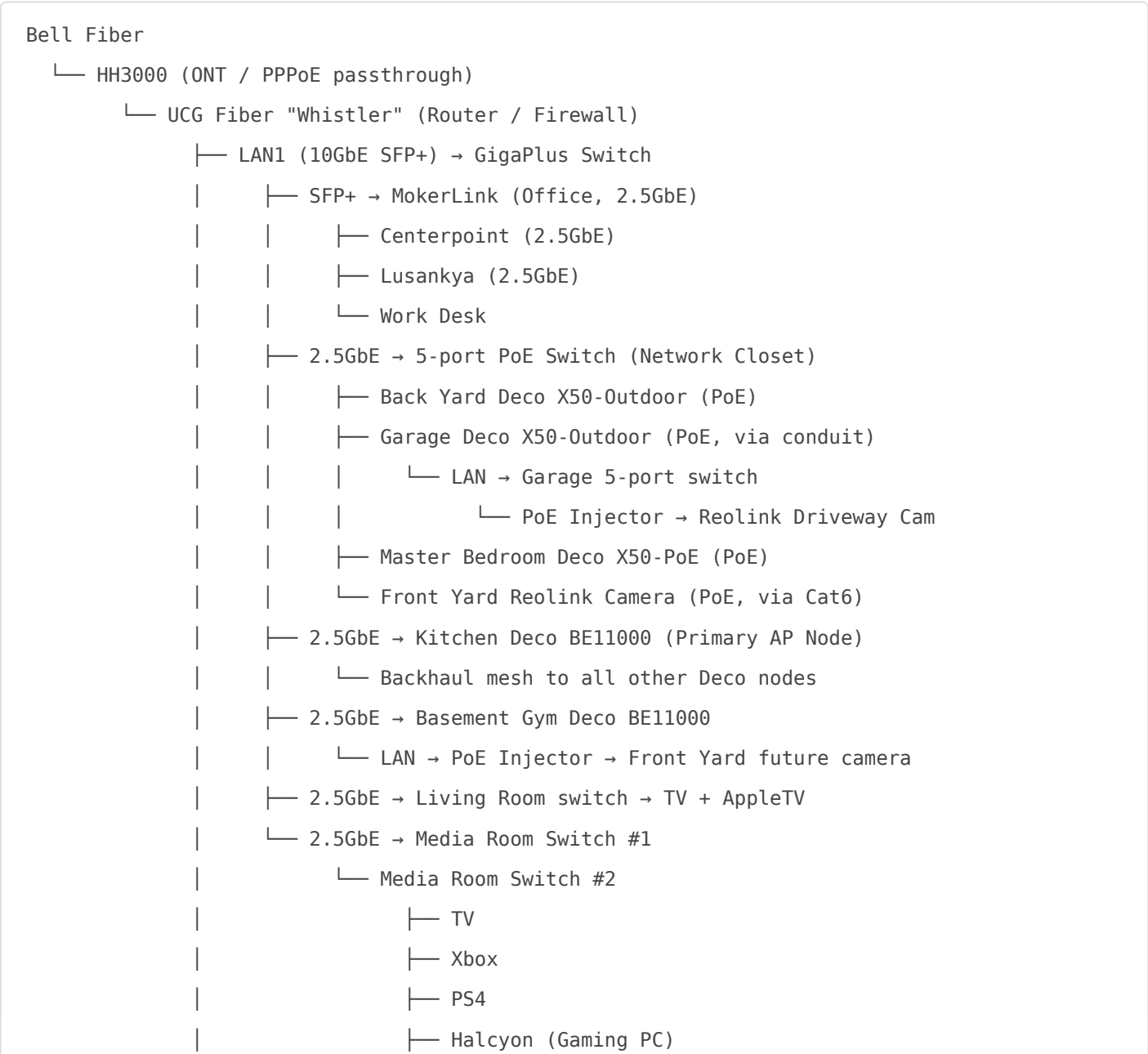
“ **Media Room note:** Both switches are daisy-chained off a single Cat5a wall drop — a known bottleneck. All Media Room bandwidth is constrained to 1GbE on a single shared uplink.

PoE Infrastructure

Injector / Source	Location	Powered Device
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5-port PoE Switch (port)	Network Closet	Back Yard Deco X50-Outdoor
5-port PoE Switch (port)	Network Closet	Garage Deco X50-Outdoor (via conduit Cat6)
5-port PoE Switch (port)	Network Closet	Master Bedroom Deco X50-PoE
5-port PoE Switch (port)	Network Closet	Front Yard Run 1 → Reolink Camera
PoE Injector (passive)	Basement Gym	Front Yard Run 2 → future gas meter camera
PoE Injector (passive)	Garage	Reolink Driveway Camera

Network Topology Diagram (Text)



Outstanding Action Items

- ☐ Identify and document Media Room switch models and port counts
- ☐ Confirm GigaPlus full model number
- ☐ Confirm exact UCG LAN1 port type (copper 2.5GbE vs SFP+)
- ☐ Evaluate managed switch replacement for Media Room (single uplink bottleneck)

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Wireless — Deco Mesh

Overview

Wireless coverage is provided by a **TP-Link Deco mesh network** operating in **AP mode** — all routing and DHCP is handled upstream by Whistler (UCG Fiber). All nodes use **wired Ethernet backhaul**; no wireless backhaul is in use.

The network supports WiFi 7 (BE) on capable nodes with Multi-Link Operation (MLO).

Node Inventory

Node	Model	Location	Mount	Power Source	Backhaul Uplink
Primary	Deco BE11000	Kitchen	Freestanding	Passive (powered via Cat6)	GigaPlus switch (Cat6)
Secondary	Deco BE11000	Basement Gym	Freestanding	Passive (powered via Cat6)	GigaPlus switch (Cat6)
Office	Deco XE75 Pro	Office	Freestanding	Passive	MokerLink switch (Cat5a)
Master Bedroom	Deco X50-PoE	Master Bedroom	On-wall	PoE (5-port PoE switch via Cat5a)	5-port PoE switch
Back Yard	Deco X50-Outdoor	Back Yard	Outdoor mount	PoE (5-port PoE switch via Cat6)	5-port PoE switch
Garage	Deco X50-Outdoor	Garage	Outdoor mount	PoE (5-port PoE switch via conduit Cat6)	5-port PoE switch

SSID Configuration

SSID	Bands	Purpose	Client Isolation
Main (MLO)	2.4 / 5 / 6 GHz	Primary devices	No

SSID	Bands	Purpose	Client Isolation
IoT	2.4 GHz only	Smart home devices	Intended — method unverified
Guest	2.4 / 5 GHz	Guest access	Yes — no local network access

“ **IoT isolation caveat:** Deco abstracts network isolation implementation details. It is the intent that IoT devices cannot communicate with main LAN devices, but the specific mechanism (VLAN, client isolation, UCG firewall rule) has not been verified. **Do not treat IoT as confirmed isolated until this is investigated.**

Known Limitations & Notes

- IoT device migration to the IoT SSID is **in progress** — not all smart home devices have been moved over yet
- The Back Yard Run 2 (non-PoE Cat6) is reserved for future WAN failover — not a Deco uplink
- No wireless backhaul in use — all nodes require a wired Ethernet connection

Outstanding Action Items

- ☐ Verify IoT network isolation mechanism — check UCG firewall rules and Deco app network settings
- ☐ Complete migration of all smart home devices to IoT SSID
- ☐ Document final device-to-SSID mapping once migration is complete

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End Devices — Network Interfaces

Overview

Key server and endpoint devices and their physical network interface configuration. All servers are assigned **static IPs configured at the UCG Fiber**. All other devices use DHCP (with or without reservations — to be documented separately).

“ Full static IP and DHCP reservation mapping is out of scope for this page — see **Network → Logical Configuration → IP Address Management** (future page).

Server & Key Endpoint Interfaces

Device	Hostname	Location	NIC Speed	Switch	IP Assignment
MiniPC Intel Core Ultra 9	Centerpoint	Office	2.5GbE onboard	MokerLink	Static (UCG)
QNAP TS-873 (UnRAID)	Lusankya	Office	2.5GbE NIC	MokerLink	Static (UCG)
N100 Server (Home Assistant OS)	Corsec	Media Room	1GbE onboard	Media Room Switch #2	Static (UCG)
Gaming PC (RTX 3060)	Halcyon	Media Room	1GbE onboard	Media Room Switch #2 (daisy-chained)	Static (UCG)
UniFi Cloud Gateway Fiber	Whistler	Network Closet	10GbE WAN + multi-port LAN	Core (is the switch root)	Static (self)

Notable Interface Constraints

- **Halcyon** is currently wired in the Media Room via daisy-chained 1GbE unmanaged switches off a single Cat5a wall drop — bandwidth is shared with all other Media Room devices including CorSec, Smart Hubs, TV, Xbox, and PS4
 - **Lusankya** has a 2.5GbE NIC but the QNAP TS-873 onboard NICs are 1GbE — confirm which NIC is active for primary traffic
 - **Centerpoint** 2.5GbE is the bottleneck on the MokerLink → GigaPlus SFP+ uplink for inter-server traffic; Lusankya is on the same segment
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Outstanding Action Items

- ☐ Document full static IP table and DHCP reservation list (separate page)
- ☐ Confirm Lusankya active NIC (onboard 1GbE vs add-in 2.5GbE)
- ☐ Evaluate moving Halcyon to Office switch when rack buildout is complete (dedicated Cat6 run consideration)

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