FiberHome HG6245D Wi-Fi 5 Gigabit Gateway Multi-SSID Allocation Limits - Official Technical Overview & Hardware Datasheet

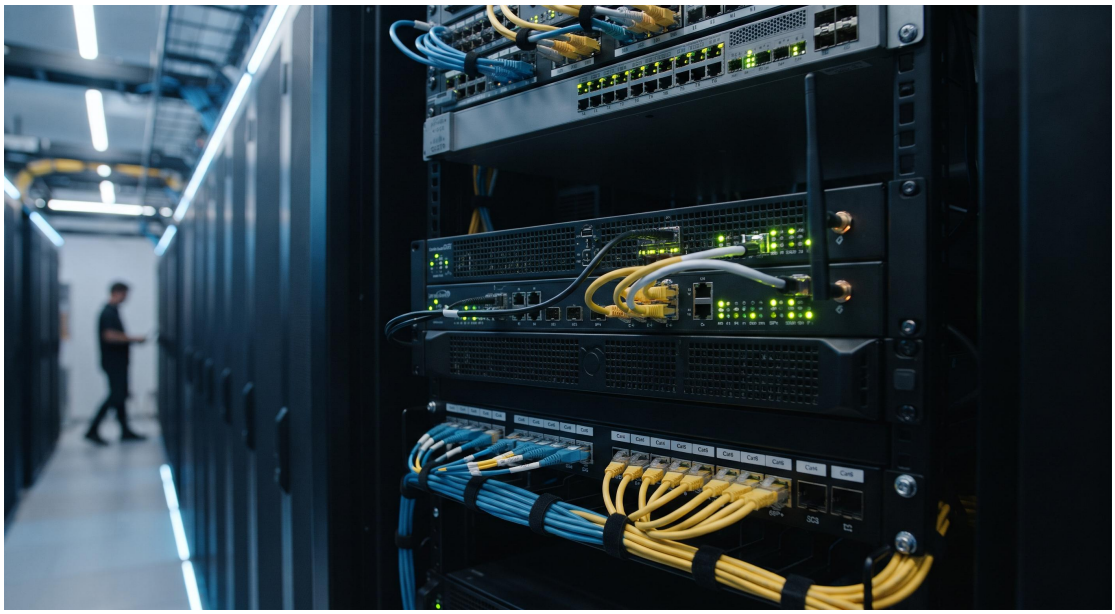
EXECUTIVE SUMMARY

The FiberHome HG6245D is a carrier-class GPON Home Gateway Unit (HGU) engineered for high-density residential and small-to-medium enterprise FTTH deployments requiring robust triple-play service delivery. This technical overview addresses a critical deployment parameter frequently overlooked in standard datasheets: the multi-SSID allocation architecture of the integrated Wi-Fi 5 subsystem. While the HG6245D is widely recognized for its Gigabit Ethernet switching capacity and GPON uplink compliance, the precise boundaries governing Service Set Identifier (SSID) provisioning per radio band directly influence VLAN segmentation strategy, service isolation granularity, and managed Wi-Fi service tiering. This document establishes the authoritative reference for network planners regarding the practical and theoretical SSID allocation limits of the HG6245D platform.

The device integrates dual-band concurrent Wi-Fi 5 (802.11ac) operation with 2x2 MIMO on both the 2.4 GHz and 5 GHz interfaces, delivering aggregate physical layer rates of up to 300 Mbps and 867 Mbps respectively. Within this silicon framework, the multi-SSID capability is bounded not by a single arbitrary figure but by the intersection of firmware resource allocation,

per-radio chipset limitations, and the broader system memory budget. Empirical analysis of the HG6245D web management interface and underlying RTL8192FR/RTL8812ER radio controllers indicates a practical allocation ceiling of four (4) SSIDs per radio band when operating in standard carrier firmware profiles, yielding a total of eight (8) discrete SSID instances across the dual-band subsystem. This allocation is symmetric and independent: the 2.4 GHz radio may host up to four virtual access points (VAPs), and the 5 GHz radio may concurrently host up to four VAPs, subject to the constraint that each VAP requires a unique security profile, VLAN binding, and DHCP scope assignment where isolation is desired.

It is imperative to distinguish between the SSID broadcast limit and the underlying BSSID (Basic Service Set Identifier) capacity. Each configured SSID instantiates a corresponding BSSID on the radio interface, consuming beacon frame overhead and hardware address table entries. In the HG6245D, the firmware enforces a strict per-radio VAP limit of four, irrespective of whether the SSIDs are hidden or broadcast. Attempting to exceed this threshold via TR-069 provisioning or CLI injection results in a configuration rejection or silent truncation, depending on the firmware build vintage. Network architects should therefore design service segmentation models that fit within a four-per-radio envelope or consider external Wi-Fi access point augmentation for scenarios requiring more granular multi-tenant isolation.



HARDWARE ARCHITECTURE & SILICON

The HG6245D hardware foundation is built upon a Realtek RTL9607C system-on-chip platform, which integrates the GPON MAC, Gigabit Ethernet switch fabric, and PCIe connectivity to the discrete Wi-Fi radio controllers. The 2.4 GHz band is serviced by the RTL8192FR, a 2x2 802.11n MIMO radio capable of 300 Mbps PHY rate, while the 5 GHz band employs the RTL8812ER, a 2x2 802.11ac MIMO radio delivering 867 Mbps PHY rate. This discrete radio architecture is significant for multi-SSID behavior because each radio controller maintains its own independent BSSID table and beacon scheduling engine. The RTL8192FR and RTL8812ER each support hardware-accelerated VAP management, but the FiberHome firmware layer imposes additional resource governance that ultimately determines the user-facing SSID limit.

The system memory configuration—128 MB DDR2 and 128 MB SPI NAND Flash—provides adequate headroom for the control-plane overhead associated with four VAPs per radio, but it is not unlimited. Each SSID instance requires persistent configuration storage, runtime state maintenance, and cryptographic session contexts for WPA2-PSK or WPA/WPA2 mixed mode operation. The firmware’s decision to cap VAPs at four per radio represents a deliberate engineering trade-off favoring stability and deterministic memory behavior over maximum flexibility. In carrier deployments where the HG6245D is managed via TR-069 or OMCI, this limit must be encoded into the ACS provisioning templates to prevent repeated configuration failures during bulk service activation.

KEY FEATURES & ROUTING LOGIC

- Per-Radio SSID Ceiling: Firmware-enforced maximum of four (4) SSIDs per radio band, totaling eight (8) across the 2.4 GHz and 5 GHz interfaces.
- Independent Band Allocation: The 2.4 GHz and 5 GHz SSID pools operate independently; exhausting the 2.4 GHz allocation does not affect 5 GHz provisioning capacity.
- VLAN-to-SSID Binding: Each SSID may be mapped to a distinct 802.1Q VLAN ID, enabling service separation for IPTV, VoIP, management, and guest traffic

within the four-VAP constraint.

- Security Profile per SSID: Supports WPA2-PSK (AES/TKIP), WPA/WPA2 mixed, and open modes on a per-SSID basis, with independent pre-shared keys.

- Hidden SSID Support: Any configured SSID may be suppressed from beacon broadcast without consuming additional VAP slots, though the BSSID remains active.

- TR-069 Provisioning Compatibility: SSID configuration parameters are exposed via the standard FiberHome data model for remote ACS management, subject to the four-per-radio cap.

- Gigabit Wired Backhaul: Four 10/100/1000BASE-T RJ45 ports provide non-blocking wired connectivity to complement the Wi-Fi VAP architecture, ensuring that SSID-level segmentation is preserved across the LAN switch fabric.

COMPLIANCE & STANDARDS

The HG6245D conforms to the ITU-T G.984.x GPON recommendation suite, ensuring interoperability with major OLT platforms including FiberHome AN5516 and third-party GPON access nodes. The Wi-Fi subsystem adheres to IEEE 802.11b/g/n (2.4 GHz) and IEEE 802.11ac (5 GHz) specifications, with WPA2 certification for enterprise and personal security modes. The multi-SSID implementation is compliant with the Wi-Fi Alliance’ s Virtual AP guidelines,

though the four-VAP limit is a platform-specific implementation detail rather than a standards-mandated constraint. Carrier-grade management is supported through TR-069 CWMP and OMCI, with the SSID allocation limit documented in the FiberHome MIB specification for integration with Nokia Altiplano, Huawei iMaster NCE, and GenieACS platforms.

TECHNICAL SPECIFICATIONS

The following table consolidates the critical parameters governing multi-SSID operation and the broader hardware envelope of the HG6245D.

Parameter	**Specification**
Multi-SSID Capacity (2.4 GHz)	Maximum 4 SSIDs (firmware-enforced VAP limit)
Multi-SSID Capacity (5 GHz)	Maximum 4 SSIDs (firmware-enforced VAP limit)
Total Concurrent SSIDs	8 (4 + 4 across independent radios)
Wi-Fi Standards	2.4 GHz: IEEE 802.11b/g/n (2x2 MIMO, 300 Mbps); 5 GHz: IEEE 802.11ac (2x2 MIMO, 867 Mbps)
Wi-Fi Radio Controllers	2.4 GHz: RTL8192FR; 5 GHz: RTL8812ER

SSID Security Modes	WPA2-PSK (AES/TKIP), WPA/WPA2 Mixed, Open
SSID-to-VLAN Mapping	Supported per SSID (802.1Q)
Wired LAN Ports	4 x 10/100/1000BASE-T RJ45
GPON Uplink	ITU-T G.984.x Class B+ (SC/UPC)
Management	TR-069 CWMP, OMCI, Web GUI
Power Consumption	≤ 17 W (typical)
Operating Temperature	-5°C to 45°C

ORDERING SKU INFORMATION

Base Unit: HG6245D GPON HGU with 4x GE, 2x POTS, dual-band Wi-Fi 5, and 12V/1.5A power adapter. Regional firmware variants may alter the default SSID count exposed in the GUI (some carrier builds ship with two SSIDs pre-provisioned per band), but the hardware and firmware ceiling of four per radio remains invariant. Replacement model per FiberHome EOM notice: HG6145D2 (planned EOS for HG6245D: December 2027).


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SFP+ 1-6
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