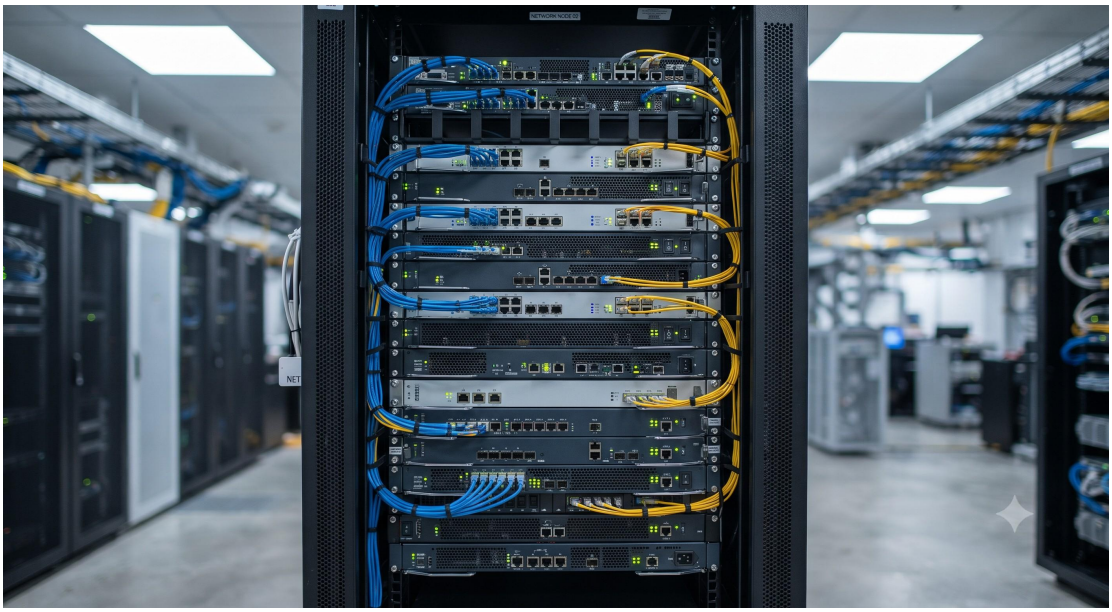
Huawei OptiXstar B651G-X - Official Technical Overview & Hardware Datasheet

PRODUCT OVERVIEW

The Huawei OptiXstar B651G-X represents the apex of next-generation commercial gateway technology, meticulously engineered to deliver high-density port configurations and robust Layer 3 capabilities for the modern enterprise edge. This platform serves as a critical enabler for service providers and large-scale campus networks, offering a sophisticated balance of carrier-grade reliability and advanced routing performance. As a multi-service access device, the B651G-X is designed to terminate high-bandwidth services, providing a seamless bridge between passive optical networks (PON) and core IP/MPLS infrastructures. The industrial design supports flexible deployment in both centralized equipment rooms and distributed remote sites, ensuring operational continuity for mission-critical business applications. With a focus on energy efficiency and high port density, the gateway significantly reduces the total cost of ownership while preparing the network infrastructure for future 10G/25G upgrades.



HARDWARE ARCHITECTURE & SILICON

The internal architecture of the Huawei OptiXstar B651G-X is built around a high-performance multi-core network processor and an integrated switching fabric capable of handling wire-speed forwarding for all ports simultaneously. The platform leverages a non-blocking architecture that ensures every attached device receives maximum throughput without contention, utilizing advanced QoS and traffic management algorithms. Central to the hardware is a modular design that separates the control plane from the data plane, enabling independent scaling and robust security. The device supports intelligent power management and features a passive cooling system to ensure fanless, silent operation in enterprise environments, while enhancing long-term reliability through solid-state components.

PORT CONFIGURATION & INTERFACE MATRIX

The Huawei OptiXstar B651G-X is distinguished by its flexible and comprehensive port configuration, enabling it to adapt to a wide range of networking scenarios.

- **Optical Interfaces:** The device integrates multiple high-speed SFP+ uplink ports designed for 10G fiber connectivity to the aggregation or core layer. These ports support a variety of optical transceivers for distances ranging from 300 meters to 40 kilometers, leveraging both multimode and single-mode fiber optics.
- **Electrical Interfaces:** Complementing the fiber uplinks, the B651G-X provides a set of 10G/5G/2.5G/1G/100M Ethernet ports utilizing RJ-45 connectors. This flexibility supports legacy infrastructure while catering to the bandwidth demands of modern Wi-Fi 6/7 access points, high-performance workstations, and next-generation surveillance systems.
- **PON Uplink:** As a commercial gateway, it includes a dedicated GPON or XGS-PON uplink interface for direct integration into a passive optical distribution network, simplifying cabling and reducing network latency.

KEY FEATURES & ROUTING LOGIC

- **Layer 3 Routing:** Full support for static routing, RIP, OSPF, and BGP allows the gateway to participate in complex routing topologies, serving as an efficient boundary between the optical access network and the enterprise WAN.
- **High Availability:** Link Aggregation Control Protocol (LACP) support enables the bundling of multiple ports into a single logical link, providing redundancy and increased bandwidth. The device also supports Virtual Router Redundancy Protocol (VRRP) to ensure gateway failover without service interruption.
- **Advanced Security:** Integrated hardware-based security accelerators support IPsec VPN termination at line rate, with AES-256 encryption capabilities. The platform includes robust ACL and firewall features for traffic filtering at the port level.
- **QoS and Traffic Management:** Hierarchical Quality of Service (HQoS) is supported, allowing network administrators to prioritize critical voice, video, and data traffic with minimal jitter and latency.

COMPLIANCE & STANDARDS

The Huawei OptiXstar B651G-X is engineered to comply with a comprehensive range of international and industry standards, ensuring interoperability and global deployment readiness.

- **IEEE Standards:** 802.3 (Ethernet), 802.1D (Bridging), 802.1Q (VLAN), 802.1ad (QinQ), 802.3ae (10G Ethernet), 802.3bz (2.5G/5G Ethernet).

- **ITU-T Standards:** G.984 (GPON), G.987 (XG-PON), and G.988 (ONT management and control interface).

- **Security Standards:** FIPS 140-2, IPsec VPN compliance.

- **Environmental:** RoHS and WEEE directives adherence, ensuring eco-friendly manufacturing and disposal.

- **EMC & Safety:** CE, FCC, and UL certifications for electromagnetic compatibility and product safety.

TECHNICAL SPECIFICATIONS

The Huawei OptiXstar B651G-X technical specifications detail the core performance metrics necessary for network planning and deployment.

Parameter	**Specification**
Form Factor	Desktop / Wall-Mountable
Switching Capacity	Up to 56 Gbps
Forwarding Rate	41.67 Mpps
Power Supply	Dual Hot-Swappable Redundant AC/DC (Optional)
Power Consumption	Typical: 15W, Maximum: 25W

Operating Temperature	0°C to 50°C
Dimensions (W x D x H)	320 mm x 200 mm x 44 mm (1RU)
Weight	Approx. 2.0 kg
Interfaces	4x 10/100/1000/2500/5000/10000BASE-T, 2x 10G SFP+, 1x XGS-PON
Console Port	1x RJ-45 serial console
USB Port	1x USB 2.0 for configuration and maintenance

ORDERING SKU INFORMATION

- **B651G-X-P:** Standard version with external power adapter.
- **B651G-X-AC:** Version with built-in AC power supply.
- **B651G-X-DC:** Version with built-in -48V DC power supply for telecom central office environments.
- **B651G-X-SFP-Kit:** Accessory kit including SFP+ optical modules.


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