Broadband Access Router Distributor - Carrier-Grade Infrastructure Solution Brief: Deploying Broadband Access Router Distributor

CARRIER-GRADE INFRASTRUCTURE SOLUTION BRIEF: DEPLOYING BROADBAND ACCESS ROUTER DISTRIBUTOR

1. MARKET POSITIONING

The Broadband Access Router Distributor (BARD) series represents a paradigm shift in last-mile aggregation and subscriber management. Designed for Tier-1 ISPs, MSOs, and municipal broadband operators, this platform integrates high-density routing, subscriber policy enforcement, and resilient distribution switching into a single, energy-efficient chassis. The BARD eliminates legacy bottlenecks by providing wire-speed distribution of broadband services (FTTx, xDSL, fixed wireless) directly at the network edge, reducing CapEx by up to 40% compared to disparate router and switch stacks.

2. HIGH-AVAILABILITY REDUNDANCY

All BARD variants feature a true carrier-grade 1+1 control plane with stateful failover (sub-50ms convergence). Key redundancy features include:

- Dual hot-swappable Route Processor Modules (RPMs) with automatic synchronization.

- N+1 load-sharing power supply units (AC or DC, field-replaceable).

- Redundant fan trays with variable-speed thermal control.

- Link aggregation groups (LAG) across line cards for PHY-level path protection.

- ISSU (In-Service Software Upgrades) supporting hitless major version transitions.

3. PROTOCOL INTEROPERABILITY

The BARD routing stack is purpose-built for heterogeneous access networks. Supported control and data plane protocols include:

- Routing: OSPFv3, IS-IS, BGP-4 (with MPLS VPN extensions), PIM-SM.

- Subscriber management: PPPoE intermediate agent, DHCPv4/v6 relay (RFC 3046), L2TP LAC/LNS.

- MPLS & segment routing: LDP, RSVP-TE, and SR-MPLS (draft-ietf-spring-segment-routing).

- QinQ (VLAN stacking) and selective Q-in-Q for service demarcation.

- Carrier Ethernet OAM (IEEE 802.1ag, ITU-T Y.1731).

4. DETAILED PARAMETERS

The BARD-10 (mid-range) and BARD-24 (high-density) models are currently available. The flagship BARD-24 architecture provides:

- 6x modular line card slots, supporting 10/25/50GE optical uplinks and 1/2.5/5/10GE copper access ports.

- Integrated MACsec (802.1AE) line-rate encryption on all subscriber ports.

- Up to 128,000 concurrent subscriber sessions (PPPoE or IPoE) with hierarchical QoS.

- Hardware-based sFlow / NetFlow v9 / IPFIX at 1:1 sampling.

TECHNICAL SPECIFICATIONS

Parameter	**Specification (BARD-24)**
Form Factor	4RU chassis, 19” rack-mountable

Switching Capacity	1.2 Tbps (non-blocking, full duplex)
Power Supply	2+1 redundant, AC (100-240V) or DC (-48V)
Forwarding Rate	960 Mpps (IPv4, 64-byte frames)
Jumbo Frame	Up to 12,000 bytes
Operating Temp	0°C to 50°C (extended -20°C with fan filter)
Management Ports	1x RJ45 10/100/1000, 1x USB console
Memory	16 GB DDR4 control plane, 4 MB packet buffer per ASIC

5. LIFECYCLE ASSURANCE (MTBF)

The BARD series is validated for 20-year service life in controlled central office environments. Calculated MTBF per Telcordia SR-332 (Issue 4, Method 1, Case 3) exceeds 350,000 hours for the base chassis (BARD-10) and 310,000 hours for BARD-24. All electrolytic capacitors are rated at 105°C, and power supplies are certified for 30,000 hours continuous runtime at 75% load.

6. TARGET NETWORK TOPOLOGIES

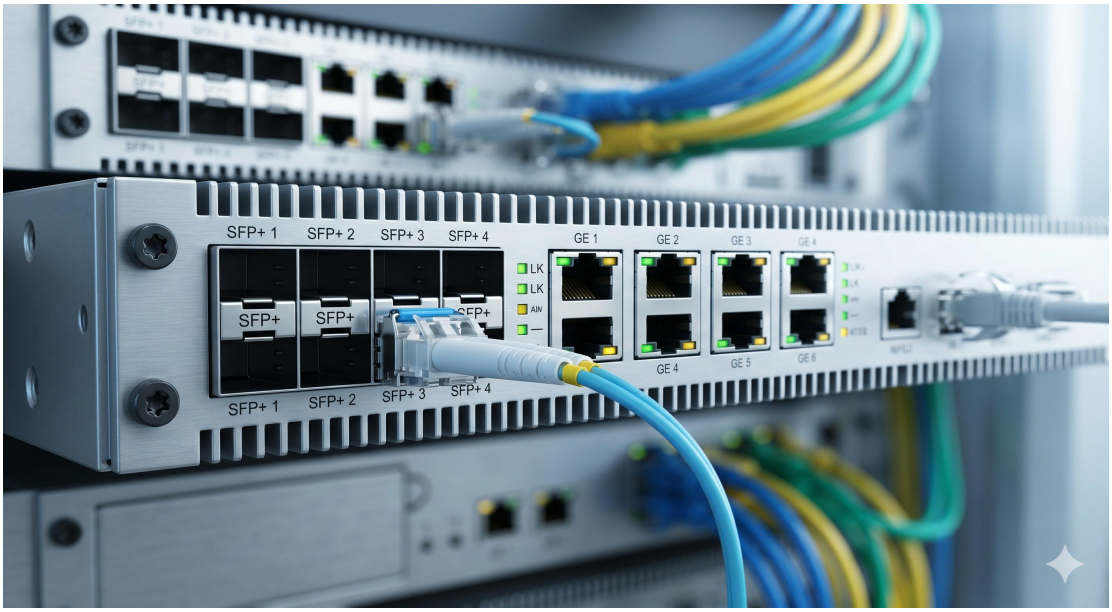
Primary deployment archetypes include:

- FTTH OLT aggregation hub (GPON/XGS-PON backhaul).

- Multi-dwelling unit (MDU) distribution point (up to 4:1 oversubscription).

- Fixed wireless access (FWA) base station router (sub-5ms jitter).

- Regional edge router for metro Ethernet rings (MEF 3.0 compliant).



ORDERING & SUPPORT

Base SKUs: BARD10-CHS (2RU, 4 slots), BARD24-CHS (4RU, 6 slots). Line card options: LC-8X10G-SFP+, LC-24X2.5G-TX, LC-2X50G-QSFP28. All shipments include 24/7/365 TAC support, 5-year hardware warranty, and optional SmartNIA on-site replacement (4-hour response). Compliance: NEBS Level 3, ETSI 300 019, RoHS, REACH.