OEM Dynamic Bandwidth Allocation (DBA) T-CONT Registry Mapping on ZTE OLT Platforms - Official Technical Overview & Hardware Datasheet

OEM DYNAMIC BANDWIDTH ALLOCATION (DBA) T-CONT REGISTRY MAPPING ON ZTE OLT PLATFORMS

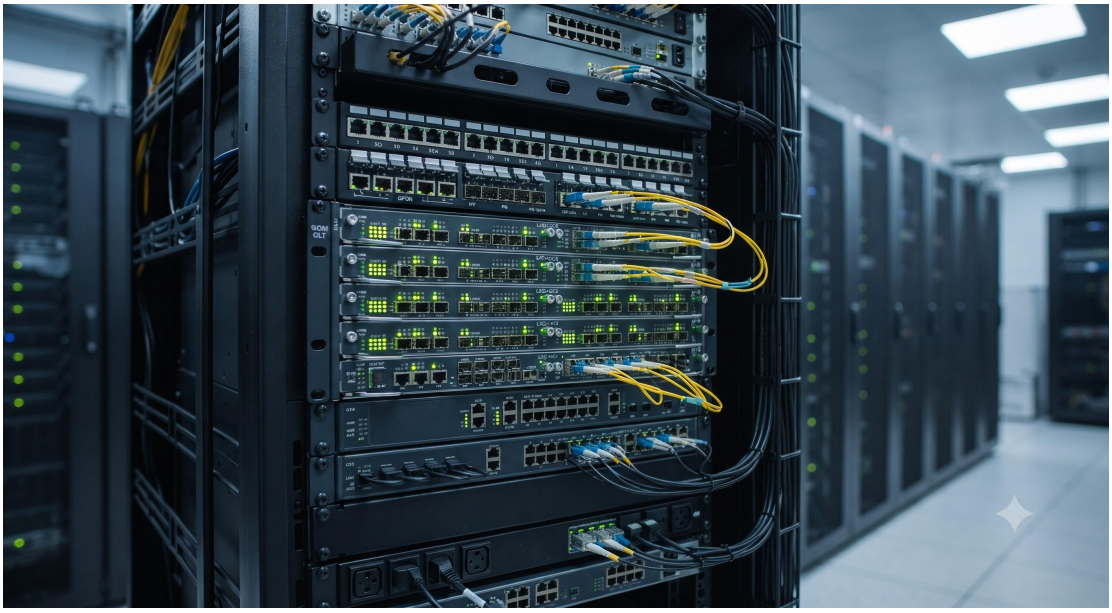
OFFICIAL TECHNICAL OVERVIEW & HARDWARE DATASHEET

EXECUTIVE SUMMARY

This document provides a comprehensive technical overview of the OEM Dynamic Bandwidth Allocation (DBA) T-CONT Registry Mapping implementation for ZTE Optical Line Terminal (OLT) platforms. Designed for carrier-grade GPON and XG-PON networks, this solution delivers sophisticated upstream bandwidth management through ITU-T G.984.3 compliant DBA mechanisms. By enabling dynamic adjustment of bandwidth grants based on real-time subscriber demand and Service-Level Agreements (SLAs), the platform optimizes upstream bandwidth utilization while maintaining strict Quality of Service (QoS) parameters. This datasheet details the hardware architecture, T-CONT registry mapping, configuration parameters, and performance specifications essential for network engineers and procurement specialists.

The solution supports up to 512 T-CONT profiles per system, providing

granular control over five distinct T-CONT types to accommodate diverse service requirements ranging from fixed-bandwidth Voice over IP (VoIP) to best-effort data services.



HARDWARE ARCHITECTURE & SILICON

The OEM DBA T-CONT Registry Mapping solution is built upon ZTE's robust OLT hardware platforms, engineered to deliver superior performance in high-density fiber access networks.

1. CHASSIS AND BACKPLANE DESIGN

The modular chassis architecture supports high-availability configurations with redundant, hot-swappable components. The backplane provides non-blocking connectivity between line cards and the switching fabric, enabling line-rate

forwarding for both GPON (2.488 Gbps downstream, 1.244 Gbps upstream) and XG-PON (9.953 Gbps downstream, 2.488 Gbps upstream) interfaces.

2. PON LINE CARDS AND SILICON

The platform incorporates dedicated PON MAC chipsets designed for efficient DBA processing. These Application-Specific Integrated Circuits (ASICs) handle real-time bandwidth calculations, T-CONT scheduling, and upstream timeslot allocation without impacting the main CPU. Advanced silicon features include:

- Hardware-accelerated DBA state machine execution for sub-millisecond response times.
- On-chip traffic monitoring engines for flow-based bandwidth prediction.
- Integrated queue management supporting up to 8 priority queues per T-CONT.

3. T-CONT REGISTRY MAPPING ENGINE

The T-CONT registry mapping engine is the core intelligent subsystem responsible for dynamic bandwidth allocation. It maintains a real-time configuration table that maps T-CONT identifiers to allocated bandwidth parameters. When a DBA cycle triggers, the engine evaluates the current traffic demands against the previous allocation, checking for significant bandwidth changes. If the system detects a required bandwidth reduction exceeding a predefined threshold, it intelligently reconfigures the T-CONT mapping to

prevent upstream packet loss and ensure smooth service adaptation.

KEY FEATURES & ROUTING LOGIC

DYNAMIC BANDWIDTH ALLOCATION (DBA)

- ITU-T G.984.3 Specification Compliance: Implements both Status Reporting (SR) and Non-Status Reporting (NSR) DBA modes to suit diverse traffic profiles.
- Upstream Bandwidth Management: Grants upstream bandwidth to ONUs based on their demand and SLA, allowing efficient oversubscription of the GPON/XG-PON link while maximizing bandwidth utilization.
- Traffic Type Support: Supports UBR (unspecified bitrate) and CBR (constant bitrate) traffic types, with flexible allocation per T-CONT.
- Bandwidth Profiling: Enables detailed bandwidth profiles through configuration of Guaranteed, Assured, Fixed, and Maximum bandwidth parameters.

T-CONT REGISTRY MAPPING AND TYPES

- T-CONT Type 1: Fixed Bandwidth (CBR). Used for real-time, latency-sensitive services such as VoIP where bandwidth must be strictly reserved. Configuration includes cbr-rt and cbr-nrt parameters.
- T-CONT Type 2: Assured Bandwidth with no fixed component. Designed for services requiring a guaranteed data rate, such as business-grade Internet

access.

- T-CONT Type 3: Assured Bandwidth with Best-Effort capabilities. Features an assured bandwidth component and can use additional non-assured or best-effort bandwidth. Suitable for triple-play services combining data, voice, and video.

- T-CONT Type 4: Best-Effort only. Offers maximum bandwidth without a guaranteed component, ideal for standard Internet access traffic.

- T-CONT Type 5: Combined Fixed, Assured, and Best-Effort bandwidth. Offers the highest level of service differentiation and traffic management flexibility.

INTELLIGENT BANDWIDTH ADAPTATION

- Advanced algorithms detect sudden drops in upstream traffic. If a decrease exceeds a configurable threshold, the system re-allocates bandwidth to avoid waste and prevent upstream packet loss.

- Configurable filtering prevents micro-fluctuations from causing unnecessary updates, ensuring a stable system.

- Supports both SR-DBA and TM (Traffic Monitoring) DBA modes for maximum flexibility.

COMPLIANCE & STANDARDS

The OEM DBA T-CONT Registry Mapping solution adheres to the following

industry standards and regulatory requirements:

- ITU-T G.984.3 – Gigabit-capable Passive Optical Networks (G-PON): Transmission convergence layer specification.
- ITU-T G.987.3 – 10-Gigabit-capable Passive Optical Networks (XG-PON): Transmission convergence (TC) layer specification.
- ANSI T1.646 – Broadband Passive Optical Networks (BPON) standards (for backward compatibility).
- IEEE 802.1Q – Virtual LAN (VLAN) tagging and trunking.
- IEEE 802.3 – Ethernet standards for copper and fiber interfaces.
- Telcordia GR-253 – SONET transport systems and generic criteria.
- ETSI TS 101 273 – Network Aspects (NA); Broadband Access Network (BAN) requirements.
- EN 300 386 – Electromagnetic compatibility and Radio spectrum Matters (ERM) for telecommunications equipment.

Parameter	**Specification**
DBA Standard	ITU-T G.984.3 (GPON), G.987.3 (XG-PON)
Supported T-CONT Types	Type 1 (Fixed), Type 2 (Assured), Type 3 (Assured + Best-Effort), Type 4 (Best-Effort), Type 5 (Combined)

Bandwidth Allocation Resolution	64 kbps (GPON) / 1024 kbps (XG-PON)
Maximum T-CONT Profiles	512
Maximum ONUs per PON	1024
Maximum Transmission Distance	20 km
Form Factor	Modular Chassis
Power Supply	Dual Hot-Swappable Redundant AC/DC



TECHNICAL SPECIFICATIONS

SYSTEM CAPACITY AND PERFORMANCE

- Maximum T-CONT Profiles: 512.

- Upstream Bandwidth Allocation Resolution: 64 kbps for GPON; 1024 kbps for XG-PON.

- DBA Cycle Period: Configurable (typically 1-10 ms).

- Maximum Reach: 20 km for GPON.

- Maximum Splitting Ratio: Up to 1:128 for GPON.

- Maximum Number of ONUs per PON: 1024.

- Switching Capacity: Up to 100 Gbps (depending on chassis configuration).

INTERFACE AND CONNECTIVITY

- PON Interfaces: GPON (2.488G Down, 1.244G Up) and XG-PON (9.953G Down, 2.488G Up).

- Uplink Interfaces: High-speed Ethernet interfaces (10GE/GE) typically using SFP+/SFP modules.

- Management Interfaces: 10/100/1000BASE-T, RS-232 Console, USB (optional).

POWER AND ENVIRONMENTAL SPECIFICATIONS

- Power Supply: Dual hot-swappable redundant AC/DC power modules (100-240V AC, 50/60Hz or -48V DC).

- Power Consumption: Typical 150W – 800W (full configuration).

- Cooling: Smart fan management system with multiple hot-swappable fans.

- Operating Temperature: 0°C to 45°C (short-term) / -5°C to 55°C.

- Storage Temperature: -40°C to 70°C.

- Operating Humidity: 5% to 95% (non-condensing).

- MTBF: > 200,000 hours at 25°C.

ORDERING SKU INFORMATION

Base Hardware Chassis, Line Cards, and optional accessory modules are available through an OEM customization and procurement process. For detailed SKU codes and specific configuration assistance, please contact your OEM account representative.