

Commercial Network Infrastructure Cost - Official Technical Overview & Hardware Datasheet

COMMERCIAL NETWORK INFRASTRUCTURE COST - OFFICIAL TECHNICAL OVERVIEW & HARDWARE DATASHEET

EXECUTIVE SUMMARY

This document provides a comprehensive technical overview of the Commercial Network Infrastructure Cost (CNIC) platform, a carrier-grade hardware solution engineered to deliver transparent, predictable, and optimizable total cost of ownership (TCO) for network operators. The CNIC system integrates advanced telemetry, granular power monitoring, and real-time asset depreciation tracking into a unified hardware suite. Designed for service providers, data center operators, and large-scale enterprises, this platform transforms cost from a passive accounting metric into an active, manageable network parameter.



ARCHITECTURE & CHASSIS DESIGN

The CNIC platform is built upon a modular, high-density chassis architecture supporting both AC and DC power infrastructures. The chassis integrates a dedicated Cost Analytics Engine (CAE) ASIC that operates in parallel to the data forwarding plane, ensuring that cost telemetry collection imposes zero latency penalty on production traffic. Key architectural elements include:

- Non-blocking backplane with dedicated management channels for cost metric collection
- Hot-swappable Cost Data Interface Modules (CDIMs) for flexible deployment
- Integrated power distribution units (PDUs) with per-port energy consumption sensing
- Front-accessible serviceability with color-coded cost-zone indicators

HARDWARE FEATURES

The CNIC hardware suite delivers precise, granular visibility into operational expenditure components:

1. REAL-TIME POWER COST METERING

Per-port and per-line card wattage monitoring with 0.5% accuracy (IEC 62053-21 compliant). Integrated with live utility rate APIs for dynamic cost-per-bit computation.

2. ASSET LIFECYCLE COST TRACKING

Embedded secure element storing procurement date, capital cost, depreciation schedule (straight-line or accelerated models), and residual value calculations.

3. BANDWIDTH UTILIZATION COST ANALYSIS

Hardware-accelerated deep packet inspection (DPI) light engine classifies traffic types (VoIP, video, bulk data, signaling) and assigns cost-per-byte metrics based on configurable business rules.

4. REDUNDANCY COST OPTIMIZATION

Intelligent power supply and fan tray management that predicts optimal

redundancy levels based on real-time reliability requirements and energy pricing.

COMPLIANCE & STANDARDS

The CNIC platform maintains rigorous adherence to global telecommunications and cost accounting standards:

- TCO Reporting: Compliant with ITU-T L.1400 (Greenhouse Gas emissions and energy efficiency)
- Power Measurement: IEC 62301 (standby power) and Energy Star 3.0 for networking equipment
- Financial Data Security: PCI-DSS Level 1 for cost telemetry that includes payment or billing information
- Environmental: RoHS 2011/65/EU, REACH, WEEE
- Safety: IEC 60950-1, IEC 62368-1
- EMI/EMC: FCC Part 15 Class A, EN 55032 Class A, EN 55035

TECHNICAL SPECIFICATIONS

Parameter	Specification
Form Factor	2RU / 4RU / 8RU Chassis (Modular)

Switching Capacity	1.28 Tbps (2RU) to 5.12 Tbps (8RU)
Power Supply	1+1 Redundant AC (100-240V) or DC (-48V), N+1 optional
Cost Measurement Accuracy	± 0.5% for power, ± 0.1% for traffic volume counters
Cost Telemetry Sampling Rate	10ms (CAE-ADVANCED) / 100ms (CAE-BASIC)
Operating Temperature	0°C to 45°C (Standard), -5°C to 55°C (Extended with fan kit)
MTBF (System)	285,000 hours (Telcordia SR-332, Ground Benign)
Power Consumption (Idle/Full Load)	Base chassis: 85W / 150W (excluding line cards)
Management Interfaces	RJ45 10/100/1000 (OOB), USB 2.0 Console, Mini-USB

ORDERING OPTIONS

Base chassis CNIC-BASE-2U (2-slot), CNIC-BASE-4U (4-slot), CNIC-BASE-8U (8-slot).

Line Cards:

- CNIC-LC-4x10GE: 4-port 10GBASE-SR/LR with per-port cost metering
- CNIC-LC-2x40GE: 2-port 40GBASE-SR4/LR4 with integrated power sensing
- CNIC-LC-8x1GE: 8-port Gigabit Ethernet copper with PoE+ and PoE cost analytics

Cost Analytics Engine Modules:

- CAE-BASIC: Standard cost telemetry (100ms polling)
- CAE-ADVANCED: High-resolution cost telemetry (10ms polling) with predictive TCO modeling

Power Supplies:

- PSU-AC-800W, PSU-AC-1600W, PSU-DC-1000W (all 1+1 or N+1 redundant configurations)

Software Licensing:

- CNIC-OS-BASE: Operating system with basic cost reporting
- CNIC-OS-PRO: Includes API access, Grafana dashboards, and cost alerting engine
- CNIC-OS-CARRIER: Adds multi-tenant cost allocation, billing integration, and regulatory reporting

