Nokia ISAM FANT-F

Network termination card

The Nokia Intelligent Services Access Manager (ISAM) FANT-F network termination (NT) card is a controller board that provides service and network intelligence in the Nokia 7360 ISAM FX access node. It provides 480 Gb/s switching matrix and 40 Gb/s connection to each line card, which makes it ideal for delivery of high capacity services in fiber networks.

The Nokia ISAM FANT-F network termination card provides four configurable small form-factor pluggable (SFP+) cages supporting 10 Gb/s and 1 Gb/s links which can be used for network interfaces, user connection or subtending. Optional hardware variants are available for applications requiring high stability clock, building integrated timing source (BITS) interface, Synchronous Ethernet (SyncE) and time of day (ToD) IEEE 1588. The FANT-F NT card runs the same field-proven IP stack as the Nokia aggregation routers and supports Ethernet, IPv4, IPv6 and multiprotocol label switching (MPLS). Two Nokia FANT-F NT cards can be run in active-active redundancy mode, ensuring system reliability and providing a total system switching capacity of 960 Gb/s and delivering up to 80 Gb/s to each line card slot.

Features

- 480 Gb/s switching matrix (bidirectional)
- Active-active redundancy
- Supports 40 Gb/s connection to each line card slot (FX-4 and FX-8)
- Supports 20 Gb/s connection to each line card slot (FX-16 and ANSI FX-12)
- 4 x 10 Gigabit Ethernet (GigE) network links with 1+1 link redundancy
- Subtending and aggregation support
- Optional hardware variants with high stability clock, BITS, SyncE and ToD clock recovery
- MPLS forwarding with enhanced routing support: Routing Information Protocol (RIP), Open Shortest Path First (OSPF), Border Gateway Protocol (BGP) and Intermediate System-to-Intermediate System (IS-IS)
- Powerful, embedded application enablement processor
- Industrial hardened

Benefits

- Market-leading switching and backplane capacity
- Delivers 99.999% availability
- Supports carrier Ethernet services
- Provides fast recovery of critical services with MPLS
- Reduces number of aggregation network ports required through self-aggregation features
- Supports clock-critical applications: voice, leased lines and mobile backhauling
- Deploys in indoor and outdoor environments

Technical specifications

Physical dimensions

- Height: 405 mm (15.9 in)
- Width
  - Top: 225 mm (8.9 in)
  - Bottom: 205 mm (8.1 in)
- Board-to-board pitch: 30 mm (1.2 in)

Operating conditions

- Temperature (inlet/ambient):
  - -5°C to 45°C (23°F to 113°F) when used in fully populated Nokia 7360 ISAM racks with multiple shelves
  - -40°C to 65°C (-40°F to 149°F) when used in standalone Nokia 7360 ISAM FX shelves
- Over-temperature sensors and shutdown
- Relative humidity (RH): 5% and 85%
- Supports tropical environments: 50°C (122°F), 99% RH
- GR-3108-CORE for operating temperature and humidity of Class 2 equipment
- Compliant with ATT-TP-76200 environmental requirements

External interfaces

- 4-port optical 10 Gb/1 Gb interface
- Optical and electrical connection through SFP and SFP+ standards
- 1-port electrical 10/100/1000Base-T (RJ-45 connector)
- 2-port BITS interface: only on BITS variant; 1 port in, 1 port out, using ITU-T G.703 (ANSI interfaces available on a separate generic flow control [GFC] unit)
- ToD interfaces

- 1-port local craft management (LCM) interface using RS-232 (RJ-45 connector)
- 1 Alarm cutoff (ACO) button for ACO and lamp test interfaces; for example, signaling and communication (ANSI ACO available on a separate GFC unit)

Forwarding

- Ethernet bridging
- Virtual local area network (VLAN) stacking for residential and business access
- 802.3ad trunking: Link Aggregation Control Protocol (LACP)
- Multiple Spanning Tree Protocol (MSTP), Rapid Spanning Tree Protocol (RSTP) and Spanning Tree Protocol (STP) support
- 4,095 VLAN-IDs, VLAN stacking (Q-in-Q), 128,000 move, add and change (MAC) addresses
- MPLS
- L3 forwarding (IPv4)
- RIP v2, OSPF v2, BGP v4, IS-IS routing protocols
- Multicast forwarding, high performance Internet Group Management Protocol (IGMP) processing, IGMP proxy
- IP quality of service (QoS)
- Dynamic Host Configuration Protocol (DHCP) relay, multiple instances
- Access control lists, denial of service protection
- Malicious MAC protection
- Lawful intercept
- Billing, accounting and hubbing support
- Ethernet ring connectivity
- Supports central broadband remote access server (BRAS) and distributed service-edge models
- Point-to-Point Protocol (PPP) connectivity to single or multiple systems
- Up to 16,000 subscribers per system

Deployment

- Simple Network Management Protocol (SNMP)
  - SNMPv1 (RFC 1157)
  - SNMPv2 (RFC 1909-1910)
  - SNMPv3 (RFC 3410-3418)
- Command-line interface (CLI): telnet (RFC 854), secure shell (SSH)
- Transaction language 1 (TL1) with or without SSH
- File Transfer Protocol (FTP):
  - FTP (RFC 959)
  - Trivial File Transfer Protocol (TFTP)
  - Secure Shell File Transfer Protocol (SFTP) for backup/restore and software download
- Simple Network Time Protocol (SNTP)
- Syslog: CLI screen, external server, local file
- Loopback interface
- CLI and TL1 operator authentication: local or Remote Authentication Dial-In User Service (RADIUS) based
- Alarm management
  - Severity handling
  - Lists: current, snapshot, delta
  - Logs
  - Filtering
- Troubleshooting counters
- IP ping and trace route
- Central processing unit (CPU) and memory load
- SFP digital diagnostics
- Performance monitoring
- Protocol tracing
  - DHCP
  - Address Resolution Protocol (ARP)
  - IGMP
  - Output to CLI, syslog or local file
- Offline migration system configuration

Eco-sustainability

- Switch ports can be selectively powered down
- Equipped with thermal sensors for temperature-controlled cooling, resulting in maximum efficiency and low acoustic noise

Standards compliance

- Environmental
  - ETS 300 019-1-1 storage – Class 1.1 (weather-protected, partly temperature-controlled locations)
  - ETS 300 019-1-2 transport – Class 2.3 (packed, public transportation)
  - ETS 300 019-1-3 stationary use – Class 3.1E (temperature-controlled locations), when used in fully populated Nokia 7360 ISAM racks with multiple shelves
  - ETS 300 019-1-3 stationary use – Class 3.3 (not temperature-controlled locations), when used in standalone Nokia 7360 ISAM shelves
  - NEBS Level 3 compliant (SR-3580)
  - GR-63-CORE
- Protection: ITU-T K.20/K.45
- Safety: IEC 60950-1/EN 60950-1
- EMC and ESD
  - ETS 300 386 V1.3.3 (2005-04) for telecommunication network equipment
  - GR-1089-CORE
- European Directive 2011/65/EU on the restriction of the use of certain hazardous substances (RoHS)

About Nokia

At Nokia, we create technology that helps the world act together.

As a B2B technology innovation leader, we are pioneering networks that sense, think and act by leveraging our work across mobile, fixed and cloud networks. In addition, we create value with intellectual property and long-term research, led by the award-winning Nokia Bell Labs.

Service providers, enterprises and partners worldwide trust Nokia to deliver secure, reliable and sustainable networks today – and work with us to create the digital services and applications of the future.

Nokia OYJ
Karakaari 7
02610 Espoo
Finland
Tel. +358 (0) 10 44 88 000

Document code: (August) CID194654