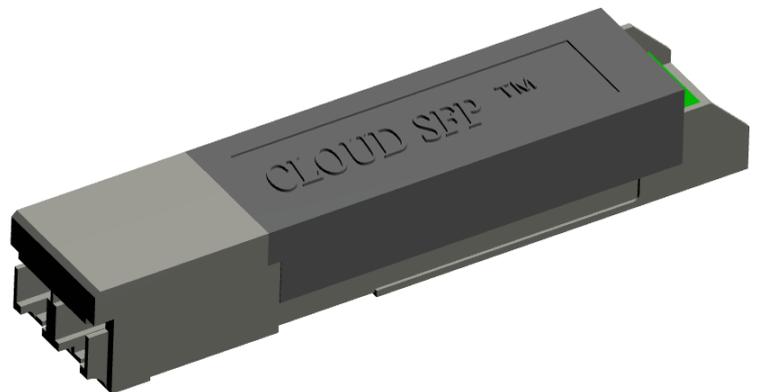


CLOUD SFP™ products allow easy deployment of different new services in the existing networks, without any complex upgrade.

Just plug in CLOUD SFP™ and play new services.

The CLOUD SFP™ product family is today composed of:

- DUAL CES SFP
- CRYPTO SFP™
- OAM SFP
- GFP SFP



CLOUD SFP™ are now available.  
Field trials start March 2014.

CLOUD SFP™ and CRYPTO SFP™ are registered trademarks of BTP Research.  
DUAL CES SFP and CRYPTO SFP™ are BTP Research patent pending products.

# CLOUD SFP™ PRODUCTS

## DUAL CES SFP

The Dual CES SFP (Dual Circuit Emulation Service SFP) provides the agnostic/structured emulation of two independent TDM E1/T1 services over Ethernet packets. This is the only SFP Module with 2 E1/T1 channels; it is a patent pending product.

Complies with ITU-T recommendation Y.1413.

Complies with IETF standards CESoP and SAToP: RFC 4553 and RFC 5086. Complies with MEF8 standard.

Complies with ITU-T G.8261 and its test cases (both deployments). Flexible different protocol packet encapsulation, on pseudo-wire based: IPv4-UDP, IPv6-UDP, MPLS, MEF8, C-VLAN, S-VLAN. Packet re-ordering. Packet Classifier. Timestamp re-ordering. Programmable packet payload size. Adaptive, differential, synchronous and loop timing clock recovery are available; they all are managed by hardware and not by software.

Structured Agnostic TDM circuit emulation. Structured Aware TDM circuit emulation. Grooming: 64Kbit (DS0) switching function. Auto-Centering implemented.

## OAM SFP

OAM SFP, Operations Administration and Maintenance SFP is a pluggable module that allows simple management and monitoring of the network domains involved: customer, provider, operator, etc.

Can be plugged in on ports of any equipment that does not support OAM Service or OAM Link but needs to be part of a managed OAM network.

Complies with Service OAM ITU-T Y.1731 (CFM and Performance Management).

Complies with Link OAM IEEE802.3ah (Monitoring of point-to-point connections).

L2 diagnostic loopbacks.

Low latency and wire speed GbE throughput.

## CRYPTO SFP™

Crypto SFP™ acts at Data Link Layer (Layer 2).

It allows the encryption of ethernet payload which is encrypted by the AES encryption algorithm with a key size of 128/256 bits. AES key is exchanged by means of a public-key cryptographic algorithm (as Diffie–Hellman or RSA )

Ethernet header is not modified. This allows switching of the frames through the network.

Selective encryption based on Vlan or Mac Address is provided. Low latency and wire speed GbE throughput. Where data encryption is needed the Crypto SFP™ provides the service without adding further equipment with benefits in terms of OPEX and CAPEX and also in the quality of the service. It is a patent pending product.

The module also has different levels of active defence against reverse engineering and tampering.

## GFP SFP

Generic Framing Procedure (GFP) SFP allows Ethernet traffic to be mapped on a SDH transport network.

Framed GFP (GFP-F) provided: it maps each ethernet client frame into a single GFP frame. Optimized for bandwidth efficiency.

Transparent GFP (GFP-T) also provided: it allows mapping of multiple 8B/10B block-coded client data streams into an efficient 64B/65B block code for transport within a GFP frame; used for low latency transport .

Fast Ethernet and Gigabit Ethernet can be mapped on STM1 or STM4 SDH frames.

Complies with ITU-T G.7041 .

Link Loss Forwarding (LLF) managed: in case of a failure on Ethernet side an LLF signal is sent through the SDH Transport Network by GFP Header.

MAC statistics provided on Ethernet side.

GFP alarms collected on SDH side.

The CLOUD SFP™ modules are fully in compliance with SFP electrical MSA, including digital diagnostic monitoring. Optical modules are available with LC duplex connector and in various optical reaches. This is a green technology lowering carbon footprint. All modules are RoHS 2 and REACH compliant. All modules are configurable by network or on site by CLI or GUI interface. Cloud Interface Adapter, CIA, is always provided. For all Modules API are available for second level integration in the host, if really necessary.

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