

# Panoramica grafica di SONET

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## Introduzione

Questo documento offre una panoramica di Synchronous Optical Network (SONET), rappresentato in immagini.

**Nota:** *Tabelle e diagrammi forniti da JDS Unifase Corporation*

## Prerequisiti

### Requisiti

Nessun requisito specifico previsto per questo documento.

### Componenti usati

Il documento può essere consultato per tutte le versioni software o hardware.

### Convenzioni

Per ulteriori informazioni sulle convenzioni usate, consultare il documento [Cisco sulle convenzioni nei suggerimenti tecnici](#).

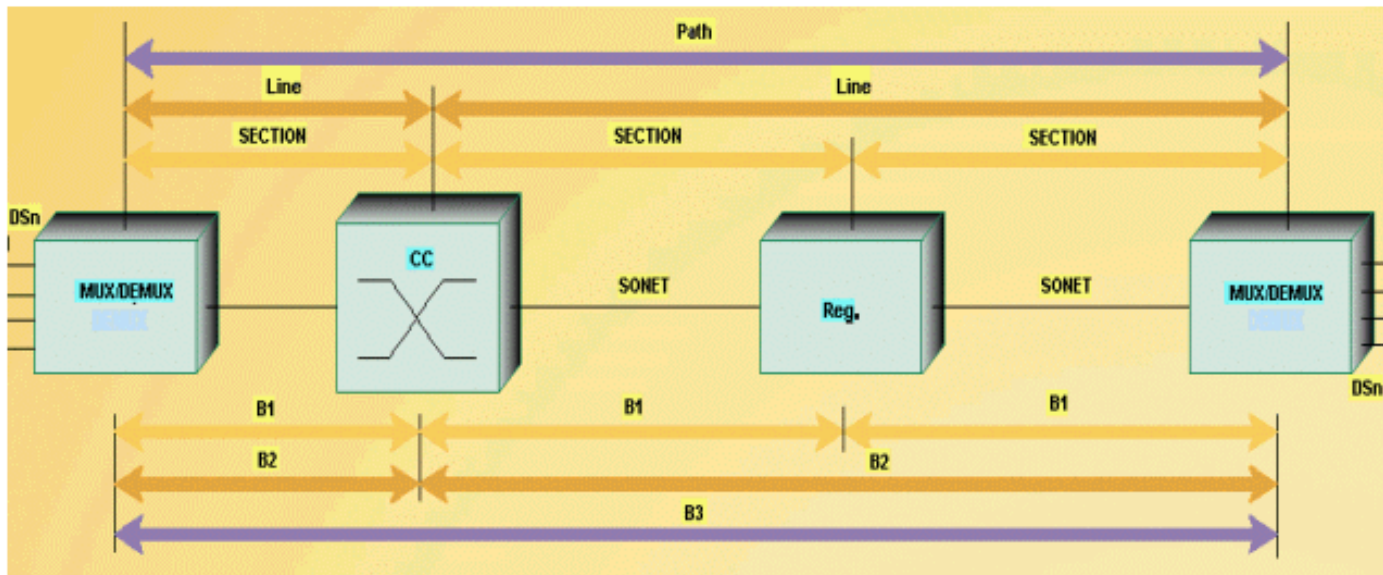
# Panoramica di SONET

In questa sezione viene fornita una panoramica di SONET in formato grafico.

## Il collegamento SONET

Nella [Figura 1](#) viene mostrato l'aspetto di un collegamento SONET.

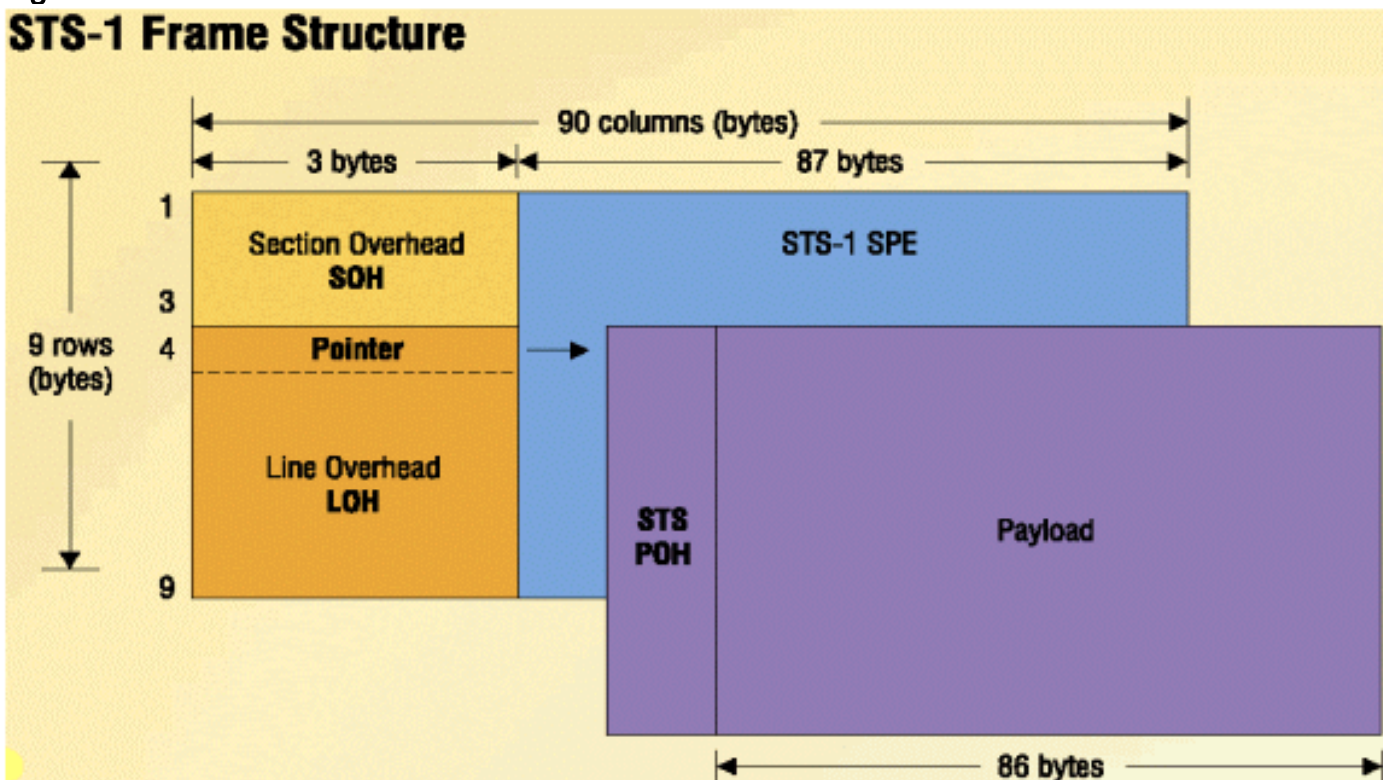
Figura 1 - Un collegamento SONET



## Frame STS-1

La [Figura 2](#) mostra la struttura del frame STS-1 (Synchronous Transport Signal Level 1).

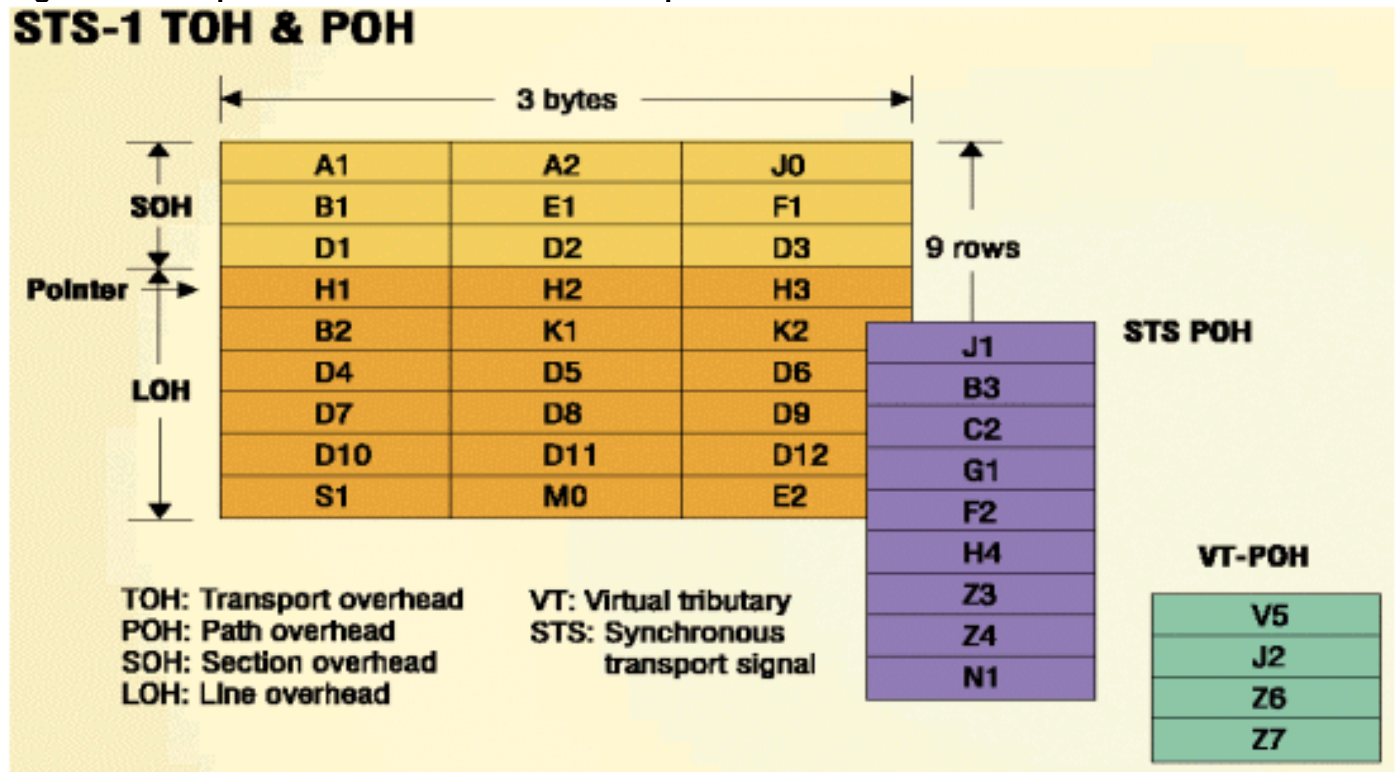
Figura 2 - Struttura del frame STS-1



## Sovraccarico SONET STS-1

La figura 3 mostra il trasporto STS-1 e il sovraccarico del percorso (SONET Overhead).

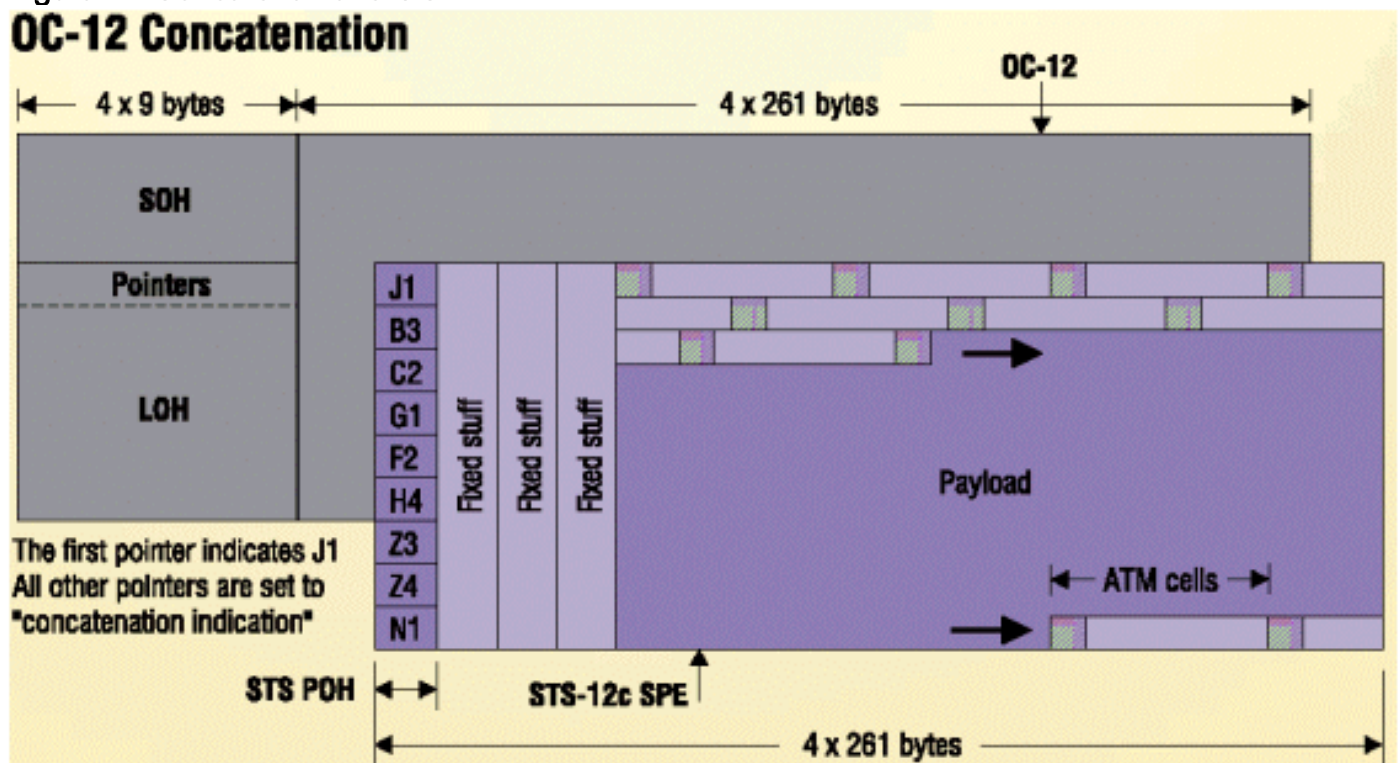
Figura 3 - Trasporto STS-1 e sovraccarico del percorso



## Concatenazione OC-12

La figura 4 esamina la concatenazione OC-12.

Figura 4 - Concatenazione OC-12

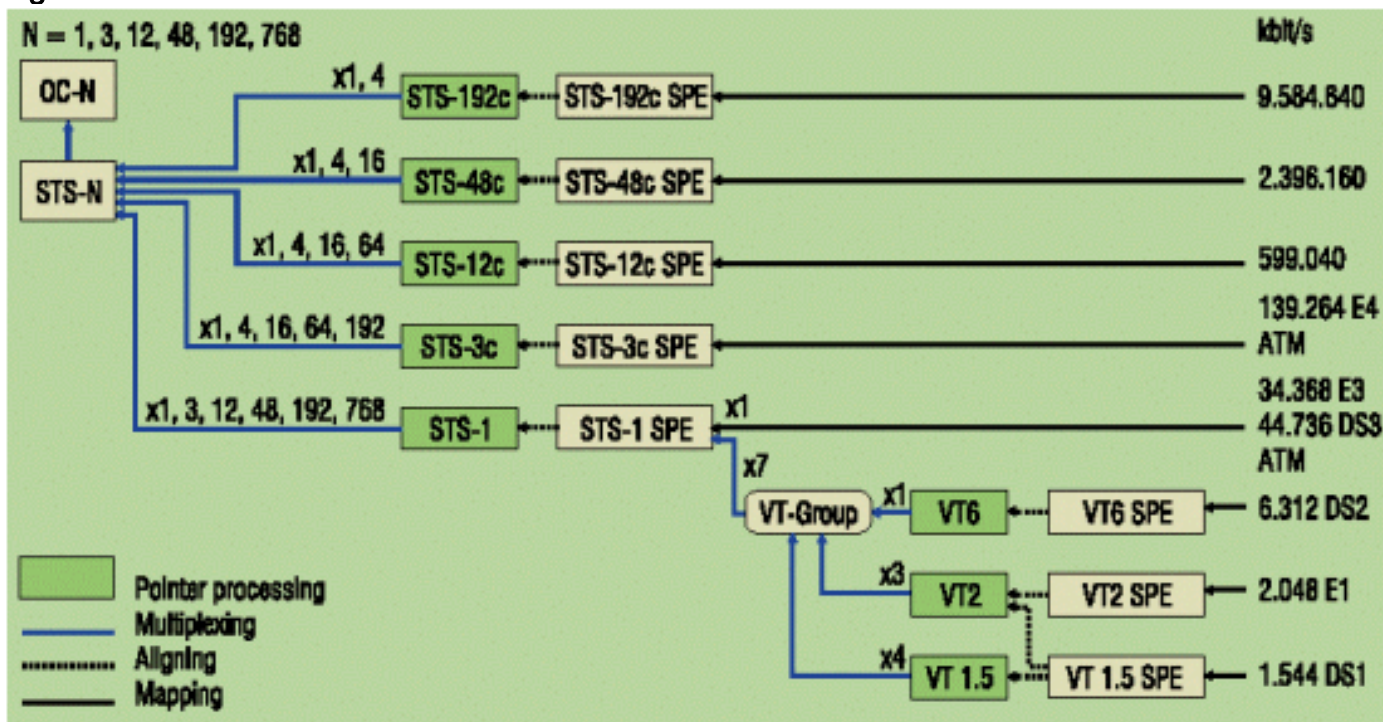




## Gerarchia SONET

La figura 5 mostra la gerarchia di SONET.

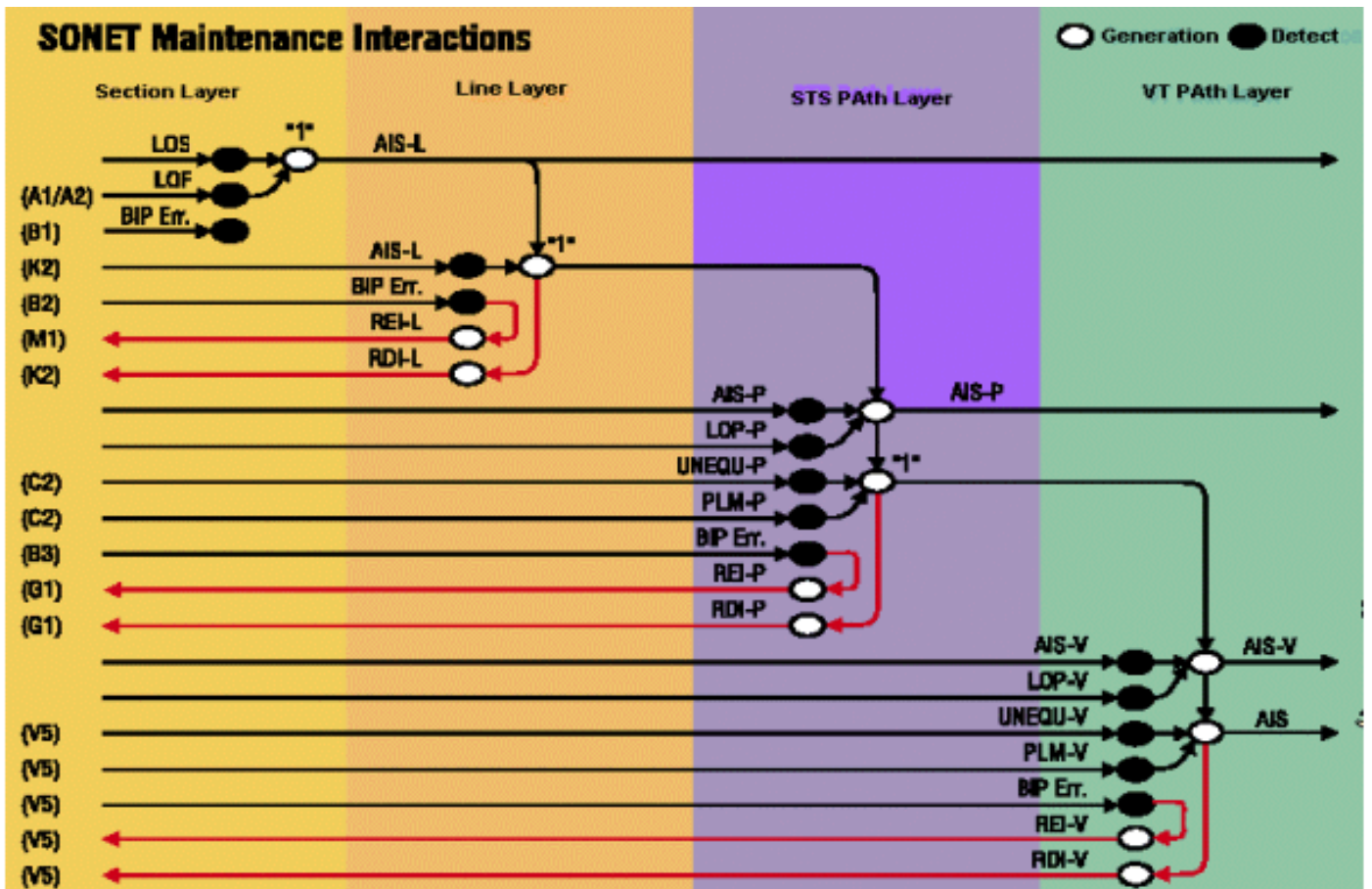
Figura 5 - Gerarchia SONET



## Interazioni manutenzione SONET

La Figura 6 mostra come appaiono le interazioni di manutenzione SONET.

Figura 6 - Interazioni di manutenzione SONET



## Allarmi e criteri di rilevamento

La [tabella 1](#) elenca il significato degli allarmi e i relativi criteri di rilevamento.

Tabella 1 - Significato degli allarmi e relativi criteri di rilevamento



	<b>Anomalies / Defects</b>	<b>Detection criteria</b>	<b>Bellcore ANSI</b>
<b>LOS</b>	Loss of Signal	All-zero pattern for $2.3 \mu s \leq T \leq 100 \mu s$	GR-253 T1.231
<b>SEF</b>	Severely Error Framing	A1, A2 errored for $\geq 625 \mu s$	GR-253 T1.231
<b>LOF</b>	Loss of Frame	If SEF persists for $\geq 3 ms$	GR-253 T1.231
<b>S-BIP Error</b>	Section BIP Error (B1)	Mismatch of the recovered and computed BIP-8 covers the whole STS-N frame	GR-253 T1.105
<b>L-BIP Error</b>	Line BIP Error (B2)	Mismatch of the recovered and computed N x BIP-8 covers the whole frame, except section overhead	GR-253 T1.105
<b>AIS-L</b>	Line-AIS	K2 (bits 6, 7, 8) = 111 for $\geq 5$ frames	GR-253 T1.231
<b>REI-L</b>	Line Remote Error Indication	Number of detected B2 errors in the sink side encoded in byte M0 or M1 of the source side	GR-253 T1.105
<b>RDI-L</b>	Line Remote Defect Indication	K2 (bits 6, 7, 8) = 110 for $\geq z$ frames ( $z = 5 - 10$ )	GR-253 T1.231
<b>AIS-P</b>	STS Path AIS	All "1" in the STS pointer bytes H1, H2 for $\geq 3$ frames	GR-253 T1.231
<b>LOP-P</b>	STS Path Loss of Pointer	8 - 10 NDF enable 8 - 10 invalid pointers	GR-253 T1.231
<b>P-BIP Error</b>	STS Path BIP Error (B3)	Mismatch of the recovered and computed BIP-8 covers entire STS-SPE	GR-253 T1.105
<b>UNEQ-P</b>	STS Path Unequipped	C2 = "0" for $\geq 5$ ( $\geq 3$ as per T1.231) frames	GR-253 T1.231
<b>TIM-P</b>	STS Path Trace Identifier Mismatch	Mismatch of the accepted and expected Trace Identifier in byte J1 (64 bytes sequence)	GR-253 T1.105
<b>REI-P</b>	STS Path Remote Error Indication	Number of detected B3 errors in the sink side encoded in byte G1 (bits 1, 2, 3, 4) of the source side	GR-253 T1.105
<b>RDI-P</b>	STS Path Remote Defect Indication	G1 (bit 5) = 1 for $\geq 10$ frames	GR-253 T1.231
<b>PLM-P</b>	STS Path Payload Label Mismatch	Mismatch of the accepted and expected Payload Label in byte C2 for $\geq 5$ ( $\geq 3$ as per T1.231) frames	GR-253 T1.231
<b>LOM</b>	Loss of Multiframe	Loss of synchronization on H4 (bits 7, 8) superframe sequence	GR-253 T1.105
<b>AIS-V</b>	VT Path AIS	All "1" in the VT pointer bytes V1, V2 for $\geq 3$ superframes	GR-253 T1.231
<b>LOP-V</b>	VT Loss of Pointer	8 - 10 NDF enable 8 - 10 invalid pointers	GR-253 T1.231
<b>V-BIP Error</b>	VT Path BIP Error (BIP-2)	Mismatch of the recovered and computed BIP-2 (V5 bits 1, 2) covers entire VT	GR-253 T1.105
<b>UNEQ-P</b>	VT Path Unequipped	V5 (bits 5, 6, 7) = 000 for $\geq 5$ ( $\geq 3$ as per T1.231) superframes	GR-253 T1.231
<b>TIM-V</b>	VT Path Trace Identifier Mismatch	Mismatch of the accepted and expected Trace Identifier in byte J2	for further study
<b>REI-V</b>	VT Path Remote Error Indication	If one or more BIP-2 errors detected in the sink side, byte V5 (bits 3) = 1 on the source side	GR-253 T1.105
<b>RDI-V</b>	VT Path Remote Defect Indication	V5 (bit 8) = 1 for $\geq 10$ superframes	GR-253 T1.231
<b>PLM-V</b>	VT Path Payload Label Mismatch	Mismatch of the accepted and expected Payload Label in byte V5 (bits 5, 6, 7) for $\geq 5$ ( $\geq 3$ as per T1.231) superframes	GR-253 T1.231

## [STS-1: SOH, LOH, POH e VT: byte POH](#)

La [Figura 7](#) e la [Figura 8](#) forniscono una descrizione di tutti i byte di STS-1 SOH, Line OverHead (LOH), Path OverHead (POH) e Virtual Tributary Path OverHead (VT POH).

Figura 7 - Sovraccarico della sezione SOH



# SOH Section Overhead

**A1, A2:** Indicates the beginning of each STS-1 within a STS-n frame. The pattern is Hex F628.

**J0:** Section trace. It is defined only for STS-1 number 1 of an STS-N signal. Used to transmit a one byte fixed length string or a 16 byte message so that a receiving terminal in a section can verify its continued connection to the intended transmitter.

**Z0:** Section growth. It is defined in each STS-1 for future growth except for STS-1 number 1 (which is defined as J0).

**B1:** Section error monitoring. The BIP-8 is calculated over all bits of the previous STS-N frame after scrambling and is placed in the B1 byte of STS-1 number 1 before scrambling. Defined only for STS-1 number 1 of an STS-N signal.

**E1:** Allocated to be used as local orderwire channels for voice communication between section terminating equipments, hubs and remote terminal locations.

**F1:** Reserved for user purposes (e.g. temporary data/voice channel connections for special maintenance purposes).

**D1 - D3:** Data communication channels (DCC). A 192 kbit/s message based channel for alarms, maintenance, control, monitoring, administration and other communication needs.

Figura 8 - Sovraccarico linea LOH

