



INTERNATIONAL TELECOMMUNICATION UNION

**ITU-T**

TELECOMMUNICATION  
STANDARDIZATION SECTOR  
OF ITU

**G.8261/Y.1361**

**Amendment 1**  
(01/2015)

SERIES G: TRANSMISSION SYSTEMS AND MEDIA,  
DIGITAL SYSTEMS AND NETWORKS

Packet over Transport aspects – Synchronization, quality  
and availability targets

SERIES Y: GLOBAL INFORMATION  
INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS  
AND NEXT-GENERATION NETWORKS

Internet protocol aspects – Transport

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**Timing and synchronization aspects in packet  
networks**

**Amendment 1**

***CAUTION !***

***PREPUBLISHED RECOMMENDATION***

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## **Amendment 1 to Recommendation ITU-T G.8261/Y.1361 (2013)**

### **Timing and synchronization aspects in packet networks: Amendment 1**

#### **Summary**

Amendment 1 to Recommendation ITU-T G.8261/Y.1361 (2013) provides the following updates:

- Addition of the network jitter limits for multilane interfaces consisting of 10 G lanes including 40GBASE-KR4/CR4/SR4/LR4 and 100GBASE-CR10/SR10 and multi-lane interfaces consisting of 25G lanes including 100GBASE-LR4/ER4.

## Amendment 1 to Recommendation ITU-T G.8261/Y.1361 (2013)

### Timing and synchronization aspects in packet networks: Amendment 1

#### 1 Clause 9.2.1.3 - EEC interface network jitter limits

Replace clause 9.2.1.3 by:

#### 9.2.1.3 EEC interface network jitter limits

See Table 7 for EEC interface network jitter limits.

**Table 7 – EEC interface network jitter limits**

| Interface                       | Reference   |          |
|---------------------------------|---|----------|
| 2048 kbit/s                     | See [ITU-T G.823], clause 6.1: Network limits for output jitter at synchronization interfaces, SEC requirements | (Note 1) |
| 2048 kHz                        |   |          |
| 1544 kbit/s                     | See [ITU-T G.824], clause 6.1: Network limits for jitter  | (Note 2) |
| STM-n                           | See [ITU-T G.825], clause 5.1: Network limits for jitter  |          |
| Ethernet (synchronous Ethernet) | See Table 7a  | (Note 2) |

NOTE 1 – Jitter limits are taken from [ITU-T G.823], [ITU-T G.824] and [ITU-T G.825] in order to allow proper interoperability with SEC based synchronization networks and combined EEC-SEC functions.

NOTE 2 – In a chain of  $n$  ( $n \leq 20$ ) connected EECs, the accumulated network jitter has to be low enough to allow all involved EECs to meet the output jitter specification at their synchronization outputs (e.g., 2048 kHz, 2048 kbit/s, 1544 kbit/s). See Figure 16 showing EECs in a chain; see also Annex D.

**Table 7a – Maximum permissible jitter at synchronous Ethernet network interfaces**

| Interface                                  | Measurement bandwidth, –3 dB frequencies | Peak-to-peak amplitude (UI <sub>pp</sub> ) |
|--|--|--|
| 1 G<br>(Notes 1, 2, <a href="#">54</a> )   | 2.5 kHz to 10 MHz                        | 1.5  |
| 10 G<br>(Notes 1, 3, <a href="#">54</a> )  | 20 kHz to 80 MHz                         | 1.5  |
| <a href="#">25 G</a><br>(Notes 1, 4, 5, 6) | <a href="#">20 kHz to 200 MHz</a>        | <a href="#">3.6</a>                        |

| Interface   | Measurement bandwidth,<br>–3 dB frequencies | Peak-to-peak amplitude<br>(UI <sub>pp</sub> ) |
|---|---|---|
| <p>NOTE 1 – There is no specific high band jitter requirement for synchronous Ethernet. The relevant [IEEE 802.3] jitter requirements shall be met in addition to the specific synchronous Ethernet wideband jitter requirements specified in this table.</p> <p>NOTE 2 – 1 G includes 1000BASE-KX, -SX, -LX; multi-lane interfaces are for further study.</p> <p>NOTE 3 – 10 G includes 10GBASE-SR/LR/ER, 10GBASE-LRM, 10GBASE-SW/LW/EW; <u>and multi-lane interfaces consisting of 10G lanes including 40GBASE-KR4/CR4/SR4/LR4 and 100GBASE-CR10/SR10</u> multi-lane interfaces are for further study.</p> <p>NOTE 4 – 25G includes multi-lane interfaces consisting of 25G lanes including 100GBASE-LR4/ER4</p> <p>NOTE 5 – 1 G (1000BASE-KX, -SX, -LX): 1 UI = 0.8 ns</p> <p>10 G (10GBASE-SR/LR/ER, -LRM, 40GBASE-KR4/CR4/SR4/LR4, 100GBASE-CR10/SR10): 1 UI = 96.97 ps</p> <p>10 G (10GBASE-SW/LW/EW): 1 UI = 100.47 ps</p> <p>25 G: (100GBASE-LR/ER): 1 UI = 37.89 ps</p> <p>NOTE 6 – <u>The peak-to-peak jitter amplitude for 25G lanes is increased from 1.5 UI to 3.6 UI, i.e., by a factor of 2.4. To compensate for this increase, the high-pass corner frequency used for 10G should first be increased by a factor of 2.5 to take account of the increase in line rate from 10G, and then decreased by a factor of 2.4 to take account of the increase in amplitude. This gives a high-pass corner frequency of 20.833 kHz, which has been rounded down to 20 kHz for convenience; this rounding to a lower value is slightly stricter.</u></p> |   |   |

Figure 16 shows the reference chain of n (n ≤ 20) EECs together with their synchronization outputs.

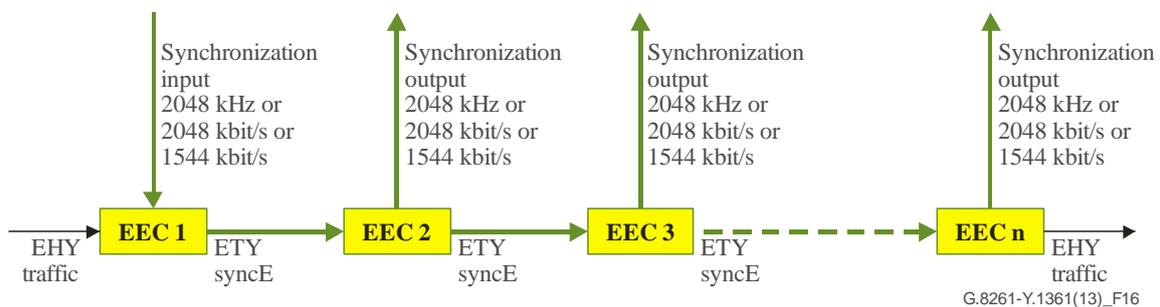


Figure 16 – EEC chain