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EMC requirements for next generation network equipment

Recommendation ITU-T K.88



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Summary

Recommendation ITU-T K.88 specifies the emission and immunity requirements for next generation network equipment, based on IP packet technologies. It also describes operational conditions for emission and immunity testing. Performance criteria for immunity tests are also specified.

History

Edition	Recommendation	Approval	Study Group
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Keywords

EMC, NGN.

FOREWORD

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In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

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Recommendation ITU-T K.88

EMC requirements for next generation network equipment

1 Scope

This Recommendation specifies the emission and immunity requirements for switching, transmission and media gateway equipment based on Internet protocol (IP) in the next generation network (NGN). It also describes operational conditions for emission and immunity testing. Performance criteria for immunity tests are also specified. The general operational condition and performance criteria are recommended in [ITU-T K.48]. This Recommendation describes the specific testing conditions to be applied to NGN equipment.

An example of equipment under this scope is presented in Annex A.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

- [ITU-T K.27] Recommendation ITU-T K.27 (1996), *Bonding configurations and earthing inside a telecommunication building*.
- [ITU-T K.34] Recommendation ITU-T K.34 (2003), *Classification of electromagnetic environmental conditions for telecommunication equipment – Basic EMC Recommendation*.
- [ITU-T K.38] Recommendation ITU-T K.38 (1996), *Radiated emission test procedure for physically large systems*.
- [ITU-T K.43] Recommendation ITU-T K.43 (2009), *Immunity requirements for telecommunication network equipment*.
- [ITU-T K.48] Recommendation ITU-T K.48 (2006), *EMC requirements for telecommunication equipment – Product family Recommendation*.
- [ITU-T K.76] Recommendation ITU-T K.76 (2008), *EMC requirements for telecommunication network equipment (9 kHz-150 kHz)*.
- [ITU-T K.80] Recommendation ITU-T K.80 (2009), *EMC requirements for telecommunication network equipment (1 GHz-6 GHz)*.
- [IEC CISPR 22] IEC CISPR 22, ed 6.0 (2008), *Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 next generation network (NGN) [b-ITU-T Y.2001]: A packet-based network able to provide telecommunication services and able to make use of multiple broadband, QoS-enabled transport technologies and in which service-related functions are independent from underlying transport-related technologies. It enables unfettered access for users to networks and to competing service providers and/or services of their choice. It supports generalized mobility which will allow consistent and ubiquitous provision of services to users.

3.1.2 immunity (to a disturbance) [ITU-T K.48]: The ability of a device, equipment, or system to perform without degradation in the presence of an electromagnetic disturbance.

3.1.3 quality of service (QoS) [b-ITU-T G.1000]: The collective effect of service performances which determine the degree of satisfaction of a user of the service.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 IP packet delay variation (IPDV): Variations in IP packet transfer delay are important. Streaming applications might use information about the total range of IP delay variation to avoid buffer underflow and overflow. Variations in IP delay will cause TCP retransmission timer thresholds to grow and may also cause packet retransmissions to be delayed or be retransmitted unnecessarily. One or more parameters that capture the effect of IP packet delay variations on different applications may be useful. It may be appropriate to differentiate the (typically) small packet-to-packet delay variations from the potentially larger discontinuities in delay that can result from a change in the IP routing.

3.2.2 IP packet loss ratio (IPLR): The ratio of total lost IP packet outcomes to total transmitted IP packets in a population of interest.

3.2.3 IP packet transfer delay (IPTD): IP packet transfer delay is defined for all successful and errored packet outcomes across a basic section or an network service entity (NSE). IPTD is the time, $(t_2 - t_1)$ between the occurrence of two corresponding IP packet reference events, ingress event IPRE_1 at time t_1 and egress event IPRE_2 at time t_2 , where $(t_2 > t_1)$ and $(t_2 - t_1) \leq T_{\max}$. If the packet is fragmented within the NSE, t_2 is the time of the final corresponding egress event. The end-to-end IP packet transfer delay is the one-way delay between the measurement point at the source host and destination host.

3.2.4 latency (store and forward devices): The time interval starting when the last bit of the input frame reaches the input port and ending when the first bit of the output frame is seen on the output port.

3.2.5 latency (bit forwarding devices): The time interval starting when the end of the first bit of the input frame reaches the input port and ending when the start of the first bit of the output frame is seen on the output port.

3.2.6 packet/frame loss ratio: Percentage of packet/frames that should have been forwarded by a network device under steady state (constant) load that were not forwarded due to lack of resources.

3.2.7 port: Particular interface of the specified equipment with the external electromagnetic environment. See Figure 1.