CETIN
ČLEN SKUPINY PPF

PŘÍLOHA 16
TECHNICKÉ PARAMETRY SLUŽEB RADO

RADO Parameters		CEA LITE (G-PON)		CEA DUO 30-300 Mbit - dočasné řešení				CEA DUO 30-300 Mbit - finální optické řešení	
		250M-1G		Metallic up to 100M		Nonlicensed MW		Symmetric	
Frame Loss Ratio on Point to Point Tail Circuit		NOT GUARANTEED		0,25% metallic infrastructure BER <10^-7		0,1% MW infrastructure, BER <10^-9		0,01% optical, BER <10^-9	
Frame Delay on Point to Point Tail Circuit		RTD <20ms		RTD <20ms		RTD <10ms		RTD <10ms	
Frame Delay Variation (95% of troughput)		NA		NA		8 ms		8 ms	
Inter Frame Delay Variation (99% of frames)*		not guaranteed (10 ms typical)		10 ms		5 ms		5 ms	
UNI MAC Address limit		1		4		8192		4	
NNI MAC Address limit		1		16		8192		16	
L2 Broadcast		conditional		conditional		conditional (max. 10Mbps)		conditional	
GbE interface for services < 100 Mbps				No		No		No	
L2 Frame Length with FCS (UNI)		1522B (taged)		1535B		1535 B		1535B	
UNI	VLAN	tagged		untagged or tagged (single VID)		untagged or tagged (single VID)		untagged or tagged (single VID)	
	VLAN ID range	1 (VLAN 850)		2-4050		2-4050		2-4050	
	Max Vlan stack size (including service delimiting tags - Nr of tags)	1		1		1		1	
Additional service: VLAN transparency	Availability	no		from 2 Mbps		no limit		no limit	
Protocol / Frame type		**Action**	**Limit [fps]**	**Action**	**Limit [fps]**	**Action**	**Limit [fps]**	**Action**	**Limit [fps]**
Generic IPv4/IPv6 unicast		PASS	NO	PASS	NO	PASS	NO	PASS	NO
Generic IPv4 broadcast		NOT GUARANTEED		PASS	NO	PASS	NO	PASS	NO
Generic IPv6 multicast to all nodes (broadcast)		NOT GUARANTEED		PASS	NO	PASS	NO	PASS	NO
Generic IPv4 multicast		NOT GUARANTEED		PASS	NO	PASS	NO	PASS	NO
Generic IPv6 multicast (exl. well known IPv6 multica		NOT GUARANTEED		PASS	NO	PASS	NO	PASS	NO
PPPoE IPv4		NOT GUARANTEED		PASS	NO	PASS	NO	PASS	NO
PPPoE IPv6		NOT GUARANTEED		PASS	24000	PASS	NO	PASS	24000
ARP		NOT GUARANTEED		PASS	30	PASS	NO	PASS	30
IPv6 ND		NOT GUARANTEED		PASS	30	PASS	NO	PASS	30
DHCPv6		NOT GUARANTEED		PASS	30	PASS	NO	PASS	30
DHCPv4 - client behind xDSL		NOT GUARANTEED		PASS	30	PASS	NO	PASS	30
DHCPv4 - server behind xDSL		NOT GUARANTEED		NOT GUARANTEED		PASS	NO	NOT GUARANTEED	
OSPFv2/v3		NOT GUARANTEED		PASS	30	PASS	NO	PASS	30
RIPv2/RIPng		NOT GUARANTEED		PASS	30	PASS	NO	PASS	30
IS-IS (ISO/IEC 10589:2002)		NOT GUARANTEED		NOT GUARANTEED		PASS	NO	NOT GUARANTEED	
IGMPv2/v3		NOT GUARANTEED		PASS	30	PASS	NO	PASS	30
MLDv1/v2		NOT GUARANTEED		PASS	30	PASS	NO	PASS	30
CDP/VTP/PAgP/DTP/UDLD		NOT GUARANTEED		PASS	30	PASS	NO	PASS	30
NTPv3/v4		NOT GUARANTEED		PASS	30	PASS	NO	PASS	30
PTP		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED	
ICMP Echo		NOT GUARANTEED		PASS	30	PASS	NO	PASS	30
HSRPv1 (IPv4)		NOT GUARANTEED		PASS	30	PASS	NO	PASS	30
HSRPv2 (IPv4/IPv6)		NOT GUARANTEED		NOT GUARANTEED		PASS	NO	NOT GUARANTEED	
802.1AE frame		NOT GUARANTEED		PASS	30	PASS	NO	PASS	30
802.1x		NOT GUARANTEED		DISCARD		NOT GUARANTEED		DISCARD	
802.3 Raw Ethernet		NOT GUARANTEED	L2	PASS	30	PASS	NO	PASS	30
STP/MSTP/PVSTP/RSTP		NOT GUARANTEED	L2	NOT GUARANTEED		PASS	NO	NOT GUARANTEED	
LLDP		NOT GUARANTEED	L2	NOT GUARANTEED		PASS	NO	NOT GUARANTEED	
LACP		NOT GUARANTEED	L2	NOT GUARANTEED		PASS	NO	NOT GUARANTEED	
Link OAM (802.3ah)		NOT GUARANTEED	L2	NOT GUARANTEED		PASS	NO	NOT GUARANTEED	
OAM CFM (802.1ag, Y.1731)		NOT GUARANTEED	L2	NOT GUARANTEED		PASS	NO	NOT GUARANTEED	
ESMC (G.8264)		NOT GUARANTEED	L2	DISCARD		NOT GUARANTEED		DISCARD	
E-LMI (MEF-16)		NOT GUARANTEED	L2	NOT GUARANTEED		PASS	NO	NOT GUARANTEED	
MMRP/MVRP/MSRP/MIRP		NOT GUARANTEED	L2	NOT GUARANTEED		PASS	NO	NOT GUARANTEED	
GARP/MRP		NOT GUARANTEED	L2	NOT GUARANTEED		PASS	NA	NOT GUARANTEED	
MPLS		NOT GUARANTEED	L2	NOT GUARANTEED		PASS	NA	NOT GUARANTEED	
VRRP v1 (IPv4), v2(IPv4/IPv6)		NOT GUARANTEED		NOT GUARANTEED		PASS	NA	NOT GUARANTEED	
MAC control UNI		NOT GUARANTEED	L2	DISCARD		PEER		DISCARD	
MAC control NNI		NOT GUARANTEED	L2	DISCARD		DISCARD		DISCARD	
SA or DA MAC 00:00:00:00:00:00		NOT GUARANTEED	L2	NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED	
SA MAC = DA MAC		NOT GUARANTEED	L2	NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED	

v1 10/2022

RADO Parameters		CEA						CEA SPECI						CEA MW	
		Asymmetric		Symmetric up to 100M		Symmetric above 100M		Metallic (ULAF)		Optical		Licensed MW		Nonlicensed MW	
Frame Loss Ratio on Point to Point Tail Circuit		0,25%, BER <10^-7		0,25% metallic infrastructure BER <10^-7		0,01% optical or MW infrastructure, BER <10^-9		0,1% metallic infrastructure BER <10^-7		0,01% optical, BER <10^-12,		0,01% MW infrastructure, BER <10^-12,		0,1% MW infrastructure, BER <10^-9	
Frame Delay on Point to Point Tail Circuit		RTD <20ms		RTD <20ms		RTD <10ms		RTD <10ms		RTD <10ms		RTD <10ms		RTD <10ms	
Frame Delay Variation (95% of troughput)		NA		NA		8 ms		5 ms		5 ms		5 ms		8 ms	
Inter Frame Delay Variation (99% of frames)*		not guaranteed (10 ms typical)		10 ms		5 ms		5 ms		5 ms		5 ms		5 ms	
UNI MAC Address limit		4		4		4		no limit		no limit		no limit		8192	
NNI MAC Address limit		16		16		16		no limit		no limit		no limit		8192	
L2 Broadcast		conditional		conditional		conditional		unconditional		unconditional		conditional (max. 30%)		conditional (max. 10Mbps)	
GbE interface for services < 100 Mbps		No		No		No		No		Yes		Yes		No	
L2 Frame Length with FCS (UNI)		1522B (taged)		till 20 Mbps 1522B, above 20 Mbps 1535B		1535B		2000 B		2000 B		2000 B		1535 B	
UNI	VLAN	untagged or tagged (single VID)		untagged or tagged (single VID)		untagged or tagged (single VID)		untagged or tagged (single VID)		untagged or tagged (single VID)		untagged or tagged (single VID)		untagged or tagged (single VID)	
	VLAN ID range	2-4050		2-4050		2-4050		2-4050		2-4050		2-4050		2-4050	
	Max Vlan stack size (including service delimiting tags - Nr of tags)	1		1		1		no limit		no limit		no limit		1	
Additional service: VLAN transparency	Availability	from 16/1 Mbps		from 2 Mbps		no limit		no limit		no limit		no limit		no limit	
Protocol / Frame type		**Action**	**Limit [fps]**	**Action**	**Limit [fps]**	**Action**	**Limit [fps]**	**Action**	**Limit [fps]**	**Action**	**Limit [fps]**	**Action**	**Limit [fps]**	**Action**	**Limit [fps]**
Generic IPv4/IPv6 unicast		PASS	NO	PASS	NO	PASS	NO	PASS	NO	PASS	NO	PASS	NO	PASS	NO
Generic IPv4 broadcast		PASS	NO	PASS	NO	PASS	NO	PASS	NO	PASS	NO	PASS	NO	PASS	NO
Generic IPv6 multicast to all nodes (broadcast)		PASS	NO	PASS	NO	PASS	NO	PASS	NO	PASS	NO	PASS	NO	PASS	NO
Generic IPv4 multicast		PASS	NO	PASS	NO	PASS	NO	PASS	NO	PASS	NO	PASS	NO	PASS	NO
Generic IPv6 multicast (exl. well known IPv6 multicast add		PASS	NO	PASS	NO	PASS	NO	PASS	NO	PASS	NO	PASS	NO	PASS	NO
PPPoE IPv4		PASS	NO	PASS	NO	PASS	NO	PASS	NO	PASS	NO	PASS	NO	PASS	NO
PPPoE IPv6		PASS	24000	PASS	24000	PASS	24000	PASS	NO	PASS	NO	PASS	NO	PASS	NO
ARP		PASS	30	PASS	30	PASS	30	PASS	NO	PASS	NO	PASS	NO	PASS	NO
IPv6 ND		PASS	30	PASS	30	PASS	30	PASS	NO	PASS	NO	PASS	NO	PASS	NO
DHCPv6		PASS	30	PASS	30	PASS	30	PASS	NO	PASS	NO	PASS	NO	PASS	NO
DHCPv4 - client behind xDSL		PASS	30	PASS	30	PASS	30	PASS	NO	PASS	NO	PASS	NO	PASS	NO
DHCPv4 - server behind xDSL		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		PASS	NO	PASS	NO	PASS	NO	PASS	NO
OSPFv2/v3		PASS	30	PASS	30	PASS	30	PASS	NO	PASS	NO	PASS	NO	PASS	NO
RIPv2/RIPng		PASS	30	PASS	30	PASS	30	PASS	NO	PASS	NO	PASS	NO	PASS	NO
IS-IS (ISO/IEC 10589:2002)		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		PASS	NO	PASS	NO	PASS	NO	PASS	NO
IGMPv2/v3		PASS	30	PASS	30	PASS	30	PASS	NO	PASS	NO	PASS	NO	PASS	NO
MLDv1/v2		PASS	30	PASS	30	PASS	30	PASS	NO	PASS	NO	PASS	NO	PASS	NO
CDP/VTP/PAgP/DTP/UDLD		PASS	30	PASS	30	PASS	30	PASS	NO	PASS	NO	PASS	NO	PASS	NO
NTPv3/v4		PASS	30	PASS	30	PASS	30	PASS	NO	PASS	NO	PASS	NO	PASS	NO
PTP		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED	
ICMP Echo		PASS	30	PASS	30	PASS	30	PASS	NO	PASS	NO	PASS	NO	PASS	NO
HSRPv1 (IPv4)		PASS	30	PASS	30	PASS	30	PASS	NO	PASS	NO	PASS	NO	PASS	NO
HSRPv2 (IPv4/IPv6)		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		PASS	NO	PASS	NO	PASS	NO	PASS	NO
802.1AE frame		PASS	30	PASS	30	PASS	30	PASS	NO	PASS	NO	PASS	NO	PASS	NO
802.1x		DISCARD		DISCARD		DISCARD		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED	
802.3 Raw Ethernet		PASS	30	PASS	30	PASS	30	PASS	NO	PASS	NO	PASS	NO	PASS	NO
STP/MSTP/PVSTP/RSTP		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		PASS	NO	PASS	NO	PASS	NO	PASS	NO
LLDP		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		PASS	NO	PASS	NO	PASS	NO	PASS	NO
LACP		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		PASS	NO	PASS	NO	PASS	NO	PASS	NO
Link OAM (802.3ah)		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		PASS	NO	PASS	NO	PASS	NO	PASS	NO
OAM CFM (802.1ag, Y.1731)		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		PASS	NO	PASS	NO	PASS	NO	PASS	NO
ESMC (G.8264)		DISCARD		DISCARD		DISCARD		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED	
E-LMI (MEF-16)		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		PASS	NO	PASS	NO	PASS	NO	PASS	NO
MMRP/MVRP/MSRP/MIRP		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		PASS	NO	PASS	NO	PASS	NO	PASS	NO
GARP/MRP		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		PASS	NA	PASS	NA	PASS	NA	PASS	NA
MPLS		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		PASS	NA	PASS	NA	PASS	NA	PASS	NA
VRRP v1 (IPv4), v2(IPv4/IPv6)		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		PASS	NA	PASS	NA	PASS	NA	PASS	NA
MAC control UNI		DISCARD		DISCARD		DISCARD		PEER		NOT GUARANTEED		NOT GUARANTEED		PEER	
MAC control NNI		DISCARD		DISCARD		DISCARD		DISCARD		DISCARD		DISCARD		DISCARD	
SA or DA MAC 00:00:00:00:00:00		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED	
SA MAC = DA MAC		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED		NOT GUARANTEED	

Notes:

PASS - frame is forwarded with fps limit provided or with service speed in case of no limit presented

NOT GUARANTEED - delivery of frame is not not guarateed and test proved that is dropped on at least some platforms

DISCARD - frame is not delivered

All other procols delivery is not guaranteed.

*IFDV je definovaná jako určitý percentil absolutních hodnot rozdílů zpoždění dvou platných rámců stejné CoS v jednom směru za podmínky, že je konstantní rozložení rámců na vstupu (delta t = 0).

Platí dle MEF 10:

Frame Delay Variation = Inter-Frame Delay Variation

Jitter ≠ Frame Delay Variation

Percentil je kvantil, který rozděluje soubor hodnot na 100 částí. Pro udávanou hodnotu x platí, Pravděpodobnost(x<IFDV) = 0,99.