

**Интерфейсы**

**E1**  
**STM-1**  
**ATM**  
**Ethernet 10/100/1000**  
**Ethernet 10G, 40GbE, 100GbE (только СПАЙДЕР)**  
**BRI/PRI**

**Протоколы  
ОКС-7**

<b>MTP 2</b>	Russian specifications,2000 Russian specifications,1994 ITU-T Q.703 White book,1993 ITU-T Q.703 Blue book,1988 ITU-T Q.703 White book high speed,1996
<b>MTP 3</b>	Russian specifications,2000 Russian specifications,1994 ITU-T Q.704 White book,1996 ITU-T Q.704 White book,1993 ITU-T Q.704 Blue book,1988
<b>SCCP</b>	Russian specifications,2001 Russian specifications,1994 ITU-T Q.713 White book,2001 ITU-T Q.713 White book,1996 ITU-T Q.713 White book,1993 ITU-T Q.713 Blue book,1988
<b>ISUP</b>	Russian specifications,2000 Russian specifications,1994 ITU-T Q.763 White book,1999 ITU-T Q.763 White book,1997 ITU-T Q.763 White book,1993 ITU-T Q.763 Blue book,1988 Internat. specifications,1991 MoU, ETSI ETS 300 121,1992
<b>TCAP</b>	Russian specifications,2001 Russian specifications,1994 ITU-T Q.773 White book,1997 ITU-T Q.773 White book,1993 ETSI ETS 300 287,1993
<b>INAP</b>	Russian specifications,2003 Russian specifications,1997 ETSI EN 302 039,2002 ETSI ETS 300 374,1994 ITU-T Q.1218 White book,1995 SIEMENS SINAP5,1997
<b>MAP</b>	3GPP TS 29.002 Ver 12.3.0,2013 3GPP Universal 3GPP TS 29.002 Ver 6.12.0,2005 ETSI GSM 09.02 Ver 6.10.0,1997 ETSI GSM 09.02,1992
<b>CAP</b>	3GPP TS 29.078 Ver 7.0.0,2005 ETSI GSM 09.78 Ver 6.5.0,1997
<b>BSSMAP</b>	ETSI GSM 08.08 Ver 8.9.0,1999 ETSI GSM 08.08 Ver 5.6.3,1997 ETSI GSM 08.08 Ver 4.12.1,1998
<b>DTAP</b>	3GPP TS 24.008 Ver 8.6.0,2009 3GPP TS 24.008 Ver 6.14.0,2006 ETSI GSM 04.08 Ver 7.9.1,1998
<b>BSSAP+</b>	3GPP TS 29.018 V6.5.0,2006
<b>SMS</b>	3GPP TS 23.040 V6.6.0,2005; 3GPP TS 24.011 V6.1.0,2005 ETSI GSM 04.11 Ver 7.1.0,1998
<b>MUP</b>	NMT Doc 900-2 Ver.11,1999 NMT Doc 900-2 Ver.10,1997 NMT Doc 900-2 Ver.8
<b>HUP</b>	NMT Doc 900-2 Ver.7
<b>TUP</b>	ITU-T Q.723 Blue book,1988

**ОКС-7 ANSI**

<b>MTP 2</b>	ANSI T1.111,1996 Russian specifications,2000 Russian specifications,1994 ITU-T Q.703 White book,1993 ITU-T Q.703 Blue book,1988 ITU-T Q.703 White book high speed,1996
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<b>MTP 3</b>	ANSI T1.111,1996 Russian specifications,2000 Russian specifications,1994 ITU-T Q.704 White book,1996 ITU-T Q.704 White book,1993 ITU-T Q.704 Blue book,1988
<b>SCCP</b>	ANSI T1.112,1996 Russian specifications,2001 Russian specifications,1994 ITU-T Q.713 White book,2001 ITU-T Q.713 White book,1996 ITU-T Q.713 White book,1993 ITU-T Q.713 Blue book,1988
<b>TCAP</b>	ANSI T1.114,1996
<b>MAP</b>	ANSI TIA/EIA-41.5-D,1997
<b>DTAP</b>	A.S0014-D v4.0,2012 A.S0014-0 v2.0,2002
<b>BSSMAP</b>	A.S0014-D v4.0,2012 A.S0014-0 v2.0,2002
<b>DSS1 PRI/BRI</b>	
<b>LAPD</b>	ETSI ETS 300 125,PRI,1991 ETSI ETS 300 125,BRI,1991 ITU-T Q.921 White book,BRI,1997 ITU-T Q.921 White book,PRI,1993 ITU-T Q.921 White book,BRI,1993 AT&T TR 41459,1999
<b>DSS1 L3</b>	ETSI EN 300 403-1 Ver 1.3.2,PRI,1999 ETSI EN 300 403-1 Ver 1.3.2,BRI,1999 ITU-T Q.931 White book,PRI,1998 ITU-T Q.931 White book,BRI,1998 ITU-T Q.931 White book,PRI,1993 ITU-T Q.931 White book,BRI,1993 AT&T TR 41459,1999 QSIG: ETSI ETS 300 172,1995

V5	
LapV5	ETSI ETS 300 324-1, ETS 300 347-1, 1994
V5 L3	ETSI ETS 300 324-1, ETS 300 347-1, 1994
A-bis	
LAPD	ETSI ETS 300 125, 1991
RSL	ETSI GSM 08.58 Ver 8.6.0, 2000 ETSI GSM 08.58 Ver 8.6.0, 2000 (SIEMENS) ETSI GSM 08.58 Ver 5.8.0, 1998 ETSI GSM 08.58 Ver 5.8.0, 1998 (SIEMENS)
DTAP	3GPP TS 24.008 Ver 8.6.0, 2009 3GPP TS 24.008 Ver 6.14.0, 2006 ETSI GSM 04.08 Ver 7.9.1, 1998
SMS	3GPP TS 23.040 V6.6.0, 2005; 3GPP TS 24.011 V6.1.0, 2005 ETSI GSM 04.11 Ver 7.1.0, 1998
O&M	ETSI GSM 08.59 Ver 3.1.0, 1995; ETSI GSM 12.21 Ver 5.0.0, 1996 ETSI GSM 08.59 Ver 3.1.0, 1995; ETSI GSM 12.21 Ver 4.5.4, 1996
X.25	
LAPB	ITU-T X.25 White book, 1996 (modulo 8) ITU-T X.25 White book, 1996 (modulo 128) ITU-T X.25 White book, 1996 (modulo 32768)
X25	ITU-T X.25 White book, 1996 (modulo 8) ITU-T X.25 White book, 1996 (modulo 128) ITU-T X.25 White book, 1996 (modulo 32768) ITU-T X.25 White book, 1998 (modulo 32768)
Application Layer	COPM COPM OrderN268
TCP/IP	
MAC	IEEE Std 802.3, 2000 IEEE Std 802.3 2000, 802.1Q
LLC	IEEE 802.2, 1998
ARP	IETF RFC 826, 1982
RARP	IETF RFC 903, 1984
PPP	IETF RFC 1134, 1989
LAPF	ITU-T Q.922, 1992
IP	IETF RFC 791, 1981
TCP	IETF RFC 793, 1981
UDP	IETF RFC 768, 1980
ICMP, ICMPv6	IETF RFC 792, 1981, IETF RFC 792, 1998
IGMP	IETF RFC 2236, 1997, IETF RFC 3376, 2002
EGP	IETF RFC 904, 1984
IS-IS	ISO IEC 10589, 2002
ES-IS	ISO IEC 9542, 1988
CLNP	ISO IEC 8473, 1998
GRE	IETF RFC 2784, 2000 IETF RFC 1701, 1994
HSRP	IETF RFC 2281, 1998
IDRP	ISO IEC 10747, 1994
OSPF	IETF RFC 2328, 1998
SSH	IETF RFC 4251, 2006 SSHv1
RSVP	IETF RFC 2205, 1997
VRRP	IETF RFC 3768, 2004
NetBIOS	IETF RFC 1002, 1987
SMB/CIFS	SNIA CIFS TR 1.0, 2002
POP3	IETF RFC 1081, 1988 IETF RFC 1939, 1996
DNS	IETF RFC 2929, 2000
IMAP4	IMAP RFC 5301 Ver 4 Rev 1, 2003
DHCP, DHCPv6	IETF RFC 2131, 1997, IETF RFC 3315, 2003
SIP	IETF RFC 3261, 2002 IETF RFC 2543, 1999 Russian specifications, 2006
HTTP	IETF RFC 2616, 1999
FTP	IETF RFC 959, 1985
SMTP	IETF RFC 5321, 2008 IETF RFC 788, 1981
BGP	IETF RFC 4271, 2006
TRIP	IETF RFC 3219, 2002
LDAPv3	IETF RFC 4511, 2006
RIP	IETF RFC 1058, 1988 IETF RFC 1388, 1993
RTCP	IETF RFC 3550, 2003
RTP	IETF RFC 3550, 2003
ICQ	ICQ Ver 7
RADIUS	IETF RFC 2865, 2000; RFC 2866, 2000

<b>SNMP</b>	IETF RFC 3412 v3,2002 IETF RFC 1901 v2c,1996 IETF RFC 1910 v2u,1996 IETF RFC 1445 v2p,1993
<b>MSRP</b>	IETF RFC 4975,2007; RFC 4976,2007
<b>H.323</b>	<b>RAS</b> Q.931 White book, 1998 Q.931 White book, 2006 <b>H.225</b> ITU-T H.225.0 White book, 1998 ITU-T H.225.0 White book, 2000 ITU-T H.225.0 White book, 2006 <b>H.245</b> ITU-T H.245 White book, 1998 ITU-T H.245 White book, 2006 <b>H.248</b> ITU-T H.248 White book, 2002 ITU-T H.248 White book, 2005
<b>MGCP</b>	IETF RFC 3435, 2003
<b>SIGTRAN</b>	<b>M2PA</b> IETF RFC 2960, 2000 <b>M3UA</b> IETF 3331, 2002 <b>SUA</b> IETF RFC 4165,2005 <b>IUA</b> IETF RFC 3332, 2002 <b>V5UA</b> IETF RFC 3868, 2004 <b>MTP3</b> IETF RFC 3057, 2001 IETF RFC 4233,2006
<b>SCCP</b>	Russian specifications,2001 ITU-T Q.713 White book,2001 ITU-T Q.713 White book,1996
<b>ISUP</b>	Russian specifications,2000 Russian specifications,1994 ITU-T Q.763 White book,1999 ITU-T Q.763 White book,1997 ITU-T Q.763 White book,1993 Internat. specifications,1991 MoU, ETSI ETS 300 121,1992
<b>TCAP</b>	Russian specifications,2001 ITU-T Q.773 White book,1993
<b>INAP</b>	Russian specifications,2003 Russian specifications,1997 ETSI EN 302 039,2002 ETSI ETS 300 374,1994 ITU-T Q.1218 White book,1995
<b>MAP</b>	3GPP TS 29.002 Ver 12.3.0,2013 3GPP Universal 3GPP TS 29.002 Ver 6.12.0,2005 ETSI GSM 09.02 Ver 6.10.0,1997 ETSI GSM 09.02,1992
<b>CAP</b>	3GPP TS 29.078 Ver 7.0.0,2005 ETSI GSM 09.78 Ver 6.5.0,1997
<b>BSSAPplus</b>	3GPP TS 29.018 V6.5.0,2006
<b>BSSMAP</b>	ETSI GSM 08.08 Ver 8.9.0,1999 A.S0014-D v4.0,2012 A.S0014-0 v2.0,2002
<b>DTAP</b>	3GPP TS 24.008 Ver 8.6.0,2009 3GPP TS 24.008 Ver 6.14.0,2006 ETSI GSM 04.08 Ver 7.9.1,1998 A.S0014-D v4.0,2012 A.S0014-0 v2.0,2002
<b>BICC</b>	ITU-T Q.1902,2001
<b>BCTP</b>	ITU-T Q.1990,2001
<b>IPBCP</b>	ITU-T Q.1970, 2006
<b>GTP</b>	3GPP TS 29.060 Ver 11.5.0,2013 3GPP TS 29.060 Ver 8.10.0,2010 ETSI GSM 09.60 Ver 7.8.0,1998
<b>DIAMETER accounting</b>	IETF RFC 3588,2003
<b>A9-int</b>	A.S0016D Ver4.0,2012
<b>A11-int</b>	A.S0017D Ver4.0,2012
<b>SNT7531DIAGNOSTIC</b>	SNT-7531 DIAGNOSTIC
<b>SMS</b>	3GPP TS 23.040 V6.6.0,2005; 3GPP TS 24.011 V6.1.0,2005 ETSI GSM 04.11 Ver 7.1.0,1998
<b>DSS1L3</b>	ITU-T Q.931 White book,PRI,1998 ETSI EN 300 403-1 Ver 1.3.2,PRI,1999 ETSI EN 300 403-1 Ver 1.3.2,BRI,1999
<b>V5L3</b>	ETSI ETS 300 324-1,ETS 300 347-1,1994
<b>GPRS Gb</b>	
<b>ProtocolLAPF</b>	ITU-T Q.922, 1992
<b>DSS1FR</b>	ITU-T Q.933 White book,2003 ITU-T Q.933 White book,1995
<b>NSControl</b>	ETSI GSM 08.16 Ver 8.0.0,1999
<b>BSSGP</b>	ETSI GSM 08.18 Ver 8.6.0,1999

<b>LLCGPRS</b>	ETSI GSM 04.64 Ver 8.6.0,1999
<b>SNDP</b>	ETSI GSM 04.65 Ver 8.0.0,1999
<b>DTAP</b>	3GPP TS 24.008 Ver 8.6.0,2009 3GPP TS 24.008 Ver 6.14.0,2006 ETSI GSM 04.08 Ver 7.9.1,1998
<b>SMS</b>	3GPP TS 23.040 V6.6.0,2005; 3GPP TS 24.011 V6.1.0,2005 ETSI GSM 04.11 Ver 7.1.0,1998
<b>IPandTCPandUDP</b>	IETF IP+TCP+UDP
<b>UTRAN Iub</b>	
<b>UTRANL2</b>	ATM UNI: ITU-T I.361,1999 MAC Ethernet + LLC + ARP + RARP MAC E1 + LLC + ARP + RARP PPP: IETF RFC 1134,1989
<b>UTRANL3</b>	SSCOP: ITU Q.2110,1994 IETF IP+TCP+UDP
<b>ALCAP</b>	ITU-T Q.2630.2,2000
<b>NBAP</b>	3GPP TS 25.433 Ver 8.2.0,2008
<b>DTAP</b>	3GPP TS 24.008 Ver 8.6.0,2009 3GPP TS 24.008 Ver 6.14.0,2006 ETSI GSM 04.08 Ver 7.9.1,1998
<b>DSS2L3</b>	ITU-T Q.2931, 1995
<b>SMS</b>	3GPP TS 23.040 V6.6.0,2005; 3GPP TS 24.011 V6.1.0,2005 ETSI GSM 04.11 Ver 7.1.0,1998
<b>FP</b>	3GPP TS 25.427 Ver 8.1.0 & 25.435 Ver 8.2.0, 2009
<b>MAC</b>	3GPP TS 25.321 Ver 8.2.0,2008
<b>RLC</b>	3GPP TS 25.322 Ver 8.3.0,2008
<b>RRC</b>	3GPP TS 25.331 Ver 8.5.0,2008
<b>PDCP</b>	3GPP TS 25.323 Ver 8.3.0,2008
<b>BMC</b>	3GPP TS 25.324 Ver 8.0.0,2007
<b>UTRAN Iur</b>	
<b>UTRANL2</b>	ATM UNI: ITU-T I.361,1999 MAC Ethernet + LLC + ARP + RARP MAC E1 + LLC + ARP + RARP PPP: IETF RFC 1134,1989
<b>UTRANL3</b>	SSCOP: ITU Q.2110,1994 IETF IP+TCP+UDP
<b>MTP3b</b>	ITU-T Q.2210,1996
<b>ALCAP</b>	ITU-T Q.2630.2,2000
<b>RNSAP</b>	3GPP TS 25.423 Ver 8.3.0,2009
<b>SCCP</b>	Russian specifications,2001 ITU-T Q.713 White book,2001
<b>DTAP</b>	3GPP TS 24.008 Ver 8.6.0,2009 3GPP TS 24.008 Ver 6.14.0,2006 ETSI GSM 04.08 Ver 7.9.1,1998
<b>SMS</b>	3GPP TS 23.040 V6.6.0,2005; 3GPP TS 24.011 V6.1.0,2005 ETSI GSM 04.11 Ver 7.1.0,1998
<b>FP</b>	3GPP TS 25.427 Ver 8.1.0 & 25.435 Ver 8.2.0, 2009
<b>MAC</b>	3GPP TS 25.321 Ver 8.2.0,2008
<b>RLC</b>	3GPP TS 25.322 Ver 8.3.0,2008
<b>RRC</b>	3GPP TS 25.331 Ver 8.5.0,2008
<b>PDCP</b>	3GPP TS 25.323 Ver 8.3.0,2008
<b>SCTP</b>	IETF RFC 2960,2000
<b>M3UA</b>	IETF RFC 3332,2002
<b>UTRAN IuCS</b>	
<b>UTRANL2</b>	ATM UNI: ITU-T I.361,1999 MAC Ethernet + LLC + ARP + RARP MAC E1 + LLC + ARP + RARP PPP: IETF RFC 1134,1989
<b>UTRANL3</b>	SSCOP: ITU Q.2110,1994 IETF IP+TCP+UDP
<b>MTP3b</b>	ITU-T Q.2210,1996
<b>ALCAP</b>	ITU-T Q.2630.2,2000 ITU-T Q.2630.1,1999
<b>RANAP</b>	3GPP TS 25.413 Ver 8.1.0,2008
<b>SCCP</b>	Russian specifications,2001 ITU-T Q.713 White book,2001
<b>DTAP</b>	3GPP TS 24.008 Ver 8.6.0,2009 3GPP TS 24.008 Ver 6.14.0,2006 ETSI GSM 04.08 Ver 7.9.1,1998
<b>SMS</b>	3GPP TS 23.040 V6.6.0,2005; 3GPP TS 24.011 V6.1.0,2005 ETSI GSM 04.11 Ver 7.1.0,1998
<b>SCTP</b>	IETF RFC 2960,2000
<b>M3UA</b>	IETF RFC 3332,2002
<b>UTRAN IuPS</b>	
<b>UTRANL2</b>	ATM UNI: ITU-T I.361,1999 MAC Ethernet + LLC + ARP + RARP MAC E1 + LLC + ARP + RARP PPP: IETF RFC 1134,1989

<b>UTRANL3</b>	SSCOP: ITU Q.2110,1994 IETF IP+TCP+UDP
<b>MTP3b</b>	ITU-T Q.2210,1996
<b>ALCAP</b>	ITU-T Q.2630.2,2000 ITU-T Q.2630.1,1999
<b>RANAP</b>	3GPP TS 25.413 Ver 8.1.0,2008
<b>SCCP</b>	Russian specifications,2001 ITU-T Q.713 White book,2001
<b>DTAP</b>	3GPP TS 24.008 Ver 8.6.0,2009 3GPP TS 24.008 Ver 6.14.0,2006 ETSI GSM 04.08 Ver 7.9.1,1998
<b>SMS</b>	3GPP TS 23.040 V6.6.0,2005; 3GPP TS 24.011 V6.1.0,2005 ETSI GSM 04.11 Ver 7.1.0,1998
<b>GTP</b>	3GPP TS 29.060 Ver 11.5.0,2013 3GPP TS 29.060 Ver 8.10.0,2010
<b>SCTP</b>	IETF RFC 2960,2000
<b>M3UA</b>	IETF RFC 3332,2002
<b>E-UTRAN</b>	
<b>PhysicalLayer</b>	MAC E1 + LLC + ARP + RARP MAC Ethernet + LLC + ARP + RARP PPP: IETF RFC 1134,1989
<b>IPandTCPandUDP</b>	IETF IP+TCP+UDP
<b>SCTP</b>	IETF RFC 2960,2000
<b>S1AP</b>	3GPP TS 36.413 Ver 9.0.0,2009
<b>X2AP</b>	3GPP TS 36.423 Ver 9.0.0,2009
<b>SGsAP</b>	3GPP TS 29.118 Ver 12.4.0,2014
<b>NAS</b>	3GPP TS 24.301 Ver 9.1.0,2009
<b>SMS</b>	3GPP TS 23.040 V6.6.0,2005; 3GPP TS 24.011 V6.1.0,2005 ETSI GSM 04.11 Ver 7.1.0,1998