

General specification of Internet service.

Examples of specified technical requirements

Shall=shall-requirements, Should=should-requirements, Stated=stated by operator, _=no requirement

		A: Enterprise	B: Enterprise	C: Enterprise	D: Household
		<i>Comment: Alternatives A, B and C signifies enterprises, gov. agencies and alike. Alt D signifies households. The alternatives C & D follows the vision of the ICT Commission that contains 5 Mb/s real capacity within the Swedish IT Infrastructure. Alt D is a service that has lower price per month than alt. C. Thus alt. D has in some respects lower demand on capacity than alt C.</i>			
04	The access point				
04.11	Connection capacity for service access point				
	Shall at least be	512 kbit/s	1920 kbit/s	10 Mbit/s	10 Mbit/s
05	Level 2 protocol				
05.11	10 Mbit/s Ethernet	Shall	Shall	Shall	Shall
05.12	100 Mbit/s Ethernet	Shall	Shall	Shall	Should
05.16	1 Gbit/s Ethernet	—	—	Should	—
06	Level 3 protocol (IPv4, IPv6)				
06.11	IPv4 Unicast forwarding	Shall	Shall	Shall	Shall
06.12	IPv4 Multicast forwarding	—	Shall	Shall	Shall
06.13	Multicast addresses	—	—	Shall	Shall
06.14	Multicast addresses between 239.0.0.0 and 239.255.255.255	—	—	Shall	—
07	Routing protocols				
	External routing protocols				
07.11 a)	Routing information with BGP4	—	Shall	Shall	—
07.14	Manually preconfigured routing (static)	Shall	Should	Should	Shall
	Internal routing protocols				
07.26	Routing information with RIPv1	Shall	Should	Should	—
	Routing protocols for Multicast				
07.31	IGMP	—	Shall	Shall	Shall
07.32	MSDP	—	Shall	Shall	—
07.33	PIM-SM	—	Shall	Shall	—
07.34	Use of PIM-SM but not MSDP	—	Shall	Shall	—
07.35	Use of NLRI Multicast when BGP4 is not used	—	Shall	Shall	—

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Routing information transferred from operator to subscriber					
07.41	Full Internet routing (without default)	__	Shall	Shall	__
07.42	Selected routing information	__	Should	Shall	__
07.43	Default route to the subscriber	Shall	__	Shall	__
Routing information transmitted from subscriber to operator					
07.51	Only address blocks from the operator's address space				
	To perform the claim the answer must be NO	Shall	Shall	Shall	__
07.53	Arbitrary prefix registered in the subscriber's name	__	Shall	Shall	Should
07.55	Multihoming	__	Should	Shall	__
07.56	Filtering of routing information from subscriber	Should	Should	Should	__
07.57 a)	Are all Unicast addresses presumed also to be Multic	__	Should	Should	Shall
07.57 b)	Does the subscriber transmit information about Unica	__	__	__	__
07.57 c)	Does the subscriber transmit information containing U	__	Shall	Shall	__
Descriptive formats of access lists					
07.63	RPSL	Should	Shall	Shall	__
07.64	List of prefixes/masks as e-mail	__	Shall	Shall	Should
07.66	Authentication with PGP or S/MIME	__	Shall	Shall	Shall
07.71	BGP dampening of external routes	__	Should	Should	__
DHCP server function at the access point					
07.81	DHCP server at the access point	Shall	Shall	Shall	Shall
07.82	Address space in static addresses and dynamic addr	Shall	Shall	Shall	Shall
07.83	Log function on DHCP server	Should	__	__	Shall
08	Performance on the operator's network and at the access point				
08.11	Minimum throughput capacity at the access connection				
	Shall at least be:	Stated	Stated	5 Mbit/s	5 Mbit/s
08.12	Maximum throughput capacity at the access connection				
	Shall at least be:	Stated	Stated	10 Mbit/s	10 Mbit/s
08.21	Maximum MTU prior to fragmentation of packets				
	Shall at least be:	Stated	Stated	1500 bytes	1500 bytes

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08.31	Throughput between two subscriber connections to the operator				
	Shall at least be:	360 kbit/s	1344 kbit/s	5 Mbit/s	5 Mbit/s
08.90*	Measuring points in North America				
	Measuring points shall be given from the operator	Stated	Stated	Stated	Stated
08.91*	Throughput between a subscriber connection and the national main exchange point in Stockholm				
	Shall at least be:	360 kbit/s	1344 kbit/s	5 Mbit/s	5 Mbit/s
08.92*	Throughput between a subscriber connection and points of measurement in North America				
	Shall at least be:	307 kbit/s	1152 kbit/s	1000 kbit/s	1000 kbit/s
08.93*	Throughput to a subscriber connected to another operator within the Swedish IT infrastructure				
	Shall at least be:	360 kbit/s	1344 kbit/s	5 Mbit/s	5 Mbit/s
08.94*	Minimum throughput to a subscriber outside the Swedish IT infrastructure				
	Shall at least be:	307 kbit/s	1152 kbit/s	1000 kbit/s	6 kbit/s
08.41	Roundtrip delay between two subscribers' connection				
	Shall not exceed:	82 ms	74 ms	30 ms	50 ms
08.95*	Roundtrip delay between a subscriber connection and the national main exchange point in Stockholm				
	Shall not exceed:	76 ms	72 ms	30 ms	50 ms
08.96*	Roundtrip delay between a subscriber connection and measuring points in North America				
	Shall not exceed:	166 ms	162 ms	200 ms	500 ms
08.51	Performance guarantees offered by the operator	Stated	Stated	Stated	Stated
08.81	Multicast performance measurements				
08.81 a)	The value of X or Y shall not exceed	—	Stated	0,30%	0,30%
08.81 b)	The least throughput shall be:	—	Stated	2 Mbit/s	3,5 Mbit/s
09	Dynamic parameters				
09.31	Average distance to root-name servers				
	Shall not exceed:	256 ms	256 ms	256 ms	1000 ms
09.32	Average distances to enumerated exchange points				
	Shall not exceed:	176 ms	176 ms	176 ms	1000 ms
09.33	Max percentage packet loss in own network				
	Shall maximum be:	0,50%	0,50%	0,25%	0.25%
09.41	Expansion of the backbone network	Stated	Stated	Stated	Stated
09.42	Enlargement of capacity to national exchange points	Stated	Stated	Stated	Stated
09.43	Enlargement of capacity to international exchange points	Stated	Stated	Stated	Stated

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09.51	Bandwidth delay quota for which the network is designed				
	Shall at least be:	Stated	Stated	15 Mbit/s	155 Mbit/s
09.52	Queue management strategy in the event of limited resources				
	Om skall-krav gäller: W-red	Stated	Stated	Stated	Shall
09.53	Queue management strategy to subscriber line				
	Om skall-krav gäller: WFQ	Stated	Stated	Stated	Shall
09.56	Routing stability				
	The largest number of routing flaps	Stated	Stated	5 cycles	—
10	Accessibility/inaccessibility				
10.11	Inaccessibility on access line				
	Shall not exceed:	33 min/month	33 min.per month	33 min.per month	33 min.per month
10.12	Inaccessibility between two subscribers within the open network				
	Shall not exceed:	33 min.per month	33 min.per month	33 min.per month	33 min.per month
10.13	Inaccessibility of packet forwarding to national mail exchange				
	Shall not exceed:	33 min.per month	33 min.per month	33 min.per month	33 min.per month
10.14	Inaccessibility of packet forwarding to international exchange point				
	Shall not exceed:	200 min.per month	200 min.per month	200 min.per month	200 min.per month
10.21	Accessibility guarantees	Stated	Stated	Stated	—
10.22	Redundant connections between backbone network	Stated	Stated	Stated	—
10.23	Redundant subscriber connections are provided	Stated	Stated	Stated	—
10.24	Connecting time for transition to reserve path				
	Shall not exceed:	5 seconds	5 seconds	5 seconds	10 seconds
10.25	Disconnection time for reversion to main path				
	Shall not exceed:	5 seconds	5 seconds	5 seconds	10 seconds
10.26	Connection of subscriber to more than one operator	Stated	Stated	Stated	—
10.90*	The operator's logical support system	—	—	Shall	Shall
11	Traffic filtering				
11.31	Packet filtering at the access point	Shall	Shall	Shall	Shall
11.32	Filtering based on IP addresses	Shall	Shall	Shall	Shall
11.33	Filtering based on protocol	Shall	Shall	Shall	Shall
11.34	Traffic filtering based on port number	Shall	Shall	Shall	Shall
11.35	Traffic filtering based on direction	Shall	Shall	Shall	Shall

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11.36 a)	Filtering of source routed packets	Shall	Shall	Shall	Shall
11.36 b)	Filtering of "short fragments"	Shall	Shall	Shall	Shall
11.37 a)	Verification of the filter function	Shall	Shall	Shall	Shall
11.37 b)	Is the filter function always verified after a change has	Shall	Shall	Shall	Shall
11.41	The subscriber can insert a filter himself	Stated	Stated	Stated	__
11.42	The operator filters prefixes intended for local sue and	Shall	Shall	Shall	Shall
12	Monitoring functions				
12.11	SNMP with read only access to router	Shall	Shall	Shall	__
12.12	SNMP with write access to router	Stated	Stated	Stated	__
12.13	Telnet access to access router, read only	Stated	Stated	Stated	__
12.14	Telnet access to access routerswrite	Stated	Stated	Stated	__
12.21	SNMP access to backbone network router against ac	Stated	Stated	Stated	__
12.22	SNMP access to all backbone network routers in the	Stated	Stated	Stated	__
13	Reachability				
13.11	All destinations within the operator's own network	Shall	Shall	Shall	Shall
13.12	All destinations advertised to any of the named excha	Shall	Shall	Shall	Shall
13.21	Inaccessible destinations				
	A list of inaccessible destinations shall be enclosed	Stated	Stated	Stated	Stated
13.50	Connected to national exchange points	Shall	Shall	Shall	Shall
13.51	Passage of packets to national Internet exchange poi	Shall	Shall	Shall	__
Services					
	Address translation functions (NAT)				
15.11	NAT at the access point	__	__	__	Should
15.15	NAT with translation 1-1	__	__	__	Should
15.16	NAT with overload translation	__	__	__	Should
15.17	Protocol for NAT function	__	__	__	Stated
15.22	The access point and use of globally unique addresses	Shall	Shall	Shall	Shall

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16	DNS				
16.11	Name-to-number for network elements in the operator's database	Shall	Shall	Shall	Shall
16.12	Number-to-name for network elements in the operator's database	Shall	Shall	Shall	Shall
16.13 a)	Support for secure DNS	Should	Should	Should	Should
16.13 b)	Does the operator sign a KEY record for a delegated zone?	Should	Should	Should	Should
16.13 c)	Does the operator manage, on a subscriber's behalf, a DNSSEC key for a delegated zone?	Should	Should	Should	Should
16.13 d)	Does the operator's DNS server verify signatures for a delegated zone?	Should	Should	Should	Should
16.14	Duplicated DNS servers	Shall	Shall	Shall	Shall
16.15	Duplicated DNS servers with dual connection	Should	Should	Should	Should
16.16	Duplicated DNS servers in two geographically separated locations	Shall	Shall	Shall	Shall
16.21	Secondary DNS server for the subscriber's name and number	Shall	Shall	Shall	_
16.22	Primary DNS server for the subscriber's name and number	Shall	Shall	Shall	Shall
16.23	Number-to-name delegation from the operator's address	Should	Should	Should	_
16.25	Functions where the operator runs a primary DNS server	Shall	Shall	Shall	_
16.26	DNS server as per technical specifications from ISO/IEC 15938	Shall	Shall	Shall	Shall
17	E-mail				
17.11	The operator can be reached via e-mail as per Internet standards	Shall	Shall	Shall	Shall
17.12	The operator's MTA DNS server is used for address resolution	Stated	Stated	Shall	Shall
17.13	The operator provides a secondary mailhost	Shall	Shall	Shall	_
17.14	Intermediate storage space for a subscriber's e-mail				
	Shall at least be:	140 Mbyte	1750 Mbyte B	7 000 Mbyte	_
17.16	Storage of e-mail	Shall	Shall	Shall	_
17.17	Operator's e-mail system configured with "No relay"	Shall	Shall	Shall	Shall
	Extra e-mail services				
17.24	The operator provides part of an e-mail function: POP3	Should	Should	Should	Shall
17.25 b)	The operator provides part of an e-mail function: POP3	Shall	Shall	Shall	_
17.25 c)	The operator provides part of an e-mail function: IMAP	Should	Should	Should	_
17.25 d)	The operator provides part of an e-mail function: SMTP	Shall	Shall	Shall	_
17.25 e)	The operator provides part of an e-mail function: ESMTP	Should	Should	Should	_
17.25 f)	Is SMTP service Extension for Authentication supported?	Should	Should	Should	_
17.25 g)	Is TLS supported as an encryption mechanism for an e-mail service?	Should	Should	Should	_
17.25 h)	Are any other access mechanisms than passwords in use?	Should	Should	Should	_

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18	NTP				
18.11	NTP server within the operator's network	Shall	Shall	Shall	Shall
18.21	NTP/SNTP at the access point	Shall	Shall	Shall	Shall
19	News				
19.31	NNTP server for news-reading from subscriber's client	_	_	_	Shall
19.32 a)	How long news groups are saved in the operator's system	_	_	_	Stated
19.41	Number of incoming newsfeeds to the operator's news server	_	_	_	Stated
Operating functions					
20	Subscriber support				
Subscriber support					
20.11	Subscriber support during office hours	Shall	Shall	Shall	Shall
20.12	Subscriber support outside office hours	_	Shall	Shall	Shall
20.13	Qualified technical assistance during office hours	Shall	Shall	Shall	Shall
20.14	Qualified technical assistance outside office hours	_	Shall	Shall	Should
20.15	Subscriber support via telephone	Shall	Shall	Shall	Shall
20.16	Subscriber support via e-mail	Shall	Shall	Shall	Shall
20.17	Subscriber support via fax	Shall	Shall	Shall	Should
20.18	Subscriber support via web	Shall	Shall	Shall	Shall
20.90*	Subscriber support in Swedish	Shall	Shall	Shall	Shall
20.21	Faults are only handled if occurring within the operator's network	Shall	Shall	Shall	Shall
20.22	Faults are handled for problems everywhere on the Internet	Shall	Shall	Shall	Shall
Trouble management					
20.31	Trouble ticket updates are e-mailed	Shall	Shall	Shall	_
20.32	Trouble ticket status accessible via the web	Should	Should	Shall	Shall
20.33	The subscriber is contacted when a trouble ticket is closed	Shall	Shall	Shall	_
Traffic statistics accessible via the web					
20.41	Traffic statistics at own access point	Should	Should	Shall	_
20.42	Traffic statistics for backbone network connections	Should	Should	Should	_
20.43	Traffic statistics for connection to other operators	Should	Should	Should	_
20.44	Traffic statistics for connection to exchange points	Should	Should	Should	_

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Availability statistics					
20.51	Availability on own line	Shall	Shall	Shall	Shall
20.52	Access to exchange points	Should	Should	Shall	Shall
Routing stability					
20.61	Statistics of routing stability	Should	Should	Should	__
Domain registrations					
20.91*	The operator is agent for registration of domain name	Shall	Shall	Shall	__
21 Operational monitoring					
21.11	Monitoring of incoming line load	Should	Should	Should	Should
21.12	Monitoring of outgoing line load	Should	Should	Should	Should
21.13	Monitoring of defective packets received	Shall	Shall	Shall	Shall
21.14	Monitoring of number of packets ignored	Shall	Shall	Shall	Shall
21.15	Monitoring of line status (up/down)	Shall	Shall	Shall	Should
21.16	Monitoring of reachability by ping	Stated	Stated	Stated	Stated
21.31	Monitoring of accessibility of support systems	Should	Should	Shall	Shall
21.32	Monitoring of support system function	Should	Should	Shall	Shall
21.33	Rectification time when a malfunction is detected during	Stated	Stated	Stated	Stated
21.34	Rectification time when a malfunction is detected outside	Stated	Stated	Stated	Stated
21.41	Indication of alternative traffic path	Stated	Stated	Should	Should
21.42	Rectification of faults	Shall	Shall	Shall	Shall
21.43	Monitoring and rectification based on network data	Shall	Shall	Shall	Shall
21.44	Rectification threshold values for data collected	Stated	Stated	Stated	Stated
21.45	Line load: % of nominal capacity	Stated	Stated	Stated	Stated
21.46	Checksum error: Number of defective packets per 5 min				
	Shall maximum be:	Stated	Stated	max.1 packet	max.10 packets
21.47	Ignored packets: Number of packets ignored per 5 min				
	Shall maximum be:	Stated	Stated	max.1 packet	max.10 packets
22 Other services					
22.11	Web cache for the operator's subscribe	Stated	Stated	__	__
22.12	Web cache storage capacity	Stated	Stated	__	__
22.13	Bandwith from web cache against backbone network	Stated	Stated	__	__

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23	Security				
23.11	Updating of software at point of access and in backbo	Shall	Shall	Shall	Shall
23.12	Information from equipment manufacturers, CERT, C	Should	Should	Shall	Shall
23.13	Procedures for dealing with security incidents	Shall	Shall	Shall	Shall
23.14	Procedures for informing the subscribers concerned	Shall	Shall	Shall	Shall
	Technical safeguards for the prevention of incidents				
23.15	Filters in outgoing routers to prevent spoofing of IP ad	Shall	Shall	Shall	Shall
23.16	Filters in the access server to prevent spoofing of the	Shall	Shall	Shall	Shall
23.17	Filter in access server to prevent spoofin of IP address	Shall	Shall	Shall	Shall
23.18	Filter in e-mail system so that the operator's e-mail sy	Shall	Shall	Shall	Shall
23.19	Filter lists for filtering unsolicited e-mail	Should	Should	Should	Should
23.20	The subscriber adds addresses to mail filter lists	_	_	_	Should
23.21	Filter in DNS system to minimize spoofing of DNS inf	Should	Should	Should	Should
23.22	Filter in router (or equivalent) so that incorrect routing	Shall	Shall	Shall	Shall
23.23	Protection of BGP sessions (or the equivalent) at pee	_	_	_	_
23.24	Filter (physical or logical) between all subscribers	Shall	Shall	Shall	Shall
23.25	Access control between Network Operations Center	Shall	Shall	Shall	Shall
23.26	Routines for adjusting access control when personne	Shall	Shall	Shall	Shall
	Other matters				
23.30	Security policy for computer systems	Should	Should	Should	Should
24	Scheduled stops and service times				
24.01	Scheduled service times	Shall	Shall	Shall	Shall
	Stated scheduled service times				
24.02	Incident training	Should	Should	Should	_
	Development				
40	Internet development				
40.11	Membership of RIPE	Shall	Shall	Shall	Shall
40.12	Membership of EOF	Should	Should	Should	Should
40.13	Membership of IETF	Should	Should	Should	Should
40.14	Membership of NANOG	Stated	Stated	Stated	Stated
40.15	Membership of APRICOT	Stated	Stated	Stated	Stated

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40.90	Membership of SOF	Shall	Shall	Shall	Shall
41	Development of the service				
41.11	Fault prevention routines	Stated	Stated	Stated	Stated
41.12	Test laboratory with dedicated personal	Stated	Stated	Shall	Shall
41.13	Pilot activity with new protocols	Stated	Stated	Shall	Shall