



Technical Specification

**IMS Network Testing (INT);
IMS/PES Performance Benchmark
Part 3: Traffic Sets and Traffic Profiles**

Reference

DTS/INT-00078-3

Keywords

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee IMS Network Testing (INT).

The present document is part 3 of a multi-part deliverable covering the IMS/PES Performance Benchmark, as identified below:

- Part 1: "Core Concepts";
- Part 2: "Subsystem Configurations and Benchmarks";
- Part 3: "Traffic Sets and Traffic Profiles";**
- Part 4: "Reference Load network quality parameters".

1 Scope

The present document is for an initial release of an IMS/PES performance benchmark. The same tests can be used also for legacy PSTN/ISDN networks or for inter-working tests between PSTN/ISDN emulation subsystem and legacy PSTN and ISDN. The metrics measured and reported are for performance of this subsystem under a communications application load.

The present document is the third part of the multi-part deliverable which consists of four parts.

TS 186 025-1 [1] contains the overall benchmark descriptions, architectures, processes, and information models that are common to all specific benchmarking scenarios.

TS 186 025-2 [2] contains the specific benchmarking use-cases and scenarios, along with scenario specific metrics and design objectives. It also defines the SUT configuration parameters. This part also contains any required extensions to the overall descriptions present in the present document, if necessary for the specific scenario.

The present document defines an initial benchmark test through the specification of a traffic set, traffic-time profile and benchmark test procedure.

TS 186 025-4 [3] defines Reference Load network quality parameters for the use cases defined in the present document.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

2.1 Normative references

The following referenced documents are necessary for the application of the present document.

- [1] ETSI TS 186 025-1: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); IMS/PES Performance Benchmark Part 1: Core Concepts".
- [2] ETSI TS 186 025-2 (V2.2.1): "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN);IMS/PES Performance Benchmark; Part 2: Subsystem Configurations and Benchmarks".
- [3] ETSI TS 186 025-4 (V2.1.1): "Telecommunications and Internet Converged Services and Protocols for Advanced Networking (TISPAN); IMS/PES Performance Benchmark; Part 4: Reference Load network quality parameters".

2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] ITU-T Recommendation T.30 (2005): "Procedures for document facsimile transmission in the general switched telephone network".
- [i.2] ITU-T Recommendation T.4 (2003): "Standardization of Group 3 facsimile terminals for document transmission".

- [i.3] ITU-T Recommendation T.24 (1998): "Standardized digitized image set".
- [i.4] ITU-T Recommendation Q.543 (1993): "Digital exchange performance objective".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

Reference load A: intended to represent the normal upper mean level of activity which Administrations would wish to provide for on customer lines and inter-exchange activities

Reference load B: intended to represent an increased level beyond normal planned activity levels

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

BA	ISDN Basic Access
BC	Bearer Capability
BHCA	Busy Hour Call Attempts
CAPS	Call Attempts Per Second
Erl	Erlang
IMS	IP Multimedia Subsystem
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
MGC	Media Gate way Controller
MGW	Media Gate Way
MHT	Mean Holding Time
MSAN	Multi-Service Access Node
NGN	Next Generation Networks
PES	PSTN Emulation Solution

NOTE: <http://www.utstar.com/files/1647.pdf>

PI	Progress Indicator
PRA	ISDN Primary Access
PSTN	Public Switched Telecommunications Network
s	second
SIP	Session Initiation Protocol
SIP-I	SIP with encapsulated ISUP
SUT	System Under Test
tm	Mean holding time for originating traffic
UDI	Unrestricted Digital Information
VBD	Voice Band Data

4 Initial benchmark traffic set and traffic-time profile

This clause defines the load profiles to simulate ISDN - non-ISDN environments. The data used in this traffic -time profile are based on profiles from Austria and Germany.

4.1 Initial benchmark traffic-time profile

Following assumptions are valid for the calculations:

The required call processing capacity depends on the number of calls offered to the exchange. The basic formula to calculate the required BHCA is:

$$\text{BHCA} = A \times 3\,600 / \text{tm}$$

A = traffic for **Reference load A** [i.4]

tm = mean holding time

Access Types		Traffic per subscriber [Erl] A = number of subscribers × originating traffic per subscriber	BHCA (BHCA = A × 3 600 / tm)	CAPS (BHCA/3600)	mean holding time [s]
POTS	Summary	0,02	0,72 (1,2 Note)	0,0002	100
ISDN-BA	B-Channel	0,050	1,80 (2 Note)	0,0005	100
	Summary	0,100	3,60	0,0010	
ISDN-PRA	B-Channel	0,5	18	0,005	100
	Summary	15	540	0,15	
ISUP-Trunk	Channel utilization	0,800	28,80	0,0080	100
	Summary	24,000	864,00	0,2400	

NOTE: The values in brackets are values proposed in ITU-T Recommendation Q.543 [i.4].

Traffic distribution of originating traffic:

Transit solution	
25 %	Intra-MGW
50 %	Inter-MGW
25 %	Inter-domain (SIP-I)
Relation between Voice and Data Traffic Types	
Voice/VBD	90:10
Relation between fax, data and text modem types	90:5:5
Voice/UDI	99:1

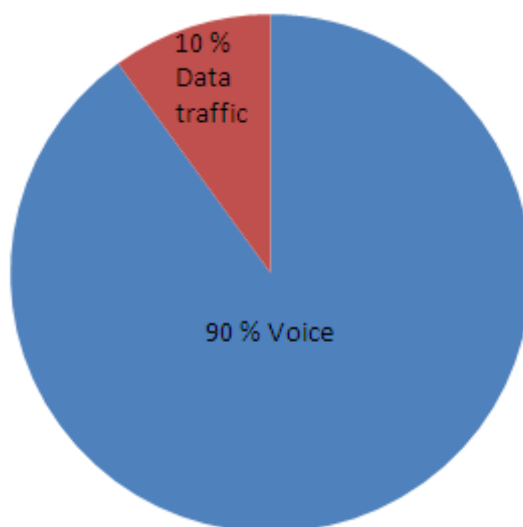


Figure 1: Relation between Voice and Voice Band Data (VBD) Traffic Types

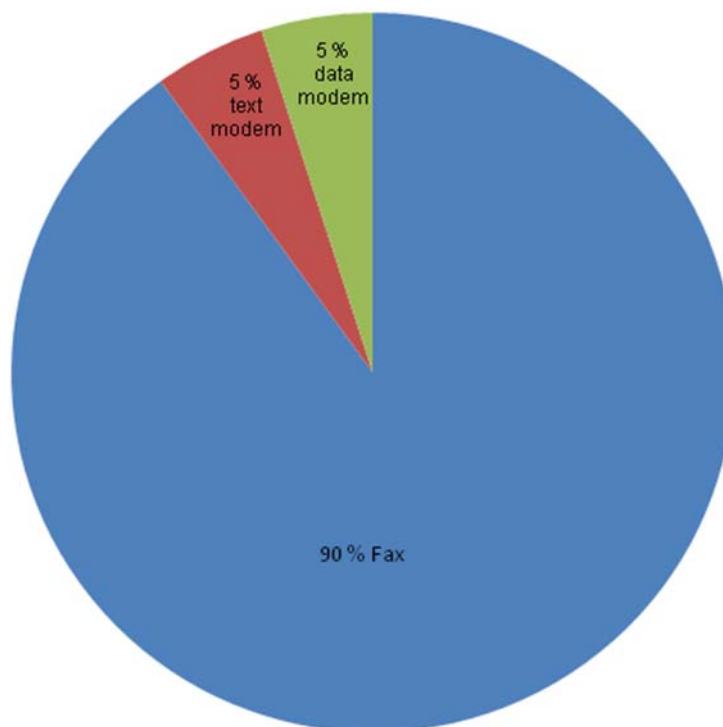


Figure 2: Relation between data modem types

4.1.1 MSAN 500 PSTN users

- Local exchange with 500 analog subscribers
- Originating BHCA
- $A = \text{number of subscribers} \times \text{originating traffic per subscriber} = 500 \times 0,02 = 10 \text{ Erl}$
- $t_m = \text{mean holding time for originating traffic} = 100 \text{ s}$
- BHCA = 360
- Load A = 0,1 CAPS

Table 1: MGW Traffic Load for 500 POTS subscriber

Type of Call	Traffic mix	Traffic (Erl)	cps
Intra-MGW	25 %	2,5	0,025
Inter-MGW	50 %	5	0,05
Inter-domain	25 %	2,5	0,025
Total	100 %	10	0,1

4.1.2 MSAN 500 POTS/ISDN mixed users

- 100 % Voice Traffic
- 333 POTS Lines
- 166 ISDN Lines

POTS:

- Local exchange with 333 analog subscribers
- Originating BHCA
- $A = \text{number of subscribers} \times \text{originating traffic per subscriber} = 333 \times 0,02 = 6,66 \text{ Erl}$
- $tm = \text{mean holding time for originating traffic} = 100 \text{ s}$
- BHCA = 240
- Load A = 0,067 CAPS

Type of Call	Traffic mix	Traffic (Erl)	cps
Intra-MGW	25 %	1,66	0,016
Inter-MGW	50 %	3,33	0,033
Inter-domain	25 %	1,66	0,016
Total	100 %	6,67	0,066

ISDN:

- MSAN with 166 ISDN subscribers (2 lines per subscriber =332 lines) Originating BHCA
- $A = \text{number of subscribers} \times \text{originating traffic per ISDN subscriber (2 lines)} = 166 \times 0,10 = 16,6 \text{ Erl}$
- $tm = \text{mean holding time for originating traffic} = 100 \text{ s}$
- BHCA = 597
- Load A = 0,166 CAPS

Type of Call	Traffic mix	Traffic (Erl)	Cps
Intra-MGW	25 %	4,15	0,042
Inter-MGW	50 %	8,3	0,083
Inter-domain	25 %	4,15	0,042
Total	100%	16,6	0,166

4.1.3 MSAN 500 POTS/ISDN mixed users with data traffic

- 90 % Voice Traffic
- 9 % Fax /Modem Traffic
- 1 % Data ISDN Traffic
- 333 POTS Lines
- 166 ISDN Lines

POTS: Voice

- Local exchange with 300 analog subscribers
- Originating BHCA
- $A = \text{number of subscribers} \times \text{originating traffic per subscriber} = 300 \times 0,02 = 6 \text{ Erl}$
- $tm = \text{mean holding time for originating traffic} = 100 \text{ s}$
- BHCA = 216 BHCA
- Load A = 0,06 CAPS

Type of Call	Traffic mix	Traffic (Erl)	Cps
Intra-MGW	25 %	1,5	0,083
Inter-MGW	50 %	3	0,166
Inter-domain	25 %	1,5	0,083
Total	100 %	6	0,06

POTS: VBD Data

- Local exchange with 33 analog subscribers (10 % of voice traffic)
- Originating BHCA
- $A = \text{number of subscribers} \times \text{originating traffic per subscriber} = 33 \times 0,02 = 0,66 \text{ Erl}$
- $tm = \text{mean holding time for originating traffic} = 120 \text{ s}$ (2 pages Horizontal: 200 or 204 scan lines per inch;
- Vertical: 200 or 196 scan lines per inch ('Fine') (see note in clause 4.1.9)
- $BHCA = 0,66 \times 3\,600 / 120 = 19,8 \text{ BHCA}$
- Load A = 0,0055 CAPS

ISDN: Voice

- MSAN with 163 ISDN subscribers (2 lines per subscriber =326 lines) Originating BHCA
- $A = \text{number of subscribers} \times \text{originating traffic per ISDN subscriber (2 lines)} = 163 \times 0,1 = 16,3 \text{ Erl}$
- $tm = \text{mean holding time for originating traffic} = 100 \text{ s}$
- $BHCA = 586,8$
- Load A = 0,163 CAPS

Type of Call	Traffic mix	Traffic (Erl)	Cps
Intra-MGW	25 %	4,075	0,04
Inter-MGW	50 %	8,15	0,0815
Inter-domain	25 %	4,075	0,04
Total	100%	16,3	0,163

ISDN: VBD Data

- Local exchange with 2 VBD subscribers (10 % of voice traffic)
- Originating BHCA
- $A = \text{number of subscribers} \times \text{originating traffic per ISDN subscriber (2 lines)} = 2 \times 0,1 = 0,2 \text{ Erl}$
- $tm = \text{mean holding time for originating traffic} = 120 \text{ s}$ (2 pages Horizontal: 200 or 204 scan lines per inch; Vertical: 200 or 196 scan lines per inch ('Fine') (see note in clause 4.1.9)
- $BHCA = 0,2 \times 3\,600 / 120 = 6 \text{ BHCA}$
- Load A = 0,0016 CAPS

ISDN: Data 64 Kbit/s; MSAN with 2 ISDN subscribers

- 2 parallel channels (2xBA)
- $tm = \text{mean holding time for originating traffic} = 500 \text{ s}$
- $BHCA = 0,27$

- Load A = 2 CAPS

4.1.4 MSAN with 500 ISDN subscribers (2 lines)

- 100 % Voice Traffic
- $A = \text{number of subscribers} \times \text{originating traffic per ISDN subscriber (2 lines)} = 500 \times 0,1 = 50 \text{ Erl}$
- $t_m = \text{mean holding time for originating traffic} = 100 \text{ s}$
- BHCA = 1 800 BHCA
- Load A = 0,5 CAPS

Type of Call	Traffic mix	Traffic (Erl)	Cps
Intra-MGW	25 %	25	0,125
Inter-MGW	50 %	50	0,25
Inter-domain	25 %	25	0,125
Total	100 %	50	0,5

4.1.5 MSAN with 1 000 analog subscribers

- 100 % Voice Traffic
- $A = \text{number of subscribers} \times \text{originating traffic per subscriber} = 1\,000 \times 0,02 = 20 \text{ Erl}$
- $t_m = \text{mean holding time for originating traffic} = 100 \text{ s}$
- $\text{BHCA} = 20 \times 3\,600 / 100 = 720 \text{ BHCA}$
- Load A = 0,2 CAPS

Type of Call	Traffic mix	Traffic (Erl)	Cps
Intra-MGW	25 %	5	0,05
Inter-MGW	50 %	10	0,1
Inter-domain	25 %	5	0,05
Total	100 %	20	0,2

4.1.6 MSAN / TRUNKING MGW with 16 PRA

- 100 % Voice Traffic
- $A = \text{number of subscribers} \times \text{originating traffic per subscriber} = 480 \times 0,5 = 240 \text{ Erl}$
- $\text{BHCA} = 480 \times 18 = 8\,640$
- Load A = $480 \times 0,005 = 2,4 \text{ CAPS}$

4.1.7 MSAN/TRUNKING MGW with 16 PRA mixed users with data traffic

- 90 % Voice Traffic
- 10 % Fax /Modem Traffic

ISDN PRA: Voice

- $A = \text{number of channels} \times \text{originating traffic per ISDN PRA channel} = 432 \times 0,5 = 216 \text{ Erl}$
- $\text{BHCA} = 432 \times 18 = 7\,776$

- Load A = $432 \times 0,005 = 2,16$ CAPS

ISDN PRA VBD Data

- Local exchange with 48 analog subscribers (10 % of voice traffic)
- $A = \text{number of channels} \times \text{originating traffic per ISDN PRA channel} = 48 \times 0,5 = 24$ Erl
- $t_m = \text{mean holding time for originating traffic} = 120$ s (2 pages Horizontal: 200 or 204 scan lines per inch;
- Vertical: 200 or 196 scan lines per inch ('Fine') (see note in clause 4.1.9)
- $BHCA = 24 \times 3\,600 / 120 = 720$ BHCA

4.1.8 Load A = 0,2 CAPS 4.1.8 MSAN/TRUNKING MGW with 100 PRA

- 100 % Voice Traffic
- $A = \text{number of channels} \times \text{originating traffic per ISDN PRA channel} = 3\,000 \times 0,5 = 1\,500$ Erl
- $BHCA = 3\,000 \times 18 = 54\,000$
- Load A = $3\,000 \times 0,005 = 15$ CAPS

4.1.9 MSAN/TRUNKING MGW with 1024 PRA

- 100 % Voice Traffic
- $A = \text{number of channels} \times \text{originating traffic per ISDN PRA channel} = 30\,720 \times 0,5 = 15\,360$ Erl
- $BHCA = 30\,720 \times 18 = 552\,960$
- Load A = $30\,720 \times 0,005 = 154$ CAPS

NOTE: Group 3 faxes conform to the ITU-T Recommendations T.30 [i.1] and T.4 [i.2]. The horizontal and vertical resolutions are allowed by the T.4 [i.2] standard to vary among a set of fixed resolutions:

- Horizontal: 100 scan lines per inch:
 - Vertical: 100 scan lines per inch
- Horizontal: 200 or 204 scan lines per inch:
 - Vertical: 100 or 98 scan lines per inch ('Standard')
 - Vertical: 200 or 196 scan lines per inch ('Fine')
 - Vertical: 400 or 391 (note not 392) scan lines per inch ('Superfine')
- Horizontal: 300 scan lines per inch:
 - Vertical: 300 scan lines per inch
- Horizontal: 400 or 408 scan lines per inch:
 - Vertical: 400 or 391 scan lines per inch ('Ultrafine')

4.2 Initial benchmark traffic set

4.2.1 ISDN/PSTN mixed initial benchmark traffic set

Use Case Section	Test Scenario	Scenario ID	Scenario % of System Load	Scenario Arrival Distribution
TS 186 025-2 [2], clause 5.1: Session Set-Up/ ISDN-ISDN Use-Case 1	TS 186 025-2 [2], clause 5.1.1.1 ISDN - ISDN Scenario 1.1 Basic call with BC= speech - enblock sending	I_I_S_1.1	10 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.1.2 ISDN - ISDN Scenario 1.2 Basic call with BC= speech - enblock sending	I_I_S_1.2	10 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.1.3 ISDN - ISDN Scenario 1.3 Basic call - overlap sending with BC= speech	I_I_S_1.3	9 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.1.4 ISDN - ISDN Scenario 1.4 Basic call with BC= 3,1 KHz audio - Fax with 33,6 kbit/s	I_I_S_1.4	2,25 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.1.5 ISDN - ISDN Scenario 1.5 Basic call with BC= 3,1 KHz audio - Fax with 14,4 kbit/s	I_I_S_1.5	2,25 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.1.6 ISDN - ISDN Scenario 1.6 Basic call with BC= 3,1 kHz with PI#3	I_I_S_1.6	30 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.1.7 ISDN - ISDN Scenario 1.7 Basic call with BC= 3,1 kHz with PI#3	I_I_S_1.7	30 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.1.8 ISDN - ISDN Scenario 1.8 Basic call with BC= 3,1 kHz - Modem V.32 bis (4,8 kbit/s, 9,6 kbit/s, 14,4 kbit/s)	I_I_S_1.8	2,25 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.1.9 ISDN - ISDN Scenario 1.9 Basic call with BC= 3,1 kHz - Modem V.34 (up to 33,6 kbit/s)	I_I_S_1.9	2,25 %	Poisson, mean selected by traffic-time profile

Use Case Section	Test Scenario	Scenario ID	Scenario % of System Load	Scenario Arrival Distribution
TS 186 025-2 [2], clause 5.1: Session Set-Up/ ISDN-ISDN Use-Case 1	TS 186 025-2 [2], clause 5.1.1.10 ISDN - ISDN Scenario 1.10 Basic call with BC= UDI - enblock sending	I_I_S_1.10	0,5 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.1.11 ISDN - ISDN Scenario 1.11 Basic call with BC= UDI - enblock sending	I_I_S_1.11	0,5 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.1.12 ISDN - ISDN Scenario 1.12 called user is user determined user busy	I_I_S_1.12	0,5 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.1.13 ISDN - ISDN Scenario 1.13 No answer from the called user	I_I_S_1.13	0,5 %	Poisson, mean selected by traffic-time profile

Use Case Section	Test Scenario	Scenario ID	Scenario % of System Load	Scenario Arrival Distribution
TS 186 025-2 [2], clause 5.1: Session Set-Up/ ISDN-PSTN Use-Case 2 (in combination with use case 3)	TS 186 025-2 [2], clause 5.1.2.1 ISDN - PSTN Scenario 2.1 Basic call with BC= speech - enblock sending	I_P_S_2.1	15 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.2.2 ISDN - PSTN Scenario 2.2 Basic call with BC= speech - enblock sending	I_P_S_2.2	15 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.2.3 ISDN - PSTN Scenario 2.3 Basic call - overlap sending with BC= speech	I_P_S_2.3	14 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.2.4 ISDN - PSTN Scenario 2.4 Basic call with BC= 3,1 KHz audio - Fax with 33,6 kbit/s	I_P_S_2.4	2,25 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.2.5 ISDN - PSTN Scenario 2.5 Basic call with BC= 3,1 KHz audio - Fax with 14,4 kbit/s	I_P_S_2.5	2,25 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.2.6 ISDN - PSTN Scenario 2.6 Basic call with BC= 3,1 kHz - Modem V.32 bis (4,8 kbit/s, 9,6 kbit/s 14,4 kbit/s)	I_P_S_2.6	0,25 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.2.7 ISDN - PSTN Scenario 2.7 Basic call with BC= 3,1 kHz - Modem V.34 (up to 33,6 kbit/s)	I_P_S_2.7	0,25 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.2.8 ISDN - PSTN Scenario 2.8 called user is user determined user busy	I_P_S_2.8	0,5 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.2.9 ISDN - PSTN Scenario 2.9 No answer from the called user	I_P_S_2.9	0,5 %	Poisson, mean selected by traffic-time profile

Use Case Section	Test Scenario	Scenario ID	Scenario % of System Load	Scenario Arrival Distribution
TS 186 025-2 [2], clause 5.1: Session Set-Up/ PSTN- ISDN Use-Case 3 (in combination with use case 2)	TS 186 025-2 [2], clause 5.1.3.1 PSTN - ISDN Scenario 3.1 Basic call. The call is released from the calling user	P_I_S_3.1	22 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.3.2 PSTN - ISDN Scenario 3.2 Basic call The call is released from the called user	P_I_S_3.2	22 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.3.3 PSTN - ISDN Scenario 3.3 Basic call with BC= 3,1 KHz audio - Fax with 33,6 kbit/s	P_I_S_3.3	2,25 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.3.4 PSTN - ISDN Scenario 3.4 Basic call with BC= 3,1 KHz audio - Fax with 14,4 kbit/s	P_I_S_3.4	2,25 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.3.5 PSTN - ISDN Scenario 3.5 Basic call with BC= 3,1 KHz audio - Modem V.90	P_I_S_3.5	0,5 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.3.6 PSTN - ISDN Scenario 3.6 called user is user determined user busy	P_I_S_3.6	0,5 %	Poisson, mean selected by traffic-time profile
	TS 186 025-2 [2], clause 5.1.3.7 PSTN - ISDN Scenario 3.7 - no answer from the called user	P_I_S_3.7	0,5 %	Poisson, mean selected by traffic-time profile

4.2.2 PSTN initial benchmark traffic set

Use Case Section	Test Scenario	Scenario ID	Type	Scenario % of System Load	Scenario Arrival Distribution
TS 186 025-2 [2], clause 5.1: Session Set-Up/ PSTN- PSTN Use-Case 4	TS 186 025-2 [2], clause 5.1.4.1 PSTN - ISDN Scenario 4.1 Basic call. The call is released from the calling user	P_P_S_4.1		44,5 %	
	TS 186 025-2 [2], clause 5.1.4.2 PSTN – PSTN Scenario 4.2 Basic call The call is released from the called user	P_P_S_4.2		44,5 %	
	TS 186 025-2 [2], clause 5.1.4.3 PSTN - PSTN Scenario 4.3 Basic call with BC= 3,1 KHz audio - Fax with 33,6 kbit/s	P_P_S_4.3		4,5 %	
	TS 186 025-2 [2], clause 5.1.4.4 PSTN - PSTN Scenario 4.4 Basic call with BC= 3,1 KHz audio - Fax with 14,4 kbit/s	P_P_S_4.4		4,5 %	
	TS 186 025-2 [2], clause 5.1.4.5 PSTN - PSTN Scenario 4.5 Basic call with BC= 3,1 KHz audio - Modem V.34 (up to 33,6 kbit/s)	P_P_S_4.5		0,5 %	
	TS 186 025-2 [2], clause 5.1.4.6 PSTN - PSTN Scenario 4.6 Basic call with BC= 3,1 KHz audio - Modem V.32 bis (4,8 kbit/s, 9,6 kbit/s, 14,4 kbit/s)	P_P_S_4.6		0,5 %	
	TS 186 025-2 [2], clause 5.1.4.7 PSTN - PSTN Scenario 4.7 Called user is user busy	P_P_S_4.7		0,5 %	
	TS 186 025-2 [2], clause 5.1.4.8 PSTN - ISDN Scenario 4.8 no answer from the called user	P_P_S_4.8		0,5 %	

History

Document history		
V1.1.1	October 2012	Publication