JTC 1

INTERNATIONAL STANDARD

ISO 8327

First edition
1987-08-15

AMENDMENT 3
1992-12-15

Information processing systems – Open Systems Interconnection – Basic connection oriented session protocol specification

AMENDMENT 3: Additional synchronization functionality

Systèmes de traitement de l'information – Interconnexion de systèmes ouverts – Protocole de session en mode connexion

AMENDEMENT 3: Fonction de synchronisation supplémentaire

Reference number
ISO 8327:1987/Amd. 3:1992 (E)

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Amendment 3 to International Standard ISO 8327:1987 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology.*

International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland
Printed in Switzerland

Information processing systems – Open Systems Interconnection – Basic connection oriented session protocol specification

AMENDMENT 3: Additional synchronization functionality

Introduction to this Amendment

This Amendment introduces the data separation functional unit into the Session Protocol Specification. The data separation functional unit supports the additional functionality of separation of data before and after a minor synchronization point. It should be noted that the page and clause numbering in this Amendment relate to SC 21 N4656 "Revised version of ISO 8327", which is planned to be submitted for publication later this year. This is because this Amendment affects changes introduced by earlier Amendments and Addenda. This Amendment makes no change to any other part of the Session Protocol.

Page 4

Subclause 4.5 Local variables

Insert new items in the list after Vsc as follows

"V(Ado) see 5.8.3.5

V(Adi) see 5.8.3.6"

Page 8

Subclause 5.4.3 Data transfer phase

Insert a new item after 5.4.3 f) as follows and re-letter the subsequent items g) to k) as h) to l)

"g) data separation is used in association with either minor synchronization or symmetric synchronization. This allows the user to set specific minor synchronization points which have the property of protecting the flow sent before these points from being purged by a subsequent resynchronize. When such a point is set in the data flow, SPDUs received by the requesting SPM before this point has been acknowledged will not be discarded by a subsequent resynchronize."

Page 9

Table 3 — Functional units

Insert a new entry after Symmetric Synchronize as follows

Functional unit	SPDU code	SPDU name	Reference
Data separation		No additional associated SPDUs	

Page 11

Subclause 5.5 Functional units

Insert a new subclause after subclause 5.5.9 and re-number subsequent subclauses 5.5.10 to 5.5.13 as 5.5.11 to 5.5.14:

> **"5.5.10 Data separation functional unit**
>
> The data separation functional unit is always associated with either the minor synchronize functional unit or the symmetric synchronize functional unit. It allows the user to define minor synchronization points which clearly separate the normal flow before and after these points and which are protected against possible discard by a subsequent resynchronize. It is not valid to select both this functional unit and the activity management functional unit for use on the same session connection."

Page 11

Subclause 5.7.1 Negotiation of functional units

Insert a new paragraph at the end of subclause 5.7.1 as follows

> "The data separation functional unit can only be proposed if the minor synchronize functional unit or the symmetric synchronize functional unit is proposed."

Page 12

Subclause 5.8.3 Synchronization point variables for use without the symmetric synchronize functional unit

Insert two new subclauses after subclause 5.8.3.4

> **"5.8.3.5 V(Ado)**
>
> V(Ado) is used by the SPM and is the highest synchronization point serial number which was sent in a MINOR SYNCHRONIZATION POINT SPDU with the data separation parameter set to true. Received SPDUs cannot be discarded in case of resynchronization when V(Ado) is greater than or equal to V(A).
>
> **5.8.3.6 V(Adi)**
>
> V(Adi) is used by the SPM and is the highest synchronization point serial number which was received in a MINOR SYNCHRONIZATION POINT SPDU with the data separation parameter set to true."

Page 29

Subclause 7.20.1 Content of the MINOR SYNC SPDU

Replace item a) by the following

"a) a Sync Type item which is used to indicate :

1) if an explicit confirmation is required;

2) if the data separation is requested."

Page 29

Subclause 7.20.2 Sending the MINOR SYNC SPDU

Add the following before the last sentence

"If the Sync Type parameter has the value "data separation", V(Ado) is set to V(M)."

Page 32

Subclause 7.24.2.1 Sending the RESYNCHRONIZE SPDU without symmetric synchronization

Replace the last sentence of the first paragraph with the following

"If the transport expedited flow is available to this session connection and the Data Separation functional unit has not been selected, a PREPARE (RESYNCHRONIZE) SPDU is sent simultaneously, or earlier, on the transport expedited flow. If the transport expedited flow is available to this session connection and the Data Separation functional unit has been selected, one of the following applies:

a) if a previously sent MINOR SYNCHRONIZATION POINT SPDU with the Sync Type Item having the value "data separation" has not been acknowledged, then a PREPARE (RESYNCHRONIZE) SPDU shall not be sent;

b) otherwise, a PREPARE (RESYNCHRONIZE) SPDU may be sent, as a local matter."

Page 32

Subclause 7.24.2.1 Sending the RESYNCHRONIZE SPDU without symmetric synchronization

Replace the second paragraph with the following

"The SPM goes into a state where incoming SPDUs are discarded in the following way :

a) if the Data Separation functional unit is not selected or if there is no unacknowledged minor synchronization point with the Sync Type item having the value "data separation" (previously sent by the local SPM), all SPDUs are discarded except : PREPARE (RESYNCHRONIZE), RESYNCHRONIZE, PREPARE (RESYNCHRONIZE ACK), RESYNCHRONIZE ACK, ACTIVITY DISCARD, ACTIVITY INTERRUPT and ABORT SPDUs.

b) if the Data Separation functional unit is selected and there are unacknowledged minor synchronization points with the Sync Type item having the value "data separation" (previously sent by the local SPM), only the following SPDUs are discarded : PREPARE (MAJOR SYNC ACK) SPDUs, MAJOR SYNC ACK SPDUs (see the note).

NOTE — The MAJOR SYNC ACK SPDU is discarded (and therefore does not result in an S-SYNC-MAJOR confirm) because the previously issued S-RESYNC request prevented the completion of the dialogue unit. It is not possible to deliver the S-SYNC-MAJOR confirm because this would cause V(R) to be updated and this may be a later value than that to which the resynchronize is occurring."

Page 32

Subclause 7.24.2.2 Receiving the RESYNCHRONIZE SPDU without symmetric synchronization

Replace the second paragraph with the following

"When the PREPARE(RESYNCHRONIZE) SPDU is received, the SPM goes into a state where incoming SPDUs are discarded in the following way :

a) if the Data Separation functional unit is not selected or if there is no outstanding minor synchronization point with the Sync Type item having the value "data separation", all SPDUs are discarded, until the RESYNCHRONIZE SPDU is received, except for ABORT SPDUs.

b) if the Data Separation functional unit is selected and there are one or more outstanding minor synchronization points with the Sync Type item having the value "data separation" (previously sent by the SPM), only the following SPDUs are discarded, until the RESYNCHRONIZE SPDU is received : PREPARE (MAJOR SYNC ACK) SPDUs, MAJOR SYNC ACK SPDUs (see the note).

NOTE — The MAJOR SYNC ACK SPDU is discarded (and therefore does not result in an S-SYNC-MAJOR confirm) because the previously issued S-RESYNC request prevented the completion of the dialogue unit. It is not possible to deliver the S-SYNC-MAJOR confirm because this would cause V(R) to be updated and this may be a later value than that to which the resynchronize is occurring."

Page 35

Subclause 7.25.2.1 Sending the RESYNCHRONIZE ACK SPDU without symmetric synchronization

Add a new paragraph at the end of 7.25.2.1 as follows

"If the Data Separation functional unit has been selected, V(Ado) is set to -1."

Page 35

Subclause 7.25.2.2 Receiving the RESYNCHRONIZE ACK SPDU without symmetric synchronization

Add a new paragraph at the end of 7.25.2.2 as follows

"If the Data Separation functional unit has been selected, V(Adi) is set to -1."

Page 47

Subclause 8.3.1.13

Insert a new item after 8.3.1.13 l) as follows and re-letter the subsequent items m) and n) as n) and o)

"m) bit 13 : data separation functional unit"

Replace "Bits 13-16 are reserved" with "Bits 14-16 are reserved"

Page 56

Subclause 8.3.20.3

Replace the subclause as follows

"**8.3.20.3** The Sync Type item PV field, if present, shall indicate the following

a) bit 1 = 1 : explicit confirmation not required
   bit 1 = 0 : explicit confirmation required
b) bit 2 = 1 : data separation required
   bit 2 = 0 : data separation not required

Bits 3-8 are reserved.

This parameter field shall be absent if an explicit confirmation is required and data separation is not required."

Page 70

Subclause A.5.1 Functional units

Replace the fu-dom expression as follows

"fu-dom = {FD, HD, EXCEP, TD, NR, SY, SS, DS, MA, RESYN, EX, ACT, CD}"

Add the following to the list of functional units after "SS = Symmetric synchronize functional unit"

"DS = Data separation functional unit"

Page 73

Subclause A.5.4 Variables

Insert two subclauses after subclause A.5.4.14 and renumber subsequent subclauses A.5.4.15 to A.5.4.18 as A.5.4.17 to A5.4.20

"**A.5.4.15 V(Ado)**

V(Ado) is used by the SPM and is the highest synchronization point serial number which was sent in a MINOR SYNCHRONIZATION POINT SPDU with the data separation parameter set to true. Received SPDUs cannot be discarded in case of resynchronization when V(Ado) is greater than or equal to V(A).

A.5.4.16 V(Adi)

V(Adi) is used by the SPM and is the highest synchronization point serial number which was received in a MINOR SYNCHRONIZATION POINT SPDU with the data separation parameter set to true."

Page 75

Table 47 — Incoming events

Insert a new entry after SSYNmreq as follows

Abbreviated name	Category	Name and description
SSYNmdreq	SS-user	S-SYNC-MINOR (data separation) request primitive

Page 76

Table 47 — Incoming events

Insert a new entry after MIP as follows

Abbreviated name	Category	Name and description
MIP-d	SPDU	MINOR SYNC POINT (data separation) SPDU

Page 78

Table 49 — Outgoing events

Insert a new entry after SSYNmind as follows

Abbreviated name	Category	Name and description
SSYNmdind	SS-user	S-SYNC-MINOR (data separation) indication primitive

Page 79

Table 49 — Outgoing events

Insert a new entry after MIP as follows

Abbreviated name	Category	Name and description
MIP-d	SPDU	MINOR SYNC POINT (data separation) SPDU

Pages 82, 83

Table 52 — Specific actions

Change the following actions

[5]	insert	Set V(Ado) = -1 Set V(Adi) = -1
[28]	insert	Set V(Ado) = -1 Set V(Adi) = -1
[68]	insert	Set V(Ado) = -1 Set V(Adi) = -1
[71]	insert	Set V(Ado) = -1 Set V(Adi) = -1

Insert new actions as follows

[41]	Set V(Ado) = V(M)
[42]	Set V(Ado) = V(Ms)
[43]	Set V(Ado) = -1 Set V(Adi) = -1
[44]	Set V(Adi) = V(M)
[45]	Set V(Adi) = V(Mr)

Pages 84, 85

Table 53 — Predicates

Replace predicate p35 as follows

p35	FU(RESYN) & [¬TEXP OR FU(DS)]

Replace predicate p185 as follows

p185	discard-rcv-flow & ¬p81

Insert new predicates as follows

p80	¬FU(DS) OR [¬FU(SS) & V(Adi) < V(A)] OR [FU(SS) & V(Adi) < V(Ar)]
p81	[¬FU(SS) & V(Ado) ≥ V(A)] OR [FU(SS) & V(Ado) ≥ V(As)]
p82	FU(DS)

After the table insert new note 5 as follows

"5 PR is not sent if p81 is true, or TEXP is false, or, as a local choice, if the data separation functional unit is selected."

Pages 86-1 to 86-44

Tables 54 to 71 — State tables

Replace the state tables with the following pages.

Editorial note: Any transitions which are possibly missing from the 1990 text are ***not*** *included. The changes are made to both the state tables without the symmetric synchronize functional unit and the state tables with the symmetric synchronize functional unit. However, a number of errors have been discovered in the second set of state tables. No attempt has been made to correct these errors in this Amendment, so the first set of state tables should be regarded as more complete and correct.*

Cells which have been altered are shaded.

Table 54 — Connection establishment state table without the symmetric synchronize functional unit

State / Event	STA01 idle no TC	STA01A await AA	STA01B await TCONcnf	STA01C idle TC con	STA01D await CDO	STA02A await AC	STA02B await OA	STA08 await SCONrsp	STA15D wait after PR-AB	STA16 await TDISind
AC	//	STA01A	//	TDISreq STA01		SCONcnf+ [5][11] STA713 [6]			STA15D	STA16
CDO	//		//	TDISreq STA01	¬p202 [50] STA01D p202 SCONind STA08				STA15D	
CN	//	TDISreq [3] STA01	//	¬p01&¬p76&p204 OA [50] STA01D ¬p01&¬p76&¬p204 SCONind STA08 ¬p01&p76&¬p02 RF-nr [4] STA16 ¬p01&p76&p02 RF-r STA01C p01 TDISreq STA01						TDISreq [3] STA01
OA	//		//	TDISreq STA01			CDO [51] STA02A		STA15D	
RF-nr	//	STA01A	//	TDISreq STA01		SCONcnf- TDISreq STA01	SCONcnf- TDISreq STA01			STA16
RF-r	//	STA01A	//	TDISreq STA01		¬p02 SCONcnf- TDISreq STA01 p02 SCONcnf- STA01C	¬p02 SCONcnf- TDISreq STA01 p02 SCONcnf- STA01C			STA16
SCONreq	TCONreq [2] STA01B			p01&p204 CN STA02B p01&¬p204 CN STA02A						
SCONrsp+								AC [5][11] STA713	STA15D	
SCONrsp-								¬p02 RF-nr [4] STA16 p02 RF-r STA01C	[4] STA16	
TCONcnf	//	//	p204 CN STA02B ¬p204 CN STA02A	//	//	//	//	//	//	//
TCONind	TCONrsp [1] STA01C	//	//	//	//	//	//	//	//	//

Table 55 — Data transfer state table without the symmetric synchronize functional unit

State / Event	STA01A await AA	STA01C idle TC con	STA01D await CDO	STA02A await AC	STA03 await DN	STA04A await PR or MAA	STA04B await PR or AEA	STA05A await PR or RA	STA05B await PR or AIA
DT	STA01A	TDISreq STA01	TDISreq STA01		p05&p10 SDTind STA03	p05 SDTind STA04A	p05 SDTind STA04B	p05&p185 STA05A p05&¬p185 SDTind STA05A	p05 STA05B
EX	STA01A	TDISreq STA01	TDISreq STA01	[10] STA02A	p09 SEXind STA03	p08 SEXind STA04A	p08 SEXind STA04B	p08&p185 STA05A p08&¬p185 SEXind STA05A	p08 STA05B
TD	STA01A	TDISreq STA01	TDISreq STA01		p06&p10 STDind STA03	p06 STDind STA04A	p06 STDind STA04B	p06&p185 STA05A p06&¬p185 STDind STA05A	p06 STA05B
SDTreq									
SEXreq									
STDreq									

Table 55 *(continued)*

State / Event	STA05C await PR or ADA	STA06 await RS after coll	STA09 await SRELrsp	STA10A await SSYNMrsp	STA10B await SACTErsp	STA11A await SRSYNrsp	STA15A wait after PR-MAA	STA15B wait after PR-RS
DT	p05 STA05C	p05&p185 STA06 p05&¬p185 SDTind STA06				p05&¬p185 SDTind STA11A	p05 SDTind STA15A	p05&p185 STA15B p05&¬p185 SDTind STA15B
EX	p08 STA05C	p08 [10] STA06				p08&¬p185 SEXind STA11A	p08 [10] STA15A	
TD	p06 STA05C	p06&p185 STA06 p06&¬p185 STDind STA06					p06 STDind STA15A	p06&p185 STA15B p06&¬p185 STDind STA15B
SDTreq			p04 DT STA09	p03 DT STA10A	p03 DT STA10B			p03 STA15B
SEXreq			p09 EX STA09	p08 EX STA10A	p08 EX STA10B			p08 STA15B
STDreq			p07 TD STA09	p06 TD STA10A	p06 TD STA10B			p06 STA15B

Table 55 *(concluded)*

State / Event	STA15C wait after PR-RA	STA15D wait after PR-AB	STA16 await TDISind	STA18 await GTA	STA19 await recovery(init)	STA20 await recovery	STA21 await CDA	STA713 data transfer
DT	p05&p185 STA15C p05&¬p185 SDTind STA15C	STA15D	STA16	p70 SDTind STA18	STA19	p05 STA20	p70 SDTind STA21	p05 SDTind STA713
EX	p08 [10] STA15C		STA16	p08 SEXind STA18	p08 STA19	p08 STA20	p08 SEXind STA21	p08 SEXind STA713
TD	p06&p185 STA15C p06&¬p185 STDind STA15C	STA15D	STA16	p06 STDind STA18	p06 STA19	p06 STA20	p06 STDind STA21	p06 STDind STA713
SDTreq		STA15D		p70 DT STA18				p03 DT STA713
SEXreq		STA15D		p08 EX STA18				p08 EX STA713
STDreq		STA15D		p06 TD STA18				p06 TD STA713

Table 56 — Synchronization state table without the symmetric synchronize functional unit

State / Event	STA01A await AA	STA01C idle TC con	STA01D await CDO	STA04A await PR or MAA	STA04B await PR or AEA	STA05A await PR or RA	STA05B await PR or AIA	STA05C await PR or ADA	STA06 await RS after coll
MAA/AEA	STA01A	TDISreq STA01	TDISreq STA01	p16&p20 SSYNMcnf [14][22] STA713	p16&p20 SACTEcnf [14][22] STA713	[43] STA05A	[43] STA05B	[43] STA05C	[43] STA06
MAP	STA01A	TDISreq STA01	TDISreq STA01			p12&p185 STA05A p12&¬p178&¬p185 SSYNMind [23] STA05A			p12&p185 STA06 p12&¬p178&¬p185 SSYNMind [23] STA06
PR-MAA	STA01A	TDISreq STA01	TDISreq STA01	STA15A	STA15A	STA05A	STA05B	STA05C	
SSYNMreq									
SSYNMrsp									

Table 56 *(concluded)*

State / Event	STA10A await SSYNMrsp	STA15A wait after PR-MAA	STA15B wait after PR-RS	STA15C wait after PR-RA	STA15D wait after PR-AB	STA16 await TDISind	STA19 await recovery(init)	STA20 await recovery	STA713 data transfer
MAA/AEA		p20&¬p23 SSYNMcnf [14][22] STA713 [6] p20&p23 SACTEcnf [14][22] STA713 [6]	[43] STA15B	[43] STA15C	STA15D	STA16		p20 STA20	
MAP			p12 STA15B	p12&p185 STA15C p12&¬p178&¬p185 SSYNMind [23] STA15C	STA15D	STA16	p12&p19 [31] STA19	p12&p19 [31] STA20	p12&p19 SSYNMind [13][31] STA10A
PR-MAA						STA16			
SSYNMreq			p13 STA15B		STA15D				p13 MAP [13][24] STA04A
SSYNMrsp	PR-MAA(1) MAA [14][22] STA713		STA15B		STA15D				