ISO/IEC JTC 1/SC 32 N 1991

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REPLACES: —

ISO/IEC JTC 1/SC 32

Data Management and Interchange

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DOCUMENT TYPE	Summary of Voting/Table of Replies
TITLE	Summary of Voting on 32N1941 FCD2 13249-7 Information technology - Database languages - SQL Multimedia and Application Packages - Part 7: History
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PROJECT NUMBER	1.32.04.03.07.00
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ISO/IEC JTC 1/SC 32 N1991

Summary of Voting on Document SC 32 N 1941

Title: FCD2 13249-7 Information technology - Database languages - SQL Multimedia and Application Packages - Part 7: History

Project: 1.32.04.03.07.00

"P" Member	Approval	Approval with Comments	Disapproval with Comments	Abstention with Comments
Canada			1	
China	1			
Czech Republic	1			
Egypt				
Finland				1
Germany				1
India				
Japan		1		
Korea, Republic of	1			
Sweden				
Russian Federation				
Portugal				
United Kingdom			1	
United States			1	
Total "P"	**3**	**1**	**3**	**2**
"O" Member				
Austria				
Belgium				
France				
Ghana				
Hungary				
Indonesia				
Italy				
Kazakhstan				
Netherlands, The				
Norway				
Romania				
Switzerland				
Total "O"				

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COMMENTS:

Canada
NO. See comments below:

Finland
Abstain. Lack of expertise:

Germany
Abstain. Lack of expertise:

Japan
YES. See comments below:

UK
NO. See comments below:

US
NO. See comments below:

ISO
See comments below:

National Body CAN Comments — 2010-03-20
for SQL/MM Part 7: History

SEQ #	Cmnt ID	See Also	Severity	Reference	Description	Addressed By
ISO/IEC FCD 13249-7 SQL/MM-Part 7: History						
	CAN-P07-001		1-Major Technical	*P07-No specific location*	Canada votes NO on the second FCD of SQL/MM Part 7 – History. Canada has found many Major Technical items which we believe are serious flaws in the FCD that we insist need to be fixed before we would change our vote from No. Note that some of these flaws were identified in the previous CD and FCD documents and caused Canada to vote no on progression to second FCD. These problems include: a) restrictions on the applicability of the specification since it makes several assumptions that we believe will severely limits its market success e.g. the tracked table must have a primary key, no schema changes are permitted, etc. b) lack of a complete specification which makes the specification inadequate for standardization e.g. no clear description of the impact of SQL isolation level, c) no clear description of the impact of SQL privileges on the defined methods, functions and procedures. d) several technical problems including defining the begin and end history attributes on a TIMESTAMP that use a default precision of seconds. **Solution** No solution provided.	
	CAN-P07-002		1-Major Technical	*P07-01, Scope*	The Scope includes the following restrictions: The scope of this part is limited to support for history when there is no changes to the definition of the tracked columns of a tracked table. The following operations are not supported in this standard. - DROP COLUMN operation to a tracked column of a tracked table. - ALTER COLUMN operation to a tracked column of a tracked table. The scope of this part is limited to support for history when a tracked table has primary key columns.	

SEQ #	Cmnt ID	See Also	Severity	Reference	Description	Addressed By
					Canada maintains its previous position that this specification MUST NOT be approved until these restrictions are removed since this restrictsthe applicability of the specification to too small a domain of SQL databases. **Solution** No solution provided with comment.	
	CAN-P07-003		1-Major Technical	*P07-01, Scope*	The Scope includes the following restrictions: The scope of this part is limited to support for history when there is no changes to the definition of the tracked columns of a tracked table. The following operations are not supported in this standard. - DROP COLUMN operation to a tracked column of a tracked table. - ALTER COLUMN operation to a tracked column of a tracked table. The scope of this part is limited to support for history when a tracked table has primary key columns. There are some ALTER COLUMN operations which could be permitted on tracked columns. For example, permissible data type changes to tracked columns should not be out of scope. **Solution** No solution provided with comment.	
	CAN-P07-004		2-Minor Technical	*P07-01, Scope*	The Scope includes the following restriction: The scope of this part is limited to support for history when a tracked table has primary key columns. Primary key constraints in ISO 9075 are unique constraints that specify PRIMARY KEY. We believe that history is limited to those tables that have at least one unique constraint. If this comment is accepted then the 9075-1 definition of “unique constraint” needs to be added. **Solution** Replace this text with the following: The scope of this part is limited to support for history when a tracked table has at least one unique constraint. Note to Editor: There are many uses of the term “primary key” in SQL/History that will have to change if this comment is accepted.	

SEQ #	Cmnt ID	See Also	Severity	Reference	Description	Addressed By
	CAN-P07-005		2-Minor Technical	*P07-01, Scope*	The Scope includes the following restriction: The scope of this part is limited to support for history when a tracked table has primary key columns. This scope limitation is not sufficient since it needs to handle the case where the unique constraint (aka primary key) is dropped and then re-created with an ALTER TABLE. . **Solution** Replace this text with the following: The scope of this part is limited to support for history when a tracked table has at least one unique constraint that is not modified by any ALTER TABLE statements.	
	CAN-P07-006		4-Minor Editorial	*P07-01, Scope*	The Scope includes the following restrictions: The scope of this part is limited to support for history when there is no changes to the definition of the tracked columns of a tracked table. **Solution** Replace this text with the following: The scope of this part is limited to support for history when there **are** no changes to the definition of the tracked columns of a tracked table.	
	CAN-P07-007		2-Minor Technical	*P07-03.01.01, Definitions take from ISO/IEC 9075-1*	Canada previously pointed that several terms/concepts like “atomic” taken from ISO 9075 needed to be added to SQL/History in our comment CAN-P07-004 on FCD1. We originally requested “Ensure that all terms defined in other standards are actually referenced in this specification.” Canada believes that this still has not been done. For example the following terms/concepts still need to be added: “row”, “table”, “unique constraint”, “information schema”, “user-defined type”, etc. The Editor should be tasked with doing a careful sweep of the SQL/MM History document to find all terms and concepts defined in ISO/IEC 9075. **Solution** No solution provided.	

SEQ #	Cmnt ID	See Also	Severity	Reference	Description	Addressed By
	CAN-P07-008		1-Major Technical	*P07-04.01.02, Concept of Transaction Time*	This specification does not provide any information about the possible impact of the SQL-transaction's isolation level on the history tables. In particular it is not obvious whether this specification works for lower isolation levels than SERIALIZABLE. During the previous FCD, the Canadian comment CAN-P07-015 was rejected with rationale given in LCY-023R1: 8) SEQ#28, CAN-P07-015, 1-Major Technical Part 7:History is specified as application package using SQL, (that is upper layer of SQL) as well as the other parts of SQL/MM (ISO/IEC 13249). Therefore, the SQL-transaction's isolation level behaves according to the specification of SQL. Although the history tables can not be directly reffered by any users, a history table created from a tracked table is the persistent base table of SQL as well as a tracked table. In Part 7:History, the specifiable values for the isolation level are not necessarily restricted as well as the other parts of SQL/MM. Consequently, the particular descriptions for the isolation level are no need for Part 7:History as well as the other parts of SQL/MM. Canada maintains its position that SQL/MM History will only be guaranteed to work correctly without usage of the isolation level of SERIALIZABLE. For example, consider the case where there are two transactions T1 and T2 updating the same tracked column value in the same row in the same base table. If these two transactions are run at an isolation level other than SERIALIABLE then their "transaction timestamp" might not be in right time order and might not be monotonically increasing (see USA-P07-002 on FCD1). For example, T1 might make its changes before T2 and T2 might be able to see the T1 change and T1 might choose a "transaction timestamp" that is after the T2 "transaction timestamp" since T1 and T2 overlap in real time. This would result in a history table that does not contain history rows that reflect the correct periods. This problem might be avoided by only permitting the isolation level to SERIALIZABLE. **Solution** Add the following to the SQL/MM Scope clause:	

SEQ #	Cmnt ID	See Also	Severity	Reference	Description	Addressed By
					The scope of this part is limited to support for history when only SERIALIZABLE transactions are permitted.	
	CAN-P07-009		2-Minor Technical	*P07-04.01.04, Operations on time periods*	This section enumerates the methods provided and describes only some of these functions. For example the following methods are NOT described in this section: HS_MonthInterval, HS_DayInterval, HS_Intersects, HS_Union, HS_Except. All of the methods provided should be described in this section. NOTE: This comment (CAN-P07-023) was marked as NOT resolved in disposition of comments for FCD1 (SC32 N1942). **Solution** No solution provided with comment.	
	CAN-P07-010		3-Major Editorial	*P07-04.01.05, Concept of Period Normalization*	This section describes “period normalization” with an example that involves two tracked columns and a “normalization” operation that looks at the changes to only one of the tracked columns. The section should also include an example to show that normalization operation can be applied generally to the case where there are N tracked columns and the normalization occurs for any number of columns that is less than N. NOTE: This comment (CAN-P07-025) was marked as NOT resolved in disposition of comments for FCD1 (SC32 N1942). **Solution** No solution provided with comment.	
	CAN-P07-011		3-Major Editorial	*P07-04.01.05, Concept of Period Normalization*	This section includes an example which provides a table of values entitled “History Table of Tracked Table TT”. This example should be related back to the example in Section 4.1.1 so that it is obvious to the reader that the ID column is meant to represent the primary key of the tracked table. NOTE: This comment (CAN-P07-026) was marked as NOT resolved in disposition of comments for FCD1 (SC32 N1942). **Solution** No solution provided with comment.	
	CAN-P07-012		3-Major Editorial	*P07-04.01.05, Concept of Period Normalization*	This section includes an example which provides a table of values entitled “History Table of Tracked Table TT”. This example should be expanded to be more realistic so that there are history rows for more than one primary key table from the tracked table. Then the example could show the collection of the	

SEQ #	Cmnt ID	See Also	Severity	Reference	Description	Addressed By
					history rows into sets for each primary key value since this is an important part of the period normalization process. NOTE: This comment (CAN-P07-027) was marked as NOT resolved in disposition of comments for FCD1 (SC32 N1942). **Solution** No solution provided with comment.	
	CAN-P07-013		4-Minor Editorial	*P07-04.01.05, Concept of Period Normalization*	This section contains the following text: Period normalization of selected columns of a history table is an operation that dervies a single history row from makes one or more history rows. **Solution** Replace with the following text: Period normalization of selected columns of a history table is an operation that derives a single history row from one or more history rows.	
	CAN-P07-014		1-Major Technical	*P07-04.01.05, Concept of Period Normalization*	This section contains the following text: In each such set of history rows, the values of the selected columns are identical from the begin time of the oldest history row in the set to the end time of the latest history row in the set. This text uses the definition of “identical” from ISO 9075-2 as per the definition in Section 3.1.2 “Definitions taken from ISO/IEC 9075-2”. In ISO/IEC 9075-2 Section 9.8 “Determination of identical values” is used to implement the definition of “identical”. This section treats two NULL values as being identical. But the SQL specification in the procedure HS_CreatePNormalizeMethod in Section 5.1.9 uses the <distinct predicate> to implement the test of “identical” values for period normalization. But the <distinct predicate> does NOT treat two NULL values as being identical! We believe a check might need to be performed in the HS_CreatePNormalizeMethod procedure to evaluate the state of ‘identical’ if the tracked column values being compared are NULL prior to the NOT DISTINCT specification. **Solution**	

SEQ #	Cmnt ID	See Also	Severity	Reference	Description	Addressed By
					None provided with comment.	
	CAN-P07-015		1-Major Technical	*P07-05.01.01, HS_CreateHistory Procedure*	The *HS_CreateHistory* procedure does not appear to check that the authorization identifier being used has the appropriate privileges on the history table columns that are being tracked. NOTE: This FCD1 comment (CAN-P07-043) was marked as being "Addressed By" LCY-019 in the disposition of comments for FCD1 (SC32 N1942) BUT LCY-019 was not adopted by the editing meeting and none of the changes proposed by LCY-019 have been made. We believe that this comment is still open and unresolved. **Solution** No solution provided with comment.	
	CAN-P07-016		1-Major Technical	*P07-05.01.01, HS_CreateHistory Procedure*	It is not clear what would happen if the privileges on the history table columns that are being tracked that are required to successfully execute the *HS_CreateHistory* procedure are subsequently revoked. The specification must handle this situation by clearly specifying what privileges are required and what happens to the history table if those privileges are ever revoked during the life of the history table. NOTE: This FCD1 comment (CAN-P07-044) was marked as being "Addressed By" LCY-019 in the disposition of comments for FCD1 (SC32 N1942) BUT LCY-019 was not adopted by the editing meeting and none of the changes proposed by LCY-019 have been made. We believe that this comment is still open and unresolved. **Solution** No solution provided with comment.	
	CAN-P07-017		1-Major Technical	*P07-05.01.01, HS_CreateHistory Procedure*	It is not clear what would happen if the privileges on the history table columns that are being tracked that are required to successfully execute the *HS_CreateHistory* procedure are not the same as the privileges of the <user identifier> that is in effect for other operations that act on the history table. For example, what happens if a <user identifier> that does not have SELECT privilege on one of the tracked columns attempts to execute the HS_PNormalize method on that column? Don't the privileges on the tracked columns need be mimicked in the history table? NOTE: This FCD1 comment (CAN-P07-045) was marked as being "Addressed By" LCY-019 in the disposition of comments for FCD1 (SC32 N1942) BUT	

SEQ #	Cmnt ID	See Also	Severity	Reference	Description	Addressed By
					LCY-019 was not adopted by the editing meeting and none of the changes proposed by LCY-019 have been made. We believe that this comment is still open and unresolved. **Solution** No solution provided with comment.	
	CAN-P07-018		3-Major Editorial	*P07-03.01.05.05, period*	The period definition states: **3.1.5.5** **period** a duration of time with a begin time and an end time NOTE 1 In this standard a period includes the begin time but not the end time. The NOTE should refer to a period value. **Solution** Change the NOTE the following: NOTE 1 In this standard a period value is a half-open duration that includes the begin time but not the end time.	
	CAN-P07-019		1-Major Technical	*P07-03.01.05.08, tracked column*	The “tracked column definition states: **3.1.5.8** **tracked column** a column of a tracked table for which changes are to be recorded NOTE 2 the tracked columns of a tracked table must include the primary key of that table.. Other parts of this specification contradict the statement that the set of tracked columns include the columns of the primary key of the table. For example, the SQL specification in Section 5.1.2 HS_CreateHistoryErrorCheck Procedure specifically checks that the tracked columns are NOT part of the primary key. If NOTE2 is meant to be correct then other places that reference the tracked columns to NOT include the columns in the primary key must ALL be changed. **Solution** Remove NOTE 2.	
	CAN-P07-020		3-Major Editorial	*P07-03.02.02, Notations provided in Part 7*	This sections states: This part of ISO/IEC 13249 uses the following representation in a figure	

SEQ #	Cmnt ID	See Also	Severity	Reference	Description	Addressed By
					for a table that includes the column of HS_Hist of the structured type, HS_History. | *<column name> of Predefined Type* | *<column name> of Predefined Type* | *HS_Hist (HS_BeginTime, HS_EndTime)* | The text in the first two columns appears to limit the columns to those that have a "predefined type" which a type defined by ISO/IEC 9075-2. This is not correct. **Solution** Remove "of Predefined Type" in column 1 and column 2 of the table.	
	CAN-P07-021		3-Major Editorial	*P07-04.01.01, Tracked Table and History Table*	This section states: A history table consists of the columns corresponding to all tracked columns of the tracked table and a column of a structured type for a period of a history row. This text omits that the primary key columns must be part of the history table. **Solution** Replace the text with: A history table consists of the columns corresponding to all tracked columns of the tracked table, the columns of the primary key and a column of a structured type for a period of a history row.	
	CAN-P07-022		3-Major Editorial	*P07-04.01.01, Tracked Table and History Table*	This section states: In this example, ID is a primary key column of the tracked table TT. In the example, ID is the only primary key column. **Solution** Replace the text with: In this example, ID is the primary key column of the tracked table TT.	
	CAN-P07-023		3-Major Editorial	*P07-04.02 , Structure of History Table*	This section states: A history row is represented by the following type which is automatically generated for every tracked table:	

SEQ #	Cmnt ID	See Also	Severity	Reference	Description	Addressed By
					- The <TableTypeIdentifier> type with the following attributes: - attributes correspond to all tracked columns of the tracked table; - HS_Hist: an HS_History value to store the period which is associated with a history row; This text can be improved to give the kind of type defined, to more clearly enumerate the attributes of the structured type and to avoid referring to the term "value". **Solution** Replace the text with: A history row is represented by the following structured type which is automatically generated for every tracked table: - The <TableTypeIdentifier> structured type with the following attributes: - one attribute for each column of the primary key of the tracked table - one attribute for each tracked column of the tracked table; - an attribute HS_Hist of type HS_History to contain the period which is associated with a history row.	
	CAN-P07-024		2-Minor Technical	*P07-04.05.01.01, Attributes of the HS_History type*	This section states: b) *V*.HS_BeginTime is less than CURRENT_TIMESTAMP. … d) If *V*.HS_EndTime is not null, then *V*.HS_EndTime is strictly greater than *V*.HS_BeginTime but less than or equal to CURRENT_TIMESTAMP. Since CURRENT_TIMESTAMP varies in value it is not clear what these point are trying to say. Should CURRENT_TIMESTAMP here be "transaction timestamp"? But these "constraints" on the values of the attributes of HS_History should be reworded to be independent of variables like CURRENT_TIMESTAMP ie make the constraints invariant. **Solution** No solution provided.	
`	CAN-P07-025		2-Minor Technical	*4.5.2.1 Attributes of the <TableTypeIdent*	This section states: The <TableTypeIdentifier> type is an abstraction for attributes of a	

SEQ #	Cmnt ID	See Also	Severity	Reference	Description	Addressed By
				ifier> type	history row, using the following attributes: - attributes correspond to all tracked columns of a tracked table; - HS_Hist: a HS_History value; This text can be improved to give the kind of type defined, to more clearly enumerate the attributes of the structured type and to avoid referring to the term "value". **Solution** Change the text to the following: The <TableTypeIdentifier>structured type defines the structure of a history row of a tracked table using the following attributes: - one attribute for each column of the primary key of the tracked table - one attribute for each of the tracked column of the tracked table - an attribute HS_His of type HS_History.	
	CAN-P07-026		1-Major Technical	*P07-04.05.02.02, Attributes of the <TableTypeIdentifier> type*	This section states: The type <*TableTypeIdentifier*> provides the following methods for public use This text implies that the methods defined in this section are accessible to all users regardless of whether they have SELECT privilege on the tracked columns of the base table. Since the HS_HistoryTable() method returns the entire history table if any user can execute this method then they would have access to all of the data in the history table even if they did not have the appropriate SELECT privilege on the original data in the table being tracked. This would appear to be a security problem with the design of SQL/MM History and one for which we cannot provide any kind of solution. This problem did not occur in other SQL/MM parts since none of these parts copied SQL-data from the base tables and provided access to this data via SQL functions/methods. Note that this problem is directly related to the comments that Canada and other National Bodies made on FCD1 about the privilege model and that were NOT resolved during FCD1. **Solution** No solution provided.	

SEQ #	Cmnt ID	See Also	Severity	Reference	Description	Addressed By
	CAN-P07-027		1-Major Technical	*P07-05.01.04, HS_CreateHistoryTable Procedure*	In FCD1, this section contained the following Possible Problem: ****Editor's Note 7-163**** Possible Problem: (Described in BWU-017 B.1)a) and B.1)b) While reviewing this paper we looked at the HS_CreateHistoryTable routine and noticed the Definitional Rule 2 which defines access rights the generated history table. We find the use of terms like “everyone”, “anyone”, “others” as being undefined. We believe this DR should be replaced with actual GRANT statements so that it is clear what USERs and/or ROLEs are granted what privileges. In addition the subrules in DR 2 mentions granting access to TRIGGERS which we are not sure how this is done. This Possible Problem was resolved by CJU-023 by simply deleting the quoted Definitional Rules with the following rationale: > Possible Problem noted by Editor's Note 7-163 addresses the problem that it is not clear which users and/or roles are granted what privileges for a history table. However, no access rights for a history table is needed because history table is virtualized and it can only be accessed by using methods. By resolving Possible Problem 7-163, ballot comment SEQ#67 is also resolved. As indicated in other Canadian comments we believe that permitting the history table to be accessed “by using methods” still leaves a security problem with the design of SQL/MM History. It is possible that regardless of whether the history table is virtual, it might have been more appropriate for the virtual history table to have the same SELECT privileges of the tracked columns of the underlying tracked table so these privileges could be checked at runtime when access was permitted “by using methods”. The SQL SELECT privilege gives a user access to the current SQL-data in a table (or a subset of the columns of the table). So if SQL/MM History only tracks the current SELECT privilege of the tracked columsn then it is possible that a user will be able to access data in the past that existed when they did NOT have SELECT privilege on the tracked columns. To further complicate matter if the tracked table is created with the	

SEQ #	Cmnt ID	See Also	Severity	Reference	Description	Addressed By
					SELECT privileges that exist at creation time, then it is possible that the SELECT privilege for a user or role might be revoked and if this action is not considered by SQL/MM History then access might be permitted to SQL-data that is not currently available on the base table. Note that this problem has NEVER in other SQL/MM parts since those parts do not actually copy SQL-data and provided subsequent access to that data. **Solution** No solution provided with comment.	
	CAN-P07-028		1-Major Technical	*P07-05.01.05, HS_CreateUpdateTrigger Procedure*	The *HS_CreateUpdateTrigger* procedure does not appear to handle the case where the update operation changes the values of one or more of columns in the primary key. It seems to only check if the update operation impacts the tracked columns. The specification must clearly state how the history table handles changes to the primary key column values. NOTE: This FCD1 comment (CAN-P07-047) was marked as NOT resolved in disposition of comments for FCD1 (SC32 N1942). **Solution** No solution provided with comment.	
	CAN-P07-029		1-Major Technical	*P07-05.01.08, HS_CreatePNormalizeMethod Procedure*	The *HS_CreatePNormalizeMethod* procedure appears to assume no changes in the primary key values for the set of history tables rows being processed. How does this operation handle the case where an update to the tracked table involves changes to the columns that make up the primary key? NOTE: This FCD1 comment (CAN-P07-049) was marked as NOT resolved in disposition of comments for FCD1 (SC32 N1942). **Solution** No solution provided with comment.	
	CAN-P07-030		3-Major Editorial	*P07-05.05, Schema for <TableTypeIdentifier> Type*	The title for this section includes the text “<TableTypeIdentifier> type”. Several places in this section use only the term “<TableTypeIdentifier>” without the term “type” after it: **Purpose** Specify the schema which <*TableTypeIdentifier*> is created in.	

SEQ #	Cmnt ID	See Also	Severity	Reference	Description	Addressed By
					. **Solution** Change the Purpose as follows: **Purpose** Specify the schema in which <*TableTypeIdentifier*> type is created.	
	CAN-P07-031		3-Major Editorial	*P07-05.05, Schema for <TableTypeIdentifier> Type*	The first Definitional rule is unclear since it is referring to two schemas and it is not clear in some cases what schema is being referred to. Note the following changes add a variable “schema S” to the text. This variable might also be useful in other DR and the Description in this section. . **Solution** Change the DR as follows: 1) For each schema that includes a tracked table, a schema S is provided in order to create the <*TableTypeIdentifier*> type. The schema Sis created before an invocation of *HS_CreateHistory* procedure or is effectively created on an execution of *HS_CreateHistory*. NOTE 5 – Objects other than the <*TableTypeIdentifier*> *type* and its methods, such as a history table and triggers, may also be created in schema S. However, this part of ISO/IEC13249 requires only <*TableTypeIdentifier*> type and its methods for the conformance. NOTE 6 – Schema S may or may not be identical to the schema that includes the tracked table whose history is being defined.	
	CAN-P07-032		3-Major Editorial	*P07-05.05, Schema for <TableTypeIdentifier> Type*	Definitional Rules 2) thru 4) are unclear since they appear to be based on <TableName> which is undefined in this section. Does <TableName> come from the tracked table? . **Solution** No solution provided.	
	CAN-P07-033		2-Minor Technical	*P07-05.05, Schema for <TableTypeIdentifier> Type*	Description 1) in this section in FCD 1 stated: 1) The <schema name> of <*CatalogName*> . <*SchemaName*>, together with the schema which includes routines and types predefined by ISO/IEC 13249, is contained in the	

SEQ #	Cmnt ID	See Also	Severity	Reference	Description	Addressed By
					implementation-defined <schema name list> of the SQL-path of an SQL-client module, an SQL-server module, schema definition, or SQL-session. Canada's previous comment CAN-P07-039 on FCD1 asked: It is unclear what "schema definition" refers to in this Description. Is it meant to refer to "<schema definition>" from ISO 9075-2? CAN-P07-039 on FCD1 was resolved by LCY-020 by removing the word "definition". We think this was an error and that the phrase "schema definition" should have been changed to the BNF term <schema definition> since a <schema definition> in ISO 9075-2 can indeed have a <schema path specification> **Solution** Undo the LCY-020 change for CAN-P07-039 on FC1 and change "schema definition" to "<schema definition>.	

	CAN-P07-034		1-Major Technical	*P07-06.01.01, HS_History Type*	This section defines the HS_History type as follows:
					
					`CREATE TYPE HS_History`
					`AS (`
					`  HS_BeginTime TIMESTAMP,`
					`  HS_EndTime TIMESTAMP`
					`)`
					…
					
					This CREATE TYPE defines both the HS_BeginTime and HS_EndTime attributes with a <timestamp precision> of zero since the value is omitted as permitted for a <datetime type>. This means that all HS_BeginTime and HS_EndTimes resolve to the second level since there are no fractional second values stored.
					
					If a series of changes to a row with a particular primary key value in the tracked table are all made within the same second of time then it is possible that the begin time and end time for multiple rows in the history table will all have the same TIMESTAMP value. This appears to be a serious problem since several of the procedures in this specification assume that the HS_BeginTime and the HS_EndTime attributes within a row or across rows do NOT have the same value.
					
					We believe that the definition of this type must be changed to use the	

SEQ #	Cmnt ID	See Also	Severity	Reference	Description	Addressed By
					"TIMESTAMP(P)" syntax permitted <datetime type> to define the <timestamp precision> value of P. In addition P must be large enough to guarantee that all HS_BeginTime and HS_EndTimes are different! In fact the procedures in this specification that add rows to the history table should be changed to ensure that it is NOT possible to create history rows whose HS_BeginTime and HS_EndTimes are NOT different. In addition there are other functions or methods that return accept or return a TIMESTAMP value without <timestamp precision>. The usage of "TIMESTAMP(P)" must be consistent throughout this specification. NOTE: This FCD1 comment (CAN-P07-057) was marked as NOT fully resolved in disposition of comments for FCD1 (SC32 N1942). **Solution** No solution provided with comment.	
	CAN-P07-035		1-Major Technical	*P07-No specific location*	Several ballot comments on the previous FCD from other National Bodies were not resolved. All NB comments not resolved during processing of the previous FCD should be carried forward for processing including at least: a) USA-P07-008 on the lack of an algorithm to compute transacation timestamp. b) JPN-P07-004 on the need to consider if the rate of transactions exceeds the precision of transacation timestamp values. In the future, Canada recommends that such unresolved ballot comments should be included directly in subsequent based documents possibly as Possible Problems to ensure that unresolved comments are not lost between document cycles is done by SC32 WG3 for all parts of ISO/IEC 9075. **Solution** No solution provided with comment.	
	CAN-P07-036		1-Major Technical		Defining the semantics using "generated SQL" statements is verydifficult especially when the SQL fragments contain few if no comments. The SQL code is being used as a specification and additional comments are needed. NOTE: This FCD1 comment (CAN-P07-059) was marked as NOT resolved in disposition of comments for FCD1 (SC32 N1942).	

SEQ #	Cmnt ID	See Also	Severity	Reference	Description	Addressed By
					Solution No solution provided with comment.	
	CAN-P07-037		1-Major Technical	*P07-No specific location*	All Possible Problems and Editor's Notes must be satisfactorily resolved and all problems discovered during the course of the ballot resolution process must be satisfactorily resolved. **Solution** No solution provided with comment.	

Japan Comments on SC32 N 1941: ISO/IEC FCD2 13249-7

SEQ #	Cmnt ID	See Also	Severity	Reference	Description	Addressed By
SQL/MM Part 7: History						
1	JPN-P07-001		4- Minor Editorial	*P07-03.01.07, Definitions provided in Part 7*	The numbering from clause 3.1.5.1 to clause 3.1.5.11 is incorrect. **Solution** Change the numbering from clause 3.1.5.1 to clause 3.1.5.11 to from clause 3.1.7.1 to clause 3.1.7.11.	
2	JPN-P07-002		4- Minor Editorial	*P07-03.01.05.01, contiguous periods*	In the term definition of contiguous periods, it should be better to define the precise relation between the begin time of the i-th period and the begin time of the (i-1)-th period. **Solution** Change 'the begin time of the i-th period is equal to the end time of the (i-1)-th period' to 'the begin time of the i-th period is greater than the begin time of the (i-1)-th period and is equal to the end time of the (i-1)-th period'.	

End of Paper

Template for comments and secretariat observations

Date:	Document:

1	2	(3)	4	5	(6)	(7)
MB[1]	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph/ Figure/Table/ Note** (e.g. Table 1)	**Type of com-ment**[2]	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
GB	4.1.1	Paragraph 3	ed	In the paragraph: "In this example, ID is a primary key column of the tracked table TT. Column A and Column B are tracked columns of the tracked table TT.", column ID needs to be included in the second sentence as a tracked column.	Replace by: "In this example, ID is a primary key column of the tracked table TT. Column ID, Column A and Column B are tracked columns of the tracked table TT.",	
GB	4.1.2		te	The concept of a transaction timestamp is now included in FCD 9075-2. This subclause should either be replaced by a reference to the SQL concept or there should be an explanation of how the History version differs from the SQL version.		
GB	4.1.3	Paragraph 2	ed	... all rows in the tracked table is ...	Change to: ... all rows in the tracked table are ...	
GB	4.1.4		ed	For the operation Overlaps, there should be a note to explain that it includes the possibility of either X or Y containing the other, which is not shown on the diagram.		
GB	4.1.4		te	The operations Meets should be commutative; that is, if X Meets Y, then Y Meets X. However, the definition does not reflect this.	X Meets Y is: - true if and only if e1 = b2 is true or e2 = b1 is true;	
GB	4.1.4		te	This subclause should include operations involving a period and a time.		
GB	4.1.5	Paragraph 2	ed	"In the sub-section, we consider the case where a history table has two tracked columns." Make it clear that this is just a motivating example, and that the two tracked columns do not include the primary key.	Replace the sentence by: "As an example, consider the case where a history table has two tracked columns in addition to the primary key."	
Gb	4.1.5	Paragraph 3	ed	In the second sentence, the length of the periods is not of interest, just the periods.	Delete "length of the "	
GB	4.1.5		ed	In this subclause there needs to be clearer separation of the example and the general concept.	Move the general concepts to follow the example tables.	
GB	4.1.5	Paragraph 5	ed	"Period normalization of selected columns of a history table is an operation that dervies a single history row from makes one or more history rows." Contains a spelling mistake and erroneous 'makes'.	Replace by: "Period normalization of selected columns of a history table is an operation that derives a single history row from one or more history rows."	
GB	4.5.1.1		te	“b) V.HS_BeginTime is less than the CURRENT_TIMESTAMP.” It is possible that the begin-time could be equal to		

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NOTE Columns 1, 2, 4, 5 are compulsory.

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				CURRENT_TIMESTAMP.		
GB	4.5.1.1		te	"d) If *V*.HS_EndTime is not null, then *V*.HS_EndTime is strictly greater than *V*.HS_BeginTime but less than or equal to CURRENT_TIMESTAMP. In this case *V* represents a period extending from *V*.HS_BeginTime (inclusive) through *V*.HS_EndTime (exclusive)." All TIMESTAMP values have a granularity, so it is possible that an end-time is not greater than a begin-time.		
GB	4.5.1.1.2		ed	The first HS_Overlaps includes the description: "Test whether the period of an HS_History value overlaps with the specified period;". However, no period is specified, but two time values. This is just the first of several occurrences of this problem.	Replace the description by: "Test whether the period of an HS_History value overlaps with the period determined by the start time given by the first argument and the end time given by the second argument;"	
GB	4.5.1.1.2		te	The first HS_Meets includes the description: "Test whether the period of an HS_History value meets the specified period;". However, no period is specified, but a single time. The concept of a period meeting a time has not been explained. There are several other occurrences of a single time argument being referred to as a period.		
GB	4.5.2.2		te	The parameters of the returned tables have separate primary key definitions and tracked column definitions, whereas it is specified that primary key columns are included in tracked columns. This is just the first of many occurrences of this problem.		
GB	5.3.9	Definition and Description	te	The Definition references the Description as follows: “-- !! See Description” but the Description does not provide any additional information.		
GB	6.1.4		te	The definitions of the methods should be commutative (see 4.1.4 comment)		
GB	9	F16 and F22	te	Empty periods are defined as exception conditions, however empty periods would be possible in some situations.		

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Template for comments and secretariat observations

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GB	10.1			"4) All of methods of HS_History type .....".	Delete first 'of'	
GB	general		te	All problems identified during processing of ballot comments must be resolved.		

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USA comments on FCD 13249-7

FCD SQL/MM History						
	USA-P07-001		1-Major Technical	*P07-No specific location*	Even if the approach described in the SQL/MM History draft were a valid approach to the issue of capturing historical data changes, it is not the only approach, and is not the best approach. Most of the decision points in this area are specific to individual applications, so it is inappropriate to codify one approach. We think that such work should be done within the context of the SQL standard itself. **Solution** None provided with comment.	
	USA-P07-002		1-Major Technical	*P07-No specific location*	While a number of the topic areas addressed by SQL/MM History are potentially useful, for details to work well, they need to be integrated into SQL/Foundation. Because of the well-known limitations of the technical approach adopted by this document, we have serious doubts about its market-place success. **Solution** None provided with comment.	
	USA-P07-003		1-Major Technical	*P07-No specific location*	Numerous grammatical errors still remain throughout the document resulting in significant technical ambiguities. **Solution** None provided with comment.	
	USA-P07-004		1-Major Technical	*P07-No specific location*	The specification of SQL/MM History could be dramatically simplified if it makes use of the system-versioned tables feature found in the ISO/IEC FCD 9075-2 (SQL/Foundation). In particular, the SQL/MM History specification needs to make sure that it works well in the future when SQL-implementations start supporting system-versioned tables. **Solution** None provided with comment.	
	USA-P07-005		1-Major Technical	*P07-No specific location*	All Possible Problems and Editor's Notes must be satisfactorily resolved and all problems discovered during the course of the ballot resolution process must be satisfactorily resolved. **Solution** None provided with comment.	

Template for comments and secretariat observations

Date: 2010-05-03	Document: **ISO/FCD 13249-7**

1	2	(3)	4	5	(6)	(7)
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**	Introduction		ed	First paragraph uses "this International Standard", second paragraph uses "this document".	Replace "this International Standard" with "ISO/IEC 13249" and "this document" with "ISO/IEC 13249" or "this part of ISO/IEC 13249", as appropriate.	
**	Page 1		ed	Unnecessary capitalization in document title.	Replace "SQL Multimedia and Application Packages" with "SQL multimedia and application packages".	
**	Clause 1		ed	The scope shall consist of a series of statements of fact describing the content of the document from Clause 4 onwards. Commentary about the technical content shall be given in the introduction.	Redraft the scope in line with the comment, deleting a) to c) and the commentary following the list.	
**	Clause 2		ed	Outdated introductory paragraph.	Replace with the following: "The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies."	
**	Clause 2		ed	A subclause may not be created unless there is at least one other subclause.	Delete subclause no. 2.1 and title.	
**	2.1		ed	The normative references clause lists only those documents which are cited elsewhere in the document in a way which indicates that the user of ISO/IEC 13249-7 is required to consult them.	Delete ISO/IEC 9075-4 and ISO/IEC 9075-11, which are not cited elsewhere in a normative manner.	
**	Clauses 2-3		ed	Although it might be useful to start technical clauses on a new page, this should not be done for Clauses 2 and 3.	Delete page breaks before Clauses 2 and 3.	
**	Clause 3		ed	Terms and definitions shall be presented in a separate subclause from concepts.	Reorganize Clause 3 as follows: **3 Terms, definitions, concepts, notations and conventions** **3.1 Terms and definitions**	

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					3.1.1 Definitions taken from ISO/IEC 9075-1 For the purposes of this document, the following terms defined in ISO/IEC 9075-1 apply. a) ... **3.1.2 Definitions taken from ISO/IEC 9075-2** For the purposes of this document, the following terms defined in ISO/IEC 9075-2 apply. a) ... **3.1.3 Other definitions** For the purposes of this document, the terms and definitions given in ISO/IEC 13249-1 and the following apply. **3.1.3.1** **.** **.** **.** **3.1.3.11** **3.2 Concepts** **3.2.1 Concepts taken from ISO/IEC 9075-1** For the purposes of this document, the following concepts defined in ISO/IEC 9075-1 apply. a) ... **3.2.2 Concepts taken from ISO/IEC 9075-2** For the purposes of this document, the following concepts defined in ISO/IEC 9075-2 apply. a) ... **3.2.3 Syntactic elements taken from ISO/IEC**	

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					9075-2 For the purposes of this document, the following concepts defined in ISO/IEC 9075-2 apply. a) ... **3.3 Notations** **3.4 Conventions**	

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