Start of System

Client A Server SC=None (Csc=0) last_sync=0 Ssc=None obj=None Obj=None

Client B (Csc=0) last_sync=0 obj=None

Comment

No sync count. No objects.

Csc would appear as zero.

Local Change Server Client A SC=None (Csc=0) last_sync=0 Ssc=None sid=0,ls=0,lc=1 Obj=None

Client B (Csc=0) last sync=0 obj=None

Client A creates an object locally.

Csc would appear unchanged.

Start Upload Phase

Client A Server sid=0,ls=0 SC=1,isC=0 last_sync=0 sid=0,ls=0,lc=1 Obj=None

Client B (Csc=0) last sync=0 obj=None

Session started. Ssc is issued outside of the data transaction.

Csc would appear unchanged.

Server Client A id=1,lS=1 last_sync=0 SC=1.isC=1 Ssc=None sid=1,ls=1,lc=0 id=1,lS=1

Client B (Csc=1) last_sync=0 obj=None

New object will be committed due to provided sid=0. Session is marked committed. List of objects is returned. Csc would appear changed.

Start Download Phase

Client A SC=1,isC=1 last_sync=0 last_sync=0 sid=1,ls=1,lc=0 Ssc=None id=1,lS=1 Client B

(Csc=1) last_sync=0 obj=None

Client A download phase. Client sends last_sync.

Csc would appear unchanged.

Server Client A SC=1,isC=1 Csc=1 last_sync=1 Ssc=None Obj=None sid=1,ls=1,lc=0 id=1, lS=1 Client B

(Csc=1) last_sync=0 obj=None

Server returns objects where lS > last_sync and lastUpdatedBy != clientId

Csc would appear unchanged.

Start Download Phase

Server Client A SC=1,isC=1 (Csc=1) last_sync=1 Ssc=None sid=1,ls=1,lc=0 id=1, \S=1 Client B last_sync=0 last_sync=0 obj=None

Client B download phase. Client sends last_sync.

Csc would appear unchanged.

Server Client A (Csc=1) SC=1,isC=1 last svnc=1 Ssc=None sid=1,ls=1,lc=0 id=1,lS=1

Client B Csc=1 last sync=1 id=1,lS=1 sid=1,ls=1,lc=0 Server returns objects where lS > last sync and lastUpdatedBy != clientId

Csc would appear unchanged.

Local Change

Client A Server (Csc=1) SC=1.isC=1 last_sync=1 sid=1,ls=1,lc=1 Ssc=None id=1,lS=1 Client B (Csc=1) last_sync=1
sid=1,ls=1,lc=0

Client A changes object locally.

Csc would appear unchanged.

Start Upload Phase

Server	<<<	Client A
Server SC=2,isC=0 Ssc=2 id=1.1S=1	sid=1,ls=1	last_sync=1
Ssc=2		sid=1,ls=1,lc=1
id=1.1S=1		

Client B

(Csc=1) last_sync=1 sid=1,ls=1,lc=0 Session started. Ssc is issued outside of the data transaction.

Csc would appear unchanged.

Object committed due to

Server Client A C=2,isC=1 id=1,lS=2 last_sync=1 Ssc=None sid=1,ls=2,lc=0 id=1,1S=2 Client B

(Csc=2)

provided ls >= lS. Session is marked committed. List of objects is returned.

sid=1,ls=1,lc=0 Csc would appear changed.

sid=1,ls=1,lc=1

last sync=1

Local Change

Client A Server SC=2,isC=1 (Csc=2) last sync=1 Ssc=None sid=1,ls=2,lc=0 id=1,lS=2 Client B (Csc=2) last_sync=1

Local change made to previous version of object. Csc would appear unchanged

Start Upload Phase

Client A Server (Csc=2) last sync=1 sid=1,ls=2,lc=0 id=1,lS=2 <<< Client B

Session started. Ssc is issued outside of the data transaction.

sid=1,ls=1 last_sync=1 Csc would appear unchanged sid=1.ls=1.lc=1

Server Client A (Csc=3) SC=3.isC=1 last_sync=1 Ssc=None sid=1,ls=2,lc=0 id=1,lS=2

Object is not committed due to NOT 1s >= 15. Session is marked committed. List of objects is returned, sid #1 with values. Possible notice to user: Csc would appear changed.

Sync returned new versions, some local changes disgarded. Sync before making changes to avoid this.

Client B id=1,lS=2 last_sync=1

Local Change

Client A (Csc=3) SC=3.isC=1 last_sync=1 Ssc=None sid=1,ls=2,lc=0id=1.1S=2 Client B (Csc=3) last_sync=1 sid=1,ls=2,lc=1

Local change made to current version of object.

Csc would appear unchanged.

Start Upload Phase

Server Client A SC=4,isC=0 (Csc=3)last_sync=1 5sc=4 sid=1,ls=2,lc=0 id=1,lS=2 Client B sid=1,ls=2 last_sync=1 sid=1,ls=2,lc=1

Session started. Ssc is issued outside of the data transaction. Csc would appear unchanged.

Client A Server (Csc=4) SC=4,isC=1 last_sync=1 Ssc=None sid=1,ls=2,lc=0 id=1.1S=4 Client B id=1,lS=4 last_sync=1 sid=1,ls=4,lc=0

Object is committed due to provided ls >= lS. Session is marked committed. List of objects is returned. Csc would appear changed.

Start Download Phase

Client A Server SC=4,isC=1 last_sync=1 last_sync=1 sid=1,ls=2,lc=0 id=1, lS=4

Client sends last_sync.

Client B (Csc=4) last svnc=1 sid=1,ls=4,lc=0

Csc would appear unchanged.

Client A download phase.

Server Client A SC=4,isC=1 Csc=4 last sync=4 Ssc=None id=1,lS=4 sid=1,ls=4,lc=0 id=1,lS=4 Client B (Csc=4) last_sync=1 sid=1,ls=4,lc=0

Server returns objects where lS > last sync and lastUpdatedBy != clientId Csc would appear unchanged.

Start of Sys	stem		Comment				
Server	-	Client A	No sync count.				
SC=None Ssc=None Obj=None	(Csc=0)	last_sync=0 obj=None	No objects.				
,	- (Csc=θ)	Client B last_sync=0					
		obj=None	Csc would appear as zero.				
Local Change				Local Change			
Server	-	Client A	Client A creates an object	Server	-	Client A	Client B creates an object
SC=None	(Csc=0)	last sync=0	locally.	SC=None	(Csc=0)	last sync=0	locally.
Ssc=None		sid=0,ls=0,lc=1		Ssc=None		sid=0,ls=0,lc=1	
Obj=None				Obj=None			
	-	Client B			-	Client B	
	(Csc=0)	last_sync=0			(Csc=0)	last_sync=0	
		obj=None	Csc would appear unchanged.			sid=0,ls=0,lc=1	Csc would appear unchanged.
C++ #-1				Stant Halland	04		
<i>Start Upload</i> Server	1 Phase	Client A	Session started.	Start Upload Server	rnase -	Client A	Session started.
SC=1,isC=0	sid=0,ls=0	last_sync=0	Ssc is issued outside of	SC=1,isC=0	(Csc=0)	last sync=0	Ssc is issued outside of
Ssc=1	.,	sid=0,ls=0,lc=1	the data transaction.	SC=2,isC=0		sid=0,ls=0,lc=1	the data transaction.
Obj=None				Ssc=2			
,				Obj=None			
	-	Client B			<<<	Client B	
	(Csc=0)	last_sync=0			sid=0,ls=0	last_sync=0	
		sid=0,ls=0,lc=1	Csc would appear unchanged.			sid=0,ls=0,lc=1	Csc would appear unchanged.
_				-			
Server	>>>	Client A	New object will be committed	Server		Client A	New object will be committed
SC=1,isC=1	id=1,lS=1	last_sync=0	due to provided sid=0.	SC=1,isC=1	(Csc=2)	last_sync=0	due to provided sid=0.
SC=2,isC=0		sid=1,ls=1,lc=0	Session is marked committed.	SC=2,isC=1		sid=1,ls=1,lc=0	Session is marked committed.
Ssc=None		Client B	List of objects is returned.	Ssc=None	>>>	Client B	List of objects is returned.
id=1,lS=1	(Csc=1)	last sync=0		id=1, lS=1 id=2, lS=2		last sync=0	
	(656-1)	sid=0,ls=0,lc=1		10-2, (3-2	10-2, (3-2	sid=2,ls=2,lc=0	
		314-0, (3-0, (C-1	Csc would appear changed.			310-2, (3-2, (0-0	Csc would appear changed.
							J (200 20 20 20 20 20 20 20 20 20 20 20 20
Start Downlo				Start Downloa	nd Phase		
Server	<<<	Client A	Client A download phase.	Server	-	Client A	Client B download phase.
	last_sync=0	last_sync=0	Client sends last_sync.	SC=1,isC=1	(Csc=2)	last_sync=0	Client sends last_sync.
SC=2,isC=1		sid=1,ls=1,lc=0		SC=2,isC=1		sid=1,ls=1,lc=0	
Ssc=None				Ssc=None			
id=1,lS=1 id=2,lS=2		Client B		id=1, lS=1 id=2, lS=2	<<<	Client B	
1u-2, t3-2	(Csc=2)	last sync=0		10-2, (3-2		last sync=0	
	(636-2)	sid=2,ls=2,lc=0			tust_sync=0	sid=2,ls=2,lc=0	
		310 2713 2710 0	Csc would appear unchanged.			310 27 (3 27 (6 0	Csc would appear unchanged.
Server	>>>	Client A	Server returns objects where	Server	-	Client A	Server returns objects where
SC=1,isC=1	Csc=2	last_sync=2	lS > last_sync and	SC=1,isC=1	(Csc=2)	last_sync=2	lS > last_sync and
SC=2,isC=1	id=2,lS=2	, . ,	lastUpdatedBy != clientId	SC=2,isC=1		sid=1,ls=1,lc=0	lastUpdatedBy != clientId
Ssc=None		sid=2,ls=2,lc=0		Ssc=None		sid=2,ls=2,lc=0	
id=1,lS=1				id=1,lS=1			
id=2,lS=2	- (6 2)	Client B		id=2,lS=2	>>>	Client B	
	(Csc=2)	last_sync=0			Csc=2	last_sync=2	
		sid=2,ls=1,lc=0	Csc would appear unchanged.		1u=1, tS=1	sid=2,ls=2,lc=0 sid=1,ls=1,lc=0	Csc would appear unchanged
						31U-1, (S-1, (C=0	Csc would appear unchanged.
Local Change	<u> </u>			Local Change			
Server	-	Client A	Client A changes an object	Server	-	Client A	Client B changes the same
SC=1,isC=1	(Csc=2)	last_sync=2	locally.	SC=1,isC=1	(Csc=2)	last_sync=2	object locally.
SC=2,isC=1		sid=1,ls=1,lc=1		SC=2,isC=1		sid=1,ls=1,lc=1	
Ssc=None		sid=2,ls=2,lc=0		Ssc=None		sid=2,ls=2,lc=0	
id=1,lS=1		61 1		id=1,lS=1		67 1	
id=2,lS=2	- (Csc=2)	<pre>Client B last_sync=2</pre>		id=2,lS=2	- (Csc=2)	Client B last_sync=2	

Csc would appear unchanged.

Csc would appear unchanged.

(Csc=2) last_sync=2 sid=2,ls=2,lc=0 sid=1,ls=1,lc=1

(Csc=2) last_sync=2 sid=2,ls=2,lc=0 sid=1,ls=1,lc=0

Concurrency 1

Start Upload Phase

Server	<<<	Client A
SC=3,isC=0	sid=1,ls=1	last_sync=2
Ssc=3		sid=1,ls=1,lc=1
id=1,lS=1		sid=2,ls=2,lc=0
id=2,lS=2		
	-	Client B
	(Csc=2)	last_sync=2
		sid=2,ls=2,lc=0
		sid=1,ls=1,lc=1

Session started. Ssc is issued outside of the data transaction. Trailing committed SC rows are deleted.

Csc would appear unchanged.

Start Upload Phase

otar t optoda .		
Server	-	Client A
SC=3,isC=0	(Csc=2)	last_sync=2
SC=4,isC=0		sid=1,ls=1,lc=1
Ssc=4		sid=2,ls=2,lc=0
id=1,lS=1		
id=2,lS=2	<<<	Client B
	sid=1,ls=1	last_sync=2
		sid=2,ls=2,lc=0
		sid=1,ls=1,lc=1

Session started.
Ssc is issued outside of
the data transaction.

Csc would appear unchanged.

Server	>>>	Client A
SC=3,isC=1	id=1,lS=3	last_sync=2
SC=4,isC=0		sid=1,ls=3,lc=0
Ssc=None		sid=2,ls=2,lc=0
id=1,lS=3		
id=2,lS=2	-	Client B
	(Csc=3)	last_sync=2
		sid=2,ls=2,lc=0
		sid=1,ls=1,lc=1

Object committed due to provided ls >= lS. Session is marked committed. List of objects is returned.

Csc would appear changed.

 Object is not committed due to NOT ls >= lS.
Session is marked committed.
List of objects is returned, sid #1 with values.
Possible notice to user:

Csc would appear changed.

Alternate Outcome

Server	1-	Client A
SC=3,isC=0	(Csc=2)	last_sync=2
SC=4,isC=1		sid=1,ls=1,lc=1
Ssc=None		sid=2,ls=2,lc=0
id=1,lS=4		
id=2,lS=2	>>>	Client B
id=2,lS=2	>>> id=1,lS=4	<pre>Client B last_sync=2</pre>
id=2,lS=2		

Object committed due to provided ls >= lS. Session is marked committed. List of objects is returned.

Csc would appear unchanged.

Server	>>>	Client A
SC=3,isC=1	id=1,lS=4	last_sync=2
SC=4,isC=1		sid=1,ls=4,lc=0
Ssc=None		sid=2,ls=2,lc=0
id=1,lS=4		
id=2,lS=2	-	Client B
id=2,lS=2	- (Csc=4)	<pre>Client B last_sync=2</pre>
id=2,lS=2	- (Csc=4)	
id=2,lS=2	- (Csc=4)	last_sync=2

Object is not committed due to NOT ls >= lS. Session is marked committed. List of objects is returned, sid #1 with values. Possible notice to user:

Csc would appear changed.

			Con	currency 2			
Start of Sys	tem		Comment				
Server	-	Client A	No sync count.				
SC=None Ssc=None Obj=None	(Csc=0)	last_sync=0 obj=None	No objects.				
obj none	- (Csc=0)	Client B last_sync=0					
		obj=None	Csc would appear as zero.				
Local Change				Local Change			
Server SC=None Ssc=None Obj=None	- (Csc=0)	<pre>client A last_sync=0 sid=0,ls=0,lc=1</pre>	Client A creates an object locally.	Server SC=None Ssc=None Obj=None	(Csc=0)	<pre>Client A last_sync=0 sid=0,ls=0,lc=1</pre>	Client B creates an object locally.
	- (Csc=0)	Client B last_sync=0			- (Csc=0)	<pre>Client B last_sync=0</pre>	
		obj=None	Csc would appear unchanged.			sid=0,ls=0,lc=1	Csc would appear unchanged.
Start Upload	Phase			Start Upload H	Phase		
Server	<<<	Client A	Session started.	Server	-	Client A	Session started.
SC=1,isC=0 Ssc=1 Obj=None	sid=0,ls=0	<pre>last_sync=0 sid=0,ls=0,lc=1</pre>	Ssc is issued outside of the data transaction.	SC=1,isC=0 SC=2,isC=0 Ssc=2	(Csc=0)	<pre>last_sync=0 sid=0,ls=0,lc=1</pre>	Ssc is issued outside of the data transaction.
	- (Csc=0)	Client B		Obj=None	<<<	Client B	
	(CSC=0)	last_sync=0 sid=0,ls=0,lc=1	Csc would appear unchanged.		S10=0, (S=0	<pre>last_sync=0 sid=0,ls=0,lc=1</pre>	Csc would appear unchanged.
C	>>>	Client A	No. object villa in the control of t	Server		614	Name and a second second
Server SC=1,isC=1		Client A last sync=0	New object will be committed due to provided sid=0.	Server SC=1,isC=1	(Csc=2)	Client A last sync=0	New object will be committed due to provided sid=0.
SC=2,isC=0	,	sid=1,ls=1,lc=0	Session is marked committed.	SC=2,isC=1	(/	sid=1,ls=1,lc=0	Session is marked committed.
Ssc=None			List of objects is returned.	Ssc=None			List of objects is returned.
id=1,lS=1	(Csc=1)	Client B		id=1,lS=1 id=2,lS=2	>>> id=2 1c=2	Client B	
	(CSC=1)	<pre>last_sync=0 sid=0,ls=0,lc=1</pre>		10=2, (S=2	1u=2, t5=2	<pre>last_sync=0 sid=2,ls=2,lc=0</pre>	
			Csc would appear changed.				Csc would appear changed.
Local Change				Local Change			
Server	-	Client A	Client A changes an object	Server	-	Client A	Client B changes an object
SC=1,isC=1 SC=2,isC=1	(Csc=2)	<pre>last_sync=0 sid=1,ls=1,lc=1</pre>	locally.	SC=1,isC=1 SC=2,isC=1 Ssc=None	(Csc=2)	<pre>last_sync=0 sid=1,ls=1,lc=1</pre>	locally.
Ssc=None id=1,lS=1 id=2,lS=2	- (Csc=2)	Client B last_sync=0		id=1,lS=1 id=2,lS=2	- (Csc=2)	Client B last_sync=0	
		sid=2,ls=2,lc=0	Csc would appear unchanged.			sid=2,ls=2,lc=1	Csc would appear unchanged.
			ese would appear unchanged.				csc would appear unchanged.
Start Upload	Phase <<<			Start Upload F	Phase		1
Server SC=3,isC=0 Ssc=3 id=1,lS=1		<pre>Client A last_sync=0 sid=1,ls=1,lc=1</pre>	Session started. Ssc is issued outside of the data transaction. Trailing committed SC rows	Server SC=3,isC=0 SC=4,isC=0 Ssc=4	(Csc=2)	<pre>Client A last_sync=0 sid=1,ls=1,lc=1</pre>	Session started. Ssc is issued outside of the data transaction.
id=2,1S=2	- (Csc=2)	Client B last_sync=0	are deleted.	id=1,lS=1 id=2,lS=2	<<< sid=2,ls=1	Client B last_sync=0	
		sid=2,ls=2,lc=1	Csc would appear unchanged.			sid=2,ls=2,lc=1	Csc would appear unchanged.
			Long running transaction	Server	-	Client A	Object will be committed due
			and inserts running in background.	SC=3,isC=0 SC=4,isC=1 Ssc=None	(Csc=2)	<pre>last_sync=0 sid=1,ls=1,lc=1</pre>	to ls >= lS. Session is marked committed. List of objects is returned.
				id=1,1S=1 id=2,1S=4	>>> id=2,lS=4	Client B last_sync=0 sid=2,ls=4,lc=0	Csc would appear unchanged.
Server SC=3,isC=1	>>> id=1,lS=3	Client A last_sync=0	Object will be committed due to ls >= lS.				Idle
SC=4,isC=1 Ssc=None	, , , , ,	sid=1,ls=3,lc=0	Session is marked committed. List of objects is returned.				
id=1,1S=3 id=2,1S=4	- (Csc=4)	Client B last_sync=0 sid=2,ls=4,lc=0					
		,,0	Csc would appear changed.				

Csc would appear changed.

Start of System

Start or Sys	Start or System				
Server	-	Client A			
SC=None	(Csc=0)	last_sync=0			
Ssc=None		obj=None			
Obj=None					
	_	Client R			

(Csc=0) last_sync=0 obj=None

Comment No sync count. No objects. Csc would appear as zero.

Server Client A (Csc=1) SC=1,isC=1 last_sync=0 Ssc=None obj=None id=1,lS=1 Client B (Csc=1) last_sync=0 obj=None Object committed to server. (Raw data load example) (Do not perform online) (Recovery or preload example) Csc would appear as 1.

Start Download Phase Server

Start DOWNLO	au riiase	
Server	<<<	Client A
SC=1,isC=1	last_sync=0	last_sync=0
Ssc=None		obj=None
id=1,lS=1		
	-	Client B
	(Csc=1)	last_sync=0
		obj=None

Client A download phase. Client sends last_sync. Csc would appear unchanged

Server Client A Csc=1 last_sync=1 id=1,lS=1 sid=1,ls=1,lc=0 SC=1,isC=1 Ssc=None id=1,lS=1 Client B (Csc=1) last_sync=0

obj=None

Server returns objects where lS > last_sync and
lastUpdatedBy != clientId Csc would appear unchanged.

Start Download Phase

-	Client A
	CCICIIC A
(Csc=1)	last_sync=1
	sid=1,ls=1,lc=0
<<<	Client B
last_sync=0	last_sync=0
	obj=None
	<<<

Client B download phase. Client sends last_sync. Csc would appear unchanged.

Client A Server SC=1,isC=1 (Csc=1) last_sync=1 Ssc=None sid=1,ls=1,lc=0 id=1,lS=1

Client B Csc=1 last_sync=1
id=1,lS=1 sid=1,ls=1,lc=0

Server returns objects where lS > last_sync and lastUpdatedBy != clientId Csc would appear unchanged.

Start of System

Start of Sy	stem	Comment	
Server	-	Client A	No sync count.
SC=None	(Csc=0)	last_sync=0	No objects.
Ssc=None		obj=None	
Obj=None			
	-	Client B	
	(Csc=0)	last_sync=0	
		obi=None	Csc would appear as zero

Start Download Phase

Server	<<<	Client A	Client A download phase.
SC=None	last_sync=0	last_sync=0	Client sends last_sync.
Ssc=None		obj=None	
Obj=None			
	-	Client B	
	(Csc=0)	last_sync=0	
		obj=None	Csc would appear unchanged.
Server	>>>	Client A	Server returns objects where
SC=None	Csc=0	last_sync=0	lS > last_sync and
Ssc=None	Obj=None	obj=None	lastUpdatedBy != clientId

Server	>>>	Client A	Server returns objects where
SC=None	Csc=0	last_sync=0	lS > last_sync and
Ssc=None	Obj=None	obj=None	lastUpdatedBy != clientId
Obj=None			
	-	Client B	
	(Csc=0)	last_sync=0	
		obj=None	Csc would appear unchanged.

LEGEND

SC	Sync Count		
isC	isCommitted		
Csc	Committed sync count*		
Ssc	Session sync count*		
id	Object ID on server		
ls	Object last sync on server		
last_sync	last sync down on client		
sid	server object_id		
ls	object last_sync		
lc	local changes		

^{*}generated by queries.