

P802.1CBec



State Machines of the modified SeqGen and SeqRcvy (update)

IEEE 802.1 TSN TG
2026 Sept

State Machines of SeqGen and SeqRcvy

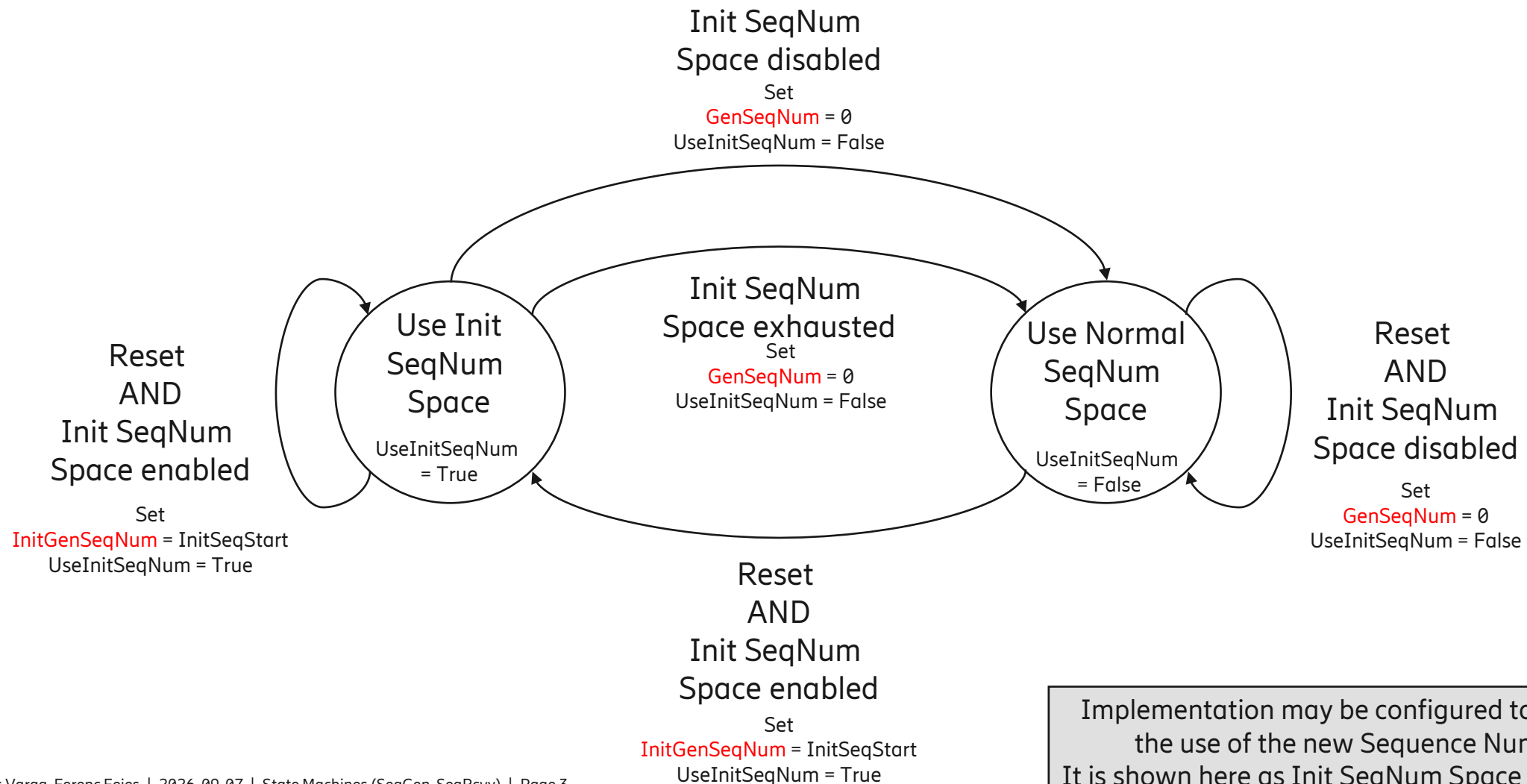


- One of the steps towards a pseudocode ...
- There are
 - TWO sequence number spaces
 - TWO flags
 - Many new variables ...
 - Each SeqNumSpace has its own set (e.g., distinguished by an “Init” prefix)
 - Management variables (e.g., for usage of the InitSeqNumSpace)

SeqGen operation (theory)

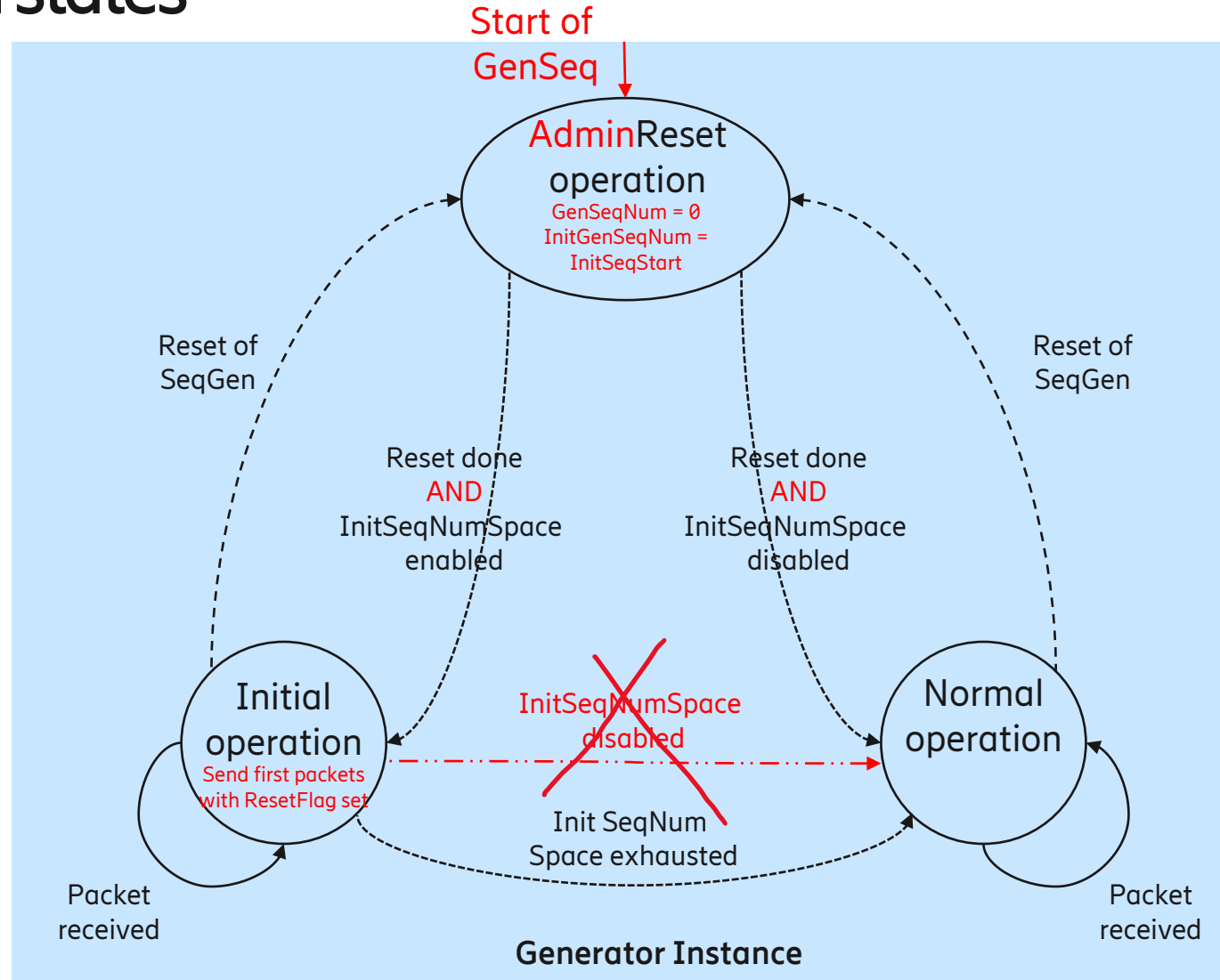
Which SeqNum Space to use for the next packet to be sent?

*red text refers
to changes



State Machine of SeqGen

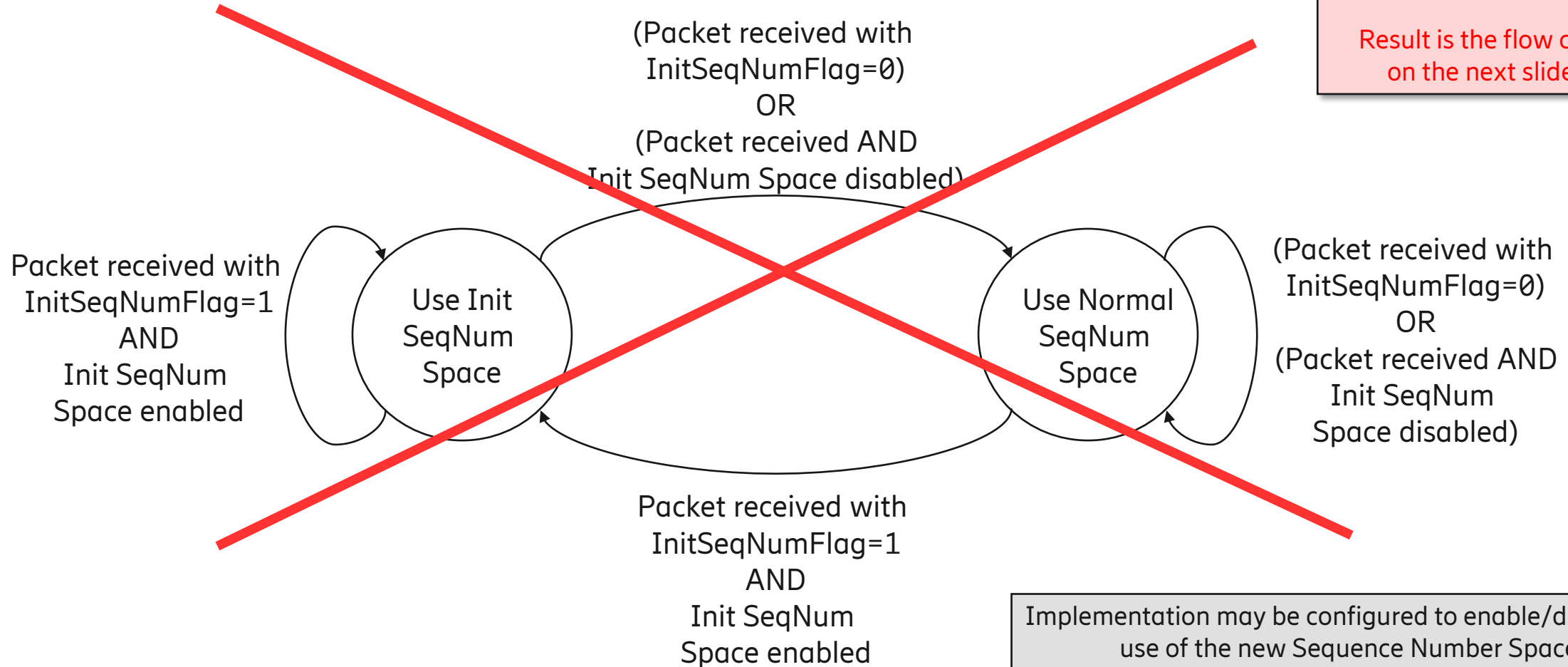
Operational states



Configuration to enable/disable the use of the Init Sequence Number Space takes effect only after AdminReset operation !!!

SeqRcvy operation (theory)

Which SeqNum Space to use for a received packet?



Used only for discussion purposes !!!

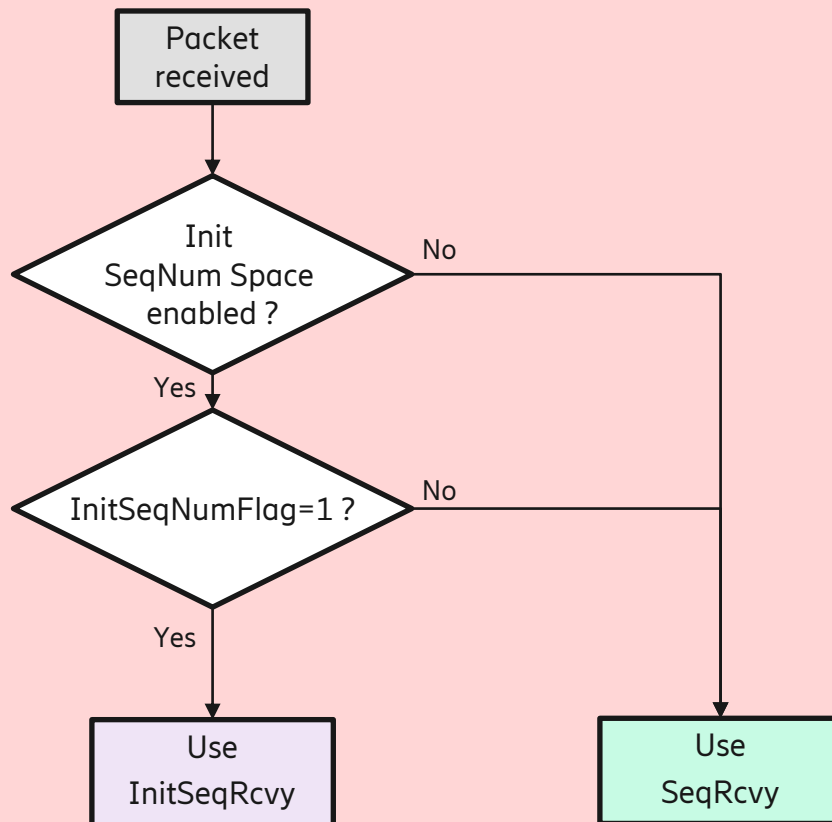
Result is the flow char on the next slide.

Implementation may be configured to enable/disable the use of the new Sequence Number Space. It is shown here as Init SeqNum Space enabled/disabled

SeqRcvy function instance selection (NEW)

Which SeqNum Space to use for a received packet?

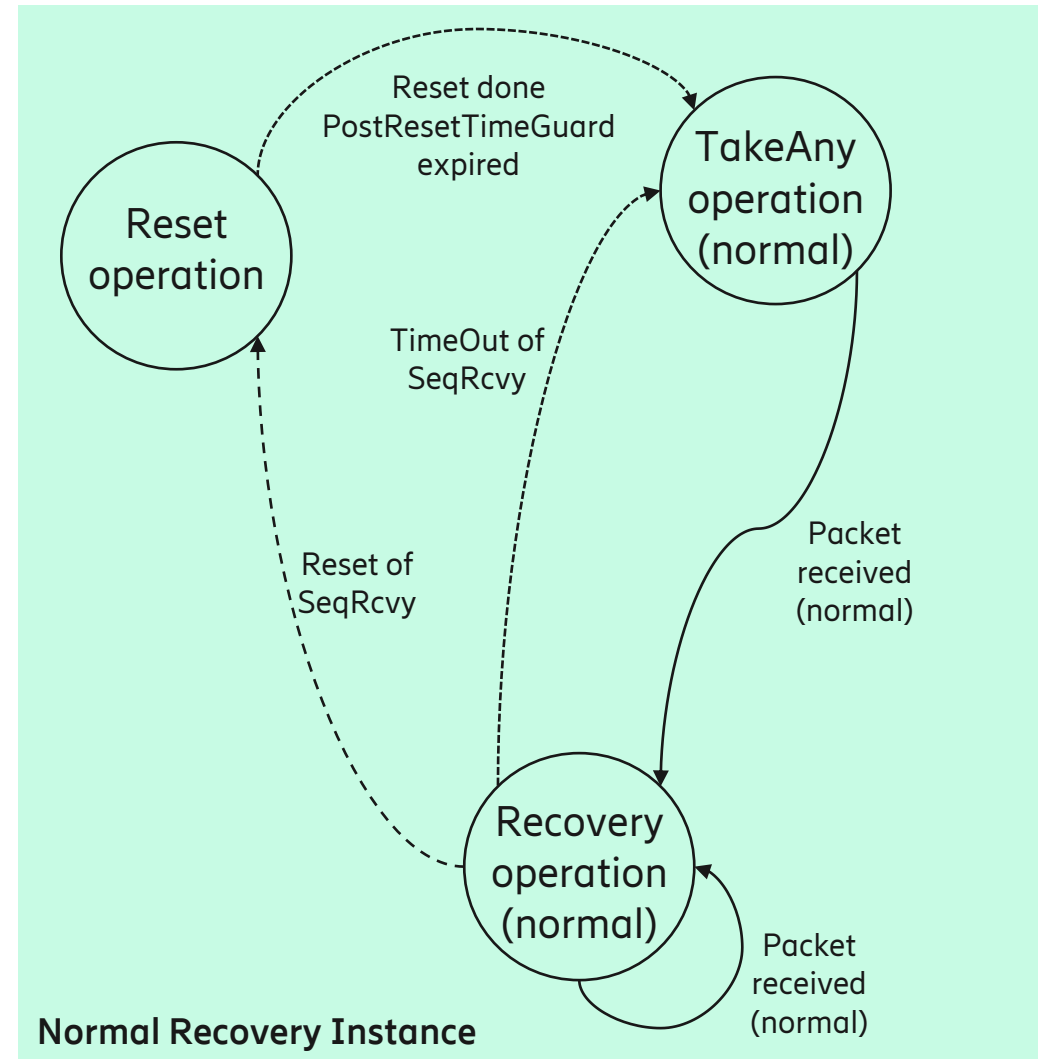
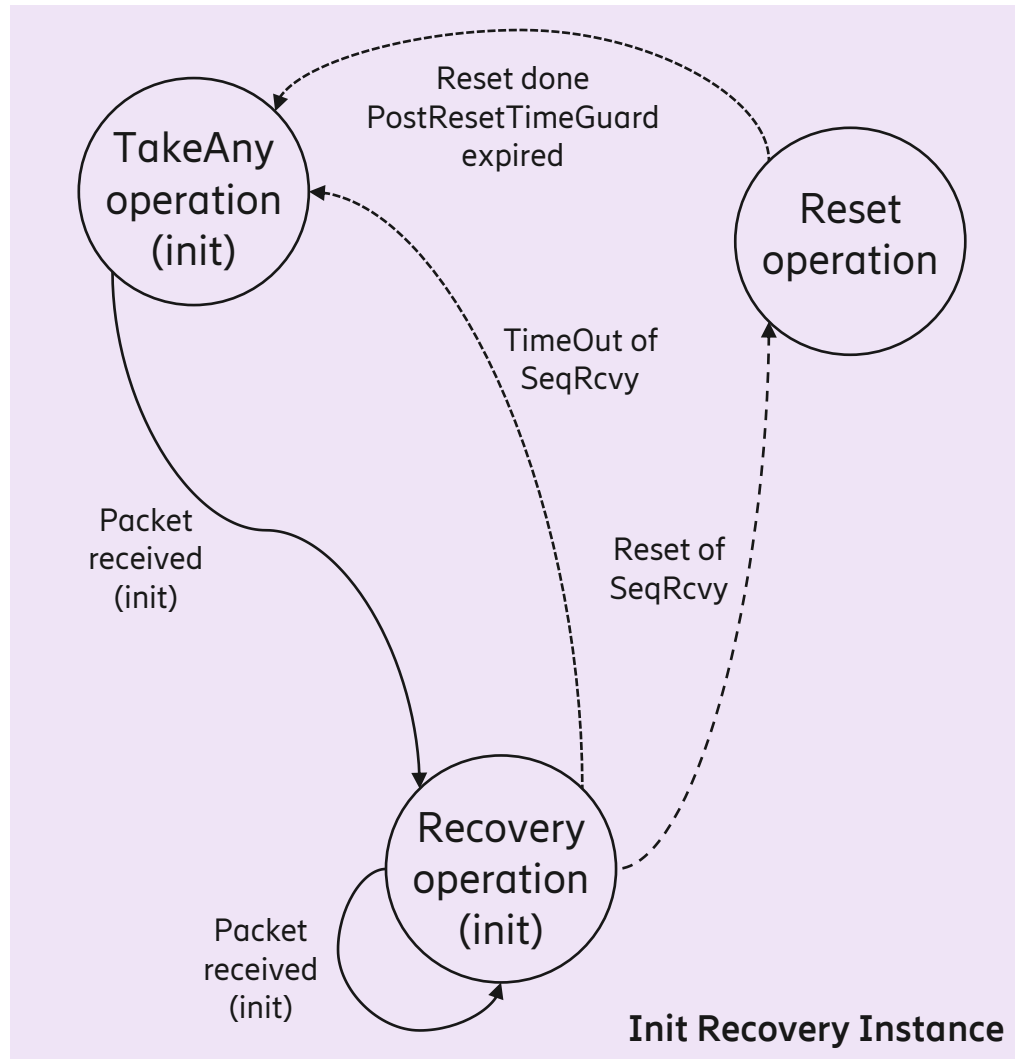
*red background
refers to new slide



Implementation may be configured to enable/disable the use of the new Sequence Number Space, It is shown here as Init SeqNum Space enabled/disabled

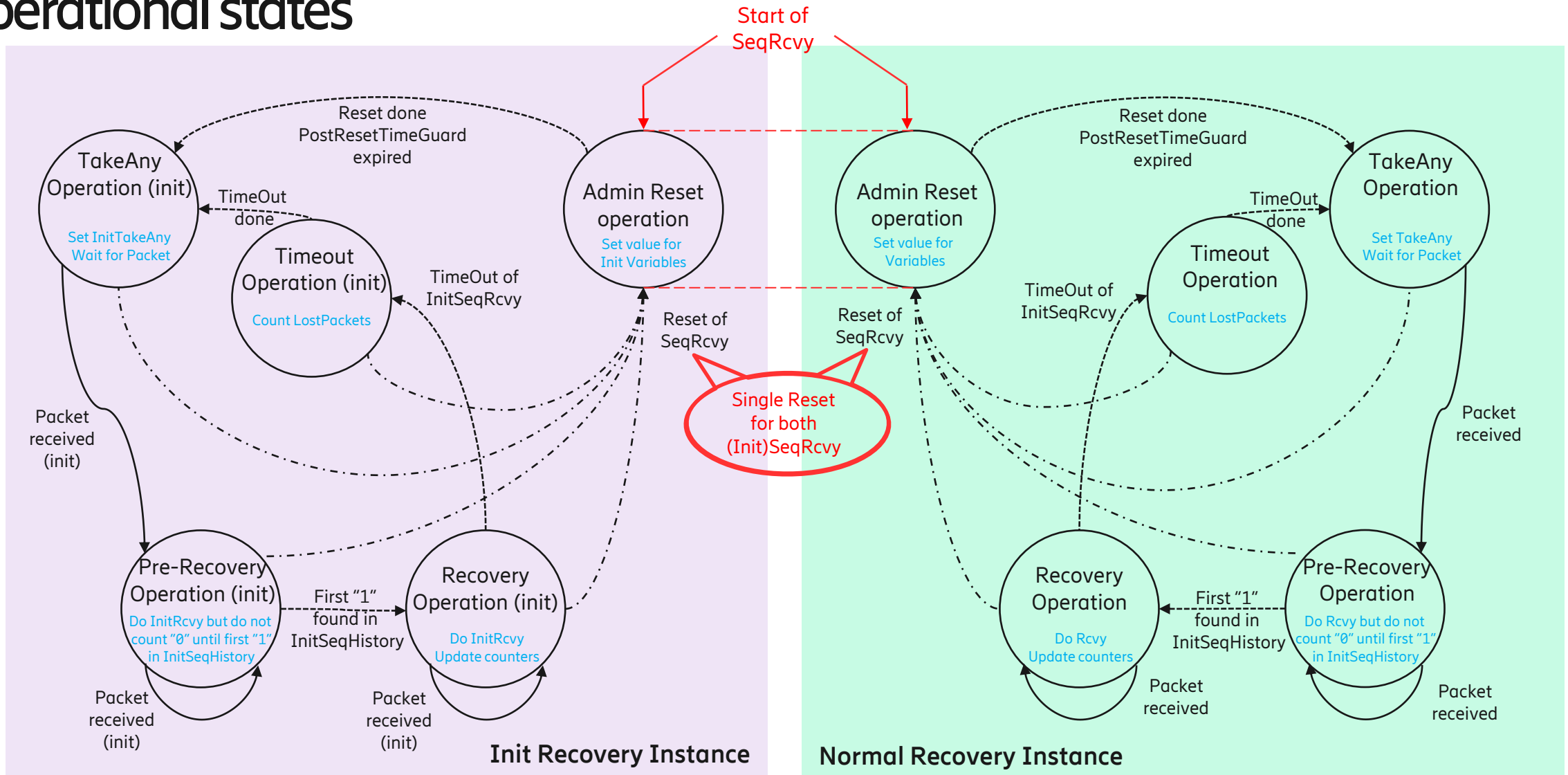
State Machine of SeqRcvy (first draft presented '26 Jul)

Operational states



State Machine of SeqRcvy (detailed version)

Operational states



Characteristics of the State Machine diagram (NEW)



The concept does not change ...

- Recovery operation described using TWO Instances paired together
 - Doing recovery on the packets in the TWO SeqNumSpace
 - Operates as “Ships in the Night” (only their AdminReset states are bounded)
 - Under normal operation One is in “TakeAny” (Init Recovery Instance) and the Other is in “RcvyOperation” (Normal Recovery Instance)
- Instances use the SAME stream counters (e.g., frerCpsSeqRcvyResets, frerCpsSeqRcvyLostPackets, frerCpsSeqRcvyPassedPackets, frerCpSeqRcvyDiscardPackets, ...)
- Re-use current .1CB description:
 - Pseudocode concept not changed (Reset, TakeAny, TimeOut, Rcvy phases of operation)
 - Instances use their own set of variables
 - New functionality covered by added pseudocodes
- Note: implementation may collapse some pseudocode functions

Characteristics of the State Machine diagram (NEW)



New Variables needed ...

- SeqGen
 - GenSeqNum / InitGenSeqNum
 - SendResetFlagNum, UseInitSeqNum
- SeqRcvy
 - TakeAny, RecovSeqNum, SequenceHistory[i], RemainingTicks / InitTakeAny, InitRecovSeqNum, InitSequenceHistory[i], InitRemainingTicks
 - InitRecovSeqStart
 - SuppressLostUntilPacket / InitSuppressLostUntilPacket



Subclauses to be updated (SeqGen)

Initial non-exhaustive list

7.4.1 Sequence generation function

- 7.4.1.3 SequenceGenerationReset
 - Add initialization of InitGenSeqNum (= InitSeqStart)
- 7.4.1.4 SequenceGenerationAlgorithm
 - Add usage of InitSeqNumSpace (update code, add state machine(?))

Subclauses to be updated (SeqRcvy)

Initial non-exhaustive list



7.4.2 Sequence recovery function

- 7.4.3.3 SequenceRecoveryReset
 - Add initialization of InitSeqNumSpace (InitRecovSeqNum, InitSequenceHistory, InitTakeAny)
- 7.4.3.4 VectorRecoveryAlgorithm
 - Add usage of InitSeqNumSpace
- 7.4.3.5 MatchRecoveryAlgorithm
 - Include check of Flags (???)
- 7.4.3.6 ShiftSequenceHistory
 - Add usage of InitSeqNumSpace
 - Add fix of errors in lost-counter



Discussion