

FCP-3: RR_TOV Timer(s)
(T10/04-293r1)
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The RR_TOV timer as currently specified in FCP-3 is used for two purposes:

11.4 Resource Recovery Timer (RR_TOV)

RR_TOV is the minimum time a target shall wait for a specific initiator to perform Exchange Authentication following the completion of the Loop Initialization Protocol (i.e., the receipt of CLS while in the OPEN-INIT state) (see FC-DA). RR_TOV is also the minimum time a target shall wait for an initiator response following transfer of Sequence Initiative from the target to the initiator (e.g., following transmission of the FCP_XFER_RDY IU during a write command). If either of these two conditions is not recovered successfully before expiration of RR_TOV, a target may implicitly or explicitly perform a LOGO with that initiator, terminate all open Exchanges for that initiator, and reclaim the resources associated with those Exchanges (see 12.4.1.5).

The value of RR_TOV may be set using the Fibre Channel Port Control mode page (see 10.4.10).

If the RETRY bit is set to one the value of RR_TOV is specified as “ $\geq \text{REC_TOV} + 2 \times \text{R_A_TOV}_{\text{ELS}} + 1 \text{ sec}$ ”.
The default value then equates to (3 seconds + 20 seconds + 1 second) \geq 24 seconds.

A minimum time of 24 seconds to wait for authentication to occur is not desirable. As such, this timer should be split into two timers. Proposed changes:

11.4 Resource Recovery Timer (RR_TOV)

RR_TOV has two separate components, labeled $\text{RR_TOV}_{\text{AUTH}}$ and $\text{RR_TOV}_{\text{SEQ_INIT}}$.

$\text{RR_TOV}_{\text{AUTH}}$ is the minimum time a target shall wait for a specific initiator to perform Exchange Authentication following the completion of the Loop Initialization Protocol (i.e., the receipt of CLS while in the OPEN-INIT state) (see FC-DA). $\text{RR_TOV}_{\text{SEQ_INIT}}$ is ~~also~~ the minimum time a target shall wait for an initiator response following transfer of Sequence Initiative from the target to the initiator (e.g., following transmission of the FCP_XFER_RDY IU during a write command). If either of these two conditions is not recovered successfully before expiration of RR_TOV, a target may implicitly or explicitly perform a LOGO with that initiator, ~~terminate all open Exchanges for that initiator,~~ and reclaim the resources associated with those Exchanges (see 12.4.1.5).

The value of $\text{RR_TOV}_{\text{SEQ_INIT}}$ may be set using the Fibre Channel Port Control mode page (see 10.4.10).

Table 30 - Timer summary

Timer	Implementation Mandatory (M) or Optional (O)		Description	Default Value	Notes	Ref
	Initiator	Target				
E_D_TOV	M	O	Error_Detect_Time-out Value	2 sec.	2,3	11.2
R_A_TOV _{SEQ_QUAL}	M	O	Resource_Allocation Time-out Value	Private loop = 0 sec. Public loop = 10 sec.	1,2	11.3
R_A_TOV _{ELS}	M	M		Private loop = 2 sec. Public loop = 10 sec.	1,2	11.3
RR_TOV _{AUTH}		M	Resource Recovery Time-out Value	2 sec.		11.4
RR_TOV _{SEQ_INIT}		M		If RETRY bit is set to 0: 2 sec. If RETRY bit is set to 1: ≥ REC_TOV + 2xR_A_TOV _{ELS} + 1 sec.		11.4
REC_TOV	M	M	REC Time-out Value	≥ E_D_TOV + 1 sec. (minimum)	4	11.5
ULP_TOV	M		Upper Level Protocol Time-out Value	If RETRY bit is set to 0: ≥ Operation-specific timer + E_D_TOV + 1 sec. If RETRY bit is set to 1: ≥ Operation-specific timer + 2xRR_TOV		11.6
<p>NOTES:</p> <p>1 R_A_TOV is defined by FC-FS-2. This standard defines the default R_A_TOV for Sequence Qualifiers as zero for private loops and 10 seconds for public loops. This standard defines the default R_A_TOV for ELS responses as 2 seconds for private loops and 10 seconds for public loops. If ELSs are used to set R_A_TOV, the same value is applied for both uses. Other Fibre Channel standards may specify different default values for R_A_TOV for different topologies.</p> <p>2 Targets that support Class 2 delivery service shall implement this timer.</p> <p>3 E_D_TOV default time-out values are defined by FC-FS-2, and FC-DA. ELSs are provided to set values other than the default value. This standard defines the default value required by the recovery protocol, deriving the value as follows:</p> <p>a Public loop devices compliant with FC-DA use an E_D_TOV value of 2 seconds before fabric login and the value obtained in the FLOGI ACC after fabric login.</p> <p>b Private loop devices compliant with FC-DA use the default E_D_TOV value of 2 seconds.</p> <p>c Devices attached through a fabric or point-to-point connection use the default E_D_TOV value specified by FC-FS-2 before fabric login and the value obtained in the FLOGI ACC after fabric login.</p> <p>4 REC_TOV is required by the target for FCP_CONF IU error detection.</p>						

Table 28 - Fibre Channel Port Control mode page (19h)

Bit Byte	7	6	5	4	3	2	1	0
0	PS	SPF (0b)	PAGE CODE (19h)					
1	PAGE LENGTH (06h)							
2	RESERVED				PROTOCOL IDENTIFIER (FCP = 0h)			
3	DTFD	PLPB	DDIS	DLM	RHA	ALWI	DTIPE	DTOLI
4	RESERVED							
5	RESERVED							
6	RESERVED					RR_TOV UNITS		
7	RESOURCE RECOVERY TIME-OUT VALUE (RR_TOV _{SEQ_INIT})							

10.4.10 RESOURCE RECOVERY TIME-OUT VALUE (RR_TOV_{SEQ_INIT})

The RR_TOV is defined by bytes 6 and 7 in the following manner. ~~See 11.4.~~ (see 11.4).

The RR_TOV UNITS field indicates the units for the RR_TOV_{SEQ_INIT} field value, according to table Table 29 -.

Table 29 - Values for RR_TOV UNITS

Byte 6			Units of measure for RR_TOV _{SEQ_INIT}
bit 2	bit 1	bit 0	
0	0	0	No timer is specified
0	0	1	0.001 seconds
0	1	1	0.1 seconds
1	0	1	10 seconds
All other values			Reserved

The RR_TOV_{SEQ_INIT} field indicates the number of time units specified by the RR_TOV UNITS field that shall be used by the timer that performs the RR_TOV_{SEQ_INIT} time-out functions. If no timer is specified, the RR_TOV_{SEQ_INIT} value shall be ignored by the device server and a vendor specific default value shall be used for RR_TOV_{SEQ_INIT}. ~~See 11.4 and FC-DA for the RR_TOV time-out functions.~~