

Document: X3T10/95-348r1  
To: X3T10 Committee Membership  
From: Edward A. Gardner  
Subject: FCP-2 use of Disconnect-Reconnect Mode Page

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Document 95-208r3 was accepted at the September X3T10 meeting (Bedford, NH), splitting the description of the current disconnect-reconnect mode page between SPC and SIP to allow protocol specific use of that mode page. This document is a proposal for FCP-2 use of that mode page.

Add the following glossary entries:

**FCP bus inactivity:** an interval during which a node prevents other uses of the link (e.g. maintains an FCP interconnect tenancy) and is itself unable to either send or receive information frames.

**FCP interconnect tenancy:** in a loop configuration, the interval from a node sending or receiving an OPN primitive until it sends the subsequent CLS primitive.

**First burst data transfer:** a data transfer sequence that is sent prior to any transfer of sequence initiative within its exchange.

Remove any existing discussion of disconnect-reconnect mode page parameters from FCP, then add the following new section.

n.n.n Use of Disconnect-reconnect page parameters

The disconnect-reconnect page (defined in SPC) provides the application client the means to tune the performance of the service delivery subsystem. The following describes the parameters in that mode page that are appropriate for the FCP protocol and their interpretation.

*[editorial note: FCP-2 is supposed to define SAM compliant service interfaces, with application clients and service delivery subsystems and the like. I am assuming that FCP-2 uses similar terminology to SIP, e.g. that "Target Role Agent" is a correct term. The terminology in this section may have to be updated if FCP-2 changes the meaning of or introduces new terms.]*

The application client passes parameter values controlling the service delivery subsystem to the target device server by means of this mode page. The target device server in turn communicates the parameter values to its Target Role Agent to control use of the Fibre Channel Protocol. Parameter values are communicated from the target device server to its Target Role Agent using an internal interface (within the target device) that is outside the scope of SCSI-3.

Only the parameters discussed below are appropriate to FCP. If any parameter other than those discussed below is non-zero, the device server shall return CHECK CONDITION status. The sense key shall be set to ILLEGAL REQUEST and the additional sense code set to ILLEGAL FIELD IN PARAMETER LIST.

The buffer full and buffer empty ratios are interpreted as described in SPC.

The bus inactivity limit field indicates the maximum duration of any FCP bus inactivity measured in transmission word increments. Target devices in loop configurations shall send CLS if this limit would be exceeded. A value of zero indicates that the target device should use the shortest bus inactivity limit that it implements; the precise value is vendor unique. A value of all ones (0xFFFF) indicates that the bus inactivity limit does not apply.

The disconnect time limit indicates the minimum delay between FCP interconnect tenancies measured in increments of 128 transmission words. Target devices in loop configurations shall

delay at least this time interval after each FCP interconnect tenancy before beginning arbitration. A value of zero indicates that the disconnect time limit does not apply.

The connect time limit indicates the maximum duration of an FCP interconnect tenancy measured in increments of 128 transmission words. Target devices in loop configurations shall send CLS if this limit is exceeded. A value of zero indicates that the connect time limit does not apply.

The maximum burst size field indicates the maximum amount of data that the device server may transfer using a single Fibre Channel sequence. This parameter does not affect how much data is transferred in an interconnect tenancy. This value is expressed in increments of 512 bytes (e.g. a value of one means 512 bytes, two means 1024 bytes, etc.). A value of zero indicates this limit does not apply.

The enable modify data pointers (EMDP) bit indicates whether or not the target may re-order multiple Fibre Channel sequences. If the EMDP bit is zero, the target shall generate continuously increasing DATA\_RO values within each FCP IO operation. If the EMDP bit is one, the target may generate consecutive DATA\_RO values that are not continuously increasing within a single FCP IO operation. Note that this bit does not affect the order of frames within a sequence.

The FARd, FAWrt, and FAStat bits indicate whether a target in a loop configuration shall use the access fairness algorithm when arbitrating for the loop. An FA bit of one indicates that the target shall use the access fairness algorithm. An FA bit of zero indicates that the target may choose to not use the access fairness algorithm. The FARd bit controls arbitration when the target wishes to send one or more FCP\_DATA frames to an initiator. The FAWrt bit controls arbitration when the target wishes to send one or more FCP\_XFER\_RDY frames to an initiator. The FAStat bit controls arbitration when the target wishes to send one or more FCP\_RSP frames to an initiator or FCP\_CMND frames to another target. If the target intends to send multiple frame types, it may choose to not use the access fairness algorithm if any applicable FA bit is zero. The FA bits are ignored in non-loop configurations.

The disconnect immediate (DImm) and data transfer disconnect control (DTDC) fields are not appropriate to FCP devices. If either DImm or DTDC are non-zero, the device server shall return CHECK CONDITION status. The sense key shall be set to ILLEGAL REQUEST and the additional sense code set to ILLEGAL FIELD IN PARAMETER LIST.

The first burst size field indicates the maximum amount of data that an initiator may send as a first burst data transfer. The target shall configure its buffers to accept up to this much data following any write-type command. This value is expressed in increments of 512 bytes (e.g. a value of one means 512 bytes, two means 1024 bytes, etc.). A value of zero indicates that this limit does not apply.