



March 18, 1998

**To:** T10 Committee

**From:** Tom Coughlan  
Digital Equipment Corporation  
Mail Stop ZKO-3-4/U14  
110 Spitbrook Road  
Nashua, New Hampshire  
Telephone: 603-884-0933  
E-mail: tom.coughlan@digital.com

**Subject: Clarifications Regarding Duplicate Persistent  
Reservation Descriptors**

During the implementation of Persistent Reservation, a question arose regarding the circumstances in which a PERSISTENT RESERVE IN command with a Read Reservations service action will deliver duplicate reservation descriptors to the application client.

The issue is resolved below, and a change to SPC-2 is proposed to resolve the question. (The following text is based on SPC-2 Rev. 1.)

The device sever may contain duplicate reservation descriptors under two circumstances:

1. A particular initiator creates the same reservation multiple times.
2. Multiple initiators with the same key create identical compatible reservations.

Note that in the first case the reservation descriptors are identical because the reservations are identical. In the second case the reservations are unique because they are from different initiators, but since descriptors do not include the initiator identifier, the descriptors are identical.

Also note that the device server is not required to store duplicate reservations from the same initiator, because the duplicates serve no useful function. In fact, steps were taken in 97-218r2 to facilitate this option, by stipulating that multiple identical reservations from the same initiator are all simultaneously released by a single Release service action.

Thus, the device server should not be required to send multiple reservation descriptors for duplicate reservations. In fact, it is desirable to prohibit this, so that the application client can unambiguously detect the second circumstance described above. The standard should explicitly state that the Read Reservations service action shall return one reservation descriptor for each unique reservation. A note should be added to indicate that duplicate reservation descriptors are possible if initiators use the same key.

The specific proposal is to make the following changes at the earliest time allowed by the standardization process:

#### **7.12.1.2 Read Reservations**

The Read Reservations service action requests that the device server return a parameter list containing a header and a complete list of all >>unique<< persistent reservations that are presently active in the device server and its extents. >>(Duplicate persistent reservations from the same initiator shall not be reported.)<<

#### **7.12.3 PERSISTENT RESERVE IN parameter data for Read Reservations**

(Starting in the fourth paragraph.)

The format of a single read Reservation descriptor is defined in table 40. There shall be one read Reservation descriptor for each >>unique<< persistent reservation held on the logical unit by any initiator. >>(Duplicate persistent reservations from the same initiator shall not be reported.)<<

For each >>unique<< persistent reservation held on the logical unit, there shall be a read Reservation descriptor presented in the list of parameter data returned by the device server in response to the PERSISTENT RESERVE IN command with a Read Reservations action. The descriptor shall contain the Reservation Key under which the persistent reservation is held. The Type and Scope of the persistent reservation as present in the PERSISTENT RESERVE OUT command that created the persistent reservation shall be returned (see 7.12.3.1 and 7.12.3.2). >>Duplicate Reservation descriptors are possible, if multiple initiators use the same reservation key.<<