The page table mechanism in SBP-2 was designed and optimized for disk transfers. However, it is overly restrictive for other classes of devices that may want to use SBP-2. Additionally, it is not clear in the current draft the meaning of the page table when the `page_table_present` bit is one and `page_size` is zero. I would like to use this combination to indicate that the page table is an unrestricted scatter/gather list.

I propose the following changes to the document:

In section 5.1.2.1 add the following paragraph just before the paragraph beginning “If `page_table_present` is zero, the `data_size` field...”

If `page_table_present` is one and `page_size` is zero then the page table represents an unrestricted scatter/gather list with no inherent page size.

In section 5.2:

The data buffer associated with an ORB is specified by the `data_descriptor`, `page_table_present`, `page_size` and `data_size` fields. The data buffer is a logically contiguous area in system memory. As previously described, when `page_table_present` is zero, the data buffer is also contiguous within Serial Bus address space. In this case, `data_descriptor` contains the 64-bit address of the data buffer and `data_size` specifies its length, in bytes.

In the other case, when `page_table_present` is equal to one, the data buffer is composed of segments that are discontinuous within Serial Bus address space and it is necessary to use a page table to describe the segments that form the data buffer. The page table is a variable-length array of elements whose format is determined by `page_size`. When `page_size` is non-zero the page table uses the normalized format. When `page_size` is zero the page table uses the unrestricted scatter/gather list format. Each element describes one segment that is contiguous within Serial Bus address space. Page table elements shall be octlet aligned.

The presence of a page table is indicated by the value of `page_table_present` in the ORB. When `page_table_present` is nonzero, the `data_descriptor` field in the ORB shall contain the address of the page table and the `data_size` field shall contain the number of elements in the page table.

When a page table is used it shall be located in the same node as the data buffer it describes. The `spd` and `max_payload` fields of the ORB shall describe data transfer capabilities for both the data buffer and the page table.

The target shall access the data buffer using 1394 read or write transactions, as appropriate to the direction of the transfer. When a page table is present these transactions shall specify an address and length that is wholly contained within that portion of the data buffer described by a single page table entry.
5.2.1 Normalized page tables

The page table shall be contiguous within Serial Bus address space and shall be accessible to Serial Bus block read transactions with a data_length less than or equal to $2^{\text{page_size}}$ bytes so long as a block read transaction does not cross Serial Bus address boundaries that occur every $2^{\text{page_size}+8}$ bytes.

<table>
<thead>
<tr>
<th>most significant</th>
<th>segment_length</th>
<th>segment_base_hi</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>segment_base_lo</td>
<td>segment_offset</td>
</tr>
<tr>
<td>least significant</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1 – Page table element (when page_size equals four)

NOTE – In the figure above, the field widths of segment_base_lo and segment_offset, 20 and 12 bits, respectively, are chosen only for the purposes of illustration. The size of segment_base_lo and segment_offset vary according to page_size. The field width, in bits, of segment_offset shall be page_size+8. In the example shown above, the page size is assumed to be 4096 bytes.

The segment_length field shall specify the length, in bytes, of the portion of the data buffer described by the page table element. The value of segment_length shall be less than or equal to $2^{\text{page_size}+8}$.

The segment_base_hi and segment_base_lo fields together shall specify the base address of the segment within the node’s 48-bit system memory address range.

The segment_offset field shall specify the starting address for data transfer within the segment.

The 64-bit system memory address used to address the data is formed by the concatenation of the 16-bit node_ID field from the data_descriptor field in the ORB, segment_base_hi, segment_base_lo and segment_offset.

In all page table elements, the sum of segment_length and segment_offset shall be less than or equal to $2^{\text{page_size}+8}$.

In addition to the preceding requirements, the values of segment_length and segment_offset are constrained by their position within the page table. These additional restrictions are summarized below.

<table>
<thead>
<tr>
<th>Element</th>
<th>Total page table elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>No additional restrictions</td>
</tr>
<tr>
<td>1 – n-2</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>n-1</td>
<td>—</td>
</tr>
</tbody>
</table>

The presence of a page table is indicated by the value of page_table_present in the ORB. When page_table_present is nonzero, the data_descriptor field in the ORB shall contain the address of the page table and the data_size field shall contain the number of elements in the page table.

When a page table is used it shall be located in the same node as the data buffer it describes. The spd and max_payload fields of the ORB shall describe data transfer capabilities for both the data buffer and the page table. The page table shall be contiguous within Serial Bus address space and shall be accessible to Serial Bus block read transactions with a data_length less than or equal to $2^{\text{page_size}+8}$.
bytes so long as a block read transaction does not cross Serial Bus address boundaries that occur
every $2^{\text{page_size}+8}$ bytes.

5.2.2 Unrestricted scatter/gather lists

The page table shall be contiguous within Serial Bus address space and shall be accessible to Serial
Bus block read transactions with a $\text{data_length}$ less than or equal to $\text{data_size} \times 8$ bytes.

\begin{table}
\begin{tabular}{c c c}
\hline
segment_length & segment_base_hi & segment_base_lo \\
\hline
\end{tabular}
\end{table}

\textbf{Figure 32 – Page table element (when page_size equals zero)}

The $\text{segment_length}$ field shall specify the length, in bytes, of the portion of the data buffer described by
the page table element. A $\text{segment_length}$ value of zero shall not be used.

The $\text{segment_base_hi}$ and $\text{segment_base_lo}$ fields together shall specify the base address of the
segment within the node’s 48-bit system memory address range.

The 64-bit system memory address used to address the data is formed by the concatenation of the
16-bit $\text{node_ID}$ field from the $\text{data_descriptor}$ field in the ORB, $\text{segment_base_hi}$ and
$\text{segment_base_lo}$. 