TABLE 2-continued

Options for Fragment-header syntax for syntactic fragmentation

Fragment header syntax	Description	Overhead	Advantages	Disadvantages
			and concealment. Suitable for error concealment when very frequent occurrence of small packet loss happens.	
Option 1: TotalFragments PerSample, Nesting ID	Each fragment contains the total number of fragments in the sample along with corresponding nesting IDs.	4 bits + String of varying length	No ambiguities in the event of multiple packet loss as shown in FIG. 12. Helps the receiver in error recovery and concealment. Suitable for error concealment when very frequent occurrence of large packet loss occurs.	Additional overhead. Refer to FIG. 12.

[0064] For error recovery when utilizing syntactic XML fragmentation, a receiver should be able to first identify the missing fragments from the syntax of the received fragments. Among the two options summarized in Table 2, Syntax Option 1 helps the receiver in determining the fraction of the missing fragments with minimal ambiguity. Syntactic fragmentation can help the receiver to perform error concealment by reconstructing the DOM correctly by either excluding the missing elements or "guesstimating" the missing information from the content received. Such error concealment methods can be used rather than retransmission particularly when frequent packet loss occurs. This prevents the frequent retransmission of missing packets, which can tie up transmission resources and increase traffic.

[0065] In syntactic XML fragmentation, similar to brute force XML fragmentation, the P flag in the common payload header informs the receiver what the priorities of the missing fragments are. This information is important as it allows the receiver to decide whether to request retransmission or perform error concealment. While in brute force XML, priority assignment for a particular sample is determined at the authoring level, in syntactic based fragmentation, priority can depend on the nesting property of the XML content. Basically, a given element with many children can be deemed to be important and assigned a high priority. For example, in SVG, the "svg" element, which is denoted by the <svg> and </svg> tags are the outermost tags in an SVG, XML document, and hence have a large number of children. Therefore, a rule for assigning priority can be represented as follows: If $C(E)>T_i$ then mark E as P_i; where, C(E) denotes the number of children of element E, T_i is the threshold number used to demarcate a particular priority P_i, and $0<=i<=N$, where N is the total number of priorities that can be assigned to the fragment packets. In the event of packet loss, if the priority of the missing packet is high, the receiver can opt for retransmission rather than error concealment and vice-versa.

[0066] FIG. **13*a*** shows an RTP fragment packet **1328**, where the fragment header **1352** is comprised of a 2-bit, binary syntax identifier indicating syntax option 0, a nesting ID field **1362**, and a reserved field **1368**. FIG. **13*b*** shows an RTP fragment packet **1328**, where the fragment header **1328** is comprised of a 2-bit, binary syntax identifier indicating syntax option 1, nesting ID field **1362**, TotalFragmentsPerSample field **1366**, and a reserved field **1368**.

[0067] FIG. **9** shows a method of identifying a group of fragment packets in the event of packet loss utilizing syntactic XML fragmentation using nesting IDs: A content sample 1 is shown as being partitioned into five fragments, each of which is contained in RTP transport packets **900-940**, respectively. From the RTP sequence numbers a receiver can determine that the fourth RTP transport packet **930** is missing. From the nesting IDs for the third and fifth RTP transport packets **920** and **940**, the receiver can further infer that the missing RTP transport packet **930** belongs to content sample 1. Although retransmission could be used for the missing RTP transport packet **930**, it is also possible to apply error concealment and reconstruct an XML DOM correctly with balanced nested elements based on the nesting ID information associated with each of the RTP transport packets **900-940**. It should be noted that a value L can denote the number of RTP transport packets that are lost, where L equals the difference in RTP sequence numbers.

[0068] FIG. **10** shows another method of identifying a group of fragment packets in the event of packet loss utilizing syntactic XML fragmentation using nesting IDs: A content sample 1 is shown as being partitioned into three fragments, each of which is contained in RTP transport packets **1000-1020**, respectively. A content sample 2 is also shown, where the content sample 2 is partitioned into two fragments, each of which is contained in RTP transport packets **1030** and **1040**, respectively. From the RTP sequence numbers a receiver can determine that the fourth RTP transport packet **1030** is missing. From the nesting IDs for the fifth RTP transport packet **1040**, the receiver can infer