CLAIMS:

What is claimed is:

1. A method of point cloud coefficient coding, the method being performed by at least one processor, comprising:

decomposing transform coefficients associated with point cloud data into set-index values and symbol-index values, the symbol index-value specifying location of the transform coefficients with a set;

partitioning the decomposed transform coefficients into one or more sets based on the set-index values and the symbol-index values;

entropy-coding the set-index values of the partitioned transform coefficients;

bypass-coding the symbol-index values of the partitioned transform coefficients; and

compressing the point cloud data based on the entropy-coded set-index values and the bypass-coded symbol-index values,

wherein frequency values associated with the transform coefficients are stored in a cache or frequency-sorting based lookup table in a descending order, wherein a lowest set-index value is assigned to a transform coefficient having a greatest frequency value.

2. The method of claim 1, wherein the symbol-index values and the set-index values are signaled to indicate an alphabet-partition having associated boundary values based on one or more alphabet-partition types shared between an encoder and a decoder.

3. The method of claim 2, wherein the one or more alphabet-partitioning types are used for one or more level-of-detail layers corresponding to the transform coefficients.

4. The method of claim 2, wherein the one or more alphabet-partitioning types are used for one or more quantization parameters based on quantization of the transform coefficients.

5. The method of claim 2, wherein the one or more alphabet-partitioning types are used for one or more layers of scalability for signal-to-noise ratio-scalable coding based on correlations between the transform coefficients.

6. The method of claim 1, wherein the set-index values are coded by multi-symbol arithmetic coding.

7. An apparatus for point cloud coefficient coding, the apparatus comprising:

at least one memory configured to store computer program code; and

at least one processor configured to access the at least one memory and operate according to the computer program code, the computer program code comprising:

decomposing code configured to cause the at least one processor to decompose transform coefficients associated with point cloud data into set-index values and symbol-index values, the symbol index-value specifying location of the transform coefficient within a set;

partitioning code configured to cause the at least one processor to partition the decomposed transform coefficients into one or more sets based on the set-index values and the symbol-index values;

entropy-coding code configured to cause the at least one processor to entropy-code the set-index values of the partitioned transform coefficients;

bypass-coding code configured to cause the at least one processor to bypass-code the symbol-index values of the partitioned transform coefficients; and

compressing code configured to cause the at least one processor to compress the point cloud data based on the entropy-coded set-index values and the bypass-coded symbol-index values,

wherein frequency values associated with the transform coefficients are stored in a cache or frequency-sorting based lookup table in a descending order, wherein a lowest set-index value is assigned to a transform coefficient having a greatest frequency value.

8. The apparatus of claim 7, wherein the symbol-index values and the set-index values are signaled to indicate an alphabet-partition having associated boundary values based on one or more alphabet-partition types shared between an encoder and a decoder.

9. The apparatus of claim 8, wherein the one or more alphabet-partitioning types are used for one or more level-of-detail layers corresponding to the transform coefficients.

10. The apparatus of claim 8, wherein the one or more alphabet-partitioning types are used for one or more quantization parameters based on quantization of the transform coefficients.

11. The apparatus of claim 8, wherein the one or more alphabet-partitioning types are used for one or more layers of scalability for signal-to-noise ratio-scalable coding based on correlations between the transform coefficients.

12. The apparatus of claim 7, wherein the set-index values are coded by multi-symbol arithmetic coding.

13. A non-transitory computer-readable storage medium storing instructions configured to cause at least one processor to:

decompose transform coefficients associated with point cloud data into set-index values and symbol-index values, the symbol index-value specifying location of the transform coefficient in a set;

partition the decomposed transform coefficients into one or more sets based on the set-index values and the symbol-index values;

entropy-code the set-index values of the partitioned transform coefficients; and

bypass-code the symbol-index values of the partitioned transform coefficients; and

compress the point cloud data based on the entropy-coded set-index values and the bypass-coded symbol-index values,

wherein frequency values associated with the transform coefficients are stored in a cache or frequency-sorting based lookup table in a descending order, wherein a lowest set-index value is assigned to a transform coefficient having a greatest frequency value.

14. The computer-readable medium of claim 13, wherein the symbol-index values and the set-index values are signaled to indicate an alphabet-partition having associated boundary values based on one or more alphabet-partition types shared between an encoder and a decoder.

15. The computer-readable medium of claim 14, wherein the one or more alphabet-partitioning types are used for one or more level-of-detail layers corresponding to the transform coefficients.

16. The computer-readable medium of claim 14, wherein the one or more alphabet-partitioning types are used for one or more quantization parameters based on quantization of the transform coefficients.

17. The computer-readable medium of claim 14, wherein the one or more alphabet-partitioning types are used for one or more layers of scalability for signal-to-noise ratio-scalable coding based on correlations between the transform coefficients.