This device comprises:

- an extractor of data contained in packets belonging to a stream defined by a transmitter, a receiver and a protocol;
- a syntax analyzer arranged for:
  - receiving the data from the extractor in real time;
  - breaking down the data received into elements according to syntactic rules of said protocol, the syntactic rules making it possible to represent said elements as a tree structure, said tree structure being a data structure comprising a root data item and child data such that a child data item is only linked to a single higher-level parent data item, a data item having links to child data items being called a tree node and a data item with no child data item being called a leaf; and
  - associating respective tree state indicators with at least some of said elements, where the tree state indicator associated with an element labels said element in the tree structure; and
- an interface for transmitting the tree state indicators to a stream analyzer, together with the elements with which they have been associated.

[0013] In an embodiment of the device, the tree state indicator associated with an element comprises an identifier of a parent node of the tree structure to which is attached a site receiving said element in the tree structure representation. The syntax analyzer can be arranged for:

- allocating a node identifier to a current element if it is determined according to the syntactic rules that the current element is received, in the tree structure representation, at a site situated at a node of the tree structure; and
- including the node identifier allocated to the current element in the tree state indicator associated with said current element.

[0014] In an advantageous embodiment, the syntax analyzer is arranged

so as to contain in memory, for a given stream after transmission of an element and its associated tree state indicator, only each node identifier encountered when moving up the tree structure from the site receiving said element in the tree structure representation.

[0015] Another aspect of the invention relates to a system for monitoring streams in a data network using a packet transmission mode. This system comprises a data collection device such as defined above and a stream analyzer receiving the transmitted elements with the associated tree state indicators.

[0016] Yet another aspect of the invention relates to a method for monitoring streams in a data network using a packet transmission mode. The method comprises:

- extracting data contained in packets belonging to a stream defined by a transmitter, a receiver and a protocol;
- breaking down the data received into elements in real time, according to syntactic rules of said protocol, the syntactic rules making it possible to represent said elements according to a tree structure, said tree structure being a data structure comprising a root data item and child data such that a child data item is only linked to a single higher-level parent data item, a data item having links to child data items being called a tree node and a data item with no child data item being called a leaf;
- associating respective tree state indicators with at least some of said elements, where the tree state indicator associated with an element labels said element in the tree structure; and
- transmitting the tree state indicators to a stream analyzer, together with the elements with which they have been associated.

[0017] The method can comprise moreover the construction of at least a part of the tree structure, at the stream analyzer level, from the transmitted elements with the associated tree state indicators.

[0018] Other features and advantages of the present invention will become apparent in the following description of a non-limitative