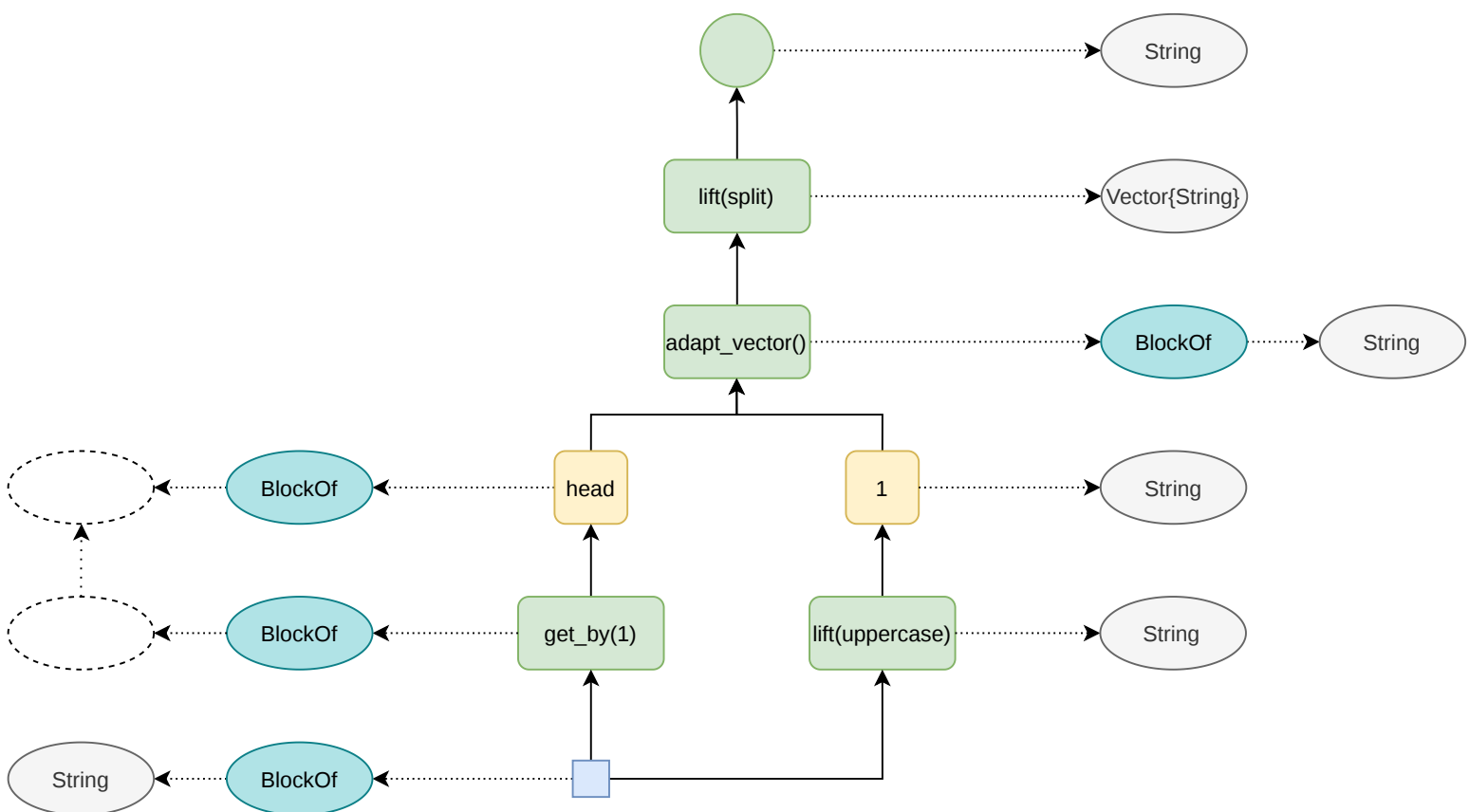




The diagram illustrates the transformation of a flat table into a hierarchical tree structure through four stages, connected by large gray arrows.

- Stage 1:** A flat table with two columns: an index column containing '1' and a data column containing 'Hello World'.
- Stage 2:** The data is split into two rows based on a hidden pivot point. The first row has index '1' and data '1'. The second row has index '2' and data '3'. A separate node contains the string array `String["Hello", "World"]`.
- Stage 3:** The data is further split. The first row has index '1' and data '1'. The second row has index '2' and data '3'. A separate node contains the string array `String["HELLO", "WORLD"]`. Below this, a separate node shows the result of a join operation: a table with index '1' and data 'HELLO', and index '2' and data 'WORLD'.
- Stage 4:** The final hierarchical tree structure. The root node branches into two children. The left child is a table with index '1' and data '1', and index '2' and data '2'. The right child is a table with index '1' and data '1'.



wrap()



chain\_of(tuple\_of(2), column(1))



sieve\_by()

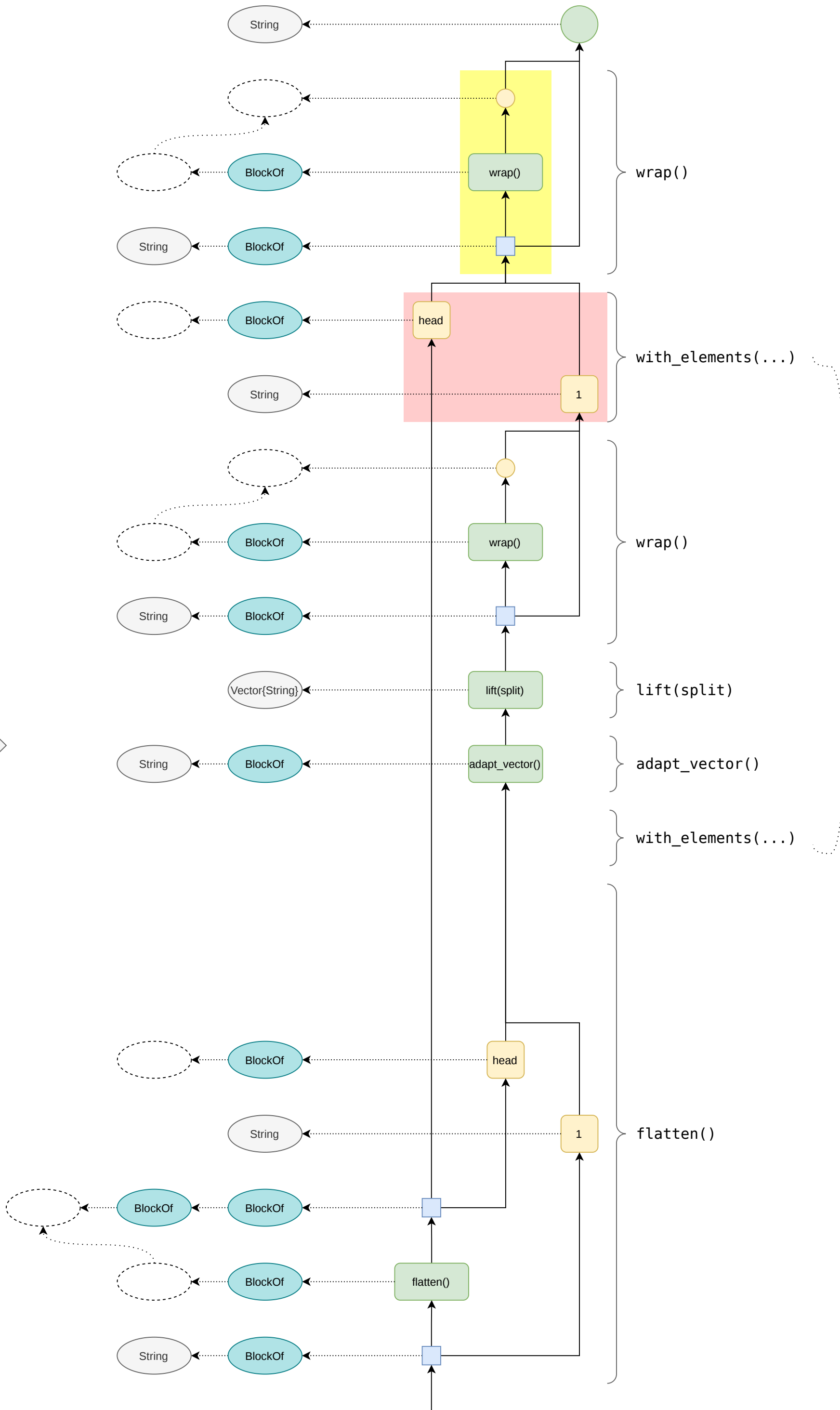


chain\_of(wrap(), block\_length())



@query "Hello World" split(it)

```
chain_of(  
  wrap(),  
  with_elements(  
    chain_of(  
      wrap(),  
      lift(split),  
      adapt_vector()),  
    flatten()  
  )  
)
```



untrace(n::NodeRef, guard::NodeRef)::Tuple{Pipeline,Vector{NodeRef}}







@query "Hello World" split(it)

```
chain_of(
  wrap(),
  with_elements(
    chain_of(
      wrap(),
      lift(split),
      adapt_vector()),
    flatten())
```







`untrace(n::NodeRef, guard::NodeRef)::Tuple{Pipeline,Vector{NodeRef}}`

$$\{it^2, (it^2)^3\}$$


```
untrace(n::NodeRef, guard::NodeRef)::Tuple{Pipeline, Vector{NodeRef}}
```

@query "Hello World" split(it)

```
chain_of(
  wrap(),
  with_elements(wrap()),
  with_elements(lift(split)),
  with_elements(adapt_vector()),
  flatten())
```

