Box and Pointer Diagrams

Draw the stack and heap diagram for the following code at the instant before the callMe method returns for the first time. Include a box for every activation record and object in memory and specify the value of every field with either a literal, null, or a pointer to the object it references. Don't forget the this field wherever it's appropriate. Entities on the stack should be on the left hand side of the page, and entities not on the stack should be on the right-hand side.

```
public class StringThing {
  public String[] tokens;
  public static void main(String[] args) {
    StringThing st = new StringThing();
    st.tokens = new String[5];
    st.tokens[2] = "Hello";
    st.tokens[0] = st.tokens[3];
    st.tokens[3] = "Goodbye";
    st.tokens = st.callMe(st.tokens, st.tokens[3]);
  }

  private String[] callMe(String[] sarray, String s) {
    if (s == null) {
      sarray[0] = "Hello";
      sarray[3] = new String("Hello");
      s = tokens[3];
    } else {
      String[] others = sarray;
      sarray = new String[4];
      tokens[1] = s;
      sarray[2] = others[1];
      tokens = callMe(sarray, others[0]);
    }

    return sarray;
  }
}
```