## 5. 生成器（Builder）

### Intent

封装一个对象的构造过程，并允许按步骤构造。

### Class Diagram

### Implementation

以下是一个简易的 StringBuilder 实现，参考了 JDK 1.8 源码。

public class AbstractStringBuilder {  
 protected char[] value;  
  
 protected int count;  
  
 public AbstractStringBuilder(int capacity) {  
 count = 0;  
 value = new char[capacity];  
 }  
  
 public AbstractStringBuilder append(char c) {  
 ensureCapacityInternal(count + 1);  
 value[count++] = c;  
 return this;  
 }  
  
 private void ensureCapacityInternal(int minimumCapacity) {  
 // overflow-conscious code  
 if (minimumCapacity - value.length > 0)  
 expandCapacity(minimumCapacity);  
 }  
  
 void expandCapacity(int minimumCapacity) {  
 int newCapacity = value.length \* 2 + 2;  
 if (newCapacity - minimumCapacity < 0)  
 newCapacity = minimumCapacity;  
 if (newCapacity < 0) {  
 if (minimumCapacity < 0) // overflow  
 throw new OutOfMemoryError();  
 newCapacity = Integer.MAX\_VALUE;  
 }  
 value = Arrays.copyOf(value, newCapacity);  
 }  
}

public class StringBuilder extends AbstractStringBuilder {  
 public StringBuilder() {  
 super(16);  
 }  
  
 @Override  
 public String toString() {  
 // Create a copy, don't share the array  
 return new String(value, 0, count);  
 }  
}

public class Client {  
 public static void main(String[] args) {  
 StringBuilder sb = new StringBuilder();  
 final int count = 26;  
 for (int i = 0; i < count; i++) {  
 sb.append((char) ('a' + i));  
 }  
 System.out.println(sb.toString());  
 }  
}

abcdefghijklmnopqrstuvwxyz

### JDK

* [java.lang.StringBuilder](http://docs.oracle.com/javase/8/docs/api/java/lang/StringBuilder.html)
* [java.nio.ByteBuffer](http://docs.oracle.com/javase/8/docs/api/java/nio/ByteBuffer.html#put-byte-)
* [java.lang.StringBuffer](http://docs.oracle.com/javase/8/docs/api/java/lang/StringBuffer.html#append-boolean-)
* [java.lang.Appendable](http://docs.oracle.com/javase/8/docs/api/java/lang/Appendable.html)
* [Apache Camel builders](https://github.com/apache/camel/tree/0e195428ee04531be27a0b659005e3aa8d159d23/camel-core/src/main/java/org/apache/camel/builder)