What is the type of a string literal in C++? [duplicate]

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For example, what is the type of the string literal `"Hello"`, `const char[6]` or `const char*` ?

`c++`   `string`   `types`

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asked Mar 19, 2013 at 18:56
Belloc
6,238 ●3 ●20 ●51

13 `const char[6]` . – juanchopanza Mar 19, 2013 at 18:56

1   what do you mean by saying "type"? – nabroyan Mar 19, 2013 at 18:56

1   @nabroyan In C++, every value has a type. OP wants to know the type of a string literal. – user529758 Mar 19, 2013 at 19:00

1   @H2CO3 I know that, but he answered his question right in his answer, so I taught that he means something else – nabroyan Mar 19, 2013 at 19:03

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2 Answers

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The type of the string literal `"Hello"` is "array of 6 `const char`".

> Ordinary string literals and UTF-8 string literals are also referred to as narrow string literals. A narrow string literal has type "array of *n* `const char`", where *n* is the size of the string [...]

It can, however, be converted to a `const char*` by array-to-pointer conversion. Array-to-pointer conversion results in a pointer to the first element of the array.

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answered Mar 19, 2013 at 18:57
Joseph Mansfield
104k ●18 ●230 ●311

This probably explains why this code shows a warning `C4172 returning address of local variable or temporary` for this function `const char* const& f() { return "hello"; }` in VS2010. Do you agree with this ? – **Belloc** Mar 19, 2013 at 19:02 ✏

1   @user1042389 The pointer resulting from the array-to-pointer conversion is a temporary object. You are returning a reference to that object, so that reference is left dangling. – Joseph Mansfield Mar 19, 2013 at 19:05

Where is the temporary ? "hello" exists in static memory ! – **Belloc** Mar 19, 2013 at 19:09

1   @user1042389 The **reference** to it is a temporary. – user529758 Mar 19, 2013 at 19:09

1   @user1042389 The *array* exists in static memory. The pointer that we get from array-to-pointer conversion is temporary. Just like if you have an `int x;` and do `(float)x` - the casted `float` is temporary. – Joseph Mansfield Mar 19, 2013 at 19:17 ✏

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The Standard defines it as an "array of n `const char`", so it's `const char[n]` (n is the size of the string, including the terminating NUL byte).

Section 7, § 2.14.15:

> A narrow string literal has type "array of n const char", where n is the size of the string as defined below, and has static storage duration.

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answered Mar 19, 2013 at 18:57
user529758

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