Why to use std::move despite the parameter is an r-value reference

Asked 3 years ago   Modified 2 years, 1 month ago   Viewed 2k times

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I am confused about using `std::move()` in below code:

If I uncomment line at (2) the output would be: `1 2 3` but if I uncomment line at (1) output would be nothing which means that move constructor of `std::vector` was called!

Why do we have to make another call to `std::move` at (1) to make move constructor of `std::vector` to be called?

What I understood that `std::move` get the `r-value` of its parameter so, why we have to get the `r-value` of `r-value` at (1)?

I think this line `_v = rv;` at (2) is more logical and should make `std::vector` move constructor to be called without `std::move` because `rv` itself is `r-value` reference in the first place.

```cpp
template <class T>
class A
{
public:
    void set(std::vector<T> & lv)
    {

    }
    void set(std::vector<T> && rv)
    {
        //_v = std::move(rv);        (1)
        //_v = rv;                   (2)
    }

private:
    std::vector<T> _v;
};

int main()
{
    std::vector<int> vec{1,2,3};
    A<int> a;

    a.set(std::move(vec));
    for(auto &item : vec)
        cout << item << " ";
    cout << endl;

    return 0;
}
```

`c++` `c++11` `c++14` `move` `stdmove`

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edited Feb 5, 2020 at 11:42
Ajay
17.4k ●10 ●51 ●96

asked Mar 1, 2019 at 20:12
Islam Abdeen
509 ●2 ●10

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Every named object is Lvalue ref about Lvalue:

> the name of a variable, a function, a template parameter object (since C++20), or a data member, regardless of type, such as std::cin or std::endl. **Even if the variable's type is rvalue reference, the expression consisting of its name is an lvalue expression**;

`vector` has two overloads of assignment operator, one for Lvalue reference and another for Rvalue reference.
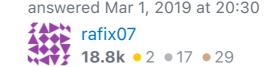
```cpp
vector::operator=(const vector&) // copy assignment operator
vector::operator=(vector&&) // move assignment operator
```
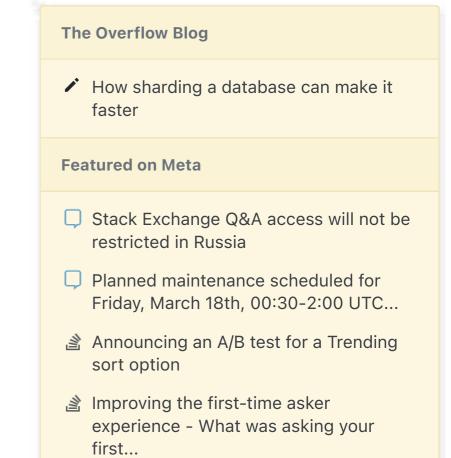
Overload which takes Lvalue reference is called when Lvalue is passed as argument for `operator=` . Details here

> when a function has both rvalue reference and lvalue reference overloads, the rvalue reference overload binds to rvalues (including both prvalues and xvalues), while the lvalue reference overload binds to lvalues

By `std::move(rv);` you cast `rv` - Lvalue to Rvalue reference, and `operator=` which takes Rvalue reference is called. Otherwise, Lvalue binds to Lvalue reference and vector is copied instead of being moved.

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answered Mar 1, 2019 at 20:30
rafix07
18.8k ●2 ●17 ●29

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