

## What is the difference between cout, cerr, clog of iostream header in c++? When to use which one?

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I tried researching the difference between `cout`, `cerr` and `clog` on the internet but couldn't find a perfect answer. I still am not clear on when to use which. Can anyone explain to me, through simple programs and illustrate a perfect situation on when to use which one?

I visited [this site](#) which shows a small program on `cerr` and `clog`, but the output obtained over there can also be obtained using `cout`. So, I'm confused over each one's exact use.

`c++` `iostream` `cout` `clog`

edited Aug 11 '17 at 7:30



[Kashif Faraz Shamsi](#)  
430 1 3 18

asked May 27 '13 at 12:04



[Arlene Batada](#)  
457 1 6 9

4 Each one has a computer-recognized stream, `stdout`, `stdin` (for `cin`), and `stderr` that it uses by default. I believe `clog` is just `cerr` with a buffering change. – [chris](#) May 27 '13 at 12:08

### 7 Answers

`stdout` and `stderr` are different streams, even though they both refer to console output by default. Redirecting (piping) one of them (e.g. `program.exe >out.txt`) would not affect the other.

Generally, `stdout` should be used for actual program output, while all information and error messages should be printed to `stderr`, so that if the user redirects output to a file, information messages are still printed on the screen and not to the output file.

answered May 27 '13 at 12:17



[riv](#)  
2,514 10 23

4 You don't even talk about `clog` .... – [void.pointer](#) Aug 11 '17 at 15:27

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Generally you use `std::cout` for normal output, `std::cerr` for errors, and `std::clog` for "logging" (which can mean whatever you want it to mean).

The major difference is that `std::cerr` is not buffered like the other two.

In relation to the old C `stdout` and `stderr`, `std::cout` corresponds to `stdout`, while `std::cerr` and `std::clog` both corresponds to `stderr` (except that `std::clog` is buffered).

answered May 27 '13 at 12:09



[Some programmer dude](#)  
255k 22 199 334

4 I think this is the best answer. – [Ren](#) Nov 30 '15 at 11:18

I've read that `clog` also outputs to `cerr`. So based on that, which one do you choose? If `clog` is normally for "logging", why would I want that to go to the error stream? Logs seem more like "normal logs" (a.k.a. `cout`) than errors. – [void.pointer](#) Aug 11 '17 at 15:27

@void.pointer As I said in my answer, both `cerr` and `clog` uses the standard "error" output, but `clog` is buffered which might be why it seems more like `cout`. Which one to pick for error output? Depends I guess, on more reasons than I can list and it has to be decided from case to case. – [Some programmer dude](#) Aug 11 '17 at 15:48

**cerr** does not require a buffer, so it is faster than the other ones and does not use the memory

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- Use **cerr** to show errors.
- Use **clog** for logging.

answered Jun 7 '15 at 15:41



David Vargas Carrillo

99 1 5

**Standard output stream (cout):** `cout` is the instance of the `ostream` class. `cout` is used to produce output on the standard output device which is usually the display screen. The data needed to be displayed on the screen is inserted in the standard output stream ( `cout` ) using the insertion operator ( `<<` ).

**Un-buffered standard error stream (cerr):** `cerr` is the standard error stream which is used to output the errors. This is also an instance of the `ostream` class. As `cerr` is **un-buffered** so it is used when we need to display the error message immediately. It does not have any buffer to store the error message and display later.

**Buffered standard error stream (clog):** This is also an instance of `ostream` class and used to display errors but unlike `cerr` the error is first inserted into a **buffer** and is stored in the buffer until it is not fully filled.

further reading : [basic-input-output-c](#)

answered Sep 12 '17 at 6:45



roottraveller

2,571 1 24 30

`cout` is usually used to display some statements on user screen. ex- :

```
cout<<"Arlene Batada";
```

output:

Arlene Batada

answered Sep 19 '17 at 14:43



Devendra singh

11 1

Both **cout** and **clog** are buffered but **cerr** is un-buffered and all of these are predefined objects which are instances of class `ostream`. The basic use of these three are **cout** is used for standard input whereas **clog** and **cerr** is used for showing errors. The main point why **cerr** is un-buffered is may be because suppose you have several outputs in the buffer and an error exception is mentioned in the code then you need to display that error immediately which can be done by **cerr** effectively.

Please correct me if I am wrong.

answered Aug 10 '17 at 14:30



Kashif Faraz Shamsi

430 1 3 18

The difference of these 3 streams is buffering.

1. With `cerr`, the output flushes
  - immediately (because `cerr` does not use buffer).
2. With `clog`, the output flushes
  - after you finish your current function.
  - explicitly call the function flush.
3. With `cout`, the output flushes
  - after you have call to any output streams (`cout`, `cerr`, `clog`).
  - after you finish your current function.
  - explicitly call the function flush.

Please check the following code, and run DEBUG through 3 lines: `f(std::clog)`, `f(std::cerr)`, `f(std::out)`, then open 3 output files to see what happened. You can swap these 3 lines to see what will happen.

```
#include <iostream>
#include <fstream>
#include <string>
```

```

std::cin.seekg(0, std::cin.beg); // seek to begin

std::string line;
while(std::getline(std::cin, line)) //input from the file in.txt
    os << line << "\n"; //output to the file out.txt
}

void test()
{
    std::ifstream in("in.txt");
    std::ofstream out("out.txt", err("err.txt"), log("log.txt"));
    std::streambuf *cinbuf = std::cin.rdbuf(), *coutbuf = std::cout.rdbuf(),
    *cerrbuf = std::cerr.rdbuf(),
    *clogbuf = std::clog.rdbuf();

    std::cin.rdbuf(in.rdbuf()); //redirect std::cin to in.txt!
    std::cout.rdbuf(out.rdbuf()); //redirect std::cout to out.txt!
    std::cerr.rdbuf(err.rdbuf());
    std::clog.rdbuf(log.rdbuf());

    f(std::clog);
    f(std::cerr);
    f(std::cout);

    std::cin.rdbuf(cinbuf);
    std::cout.rdbuf(coutbuf);
    std::cerr.rdbuf(cerrbuf);
    std::clog.rdbuf(clogbuf);
}

int main()
{
    test();
    std::cout << "123";
}

```

answered Nov 1 '17 at 4:47



Duc-Viet Ha

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