



A std::fs::path from bug to patch

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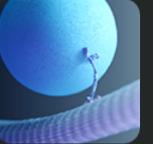
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Big and expensive scientific instrument



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 Start New Session in Bluelake

Software team: 9 people of 8 different nationalities across Europe and South America

- All with ASCII first names

Internal company testing with application scientists

- Still ASCII...

External beta program with customers

- No issues



We hired a Canadian

- He saved us on his first day of work

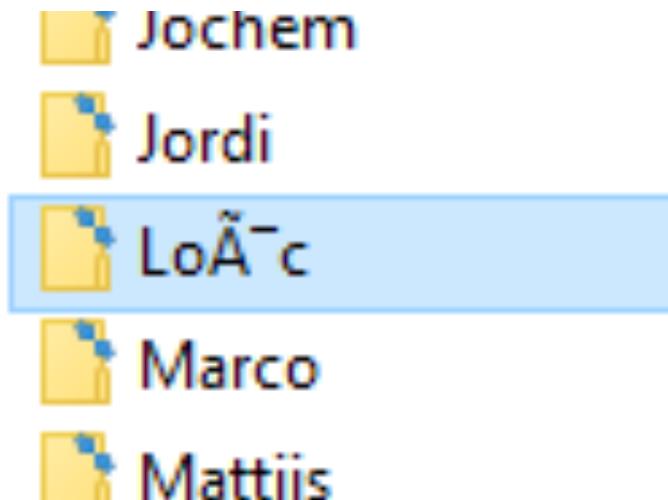
The UI:



The log:

```
[E] [10:02:02.123] TimeLine Database query error: No query Unable to fetch row  
[E] [10:02:02.145] TimeLine Database query error: No query Unable to fetch row  
[E] [10:02:02.146] TimeLine Database query error: No query Unable to fetch row  
[E] [10:02:02.147] TimeLine Database query error: No query Unable to fetch row  
[E] [10:02:02.148] TimeLine Database query error: No query Unable to fetch row  
[E] [10:02:02.149] TimeLine Database query error: No query Unable to fetch row  
[E] [10:02:02.149] TimeLine Database query error: No query Unable to fetch row  
[E] [10:02:02.150] TimeLine Database query error: No query Unable to fetch row  
[E] [10:02:02.151] TimeLine Database query error: No query Unable to fetch row  
[E] [10:02:02.242] TimeLine Database query error: No query Unable to fetch row
```

The filesystem:



Oh, right, unicode.

Stack

- Qt QML: **utf-8**
- Python: **utf-8**
- C++: `\u(ツ)/*`

(This was before `char8_t`)

```
// What we wrote
auto bug = std::filesystem::path(utf8_name_from_ui);
// What we should have written
auto works = std::filesystem::u8path(utf8_name_from_ui);
```

Guideline

In our codebase, don't use this:

```
std::filesystem::path
```

Use this instead:

```
std::filesystem::u8path
```

clang-tidy

We use clang-tidy extensively.
We've never written a custom clang-tidy rule.
There's a learning curve.

Wrap it

```
class OurPath {  
|   std::filesystem::path m_value;  
  
public:  
    // implement 80-ish things  
};
```

Inherit

```
class OurPath : public std::filesystem::path {  
public:  
    // evil  
};
```

Back to a guideline

In our codebase, don't use this:

`std::filesystem::path`

Use this instead:

`OurPath`

```
# Patch C++'s <filesystem> to deprecate unicode-unsafe implicit conversions
RUN patch -p1 /usr/include/c++/$GCC_VERSION/bits/fs_path.h fs_path.patch
```

```
diff --git a/fs_path.h b/fs_path.h
index ad2518f..9642f82 100644
--- a/fs_path.h
+++ b/fs_path.h
@@ -276,12 +276,14 @@ namespace __detail
    _M_cmpts(std::move(_p._M_cmpts))
    { _p.clear(); }

+ [[deprecated("Implicit string conversion is not unicode-safe. Use `u8path()` instead.")]]
path(string_type&& __source, format = auto_format)
: _M_pathname(std::move(__source))
{ _M_split_cmpts(); }
```



```
error: 'path' is deprecated: Implicit string conversion is not unicode-safe. Use
`u8path()` instead. [-Werror,-Wdeprecated-declarations]
    return root / (name + ".json");
                           ^
```

We patched a std library header as a cheap alternative
to clang-tidy.

This is terrible.
Don't do this.

(It worked perfectly.)