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How to implement Error::cause properly?

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I have a problem implementing the `Error` trait. I want to wrap an error from Diesel or another database driver. I didn't even get close to implementing `From` since I'm already failing at implementing `Error`. The line that causes the code not to compile is the one at the very end of the code block.

```
use std::fmt;
use std::error::{self, Error};

#[derive(Debug)]
pub enum MyError {
    NotFound(String),
    PersistenceError(Box<Error + Send + Sync>),
}

pub type MyResult<T> = Result<T, MyError>;

impl fmt::Display for MyError {
    fn fmt(&self, f: &mut fmt::Formatter) -> fmt::Result {
        match *self {
            MyError::NotFound(ref msg) => write!(f, "Not found: {}", msg),
            MyError::PersistenceError(ref cause) => write!(f, "Persistence error: {}", cause),
        }
    }
}

impl Error for MyError {
    fn description(&self) -> &str {
        match *self {
            MyError::NotFound(ref msg) => msg,
            MyError::PersistenceError(ref cause) => cause.description(),
        }
    }

    fn cause(&self) -> Option<&Error> {
        match *self {
            MyError::NotFound(_) => None,
            // '*cause' does not live long enough
            MyError::PersistenceError(cause) => Some(&*cause),
        }
    }
}
```

I also tried:

```
*cause does not live long enough
```

```
MyError::PersistenceError(cause) => Some(&*cause),
```

```
the trait core::marker::Sized is not implemented for the type std::error::Error + Send + Sync + 'static [E0277]
```

```
MyError::PersistenceError(ref cause) => Some(cause),
```

```
the trait std::error::Error is not implemented for the type `&Box
```

```
MyError::PersistenceError(ref cause) => Some(&cause)
```

But none of these worked.

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edited Mar 23 '16 at 17:40



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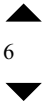
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It is useful to [print the type of variables](#) in cases like this:

```
match *self {  
  MyError::NotFound(_) => None,  
  MyError::PersistenceError(ref cause) => {  
    let () = cause;  
  },  
}
```

This will tell you that `cause` is a `&Box<std::error::Error + Send + Sync>`.

If we dereference it once, we will have a `Box<std::error::Error + Send + Sync>` and if we dereference it a second time we will have a `std::error::Error + Send + Sync` (this isn't a real type). We can then take another reference which can be implicitly made into an `&Error`:

```
match *self {  
  MyError::NotFound(_) => None,  
  MyError::PersistenceError(ref cause) => Some(&**cause),  
}
```

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edited May 23 '17 at 12:30



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