Subject: Unable to Compile ScatterCtrl Example on Debian 12 (ARM64, Clang 18) -- Eigen Package Error
Posted by nikitha_k on Mon, 13 Oct 2025 18:34:47 GMT
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Hello everyone,

I'm currently working on Debian GNU/Linux 12 (Bookworm) with the ARM64 architecture and Clang 18. While most of my projects compile and run successfully, I'm encountering an issue when trying to build the ScatterCtrl example program.

The build process fails with an error related to the Eigen package.

Has anyone faced a similar issue or know how to resolve this problem? Any suggestions or guidance would be greatly appreciated.

Subject: Re: Unable to Compile ScatterCtrl Example on Debian 12 (ARM64, Clang 18) -- Eigen Package Error
Posted by koldo on Tue, 14 Oct 2025 09:09:07 GMT
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Thank you for the report.

plugin/Eigen is just updated to the latest stable version 5.0.0 (09/10/2025).
Please check if this solves the problem. It happens in ARM64 architecture, that I cannot test.

Subject: Re: Unable to Compile ScatterCtrl Example on Debian 12 (ARM64, Clang 18) -- Eigen Package Error
Posted by koldo on Wed, 15 Oct 2025 06:21:34 GMT
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Hi Nikitha

The problem seems to be that when building Eigen on ARM platforms with NEON enabled, compilation fails with errors like:
error: unknown type name 'float32x4_t'; did you mean 'Upp::float32x4_t'?
/usr/lib/llvm-18/lib/clang/18/include/arm_vector_types.h: note: 'Upp::float32x4_t' declared here
This happens whenever Eigen includes <arm_neon.h> after U++ headers are already processed.
U++ wraps many system headers inside the Upp namespace -- including <arm_neon.h> and <arm_vector_types.h> -- so NEON vector types like float32x4_t and intrinsics like vdupq_n_f32 are declared as Upp::float32x4_t, not in the global namespace.
However, Eigen expects these NEON types and intrinsics to exist in the global namespace, so it can't find them.
The easy solution would be including Eigen before U++ headers. Unfortunately this breaks the #define eigen_assert(x) ASSERT(x) in Eigen.h that links Eigen assertions with U++ ones.

The fix that is being implemented is to re-export NEON types and intrinsics from U++ into the global namespace before including Eigen headers.
This is done doing this in Eigen.h:

```
#ifdef CPU_NEON
namespace {
   using Upp::float32x2_t;
   using Upp::float32x4_t;
   using Upp::int8x8_t;
...
```

Thank you for your patience and support.

Subject: Re: Unable to Compile ScatterCtrl Example on Debian 12 (ARM64, Clang 18) -- Eigen Package Error
Posted by koldo on Thu, 16 Oct 2025 07:16:50 GMT
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Hi to all

I just wanted to say that the problems with ARM NEON have been resolved.
Nikitha not only detected them, but also helped a lot to solve them.
Thank you very much.

Subject: Re: Unable to Compile ScatterCtrl Example on Debian 12 (ARM64, Clang 18) -- Eigen Package Error
Posted by nikitha_k on Thu, 16 Oct 2025 08:58:50 GMT
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Thanks Iñaki,

I'm glad to contribute to fix the bug, Also thanks for your support.

Regards,
Nikitha K
