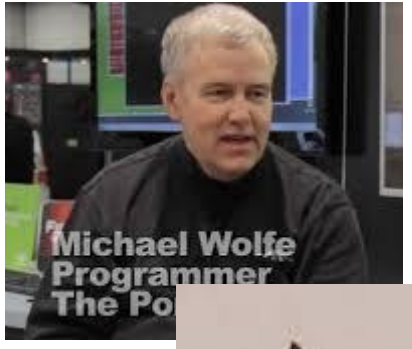
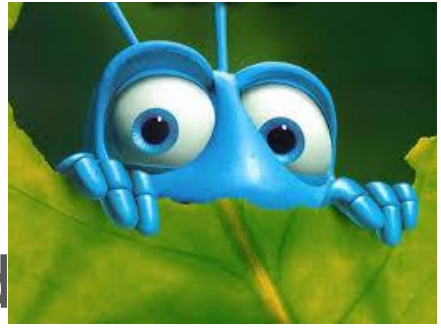
UDELHACK16 - Day3

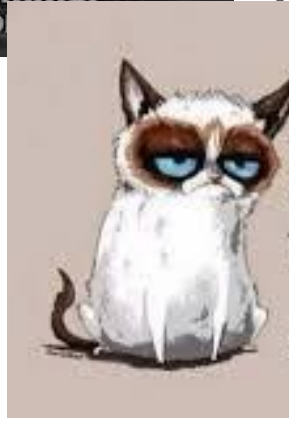
The pit of despair continues……..



99 little bugs in the compiler,
99 little bugs in the compiler,



Take one down, patch it around



127 little bugs in the compiler

Finally on the GPU!

```
==29734== Profiling application: ./Benchmark_dwf
==29734== Profiling result:
Time(%)      Time     Calls       Avg       Min       Max  Name
 65.07%  532.32us       100  5.3230us  5.2800us  6.2080us  Grid::QCD::WilsonFermion5D<Grid::QCD:
:WilsonStencil<Grid::iScalar<Grid::iVector<Grid::iVector<Grid::Grid_simd<std::complex<float>, Gr
id::Optimization::u128f>, int=3>, int=4>>, Grid::iScalar<Grid::iVector<Grid::iVector<Grid::Grid_
simd<std::complex<float>, Grid::Optimization::u128f>, int=3>, int=2>>>& Grid::QCD::WilsonImpl<Gr
id::Grid_simd<std::complex<float>, Grid::Optimization::u128f>, int=3>(Grid::LebesgueOrder&, Grid
<Grid::iScalar<Grid::iMatrix<Grid::Grid_simd<std::complex<float>, Grid::Optimization::u128f>, in
t=3>>, int=8>::iVector&)>::DhopInternalCommsThenCompute
 34.93%  285.77us       100  2.8570us  2.5920us  3.7450us  [CUDA memcpy HtoD]

==29734== API calls:
Time(%)      Time     Calls       Avg       Min       Max  Name
 58.71%  282.37ms         1  282.37ms  282.37ms  282.37ms  cuDevicePrimaryCtxRetain
 20.40%  98.129ms         1  98.129ms  98.129ms  98.129ms  cuDevicePrimaryCtxRelease
 12.49%  60.075ms         1  60.075ms  60.075ms  60.075ms  cuMemHostAlloc
  5.39%  25.946ms         1  25.946ms  25.946ms  25.946ms  cuMemFreeHost
  1.28%  6.1696ms         1  6.1696ms  6.1696ms  6.1696ms  cuModuleLoadData
  0.67%  3.2314ms       100  32.314us  15.501us  663.76us  cuLaunchKernel
  0.37%  1.7852ms       100  17.852us  9.6390us  73.042us  cuMemcpyHtoDAsync
  0.29%  1.4015ms       200  7.0070us  5.4180us  20.265us  cuStreamSynchronize
  0.25%  1.1923ms         1  1.1923ms  1.1923ms  1.1923ms  cuMemAllocHost
  0.12%  568.99us         2  284.49us  279.86us  289.13us  cuMemAlloc
  0.01%  53.904us         1  53.904us  53.904us  53.904us  cuStreamCreate
  0.00%  19.117us         4  4.7790us     480ns  17.192us  cuModuleGetFunction
  0.00%  5.9650us         2  2.9820us     391ns  5.5740us  cuMemFree
  0.00%  5.7140us         2  2.8570us  1.2230us  4.4910us  cuDeviceGetCount
  0.00%  5.5770us         2  2.7880us  1.5000us  4.0770us  cuCtxSetCurrent
  0.00%  2.7940us         2  1.3970us  1.3430us  1.4510us  cuDeviceGet
  0.00%  1.2100us         1  1.2100us  1.2100us  1.2100us  cuDeviceComputeCapability
  0.00%     742ns         1     742ns     742ns     742ns  cuCtxGetDevice
```

What it takes:

- “Comment and conquer”
- Main function body commented out.
- No data managment

```
#pragma acc routine seq
template<class Impl>
void WilsonKernels<Impl>::DiracOptDhopSite(StencilImpl &st,DoubledGaugeField &U,
                      Vector<SiteHalfSpinor>  &buf,
                      int sF,int sU,const FermionField &in, FermionField &out)
{
  SiteHalfSpinor  tmp;
  SiteHalfSpinor  chi;
  SiteHalfSpinor *chi_p;
  SiteHalfSpinor Uchi;
  SiteSpinor result;
  StencilEntry *SE;
  int ptype;
  ////////////////////////////
  // Xp
  ////////////////////////////
  SE=st.GetEntry(ptype,Xm,sF);

#if 0
  if ( SE->_is_local ) {
    chi_p = &chi;
    if ( SE->_permute ) {
      spProjXp(tmp,in._odata[SE->_offset]);
      permute(chi,tmp,ptype);
    } else {
      spProjXp(chi,in._odata[SE->_offset]);
    }
  } else {
    chi_p=&buf[SE->_offset];
  }
```

On the Bright Side……

- Met the goal we set yesterday:

Mathew Colgrove
To: Meifeng Lin, Mathias Wagner Cc: Zhihua Dong, Christopher Kelly, Chulwoo Jung
RE: pgc++-Fatal ... TERMINATED signal 11

Logged as TPR#22527

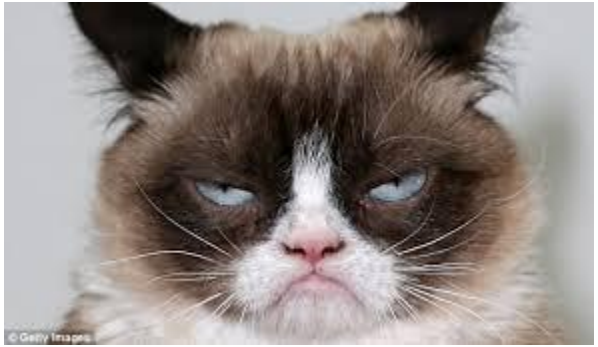
Mathew Colgrove
To: Meifeng Lin Cc: Zhihua Dong, Christopher Kelly, Chulwoo Jung, Mathias Wagner
RE: memmove error (possible duplication)

I have this reported as TPR#22509.

Mathew Colgrove
To: Mathias Wagner Cc: Zhihua Dong, Christopher Kelly, Meifeng Lin, Chulwoo Jung
RE: llvm bug, expected =

Reported as TPR#22525.

+3 more bugs reported!



Goals:

- Continue to report compiler bugs;
  Every bug brings us a step closer (or 28 steps further..) from compiling code.
- See if we can find *something* that will compile with acc in Grid.
- Alternative: find another, simpler c++ application to work with.