BLAS Interface for Different Precisions

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• BLAS Technical Forum defined
  Extended and Mixed Prevision BLAS
    ▪ Single, Double, Indigenous, Extra
    ▪ BLAS_ZGEMM with argument PREC
Nvidia 16 bit BLAS

- `cublasHgemm()` has been added to support half-precision floating point (FP16).

- Nvidia’s P100
  - 5.3 TeraFLOPS double-precision performance
  - 10.6 TeraFLOPS single-precision performance
  - 21.2 TeraFLOPS half-precision performance
Compiler Support?

• gcc support __fp16 type
  ▪ but only as storage type - to compute they cast to float, etc
Proposing Something Along the Lines of...

- **RGEMM_xx** and **CGEMM_xx**
  - With the same calling sequence as SGEMM and CGEMM

- **RGEMM_32** is equivalent to **SGEMM**
- **RGEMM_64** is equivalent to **DGEMM**
- **RGEMM_16** would be the 16-bit floating point version of GEMM.

- **RGEMM_128** etc.
- **Arbitrary? RGEMM_12**