What is Brook+?

**Brook** is an extension to the C-language for stream programming originally developed by Stanford University.

**Brook+** is an implementation by AMD of the Brook GPU spec on AMD's compute abstraction layer with some enhancements.
Example

```c
kernel void sum(float a<>, float b<>, out float c<>)
{
    c = a + b;
}

int main(int argc, char** argv)
{
    int i, j;
    float a<10, 10>;
    float b<10, 10>;
    float c<10, 10>;

    float input_a[10][10];
    float input_b[10][10];
    float input_c[10][10];

    for(i=0; i<10; i++) {
        for(j=0; j<10; j++) {
            input_a[i][j] = (float) i;
            input_b[i][j] = (float) j;
        }
    }

    streamRead(a, input_a);
    streamRead(b, input_b);
    sum(a, b, c);
    streamWrite(c, input_c);
...}
```
Brook+ Compiler

Converts Brook+ files into C++ code. Kernels, written in C, are compiled to AMD’s IL code for the GPU or C code for the CPU.
Brook+ Runtime

IL code is executed on the GPU. The backend is written in CAL.
Brook+ Features

Brook+ is an extension to the Brook for GPUs source code.

Features of Brook for GPUs relevant to modern graphics hardware are maintained.

Kernels are compiled to AMD’s IL.

Runtime uses CAL for the GPU backend.

Original CPU backend also included.
Folding@Home Stats

Folding@Home client using Brook+

Currently 39 TFLOPS on 664 GPU clients

Avg. **60 GFLOPS** per GPU client

Compared to:

Avg. 25 GFLOPS per PS3 client

Avg. 1 GFLOPS per CPU client
Brook+ Release

Brook+ package:
- Compiler and runtime binaries
- Source code and build environments
- Sample applications

Source code released under the BSD License.

Project will also reside on SourceForge.net.
Brook+ Moving Forward

Double precision - FireStream 9170

Mem-export (scatter)

Graphics API interoperability

Multi-GPU support

Other operating systems (Linux, Vista, 64-bit)
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