API

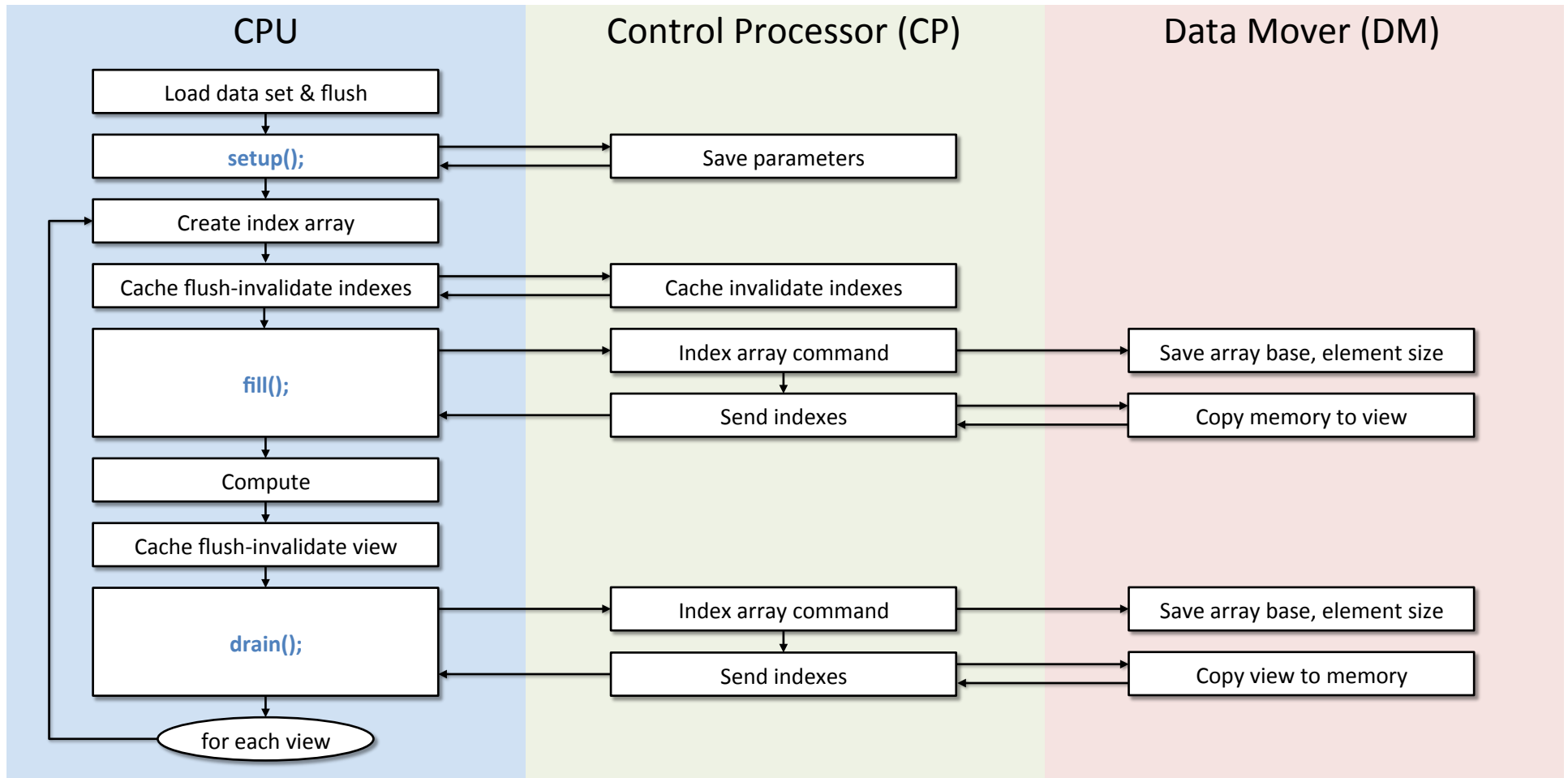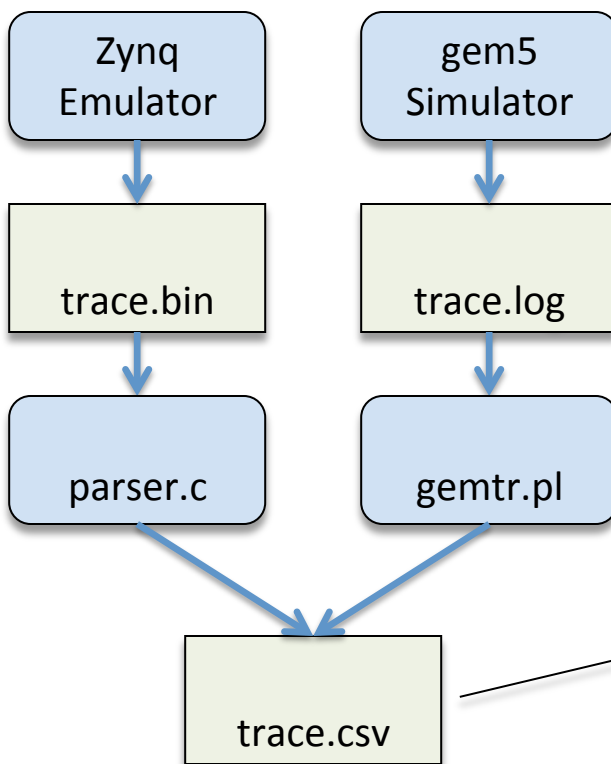|	

setup	**Specify the location and size of application data structures and other parameters for gather/scatter**
	
	/* ImageDiff: Specify image location, dimensions, and decimation factor */
	void setup(void *ref, size_t ref_width, size_t ref_height, size_t elem_sz, size_t decimate);
	/* PageRank, RandomAccess, SpMV: Specify reference table and index array */
	void setup(void *ref, size_t elem_sz, const void *index, size_t len);

fill	**Copy from DRAM to the buffer according to the access pattern established during setup** /* Specify view and window offset */ void fill(void *buf, size_t buf_sz, size_t offset);
drain	**Copy from the buffer into DRAM according to the access pattern established during setup** /* Specify buffer and window offset */ void drain(void *buf, size_t buf_sz, size_t offset);

Control flow for gather-scatter operations

CPU	Control Processor (CP)	Data Mover (DM)
Load data set & flush		
setup();	Save parameters	
Create index array		
Cache flush-invalidate indexes	Cache invalidate indexes	
fill();	Index array command	Save array base, element size
	Send indexes	Copy memory to view
Compute		
Cache flush-invalidate view		
drain();	Index array command	Save array base, element size
	Send indexes	Copy view to memory
for each view		

Trace Capture

```
Zynq
Emulator
```

```
gem5
Simulator
```

```
trace.bin
```

```
trace.log
```

```
parser.c
```

```
gemtr.pl
```

```
trace.csv
```

```
0,R,0x40101520,32,29,2131065
0,R,0x7f186b20,32,30,2131091
1,R,0x40185060,8,0,2132263
1,R,0x40185080,8,0,2132270
…
1,W,0x40000030,8,2,2132548
1,W,0x40000034,8,2,2132554
1,R,0x40185260,8,0,2132571
1,R,0x40185280,8,0,2132575
1,W,0x40000038,8,2,2132577
1,W,0x4000003c,8,2,2132581
```

Trace format by column
1) CPU=0 / Accelerator=1
2) Read/Write
3) Address
4) Transaction size in bytes
5) AXI ID
6) Time stamp