CHAPTER 22

Advanced practices and future evolution

CPU Code

```
void sortfile(FILE *fp, int N) {
  char *data;
  data = (char *)malloc(N);

  fread(data, 1, N, fp);

  qsort(data, N, 1, compare);


  use_data(data);

  free(data);
}
```

CUDA 6 Code with Unified Memory

```
void sortfile(FILE *fp, int N) {
  char *data;
  cudaMallocManaged(&data, N);

  fread(data, 1, N, fp);

  qsort<<<...>>>(data,N,1,compare);
  cudaDeviceSynchronize();

  use_data(data);

  cudaFree(data);
}
```

FIGURE 22.1

Unified memory simplifies porting of CPU code (left) to CUDA code (right).

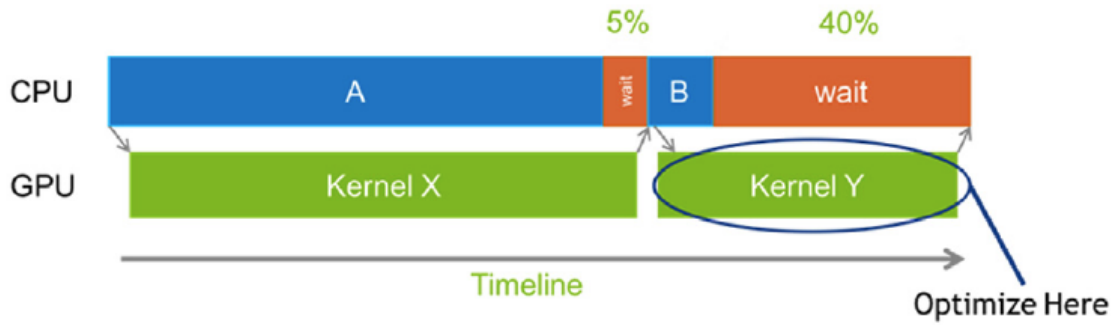

FIGURE 22.2

Importance of critical path analysis for identifying the key kernels to optimize.

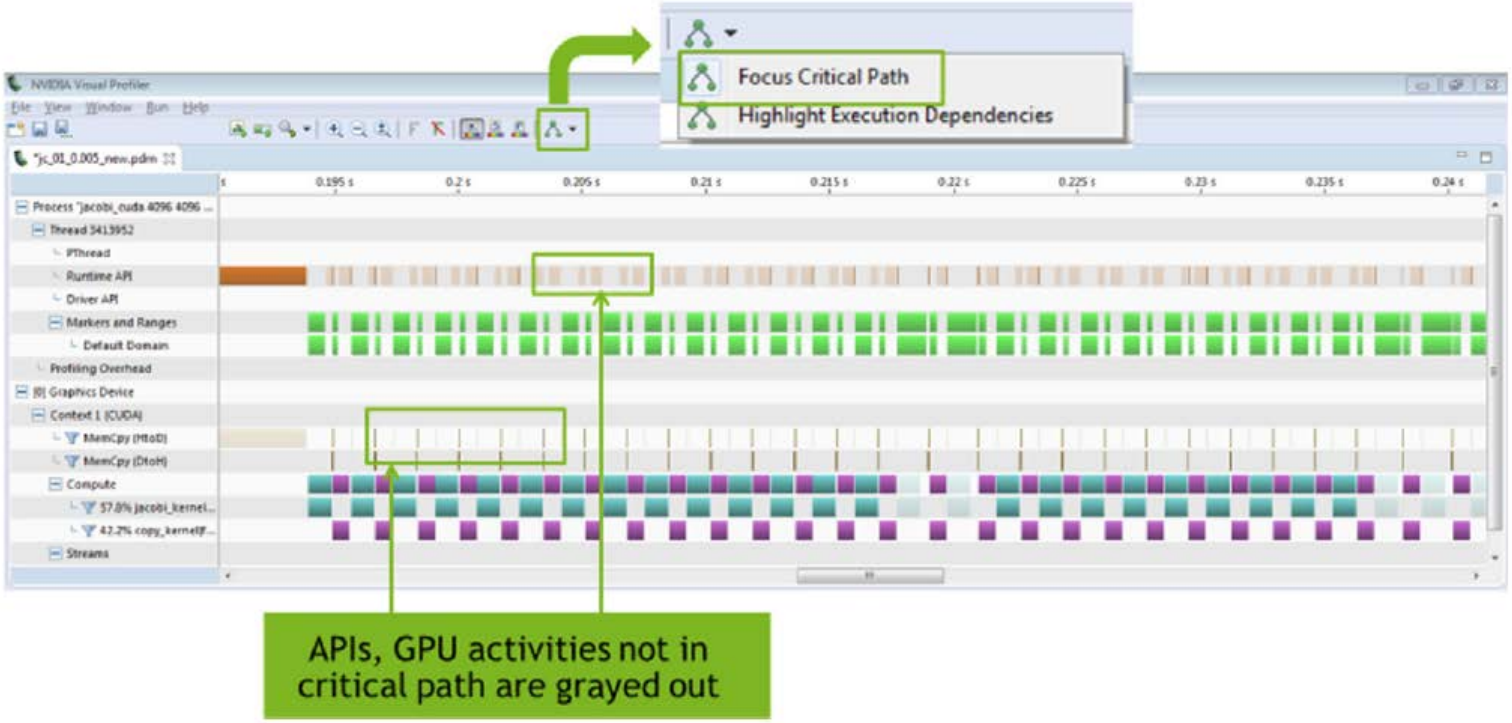

FIGURE 22.3

Application critical path analysis in CUDA 8 Visual Profiler.