Processes and Threads

CS 241

Sept. 27, 2013

fork() Example

```
void main() {
    int i = 0;
    for (i = 0; i < 10; i++)
        if (!fork())
            break;
}
```

What makes up a process?

- Operating systems manage processes in a structure called a **process control block** (PCB). Includes:
  - Identification information
  - Runtime information
  - Accounting information

Threads

- The purpose of a process is to act as a container of **threads**.
  - Threads are the “computational engine” of the process: ***they run code***!
  - At startup:

What makes up a threads?

- Operating systems manage threads in a structure called a **thread control block** (TCB). Includes:
  - Identification information
  - Runtime information
  - Accounting information

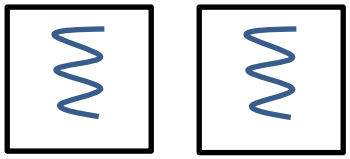
Modeling a Thread/Process

- To understand the interactions of thread, processes are modeled using a state diagram.
  - For a process with only one thread, this also models the entire process

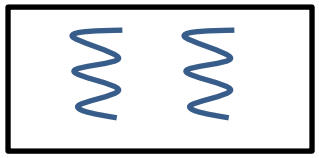
- Two-State Model:

Five-State Model

Two process, each with 1 thread



One process with two threads



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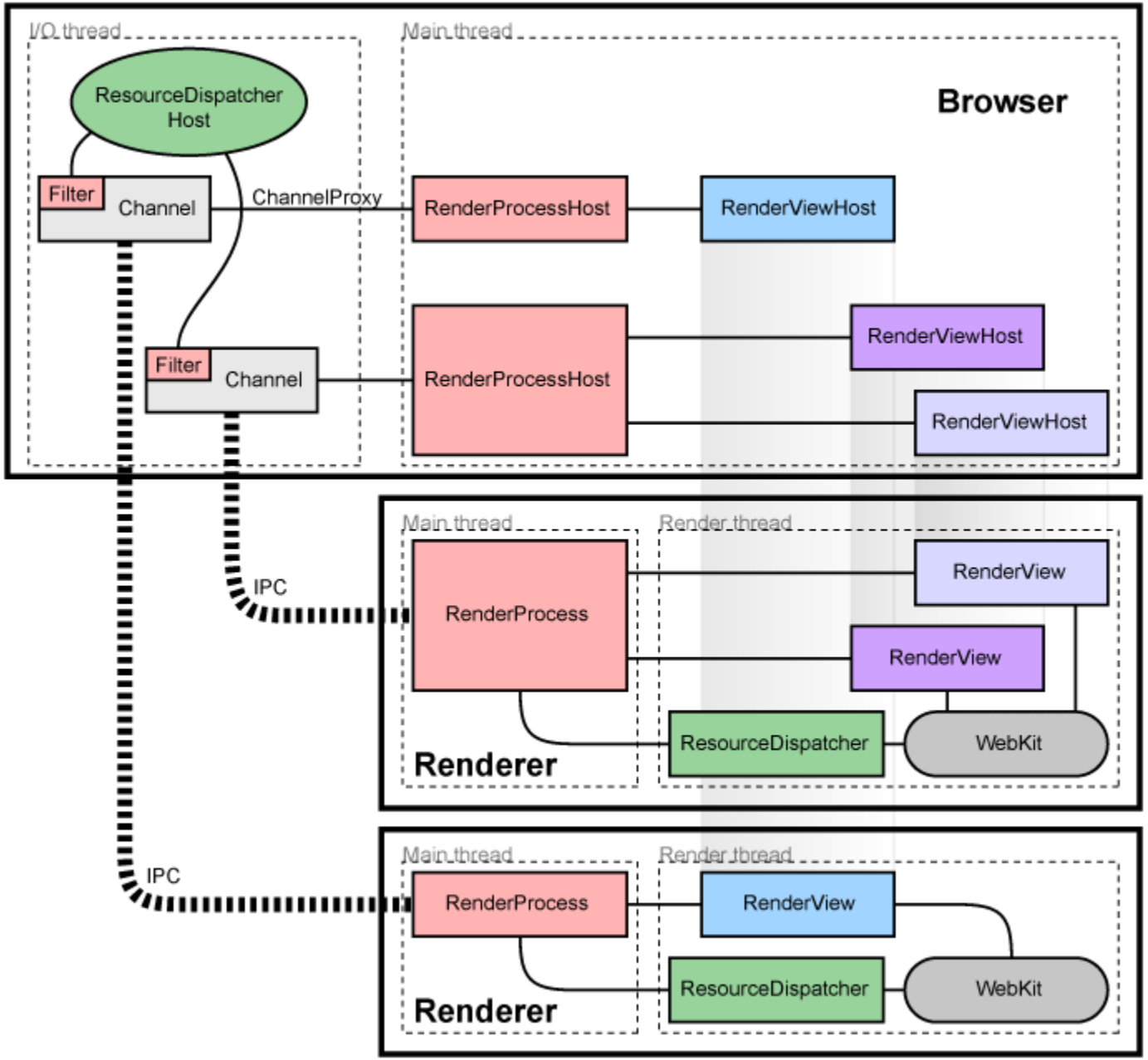

Image: http://www.chromium.org/developers/design-documents/multi-process-architecture