

**A Self-Adapting Web Server
Architecture:
Towards Higher Performance and Better Utilization**
(Part II)

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Review

- ❖ **Macro vs. Micro Performance**
- ❖ **Concurrency through:**
 1. **Asynch. system calls**
 2. **Multiple instances of server**
- ❖ **The two original architectures**

Agenda

- 1. Objectives**
- 2. Literature Review**
- 3. Issues**
- 4. The Self-Adapting Model**
- 5. Conclusion**

Objectives

- 1. Survey existing architectures**
- 2. Propose a new model**
 - **Dynamic and flexible**
 - **Utilizes resources better**
 - **Efficient with available system calls**
 - **Provides higher performance**

Literature Review

1) **Modify other internal aspects**

- **Increase cache locality (2001)**
- **Multi-accept (2001, 2004)**

Literature Review

2) Hybrid architectures

- **AMPED (1999)**
- **SEDA (2001)**
- **HYBRID (2005)**
- **SYMPED (2007)**

Literature Review

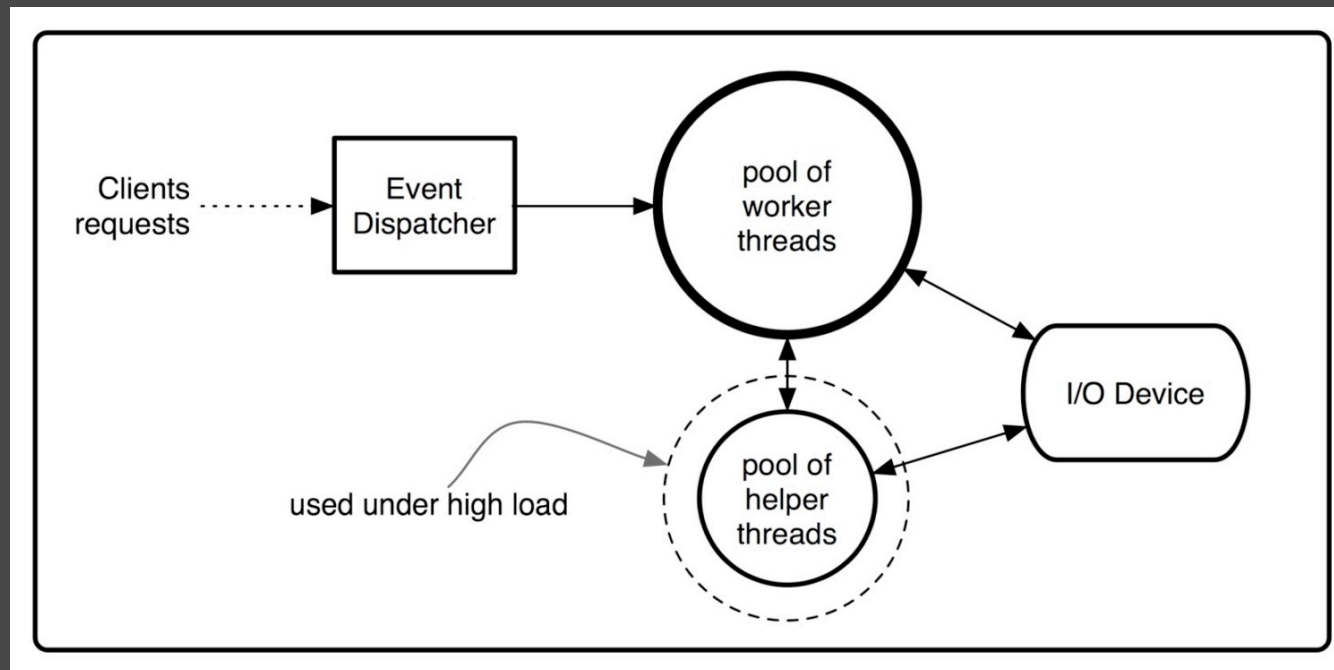
3) Replacement libraries

- **Capriccio (2001)**
- **Lazy Asynchronous I/O (2004)**

Issues

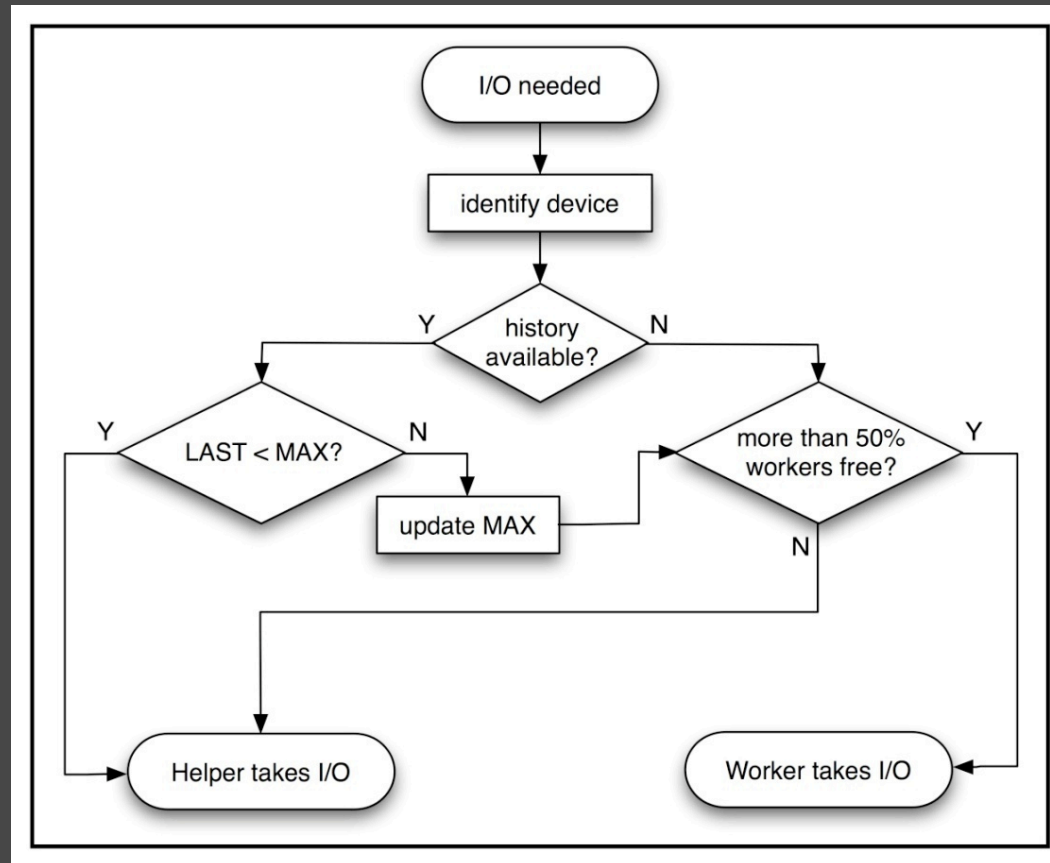
- ❖ **Still room for improvement**
- ❖ **Efficiency with available system calls**
- ❖ **Expensive scenarios exist**
- ❖ **Need for adaptability**

The Self-Adapting Model



Either worker or helper threads can perform I/O, whichever is less expensive

The Self-Adapting Model



The algorithm for the proposed model

The Self-Adapting Model

- 1) Survey (complete)**
- 2) Algorithm (complete)**
- 3) Simulation (in progress)**
 - **Flash (AMPED)**
 - **Capriccio**
 - **Hybrid 05**
- 4) Evaluation**
 - **HTTPerf**
 - **Profiling**

Conclusion

- ❖ **Adaptability is needed:**
 - **Opens up the door for new ideas**
 - **Provides flexible operation**
 - **Better utilizes resources**
 - **Provides a more logical scenario**
 - **Can (hopefully) improve performance**
- ❖ **Relax current limitations in system calls**