What is an Operating System?

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Quantums

Two Kinds of Quantums Make Up the Universe

Bosons and Fermions
Fundamental Interactions

4 Interactions That Are Running the Universe

- Strong
- Weak
- Electromagnetic
- Gravitation
Complexity of a Computer

- Intel Xeon Processors Have 2,600,000,000 Transistors
- Elizabeth Bradley Found that Computer Systems Show Chaotic Behavior like Nature
Complexity of a Computer
Overcoming Complexity

- An **Application Developer** Can Not Handle This Complexity
- A pianist would not want to build a piano whenever she plays
- Notion of **Abstraction**
- How do you drive a car **without** understanding mechanical engineering?
Overcoming Complexity

- We Need Well-Founded Laws for Our Computers to Follow
- Operating Systems
  - Abstract underlying hardware details by defining quantums
  - Manage interactions between quantums