Introduction

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Chapter 1

Fundamentals

1.1 Eight Great Ideas

- Design for Moore's Law
- Use abstraction to simplify design
- Make the common case fast
- Performance via parallelism
- Performance via pipelining
- Performance via prediction
- Hierarchy of memories
- Dependability via redundancy

1.1.1 Design for Moore's Law

1.1.2 Abstraction

1.1.3 Semiconductors

Definition 1.1.1: Semiconductor

A material that has an electrical conductivity between that of a conductor and an insulator.

Definition 1.1.2: P-Type

A semiconductor material that has been doped with an electron acceptor element. This creates a material that has a net positive charge.

Definition 1.1.3: N-Type

A semiconductor material that has been doped with an electron donor element. This creates a material that has a net negative charge.

Definition 1.1.4: PNP Transistor

A type of transistor that consists of a layer of N-type semiconductor between two layers of P-type semiconductor.

Definition 1.1.5: NPN Transistor

A type of transistor that consists of a layer of P-type semiconductor between two layers of N-type semiconductor.

Semiconductors are used in the construction of transistors, which are the building blocks of modern computers. Transistors are made up of three parts:

- Gate
- Drain
- Source