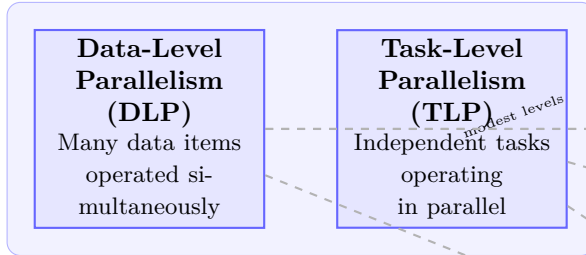
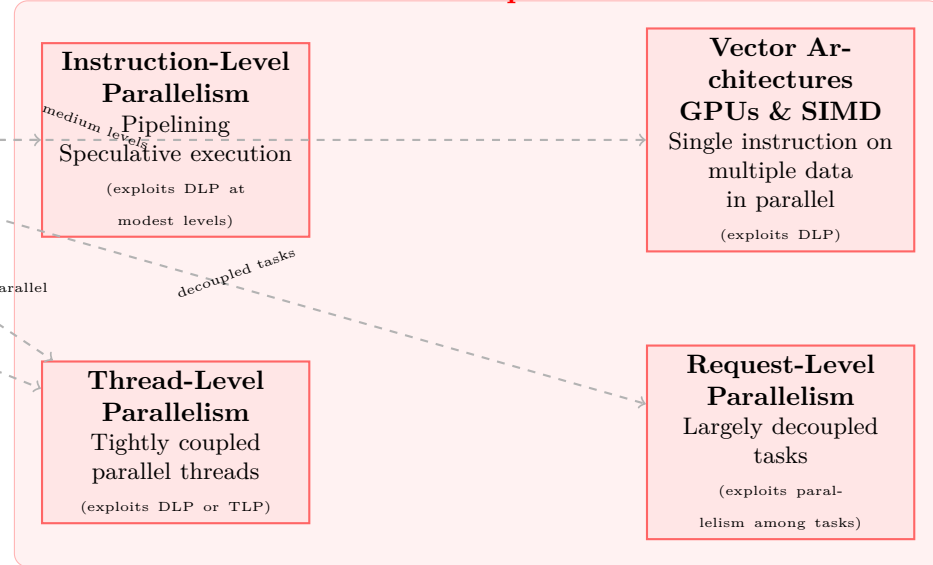


# Parallelism in Applications and Hardware

## Application Parallelism



## Hardware Exploitation



### DLP Examples:

- Matrix multiplication
- Image processing
- Array operations
- SIMD operations

### TLP Examples:

- Web server requests
- Database transactions
- Independent algorithms
- Producer-consumer tasks

### Hardware Techniques:

- **ILP:** Pipeline stages, branch prediction
- **Vector:** SSE, AVX, GPU cores
- **Thread:** Multi-core, SMT
- **Request:** Cluster computing

### Legend:

Blue: Application Level

Red: Hardware Level

Dashed: Exploitation relationship