Defence Against the Unknown

Preventing Side Channel Attacks You Don't Know Exist

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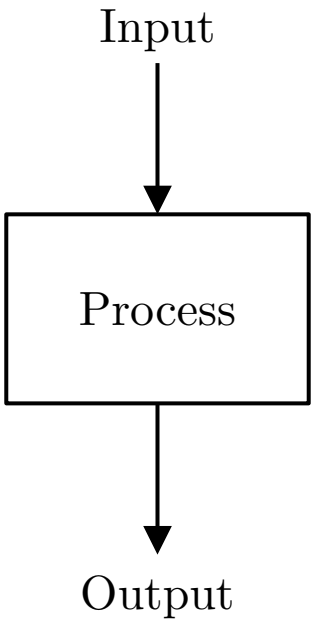
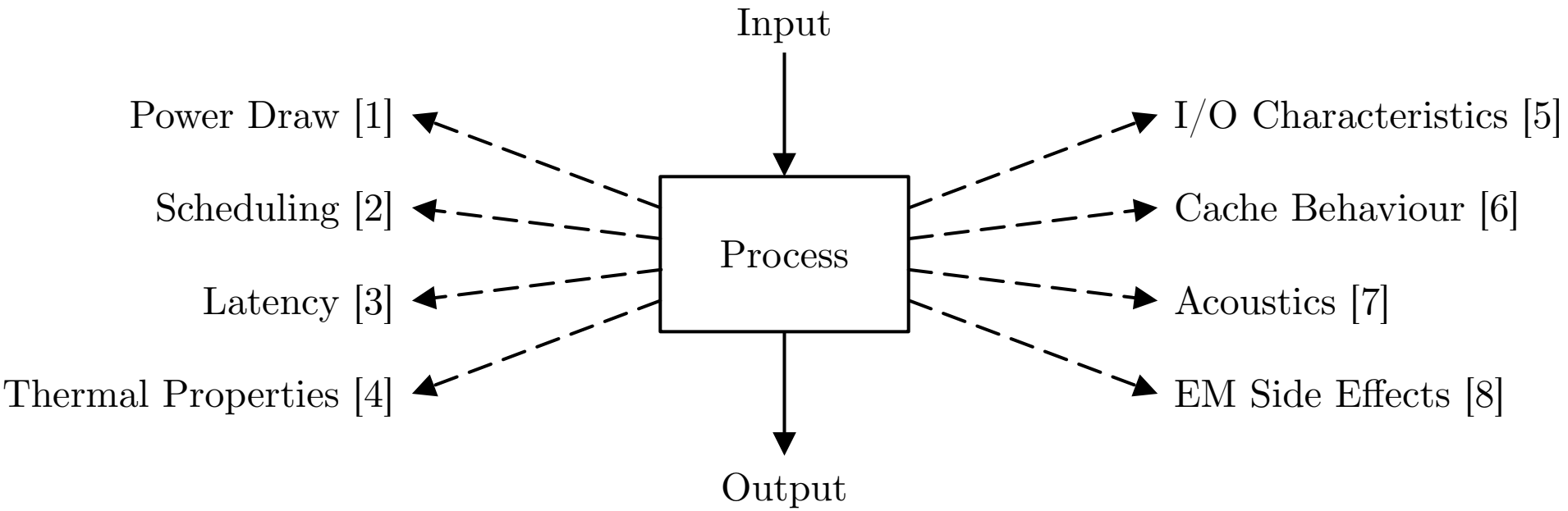
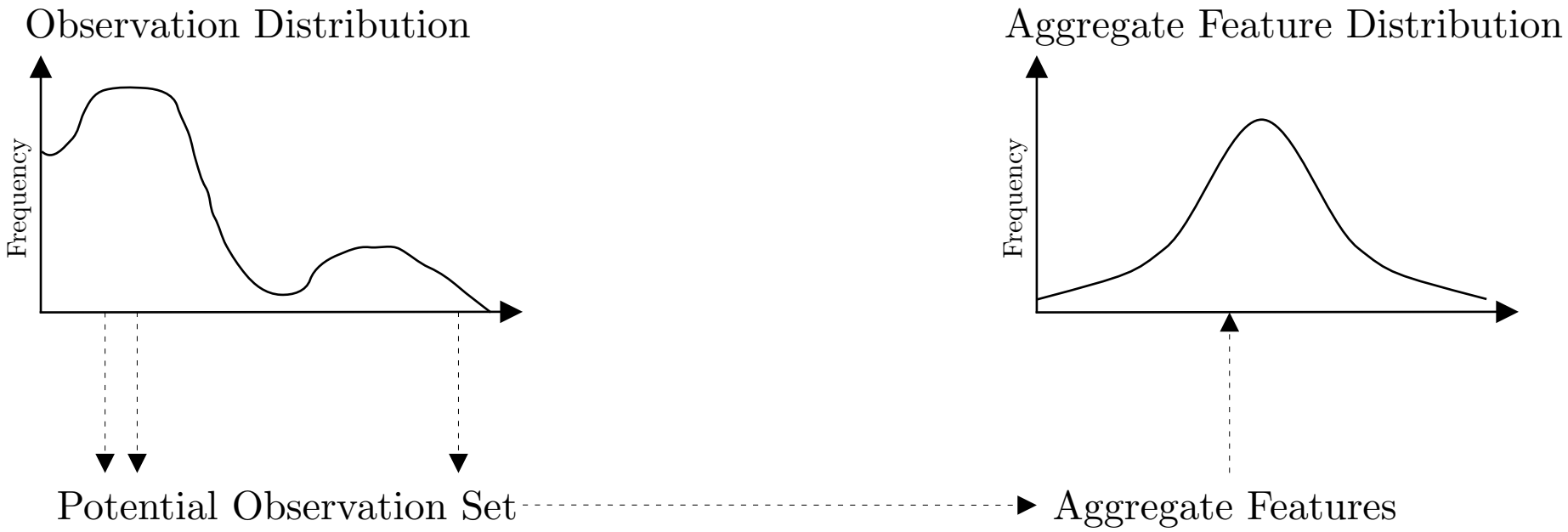
Side Channels



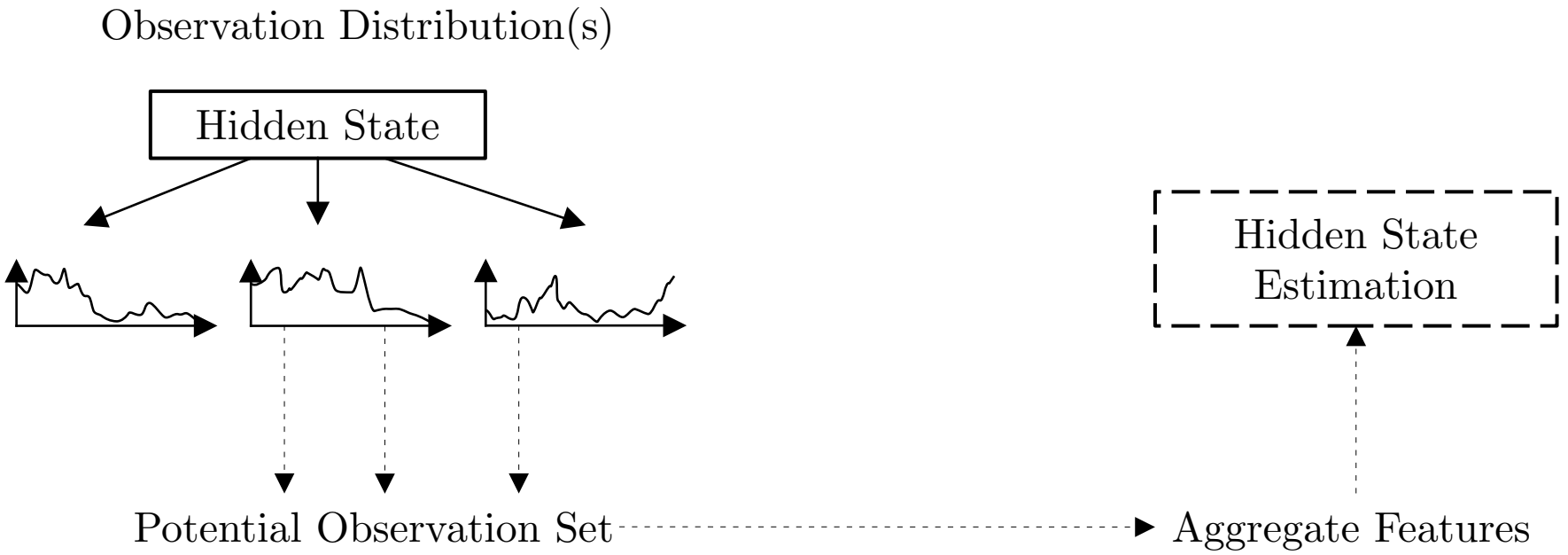
Side Channels



Stateless Information Leaks



Stateful Information Leaks

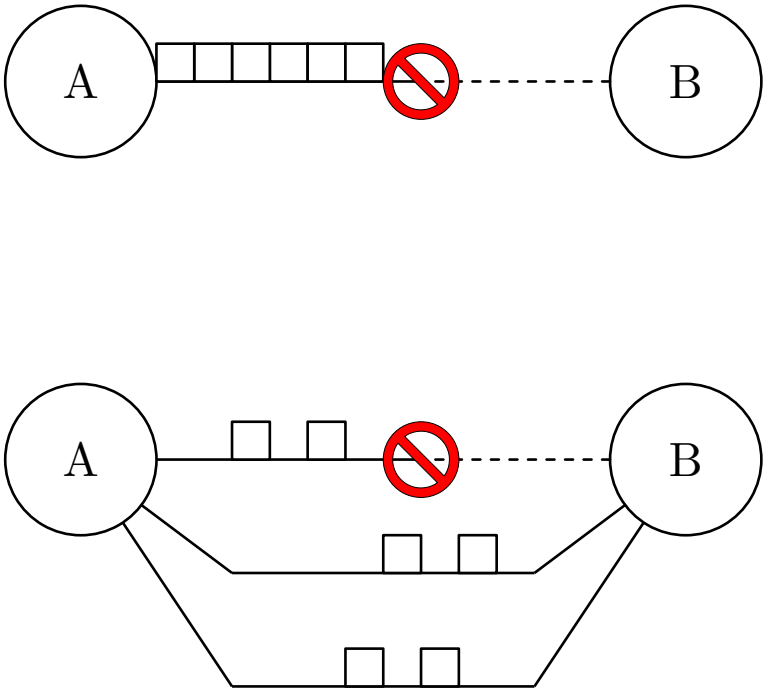


Privacy as Failure

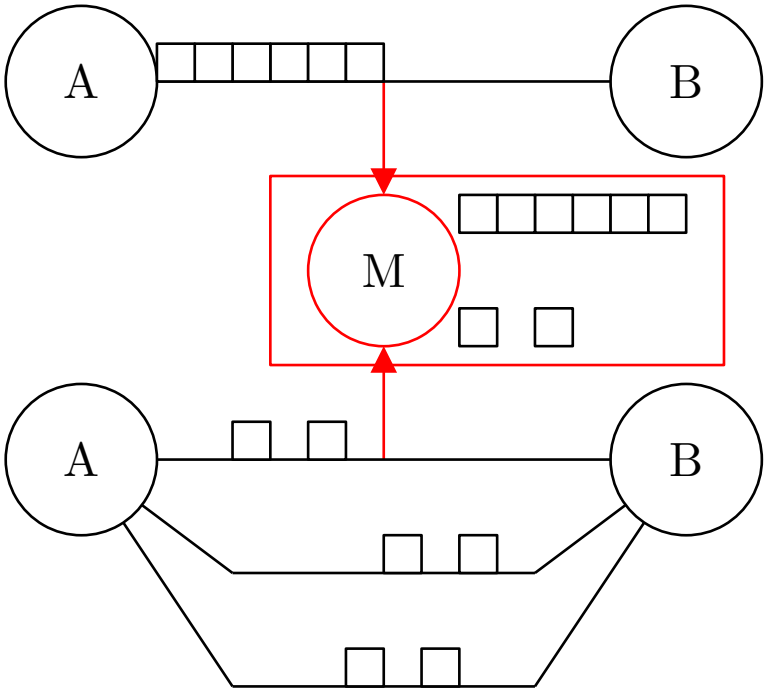
- Failure is inevitable
- Fault-tolerance:
  - Limit failure domains
  - Redundancy
- Acceptable failure rate

- Compromise is inevitable
- Compromise-tolerance:
  - Limit compromise domains
  - Redundancy
- Acceptable compromise rate

In Practice: Multipath



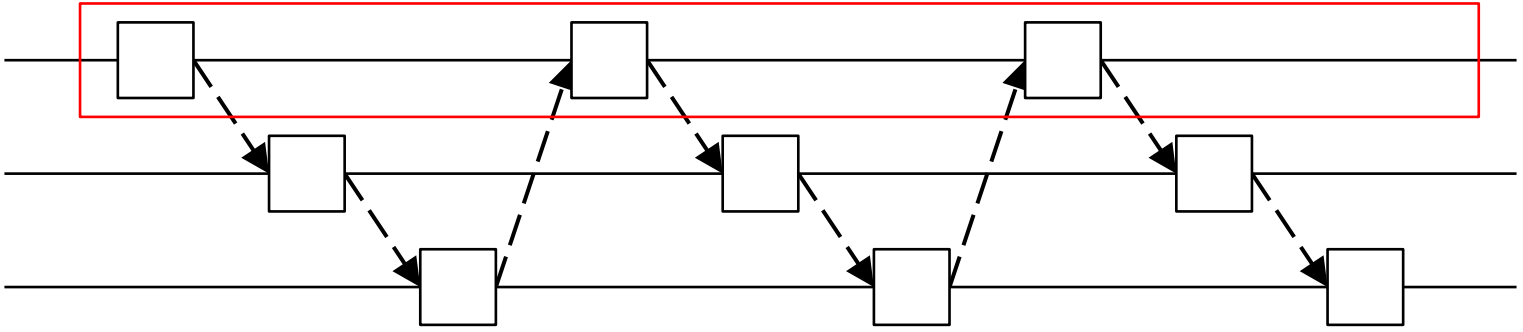
Fault Tolerance



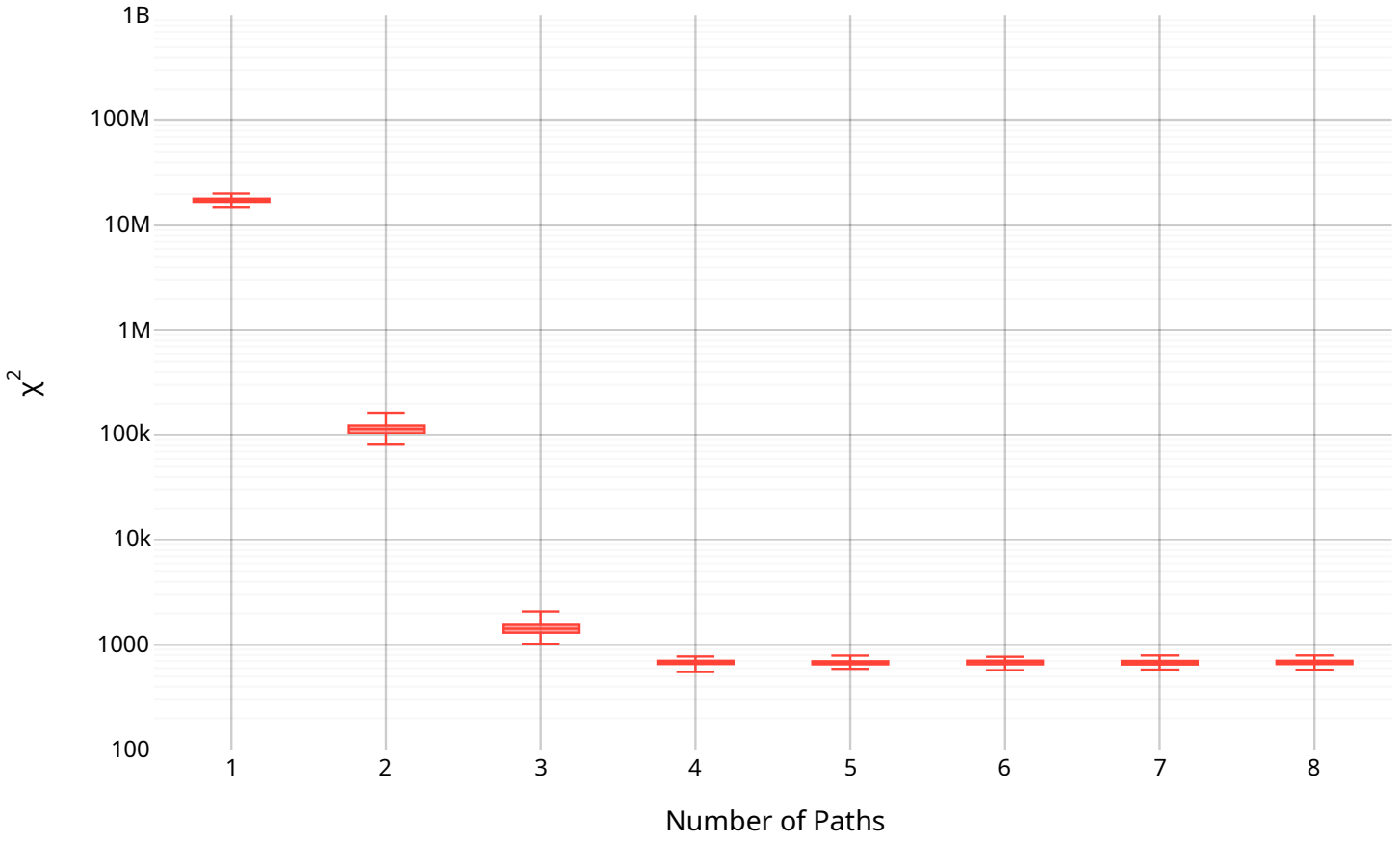
Compromise Tolerance

Partial vs Limited

- Prtl cmprms my stll b sffcnt fr th ttckr
  - **Stateful** information cascades
  - **Stateless** information does not
- Ensure limited compromise domain is stateless



Observed Bigrams vs Unigrams



General Defence

- Partial compromise of stateless domains
  - **Partial:** limited to a subset of observations
  - **Stateless:** does not cascade
- Any process!
- Any side channel!
- Does not prevent stateless attacks

Summary

- Side channel attacks can be disrupted
  - Even if they are unknown!
- Resilient to future attacks
- Performance cost is not necessary
- Implemented for round-robin multipath
- Keen to implement in other domains!

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