

# DS 2010 revision

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# What makes things special?

- ▶ normal software failure
- ⇒ errant behaviour not accommodated by other parts of the system
- ⇒ a cascade of the failure that is spectacular

# Fundamental characteristics

1. concurrent execution of components
2. independent failure modes
3. transmission delay
4. no global time

## Implications:

- 2, 3 can't know why there's no reply—node/comms. failure and/or node/comms. congestion
- 4 can't use locally generated timestamps for ordering distributed events
- 1, 3 inconsistent views of state/data when it's distributed
- 1 can't wait for quiescence to resolve inconsistencies

# Guidelines for design

- ▶ don't depend on time—force causality
- ▶ don't expect the other end to be there
- ▶ minimise coupling and interactions
- ▶ use aggressive caching, for reliability as well as for performance
- ▶ simpler is better

The key thing to remember

THINGS ARE WORSE  
THAN YOU THINK THEY  
ARE