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