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uDIREC: Unified Diagnosis and Reconfiguration for Frugal Bypass of NoC Faults

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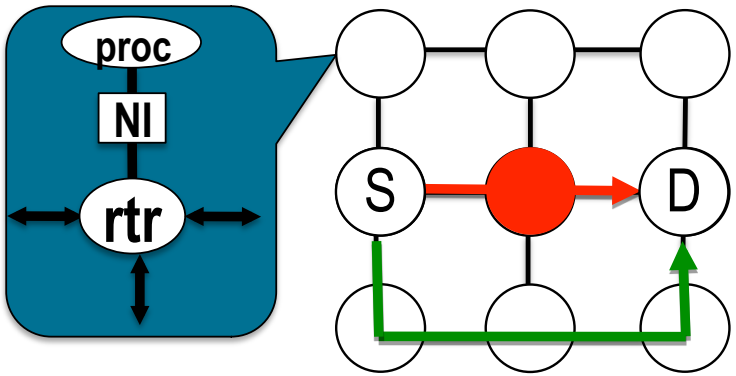
Unified Diagnosis and Reconfiguration



✖ cannot resend

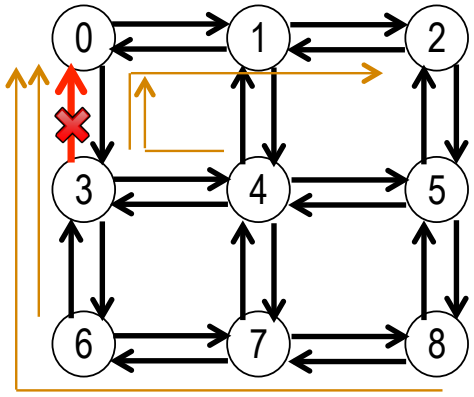
✔ need to re-route around fault

Our contributions:

- **Fault Diagnosis** at fine granularity
- **Integrated Reconfiguration** to find new routes

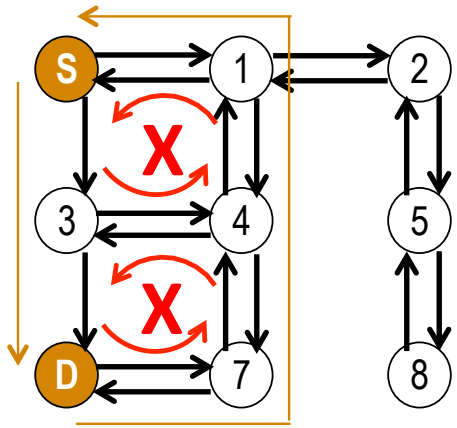
Diagnosis

- End-to-end scheme in SW
- Based on analyzing faulty routes
- Passive and fine-grained



Reconfiguration

- Based on a novel routing algorithm
- Tightly integrated with the diagnosis scheme
- Unconstrained by number and location of fault



Faulty irregular network with deadlock-free routes

Reliability and Performance Benefits

- Dedicated testing is not required → no overhead in absence of errors
- Unified implementation in software → low area overhead