

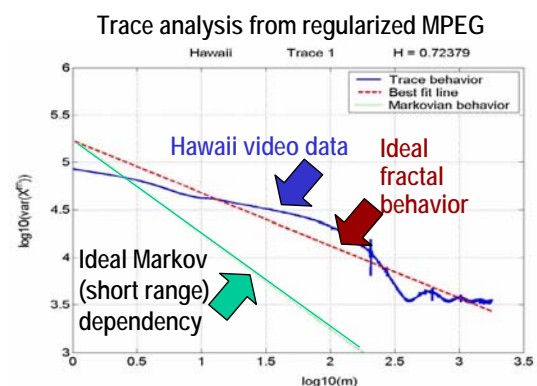
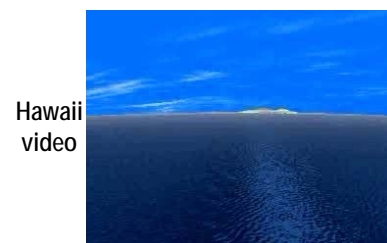
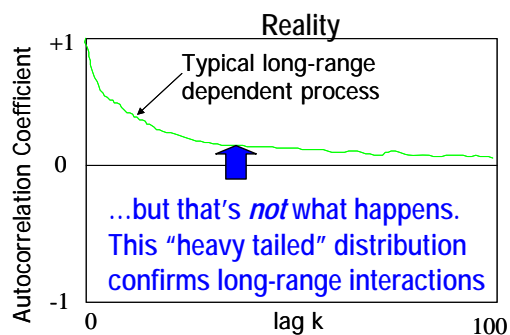
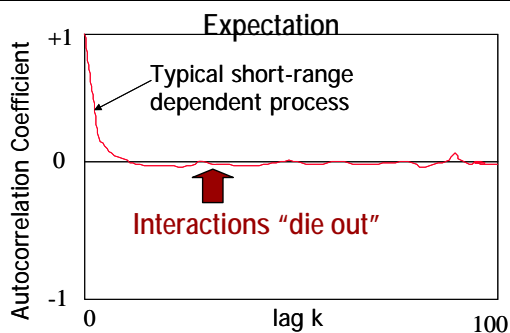
Proliferating the Use and Acceptance of NoC Benchmark Standards

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On-chip traffic characteristics are essential

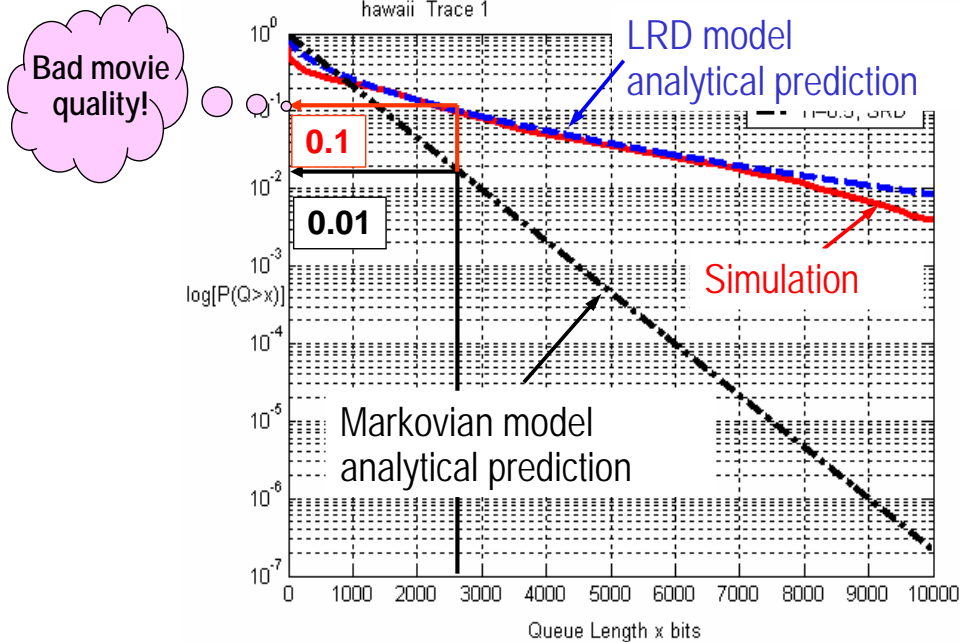


▼ The rate at which autocorrelation decays is described by the *Hurst parameter* (H)

▼ Self-similar (fractal) processes model long range dependence ($0.5 < H < 1.0$)

• Multimedia exhibits self-similar behavior. Other applications may need special attention too.

... and so designing on-chip networks is quite unique

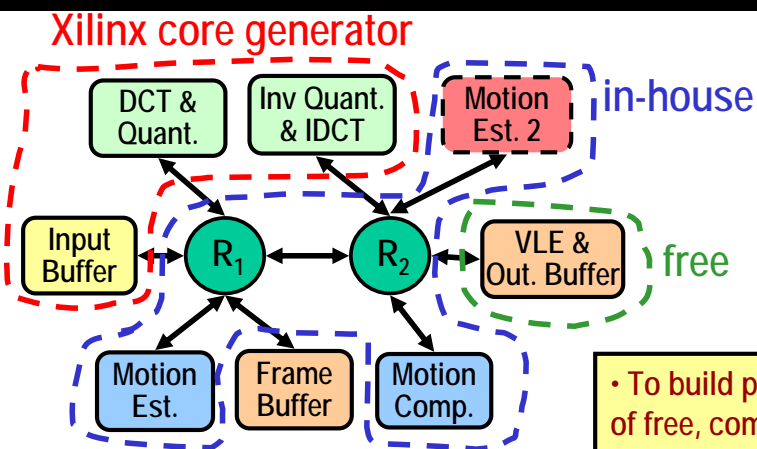


Implications of long-range dependent traffic on on-chip network design

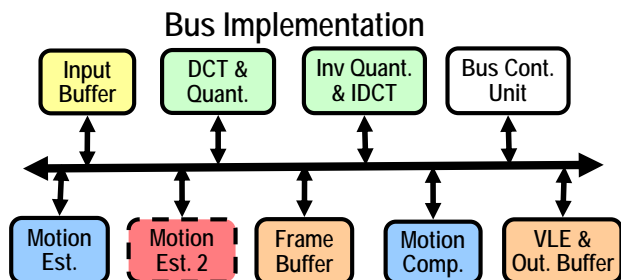
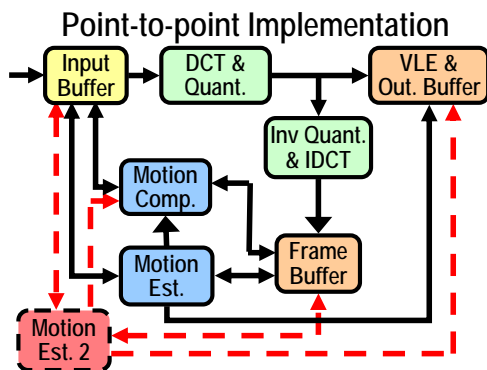
- The average delay of a buffer increases sharply at surprisingly low utilization factors
- If ignored, this results in optimistic performance predictions and inadequate resource allocation

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Prototyping helps benchmark generation

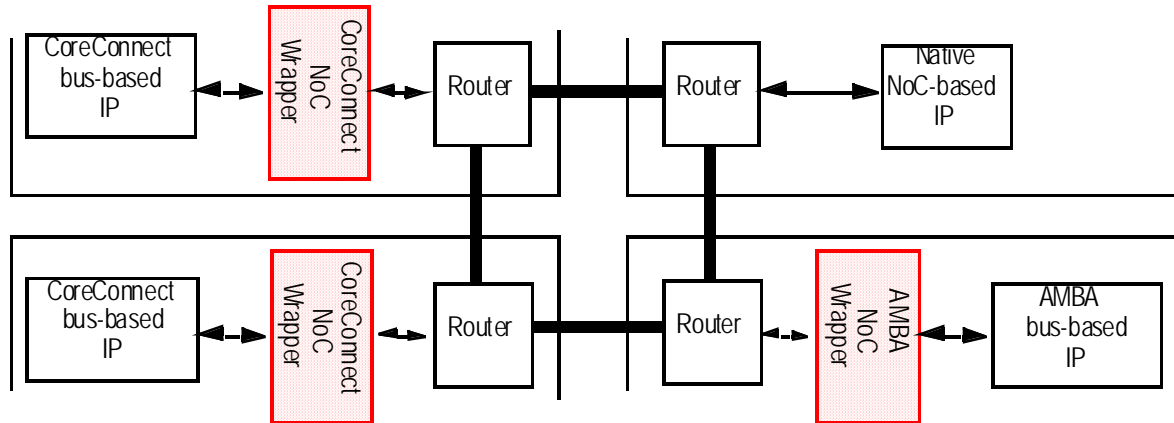


Synthesis for Xilinx Virtex II FPGA with CIF (352x288) frames



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Standard interfaces for heterogeneous IPs



- Specification of NoC services and protocols exported to wrapper
 - ▶ Power and performance efficient ways of supporting these functions
- Quality-of-Service (QoS)-based strategy for on-chip routing
 - ▶ Route around congestion paths or errors

• Use of standard protocols and benchmarks will enable higher IP re-use. The OCP-IP-supported initiative on benchmarking is such an example.