CREST: A new model for Decentralized, Internet-Scale Applications

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ABSTRACT

CREST is a new architectural style for highly dynamic distributed applications. CREST (Computational REST) is a generalization of the REST architectural style that shaped the scaleable WWW. In CREST, URLs denote loci of computations and the representations exchanged are expressions that may be as simple as a string literal or as rich as full continuations or closures. CREST eliminates the client-server distinction of the WWW in favor of an economy of dynamic, individualistic peers. Hence CREST supports a computational exchange web where delivered content is a "side-effect" of such exchange. CREST emerged from long-term study of Web applications, examining the ways in which dynamism has started to appear, and the ways in which developers have struggled to apply REST principles in increasingly demanding applications. The paper presents the five key CREST axioms and discusses the issues that application designers must address. A framework supporting implementation of CREST applications is described and illustrated through discussion of a demo application, a dynamic news feed processor. The framework is fully backwards compatible with the existing Web infrastructure.