

# Autonomic Computing Engines for Internet Scale Applications

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## Abstract

Internet scale desktop grids can aggregate large numbers of globally distributed resources to support large computations, and can potentially be used to address large applications in science, engineering and business with significant computational requirements. However current practices are largely limited to embarrassingly parallel applications, where the individual tasks are independent and do not require inter-task communications, which seriously limits the class of application that can benefit from these environments. This talk will describe an autonomic computing engine that extends traditional desktop grids to support more general application workflows and formulations, which require synchronization and inter-task communications. The engine provides the abstractions and mechanisms required to support Internet scale parallel applications, including mechanisms for dynamic resource discovery, dynamic and anonymous task distribution, task coordination and execution, decoupled communication and data exchange, task/resource failures, etc. Deployment of the engine and its evaluations using the PlanetLab wide-area testbed will be presented.

**Categories & Subject Descriptors:** C.0 [GENERAL] System architectures

**General Terms:** Management

**Keywords:** Autonomic Computing, Grid System/Application Infrastructure, Grid Programming System

## Bio

Manish Parashar is Professor of Electrical and Computer Engineering at Rutgers University, where he is also the director of the NSF Center for Autonomic Computing (CAC) and the Applied Software Systems Laboratory. He received a BE degree in Electronics and Telecommunications from Bombay University, India and MS and Ph.D. degrees in Computer Engineering from Syracuse University. He has received the Rutgers Board of Trustees Award for Excellence in Research (2004-2005), NSF CAREER Award (1999) and the Enrico Fermi Scholarship from Argonne National Laboratory (1996). His research is in the broad area of computational science and applied parallel & distributed computing, and specifically on solving science and engineering problems on very large systems. For more information please visit <http://www.caip.rutgers.edu/~parashar/>.