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Computer Science Seminar Series

National Capital Region

Towards Providing Reliability as a Service (RaaS) in Cloud Computing

Speaker: Prof. Suresh Subramaniam
George Washington University

1:00PM- 2:00PM, Friday, November 8, 2013
207 NVC & 457 Whittemore Hall in Blacksburg

Abstract

Today's data centers provide the same level of reliability to all users. Such a one-size-for-all approach may not be ideal - it may be inadequate for some users while being too expensive for others. In this talk, we present some ideas for offering reliability as a service (RaaS) in cloud computing by harnessing the well-known checkpointing technique. First, we propose a peer-to-peer checkpointing strategy and formulate a problem to jointly optimize users' reliabilities by suitable locations of their checkpoint destinations and network resource allocations. We show that our solution to this problem can improve users' reliabilities significantly over random checkpointing and centralized checkpointing schemes.

In large data centers, scalability requires that checkpoint scheduling be done in a distributed manner. However, uncoordinated scheduling runs the risk of starving some users and could lead to reduced reliabilities. To mitigate this issue, we propose a CSMA-like distributed contention-free checkpoint scheduling protocol and show that such a protocol outperforms a contention-oblivious scheme.

Biography

Suresh Subramaniam is a Professor of Electrical and Computer Engineering at George Washington University. He received the PhD degree in Electrical Engineering in 1997 from the University of Washington, Seattle. His research interests include architectures and algorithms for, and performance modeling of networks. His current focus is on optical and datacenter networks. His research has been supported by the NSF, DARPA, and NSA. He has published over 140 refereed articles in leading conferences and journals. He has co-edited three books on optical networking, the most recent one being "Cross-layer design in optical networks" published in 2013.

He serves on the editorial boards of the IEEE/ACM Transactions on Networking, Optical Switching and Networking, Photonic Network Communications, and KICS Journal of Communications and Networks. He has also served in leadership roles in many conferences, including being TPC Co-Chair of INFOCOM 2013 and IEEE LANMAN 2014. He is a Senior Member of the IEEE.