Network processor algorithms: Design and analysis

Balaji Prabhakar
Departments of Electrical Engineering and Computer Science
Packard Building, Room 269
Stanford University
Stanford, CA 94305-9510, USA

Abstract

Network processors help expand the functionality of routers and switches by performing many important tasks which are not central to switching or routing. For example, they can help schedule packets at egress ports (e.g. partition egress link bandwidth according to some fair queueing algorithm), maintain traffic flow statistics (e.g. count the number of bytes/packets a flow sent), etc. Because they add rich features to routers, network processors have been receiving a lot of attention in the industry recently. For the research community, they pose interesting and novel algorithm design problems.

I will give a brief background about network processors, focussing on two problems:

(i) designing traffic statistics counters, and

(ii) schemes for identifying and serving the packets of short flows.

I will describe the results we have obtained and outline further work.