IP Fabrics' PPL "Bump in the Wire" Program

IP Fabrics has taken a significantly different approach to creating data-plane applications on the Intel IXP 2xxx NPUs. Rather than requiring the use of C or micro-assembler, IP Fabrics has created a virtual-machine environment on the IXP microengines, and created a very-high-level functional (as opposed to procedural) language called PPL (Packet Processing Language) as the interface to the virtual machine. "Primitives" in PPL include such functions as encrypting a packet, removing an outer header, tracking a TCP or SIP connection, and scanning a payload for a regular expression. PPL is made up of rules (statements of expressions and actions to be performed if the expressions evaluate to true), policies (descriptions of complex packet transformations), and events (groupings of rules and associations with network ports).

"Bump in the wire" as coded in PPL uses just a small part of the PPL language yet is a complete implementation. In fact, it does several things the other implementations don't do:

1. It functions on both IPv4 and IPv6 packets.
2. The rule will not evaluate true for packets that aren't legitimate TCP packets.
3. It handles fragments correctly (the rule will not evaluate true if the packet is a "not first" fragment, meaning a non-zero fragment offset for IPv4 or the presence of a fragment extension header with non zero offset for IPv6).

About IP Fabrics: IP Fabrics, located in Beaverton, Oregon, was formed in 2002 by a group of individuals with extensive NPU experience with the intent of creating a radically different approach to developing high-speed, complex, network processor applications. Financial backers of IP Fabrics include Ignition Venture Partners (ex Microsoft senior executives) and Intel Capital. IP Fabrics is led by CEO Glen Myers, who previously had formed RadiSys Corporation in 1987 and led it to a significant revenue base ($341 million) by 2000.