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# Enabling active flow manipulation in silicon-based network forwarding engines

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### Abstract

A significant challenge arising from today's increasing Internet traffic is the ability to flexibly incorporate intelligent control in high performance commercial network devices. The paper tackles this challenge by introducing the active flow manipulation (AFM) mechanism to enhance traffic control intelligence of network devices through programmability. With AFM, customer network services can exercise active network control by identifying distinctive flows and applying specified actions to alter network behavior in real-time. These services are dynamically loaded through Openet by the CPU-based control unit of a network node and are closely coupled with its silicon-based forwarding engines, without negatively impacting forwarding performance. AFM is exposed as a key enabling technology of the programmable networking platform Openet. The effectiveness of our approach is demonstrated by four active network services on commercial network nodes

### Index Terms

#### Inspec

##### Controlled Indexing

[Internet](#) [intelligent control](#) [intelligent networks](#) [telecommunication congestion control](#) [telecommunication network routing](#)

##### Non-controlled Indexing

[CPU-based control unit](#) [Internet traffic](#) [Openet](#) [active flow manipulation](#) [customer network services](#) [distinctive flows](#) [high performance commercial network devices](#) [intelligent control](#) [intelligent network](#) [network behavior](#) [programmable networking platform](#) [silicon-based network forwarding engines](#) [traffic control intelligence](#)

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