A method and apparatus for packet scheduling using a virtual time stamp for high capacity combined input and output queued switching system. A network employs a virtual time reference system (VTRS) to generate packet virtual time stamps associated with each packet traversing the network. The VTRS includes edge conditioners located at the edge of the network that receive unregulated packet traffic and generate regulated packet traffic for a given flow. The edge conditioners also add a packet virtual time stamp to each incoming packet. Core routers within a network core reference the packet virtual time stamps to schedule packet flow. The core routers also update the packet virtual time stamps using virtual delays. The packet virtual time stamps are removed from the packets when the packets leave the network core through an edge conditioner.

26 Claims, 6 Drawing Sheets