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SOME TRAFFIC ISSUES IN DIGITAL CROSS-CONNECT SYSTEMS

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ABSTRACT

Digital cross-connect systems allow for remote access to digital circuits for testing purposes and provide for cross connection of circuit legs remotely. Digital transmission facilities to various destinations are attached to frames of such systems via ports, thus, the frame of the cross-connect system plays the role of a distributing frame which can be activated remotely. For example, the Digital Access and Cross-Connect System (DACS), see [1,2,3,4,5,6] accepts up to 3048 DS0 circuits - 24 circuits for each of the 127 DS1 ports, with an additional port reserved for testing.

Multi-frame offices are often required because of the limited capacity of a single frame and ports are reserved for interframe connections or *ties*, sometimes via designated tandem frames.

Digital cross-connect systems are often used in special services applications [7] with circuit lifetimes measured in months. This results in a stream of connect and disconnect orders of circuits also known as the "churn" phenomenon [8].

Traffic models are presented to determine the number of ports that should be reserved for tying purposes. These models, resembling overflow systems [9], take into account the stochastic nature of the circuit activity, the spreading of same-destination facilities across frames, and their fill.

In a network setting, where the offices are equipped with cross-connect frames, structural and administration issues are raised and discussed.

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