INCITS: Technical Committee T11 on Fibre Channel Provides Standards for Storage Environments

Background
In the 70's and 80's there were many proprietary technologies to connect large and medium sized servers to storage devices and to couple servers to each other. More importantly many technologies were based on parallel architectures that had yet to take advantage of the new optical technologies and serial architectures. Due to the proprietary nature of these interfaces, they were often quite expensive. In addition with the advent of the PC, an entire new class of servers were being introduced that would require new connectivity options for storage.

Problem
In order to lower the cost for high speed connectivity and to take advantage of new advances being made in serial and optical technology, a technical forum was needed to define the application of these new technologies to existing high speed interfaces and storage protocols.

Approach
To address the definition of these new technologies, the Accredited Standards Committee X3 approved a project to develop a fibre optic channel physical layer for the Intelligent Peripheral Interface (IPI), SCSI, and the High Performance Parallel Interface (HIPPI). This project was assigned to the X3T9.3 Task Group. This new layer became what we now know as Fibre Channel. The committee defined the physical aspects (fibre and copper), the encoding scheme, and the basic framing and signaling protocols.

During the definition of Fibre Channel it became apparent that multiple topologies should be supported. The committee defined the point to point, arbitrated loop, and switched topologies. The switched topology along with the FC services defined a complete Fibre Channel Fabric. In addition efforts were initiated to define the command set mapping to Fibre Channel for multiple networking and storage protocols that included SCSI, Single Byte (ESCON, FICON), and IP.

Eventually the X3T9.3 committee became X3T11, which became NCITS T11, which in turn became INCITS T11. Even as the committee changed names, the main goal to define a complete high speed interconnect and fabric architecture for storage, never changed. Today we continue to make refinements and improve the Fibre Channel architecture. This is through speed increases, new protocol functionality, and new transport technologies.

Outcome
Fibre Channel is nothing short of an amazing success story. With the advent of the Switch Fabric and to some extent the Arbitrated Loop topologies, Fibre Channel became and remains the technology of choice for the implementation of Storage Area Networks (SANs). The multi-billion dollar SAN industry is served by all the major OEMs and many supplying vendors. More importantly the SAN is well entrenched as a storage solution in many of the Fortune 500 companies.

Another key piece of the Fibre Channel success story is the Fibre Channel Industry Association (FCIA, www.fibrechannel.org). This marketing group was formed in 2001 and has been instrumental in guiding the development direction of T11 Fibre Channel standards (www.t11.org).