FCIA Market Positioning and FAQ for FCoE

Industry drafted standard statement:

"Fibre Channel (FC) is the technology standard for datacenter SAN environments, and Fibre Channel over Ethernet (FCoE) is an example of continued innovation that will enhance investments in FC-based architectures and business solutions. FCoE expands Fibre Channel into the Ethernet environment, combining two leading technologies - FC and Ethernet - to provide more options to end users for SAN connectivity and networking. We expect FCoE to deliver leading performance without the latency and complexity issues of TCP, to provide greater flexibility in network infrastructure and protocol decisions through network convergence, and to enhance FC investments in the datacenter."

FCoE:

- Provides a method to encapsulate Fibre Channel over the Ethernet transport
- Is similar to other Fibre Channel encapsulations defined in the T11 Back Bone project
- Transmits FC frames over native Ethernet rather than TCP to ensure good performance
- Takes advantage of proposed enhancements to Ethernet in support of today's demanding datacenter environments
- Expands FC into the Ethernet environment, providing more options for SAN connectivity and networking
- Allows servers using multi-protocol attached NICs to leverage & extend existing FC networks
- Allows network convergence for attachment of FC SANs, IP LANs, and RDMA clustering on a single network structure.
- Helps to ensure FC remains the technology of choice for SAN connectivity

Frequently Asked Questions (FAQ):

Q1: What is FCoE?
Q2: Why another standard?
Q3: What effect will FCoE have on iSCSI?
Q4: When should I expect to see products using FCoE?
Q5: Where is FCoE in the standards process?
Q6: How long will it take to get through the standards process?
Q7: Should I wait to implement my SAN based on FCoE?
Q8: How does FCoE affect the existing FC roadmap?
Q9: How does FCoE affect my existing FC SANs?
Q10: What effect will FCoE have on SAN adoption in general?
Q11: How does FCoE relate to all the other IP type of protocols like FCIP, iFCP, iSCSI?
Q12: How does the standards committee plan to ensure high performance over FCoE?
Q13: Does FCoE require any changes and enhancements to Ethernet? What are they?
Q14: Is the bandwidth between Ethernet and FC equivalent?
Q15: How does an InfiniBand (IB) fabric relate to an FCoE fabric?
Q16: What is the motivation behind trying to bring the FCoE protocol to market?
Q17: Can FCoE traffic and LAN traffic run on the same link?
Q18: What are the benefits to running both FCoE and LAN traffic on the same link?
Q19: How much credence should I give to Robert Metcalfe when he says "Fibre Channel is dead"?
Q20: Where should I go for additional information?

Q1: What is FCoE?
A: FCoE stands for "Fibre Channel over Ethernet". FCoE is a proposed standard within the INCITS T11 FC-BB-5 committee for transporting Fibre Channel traffic over Ethernet. FCoE operates at the same OSI layer as IP, making FC over Ethernet analogous to IP over Ethernet.

Q2: Why another standard?
A: There are many forces at work giving FCoE serious momentum. FCoE offers a seamless protocol connection to existing FC SAN's, bringing the ability to mix FC and FCoE, or to migrate to FCoE from FC while continuing with the proven FC SAN management processes. The ability for Host systems to consolidate their external connections onto a single type of connection also brings tremendous value to businesses both large and small.

Q3: What effect will FCoE have on iSCSI?
A: FCoE is being designed to make its implementation as light-weight as possible. This means it does not need the overhead of TCP, as does iSCSI. With iSCSI a gateway function is needed to terminate/originate the TCP/IP connections. This being said, FCoE works best with new features being worked on by the 802.3 committees to provide such capabilities as lossless frame transmission and multi-pathing. This means iSCSI will still be useful for quite some time to allow transmission of block data over LAN and WAN infrastructures outside the datacenter. iSCSI will also be useful wherever there is a mix of existing and new Ethernet capabilities.

Q4: When should I expect to see products using FCoE?
A: Best estimates to date are late 2008 to early 2010.

Q5: Where is FCoE in the standards process?
A: The project has been approved and meetings have been scheduled to agree upon details of the standard. There is wide agreement on most fundamental aspects of the technology. The wide technical interest assures that the standard is likely to meet its target date of 2H'08.

Q6: How long will it take to get through the standards process?
A: The standard is scheduled to be forwarded in 2H'08.

Q7: Should I wait to implement my SAN based on FCoE?
A: Absolutely not! The FC SAN you buy today will be completely compatible with the products based on the new FCoE standard. Even with FCoE, the architecture of your SAN in the future will include a high percentage of existing FC equipment.

Q8: How does FCoE affect the existing FC roadmap?
A: FC will continue to evolve along the existing roadmap speeds. As an example, 8GFC, with products deploying in 2008, is still a vital part of the FC story.

Q9: How does FCoE affect my existing FC SANs?
A: One of the motivations behind FCoE is the transparent transport of the FC protocol throughout the infrastructure. Because of this, all existing FC deployments will be able to include or exclude FCoE, making the implementation of an FCoE solution seamless.

Q10: What effect will FCoE have on SAN adoption in general?
A: Fibre channel SANs are proven to provide efficient and easy to manage storage, and FCoE will extend the usage of FC SANs in the datacenter.

Q11: How does FCoE relate to all the other IP type of protocols like FCIP, iFCP, iSCSI?
A: As shown in figure 1, FCoE replaces the TCP/IP stack needed by FCIP, iFCP and iSCSI. FCoE is a layer 2 Ethernet protocol.
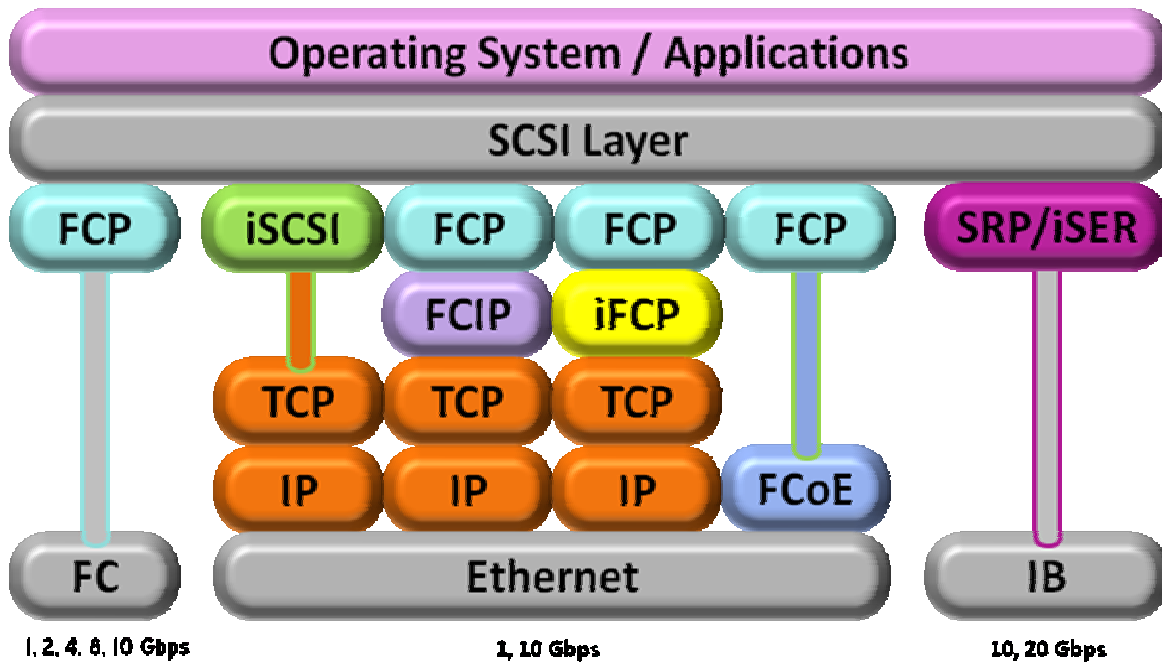
Figure 1- FCoE Relation to ISO Layers

Q12: How does the standards committee plan to ensure high performance over FCoE?
A: The FCoE standard is designed to create efficient implementations that will perform comparable to Fibre Channel links. FCoE will leverage Ethernet enhancements being discussed in IEEE 802.

Q13: Does FCoE require any changes and enhancements to Ethernet? What are they?
A: No. However, there is work going on In the IEEE 802 committees that will enhance FCoE, such as Priority-based Flow Control (PFC).

Q14: Is the bandwidth between Ethernet and FC equivalent?
A: 1GFC is 1.0625 Gb/s, while 1GbE is 1.25 Gb/s. Both use 8b10b encoding. 10GFC has a line rate of 10.52 Gb/s and 10 GbE has a line rate of 10.31 Gb/s. Both use 64b/66b encoding.

Q15: How does an InfiniBand (IB) fabric relate to an FCoE fabric?
A: IB is primarily used as a server-to-server interconnect. FCoE is primarily used as a server-to-storage interconnect.

Q16: What is the motivation behind trying to bring the FCoE protocol to market?
A: The primary motivating issue is for the Host system to consolidate its external connections onto a single type of connection. Currently, there are two possible technologies that can be used as a base for the consolidated connection to Host systems. One is InfiniBand and the other is Ethernet. InfiniBand will continue to be an option well into the future, but even then at some point InfiniBand needs to bridge into Ethernet to get to all needed clients and other nodes. Therefore, to achieve true consolidation on a common Link, Ethernet is a reasonable choice for most of the market which can accept 10 GbE as the link speed. InfiniBand will probably be around a long time at the very high end performance part of the market.

Q17: Can FCoE traffic and LAN traffic run on the same link?
A: Yes.

Q18: What are the benefits to running both FCoE and LAN traffic on the same link?
A: IO consolidation, e.g. fewer adapters, consistent management, power savings, cable management.

Q19: How much credence should I give to Robert Metcalfe when he says "Fibre Channel is dead"?
A: None.

Q20: Where should I go for additional information?
A: www.FibreChannel.org.