FICON Planning, Implementation, Operation and Problem Determination

Duration: 3 Days       Course Code: ES32G

Overview:
This course teaches the students the fibre channel connection (FICON) channel and the System z High Performance FICON (zHPF) operating environment. Planning and implementation considerations will be discussed to go from Enterprise Systems Connections (ESCON) to FICON or to zHPF configurations. Topics covering all aspects of the various FICON features across the latest System z servers, including error recovery and problem determination.

The course compares the operational protocols that is used with zHPF, FICON, ESCON, and even parallel channel. You will discuss topics such as how the FICON operating environment and configurations can be tied into the open systems operating environment, the reasons why a new FICON channel was introduced, and how it can replace or supplements the existing ESCON channels. New terminology is covered along with all the new enhancements that are now available with various FICON configurations in the mainframe environment. Valid and invalid FICON configurations are identified, including the new zHPF FICON architecture and persistent IU pacing for extended distances available on the System z10 servers. The zHPF architecture will be discussed in detail identifying the differences between transport mode and command mode channel operations.

In addition other recent channel subsystems enhancements concerning FICON will be identified and discussed, such as, FICON channel-to-channel (CTC) capability, and FICON cascaded director support. Channel operation and performance between ESCON and FICON and zHPF will be compared and discussed.

System z Linux Fiber Channel Protocol (FCP) channel planning and channel sharing implications within a storage area network (SAN) and hardware configuration definition (HCD)/input/output configuration program (IOCP) coding requirements will be discussed. Student should learn and understand the security requirements of logical unit number (LUN) masking, zoning, FICON channel sharing and multipathing as they apply to Linux on the System z servers.

The course describes FICON error recovery and path problems, what type of indications surface, potential trouble areas, and corrective action. Operator messages and indications on the z/OS console, Hardware Management Console (HMC) and Support Element (SE) will be shown. HMC and z/OS command usage will be identified to display current FICON channel and path status.

Target Audience:
The class should consist of hardware planners, technical support personnel, system programmers, or anyone who needs a complete understanding of FICON.

Objectives:
- Define the FICON channel and the reason why FICON is necessary
- Identify the benefits of the FICON channel over other channel types
- Describe the FICON channel
- Identify FICON configurations
- Identify FICON Bridge configurations
- List current FICON implementation limits
- Introduce storage area network (SAN) concept
- Describe emerging relationship of FICON and SAN
- Describe the evolution of the fibre channel standard and the FC Single-Byte Command Set protocol used by FICON
- List the fibre channel layers FC-0 through FC-4, how they are used and the associated FC terminology
- Define non-cascaded and cascaded switch configurations and how they relate to ESCON
- Describe data framing, buffer credits, and classes of service for
- Identify the servers, z/OS release levels and FICON Express features supporting System z high performance FICON
- Describe the differences between a channel I/O operation using zHPF (transport mode) and an channel I/O operation using FICON (command mode)
- Describe the use of the Interrogate function and why it is needed
- Identify FICON enhancements and other multiple logical channel subsystem (MLCSS) definition requirements for System z10 and z9
- Describe the following CSS enhancements and how they apply to the System z9 and z10 servers:
  - Multiple logical channel subsystems
  - Multiple subchannel sets
  - MIDAW facility
  - FICON for extended distance (Persistent IU pacing)
  - HSA considerations
  - List the high-level hierarchical steps (link-level and device-level) used in the error recovery process
Describe how the channel and control unit detects missing IUs and the recovery action
Identify console messages and indicators of FICON path problems
Identify and use operator commands and HMC/SE and FICON director panels for problem determination of FICON-related path problems
Define FICON Fibre Channel Protocol
Identify IOCP/HCD FCP coding and usage
List the various mapping elements that are required for System z Linux FCP usage
Identify the following components and how they apply in a System z FCP SAN environment
Multipathing
Channel sharing
Zoning
LUN masking
Describe the difference between FCP LUN Access Control and NPIV and what System z servers support them
Identify the optional SCSI Load and Dump feature on System z servers
Identify and define ESCON/FICON channel paradigms
Identify FICON FCV and FC benefits
List and compare the various phases of an I/O operation between FICON, zHPF, and ESCON
Describe the components of the FICON adapter and where they are reported in RMF
Identify and discuss why certain performance recommendations are listed for FICON channel and CU adapters
Identify performance comparisons of zHPF and FICON with FICON Express (2, 4, and 8) features as documented in FICON performance white papers

Prerequisites:
You should have an understanding of:
- Basic data processing concepts
- I/O concepts

Define link loss budget
State maximum unrepeated distances supported for FICON LX and SX configurations
State maximum repeated supported distances for FICON LX and SX
Determine the number of buffers required in extended distance solutions
Identify basic architectural rules and how they are used when planning and designing I/O configurations
Describe I/O concurrency between ESCON and FICON and how they apply when designing a configuration
Define a FICON cascaded switch and FICON CTC configurations
Define a high integrity fabric and why it is necessary for cascaded switch configurations
Identify a planning approach when designing a FICON configuration
Identify new keyword or entries added to IOCP/HCD to support new FICON channels and FICON configurations
Use IOCP/HCD to define a FICON cascaded switch configuration

Identify characteristics unique to the fibre channel point-to-point and switched fabric topologies
Compare and explain the major differences between parallel, ESCON, and FICON architecture for an CCW I/O operation
Identify frame structure, addressing, and usage between ESCON and FICON
Describe how the FICON adapter processes an I/O request
Describe the two approaches for port addressing:
z/Architecture definition approach (and why it is necessary)
FCP HBA discovery approach
Identify the supported cabling options for FICON LX and SX
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Content:

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<td>FICON introduction</td>
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<td>FICON channel path and port performance characteristics and recommendations</td>
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Further Information:

For More information, or to book your course, please call us on Head Office 01189 123456 / Northern Office 0113 242 5931

info@globalknowledge.co.uk
www.globalknowledge.co.uk

Global Knowledge, Mulberry Business Park, Fishponds Road, Wokingham Berkshire RG41 2GY UK