



# INFINIBAND PROFESSIONAL CERTIFICATION

## Certification Exam Objectives

### CERTIFICATION EXAM OBJECTIVES: INFINIBAND PROFESSIONAL

| Domain                         | % of Examination |
|--------------------------------|------------------|
| Introduction to InfiniBand     | 10%              |
| InfiniBand Architecture        | 25%              |
| Fabric Management              | 22%              |
| InfiniBand Drivers             | 8%               |
| InfiniBand Utilities and Tools | 20%              |
| Integrative Questions          | 15%              |
| <b>Total</b>                   | <b>100%</b>      |

### CERTIFICATION OBJECTIVES

1. Introduction to InfiniBand
2. InfiniBand Architecture
  - 2.1 Physical layer
    - 2.1.1. Link rate
    - 2.1.2. Link structure
    - 2.1.3. Virtual lanes
  - 2.2. Data link layer
    - 2.2.1. Services
      - 2.2.1.1. Payload size
      - 2.2.1.2. Addressing
      - 2.2.1.3. Forwarding

- 2.2.1.4. Flow control
    - 2.2.1.5. SL to VL
  - 2.3. Network layer
    - 2.3.1. Fabric routing – Global IDs (GIDs)
  - 2.4. Transport layer
    - 2.4.1. Queue pairs
    - 2.4.2. QP work flow
    - 2.4.3. Work queue operations
      - 2.4.3.1. Send operation
        - 2.4.3.1.1. RDMA
          - 2.4.3.1.1.1. Write
          - 2.4.3.1.1.2. Read
          - 2.4.3.1.1.3. Atomic
        - 2.4.3.1.2. Memory binding
      - 2.4.3.2. Receive operation
    - 2.4.4. Services
      - 2.4.4.1. Reliable and unreliable connection
      - 2.4.4.2. Reliable and unreliable datagram
      - 2.4.4.3. Connection vs. datagram
      - 2.4.4.4. Acknowledged vs. unacknowledged
      - 2.4.4.5. Dynamically connected
      - 2.4.4.6. Retransmission
  - 2.5. Upper layers
    - 2.5.1. Upper layer protocols
      - 2.5.1.1. MPI
      - 2.5.1.2. IPoIB
      - 2.5.1.3. SDP
      - 2.5.1.4. RDS
      - 2.5.1.5. iSCSI
      - 2.5.1.6. Management services
    - 2.5.2. Verbs
- 3. InfiniBand Management
  - 3.1. Perform basic operations with the Subnet Manager
    - 3.1.1. Describe the processes during the fabric initialization process
      - 3.1.1.1. Physical fabric establishment
      - 3.1.1.2. Subnet discovery
      - 3.1.1.3. Information gathering
      - 3.1.1.4. LIDs assignment
      - 3.1.1.5. Paths establishment
      - 3.1.1.6. Ports and switches configuration
      - 3.1.1.7. Subnet activation

- 3.1.2. Monitoring the fabric
  - 3.1.3. OpenSM
  - 3.1.4. Common routing algorithms
  - 3.1.5. High availability
  - 3.1.6. Running the Subnet Manager
    - 3.1.6.1. UFM
    - 3.1.6.2. Server
    - 3.1.6.3. Switch
- 3.2. Fabric addressing
  - 3.2.1. Global Unique ID – GUID
  - 3.2.2. Local ID – LID
- 3.3. Fabric routing – GUID
- 3.4. Fabric segmentation – partitioning
- 4. InfiniBand Topologies and Routings
  - 4.1. Routings
    - 4.1.1. Torus-2QoS
    - 4.1.2. Up-Down
    - 4.1.3. Ftree
    - 4.1.4. Min-Hop
  - 4.2. Topologies
    - 4.2.1. Fat Tree
    - 4.2.2. Torus 3D
- 5. Install the InfiniBand Drivers
  - 5.1. Mellanox OFED
    - 5.1.1. For Linux
    - 5.1.2. For Windows
    - 5.1.3. For VMware vSphere
- 6. OFED
  - 6.1. Node based tools
    - 6.1.1. ofed\_info -s
    - 6.1.2. openibd status
    - 6.1.3. ibstatus