National University of Computer and Emerging Sciences



Assignment 06

COAL

|  |  |
| --- | --- |
| Name | Muhammad Zain |
| Roll No. | 19F-0228 |
| INSTRUCTOR | Mr. Abdul Qadir Bilal |
| Semester | Fall 2020 |

# Direct Cache Access (DCA)

The Technique by which I/O functions have direct access to aches. this technique is enhancing the performance of these functions.

# Management of DCA:

Following are the steps to Manage cache:

1. When an application has a bock of data to transfer to a remote system, It place data in apps Buffer and alert operating System by call.
2. For Transmission Purpose, Operating System demands IP process to create IP Packets. IP Process also creates a packet descriptor that is placed in memory shared with DMA Module.
3. Output Operation demands driver of device to Signal the DMA Module.
4. Firstly, DMA transfer read the packet descriptor, then it performed from main memory to NIC. The Invalidates happen when the DMA modules reads the data.
5. After the transfer is complete, NIC signals the driver on the core that originated the send signals.

# Block Diagram:

Data Data

Address

# Accessing Strategies:

Strategies have been proposed for making more efficient use of caches for network I/O.

1. The simplest strategy is one that was implemented as a prototype on several Intel Xeon processors between 2006 and 2010.This form of DCA applies only to incoming network traffic.
2. The DCA function in the memory controller sends a prefetch hint to the core as soon as the data are available in system memory.
3. This enables the core to prefetch the data packet from the system buffer, thus avoiding cache misses and the associated waste of core cycles.

# Cache Line Update technique:

1. All write operation are made to main memory as well as to cache, Main memory is always valid.
2. A cache write operation may back a cache which hold more two strategies:
   1. The required Line is loaded into cache from main memory.
   2. The Block is modified directly in main Memory.