Adapters and Drivers

Network Adapter and Driver Issues

One aspect that causes many performance problems is adapater and NIC compatability issues (full vs half duplex as an example. The document *"Troubles hooting Cisco Catalyst Switches to NIC Compatibility Issues"* from Cisco covers many vendor NICs.

Performance Impacts of Host Architecture

The host architecture has impact on performance especially with higher rates. Important factors include:

- Bus speeds and attached cards
- Amount of memory, latency and bus speed
- The type and speed of the CPU(s)
- The amount of L1/L2 cache

Performance-Friendly Adapter and Driver Features

There are several different techniques that enhance network performance by moving critical functions to the network adapter. Those techniques typically (but with the notable exception of GSO) require both special hardware support in the adapter and support at the *device driver* level to make use of that special hardware.

- Large-Send Offload (LSO), UDP Fragmentation Offload (UFO), Generic Segmentation Offload (GSO)
- Interrupt Coalescence (or "Interrupt Moderation"), Large-Receive Offload (LRO), Generic Receive Offload (GRO)
- Checksum Offload
- TCP Offload Engines (TOEs)
- Demultiplexing towards multiple threads: Receive Packet/Flow Steering, Multi-Queue adapters etc.

References

- *Troubleshooting Cisco Catalyst Switches to NIC Compatibility Issues,* Cisco Tech Note 17053, http://www.cisco.com/en/US/products/hw/switches/ps700/products_tech_note09186a00800a7af0.shtml
- *Windows Network Task Offload,* Microsoft Web site, December 2001, http://www.microsoft.com/whdc/device/network/taskoffload.mspx

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