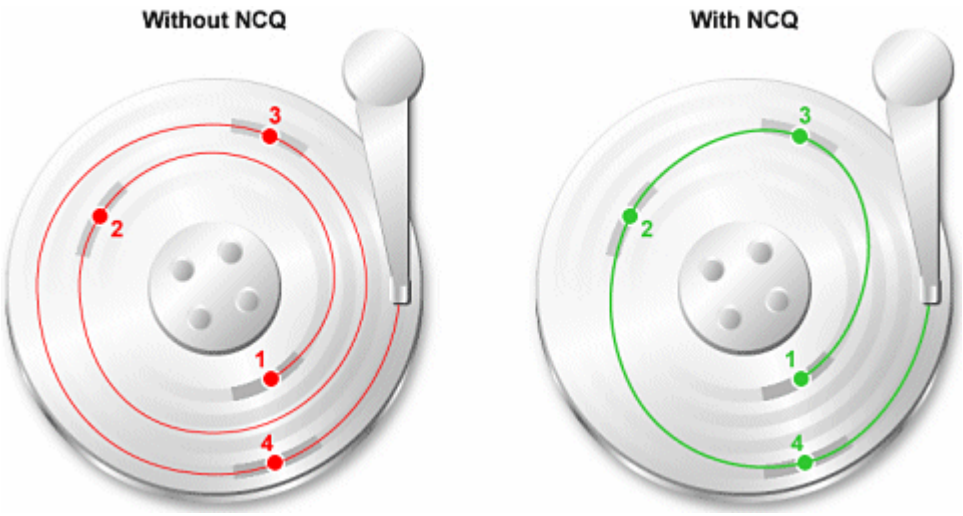
Native Command Queuing (NCQ) – A Primer

Native Command Queuing (NCQ) is a technology designed to increase performance of SATA hard disks by allowing the individual hard disk to receive more than one I/O request at a time and decide which to complete first. Using detailed knowledge of its own seek times and rotational position, the drive can compute the best order to perform the operations. This can reduce the amount of unnecessary seeking (going back-and-forth) of the drive's heads, resulting in increased performance (and slightly decreased wear of the drive) for workloads where multiple simultaneous read/write requests are outstanding, most often occurring in server-type applications.



Native Command Queuing is the second attempt to add Tagged Command Queueing (TCQ) to the ATA hard drive system. First developed on SCSI drives, and widely used there, the original design of TCQ for PATA drives was very awkward and not widely implemented. The new name NCQ was coined for the completely new SATA design. There is no SCSI technology called NCQ because the existing SCSI TCQ is not seen as needing replacement.

Note that while command queuing can be a tremendous help if there are multiple outstanding I/O requests, NCQ adds a small amount of overhead to single requests, resulting in slightly lower performance on some single-threaded benchmarks typical of single-user computer use. The difference is never large.

For NCQ to be enabled, it must be supported and turned on in the SATA controller driver and in the hard drive itself. Method of activation varies depending on the controller. All HighPoint RocketRAID SATA II RAID controllers support NCQ.