**MICROSOFT CLUSTER CLOCK SYNCHRONIZATION**

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According to Microsoft, the Windows Time service is not an exact implementation of the Network Time Protocol (NTP), it uses the complex suite of algorithms that is defined in the NTP specifications to ensure that clocks on computers throughout a network are as accurate as possible. Ideally, all computer clocks in an Active Directory Domain Services (AD DS) domain are synchronized with the time of an authoritative computer.

Many factors can affect time synchronization on a network. For example, the factors often affect the accuracy of synchronization in AD DS: Network conditions, the accuracy of the computer's hardware clock, the amount of CPU and network resources available to the Windows Time service.

An AD DS forest has a predetermined time synchronization hierarchy. The Windows Time service synchronizes time between computers within the hierarchy, with the most accurate reference clocks at the top. If more than one time source is configured on a computer, Windows Time uses NTP algorithms to select the best time source from the configured sources based on the computer's ability to synchronize with that time source. The Windows Time service does not support network synchronization from broadcast or multicast peers.

Every computer that is running the Windows Time service uses the service to maintain the most accurate time. Computers that are members of a domain act as a time client by default; therefore, in most cases it is not necessary to configure the Windows Time Service. Time protocols determine how closely two computers' clocks are synchronized. A time protocol is responsible for determining the best available time information and converging the clocks to ensure that a consistent time is maintained on separate systems.

The Windows Time service uses the Network Time Protocol (NTP) to help synchronize time across a network. NTP is an Internet time protocol that includes the discipline algorithms necessary for synchronizing clocks. NTP is a more accurate time protocol than the Simple Network Time Protocol (SNTP) that is used in some versions of Windows; however, W32Time continues to support SNTP to enable backward compatibility with computers running SNTP-based time services, such as Windows 2000.

**References:**

* [*"Scalability Day falls short"*](http://news.cnet.com/Scalability-Day-falls-short/2100-1001_3-279928.html)*.* [*CNET*](https://en.wikipedia.org/wiki/CNET)*.* [*CBS Interactive*](https://en.wikipedia.org/wiki/CBS_Interactive)*. Retrieved 23 May 2009.* Davis*, Jim (20 May 1997).*
* [*"Microsoft Launches Windows Compute Cluster Server 2003"*](http://www.informationweek.com/microsoft-launches-windows-compute-cluster-server-2003/d/d-id/1044078)*.* [*InformationWeek*](https://en.wikipedia.org/wiki/InformationWeek)*.* [*UBM plc*](https://en.wikipedia.org/wiki/UBM_plc)*.* Gardner*, W. David (9 June 2006)*
* [*Microsoft Clustering Services*](https://msdn.microsoft.com/en-us/library/ms952401.aspx)*.*