QoS AND MOBILE TECHNOLOGIES

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CHAPTER 34

TIME SYNCHRONIZATION PROTOCOLS AND APPROACHES

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34.1 INTRODUCTION

Network time protocol (NTP) is a protocol for the purpose of synchronizing the clocks over packet-switched networks [1]. It is designed mainly in the direction of reducing the effects of variable latency through jitter buffer. Network Time Protocol (NTP) aims to synchronize timekeeping among several distributed time servers as well as clients. It is structured based on the Internet Protocol (IP) and User Datagram Protocol (UDP) that offers a connectionless transport technique. Nevertheless, it can be adjustable to other protocol suites. NTP has been developed from the time protocol and the Internet Control Message Protocol (ICMP) timestamp message which is predominantly designed in order to ensure accuracy and robustness, while used over usual internet pathways. The service model is founded on a returnable time design that is measured clock offsets depended and eliminates the need of reliable message delivery. A self-organized, hierarchical-master-slave arrangement is used by synchronization where a minimum-weight spanning tree determines the synchronization paths.

34.2 IEEE 1588 TIMING PROTOCOL

IEEE 1588 Version 1 (V1) specification points to the fact that the best Precision Time Protocol (PTP) performance can be obtained through reducing the number of nodes between the clock source and the slave devices. Synchronization (SYNC) message rates are relatively faster than IEEE 1588 Version 1(IEEE Instrumentation and Measurement Society, 2002). IEEE 1588 Version 2 (V2) identifies an extensive range of mean SYNC message rates which allows much larger rates than 1000 messages per second. Conversely, the majority of the systems are likely to use mean SYNC message rates much less than IEEE 1588 Version 2 (V2) to minimize network traffic as well as optimize the time of network loading with improving the performance of synchronization. However, faster SYNC message rates are