

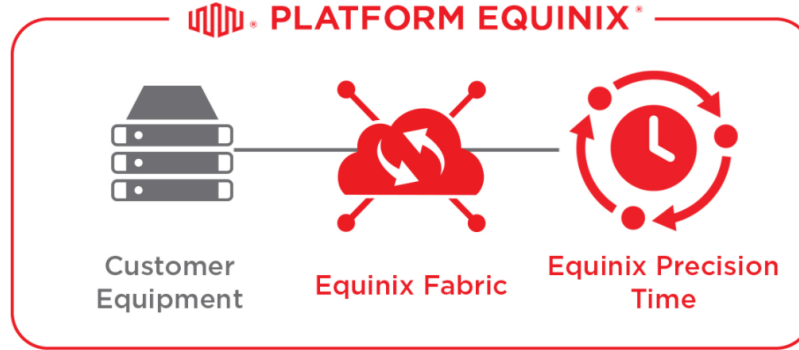
Edge Precision Time

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Edge Precision Time

Edge Precision Time (or EPT) is a subscription-based service [Equinix Fabric](#) that provides accurate, secure, and reliable time to distributed enterprise applications.

Edge Precision Time sources time from redundant GNSS (GPS) receivers with the antennas strategically located within the Equinix IBX infrastructure. The master time sources distribute accurate time over [Equinix Fabric](#), our high-performance network backbone.



The Need for Accurate Time

Clocks included in hardware systems are inexpensive quartz oscillators that have a tendency to drift. Inaccurate clocks result in inaccurate timing that can cause a loss of synchronization across networks. Timing inaccuracies can range from milliseconds to seconds and even to minutes if left unchecked for an extended period of time. Such timing inaccuracies can result in network operational issues large enough to lead to mission failure.

When the functionality of an application depends on accurate time, it must turn to a time source outside the built-in system clocks. If the application has Equinix Fabric connectivity, it can synchronize with the EPT time source for accurate time.

Features

Edge Precision Time provides these capabilities and options:

- **Time Protocols** – EPT supports both the Network Time Protocol (NTPv3 and NTPv4) and the Precision Time Protocol (PTPv2).
To synchronize time, clients directly connect to the Edge Precision Time NTP or PTP primary sources.
- **Service Tiers** – Equinix provides different service tiers for the NTP and PTP protocols.
The service tier you choose determines the number of NTP or PTP clients you can synchronize on your side using direct connections to the EPT NTP or PTP primary sources. For more on direct connectivity, see [Network Models and Time Synchronization](#).
The following table provides an estimation of the number of clients you can synchronize per second at a packet rate of 1 per second. Client rates are shown for both the NTP and PTP protocols. Keep in mind the actual number of clients you can synchronize depends on the combination and configuration of your system hardware.
The following table lists the approximate number of client synchronizations per second:

	Standard Service Tier	Enterprise Service Tier
Network Time Protocol	1,000	2,000
Precision Time Protocol	20	100

- **Accuracy** – For PTP, EPT ensures an accuracy of 50 microseconds from UTC.
The actual time accuracy you achieve is based on a combination of the consumption model in use and the physical distance between the client device and the EPT service location. In practice, our experience shows your end devices might achieve even greater accuracy than the listed tolerance.
- **Availability** – The high reliability of the service is made possible by multiple levels of redundancy in the architecture.
 - Every region has at least two metros that serve as the sources of time.
 - For North America, you can choose to connect to either one or both the service locations – Silicon Valley (SV) and New York (NY).
 - Each of these metros have redundant GNSS (GPS) receivers with the antennas and time server infrastructure in at least two geographically distributed data centers (IBXs).
 - Once you select either one or both service locations, this level of redundancy is available to you automatically. For example, if a data center becomes unavailable in SV or NY, your devices continue to receive accurate time from one of the other locations.
 - Within each of these data centers EPT connects your services to two timing masters that act as primary and secondary masters over a redundant switching infrastructure.
- **Security** – EPT time is distributed over [Equinix Fabric](#), a state-of-the-art private network, so EPT time packets are never exposed to the public internet, making EPT a secure timing service.
EPT infrastructure is installed and secured inside Equinix state-of-the-art IBX data centers. Our data centers meet the highest standards of security, certification, and sustainability. Additionally, Edge Precision Time services can only be provisioned using the EPT Services Portal, which requires authentication using the same Equinix customer credentials used by other Equinix portals (such as ECP or Equinix Fabric).

Use Cases

Getting accurate time is an important requirement for both consumer and business applications. Although the required level of reliability, security, and accuracy depends on your individual use cases, we see that security and reliability have become critical for all enterprise applications. In certain vertical markets, mission critical applications require the highest possible degrees of precision to meet compliance and regulatory mandates.

- **Financial Services** – High-frequency trading platforms need highly accurate time (in the order of single digit microseconds or better) to maintain an ordered sequence of transactions. The trading ecosystem comprises of stock and commodities exchanges, traders and FinTech companies that provide digital services in this space.
- **Enterprise Applications** – As applications become more geographically distributed, systems are challenged to distribute transactional databases, ensure the accuracy of ordering logs, and analyze and prevent online attacks. A narrow-drift offset from a secure and reliable time source is necessary to resolve these challenges.
- **Broadcasting** – Audio and video feeds are sent separately to end devices. If the time between these feeds is not synchronized, "lip sync" errors can occur, which significantly degrade the quality of service. Accordingly, the broadcasting industry has specific standards (SMPTE 2110), that require accurate time synchronization between the audio and video feeds.
- **Gaming** – Online gaming and e-sports platforms require accurate time synchronization in order to ensure proper functionality (for example, the time between a player's action and the resulting game state). This synchronization problem becomes increasingly exasperated when players are in geographically distributed locations.

- **telecommunications** – telecom service providers are required to maintain precise synchronization of their infrastructure in order meet their quality-of-service requirements. Managing billing and other customer facing infrastructure also requires accurate timing. Poor timing synchronization can result in dropped calls and poor customer service resulting from unreliable data.
- **Manufacturing** – To maintain seamless manufacturing processes, manufacturing operations (including process automation, MRP systems, and logistics systems) have become reliant on accurate time synchronization across the all the systems and infrastructure involved in the process.