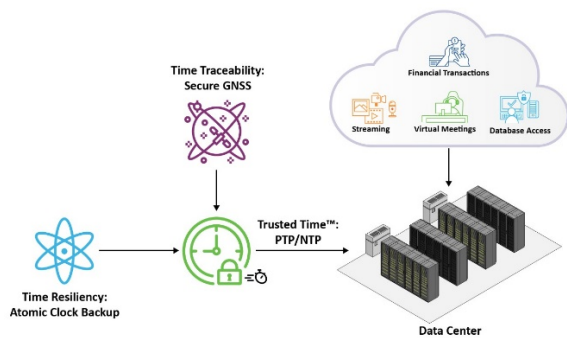





# Data Center Timing and Synchronization





Regulatory and user requirements for data centers demand sub-microsecond sequential time stamps. Time stamping precision and accuracy is critical not only across servers in a data center, but also between data centers in a network. From hyperscale applications to colocation data center clients, we offer a full range of timing solutions, including the Virtual Primary Reference Clock (vPRTC), that ensure precise, accurate, secure and resilient time.



## Timing and Synchronization Solutions for All Data Center Applications

		
<p><b>Hyperscale Data Center</b></p> <ul style="list-style-type: none"> <li>• Thousands of servers owned by one entity</li> <li>• Hosted cloud services</li> <li>• Clients lease capacity and services</li> </ul>	<p><b>Colocation Data Center Provider</b></p> <ul style="list-style-type: none"> <li>• Multiple servers collocated in one structure</li> <li>• One entity owns structure, utilities and services</li> <li>• Clients place hardware in cages</li> <li>• Clients lease infrastructure, utilities and services</li> <li>• Provide time or GPS as service to clients</li> </ul>	<p><b>Colocation Data Center Client</b></p> <ul style="list-style-type: none"> <li>• Clients place hardware in cages</li> <li>• Clients lease infrastructure and services</li> <li>• Control your own timing</li> </ul>
<p>Recommended Products:</p> <ul style="list-style-type: none"> <li>• BlueSky™ GNSS Firewall</li> <li>• Cesium atomic clocks</li> <li>• NTP servers and/or PTP grandmasters</li> </ul>	<p>Recommended Products:</p> <ul style="list-style-type: none"> <li>• BlueSky GNSS Firewall</li> <li>• Cesium atomic clocks</li> <li>• NTP servers and/or PTP grandmasters</li> </ul>	<p>Recommended Product:</p> <p>SyncServer S600 with:</p> <ul style="list-style-type: none"> <li>• Embedded 72-channel receiver</li> <li>• Embedded rubidium</li> <li>• PTP or NTP distribution</li> </ul>

## Featured Products

			
<p><b>BlueSky™ GNSS Firewall</b></p> <hr/> <p><b>Secure Time Traceability</b></p> <ul style="list-style-type: none"> <li>Identifies GNSS systems and protects them from spoofing and jamming</li> <li>Integrates seamlessly between existing GNSS antenna and GNSS system</li> <li>Compatible with any GNSS antenna that receives the L1 frequency</li> <li>Optional rubidium Miniature Atomic Clock (MAC) can be installed inside unit</li> </ul>	<p><b>5071A Cesium Standard</b></p> <hr/> <p><b>Time Resiliency</b></p> <ul style="list-style-type: none"> <li>Unsurpassed stability in the lab or field</li> <li>Accuracy: <math>\leq \pm 5.0E-13</math></li> <li>Stability: <math>\leq 5.0E-12</math> (for 1 second averaging time)</li> <li>Long-term stability: <math>\leq 1.0E-14</math> (for five-day averaging time)</li> <li>Proven reliability with an MTBF of greater than 160,000 hours</li> <li>Full traceability to NIST</li> <li>AC and DC input and internal battery back-up</li> </ul>	<p><b>CSIII 4310B Cesium Standard</b></p> <hr/> <p><b>Time Resiliency</b></p> <ul style="list-style-type: none"> <li>Cesium Beam atomic clock</li> <li>5 and 10 MHz sinewave outputs</li> <li>10 MHz TTL output</li> <li>1 pps input and output</li> <li>2U, 19-inch rack mounted chassis</li> <li>Provides autonomous timekeeping as a backup to GNSS</li> </ul>	<p><b>SyncServer S600 NTP and PTP Network Time Server</b></p> <hr/> <p><b>Time Distribution</b></p> <ul style="list-style-type: none"> <li>&lt; 15 ns RMS to UTC (USNO) via GPS</li> <li>&lt; 1E-12 frequency accuracy</li> <li>NTP monitoring, charting and MRU logging</li> <li>Web-based management with high-security cipher suite</li> </ul>

## Virtual Primary Reference Time Clock (vPRTC)

The requirements for timing and synchronization are shifting from accuracy and precision to security and resiliency. Simply delivering an accurate timing instance is no longer enough. Designers of critical infrastructure must ensure that their timing source can be validated and trusted, that they maintain network-wide visibility and monitoring and, most importantly, that they have resiliency in the form of backups and protection when something goes wrong, because it will.

