

Information Technology Policy

Network Timing Protocol

ITP Number ITP-NET017	Effective Date October 19, 2007
Category Network	Supersedes None
Contact RA-ITCentral@pa.gov	Scheduled Review October 2022

1. Purpose

This Information Technology Policy (ITP) establishes enterprise-wide standards for the Network Timing Protocol (NTP).

2. Scope

This ITP applies to all departments, offices, boards, commissions and councils under the Governor's jurisdiction (hereinafter referred to as "agencies"). Agencies not under the Governor's jurisdiction are strongly encouraged to follow this ITP.

Third-party vendors, licensors, contractors, or suppliers shall meet the policy requirements of this ITP as outlined in the Responsibilities section.

3. Definitions

3.1 Network Timing Protocol (NTP) – A networking protocol designed to synchronize the clocks of computers over a network. Typical NTP configurations utilize multiple redundant servers and diverse network paths to achieve high accuracy and reliability.

4. Background

A reliable network time service requires provisions to prevent accidental or malicious attacks on the servers and clients in the network. Reliability requires that clients can determine that received messages were authentic and were sent by the intended server and not manufactured or modified by an intruder.

Web servers, mail servers, and other devices that make use of time sensitive functions such as log files or cron jobs are to be timed accurately with precision to within one-hundredth of a second. If servers are not timed accurately, the usefulness of time sensitive information such as, but not limited to, entries in log files is diminished.

An NTP primary server is called a Stratum 1. It is a computer connected to a high precision reference clock and equipped with NTP software.

The number of computers that can be indirectly synchronized by a single primary is, for all intents and purposes, unlimited. The NTP software continuously monitors the figures of stability and accuracy of all configured servers, switching dynamically to the server with the best figures.

5. Policy

The Commonwealth network Enterprise NTP servers are owned by the Statewide Radio Network Division of the Pennsylvania State Police. The current NTP design is supported by

eight (8) geographically diverse Stratum 1 devices. All COPANET core devices are managed by the Office of Administration, Office for Information Technology (OA OIT) and are synchronized with these Stratum 1 clocks. These services are available via the agency's metropolitan area network (MAN) connection.

Agencies shall synchronize time on all devices on the Commonwealth network at least once every twenty-four hours, with the following methodology:

- Pull NTP from COPANET for core devices as identified above
- Point downstream devices to core devices

The procedures below should be followed to configure the NTP server for Enterprise synchronization via the agency's MAN gateway:

1. NTP server xxx.xxx.xxx.xxx
2. Agency firewall changes may also be required to allow NTP traffic out. Refer to ITP-SEC034 *Enterprise Firewall Rule Set* for guidance.
3. Agencies can validate settings using this command to show associations:

```
#MAN DOH1A>sh ntp associations
```

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address          ref clock      st  when  poll reach  delay  offset  disp
*~xxx.xxx.xxx.xxx xxx.xxx.xxx.xxx  2   68   256  377 11.202 -34.664  1.174
+~xxx.xxx.xxx.xxx xxx.xxx.xxx.xxx  2   127  256  377 16.808 -32.243  1.626
* sys.peer, # selected, + candidate, - outlyer, x falseticker, ~ configured

```

Agencies utilizing Cloud solutions under Commonwealth enterprise control are advised that time synchronization is available via the gateway to the network on the assets that reside in the Cloud solution.

Agencies shall synchronize time on all such devices, for which time synchronization is their responsibility, at least once every twenty-four hours, with the following methodology:

- Pull NTP from the local gateway

OA OIT shall synchronize time on all Commonwealth Enterprise Cloud devices for which time synchronization is their responsibility at least once every twenty-four hours, with the following methodology:

- Pull NTP from the local gateway

Agencies should contact the OA, Enterprise Network Services: ens@pa.gov if they have any questions or require assistance. Alternatively, a request can be submitted via ServiceNow to:

Bureau of Infrastructure & Operations
Enterprise Network Services
Network Management
NTP Request

6. Responsibilities

6.1 Agencies shall comply with the requirements outlined in this ITP.

6.2 Office of Administration, Office for Information Technology (OA, OIT) shall comply with the requirements in this ITP.

6.3 Third-party vendors, licensors, contractors, or suppliers shall:

- Utilize the Commonwealth's time sources on all systems on the commonwealth network for which time synchronization is their responsibility.
- Utilize the commonwealth's time sources on all systems that reside in the commonwealth's Cloud offerings for which time synchronization is their responsibility.

7. Related ITPs/Other References

Definitions of associated terms of this policy are published on the Office of Administration's public portal: <http://www.oa.pa.gov/Policies/Pages/Glossary.aspx>

Commonwealth policies, including Executive Orders, Management Directives, and IT Policies are published on the Office of Administration's public portal:

<http://www.oa.pa.gov/Policies/Pages/default.aspx>

- [Management Directive 205.34](#) Amended *Commonwealth of Pennsylvania Information Technology Acceptable Use Policy*
- [ITP-ACC001](#) *Information Technology Digital Accessibility Policy*
- [ITP-SEC000](#) *Information Security Policy*
- [ITP-SEC034](#) *Enterprise Firewall Rule Set*
- ServiceNow: <https://itcentral.pa.gov/ITSM/Pages/ServiceNow.aspx> (CWOPA Access only)

8. Authority

[Executive Order 2016-06](#), Enterprise Information Technology Governance

9. Publication Version Control

It is the [Authorized User](#)'s responsibility to ensure they have the latest version of this publication, which appears on <https://itcentral.pa.gov> for Commonwealth personnel and on the Office of Administration public portal: <http://www.oa.pa.gov/Policies/Pages/default.aspx>. Questions regarding this publication are to be directed to RA-ITCentral@pa.gov.

10. Exemption from This Policy

In the event an agency chooses to seek an exemption from the guidance within this ITP, a request for a policy waiver is to be submitted via the enterprise IT policy waiver process. Refer to [ITP-BUS004 IT Policy Waiver Review Process](#) for guidance.

This chart contains a history of this publication's revisions. Redline documents detail the revisions and are available to CWOPA users only.

Version	Date	Purpose of Revision	Redline Link
Original	10/19/2007	Base Document	
Revision	12/20/2010	ITP Refresh	
Revision	10/17/2017	ITP Reformat Added Enterprise NTP Procedures Added References	
Revision	07/29/2018	Revised NTP design language for clarity Updated the NTP server configuration guidance	

Revision	10/05/2021	<ul style="list-style-type: none">• Mandated time sources for assets on the commonwealth network and those in commonwealth Cloud solutions.• Added third-party language to Scope and Responsibilities Section• Added Network Timing Protocol Definition	Revised IT Policy Redline <10/05/2021>
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