

**Correctional Service Canada
Technical Services Branch
Electronic Security Systems Division**

**ES/STD – 0300R1E
Revision 1
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**ELECTRONICS ENGINEERING
STANDARDS
NETWORK TIME PROTOCOL TIME SERVER**

AUTHORITY

This standard defines the requirements of Correctional Service Canada (CSC) for a Network Time Server (NTS) at federal correctional institutions.

Recommended corrections, additions or deletions should be addressed to the Design Authority at the following address: Director, Electronic Security Systems, Correctional Service Canada, 340 Laurier Avenue West, Ottawa, Ontario, K1A 0P9

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RECORD OF REVISIONS

Revision	Paragraph	Comment
0	N/A	Original issue.
1	Cover Page	Added Authority Statement. Updated "prepared by" and "approved by" titles
	Header	Added "Network Time Protocol Time Server"
	Table of Contents	Added "Applicable Documents." Adjusted section page numbers accordingly
	6.5	Modified and expanded requirements
	6.8	Expanded design requirement. Replaced statement 6.8 with statements 6.8 and 6.9
	6. Design Requirements	Added additional requirement due to 6.8 changes
	6.13 (previously 6.12)	Added "IP enabled"
	Page 4 ABBRIV. and Page 6 SYSTEM list	Added PPA, PPALS, PIDS, PIU, FAAS, FIU, Intercom and PA. Replaced pg 6 table with bulleted list
	Entire Document	Replaced "shall" with "must"

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ABBREVIATIONS

The following abbreviations are used in this specification:

API	Application Programming Interface
CSC	Correctional Service Canada
FAAS	Facility Alarm Annunciation Unit
FIU	Facility Integration Unit
GPS	Global Positioning System
NTP	Network Time Protocol
NTS	Network Time Server
RU	Rack Units
PIDS	Perimeter Intrusion Detection Unit
PIU	PIDS Integration Unit
PPA	Personal Portable Alarm
PPALS	Portable Personal Alarm Locatable System
TCP/IP	Transmission Control Protocol / Internet Protocol
UPS	Uninterruptible Power Supply
UTC	Universal Time Code

1. SCOPE

This standard defines the requirements of Correctional Service Canada (CSC) for a Network Time Server (NTS) at federal correctional institutions.

2. GENERAL

CSC deploys a number of Security, Operational and Communications systems at each institution. The majority of these systems provide data output, audio or video logs or files that are recorded and stored for future evaluation and assessment. Currently these systems do not source a central time signal to ensure that the stored data items are synchronised in a consistent manner. CSC plans to purchase and deploy NTSs at each institution to interconnect all required systems to the server to ensure that each system derives its date and time from a central source to facilitate an appropriate analysis.

The purpose of the NTS is to ensure all computer systems on the network remain synchronized with a relative time. The NTS provides the point of reference between all electronics on the network. The system will ensure a synchronized time is present throughout the network which will assist the staff to match system records for evidence review.

3. ENVIRONMENTAL CONDITIONS

The NTS must operate over the following indoor environmental conditions:

- 3.1. Temperature: 0° C to +70° C; and
- 3.2. Humidity: 20 to 80% relative, non-condensing.

4. POWER REQUIREMENTS

The NTS must use standard commercial VAC power within the following range:

- 4.1. Voltage: 120 VAC \pm 10%;
- 4.2. Frequency: 60 Hz \pm 1.5%;
- 4.3. Transients: up to 5 times nominal voltage for up to 100 msec durations. Changes in the input power or any fluctuations within the above limits must not cause damage to the unit;
- 4.4. Power: power consumption must not exceed 100 watts; and
- 4.5. Power backup: the NTS must be supported by UPS for a minimum of 1 hour.

5. MECHANICAL REQUIREMENTS

The NTS must meet the following mechanical requirements:

- 5.1. Width: fit standard 19" rack mount;
- 5.2. Height: maximum 2 RU;

- 5.3. Depth: maximum 600 mm; and
- 5.4. Weight: maximum 30 kg.

6. DESIGN REQUIREMENTS

The NTS must meet the following design requirements:

- 6.1. Be self contained.
- 6.2. Use commercial off-the-shelf equipment.
- 6.3. Have Power Failure Recovery to enable the NTS to resume functioning in the same state that it was in at the time of the power failure without operator intervention.
- 6.4. All equipment must be modular with plug-in circuit cards and assemblies.
- 6.5. The system design shall provide open Ethernet TCP/IP APIs to the consoles and the edge devices to allow integration with future systems. The goal is for the APIs to be usable in an extensible, open architecture, security electronics framework

The NTS must have the capability to

- a) Be managed with a non-proprietary interface;
- b) Include an open SDK for the display interface generation;
- c) provide a managed, object model for all TCP/IP end devices that abstracts their core functionality;

Provide a published or standard protocol for all TCP/IP end devices preferably based on existing network standards such as SNMP

- 6.6. Have a mean time between failure greater than 10,000 hours.
- 6.7. NTS and all associated equipment must be rated and capable of continuous operation.
- 6.8. Provide remote diagnostics to indicate failure to Data Logger

The system design shall provide an interface to the MCCP Data Logger described in ES/SPEC-0005. All events generated by the NTP shall be logged including fault alarms, reboots, and configuration changes. The eventual cable connection and integration into the FAAS shall be under a separate contract. All faults and alarms shall be provided in a format compatible with the FAAS specification.

- 6.9. Provide remote diagnostic to indicate failure to MCCP/FAAS

The system design shall provide an interface to the MCCP Data Logger described in ES/SPEC-0005. All events generated by the NTP shall be logged including fault alarms, reboots, and configuration changes. The message formats

shall be as described in ES/STD-0102. It is preferable that the messages be provided over TCP/IP. The eventual integration of these alarms into the FAAS is under a separate contract, but this capability must be demonstrated as part of this work

- 6.10. Provide user login, password and rights management such as to limit user's access via a web browser interface.
- 6.11. Accept a signal from a Universal Time Code (UTC) source, when available.
- 6.12. Have an option to integrate a Global Positioning System (GPS) receiver and associated antenna.
- 6.13. Provide Network Time Protocol (NTP) synchronization to various IP enabled operating system platforms.

* Including but not limited to the following Systems:

- Video Surveillance
- Audio Intercept
 - V&C
 - Inmate telephone intercept
- Cell Call
- Guard Tour
- PPA /PPALS
- PIDS PIU
- FAAS FIU
- Switches, Routers
- Door Control System
- Intercoms PA

7. TECHNICAL REQUIREMENTS

The NTS must meet the following technical requirements:

- 7.1. Interface : 100Base-T/10Base-T (auto fallback) fibre 1000Base-T Is acceptable.
- 7.2. System Failure Indication: A system failure must be deemed to have occurred when any required alarm or warning (visual or audible) is not produced or when any required control function cannot be performed.
- 7.3. Protocol: Network Time Protocol.

8. APPLICABLE DOCUMENTS

- 8.1. SP0005: Systems Integration MCCP
- 8.2. ES/STD-0102: Data Logger

9. INTERFERENCE

The NTS performance must not be affected by the presence or use of standard CSC electronic equipment. The unit must work at the following distance limits:

- 9.1. 5 watt CB transceivers at 1 meter or more;
- 9.2. 6 watt VHF and UHF transceivers at 1 meter or more;
- 9.3. 25 mWt 420-430 MHz Personal Portable Transmitters at 1 meter or more;
- 9.4. Other radio frequency transmitting, receiving and distribution equipment at 5 meters or more; and
- 9.5. Personal computer and/or computer work stations at 5 meters or more.

10. SAFETY

The NTS must be CSA, UL, ULC or CE approved, as required by law.

-END OF TEXT-