
DRAFT
Standard Development Report
for
NTCIP 2202 v02.04
Internet (TCP/IP and UDP/IP)
Transport Profile

January 9, 2025

The following Standard Development Report (SDR) is made in accordance with the Institute of Transportation Engineers (ITE) procedures for the National Transportation Communications for ITS Protocol.

Contents

1 LATEST VERSION OF THE DRAFT PROPOSED STANDARD 3

2 SUMMARY STATUS 3

3 STATUS REPORT 3

4 COMMENTS LISTING 3

5 COMMITTEE OBJECTIVES 4

6 COMMITTEE MEMBERS 4

7 OTHER MATERIAL OF INTEREST 5

 7.1 NORMATIVE REFERENCES 5

 7.2 OTHER REFERENCES 5

8 DECLARATION REGARDING OTHER KNOWN NATIONAL AND INTERNATIONAL STANDARDS 6

9 ABSTRACT OF THE STANDARD 6

1 Latest Version of the Draft Proposed Standard

This Standards Development Report (SDR) references Recommended Standard (RS) NTCIP 2202 v02.04 *Internet (TCP/IP and UDP/IP) Transport Profile*. When Jointly Approved, NTCIP 2202 v02.04 will be a major update to the current NTCIP 2202:2001, dated December 2001. Jointly Approved means that the standard is formally balloted and approved separately by the three cooperating standard development organizations (SDOs): the American Association of State Highway and Transportation Officials (AASHTO), the Institute of Transportation Engineers (ITE), and the National Electrical Manufacturers Association (NEMA).

2 Summary Status

NTCIP 2202 v02.04 has been accepted as a Recommended Standard of the Joint Committee on the NTCIP. The standard was updated as a part of the Infrastructure Standards Security Implementation (ISSI) project, which is intended to improve the security of NTCIP communications. The standard contains the detailed specifications for how to send NTCIP data over the Internet Protocol (IP) using either Datagram Transport Layer Security (DTLS) or Transport Layer Security (TLS) v1.3. This is a major upgrade from the NTCIP 2202:2001, which did not discuss DTLS or TLS.

NTCIP 2202 v02.04 is now distributed to the members of AASHTO, ITE, and NEMA for balloting and approval. After all three standards development organizations (SDOs) have individually approved RS NTCIP 2202 v02.04, it is a Jointly Approved Standard and published with the designation (and to be cited as) NTCIP 2202 v02.

3 Status Report

NTCIP 2202:2001 was published as a Jointly Approved standard of the Joint Committee on the NTCIP in December 2001. The effort to produce NTCIP 2202 v02 is based on the results of the prior effort to define a path to secure NTCIP communications, which resulted in a set of recommendations published in NTCIP 9014. The Infrastructure Standards Security Implementation (ISSI) project was initiated in June 2022 to begin implementing the recommendations in NTCIP 9014; the update to NTCIP 2202 is one of the foundational standards that are first to be updated by this project.

The BSP2 WG held a series of fourteen meetings between October 14, 2022 and December 16, 2024 to discuss the proposed changes to NTCIP 1201, 2202, 2301, and 8007, as well as updates to related standards, including RFC 6353, ISO 15784-2, and ISO 26048-1. During these meetings, proposed revisions were explained, and questions were raised to the group on topics of questionable direction. The feedback from the group was incorporated into the subsequent revisions of the document. In addition, comments (written inputs) were solicited during the User Comment Draft (UCD) stage. Review of the input received during each phase of development led to a successful vote accepting the recommended standard during RS Stage.

A summary of the significant technical changes included in NTCIP 2202 v02.04 as compared to NTCIP 2202:2001 is provided below:

- Added requirements related to the support of DTLS and TLS
- Added an option for IPv6
- Updated references, including adding explicit requirements to support MIB objects from relevant RFCs

NTCIP 2202 v02.04 was accepted as a Recommended Standard via a vote that closed on **May 3, 2024 with a vote of 8 yeas, 0 nays, and 0 abstention out of 13 total members.**

4 Comments Listing

No comments were received on NTCIP 2202 v02.04 during the public comment period known as the User Comment Draft (UCD) stage.

5 Committee Objectives

The objective of the BSP2WG in this project is to produce a new version of the NTCIP 2202 standard that implements the security recommendations contained in NTCIP 9014. The distribution of NTCIP 2202 v02.04 for formal balloting is a step in this process to ensure consensus among the members of the SDOs.

6 Committee Members

This standard has been developed under the oversight of the Joint Committee on the NTCIP which is made up of representatives from the American Association of State Highway and Transportation Officials (AASHTO), the Institute of Transportation Engineers (ITE), and the National Electrical Manufacturers Association (NEMA). The work in developing this standard was performed by the Base Standards, Protocols, and Profiles (BSP2) Working Group (WG), a technical subcommittee of the Joint Committee.

BSP2 Working Group

- Washington State DOT: Michael Forbis (Co-Chair)
- Caltrans: Patrick Leung (alternate: Mohammad Iraki, David Guan, Jay Schultz, or Mike Robinson)
- Florida DOT: Robert Lopes (alternate Derek Vollmer)
- Georgia DOT: Justin Hatch (alternate: Alan Davis)
- Michigan DOT: Joe Gorman
- Minnesota DOT: Terry Haukom (alternate: Mike Manning)
- Nevada DOT: Rodney Schilling (alternate: Gary Molnar, Jacob Grivette)
- Q-Free: Doug Crawford (Co-chair) (alternate: Douglas Tarico)
- AECOM: Alex Mousadi
- Applied Information: Walt Townsend (alternate: Alan Luchuk)
- Daktronics: Steve Bostrom (alternate: Denver Kruse)
- Econolite: Dustin DeVoe (alternate: Shea Tomsin or Dan Brandesky)
- KLD Corporation: Satya Muthuswamy
- Transcore: Bob Rausch (alternate: Keith Patton)
- Yunex Traffic: Wolfgang Buckel (alternate: Andrew Valdez)

Joint Committee on the NTCIP

- Doug Crawford, Intelight
- Alan Davis, Georgia DOT
- Ray Deer, Peek Traffic
- Kleinjan Deetlefs, McCain
- Gary Duncan, Econolite
- Scott Evans, Eberle Design
- Daniel Farley, Pennsylvania DOT
- Matt Luker, Utah DOT
- Andrew Mao, Texas DOT
- Dave Miller, Siemens
- Robert Rausch, TransCore
- Edward Seymour, Texas Transportation Institute
- Mohamed Talas, New York City DOT
- John Thai, City of Anaheim
- Lei Wang, Louisiana DOTD
- Henry Wickes, Texas DOT
- Jon Wyatt, Parsons
- Derek Vollmer, Florida DOT

7 Other Material of Interest

Normative and other documents cited in NTCIP 1201 v04.08 are as follows.

7.1 Normative References

Normative References

Normative references contain provisions that, through reference in the document, constitute provisions of the document.

IAB STD 3	<i>(RFC 1122: 1989, Requirements For Internet Hosts - Communication Layers, RFC 1123: 1989, Requirements For Internet Hosts - Application and Support)</i>
IAB STD 5	<i>(RFC 791: 1981, Internet Protocol, RFC 792: 1981, Internet Control Message Protocol, RFC 919: 1984, Broadcasting Internet datagrams, RFC 922: 1984, Broadcasting Internet datagrams in the presence of subnets, RFC 950: 1985, Internet standard subnetting procedure, RFC 1112: 1989, Host extensions for IP multicasting)</i>
IAB STD 6	<i>(RFC 768: 1980, User Datagram Protocol)</i>
IAB STD 7	<i>(RFC 9293: 2022, Transmission Control Protocol)</i>
IAB STD 86	<i>(RFC 8200: 2017, Internet Protocol, Version 6 (IPv6) Specification)</i>
RFC 1349	Type of Service in the Internet Protocol Suite, July 1992
RFC 2236	Internet Group Management Protocol, November 1997
RFC 2863	The Interfaces Group MIB, June 2000
RFC 4022	Management Information Base for the Transmission Control Protocol (TCP), March 2005
RFC 4113	Management Information Base for the User Datagram Protocol (UDP), June 2005
RFC 4291	IP Version 6 Addressing Architecture, February 2006
RFC 4293	Management Information Base for the Internet Protocol (IP), April 2006
RFC 4443	Internet Control Message Protocol (ICMPv6) for the Internet Protocol Version 6 (IPv6) Specification, March 2006
RFC 4884	Extended ICMP to Support Multi-Part Messages, April 2007
RFC 6298	Computing TCP's Retransmission Timer, June 2011
RFC 6633	Deprecation of ICMP Source Quench Messages, May 2012
RFC 6864	Updated Specification of the IPv4 ID Field, February 2012
RFC 6918	Formally Deprecating Some ICMPv4 Message Types, April 2013

7.2 Other References

Other references are included to provide a more complete understanding of this document and its relationship to other documents.

ISO/IEC 7498-1:1994	<i>Information technology — Open Systems Interconnection — Basic Reference Model: The Basic Model</i>
ISO 21217:2020	<i>Intelligent transport systems — Station and communication architecture</i>

7.3 Contact Information

7.3.1 IAB and IETF Documents

For Internet Architecture Board (IAB) and Internet Engineering Task Force documents, contact:

Internet Architecture Board (IAB)

www.rfc-editor.org

7.3.2 NTCIP Documents

Copies of NTCIP documents may be obtained from:

NTCIP Coordinator

National Electrical Manufacturers Association

1300 N.17th Street, Suite 1752

Rosslyn, Virginia 22209-3801

www.ntcip.org

e-mail: ntcip@nema.org

Draft amendments, which are under discussion by the relevant NTCIP Working Group, and amendments recommended by the NTCIP Joint Committee are available.

8 Declaration Regarding Other Known National and International Standards

This statement confirms that other known national and international standards have been examined with regard to harmonization and duplication of content, and no significant conflicts with other known standards have been identified.

9 Abstract of the Standard

This section is excerpted from Section 1 of NTCIP 2202 v02.04.

Scope

This standard is applicable to transportation devices and management systems that must operate in Intelligent Transportation Systems. As a transport profile, it specifies a set of protocols and standards applicable to the transport and network layers of the open systems interconnect (OSI) reference model. The set of protocols provides a secure connectionless or connection-oriented transport service over a connectionless network service. This standard is intended to provide secure message transport and delivery services between transportation devices and a management station or among multiple centers. This standard applies to end systems concerned with implementing the TCP/IP protocol suite.

APPENDIXES

Appendix I
Recommended Standard NTCIP 2202 v02.04

