802.1AS-Rev PAR Revision

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Background

- There was discussion at the January 2017 802.1 TSN TG meeting that the Scope of 802.1AS-Rev needs to mention managed objects
- It was decided that the editor should bring draft PAR-revision slides to the March 2017 meeting
- The current presentation contains those slides

Current 802.1AS-Rev PAR

- See next page

P802.1AS

Submitter Email: tony@jeffree.co.uk
Type of Project: Revision to IEEE Standard 802.1AS-2011
PAR Request Date: 16-May-2014
PAR Approval Date:
PAR Expiration Date:
Status: Unapproved PAR, PAR for a Revision to an existing IEEE Standard

1.1 Project Number: P802.1AS
1.2 Type of Document: Standard
1.3 Life Cycle: Full Use

2.1 Title: Standard for Local and Metropolitan Area Networks - Timing and Synchronization for Time-Sensitive Applications

Changes in title: ~~IEEE~~ Standard for Local and Metropolitan Area Networks - Timing and Synchronization for Time-Sensitive Applications~~in Bridged Local Area Networks~~

3.1 Working Group: Higher Layer LAN Protocols Working Group (C/LM/WG802.1)
Contact Information for Working Group Chair
Name: Glenn Parsons
Email Address: gparsons@ieee.org
Phone: 613-963-8141
Contact Information for Working Group Vice-Chair
Name: John Messenger
Email Address: jmessenger@advaoptical.com
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3.2 Sponsoring Society and Committee: IEEE Computer Society/LAN/MAN Standards Committee (C/LM)
Contact Information for Sponsor Chair
Name: Paul Nikolich
Email Address: p.nikolich@ieee.org
Phone: 857.205.0050
Contact Information for Standards Representative
Name: James Gilb
Email Address: gilb@ieee.org
Phone: 858-229-4822

4.1 Type of Ballot: Individual
4.2 Expected Date of submission of draft to the IEEE-SA for Initial Sponsor Ballot: 07/2016
4.3 Projected Completion Date for Submittal to RevCom: 02/2017

5.1 Approximate number of people expected to be actively involved in the development of this project: 40
5.2 Scope: This standard specifies the protocol and procedures used to ensure that the synchronization requirements are met for time-sensitive applications, such as audio, video, and time-sensitive control, across networks; for example, IEEE 802 and similar media. This includes the maintenance of synchronized time during normal operation and following addition, removal, or failure of network components and network reconfiguration. It specifies the use of IEEE Std 1588 specifications where applicable in the context of IEEE Std 802.1Q. Synchronization to an externally provided timing signal (e.g., a recognized timing standard such as UTC or TAI) is not part of this standard but is not precluded.

Changes in scope: This standard specifies the protocol and procedures used to ensure that the synchronization requirements are met for time-sensitive applications, such as audio, ~~and~~ video, ~~across bridged~~ and ~~virtual~~time-sensitive ~~bridged~~control, ~~local~~across ~~area~~ networks~~consisting of local area network (LAN) media where the transmission delays are fixed and symmetrical~~; for example, IEEE 802~~.3~~ ~~full duplex~~and ~~links~~similar media. This includes the maintenance of synchronized time during normal operation and following addition, removal, or failure of network components and network reconfiguration. It specifies the use of IEEE Std 1588 specifications where applicable in the context of IEEE Std 802.~~1D-2004 and IEEE Std 802.~~1Q~~-2005~~.~~1~~ Synchronization to an externally provided timing signal (e.g., a recognized timing standard such as UTC or TAI) is not part of this standard but is not precluded.

5.3 Is the completion of this standard dependent upon the completion of another standard: No
5.4 Purpose: This standard enables stations attached to bridged LANs to meet the respective jitter, wander, and time synchronization

requirements for time-sensitive applications. This includes applications that involve multiple streams delivered to multiple endpoints. To facilitate the widespread use of bridged LANs for these applications, synchronization information is one of the components needed at each network element where time-sensitive application data are mapped or demapped or a time-sensitive function is performed. This standard leverages the work of the IEEE 1588 Working Group by developing the additional specifications needed to address these requirements.

5.5 Need for the Project: The use of current IEEE 802 technologies for time-sensitive applications, such as high-quality audio/video streaming or industrial control, does not assure that the applications can present data with acceptable jitter, wander, and deviation in time. This includes applications that involve multiple streams delivered to multiple endpoints. To facilitate the widespread use of bridged LANs for these applications, synchronization information is one of the components needed at each network element where time-sensitive application data are mapped or demapped or a time sensitive function is performed. The synchronization information provided to each network element will allow the jitter, wander, and time synchronization requirements of demanding applications, such as in a residential environment, to be met. Existing time synchronization standards, IEEE Std 1588-2002 and IETF Request for Comments: 1305 (Network Time Protocol), because they operate at layer 3, impose unacceptable operational complexity and implementation costs on a developer of time-sensitive applications. This standard will leverage the work of the IEEE 1588 WG to develop the additional specifications needed to address these requirements.

5.6 Stakeholders for the Standard: Developers, manufacturers, distributors, or users of time-sensitive applications, components, and equipment.

Intellectual Property
6.1.a. Is the Sponsor aware of any copyright permissions needed for this project?: No
6.1.b. Is the Sponsor aware of possible registration activity related to this project?: No

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7.1 Are there other standards or projects with a similar scope?: No
7.2 Joint Development
Is it the intent to develop this document jointly with another organization?: No

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8.1 Additional Explanatory Notes (Item Number and Explanation): 5.2:
IEEE Std 802.1Q, IEEE Standard for Local and metropolitan area networks - Bridges and Bridged Networks
IEEE Std 1588, IEEE Standard for a Precision Clock Synchronization Protocol for Network Measurement and Control Systems

Current 802.1AS-Rev Scope and Purpose

- See next page, taken from 802.1AS-Rev/D4.5

IEEE Standard for
Local and metropolitan area networks—

Timing and Synchronization for Time-Sensitive Applications ~~in Bridged Local Area Networks~~

1. Overview

1.1 Scope

This standard specifies the protocol and procedures used to ensure that the synchronization requirements are met for time-sensitive applications, such as audio, ~~-~~video, and ~~video~~time-sensitive control, across ~~bridged and virtual bridged local area~~ networks ~~consisting of local area network (LAN) media where the transmission delays are fixed and symmetrical~~; for example, IEEE 802~~.3™ full-duplex~~and ~~-~~similar ~~links~~media. This includes the maintenance of ~~synchronized time~~synchronized time during normal operation and following addition, removal, or failure of network components and network reconfiguration. It specifies the use of IEEE 1588™ specifications where applicable in the context of IEEE Std 802~~.1D™-2004 and IEEE Std 802~~.1Q™~~-2005~~.[1] Synchronization to an externally provided timing signal (e.g., a recognized timing standard such as UTC or TAI) is not part of this standard but is not precluded.

[1]Information on references can be found in Clause 2.

1.2 Purpose

This standard enables ~~stations attached to bridged LANs~~systems to meet the respective jitter, wander, and ~~time synchronization~~time-synchronization requirements for time-sensitive applications. This includes applications that involve multiple streams delivered to multiple endpoints. To facilitate the widespread use of ~~bridged LANs~~packet–networks for these applications, synchronization information is one of the components needed at each network element where time-sensitive application data are mapped or demapped or a time-sensitive function is performed. This standard leverages the work of the IEEE 1588 Working Group by developing the additional specifications needed to address these requirements.

Scope Revision

- In first sentence, change “This standard specifies the protocol and procedures used to ensure that …” to “This standard specifies the protocol, procedures, and managed objects used to ensure that …”
- See next page for full revised scope

IEEE Standard for
Local and metropolitan area networks—

Timing and Synchronization for Time-Sensitive Applications ~~in Bridged Local Area Networks~~

IMPORTANT NOTICE: This standard is not intended to ensure safety, security, health, or environmental protection. Implementers of the standard are responsible for determining appropriate safety, security, environmental, and health practices or regulatory requirements.

1. Overview

1.1 Scope

This standard specifies the protocol, ~~and~~ procedures, and managed objects used to ensure that the synchronization requirements are met for time-sensitive applications, such as audio, video, and ~~video~~time-sensitive control, across ~~bridged and virtual bridged local area~~ networks ~~consisting of local area network (LAN) media where the transmission delays are fixed and symmetrical~~; for example, IEEE 802~~.3™ full-duplex~~and ~~similar links~~media. This includes the maintenance of ~~synchronized time~~synchronized time during normal operation and following addition, removal, or failure of network components and network reconfiguration. It specifies the use of IEEE 1588™ specifications where applicable in the context of IEEE Std 802~~.1D™-2004 and IEEE Std 802~~.1Q™~~-2005~~.[1] Synchronization to an externally provided timing signal (e.g., a recognized timing standard such as UTC or TAI) is not part of this standard but is not precluded.

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CSD

- The following slides contain the final CSD file that went with the 802.1AS-Rev PAR
- It appears that no changes are needed to the CSD

CSD for P802.1AS-REV

802.1 WG

Wednesday, 05 November 2014

Project process requirements

- ***Managed objects***
  - *Describe the plan for developing a definition of managed objects. The plan shall specify one of the following:*
    a) *The definitions will be part of this project.*
    b) *The definitions will be part of a different project and provide the plan for that project or anticipated future project.*
    c) *The definitions will not be developed and explain why such definitions are not needed.*

a) The definitions are part of the project.

Project process requirements

- ***Coexistence***
  - *A WG proposing a wireless project shall demonstrate coexistence through the preparation of a Coexistence Assurance (CA) document unless it is not applicable.*
    a) *Will the WG create a CA document as part of the WG balloting process as described in Clause 13? (yes/no)*
    b) *If not, explain why the CA document is not applicable.*
- Not applicable – this is not a wireless project.

5C requirements

- ***Broad market potential***
  - *Each proposed IEEE 802 LMSC standard shall have broad market potential. At a minimum, address the following areas:*
    - *a) Broad sets of applicability.*
    - *b) Multiple vendors and numerous users.*

a) The proposed revision would apply to all 802 networks composed of full duplex IEEE 802.3, IEEE 802.11, IEEE 802.3 EPON, and other IEEE 802 networks identified in the scope, as a means of providing timing and synchronization for time-sensitive applications. The proposed revision would also apply to Coordinated Shared Networks (CSN).

b) Many vendors and users have continually expressed their support for this standard and there are a number of implementations in the field.

5C requirements

- ***Compatibility***
  - *Each proposed IEEE 802 LMSC standard should be in conformance with IEEE Std 802, IEEE 802.1AC, and IEEE 802.1Q. If any variances in conformance emerge, they shall be thoroughly disclosed and reviewed with IEEE 802.1 WG prior to submitting a PAR to the Sponsor.*
    - *a) Will the proposed standard comply with IEEE Std 802, IEEE Std 802.1AC and IEEE Std 802.1Q?*
    - *b) If the answer to a) is no, supply the response from the IEEE 802.1 WG.*
  - *The review and response is not required if the proposed standard is an amendment or revision to an existing standard for which it has been previously determined that compliance with the above IEEE 802 standards is not possible. In this case, the CSD statement shall state that this is the case.*

a) Yes.

5C requirements

- ***Distinct Identity***
  - *Each proposed IEEE 802 LMSC standard shall provide evidence of a distinct identity. Identify standards and standards projects with similar scopes and for each one describe why the proposed project is substantially different.*
- There is no other 802 standard or approved project that provides the same functionality for bridges or end stations.

5C requirements

- ***Technical Feasibility***
  - *Each proposed IEEE 802 LMSC standard shall provide evidence that the project is technically feasible within the time frame of the project. At a minimum, address the following items to demonstrate technical feasibility:*
    a) *Demonstrated system feasibility.*
    b) *Proven similar technology via testing, modeling, simulation, etc.*

a) There are numerous implementations of the 802.1AS-2011 standard.

b) The technology has been proven in the field and in compatibility testing carried out in public testing labs.

5C requirements

- ***Economic Feasibility***
  - *Each proposed IEEE 802 LMSC standard shall provide evidence of economic feasibility. Demonstrate, as far as can reasonably be estimated, the economic feasibility of the proposed project for its intended applications. Among the areas that may be addressed in the cost for performance analysis are the following:*
    - *a) Balanced costs (infrastructure versus attached stations).*
    - *b) Known cost factors.*
    - *c) Consideration of installation costs.*
    - *d) Consideration of operational costs (e.g., energy consumption).*
    - *e) Other areas, as appropriate.*

a) The functionality needed to provide the features specified in this standard is essentially the same in bridges and end stations. The cost of providing these features in each type of device will not be significant, given the expected large volumes.

b) The cost factors are well known from implementations of 802.1AS-2011.

c) There are no incremental installation costs relative to the existing costs associated with 802.1AS-2011.

d) There are no incremental operational costs relative to the existing costs associated with 802.1AS-2011.

e) No other areas have been identified.