Video Services Forum (VSF)
Technical Recommendation TR-06-2

Reliable Internet Stream Transport (RIST) Levels Annex

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Executive Summary

The VSF has previously published Technical Recommendation TR-06-2, RIST Protocol Specification – Main Profile. This document establishes Interoperability Levels within the Main Profile.

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1 Introduction (Informative)

VSF TR-06-2, RIST Main Profile, includes a number of major and minor features. Not every vendor will implement every feature of the Main Profile. This could cause confusion in the marketplace, causing devices implementing different sets of features to interoperate at some levels but not at others.

This document defines interoperability levels for RIST Main Profile. Devices compliant with a given level are guaranteed to interoperate at that level. This simplifies the task of communicating to end users, the feature set of a given device, and improves interoperability.

This document defines required and optional features for each of the levels. Optional features are enhancements and optimizations that may or may not be present.

Note that it is possible for two implementations to be compliant with this Technical Recommendation and still fail to interoperate with regard to some optional function(s).

1.1 Contributors

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1.2 About the Video Services Forum

The Video Services Forum, Inc. (www.videoservicesforum.org) is an international association dedicated to video transport technologies, interoperability, quality metrics and education. The VSF is composed of service providers, users and manufacturers. The organization's activities include:

- providing forums to identify issues involving the development, engineering, installation, testing and maintenance of audio and video services;
- exchanging non-proprietary information to promote the development of video transport service technology and to foster resolution of issues common to the video services industry;

- identification of video services applications and educational services utilizing video transport services;
- promoting interoperability and encouraging technical standards for national and international standards bodies.

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2   Conformance Notation

Normative text is text that describes elements of the design that are indispensable or contains the conformance language keywords: "shall", "should", or "may". Informative text is text that is potentially helpful to the user, but not indispensable, and can be removed, changed, or added editorially without affecting interoperability. Informative text does not contain any conformance keywords.

All text in this document is, by default, normative, except the Introduction and any section explicitly labeled as "Informative" or individual paragraphs that start with "Note:"

The keywords "shall" and "shall not" indicate requirements strictly to be followed in order to conform to the document and from which no deviation is permitted.

The keywords, "should" and "should not" indicate that, among several possibilities, one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required; or that (in the negative form) a certain possibility or course of action is deprecated but not prohibited.

The keywords "may" and "need not" indicate courses of action permissible within the limits of the document.

The keyword "reserved" indicates a provision that is not defined at this time, shall not be used, and may be defined in the future. The keyword "forbidden" indicates "reserved" and in addition indicates that the provision will never be defined in the future.

A conformant implementation according to this document is one that includes all mandatory provisions ("shall") and, if implemented, all recommended provisions ("should") as described. A conformant implementation need not implement optional provisions ("may") and need not implement them as described.

Unless otherwise specified, the order of precedence of the types of normative information in this document shall be as follows: Normative prose shall be the authoritative definition; Tables shall be next; followed by formal languages; then figures; and then any other language forms.

3   References

VSF TR-06-1, Reliable Internet Stream Transport (RIST) Protocol Specification – Simple Profile

VSF TR-06-2, Reliable Internet Stream Transport (RIST) Protocol Specification – Main Profile

4   Level Hierarchy

This document defines the following RIST Main Profile levels:

- **Baseline Level:** includes the GRE tunneling and multiplexing

- **DTLS Level:** includes encryption support through DTLS

- **PSK Level:** includes encryption support through Pre-Shared Keys

- **Full Level:** includes both DTLS and PSK

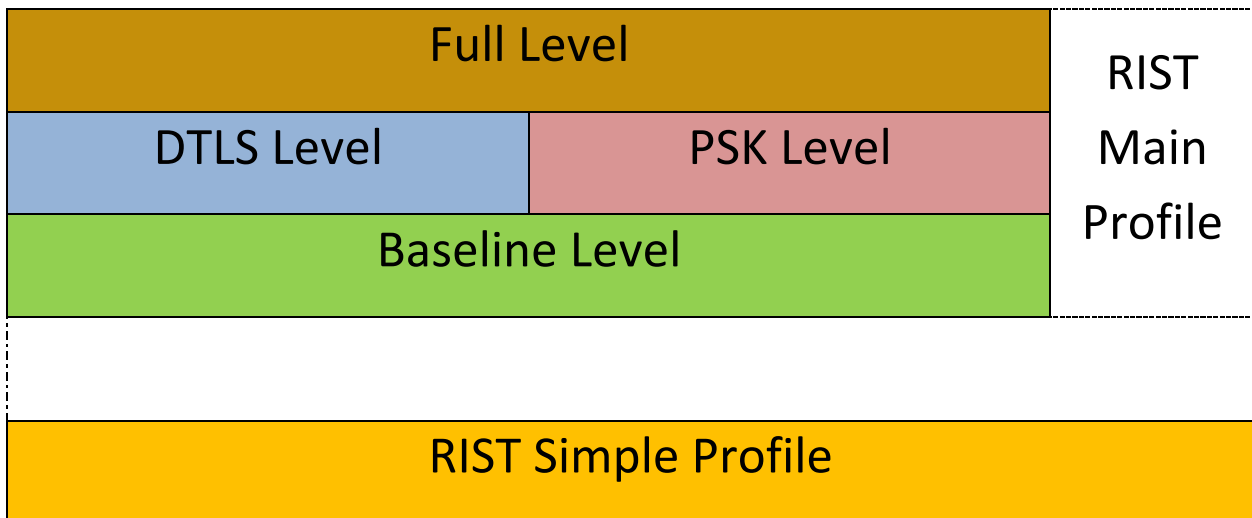Figure 1 illustrates the level hierarchy and their relationship with RIST Simple Profile.

Figure 1: Main Profile Levels

All RIST Main Profile implementations shall include RIST Simple Profile support as per VSF TR-06-1, as well as support for the Baseline Level established in this document.

Implementations compliant with DTLS Level and/or PSK Level shall support Baseline Level as well. Implementations compliant with Full Level shall include support for both DTLS and PSK Levels.

5   Main Profile Levels

5.1   Baseline Level

Baseline Level provides the minimum required interoperability for a device to be considered compliant with RIST Main Profile. Implementations claiming to operate at the Baseline Level shall implement all of the Required Features below and may implement one or more of the Optional Features below.

Required Features:

Feature	VSF TR-06-2 Section(s)
GRE over UDP Tunneling	5.1
Full Datagram Mode	5.2.1, 5.3
Periodic Keep-Alive Messages	5.5.2

Optional Features:

Feature	VS TR-06-2 Section(s)
Reduced Overhead Mode	5.2.2, 5.3
Main Profile Keep-Alive Messages	5.5.3
JSON Payload In Keep-Alive Messages	5.5.4
Inner IP Address Negotiation	5.5.4
Disconnect Message	5.5.5
Reconnect Message	5.5.6
NULL Packet Deletion	8.3
Extended Sequence Numbers	8.3, 8.4
Tunnel-Level Bonding	5.4

5.2   DTLS Level

DTLS Level provides end-to-encryption where keys are negotiated using DTLS. Implementations claiming to operate at the DTLS Level shall implement all of the Required Features below and may incorporate the Optional Features below.

Required Features:

Feature	VSF TR-06-2 Section(s)
All Required Features in Baseline Level	See table in Baseline Level
DTLS Support	6.1
Support for all five cipher suites in TR-06-2	6.2

Optional Features:

Feature	VSF TR-06-2 Section(s)
All Optional Features in Baseline Level	See table in Baseline Level
Additional cipher suites supported by DTLS	6.2
TLS-SRP	6.4
Support for server-side certificates	6.3
Support for client-side certificates	6.3
Client/Server Authentication	6.3
Support for white lists	6.3
Support for black lists	6.3

5.3   PSK Level

PSK Level provides end-to-end encryption with pre-shared keys. Implementations claiming to operate at the PSK Level shall implement all of the Required Features below and may incorporate the Optional Features below.

Required Features:

Feature	VSF TR-06-2 Section(s)
All Required Features in Baseline Level	See table in Baseline Level
PSK Support	7.1
Key Rotation	7.2
Passphrase hashing	7.3

Optional Features:

Feature	VSF TR-06-2 Section(s)
All Optional Features in Baseline Level	See table in Baseline Level
On-the-fly passphrase change	7.4
EAPOL-TLS-SRP Authentication	7.5

5.4   Full Level

Full level combines both DTLS level and PSK level. Implementations claiming to operate at the Full Level shall implement all of the Required Features below and may incorporate the Optional Features below.

Required Features:

Feature	VSF TR-06-2 Section(s)
All Required Features in Baseline Level	See table in Baseline Level
All Required Features in DTLS Level	See table in DTLS level
All Required features in PSK Level	See table in PSK Level

Optional Features:

Feature	VSF TR-06-2 Section(s)
All Optional Features in Baseline Level	See table in Baseline Level
All Optional Features in DTLS Level	See table in DTLS Level
All Optional Features in PSK Level	See table in PSK Level