

# Towards Creating Standards for Remote Digital Voting

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## 1 Introduction

On March 4, 2021, several elections experts representing a diverse set of opinions on the issue of digital voting were invited by the Government Blockchain Association (GBA)<sup>1</sup> for a public discussion on the topic “Blockchain Voting,” moderated by Gerard Dache, Director of the GBA [2]. Panelists included an election official, academics, industry associations, and a remote voting vendor. A second, follow-up panel discussion, hosted by the GBA, was held on April 26, 2021 [3]. The panelists agreed to collaborate on two documents, each of which analyzed certain issues surrounding the following seven main ballot delivery, marking, and return methods in use today.

1. Official mailed paper ballot
2. Voter-printed paper ballot
3. Fax
4. Email
5. File upload from an internet browser
6. Digitally protected file upload from an internet browser
7. Digitally protected and ledgered return from a mobile app

There was particular focus on the digital voting methods.

**Remote Accessible Ballot Roundtable for Local Election Officials**

**July 13, 2022, 3-4pm EDT.**

**Signup:** <https://gbaglobal.org/events/leo-roundtable/>

<sup>1</sup>The GBA is an international nonprofit professional association that promotes blockchain technology solutions to government. Website: <https://gbaglobal.org/>.

The first document, the Supplement for Digital Ballot Delivery, Marking, and Return (SDBDMR), recommends standards for remote and accessible digital ballot delivery, marking, and return for the U.S. Election Assistance Commission (EAC) [1]. The goal is for the EAC to include these recommendations in the next version of the VVSG (Voluntary Voting System Guidelines) [5], a document whose purpose is to facilitate the certification of election equipment.

The second document is an “apples-to-apples” comparison of remote return methods to help election officials and legislators better understand functional and security features of each ballot return method. This report, the Remote Election Technology Report (RETR), is in a final draft form. The GBA is inviting local election officials and other interested parties to a public roundtable discussion of the RETR on July 13, 2022 from 3-4 pm, EDT. Registration is free and is open at <https://gbaglobal.org/events/leo-roundtable/> [4].

The next section discusses proposed revisions to VVSG version 2.0 in the SDBDMR and Section 3 discusses the RETR. We make concluding remarks in Section 4.

## 2 Standards

Currently, VVSG 2.0 lacks standards for the testing and certification of remote digital ballot delivery, marking, return, and storage technologies, methods, and systems in particular. Nevertheless, voting via fax and phone has been available since 1990 for deployed military [6] and at least 31 states and the District of Columbia allow electronic delivery, marking, and/or return of ballots in various cases and means [7]. The proposed standards in the SDBDMR, therefore, are recommendations to supplement VVSG 2.0 in order to thoroughly assess remote digital voting solutions that are already in use.

Much has been written about the benefits of secure internet voting for absentee voters, particularly voters with disabilities, first responders, expatriate voters, and active duty military. The goal of these standards, therefore, is to ensure the quality of internet voting methods, increase confidence in these remote voting methods, and to ultimately make our elections more secure, private, and accessible to remote voters via the use of secure internet voting.

The following are several VVSG principles that need modifications and/or additional tests in order to appropriately review remote digital voting technology.

1. High-Quality Design
2. High-Quality Implementation
3. Transparent
4. Interoperable
5. Equivalent and Consistent Voter Access
6. Voter Privacy
7. Marked, Verified, and Cast as Intended

8. Robust, Safe, Usable, and Accessible
9. Auditable
10. Ballot Secrecy
11. Access Control
12. System Integrity
13. Communications

Complete details on additions and items that need modification for each of these principles can be found in the SDBDMR; the proposal is available on the Government Blockchain Association website [1].

### 3 Comparison of Remote Return Methods

The Remote Elections Technology Report (RETR) compares the functional aspects and security aspects of seven aforementioned ballot return methods.

The purpose of the RETR is to provide election officials and legislators with a convenient comparison of these ballot return methods in order to help them make informed decisions on those return methods to adopt that would best serve voting citizens they serve.

The report does not distinguish whether a paper ballot was returned in an official ballot dropbox or by either the U.S. Postal Service, a courier, or international post in the functional aspects, since voters can choose the method of paper ballot return that best suits them. However, there are some distinctions that needed to be made among these methods for the security aspects; relevant comments will be detailed in the final report.

#### 3.1 Functional Aspects of Ballot Return

The functional aspects of these return methods the RETR compares are the following.

1. **Voter Accessibility:** Can voters with disabilities vote independently, securely, and privately?
2. **Voter Usability:** Can voters cast a ballot, as intended, quickly, without errors, and with confidence that their contest and question selections were recorded correctly?
3. **Interoperability by Election Administrators:** How easily do electronically marked ballots interface with other channels of voting in overall election processes?
4. **Voter Convenience:** Do voters need assistance or accommodation to cast their ballot securely and on time, without compromising their privacy?
5. **Resilience:** Can acceptable levels of service be maintained during severe disruptions?
6. **Transparency:** Can voters and/or auditors determine that ballots were received and correctly tabulated by local election officials and that there is a clear chain of custody of their ballots?
7. **Ballot Secrecy:** Can voters mark, verify, and cast their ballots without revealing their selections?

### 3.2 Security Aspects of Ballot Return

While the functional aspects of voting return methods focused on the important issue of enabling every legal voter access to vote, of equal importance is the integrity of the election process. To this end, the RETR compares various aspects of ballot integrity and voter privacy. The security points of comparison are the following.

1. **Tamper Evident:** Can a modification to a ballot be detected?
2. **Destruction Evident:** Can one determine if a ballot has been destroyed?
3. **Digital Data Security:** Are standard encryption techniques used to protect personally identifying information, affidavits, and ballot data?
4. **Voter Privacy through Permanent Separability:** Can a ballot be masked so that it is not simultaneously visible with the accompanying affidavit? Further, can a ballot and voter affidavit be separated in a way that prevents the re-association of the two documents?
5. **Audit of Original Ballots:** Are the ballots that were used for tabulation those that were originally marked by the voter?
6. **Physical Proximity Required for Tampering:** Does an attack on a ballot need one to be physically close to the ballot?
7. **Group-Limited Threat Actor Scale:** Are attacks on ballots limited to single ballots or relatively small groups of ballots, or is a wholesale attack on voter privacy and ballot integrity possible?

The analysis of the functional and security aspects of remote ballot return methods will be discussed when the final draft of the RETR is made public and also at the Local Election Official Roundtable on July 13th [4].

## 4 Concluding Remarks and Future Developments

The work on developing testing and certification standards for ballot delivery, marking, and return on a mobile device will give election officials and legislators confidence that such a service meets or exceeds high standards. The authors of the SDBDMR recommend that the EAC review the proposed standards for inclusion in the next version of the VVSG. The authors are available to assist the EAC in this effort.

The goal of the RETR is to inform local and state election officials and legislators on the functional and security attributes of various remote voting methods. The GBA and the authors of the RETR are eager to hear your thoughts and answer your questions during the Local Election Official Roundtable on July 13th [4].

## References

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