



**Elections Division  
Office of the Secretary of State**

**Report of the Secretary of State on the Examination  
of Clear Ballot Group ClearVote 2.1 Voting  
System**

**February 2020**

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## Overview

### Application

On January 29, 2020 Clear Ballot submitted an application for Washington State Certification of ClearVote 2.1. The Voting System includes ClearDesign, ClearAccess, and ClearCount. Copies of operating and maintenance manuals, training materials, technical and operational specifications were provided as part of the Technical Data Package.

### Modification of Certified Voting System

This is a modification of a currently certified voting system. This system is a paper based digital scan voting system with a commercial off the shelf (COTS) scanners, printers, and computers.

This system has completed testing at an Election Assistance Commission (EAC) approved Voting System Test Lab (VSTL), Pro V&V.

### Software & Hardware

The following hardware and software of the system were tested by the VSTL:

Component	Model	Serial Number
<b>ClearDesign Components</b>		
Dell Latitude Laptop (client)	5580, 5590, 5500	CF3L3G2, B5TD1N2, 3C3M9Y2
Dell OptiPlex (client)	7440, XE3 SFF	JXDFHH2
Dell Precision Tower (client)	T3620	GSKRMV2 & GSKSMN2
Dell PowerEdge Server (server)	T130, T140, T440, R440, T630	5G0YLN2, 8BFH3W2, H6JZLN2, GCHLHL2
Dell 27-inch Monitor	P2717H and P2719H	CWKZRS2 3MK2RS2
Dell 22-inch Monitor	P2217H and P2219H	FV8C8W2 DLV88W2
Cisco 8-Port Switch	SG250-08-K9-NA	PSZ21451MLJ
LG DVD Burner	GP65NB60	LG-DVD-001
Anker 10 port USB 3.0 Hub	AK-68ANHUB-B10A	22XGHFWC, 22XGHGKX
SySTOR Multiple USB Duplicator	SYS-USB-11	ES-27095
Corsair Flash Padlock 3 32 GB	CMFPLA3B-32GB	N/A
SanDisk Extreme Go 64 GB USB	SDCZ800-064G-G46	N/A
SanDisk Ultra Flair 32 GB USB	SDCZ73-032G-A46, SDCZ73-032G-G46	N/A

<b>ClearAccess Components</b>		
ELO 15 inch AIO	E-Series (ESY15E2)	L17C014810 & A18C004080
Dell OptiPlex AIO	5250	HCGMGK2
Oki Data Laser Printer	B432dn	AK5B007647A0 & AK91021454C0
ELO 20 inch AIO	X-Series (ESY20X2)	D18Q000334, D18Q000335, B18Q001601, B18Q001599 & B18Q000597
Oki Data Laser Printer	B432dn-B	AK8C017016C0, AK8C017022C0
Dell Inspiron 15"	7573	80S1YD2
Clear Ballot Transport Case	CV-1022-2.0	Case-001
Clear Ballot UPS Transport Case	CV-1157-2.0	UPS-Case-001
Micrologic Tray Kit	B432TrayKit	CBG-MTK-001
Zebra Technologies Bar Code Scanner and cable	DS457-SR, CBL-58926-05	18059000501984, 18059000501981, 18095000500487, 18095000500491
Storm EZ Access Keypad	EZ-08-22201, EZ-08-22200	15000005, 20010073
Origin Instruments Sip/Puff Breeze with Headset	AC-0300-MU	CBG-SP-001, 002, 003
Samson Over-Ear Stereo Headphones	SASR350	SR350J8G390 & SR350J8G396
Clear Ballot Privacy Screen	CB-1097-1.5	CBG-PVS-001
Ergotron Neo-Flex	33-329-085	N/A
Corsair Flash Padlock 3 32 GB	CMFPLA3B-32GB	N/A
SanDisk Extreme Go 64 GB USB	SDCZ800-064G-G46	N/A
SanDisk Ultra Flair 32 GB USB	SDCZ73-032G-A46, SDCZ73-032G-G46	N/A
Würth	742-711-32, 742-712-22, 742-717-22	FRT021 through FRT025
Polyamide Film Tape 1" 2 mil	CV-1210-2.0	N/A
Polyamide Film Tape 2" 2 mil	CV-1211-2.0	N/A
Polyamide Film Tape 4" 2 mil	CV-1212-2.0	N/A
APC Smart-UPS	SMT2200C	AS1809160852
Lifetime 4-Foot Folding Table	4428	FT-001
LG DVD Burner	GP65NB60	LG-DVD-002
CyberPower Smart App UPS	PR1500RT2U	PY3HZ2002933, PY3HZ2003000
<b>ClearCount Components</b>		
Dell Latitude Laptops	5580, 5590, 5500	2F3L3G2, 9W5D1N2,

(ScanStation)		JV3WXY2
Dell Precision Tower (Election Administration)	T3620	GSKQMN2
Dell Latitude Laptops (Election Administration)	5580, 5590, 5500	C9S22G2, 5M5D1N2
Dell PowerEdge Server (ScanServer)	T130, T140, T330, T440, R440	5G0ZLN2, 8BFJ3W2, FHV9RD2, H6J5MN2, 55FDB03
Dell OptiPlex (Election Administration)	7440, XE3 SFF	JXDFHH2, 93XDB03
Fujitsu Scanner	fi-7180	A20DC10302 & A20D000798
Fujitsu Scanner	fi-6800	A9HCA00737 & A9HCC00543
Fujitsu Scanner	fi-6400	AKHCC00362 & AKHCC00609
Fujitsu Scanner	fi-7800	C39C000034
Fujitsu Scanner	Fi-7900	C30C000270
LG DVD Burner	GP65NB60	LG-DVD-003
Western Digital 4 TB External HD	WDBFJK0040HBK-NESN, WDBBGB0040HBK-NESN	WCC7K7YF11ZD
Western Digital 8 TB External HD	WDBFJK0080HBK-NESN, WDBBGB0080HBK-NESN	75H4PXJD
Netac Keypad Encryption Portable Hard Disk	K390 (86024554)	R4JT22619T
Dell 27 inch Monitor	P2717H and P2719H	CWKZRS2 3MK2RS2
Dell 22 inch Monitor	P2217H and P2219H	7818672, FV8C8W2 DLV88W2
Cisco 8-Port Switch	SG250-08-K9-NA	PSZ21451MYX
Cisco 26-Port Switch	SG250-26-K9-NA	DNI203400A6 & DNI203400AW
Corsair Flash Padlock 3 32 GB	CMFPLA3B-32GB	N/A
SanDisk Extreme Go 64 GB USB	SDCZ800-064G-G46	N/A
SanDisk Ultra Flair 32 GB USB	SDCZ73-032G-A46, SDCZ73-032G-G46	N/A
Anker USB Hub	AK-68ANHUB-B10A	22XGHFWC, 22XGHGKX
APC Smart-UPS	SMT-1500C	3S1831X12280
WorkeZ Executive Scanning Shelf	WEEs (661799222990), WEEb (661799222983)	CBG-EZ-001, 002,003, & 004
StarTech 4-Port VGA KVM Switch w/Hub	SV431USB	G73011TG80247
Brother Laser Printer	HL-L2340DW	U63879M4N62861
Brother Laser Printer	HL-L2350DW	U6496A8N238333

The ScanServer computer hosts the primary database and the ClearCount server and client software that recognizes and analyzes ballots. It can be a desktop or laptop computer. Minimum requirements include:

- 4-core, 8-thread processor
- At least 8 GB of RAM
- At least 500–1 TB of disk space
- Gigabit LAN connection
- USB 3.0 ports for backing up databases on external hard drives

When a jurisdiction installs or updates a ClearCount product, the installer program replaces the ScanServer computer's operating system with Linux. Therefore, the operating system originally installed on the ScanServer computer is unimportant.

A desktop or laptop computer enabled with a USB 2.0 or later port that can successfully run the listed software is required for use in a ScanStation. One computer is needed for each scanner in concurrent use.

The minimum requirements for a ScanStation computer are:

- 4 core, 8-thread processor
- At least 4 GB of RAM (at least 8 GB recommended)
- At least 500 GB of disk space
- Gigabit LAN connection
- USB 2.0 or later ports

Software requirements for each ScanStation computer include:

- Operating system: Windows 10 Pro
- For Fujitsu scanners:
- Fujitsu ScandAll PRO™ 2.0.12
- For ibml scanners:
  - SoftTrac® Capture Suite 4.0 (for ImageTrac 6000 series)
  - SoftTrac ScanDS 4.4.0 (for ImageTracDS 1155 and 1210)
  - ibml TWAIN driver for the connected scanner, one of:
    - 03-02-01 (for ImageTracDS 1155 and 1210)
    - TWAIN Manager 6.4.0 or later (for ImageTrac 6000 series)

## Testing & Inspection

Testing and evaluation of ClearVote 2.1 was conducted by Secretary of State staff at the OSOS Elections Office in Olympia, WA on February 6, 2020. Examining the system for the Office of the Secretary of State was Stuart Holmes, VoteWA Manager.

Due to ClearVote 2.1 receiving a successfully test at an VTSL prior to state certification testing, a two phase testing program was developed and approved by Secretary of State VIS Manager for state certification testing.

**Delivery acceptance testing** of the equipment and software to determine if the correct model and versions of the equipment and software are delivered and that the equipment, software and system operate as documented by the vendor.

**Election Results Testing** to ensure that the equipment, software and system perform each of the functions required by federal, state and local law in order to administer an election from the beginning to the end.

Ballots were manually voted using the accessible voting unit, ClearAccess, and incorporated into the results to ensure proper tabulation.

## **Executive Summary of Findings be Secretary of State Staff**

### **Voting System Accuracy**

ClearVote 2.1 successfully and accurate tabulated all ballots including manually voted ballots from the accessible voting units. Results were manually audited and reviewed.

### **Results Reporting**

ClearVote 2.1 was able to produce the state required reports for election results by precinct and cumulative. Performance improvements made to this version of ClearVote allow for the generation of those reports much faster than before. That is especially important for elections with many districts and many candidates in a county the size of King County.

### **Presidential Primary**

ClearVote 2.1 can perform all the functions necessary to comply with current state requirements for the Presidential Primary. It can detect cross-party voting in a Presidential Primary without manual intervention.

## System Limits

Characteristic	Tested Limit	Characteristic	Tested Limit
<b>Election parameters</b>			
Precincts per election	3200	Card styles per election	3200
Splits per election	3200	Contests per ballot style	60
District categories per election	100	Card styles per precinct	50
Districts per single category	3200	Parties per election	50
Districts per election	3200	Counter groups per election	7
Contests per election	3200	"Vote for" per contest	50
Choices per election	3200	Languages per election	15
Choices per contest	300	Cards per ballot (per language)	5
Vote positions per side	420	Write-ins per contest	50
<b>Reporting name parameters*</b>			
Election name (characters)	60	Contest name (characters)	60
Jurisdiction name (characters)	60	Candidate name (characters)	60
Precinct name (characters)	60	Party name (characters)	60
Vote center name (characters)	60	Write-in length (characters)	60
<b>System parameters</b>			
Central-count scanners per network	10	Cards per central-count device	4,000,000
Cards per precinct-voting device	10,000		

\*These limits are for reports only.

## Ballot Scanning

ClearVote 2.1 uses Fujitsu or IBML high-speed scanners capable of scanning up to 16,000 ballots per hour using the ImageTrac Lite. Sustained scanning speeds of each of the four available scanners are:

- Small scanner: Fi-7180 – 1,300 per hour
- Medium scanner: fi-6400 – 2,350 per hour
- Medium scanner: fi-6800 – 3,000 per hour
- Medium/Large scanner: DS 1210 - 6,000 per hour
- Large scanner: ImageTrac Lite – 16,000 per hour



## Ballot Processing

Different from other digital scan systems, most adjudication occurs after Election Day. Prior to Election Day, ballots can be adjudicated. The software is capable of identifying light marks that may not have been detected as a vote or marks that show additional voter intent.

Enabling results is logged in the system audit log so that it can be shown that at no time were results enabled prior to Election Day.

ClearCount can be used on laptops or desktop workstations. On laptops the small screen is a drawback, however the county could use the external monitor port to use a large screen monitor. Some benefits of using laptop computers is the built in battery backup and the ability for counties to store them compactly and reuse the election space when not in 'election mode' (especially in smaller counties who could benefit from repurposing their office space when not conducting an election).

## System Security

ClearDesign and ClearCount require a server that stores the election data. That connection to the server is via a HTTPS connection through a VPN router capable of IP/MAC/Domain name filtering and other high security features. This is ideal for completely locking down the internal network in large counties.

All laptops and computers will be hardened to restrict only 'approved' applications to be opened on each workstation along with securing and protecting other important areas of that workstation.

The ClearAccess devices will come with a bezel that will cover and protect the exposed ports and only expose those require for accessibility and power. Those ports can be protected via a tamper evident seal when not in use.

All software and media has an easy to view hash value that will ensure that the device's software has not changed since its last install. Additional system and election event logs can be accessed to view any activity on that device. Furthermore, users can be given roles or credentials that limit their ability to perform any action on the system.

When ClearBallot products start up, they check that the cryptographic module is operating in FIPS mode. If not, the produce displays an error message and will not proceed.

## Physical Security

An excerpt from Clear Ballot's security recommendations is:

When the components of the ClearCount system are not in use, they must be stored in a locked area under the custody and control of the jurisdiction. Access to this area must be controlled by the jurisdiction so the system cannot be accessed by unauthorized individuals and so that any breaches in security can be recognized through the auditing functions of the system.

When in storage or in use, the ClearCount system must be kept within a controlled area where only individuals authorized by the jurisdiction to handle and process ballots or maintain the voting system can come into direct contact with the ballots or components of the system. Each jurisdiction must also follow all jurisdictional and state rules for the handling and processing of ballots in addition to this Clear Ballot procedure. This means that at least one security method is employed to provide deterrence and physical security:

- Receptionists or guards with a gate or other barrier to the scanning area.
- Security cameras.
- Electronic door locking mechanisms such as ID cards or key fobs that record the identity of the device used or person to unlock the door.
- A locking computer rack or other cabinet to contain components of the ClearCount system.

### Write-Ins

ClearVote 2.1 allows for entering write-in candidates after results have been enabled. Write-in candidates do not have to be on a qualified or declared list prior to ballot processing. Clear Ballot representatives recommended that counties review marks in the write-in box prior to adjudicating write-in votes for any marks that are not write-ins (marked the write-in oval, however did not write-in a name).

In this version, ClearCount was updated to include additional write-in reporting and add administration of write-in results.

### Accessible Voting

ClearAccess has an accessible voting unit that is touchscreen, can be used with the provided accessible switches or the voter's sip-n-puff or other USB assistive device. Once the voter has completed voting, their ballot is printed onto regular ballot paper. Depending on the county's procedures and in compliance with all other state elections law, the voter could then put their ballot into a return envelope and put into a ballot drop box and processed with all other ballots returned by mail or in drop boxes. The vote is not captured electronically so this device **is not** a direct recording electronic (DRE) voting unit so this device does not need to be audited separately. The votes on ClearAccess will be a part of the post-election audit as the ballots can be mixed in with all other ballots.

### Conclusion

After an evaluation of the system, Stuart Holmes, VoteWA Manager, believes the system and its components meet current Washington State requirements for Presidential Primary, Special, Primary, and General Elections as well as security, accuracy, and transparency.