

Instructions for Estonian Internet Voting System VMs

Please note that these VMs are **NOT** perfect replicas of the true Estonian system. Some portions of the source code are not available and have been simulated. Additionally, small modifications have been made to make them easy to use. For instance, instead of burning the stripped votes to a DVD for transportation to the HLR, they are burned to an ISO and then transferred with netcat.

1 Overall

- Usernames are the VM's function (hes, hts, log, hlr, voter) and root.
- All passwords are "vote"
- All ID card PINs are "11111" (five 1's)
- To select an option, insert the digit and press Enter. If there are two different numbers, separate them with a space
 - Option 2 == "2" + Enter
 - Option 1-4 == "1 4" + Enter
- To change TTY, press Alt-FX, where FX is a function key (F1 – F6)
- These are the meanings of the voting server abbreviations
 - HES: Forward Vote Server
 - HTS: Vote Storage Server
 - HLR: Vote Count Server
 - LOG: Logging Server

2 Setting up an election

- Client
 - No action required
- HES
 - Log in as "hes" user
 - Select option 2-1 "Lae sertifikaatide konfiguratsioon"
 - Enter the path to the certificate configuration
 - * /opt/configDisk/certConfig/
 - When prompted, enter the password to restart the webserver ("vote")
 - Log in as root in a separate TTY
 - Run /root/TM_check_disable.sh
 - Switch to the "hes" user TTY and select option 2-2 "Lae valimiste seaded paigaldusfailist"
 - Enter the path to the election configuration file
 - * /opt/configDisk/electConfig.bdoc
 - When prompted to confirm, enter "jah"
 - Select option 11 "Välju"

- Switch to the “root” user TTY and press Enter to re-enable TM checking
- HTS
 - Log in as “hts” user
 - Select option 2-1 “Lae sertifikaatide konfiguratsioon”
 - Enter the path to the certificate configuration
 - * /opt/configDisk/certConfig/
 - Log in as root in a separate TTY
 - Run /root/TM_check_disable.sh
 - Switch to the “hts” user TTY and select option 2-2 “Lae valimiste seaded paigaldusfailist”
 - Enter the path to the election configuration file
 - * /opt/configDisk/electConfig.bdoc
 - When prompted to confirm, enter “jah”
 - Select option 11 “Välju”
 - Switch to the “root” user TTY and press Enter to re-enable TM checking
- LOG
 - No action required
- HLR
 - Log in as “hlr” user
 - Select option 2-1 “Lae sertifikaatide konfiguratsioon”
 - Enter the path to the certificate configuration
 - * /opt/configDisk/certConfig/
 - Log in as root in a separate TTY
 - Run /root/TM_check_disable.sh
 - Switch to the “hts” user TTY and select the option 2-2 “Lae valimiste seaded paigaldusfailist”
 - Enter the path to the election configuration file
 - * /opt/configDisk/electConfig.bdoc
 - When prompted to confirm, enter “jah”
 - Select option 4-3 “Initsialiseeri HSM”
 - Press Enter 3x to accept the default HSM configuration
 - Select option 10 “Välju”
 - Switch to the “root” user TTY and press Enter to re-enable TM checking

3 Starting the voting period

- Client
 - No action required
- HES
 - Log in as “hes” user
 - Select option 4-10 “Alusta hääetusperioodi”
 - When prompted to confirm, enter “jah”

- Select option 10 “Välju”
- HTS
 - Log in as “hts” user
 - Select option 4-7 “Alusta hääetusperioodi”
 - When prompted to confirm, enter “jah”
 - Select option 11 “Välju”
- LOG
 - No action required
- HLR
 - No action required

4 Voting

- Client
 - Log in
 - On the desktop, double click “insertSmartCard.py”
 - Click “Select Voter”
 - Click on the voter that you want to vote with
 - Click “Insert Smart Card”
 - On the desktop, double click “KOV2013client”
 - Click “ID-kaart”
 - When prompted, enter the authentication ID card PIN (“11111”)
 - At the welcome screen, click “Hääletama”
 - Click the candidate that you want to vote for
 - Click “Valin”
 - On the confirmation screen, click “Kinnitan”
 - Prompted, enter the signing ID card PIN (“11111”)
 - On the “Thank You” screen, click “Sulgen”
 - In the “SMART card” window, click “Remove Smart Card”
 - You can repeat by selecting another voter to use and repeating the process
- HES
 - No action required
- HTS
 - No action required
- LOG
 - No action required
- HLR
 - No action required

5 Verifying a vote

In order to verify a vote, the verification Android app must be used to take a picture of the QR code that is displayed after voting. Because the app must communicate with the HES VM, the patched version of the app is required (because of pinned certificates) and the phone's `/etc/hosts` file needs to be modified to redirect `hes.valimised.ee` to the IP address of the HES VM.

The easiest way to allow verification is by using an external wireless router, setting the VMs to “Bridge” networking mode to connect to the router, and connecting an Android phone the router's network. A full description is outside of the scope of this document. For more information, e-mail Travis Finkenauer at tmfink@umich.edu.

6 Ending the voting period

- Client
 - No action required
- HES
 - Log in as the “hes” user
 - Select option 2-10 “Lõpeta hääletusperiood”
 - When prompted to confirm, enter “jah”
 - Select option 10 “Välju”
- HTS
 - Log in as the “hts” user
 - Select option 2-6 “Alusta tühistusperioodi”
 - When prompted to confirm, enter “jah”
 - Select option 10 “Välju”
- LOG
 - No action required
- HLR
 - No action required

7 Audit period and exporting votes

- Client
 - No action required
- HES
 - No action required
- HTS
 - Log in as “hts” user
 - Selectn option 2-6 “Alusta lugemisperioodi”
 - When prompted to confirm, enter “jah”
 - Select option 5 “Ekspordime kõik”

- When prompted to confirm, enter “jah”
- When prompted to enter burn speed, press Enter to accept the default
 - * (note, this does not burn a DVD, this creates an ISO to be transferred)
- Select option 11 “Välju”
- LOG
 - No action required
- HLR
 - No action required

8 Transferring ballot ISO

- Log into the HLR using the “root” user
- On the HLR, run the script `/root/recieveIso.sh`
- Log into the HTS using the “root” user
- On the HTS, run the script `/root/sendIso.sh`
- Log out of the HTS
- Log out of the HLR

9 Count the ballots

- Client
 - No action required
- HES
 - No action required
- HTS
 - No action required
- LOG
 - No action required
- HLR
 - Log into the HLR using the “hlr” user
 - Select option 4-5 “Alusta lugemisperioodi”
 - When prompted to confirm, enter “jah”
 - Select option 1-1 “KOV2013 (Kohalikud omavalitsused)”
 - Select option 1-3 “Impordi hääled lugemiseks”
 - When prompted for a path, enter `/media/cdrom/evote-XXXXXXX/KOV2013/loendamisele_minevate_haalte_nimekiri`
 - Select option 2 “Loe Hääled kokku”
 - When prompted to confirm, enter “jah”

- Enter the PIN 11111
- Select option 7 “Tagasi”
- Select option 9 “Välju”
- Log into the HLR as the “root” user
- Issue the command `umount /media/cdrom`
- Log out

10 View Results

- Client
 - No action required
- HES
 - No action required
- HTS
 - No action required
- LOG
 - No action required
- HLR
 - Log into as the “hlr” user
 - Select option 1-1 “KOV2013 (Kohalikud omavalitsused)”
 - Select option 3 “Hääletamistulemus (ringkondade kaupa)”
 - These are the results of the election
 - * The far left column is the voting district
 - * The second column is the polling place
 - * The third column is the number of votes
 - * The last column is the candidate number (0 == “Polly Politician”, 1 == “Paul Politician”, 2 == “Dictator Drew”, kehtetu == ”Other”)
 - Press “q” to exit the results
 - Select option 6 “Tagasi”
 - Select option 7 “Tagasi”
 - Select option 9 “Välju”

11 Resetting the Election

- Client
 - No action required
- HES
 - Log in as “hes” user
 - Select option 8 “Lõpeta valimised”
 - When prompted to confirm, enter “jah”

- When prompted to re-confirm, enter “jah”
 - Select option 9 “Välju”
- HTS
 - Log in as “hts” user
 - Select option 9 “Lõpeta valimised.
 - When prompted to confirm, enter “jah”
 - When prompted to re-confirm, enter “jah”
 - Select option 9 “Välju”
- LOG
 - Log in as “root” user
 - Run the “clear_logs.sh” script in `/root/`
 - Logout
- HLR
 - Log in as “hlr” user
 - Select option 8 “Lõpeta valimised.
 - When prompted to confirm, enter “jah”
 - When prompted to re-confirm, enter “jah”
 - Select option 8 “Välju”