

Rosatom – Greenatom

The Secure browser

Background / Problem statement:

After a number of successful APT attacks on company N, the management of the company decided to isolate client LAN segments from the Internet. For secure browsing, users had a published web browser on a terminal farm; file exchange was realized via network share integrated with a sandbox over REST API.

With the growth of the company it became clear that this concept had some serious disadvantages:

- CPU overload of the terminal farm;
- Low level of usability;
- High cost of the user Internet access. (Greediness of the terminal farm);
- Predicted heavy resource growth.

Task:

Offer an alternative secure approach that will reduce the cost of client access to the Internet, based on the VM technology.

The solution is a python wrapper of a KVM platform that serves web surfing for 3000 users in an Active Directory forest. The solution will offer centralized authentication over kerberos, management (configurable politics for downloading, uploading, printing, clipboard, browser), logging. The solution should look natively for user on the endpoint (OS Win7-Win10). Users must only interact with a browser window. Other windows must be hidden. The solution must restore to the standard state of the application with each user's launch of the solution, but serve a persistent user profile (bookmarks, x.509 certificates, etc.). Solution browsers: Chrome or Firefox.

Solution requirements:

Conceptual diagram with a textual description.

1. Working prototype (client, management console).
2. Source code.

Technical requirements for the solution:

1. Source code: Python code
2. Diagram, description: pdf
3. Prototype must be remotely available.



Evaluation criteria:

- Criterion: Security Level.
Evaluation: maximum 5 - minimum 1.
- Criterion: Originality.
Evaluation: maximum 5 - minimum 1.
- Criterion: Cheapness.
Evaluation: maximum 5 - minimum 1.
- Criterion: Usability.
Evaluation: maximum 5 - minimum 1.
- Criterion: Centralized management.
Evaluation: maximum 5 - minimum 1.

Study materials:

<https://libvirt.org>

<https://code.x2go.org/doc/python-x2go/>