

Twining project

Micro Data services to researchers



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Goal



To allow researchers access to Data Files of the CBS anywhere and anytime according to permissions, and to perform research according to their needs.

Actions Taken to Accomplish the Goal



- Activities and operations done in the past
- Current situation and functions
- Future activity plans

Activities In Past Years



- From 2008 until last year
 - **Remote Access System for research (*Magam*)**
 - The purpose was to give researchers from Universities access to CBS data from afar (according to permissions)
 - On this system worked 15 – 20 researches

Technology of the Remote Access System



- VDI – Virtual Desktop Infrastructure

This technology allowed us to provide to end-users in the organization (and outside) a work environment according to user designated configuration



Advantages and Disadvantages of VDI



- **Advantages**

- ❑ Centralized management of the servers that store virtual machines
- ❑ Lower costs creating new users

- **Disadvantages**

- ❑ When the server crashes, it affects all users
- ❑ There is no possibility of working off-line

System Structure from the Side of the Researcher



- The researcher would connect through a web-browser and would download an add-on to his computer
- Through the add-on program, the user would receive a VDI screen that requested his logon information
- Once the logon was accepted through the Active Directory, the user was then given a screen through which he could access one of four statistical programs – SPSS, SAS, STATA, EXCEL

System Structure from the Side of the Researcher (cont'd)



- After he chose which program to use, the system would give the user a virtual machine, through which he could access his information (according to permissions granted him) and he was disconnected from his own computer.
- After his work was completed, he could transfer files **ONLY** to a dedicated directory on the virtual machine.

System Structure from the Side of the Researcher (cont'd)



- When the user disconnected from the virtual machine, the machine was deleted from his computer and when he would log on again, he would again receive a new virtual machine with his information.
- If the user wanted to receive the data from his research, he would make a request of the CBS, and after security checks, the information would be emailed to him.

System Structure from the Side of CBS



- 2 Servers (ESX for VMWare) – virtual machines
- Data Control Server
- Backup Server
- Storage System

All of the Server and System configuration was based on the Server 2003 Operating system and Windows XP

Why the Project Ended



- This project lasted until September 2015
- Reasons it ended
 - ❑ 3 of the disks in the Storage System crashed
 - ❑ All the products were based on Windows XP, and there was no longer Support
 - ❑ **Budget Constraints** did not allow:
 - ✦ upgrade the system to Windows 7
 - ✦ Upgrade to the new Version of VDI
 - ✦ Purchase of new disks



Current Projects



- Research Rooms within the CBS locales
 - Jerusalem
 - Tel Aviv
 - Haifa
- Research Room at Bank of Israel



Research Rooms within the CBS locales

Jerusalem

- ❑ Researchers must be physically present to work on their projects and pass a security check
- ❑ Research Data is prepared by CBS workers
- ❑ 10 standalone computers (no access to internet, printers, USB, disks, etc)
- ❑ Each computer is based on Windows 7 and has a variety of statistical programs according to the researchers' needs (SAS, SPSS, Stata, R, etc.)
- ❑ Each user is assigned one of the ten computers for his research. His prepared data is installed on his assigned computer in a designated directory.

Research Rooms within the CBS locales (cont'd)



- ❑ When the user wants to receive data results, he copies them to a specified directory and requests from the CBS to send it.
- ❑ Once it passes the security checks (by CBS employees) it is sent to the researcher by email.
- ❑ All computers are backed up once a week.

Research Rooms within the CBS locales



Tel Aviv and Haifa

Same as Jerusalem with the following exceptions:

- ❑ In each of these locations there are only 2 computers for the researchers in a dedicated research room.
- ❑ There is a responsible person in each of these locations who sets up the researchers' schedule and transfers the files to and from the computers in Jerusalem by way of the internal network.
- ❑ The computers in these locations use removable disks which are encrypted so they can not be read in other computers, and are stored nightly in a locked safe.

Bank Of Israel (BOI)



- Research room in the Bank of Israel for the bank researchers.
 - ❑ Located at the bank of Israel
 - ❑ Uses an IPVPN line (private Bezeq line)



Bank Of Israel (BOI) – side of BOI



- Separate research room that can only be access with a smart card
- Security cameras in the research room itself
- 2 computers which can only be accessed through fingerprints
- After they are identified, Smartcards (and passwords) give them access to the Lamas environment and their directories

Bank Of Israel (BOI) – side of CBS



- ESX 5.5 Server which houses all the virtual servers
- The virtual servers are based on VDI 5.1, which is the most current version
- A system that records every keystroke and movement within the system
- VEEM program which backs up all the virtual machines

Bank Of Israel (BOI) – side of CBS (cont'd)



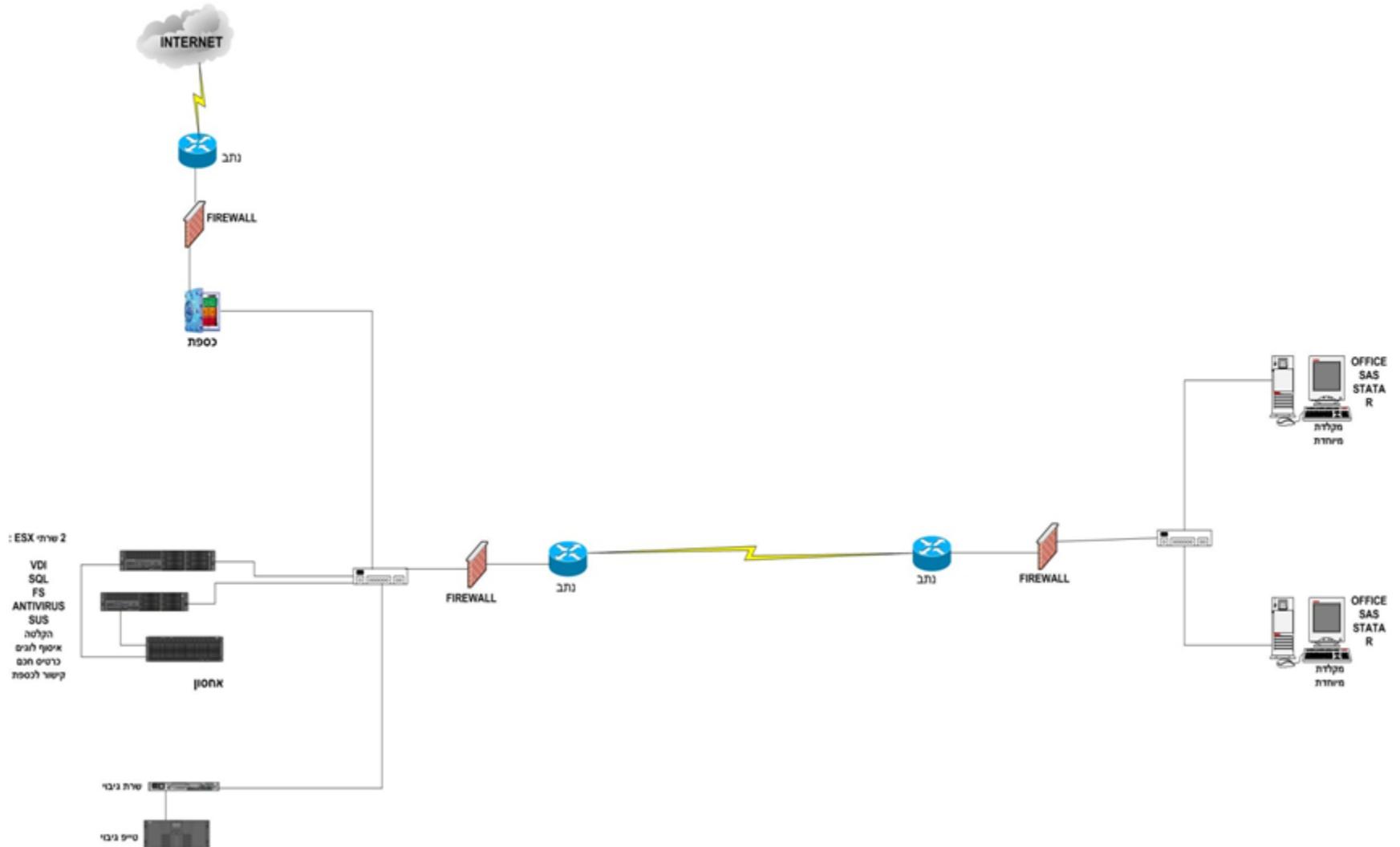
- CRL – Certificate Revocation List – a system which checks the smart cards the researchers use.
- Firewall – Fortigate that protects the transfer of information between the CBS and Bank of Israel.
- Fortigate Analyzer – that constantly checks attempts to penetrate the system.

Bank of Israel – Activity



- Administrative computer at CBS allows transfer of information to and from the BOI research computers
- Also allows date information when research projects begin and the dates when they need to be renewed.

Configuration solution of BOI



Bank Of Israel (BOI)



**All of this recent advanced technology,
systems and protections were purchased by
the Bank of Israel**

Future Plans



- **Immediate Future**

Establishment of Research Rooms at IDC in Herzliya at the same level of the research rooms in Tel Aviv and Haifa



Future Plans



- **Distant Future**

- Additional Modern Research Rooms (like Bank of Israel)

depending on:

- ✦ Specific requests
- ✦ Methodology
- ✦ Learning from other Statistical Bureaus (that already have established and proven research rooms)
- ✦ An appropriate budget





**Thank you for
your attention!**



Any questions?!