Krølls bank

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Problem definition

We have decided to create Krøll's Bank. But how does one create a bank?
A well-functioning bank would have a server that runs a website and the database for the bank. But what should such a website look like, and how should the database be structured? What kind of server infrastructure should there be and how can we ensure data loss prevention?

Server setup

Basic setup:

The physical machine is running Windows Server Datacenter 2016.
The roles installed are Hyper-V.

The physical machine is running 2 VMs:

- External server
- Internal server

The external server is responsible for tasks that are outside the internal network, such as hosting the website.

The internal server handles tasks which are on the local network, such as SMB shares and DHCP server.

Each virtual machine has 3 disks of 64 GB each.
One OS drive and 2 RAID1 drives.

The passwords on the virtual machines and the physical machine are: Kode1234!

Roles on Internal VM Server:

Active directory Domain Services
DHCP Server
DNS Server
File and storage Services

Roles on External VM Server:

Web Server(IIS)

DHCP:

DHCP range er på 192.168.1.10 til 192.168.1.254.
Default gateway er 192.168.1.1.
Lease tid er på 7 dage.
navnet på DHCP'en er BankDHCP.

Computer	Subnet Mask	IP address	Default gateway
Internal server	255.255.255.0	192.168.1.2	192.168.1.1
External server	255.255.255.0	192.168.1.3	192.168.1.1
Yordan’s computer	255.255.255.0	DHCP	192.168.1.1
Shazil’s computer	255.255.255.0	DHCP	192.168.1.1
Magnus’ computer	255.255.255.0	DHCP	192.168.1.1
Ayoub’s computer	255.255.255.0	DHCP	192.168.1.1
Lars’ computer	255.255.255.0	DHCP	192.168.1.1
Marcus’ computer	255.255.255.0	DHCP	192.168.1.1
Krølls’ computer	255.255.255.0	DHCP	192.168.1.1

DNS:

DNS’en er på 192.168.1.3 og er navngivet “kroell.dk”.

ADDS:

Navn på Activate Domain Directory Services er kroell.dk.
Password: Kode1234!

File and storage services:

SMB name	Access to SMB share
Executives	Executives-group
IT	IT-group
Shared	Everyone
ReadOnly	Everyone
Managers	Executives-group, Manager-group

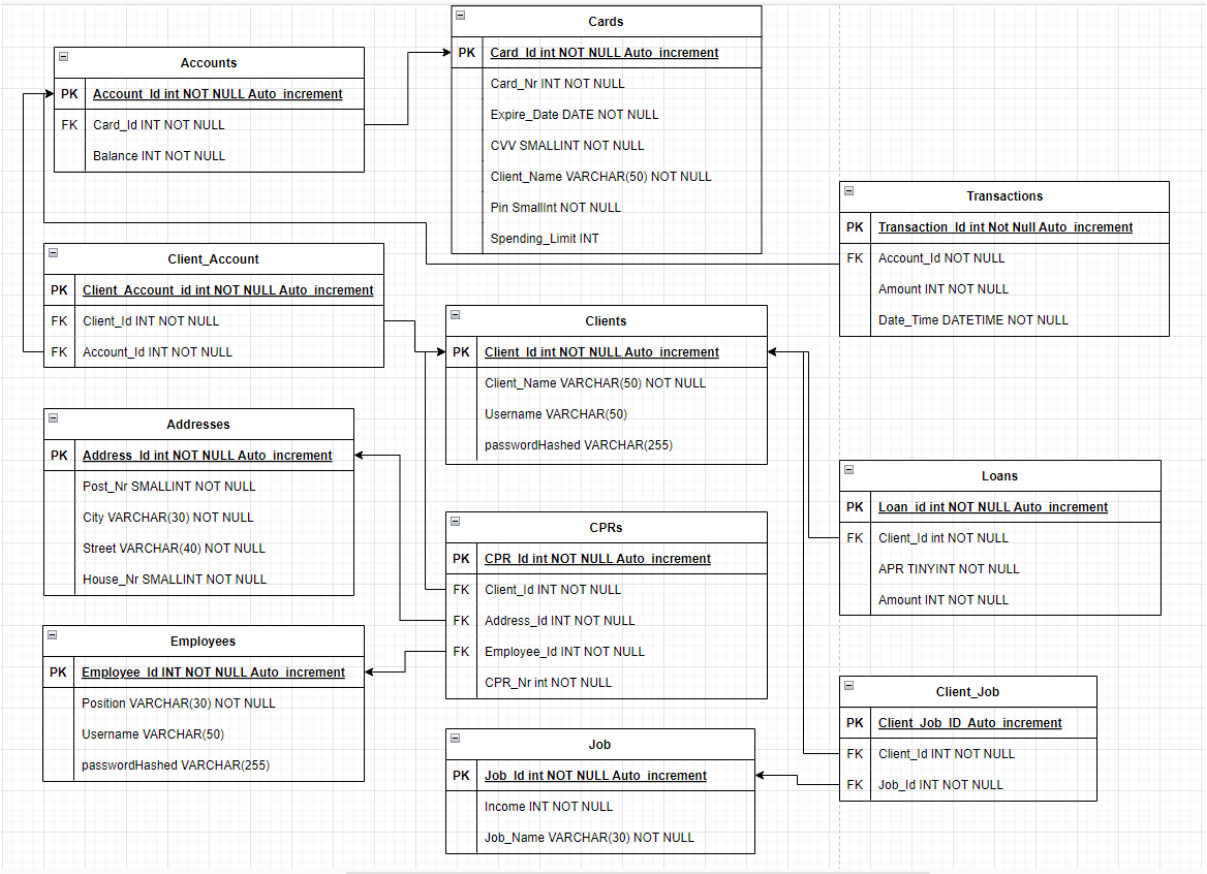
SMB name	Permissions	Groups
Executives	Read/Write	Executives-group
IT	Read/Write	IT-group
Shared	Read/Write	Everyone
ReadOnly	Read	Everyone
ReadOnly	Read/Write	Executives-group, IT-group, Manager-group
Manager	Read/Write	Manager-group
Manager	Read	Executives-group

Domain users:

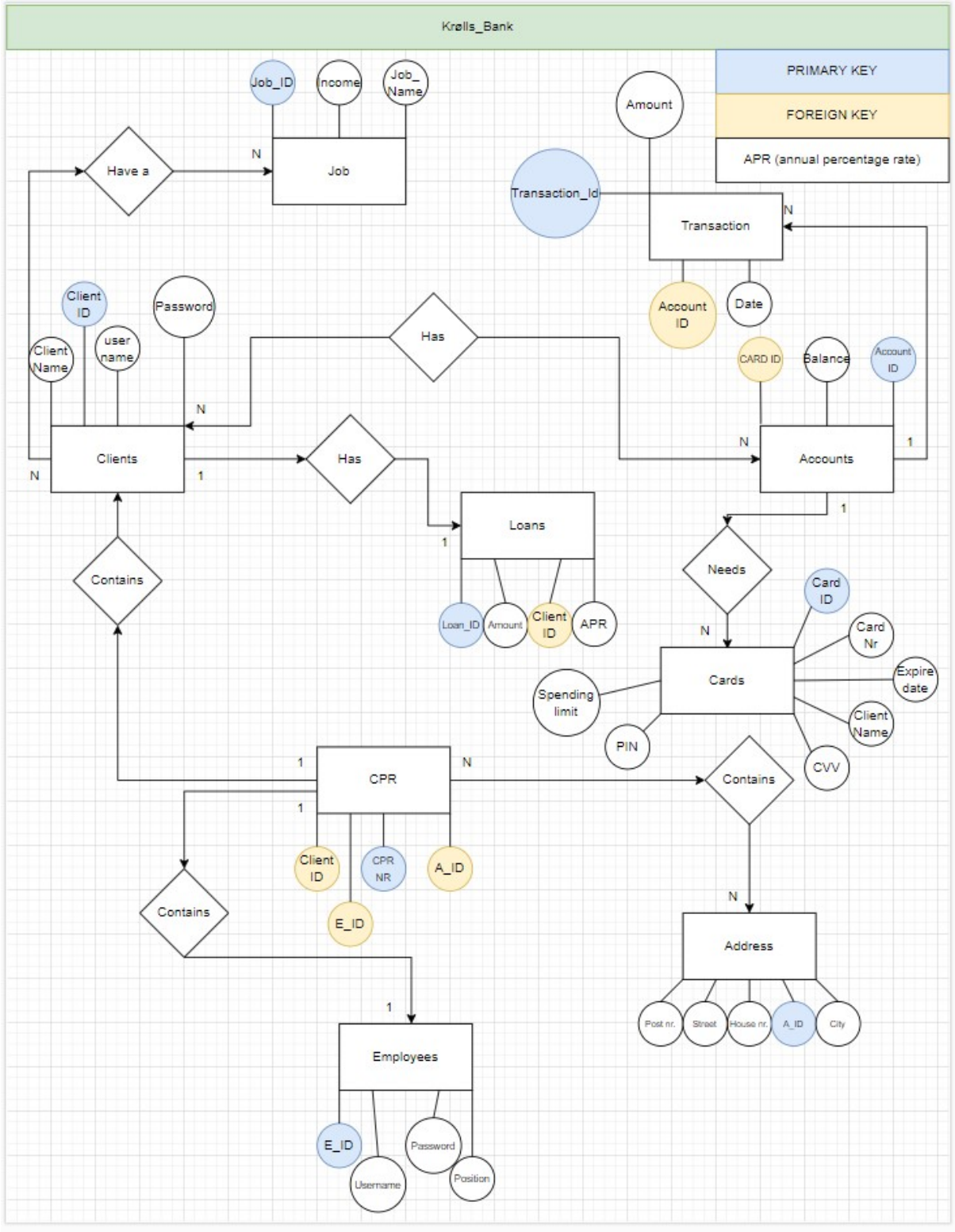
Name	Group	domain login	Password
Yordan Mitov	IT-group	YordanMitov@kroell.dk	Kode1234!
Shazil Shahid	Worker-group	ShazilShahid@kroell.dk	Kode1234!
Magnus Lund	Manager-group	MagnusLund@kroell.dk	Kode1234!
Ayoub Laroub	Worker-group	AyoubLaroub@kroell.dk	Kode1234!
Lars Hinge	Worker-group	LarsHinge@kroell.dk	Kode1234!
Marcus Wind	Worker-group	MarcusWind@kroell.dk	Kode1234!
Mikkel Krøll Christensen	Executives-group	MrKroell@kroell.dk	Kode1234!

Database

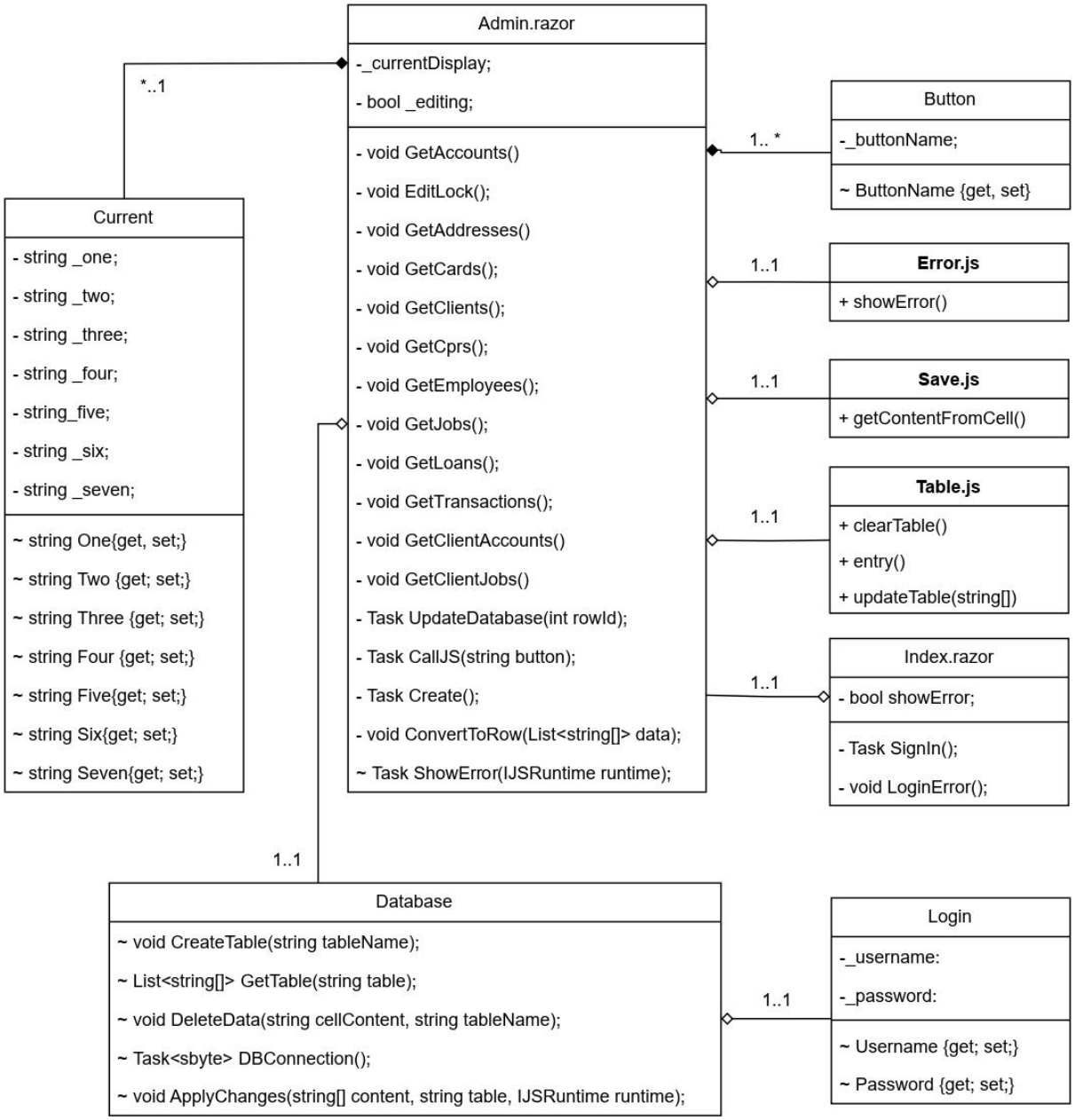
Scheme diagram:



ERD:


Krølls_Bank
PRIMARY KEY
FOREIGN KEY
APR (annual percentage rate)
Job_ID
Income
Job_ Name
Job
Have a
N
Amount
Transaction_Id
Transaction
N
Account ID
Date
Client ID
Password
Client Name
user name
Has
CARD ID
Balance
Account ID
N
Clients
N
1
Has
N
Accounts
1
1
Loans
1
Contains
Needs
Card ID
Loan_ID
Amount
Client ID
APR
N
Card Nr
Cards
Expire date
Spending limit
Client Name
PIN
CVV
1
CPR
N
Contains
1
Client ID
CPR NR
A_ID
E_ID
Contains
N
Address
Post nr.
Street
House nr.
A_ID
City
1
Employees
E_ID
Password
Username
Position

Class diagram:



This class diagram is an essential reference for understanding the structure of our system and how different classes interact with each other. It provides a high-level overview of the key components in our system.

Database setup:

The database is saved on the internal server, and it's called “Kroells_Bank”.
It's stored on the E drive, which is RAID1.
The save locations for the Database and for the logs are:

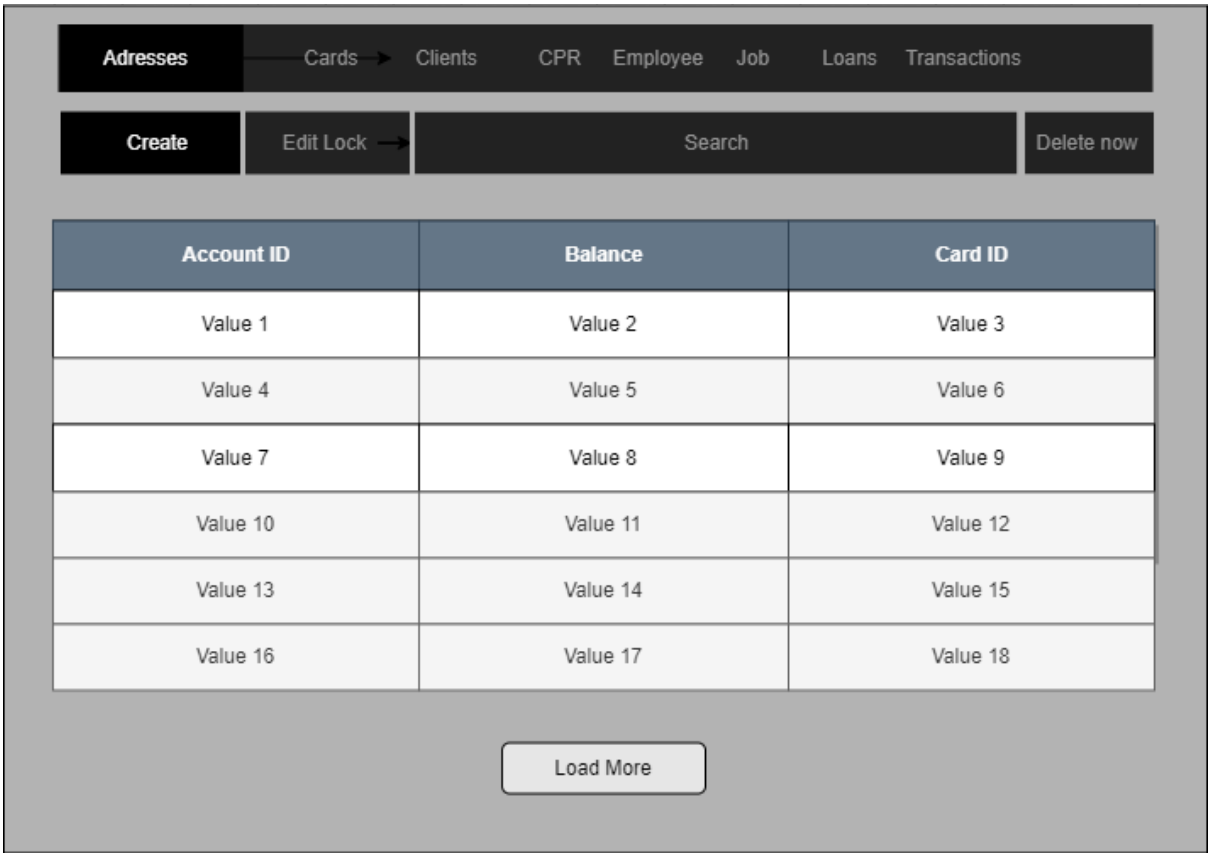
- E:\Database\Data - for databases
- E:\Database\Logs - for log files

The internal server has Microsoft SQL Server Management Studio, which is used to host the database.

The queries used for setting up the database can be found on the internal server E:\Database\Queries

Mockups

Admin site (CRUD):



This mockup has a top navbar, bottom navbar and a table.
The top navbar contains different buttons, which represent each of the tables in the database. Once a button is clicked, it will then display the appropriate table.

The tables get displayed in the big box in the middle. The box shows each row and column in the table.

The bottom navbar is for the CRUD operations.
It can create new tables, which is the C in CRUD.
Data gets read, because it's displayed in the tables area of the website.
Data gets updated by the Apply button.
Data gets deleted by the "Delete row" button.

The bottom navbar also contains an 'Edit lock' button. That button works like a toggle. If it's enabled then data can't be changed, but if the lock is disabled, data can be edited in the table. There is a search bar to find a specific value in the table. There is also a "Load more" button, to load more data. The default loaded data amount is 100. The "Load more" button loads additional 100 data entries.

The 2 navigation bars are both stuck in the position of the screen, which means the user won't have to scroll to change the displayed table or apply changes.

To change data inside a table, the user should double click the specific entry that should be changed.

Web Server(IIS):

In our IIS web server configuration, we have replaced the default website with a new one named 'kroell.dk.' The website's files are located at 'E:/IIS/KroellsManagement,' and it operates over HTTP on port 80. This site is accessible to all IP addresses, thanks to the binding set to '*'".