SECURITY FIRM DATABASE

Team 6

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Database 353-02

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Database Requirements

Overview

Our group's Database project is a database organizing the security of multiple physical locations. For those who have need of physical security to protect important assets or those who provide security to clients, they would use this database to keep track of the security and what is involved. This includes where guards can go, description of their equipment, where they have access, where access is, description of locations, and description of the client who hired security.

Client

Clients are uniquely identified by their client ID. Each client also has a name recorded in the database. The last attribute is the clients appointed representatives ID. Every client has one location to which they wish to implement the security.

Representative

A representative is identified by their unique ID. Every representative has their name and phone number documented for communication purposes with clients. A representative may have multiple clients.

Locations

Locations are where clients are located. A client may have many locations. A location may have several guards who patrol or none depending on the client's demands. A location has a unique address. It also has square footage and the maximum number of floors at the location to help determine client needs. It may also have camera's depending on the client's demands. A client must have at least one access point.

AccessPoints

An access point is a door that is normally locked but is unlocked when scanning a rfid key card. It has a unique door ID number which must reside at one location. Access points also have a required access level which is the minimum level necessary to access the door. We also store the floor the point is located on. Every time a door is accessed a log is created allowing a record of all times the door was accessed.

When a door is accessed, an event will be triggered to log the entry to the door. This is created when an employee opens a door (access point) with their key card. Each log entry will list the door accessed, the employee who accessed the door, and a timestamp.

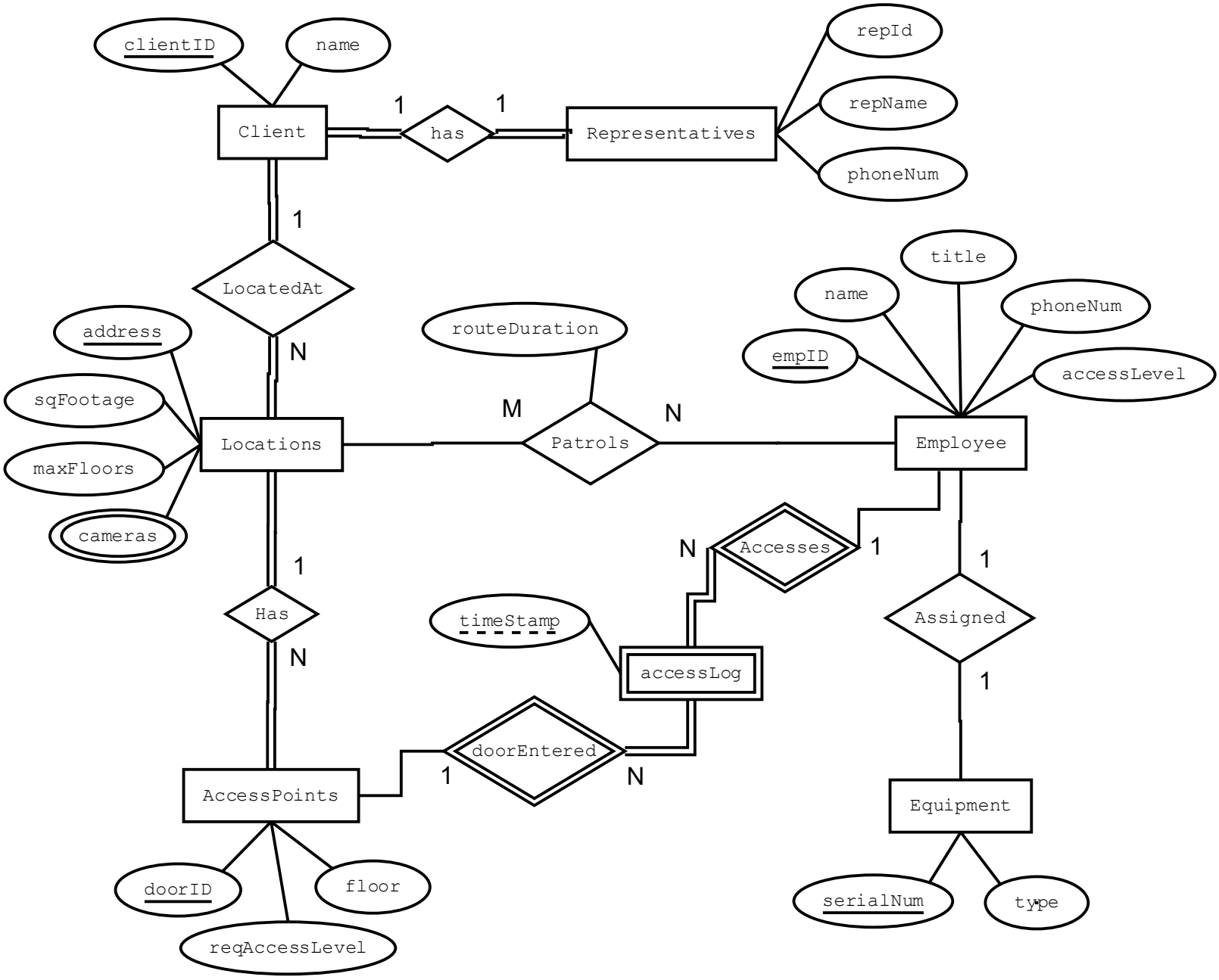
Employee

An employee is an individual that possibly patrols a location, either alone or with others. They are uniquely identified by their employee ID. Each employee also has a name, job title, phone number, access level. An employee may have access to these access logs that will allow them to enter doors. An employee also might be assigned to a single piece of equipment, however not every employee is given equipment.

Equipment

An employee might be assigned a single piece of equipment. Each piece of equipment has a type in regard to the item, as well as a unique serial number to identify the equipment. Not every employee is assigned equipment, those who are may be assigned to one.

ER Diagram


clientID
name
Client
1
has
1
Representatives
repId
repName
phoneNum
1
LocatedAt
N
address
sqFootage
maxFloors
cameras
Locations
routeDuration
M
Patrols
N
title
name
phoneNum
empID
accessLevel
Employee
N
Accesses
1
1
Assigned
1
1
Has
N
timeStamp
accessLog
doorEntered
1
N
AccessPoints
Equipment
doorID
floor
reqAccessLevel
serialNum
type

Basic Relational Schema

Client (clientID, clientName, repName, repPhone)

Location (locAddress, sqFootage, maxFloors, clientID)

Employee (empID, empName, title, phone, accessLvl, equipSerialNum)

Equipment (serialNum, type)

AccessPoint (doorID, reqAccessLvl, floor, locAddress)

AccessLog (doorID, empID, timestamp)

Cameras (locAddress, cameraName)

Patrols (empID, locAddress, routeDuration)

BCNF Relational Schema

Functional Dependencies in order from Basic Schema

clientID → clientName, repID

repID → repName, repPhone

locAddress → sqFootage, floors, clientID

empID → empName, title , phone, accessLvl, equipSerialNum

serialNum → type

doorID → reqAccessLvl, floor, LocAddress

empID, locAddress, date → routeDuration

Client (clientID, clientName, repID)

Representative (repID, repName, repPhone)

Location (locAddress, sqFootage, maxFloors, clientID)

Employee (empID, empName, title, phone, accessLvl)

Equipment (serialNum, type, empID)

AccessPoint (doorID, reqAccessLvl, floor, locAddress)

AccessLog (doorID, empID, timestamp)

Cameras (locAddress, cameraName)

Patrols (empID, locAddress, date, routeDuration)

Integrity Constraints

IC Name & table	IC Type	English Statement
IC1: Client && Location	Key	clientID is primary key for client, address is primary key for location, etc.
IC2: Client && Employee	Foreign Key	clientId is a foreign key to ClientID in Clients, employee equipSerial is foreign key to serialNum in Equipment, etc.
IC3: Employee && AccessPoint	1-Attribute	Check that the access level for Employee and AccessPoint is between 1 and 10 inclusive.
IC4: Employee	2-Attribute, 1-Row	If employee is not titled guard, then access is equal to 1-3, if they are titled as a guard their access level is equal to 4-10.