United Federation of Planets

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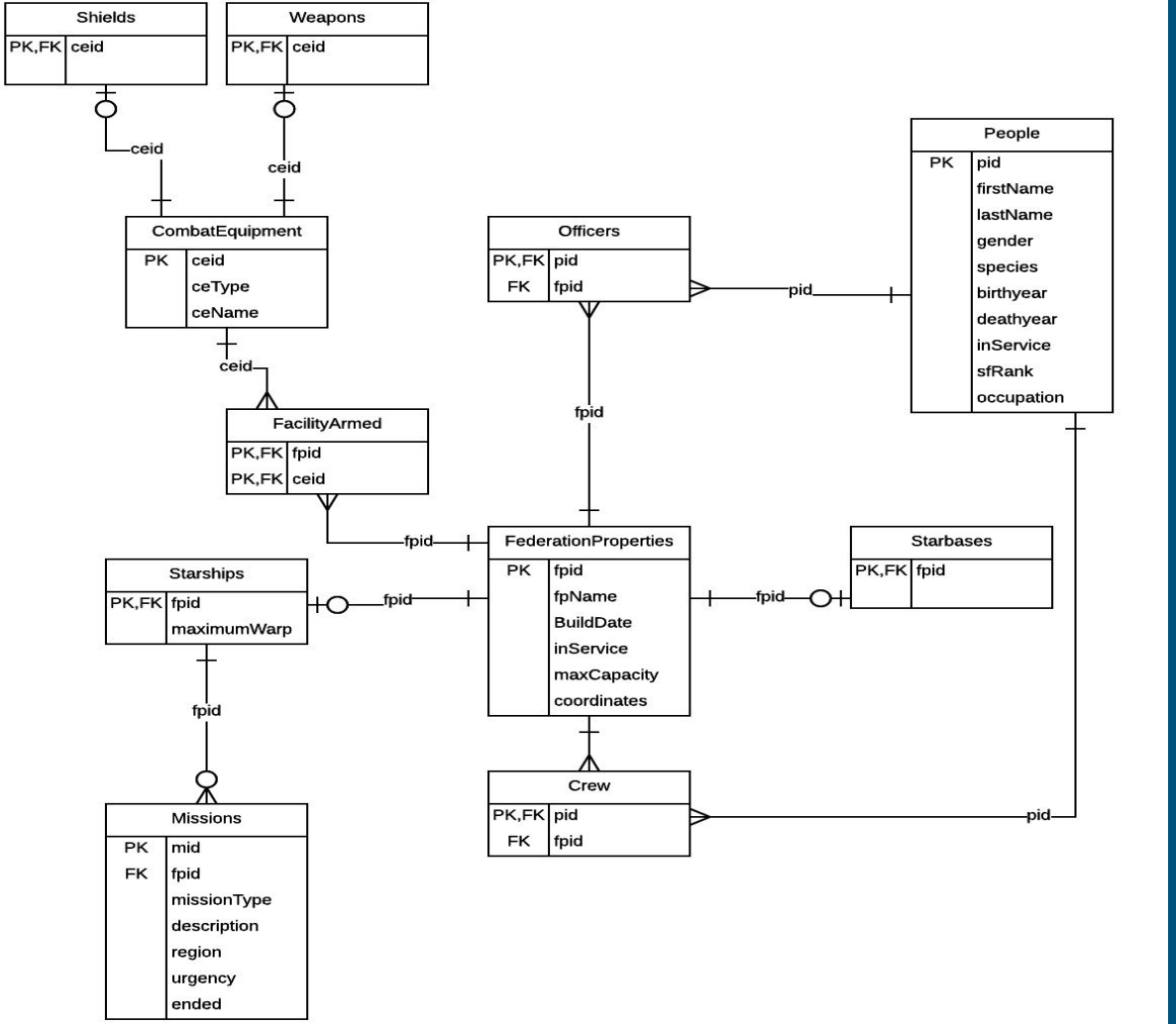
Executive Summary

The United Federation of Planets needs a way to keep tracks of their many ships, starbases, and people. This database keeps track of everyone working for the federation, as well as what ship or starbase they are assigned to. It also keeps track of what weaponry each ships is equipped with as well as what missions that have.


Shields
PK,FK ceid
Weapons
PK,FK ceid
ceid
ceid
CombatEquipment
PK ceid
ceType
ceName
ceid
FacilityArmed
PK,FK fpid
PK,FK ceid
Officers
PK,FK pid
FK fpid
pid
People
PK pid
firstName
lastName
gender
species
birthyear
deathyear
inService
sfRank
occupation
fpid
fpid
FederationProperties
PK fpid
fpName
BuildDate
inService
maxCapacity
coordinates
Starbases
PK,FK fpid
fpid
Starships
PK,FK fpid
maximumWarp
fpid
fpid
Missions
PK mid
FK fpid
missionType
description
region
urgency
ended
Crew
PK,FK pid
FK fpid
pid

People Table

```
CREATE TABLE People (
pid             char(5) NOT NULL,
firstName       TEXT NOT NULL,
lastName            TEXT,
gender          char(1),
species         TEXT NOT NULL,
birthyear       integer,
```

People Continued

```
deathyear     integer,
inService     boolean NOT NULL,
sfRank        TEXT NOT NULL,
occupation    TEXT,
PRIMARY KEY (pid)
);
```

Functional Dependencies: Every attribute besides pid is dependent on pid.

Federation Prop Table

```
CREATE TABLE FederationProperties (
fpid            char(4) NOT NULL,
fpName          TEXT NOT NULL,
buildDate       integer NOT NULL,
inService       boolean NOT NULL,
maxCapacity     integer NOT NULL,
coordinates     TEXT NOT NULL,
PRIMARY KEY (fpid)
);
```

Functional Dependencies: all non-fpid attributes dependent on fpid

Starships Table

```
CREATE TABLE Starships (
fpid            char(4) NOT NULL REFERENCES FederationProperties(fpid),
maximumWarp     integer NOT NULL,
PRIMARY KEY (fpid)
);
```

Functional Dependencies: maximumWarp dependent on fpid.

Starbases Table

```
CREATE TABLE Starbases (
fpid            char(4) NOT NULL REFERENCES FederationProperties(fpid),
PRIMARY KEY     (fpid)
);
```

Functional Dependencies: none.

Officers Table

```
CREATE TABLE Officers (
pid             char(5) NOT NULL REFERENCES People(pid),
fpid            char(4) NOT NULL REFERENCES FederationProperties(fpid),
PRIMARY KEY     (pid,fpid)
);
```

Functional Dependencies: none.

Create Views

```
-- View shows on which ship or starbase each officer is stationed

CREATE view
FPOfficers(fpid,fpName,pid,firstName,lastName,sfRank,occupation) as

    select  fp.fpid,fp.fpName,p.pid,p.firstName,p.lastName,p.sfRank,p.occupation

    from    officers o      inner join FederationProperties fp on o.fpid = fp.fpid

                            inner join People p on o.pid = p.pid

;
```

Create Views

```
-- View shows on which ship or starbase each (non-officer)crew member is stationed

CREATE view FPCrew(fpid,fpName,pid,firstName,lastName,sfRank,occupation) as

    select    fp.fpid,fp.fpName,p.pid,p.firstName,p.lastName,p.sfRank,p.occupation

    from      crew c    inner join FederationProperties fp on c.fpid = fp.fpid

                        inner join People p on c.pid = p.pid

;
```

Stored Procedure

```
-- stored procedure: if type w -> insert ceid into weapons | if type s-> insert into shields

CREATE OR REPLACE FUNCTION addCE()

RETURNS TRIGGER AS $$

BEGIN

        IF NEW.ceType = 'w' THEN

                INSERT INTO Weapons(ceid)

                values(NEW.ceid);

        END IF;
```

Stored Procedure Continued

```
IF NEW.ceType = 's' THEN
        INSERT INTO Shields(ceid)
                values(NEW.ceid);
        END IF;
        RETURN NEW;
END;
$$ language plpgsql;
```

Trigger

```
-- If something is inserted in combatEquipment, run addCE()

CREATE TRIGGER addCE

AFTER INSERT OR UPDATE ON combatEquipment

FOR EACH ROW

EXECUTE PROCEDURE addCE();
```

Security

-- An administrator can alter or even delete data

create role Administrator;

grant select, insert, update, delete

on all tables in schema public

to Administrator;

Security

```
-- Officers can add updates to the data, but they cannot delete data

create role Officer;

grant select, insert, update

on all tables in schema public

to Officer;
```

Security

```
-- other (non-officer) crew members can view people and federation

-- properties, as well as where crew members are stationed

-- but they cannot view where the officers are stationed

create role CrewMember;

grant select

on People, FederationProperties, Crew, Starships, Starbases

to CrewMember;
```

Future Enhancements

I would like to extend the database to include a Planets table for planets that are in the federation. I would like the planets to be a child of fpid just like starships and starbases so people could be stationed on planets.