Project : Data and Applications
Phase 1 - Requirements

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1 Introduction

Our miniworld is the database system for the SCP foundation (here). SCP stands for Secure Contain Protect. It is an organization responsible for securing and containing anomalous entities which may or may not be sentient. Most of the entities that the foundation deals with are dangerous and hence they need to be secured as soon as there are any sightings to prevent mass panic and any casualties. The SCP foundation is an international organization that has multiple branches throughout the world and it has been actively keeping global peace for an unknown period of time.

2 Purpose

The foundation is an international organization and has several offices, facilities, research centres, containment sites, hospitals, personnel, military units and SCPs (special containment protocols). All this data needs to be kept in a fluid and easily accessible manner to allow for instantaneous access. There are several thousands of SCPs, each of these is stored at a site such as site 19, site 16, etc. and some of them require special fail safe protocols. There is an active nuclear warhead being stored at the same site as SCP 683 in order to prevent an xk class world-ending scenario. There are also world ending scenarios and SCP specific protocols such as the Atzak protocol for SCP 3000 and the infamous procedure 110 montauk for SCP 231. Keeping all this in mind we need to design and implement an appropriate database to store all this data and describe its various relationships.

3 Users

The users of this database are foundational personnel such as researchers who wish to know more about an scp to develop weapons, expand the understanding of the world or use it to contain other SCPs and agents who have been assigned to a particular scp. Outside readers may also be allowed

to access the foundation website which uses the database however they are only allowed access to unclassified materials available for public disclosure.

4 Applications

The foundation deals with extremely dangerous entities which may cause catastrophic damage if left unchecked. Each SCP needs to be documented properly along with their item number and their respective containment procedure. The behavior of the entity along with previous incidents/ accidents also needs to be documented in a clear and concise manner. The foundation uses Class D personnel in order to test new entities. These interactions must be recorded and in case there is a change in the behaviour of an scp, the corresponding document needs to be updated ASAP. Even a small delay could mean the difference between life and death. In addition the foundation has at its disposal a vast amount of wealth and resources. These resources need to be documented and organized so that they can be mobilised and dispatched quickly to the required area. There are also several groups of interests that may pose a threat to the foundation. The foundation and its relationship with such groups needs to be documented appropriately.

5 Database Requirements

5.1 Entities

1. **SCP**
   (a) Name [**Candidate Key attribute**][**Alternate Key**][***BONUS***] - [**TEXT**] It contains the name of the SCP
   (b) Item number [**Candidate Key Attribute**][**Primary key**][***BONUS***] - [**INTEGER, 4 DIGIT**] It contains the unique identification number of the SCP.
   (c) Object class [**TEXT**] [**Single Valued**]: Value set/Domain: {Safe, Euclid, Keter, Thaumiel, Neutralized, Explained}
   (d) Special containment procedures
   (e) Description [**TEXT**] It contains the description of the SCP.
   (f) Containment date - [**INTEGER**][**dd/mm/yyyy format**]
   (g) Years in containment - [**Derived Attribute**] [**INTEGER**] Derived from Date when captured and the current date
2. **MTF (Mobile Task Force)**
   (a) Code name [**TEXT**] [**INTEGER**]- Contains the code name of the unit followed by the unit strength (eg - Beta-22, Rho-4)
   (b) ID (**Key attribute**) [**INTEGER**] [**Primary Key**]- Cannot be NULL

(c) Commanding Officer [**TEXT**] - Cannot be NULL

(d) Team Name [**TEXT**][**INTEGER**] - Team name followed by the designation (eg. Mu-3)

3. **SITE**

   (a) Site number - [**INTEGER**] [**Primary Key**] Cannot be NULL.

   (b) Capacity [**INTEGER**] - Estimated number of SCPs it can contain

   (c) Staff size [**INTEGER**] - Number of members in staff.

   (d) Location [**TEXT**] [Composite Attribute] {Country, City, Sector, Unit}

   (e) Co-ordinates [**INTEGER**] [Derived Attribute from Location]

4. **Groups of interest**

   (a) Name [**TEXT**] [**Primary Key**]

   (b) Active locations [**TEXT**] [**Multi-valued**]

   (c) Threat Level [**TEXT**]

   (d) Estimated Personnel Strength [**INTEGER**] [**TEXT**]

   (e) Possible Headquarter Location - [**TEXT**][**Composite Attribute**]{Country, City, Sector, Unit}

   (f) Possible Headquarters Coordinates [**INTEGER**] [**Derived Attribute** from Headquarter Location] Contains the coordinates of the possible headquarters.

5. **Personnel**

   (a) Name [**TEXT**][**Candidate Key Attribute**]

   (b) ID [**INTEGER**] [**Candidate Key Attribute**]

   $\left.\begin{matrix}\text{(a)}\\ \text{(b)}\end{matrix}\right\} \longrightarrow$ **BONUS - Name And Item Number together form Super Key Attribut**

   (c) AGE [**Derived Attribute**] [**INTEGER**]

   (d) Gender [**TEXT**]

   (e) Clearance Level [**TEXT** , 1 Character]: Value Set:{A,B,C,D,E, O}

   (f) Address [**Composite Attribute**][**Multi-Valued Attribute**] - Country, city, street address, zip code

   Subclasses :

   (a) RESEARCHER - If a personnel is a researcher its department attribute value set will be limited to one of the research departments eg- microbiology, anomalous entity physiology etc. and its clearance level will be set to C.

(b) AGENT - If a personnel is an agent its department attribute value set will be limited to one of the agent departments eg- SCP-173, SCP-683, etc. and its clearance level will be set to C.

(c) DOCTOR - If a personnel is a doctor its department attribute value set will be limited to one of the medical departments eg- Neuroscience, treatment of anomalous injuries, etc. and its clearance level will be set to B,C or D depending upon department.

(d) OVERSEER - If a personnel is an Overseer its department attribute value set will be NULL and clearance level will be set to O.

(e) SITE ADMINISTRATOR - If a personnel is a site Administrator its department attribute value set will be limited to the Site name and its clearance level will be set to A

(f) SITE DIRECTOR - If a personnel is a site director its department attribute value set will be limited to the Site name and its clearance level will be set to B.

6. **Airbase(Weak Entity)**

   (a) Name [**TEXT**]

   (b) ID [**INTEGER**][**Partial Key**]

   (c) Capacity [**INTEGER**]

   (d) Staff strength [**INTEGER**]

   (e) Clearance level [**INTEGER**]

7. **Special Procedures** (**Weak Entity**)
   It only exists if the relationship with the corresponding SCP exists. The entity SCP is its parent or identifying entity and the relationship containment is the identifying relationship is Protocol

   (a) Procedure name [**TEXT**]

   (b) Procedure ID [**Partial key**] [**INTEGER**]

5.2 Weak Entity

1. **Airbase**

   (a) Identifying Relationship

      i. Has Airbase

   (b) Identifying Entity

      i. Site

2. **Special Procedures**

   (a) Identifying Relationship

i. Containment Protocol

(b) Identifying Entity

i. SCP

5.3 Relationships

1. **Containment Involvement**
   This relation is about the various entities involved in the containment of an SCP such as the MTF unit stationed there, the site where the SCP is stored and the personnel such as researchers and agents involved in its containment.

   (a) Degree - 4

   (b) Participating Entities

   i. SCP
   ii. MTF
   iii. SITE
   iv. Personnel

   (c) In the form of $n-binary$ relationship and weak entities: [***BONUS***]:

   i. (SCP:MTF) = (1:m) - 1 SCP can have multiple MTF Units
   ii. (MTF:SITE) = (m:1) - Each site can have multiple MTF Units
   iii. (SITE:Personnel) = (1:n) - 1 Site can have multiple Personnel
   iv. (SCP:Site) = (1:1) - Each SCP can be contained at a single Site

   (d) Cardinality constraints:
   (SCP:MTF:SITE:Personnel) = (1:m:1:n) as for every scp there can be multiple MTF units and Multiple personnel and each scp can be stored at only one site at a given time. The scp uniquely identifies the tuple

2. **Has Airbase**
   This relation is the identifying relationship of the Airbase entity. The Airbase entity only exists if this relationship exists. It describes which airbase is located on which site.

   (a) Degree - 2

   (b) Participating Entities:

   i. Airbase (child entity)
   ii. SITE (parent entity)

   (c) Cardinality constraints:

   i. (Airbase:SITE) - (1:1) each site can have only one airbase and each airbase can be at only one site

3. **Containment Protocol**
   This relation is the identifying relationship for the special procedures entity and is about the special procedures required for a specific entity. The entity special procedure exists only if this relationship exists

   (a) Degree - 2

   (b) Participating Entities -

      i. SCP (parent entry)

      ii. Special Procedure (child entry)

   (c) Cardinality Constraints -

      i. (SCP:Special Procedures) - (1:m) as each SCP can have multiple special containment protocols.

4. **Relationship**
   This relation is between groups of interest. It tells us whether two groups are neutral, passive or aggressive towards each other. Since the SCP foundation itself is a group of interest, this relationship will also tell us whether a given group is a threat to the foundation.

   (a) Degree - 2

   (b) Participating Entities -

      i. Groups of Interest

   (c) Roles: Enemy, Ally, Indifferent - each group of interest can either be the enemy or ally or indifferent towards another group of interest [**BONUS**]

   (d) Cardinality Constraints -

      i. (Groups of Interest:Groups of Interests) = (1:1) as each GOI can be related to at most one GOI which is not itself.

5.4 n > 3 Relationships

Containment Involvement- it is a degree 4 relationship involving the entities SCP, SITE, MTF and Personnel. It tells us all the entities involved in the containment of a given SCP.

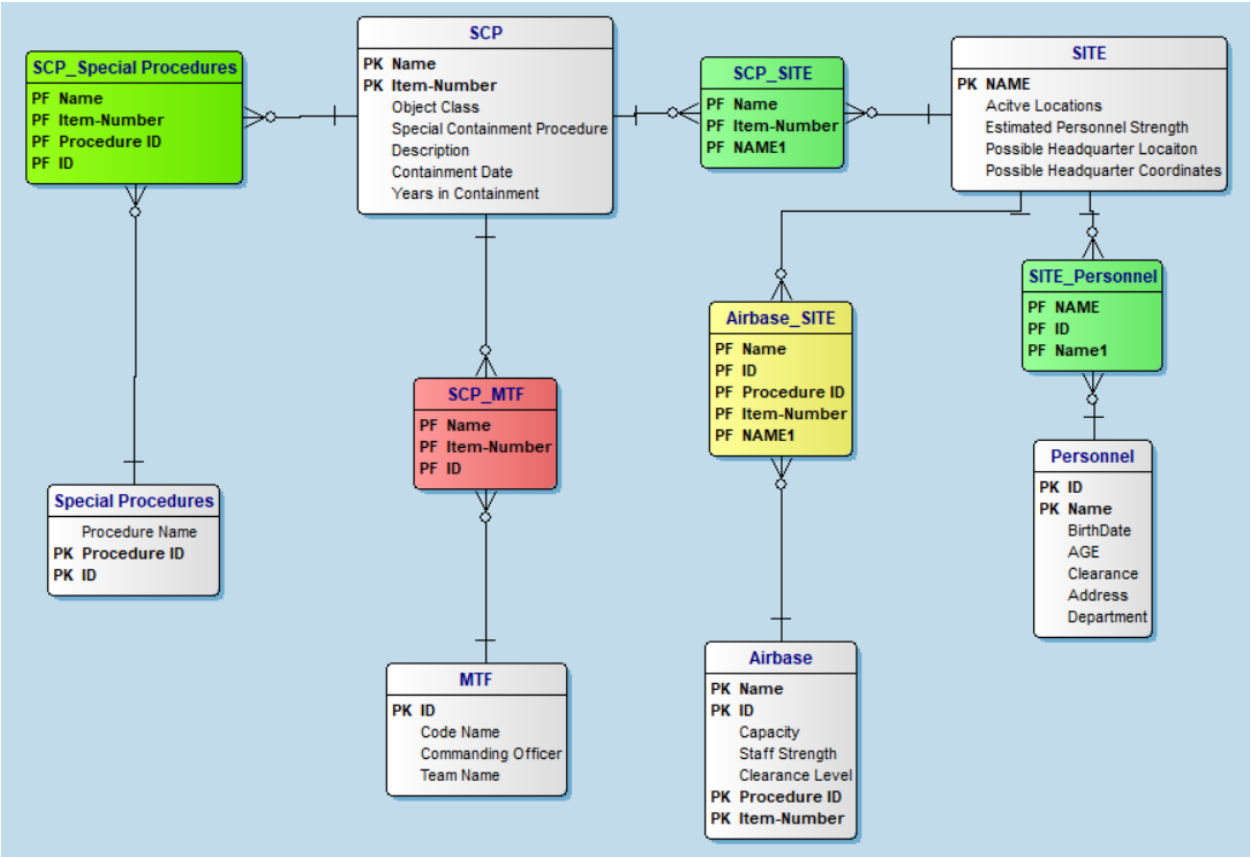

Figure 1: Key :-
White = Entities
Has Airbase Relationships
Red = Containment Protocol Relationship
Green = Constraint Involvement Relationship

6 Functional Requirements

6.1 Groups of Interest (GOI)

GOIs are decided by the Overseer council and hence can't be changed.

6.2 Modifications

1. Insert -
   (a) SCP
   INSERT INTO 'SCP'
      i. name
      ii. Item-number
      iii. Object Class
      iv. Special Containment Procedure
      v. Description
      vi. Containment Date
      vii. Years in Containment
   (b) Special Procedures
   INSERT INTO 'Special Procedure'
      i. Procedure Name
      ii. Procedure ID
      iii. ID
   (c) MTF
   INSERT INTO 'MTF'
      i. ID
      ii. Code Name
      iii. Commanding Officer
      iv. Team Name
   (d) Airbase
   INSERT INTO 'Airbase'
      i. Name
      ii. ID
      iii. Capacity
      iv. Staff Strength
      v. Clearance Level
   (e) SITE
   INSERT INTO 'SITE'
      i. Site Number
      ii. Capacity
      iii. Staff Size

iv. Location
v. Coordinates

(f) Personnel
INSERT INTO 'Personnel'
i. ID
ii. Name
iii. BirthDate
iv. AGE
v. Clearance
vi. Address
vii. Department

2. Delete -

(a) SCP entity cannot be deleted, only object class can be updated to neutralized.

(b) Delete Site entity - In case a site is destroyed it is removed from the database.

(c) Delete MTF entity- In case MTF unit is merged with another or unit is wiped out, it is deleted from the database.

(d) Delete Airbase - Incase a site is destroyed or the airbase is destroyed, it is removed from the database.

(e) Delete Personnel entity- Incase a personnel is demoted to D class or is dead or deserts the foundation the corresponding personnel entry is deleted.

(f) Delete Special Procedures- In case an SCP is neutralized and its containment protocol is no longer required, the Special procedure is deleted from the database.

3. Update -

(a) SCP
i. Object Class
ii. Special Containment Procedure
iii. Description
iv. Containment Date
v. Years in Containment

(b) MTF
i. Commanding Officer
ii. Team Name

(c) Airbase
i. Name

ii. Capacity
iii. Staff Strength
iv. Clearance Level

(d) SITE

i. Capacity
ii. Staff Size

(e) Personnel

i. ID
ii. Name
iii. BirthDate
iv. AGE
v. Clearance
vi. Address
vii. Department

6.3 Retrievals

1. Selection -

(a) SCP

i. Select Entire SCP entity by item number
ii. Select all SCP entities based on object class attribute
iii. Select entire SCP entity based on name

(b) MTF

i. Select MTF entity by name
ii. Select MTF entity by id
iii. Select MTF entity by Unit Commander

(c) SITE

i. Select Site entity by site number
ii. Select Site entity location (full location in comma separated form)
iii. Select Site entity by coordinates

(d) Personnel

i. Select Personnel entity by name
ii. Select Personnel entity by id
iii. Select Personnel entity by department
iv. Select Personnel entity by subclass type
v. Select Personnel entity by clearance level

(e) Airbase locations are of strategic locations are of strategic interest and hence classified

(f) Special containment protocols are foundation secrets and hence classified

2. Projection -

   (a) Names of all personnel age > 'x' years
   (b) All Sites which are probably located in 'X' Country
   (c) Search for airbase by capacity > x flights.
   (d) Names of the SCP's > 'x' years in containment
   (e) All SCPs with years in containment > x years or less than x years

3. Aggregate -

   (a) SUM
      i. Total Number of SCPs - counts the total number of SCPs.
      ii. Total Number of Sites - counts the total number of sites.
      iii. Total Number of Air Bases - counts the total number of Air Bases.
   (b) AVG -
   Average number of SCPs per site - Counts the total number of SCPs divided by the total number of sites (can be done on the basis of years in containment or object object class also)
   (c) MAX -
      i. Site with max number of SCPs
      ii. Oldest SCP
      iii. Site with minimum capacity
   (d) MIN -
      i. Site with minimum number of SCPs
      ii. Youngest SCP
      iii. Site with minimum capacity

4. Search -

   (a) Search for SCP by partial string match with name
   (b) Search for Personnel by partial string match with name, department, Subclass.
   (c) Search for MTF unit by partial string match with code name, team name, unit commander
   (d) Search for Groups of Interests by partial string match with name
   (e) Search for Airbase by partial string match with name

5. Analysis -

   (a) List of all SCPs with greater than x years of containment in a specific SITE

(b) List of all MTF units Associated with an SCP at a given site

(c) List of all Researches of age greater than x years in a specific SITE

(d) List of All SCPs in a given site with object level Keter in a specific site

(e) List all Special protocols of a given SCP

(f) List of Sites with an Airbase of capacity greater than x (capacity constraint is optional)

(g) List of all personnel and SCPs in a given country and not in the same SITE