

Database Normalization Report

Among Us Galactic Registry

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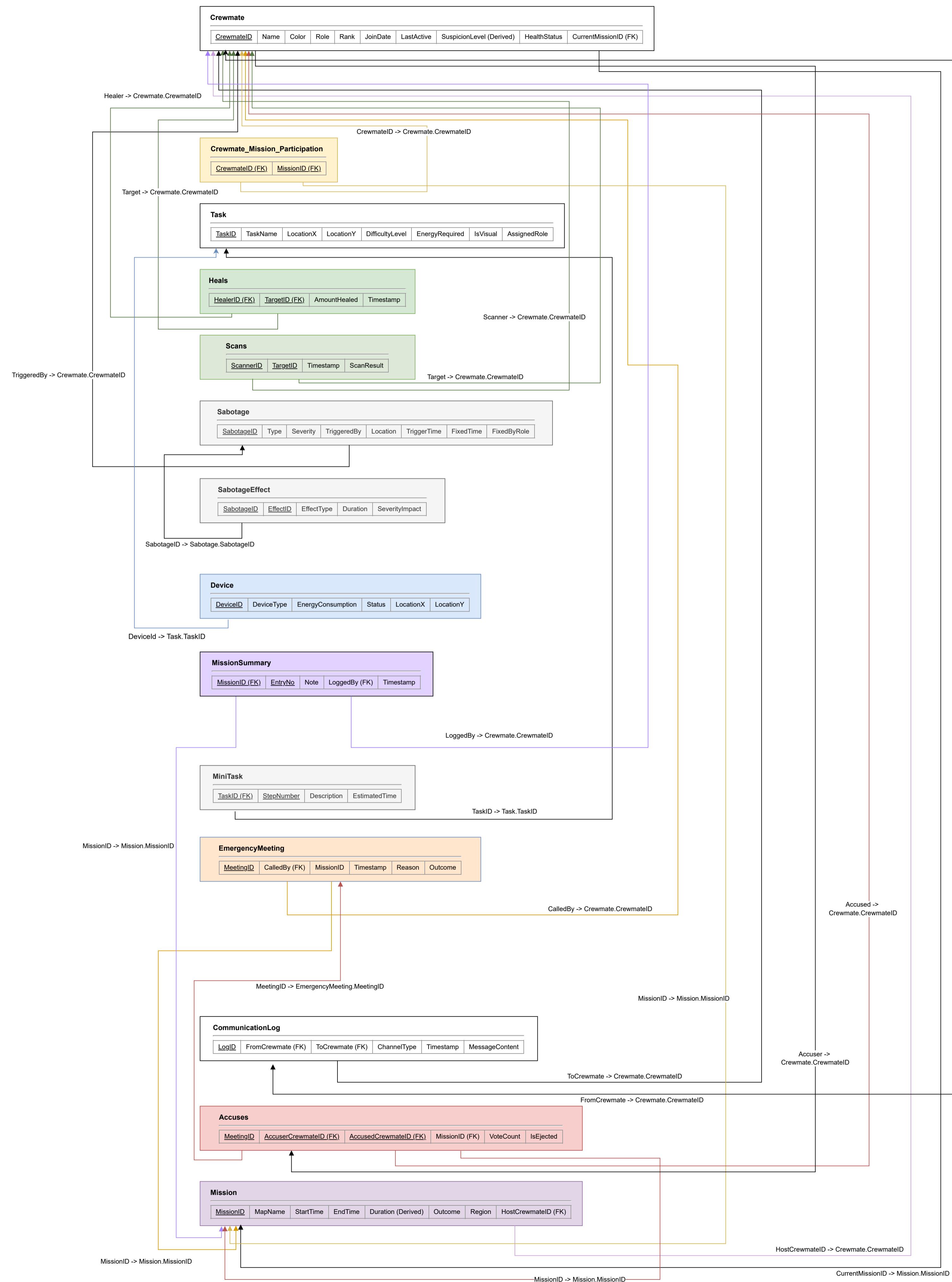
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November 14, 2025

Abstract

This report details the process of normalizing the "Among Us Galactic Registry" database schema. Starting from an unnormalized form, the schema is progressively refined through First Normal Form (1-NF), Second Normal Form (2-NF), and Third Normal Form (3-NF). Each step documents the specific changes made to the relations and the logical reasoning for each transformation, such as eliminating multi-valued attributes, partial dependencies, and transitive dependencies, to achieve a robust and efficient database structure.

1 Original Schema (Pre-Normalization)



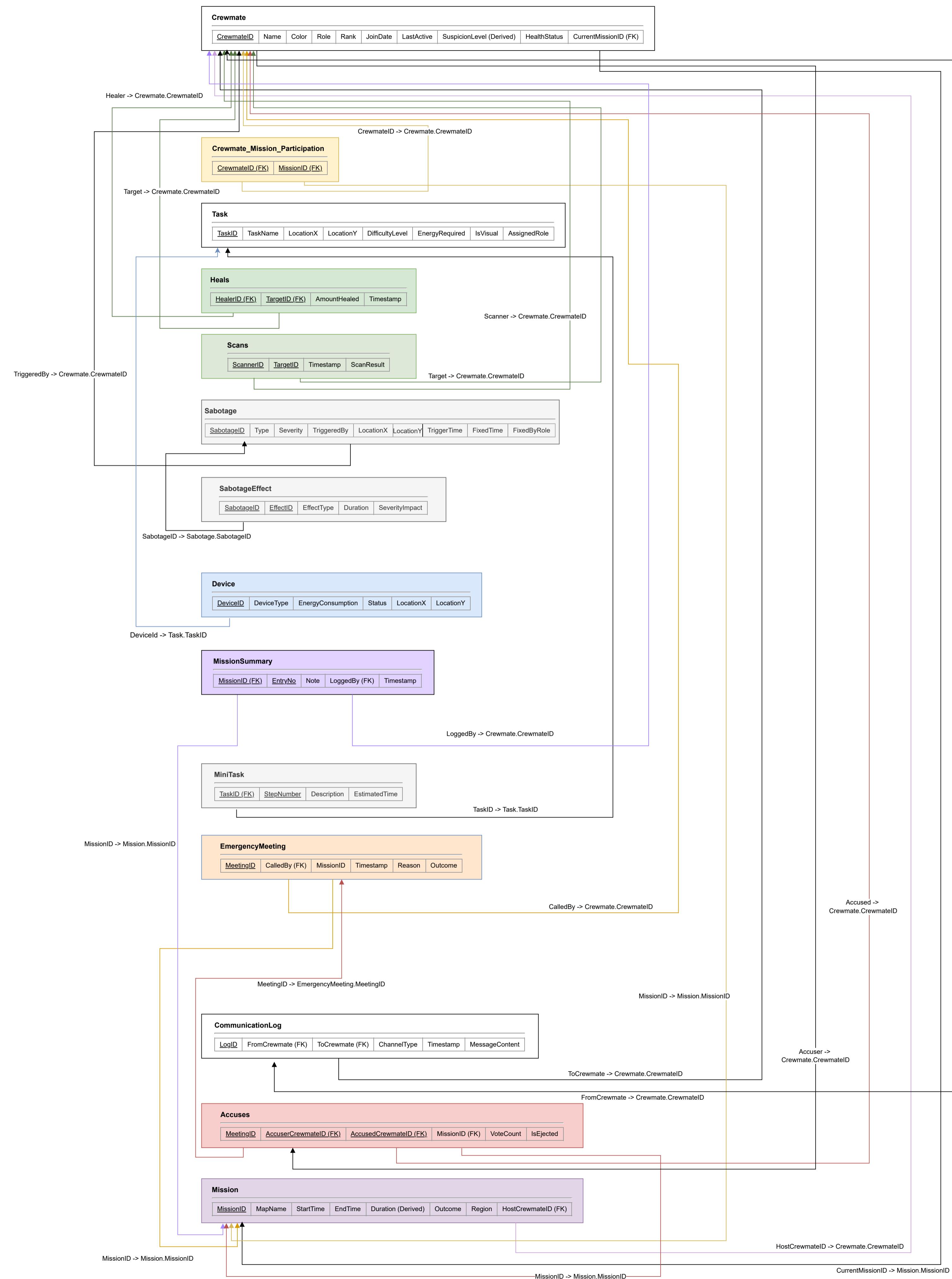
2 First Normal Form (1-NF)

2.1 Changes Made

In the Sabotage relation, the multi-valued attribute Location was replaced with two atomic attributes: LocationX and LocationY.

2.2 Reason

The original Location attribute was multi-valued, which violates the 1-NF requirement that all attribute values in a relation must be atomic.



3 Second Normal Form (2-NF)

3.1 Changes Made

The SabotageEffect relation was decomposed to resolve a partial dependency.

- **Original Relation:**

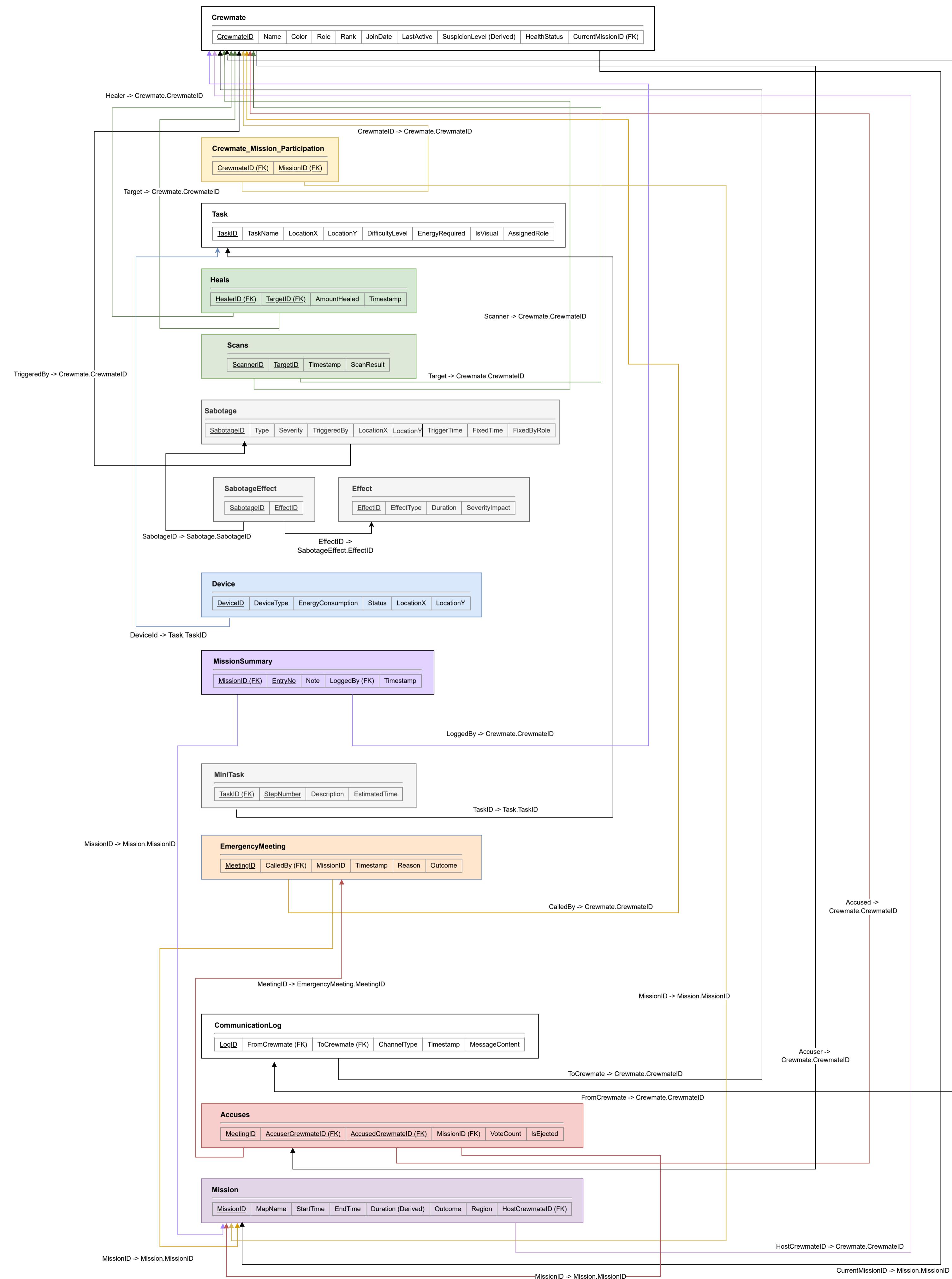
SabotageEffect(SabotageID (PK), EffectID (PK), EffectType, Duration, SeverityImpact)

- **Decomposed into:**

1. SabotageEffect(SabotageID (PK,FK), EffectID (PK,FK))
2. Effect(EffectID (PK), EffectType, Duration, SeverityImpact)

3.2 Reason

The original table had a composite primary key (SabotageID, EffectID), and the attributes EffectType, Duration, and SeverityImpact were functionally dependent only on EffectID, which is just a part of the primary key. This partial dependency violates 2-NF.



4 Third Normal Form (3-NF)

To eliminate transitive dependencies, the following relations were decomposed:

4.1 i. Crewmate Relation

- **Changes:** Broke down Crewmate(CrewmateID (PK), ..., Role, Rank, ...) into:
 1. Crewmate(CrewmateID (PK), ..., Role (FK), ...)
 2. RoleDetails(Role (PK), Rank, BaseSuspicionLevel)

4.2 ii. Task Relation

- **Changes:** Broke down Task(TaskID (PK), TaskName, ..., DifficultyLevel, ...) into:
 1. Task(TaskID (PK), TaskName (FK), LocationX, LocationY)
 2. TaskBlueprint(TaskName (PK), DifficultyLevel, EnergyRequired, ...)

4.3 iii. Sabotage Relation

- **Changes:** Broke down Sabotage(SabotageID (PK), Type, Severity, ...) into:
 1. Sabotage(SabotageID (PK), Type (FK), TriggerBy, ...)
 2. SabotageType(Type (PK), Severity, DefaultFixedByRole)

