

# Namespace ElectricDrill.SoapRpgFramework

## Classes

### [BoundedValue](#)

Abstract base class for values that can be bounded by minimum and maximum limits. Provides functionality to define optional min/max constraints and clamp values within those bounds.

### [Class](#)

Represents a character class in the RPG system. It can be used to define how attributes and stats grow over levels.

### [ClassMenuItems](#)

Provides a menu item in the Unity Editor to create a Class asset.

### [EntityClass](#)

Component that represents the class of an entity in the game. Implements [IClassSource](#) to provide access to the entity's class definition.

### [EntityCore](#)

The core component for any entity in the game. It is the mandatory base class for all entities, providing essential functionality. Provides easy access to the entity's level, stats, and attributes.

### [EntityLevel](#)

Represents the level and experience system of an entity in the RPG framework. Handles experience gain, level progression, and experience-based calculations. Implements [ILevelable](#) to provide standard leveling functionality.

### [ExpSource](#)

A MonoBehaviour component that provides a source of experience points. Implements [IExpSource](#) and can only be harvested once. Once harvested, subsequent calls to Exp will return 0.

### [GrowthFormula](#)

Represents a formula to calculate growth values for different levels, up to a maximum level.

### [GrowthFormulaMenuItems](#)

Provides a menu item in the Unity Editor to create a GrowthFormula asset.

## Interfaces

### [IAttributes](#)

Interface for entities that have an attributes system. Provides access to the entity's attributes component.

## [IClassSource](#)

Interface for objects that provide a source of a class. In RPG games, a class typically defines the role or profession of an entity, such as a warrior, mage, or rogue.

## [IExpSource](#)

Interface for objects that can provide experience points. Defines the contract for experience sources that can be harvested.

## [ILevel](#)

Interface for entities that have a level system. Provides access to the entity's level management component.

## [ILevelable](#)

Interface for entities that have a leveling system based on experience points. Provides the core functionality for level progression and experience management.

## [IStatSetSource](#)

Interface for objects that provide a source of stat sets. Defines the contract for accessing a StatSet that contains stat definitions.

# Class BoundedValue

Namespace: [ElectricDrill.SapRpgFramework](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Abstract base class for values that can be bounded by minimum and maximum limits. Provides functionality to define optional min/max constraints and clamp values within those bounds.

```
public abstract class BoundedValue : ScriptableObject
```

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← BoundedValue

## Derived

[Attribute](#), [Stat](#)

# Properties

## Has.MaxValue

Gets or sets whether this value has a maximum limit.

```
public bool Has.MaxValue { get; }
```

## Property Value

bool

## Has.MinValue

Gets or sets whether this value has a minimum limit.

```
public bool Has.MinValue { get; }
```

## Property Value

bool

## MaxValue

Gets or sets the maximum allowed value when HasMaxValue is true.

```
public long MaxValue { get; }
```

Property Value

long

## MinValue

Gets or sets the minimum allowed value when HasMinValue is true.

```
public int MinValue { get; }
```

Property Value

int

# Class Class

Namespace: [ElectricDrill.SapRpgFramework](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Represents a character class in the RPG system. It can be used to define how attributes and stats grow over levels.

```
public class Class : ScriptableObject, IStatSetSource
```

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← Class

## Implements

[IStatSetSource](#)

## Fields

### \_attributeSet

The set of attributes associated with this class.

```
[SerializeField]  
protected AttributeSet _attributeSet
```

### Field Value

[AttributeSet](#)

### \_maxHpGrowthFormula

The growth formula for the maximum HP. This is a baseline value that can be used to calculate the maximum HP of characters of this class at different levels.

```
[SerializeField]  
protected GrowthFormula _maxHpGrowthFormula
```

## Field Value

[GrowthFormula](#)

### \_statSet

The set of stats associated with this class.

```
[SerializeField]  
protected StatSet _statSet
```

## Field Value

[StatSet](#)

## Properties

### AttributeSet

Gets the AttributeSet for this class.

```
public virtual AttributeSet AttributeSet { get; }
```

### Property Value

[AttributeSet](#)

### StatSet

Gets the StatSet for this class.

```
public virtual StatSet StatSet { get; }
```

### Property Value

[StatSet](#)

# Methods

## GetAttributeAt(Attribute, int)

Calculates the value of a specific attribute at a given level.

```
public virtual long GetAttributeAt(Attribute attribute, int level)
```

Parameters

**attribute** [Attribute](#)

The attribute to calculate.

**level** int

The level to calculate the attribute value for.

Returns

long

The value of the attribute at the specified level.

## GetMaxHpAt(int)

Calculates the maximum HP for a given level.

```
public long GetMaxHpAt(int level)
```

Parameters

**level** int

The level to calculate the max HP for.

Returns

long

The maximum HP at the specified level.

## GetStatAt(Stat, int)

Calculates the value of a specific stat at a given level.

```
public virtual long GetStatAt(Stat stat, int level)
```

### Parameters

**stat** [Stat](#)

The stat to calculate.

**level** int

The level to calculate the stat value for.

### Returns

long

The value of the stat at the specified level.

### Exceptions

ArgumentException

Thrown when the growth formula for the stat is not set.

# Class ClassMenuItems

Namespace: [ElectricDrill.SapRpgFramework](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Provides a menu item in the Unity Editor to create a Class asset.

```
public static class ClassMenuItems
```

## Inheritance

object ← ClassMenuItems

## Methods

### CreateClass()

Creates a new Class asset.

```
[MenuItem("Assets/Create/SapRpgFramework/Class", false, 5)]  
public static void CreateClass()
```

# Class EntityClass

Namespace: [ElectricDrill.SapRpgFramework](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Component that represents the class of an entity in the game. Implements [IClassSource](#) to provide access to the entity's class definition.

```
[DisallowMultipleComponent]  
public class EntityClass : MonoBehaviour, IClassSource
```

## Inheritance

object ← [Object](#) ← [Component](#) ← [Behaviour](#) ← [MonoBehaviour](#) ← EntityClass

## Implements

[IClassSource](#)

## Properties

### Class

Gets or sets the class definition for this entity.

```
public Class Class { get; }
```

### Property Value

[Class](#)

## Operators

### implicit operator Class(EntityClass)

Implicit conversion operator that allows an EntityClass to be used directly as a Class.

```
public static implicit operator Class(EntityClass entityClass)
```

## Parameters

**entityClass** [EntityClass](#)

The EntityClass to convert.

## Returns

[Class](#)

The Class associated with the EntityClass.

# Class EntityCore

Namespace: [ElectricDrill.SapRpgFramework](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

The core component for any entity in the game. It is the mandatory base class for all entities, providing essential functionality. Provides easy access to the entity's level, stats, and attributes.

```
[DisallowMultipleComponent]  
public class EntityCore : MonoBehaviour, ILevel, IAttributes
```

## Inheritance

object ← [Object](#) ← [Component](#) ← [Behaviour](#) ← [MonoBehaviour](#) ← EntityCore

## Implements

[ILevel](#), [IAttributes](#)

## Properties

### Attributes

Gets the [EntityAttributes](#) component which manages the entity's attributes.

```
public virtual EntityAttributes Attributes { get; }
```

### Property Value

[EntityAttributes](#)

### Level

Gets the [EntityLevel](#) class which manages the entity's level and experience.

```
public virtual EntityLevel Level { get; }
```

### Property Value

## [EntityLevel](#)

### Name

Gets the name of the entity's GameObject.

```
public string Name { get; }
```

### Property Value

string

### Stats

Gets the [EntityStats](#) component which manages the entity's stats.

```
public virtual EntityStats Stats { get; }
```

### Property Value

[EntityStats](#)

## Methods

### Awake()

```
protected virtual void Awake()
```

### Start()

```
protected virtual void Start()
```

## Update()

```
protected virtual void Update()
```

# Class EntityLevel

Namespace: [ElectricDrill.SoapRpgFramework](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Represents the level and experience system of an entity in the RPG framework. Handles experience gain, level progression, and experience-based calculations. Implements [ILevelable](#) to provide standard leveling functionality.

```
[Serializable]  
public class EntityLevel : ILevelable
```

## Inheritance

object ← EntityLevel

## Implements

[ILevelable](#)

# Properties

## CurrentTotalExperience

Gets the current total experience of the entity. This represents all experience gained since the entity was created.

```
public long CurrentTotalExperience { get; }
```

## Property Value

long

## Level

Gets or sets the current level of the entity. Level must be between 1 and the maximum level. Setting the level will trigger the OnLevelUp event.

```
public virtual int Level { get; set; }
```

Property Value

int

## Methods

### AddExp(long)

Adds experience to the entity. The experience will be modified by any experience gain modifiers. If the entity gains enough experience to level up, the OnLevelUp event will be raised. Can trigger multiple level ups if enough experience is added.

```
public void AddExp(long amount)
```

Parameters

**amount** long

The base amount of experience to add before modifiers are applied.

### CurrentLevelTotalExperience()

Gets the total experience required to reach the current level. For level 1, this returns 0. For higher levels, it uses the experience growth formula.

```
public long CurrentLevelTotalExperience()
```

Returns

long

The total experience required for the current level.

### NextLevelTotalExperience()

Gets the total experience required to reach the next level. If the entity is already at the maximum level, returns the experience for the current level.

```
public long NextLevelTotalExperience()
```

Returns

long

The total experience required for the next level, or current level experience if at max level.

## SetTotalCurrentExp(long)

Sets the total current experience and automatically updates the level to match. The level will be calculated based on the experience growth formula.

```
public void SetTotalCurrentExp(long totalCurrentExperience)
```

Parameters

**totalCurrentExperience** long

The total experience to set.

## ValidateExperience()

Validates that the current total experience corresponds to the current level. If the experience doesn't match the level, it will be reset to the base experience for the current level. This method is useful for debugging and ensuring data consistency.

```
public void ValidateExperience()
```

# Events

## OnLevelUp

Event raised when the entity levels up. The parameter is the new level.

```
public virtual event Action<int> OnLevelUp
```

Event Type

Action<int>

## Operators

### implicit operator int(EntityLevel)

Implicitly converts an EntityLevel to its integer level value. Allows EntityLevel objects to be used directly as integers in calculations.

```
public static implicit operator int(EntityLevel entityLevel)
```

Parameters

**entityLevel** [EntityLevel](#)

The EntityLevel instance to convert.

Returns

int

The current level as an integer.

# Class ExpSource

Namespace: [ElectricDrill.SapRpgFramework](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

A MonoBehaviour component that provides a source of experience points. Implements [IExpSource](#) and can only be harvested once. Once harvested, subsequent calls to Exp will return 0.

```
public class ExpSource : MonoBehaviour, IExpSource
```

Inheritance

object ← [Object](#) ← [Component](#) ← [Behaviour](#) ← [MonoBehaviour](#) ← ExpSource

Implements

[IExpSource](#)

## Properties

### Exp

Gets the experience points from this source. The first call will return the configured experience and mark the source as harvested. Subsequent calls will return 0.

```
public long Exp { get; }
```

Property Value

long

### Harvested

Gets or sets whether this experience source has been harvested. Once set to true, the Exp property will return 0.

```
public bool Harvested { get; set; }
```

Property Value

bool

# Class GrowthFormula

Namespace: [ElectricDrill.SoapRpgFramework](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Represents a formula to calculate growth values for different levels, up to a maximum level.

```
public class GrowthFormula : ScriptableObject
```

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← GrowthFormula

## Properties

### GrowthFoValues

Gets the pre-calculated growth formula values for each level. Values are refreshed on validation. The array is indexed from 0 to maxLevel - 1, where index 0 corresponds to level 1.

```
public double[] GrowthFoValues { get; }
```

Property Value

double[]

## Methods

### GetGrowthValue(int)

Gets the growth value for a specific level. Levels start from 1.

```
public long GetGrowthValue(int level)
```

Parameters

**level** int

The level for which to get the growth value.

Returns

long

The growth value for the specified level.

# Class GrowthFormulaMenuItems

Namespace: [ElectricDrill.SapRpgFramework](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Provides a menu item in the Unity Editor to create a GrowthFormula asset.

```
public static class GrowthFormulaMenuItems
```

## Inheritance

object ← GrowthFormulaMenuItems

## Methods

### CreateGrowthFormula()

Creates a new GrowthFormula asset.

```
[MenuItem("Assets/Create/SapRpg Framework/Growth Formula", false, 6)]  
public static void CreateGrowthFormula()
```

# Interface IAttributes

Namespace: [ElectricDrill.SoapRpgFramework](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Interface for entities that have an attributes system. Provides access to the entity's attributes component.

```
public interface IAttributes
```

## Properties

### Attributes

Gets the entity's attributes component.

```
EntityAttributes Attributes { get; }
```

### Property Value

[EntityAttributes](#)

# Interface IClassSource

Namespace: [ElectricDrill.SoapRpgFramework](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Interface for objects that provide a source of a class. In RPG games, a class typically defines the role or profession of an entity, such as a warrior, mage, or rogue.

```
public interface IClassSource
```

## Properties

### Class

Gets the class.

```
Class Class { get; }
```

### Property Value

[Class](#)

# Interface IExpSource

Namespace: [ElectricDrill.SapRpgFramework](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Interface for objects that can provide experience points. Defines the contract for experience sources that can be harvested.

```
public interface IExpSource
```

## Properties

### Exp

Gets the experience points available from this source. The behavior may vary based on implementation and harvest state.

```
long Exp { get; }
```

Property Value

long

### Harvested

Gets or sets whether this experience source has been harvested. Used to track if the experience has already been collected.

```
bool Harvested { get; set; }
```

Property Value

bool

# Interface ILevel

Namespace: [ElectricDrill.SapRpgFramework](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Interface for entities that have a level system. Provides access to the entity's level management component.

```
public interface ILevel
```

## Properties

### Level

Gets the entity's level management component.

```
EntityLevel Level { get; }
```

### Property Value

[EntityLevel](#)

# Interface ILevelable

Namespace: [ElectricDrill.SapRpgFramework](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Interface for entities that have a leveling system based on experience points. Provides the core functionality for level progression and experience management.

```
public interface ILevelable
```

## Properties

### CurrentTotalExperience

Gets the current total experience of the entity. This represents all experience gained since creation.

```
long CurrentTotalExperience { get; }
```

Property Value

long

### Level

Gets or sets the current level of the entity. Setting the level may trigger level-up events and related effects.

```
int Level { get; set; }
```

Property Value

int

## Methods

## AddExp(long)

Adds experience points to the entity. May cause the entity to level up if enough experience is gained.

```
void AddExp(long amount)
```

### Parameters

**amount** long

The amount of experience to add.

## CurrentLevelTotalExperience()

Gets the total experience required to reach the current level.

```
long CurrentLevelTotalExperience()
```

### Returns

long

The experience threshold for the current level.

## NextLevelTotalExperience()

Gets the total experience required to reach the next level.

```
long NextLevelTotalExperience()
```

### Returns

long

The experience threshold for the next level.

## SetTotalCurrentExp(long)

Sets the total current experience and updates the level accordingly. The level will be recalculated based on the new experience total.

```
void SetTotalCurrentExp(long totalCurrentExperience)
```

## Parameters

**totalCurrentExperience** long

The total experience to set.

## ValidateExperience()

Validates that the current experience matches the current level. Used for debugging and ensuring data consistency.

```
void ValidateExperience()
```

# Interface IStatSetSource

Namespace: [ElectricDrill.SoapRpgFramework](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Interface for objects that provide a source of stat sets. Defines the contract for accessing a StatSet that contains stat definitions.

```
public interface IStatSetSource
```

## Properties

### StatSet

Gets the stat set that defines the available stats.

```
StatSet StatSet { get; }
```

### Property Value

[StatSet](#)

# Namespace ElectricDrill.SoapRpgFramework. Attributes

## Classes

### [Attribute](#)

Represents a character attribute that extends BoundedValue functionality. An attribute is a measurable characteristic such as strength, dexterity, luck, and so on. Can have a min and a max value.

### [AttributeMenuItems](#)

Provides Unity Editor menu items for creating attributes.

### [AttributeSet](#)

A ScriptableObject that defines a collection of attributes for use in character systems. Attribute sets are usually used to group attributes that can be shared across different characters or classes. For example, any character of any class could have the same attribute set, including attributes like strength, dexterity, constitution, intelligence, and luck.

### [AttributeSetInstance](#)

Represents a runtime instance of an AttributeSet with actual values for each attribute. Provides methods to manipulate and access attribute values during gameplay.

### [AttributeSetInstanceExtensions](#)

Extension methods for converting SerializableDictionary to AttributeSetInstance.

### [AttributeSetMenuItems](#)

Provides Unity Editor menu items for creating attribute sets.

### [EntityAttributes](#)

Manages the attributes of an entity. This component calculates attribute values by combining base values, flat modifiers, percentage modifiers, and spent attribute points. It requires an ElectricDrill.SoapRpgFramework.Attributes.EntityAttributes.EntityCore component on the same GameObject.

## Structs

### [AttributeChangeInfo](#)

Immutable structure that contains information about an attribute value change. Used to track and communicate attribute modifications across the system.

## Interfaces

### [IAttributeContainer](#)

Interface for objects that can contain and query attributes. Provides a standardized way to check for attribute containment across different attribute containers.



# Class Attribute

Namespace: [ElectricDrill.SapRpgFramework.Attributes](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Represents a character attribute that extends BoundedValue functionality. An attribute is a measurable characteristic such as strength, dexterity, luck, and so on. Can have a min and a max value.

```
[Serializable]  
public class Attribute : BoundedValue
```

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← [BoundedValue](#) ← Attribute

## Inherited Members

[BoundedValue.HasValue](#) , [BoundedValue.MaxValue](#) , [BoundedValue.HasMinValue](#) ,  
[BoundedValue.MinValue](#)

# Struct AttributeChangeInfo

Namespace: [ElectricDrill.SoapRpgFramework.Attributes](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Immutable structure that contains information about an attribute value change. Used to track and communicate attribute modifications across the system.

```
public readonly struct AttributeChangeInfo
```

## Constructors

### AttributeChangeInfo(EntityAttributes, Attribute, long, long)

Initializes a new instance of the AttributeChangeInfo structure.

```
public AttributeChangeInfo(EntityAttributes source, Attribute attribute, long oldValue,  
                           long newValue)
```

## Parameters

**source** [EntityAttributes](#)

The EntityAttributes instance that owns the changed attribute

**attribute** [Attribute](#)

The attribute that was changed

**oldValue** long

The previous value before the change

**newValue** long

The new value after the change

## Properties

## Attribute

Gets the attribute that was changed.

```
public Attribute Attribute { get; }
```

Property Value

[Attribute](#)

## NewValue

Gets the new value of the attribute after the change.

```
public long NewValue { get; }
```

Property Value

long

## OldValue

Gets the previous value of the attribute before the change.

```
public long OldValue { get; }
```

Property Value

long

## Source

Gets the EntityAttributes instance that owns the changed attribute.

```
public EntityAttributes Source { get; }
```

## Property Value

[EntityAttributes](#)

# Class AttributeMenuItems

Namespace: [ElectricDrill.SoapRpgFramework.Attributes](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Provides Unity Editor menu items for creating attributes.

```
public static class AttributeMenuItems
```

## Inheritance

object ← AttributeMenuItems

## Methods

### CreateAttribute()

Creates a new Attribute asset in the project window. Can be accessed via Assets/Create/SOAP RPG Framework/Attribute menu or Ctrl+Alt+A shortcut.

```
[MenuItem("Assets/Create/SOAP RPG Framework/Attribute ^&A", false, 0)]  
public static void CreateAttribute()
```

# Class AttributeSet

Namespace: [ElectricDrill.SapRpgFramework.Attributes](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

A ScriptableObject that defines a collection of attributes for use in character systems. Attribute sets are usually used to group attributes that can be shared across different characters or classes. For example, any character of any class could have the same attribute set, including attributes like strength, dexterity, constitution, intelligence, and luck.

```
public class AttributeSet : ScriptableObject, IAttributeContainer
```

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← AttributeSet

## Implements

[IAttributeContainer](#)

# Properties

## Attributes

Gets a read-only list of all attributes contained in this set.

```
public IReadOnlyList<Attribute> Attributes { get; }
```

## Property Value

IReadOnlyList<[Attribute](#)>

# Methods

## Contains(Attribute)

Checks whether the specified attribute is contained in this set.

```
public bool Contains(Attribute attribute)
```

Parameters

**attribute** Attribute

The attribute to check for

Returns

bool

True if the attribute is in the set, false otherwise

# Class AttributeSetInstance

Namespace: [ElectricDrill.SapRpgFramework.Attributes](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Represents a runtime instance of an AttributeSet with actual values for each attribute. Provides methods to manipulate and access attribute values during gameplay.

```
public class AttributeSetInstance : IAttributeContainer
```

**Inheritance**

object ← AttributeSetInstance

**Implements**

[IAttributeContainer](#)

## Constructors

### AttributeSetInstance(AttributeSet)

Initializes a new instance of AttributeSetInstance based on an AttributeSet. All attributes are initialized with a value of 0.

```
public AttributeSetInstance(AttributeSet attrSet)
```

Parameters

**attrSet** [AttributeSet](#)

The AttributeSet to base this instance on

## Properties

### Attributes

Gets the internal dictionary containing all attribute-value pairs.

```
public Dictionary<Attribute, long> Attributes { get; }
```

## Property Value

Dictionary<[Attribute](#), long>

## this[Attribute]

Gets or sets the value of an attribute using indexer syntax.

```
public long this[Attribute attribute] { get; set; }
```

## Parameters

**attribute** [Attribute](#)

The attribute to access

## Property Value

long

The current value when getting, or sets the value when setting

# Methods

## AddValue(Attribute, long)

Adds a value to the specified attribute. If the attribute doesn't exist, it will be created.

```
public void AddValue(Attribute attribute, long value)
```

## Parameters

**attribute** [Attribute](#)

The attribute to modify

**value** long

The value to add. Can be negative to decrease the value.

## Clone()

Creates a deep copy of this AttributeSetInstance.

```
public AttributeSetInstance Clone()
```

Returns

[AttributeSetInstance](#)

A new AttributeSetInstance with the same attribute values

## Contains(Attribute)

Checks whether the specified attribute is contained in this instance.

```
public bool Contains(Attribute stat)
```

Parameters

**stat** [Attribute](#)

The attribute to check for

Returns

bool

True if the attribute exists, false otherwise

## Get(Attribute)

Gets the current value of the specified attribute.

```
public long Get(Attribute attribute)
```

Parameters

**attribute** [Attribute](#)

The attribute to retrieve

Returns

long

The current value of the attribute

## GetAsPercentage(Attribute)

Gets the value of an attribute as a percentage.

```
public Percentage GetAsPercentage(Attribute stat)
```

Parameters

**stat** [Attribute](#)

The attribute to convert to percentage

Returns

[Percentage](#)

A Percentage representation of the attribute value

## GetEnumerator()

Returns an enumerator that iterates through the attribute-value pairs.

```
public IEnumarator<KeyValuePair<Attribute, long>> GetEnumerator()
```

Returns

IEnumerator<KeyValuePair<[Attribute](#), long>>

An enumerator for the attribute-value pairs

## Operators

**operator +(AttributeSetInstance, AttributeSetInstance)**

Adds two AttributeSetInstance objects together, combining their attribute values.

```
public static AttributeSetInstance operator +(AttributeSetInstance a,  
AttributeSetInstance b)
```

Parameters

a [AttributeSetInstance](#)

The first AttributeSetInstance

b [AttributeSetInstance](#)

The second AttributeSetInstance

Returns

[AttributeSetInstance](#)

A new AttributeSetInstance with combined values

**explicit operator**

**AttributeSetInstance(SerializableDictionary<Attribute, long>)**

Explicitly converts a SerializableDictionary to an AttributeSetInstance.

```
public static explicit operator AttributeSetInstance(SerializableDictionary<Attribute,  
long> dictionary)
```

## Parameters

**dictionary** [SerializableDictionary<Attribute, long>](#)

The dictionary to convert

## Returns

[AttributeSetInstance](#)

A new AttributeSetInstance based on the dictionary

# Class AttributeSetInstanceExtensions

Namespace: [ElectricDrill.SapRpgFramework.Attributes](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Extension methods for converting SerializableDictionary to AttributeSetInstance.

```
public static class AttributeSetInstanceExtensions
```

## Inheritance

object ← AttributeSetInstanceExtensions

## Methods

**ToAttributeSetInstance(SerializableDictionary<Attribute, long>, AttributeSet)**

Converts a SerializableDictionary of attributes to an AttributeSetInstance. Validates that all attributes from the AttributeSet are present in the dictionary.

```
public static AttributeSetInstance ToAttributeSetInstance(this  
SerializableDictionary<Attribute, long> dictionary, AttributeSet attributeSet)
```

### Parameters

**dictionary** [SerializableDictionary<Attribute, long>](#)

The dictionary to convert

**attributeSet** [AttributeSet](#)

The AttributeSet to validate against

### Returns

[AttributeSetInstance](#)

A new AttributeSetInstance with values from the dictionary

# Class AttributeSetMenuItems

Namespace: [ElectricDrill.SapRpgFramework.Attributes](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Provides Unity Editor menu items for creating attribute sets.

```
public static class AttributeSetMenuItems
```

## Inheritance

object ← AttributeSetMenuItems

## Methods

### CreateAttributeSet()

Creates a new AttributeSet asset in the project window. Can be accessed via Assets/Create/Sap RPG Framework/Attribute Set menu.

```
[MenuItem("Assets/Create/Sap RPG Framework/Attribute Set", false, 1)]  
public static void CreateAttributeSet()
```

# Class EntityAttributes

Namespace: [ElectricDrill.SoapRpgFramework.Attributes](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Manages the attributes of an entity. This component calculates attribute values by combining base values, flat modifiers, percentage modifiers, and spent attribute points. It requires an ElectricDrill.SoapRpgFramework.Attributes.EntityAttributes.EntityCore component on the same GameObject.

```
[DisallowMultipleComponent]
[RequireComponent(typeof(EntityCore))]
public class EntityAttributes : MonoBehaviour
```

## Inheritance

object ← [Object](#) ← [Component](#) ← [Behaviour](#) ← [MonoBehaviour](#) ← EntityAttributes

## Properties

### AttributeSet

Gets the [AttributeSet](#) used by this entity. The source of the attribute set depends on whether ElectricDrill.SoapRpgFramework.Attributes.EntityAttributes.useClassBaseAttributes is true. If true, it returns the attribute set from the [EntityClass](#). Otherwise, it returns the ElectricDrill.SoapRpgFramework.Attributes.EntityAttributes.fixedBaseAttributeSet.

```
public virtual AttributeSet AttributeSet { get; }
```

### Property Value

[AttributeSet](#)

### AvailableAttributePoints

Gets the number of attribute points currently available to spend.

```
public int AvailableAttributePoints { get; }
```

Property Value

int

## EntityClass

Gets the class for this entity. The class is used to determine base attributes when ElectricDrill.SoapRpg Framework.Attributes.EntityAttributes.useClassBaseAttributes is true.

```
public IClassSource EntityClass { get; }
```

Property Value

[IClassSource](#)

## FlatModifiers

Gets the instance of flat modifiers for the attributes. Flat modifiers are added directly to the base attribute values.

```
protected virtual AttributeSetInstance FlatModifiers { get; }
```

Property Value

[AttributeSetInstance](#)

## OnAttributeChanged

```
public AttributeChangedGameEvent OnAttributeChanged { get; }
```

Property Value

[AttributeChangedGameEvent](#)

## PercentageModifiers

Gets the instance of percentage modifiers for the attributes. Percentage modifiers are applied after flat modifiers.

```
protected virtual AttributeSetInstance PercentageModifiers { get; }
```

Property Value

[AttributeSetInstance](#)

## TotalAttributePoints

Gets the total number of attribute points, including both available and spent points.

```
public int TotalAttributePoints { get; }
```

Property Value

int

## Methods

### AddFlatModifier(Attribute, long)

Adds a flat modifier to an attribute.

```
public void AddFlatModifier(Attribute attribute, long value)
```

Parameters

**attribute** [Attribute](#)

The attribute to modify.

**value** long

The flat value to add.

## AddPercentageModifier(Attribute, Percentage)

Adds a percentage modifier to an attribute.

```
public void AddPercentageModifier(Attribute attribute, Percentage value)
```

Parameters

**attribute** [Attribute](#)

The attribute to modify.

**value** [Percentage](#)

The percentage value to add.

## Get(Attribute)

Gets the final calculated value of a specific attribute. The final value includes base value, flat and percentage modifiers, and spent attribute points. The result is clamped to the attribute's min/max values.

```
public long Get(Attribute attribute)
```

Parameters

**attribute** [Attribute](#)

The attribute to retrieve.

Returns

long

The final value of the attribute if the component is enabled (clamped to min/max values); otherwise, 0

## GetAllSpentPoints()

Gets a dictionary containing the number of attribute points spent on each attribute.

```
public Dictionary<Attribute, int> GetAllSpentPoints()
```

Returns

Dictionary<[Attribute](#), int>

A dictionary where keys are attributes and values are the points spent on each attribute.

## GetBase(Attribute)

Gets the base value of an attribute at the entity's current level. Base attributes don't consider flat or percentage modifiers, nor spent attribute points.

```
public long GetBase(Attribute attribute)
```

Parameters

**attribute** [Attribute](#)

The attribute to retrieve the base value for.

Returns

long

The base value of the attribute (clamped to its min/max values) if enabled; otherwise, 0

## GetSpentOn(Attribute)

Gets the number of attribute points spent on a specific attribute.

```
public int GetSpentOn(Attribute attribute)
```

Parameters

**attribute** [Attribute](#)

The attribute to check.

Returns

int

The number of points spent on the attribute.

## RefundAllSpentPoints()

Refunds all spent attribute points, making them available to spend again.

```
public void RefundAllSpentPoints()
```

## RefundPointsForAttribute(Attribute)

Refunds all spent attribute points for a specific attribute, making them available to spend again.

```
public void RefundPointsForAttribute(Attribute attribute)
```

Parameters

**attribute** [Attribute](#)

The attribute to refund points for.

## SpendOn(Attribute, int)

Spends a certain amount of attribute points on a specific attribute.

```
public void SpendOn(Attribute attribute, int amount)
```

Parameters

**attribute** [Attribute](#)

The attribute to increase.

**amount** int

The number of points to spend.

# Interface IAttributeContainer

Namespace: [ElectricDrill.SapRpgFramework.Attributes](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Interface for objects that can contain and query attributes. Provides a standardized way to check for attribute containment across different attribute containers.

```
public interface IAttributeContainer
```

## Methods

### Contains(Attribute)

Determines whether the container includes the specified attribute.

```
bool Contains(Attribute attribute)
```

#### Parameters

**attribute** [Attribute](#)

The attribute to locate in the container

#### Returns

bool

True if the attribute is found in the container; otherwise, false

# Namespace ElectricDrill.SoapRpgFramework. Events

## Classes

### [AttributeChangedGameEvent](#)

Game event that is raised when an attribute changes. Contains information about the attribute that changed, including its previous and new values.

### [AttributeChangedGameEventListener](#)

Event listener that responds to AttributeChangedGameEvent events. Receives information about the attribute that changed, including its previous and new values.

### [EntityCoreGameEvent](#)

Game event that carries EntityCore data. Used for events that need to pass information about an entity's core component.

### [EntityCoreGameEventListener](#)

Event listener that responds to EntityCoreGameEvent events. Receives EntityCore data when the associated game event is raised.

### [GameEvent](#)

A ScriptableObject-based event system that allows decoupled communication between game systems. GameEvents can be raised to notify all registered listeners without requiring direct references.

### [GameEventGenerator](#)

A ScriptableObject tool for automatically generating GameEvent and GameEventListener classes. Allows developers to define event schemas and generate strongly-typed event classes at design time.

### [GameEventGenerator.EventParameter](#)

Represents a parameter that can be passed to a generated game event. Supports both native C# types and custom MonoScript-based types.

### [GameEventGenerator.GameEventDefinition](#)

Defines a complete game event with its name, parameters, and metadata. Contains all information needed to generate the corresponding C# classes.

### [GameEventGeneric1<T>](#)

A generic ScriptableObject-based event system that can carry one parameter of type T. Supports both MonoBehaviour-based listeners and code-based Action listeners.

### [GameEventGeneric2<T, U>](#)

A generic ScriptableObject-based event system that can carry two parameters of types T and U.  
Supports both MonoBehaviour-based listeners and code-based Action listeners.

### [GameEventGeneric3<T, U, W>](#)

A generic ScriptableObject-based event system that can carry three parameters of types T, U, and W.  
Supports both MonoBehaviour-based listeners and code-based Action listeners.

### [GameEventGeneric4<T, U, W, K>](#)

A generic ScriptableObject-based event system that can carry four parameters of types T, U, W, and K.  
Supports both MonoBehaviour-based listeners and code-based Action listeners.

### [GameEventListener](#)

MonoBehaviour component that listens to GameEvent objects and responds with UnityEvents.  
Automatically registers and unregisters itself when enabled/disabled.

### [GameEventListenerGeneric1<T>](#)

MonoBehaviour component that listens to GameEventGeneric1 objects and responds with UnityEvents. Automatically registers and unregisters itself when enabled/disabled.

### [GameEventListenerGeneric2<T, U>](#)

MonoBehaviour component that listens to GameEventGeneric2 objects and responds with UnityEvents. Automatically registers and unregisters itself when enabled/disabled.

### [GameEventListenerGeneric3<T, U, W>](#)

MonoBehaviour component that listens to GameEventGeneric3 objects and responds with UnityEvents. Automatically registers and unregisters itself when enabled/disabled.

### [GameEventListenerGeneric4<T, U, W, K>](#)

MonoBehaviour component that listens to GameEventGeneric4 objects and responds with UnityEvents. Automatically registers and unregisters itself when enabled/disabled.

### [IntGameEvent](#)

Game event that carries integer data. A general-purpose event for passing integer values between game systems.

### [IntGameEventListener](#)

Event listener that responds to IntGameEvent events. Receives integer data when the associated game event is raised.

### [StatChangedGameEvent](#)

Game event that is raised when a stat changes. Contains information about the stat that changed, including its previous and new values.

### [StatChangedGameEventListener](#)

Event listener that responds to StatChangedGameEvent events. Receives information about the stat that changed, including its previous and new values.

## Interfaces

### [IRaisable<T>](#)

Interface for objects that can be raised with one parameter of type T. Defines the contract for events that carry a single piece of data.

### [IRaisable<T, U>](#)

Interface for objects that can be raised with two parameters of types T and U. Defines the contract for events that carry two pieces of data.

### [IRaisable<T, U, V>](#)

Interface for objects that can be raised with three parameters of types T, U, and V. Defines the contract for events that carry three pieces of data.

### [IRaisable<T, U, V, W>](#)

Interface for objects that can be raised with four parameters of types T, U, V, and W. Defines the contract for events that carry four pieces of data.

## Enums

### [GameEventGenerator.EventParameter.NativeType](#)

Enumeration of supported native C# types for event parameters.

### [GameEventGenerator.EventParameter.ParameterType](#)

Enumeration defining whether the parameter is a native type or a custom MonoScript type.

# Class AttributeChangedGameEvent

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Game event that is raised when an attribute changes. Contains information about the attribute that changed, including its previous and new values.

```
[CreateAssetMenu(fileName = "AttributeChanged Game Event", menuName = "Soap RPG Framework/Events/Generated/AttributeChanged")]
public class AttributeChangedGameEvent : GameEventGeneric1<AttributeChangeInfo>, IRaisable<AttributeChangeInfo>
```

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← [GameEventGeneric1<AttributeChangeInfo>](#) ← AttributeChangedGameEvent

## Implements

[IRaisable<AttributeChangeInfo>](#)

## Inherited Members

[GameEventGeneric1<AttributeChangeInfo>.OnEventRaised](#) ,  
[GameEventGeneric1<AttributeChangeInfo>.Raise\(AttributeChangeInfo\)](#) ,  
[GameEventGeneric1<AttributeChangeInfo>.RegisterListener\(GameEventListenerGeneric1<AttributeChangeInfo>\)](#) ,  
[GameEventGeneric1<AttributeChangeInfo>.UnregisterListener\(GameEventListenerGeneric1<AttributeChangeInfo>\)](#).

# Class AttributeChangedGameEventListener

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Event listener that responds to AttributeChangedGameEvent events. Receives information about the attribute that changed, including its previous and new values.

```
public class AttributeChangedGameEventListener :  
GameEventListenerGeneric1<AttributeChangeInfo>
```

## Inheritance

object ← [Object](#) ← [Component](#) ← [Behaviour](#) ← [MonoBehaviour](#) ←  
[GameEventListenerGeneric1<AttributeChangeInfo>](#) ← AttributeChangedGameEventListener

## Inherited Members

[GameEventListenerGeneric1<AttributeChangeInfo>.event](#) ,  
[GameEventListenerGeneric1<AttributeChangeInfo>.response](#) ,  
[GameEventListenerGeneric1<AttributeChangeInfo>.OnEventRaised\(AttributeChangeInfo\)](#).

# Class EntityCoreGameEvent

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Game event that carries EntityCore data. Used for events that need to pass information about an entity's core component.

```
[CreateAssetMenu(fileName = "EntityCore Game Event", menuName = "Soap RPG Framework/Events/Generated/EntityCore")]
public class EntityCoreGameEvent : GameEventGeneric1<EntityCore>, IRaisable<EntityCore>
```

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← [GameEventGeneric1<EntityCore>](#) ← EntityCoreGameEvent

## Implements

[IRaisable<EntityCore>](#)

## Inherited Members

[GameEventGeneric1<EntityCore>.OnEventRaised](#) , [GameEventGeneric1<EntityCore>.Raise\(EntityCore\)](#) ,  
[GameEventGeneric1<EntityCore>.RegisterListener\(GameEventListenerGeneric1<EntityCore>\)](#) ,  
[GameEventGeneric1<EntityCore>.UnregisterListener\(GameEventListenerGeneric1<EntityCore>\)](#).

# Class EntityCoreGameEventListener

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Event listener that responds to EntityCoreGameEvent events. Receives EntityCore data when the associated game event is raised.

```
public class EntityCoreGameEventListener : GameEventListenerGeneric1<EntityCore>
```

## Inheritance

object ← [Object](#) ← [Component](#) ← [Behaviour](#) ← [MonoBehaviour](#) ←  
[GameEventListenerGeneric1<EntityCore>](#) ← EntityCoreGameEventListener

## Inherited Members

[GameEventListenerGeneric1<EntityCore>.event](#) , [GameEventListenerGeneric1<EntityCore>.response](#) ,  
[GameEventListenerGeneric1<EntityCore>.OnEventRaised\(EntityCore\)](#).

# Class GameEvent

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

A ScriptableObject-based event system that allows decoupled communication between game systems. GameEvents can be raised to notify all registered listeners without requiring direct references.

```
[CreateAssetMenu(fileName = "New Game Event", menuName = "Soap RPG  
Framework/Events/Game Event")]  
public class GameEvent : ScriptableObject
```

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← GameEvent

## Methods

### Raise()

Raises the event, notifying all registered listeners. Listeners are processed in reverse order to handle potential modifications during iteration.

```
public void Raise()
```

### RegisterListener(GameEventListener)

Registers a listener to be notified when this event is raised. Duplicate listeners are automatically prevented.

```
public void RegisterListener(GameEventListener listener)
```

## Parameters

**listener** [GameEventListener](#)

The GameEventListener to register.

## UnregisterListener(GameEventListener)

Unregisters a listener so it will no longer be notified when this event is raised.

```
public void UnregisterListener(GameEventListener listener)
```

### Parameters

*listener* [GameEventListener](#)

The GameEventListener to unregister.

# Class GameEventGenerator

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

A ScriptableObject tool for automatically generating GameEvent and GameEventListener classes. Allows developers to define event schemas and generate strongly-typed event classes at design time.

```
[CreateAssetMenu(fileName = "GameEventGenerator", menuName = "Soap RPG Framework/Events/GameEventGenerator")]
public sealed class GameEventGenerator : ScriptableObject
```

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← GameEventGenerator

## Fields

### baseSaveLocation

Gets or sets the base directory where generated files will be saved.

```
public string baseSaveLocation
```

#### Field Value

string

### eventsToGenerate

Gets or sets the list of event definitions to generate classes for.

```
public List<GameEventGenerator.GameEventDefinition> eventsToGenerate
```

#### Field Value

List<[GameEventGenerator.GameEventDefinition](#)>

## menubasePath

Gets or sets the menu path prefix for CreateAssetMenu attributes on generated events.

```
public string menubasePath
```

Field Value

string

## rootNamespace

Gets or sets the root namespace for generated event classes.

```
public string rootNamespace
```

Field Value

string

## Methods

### GenerateGameEvents()

Generates C# class files for all defined game events and their corresponding listeners. Creates the necessary directory structure and writes the generated code to disk.

```
public void GenerateGameEvents()
```

### RemoveGeneratedEventFiles(string, int)

Removes the generated files for a specific event from the file system.

```
public void RemoveGeneratedEventFiles(string eventName, int parameterCount)
```

## Parameters

**eventName** string

The name of the event whose files should be removed

**parameterCount** int

The number of parameters the event had

# Class GameEventGenerator.EventParameter

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Represents a parameter that can be passed to a generated game event. Supports both native C# types and custom MonoScript-based types.

```
[Serializable]  
public class GameEventGenerator.EventParameter
```

## Inheritance

object ← GameEventGenerator.EventParameter

## Fields

### monoScript

```
public MonoScript monoScript
```

#### Field Value

MonoScript

### nativeType

```
public GameEventGenerator.EventParameter.NativeType nativeType
```

#### Field Value

[GameEventGenerator.EventParameter.NativeType](#)

### parameterType

```
public GameEventGenerator.EventParameter.ParameterType parameterType
```

## Field Value

[GameEventGenerator.EventParameter.ParameterType](#)

# Enum GameEventGenerator.EventParameter.NativeType

Namespace: [ElectricDrill.SoapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Enumeration of supported native C# types for event parameters.

```
public enum GameEventGenerator.EventParameter.NativeType
```

## Fields

bool = 3

float = 2

int = 0

long = 1

# Enum **GameEventGenerator.EventParameter.ParameterType**

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Enumeration defining whether the parameter is a native type or a custom MonoScript type.

```
public enum GameEventGenerator.EventParameter.ParameterType
```

## Fields

**MonoScript** = 1

**Native** = 0

# Class

## GameEventGenerator.GameEventDefinition

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Defines a complete game event with its name, parameters, and metadata. Contains all information needed to generate the corresponding C# classes.

```
[Serializable]  
public class GameEventGenerator.GameEventDefinition
```

### Inheritance

object ← GameEventGenerator.GameEventDefinition

## Fields

### documentation

```
[HideInInspector]  
public string documentation
```

Field Value

string

### eventName

```
public string eventName
```

Field Value

string

## isGenerated

```
[HideInInspector]  
public bool isGenerated
```

### Field Value

bool

## parameters

```
public List<GameEventGenerator.EventParameter> parameters
```

### Field Value

List<[GameEventGenerator.EventParameter](#)>

# Class GameEventGeneric1<T>

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

A generic ScriptableObject-based event system that can carry one parameter of type T. Supports both MonoBehaviour-based listeners and code-based Action listeners.

```
public abstract class GameEventGeneric1<T> : ScriptableObject, IRaisable<T>
```

## Type Parameters

T

The type of data this event carries.

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← GameEventGeneric1<T>

## Implements

[IRaisable](#)<T>

## Derived

[AttributeChangedGameEvent](#), [EntityCoreGameEvent](#), [IntGameEvent](#), [StatChangedGameEvent](#)

# Methods

## Raise(T)

Raises the event with the specified context, notifying all registered listeners. Both MonoBehaviour listeners and Action listeners are notified.

```
public virtual void Raise(T context)
```

## Parameters

context T

The data to pass to all listeners.

## RegisterListener(GameEventListenerGeneric1<T>)

Registers a MonoBehaviour-based listener to be notified when this event is raised. Duplicate listeners are automatically prevented.

```
public void RegisterListener(GameEventListenerGeneric1<T> listener)
```

### Parameters

listener [GameEventListenerGeneric1<T>](#)

The GameEventListenerGeneric1 to register.

## UnregisterListener(GameEventListenerGeneric1<T>)

Unregisters a MonoBehaviour-based listener so it will no longer be notified when this event is raised.

```
public void UnregisterListener(GameEventListenerGeneric1<T> listener)
```

### Parameters

listener [GameEventListenerGeneric1<T>](#)

The GameEventListenerGeneric1 to unregister.

## Events

### OnEventRaised

Event that can be subscribed to from code using standard C# event syntax. Automatically handles registration and unregistration of Action listeners.

```
public virtual event Action<T> OnEventRaised
```

### Event Type

Action<T>



# Class GameEventGeneric2<T, U>

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

A generic ScriptableObject-based event system that can carry two parameters of types T and U. Supports both MonoBehaviour-based listeners and code-based Action listeners.

```
public abstract class GameEventGeneric2<T, U> : ScriptableObject, IRaisable<T, U>
```

## Type Parameters

T

The type of the first parameter this event carries.

U

The type of the second parameter this event carries.

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← GameEventGeneric2<T, U>

## Implements

[IRaisable](#)<T, U>

# Methods

## Raise(T, U)

Raises the event with the specified contexts, notifying all registered listeners. Both MonoBehaviour listeners and Action listeners are notified.

```
public virtual void Raise(T context1, U context2)
```

## Parameters

context1 T

The first parameter to pass to all listeners.

**context2** U

The second parameter to pass to all listeners.

## RegisterListener(GameEventListenerGeneric2<T, U>)

Registers a MonoBehaviour-based listener to be notified when this event is raised. Duplicate listeners are automatically prevented.

```
public void RegisterListener(GameEventListenerGeneric2<T, U> listener)
```

### Parameters

**listener** [GameEventListenerGeneric2<T, U>](#)

The GameEventListenerGeneric2 to register.

## UnregisterListener(GameEventListenerGeneric2<T, U>)

Unregisters a MonoBehaviour-based listener so it will no longer be notified when this event is raised.

```
public void UnregisterListener(GameEventListenerGeneric2<T, U> listener)
```

### Parameters

**listener** [GameEventListenerGeneric2<T, U>](#)

The GameEventListenerGeneric2 to unregister.

## Events

### OnEventRaised

Event that can be subscribed to from code using standard C# event syntax. Automatically handles registration and unregistration of Action listeners.

```
public virtual event Action<T, U> OnEventRaised
```

Event Type

Action<T, U>

# Class GameEventGeneric3<T, U, W>

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

A generic ScriptableObject-based event system that can carry three parameters of types T, U, and W. Supports both MonoBehaviour-based listeners and code-based Action listeners.

```
public abstract class GameEventGeneric3<T, U, W> : ScriptableObject, IRaisable<T, U, W>
```

## Type Parameters

T

The type of the first parameter this event carries.

U

The type of the second parameter this event carries.

W

The type of the third parameter this event carries.

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← GameEventGeneric3<T, U, W>

## Implements

[IRaisable](#)<T, U, W>

# Methods

## Raise(T, U, W)

Raises the event with the specified contexts, notifying all registered listeners. Both MonoBehaviour listeners and Action listeners are notified.

```
public virtual void Raise(T contextT, U contextU, W contextW)
```

## Parameters

**contextT T**

The first parameter to pass to all listeners.

**contextU U**

The second parameter to pass to all listeners.

**contextW W**

The third parameter to pass to all listeners.

## RegisterListener(GameEventListenerGeneric3<T, U, W>)

Registers a MonoBehaviour-based listener to be notified when this event is raised. Duplicate listeners are automatically prevented.

```
public void RegisterListener(GameEventListenerGeneric3<T, U, W> listener)
```

## Parameters

**listener [GameEventListenerGeneric3](#)<T, U, W>**

The GameEventListenerGeneric3 to register.

## UnregisterListener(GameEventListenerGeneric3<T, U, W>)

Unregisters a MonoBehaviour-based listener so it will no longer be notified when this event is raised.

```
public void UnregisterListener(GameEventListenerGeneric3<T, U, W> listener)
```

## Parameters

**listener [GameEventListenerGeneric3](#)<T, U, W>**

The GameEventListenerGeneric3 to unregister.

# Events

## OnEventRaised

Event that can be subscribed to from code using standard C# event syntax. Automatically handles registration and unregistration of Action listeners.

```
public virtual event Action<T, U, W> OnEventRaised
```

### Event Type

Action<T, U, W>

# Class GameEventGeneric4<T, U, W, K>

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

A generic ScriptableObject-based event system that can carry four parameters of types T, U, W, and K. Supports both MonoBehaviour-based listeners and code-based Action listeners.

```
public abstract class GameEventGeneric4<T, U, W, K> : ScriptableObject, IRaisable<T, U, W, K>
```

## Type Parameters

T

The type of the first parameter this event carries.

U

The type of the second parameter this event carries.

W

The type of the third parameter this event carries.

K

The type of the fourth parameter this event carries.

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← GameEventGeneric4<T, U, W, K>

## Implements

[IRaisable](#)<T, U, W, K>

## Methods

### Raise(T, U, W, K)

Raises the event with the specified contexts, notifying all registered listeners. Both MonoBehaviour listeners and Action listeners are notified.

```
public virtual void Raise(T contextT, U contextU, W contextW, K contextK)
```

## Parameters

**contextT T**

The first parameter to pass to all listeners.

**contextU U**

The second parameter to pass to all listeners.

**contextW W**

The third parameter to pass to all listeners.

**contextK K**

The fourth parameter to pass to all listeners.

## RegisterListener(GameEventListenerGeneric4<T, U, W, K>)

Registers a MonoBehaviour-based listener to be notified when this event is raised. Duplicate listeners are automatically prevented.

```
public void RegisterListener(GameEventListenerGeneric4<T, U, W, K> listener)
```

## Parameters

**listener GameEventListenerGeneric4<T, U, W, K>**

The GameEventListenerGeneric4 to register.

## UnregisterListener(GameEventListenerGeneric4<T, U, W, K>)

Unregisters a MonoBehaviour-based listener so it will no longer be notified when this event is raised.

```
public void UnregisterListener(GameEventListenerGeneric4<T, U, W, K> listener)
```

## Parameters

`listener GameEventListenerGeneric4<T, U, W, K>`

The GameEventListenerGeneric4 to unregister.

## Events

### OnEventRaised

Event that can be subscribed to from code using standard C# event syntax. Automatically handles registration and unregistration of Action listeners.

```
public virtual event Action<T, U, W, K> OnEventRaised
```

### Event Type

Action<T, U, W, K>

# Class GameEventListener

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

MonoBehaviour component that listens to GameEvent objects and responds with UnityEvents.  
Automatically registers and unregisters itself when enabled/disabled.

```
public class GameEventListener : MonoBehaviour
```

## Inheritance

object ← [Object](#) ← [Component](#) ← [Behaviour](#) ← [MonoBehaviour](#) ← GameEventListener

## Methods

### OnEventRaised()

Called by the GameEvent when it is raised. Invokes the configured UnityEvent response.

```
public void OnEventRaised()
```

# Class GameEventListenerGeneric1<T>

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

MonoBehaviour component that listens to GameEventGeneric1 objects and responds with UnityEvents. Automatically registers and unregisters itself when enabled/disabled.

```
public class GameEventListenerGeneric1<T> : MonoBehaviour
```

## Type Parameters

T

The type of parameter the listened event carries.

## Inheritance

object ← [Object](#) ← [Component](#) ← [Behaviour](#) ← [MonoBehaviour](#) ← GameEventListenerGeneric1<T>

## Derived

[AttributeChangedGameEventListener](#), [EntityCoreGameEventListener](#), [IntGameEventListener](#),  
[StatChangedGameEventListener](#)

## Fields

### \_event

```
[SerializeField]  
protected GameEventGeneric1<T> _event
```

### Field Value

[GameEventGeneric1<T>](#)

### \_response

```
[SerializeField]  
protected UnityEvent<T> _response
```

Field Value

UnityEvent<T>

## Methods

### OnEventRaised(T)

Called by the GameEvent when it is raised. Invokes the configured UnityEvent response with the provided context.

```
public void OnEventRaised(T context)
```

Parameters

**context** T

The data passed from the event.

# Class GameEventListenerGeneric2<T, U>

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

MonoBehaviour component that listens to GameEventGeneric2 objects and responds with UnityEvents.  
Automatically registers and unregisters itself when enabled/disabled.

```
public class GameEventListenerGeneric2<T, U> : MonoBehaviour
```

## Type Parameters

T

The type of the first parameter the listened event carries.

U

The type of the second parameter the listened event carries.

## Inheritance

```
object < Object < Component < Behaviour < MonoBehaviour <
GameEventListenerGeneric2<T, U>
```

## Fields

### \_event

```
[SerializeField]
protected GameEventGeneric2<T, U> _event
```

### Field Value

[GameEventGeneric2<T, U>](#)

### \_response

```
[SerializeField]  
protected UnityEvent<T, U> _response
```

## Field Value

UnityEvent<T, U>

## Methods

### OnEventRaised(T, U)

Called by the GameEvent when it is raised. Invokes the configured UnityEvent response with the provided contexts.

```
public void OnEventRaised(T contextT, U contextU)
```

#### Parameters

**contextT** T

The first parameter passed from the event.

**contextU** U

The second parameter passed from the event.

# Class GameEventListenerGeneric3<T, U, W>

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

MonoBehaviour component that listens to GameEventGeneric3 objects and responds with UnityEvents. Automatically registers and unregisters itself when enabled/disabled.

```
public class GameEventListenerGeneric3<T, U, W> : MonoBehaviour
```

## Type Parameters

T

The type of the first parameter the listened event carries.

U

The type of the second parameter the listened event carries.

W

The type of the third parameter the listened event carries.

## Inheritance

```
object < Object < Component < Behaviour < MonoBehaviour <
GameEventListenerGeneric3<T, U, W>
```

## Fields

### \_event

```
[SerializeField]
protected GameEventGeneric3<T, U, W> _event
```

### Field Value

[GameEventGeneric3<T, U, W>](#)

## \_response

```
[SerializeField]  
protected UnityEvent<T, U, W> _response
```

### Field Value

UnityEvent<T, U, W>

## Methods

### OnEventRaised(T, U, W)

Called by the GameEvent when it is raised. Invokes the configured UnityEvent response with the provided contexts.

```
public void OnEventRaised(T contextT, U contextU, W contextW)
```

### Parameters

**contextT T**

The first parameter passed from the event.

**contextU U**

The second parameter passed from the event.

**contextW W**

The third parameter passed from the event.

# Class GameEventListenerGeneric4<T, U, W, K>

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

MonoBehaviour component that listens to GameEventGeneric4 objects and responds with UnityEvents. Automatically registers and unregisters itself when enabled/disabled.

```
public class GameEventListenerGeneric4<T, U, W, K> : MonoBehaviour
```

## Type Parameters

T

The type of the first parameter the listened event carries.

U

The type of the second parameter the listened event carries.

W

The type of the third parameter the listened event carries.

K

The type of the fourth parameter the listened event carries.

## Inheritance

object ← [Object](#) ← [Component](#) ← [Behaviour](#) ← [MonoBehaviour](#) ← GameEventListenerGeneric4<T, U, W, K>

## Fields

### \_event

```
[SerializeField]  
protected GameEventGeneric4<T, U, W, K> _event
```

## Field Value

[GameEventGeneric4](#)<T, U, W, K>

## \_response

```
[SerializeField]  
protected UnityEvent<T, U, W, K> _response
```

## Field Value

UnityEvent<T, U, W, K>

## Methods

### OnEventRaised(T, U, W, K)

Called by the GameEvent when it is raised. Invokes the configured UnityEvent response with the provided contexts.

```
public void OnEventRaised(T contextT, U contextU, W contextW, K contextK)
```

#### Parameters

**contextT** T

The first parameter passed from the event.

**contextU** U

The second parameter passed from the event.

**contextW** W

The third parameter passed from the event.

**contextK** K

The fourth parameter passed from the event.

# Interface IRaisable<T>

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Interface for objects that can be raised with one parameter of type T. Defines the contract for events that carry a single piece of data.

```
public interface IRaisable<T>
```

## Type Parameters

T

The type of data this raisable object carries.

## Methods

### Raise(T)

Raises the event with the specified context.

```
void Raise(T context)
```

## Parameters

context T

The data to pass when raising the event.

# Interface IRaisable<T, U>

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Interface for objects that can be raised with two parameters of types T and U. Defines the contract for events that carry two pieces of data.

```
public interface IRaisable<T, U>
```

## Type Parameters

T

The type of the first parameter.

U

The type of the second parameter.

## Methods

### Raise(T, U)

Raises the event with the specified contexts.

```
void Raise(T context1, U context2)
```

## Parameters

context1 T

The first parameter to pass when raising the event.

context2 U

The second parameter to pass when raising the event.

# Interface IRaisable<T, U, V>

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Interface for objects that can be raised with three parameters of types T, U, and V. Defines the contract for events that carry three pieces of data.

```
public interface IRaisable<T, U, V>
```

## Type Parameters

T

The type of the first parameter.

U

The type of the second parameter.

V

The type of the third parameter.

## Methods

### Raise(T, U, V)

Raises the event with the specified contexts.

```
void Raise(T context1, U context2, V context3)
```

## Parameters

context1 T

The first parameter to pass when raising the event.

context2 U

The second parameter to pass when raising the event.

**context3** V

The third parameter to pass when raising the event.

# Interface IRaisable<T, U, V, W>

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Interface for objects that can be raised with four parameters of types T, U, V, and W. Defines the contract for events that carry four pieces of data.

```
public interface IRaisable<T, U, V, W>
```

## Type Parameters

T

The type of the first parameter.

U

The type of the second parameter.

V

The type of the third parameter.

W

The type of the fourth parameter.

## Methods

### Raise(T, U, V, W)

Raises the event with the specified contexts.

```
void Raise(T context1, U context2, V context3, W context4)
```

## Parameters

context1 T

The first parameter to pass when raising the event.

**context2** U

The second parameter to pass when raising the event.

**context3** V

The third parameter to pass when raising the event.

**context4** W

The fourth parameter to pass when raising the event.

# Class IntGameEvent

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Game event that carries integer data. A general-purpose event for passing integer values between game systems.

```
[CreateAssetMenu(fileName = "Int Game Event", menuName = "Soap RPG Framework/Events/Generated/Int")]
public class IntGameEvent : GameEventGeneric1<int>, IRaisable<int>
```

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← [GameEventGeneric1<int>](#) ← IntGameEvent

## Implements

[IRaisable<int>](#)

## Inherited Members

[GameEventGeneric1<int>.OnEventRaised](#) , [GameEventGeneric1<int>.Raise\(int\)](#) ,  
[GameEventGeneric1<int>.RegisterListener\(GameEventListenerGeneric1<int>\)](#) ,  
[GameEventGeneric1<int>.UnregisterListener\(GameEventListenerGeneric1<int>\)](#).

# Class IntGameEventListener

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Event listener that responds to IntGameEvent events. Receives integer data when the associated game event is raised.

```
public class IntGameEventListener : GameEventListenerGeneric1<int>
```

## Inheritance

object ← [Object](#) ← [Component](#) ← [Behaviour](#) ← [MonoBehaviour](#) ←  
[GameEventListenerGeneric1](#)<int> ← IntGameEventListener

## Inherited Members

[GameEventListenerGeneric1<int>.event](#) , [GameEventListenerGeneric1<int>.response](#) ,  
[GameEventListenerGeneric1<int>.OnEventRaised\(int\)](#).

# Class StatChangedGameEvent

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Game event that is raised when a stat changes. Contains information about the stat that changed, including its previous and new values.

```
[CreateAssetMenu(fileName = "StatChanged Game Event", menuName = "Soap RPG Framework/Events/Generated/StatChanged")]
public class StatChangedGameEvent : GameEventGeneric1<StatChangeInfo>,
IRaisable<StatChangeInfo>
```

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← [GameEventGeneric1<StatChangeInfo>](#) ← StatChangedGameEvent

## Implements

[IRaisable<StatChangeInfo>](#)

## Inherited Members

[GameEventGeneric1<StatChangeInfo>.OnEventRaised](#) ,  
[GameEventGeneric1<StatChangeInfo>.Raise\(StatChangeInfo\)](#) ,  
[GameEventGeneric1<StatChangeInfo>.RegisterListener\(GameEventListenerGeneric1<StatChangeInfo>\)](#) ,  
[GameEventGeneric1<StatChangeInfo>.UnregisterListener\(GameEventListenerGeneric1<StatChangeInfo>\)](#) .

# Class StatChangedGameEventListener

Namespace: [ElectricDrill.SapRpgFramework.Events](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Event listener that responds to StatChangedGameEvent events. Receives information about the stat that changed, including its previous and new values.

```
public class StatChangedGameEventListener : GameEventListenerGeneric1<StatChangeInfo>
```

## Inheritance

object ← [Object](#) ← [Component](#) ← [Behaviour](#) ← [MonoBehaviour](#) ←  
[GameEventListenerGeneric1<StatChangeInfo>](#) ← StatChangedGameEventListener

## Inherited Members

[GameEventListenerGeneric1<StatChangeInfo>. event](#) ,  
[GameEventListenerGeneric1<StatChangeInfo>. response](#) ,  
[GameEventListenerGeneric1<StatChangeInfo>.OnEventRaised\(StatChangeInfo\)](#)

# Namespace ElectricDrill.SoapRpgFramework. Scaling

## Classes

### [AttributeScalingComponentMenuItems](#)

Provides a menu item in the Unity Editor to create an AttributesScalingComponent asset.

### [AttributesScalingComponent](#)

A scaling component that calculates a value based on an entity's attributes.

### [ScalingComponent](#)

Abstract base class for all scaling components. A scaling component calculates a value based on an entity's properties.

### [ScalingFormula](#)

Represents a formula to calculate a value based on values returned by several scaling components. The calculation of each scaling component can either be based on the "self" entity (the entity that owns the formula) or the "target" entity (the entity that will be targeted by the action). For example, a scaling formula for an attack that deals the more damage the higher the enemy's armor is, can use the "self" entity to calculate the damage based on the attacker's stats and the "target" entity to calculate additional damage based on the target's armor. The final damage will be the sum of the value returned by the two scaling components.

### [ScalingFormulaMenuItems](#)

Provides a menu item in the Unity Editor to create a ScalingFormula asset.

### [SoSetScalingComponentBase<SetType, KeyType>](#)

Abstract base class for scaling components that work with ScriptableObject-based sets.

### [StatScalingComponentMenuItems](#)

Provides a menu item in the Unity Editor to create a StatsScalingComponent asset.

### [StatsScalingComponent](#)

A scaling component that calculates a value based on an entity's stats.

# Class AttributeScalingComponentMenuItems

Namespace: [ElectricDrill.SapRpgFramework.Scaling](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Provides a menu item in the Unity Editor to create an AttributesScalingComponent asset.

```
public static class AttributeScalingComponentMenuItems
```

## Inheritance

object ← AttributeScalingComponentMenuItems

## Methods

### CreateAttributeScalingComponent()

Creates a new AttributesScalingComponent asset.

```
[MenuItem("Assets/Create/Sap RPG Framework/Scaling/Attribute Scaling Component", false, 1)]  
public static void CreateAttributeScalingComponent()
```

# Class AttributesScalingComponent

Namespace: [ElectricDrill.SapRpgFramework.Scaling](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

A scaling component that calculates a value based on an entity's attributes.

```
public class AttributesScalingComponent : SoSetScalingComponentBase<AttributeSet, Attribute>
```

## Inheritance

```
object ← Object ← ScriptableObject ← ScalingComponent ←  
SoSetScalingComponentBase<AttributeSet, Attribute> ← AttributesScalingComponent
```

## Inherited Members

```
SoSetScalingComponentBase<AttributeSet, Attribute>.set ,  
SoSetScalingComponentBase<AttributeSet, Attribute>.CalculateValue(EntityCore) ,  
SoSetScalingComponentBase<AttributeSet, Attribute>.ValidateEntitySet(EntityCore) ,  
SoSetScalingComponentBase<AttributeSet, Attribute>.GetEntitySet(EntityCore) ,  
SoSetScalingComponentBase<AttributeSet, Attribute>.GetEntityValue(EntityCore, Attribute) ,  
SoSetScalingComponentBase<AttributeSet, Attribute>.OnValidate() ,  
SoSetScalingComponentBase<AttributeSet, Attribute>.GetSetItems() ,  
ScalingComponent.CalculateValue(EntityCore)
```

## Methods

### GetEntitySet(EntityCore)

Gets the AttributeSet from the specified entity.

```
protected override AttributeSet GetEntitySet(EntityCore entity)
```

#### Parameters

entity [EntityCore](#)

The entity.

#### Returns

## AttributeSet

The entity's AttributeSet.

## GetEntityValue(EntityCore, Attribute)

Gets the value of a specific attribute from the entity.

```
protected override long GetEntityValue(EntityCore entity, Attribute key)
```

Parameters

**entity** [EntityCore](#)

The entity.

**key** [Attribute](#)

The attribute to get the value of.

Returns

long

The value of the attribute.

## GetSetItems()

Gets the collection of attributes from the associated AttributeSet.

```
protected override IEnumerable<Attribute> GetSetItems()
```

Returns

IEnumerable<[Attribute](#)>

An enumerable of attributes.

# Class ScalingComponent

Namespace: [ElectricDrill.SapRpgFramework.Scaling](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Abstract base class for all scaling components. A scaling component calculates a value based on an entity's properties.

```
public abstract class ScalingComponent : ScriptableObject
```

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← ScalingComponent

## Derived

[SoSetScalingComponentBase<SetType, KeyType>](#)

## Methods

### CalculateValue(EntityCore)

Calculates the value of this component based on the provided entity.

```
public abstract long CalculateValue(EntityCore entity)
```

#### Parameters

entity [EntityCore](#)

The entity whose properties are used for calculation.

#### Returns

long

The calculated value from this component.

# Class ScalingFormula

Namespace: [ElectricDrill.SapRpgFramework.Scaling](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Represents a formula to calculate a value based on values returned by several scaling components. The calculation of each scaling component can either be based on the "self" entity (the entity that owns the formula) or the "target" entity (the entity that will be targeted by the action). For example, a scaling formula for an attack that deals the more damage the higher the enemy's armor is, can use the "self" entity to calculate the damage based on the attacker's stats and the "target" entity to calculate additional damage based on the target's armor. The final damage will be the sum of the value returned by the two scaling components.

```
public class ScalingFormula : ScriptableObject
```

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← ScalingFormula

## Properties

### TmpSelfScalingComponents

Gets the list of temporary scaling components for the "self" entity. These are not serialized and are used for runtime modifications.

```
public List<ScalingComponent> TmpSelfScalingComponents { get; }
```

### Property Value

List<[ScalingComponent](#)>

### TmpTargetScalingComponents

Gets the list of temporary scaling components for the "target" entity. These are not serialized and are used for runtime modifications.

```
public List<ScalingComponent> TmpTargetScalingComponents { get; }
```

## Property Value

List<[ScalingComponent](#)>

## Methods

### CalculateValue(EntityCore)

Calculates the final value using only the "self" entity. This method assumes there are no target scaling components.

```
public long CalculateValue(EntityCore self)
```

#### Parameters

**self** [EntityCore](#)

The entity providing values for self-scaling components.

#### Returns

long

The calculated value.

### CalculateValue(EntityCore, EntityCore)

Calculates the final value using both "self" and "target" entities.

```
public long CalculateValue(EntityCore self, EntityCore target)
```

#### Parameters

**self** [EntityCore](#)

The entity providing values for self-scaling components.

## **target** [EntityCore](#)

The entity providing values for target-scaling components.

Returns

long

The calculated value.

## CalculateValue(EntityCore, EntityCore, int)

Calculates the final value using both "self" and "target" entities, and a specific level for the base value. This method assumes the formula uses a scaling base value.

```
public long CalculateValue(EntityCore self, EntityCore target, int level)
```

Parameters

### **self** [EntityCore](#)

The entity providing values for self-scaling components.

### **target** [EntityCore](#)

The entity providing values for target-scaling components.

**level** int

The level to use for calculating the base value.

Returns

long

The calculated value.

## CalculateValue(EntityCore, int)

Calculates the final value using the "self" entity and a specific level for the base scaling value. This method assumes there are no target scaling components and the formula uses a scaling base value.

```
public long CalculateValue(EntityCore self, int level)
```

## Parameters

**self** [EntityCore](#)

The entity providing values for self-scaling components.

**level** int

The level to use for calculating the base value.

## Returns

long

The calculated value.

## GetBaseValue()

Returns the fixed base value of the formula. If **useScalingBaseValue** is true, an exception is thrown because a level is required.

```
public long GetBaseValue()
```

## Returns

long

The fixed base value.

## Exceptions

[AssertionException](#)

Thrown if **useScalingBaseValue** is true, since a level must be specified in that case.

## GetBaseValue(int)

Returns the base value of the formula for the specified level. If `useScalingBaseValue` is true, the value is calculated using the associated growth formula. If `useScalingBaseValue` is false and a level is provided, an exception is thrown.

```
public long GetBaseValue(int level)
```

Parameters

`level` int

The level to use for calculating the base value.

Returns

long

The calculated base value.

Exceptions

[AssertionException](#)

Thrown if the growth formula is not set, if the level is less than or equal to zero, if the level exceeds the maximum allowed by the growth formula, or if `useScalingBaseValue` is false and a level is provided.

## ResetTmpScalings()

Clears all temporary scaling components for both "self" and "target".

```
public void ResetTmpScalings()
```

# Class ScalingFormulaMenuItems

Namespace: [ElectricDrill.SapRpgFramework.Scaling](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Provides a menu item in the Unity Editor to create a ScalingFormula asset.

```
public static class ScalingFormulaMenuItems
```

## Inheritance

object ← ScalingFormulaMenuItems

## Methods

### CreateScalingFormula()

Creates a new ScalingFormula asset.

```
[MenuItem("Assets/Create/SapRpg Framework/Scaling/Scaling Formula")]
public static void CreateScalingFormula()
```

# Class SoSetScalingComponentBase<SetType, KeyType>

Namespace: [ElectricDrill.SapRpgFramework.Scaling](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Abstract base class for scaling components that work with ScriptableObject-based sets.

```
public abstract class SoSetScalingComponentBase<SetType, KeyType> : ScalingComponent where
    SetType : ScriptableObject
```

## Type Parameters

### SetType

The type of ScriptableObject set that contains the items used for defining the scaling value

### KeyType

The type of items within the set that can be used to calculate the scaling value

## Inheritance

```
object ← Object ← ScriptableObject ← ScalingComponent ←
SoSetScalingComponentBase<SetType, KeyType>
```

## Derived

[AttributesScalingComponent](#), [StatsScalingComponent](#)

## Fields

### \_set

```
[SerializeField]
protected SetType _set
```

## Field Value

### SetType

# Methods

## CalculateValue(EntityCore)

Calculates the final scaled value based on the entity's values and the configured scaling multipliers.

```
public override long CalculateValue(EntityCore entity)
```

Parameters

**entity** [EntityCore](#)

The entity to calculate the scaled value for

Returns

long

The calculated scaled value as a long integer

## GetEntitySet(EntityCore)

Gets the set associated with the specified entity. This method must be implemented by derived classes to define how to retrieve the entity's set.

```
protected abstract SetType GetEntitySet(EntityCore entity)
```

Parameters

**entity** [EntityCore](#)

The entity to get the set for

Returns

SetType

The set associated with the entity

## GetEntityValue(EntityCore, KeyType)

Gets the current value of a specific key for the given entity. This method must be implemented by derived classes to define how to retrieve entity values.

```
protected abstract long GetEntityValue(EntityCore entity, KeyType key)
```

### Parameters

**entity** [EntityCore](#)

The entity to get the value from

**key** KeyType

The specific key to get the value for

### Returns

long

The current value of the specified key for the entity

## GetSetItems()

Gets all items from the current set that can be used for scaling. This method must be implemented by derived classes to define which items are available for scaling.

```
protected abstract IEnumerable<KeyType> GetSetItems()
```

### Returns

IEnumerable<KeyType>

An enumerable collection of all scalable items in the set

## OnValidate()

Validates and refreshes the scaling attribute values based on the current set. Called automatically when the component is validated in the editor.

```
protected virtual void OnValidate()
```

## ValidateEntitySet(EntityCore)

Validates that the entity's set is compatible with this scaling component's set. By default, requires exact equality. Derived classes can override for different validation logic.

```
protected virtual void ValidateEntitySet(EntityCore entity)
```

### Parameters

**entity** [EntityCore](#)

The entity to validate

# Class StatScalingComponentMenuItems

Namespace: [ElectricDrill.SapRpgFramework.Scaling](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Provides a menu item in the Unity Editor to create a StatsScalingComponent asset.

```
public static class StatScalingComponentMenuItems
```

## Inheritance

object ← StatScalingComponentMenuItems

## Methods

### CreateStatScalingComponent()

Creates a new StatsScalingComponent asset.

```
[MenuItem("Assets/Create/Sap RPG Framework/Scaling/Stat Scaling Component", false, 2)]  
public static void CreateStatScalingComponent()
```

# Class StatsScalingComponent

Namespace: [ElectricDrill.SapRpgFramework.Scaling](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

A scaling component that calculates a value based on an entity's stats.

```
public class StatsScalingComponent : SoSetScalingComponentBase<StatSet, Stat>
```

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← [ScalingComponent](#) ←  
[SoSetScalingComponentBase](#)<[StatSet](#), [Stat](#)> ← StatsScalingComponent

## Inherited Members

[SoSetScalingComponentBase](#)<[StatSet](#), [Stat](#)>.set ,  
[SoSetScalingComponentBase](#)<[StatSet](#), [Stat](#)>.CalculateValue([EntityCore](#)) ,  
[SoSetScalingComponentBase](#)<[StatSet](#), [Stat](#)>.ValidateEntitySet([EntityCore](#)) ,  
[SoSetScalingComponentBase](#)<[StatSet](#), [Stat](#)>.GetEntitySet([EntityCore](#)) ,  
[SoSetScalingComponentBase](#)<[StatSet](#), [Stat](#)>.GetEntityValue([EntityCore](#), [Stat](#)) ,  
[SoSetScalingComponentBase](#)<[StatSet](#), [Stat](#)>.OnValidate() ,  
[SoSetScalingComponentBase](#)<[StatSet](#), [Stat](#)>.GetSetItems() ,  
[ScalingComponent](#).CalculateValue([EntityCore](#)) .

## Methods

### GetEntitySet([EntityCore](#))

Gets the StatSet from the specified entity.

```
protected override StatSet GetEntitySet(EntityCore entity)
```

#### Parameters

**entity** [EntityCore](#)

The entity.

#### Returns

## StatSet

The entity's StatSet.

## GetEntityValue(EntityCore, Stat)

Gets the value of a specific stat from the entity.

```
protected override long GetEntityValue(EntityCore entity, Stat key)
```

Parameters

**entity** [EntityCore](#)

The entity.

**key** [Stat](#)

The stat to get the value of.

Returns

long

The value of the stat.

## GetSetItems()

Gets the collection of stats from the associated StatSet.

```
protected override IEnumerable<Stat> GetSetItems()
```

Returns

IEnumerable<[Stat](#)>

An enumerable of stats.

## ValidateEntitySet(EntityCore)

Validates that the entity's StatSet is equal to or contains the scaling component's StatSet. This allows entities with StatSets that include the component's StatSet to be compatible.

```
protected override void ValidateEntitySet(EntityCore entity)
```

### Parameters

**entity** [EntityCore](#)

The entity to validate

# Namespace ElectricDrill.SoapRpgFramework. Stats

## Classes

### [EntityStats](#)

Component that manages the statistics of an entity in the game. It handles base stats, flat stat modifiers, stat to stat modifiers, and percentage stat modifiers. Base stats can either be fixed or come from the entity's class (if one is available on the Game Object). When stats change because of a modifier of any kind, the assigned [StatChangedGameEvent](#) is raised.

### [Stat](#)

Represents a stat in the RPG system that extends BoundedValue with attribute scaling capabilities. Stats can be scaled based on entity attributes and provide equality comparison based on name.

### [StatMenuItems](#)

Provides Unity Editor menu items for creating Stat assets.

### [StatSet](#)

A ScriptableObject that defines a collection of stats that can be used by entities. Implements IStatContainer to provide stat containment functionality.

### [StatSetInstance](#)

Represents an instance of a StatSet with actual values for each stat. Implements IEnumerable and IStatContainer to provide collection functionality.

### [StatSetMenuItems](#)

Provides Unity Editor menu items for creating StatSet assets.

### [StatToStatModifier](#)

A ScriptableObject that defines how one stat can scale upon another stat basing on a percentage. Used to create relationships between different stats in the RPG system.

### [StatToStatModifierMenuItems](#)

Provides Unity Editor menu items for creating StatToStatModifier assets.

## Structs

### [StatChangeInfo](#)

Contains information about a stat change event, including the entity, stat, and old/new values. Used for tracking and responding to stat modifications.

## Interfaces

## IStatContainer

Interface for objects that can contain and check for the presence of stats. Provides basic functionality for stat container validation.

# Class EntityStats

Namespace: [ElectricDrill.SapRpgFramework.Stats](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Component that manages the statistics of an entity in the game. It handles base stats, flat stat modifiers, stat to stat modifiers, and percentage stat modifiers.

Base stats can either be fixed or come from the entity's class (if one is available on the Game Object).

When stats change because of a modifier of any kind, the assigned [StatChangedGameEvent](#) is raised.

```
[DisallowMultipleComponent]
[RequireComponent(typeof(EntityCore))]
public class EntityStats : MonoBehaviour, IStatSetSource
```

## Inheritance

object ← [Object](#) ← [Component](#) ← [Behaviour](#) ← [MonoBehaviour](#) ← EntityStats

## Implements

[IStatSetSource](#)

## Fields

### \_entityClass

```
protected IClassSource _entityClass
```

#### Field Value

[IClassSource](#)

### \_flatModifiers

```
protected StatSetInstance _flatModifiers
```

#### Field Value

## [StatSetInstance](#)

### \_percentageModifiers

```
protected StatSetInstance _percentageModifiers
```

#### Field Value

#### [StatSetInstance](#)

## Properties

### EntityClass

The class source of the entity. In most cases, this is the [EntityClass](#) component attached to the entity.

```
public IClassSource EntityClass { get; }
```

#### Property Value

#### [IClassSource](#)

### EntityCore

The entity core associated with this stats component.

```
public EntityCore EntityCore { get; }
```

#### Property Value

#### [EntityCore](#)

### OnStatChanged

Event raised when a stat changes due to a modifier.

```
public StatChangedGameEvent OnStatChanged { get; }
```

## Property Value

[StatChangedGameEvent](#)

## StatSet

The stat set used to calculate the entity's stats.

```
public virtual StatSet StatSet { get; }
```

## Property Value

[StatSet](#)

If useBaseStatsFromClass is true, it returns the stat set of the entity's class. Otherwise, it returns the fixed base stats stat set.

## UseClassBaseStats

Indicates whether to use base stats from the entity's class or the fixed base stats.

```
public bool UseClassBaseStats { get; }
```

## Property Value

bool

## Methods

### AddFlatModifier(Stat, long)

Adds a flat modifier to a stat.

```
public void AddFlatModifier(Stat stat, long value)
```

## Parameters

**stat** [Stat](#)

The stat to add the flat modifier to.

**value** long

The value of the flat modifier.

## AddPercentageModifier(Stat, Percentage)

Adds a [Percentage](#) modifier to a stat. Such modifiers consider the base value of the stat, the flat modifiers, and the stat-to-stat modifiers.

```
public void AddPercentageModifier(Stat stat, Percentage value)
```

## Parameters

**stat** [Stat](#)

The stat to add the percentage modifier to.

**value** [Percentage](#)

The value of the percentage modifier.

## AddStatToStatModifer(Stat, Stat, Percentage)

Adds a stat-to-stat modifier. Such modifiers add a percentage of the source stat to the target stat. Such modifiers consider the base value and the flat modifiers of the source stat.

```
public void AddStatToStatModifer(Stat target, Stat source, Percentage percentage)
```

## Parameters

### **target Stat**

The target stat.

### **source Stat**

The source stat.

### **percentage Percentage**

The [Percentage](#) of the source stat to add to the target stat.

## Get(Stat)

The final value of a stat, considering all the modifiers. Calculation is done in the following order:

1. Base value
2. Flat modifiers
3. Stat to stat modifiers
4. Percentage modifiers

```
public virtual long Get(Stat stat)
```

### Parameters

#### **stat Stat**

The stat to get the final value of.

### Returns

long

The final value of the stat if the component is enabled (clamped to min/max values); otherwise, 0

## GetBase(Stat)

The base value is the value of the stat without any modifiers. If UseClassBaseStats is true, it returns the value from the entity's class. Otherwise, it returns the value from the fixed base stats.

```
public long GetBase(Stat stat)
```

Parameters

**stat** [Stat](#)

The stat to get the base value of.

Returns

long

The base value of the stat (clamped to the stat's min and max values) if enabled; otherwise, 0

## OnLevelUp(int)

Callback method called when the entity levels up.

```
protected virtual void OnLevelUp(int level)
```

Parameters

**level** int

The new level of the entity.

## SetFixed(Stat, long)

Sets the value of a fixed base stat.

```
public void SetFixed(Stat s, long v)
```

Parameters

**s** [Stat](#)

The stat to set.

v long

The value to set.

# Interface IStatContainer

Namespace: [ElectricDrill.SapRpgFramework.Stats](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Interface for objects that can contain and check for the presence of stats. Provides basic functionality for stat container validation.

```
public interface IStatContainer
```

## Methods

### Contains(Stat)

Determines whether the container contains the specified stat.

```
bool Contains(Stat stat)
```

#### Parameters

**stat** [Stat](#)

The stat to check for.

#### Returns

bool

true if the container contains the stat; otherwise, false.

# Class Stat

Namespace: [ElectricDrill.SapRpgFramework.Stats](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Represents a stat in the RPG system that extends BoundedValue with attribute scaling capabilities. Stats can be scaled based on entity attributes and provide equality comparison based on name.

```
public class Stat : BoundedValue
```

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← [BoundedValue](#) ← Stat

## Inherited Members

[BoundedValue.HasValue](#) , [BoundedValue.MaxValue](#) , [BoundedValue.HasMinValue](#) ,  
[BoundedValue.MinValue](#)

# Properties

## AttributesScaling

Gets or sets the attributes scaling component that determines how this stat scales with entity attributes. Can be null if the stat doesn't scale with attributes.

```
[CanBeNull]  
public AttributesScalingComponent AttributesScaling { get; }
```

## Property Value

[AttributesScalingComponent](#)

# Methods

## Equals(object)

```
public override bool Equals(object obj)
```

Parameters

**obj** object

Returns

bool

## GetHashCode()

```
public override int GetHashCode()
```

Returns

int

# Operators

## operator ==(Stat, Stat)

Determines whether two Stat objects are equal based on their names.

```
public static bool operator ==(Stat a, Stat b)
```

Parameters

**a** [Stat](#)

The first stat to compare.

**b** [Stat](#)

The second stat to compare.

Returns

bool

true if the stats are equal; otherwise, false.

## operator !=(Stat, Stat)

Determines whether two Stat objects are not equal.

```
public static bool operator !=(Stat a, Stat b)
```

### Parameters

a [Stat](#)

The first stat to compare.

b [Stat](#)

The second stat to compare.

### Returns

bool

true if the stats are not equal; otherwise, false.

# Struct StatChangeInfo

Namespace: [ElectricDrill.SapRpgFramework.Stats](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Contains information about a stat change event, including the entity, stat, and old/new values. Used for tracking and responding to stat modifications.

```
public struct StatChangeInfo
```

## Constructors

### StatChangeInfo(EntityStats, Stat, long, long)

Initializes a new instance of the StatChangeInfo structure.

```
public StatChangeInfo(EntityStats entity, Stat stat, long oldValue, long newValue)
```

## Parameters

**entity** [EntityStats](#)

The EntityStats component that owns the stat.

**stat** [Stat](#)

The stat that was changed.

**oldValue** long

The previous value of the stat.

**newValue** long

The new value of the stat.

## Fields

## EntityStats

The EntityStats component that owns the changed stat.

```
public EntityStats EntityStats
```

### Field Value

[EntityStats](#)

## NewValue

The value of the stat after the change.

```
public long NewValue
```

### Field Value

long

## OldValue

The value of the stat before the change.

```
public long OldValue
```

### Field Value

long

## Stat

The stat that was changed.

```
public Stat Stat
```

Field Value

[Stat](#)

# Class StatMenuItems

Namespace: [ElectricDrill.SapRpgFramework.Stats](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Provides Unity Editor menu items for creating Stat assets.

```
public static class StatMenuItems
```

## Inheritance

object ← StatMenuItems

## Methods

### CreateStat()

Creates a new Stat asset in the project window.

```
[MenuItem("Assets/Create/SapRpg Framework/Stat ^&S", false, 2)]  
public static void CreateStat()
```

# Class StatSet

Namespace: [ElectricDrill.SapRpgFramework.Stats](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

A ScriptableObject that defines a collection of stats that can be used by entities. Implements IStatContainer to provide stat containment functionality.

```
public class StatSet : ScriptableObject, IStatContainer
```

Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← StatSet

Implements

[IStatContainer](#)

## Fields

\_includedStatSets

```
[SerializeField]  
public SerializableHashSet<StatSet> _includedStatSets
```

Field Value

[SerializableHashSet<StatSet>](#)

## Properties

Stats

Gets a read-only list of all stats in this set, including stats from included StatSets. Duplicates are automatically removed.

```
public IReadOnlyList<Stat> Stats { get; }
```

## Property Value

IReadOnlyList<[Stat](#)>

## Methods

### Contains(Stat)

Determines whether this stat set contains the specified stat. Also checks in included StatSets.

```
public virtual bool Contains(Stat stat)
```

#### Parameters

**stat** [Stat](#)

The stat to check for.

#### Returns

bool

true if the stat set contains the stat; otherwise, false.

### Contains(StatSet)

Determines whether this stat set contains another stat set. Either directly or indirectly.

```
public virtual bool Contains(StatSet statSet)
```

#### Parameters

**statSet** [StatSet](#)

The stat set to check for.

#### Returns

bool

true if the `statSet` is contained in this stat set; otherwise, false.

## Get(Stat)

Gets the stat from this set that matches the specified stat. Also looks in included StatSets.

```
public Stat Get(Stat stat)
```

### Parameters

`stat` [Stat](#)

The stat to find.

### Returns

[Stat](#)

The matching stat from this set.

# Class StatSetInstance

Namespace: [ElectricDrill.SapRpgFramework.Stats](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Represents an instance of a StatSet with actual values for each stat. Implements IEnumerable and IStatContainer to provide collection functionality.

```
public class StatSetInstance : IStatContainer
```

Inheritance

object ← StatSetInstance

Implements

[IStatContainer](#)

## Constructors

### StatSetInstance(StatSet)

Initializes a new StatSetInstance based on the provided StatSet. All stats from the StatSet are initialized with a value of 0.

```
public StatSetInstance(StatSet statSet)
```

Parameters

**statSet** [StatSet](#)

The StatSet to base this instance on.

## Properties

### this[Stat]

Gets or sets the value of the specified stat using indexer syntax.

```
public long this[Stat stat] { get; set; }
```

## Parameters

### **stat** Stat

The stat to get or set.

## Property Value

long

The current value of the stat.

## Methods

### AddValue(Stat, long)

Adds value to the specified stat. If the stat doesn't exist, it will be created with the specified value. Use negative values to subtract from the stat.

```
public void AddValue(Stat stat, long value)
```

## Parameters

### **stat** Stat

The stat to modify.

**value** long

The value to add (can be negative).

### Clone()

Creates a deep copy of this StatSetInstance.

```
public StatSetInstance Clone()
```

Returns

### [StatSetInstance](#)

A new StatSetInstance with the same stats and values.

## Contains(Stat)

Determines whether this instance contains the specified stat.

```
public bool Contains(Stat stat)
```

Parameters

### **stat** [Stat](#)

The stat to check for.

Returns

bool

true if the instance contains the stat; otherwise, false.

## Get(Stat)

Gets the current value of the specified stat.

```
public long Get(Stat stat)
```

Parameters

### **stat** [Stat](#)

The stat to retrieve.

Returns

long

The current value of the stat.

## GetAsPercentage(Stat)

Gets the value of the specified stat as a Percentage.

```
public Percentage GetAsPercentage(Stat stat)
```

Parameters

**stat** [Stat](#)

The stat to get as a percentage.

Returns

[Percentage](#)

The stat value wrapped in a Percentage object.

## GetEnumerator()

```
public IEnumarator<KeyValuePair<Stat, long>> GetEnumerator()
```

Returns

[IEnumarator<KeyValuePair<Stat, long>>](#)

## Operators

### operator +(StatSetInstance, StatSetInstance)

Adds the values of corresponding stats from two StatSetInstances. All stats present in the first instance must also be present in the second instance.

```
public static StatSetInstance operator +(StatSetInstance a, StatSetInstance b)
```

## Parameters

a [StatSetInstance](#)

The first StatSetInstance.

b [StatSetInstance](#)

The second StatSetInstance.

## Returns

[StatSetInstance](#)

A new StatSetInstance with the sum of corresponding stat values.

## Exceptions

KeyNotFoundException

Thrown when a stat from instance 'a' is not found in instance 'b'.

# Class StatSetMenuItems

Namespace: [ElectricDrill.SapRpgFramework.Stats](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Provides Unity Editor menu items for creating StatSet assets.

```
public static class StatSetMenuItems
```

## Inheritance

object ← StatSetMenuItems

## Methods

### CreateStatSet()

Creates a new StatSet asset in the project window.

```
[MenuItem("Assets/Create/SapRpg Framework/Stat Set", false, 3)]  
public static void CreateStatSet()
```

# Class StatToStatModifier

Namespace: [ElectricDrill.SapRpgFramework.Stats](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

A ScriptableObject that defines how one stat can scale upon another stat basing on a percentage. Used to create relationships between different stats in the RPG system.

```
public class StatToStatModifier : ScriptableObject
```

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← StatToStatModifier

## Properties

### Percentage

Gets the percentage of the source stat value that will be applied to the target stat.

```
public Percentage Percentage { get; }
```

### Property Value

[Percentage](#)

### SourceStat

Gets the stat that provides the value for the modification calculation.

```
public Stat SourceStat { get; }
```

### Property Value

[Stat](#)

## TargetStat

Gets the stat that will be modified by the source stat.

```
public Stat TargetStat { get; }
```

Property Value

[Stat](#)

# Class StatToStatModifierMenuItems

Namespace: [ElectricDrill.SapRpgFramework.Stats](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Provides Unity Editor menu items for creating StatToStatModifier assets.

```
public static class StatToStatModifierMenuItems
```

## Inheritance

object ← StatToStatModifierMenuItems

## Methods

### CreateStatToStatModifier()

Creates a new StatToStatModifier asset in the project window.

```
[MenuItem("Assets/Create/SapRpg Framework/Stat to Stat Modifier ^&M", false, 4)]  
public static void CreateStatToStatModifier()
```

# Namespace ElectricDrill.SoapRpgFramework. Utils

## Classes

### [Cache<KType, VType>](#)

A generic cache class that provides basic caching functionality.

### [InitializationUtils](#)

Provides utility methods for initializing and refreshing collections during object setup. Contains helper methods commonly used during component initialization and validation.

### [IntRef](#)

A reference to an integer value. Can either be a constant value or a reference to an [IntVar](#) ScriptableObject.

### [IntVar](#)

ScriptableObject that holds an integer value. Can be used to share an integer value between different GameObjects and scenes.

### [LongRef](#)

A reference to a long value. Can either be a constant value or a reference to a [LongVar](#) ScriptableObject.

### [LongVar](#)

ScriptableObject that holds a long value. Can be used to share a long value between different GameObjects and scenes.

### [Percentage](#)

The Percentage class represents a percentage value and provides various operators and conversions. Implicit long to Percentage value conversion is available. To express a 100% value, use 100L. Implicit Percentage to double conversion is available. When doing so, the percentage is automatically divided by 100.

### [SerializableDictionary< TKey, TValue >](#)

A serializable dictionary implementation that can be displayed and edited in the Unity Inspector. Provides all standard dictionary functionality while maintaining Unity serialization compatibility.

### [SerializableHashSet< T >](#)

A serializable hash set implementation that can be displayed and edited in the Unity Inspector. Provides all standard hash set functionality while maintaining Unity serialization compatibility.

## Structs

## SerKeyValuePair<T, U>

A serializable key-value pair structure that can be used in Unity's inspector. Provides implicit conversion to and from the standard KeyValuePair.

# Class Cache<KType, VType>

Namespace: [ElectricDrill.SoapRpgFramework.Utils](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

A generic cache class that provides basic caching functionality.

```
public class Cache<KType, VType>
```

## Type Parameters

### KType

The type of the keys in the cache.

### VType

The type of the values in the cache.

### Inheritance

object ← Cache<KType, VType>

## Properties

### this[KType]

Gets or sets the value for the specified key in the cache.

```
public VType this[KType key] { get; set; }
```

## Parameters

### key KType

The key of the item to get or set.

## Property Value

### VType

The value associated with the specified key.

## Methods

### Get(KType)

Gets the value for the specified key from the cache. If the key is not found, a KeyNotFoundException is thrown.

```
public VType Get(KType key)
```

Parameters

**key** KType

The key of the item to get.

Returns

VType

The value associated with the specified key.

Exceptions

KeyNotFoundException

Thrown when the key is not found in the cache.

### Has(KType)

Determines whether the cache contains an item with the specified key.

```
public bool Has(KType key)
```

Parameters

**key** KType

The key to locate in the cache.

Returns

bool

true if the cache contains an item with the key; otherwise, false.

## Invalidate(KType)

Invalidates the cache item for the specified key. If key is not found, nothing happens.

```
public void Invalidate(KType key)
```

Parameters

**key** KType

The key of the item to invalidate.

## InvalidateAll()

Invalidates all items in the cache.

```
public void InvalidateAll()
```

## Set(KType, VType)

Sets the value for the specified key in the cache. UPSERT operation.

```
public void Set(KType key, VType value)
```

Parameters

**key** KType

The key of the item to set.

**value** VType

The value to set for the specified key.

## TryGet(KType, out VType)

Tries to get the value for the specified key from the cache.

```
public bool TryGet(KType key, out VType value)
```

### Parameters

**key** KType

The key of the item to get.

**value** VType

When this method returns, contains the value associated with the specified key, if the key is found; otherwise, the default value for the type of the value parameter.

### Returns

bool

true if the cache contains an item with the specified key; otherwise, false.

# Class InitializationUtils

Namespace: [ElectricDrill.SapRpgFramework.Utils](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

Provides utility methods for initializing and refreshing collections during object setup. Contains helper methods commonly used during component initialization and validation.

```
public static class InitializationUtils
```

## Inheritance

object ← InitializationUtils

## Methods

**RefreshInspectorReservedValues<TKey, TValue>(ref List<SerKeyValPair<TKey, TValue>>, IEnumerable<TKey>)**

Refreshes a list of key-value pairs to match a provided set of keys, preserving existing values where possible. This method ensures that the inspector-reserved values list contains exactly the keys specified, maintaining any previously assigned values and setting defaults for new keys.

```
public static void RefreshInspectorReservedValues<TKey, TValue>(ref List<SerKeyValPair<TKey, TValue>> inspectorReservedValues, IEnumerable<TKey> keys)
```

### Parameters

**inspectorReservedValues** List<[SerKeyValPair](#)<TKey, TValue>>

The list to refresh (passed by reference)

**keys** IEnumerable<TKey>

The collection of keys that should be present in the list

### Type Parameters

**TKey**

The type of the keys

**TValue**

The type of the values

# Class IntRef

Namespace: [ElectricDrill.SapRpgFramework.Utils](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

A reference to an integer value. Can either be a constant value or a reference to an [IntVar](#) ScriptableObject.

```
[Serializable]  
public class IntRef
```

## Inheritance

object ← IntRef

## Fields

### ConstantValue

The constant integer value.

```
public int ConstantValue
```

#### Field Value

int

### UseConstant

If true, uses the constant value. Otherwise, uses the [IntVar](#) variable.

```
public bool UseConstant
```

#### Field Value

bool

# Variable

The [IntVar](#) variable.

```
public IntVar Variable
```

## Field Value

[IntVar](#)

# Properties

## Value

Gets or sets the value of the reference.

```
public int Value { get; set; }
```

## Property Value

int

# Operators

## implicit operator int(IntRef)

Allows implicit conversion from an IntRef to an int.

```
public static implicit operator int(IntRef reference)
```

## Parameters

**reference** [IntRef](#)

The IntRef to convert.

## Returns

int

## implicit operator IntRef(int)

Allows implicit conversion from an int to an IntRef, creating a constant reference.

```
public static implicit operator IntRef(int value)
```

### Parameters

**value** int

The integer value.

### Returns

[IntRef](#)

# Class IntVar

Namespace: [ElectricDrill.SapRpgFramework.Utils](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

ScriptableObject that holds an integer value. Can be used to share an integer value between different GameObjects and scenes.

```
[CreateAssetMenu(fileName = "Int Var", menuName = "Soap RPG Framework/Utils/Int Var")]
public class IntVar : ScriptableObject
```

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← IntVar

## Properties

### Value

The integer value.

```
public int Value { get; set; }
```

### Property Value

int

## Operators

### implicit operator int(IntVar)

Allows implicit conversion from an IntVar to an int.

```
public static implicit operator int(IntVar var)
```

## Parameters

**var** [IntVar](#)

The IntVar to convert.

Returns

int

# Class LongRef

Namespace: [ElectricDrill.SapRpgFramework.Utils](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

A reference to a long value. Can either be a constant value or a reference to a [LongVar](#) ScriptableObject.

```
[Serializable]  
public class LongRef
```

## Inheritance

object ← LongRef

## Fields

### ConstantValue

The constant long value.

```
public long ConstantValue
```

### Field Value

long

### UseConstant

If true, uses the constant value. Otherwise, uses the [LongVar](#) variable.

```
public bool UseConstant
```

### Field Value

bool

# Variable

The [LongVar](#) variable.

```
public LongVar Variable
```

## Field Value

[LongVar](#)

# Properties

## Value

Gets or sets the value of the reference.

```
public long Value { get; set; }
```

## Property Value

long

# Operators

## implicit operator long(LongRef)

Allows implicit conversion from a LongRef to a long.

```
public static implicit operator long(LongRef reference)
```

## Parameters

[reference](#) [LongRef](#)

The LongRef to convert.

## Returns

long

# Class LongVar

Namespace: [ElectricDrill.SapRpgFramework.Utils](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

ScriptableObject that holds a long value. Can be used to share a long value between different GameObjects and scenes.

```
[CreateAssetMenu(fileName = "Long Var", menuName = "Soap RPG Framework/Utils/Long Var")]
public class LongVar : ScriptableObject
```

## Inheritance

object ← [Object](#) ← [ScriptableObject](#) ← LongVar

## Properties

### Value

The long value.

```
public long Value { get; set; }
```

### Property Value

long

## Operators

### implicit operator long(LongVar)

Allows implicit conversion from a LongVar to a long.

```
public static implicit operator long(LongVar var)
```

## Parameters

`var LongVar`

The LongVar to convert.

Returns

`long`

# Class Percentage

Namespace: [ElectricDrill.SoapRpgFramework.Utils](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

The Percentage class represents a percentage value and provides various operators and conversions. Implicit long to Percentage value conversion is available. To express a 100% value, use 100L. Implicit Percentage to double conversion is available. When doing so, the percentage is automatically divided by 100.

```
[Serializable]
public class Percentage
```

## Inheritance

object ← Percentage

## Constructors

### Percentage(long)

Initializes a new instance of the Percentage class with the specified value. To express a 100% value, use 100L.

```
public Percentage(long value)
```

## Parameters

**value** long

The value of the percentage.

## Methods

### CompareTo(Percentage)

Compares the current Percentage instance with another Percentage instance.

```
public int CompareTo(Percentage other)
```

## Parameters

### other Percentage

The other percentage to compare to.

## Returns

int

An integer indicating the relative order of the percentages.

## ToString()

Returns a string representation of the percentage value.

```
public override string ToString()
```

## Returns

string

A string representing the percentage value.

# Operators

## operator +(Percentage, Percentage)

Overrides the + operator to add two Percentage instances.

```
public static Percentage operator +(Percentage a, Percentage b)
```

## Parameters

### a Percentage

The first percentage.

#### b [Percentage](#)

The second percentage.

Returns

#### [Percentage](#)

A new Percentage instance representing the sum.

## explicit operator long(Percentage)

Explicit conversion from Percentage to long. The conversion does not divide the value by 100.

```
public static explicit operator long(Percentage percentage)
```

Parameters

#### percentage [Percentage](#)

The percentage to convert.

Returns

long

## implicit operator double(Percentage)

Implicit conversion from Percentage to double. The conversion automatically divides the value by 100.

```
public static implicit operator double(Percentage percentage)
```

Parameters

#### percentage [Percentage](#)

The percentage to convert.

Returns

double

## implicit operator Percentage(long)

Implicit conversion from long to Percentage. To express a 100% value, use 100L.

```
public static implicit operator Percentage(long value)
```

Parameters

**value** long

The value to convert.

Returns

[Percentage](#)

## operator -(Percentage, Percentage)

Overrides the - operator to subtract one Percentage from another.

```
public static Percentage operator -(Percentage a, Percentage b)
```

Parameters

**a** [Percentage](#)

The first percentage.

**b** [Percentage](#)

The second percentage.

Returns

[Percentage](#)

A new Percentage instance representing the difference.

## operator -(Percentage)

Overrides the unary - operator to negate a Percentage.

```
public static Percentage operator -(Percentage a)
```

Parameters

a [Percentage](#)

The percentage to negate.

Returns

[Percentage](#)

A new Percentage instance representing the negated value.

# Struct SerKeyValuePair<T, U>

Namespace: [ElectricDrill.SapRpgFramework.Utils](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

A serializable key-value pair structure that can be used in Unity's inspector. Provides implicit conversion to and from the standard KeyValuePair.

```
[Serializable]  
public struct SerKeyValuePair<T, U>
```

## Type Parameters

T

The type of the key.

U

The type of the value.

## Constructors

### SerKeyValuePair(T, U)

Initializes a new instance of the SerKeyValuePair structure with the specified key and value.

```
public SerKeyValuePair(T key, U value)
```

## Parameters

key T

The key of the key-value pair.

value U

The value of the key-value pair.

# Fields

## Key

The key of the key-value pair.

```
public T Key
```

## Field Value

T

## Value

The value of the key-value pair.

```
public U Value
```

## Field Value

U

# Operators

## implicit operator KeyValuePair<T, U>(SerKeyValPair<T, U>)

Implicitly converts a SerKeyValPair to a KeyValuePair.

```
public static implicit operator KeyValuePair<T, U>(SerKeyValPair<T, U> serKeyValPair)
```

## Parameters

**serKeyValPair** [SerKeyValPair](#)<T, U>

The SerKeyValPair to convert.

## Returns

## **KeyValuePair<T, U>**

A KeyValuePair with the same key and value.

## **implicit operator SerKeyValPair<T, U>(KeyValuePair<T, U>)**

Implicitly converts a KeyValuePair to a SerKeyValPair.

```
public static implicit operator SerKeyValPair<T, U>(KeyValuePair<T, U> keyValuePair)
```

### Parameters

**keyValuePair** KeyValuePair<T, U>

The KeyValuePair to convert.

### Returns

[SerKeyValPair<T, U>](#)

A SerKeyValPair with the same key and value.

# Class SerializableDictionary<TKey, TValue>

Namespace: [ElectricDrill.SapRpgFramework.Utils](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

A serializable dictionary implementation that can be displayed and edited in the Unity Inspector. Provides all standard dictionary functionality while maintaining Unity serialization compatibility.

```
[Serializable]
public class SerializableDictionary<TKey, TValue>
```

## Type Parameters

### TKey

The type of the dictionary keys

### TValue

The type of the dictionary values

## Inheritance

object ← SerializableDictionary<TKey, TValue>

## Properties

### this[TKey]

Gets or sets the value associated with the specified key.

```
public TValue this[TKey key] { get; set; }
```

## Parameters

### key TKey

The key of the value to get or set

## Property Value

## TValue

The value associated with the specified key

## Keys

Gets a collection containing the keys in the dictionary.

```
public Dictionary<TKey, TValue>.KeyCollection Keys { get; }
```

## Property Value

Dictionary<TKey, TValue>.KeyCollection

## Values

Gets a collection containing the values in the dictionary.

```
public Dictionary<TKey, TValue>.ValueCollection Values { get; }
```

## Property Value

Dictionary<TKey, TValue>.ValueCollection

## Methods

### Clear()

Removes all keys and values from the dictionary.

```
public void Clear()
```

### ContainsKey(TKey)

Determines whether the dictionary contains the specified key.

```
public bool ContainsKey(TKey key)
```

Parameters

**key** TKey

The key to locate

Returns

bool

True if the dictionary contains the key; otherwise, false

## GetEnumerator()

Returns an enumerator that iterates through the dictionary.

```
public IEnumerator<KeyValuePair<TKey, TValue>> GetEnumerator()
```

Returns

IEnumerator<KeyValuePair<TKey, TValue>>

An enumerator for the dictionary

## OnAfterDeserialize()

Reconstructs the internal dictionary from the serialized list format. Called automatically by Unity after deserialization occurs.

```
public void OnAfterDeserialize()
```

## OnBeforeSerialize()

Converts the internal dictionary to a serialized list format for Unity serialization. Called automatically by Unity before serialization occurs.

```
public void OnBeforeSerialize()
```

## TryGetValue(TKey, out TValue)

Attempts to get the value associated with the specified key.

```
public bool TryGetValue(TKey key, out TValue value)
```

### Parameters

**key** TKey

The key to locate

**value** TValue

The value associated with the key, if found

### Returns

bool

True if the key was found; otherwise, false

## Operators

implicit operator Dictionary<TKey, TValue>  
(SerializableDictionary<TKey, TValue>)

```
public static implicit operator Dictionary<TKey, TValue>(SerializableDictionary<TKey, TValue> serializableDictionary)
```

### Parameters

**serializableDictionary** [SerializableDictionary<TKey, TValue>](#)

### Returns

Dictionary< TKey, TValue >

## implicit operator SerializableDictionary< TKey, TValue > (Dictionary< TKey, TValue >)

```
public static implicit operator SerializableDictionary< TKey, TValue >(Dictionary< TKey, TValue > dictionary)
```

### Parameters

**dictionary** Dictionary< TKey, TValue >

### Returns

[SerializableDictionary](#)< TKey, TValue >

# Class SerializableHashSet<T>

Namespace: [ElectricDrill.SapRpgFramework.Utils](#)

Assembly: com.electricdrill.soap-rpg-framework.Runtime.dll

A serializable hash set implementation that can be displayed and edited in the Unity Inspector. Provides all standard hash set functionality while maintaining Unity serialization compatibility.

```
[Serializable]  
public class SerializableHashSet<T>
```

## Type Parameters

T

The type of elements in the hash set

## Inheritance

object ← SerializableHashSet<T>

# Properties

## Count

Gets the number of elements contained in the hash set.

```
public int Count { get; }
```

## Property Value

int

## IsReadOnly

Gets a value indicating whether the hash set is read-only.

```
public bool IsReadOnly { get; }
```

Property Value

bool

## Methods

### Add(T)

Adds the specified element to the hash set.

```
public void Add(T item)
```

Parameters

**item** T

The element to add

### Clear()

Removes all elements from the hash set.

```
public void Clear()
```

### Contains(T)

Determines whether the hash set contains the specified element.

```
public bool Contains(T item)
```

Parameters

**item** T

The element to locate

Returns

bool

True if the hash set contains the element; otherwise, false

## CopyTo(T[], int)

Copies the elements of the hash set to an array, starting at the specified array index.

```
public void CopyTo(T[] array, int arrayIndex)
```

Parameters

array T[]

The destination array

arrayIndex int

The zero-based index in array at which copying begins

## GetEnumerator()

Returns an enumerator that iterates through the hash set.

```
public IEnumerator<T> GetEnumerator()
```

Returns

IEnumerator<T>

An enumerator for the hash set

## GetObjectData(SerializationInfo, StreamingContext)

Populates a SerializationInfo with the data needed to serialize the hash set.

```
public void GetObjectData(SerializationInfo info, StreamingContext context)
```

## Parameters

**info** SerializationInfo

The SerializationInfo to populate

**context** StreamingContext

The destination for this serialization

## OnAfterDeserialize()

Reconstructs the internal hash set from the serialized list format. Called automatically by Unity after deserialization occurs.

```
public void OnAfterDeserialize()
```

## OnBeforeSerialize()

Converts the internal hash set to a serialized list format for Unity serialization. Called automatically by Unity before serialization occurs.

```
public void OnBeforeSerialize()
```

## Remove(T)

Removes the specified element from the hash set.

```
public bool Remove(T item)
```

## Parameters

**item** T

The element to remove

Returns

bool

True if the element was successfully removed; otherwise, false

## RemoveWhere(Predicate<T>)

Removes all elements that match the conditions defined by the specified predicate.

```
public int RemoveWhere(Predicate<T> match)
```

Parameters

**match** Predicate<T>

The predicate that defines the conditions of the elements to remove

Returns

int

The number of elements that were removed