BioWare Aurora Engine

Common Game GFF Structures

1. Introduction

This document describes **Structs** and **Lists** that are frequently seen in files saved in the BioWare **Generic File Format**. This document assumes that the reader is already familiar with the Generic File Format document.

When describing a Struct in this document, the StructID is provided for completeness, although in some cases, the StructID may vary depending on the List or Struct that contains the Struct being described. Also, in most cases, the game and toolset do not actually check the StructID.

This document is intended to supplement the documentation for various GFF files (eg., IFO, ARE, etc.). Consequently, it may not fully disclose the details of any given Struct. In those instances where a Struct is not completely described, it is strongly recommended that an application should write it out to disk exactly as it was read in originally, with no modifications. Modifying a Struct without a good understanding of it can lead to corrupted modules and corrupted saved games.

2. Location Struct

A **Location** is a Struct that describes a location in a module.

Table 2: Fields in a Location Struct (StructID 1)

Label	Туре	Description
Area	DWORD	ObjectId of the area containing the location
OrientationX	FLOAT	(x,y,z) components of the direction vector in
OrientationY		which the location faces
OrientationZ		
PositionX	FLOAT	(x,y,z) coordinates of the location
PositionY		
PositionZ		

3. VarTable List, Variable Struct

A **VarTable** is a GFF List containing **Variable** GFF Structs. It is a list of scripting variables and their values.

Table 3.1: Fields in a Variable Struct (StructID 0)

Label	Туре	Description
Name	CExoString	The name of the variable as set by the SetGlobalInt(), SetGlobalString(), etc.
		scripting functions, and retrieved by the corresponding GetGlobal*() functions.
Туре	DWORD	Variable's data type
Value	Depends on Type	The value of the Variable

The actual data type of a Variable's 'Value' Field depends on the value of it's 'Type' Field. The table below lists the type IDs and their associated data types.

Table 3.2: Variable Types

TypeID	GFF Type	NWScript Type
1	INT	int
2	FLOAT	float
3	CExoString	string
4	DWORD	object
5	Location Struct. See Section 2.	location

4. EffectsList List, Effect Struct

An **EffectsList** is a GFF List containing **Effect** GFF Structs. It is a list of effects on an object.

Table 4: Fields in an Effect Struct (variable StructID)

Label	Туре	Description
CreatorId	DWORD	ObjectID of effect's creator
Duration	FLOAT	Duration of the effect
ExpireDay	DWORD	Day the effect expires
ExpireTime	DWORD	Time the effect expires
FloatList	List	StructID 4. Struct given on next line:
Value	FLOAT	List of float parameters for the effect
IntList	List	StructID 3. Struct given on next line:
Value	INT	List of int parameters for the effect
IsExposed	INT	Bool – is the effect exposed to scripting?
IsIconShown	INT	Bool – does it show the icon?
NumIntegers	INT	-
ObjectList	List	StructID 6. Struct given on next line:
Value	DWORD	List of ObjectID parameters for the effect
SkipOnLoad	BYTE	Bool – should this effect be added on load?
		Or skipped?
SpellId	DWORD	-
StringList	List	StructID 5. Struct given on next line:
Value	CExoString	String parameters for the effect
SubType	WORD	The effect sub-type
Туре	WORD	The type of the effect.

5. EventQueue List, Event Struct

An **EventQueue** is a GFF List containing **Event** GFF Structs. The Fields in an Event are given in the table below:

Table 5.1: Fields in an Event Struct (StructID 0xABCD)

Label	Туре	Description
CallerId	DWORD	Object Id of the actor object
Day	DWORD	Game day the event should fire
EventData	Depends on EventId	Struct that depends on the EventId
EventId	DWORD	ID of the Event type
ObjectId	DWORD	Object ID the event is acting on
Time	DWORD	Game time the event should fire

The EventData Field is a GFF Struct that depends on the value of the EventId Field. The table below lists some EventId values and what Structs are associated with them. These Structs are saved using the StructID specified in the table, rather than whatever StructIDs they may normally use. Some EventIds do not save an EventData Struct at all.

Table 5.2: EventId values

EventId	EventData StructID	Event Description	Struct
1	0x7777	TIMED_EVENT	ScriptSituation. See Section 7.
2	-	ENTERED_TRIGGER	none
3	_	LEFT_TRIGGER	none
4	0x9999	REMOVE_FROM_AREA	Struct consists of a single BYTE Field of Label "Value"
5	0x1111	APPLY_EFFECT	Effect Struct. See Section 4.
6	-	CLOSE_OBJECT	none
7	-	OPEN_OBJECT	none
8	0x6666	SPELL_IMPACT	SpellScriptData Struct
9	0x3333	PLAY_ANIMATION	Struct consists of a single INT Field of Label "Value"
10	0x4444	SIGNAL_EVENT	ScriptEvent. See Section 7.
11	-	DESTROY_OBJECT	none
12	-	UNLOCK_OBJECT	none
13	-	LOCK_OBJECT	none
14	0x1111	REMOVE_EFFECT	Effect Struct. See Section 4.
15	0x2222	ON_MELEE_ATTACKED	CombatAttackData Struct.
16	-	DECREMENT_STACKSIZE	none
17	0x5555	SPAWN_BODY_BAG	BodyBagInfo Struct
18	0x8888	FORCED_ACTION	ForcedAction Struct
19	0x6666	ITEM_ON_HIT_SPELL_IMPACT	SpellScriptData Struct
20	0xAAAA	BROADCAST_AOO	Struct consists of a single DWORD Field of Label "Value"
21	0x2222	BROADCAST_SAFE_PROJECTILE	CombatAttackData Struct.
22	0xCCCC	FEEDBACK_MESSAGE	ClientMessageData Struct
23	-	ABILITY_EFFECT_APPLIED	none
24	0xDDDD	SUMMON_CREATURE	ScriptEvent. See Section 7.
25	_	ACQUIRE_ITEM	none

6. ActionList List, Action Struct

Game object instances may have actions queued up at the time that the game is saved. Any such instances will contain a number of Action objects in their ActionList Field. The table below describes an Action Struct.

Table 6.1: Fields in an Action Struct (StructID 0)

Label	Туре	Description
ActionId	DWORD	-
GroupActionId	WORD	-
NumParams	WORD	Number of elements in the Parameter List
Paramaters	List	List of Parameter Structs (StructID 1). See Table 6.2
		This List is not present if NumParams $== 0$.

Note that the spelling of the "Paramaters" Field is not a typographical error. It really is spelled that way. By the time someone noticed that the spelling of "parameters" was incorrect, there was too much existing data to justify fixing the spelling.

The table below describes a Struct in the Parameter List.

Table 6.2: Fields in a Parameter Struct (StructID 1)

Label	Туре	Description
Type	DWORD	The Parameter Value's data type
Value	Depends on Type	The value of the Parameter

In a Parameter Struct, the actual datatype of the Value Field varies depending on the value of the Type Field. The table below specifies the Value datatypes associated with each Parameter Type.

Table 6.3: Parameter Types

Parameter Type	GFF Type of the Value Field	Description
1	INT	Integer
2	FLOAT	Floating point value
3	DWORD	Object ID
4	CExoString	String
5	Struct	Script Situation. StructID 2.
		Corresponds to a ScriptSituation in the
		virtual machine. See Section 7 .

7. Script Situation Struct and Substructs

A Script Situation is a very complicated structure that is used by the scripting virtual machine. Details of this structure are provided in here, but it is highly recommended that if an application reads this structure, then it should write it back out exactly as it was read in originally.

Table 7.1: Fields in a Script Situation Struct (variable StructID)

Label	Туре	Description
CodeSize	INT	
Code	VOID	
InstructionPtr	INT	
SecondaryPtr	INT	
Name	String	
StackSize	INT	
Stack	Struct	Stack Structure. StructID 0. See Table 7.2 .

Table 7.2: Fields in a Stack Struct (StructID 0)

Label	Туре	Description
BasePointer	INT	
StackPointer	INT	
TotalSize	INT	
Stack	List	Has a number of elements equal to the value of the StackPointer Field. StructID of each list element is equal to the index of the Struct in the List. See Table 7.3a.

Table 7.3a: Fields in each Struct in the Stack List (variable StructID)

Label	Туре	Description
Туре	CHAR	Specifies the Field Type of the Value Field. See Table 7.3b .
Value	Variable	Depends on Type Field. See Table 7.3b .

Table 7.3b: Stack Element Value Types

Stack Element Type	GFF Type of the Value Field	Description
3	INT	Integer

4	FLOAT	Floating point value
5	CExoString	String
6	DWORD	Object ID
10 to 19	Struct	Game engine structure. Subtract 10 from the Type to get the StructID and look up the structure type in Table 7.3c.

Table 7.3c: Game Engine Structure IDs

Struct ID/Stack Element Type	Description
0	Effect. See Section 4.
1	ScriptEvent. See Table 7.3
2	ScriptLocation. See Table 7.5
3	ScriptTalent. See Table 7.6
4	ItemProperty . Same save function as effects. See Section 4 .
5 to 8	Unused; Reserved

Table 7.4: ScriptEvent Fields (StructID 1)

Label	Туре	Description
EventType	WORD	
IntList	List	List of Structs having StructID 105.
		Each Struct contains a single Field having the Label
		"Parameter" and the Field is an INT
FloatList	List	List of Structs having StructID 105.
		Each Struct contains a single Field having the Label
		"Parameter" and the Field is a FLOAT
StringList	List	List of Structs having StructID 105.
		Each Struct contains a single Field having the Label
		"Parameter" and the Field is a CExoString
ObjectList	List	List of Structs having StructID 105.
		Each Struct contains a single Field having the Label
		"Parameter" and the Field is a DWORD.

Table 7.5: ScriptLocation Fields (StructID 2)

		-
Label	Туре	Description
Area	DWORD	ObjectID of area
OrientationX, OrientationY, OrientationZ	FLOAT	orientation vector
PositionX, PositionY, PositionZ	FLOAT	position vector

Table 7.6: ScriptTalent Fields (StructID 3)

Label	Туре	Description
ID	INT	
Туре	INT	
MultiClass	BYTE	
Item	DWORD	Object ID
ItemPropertyIndex	INT	
CasterLevel	BYTE	
MetaType	BYTE	