Policy Builder - CLASS DIAGRAM

Axiom

Rampart Policy

+ Consts
⊞ fields
— constructors
— methods

+ ContextConstant
⊞ fields
— constructors
— methods

+ ElementReader
⊞ fields
⊞ constructors
⊞ methods

+ PolicyBehavior
⊞ fields
⊞ constructors
⊞ methods

+ AlgoSuite
⊞ fields
⊞ constructors
⊞ methods

+ AlgoSuiteComparator
implements Comparator
⊞ fields
— constructors
⊞ methods

+ PolicyBuilder extends PolicyBehavior
⊞ fields
⊞ constructors
⊞ methods

+ AsymmetricBindingBehavior extends PolicyBehavior
⊞ fields
⊞ constructors
⊞ methods

rderedElementReader extends ElementReader
fields
nstructors
ethods

+ AlgorithmSuiteBehavior extends PolicyBehavior
⊞ fields
⊞ constructors
⊞ methods

+ EncryptedPartsBehavior extends PolicyBehavior
⊞ fields
⊞ constructors
⊞ methods

mmetricBindingBehavior extends PolicyBehavior
ds
nstructors
methods

+ Context
⊞ fields
— constructors
⊞ methods

+ SymmetricProtectionBehavior extends PolicyBehavior
⊞ fields
⊞ constructors
⊞ methods

+ RecipientTokenBehavior extends PolicyBehavior
⊞ fields
⊞ constructors
⊞ methods

ncryptSignOrderBehavior extends PolicyBehavior
lds
nstructors
method

+ InitiatorTokenBehavior extends PolicyBehavior
⊞ fields
⊞ constructors
⊞ methods

+ TokenBehavior extends PolicyBehavior
⊞ fields
⊞ constructors
⊞ methods

+ AsymmetricTokenBehavior extends PolicyBehavior
⊞ fields
⊞ constructors
⊞ methods

+ PolicyContext extends Context
— fields
— constructors
⊞ methods

+ TransportBindingBehavior extends PolicyBehavior
⊞ fields
⊞ constructors
⊞ methods

+ SignedPartsBehavior extends PolicyBehavior
⊞ fields
⊞ constructors
⊞ methods

+ TimeStampBehavior extends PolicyBehavior
⊞ fields
⊞ constructors
⊞ methods

+ Property
— fields
— constructors
— methods

+ PropertyFactory
⊟ fields
properties : HashMap
⊟ constructors
+ PropertyFactory()
⊟ methods
— getProperties () : Map

+ TimeStampPropertyFactory extends PropertyFactory
⊞ fields
— constructors
⊞ methods

+ MessageProperty extends
⊞ fields
⊞ constructors
⊟ methods
+ getPropertiesCount () : int
+ getProperties (key:String) : Obj
+ contains (value: Object) : boole
+ setProperty (property: String ,

+ AsymmetricTokenPropertyFactory extends PropertyFactory
⊞ fields
— constructors
⊞ methods

+ AlgorithmSuitePropertyFactory extends PropertyFactory
⊞ fields
— constructors
⊞ methods

+ PolicyProperty extends Property
— fields
— constructors
— methods

+ EncryptSignOrderPropertyFactory extends PropertyFactory
⊞ fields
— constructors
⊞ methods

+ InitiatorTokenPropertyFactory extends PropertyFactory
⊞ fields
— constructors
⊞ methods

+ SignedPartsPropertyFactory extends PropertyFactory
⊞ fields
— constructors
⊞ methods

+ AsymetricPropertyFactory extends PropertyFactory
— fields
— constructors
⊞ methods

+ ProtectionTokenPropertyFactory extends PropertyFactory
⊞ fields
— constructors
⊞ methods

+ TokenPropertyFactory extends PropertyFactory
⊞ fields
— constructors
⊞ methods

+ EncryptedPartsPropertyFactory extends PropertyFactory
⊞ fields
— constructors
⊞ methods

+ TransportPropertyFactory extends PropertyFactory
⊞ fields
— constructors
⊞ methods

+ SymmetricPropertyFactory extends PropertyFactory
⊞ fields
— constructors
⊞ methods

+ StaticInitiator

— fields

⊟ methods

+ *initiate () : boolean*

+ PolicyBehavior

⊞ fields

⊞ constructors

⊞ methods

+ Initiator

implements StaticInitiator

⊞ fields

⊞ constructors

⊞ methods

+ Configurator

⊞ fields

⊟ constructors

+ Configurator()

⊟ methods

+ setNewConfiguration() : boolean

+ getCurrentConfiguration() : OMElement

+ discardOldConfig () : void

+ getNamespace() : String

+ getSearchType() : String

+ AssertionLoader

⊟ fields

- assertion : AbstractSecurityAssertion

- ver: int

- status : boolean

— constructors

⊞ methods

+ BehaviorLoader extends ClassLoader

⊞ fields

⊞ constructors

⊟ methods

- getClassImplFromDataBase (className:String) : byte[]

+ loadClass (className:String) : Class

+ synchronized loadClass (className:String, resolveIt: boolean) : Class

+ AbstractSearch

⊞ fields

— constructors

⊟ methods

+ *search () : boolean*

+ getCurrent () : OMElement

+ getBehaviorName () : String

+ getAssertionParam () : String

+ getAssertionName () : String

+ getSkipParam () : String

+ getID () : String

+ isSerializable () : boolean

+ terminateSearching () : boolean

+ DefaultSearch extends AbstractSearch

⊞ fields

⊞ constructors

⊞ methods

+ IndexedSearch extends AbstractSearch

— fields

— constructors

⊞ methods

+ PolicyBehavior
- ⊞fields
- ⊞constructors
- ⊞methods

+ XMLAssembler extends EngineAssembler
- ⊞fields
- —constructors
- ⊟methods
- + assemble(input:String) : String
- + main(args:String[]) : void
- – doLoading(init:Initiator, context:Context) : void

+ XMLReader
- —fields
- —constructors
- ⊞methods

+ StaticInitiator
- —fields
- ⊟methods
- + *initiate() : boolean*

+ XMLFileReader extends XMLReader
- ⊞fields
- ⊞constructors
- ⊞methods

+ XMLInputStreamReader extends XMLReader
- ⊞fields
- ⊞constructors
- ⊞methods

+ XMLStringReader extends XMLReader
- ⊞fields
- ⊞constructors
- ⊞methods

+ Initiator
implements StaticInitiator
- ⊞fields
- ⊞constructors
- ⊞methods

+ EngineAssembler
- ⊞fields
- —constructors
- ⊟methods
- + *assemble(input:String) : String*
- + print () : String
- – print (current: ArrayList) : String
- + printConfigs () : String

+ XMLAssembler extends EngineAssembler
- ⊞fields
- —constructors
- ⊟methods
- + assemble(input:String) : String
- + main(args:String[]) : void
- – doLoading(init:Initiator, context:Context) : void

+ ManualAssembler extends EngineAssembler
- ⊟fields
- – log : Log
- + hasNewConfig : boolean
- —constructors
- ⊟methods
- + assemble(input:String) : String
- + main(args:String[]) : void

Policy Engine – Policy Extraction Process
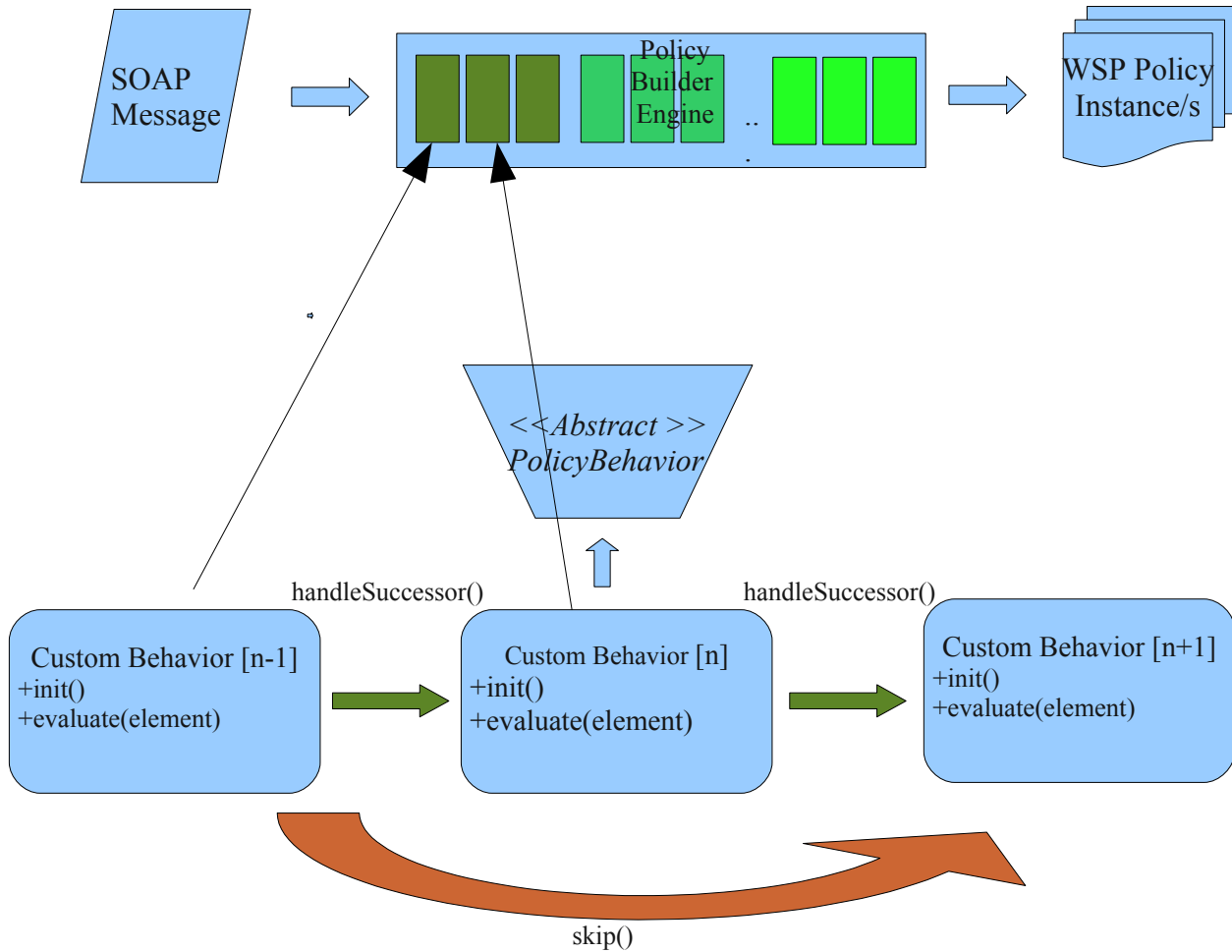
Policy Engine extracts a wsp:Security Policy compliant policy assertions using the underline SOAP message.Basically this Procedure is started with the provided SOAP Message entering the handler/behavior chain which was contructed at the startup of the policybuilder system. Each individual handler checks for underline policy mappings in the SOAP message inside their 'evaluate' methods. Developers are provided with two abstract methods 'handleSuccessor(OMelement)' and 'skip(OMElement)' inorder to continue with the current phase or skip to the next phase(ie:-incase SOAP doesn't relate to current policy checking phase) respectively.

Policy Extraction Engine - Initializing

XML Descriptor

XML Assembler

Behavior
(Handler)

Process/Group
Handler Chain

...
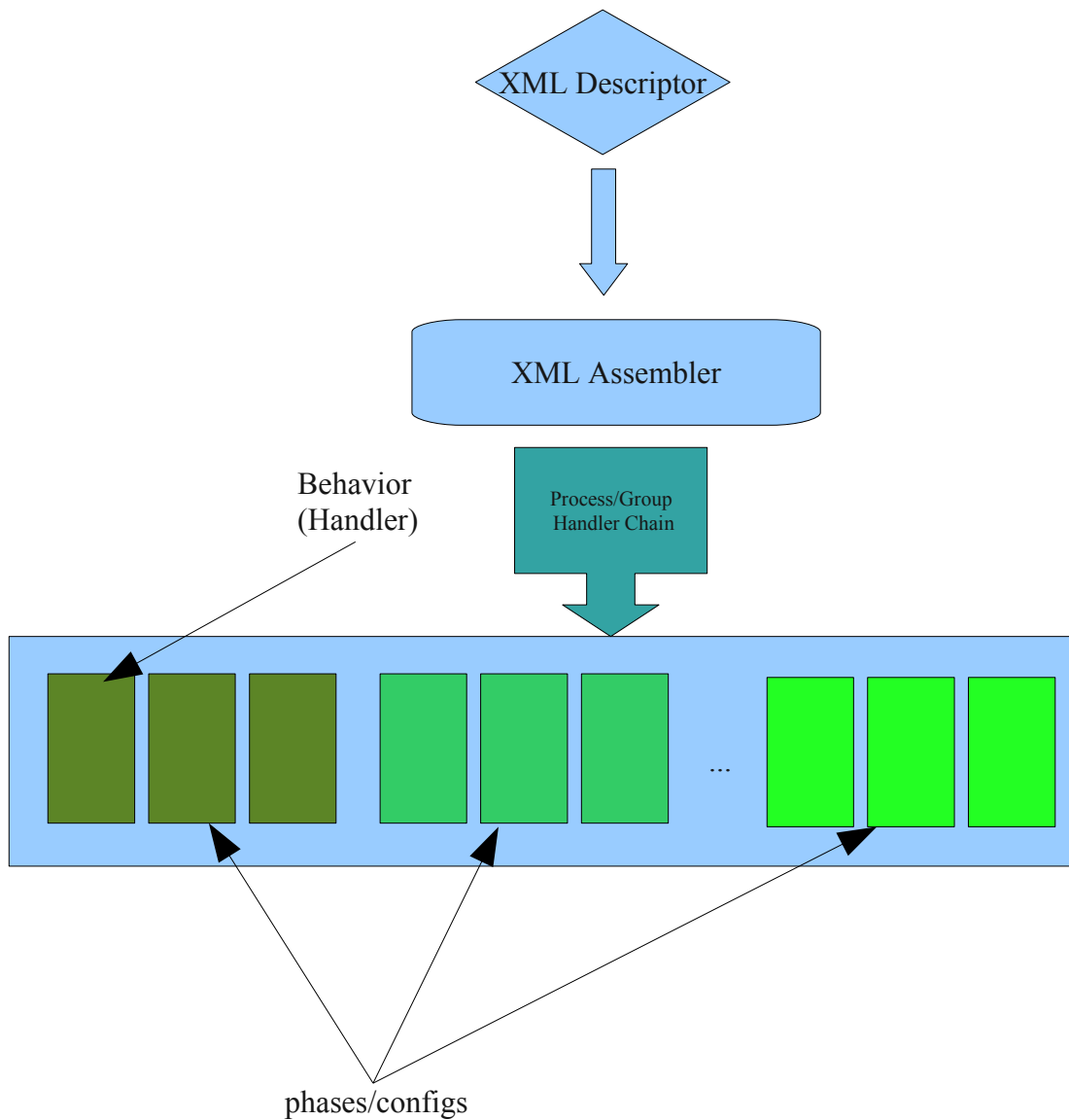
phases/configs

An External Descriptor file(builder.xml) is used to build the handler chain. This is kind of similar to Chain of Responsibility configuration for a handler set (/set of Behaviors) . However behavior set is grouped into configurations or phases where each seperate set can be operated seperately..Policy extraction will be done for each phase and a security policy instance will be derived for each individual phase.

Handler Data Flow

Policy
Context

Behavior
Property
Factories

Context
Info

Behavior/
Handler

Related
Property
Info

SOAP
Input

Stax
Parser
(Axiom)

Behavior/
Handler

OM
Element

Raw
XML
Stream

XML
Object
Model

Policy
Model
Info

Policy
Model Serializer

Output

Raw
Output
Stream
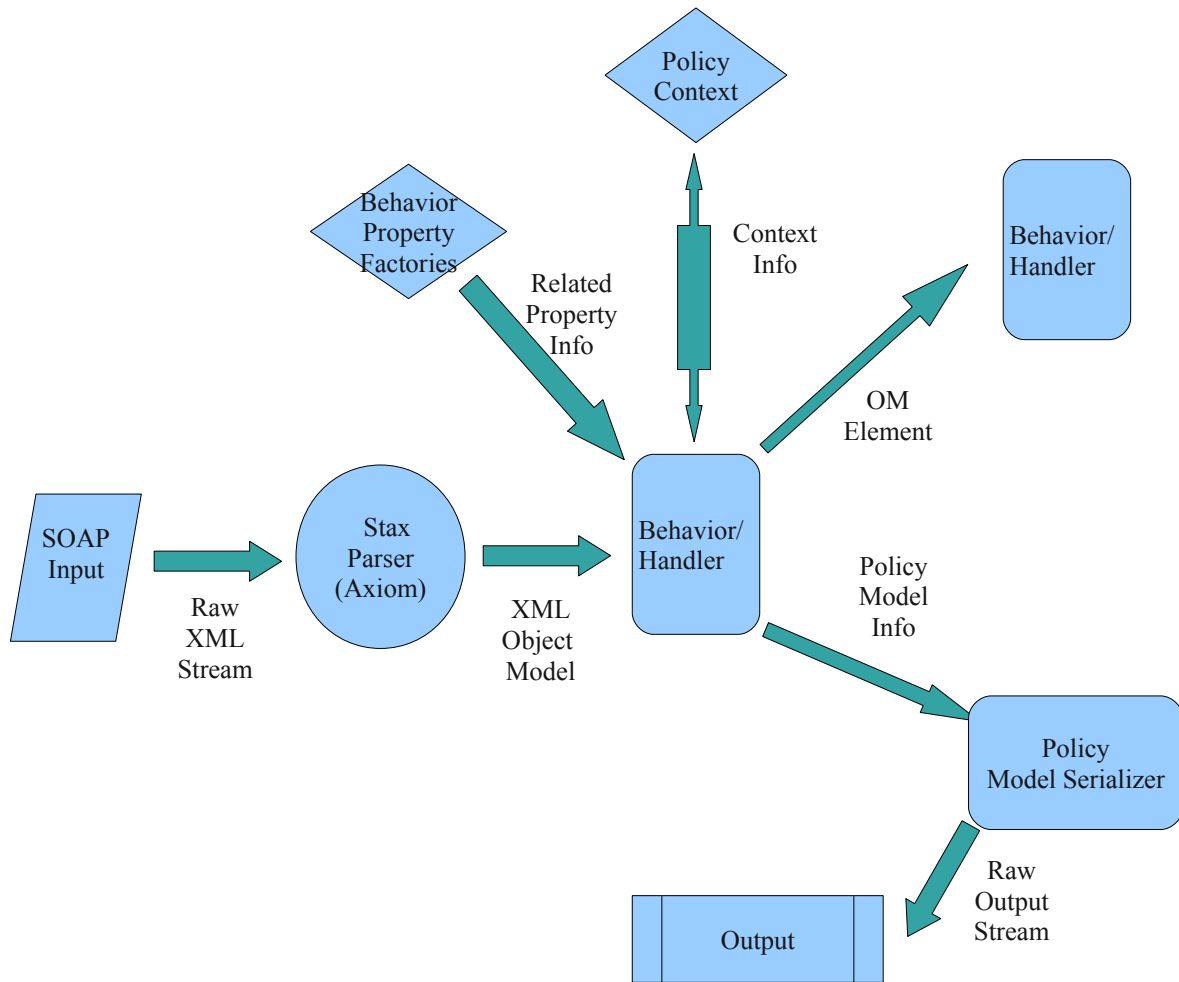
Axiom Object model and Rampart Security Policy Model is extensively used in the Policy Builder System.Policy Builder uses StaxParser (A Pull parser used in Apache Axiom) to generate XML Object Model and provide it as input to the handlers. Using the property information and other context information , underline security policy information is derived and inturn provided for Policy Model which is then made responsible for policy serialization.

Policy Builder UI
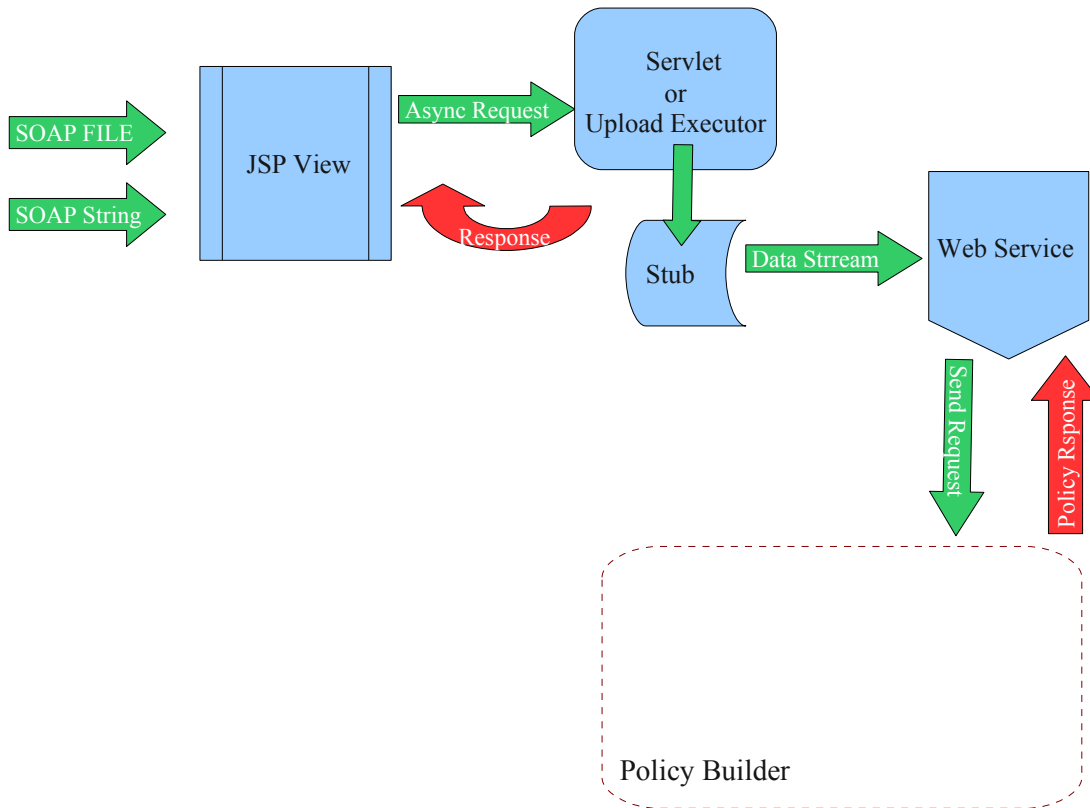
In the user interface of the Policy builder ,jsp dispatches the input stream of SOAP data asynchronously into Servlet Dispatcher (Upload Executor) which inturn uses a stub generated (using the Service WSDL) to invoke the web Service. Web Service interacts with the Policy Builder System and provides the derived output to the servlet. Sevlet will inform the jsp of the response through a the Ajax CallBack.

Author : U.S.Wickramasinghe

gmail : mastershield2007@gmail.com