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WS-Agreement Implementation:

Infrastructure for protocol support, and its use in Job Scheduling

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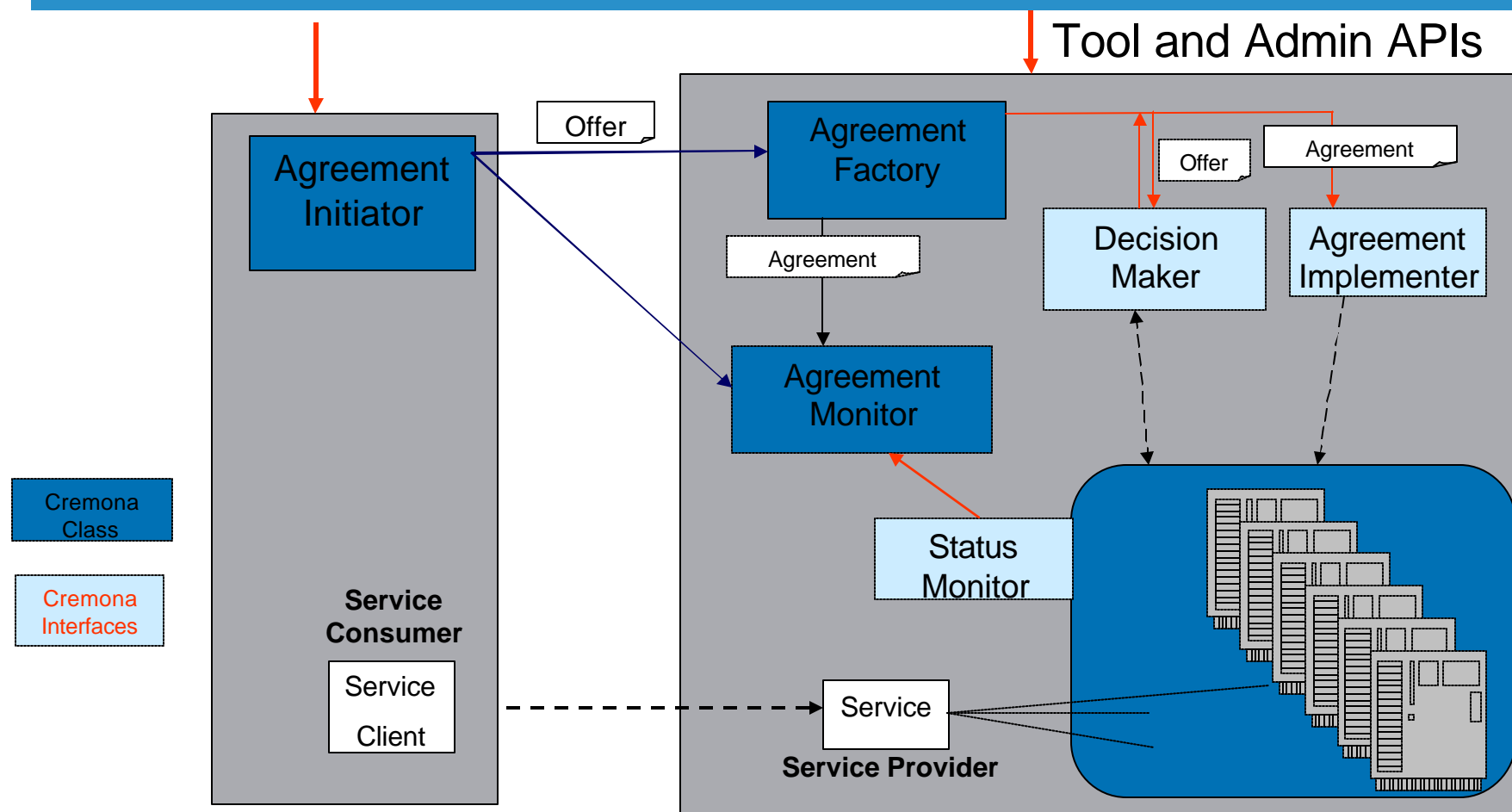
Experience report

1. ## Outcomes and achievements

   - WS-Agreement Creation and Monitoring Framework (Cremona)
     - http://awwebx04.alphaworks.ibm.com/ettk/demos/wstkdoc/README.htm
   - Use of WS-Agreement in resource allocation
     - Motivation – use of Flexible objectives and associated BV
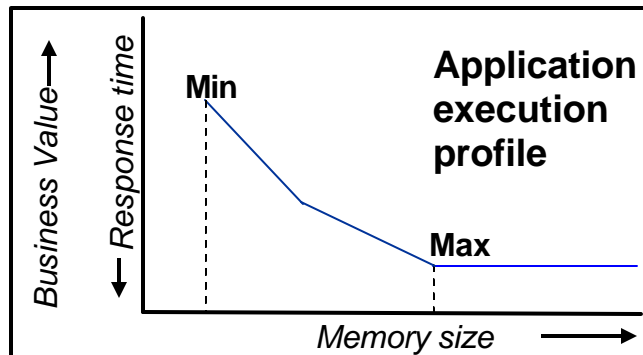
2. ## Open Issues/Next steps

   - Need to have more synergy with Job submission/JSDL specification
     - Modeling of a resource preference/committment profile in repeated job submissions
     - Passing agreement id as part of job submission
   - Demonstrate value of WS-Agreement specification through inter-operability

Cremona - WS-Agreement Protocol Support

Tool and Admin APIs

Offer

Agreement Initiator

Agreement Factory

Offer

Agreement

Agreement

Decision Maker

Agreement Implementer

Agreement Monitor

Cremona Class

Cremona Interfaces

Service Consumer

Service Client

Status Monitor

Service

Service Provider

- Libraries for core protocol support can be used by both initiators and providers in all WS-Agreement usage scenarios

Job Submission with Flexible Resource Objectives

Business Value *is simply a measure of what a business cares about the execution of a job:*

- *Response time, throughput, Cost, Resiliency*

✍Establish resource preference/commitment profile to be used for subsequent job submissions using WS-Agreement

- Use of JSDL as *service description term* for specifying resource model (partial description of a job)
- Use of guarantee term referencing *service description term* to specify resource preferences – using BV expression

✍Job submission under pre-established agreement

- Specify additional details using JSDL
- Either specify agreement id explicitly or inference from submitter context

Service Description Term – resource model

```
<wsag:ServiceProperties>

    <wsag:VariableSet>

        <wsag:Variable wsag:Name="Jsdl_physicalMemory">

            <wsag:Location>//jsdl:jobdefinition/jsdl:resource/jsdl:physicalMemory>

        </wsag:Variable>

        <wsag:Variable wsag:Name="Jsdl_priority">

        <wsag:Location>//jsdl:jobdefinition/jsdl:scheduling/jsdl:priority</wsag:Location>

        </wsag:Variable>

    </wsag:VariableSet>

</wsag:ServiceProperties>
```

Guarantee Term – Resource preference

```
<wsag:GuaranteeTerm>

…

  <wsag:BusinessValueList>

   <wsag:Reward>

    <wsag:ValueExpression>

     <exp:Plus>

        <exp:Variable name="Jsdl_priority"/>

        <exp:Product>

            <Variable name="Jsdl_physicalMemory"/>

            <exp:IntConstant><exp:Value>80</exp:Value></exp:IntConstant>

         </exp:Product>

     </exp:Plus>

    </wsag:ValueExpression>

   </wsag:Reward>

  </wsag:BusinessValueList>

 </wsag:GuaranteeTerm>
```

Business Value = priority
+ (free memory * factor)