IEEE Draft Discussion

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Background and Purpose

- **Background**
  - **At AMG25**
    - **The AMG reviewed issues raised with Draft1 of the IEEE draft HLA standard (1516) and SDG recommendations**
    - **AMG supported the recommended SDG actions**
  - **At AMG26**
    - **The AMG reviewed Draft2 of the IEEE draft 1516 and outstanding issues**
    - **The AMG endorsed Draft2 and supported recommended actions to submit comments on Draft2**
- **Purpose**
  - **Review results of the Draft2 SDG process and plans for Draft3**
  - **Review outstanding issues and proposed actions**

IEEE Draft 1516 Progress

- **Draft2**
  - **Followup actions were taken in accordance with AMG26 discussions *(status will be discussed)***
  - **IEEE SISO SDGs met in September to review comments on Draft2**
- **Draft3**
  - **Draft3 will be released on 16 November**
  - **Draft3 comment period is 16 November - 7 December**
- **Next SDG meeting is 5 - 7 January**
- **Resulting Draft4 will either**
  - **go forward for balloting**
  - **begin another comment cycle**

Review of AMG26 Outstanding Issues

- **As discussed at AMG26**
  - ***With the issuance of Draft2, there were a set of issues still to be addressed***
  - ***TSTCore and Spec Reps met to review these issues***
  - ***Review process included discussions with the users who expressed needs for certain capabilities and queries of representations who might be affected by the changes***
  - ***Issues***
    - ***User supplied time***
    - ***Unique object instance handles***
    - ***Multiple routing spaces***
    - ***Federate failure notification***
    - ***OMT tables and data typing***
  - ***Each issue is discussed in terms of the user need, background on AMG experience with the issues, and recommended actions***
- **In following slides, issues are reviewed and current status is described**

User Supplied Time

- **AMG26 Discussion**
  - ***Issue***
    - ***Certain realtime users (RPR-FOM group and others) have the need to send 'user defined time' with all attribute updates and interaction***
    - ***This 'user defined time' is to be used by the recipient in the process of the update or interaction***
    - ***This user defined tag is substantively different from the current time management services where time values are processed by the RTI to support event synchronization***
  - ***AMG/HLA Experience/Assessment***
    - ***This need is unrelated to the current time management services which support event synchronization; these users was receive order delivery of attributes and updates***
    - ***The existing user supplied tag provides the desired atomic attribute association but limits the associated data representation to a string.***

User Supplied Time (Continued)

- **AMG26 discussion (continued)**
  - ***Recommendation***
    - ***Employ the user supplied tag service argument mechanism.***
    - ***Enhance the definition of the user supplied tag to permit arbitrary values.***
    - ***Add a new OMT table to document the use of the user supplied tag mechanism.***
  - ***Action***
    - ***Submit comment to the IEEE SDG***
- **Current status**
  - **Recommended comment was submitted and accepted**
  - **An additional set of recommendations to extend the time management services to address this issue were developed following AMG26, submitted and accepted**

Unique Object Instance Handles

- **AMG26 discussion**
  - ***Issue***
    - ***Prior to Spec 1.2 the RTI was required to generate federation execution-wide unique object instance handles.***
    - ***In Spec 1.3 the object instance handles were only required to be unique to a given Federate and object instance names were introduced.***
    - ***Users feel that names are cumbersome and resource consumptive for use across the federation at execution time.***
  - ***AMG/HLA Experience/Assessment***
    - ***DMSO canvassed current RTI developers and found no perceived implementation issues with a reversion to federation-wide unique object handles.***
  - ***Recommendation***
    - ***Go back to federation execution-wide unique handles***
  - ***Action***
    - ***Submit comment to IEEE SDG***
- **Comment was submitted and accepted**

Multiple Routing Spaces

- **AMG26 discussion**
  - ***Issue***
    - ***RPR-FOM group has asked that a given class attribute/interaction class be allowed to have multiple routing spaces assigned to it.***
  - ***AMG/HLA Experience/Assessment***
    - ***DDM assessment during review of STOW experience suggested that the current routing space flexibility supported the range of anticipated uses and can be implemented efficiently***
  - ***Recommendation***
    - ***No change to Spec at this time***
  - ***Action***
    - ***Investigate with actual users (Perceptronics and LADS) the extent to which there may be real limits in the current specification and possible options for addressing these***
      - ***Assess how applications are supported with current, thorough experimentation***
- **Investigation is underway**

Federation Execution Failure Model

- **AMG26 discussion**
  - ***Issue***
    - ***Execution managers have difficulties determining the status of participating federates in the presence of certain failures***
    - ***Internally the RTI is aware of failures on the part of participating federates and it is desireable for this information to be made available to federates***
  - ***Recommendation***
    - ***Add federate status information to the MOM***
    - ***Perform additional research on a standard Federation Execution Failure Model (what does 'failure' mean under different RTI development strategies)***
  - ***Action***
    - ***Submit comment to IEEE SDG***
- **Still pending**

OMT Tables

- **AMG26 discussion**
  - ***Issue***
    - ***Users suggested that the data type mechanism in the OMT is limited and there needs to be a new way to capture the representation of certain types.***
  - ***AMG/HLA Experience/Assessment***
    - ***Cadre, RPR-FOM, and IEEE SDG comments have all pointed to these issues.***
  - ***Recommendation***
    - ***Make Annex B a table and add new type construction functions (fixed and variant records, arrays, and simple type definitions) to the OMT.***
    - ***Investigate the impact of these new and changed tables on the OMT DIF.***
  - ***Action***
    - ***Submit to IEEE SDG***
    - ***Review DIF formats and investigate use of applicable existing industry standards.***
- **OMT recommendations submitted and accepted**

XML to Support HLA DIFs

- **Background**
  - **HLA DIFs (OMT, FED) need to be updated to reflect changes in specifications (e.g. OMT tables)**
  - **With the spec review for standardization, option for use of an industry standard to support HLA DIFs was considered**
- **Current HLA DIF specification uses BNF**
  - **Offers a great deal of flexibility**
  - **Well suited to early development phase**
  - **Allows/requires user to customize 'grammar' to particular needs of application**
- **XML (Extended Markup Language) provides an industry standard option to support HLA DIFs**
  - **We are beyond development phase with HLA DIFs; good time to consider standard approaches**
- **Assessment was conducted to evaluate advisability of XML to support HLA DIFs**
  - **Technically**
  - **Business case perspective**

XML Technical Assessment

- **What is XML?**
  - **Extended Markup Language; industry standard markup language; cited in JTA as emerging standard**
- **Does XML do what we need to support HLA DIFS (OMT; FED)? How do we know?**
  - **Initial 'paper' assessment indicated that XML could support current DIF capabilities (MITRE, UT-ARL)**
  - **Drafted an XML "document type definition" (DTD: method of tailoring XML to the needs of your domain) (MITRE/GTRI)**
  - **Implemented an XML version of the "restaurant FOM" from OMT specification using the DTD (MITRE/GTRI)**
  - **Conducted an experiment (GTRI)**
    - **A freeware, validating XML parser was obtained from IBM (xml4j) and used to create a FED file generator**
    - **This tool, accepts XML FOMs and produces old-style FED files**
    - **The tool required 2 full days of effort and 753 lines of Java in addition to the freeware**
- **Result: XML is a good technical candidate for HLA DIFs**

XML Business Case Assessment

- **Why move to XML?**
  - **Leverage the collective ideas of industry beyond our community ('standards are as standards do')**
    - **Growing broad based population of XML users**
  - **Lower costs of maintenance**
    - **Use an available standard instead of maintaining our own**
  - **Access to a trained work force**
    - **Industry is using XML already, the HLA DIFs will be just another XML application**
  - **Access to free and commercial supporting software**
    - **Widespread use of XML is leading to XML support in existing products and availability of freeware support tools**
- **Possible risks and risk mitigation**
  - **XML dies out or moves away from our needs in future versions**
    - **We stay at this version, and redistribute (current) freeware tools**
  - **Freeware does not materialize as quickly as is expected**
    - **We supplement with freeware tools we develop (no difference than if we stayed on current course); lots of XML tools already available based on experiment**
- **Result: good business case for moving to XML**

Next Steps

- **Recommend XML based HLA DIFs in comment to Draft3**
  - **Early draft in progress**
- **Review our draft DTD and implementation with industry 'experts'**
  - **ArborText under contract for XML consulting services**
- **Investigate unifying HLA DIFs into single DIF**
  - **In Draft3 of OMT and IF Specs, OMT DIF is a superset of FED DIF**
  - **Experiment demonstrated that subsetting in XML is natural**
  - **Offers the opportunity for possible simplification in the specification ('less is more')**
- **Propose to hold a technical exchange at the next AMG on XML and its application to HLA DIFs; disscussion of experiments**