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AMM/ADM/ARI Updates for DTNMA

IETF 119 DTN WG

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Background

- The DTNMA draft is now at revision 12 draft-ietf-dtn-dtnma-12
- The AMM/ADM and ARI documents have been adopted by WG
  - ARI document at draft-ietf-dtn-ari-00 is complete
  - AMM portion of document at draft-ietf-dtn-adm-00 needs further edits for “TBD” and empty sections, ADM portions are complete
- Existing implementation of earlier drafts of DTNMA (called AMP) existed and are now maintained as part of NASA ANMS and APL DTNMA Tools

DTNMA Topic Areas

- Application Management Model: What is being managed, structural and behavioral definitions
  - Object types
  - Data values and structure
  - Built-in value types, semantic value types
  - Agent and Manager Activities
- Application Data Models: Static instances of AMM object types
  - Representation (*e.g.* YANG-syntax module)
  - Base semantic types (*e.g.* AMM module)
- Operational Data Models: Runtime AMM object instances
  - Representation (*e.g.* Agent introspection)
- Data Value Exchange: ARI structure
  - Representation
  - Transport bindings, including security requirements
- Agent State Management
  - Initial “Agent ADM” and “Access Control ADM”

Open Issues

- Translating ARI's and Semantic Types
  - AMM values have a semantic type
  - ARI syntax have no semantic type information
  - Procedures translating between AMM values and ARI syntax need to be validated by a trial implementation
- Type Display Hints
  - Similar to the pre-existing notion of "units" text annotation, but for display of the value itself
- Type Matching
  - Provide definition of type matching
  - Type matching does not affect the AMM value
- Define Basic Operations
  - Boolean, bitwise, and numeric operators
- Access Control Lists (ACL)
  - Security concerns with protected object assigned to unprotected variable
  - Open items in the ACL ADM
- ARI Relative Paths
  - Relative object paths and resolving are TBD
  - Simple method is to always use the object-containing namespace as a base URI for resolving URI References
- Registration of CBOR Tag for a binary-form ARI
  - Needs to be registered with the IANA

Implementation Experience

- Aspects of the new changes have been prototyped using ANMS' ACE library as a basis for encoding/decoding ARIs and ADMs
- Prototyping has led to improvements in usability for the ADM syntax especially, using ARI as the principal form of cross-reference to AMM objects and type names
- Prototyping has brought up nuances such as the exact logic and requirements for relative ARI paths
- Longer-term plan is to eventually treat these updates as "external" contributions to the ANMS project, which is the sustainment mechanism for the associated libraries

Next Steps

- Close any known gaps in the AMM/ADM and ARI documents to make them have complete definitions.
- Gather more implementation experience of for new ARI and ADM representations.
- Refine the requirements and documentation.