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](https://datatracker.ietf.org/doc/draft-ietf-dtn-dtnma-12/)

• The AMM/ADM and ARI documents have been adopted by WG
  - ARI document at [draft-ietf-dtn-ari-00](https://datatracker.ietf.org/doc/draft-ietf-dtn-ari-00/) is complete
  - AMM portion of document at [draft-ietf-dtn-adm-00](https://datatracker.ietf.org/doc/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](https://www.nasa.gov/) and APL [DTNMA Tools](https://www.alliance-dtn.org/)
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

• 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 new ARI and ADM representations.
• Refine the requirements and documentation.