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# IETF 111 DTN WG Naming of ADMs

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This briefing is unclassified. Some slides are marked JHU/APL Proprietary / Patent Pending.

# Agenda

- Asynchronous Data Model (ADM) Structure and example
- Asynchronous Management Model (AMM) Resource Identifier (ARI)
  - Namespaces
  - Nicknames
- Proposal for new RFC to define ARI schema
- Discussion

# DTN NM is Documented in 3 Ways

## 1. Asynchronous Management Architecture (AMA)

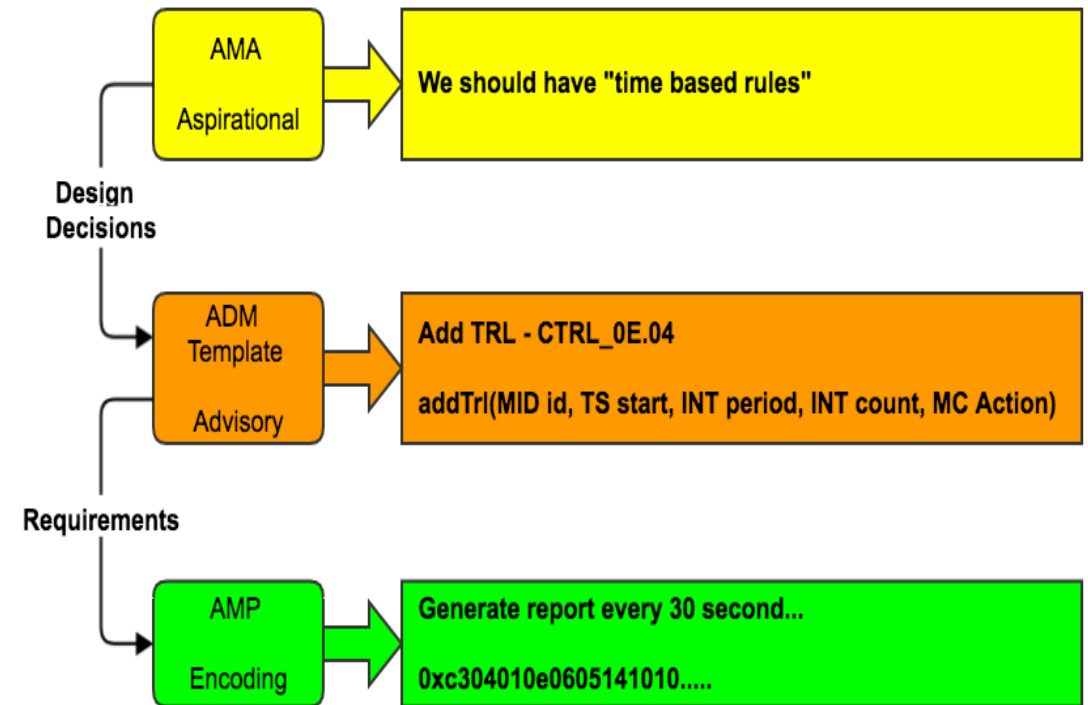
- Aspirational – reasons why we need this for DTN.
- <https://datatracker.ietf.org/doc/draft-ietf-dtn-ama/>

## 2. Asynchronous Management Model (AMM)

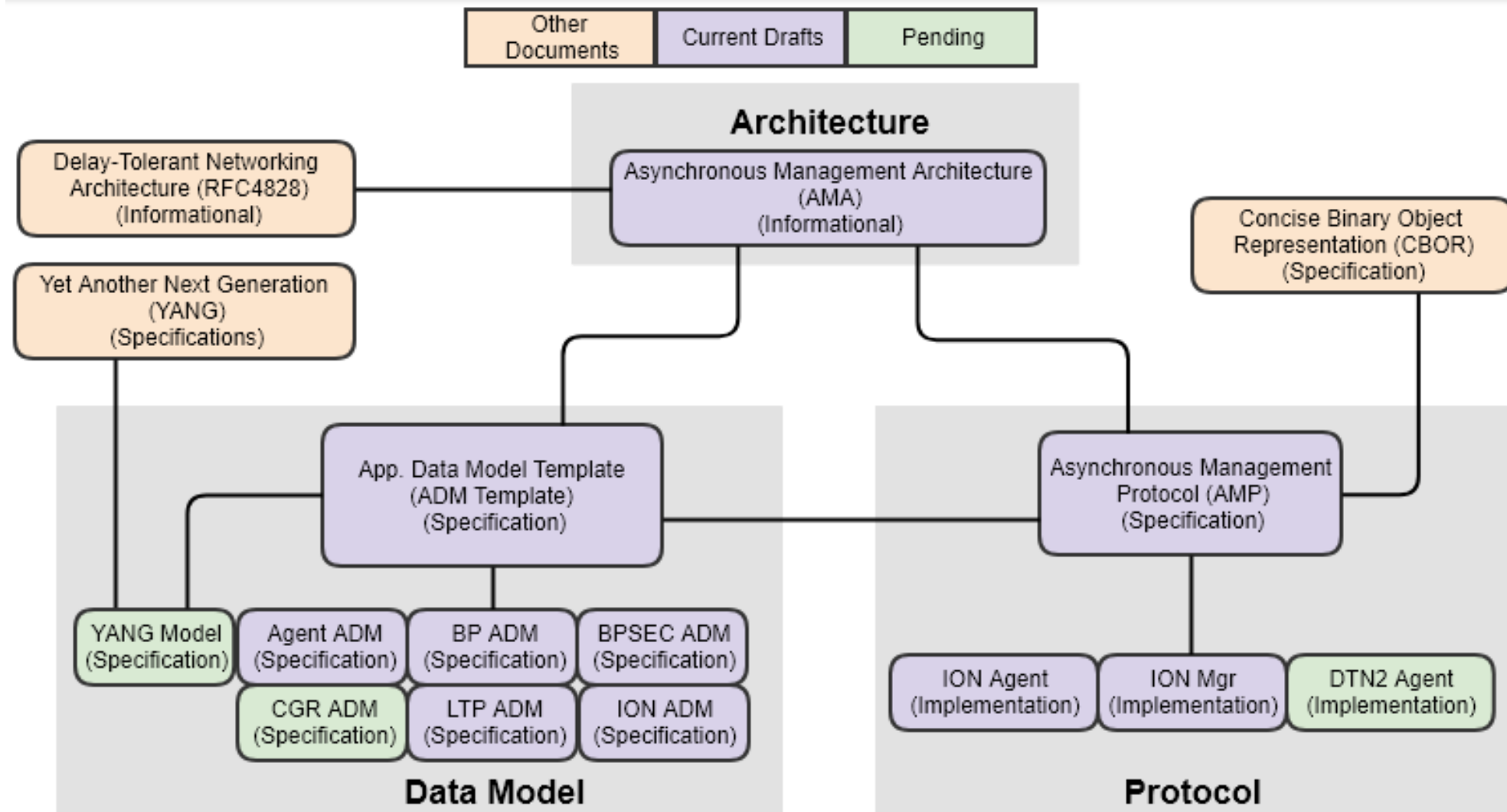
- Series of data objects (rules, tables...)
- Template for describing objects for an application
  - Application Data Model (ADM) Template
  - JSON encoding
- Multiple ADMs for applications
- <https://datatracker.ietf.org/doc/draft-birrane-dtn-adm/>

## 3. Asynchronous Management Protocol (AMP)

- Efficient, binary encoding of ADMs
- Messaging model and behavior of agents/managers
- <https://datatracker.ietf.org/doc/draft-birrane-dtn-amp/>

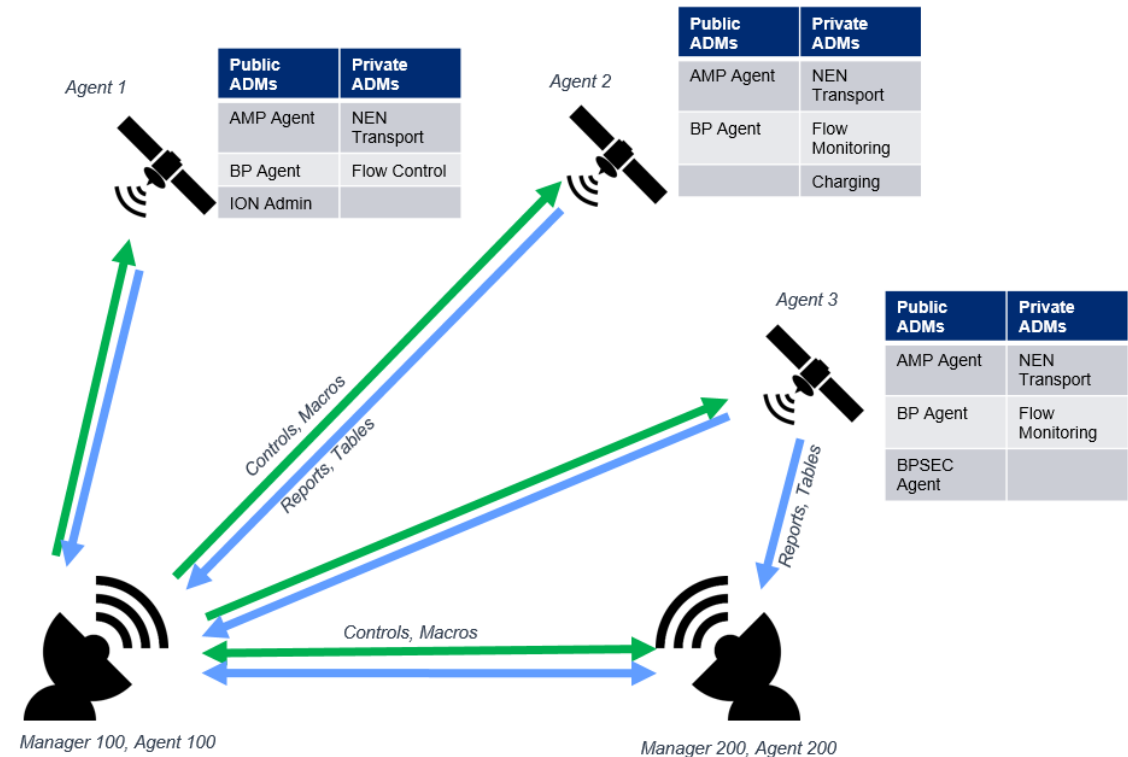
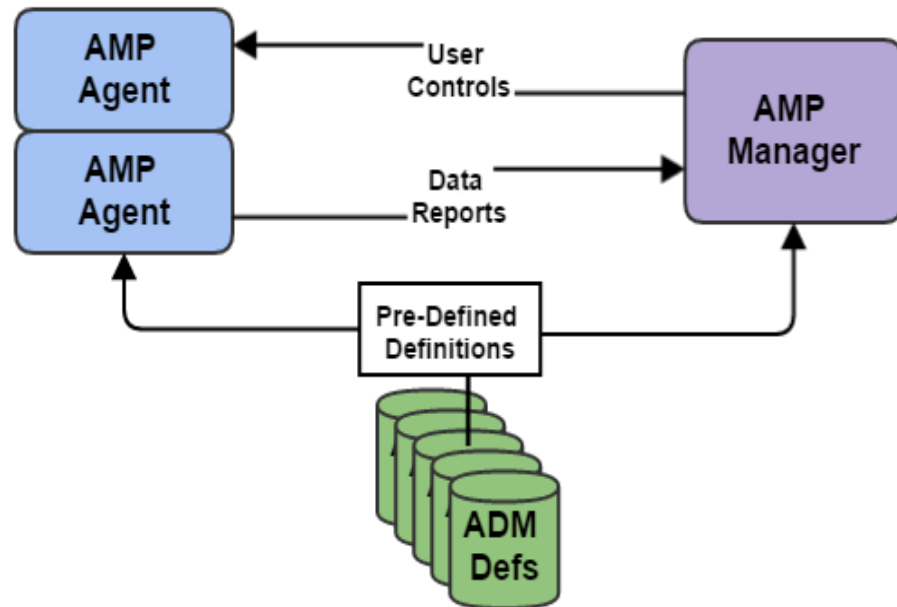


# Standards: DTN NM as it exists in the IETF today



# What is an Application Data Model (ADM)

- Application Data Model (ADM) - The set of statically-defined data items necessary to manage an application asynchronously.



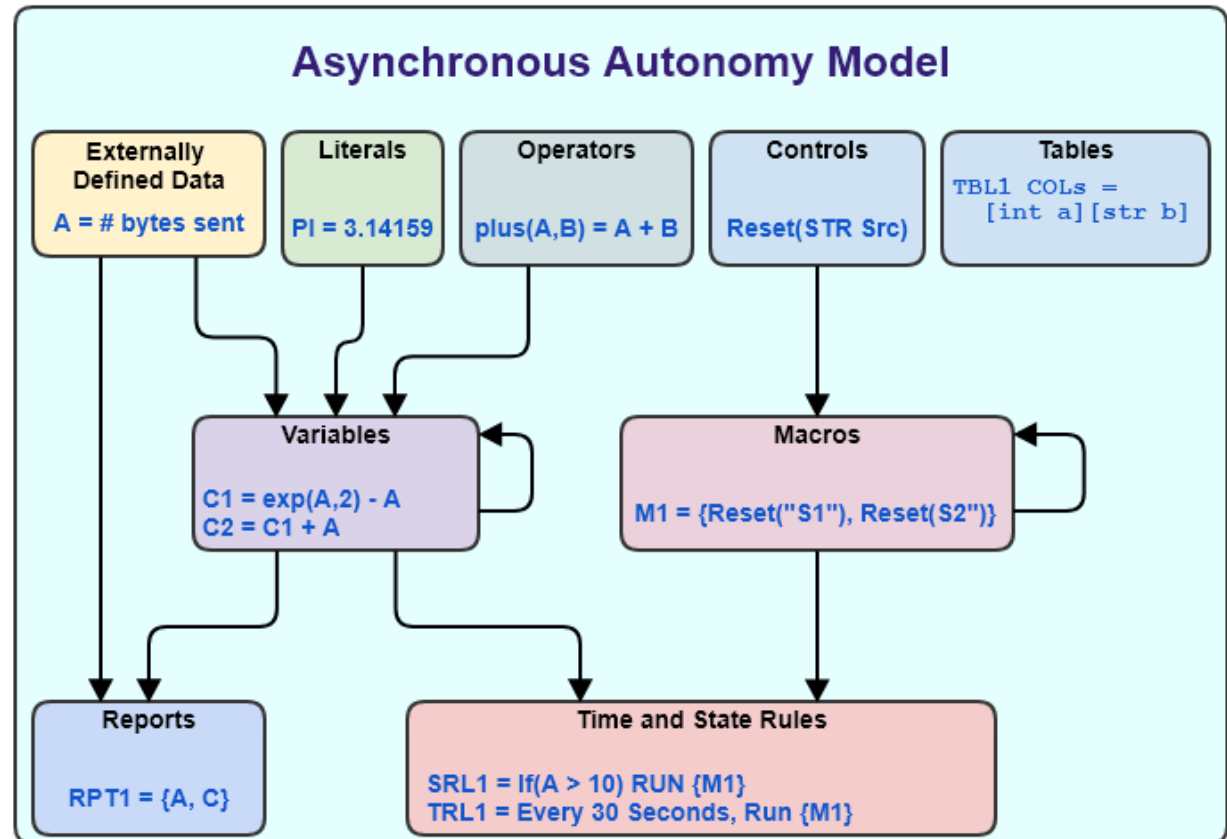
Data models are necessary to the asynchronous management of DTN resources  
 Each DTN resource will likely utilize many different ADMs

# What is included in the Data Model

From [draft-birrane-dtn-adm](#)

- “Atomic” Elements
  - **EDDs**: collected by agents.
  - **Literals**: useful constants.
  - **Ops**: opcodes for math functions.
  - **Ctrls**: opcodes for agent behavior.
  - **Tables**: Structured data sets
- “Dynamic” Elements
  - **Vars**: strong-typed variables
  - **Macro**: Ordered set of Ctrls.
  - **Rpts**: Ordered sets of data
  - **Rules**: Time or State based autonomy.

The model defines 9 types of data that can be used to manage applications and protocols.



# ARIs for Unique Identification of ADMs

According to: <https://datatracker.ietf.org/doc/draft-birrane-dtn-adm/>

- *“Every object in the AMM must be uniquely identifiable, regardless of whether the item is defined formally in an ADM document or informally by operators in the context of a specific network deployment. The AMM Resource Identifier (ARI) uniquely identifies AMM objects.”*
- **AMM Resource Identifier (ARI)**: A unique identifier for any AMM object, syntactically conformant to the Uniform Resource Identifier (URI) syntax documented in [RFC3986] and using the scheme name "ari".

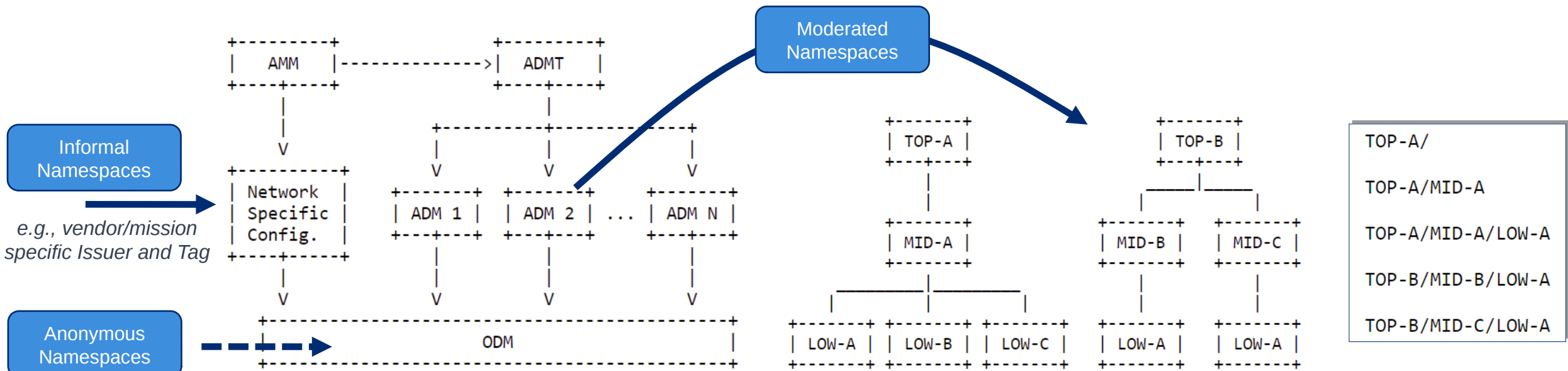
## Three components of ARIs:

- Namespaces
- Object names
- Parameters

# Namespaces

According to: <https://datatracker.ietf.org/doc/draft-birrane-dtn-adm/>

- ADM Namespace: A moderated, hierarchical taxonomy of namespaces that describe a set of ADM scopes. Specifically, an individual ADM namespace is a specific sequence of ADM namespaces, from most general to most specific, that uniquely and unambiguously identify the namespace of a particular ADM.
  - unique namespaces to prevent conflicting names within network deployments





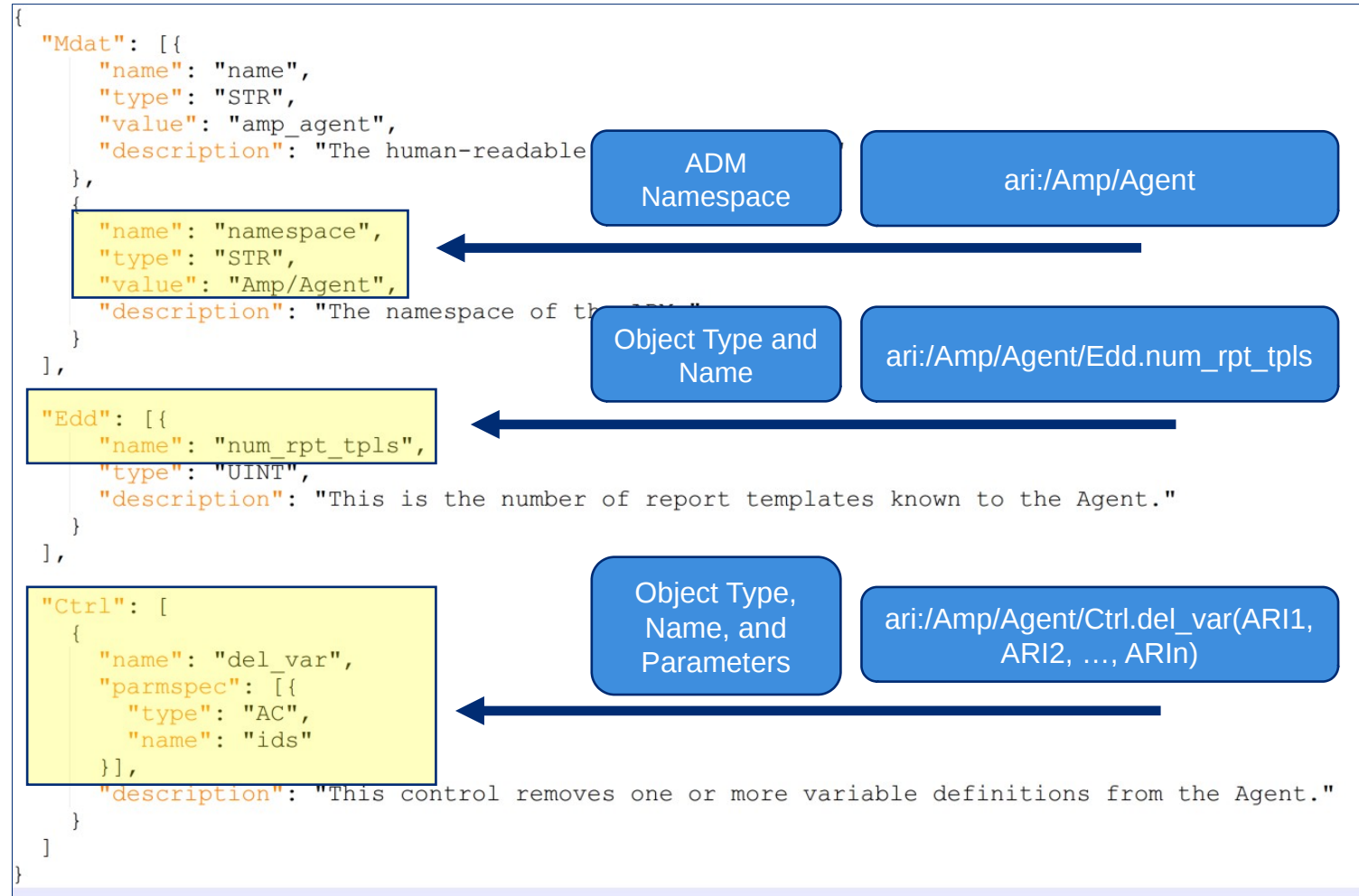
# Moderated Namespaces, Object Names, and Parameters

From: <https://datatracker.ietf.org/doc/draft-birrane-dtn-adm-agent/>

- Each moderated ADM defines a namespace
- The scheme name of the ARI is "ari". The scheme-specific part of the "ari" scheme follows the format:  
ari:<Namespace>/
- <ObjectName><(Parameters)>

```
{  
  "Mdat" : [],  
  "Edd" : [],  
  "Var" : [],  
  "Rptt" : [],  
  "Tblt" : [],  
  "Ctrl" : [],  
  "Const" : [],  
  "Mac" : [],  
  "Oper" : []  
}
```

ADM Object Types



# Nicknames

According to: <https://datatracker.ietf.org/doc/draft-birrane-dtn-amp/>

- String encoding of ARIs can be quite verbose...

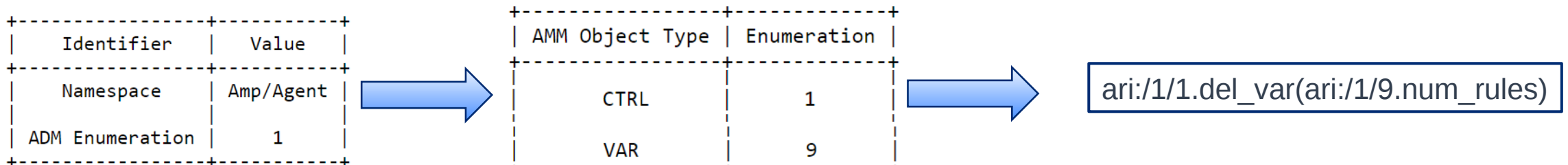
```
"Ctrl": [
  {
    "name": "del_var",
    "parmspec": [{
      "type": "AC",
      "name": "ids"
    }],
  }
]
```

Object Type,  
Name, and  
Parameters

ari:/Amp/Agent/Ctrl.del\_var(ARI1,  
ARI2, ..., ARIn)

A Collection of ARIs

- Nicknames (NN)**: Mechanism defined in Asynchronous Management Protocol (AMP) to reduce the overall size of the encoding of ARIs that are defined in the context of an ADM
  - A NN is calculated as a function of an ADM Moderated Namespace and the type of object being identified



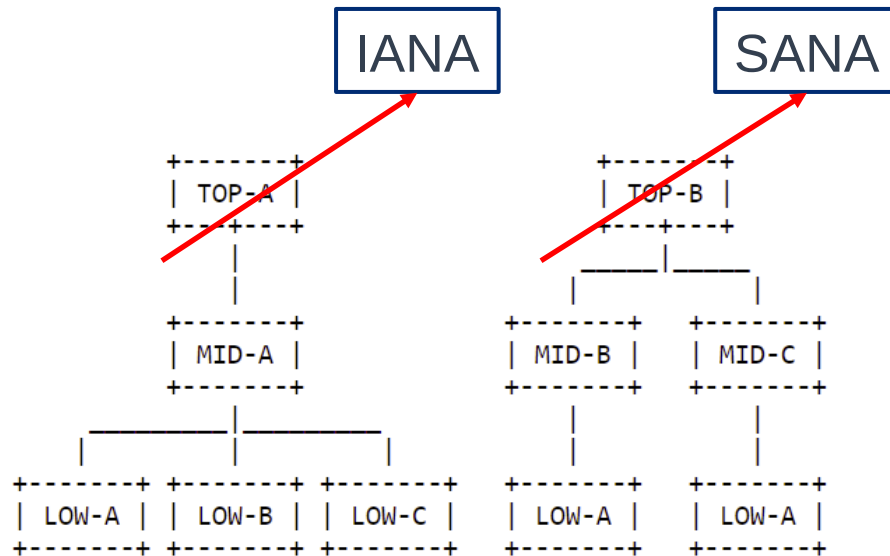
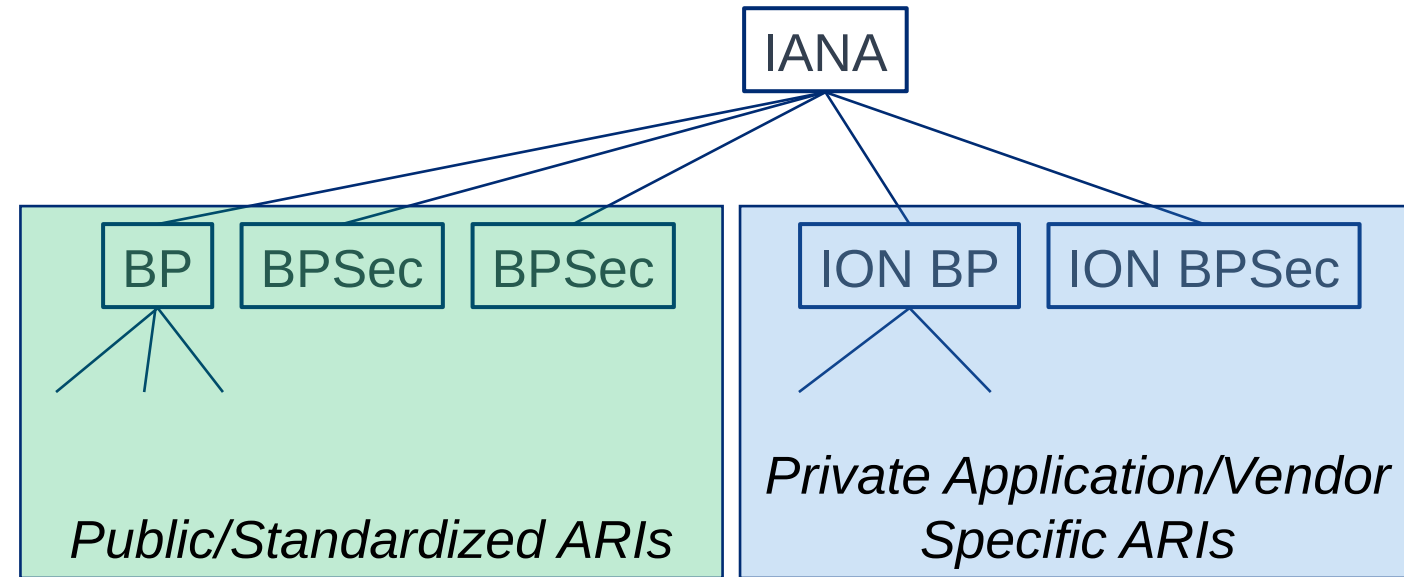
# Need for moderated Namespaces and Nicknames

- From <https://datatracker.ietf.org/doc/draft-birrane-dtn-adm/>
  - IANA Considerations: This document defines a moderated namespace registry in Section 5.1.1.1. **This registry is envisioned to be moderated by IANA.** Entries in this registry are to be made through Expert Review.
  - Further, the ADM defines a new URI scheme, “ari”, as defined in Section 5.1.5
- From: <https://datatracker.ietf.org/doc/draft-birrane-dtn-amp/>
  - IANA Considerations: **A Nickname registry needs to be established.**

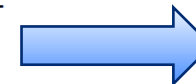
# Proposal for new RFC for ARI Schema

## Namespaces and Nicknames

- Namespace ARIs referenced to ADMs
- Globally unique nicknames for each:
  - Namespace
  - Object Type



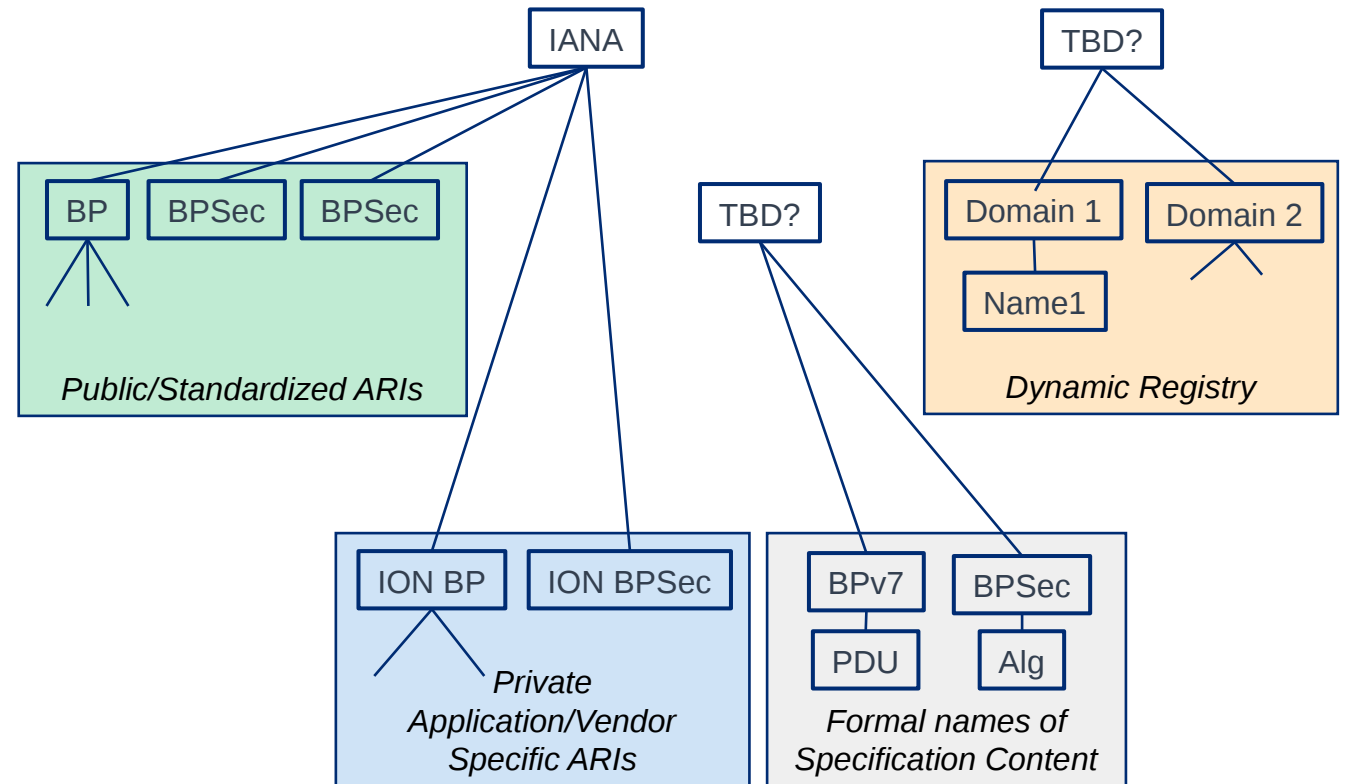
Identifier	Value
Namespace	Amp/Agent
ADM Enumeration	1



AMM Object Type	Enumeration
CTRL	1
VAR	9

# Discussion

- Are moderation of namespaces and nicknames possible?
- How to think beyond Moderated ADMs as a source for content?
  - Anonymous and Informal namespaces
  - Services and Information Flows
  - Protocol specific features such as content of a BPv7 PDU that are merely crafting according to the spec (not managed via AMA)
- Will a dynamic registry be required for these?





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