# Anima Bootstrapping for Network Management

## (draft-nmdt-anima-management-bootstrap-00 )

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# Problems

- When an ANI enabled network is brought into an NMS/Controller-based network management, there are some gaps
  - Since the addresses in ACP are self-generated, the NMS/Controller cannot figure out "which is which".
  - The Autonomic Nodes also don't know who is the NMS Server/Controller.
  - The NMS Server/Controller don't know the topology of the Autonomic Network.

# Approaches

- Since the addresses in ACP are self-generated, the NMS/Controller cannot figure out "which is which".

   (An autonomic naming mechanism to carry meaningful information in the name)

- The Autonomic Nodes also don't know who is the NMS Server/Controller.

   (NMS Server/Controller discovery)

- The NMS Server/Controller don't know the topology of the Autonomic Network.

   (Local topology discovery; topology reporting to the NMS Server/Controller)

# Structured Naming

- Naming element
  - Key information/hints of a name
  - Mandatory and optional elements
- Element attribute
  - Additional information of each naming element
- Naming element semantics
  - Device type, Ownership, Location, Role, Functions, etc.
- Naming pattern
  - E.g. Location-DeviceType-FunctionalRole-DistinguisherNumber@NameofDomain
  - Example: PragueHilton-Router-BordRouter-356879@ietf.org

# Autonomic Naming Approaches

- Self-generated
  - E.g. some hardware/system information
  - distinguish number

- Hardware interface
  - Naming pattern/element information input through hardware interface such as USB flash etc.

- Network interface
  - Received from the network (e.g. through Intent)

# NMS Server/Controller Discovery

- GRASP
  - discovery-message = [M_NEG_SYN, session-id, initiator, Centralized-tool-objective] Centralized-tool-objective = ["AN_centralized_tool", F_SYNCH, loop-count, centralized-tool-address] centralized-tool-address = ipv6-address
  - response-message = [M_RESPONSE, session-id, initiator, ttl, (+locator-option // divert-option), Centralized-tool-objective)]
- mDNS
  - "_centralize_management_address.udp.local"

# Topology Discovery and Collection

- Local Topoloty Discovery
  - For the traditional centralized tools such as NMS hosts, the Link Layer Dicovery Protocol (LLDP) is used to dicovery the neigbor nodes and the links between two nodes, this was specified in IEEE802.1ab.

- Topology Collection by NMS/Controller
  - GRASP is used to carry topology information to the NMS/Controller.
  - Content TBD.

# Next Step

- Complete the requirement and design
- A potential future work in Anima? Any interest?

## Comments?

### Thank you!

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