



# **1722.1 Proposal**

# **Dynamic Models**

Ashley Butterworth  
Apple Inc

# What is it

- There are devices that can change their models at runtime through user actions
  - e.g. a device has hot pluggable ports that can add and remove features.
- We need a way to convey to a controller that the entity model is changing and what those changes are.

# How will it work

- 5 new unsolicited notifications:
  - BEGIN\_DYNAMIC\_MODEL\_CHANGE
  - REMOVED\_DESCRIPTOR
  - RENUMBERED\_DESCRIPTOR
  - ADDED\_DESCRIPTOR
  - END\_DYNAMIC\_MODEL\_CHANGE
- ATDECC Entity will send these in order to tell registered ATDECC Controllers of the changes.

# BEGIN\_DYNAMIC\_MODEL\_CHANGE

- Includes a 16 bit change\_id which is added to all messages to tie them together into one transaction
- Triggers the controller to start collecting the changes together

# REMOVED\_DESCRIPTOR

- Zero or more of these are sent to remove descriptors from the model
- List of 3-tuples of configuration\_index, descriptor\_type and descriptor\_index of the descriptors to be removed
- descriptor\_index is of the descriptor before the changes are made

# RENUMBERED\_DESCRIPTOR

- Zero or more of these are sent to move existing descriptors to account for those being removed or added
- List of 4-tuples of configuration\_index, descriptor\_type, old\_descriptor\_index, new\_descriptor\_index
- old\_descriptor\_index is prior to the changes being made, new\_descriptor\_index is after.

# ADDED\_DESCRIPTOR

- Zero or more of these are sent to add descriptors to the model
- 3-tuple of configuration\_index, descriptor\_type, descriptor\_index
- descriptor\_index is after the changes are made

# END\_DYNAMIC\_MODEL\_CHANGE

- Includes a count of the number of REMOVED\_DESCRIPTOR, RENUMBERED\_DESCRIPTOR AND ADDED\_DESCRIPTOR notifications were sent
- Triggers the controller to make the changes and read any newly added descriptors.



# Error Handling

- If the controller receives a second BEGIN\_DYNAMIC\_MODEL\_CHANGE for a different change\_id without having received the END\_DYNAMIC\_MODEL\_CHANGE then it waits till it receives the new END\_DYNAMIC\_MODEL\_CHANGE that corresponds to the BEGIN\_DYNAMIC\_MODEL\_CHANGE, dumps the whole model and completely re-enumerates
- If the controller receives the END\_DYNAMIC\_MODEL\_CHANGE and the counts do not match the number of messages it has then it dumps the whole model and completely re-enumerates

# What do we need to do

- Add unsolicited notification response types for the 5 new messages
- Add an annex on how to use the notifications to signal the change of model and update the model