UUID Maps

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TC184/SC4

Notes from conference call

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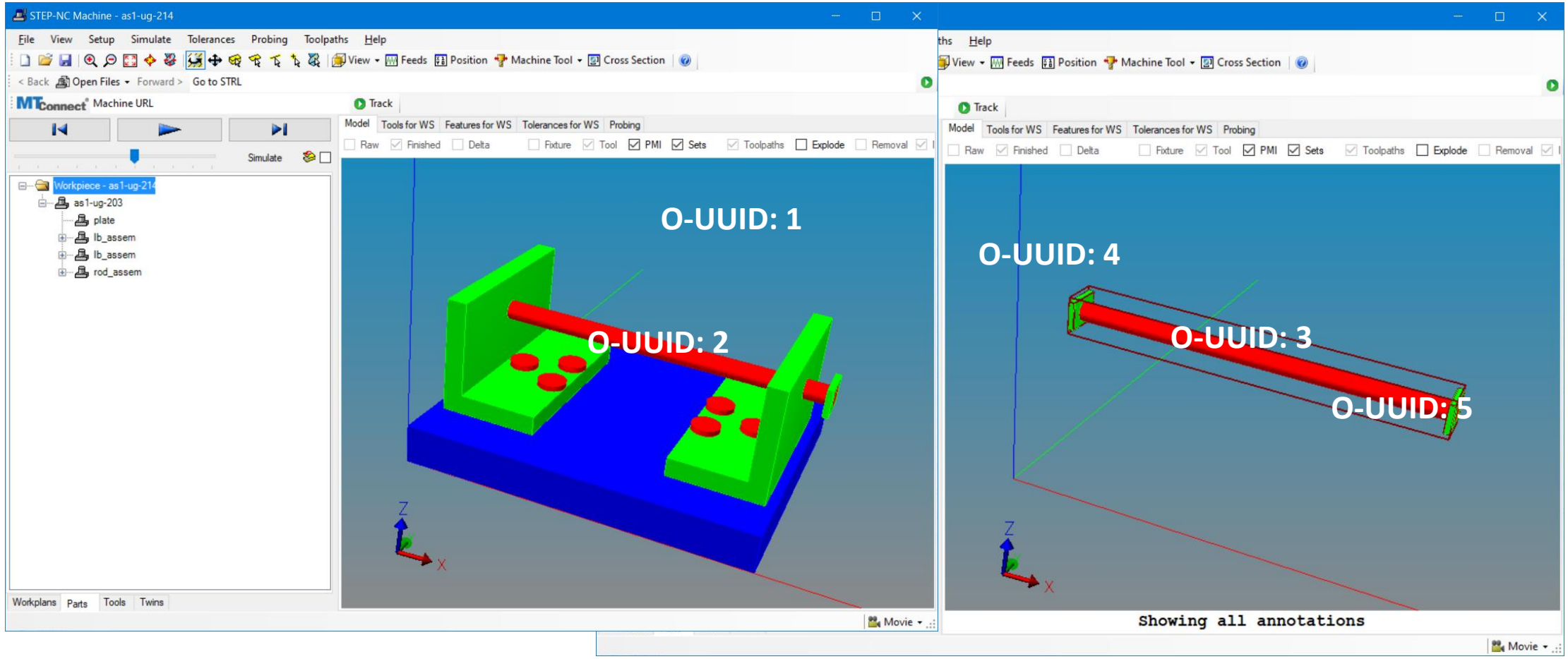
UUID Maps

- Inspired by similar ideas from
  - Jean Brange, Jaques Heinisch and JWG16
  - Also Tom Thurman, Larry Maggiano, Asa Trainer
  - Also Scott Truitt and I expect many others
- Basic idea – enable easier sharing of digital twins using UUID maps
  1. Create UUIDs in CAD, CAM, CNC and CMM
  2. For products, processes, tooling, tolerances and features
  3. Make maps to enable large scale sharing and display of the digital twins identified by the UUID's

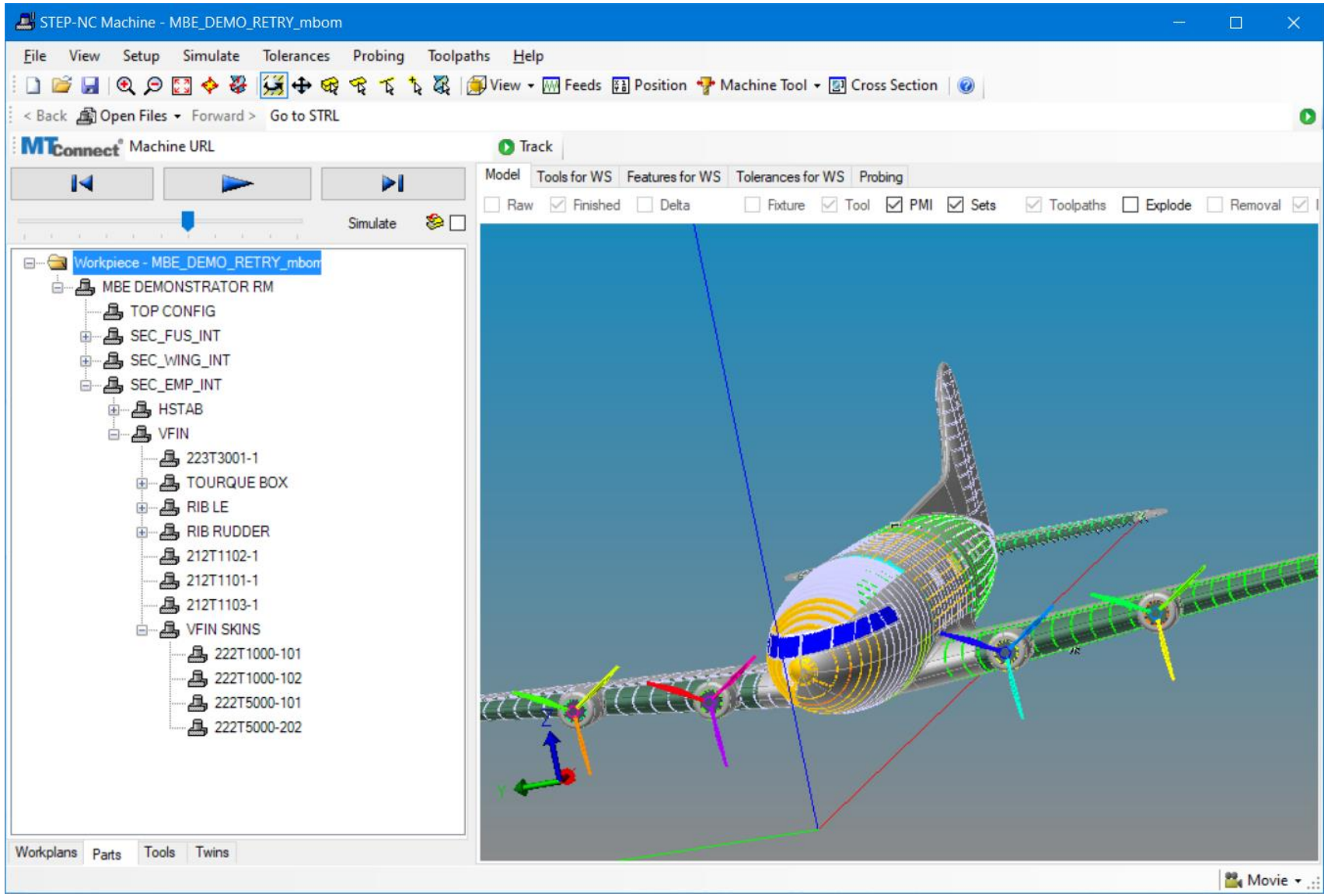
UUID Map for AS1-PE model

{
"product_table": {"nb_products": 9, "products": {
[{“uuid":1, uri:”xxx”, "name": “as1-assembly", "filename=": “as1-pe.stp", "bbox": [-10.0 190.0 0.0 150.0 -4.0 80.0] },
{ “uuid": 2, "name": "rod-assembly", "filename=": "(null)", "bbox": [-10.0 10.0 -7.5 7.5 0.0 200.0] },
{ “uuid": 3, "name": "l-bracket-assembly", "filename=": “lb.map", "bbox": [0.0 52.5 -100.0 0.0 -24.0 60.0] },
{ “uuid": 4, "name": "plate", "filename=": "plate.stp", "bbox": [0.0 180.0 0.0 150.0 0.0 20.0] },
{ “uuid": 5, "name": "nut", "filename=": “(null)", "bbox": [0.0 20.0 0.0 15.0 0.0 3.0] },
…..]
"occurrence_table": {"nb_occurrences": 28, "max_depth": 3, "occurrences": {
[{“uuid": 1, “o-uuid”:1, "name": “as1-assembly", "translation": [0.0, 0.0, 0.0], "children": [
{“uuid": 2, “o-uuid”:2, "name": "rod-assembly", "translation": [-10.0 75.0 60.0], "children": [
{“uuid": 5, “o-uuid”:3, "name": "nut", "translation": [175.0 67.5 70.0], “rotation”:},
{“uuid": 5, ”o-uuid”:4 "name": "nut", "translation": [2.0 67.5 70.0], “rotation”:},
{ “uuid”:6, “o-uuid": 7, "name": “rod", "translation": [-10.0 75.0 60.0], “rotation”:}
] },
“instance-table”:{“nb_instances”:24307181,”instances”:{
[{“o-uuid’:1, “i-uuid”:1, “serial”:”as1-1”, “production”:”mtc-1”, “measure”:”qif-1”}

Visualization



UUID map this!



What are the rules?

What are the potential benefits

- Efficient large model sharing
  - Priority tables in the maps
- Faster browsing and finding
  - Traversal using the maps
- Digital twin composition
  - Automated by joining maps
- Digital threading
  - Product linking (uuid)
  - Occurrence linking (o-uuid)
  - Instance linking (i-uuid)

How to enable them

- Cardinality
  - One map per twin?
  - One map per prototype?
  - One map per STEP file?
- Functionality
  - Assembly map
  - Tolerance map
  - Feature map
  - Process map
  - Tooling map
  - All-in-one map

How to make the maps

- Every map is different but all follow similar conventions
- A town can change but its maps stay useful
- Some maps describe future towns (plans)
- Different maps are used for large and small distances
- Maps have existed for thousands of years
- The organization with the best map wins!