New X3D Profile: Common Capabilities and Requirements for 3D Printing, 3D Scanning and CAD

Needed X3D Capabilities	3D PRINTING	3D SCANNING	CAD	notes
Point Cloud (unordered, overlapping)	?	☑	☐	
"Point Mesh"? (ordered, distinct)	☑	☑	☑	superposition
"Polygon Mesh"? (ordered, well defined)	☑	☑	☑	for comparison
• PointProperties node				
• closed solid (watertight) attribute	☑	☐	☑	Identify tools
• closed solid, except for bottom?	☐	☐	☐	of interest
• Informational (post-tool) or directive?				
• wall thickness	likely		?	STEP practice?
• Normals used for curved triangles (as defined in AMF)	☑			Demonstrate correspondence
LineSet, IndexedLineSet	Support struts?	Scan Boundaries?	Help guides and callouts	
• LineProperties			☑	
Physically based materials, lighting	☑ Varying use	☑ Scan properties	☑ Bill of materials	SRC/glTF work, also metadata
Non-Uniform Rational B-Splines (NURBS)				
Volumetric data	☑	☑		Correspondences to .nrrd?
Metadata standards for • Creation pedigree (materials, etc.) • IPR and usage rights • Addition of supports, etc.	☑	☑	☑	Applying other specs, practices, e.g. Creative Commons etc.
Metadata display and callouts: draft X3D Annotation Component • Identifying shared features • Correlating scans with models	☑	☑	☑	Aligning with other specs (e.g. ISO STEP)
Progressive mesh streaming (SRC)			☑	Status of SRC?
Geometric Compression (SRC)	☑	☑	☑	Status of SRC?
Data Compression (EXI)	☑	☑	☑	Ready to apply
Digital Signature for Authentication	☑	☑	☑	Ready to apply
Encryption for Privacy, Access Control	☑	☑	☑	Ready to apply
Layer or plating of physical material (e.g. paint or coating)				External surface

Status: continue reviewing/refining "X3D version 4.0 Development: Candidate capabilities" list at

http://www.web3d.org/wiki/index.php/X3D_version_4.0_Development#Candidate_capabilities