Revised 21 July 2016

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

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| --- | --- | --- | --- | --- |
| New 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 * closed solid, except for bottom? * Informational (post-tool) or directive? | 🗹  🞎 | 🞎  🞎 | 🗹  🞎 |  |
| * wall thickness | likely |  | ? |  |
| * Normals used for curved triangles   (as defined in AMF) | 🗹 |  |  | Are they identical? |
| LineSet, IndexedLineSet | Support struts? | Scan Boundaries? | Help guides and callouts |  |
| * LineProperties |  |  | 🗹 |  |
| Advanced materials, lighting | 🗹  Varying use | 🗹  Scan properties | 🗹  Bill of materials | Possibly solved with metadata |
| Non-Uniform Rational B-Splines  (NURBS) |  |  |  |  |
| Volumetric data | 🗹 | 🗹 |  |  |
| Metadata standards for   * Creation pedigree (materials, etc.) * IPR and usage rights * Addition of supports, etc. | 🗹 | 🗹 | 🗹 | Allow external standards |
| Metadata display and callouts:  draft X3D Annotation Component | 🗹 | 🗹 | 🗹 |  |
| Progressive mesh streaming (SRC) |  |  | 🗹 |  |
| Geometric Compression (SRC) | 🗹 | 🗹 | 🗹 |  |
| Data Compression (EXI) | 🗹 | 🗹 | 🗹 |  |
| Digital Signature for Authentication | 🗹 | 🗹 | 🗹 |  |
| Encryption for Privacy, Access Control | 🗹 | 🗹 | 🗹 |  |
| Layer or plating of physical material  (e.g. paint or coating) |  |  |  | External surface |
|  |  |  |  |  |
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TODO: 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>