



# TheoremXR

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## PRODUCT RELEASE ANNOUNCEMENT

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Product Category	<b>TheoremXR</b>
Product Group	All Associated Products
Release Version	Version 2023.2

Document Type	<b>Product Release Announcement</b>
Status	Released
Revision	2.0
Author	Product Manager
Issued	18-Jul-23



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## History

Revision	Update Information
1.0	Version 2023.2 Released
2.0	Updated link to Focus 3 Build

**Note!** Theorem versioning has changed from a syntax of “<Quarter release> <Year>” to “<Year> <Release Version>”. This is to allow for client / server compatibility checks at run time.



Product - Distribution Media

CD images of the latest release are available from the following download sites.

Product	URL for .msi installer and install package download
Visualization Pipeline	<a href="#">2023.2 (20230717)</a>
VR Client Support	<a href="#">V2023.2.4 – EXE</a> <a href="#">V2023.2.4 - Installer</a>
Quest 2 Untethered Support	<a href="#">V2023.2</a>
Focus 3 Untethered Support	<a href="#">V2023.2</a>
Desktop Experience Support	<a href="#">V2023.2.4 – EXE</a> <a href="#">V2023.2.4 - Installer</a>
HoloLens 2 Support	<a href="#">V2023.2</a>
AR Android Client Support	<a href="#">V2023.2 – APK</a> <a href="#">V2023.2 - Google Play Store</a>
AR Apple Client Support	<a href="#">V2023.2 – App Store</a>

**Note!** Flex Version 11.19 is required for this release it can be found [here](#). A new license will be required once flex 11.19 has been installed.

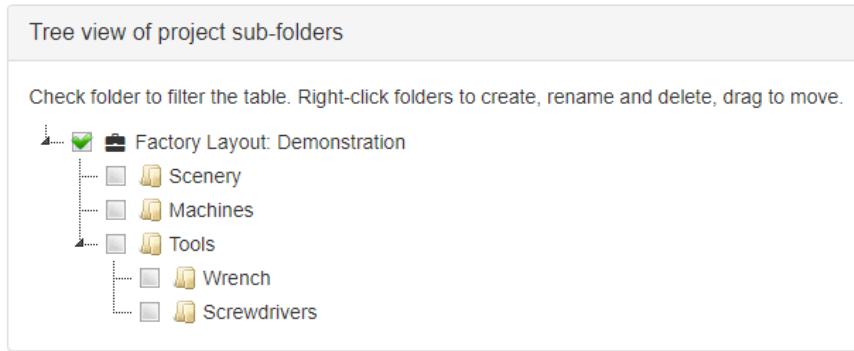
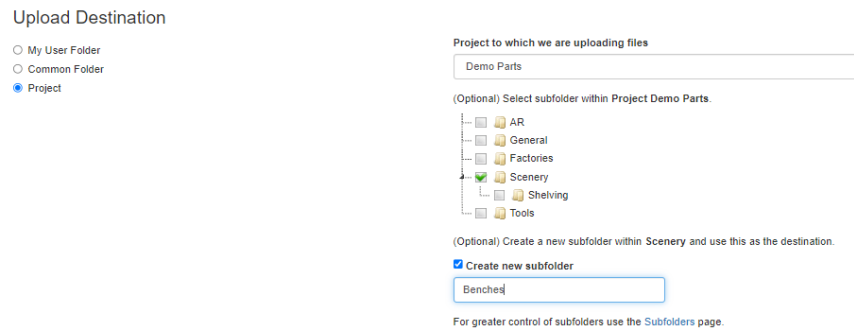
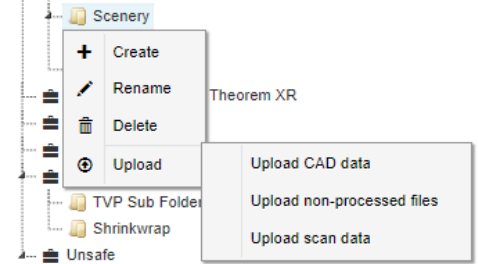


## TheoremXR Online Documentation

Click to review the [User Guide](#)

### New Features / Enhancements

The following new features or enhancements have been introduced with this release.

Ref ID	New Feature / Enhancement Description
<b>TheoremXR Visualization Pipeline (TVP)</b>	<ul style="list-style-type: none"><li>• Multi-Level Project Structure (REQ-551, REQ-432)<ul style="list-style-type: none"><li>○ Allows the creation of multiple nested projects within each other, these can be created on the project models page and selecting an already made project.</li></ul></li></ul>
	 <p>Tree view of project sub-folders</p> <p>Check folder to filter the table. Right-click folders to create, rename and delete, drag to move.</p>
	<ul style="list-style-type: none"><li>○ Sub-folders can now be made on the upload page.</li></ul>
	 <p>Upload Destination</p> <p>Project to which we are uploading files</p>
	<ul style="list-style-type: none"><li>○ Access to the data upload pages now exists on the sub-folder page.</li></ul>
	



- Enhanced 3D Slicing (REQ-576)
  - JTs can now be grouped together before slicing, allowing for multiple assemblies to be sliced together rather than separately. A TDP must be composed with an appropriate slice file to also be sliced.

**Combine JTs**  
Combine all JTs contained in the TDP upload to produce a single model file.

Combine JTs.

- Command File Creation (REQ-536)
  - Command files can be created on the TVP after uploading a model. Once uploaded the product structure is extracted and can be selected to allow a user to apply further specified optimization options on desired parts.

**Create Command File**  
Create a command file containing optimizations that can be applied to either the whole model or specific parts of the product structure.

Displaying structure for: Engine3

- connector
- 4\_wire\_connector
- cable\_04
- cable\_03
- wire\_brace
- cable\_02
- cable\_01
- connector\_unit\_4\_wire
- connector\_wire\_04
- connector\_wire\_03
- connector\_wire\_02
- connector\_wire\_01
- connector\_6.75
- connector\_6.75
- spark\_plug\_cable\_04
- spark\_plug\_cable\_03
- spark\_plug\_cable\_02
- spark\_plug\_cable\_01
- spark\_plug\_starter
- spark\_plug\_starter
- spark\_plug\_starter


Available optimizations

Showing 1 to 5 of 32 rows 5 rows per page

Optimization Name	Description	Value Required	Target	Add
COLLAPSE_LEVEL	Collapse assembly structure to the specified level.	int	Global	+ Add
COLLAPSE_TOP	Collapse assembly structure to the top level.		Global	+ Add
COMBINE_PART	If there are multiple faceted solids in a node of an assembly they can be combined into a single Fsol.		Single Part	+ Add
DECIMATE	Attempt to reduce the total number of triangles in a faceted solid to a percentage of the original number.	float	Single Part	+ Add
DECIMATE_TOL	Reduce the total number of triangles in a faceted tolerance such that the accuracy of the model doesn't worsen by more than the specified tolerance.	float	Single Part	+ Add

Showing 1 to 5 of 32 rows 5 rows per page

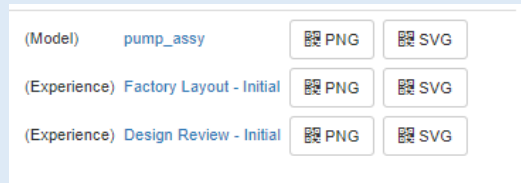
- Random Password generation for All Users (REQ-657)
  - Existing users can now be given random passwords.
- Job Status Enhancements: Cancelled Jobs (REQ-508)
  - A new indicator is given for cancelled jobs.



**Job was cancelled**



- Job Scheduler Enhancements (REQ-379)
  - The Job Scheduler has been improved to include more flexible daily timing (15 minute timings), increase the number of times a job can run per day, the ability to run a job ad-hoc using a new 'trigger' button and retain a user defined number of previous output files.
- Deep-link Generation (REQ-779)
  - To support the new Theorem AR Deep-linking feature, each model / experience now produces a link. These links can be pressed on a mobile device which will load it straight into the application (if installed).
  - These links can be copied and applied to QR codes for a scan and load functionality.



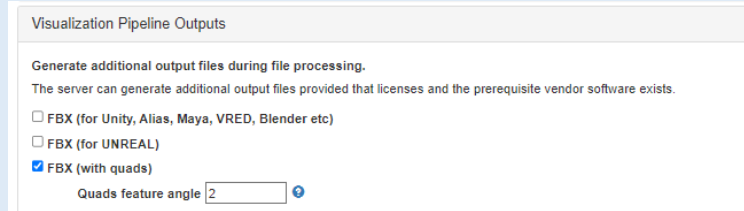
- To enable this feature the web.config must be changed to true under:
 

```
<add key="ShowDeepLinkUrls" value="true" />
```
- If any help is required discuss with your account representative to activate on your TVP.
- Map Active Directory (AD) Groups to TVP User Roles (REQ-425)
  - User groups on active directory can now be mapped to TVP roles to allow for synchronous access control across AD and TVP.
  - If user groups have different names on AD, they can be adjusted in the web.config at Value="enter your group name here"
  - If any help is required discuss with your account representative to activate on your TVP.

```
<add key="OidcProvider_UpdateUserRolesFromClaims" value="true" />
<add key="OidcProvider_UserGroupForRole_Admin" value="TVP_Admin" />
<add key="OidcProvider_UserGroupForRole_LicenceCutter" value="TVP_LicenceCutter" />
<add key="OidcProvider_UserGroupForRole_CadFileUploader" value="TVP_Uploader" />
<add key="OidcProvider_UserGroupForRole_MetadataUploader" value="TVP_MetadataUploader" />
<add key="OidcProvider_UserGroupForRole_RemoteExpert" value="TVP_RemoteExpert" />
<add key="OidcProvider_UserGroupForRole_ProgramManager" value="TVP_ProgramManager" />
<add key="OidcProvider_UserGroupForRole_LibraryUploader" value="TVP_LibraryUploader" />
```



- Default Value for Quad settings (REQ-519)
  - When outputting FBX (with quads) default values recommended values are now applied



- TVP lockout on failed login (REQ-649)
  - Upon multiple failed entries of login details accounts will now be locked out for a defined number of minutes. An admin can unlock accounts by request.
  - The criteria for an account being locked out can be modified in the web.config under:
 

```
<!-- User lockout -->
<add key="DefaultAccountLockoutMinutes" value="15" />
<add key="MaxFailedAccessAttemptsBeforeLockout" value="5" />
```
  - If any help is required discuss with your account representative to activate on your TVP.

Locked out  
 This account has been locked out, please try again later.

- New Role for editing model properties (REQ-811)
  - Properties can alter how a model is viewed in the client application. A new role has been made that allows users to specifically edit these properties.





- Top-Level Extraction (REQ-381)
  - If an assembly is made of multiple top levels these can now be extracted to create individual model files.
  - Once processed a new experience will be made that combines all of the models to create a combined layout. This layout will allow all components to be moved around without having to add them after experience creation.
  - A global rotation can be applied at the upload step to rotate the entire assembly on an axis.


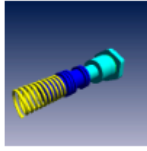

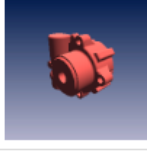

**Extract top level assemblies**  
 Extracts top level assemblies from the source data into separate model files. A 'Production Layout' experience is made to recreate the original data.  
 The 'Axis Rotation' option is necessary to use this, else the production layout experience will have incorrectly rotated components.

Extract top level assemblies

**Axis rotation**  
 Rotate the assembly. The assembly is rotated clockwise on the z-axis, x-axis and then the y-axis by the values specified (Euler angles in degrees for a left-hand coordinate system).

Apply axis rotation

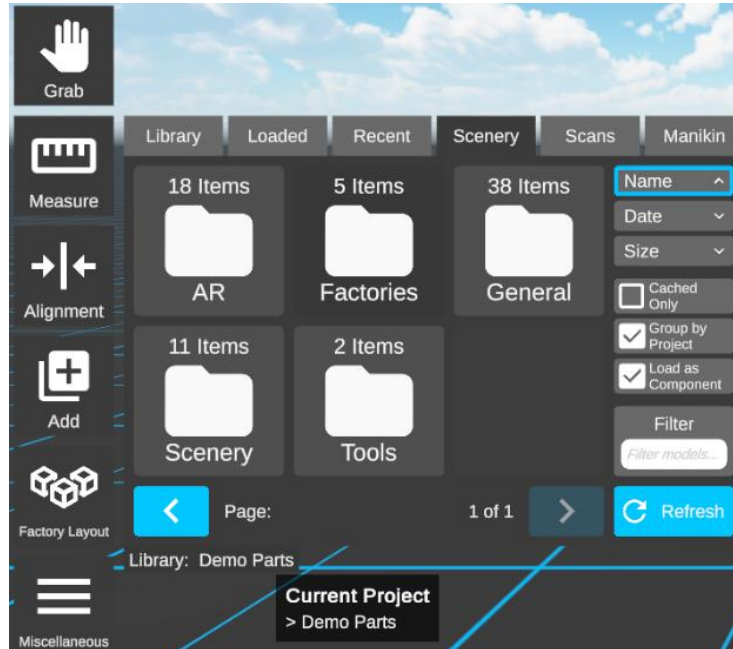
X axis  Y axis  Z axis

<input type="checkbox"/>	Name	Image	File Size	Modified Date
<input type="checkbox"/>	pump_assy		1 Kb	Thursday, 13 July 2023 at 15:56:10 British Summer Time
<input type="checkbox"/>	valve_assy		4245 Kb	Thursday, 13 July 2023 at 15:55:12 British Summer Time
<input type="checkbox"/>	TS-007-DPX		41 Kb	Thursday, 13 July 2023 at 15:55:07 British Summer Time
<input type="checkbox"/>	TS-005-HNG		3885 Kb	Thursday, 13 July 2023 at 15:55:06 British Summer Time
<input type="checkbox"/>	TS-004-SLV		371 Kb	Thursday, 13 July 2023 at 15:55:01 British Summer Time

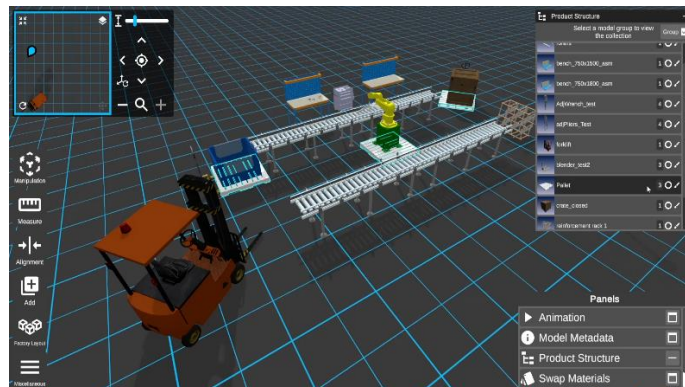


**TheoremXR  
for VR and  
Desktop**

- Multi-Level Project Structure (REQ-432)
  - Support for TVPs multi-level projects, models are separated into their sub projects for clarity and better organisation.



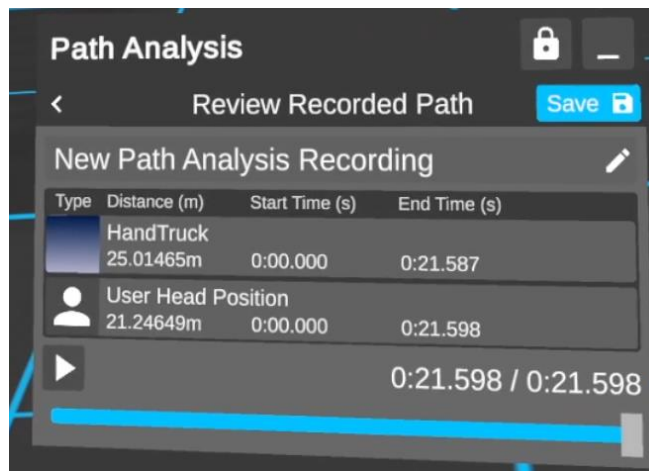
- BOM Display (REQ-551)
  - A high-level view of all components in a layout is now accessible from the Product Structure View, it lists the amounts of each component. All the same components can be highlighted so they are all viewable in a layout from a glance.
  - Any outline changes can be seen in collaboration sessions.



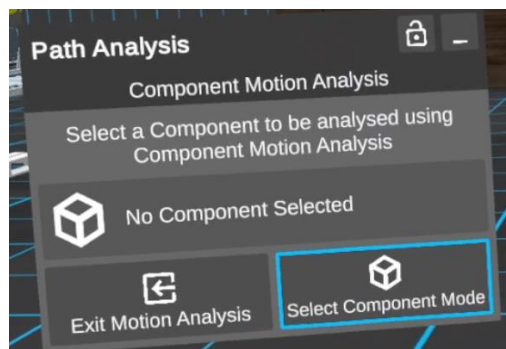
- Full Screen mode (REQ-662)
  - Makes the application full screen upon pressing 'alt + Enter'.



- Path Analysis Tool (REQ-551)
  - Paths can be recorded to track distance over time for a specific task.
  - Breadcrumbs are recorded to show playback of both the user and the component(s).
  - Movement can be replayed to show the progress over time in context.
  - Multiple paths can be reviewed to find the optimum route for specific models.



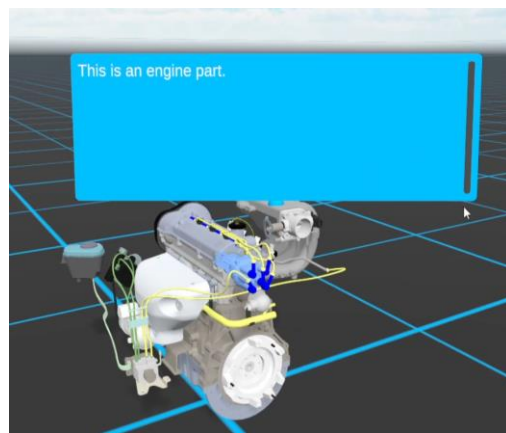
- An avatar and controller outline are displayed when reviewing a path.
- Component Manipulation Analysis Mode (REQ-551)
  - Allows a user to evaluate the motion required to move a component from its real-life starting location to its desired location.
  - Components can be set at their target position then moved to their current position. When ready Path Analysis can be recorded to analyse how long a component can get into the desired location.



- Multiple Models can be selected for Component Manipulation Analysis Mode.



- Sticky Note Comment Support (REQ-551)
  - Quick comments can now be placed around the model like sticky notes.
  - These comments only support text and are a viewable alternative to the comments panel.
  - To create a comment there is a sticky note toggle in the comments panel, once activated a pin may be placed where the comment should go. All users in the session can see the comments but each user can place the comment where they want. A line connects the comment to the origin point.



- Proximity Grab (REQ-551)
  - Moving models can now be done via a proximity tool. This tool gives a natural way to grab and move models around a layout.
  - Under the grab menu there are two options, one for the default laser tool and one for proximity mode. When in proximity mode a translucent globe will appear on the hand which shows the range at which grab is operable. Both free grab and normal grab both function while in this mode.



- Extendable World Bounds (REQ-668)
  - Large data is no longer confined to our maximum world bounds, if a model is too large custom bound limits are available using the TVP application preference CustomMaxBounds. If a value above 1500 (our previous limit) is entered the world bounds will scale to that limit. Value applied is in meters.
  - If any help is required discuss with your account representative.

Client Application Preferences

View and edit the client application settings per device type.

Custom

Showing 1 to 1 of 1 rows

<input type="checkbox"/>	Client Type	Name	Value	Description
<input type="checkbox"/>	Any	CustomMaxBounds	3200	-

Showing 1 to 1 of 1 rows

- Group Experiences by project (REQ-609)
  - Experience view in the model listing panel can now be sorted via projects.

TheoremXR for AR

- Multi-Level Project Structure (REQ-704)
  - Support for multi-level project structures.
- Improved Measurements Labels (XR-1292)
  - Measurement labels can now be moved around for better viewing angles.
- Slicing Support (REQ-687)
  - There is now support for loading sliced experiences in AR. This is a port from Desktop and VR.
  - To make slice experiences a SliceFile.csv must be uploaded with the model either within a TDP or on the upload page.

**Slice File**

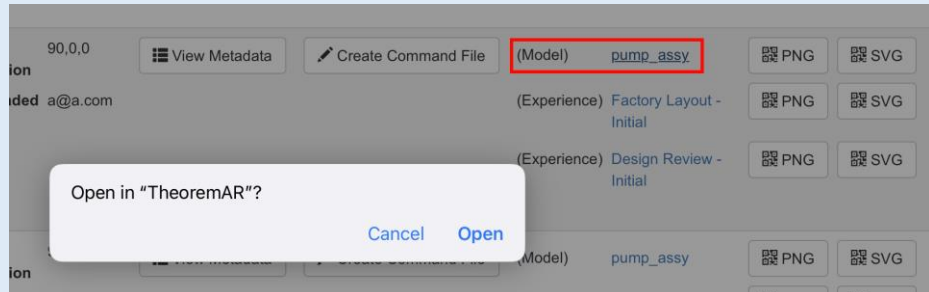
A slice file is a collection of named bounding boxes in CSV file format. Uploaded data is sliced into multiple outputs based on the geometry that is contained within each bounding box. The final model contains the geometry that is not contained in any of the slice file bounding boxes. The bounding boxes defined in the slice file should not intersect. The slice file can be provided in the field below or contained within the TDP upload when named 'SliceFile.csv'. An example file can be downloaded [here](#).

Upload slice file

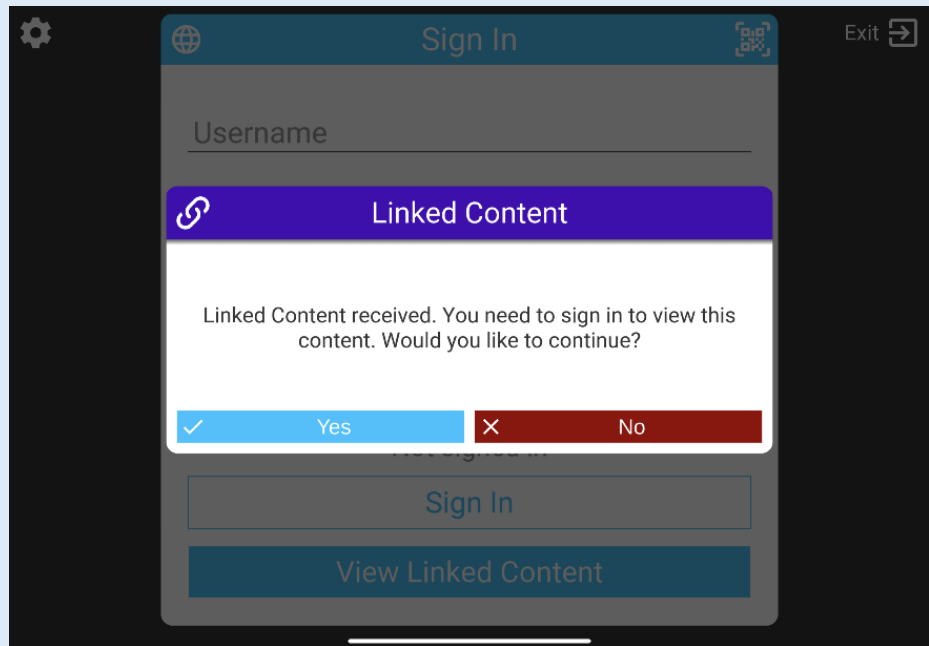
No file chosen



- Loading models via URL requests (Deep-linking) (REQ-269)
  - Models can be loaded via URLs that are generated on the TVP.



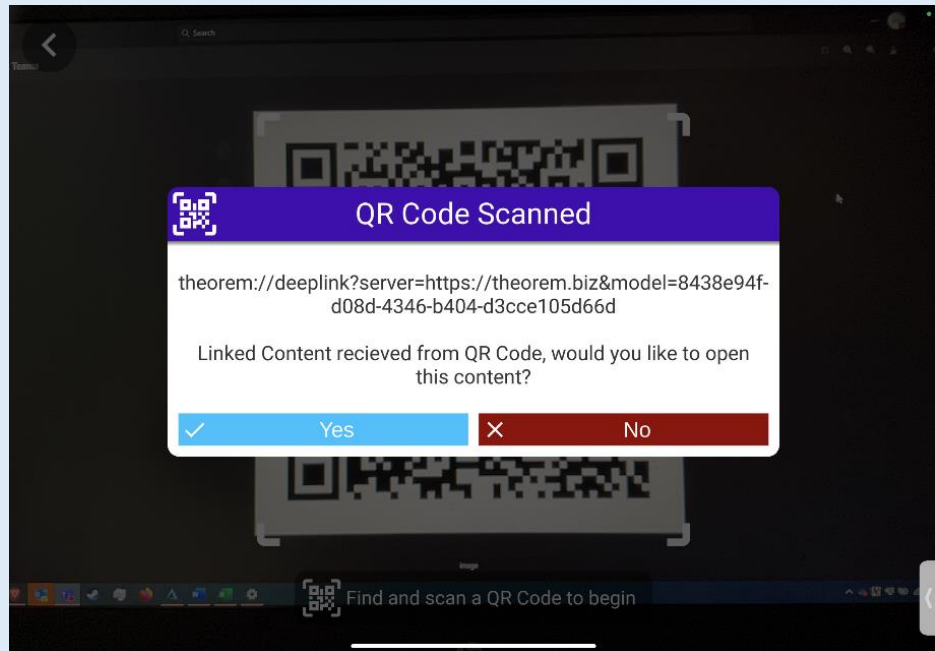
- Selecting one of these links will attempt to log the user into the TVP assigned to the model. Once logged in the model will be presented with the appropriate experience selected. A visualization mode can now be selected to view the model.



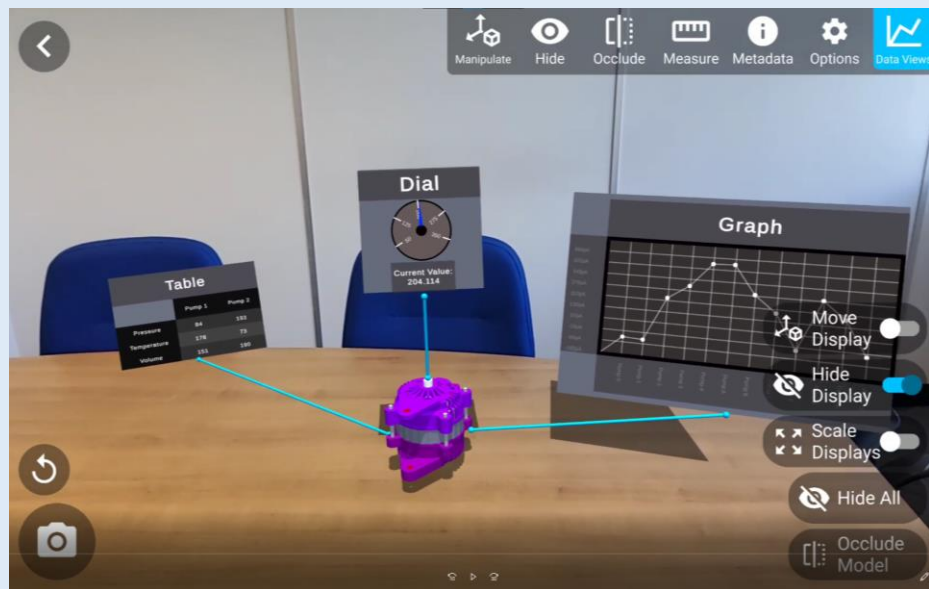
- The links are enabled in the web.config:  
`<add key="ShowDeepLinkUrls" value="true" />`
- If any help is required discuss with your account representative to activate on your TVP.



- QR Code interpretation (REQ-739)
  - QR Codes that have been encoded with Theorem Deep-Links can be read within the application.
  - The QR Codes can be found on the model listing page.



- IOT Data Display – Beta (REQ-189)
  - Data for specific parts can now be displayed in data views. These views can be manipulated and hidden depending on what is needed. Data for these views may be populated via the client’s needs.

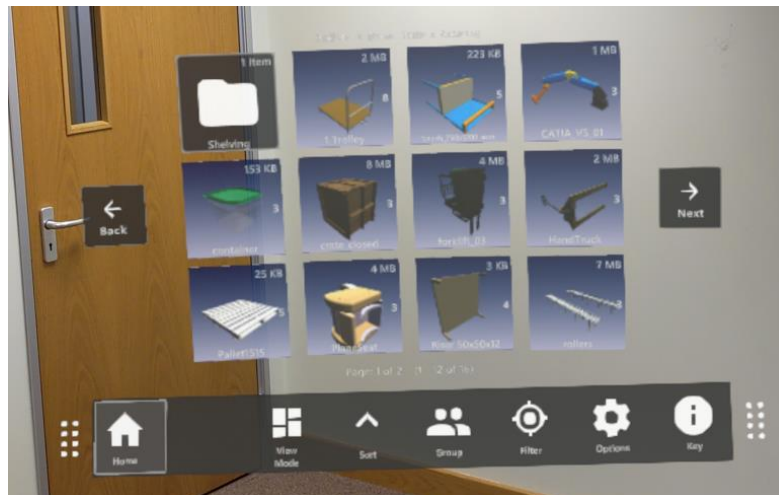


**HoloLens 2 Support**

- Slicing Support (REQ-356)
  - There is now support for loading sliced experiences in MR.
- Cache Management (RP-109)
  - Cache can now be individually deleted from both the model listing page and the settings panel.

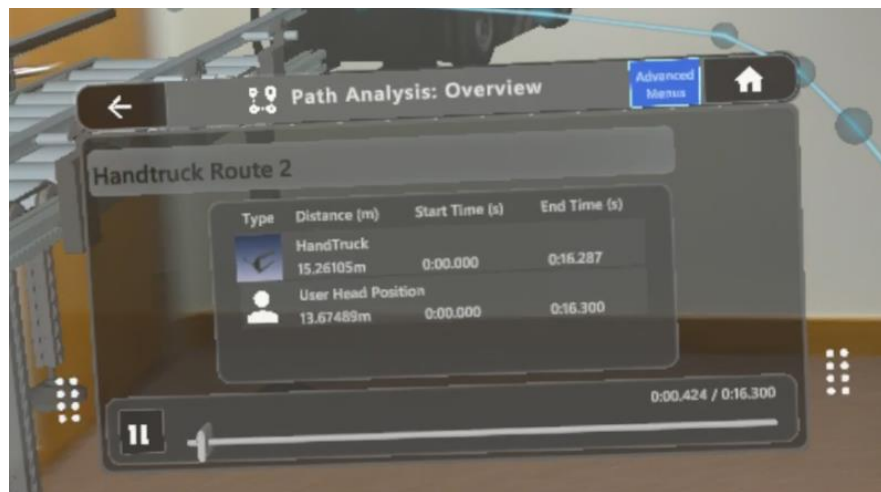


- Active Directory logout support (REQ-548)
  - A user can now fully logout of their AD Session. This allows another user to login to the application using AD.
- ADFS Integration (REQ-741)
  - Active Directory login now fully supports ADFS and Azure AD login methods.
- Multi-Level Project Structure (REQ-433)
  - Support for Multi-Level Projects Structures.





- Path Analysis Tool (RP-124, 147)
  - Paths can be recorded to track distance over time for a specific task.
  - Breadcrumbs are recorded to show playback of both the user and the component(s).
  - Movement can be replayed to show the progress over time in context.
  - Multiple paths can be reviewed to find the optimum route for specific models.



- An avatar and hand outline are displayed when reviewing a path.
- Component Manipulation Analysis Tool (RP-148, 125)
  - Allows a user to evaluate the motion required to move a component from its real-life starting location to its desired location.
  - Components can be set at their target position then moved to their current position. When ready Path Analysis can be recorded to analyse how long a component can get into the desired location.
  - Multiple Models can be selected for Component Manipulation Analysis Mode.
- App Launch Config (REQ-375)
  - A predefined config may be uploaded to the HL2 device which allows the app to launch with predefined servers or settings.
  - When many devices are used within an organisation this may be used to pre-input server listings or recommended visualisation settings ready for the application to utilise.



- Component Manipulation Analysis Mode (REQ-551)
  - Allows a user to evaluate the motion required to move a component from its real-life starting location to its desired location.
  - Components can be set at their target position then moved to their current position. When ready Path Analysis can be recorded to analyse how long a component can get into the desired location.
  - Multiple Models can be selected for Component Manipulation Analysis Mode.
- Path Analysis Tool (REQ-551)
  - Paths can be recorded to track distance over time for a specific task.
  - Breadcrumbs are recorded to show playback of both the user and the component(s).
  - Movement can be replayed to show the progress over time in context.
  - Multiple paths can be reviewed to find the optimum route for specific models.

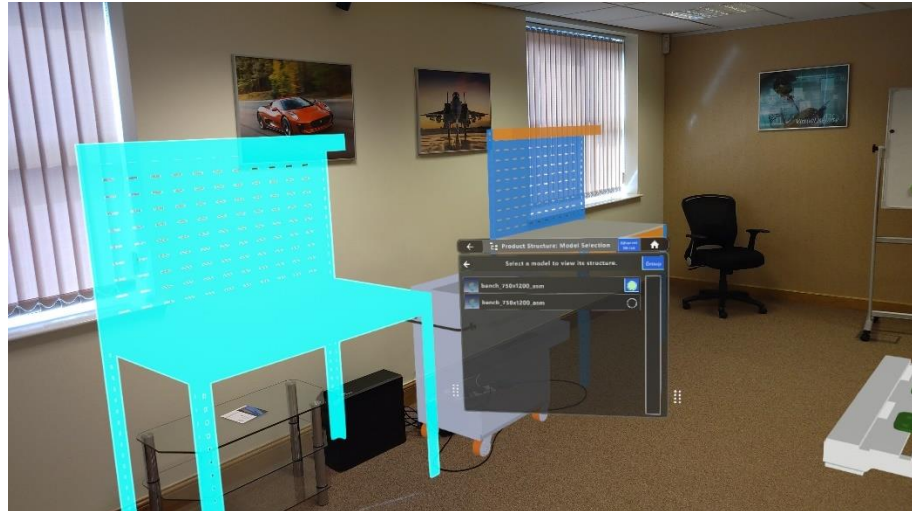


- PMI Support (RP-97)
  - PMI is viewable within our experiences. This must be uploaded with the TVP option ReadPmi
- Experience View Support (RP-91)
  - The model listing panel may now be restricted to only show experiences.



- BOM Display (REQ-551)

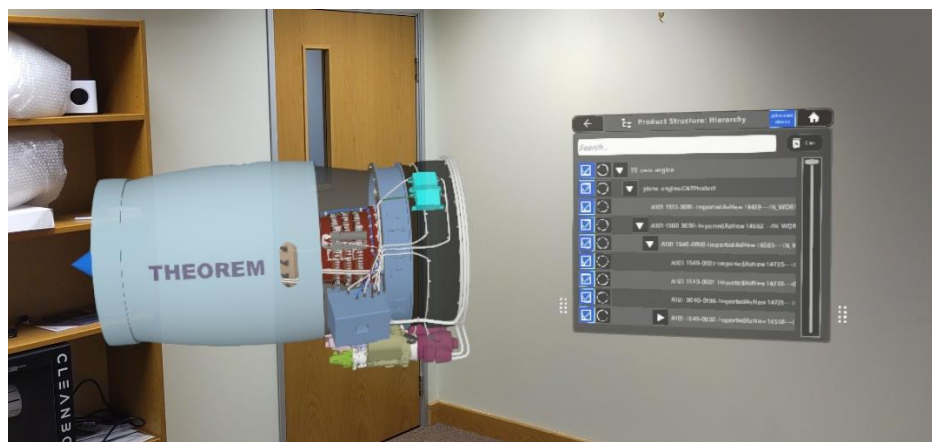
- A high-level view of all components in a layout is now accessible from the Product Structure View, it lists the amounts of each component. All the same components can be highlighted so they are all viewable in a layout from a glance.



- Any outline changes can be seen in collaboration sessions.

- Product Structure Viewer (REQ-699)

- Lists the full assembly structure for the loaded models. It is possible to highlight specific parts to identify what to review. The list can be filtered using the search bar across the top. Certain structures can be expanded or collapse based on what is needed.
- Any outline changes can be seen in collaboration sessions.



## Bug Fixes

Ref ID	Limitations and Restrictions
REQ-740	Fixed an issue where AD registration would not enable a new account.
REQ-741	Changed from Web app to allow a public client on Active Directory. This was restricting the login for HL2 devices.
REQ-784	Thumbnail Generator Access Permissions  A change in permissions was causing the thumbnail generator to fail which has been fixed.
TH-338	TVP Server Fails to upload file when Command File has been modified.  If a command file has been edited while attempting to upload multiple jobs it would cause an upload error. This has been fixed so that newly edited files do not cause this error.
REQ-272	Metadata information not showing with part instance names.  When uploading parts with duplicate names received a appended instance name. These new instance names would cause issues with metadata which has been resolved.
TH-319	TVP Services Stopping  There was instability in services required for the TVP stopping. TVP installation now sets checks and triggers to help with instability of TVP services.
REQ-381	Top-Level Extraction Placement Issues  When supplying a per part rotation degree each model placed in the top-level extraction experience was placed incorrectly.  This has been resolved with a global rotation toggle when uploading a top-level extracted model.
REQ-631	Shrinkwrap Optimisation Timing Out on Assembly  Fixed an issue where shrinkwrap could time out on operation.
REQ-720	Increase Timeout length in Client Applications  With large model listing panels the time to download a process them would cause a timeout. This has been adjusted to allow for a longer timeout length.



## Known Limitations and Restrictions

The following limitations and restrictions have been identified during final testing prior to release and will be resolved for a future lock-down:

Ref ID	Limitations and Restrictions
QA-275	Colour Picker not accurate in HL2 tools.
QA-449	Component Manipulation Analysis highlight overlaps manipulation handles.
QA-460	After a long session in IOS AR viewer the app can be unstable due to multi-threaded rendering.
QA-466	Image tracked models have their heigh reset when scaling the model.
QA-424	Indicator for a locked component doesn't show if highlighting another model in the group
QA-421	No support for Focus 3 tooltips
QA-484	Using Deep-Linking within AR will allow the user to skip through to attempt to load an image tracking experience. If the user doesn't have a VDT License, the experience will not load.

