



PRODUCT RELEASE ANNOUNCEMENT

Product Category	Theorem-XR
Product Group	All Associated Products
Release Version	Version Q1 2022

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Contents

History	2
Product Codes	2
Product - Distribution Media	3
New Features / Enhancements	4
Known Limitations and Restrictions	15



History

Revision	Update Information
1.0	Version Q1 2022 Release

Note! During 2021 Theorem-XR products have transitioned from a customer focused release cycle to a quarterly release cycle. Version 44.0 was the last customer focused release. The full history of the Theorem-XR Release Notes (formally Digital Realities) is now archived. Going forward, customers will submit their requirement requests via their Theorem Account representative. These will then be considered for inclusion in a future release.

Product Codes

Product Code	Product Description
XRVP-L-U1	Theorem-XR Visualization Pipeline (AKA Theorem Experience Server)
XR-VIZ-CA	Theorem-XR Visualization Experience
XRDES-CA	Theorem-XR Design Review Experience
XRFLA-CA	Theorem-XR Factory Layout Experience
XRG-AU-CA	Theorem-XR Guides Authoring Experience
XRGOP-CA	Theorem-XR Guides Operator Experience
XRREV-DV	Desktop Experience - Visualization
XRREV-DR	Desktop Experience - Design Review
XRREV-FL	Desktop Experience - Factory Layout
XRREV-GA	Desktop Experience - Guides Authoring
XRREV-GO	Desktop Experience - Guides Operator
XRARR-CA	Theorem-XR ARR Experience



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	V20220314 - Download
VR Client Support	V2022.1.2 - Download
Quest 2 Untethered Support	V2022.1.2 - Download
Desktop Experience Support	V2022.1.2 - Download
HoloLens 2 Support	V2022.2.5 - Download
AR Android Client Support	V2021.12.1 - Download
AR Windows Client Support	V2021.12.1 - Download
AR Apple Client Support	V2021.12.1 - <i>App Store</i>



New Features / Enhancements

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

Ref ID	New Feature / Enhancement Description
<p>Theorem-XR Visualization Pipeline (TVP)</p>	<p>V20220314 – TheoremVisualizationPipeline_Q1-2022.zip</p> <ul style="list-style-type: none"> <p>• Invalid Binary Files Generated (XR-758)</p> <ul style="list-style-type: none"> ○ Ability to set the root assembly name within VWR_DR (to support ARR) allowed for a naming collision in BIN file, making it invalid and unreadable and the exe to crash when counting the triangles after. This has been resolved <p>• GLTF - output binary format GLB from TVP (XR-757)</p> <ul style="list-style-type: none"> ○ By default when a user selects to output from GLTF from TVP a user will be given a .GLTF file. This has been enhanced to also allow a user to export the binary GLTF format .GLB. <div data-bbox="651 929 946 1010" style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <input checked="" type="checkbox"/> GLTF <input checked="" type="checkbox"/> Export as .GLB </div> <p>• UploadTdpToServer Exe – Error Not Found (XR-746)</p> <ul style="list-style-type: none"> ○ When the utility used chunked uploads, it wasn't sending the projectId. Updated exe resolves this issue <p>• Offline Licensing Support (XR-731)</p> <ul style="list-style-type: none"> ○ Pipeline has been enhanced so that clients can request to loan out licenses from the server for a fixed period. This allows users without network access to continue to use their client experiences and cached models. <p>• Shrinkwrap: Sliver Face Exemption (XR-679, XR-651)</p> <ul style="list-style-type: none"> ○ Added support for a switchable call that allows Sliver faces to be exempt from Shrinkwrapping. This will be determined by mesh volume. This is in support for the Per face meshing system. The following option has been added to the 'ShrinkWrapping' optimization menu <div data-bbox="651 1783 1310 1989" style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p>Keep Small Solids If enabled keep solids that have a volume less than the threshold even if they would otherwise not be deemed visible under the other settings.</p> <p><input type="checkbox"/> Set small solid volume threshold (mm³)</p> <div style="border: 1px solid #ccc; padding: 2px; width: 100px; margin-top: 5px;">5</div> </div>



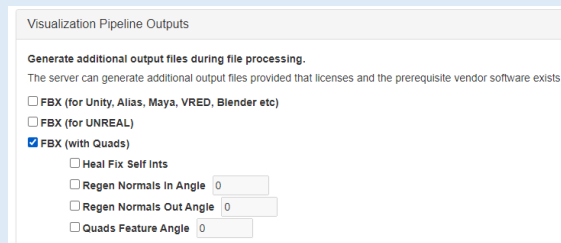
To enable, select the tick box shown and define the volume value of faces you wish to omit from shrink wrapping.

- **CATIA V5 Independent read support (XR-632)**

- Enhanced the processing script to allow Theorem’s V5i (CATIA Independent) translators to be used in conjunction with TVP.

- **Quads input menu (XR-603)**

- Enabling quads was previously only possible using the options string box. Menu options have been added to “Visualization Pipeline Outputs” to aid this usage:



- **Revit read support (XR-599)**

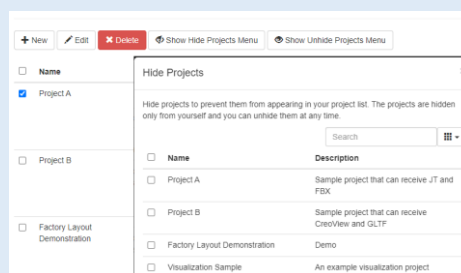
- Support for both interactive upload (from within Revit) and direct upload (Drag & Drop) on to TVP of Revit files.

- **User License Allocation (XR-553)**

- When allocating licenses there are now a higher number of available features a user can be allocated. Previously, if the number of features went over two pages. The max a user could pick is the first 10. It didn’t remember selection when navigating between 2 pages. This has been amended so a user can now pick all licenses required.

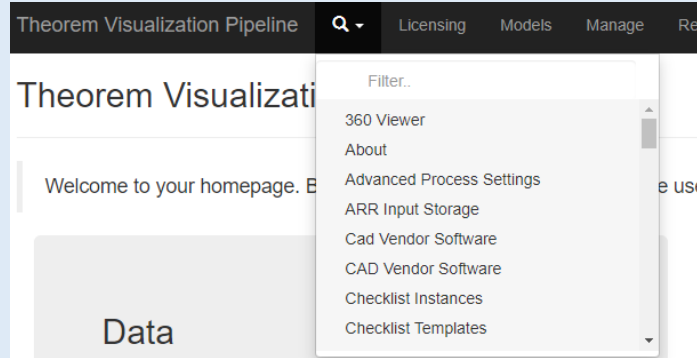
- **Archive or Disable projects (XR-549)**

- A method to allow a user to hide the projects which are visible to them in application has been included:



- **TVP Search bar (XR 544)**

- Search functionality has been included on the server homepage. This now allows a user to search for pages required.

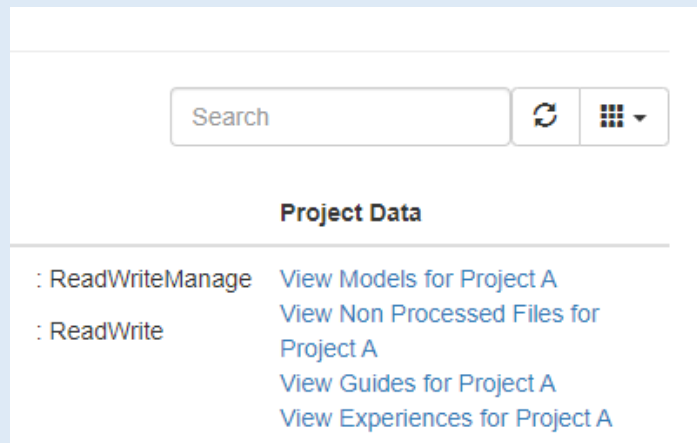


- **Optimization : Shrinkwrap, Collapse & Combine (XR-532)**

- When using the specified options together, the model now correctly removes internal components that have been grouped with some external facing ones.

- **Project Data Consolidation (XR-87)**

- The “Project Data” pages have been updated to allow users to now access all associated data to a project from one page. Experiences, Non Processed data and Guides for any project can be viewed from the Projects page.



- **Credentials Manager - UploadTdpToServer**

- Resolved issue where using UploadTdpToServer utility reported “unhandled exception” when using log in credentials stored in Windows Credentials Manager



<p>Theorem-XR for VR</p> <p>&</p> <p>Theorem-XR for Desktop</p>	<p>V2022.1.2 - TheoremDesktop_Q1-2022.zip V2022.1.2 – TheoremVR_Q1-2022.zip V2022.1.2 – TheoremVR_Quest_Q1-2022.zip</p> <ul style="list-style-type: none"> ● Guides – Training Level Enhancements (XR-112 , XR-783) <ul style="list-style-type: none"> ○ Guides capability has been enhanced to allow a user to define success criteria for individual tasks, any failures will be documented and on completion of a training guide a user will be informed of the completion success level. ● Recording Checklist Comments (XR-782) <ul style="list-style-type: none"> ○ Checklist comment record buttons (Video, Image etc.) now auto-launch the comment panel on selection, this improves the user experience. ● Theorem-XR for Desktop : Panel Management System (XR-780) <ul style="list-style-type: none"> ○ Implemented a more scalable and modular panel system for the desktop application, with a view to improving general user experience when using feature panels. ● Factory Layout: Base Transitioning (XR-779) <ul style="list-style-type: none"> ○ Added fix for transition clipping logic in the event of base factory layout scenery, some models were observed to be invisible due to not being included within the transition clipping collision logic. This is resolved ● Snapshots – Access With User Based Licensing (XR-775) <ul style="list-style-type: none"> ○ Enhanced user based licensing so snapshots experience can be used. ● Vive Focus 3 – Audio Support (XR-738) <ul style="list-style-type: none"> ○ At previous release there was a known issue with the Focus 3 hardware accessing the device microphone. HTC have updated the Vive Business Streaming to version (1.05.0 BETA). Taking advantage of this the device’s microphone and speakers are supported ● Offline Licensing Support (XR-730, XR-710) <ul style="list-style-type: none"> ○ Added logic to allow a user to specify licenses to take offline, this is currently handled via a UI panel within the Web Service Panel on the Startup Scene. The user must first have checked out the license type that they wish to take
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offline, so if a user has not already checked out a license that they wish to take offline, such as “Visualization”, then the behaviour will automatically attempt to check out a license of type “Visualization”. The licenses that a given user can opt to take offline is based on what licenses the user has available to them. Licenses have a fixed duration of 7 days from check out.

This is currently limited to Visualization, Factory Layout and Design Review

On reconnecting to a server a user will be prompted whether to:

- Retain their current checked out licenses
- Extend their current checked out licenses
- Return their current checked out licenses

- **Object Rotation – Drop to Floor (XR-720)**

- After rotating an item and dropping the item to the floor with the move tool, the point at which it calculates where to drop the model was not correct. Application has been updated to drop the model to the lowest point.

- **Reviewing Control Operations (XR-719, XR-711)**

- General improvement into pointer trigger systems resolving contest between old and new style interaction systems. Code has been updated to ensure that left click / right trigger selection does not cause competition between features.

- **Measurements - Snapping to world bounds (XR-717)**

- Grid Scene floor is now excluded from vertex snapping to aid applying user measurements.

- **Application Mirroring (XR-712)**

- Improved application mirroring feature to ensure applications are launched at a useable correct scale.

- **Guides – QA Enhancements (XR-704 – 709)**



	<ul style="list-style-type: none"> ○ A number of minor issues noted during QA are resolved, including Auto-Mover usage, task description, highlighting models and model outlines. ● Vive Focus 3 : Guardian Bounds outside the lobby (XR-695) <ul style="list-style-type: none"> ○ Fixed an issue where custom defined play bounds in VR would spawn the user outside of the world bounds. ● Default Model Shader Settings (XR-585) <ul style="list-style-type: none"> ○ The Medium quality setting was noticeably darker in the World scenes. This quality level has been amended so that it now has brighter lighting, but still utilises shadows. ● Guides – Auto Playback (XR-343) <ul style="list-style-type: none"> ○ Allow a user to replay a guide and watch the actions complete automatically. Each step plays itself, whether that be moving items or using tools. ● Guides – Ad-Hoc Operator Feedback (XR-114) <ul style="list-style-type: none"> ○ This mechanism will allow a user to add a comment about a specific step in the Training Guide
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<p>Theorem-XR for AR</p>	<p><i>V2021.12.1 - TheoremAR_Android_Q1-2022.zip</i> <i>V2021.12.1 - TheoremAR_Windows_Q1-2022.zip</i> <i>V2021.12.1 – Apple – App Store</i></p> <ul style="list-style-type: none"> ● New offline licensing updates (XR-622) <ul style="list-style-type: none"> ○ Updated each app to ensure that the new changes included in TVP for offline license working allows users to still use the tablet applications
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<p>HoloLens 2 Support</p>	<p>V2022.2.5 - TheoremHL2_Q1-2022.zip</p> <ul style="list-style-type: none"> • ARR <ul style="list-style-type: none"> ○ XR-649 – Collaboration in ARR ○ Added ARR Panel switch on/off toggle to prevent accidental use of ARR when not required ○ Home Panel ARR: When returning from SU/Collaboration, set ARR 'Session Stop' text if session is running. ○ Layout ARR: Load Models with ARR data from ARR remote server if ARR is active. ○ ARR: On sign in, a check is made to see if the ARR feature is available. ○ ARR: When a session is started (either manually or triggered by a load request) a license is checked out. ○ ARR: After loading a large model, process its entities in the background (previously could freeze for several seconds) ○ ARR: Handle single-mesh ARR models ○ ARR: Fixed issue with Explode ○ ARR: prevent session stop while connecting ○ ARR Swap Material: set CADLayer (to allow other functionality to operate, such as measurements to attach) ○ ARR: Calculate bounds for added nodes to obtain correct grab boxes. ○ ARR: Debug panel shows ARR connection host IP/name. ○ ARR active state: if start in off state, don't enable ARR. ○ Layouts ARR: added components now use the defined orientation ○ Layouts ARR: added components with ARR toggle off now load as non-ARR models ○ Layouts ARR: loaded components use saved orientation/position. ○ Layout: copied ARR components are now pasted as ARR ○ ARR: Detect high polygon count when adding components using the standard server and show message if high. ○ ARR: handle models with scaled root entities ○ ARR: unloaded models have their materials reset to prevent a reload from inheriting them (possibly an ARR server bug?) ○ Layout: Store save layout info for ARR (fixes name and date issue) ○ Licensing: refined some handling around ARR licenses ○ Licenses: features now checked out for ARR loads, ○ Comments: Fixed issues with ARR components and implemented better highlighting. ○ Collaboration: initial implementation of ARR handling. ○ Layout: applied orientation to added ARR scenery ○ Comments: ARR pictures are flipped ○ Added new "Keep In View" UI for messages (used to show ARR limit warning) ○ ARR: Updated ARR Package from V1.06 to the most recent V1.034
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- ARR: Implemented new local reprojection mode (it is now more stable with a mix of local and remote content)
- Design Review: ARR - sync initial component positions and fix scale of root component position.
- ARR: Updated ARR Package from V1.06 to the most recent V1.034
- ARR: Implemented new local reprojection mode (it is now more stable with a mix of local and remote content)
- Design Review: ARR - sync initial component positions and fix scale of root component position.
- Layouts-ARR: Show ARR Load question in view (QA-33)
- Layouts-ARR: fixed issues when loading multiple models at the same time (QA-37)
- ARR: DR/Layouts: fixed issues with Undo/Redo (QA-45)
- DR: fixed sectioning of base scenery model with RE host (for ARR and local models) (QA-49)
- ARR: prevent ARR load if ARR is off
- Fixed issues with ARR sectioning (QA-51)
- ARR Sectioning: Added handling for sectioning components of scenery (QA-51).
- Reverted previous change to flip picture comments for ARR (QA-23)
- ARR: handle availability state when switching servers (QA-52)
- ARR: sectioning grouped components now supported (QA-59)
- ARR Layout: Fixed issue with Manipulation Box size being incorrect on first use. (QA-111)
- ARR: Handle models with no structure (QA-115)
- ARR host sync issue (QA-38)
- ARR component measurements fixed scaling (QA-46)
- ARR Alignment boxes now positioned using bounds centre (QA-110)
- ARR measurements: fixed issue with joining a session that has measurements on ARR components.
- Changed collaborative bounds for ARR to make them axis-aligned
- Layouts Add as passive user - only load as ARR if ARR is connected (QA-184)
- Home panel: fixed Remote Rendering toggle becoming inactive on return from single user.

● **Collaboration**

- Collaboration: Changed Production Layout tile to Factory Layout
- Collaboration Pointer Pin: fixed for cm-scale models.
- Collaboration Comments: fixed review for the highlighted component.
- Collaboration Join/Open: modified Session Data to include creator and start time



- Collaboration Model Selection: fixed animation icon (was on tile, now in info panel)
- Collaboration: Fixed passive manipulation box interaction
- Collaboration: Added voice control
- Collaboration: Fixed Voice Control toggle.
- Collaboration: switch host while model selection is active now changes to the passive user menu
- Collaboration: create session now has timeouts to catch issues with the create process
- Collaboration: reset orientation when loading new model.
- Collaboration: leaving a session now handles exceptions.
- Collaboration: prevent host change in measurements and comments.

- **Factory Layout**

- Factory Layout: notify user of missing components on load
- Factory Layout: delete scenery now notifies other users and creates an Undo entry
- Factory Layout: handle error if load missing experience
- Layout: Use the base CAD file Id for Saves (fixes unreferenced save issue)
- Layout Add Component: fixed size of group project disabled blocking panel.
- Layouts/DR: Disassembled scenery is saved
- Layouts/DR: Hide scenery - reverted to base model only
- Layout: prevent two-handed scaling when scaling is not available (QA-61)
- Model Selection: now refreshes (via checksum) on start – fixes issue when saved layout is not updated
- Added new functionality to handle saved layout component ids
- Added new functionality to handle saved layout disassembled scenery
- Layout: Axis and Origin Show Model toggle now applies to all scenery models
- Add Component: fixed size of Group Projects toggle highlight panel.
- Add Component: implemented scenery project files refresh.
- Layout Add Component: added refresh option and made some minor refinements to buttons and panels

- **Design Review**

- Design Review: position initial scenery at the origin
- Design Review/Layout: close when save on exit after save message closed
- Design review: fixed handling of double-sided models
- Design Review: changed initialisation to fix issues with component instance creation.



- Design Review: fixed issue with bounds not encapsulating the base scenery model when joining a session in which the model has moved components and is currently in root manipulation mode
- Design Review: changed initialisation to fix issues with component instance creation.
- Design Review: fixed issue with bounds not encapsulating the base scenery model when joining a session in which the model has moved components and is currently in root manipulation mode
- DR: Save fixed position scaling (QA-48)
- DR: Changed ManipulationManager EncapsulateDesignReview to match changes in Theorem RE
- DR Sectioning: fixed scale issue with sectioning cut planes (QA-53)

● **Visualization**

- Visualization: Explode is now quicker to resolve overlapping meshes
- Visualization: Reset now resets to loaded transform (if the user joined a session late, this will use the position at the time of joining),
- Swap Materials: Fixed issues with reset and custom material add/delete.
- Visibility “ShowAll” has improved error checking and exception handling

● **General**

- Licensing: changed start-up to check for user-based licensing,
- Licensing: changed heartbeat to check out licenses if a delay was detected and to exit if a license cannot be obtained
- Implemented Offline licensing
- Offline licenses: added Snapshot (Guide Operator) license
- Tooltips: better dynamic scaling and positioning with distance
- PDF Viewer: new UI with simple paging and zooming.
- Materials: Improved handling of transparent materials (QA-50)
- Model Selection: Projects now sorted by name
- MRTK: updated to 2.6.1 (with significant changes to shaders and buttons)
- New Feature: Added Launch Browser button to Miscellaneous menu (defaults to google.com, but BrowserURL client property overrides this)
- Changed Design Review Icon from visualisation image to the single cube image (to match Theorem RE)
- Refined experience tile panel (button positions, tooltips and press depth)



- If offline, only show cached experiences and cached library files (QA-126)
 - Updated the package certificate (now expires on 07/01/23)
 - Manipulation box: fixed issues with rotation and scale box colliders.
 - Comments: Fixed avatar pointer end position.
 - New Manipulation box: rotate and scale handles always visible and will now scale better
 - Manipulation box: improved size and positioning of handles and frame, limit smallest scale size to 5cm.
 - Comments: show message when no comments (QA-57)
 - Transparent materials: change depth buffer for better rendering (QA-47)
 - Hand pointer: now operates similarly to the main HL2 pointer: bends up/down relative to height (RP-54)
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Known Limitations and Restrictions

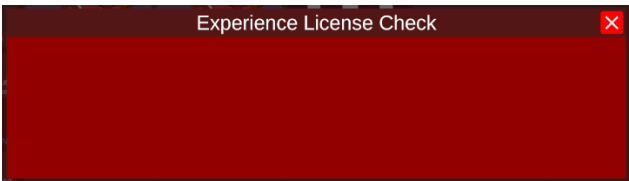
The following limitations and restrictions have been identified during final testing prior to release and will be resolved for a future lock-down:

Ref ID	Limitations and Restrictions
<p>XR-69</p>	<p><i>Exporting a Layout as JT</i></p> <ul style="list-style-type: none"> • For the JT export to function correctly, a user must have the following minimum version Theorem JT translator installed: cdCAD_24.1_CA5JT_WIN.01. If this is not installed, a user may see a JT with empty (2KB) subordinate JTs created • If a user presses the “Output as JT” on a chosen layout, but a JT is not generated and the server appears to be unresponsive, the service that runs this capability may hang. To reset this, the following steps should be taken: <ul style="list-style-type: none"> ○ Launch the “Task Manager”, on the “Details” tab locate “FBXGenerator.exe” ○ Right click on the FBXGenerator.exe and select to “End Task” and select to “End Process” when prompted ○ Change to the “Services” tab and locate “Theorem Experience Server Service” ○ Right click on this service and click to “Stop” then “Start” the service. ○ Once running, navigate back to the server page and select to “Output as JT” again • A user must have a valid FBX_DEFAULT license feature to use the JT Export option
<p>XR-496</p>	<p><i>Migration from SQLite to MS SQL Database</i></p> <ul style="list-style-type: none"> • The existing data in the MSSQL database is replaced (not merged)! • Once complete any existing logins will no longer be valid. It will be required to sign in as a user imported from the SQLite database. • The SQLite database file is moved afterwards to prevent an admin re-running this procedure at a later date and losing all data added in the interim period. Ensure that the SQLite database file is backed up



<p>XR-507</p>	<p>New TVP Licensing</p> <ul style="list-style-type: none"> On the licensing page a new menu item is listed: <i>“FlexLm license features that limit this server's functionality (including license and license features for clients)”</i> <p>If legacy licensing is being used, expanding this will show several server license features, all listed as false. These values do not apply to legacy licensing, so the information will not be true for your server.</p> <ul style="list-style-type: none"> To use shrink wrapping successfully a server will need access to the following license features: <ul style="list-style-type: none"> Legacy – DRFBX-U1 New - XRFBX-U1
<p>XR-184</p>	<p>New Client Licensing</p> <ul style="list-style-type: none"> To successfully use a new Checklist license (XRCHK-U1) a user must also have a valid comments license (XRCOM-U1)
<p>XR-599</p>	<p>Revit Direct Upload</p> <ul style="list-style-type: none"> If, when a Revit file is loaded interactively in Revit, it spawns a pop-up box. Then this file cannot be uploaded directly on to TVP, the pop-up will cause the upload to crash. A work around is to upload a file of this type directly via the interactive upload from within Revit.
<p>XR-611</p>	<p>Panoramic Viewer</p> <ul style="list-style-type: none"> If a 360 viewer package contains two images/videos with the same coordinates it will only display one image on that coordinate. Separate coordinates must be applied The co-ordinate values are applied in metres. Large scale differences will mean a user can't see two points on the minimap.
<p>XR-622</p>	<p>Theorem AR - Offline Licensing</p> <ul style="list-style-type: none"> Tablets do not yet support offline licensing usage.
<p>XR-636</p>	<p>Vive Focus 3</p> <ul style="list-style-type: none"> Controllers are shown, but hand representation is not included at this release.



XR-712	<ul style="list-style-type: none"> Client preference 'EnableUnrestrictedApplicationMirror' should be changed to 'EnableApplicationMirroring'
XR-757	<ul style="list-style-type: none"> If GLB is selected as an output type, it appears in the download list as "GLTF", when selected, the part is a GLB as required, it is just labelled incorrectly.
	<ul style="list-style-type: none"> Currently uploading snapshots when using the "use instance name" option with the latest release, the models will not visualise correctly in client applications. Theorem will provide an overlay to resolve this if this configuration is required.
-	<p>User based licensing – offline licensing</p> <ul style="list-style-type: none"> At this release, the underlying licensing method was updated for user-based licensing to support offline working. If you use user-based licensing and you upgrade to this release, you will also need to upgrade all clients. Otherwise you will receive a license error on trying to load the app: <div data-bbox="566 958 1197 1137" data-label="Image">  </div>
-	<p>Theorem AR: Movement of measurement tooltips</p> <ul style="list-style-type: none"> Current measurement labels are fixed in location. They cannot be moved and sometimes may appear inside a model
-	<p>Theorem AR: Apple Device – Can't find host</p> <ul style="list-style-type: none"> On initial load user receives Apple prompt - allow Theorem-AR to find device on network. Selected OK but app first notes: Can't find host. To resolve a user needs to select OK again to reattempt connection.
-	<p>Theorem AR: Mode change switches camera orientation</p> <ul style="list-style-type: none"> In landscape mode, switching between Render Mode and AR Mode in Image tracking and display can rotate the camera feed. To resolve rotate device through portrait / landscape mode.
-	<p>Theorem AR: Animation playback speed</p> <ul style="list-style-type: none"> Animation is tied to device frame rate, this can give the illusion of stuttering in animation replay.



-	<p>HL2: Large Model movement</p> <ul style="list-style-type: none"> • Passive HL2 user does not see large model movement.
-	<p>HL2: No support for VR users' tools in collaboration</p> <ul style="list-style-type: none"> • No support for tool meshes (painting using tools) in HL2
-	<p>HL2: Duplicated model groups</p> <ul style="list-style-type: none"> • Grouping copy/paste and then attempting to hide one of the copy and pasted models won't hide it for a passive user. As a side effect I couldn't create measurements for a passive user to view between the same model that wouldn't hide and anything else.
-	<p>Snapshot data not appearing</p> <ul style="list-style-type: none"> • To use Snapshots successfully at this release, a user will require a patch to the delivered Q1 2022 release. This can be accessed from here <p>The overlay bundle should be copied into:</p> <p>%TVP_INSTALL%\TPM\Utilities\DR</p> <p>This overlay should not be used if collaborative ARR is also being used from this server instance.</p>
-	<p>HL1 App / HL1 port for HL2 app</p> <ul style="list-style-type: none"> • Design review unsupported • Limited Measurement support • Limited material support

