Changes from 4.7-5 to 4.7-6

1. Attach spring bug fix
   - Attach springs connected to inactivated cloth objects caused incorrect behavior, and this bug is fixed

Changes from 4.7-4 to 4.7-5

1. Slide constraint
   a. Slide constraint behaves similar to nCloth's "Slide on Surface" constraint.
   b. Select vertices of a cloth mesh, and a target mesh on which those vertices would slide. The target mesh can also be a cloth mesh.
   c. The initial rest lengths are measured at the creation time. To update them, use "Qualoth>Constraint>Get Vertices" followed by "Set Vertices".
   d. Unlike nCloth's "Slide on Surface" constraint, users must create a collider explicitly if they want to make the cloth vertices to collide the target mesh.

Changes from 4.7-3 to 4.7-4

1. Memory leak bug fix
   a. 4.7-3 had memory leak bug when self collision is enabled. This bug is fixed

Changes from 4.7-2 to 4.7-3

1. Large proximity criterion
   a. Previously, the proximity criterion which describes the intra-cloth collision thickness could not be much larger than the default value which depends on the mesh resolution.
   b. This update allows arbitrary value for proximity criterion (at the cost of increased computation), which enables proximity criterion to be consistent regardless of the mesh resolution.
2. Self collision artifacts from “Complete Weld”
   a. Welded vertices by “Complete Weld” method created self-collision artifacts, and this bug is fixed.
3. “Show Vertex Status” option of the qlSolver now visualizes proximate edges in addition to proximate vertices in green line segments.

Changes from 4.7-1 to 4.7-2

1. Hard constraining support for qlWeldConstraint
   a. Previously qlWeldConstraint provided only soft constraining implemented as springs. In this release, new option “Complete Welding” is added to support hard constraint
   b. Change the “Rest Length Method” under the “Spring Control” category to “Complete Welding”. Then all the spring related attributes are disabled, and hard constraining is activated.
   c. By “Complete Welding”, the rest length is assumed to be zero, and the welded vertices perfectly coincide at all times.
   d. Compared to the soft constraining with high stiffness, this hard constraint does not increase the solver time.
2. Bend Angle Dropoff & Bend Damp Dropoff

a. Bend Angle Dropoff : As this value gets larger, the small angle gets lower bending resistance.
b. Bend Damp Dropoff : As this value gets larger, the small angular velocity gets lower bending damping. Previously, the non-zero bend damping affected the wrinkle shapes greatly even though the angular velocity is low. By setting “Bend Damp Dropoff” to 1.0, you can see the wrinkle shapes are almost preserved while preventing high frequency oscillation effectively.

Changes from 4.6-11 to 4.7-1

1. Maya 2020 support
   a. Cached playback support
      i. To enable the cached playback with Qualoth, the ‘cache dynamics’ option must be turned on at the cached playback preference window (“Windows>Settings/Preferences/Preferences/Settings/Cached Playback”)
      ii. Note that the Maya’s playback cache and Qualoth’s cache are independent. “Qualoth>Clear Cache” does not clear the playback cache. To re-compute only the dynamics playback cache in background, one of the simplest way is executing “Qualoth>Re-initialize Solver” which clears the Qualoth’s cache and triggers re-evaluation of the playback cache at the same time.
2. Online help page
   a. “Qualoth>Help” will launch a web browser for the online help pages
   b. Reference manual is updated
3. ‘invisibility’ evaluator bug fix
      i. When Qualoth nodes such as constraints are hidden, they are not evaluated correctly in Parallel mode in case the ‘invisibility’ evaluator is active. The ‘invisible’ evaluator skips evaluation of hidden nodes at any circumstance in Parallel/Serial modes.
      ii. This bug can be observed at Maya 2017 or later versions
      iii. When ‘invisibility’ evaluator needs to be activated, unhide the Qualoth nodes before evaluation in Parallel mode.
      iv. Note that when Qualoth plug-in is loaded, it turns off the ‘invisibility’ evaluator, and does not turn it on again even when Qualoth is unloaded.
      v. The ‘invisibility’ evaluator can be controlled by “Windows>General Editors>Evaluation Toolkit>04) Custom Evaluators”.
4. Field evaluation bug
      i. When a Maya’s dynamics field such as ‘Air Field’ is used for two different qlFieldFilters and those two qlFieldFilter are connected to different qlSolvers, one of them was not working correctly.
      ii. When a field is connected to more than two cloth nodes as external force, it caused cyclic evaluation and produced warning messages, and caused double computations of a solver.
5. “Change Solver” bug fix
   a. When there are weld constraints connected to the cloth nodes, they are not handled by “Change Solver” command
6. “Constraint>Get/Set Vertices” bug fix
   a. Get/Set Vertices didn’t work for weld constraints when the cloth nodes have connected fields.
7. “Convert Selection” bug fix
   a. It didn’t work for the weld constraints or attach springs.
8. Deprecated menu command is removed
   a. “Qualoth>Convert Q2013 to Q2014” is removed

Changes from 4.6-10 to 4.6-11

1. “Constraint>Get Vertices” didn’t work for weld constraints. This bug is fixed
2. Bend rest angle computation bug fix
    a. All the bending rest angle calculation related functions had a bug in computing the correct angle difference. This bug fix affects the bend control of the weld constraint, plasticity computation, crease angle for qlSeam node, etc.
    b. This bug is only observed when the angle difference (current angle to rest angle) is extremely close to 180.0 degrees.

Changes from 4.6-9 to 4.6-10

1. “Steady Contact” attribute is added to qlSolver
    a. The recent self collision improvement at 4.6-8 created some bubbling contact artifacts which was not observed in earlier versions. This new option enables switching to the old self-collision algorithm.
    b. This option is turned on by default, which means the self-collision mechanism of 4.6-7 or earlier versions are selected by default.
    c. Turn off this option when the cloth vertices are prone to stick to other cloth vertices undesirably. For example, if cloth vertices of skirts are pulled up by the arm of a shirt and are not to fall off easily, then turn this option off.

Changes from 4.6-8 to 4.6-9

1. Non-default frame rate bug fix
    a. When the time unit is set to other than default frame rate such as 100fps, the simulation didn’t work correctly in certain conditions.
2. Self-collision improvement
    a. When the inner layer cloth is tighter to the body than the outer layer cloth, the self collision test produced unstable flickering. This behavior is removed.
    b. Limitation : When there are three or more layers of cloth, and the middle layer is set to tighter to the body mesh than the outer layer, the outer layer may still produce unstable flickering. This behavior was not present at 4.6-2 or earlier versions, and this behavior will be completely removed at all cases in the future.

Changes from 4.6-7 to 4.6-8

1. Self-collision (cloth-to-cloth) improvements
    a. Sticky behavior of self-collision is greatly reduced
    b. The cloth-to-cloth contact is more stabilized when the motion is steady

Changes from 4.6-6 to 4.6-7

1. Improved handling for sticky contact behavior

a. 4.6-4, 4.6-5, and 4.6-6 had improved sticky contact behavior, but produced unstable contact handling due to frequent contact state change. This instability is removed.

Changes from 4.6-5 to 4.6-6

1. Added “Bend Rest Angle Method” attribute to qlWeldConstraint (under “Bend Control” category)
   a. There two rest angle calculation method
      i. Use Initial Shape – The rest angle of each welded edges are computed from the initial shape (note that initial shape is different from rest shape)
      ii. Constant (Default) – The rest angle is specified as a constant for all edges of this weld constraint

Changes from 4.6-4 to 4.6-5

2. Self collision color map bug fix
   a. When a cloth mesh has long upstream histories, the color map for self collision was not updated correctly.

Changes from 4.6-3 to 4.6-4

1. Sticky collision behavior bug fix
   a. Cloth vertices tend to stick to colliders even when the colliders are moving away from them. This bug is fixed.

Change from 4.6-2 to 4.6-3

1. ″readOnly″ option is added to qlClothShape (under ″Cache attributes″ category)
   a. When this option is enabled, the new cache is not written in any circumstance.
   b. Specifically, following actions have no effect on the corresponding cloth cache
      i. Run simulation : If there is no cache, it throws error instead of writing new cache.
      ii. Clear Cache
      iii. Truncate Cache
      iv. Re-initialize Solver
      v. Update Initial Pose
      vi. Update Tweaks
      vii. Local Simulation (Only the solver states are updated, but the cache is not)

2. More reliable cache existence checking

3. Removed creating unnecessary setAttrs during simulation
   a. proximityCriterion, thickness, overrideShading, overrideEnabled attributes are set at each frame even though they are not needed to be updated. These unnecessary updates are removed

Chnages from 4.6-1 to 4.6-2

1. Weld constraint bug fixes
    a. Changing the search method from ″Component Order″ to ″Max Distance″ caused crash in Maya 2018 or earlier versions.
    b. The weld constraints converted from qlSeam nodes by ″Qualoth>Convert Seams to Weld Constraints″ caused crash when it changes the search method to any method.
    c. A weld constraint created between more than two cloth meshes, and one of the cloth is removed, the weld constraint retains invalidated connections
    d. The weld constraint connections does not show up in the viewport at Maya 2015
    e. The rest lengths of weld constraints are not computed correctly at Maya 2015

2. Solver performance improvement
    a. Dynamics computation speed (corresponding to SOL time at the printed statistics) increased about 5~10%

Changes from 4.5-8 to 4.6-1

1. Input node evaluation performance issue at Maya 2018 (a.k.a DEP issue)
    a. The DEP time (input node eval time) significantly increased at Maya 2018, due to Maya's internal bug only present at Maya 2018 (MAYA-91152)
    b. This problematic API is avoided and now the DEP eval speed is even faster than 2017 or 2019
    c. This improvement is applied to 2019 too, though 2019 has fixed the MAYA-91152 bug, for better performance.

2. Maya 2019 multi-threading performance issue
    a. At Maya 2019 the Qualoth's multi-threading performance dropped about 50%, and this bug is fixed.

Changes from 4.5-7 to 4.5-8

1. Bug fix : When some of cloth objects which have field connections are removed, the field didn't work correctly in case the scene is re-opened and new field is added to a cloth object.

Changes from 4.5-6 to 4.5-7

1. Bug fix : When some of cloth objects which have field connections are removed, the field didn't work correctly when the scene is re-opened.

Changes from 4.5-5 to 4.5-6

1. Bug fix : When some of cloth objects are removed from a solver, the corresponding solver didn't work correctly when re-opened.

Changes from 4.5-4 to 4.5-5

1. Weld Constraint improvements
    a. bug fix : When cloth objects have ″attach springs″ connected, the weld constraints didn′t work correctly in case the search method is ′Component Order′.
    b. ′Reverse Order′ attribute is added : When the search method is ′Component Order′, this attribute enables reversing the component order.

2. ′Merge Seams′ attribute is added to ′qlDiscretizer′ node.
    a. This attribute is set to ′true′ by default
    b. When it is disabled, the seam vertices are not merged but only the number of curve vertices corresponding to each seam curve pairs are made to be equal. This option is automatically disabled when ″Qualoth>Convert Seams to Weld Constraints″ described below is executed.

3. New commands added
    a. ′Qualoth>Convert Seams to Weld Constraints′ : All the seams created by qlSeam nodes are replaced with qlWeldConstraint nodes. Seaming by qlWeldConstraint nodes by this command enables seaming the pattern based cloth objects without merging the seam vertices, and thus it lets the cloth mesh topology remain unchanged
    b. ′Qualoth>Revert Weld Constraints to Seams′ : This command reverses the process of the above command. This command does not work for the normal weld constraints.

Changes from 4.5-3 to 4.5-4

1. Weld constraint
    a. “min distance” attribute is added for “Max Distance” search method. With the “Max Distance” search method, the vertex pairs whose distances are longer than “min distance” and shorter than “max distance” are chosen. The default value of “min distance” is 0.0.

2. qlCache node
    a. qlCache node created by "Qualoth>Connect Objects>Cache” didn’t support sub-framed cache files in previous versions. This fix added the subframe cache support to qlCache.

3. Self-collision bug fix
    a. When only partial cloth objects are cached within a solver, and at the same time ‘simple subsampling’ is off, the collision between cloth objects are not working correctly. This bug is fixed.

Changes from 4.5-1 to 4.5-2

1. Weld Constraint improvements
    a. ‘Border Vertices Only’ option is added under ‘Connection Control’ category.
    b. Locator display speed improvement – dramatically faster than the previous version both in VP2.0 and legacy VP.

Changes from 4.4-5 to 4.5-1

1. Weld constraint
    a. Select cloth mesh vertices, and click “Qualoth>Constraint>Weld Constraint”.
    b. The attributes are,

        i. Connection Control
            1. Search Method – ‘Component Order’, ‘Nearest’, ‘Max Distance’ : Defines the way to find the spring pairs
            2. Max Distance – In case of ‘Max Distance’ is chosen as the search method, this value is used for the limit
            3. Connection Density – Randomly samples the fraction of the searched pairs with the given density.
            4. Allow Self Connection – Determines whether the springs can pair the vertices within the a cloth mesh or not

        ii. Spring Control
            1. Rest Length Method – ‘At Creation’, ‘Constant’ : Define how the rest length are determined. By ‘At Creation’ method, the rest length is determined the distance at spring creation time, and by ‘Constant’ the rest length is defined by the ‘Rest Length’ attribute.
            2. Rest Length – In case of ‘Constant’ method, this value is used for rest length for all springs within this weld constraint.
            3. Rest Length Scale – Scales the rest length determined by the above method.
            4. Stretch stiffness – The amount of resistance to stretching.
            5. Compression stiffness – The amount of resistance to compression
            6. Stretch damping – The amount of damping to stretch/compression

        iii. Bend Control
            1. Bend Control – Enable or disable bend control. Note that when ‘Max Distance’ is chosen as the search method, bend control is automatically disabled. Bend control is possible only when ‘Nearest’ or ‘Component Order’ methods are chosen.
            2. Bend Stiffness – The amount of resistance to bending
            3. Bend Damping – The amount of damping for bending
            4. Bend Rest Angle – The rest angle for bending

Changes from 4.4-4 to 4.4-5

1. Cloth-to-solid collision handling bug fix
    a. When ‘sharp feature’ option is on in the solid collision attributes category, the collision handling was imperfect even with high frame samples. This bug is fixed at the cost of slightly increased computation time for ‘sharp feature’ handling (about 10% more collision computation time)

Changes from 4.4-3 to 4.4-4

1. Cloth-to-cloth friction behavior improvement
    a. The self friction behavior is much more consistent with the cloth-to-solid behavior. (not exactly identical, but reasonably consistent)
    b. The default self friction parameter range changed to 0~1.0

Changes from 4.4-2 to 4.4-3

1. Intra-collision option bug fix
    a. Intra-collision didn't work when inter-collision is disabled. This bug is fixed

Changes from 4.4-1 to 4.4-2

1. Self-collision bug fix
    a. When multiple cloth objects intersect each other, the sim time was not decreased even with 'inter collision' off. This bug is fixed
2. Changed to allow negative values for 'Pressure' parameter of qlCloth

Changes from 4.3-8 to 4.4-1

1. Local space simulation
    A. Each cloth solver can switch between local/world space simulation mode

    B. Typical use case – in case of abrupt linear/angular speed change or fast rotating motions, the cloth simulation can be unstable or undesirable due to excessive inertial effects or erroneous collision handling. By using local space simulation, such artifacts can be greatly reduced by explicitly controlling the inertial effects.

    C. Usage

        i. Step 1: For a solver which has multiple cloth objects, first check if the output mesh transform of each cloth object have identical transformation matrices.

        ii. Step 2: Choose or create a transform node that will act as the reference transform (for example, constrain an object to a face or a vertex of the body mesh using "Constrain>Point on Poly" command)

        iii. Step 3: Parent the output cloth meshes to the selected reference transform node which follows the body mesh motion

        iv. Step 4: Select a solver, or a cloth under the solver, and click "Qualoth>Set Local Space Simulation". To undo this, select a solver and click "Qualoth>Set World Space Simulation" (Note that local space simulation is performed per solver, not a cloth object, even though the inertial effects can be scaled differently per cloth object as described below)

D. Inertial effect control

i. The solver and the cloth object have following four scale parameters for each inertial effect. The scale parameters of each cloth object are multiplied by the solver's corresponding parameters before application.

1. Linear Velocity Scale – affects the air drag force caused by the linear movement of the reference transform

2. Linear Acceleration Scale – affects linear inertial effect caused by the linear acceleration of the reference transform

3.Angular Velocity Scale – affects (1) centrifugal force, (2) Coriolis force, and (3) air drag force caused by the angular motion of the reference transform

4. Angular Acceleration Scale – affects Euler force caused by the angular acceleration of the reference transform

ii. Each of the above four parameters can be larger than 1.0, or even can be negative. Typical range would be 0.0~5.0

2. Visualization of "proximity criterion" and "thickness" of cloth objects

A. The following attributes are added to "qlClothShape" node.

i. Display Proximity Criterion

ii. Display Thickness

B. Each information are rendered in shaded or wireframe mode with the specified "Display Color" in the attribute editor.

3. Bug fixes

A. "Active" option of qlClothShape didn't work correctly, when the scene file is re-opened. This bug is fixed

Changes from 4.3-7 to 4.3-8

1. Friction behavior improvement

A. Same size meshes with different polygon resolution showed different frictional behavior in the previous version. This bug is fixed

B. The solid proximity force affected the frictional force, but now such dependency is removed

C. When "sharp feature" is on in the solid collision attribute, the friction behavior was inconsistent. This bug is fixed.

2. The solid-to-cloth friction parameter interpretation has changed

A. Previously, the solid-to-cloth friction force only relied on the friction parameter of the solid (collider), but now the friction parameter of the cloth material is considered too. The final effective friction value between cloth and collider is the average of each friction value.

3. Cloth-to-cloth friction model improvement

A. The cloth-to-cloth friction behavior is now consistent with the new friction behavior between solid and cloth.

4. “sharp feature” improvement

A. The collision handling between sharp features (sharp edges, points) of solid and cloth is improved. Previous collision handling introduced undesired lagging or friction on the sharp edges and points. Now such artifacts are greatly reduced.

Changes from 4.3-6 to 4.3-7

1. Enhanced solid friction
    A. Static/kinetic friction model between cloth and solid colliders are improved.
    B. A friction value between 0.0~1.0 works for most cases. 1.0 corresponds to very high friction. (See the attached video which used 0.5 for friction)
2. “Time Scale” of qlSolver node is changed to floating point type from integer type.
3. The following related nodes of qlCloth in the attribute editors are added
    A. Colliders
    B. Constraints
    C. Fields

Changes from 4.3-5 to 4.3-6

1. Weft(U) Rubber Map, Warp(V) Rubber Map are added

Changes from 4.3-4 to 4.3-5

1. Rest shape bug with anisotropic control
    A. Under the following conditions, the rest shape didn’t work correctly. This bug is fixed
        i. Turn on “Anisotropy from UV” in the qlConverter
        ii. Connect a rest shape
        iii. Turn on Anisotropic Control in qlCloth
        iv. Set values other than 1 at weft/warp rubber scale
2. Warp/Weft notation changed
    A. Previously Warp=U and Weft=V, now Weft=U and Warp=V

Changes from 4.3-3 to 4.3-4

1. Rubber scale bug
    A. Even though the rubber values are all default values (1.0), the cloth mesh scaled up. This bug is fixed.

Changes from 4.3-2 to 4.3-3

1. “Preserve Wrinkle Map” is added
   A. This map scales the bent angles of the input mesh or the rest mesh.
   B. This map will take effect when “Preserve Wrinkle” of the qlConverter is on, or “Update Bending” of qlCloth under the “Rest Shape Attributes” category is on.
2. Anisotropic rubber control
   A. “Warp(U) Rubber Scale” and “Weft(V) Rubber Scale” attributes are added to qlCloth node.
   B. Those two attributes are activated when “Anisotropic Control” of qlCloth is on. When it is off, each scale is set to 1.0 by default.
   C. Each scale is multiplied to the original “rubber” value before application.

Changes from 4.3-1 to 4.3-2

1. Collision bug fix

   A. Using 2 or greater frame samples under simple subsampling caused collision error for moving objects -> fixed

Changes from 4.2-11 to 4.3-1

1. Different cloth behaviors at each run

   A. “Clear Cache” didn’t initialize the collision status correctly so the simulation results differed at every simulation slightly. This bug also resulted in different behavior of simulation under different solver of the same properties.

   B. By this bug fix, 4.3-1 always generates perfectly identical simulation results under the following conditions

      i. Number of threads is set to 1

      ii. Evaluation mode set to “DG”

   C. Limitations : If the number of threads is set to 2 or greater, or “Parallel” evaluation mode is used, the floating point computation indeterminism problem arises, which is unavoidable for performance gain. This floating-point indeterminism results in slightly different simulation results at each run. The difference of each run may amplify as the total simulation time increases, since dynamic simulation depends on the previous status.

2. “Change Solver” improvements

   A. Springs attached to a cloth object were not transferred to the new solver. This bug is fixed. Now the springs attached to a cloth object are automatically transferred to the new solver along with the cloth object.

   B. “Change Solver” now support Colliders. Select the collision mesh and execute “Change Solver” to transfer the colliders to the new solver.

3. Soft Constraint stiffness scaling improvement

   A. The stiffness of soft constraints didn’t scale well linearly before. For example, very small values like 0.001 are needed to make them soft actually. Now the softness scales better.

4. Cache playback speed improvement

A. The cache playback speed is increased. In “DG” evaluation mode, you will get the increased speed automatically, but in “Parallel” evaluation mode, turn on “Enable Fast Playback” check box in the Qualoth main menu to get the increased speed. Note that when “Enable Fast Playback” is on at any mode(DG, Parallel), the solver does not solve new frames, so if you need to solve new frames, turn it off.

5. With “Anisotropy from UV” on, the collision handling time increased too much

   A. 4.3-1 gives consistent collision handling time regardless of the usage of “Anisotropy from UV”

6. “Override Compression” bug fix

   A. When “Override Compression” is used, the shear deformation is biased in one direction. This bug is fixed

7. “Unbiased Triangulation” option is added to the “qlConverter”

   A. When either “Metric from UV” or “Anisotropy from UV” is used for a quad mesh, the shear deformation was biased unpredictably in previous versions.

   B. With this option on, the deformation is unbiased. This feature is made optional for backward compatibility since the cloth exhibits slightly different physical behavior by this option (Note that this option may introduce slightly increased “artificial rigidity” of the bending and shear deformation)

Changes from 4.2-10 to 4.2-11

1. Viewport 2.0 is supported
2. More reliable “Escape to kill”
   A. In case of Maya 2016 or later versions, the escape key works correctly only when the evaluation mode is “DG” and viewport 2.0 is off.
   B. Maya 2015 or earlier versions works fine even with Viewport 2.0
   C. This limitation seems to apply to Maya’s own dynamics modules like nCloth, etc.
3. “Get Vertices” now clears selection before selecting verts.

Changes from 4.2-9 to 4.2-10

- Enhanced license server probing for floating license

Changes from 4.2-8 to 4.2-9

- The thread affinity control embedded in Qualoth is removed for supporting multiple sessions of Maya in a single host.

Changes from 4.2-7 to 4.2-8

1. Anisotropy from UV
   A. qlConverter node has a new option “Anisotropy from UV”
   B. When this option is on, only the anisotropy direction (shear direction) is computed from the UV map of the input mesh, and the edge lengths are computed from the 3D vertices of the input mesh.
   C. When “Metric from UV” is on, it means “Anisotropy from UV” is automatically on regardless of its value.

Changes from 4.2-6 to 4,.2-7

1. “Metric from UV” is supported even when “Rest Shapes” are connected

A. Note that the UV map used for “Metric from UV” comes from the original input mesh, not the rest shapes. The rest shapes only need to provide 3D polygon mesh as before
B. The new UV directions for each polygon of the rest shape is computed automatically from the UV map of the original input mesh.
C. In effect, the rest edge lengths and rest bend angles come from the rest shape mesh, and UV directions for each polygons are computed(remapped) from the original input mesh to the rest shape mesh, automatically.

Changes from 4.2-5 to 4.2-6

1. Cache sub-frame bug fix
   A. The cache sub-frames are not interpolated and displayed correctly on the Maya view. This bug is fixed.
   B. Note that the sub-frame cache files themselves were correctly stored in prev versions, though. It means that you don’t need to re-calculate the cache of the scene files of prev versions.

Changes from 4.2-4 to 4.2-5

1. The minimum values of “Proximity Criterion” and “Thickness” is lowered (15 times lowered).
   A. Those minimum values are dependent on the cloth meshes, and you can verify it by entering zero values at the attribute editor, which is clamped to the minimum value allowed.

Changes from 4.2-3 to 4.2-4

1. Cloth visibility bug fix
   A. When a cloth is hidden while active, the remaining unhidden cloth objects belonging to the same solver were not cached correctly. They were cached at 1 frame behind the current frame. This bug is fixed
2. Truncate cache bug fix
   A. When the per frame cache folder is set to relative path, “Truncate cache” didn’t work correctly. This bug is fixed

Changes from 4.2-2 to 4.2-3

1. Thickness map bug fix
   A. Under the following three conditions, the cloth objects exploded
      i. The thickness is larger than the default value
      ii. The thickness map has steep ramp
      iii. There are two or more cloth objects, and self-collision, inter-cloth collision are on.

Changes from 4.2-1 to 4.2-2

1. Collider color map bug fix - The topology of the collider offset mesh changes from time to time when the scene file is reopened. This caused the color map to be broken.

Changes from 4.1-8 to 4.2-1

1. FXLM, the new floating license manager is introduced.

- supports multiple license key files of different products and versions
- support multiple NICs for license key registration
- support the server status query command (See help 'fxlm -h')

2.Multi-threading bug fixed

- Maya 2015 version of Qualoth-4.1-8 for Windows OS had a bug for multi-threading, resulting in performance degrade (down to 30% of the full speed). This bug was fixed

3. DG evaluation bug fix

- Maya 2016 version of Qualoth-4.1-8 both for Windows and Linux had dependency graph evaluation bug, which caused multiple evaluations of a solver node under "Parallel" evaluation mode of Maya, in case there exist inactive cloth objects under the solver.

4. Performance enhancement

- The multi-core efficiency (and also the solver speed) is slightly increased (about 10%)

Changes from 4.1-7 to 4.1-8

1. Maya 2016 is supported. Specifically, the ‘parallel’ evaluation mode works correctly with Qualoth.

Changes from 4.1-6 to 4.1-7

1. "Break length" of springs created from "Create Spring" or "Weld Proximate Vertices" didn't work correctly. This bug is fixed.
   A. To use the updated feature, all the springs must be re-created. The ‘break length of the springs from the old scene files would not work correctly.

Changes from 4.1-5 to 4.1-6

1. Improved stability for degenerate cases in collision handling such as axis-aligned, coincident edges or vertices.

Changes from 4.1-4 to 4.1-5

1. Improved stability for self-collision handling of coincident vertices or edges from different cloth meshes.