What's new in Qt 3D and Kuesa
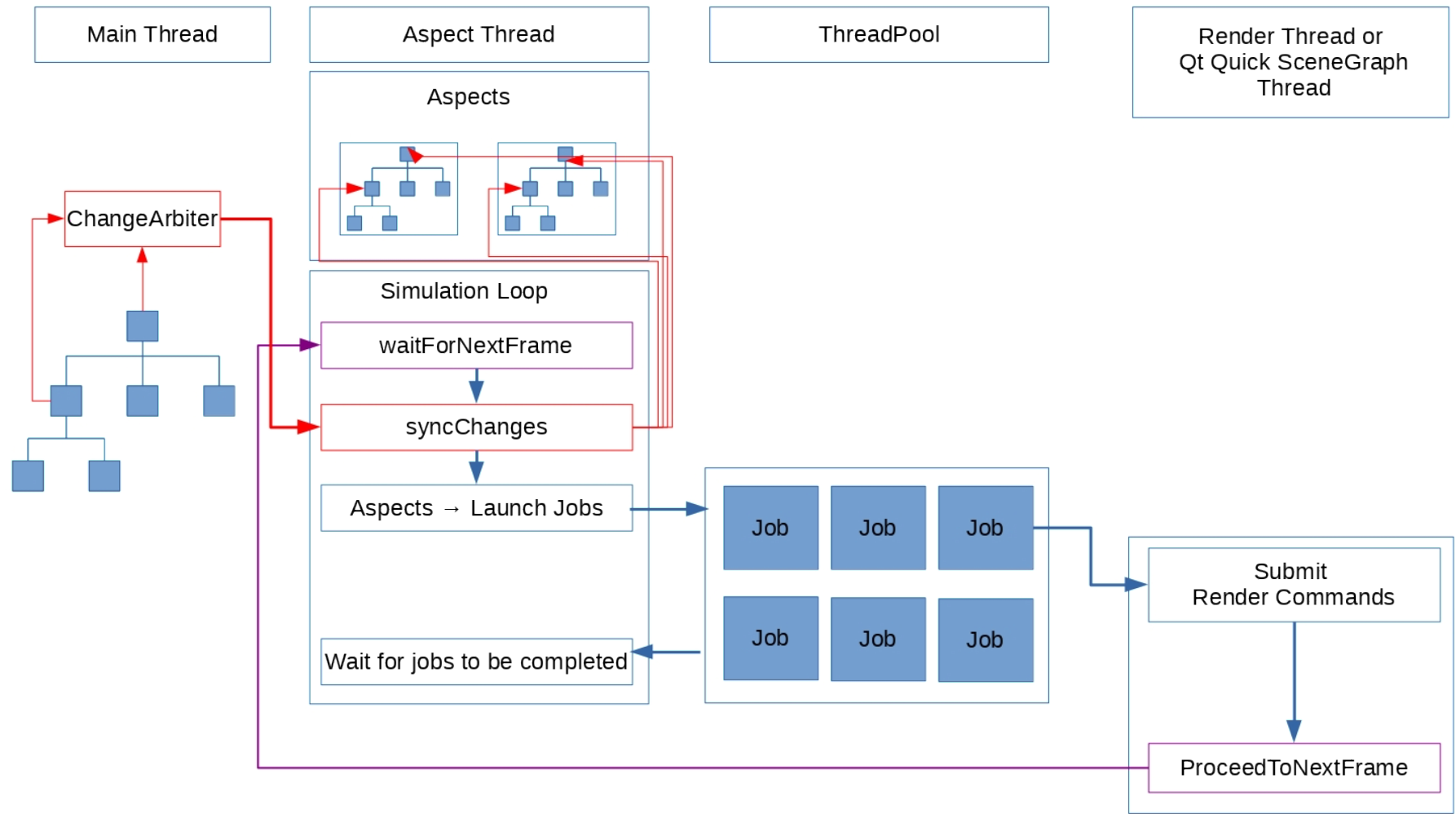
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The Qt, OpenGL and C++ experts
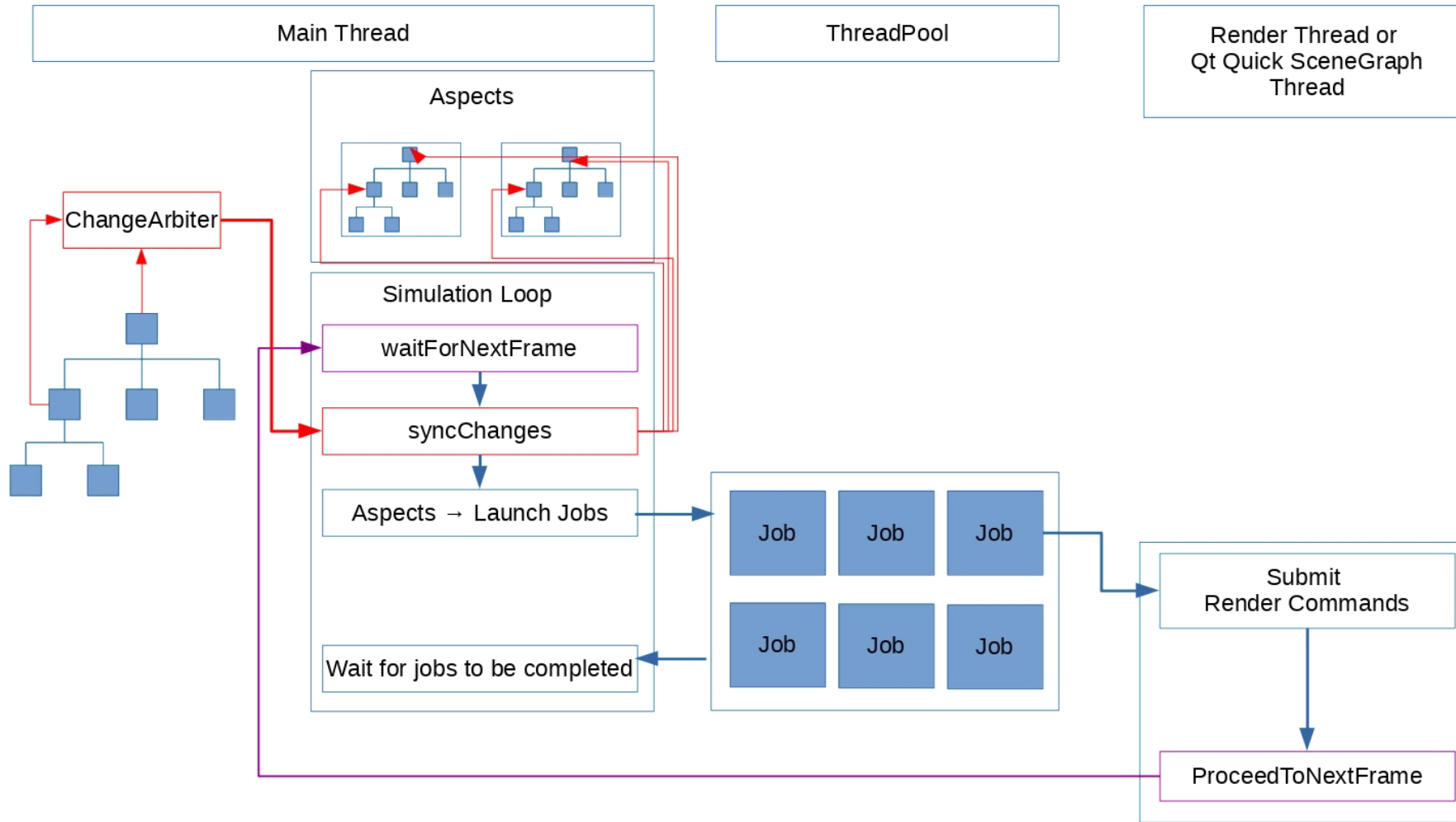
What's new in Qt 3D 5.14?

Qt 3D 5.14

- Goals
  - Improving performance and maintainability
    - Threading overhaul
    - Aspects/Nodes synchronization
  - Ground work for Qt 6
    - Research on how to best leverage modern Graphics API
    - API reviews

- New additions

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Threads in Qt 3D 5.12/5.13

Threads in Qt 3D 5.14

Main Thread

ThreadPool

Render Thread or
Qt Quick SceneGraph
Thread

Aspects

ChangeArbiter

Simulation Loop

waitForNextFrame

syncChanges

Aspects → Launch Jobs

Wait for jobs to be completed

Job   Job   Job

Job   Job   Job

Submit
Render Commands

ProceedToNextFrame

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Threading architecture overhaul

- ## Simplify Architecture

    - Easier to maintain

    - Easier to control the Qt 3D run loop

        - Makes integration with 3rd party engines / Qt Quick a lot nicer

        - Ground work for Qt 6 and RHI integration

    - Allows for some optimizations

        - Direct sync of frontend/backend trees

    - Reduces the numbers of frames between a frontend action and response from the backend (down to 1 frame)

Improved synchronizations between Aspect

- Deprecation of message based syncing

- Direct frontend node access instead

  - Possible because of Aspect thread removal

  - Syncing 5000 entities (12ms vs 4ms)

What's next for Qt 3D and Qt 6

- ## Currently investigating RHI rendering backend

  - Current limitations:

    - Assumes single threaded rendering pipeline

    - Pre compiled shaders

- ## Linearized FrameGraph description

  - Will allow tooling around that

  - Will make caching commands between frames easier

- ## Rendering optimization information

  - Display number of drawn entities/triangles ...

New additions in 5.14

- Scene3D
  - underlay mode
  - Scene3DView

- FrameGraph
  - QNoPicking
  - QSubtreeEnabler
    (Michael Brasser - Ford)
  - QSortPolicy
    - Sorting render commands by Texture

- QTransform:
  - worldMatrix property added

- QTexture
  - ktx support added

- QShaderImage
  - OpenGL 4 Image support

- QObjectPicker
  - NearestPriorityPick picking mode added

What's new in Kuesa?

What is Kuesa?

- Asset creation and integration workflow

- Let designers export from designer tools (Blender, 3DSMax) in glTF2 format

- Let developers import glTF2 assets into applications

- Provides tooling to preview and condition assets

- Built on top of Qt 3D

- Code available on https://github.com/KDAB/kuesa

- Free and commercial licenses available

What is Kuesa?

KDAB

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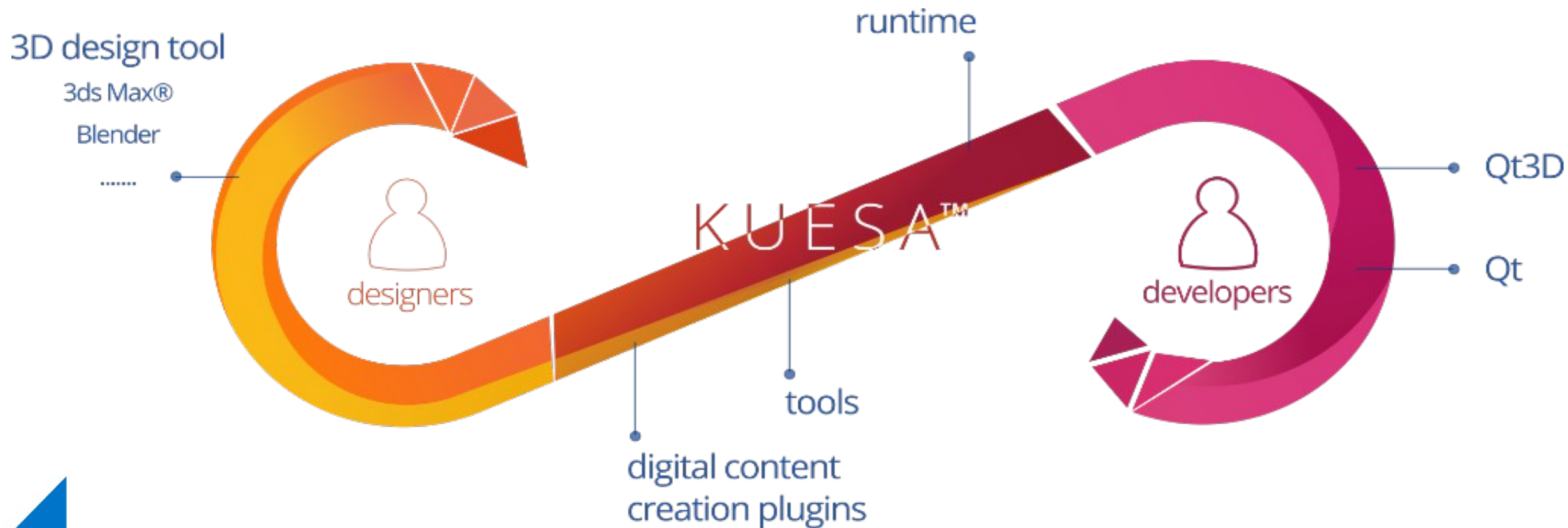
Kuesa 1.1 Runtime Highlights

- Runs on top of Qt 3D 5.12.5 or later

- C++/QML APIs and Python bindings

- Asset Collections

  - Retrieve resources by name after import

- Up to date examples and documentation

- glTF Importer

  - glTF 2 compliant

  - Physically Based Materials

  - Skinned and Morph Target animation support

  - Mesh compression with draco

- Post Processing Effects

  - Blur

  - Depth Of Field

  - Tone Mapping

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Kuesa 1.1- Tools

- gltfEditor

- gltfViewer

- assetprocessor

- cubemaptooctahedralmap
  - Used to support PBR on ES 2

Demo

Questions?