Khronos Overview
Connecting Software to Silicon

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What is A True Open Standard?

INTEROPERABILITY standards define precise COMMUNICATION
Through a specification that enables multiple conformant implementations
Created under multi-company governance at a Standards Developing Organization (SDO)

E.g., Software <-> Hardware Communication through an Application Programming Interface (API)

Standards Grow Markets
By reducing consumer confusion and increasing capabilities and usability

Standards Reduce Costs
By sharing development between many companies and driving volume

Standards Speed Time to Market
With well-proven functionality, testing and interoperability

Standards Enable Innovation
Companies compete on implementation quality, performance, power etc. etc.
Khronos Connects Software to Silicon

Open, royalty-free interoperability standards to harness the power of GPU, multiprocessor and XR hardware

3D graphics, augmented and virtual reality, parallel programming, inferencing and vision acceleration

Non-profit, member-driven standards organization, open to any company

Well-defined multi-company governance and IP Framework

Founded in 2000

>150 Members ~ 40% US, 30% Europe, 30% Asia
Khronos Active Initiatives

3D Graphics
Desktop, Mobile and Web

3D Assets
Authoring and Delivery

Portable XR
Augmented and Virtual Reality

Parallel Computation
Vision, Inferencing, Machine Learning

Safety Critical APIs

- Vulkan
- ANARI
- glTF
- GLSL
- OpenGL
- OpenCL
- OpenVR
- NNEF
- SYCL
- SPIR
- OpenCLsc
- VulkanSC
- 3DCommerce
- COLLADA
- OpenGlES
- WebGL

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Multiple Khronos standards are often relevant to developers with similar requirements.

Khronos currently identifies six such market segments:

- Embedded 3D
- Performance 3D
- Performance Compute
- Interactive 3D and Compute on Desktop and Mobile
- XR
- Parallel Computing and Visualization on HPC and Desktop

Working Groups within a segment coordinate and cooperate to develop coherent solutions and outreach programs.
Khronos Principles of Organization

Any company is welcome to join. One company one vote

Any company can propose new standards initiatives: members and non-members

Only invest where there is strong industry momentum to ensure industry relevance - let Darwinism rule!

IP Framework protects members IP while enabling ROYALTY-FREE specifications: members agree not assert patents against conformant implementations they help create

Conformance Tests and Adopters Programs for specification integrity and cross-vendor portability

Non-profit organization, Membership and Adopters fees cover operating, marketing and engineering expenses
Khronos Cooperative Framework

API Working Groups (Industry, Academic and Associate members)

Advisory Panels of invited industry Experts. Provide requirements and specification feedback

Adopters
Build conformant implementation and products

Developers
Develop applications using the APIs

Educators / Certifiers
Create Courses Training and Certification

Industry and Community Feedback and participation

Open and royalty-free, often open sourced

Adopters Programs
Conformance Tests
Royalty-Free Specifications
Implementations, Tools Documentation, Samples
Educator Guidelines Courseware Materials

Khronos Board
sets strategy, budget and oversight

One vote per industry member

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Get Involved!

- These slides and information on Khronos Standards
  - [www.khronos.org](http://www.khronos.org)
- Any company is welcome to join Khronos
  - [https://www.khronos.org/members/](https://www.khronos.org/members/)
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Benefits of Khronos Membership