

CodeXL Welcome Screen

[Create new Project](#)

[Open a Project](#)

[Load the Teapot sample](#)

Recent Projects

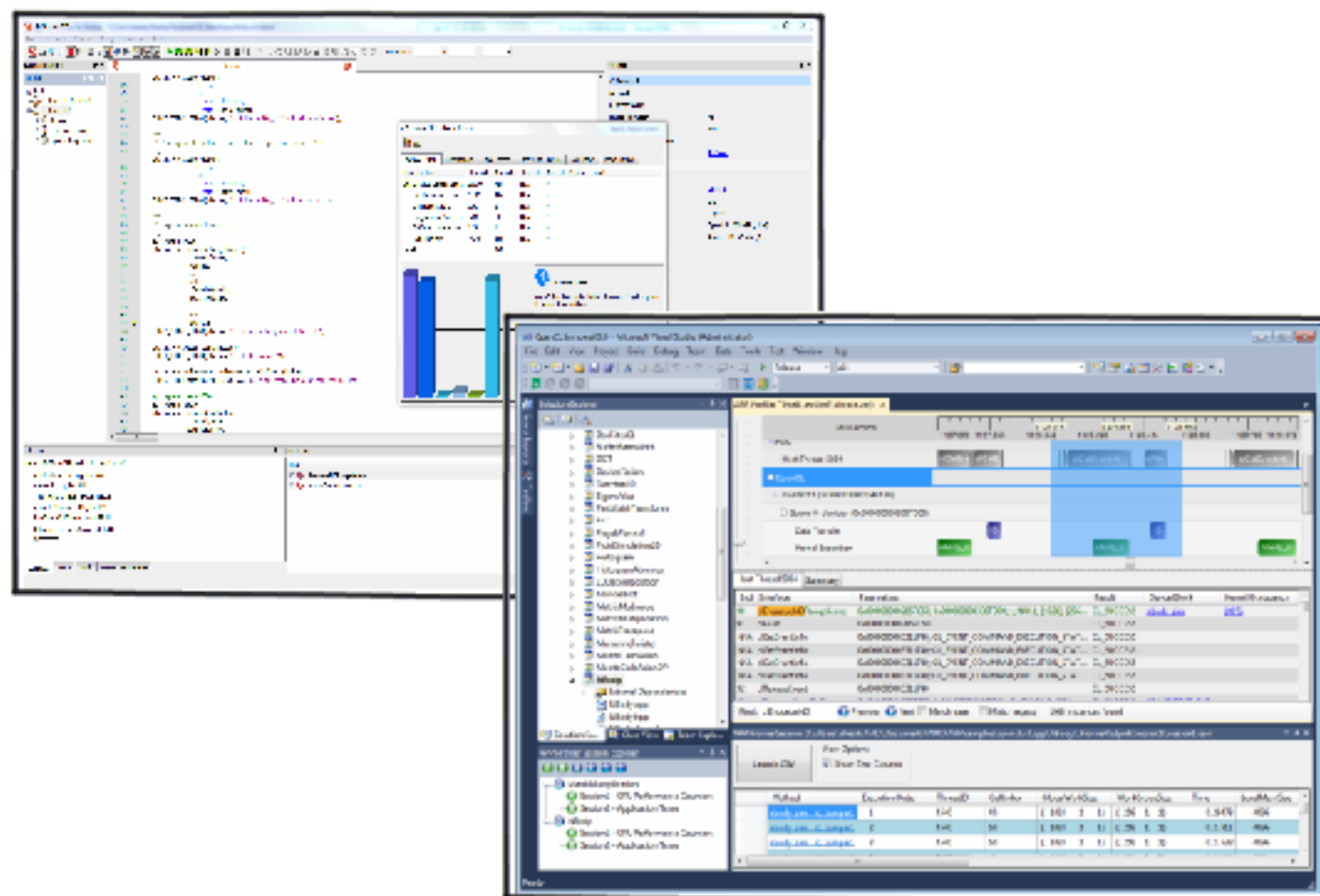
[DCT \(Profile mode\)](#)

[Mandelbrot \(Debug mode\)](#)

[URNG \(Debug mode\)](#)

[ExampleCL \(Debug mode\)](#)

[ExampleCL \(Profile mode\)](#)



File Edit View Debug Profile Tools Window Help

New Project... Ctrl+N

Homepage Ctrl+Alt+O

Open Project... Ctrl+O

Save Project Ctrl+S

Save Project As...

Project Settings...

Open File Ctrl+Shift+O

Save File Ctrl+Alt+S

Save File As...

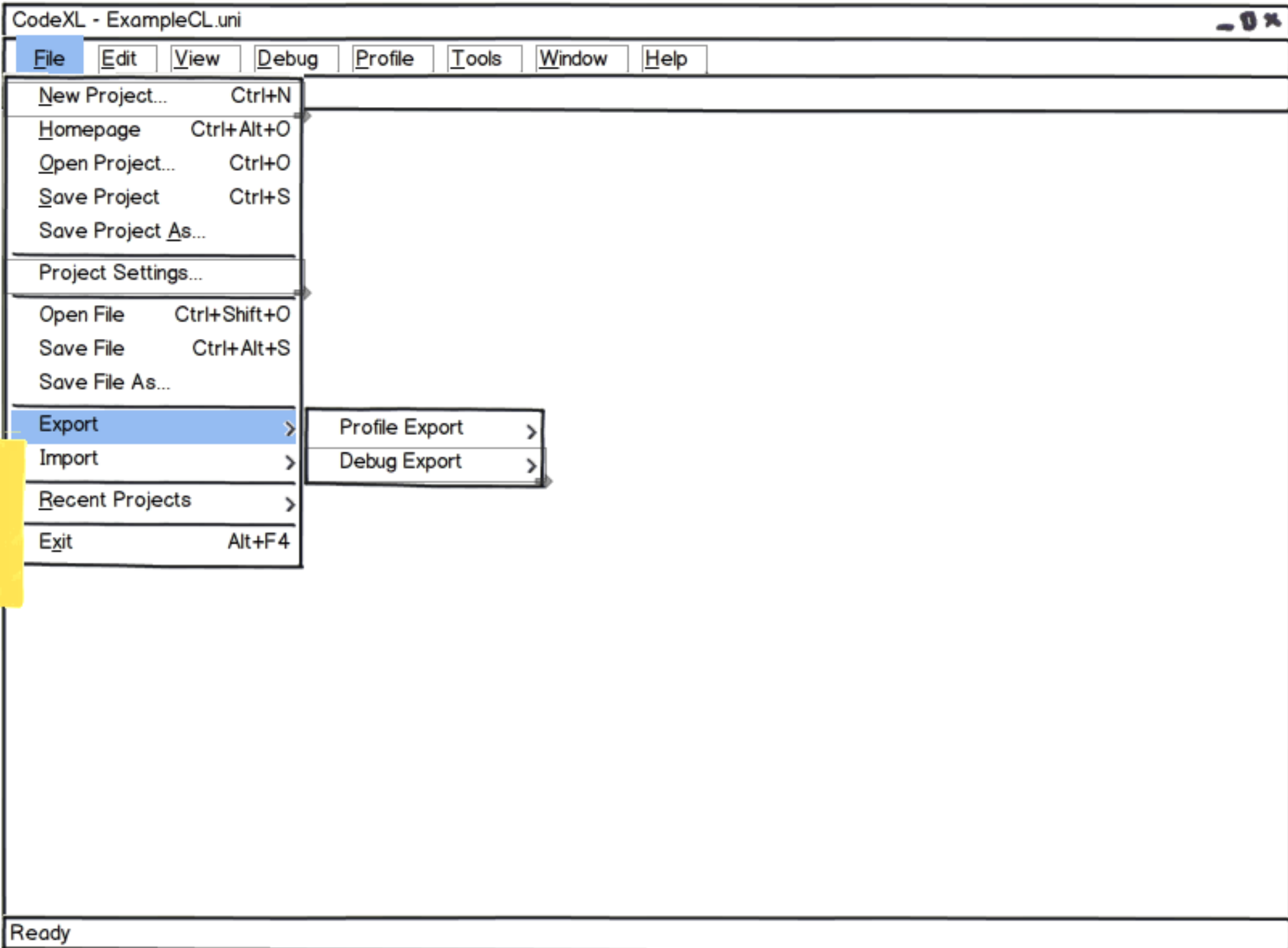
Export >

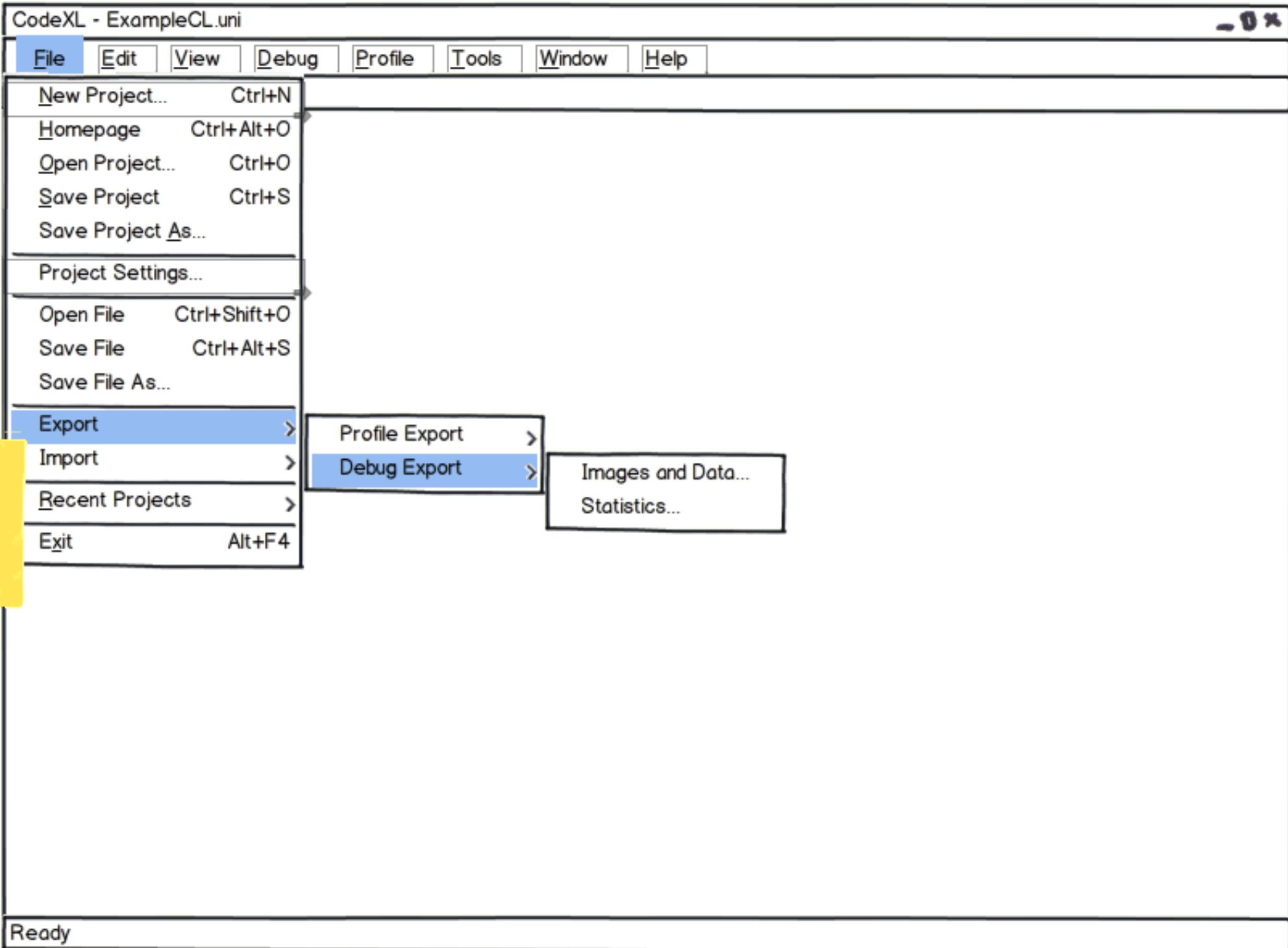
Import >

Recent Projects >

Exit Alt+F4

Is Import
needed?





File Edit View Debug Profile Tools Window Help

D	P	Cut	Ctrl+X
		Copy	Ctrl+C
		Paste	Ctrl+V
<hr/>			
		Select All	Ctrl+A
<hr/>			
		Find	Ctrl+F
		Find Next	F3

File Edit **View** Debug Profile Tools Window Help



Properties Window

Debug >

Profile >

Toolbars >

Show Line Numbers

Reset GUI Layout

File Edit **View** Debug Profile Tools Window Help



Properties Window

Debug >

Profile >

Toolbars >

Show Line Numbers

Reset GUI Layout

Debug Explorer

OpenCL Multi-Watch 1

OpenCL Multi-Watch 2

OpenCL Multi-Watch 3

Performance Graph

Performance Dashboard

Command Queues Realtime Statistics

Call Stack

Memory

Breakpoints

Locals

Watch

Statistics

OpenGL State Variables

OpenCL Command Queues

Function Calls History

Debugged Process Events

File Edit **View** Debug Profile Tools Window Help



Properties Window

Debug >

Profile >

Toolbars >

Show Line Numbers

Reset GUI Layout

Session List

File Edit View Debug Profile Tools Window Help



Images >

System Information...

Options...

File Edit View Debug Profile Tools Window Help



Images >

System Information...

Options...

Select Tool

Zoom In +

Zoom Out -

Pan Tool

Enable the Red Channel

Enable the Green Channel

Enable the Blue Channel

Enable the Alpha Channel

Enable Grayscale Mode

Enable Color Invert Mode

Original Size (100%)

Best Fit

Rotate Left

Ctrl+L

Rotate Right

Ctrl+R

File Edit **View** Debug Profile Tools Window Help



Properties Window

Debug >

Profile >

Toolbars >

Show Line Numbers

Reset GUI Layout

Views Toolbar

Debug Toolbar

Images and Buffers Toolbar

Kernel Work Items Toolbar

File Edit View **Debug** Profile Tools Window Help



Start Debugging

Debug Mode

Frame Step Ctrl+F11

Draw Step Shift+F10

Step Over F10

Step In F11

Step Out Shift+F11

Break Shift+F5

Stop Debugging F6

Breakpoints >

Add / Remove Breakpoints... Alt+Shift+B

Enable all Breakpoints

Debug Settings...

File Edit View Debug Profile Tools Window Help



Debug Explorer



Memory

Object Type	Memory Size	Count

Statistics

Call Stack

Properties

Breakpoints

Locals

Watch

OpenGL State Variabl

Debugged Process Events

File Edit View Debug Profile Tools Window Help



Debug Explorer



AMDTeaPot

GL Context1 (Shared - CL1)

Static Buffers

CL Context1 (Shared - GL1)

amdtteapotoclsmokesystem.cpp

```

        msg.reset();
        msg.printf("Building program
\\\"%S\\\" ...", kernel._sourcePath);
        logger->setProgress(msg.str);

        status = _clBuildProgram(
            kernel._clProgram,
            1,
            &devid,
            str,
            NULL,
            NULL);

        char* log = NULL;
        size_t logSize;
        if (_clGetProgramBuildInfo(

```

Memory

Object Type	Memory	Count
Static	3,596 KB	16
Total	3,596 KB	16

Statistics

Call Stack

Properties

Breakpoints

Locals

Watch

OpenGL State Variabl

Debugged Process Events

```

Building OpenCL Program (Conte
DLL Loaded: C:\Users\franksw\Ap
Could not build OpenCL Program
Building OpenCL Program (Conte
Break

```

CodeXL - ExampleCL.uni (Debug Mode)

FileEditViewDebugProfileToolsWindowHelp

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Debug Explorer

AMDTeaPot

GL Context1 (Sho

Static Buffer

CL Context1 (Sho

Start Debugging

✓ Debug Mode

Frame StepCtrl+F11

Draw StepShift+F10

Step OverF10

Step InF11

Step OutShift+F11

BreakShift+F5

Stop DebuggingF6

Breakpoints>

Add / Remove Breakpoints...Alt+Shift+B

Enable all Breakpoints

Debug Settings...

n.cpp

et();

ntf("Building program

h);

>setProgress(msg.str);

_clBuildProgram(

kernel._clProgram,

1,

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Memory

Object Type	Memory	Count
Static	3,596 KB	16
Total	3,596 KB	16

Statistics

Call Stack

Properties

Breakpoints

Locals

Watch

OpenGL State Variabl

Debugged Process Events

Building OpenCL Program (Conte

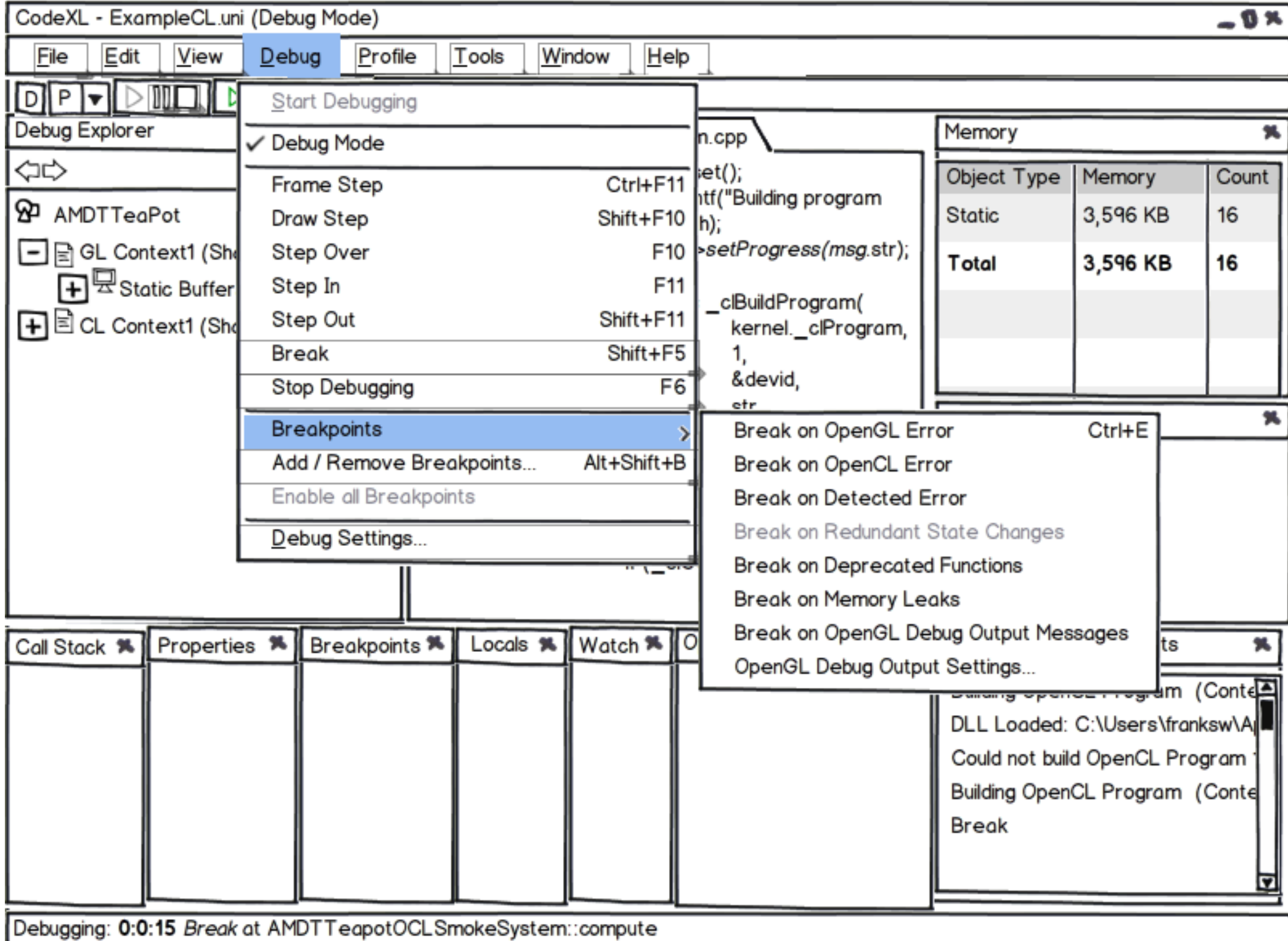
DLL Loaded: C:\Users\franksw\Ap

Could not build OpenCL Program

Building OpenCL Program (Conte

Break

Debugging: 0:0:15 Break at AMDTeapotOCLSmokeSystem::compute



File Edit View Debug Profile Tools Window Help



Debug Explorer



amdteapotoclsmokesystem.cpp

```
msg.reset();  
msg.printf("Building program  
\"%S\" ...", kernel._sourcePath);  
logger->setProgress(msg.str);  
  
status = _clBuildProgram(  
    kernel._clProgram,  
    1,  
    &devid,  
    str,  
    NULL,  
    NULL);  
  
char* log = NULL;  
size_t logSize;  
if (_clGetProgramBuildInfo(
```

Memory

Object Type	Memory Size	Count

Statistics

Call Stack

Properties

Breakpoints

Locals

Watch

OpenGL State Variabl

Debugged Process Events

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DLL Loaded: C:\Users\franksw\Ap
Could not build OpenCL Program
Building OpenCL Program (Conte
Break

CodeXL - ExampleCL.uni (Debug Mode)

FileEditViewDebugProfileToolsWindowHelp

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P

Start Debugging

✓ Debug Mode

Frame StepCtrl+F11

Draw StepShift+F10

Step OverF10

Step InF11

Step OutShift+F11

BreakShift+F5

Stop DebuggingF6

Breakpoints

Add / Remove Breakpoints...Alt+Shift+B

Enable all Breakpoints

Debug Settings...

Debug Explorer

AMDTeaPot

GL Context1 (Shared)

Static Buffers

CL Context1 (Shared)

kernel._clProgram,

et();

ntf("Building program

h);

setProgress(msg.str);

_clBuildProgram(

kernel._clProgram,

1,

&devid,

str,

NULL,

NULL);

g = NULL;

ogSize;

etProgramBuildInfo(

Memory

Object Type	Memory Size	Count
Static Buffers	3,596 KB	16
Total	3,596 KB	16

Statistics

OpenCL Command Queues

Function Calls History

Call Stack

Properties

Breakpoints

Locals

Watch

OpenGL State Variabl

Debugged Process Events

Debugging: 0:0:15 Break at AMDTeapotOCLSmokeSystem::compute

File Edit View Debug **Profile** Tools Window Help

First 3 are
the most
recent profile
modes used

Start Profiling

Profile mode - CPU: Instruction-based sampling

CPU: Timer-based sampling

- CPU: Instruction-based sampling

CPU: Events assess performance

CPU: Timer-based sampling

CPU: Instruction-based sampling

CPU: Events assess performance

CPU: Timer-based sampling

CPU: Instruction-based sampling

All Profiles >

Profile Settings...

Next 5 modes
are the Pre-
defined
Profile modes

File Edit View Debug **Profile** Tools Window Help



First 3 are
the most
recent profile
modes used

Start Profiling

✓ Profile mode - CPU: Instruction-based sampling

CPU: Timer-based sampling

● CPU: Instruction-based sampling

CPU: Events assess performance

CPU: Timer-based sampling

CPU: Instruction-based sampling

CPU: Events assess performance

CPU: Timer-based sampling

CPU: Instruction-based sampling

All Profiles >

Profile Settings...

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CPU: Instruction-based sampling

CPU: Events assess performance

CPU: Timer-based sampling

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CPU: Events assess performance

CPU: Timer-based sampling

CPU: Instruction-based sampling

All Profiles >

Profile Settings...

Next 5 modes
are the Pre-
defined
Profile modes

File Edit View Debug Profile Tools **Window** Help



<10 Open Windows>

All



Close All

"All" will show the
entire list of windows
open in case there
are more than 10

File Edit View Debug Profile Tools Window Help



View Help...

View Tutorial...

Check for Updates...

AMD Developer Tools Support Forum

AMD Developer Tools Knowledge Base

Open a Support Request

About CodeXL...

File Edit View Debug Profile Tools Window Help



Profiling Sessions

Session 2

- 0 x

[-] Timer-based sampling

Session 1

Renamed Session

Session 2

[-] Instruction-based sampling

Session 1

[-] Events assess performance

Session 1

Session 2

Session 3

[+] Events investigate L2 cache access

[+] Events investigate branching

[-] Events investigate data access

Session 1

Session 2

Time-based profile

Manage

Separate by none

Overview

System Data

Session 2

Properties

Breakpoints

CodeXL - ExampleCL.uni (Profile Mode)

File

Edit

View

Debug

Profile

Tools

Window

Help

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Profiling Sessions

-

Timer-based sampling

- Session 1
- Renamed Session
- Session 2

-

Instruction-based sampling

- Session 1

-

Events assess performance

- Session 1
- Session 2
- Session 3

+

Events investigate L2 cache access

+

Events investigate branching

-

Events investigate data access

- Session 1
- Session 2

Session 2

Time-based profile

Manage

Separate by none

Overview

System Data

Properties

Session 2

- General

Notes

Executed

Arguments

Working Directory

Environmental Variables

+ Start Options

- Duration

Profile Entire Duration

Duration

Terminate after

- Call Stack Collection

Collect Call Stacks

Unwind Depth

Frequency

- Cache Line Utilization

Analyze Cache Line Utilization

C:/code/Example/release/Example.exe

-V 1

C:/code/Example/release/

☒

15 S

☐

☒

10

1

☐

Properties

Breakpoints

Profiling: CPU: Timer-based sampling 0:0:13 Paused

Session 2

- General

Notes

Executed

Arguments

Working Directory

Environmental Variables

+ Start Options

- Duration

Profile Entire Duration

Duration

Terminate after

- Call Stack Collection

Collect Call Stacks

Unwind Depth

Frequency

- Cache Line Utilization

Analyze Cache Line Utilization

C:/code/Example/release/Example.exe

-V 1

C:/code/Example/release/

☒

15 S

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10

1

☐

CodeXL - ExampleCL.uni (Profile Mode)

FileEditViewDebugProfileToolsWindowHelp

Properties Window

Debug

Profile

Toolbars

Show Line Numbers

Reset GUI Layout

Session List

Session 2

Profiling Sessions

Session

Session 1

Renamed Session

Session 2

Time-based profile

Manage

Separate by none

Group Events

Overview

System Data

Ready

Properties

Session 2

- General

Notes

Executed

Arguments

Working Directory

Environmental Variables

+ Start Options

- Duration

Profile Entire Duration

Duration

Terminate after

- Call Stack Collection

Collect Call Stacks

Unwind Depth

Frequency

- Cache Line Utilization

Analyze Cache Line Utilization

C:/code/Example/release/Example.exe

-V 1

C:/code/Example/release/

☒

15 S

☐

☒

10

1

☐

File Edit View Debug Profile Tools Window Help



Profiling Sessions

Session 2

- 0 x

[-] Timer-based sampling

[icon] Session 1

[icon] Renamed Session

[icon] Session 2

[-] Instruction-based sampling

[icon] Session 1

[-] Events assess performance

[icon] Session 1

[icon] Session 2

[icon] Session 3

[+] Events investigate L2 cache access

[+] Events investigate branching

[-] Events investigate data access

[icon] Session 1

[icon] Session 2

Time-based profile

Manage

Separate by none

Overview

System Data

Profiling

Session 2

Profiling Started...



Properties

Breakpoints

File Edit View Debug **Profile** Tools Window Help

First 3 are
the most
recent profile
modes used

Start Profiling

✓ Profile mode - CPU: Timer-based sampling

• CPU: Timer-based sampling

CPU: Instruction-based sampling

CPU: Events assess performance

CPU: Timer-based sampling

CPU: Instruction-based sampling

CPU: Events assess performance

CPU: Timer-based sampling

CPU: Instruction-based sampling

All Profiles >

Profile Settings...

Next 5 modes
are the Pre-
defined
Profile modes

New Project...

Project Name:

ExampleCL

General

Executable or script

Profile

Debug

(Extend)

Working Directory

Program Arguments (optional)

Environmental Variables (optional)

Kernel Source files folder

Ok

Cancel

Project Settings

Project Name:

General Executable or script

Profile
Debug Working Directory

(Extend)
Program Arguments (optional)

Environmental Variables (optional)

Kernel Source files folder

Do we need OpenCL
Frame-Terminators
for Profiling?

Enabled only after
something in the
settings had changed

New Project...

Project Name:

General

Profile Name

Profile

Profile Type

Debug

Timer-based sampling settings

(Extend)

Profile Start Options

Delay (S)

CPU Affinity Mask

☐ Profiling

Profile Duration

☒ Profile entire duration

Duration (S)

☐ Then, terminate the application

Call Stack Collection

Unwind Depth

Call Stack collection frequency

Track Utilization

☐ CPU ☐ Memory

Project Settings

Project Name:

General

Profile Name

Profile Type

Profile

Timer-based sampling settings

Profile Start Options

Delay (S) CPU Affinity Mask

☐ Profiling

Profile Duration

☒ Profile entire duration Duration (S)

☐ Then, terminate the application

Call Stack Collection

Unwind Depth

Call Stack collection frequency

Track Utilization

☐ CPU ☐ Memory

Do we need OpenCL
Frame-Terminators
for Profiling?

Enabled only after
something in the
settings had changed

New Project...

Project Name:

General
Profile
Debug
(Extend)

OpenGL Render Frame Terminators

<input type="checkbox"/> glClear	<input checked="" type="checkbox"/> swapBuffers
<input type="checkbox"/> glFlush	<input type="checkbox"/> wglMakeCurrent
<input type="checkbox"/> glFinish	<input type="checkbox"/> glFrameTerminatorGREMEDY
<input type="checkbox"/> SwapLayerBuffers	

OpenCL Computation Frame Terminators

<input type="checkbox"/> clFlush	<input checked="" type="checkbox"/> cl_gremedy_computation_frame
<input type="checkbox"/> clFinish	<input type="checkbox"/> clWaitForEvents

Advanced

☐ Initialize DirectDraw library on startup

Select Breakpoints

Ok Cancel

Do we still
need the
DirectDraw
feature?

Project Settings

Project Name:

General

Profile

Debug

(Extend)

OpenGL Render Frame Terminators

<input type="checkbox"/> glClear	<input checked="" type="checkbox"/> swapBuffers
<input type="checkbox"/> glFlush	<input type="checkbox"/> wglMakeCurrent
<input type="checkbox"/> glFinish	<input type="checkbox"/> glFrameTerminatorGREMEDY
<input type="checkbox"/> SwapLayerBuffers	

OpenCL Computation Frame Terminators

<input type="checkbox"/> clFlush	<input checked="" type="checkbox"/> cl_gremedy_computation_frame
<input type="checkbox"/> clFinish	<input type="checkbox"/> clWaitForEvents

Advanced

☐ Initialize DirectDraw library on startup

Select Breakpoints

Restore Defaults

Ok Cancel

Do we still
need the
DirectDraw
feature?

Enabled only after
something in the
settings had changed

OpenGL and OpenCL Breakpoints

Add a function to the 'Active Breakpoints' list to set it as a debugging breakpoint

Breakpoints

API Functions

Kernel Functions

Error/Warning

clBeginComputationFrameAMD
clBuildProgram
clCompileProgram
clCreateBuffer
clCreateCommandQueue
clCreateContext
clCreateContextFromType
clCreateEventFromGLsyncKHR
clCreateFromGLBuffer
clCreateFromGLRenderbuffer
clCreateFromGLTexture2D
clCreateFromGLTexture3D
clCreateKernel

Add >>

<< Remove

Remove All

Active Breakpoints

Breakpoint Name	Type
-----------------	------

Type kernel function name	

☐ Enable all Breakpoints

Ok

Cancel

OpenGL Debug Output Settings

General Settings

☐ Enable OpenGL Debug Output Logging

☐ Break on OpenGL Debug Output Reports

Reported Messages Severity: Low

Reported Categories

<input type="checkbox"/> API Error	<input type="checkbox"/> Performance
<input type="checkbox"/> Window System	<input type="checkbox"/> Shader Compiler
<input type="checkbox"/> Deprecations	<input type="checkbox"/> Application
<input type="checkbox"/> Undefined Behavior	<input type="checkbox"/> Other

Ok Cancel

Manage Components

Name	Description	Enabled
gDEBugger	OpenCL and OpenGL debugger and memory analyzer	<input checked="" type="checkbox"/>
CodeAnalyst	CPU profiling tools	<input checked="" type="checkbox"/>

Ok Save

Allows for user control.
Also appears after the
welcome screen when
the available
components change.

System Information

System Display OpenGL Renderer OpenGL Pixel Formats OpenGL Extensions OpenGL Platforms OpenGL Devices

Item	Value
Computer Name	FooBar
User	Tester
OS name	Windows 7
OS version	6.1.7601
Number of Processors	2
System Type	x86
Processor Details	Family: 10h, Model: 10, Stepping: 0
Total Physical Memory	7926 MB
Available Physical Memory	4203 MB
Total Virtual Memory	2027 MB
Available Virtual Memory	1735 MB
Total Page Files	15851 MB
Available Page Files	12409 MB
Loaded Components	gDEBugger

Ok

Save

Options

General Source Log Files Debug Profile Manage Components

3 Floating-point digits of precision

- ☒ Show welcome dialog on start up
- ☒ Show manage components dialog when the available components change

Ok

Save

Options

General Source Log Files Debug Profile Manage Components

Source Files

- ☒ Additional Source Code Directories C:\ProgramData\example\src ...
- ☐ Source Code Root Location
- ☐ Alert when no source is available

Symbols

- ☒ Additional Debug Symbols Paths C:\ProgramData\example\symbols ...

Symbol Server ☒

- ☒ Download Directory C:\users\tester\Symbols

New

Remove

Move Up

Move Down

- ☒ <http://msdl.microsoft.com/downloads/symbols>

Ok

Save

Options

General Source Log Files Debug Profile Manage Components

Log files and images directory: C:\Users\tester\logs



Debug log level:

Info



☐ Flush log file after every monitored function call (not recommended)

Calls History Logging

Texture and Image Logging ☒

- ☒ PNG (Preserves alpha values)
- ☐ JPEG
- ☐ TIFF (3D Textures and Images always stored in TIFF)
- ☐ BMP

Maximum items logged

OpenGL function calls (per context) 4000000

OpenCL function calls (per context)

50000

*If this maximum is exceeded, the log will be cleared.

Define a frame terminator to avoid the automatic clearing.

OpenCL queue commands (per queue)

2000

Ok

Save

Options

General Source Log File Debug Profile Manage Components

☒ Collect allocated objects' creation call stacks

☐ I am using an HTTP proxy server:

Port number:

Performance Counters sample interval (mS):

Ok

Save

Options

General Source Log File Debug Profile Manage Components

Source display

- ☐ Bypass source, only display disassembly
- ☐ Alert when the source file is not available

10



Maximum shown parallel queues

If the profile includes
OpenCL Gantt chart
information

Ok

Save

Options

General

Source

Log Files

Debug

Profile

Manage Components

Name	Description	Enabled
gDEBbugger	OpenCL and OpenGL debugger and memory analyzer	<input checked="" type="checkbox"/>
CodeAnalyst	CPU profiling tools	<input checked="" type="checkbox"/>

Ok

Save



- Start Debugging
- ✓ Debug Mode
- Frame Step Ctrl+F11
- Draw Step Shift+F10
- Step Over F10
- Step In F11
- Step Out Shift+F11
- Break Shift+F5
- Stop Debugging F6
- Breakpoints >
- Add / Remove Breakpoints... Alt+Shift+B
- Enable all Breakpoints
- Debug Settings...

Command Queues Realtime

Device 1 C1 Q1	

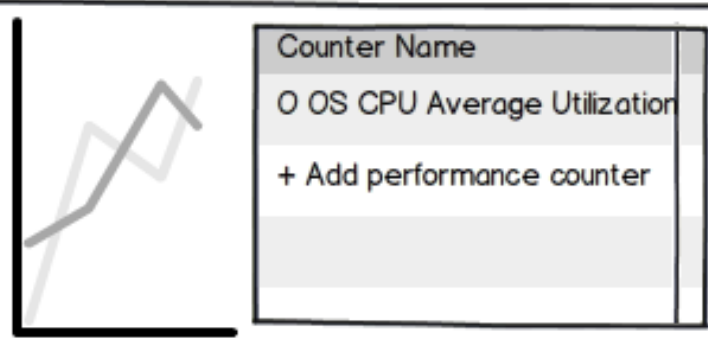
Debug Warning!

No breakpoints were set!
You will have to manually break the application at an OpenCL or OpenGL API call.

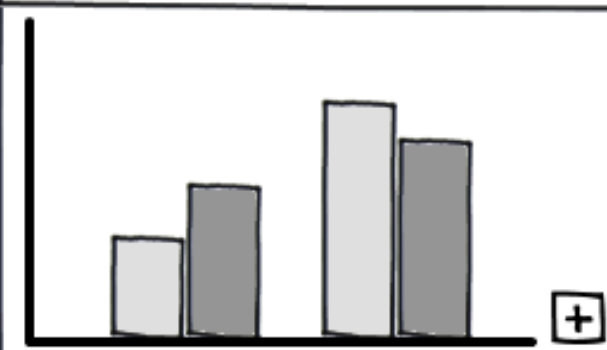
Ok

Shows up when Go is selected without breakpoints being set.

Performance Graph



Performance Dashboard



Debugged Process Events

Building OpenCL Program (Conte
DLL Loaded: C:\Users\franksw\A
Could not build OpenCL Program
Building OpenCL Program (Conte
Build Log: