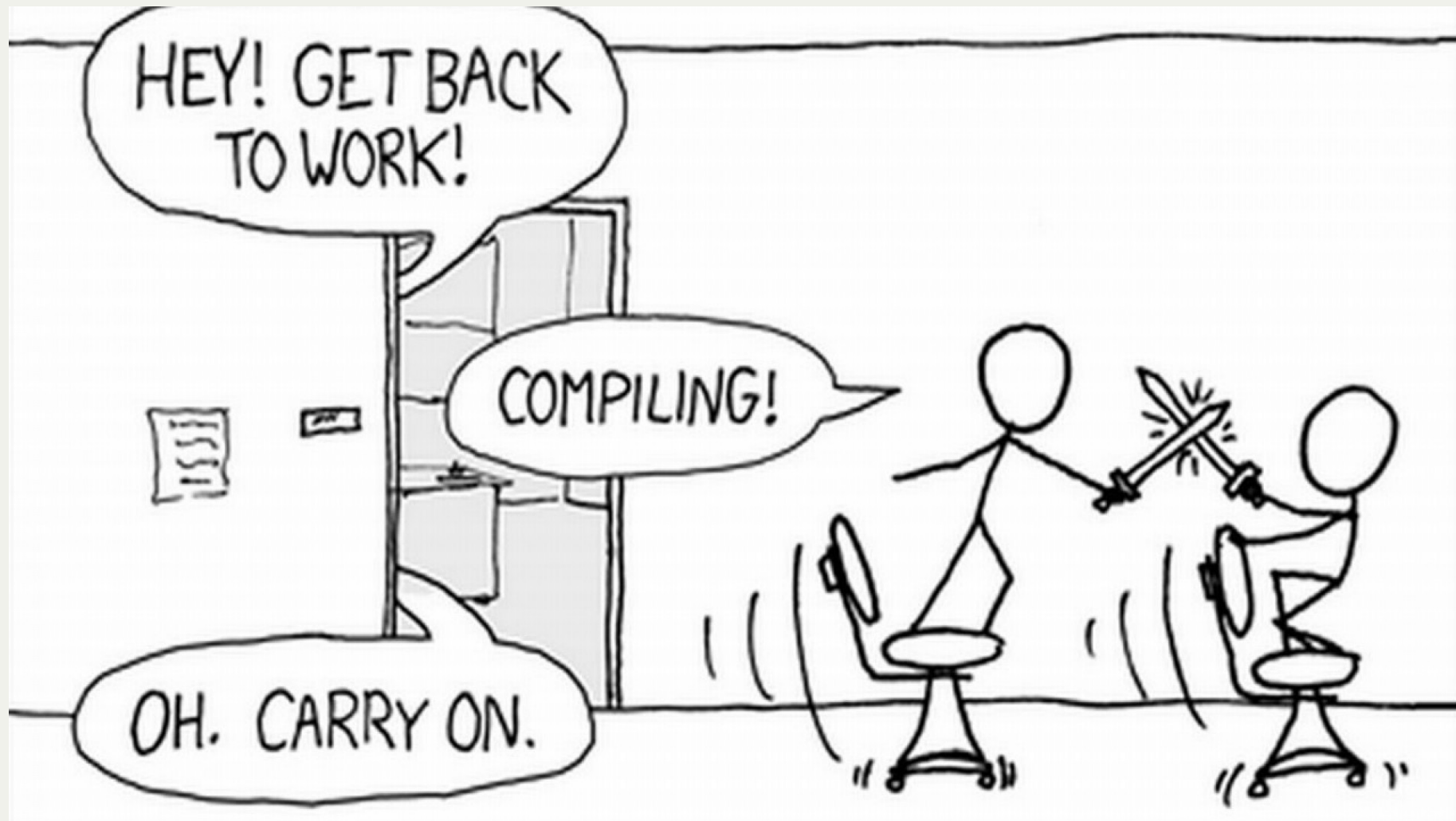


Ускорение сборки КОМПАС-3D с помощью RCH

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Проблема



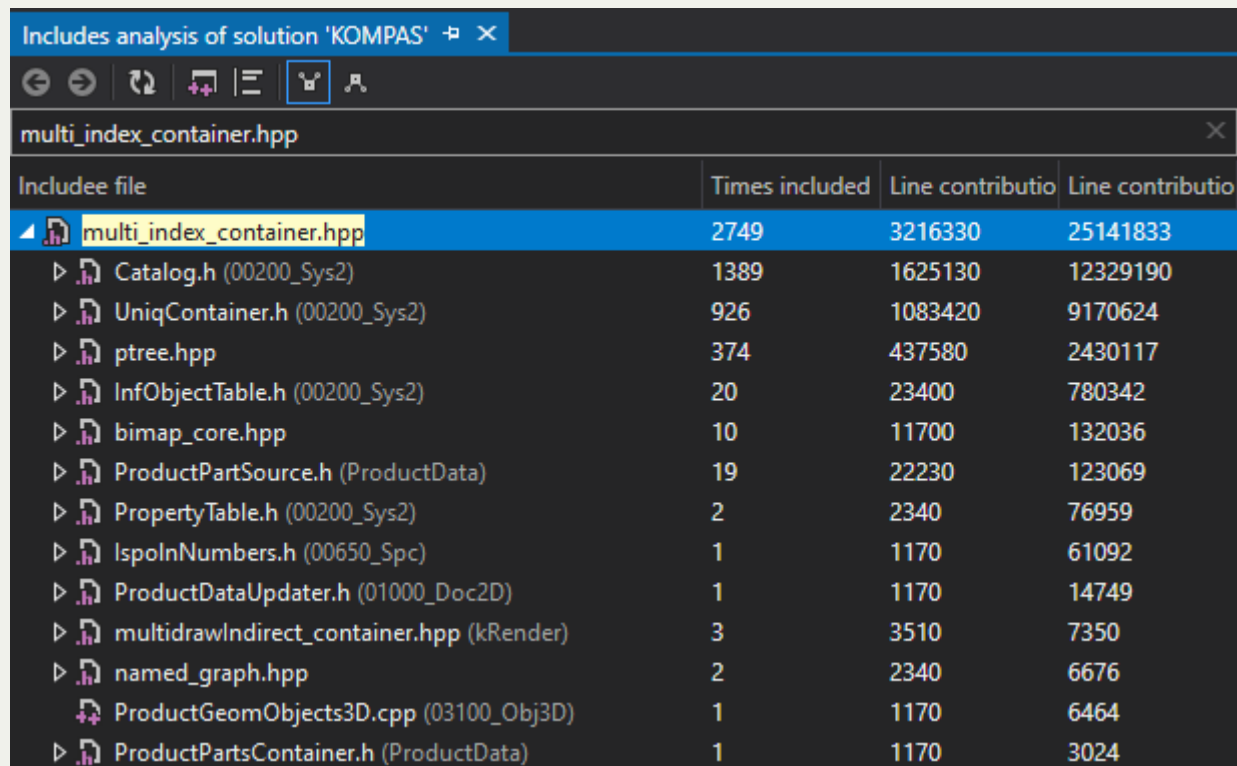
Что есть ?

- ~3 миллиона строк
- ~4500 .cpp & ~4000 .h
- 55 проектов
- boost, stl, winapi

Поиск узких мест

- ReSharper C++ Analyze Includes
- C++ Build Insights

Resharper C++ Analyze Includes



The screenshot shows the 'Analyze Includes' window in Resharper C++. The title bar reads 'Includes analysis of solution 'KOMPAS'' with a close button. Below the title bar is a toolbar with icons for back, forward, refresh, add, list, and search. The main area displays a table of include files for 'multi_index_container.hpp'. The table has four columns: 'Includee file', 'Times included', 'Line contributio', and 'Line contributio'. The first row is highlighted in blue and shows 'multi_index_container.hpp' with 2749 times included, 3216330 line contributions, and 25141833 line contributions. Subsequent rows show various other include files with their respective statistics.

Includee file	Times included	Line contributio	Line contributio
multi_index_container.hpp	2749	3216330	25141833
▶ Catalog.h (00200_Sys2)	1389	1625130	12329190
▶ UniqContainer.h (00200_Sys2)	926	1083420	9170624
▶ ptree.hpp	374	437580	2430117
▶ InfObjectTable.h (00200_Sys2)	20	23400	780342
▶ bimap_core.hpp	10	11700	132036
▶ ProductPartSource.h (ProductData)	19	22230	123069
▶ PropertyTable.h (00200_Sys2)	2	2340	76959
▶ lspolnNumbers.h (00650_Spc)	1	1170	61092
▶ ProductDataUpdater.h (01000_Doc2D)	1	1170	14749
▶ multidrawIndirect_container.hpp (kRender)	3	3510	7350
▶ named_graph.hpp	2	2340	6676
▶ ProductGeomObjects3D.cpp (03100_Obj3D)	1	1170	6464
▶ ProductPartsContainer.h (ProductData)	1	1170	3024

C++ Build Insights

- Visual Studio 2019
- latest Windows ADK
- `perf_msvcbuildinsights.dll` -> WPA directory
- `perfcore.ini` add
`perf_msvcbuildinsights.dll`

C++ Build Insights

- `vcperf /start MySessionName`
- compile your project
- `vcperf /stop MySessionName`
`outputFile.etl`



C++ Build Insights

Line #	Activity Name	Included Path	Inclusive Duration (s)	Wall Clock Time Responsibility (s)	Exclusive	Start Time (ns)	Inclusive Duration (s)	Legend
1	▼ Parsing		291,248,166000000	794,341000000				
2		▸ A:\src\Source\ProductData\PropertyData.h	4,084,544000000	13,616000000				
3		▸ A:\src\Source\2D\FSys\Option.h	2,800,288000000	9,320000000				
4		▸ A:\src\Tools\Boost\boost\variant\variant.hpp	2,689,562000000	8,409000000				
5		▸ A:\src\Source\2D\FSys\Cfgopt.h	2,526,610000000	8,335000000				
6		▸ A:\src\Source\2D\DocT\Dbseedit.h	2,301,613000000	8,173000000				
7		▸ A:\src\Source\2D\ObjS\Obj.h	2,572,620000000	8,169000000				
8		▸ A:\src\Source\2D\Options\EmbodimentsTree.h	2,518,660000000	8,049000000				
9		▸ A:\src\Source\ProductData\PropRefsBase.h	2,409,359000000	7,561000000				
10		▸ A:\src\Source\ProductData\MetaProductData.h	2,218,591000000	7,046000000				
11		▸ A:\src\Source\2D\ObjS\Complobj.h	2,017,424000000	6,670000000				
12		▸ A:\src\Source\2D\Options\Wsdef.h	2,101,165000000	6,636000000				
13		▸ A:\src\Source\2D\ObjS\Objlist.h	1,949,444000000	6,472000000				
14		▸ A:\src\Source\2D\TedB\Ted_base.h	1,915,549000000	6,115000000				
15		▸ A:\src\Source\2D\DocS\Dbsecont.h	1,712,567000000	5,975000000				
16		▸ A:\src\Tools\Boost\boost\multi_index_container.hpp	1,981,786000000	5,868000000				
17		▸ A:\src\Source\2D\Options\Komdoc.h	1,707,304000000	5,686000000				
18		▸ A:\src\Source\2D\FSys\Prjopt.h	1,699,975000000	5,379000000				
19		▸ A:\src\Source\2D\DocE\Dvbsedit.h	1,473,623000000	5,256000000				
20		▸ A:\src\Source\c3d\Include\io_tape.h	1,861,150000000	5,167000000				
21		▸ A:\src\Source\3D\K3dObj01\Ifcompnt.h	1,522,513000000	5,070000000				
22		▸ A:\src\Source\2D\DocT\D23docedit.h	1,470,662000000	5,066000000				
23		▸ A:\src\Source\3D\K3dObj01\HotPoint.h	1,495,312000000	4,981000000				
24		▸ A:\src\Source\2D\FSys\Catalog.h	1,618,259000000	4,959000000				
25		▸ A:\src\Source\2D\DocS\Drndpt.h	1,414,098000000	4,794000000				
26		▸ A:\src\Source\2D\Options\Wsid.h	1,365,502000000	4,658000000				
27		▸ A:\src\Source\3D\K3dObj01\PARTOBJ.H	1,376,792000000	4,593000000				
28		▸ A:\src\Source\2D\DocS\Ifdrfsrv.h	1,343,431000000	4,513000000				
29		▸ A:\src\Source\3D\K3dObj01\foundobj.h	1,291,557000000	4,316000000				
30		▸ A:\src\Source\ProductData\MetaProductSignals.h	1,268,790000000	4,297000000				
31		▸ A:\src\Source\2D\ObjE\Leader.h	1,315,306000000	4,125000000				
32		▸ A:\src\Tools\Boost\boost\signals2.hpp	1,218,208000000	4,122000000				
33		▸ A:\src\Source\2D\ObjS\Tcurve.h	1,344,972000000	3,995000000				
34		▸ A:\src\Source\2D\ObjS\AppearanceObj.h	1,265,915000000	3,968000000				
35		▸ A:\src\Source\2D\FSys\UniqContainer.h	1,233,713000000	3,602000000				
36		▸ A:\src\Source\2D\ObjS\Annsymb.h	1,125,564000000	3,564000000				
37		▸ A:\src\Source\API\API5_2D\IAPViewsAndLayers.h	947,529000000	3,538000000				
38		▸ A:\src\Source\3D\K3dObj01\OBJECT3D.H	1,055,877000000	3,500000000				
39		▸ A:\src\Source\3D\K3dObj01\OBJ3DTYP.H	1,057,743000000	3,494000000				
40		▸ A:\src\Source\3D\K3dObj01\IfGenerativeDimensionsOwner.h	998,825000000	3,284000000				

C++ Build Insights

```
MINGW64://tulup-a/dev/experimental/includes // Autogenerated include files. Do not edit!!!
// #if defined(_cplusplus) && !defined(DONT_USE_GENERATED_PCH)
tulup@tulup-A MINGW64 //tulup-a/dev/experimental/includes (master) //K3dObj01/HotPoint.h> // 349 of 491: 0,8% 387.814s
$ dotnet fsi ./include-analyzer.fsx ".\\f11cb3f9045131b86a1aadd086cf6b9ab355cd1.includes.bin" "multi_index_container.hpp" "UniqContainer.h" "ObjS\\MdFList.h" "ObjS\\ObjList.h"
- multi_index_container.hpp 36 #include <2D/00200_Sys2/00200_sys2_def.h> // 479 of 491: 0,73% 261.413s
- A:\\src\\Tools\\Boost\\boost\\bimap\\detail\\bimap_core.hpp, 732 #include <3D/03100_Obj3D/03100_obj3D_def.h> // 474 of 491: 0,66% 236.354s
- A:\\src\\Source\\2D\\FSys\\UniqContainer.h, 686 #include <3D/K3dObj01/PARTOBJ.H> // 338 of 491: 0,64% 229.526s
- A:\\src\\Tools\\Boost\\boost\\property_tree\\ptree.hpp, 68 #include <3D/K3dObj01/GenerativeDimensionsOwner.h> // 338 of 491: 0,44% 156.493s
- A:\\src\\Source\\ProductData\\ProductPartSource.h, 66 #include <3D/K3dObj01/IfGenerativeDimensionsOwner.h> // 338 of 491: 0,43% 154.795s
- A:\\src\\Source\\3D\\K3dObj01\\SubElement.h, 50 #include <3D/K3dObj01/Ifcompnt.h> // 407 of 491: 0,42% 150.181s
- A:\\src\\Source\\3D\\K3dMate\\mtGroup.h, 19 #include <3D/K3dObj01/foundobj.h> // 388 of 491: 0,37% 132.110s
- A:\\src\\Source\\Render\\mdi\\impl\\multidrawIndirect_container.hpp, 2 #include <3D/K3dObj01/DetailSolid.h> // 212 of 491: 0,3% 108.494s
- A:\\src\\Source\\SPC\\Base\\IsopolnNumbers.h, 2 #include <3D/K3dObj01/DesignationObject.h> // 94 of 491: 0,28% 101.738s
- A:\\src\\Source\\2D\\FSys\\Catalog.cpp, 1 #include <2D/ObjectProperties/ObjProp.h> // 431 of 491: 0,27% 96.970s
- A:\\src\\Source\\3D\\K3dObj01\\SubElementData.cpp, 1 #include <3D/K3dObj01/REFCONT.H> // 336 of 491: 0,23% 83.998s
- A:\\src\\Source\\3D\\K3dObj01\\ProductGeomObjects3D.cpp, 1 #include <3D/K3dObj01/ResultDe.h> // 168 of 491: 0,22% 80.474s
- A:\\src\\Source\\3D\\K3dObj01\\ShMtBendStraighten.CPP, 1 #include <3D/K3dObj01/AuxiliaryGeometry.h> // 176 of 491: 0,22% 78.095s
- A:\\src\\Source\\2D\\Options\\InfObjects\\PropertyTable.h, 1
- A:\\src\\Source\\ProductData\\ProductDataUpdater.h, 1
- UniqContainer.h
- A:\\src\\Source\\2D\\ObjS\\MdFList.h, 1270
- A:\\src\\Source\\2D\\DocS\\ProductGeomObj2D.h, 1
- ObjS\\MdFList.h
- A:\\src\\Source\\2D\\ObjS\\ObjList.h, 1271
- ObjS\\ObjList.h
- A:\\src\\Source\\2D\\ObjS\\ObjectsModel.h, 1052 Issues found
- A:\\src\\Source\\2D\\DocS\\Vbsedit.h, 149
- A:\\src\\Source\\2D\\ObjT\\StubObj.cpp, 1
- A:\\src\\Source\\2D\\ObjT\\StubUtil.cpp, 1 from: Source Control - Git
- A:\\src\\Source\\2D\\ObjE\\Dimctr.cpp, 1 repositories:
- A:\\src\\Source\\2D\\ObjT\\Macroobj.cpp, 1
- A:\\src\\Source\\2D\\DocS\\Vbscont.cpp, 1 mpas\\KOMPAS_WRK
- A:\\src\\Source\\2D\\DocS\\MdLayersFeature.cpp, 1
```

Include What You Use (iwyu)

- удаляет лишние include
- добавляет forward declaration

Include What You Use (iwyu)

- `llvm`
- `-DLLVM_ENABLE_PROJECTS="clang;clang-tools-extra"`

Include What You Use (iwyu)

```
// найти лишние include  
iwyu_tool -j 256 -p compile_commands.json -- -w > iwyu_res.cpp
```

```
// применить исправления  
fix_includes.py < iwyu_res.cpp
```

PCH

- `vcperf /start MySessionName`
- compile your project
- `vcperf /stopnoanalyze MySessionName
outputFile.etl`

Имя	Дата изменения	Тип
build	02.08.2021 9:39	Папка с файлами
perf-reports	30.07.2021 19:37	Папка с файлами
src	02.08.2021 7:23	Папка с файлами
temp	03.08.2021 12:41	Папка с файлами
Aggregated Parsing Duration: 2308662 ms		
Front-End Time Percentage: 3.4%	30.07.2021 19:04	Файл "BIN"
Inclusion Count: 473	02.08.2021 8:45	SVG-документ
Path: A:\src\Source\2D\Doc\Bbsedit.h	02.08.2021 8:28	Исходный файл ..
includes.dot		
Aggregated Parsing Duration: 2126157 ms		
Front-End Time Percentage: 3.2%	30.07.2021 18:52	Файл "ETL"
Inclusion Count: 943	30.07.2021 18:38	Файл "ETL"
Path: A:\src\Source\2D\Options\Komdoc.h		
Aggregated Parsing Duration: 1901246 ms		
Front-End Time Percentage: 2.8%		
Inclusion Count: 3351		
Path: A:\src\Source\c3d\Include\io_tape.h		
Aggregated Parsing Duration: 1818835 ms		
Front-End Time Percentage: 2.7%		
Inclusion Count: 2289		
Path: A:\src\Source\2D\Options\Wsdef.h		
Aggregated Parsing Duration: 1784243 ms		
Front-End Time Percentage: 2.7%		
Inclusion Count: 586		
Path: A:\src\Source\2D\Doc\Bbscont.h		
Aggregated Parsing Duration: 1515487 ms		
Front-End Time Percentage: 2.3%		
Inclusion Count: 954		
Path: A:\src\Source\ProductData\ProductDataUpdater.h		



PCH

```
30 #include <boost/icl/interval_map.hpp>
31 #include <boost/icl/interval.hpp>
32
33 // Autogenerated include files. Do not edit!!!
34 #if defined(_cplusplus) && !defined(DONT_USE_GENERATED_PCH)
35 #include <3D/K3dObj01/HotPoint.h> // 349 of 491: 0,8% 287.014s
36 #include <2D/00200_Sys2/00200_sys2_def.h> // 479 of 491: 0,73% 261.413s
37 #include <3D/03100_Obj3D/03100_obj3d_def.h> // 474 of 491: 0,66% 236.354s
38 #include <3D/K3dObj01/PARTOBJ.H> // 338 of 491: 0,64% 229.526s
39 #include <3D/K3dObj01/GenerativeDimensionsOwner.h> // 338 of 491: 0,44% 156.493s
40 #include <3D/K3dObj01/IfGenerativeDimensionsOwner.h> // 338 of 491: 0,43% 154.795s
41 #include <3D/K3dObj01/Ifcompt.h> // 407 of 491: 0,42% 150.181s
42 #include <2D/ObjJs/Annsymb.h> // 365 of 491: 0,37% 133.961s
43 #include <3D/K3dObj01/foundobj.h> // 388 of 491: 0,37% 132.110s
44 #include <3D/K3dObj01/DetailSolid.h> // 212 of 491: 0,3% 108.494s
45 #include <3D/K3dObj01/DesignationObject.h> // 94 of 491: 0,28% 101.738s
46 #include <2D/ObjectProperties/ObjProp.h> // 431 of 491: 0,27% 96.970s
47 #include <3D/K3dObj01/REFCONT.H> // 336 of 491: 0,23% 83.998s
48 #include <3D/K3dObj01/ResultDe.h> // 168 of 491: 0,22% 80.474s
49 #include <3D/K3dObj01/AuxiliaryGeometry.h> // 176 of 491: 0,22% 78.095s
50 #include <3D/K3dObj01/D3BaseDimension.h> // 61 of 491: 0,21% 76.676s
51 #include <3D/K3dObj01/CSubAnyCopy.h> // 61 of 491: 0,2% 72.350s
52 #include <3D/K3dObj01/PARTOPER.H> // 180 of 491: 0,2% 72.294s
53 #include <3D/K3dObj01/concurve.h> // 86 of 491: 0,19% 69.385s
54 #include <2D/FSys/KompasAppID.h> // 276 of 491: 0,19% 67.832s
55 #include <2D/ObjJs/Obj.h> // 382 of 491: 0,18% 65.759s
56 #include <3D/K3dObj01/CPoint3DParam.h> // 230 of 491: 0,18% 65.482s
57 #include <3D/K3dObj01/SourceColor.h> // 429 of 491: 0,17% 61.417s
58 #include <3D/K3dObj01/COPYPAT.H> // 128 of 491: 0,17% 60.574s
59 #include <3D/K3dObj01/CVector3D.h> // 249 of 491: 0,16% 58.984s
60 #include <3D/K3dObj01/ADVCOLOR.H> // 367 of 491: 0,16% 57.550s
61 #include <3D/K3dObj01/D3DRAW.H> // 378 of 491: 0,16% 56.021s
62 #include <2D/FSys/Ifsmthng.h> // 466 of 491: 0,14% 50.294s
63 #include <2D/ObjJs/Tcurve.h> // 366 of 491: 0,14% 49.933s
64 #include <3D/K3dObj01/Obj3DTYP.H> // 392 of 491: 0,13% 48.194s
65 #include <3D/K3dObj01/ObjJECT3D.H> // 393 of 491: 0,13% 48.166s
66 #include <3D/CompStyle/DrawDef.h> // 420 of 491: 0,13% 47.723s
```

Результаты

Line #	Activity Name	Included Path	Inclusive Duration (s) Sum	Exclusive Duration (s) Sum	Count Sum	Included By
1	▼ Parsing		211 745,477000000	25 615,136000000	3 082 932	
2		▸ A:\src\Source\2D\Doc\Docsedit.h	2 298,329000000	9,207000000	473	
3		▸ A:\src\Source\2D\Options\Komdoc.h	2 066,588000000	129,441000000	942	
4		▸ A:\src\Source\c3d\Include\io_tape.h	1 989,162000000	230,592000000	3 351	
5		▸ A:\src\Source\2D\Doc\Docscont.h	1 777,383000000	19,406000000	586	
6		▸ A:\src\Source\2D\Options\Wsdef.h	1 743,275000000	32,410000000	2 289	
7		▸ A:\src\Source\2D\TedB\Ted_base.h	1 476,638000000	84,326000000	1 521	
8		▸ A:\src\Source\ProductData\ProductDataUpdater.h	1 466,511000000	11,386000000	953	
9		▸ A:\src\Source\2D\DocE\Dvbsedit.h	1 338,844000000	6,323000000	357	
10		▸ A:\src\Source\c3d\Include\math_define.h	1 171,573000000	332,271000000	3 050	
11		▸ A:\src\Source\3D\K3dObj01\HotPoint.h	1 135,875000000	32,684000000	1 085	
12		▸ A:\src\Tools\Boost\boost\multi_index_container.hpp	1 108,068000000	11,612000000	1 226	
13		▸ A:\src\Source\2D\Options\Komdocrw.h	1 080,165000000	50,286000000	2 341	
14		▸ A:\src\Source\2D\Doc\T\23docedit.h	1 057,922000000	9,910000000	568	
15		▸ A:\src\Source\2D\ObjS\Obj.h	1 055,374000000	46,774000000	2 215	
16		▸ A:\src\Source\c3d\Include\tool_cstring.h	1 015,731000000	49,004000000	3 784	
17		▸ A:\src\Source\3D\K3dObj01\PARTOBJ.H	1 008,018000000	22,360000000	947	
18		▸ A:\src\Source\2D\Options\Libwst.h	996,129000000	33,643000000	2 292	
19		▸ A:\src\Source\ProductData\MetaProps.h	972,140000000	197,932000000	1 071	
20		▸ A:\src\Source\2D\ObjS\Ann symb.h	954,504000000	17,173000000	1 870	
21		▸ A:\src\Source\2D\DocS\Drndpt.h	952,945000000	18,243000000	1 064	
22		▸ A:\src\Source\ProductData\MetaProductSignals.h	943,571000000	46,240000000	586	
23		▸ A:\src\Source\2D\FSys\Catalog.h	935,084000000	83,470000000	2 375	
24		▸ A:\src\Tools\Boost\boost\preprocessor\iteration\detail\iter\forward1.hpp	903,690000000	15,479000000	3 316	
25		▸ A:\src\Source\2D\ObjS\Complobj.h	901,254000000	10,017000000	776	
26		▸ A:\src\Source\ProductData\PropertyData.h	894,718000000	440,896000000	1 118	
27		▸ A:\src\Tools\Boost\boost\signals2.hpp	894,139000000	1,282000000	586	
28		▸ A:\src\Source\2D\DocS\lfdfrsrv.h	877,712000000	33,478000000	1 083	
29		▸ A:\src\Source\2D\Options\EmbodimentsTree.h	859,698000000	51,818000000	2 623	
30		▸ A:\src\Source\2D\00200_Sys2\00200_sys2_def.h	842,966000000	68,559000000	2 836	
31		▸ A:\src\Source\2D\Options\Wsbank.h	825,016000000	18,367000000	2 280	
32		▸ A:\src\Source\c3d\Include\model_item.h	811,789000000	51,772000000	2 227	
33		▸ A:\src\Source\3D\K3dObj01\IfGenerativeDimensionsOwner.h	792,801000000	15,531000000	1 032	
34		▸ A:\src\Source\2D\ObjS\Objlist.h	780,973000000	62,541000000	228	
35		▸ A:\src\Source\2D\CurveStyles\Drawtool.h	778,000000000	106,660000000	2 897	

Результаты

https://docs.google.com/spreadsheets/d/1cbizmv5p2pZk-3vLuv1MqV849x4IXV85vQmua3JO_F8/edit#gid=0

AMD EPYC 7742 64 x 2 Core @ 2.25 GHz	1 TB	linux	6m31s	6m33s	5m12s	
AMD EPYC 7742 64 x 2 Core @ 2.25 GHz	1 TB	linux	5m4s	4m53s	4m2s	2dc76351284f52c6290026bf752d1ce1b0dc5efd
AMD EPYC 7742 64 x 2 Core @ 2.25 GHz	1 TB	linux	4m36s	4m35s	3m50s	0a63db91fe413b3ac222208b493b0cadd192050b
i7-5820K CPU @ 3.30GHz	32 GB	Тулуп	26m59s	22m10s		
i7-5820K CPU @ 3.30GHz	32 GB	Тулуп	23m54s	18m13s		2dc76351284f52c6290026bf752d1ce1b0dc5efd
i7-5820K CPU @ 3.30GHz	32 GB	Тулуп	21m54s	16m35s		0a63db91fe413b3ac222208b493b0cadd192050b
i7-5820K CPU @ 3.30GHz	32 GB	Тулуп		15m00s		92cb9c7e328b49ff62da04771db19e210947cd86
i7-5820K CPU @ 3.30GHz	32 GB	Тулуп		13m41s		adaf388f816fc9354054e5b8aa4c7c37c115d460
i7-5820K CPU @ 3.30GHz	32 GB	Тулуп		12m59s		d1517387eb1b23c2ed2cb78188712250006fa4b1
i7-5820K CPU @ 3.30GHz	32 GB	Тулуп		12m25s		e6222d14c44eaff476afa89faf662a488e3575c7
i7-10750H CPU @ 2.60GHz	32 GB	Тулуп		18m39s		
i7-10750H CPU @ 2.60GHz	32 GB	Тулуп		16m39s		2dc76351284f52c6290026bf752d1ce1b0dc5efd
i7-10750H CPU @ 2.60GHz	32 GB	Тулуп		14m37s		0a63db91fe413b3ac222208b493b0cadd192050b
i7-7700 CPU @ 3.60 GHz	32 GB	Виноградов		~25m		
i7-7700 CPU @ 3.60 GHz	32 GB	Виноградов		~17m		0a63db91fe413b3ac222208b493b0cadd192050b
i7-7700 CPU @ 3.60 GHz	32 GB	Виноградов		~14m		e6222d14c44eaff476afa89faf662a488e3575c7
i7-9700K CPU @ 3.60GHz	32 GB	Шапошникова	23m25s	17m49s	20m57s	
i7-9700K CPU @ 3.60GHz	32 GB	Шапошникова	20m35s	14m50s	21m11s	2dc76351284f52c6290026bf752d1ce1b0dc5efd
i7-9700K CPU @ 3.60GHz	32 GB	Шапошникова	15m43s	12m9s		0a63db91fe413b3ac222208b493b0cadd192050b
i7-4770 CPU @ 3.40GHz	16 GB	Кондриков	36m44s	30m27s	36m55s	
i9-9900kf CPU @ 3.60GHz	16 GB	Ерохин	17m28s	15m4s	17m8s	49654047d1888eb818088554a6a779479dd834fa
i7-3770 CPU @ 3.40GHz	16 GB	Кузнецов		30m17s		49654047d1888eb818088554a6a779479dd834fa
i7-7700 CPU @ 3.60 GHz	32 GB	Синюков		24m50s		
i9-9900kf CPU @ 3.60GHz	16 GB	Ерохин	18m11s	15m3s	16m59s	
i9-9900kf CPU @ 3.60GHz	16 GB	Ерохин		13m36s	17m3s	2dc76351284f52c6290026bf752d1ce1b0dc5efd
i9-9900kf CPU @ 3.60GHz	16 GB	Ерохин		10m57s	13m5s	0a63db91fe413b3ac222208b493b0cadd192050b
i7-7700K CPU @ 4.20GHz	64 Gb	Сидякин		17m42.039s		853ef5bb5f22ae8662afe1d6fc8d995df0ed9cfc

Результаты

22m10s		
18m13s		2dc76351284f52c6290026bf752d1ce1b0dc5efd
16m35s		0a63db91fe413b3ac222208b493b0cadd192050b
15m00s		92cb9c7e328b49ff62da04771db19e210947cd86
13m41s		adaf388f816fc9354054e5b8aa4c7c37c115d460
12m59s		d1517387eb1b23c2ed2cb78188712250006fa4b1
12m25s		e6222d14c44eaff476afa89faf662a488e3575c7

Спасибо!

ССЫЛКИ

- Include What You Use
- Finding build bottlenecks with C++ Build Insights