IMSCAD put Intel's CORE i7 vPro 8th Gen processor with Radeon Pro Graphics (Kaby Lake G) through its paces with market leading graphical applications and workflows.

Executive Summary:

IMSCAD tested the uplift in performance of various CAD workloads running on the new Intel® Core i7 vPro 8th Gen Processor and Radeon* RX Vega M Graphics (Kaby Lake G). The work involved performing various timed end user actions on a selection of industry leading CAD and 3D applications for performance validation. IMSCAD will run the same tests and workloads across 3 platforms which includes Kaby Lake G, Intel's 6th Generation Intel® Core™ Processor (Sky Lake) and NVIDIA's vGPU running on the M60 GPU. To ensure "Apples for Apples" comparison, each platform tested will be assigned the same resource as the bare metal Kaby Lake G solutions such as Cores, Memory and Video RAM, as well as the same Windows Server 2016 operating system. All tests will be carried out from remote locations with users accessing a published desktop via a NetScaler over the Internet.

Testing Overview:

Application/s Tested: AutoCAD 2018, Revit 2018, and Inventor 2018.
Sample file Size: We have tested various file sizes across all the applications ranging from 2.5MB up to 419 MB

IMSCAD tested the largest test models of each application on all 3 platforms, previous testing on the Sky Lake had shown that the small and mid-range models were coped with comfortably, with the larger model providing a better insight as to how the solution coped with a shared resource workload. IMSCAD use a 6-point testing plan and will test speed of solution to the naked eye as will as well as the effect on hardware resources such as CPU, Memory and GPU.

1. Orientate to Plan View
2. Orientate to Side view
3. 180 Degree Rotation
4. Zoom to Region
5. Load to Camera View
6. Render Image

To collect data on resource utilization IMSCAD will use the following tools:

GPU-Z for Session GPU Load
Microsoft Performance Monitor for session Memory and CPU Utilization
Citrix Insight for Round Trip Time and ICA Latency

FRAPS record Frames per Second whilst running Unigines Heaven (Version 4.0) graphically intensive Benchmark
As well as 4 experienced in-house engineers, to get single and multi-user test results

IMSCAD Test Model 3: Apartment Block– File Size 419MB

Revit 2018	Avg Memory Usage %	Avg ICA Latency MS	Avg CPU Usage %	Avg RTT MS	Avg GPU Load %
Kaby Lake G	19.15	11	49.96	19.95	4.31
Sky Lake	22.36	10	55.69	37.95	6.56
Nvidia M60	16.86	9	51.39	17.05	4.51

Timed Tasks	Task Completed in (Sec) – Kaby Lake G	Task Completed in (Sec) - Sky Lake	Task Completed in (Sec) - Nvidia M60
1. Orientate to Plan View	0.90	1.32	0.98
2. Orientate to Side view	0.92	1.30	0.98
3. 180 Degree Rotation	0.93	2.25	1.29
4. Zoom to Region (Window)	0.39	1.25	0.45
5. Load to Camera View	2.35	5.18	6.92
6. Render Scene\Image	10 mins 54 Secs	13 min 9 secs	10 min 32 Secs

AutoCAD is a key application in the CAD market and to see this perform as well as an NVIDIA M60 solution was very impressive.

These graphs show that when running AutoCAD on both Kaby Lake G and NVIDIA M60 you get very similar results. We have not included Sky Lake here as it runs significantly worse. To see an Intel CPU/GPU solution compete well with the M60 shows how much improvement has been made by Intel in this area.

Let's bring this down to hard cash, the Kaby Lake G is a processor that costs in the region of $400 and with the GPU version around $800. When you consider you could run up to 5:1 user per processor (based on requirement of your users) you have something that offers real value against the more expensive M60.

With the Kaby Lake G, no licensing is required, saving significant money compared to the software based solution being offered by the M60. Another distinct advantage of the Kaby Lake G, compared to the M60, is the ease of deployment, saving both time and money.

In short, the Kaby Lake G is comparable in terms of performance, is far more competitively priced and is an easier solution to deploy.

We offer any customer the opportunity to try out this new solution hosted in the cloud with any application.

If you would like a free test of this, please email us - info@imscadglobal.com

Application and Industry recommendation table

Recommended	In some cases	Not recommended

Applications	Skylake	Kaby Lake G	NVIDIA M60
Microsoft Office			
Adobe, SAP			
AutoCAD, Revit			
Inventor, Solidworks			
Siemens NX, PTC Creo			
CATIA, schlumberger			

Industries	Skylake	Kaby Lake G	NVIDIA M60
Office workers			
Viewing, editing design			
Architectural			
Engineering			
Product design			
Automotive			

These tables show the improvements made by Intel and how now, there is a real challenge to the performance of the M60. When you factor in cost vs performance, this new system is worth investigating.

Kaby Lake G versus Nvidia M60

Kaby Lake G consistently outperformed Nvidia during the timed tasks across all testing phases (single and multi-user testing) in some cases testers were seeing a time saving of over 5 seconds:

Revit 2018 - Timed Tasks	Task Completed in (Sec) - Kaby Lake G	Task Completed in (Sec) - Sky Lake	Task Completed in (Sec) - Nvidia M60
	Single User	Single User	Single User
Load to Camera View	2.35	5.18	6.92

During multi user testing Kaby Lake G handled load with very little impact to recorded times, despite the additional load users were seeing time savings vs Nvidia during the timed tasks of over 400%. Example below shows the time saving User 2 experienced during the 3x multi user test:

Revit 2018 - Timed Tasks	Task Completed in (Secs) - Kaby Lake G	Task Completed in (Secs) - Sky Lake	Task Completed in (Secs) - Nvidia M60
	User 2	User 2	User 2
Load to Camera View	1.25	6.30	7.18

During multi user testing users experienced a significant time saving relating to average model opening times vs Nvidia, with AutoCAD seeing a 19.43 second saving, Revit seeing a 7.40 second saving and Inventor seeing a 14.52 second saving. Average load times can be seen below:

3x Users	Avg Load Times – Kaby Lake G	Avg Load Times - Sky Lake	Avg Load Times – Nvidia M60
AutoCAD – Model 3	18.40 secs	35.63 secs	37.83 secs
Revit – Model 3	55.29 secs	148 secs	62.69 secs
Inventor – Model 3	24.43 secs	43.28 secs	38.95 secs

No additional licensing required on the Intel systems.

The current Sky Lake system is a solid performer with most workloads achievable. The only slight criticism is the graphics cannot handle the bigger GPU based applications. The CPU is great and delivers a smooth faultless experience.

Recommended model sizes per system.

Model size, up to	Skylake	Kaby Lake G	NVIDIA M60
50mb			
100mb			
200mb			
400mb			
1Gb			
2Gb			

Overall Experience:

All users preferred the Kaby Lake G solution.

Throughput the testing IMSCAD found the performance of the Kaby Lake G to consistent and reliable even when loading the system with multiple users. Kaby Lake G was able to outperform the Sky Lake and Nvidia platforms. In terms of performance there are areas where we saw an uplift of over 50 percent when performing the Zoom to region\window task and loading camera view. The most impressive performance was the high frame rate while running the Unigine Heaven Benchmark Kaby Lake G performed over 400% better compared to Sky Lake and 100% better than Nvidia M60.

In our view, the Intel® Core i7 vPro 8th Gen Processor and Radeon* RX Vega M Graphics is a massive step forward by Intel.

If you would like a free test of any of these systems please email us - info@imscadglobal.com

www.imscadglobal.com