Information & eGovernment
Authority

Governance & Enterprise
Architecture Directorate

Standards & Guidelines
for Government Personal
Computing Purchases

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Glossary

Acronyms	Definition
CPU	Central Processing Unit
DDR	Double Data Rate
GB	Gigabyte
GIS	Geographic Information System
GPU	Graphics Processing Unit
HDD	Hard Disk Drive
iGA	Information and eGovernment Authority
IR	Infrared Radiation
PassMark	A software development group specialized in developing of high-quality benchmarking solutions for computer hardware performance
PC	Personal Computer
RAM	Random Access Memory
SSD	Solid-State Drive
TB	Terabyte
TPM	Trusted Platform Module

1. Preface

This document is intended to set standards and guidelines for Computer Desktops and Laptops purchases for government employees in the Kingdom of Bahrain. The objectives include:

- Optimizing cost of computer-related purchases by selecting appropriate specifications based on business needs and ensuring optimum utilization of the procured devices.
- Reducing technical issues by investing in reliable and efficient technologies to prolong the life span of the procured devices.
- Enhancing IT security by utilizing multi-factor authentication for system login.
- Protecting environment with Green-IT practices by investing in energy efficient technologies.

In order to ensure that the procured machines meet the standard performance requirements, without limiting the purchases to specific brands or slowing down the adoption of technology updates, the performance requirements are defined by performance benchmarks. CPU and GPU performance benchmarks are a method to compare their performance in real life scenarios. These benchmarks act as references independent of brand or model.

The standards and guidelines are not meant to limit the options of government entities, but rather ensure entities get the best value for their money while not compromising their staff's productivity.

This document will undergo periodic updates to keep up with emerging and future demands and advances in technology.

2. Roles and Responsibilities

Government Entities
- Comply with the standards in all IT procurements and projects that include personal computers.

Information and eGovernment Authority
- Apply the standards in IT procurement review process.
- Manage and maintain the documentation of the standards.
- Publish and communicate the standards to government entities and create awareness programs where necessary.

ICT Governance Committee (ICTGC)
- Set the strategic direction for the standards.
- Oversee the effective and consistent usage of the standards.
- Review and approve any deviations or exemptions requirements.
- Approve all changes in the standards.

3. General Standards & Guidelines

1   Computer-related purchase requests should include detailed requirements about the requested **machines**, such as, quantity, unit costs, specifications, along with a list of applications that will be installed and used on each machine specifications.

2   The purchase requests should include details about the **users**, such as user roles, their numbers, their usage and their associated machines specifications.

3   The requested machines **specifications should be aligned with job requirements** of the intended users.

4   The purchase requests should specify whether the requested items are new purchases to cover new recruitments, or to replace existing machines. If it is a replacement request, entity should specify the age of the existing devices along with their specifications.

5   For "3D and Animation Modeling" roles, desktop computers are preferred over laptops due to their high performance, durability, scalability & cost effectiveness. Laptops can be provided at exceptional cases where portability is a core requirement.

   a.   For all other user categories, Laptops are preferred over desktops in line with the government's adoption of the flexible working hour system and the introduction of work-from-home and based on user's job requirements.

6   Procurement requests should not specify brands unless there is a compelling technical justification.

7   The machine processor generation for CPUs should not be older than 3 generations. For example, if the current Intel CPU generation is the 13th, then government entities can get 11th, 12th & 13th generation CPUs, whereas 10th or older generations should be avoided. The same concept applies to AMD CPUs.

   a.   The different CPU series (e.g. Intel's i3, i5, i7, AMD's Ryzen 3, 5, 7, etc.) refer to a range of features included in each series related to the number of cores, size / levels of cache available, hyperthreading and so on; however, they are not indicative of the overall performance in general. The proposed benchmarks in this standard ensure whichever model is acquired delivers the required performance, in addition to other constraints – such as the number of physical cores – based on the nature of the targeted applications that the user needs.

8   The primary storage configuration for both desktops and laptops should be SSD rather than HDD. HDD can be chosen only for secondary storage in exceptional cases where massive storage is needed. Typically, the average employee should get no more than 256GB of SSD storage considering the availability of Microsoft Office365 and the OneDrive On-Demand feature, which

optimizes usage of local storage by giving users direct access to their files through the cloud without consuming local storage space.

9   Windows 11 is memory intensive, therefore, all machines must have a minimum of 16GB of memory to ensure their performance and longevity.

10 In many cases, older machines can work efficiently for upwards of 3 more years – on top of their 5-year replacement policy – if they receive SSD storage along with RAM upgrade, provided that hardware-support is available in the market at a reasonable price. This option allows entities to save more than 60% of the cost of procuring new machines without compromising the continuity of their work.

11 The requested machines must meet the following **minimum requirements** in order to enable Windows Hello security feature:
    a. Windows 10 (Build 1803 or later).
    b. TPM 2.0 (for PIN number).
    c. At least one of the following features:
            i.   Fingerprint Reader (for Fingerprint Recognition feature).
            ii. Compatible IR Camera (for Face Recognition feature).

12 Once proposals / quotations are received from vendors, government entities are advised to capture and document the benchmark score for audit purposes. This applies to both CPU and GPU benchmarks.

13 Exceptions to the standard are to be provided to iGA ICT Taskforce in the following events:

    a. If there is a business need that is not satisfied by the specifications listed in this standard, an exception may be granted upon valid justification.
    b. If the target specifications are not available in the market, an exception is granted upon the confirmation of the unavailability of said specifications.

4. Benchmark Mechanism for CPU & GPU:

PassMark Benchmarks will be the reference for government entities for evaluating and choosing their machines. PassMark is one of the most widely adopted computer benchmarking platform. In the extreme event that PassMark goes offline for an extended period of time, the ICT Task Force will provide an alternative benchmarking reference.

5. Benchmark Threshold for Device Upgrades and Replacements:

The following table defines the eligibility criteria for upgrades and replacements based on the benchmark in relation to each of the user category benchmarks.

User Category	Criteria for Upgrade		Criteria for Replacement	
Standard Government User	PC	Laptop	PC	Laptop
	Processor		**Processor**	
	≥ 60% of the Minimum CPU Benchmark E.g. if Minimum is 13,000 then 7,800 and above is eligible for upgrade		< 60% of the Minimum CPU Benchmark E.g. if Minimum is 13,000 then 7,799 and below is eligible for Replacement	
All Other Categories	PC	Laptop	PC	Laptop
	Processor		**Processor**	
	≥ 90% of the Minimum CPU Benchmark E.g. if Minimum is 13,000 then 11,700 and above is eligible for upgrade		< 90% of the Minimum CPU Benchmark E.g. if Minimum is 13,000 then 11,699 and below is eligible for Replacement	

6. Recommended Specifications based on Usage:

The following table defines recommended specification based on different user categories.

User Category	Common Applications Used	Recommended Specifications	
Standard Government User / Project Management / System Analysts / System Administrators/Helpdesk Agent	**Microsoft Office 365** **Microsoft Project** **Microsoft Visio** **Microsoft Teams** **Adobe Reader / Acrobat Pro** **WinZip / WinRAR** **Image editing for basic users** **Remote access to services that are not executed on the user's own machine**	**PC**	**Laptop**
		Processor	
		CPU Benchmark 13,000 ~ 18,000	
		Memory (RAM):	
		16GB	
		Storage (Hard Disk):	
		256GB SSD	
System Development	In addition to the Standard Government User applications: Microsoft Visual Studio Eclipse • Adobe Dreamweaver • Oracle SQL Developer • Aqua data Studio • Jaspersoft Studio	PC	Laptop
		Processor	
		CPU Benchmark 13,000 ~ 18,000	
		Memory (RAM):	
		16GB	
		Storage (Hard Disk):	
		256GB SSD	
		Optional: Up to 1TB of Additional Secondary Storage for virtual machines storage (i.e. VMware, Hyper-V, VirtualBox, etc...)	

User Category	Common Applications Used	Recommended Specifications		
Media and Marketing	In addition to the Standard Government User applications: • Adobe Illustrator • Adobe InDesign • Adobe Photoshop • Adobe Premiere Pro • Adobe After Effects • DaVinci Resolve • Blender • 3ds Max • Maya	**Usage**	**PC**	**Laptop**
		Processor		
		Still Graphics	CPU Benchmark 13,000 ~ 18,000	
		Video Editing & 3D Rendering: (Min. 4 physical cores)	CPU Benchmark 16,000 ~ 21,000	
		3D & Animation Modeling: (Min. 4 physical cores)	CPU Benchmark 20,000 ~ 25,000	CPU Benchmark 18,000 ~ 23,000
		Memory (RAM):		
		Still Graphics	16GB	
		Video Editing & 3D Rendering	24GB / 32GB (2x8GB+2x4GB), (2x16GB), (4x8GB)	
		3D and Animation Modeling	64GB	
		Graphic:		
		Still Graphics (Optional)	GPU Benchmark ≤ 6,000	GPU Benchmark ≤ 5,000
		Video Editing & 3D Rendering	GPU Benchmark 12,000 ~ 16,000 (≤ 10GB)	GPU Benchmark 8,000 ~ 11,000 (≤ 8GB)
		3D and Animation Modeling	GPU Benchmark 16,000 ~ 21,000 (≤ 16GB)	GPU Benchmark 11,000 ~ 14,000 (≤ 10GB)
		Storage (Hard Disk):		
		256GB ~ 512GB SSD		
		Optional: Up to 1TB of Additional Secondary Storage for media storage		

User Category	Common Applications Used	Recommended Specifications		
Architecture & Engineering	In addition to the Standard Government User applications: • Bentley MicroStation • ArcGIS • AutoDesk AutoCAD • Inventor • Revit	**Usage**	**PC**	**Laptop**
		Processor		
		Standard Architect / Engineer	CPU Benchmark 13,000 ~ 18,000	
		3D Rendering/ Viewing	CPU Benchmark 16,000 ~ 21,000	
		3D Modeling	CPU Benchmark 20,000 ~ 25,000	CPU Benchmark 18,000 ~ 23,000
		Minimum 4 Physical cores		
		Memory (RAM):		
		Standard Architect / Engineer	16GB	
		3D Rendering/ Viewing	24GB / 32GB (2x8GB+2x4GB), (2x16GB), (4x8GB)	
		3D Modeling	64GB	
		Graphic:		
		Standard Architect / Engineer (Optional)	GPU Benchmark ≤ 6,000	GPU Benchmark ≤ 5,000
		3D Rendering/ Viewing	GPU Benchmark 12,000 ~ 16,000 (≤ 10GB)	GPU Benchmark 8,000 ~ 11,000 (≤ 8GB)
		3D Modeling	GPU Benchmark 16,000 ~ 21,000 (≤ 16GB)	GPU Benchmark 11,000 ~ 14,000 (≤ 10GB)
		Storage (Hard Disk):		
		256GB ~ 512GB SSD		
		Optional: Up to 1TB of Additional Secondary Storage for GIS media storage		
Others / Special Requirements	Please send your requirements to iGA IT Standards Team (standards@iga.gov.bh) to get the recommended specifications.			