Government of Sultanate of Oman

Information Technology Authority

Oman eGovernment Architecture Framework (OeGAF)

Technical Standards Compliance List

Revision History

Version	Date of Revision	Prepared / Updated By	Reviewed By	Reason for Change	Affected Sections
1.4	23 Dec 13	Project Manager	OeGAF Core Team	Consolidate all the technical standards compliance checklist into a single document for easy reference	This is a new document; however the original contents were taken from the technical standards in the various reference models
1.6	05 March 2014	Project Manager	OeGAF Core Team	Minor Adjustments and improved formatting; Improved the standards classification	All

Table of Contents

List of Tables

1 Overview

1.1 Objectives of Technical Standards Compliance List

The objectives of this list of technical standards are as follows:

(a) To ensure that all government agencies comply with the relevant technical standards

(b) To aid inter-operability both within a government agency and for inter-agency communications and information sharing by implementing these technical standards

(c) To aid searching of relevant technical standards and their inter-dependencies.

1.2 Components of Technical Standard Compliance List

Since it is a technical compliance list, this list is aligned to the three reference models – Solution Reference Model (SRM), Information Reference Model (IRM) and Technical Reference Model (TRM).

For each domain within the reference model, the relevant technical standards are listed with a brief explanation of the standard and the compliance requirement. Government agencies are to abide to comply with these technical standards.

For completeness, government agencies are to also comply with the OeGAF Obsolete Compliance List and can also refer to the OeGAF Technical Reference Guide on other technical recommendations.

1.3 Standards Classification

Each technical standard in the different domains is identified with a classification. Table TC-1 describes the definition of these two standards classifications.

In short, all new ICT enhancements and new ICT systems have to comply with the Mandatory standards, and where possible comply with the Recommended standards.

For current ICT systems, over time, they will be obsoleted if these systems are not replaced. Hence, these systems have to also comply by not using the obsoleted technologies.

Standards Classification / ICT Systems	Mandatory* This is the minimum technology standard that is mandatory for enhancements and new ICT Systems. Government agencies shall migrate to this mandatory classification.	Recommended* This is the technology standard that supplements the Mandatory standard. This standard is applicable to enhancements to existing ICT Systems and all new ICT Systems. It is advisable for the government agencies to adopt this standard where possible.
Enhancements to existing ICT Systems	✓	✓
New ICT Systems	✓	✓

***** Government agencies are to seek ITA advice for exemptions.

Table TC-1: Standards Classification

2 List of Technical Standards for Compliance

2.1 Technical Standards Compliance List for Solution Reference Model

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
				(1)	☐ Yes ☐ No
				(2)	☐ Yes ☐ No
				(2)	☐ Yes ☐ No
				(2)	☐ Yes ☐ No
				(2)	☐ Yes ☐ No
				(2)	☐ Yes ☐ No

Standard Classification: (1) Mandatory (2) Recommended

Table TS-2: Compliance List for Solution Reference Model

2.2 Technical Standards Compliance List for Information Reference Model

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
				(1)	☐ Yes ☐ No
				(2)	☐ Yes ☐ No
				(2)	☐ Yes ☐ No
				(2)	☐ Yes ☐ No
				(2)	☐ Yes ☐ No
				(2)	☐ Yes ☐ No

Table TS-3: Compliance List for Information Reference Model

2.3 Technical Standards Compliance List for Technical Reference Model

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
TA.NW.1.1	WAN, LAN, WLAN Reference site: www.ietf.org	All technology components	Requires standardization in all government entities in term of Network Connectivity. Use TCP/IP as standard network protocol for all government agencies.	(1)	☐ **Yes** ☐ **No**
TA.NW.1.2	WAN, LAN, WLAN Reference site: www.ietf.org	All technology components	Scalable and unconstrained IP address abundance is required. All devices in LAN and WAN infrastructure shall support IPv6	**(2)**	☐ **Yes** ☐ **No**

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
			standards (128 bits for addressing).		
TA.NW.1.3	WAN Reference site: www.ietf.org	Network Communication Devices	Standardized routing protocols should be used for network devices by all entities. Support Open Shortest Path First (OSPF, OSPF2, Multi-path OSPF) for core switch.	**(2)**	☐ **Yes** ☐ **No**
TA.NW.1.4	WAN Reference site: www.ietf.org	Network Communication Devices / Network Security Devices	Secure communication should be used for data communication at Network layer. Internet Protocol Security (IPSec) should be used for secure	**(2)**	☐ **Yes** ☐ **No**

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
			authentication and encryption.		
TA.NW.1.5	WAN Reference site: www.ietf.org	Network Communication Devices / Network Security Devices	Secure method or protocol should be used for communication at application layer. Use Secure Sockets Layer (SSLv3) for mutual authentication between a client and server.	**(2)**	☐ **Yes** ☐ **No**
TA.NW.1.6	WAN Reference site: www.ietf.org	Network Communication Devices /	All remote login and file transfer activities should be performed in a secure way.	**(2)**	☐ **Yes** ☐ **No**

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
		Network Security Devices	SSH can be used for secure remote login, secure file transfer and secure TCP/IP and X11 forwarding.		
TA.NW.1.9	WAN Reference site: www.commoncriteriaportal.org	Network Security Devices	Certifiied to Common Critera EAL-4 (Evaluation Assurance Level) for firewall.	**(2)**	☐ **Yes** ☐ **No**
TA.NW.1.10	WAN Reference site: www.ietf.org	Network Security Devices	Authenticate using two factor authentication methods such as Token or One-time Password (RFC 2289).	**(2)**	☐ **Yes** ☐ **No**

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
TA.NW.1.11	WAN Reference site: www.ietf.org	Transport Method	Support Multi-Protocol Label Switching (MPLS).	(1)	☐ **Yes** ☐ **No**
TA.NW.1.12	WAN Reference site: www.itu.int	Transport Method	Use H.320 for audio, video and graphical communications.	**(2)**	☐ **Yes** ☐ **No**
TA.NW.1.13	LAN Reference site: www.ieee802.org	Network Communication Devices / Network Interface Card (NIC)	Support any of the following: (a) IEEE 802.3u-100Base T (for Fast Ethernet over twisted pair cables) (b) IEEE 802.3u-100BaseFx (for	(1)	

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
			fast Ethernet over optical fibre) (c) IEEE 802.3ab (1 Gbps over Cat5e/6 cabling system) (d) IEEE 802.3z (for Gigabit Ethernet over fibre and cable).		
TA.NW.1.14	LAN Reference site: www.ietf.org	Network Communication Devices	Use Dynamic Host Configuration Protocol (DHCP) for dynamic IP addresses assignment to devices.	**(1)**	☐ **Yes** ☐ **No**

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
TA.NW.1.15	LAN Reference site: www.ieee802.org	Network Communication Devices	Support IEEE 802.1w (Rapid Spanning Tree Protocol) to provide rapid reconfiguration capability.	**(2)**	☐ **Yes** ☐ **No**
TA.NW.1.16	LAN Reference site: www.ieee802.org	Network Communication Devices	Support IEEE 802.3ad for link aggregation for edge switch.	**(2)**	☐ **Yes** ☐ **No**
TA.NW.1.17	LAN Reference site: www.ieee802.org	Network Communication Devices	Support IEEE 802.3x to define full duplex operation and flow control on 100Mbps Ethernet network for edge switch	**(2)**	☐ **Yes** ☐ **No**

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
TA.NW.1.18	LAN Reference site: www.ietf.org	Network Communication Devices	Single point of failure should be avoided at perimeter devices such as router. Provide redundancies for critical components to meet government agencies' business or operational requirements. Multiple routers can be placed with Support Virtual Router Redundancy Protocol (VRRP) to eliminate the single point of failure inherent in the static default routed	**(2)**	☐ **Yes** ☐ **No**

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
			environment for core switch.		
TA.NW.1.19	LAN Reference site: www.ietf.org	Network Communication Devices	Support Differentiated Service (DiffServ) to provide QoS to the traffic for core switch.	**(2)**	☐ **Yes** ☐ **No**
TA.NW.1.20	LAN Reference site: www.ieee802.org	Network Communication Devices	Support IEEE 802.1q for Virtual LAN (VLAN).	**(2)**	☐ **Yes** ☐ **No**
TA.NW.1.21	LAN Reference site: www.ieee802.org	Network Communication Devices	Support 1000Base-LH (Long Haul) to provide gigabit speed over distance between 70 100Km	**(2)**	☐ **Yes** ☐ **No**

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
TA.NW.1.22	LAN Reference site: www.ieee.org	Network Communication Devices	Support IEEE802.3af for edge switches supporting devices which require twisted-pair cables (e.g. IP Phone Clients and wireless LAN access points).	**(2)**	☐ **Yes** ☐ **No**
TA.NW.1.23	LAN Reference site: www.ieee.org	Network Communication Devices	Support IEEE 802.3ae to support operating speed of 10Gbps Ethernet over fibre for core switch.	**(2)**	☐ **Yes** ☐ **No**
	LAN Reference site: www.tiaonline.org	Structured Cabling System	Industry best practices and standards should be considered for cabling.	**(2)**	☐ **Yes** ☐ **No**

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
	LAN Reference site: www.tiaonline.org	Structured Cabling System	TIA-568-C.1 provides detailed design requirements for horizontal and backbone cabling infrastructure and distribution facilities.	**(2)**	☐ **Yes** ☐ **No**
TA.NW.1.24	LAN Reference site: www.tiaonline.org	Structure Cabling System	Use Unshielded Twisted Pair (UTP) Category 6 for Structured Cabling System based on ANSI/TIA-568-C.2.	**(2)**	☐ **Yes** ☐ **No**
TA.NW.1.25	LAN Reference site: www.tiaonline.org	Structured Cabling System	Use fibre cables to interconnect network devices and backbone connections for	**(2)**	☐ **Yes** ☐ **No**

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
			Structured Cabling system as described by ANSI/TIA-568-C.3. Multimode fibre is used for short distance transmissions with LED based fibre optic equipment. Single-mode fibre is used for long distance transmissions with laser diode based fibre optic transmission equipment.		

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
			Physical layer standards for optical fibre are: (a) Support 1000Base-SX (short wavelength laser) to provide gigabit speed over maximum distance of 220m (for 62.5 micron multimode fibre) and 550m (for 50 micron multimode fibre).		

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
			(b) Support 1000Base-LX (long wavelength laser) to provide gigabit speed over maximum distance of 550m (for 50 and 62.5 micron multimode fibre).		
TA.NW.1.26	LAN Reference site: www.tiaonline.org	Structured Cabling System	Use Commercial Building Telecommunications Cabling Standard based on ANSI/TIA-568-C	**(2)**	☐ **Yes** ☐ **No**

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
TA.NW.1.27	LAN Reference site: www.iec.ch	Structured Cabling System	Use Generic Cabling for Customer Premises (International Standards) 2002 based on ISO/IEC 11801.	**(2)**	☐ **Yes** ☐ **No**
TA.NW.1.29	LAN Reference sites: www.iec.ch www.tiaonline.org	Structured Cabling System	ISO/IEC 11801, , 14763-1, 14763-2, 14763-3, IEC 61935-1, ANSI/TIA-568-C, EN50173, TIA/EIA 606-A, ANSI/TIA-606-B, IEC332-1 IEC332-2	**(2)**	☐ **Yes** ☐ **No**

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
TA.NW.1.30	LAN Reference site: www.tiaonline.org	Structured Cabling System	Use Commercial Building Standard for Telecommunications Pathways and Spaces 2004.	**(2)**	☐ **Yes** ☐ **No**
TA.NW.1.31	LAN Reference site: www.iec.ch	Structured Cabling System	Build and install cables based on ISO/IEC 14763-2 ed1.0 Information technology - Implementation and operation of customer premises cabling - Part 2: Planning and installation	**(2)**	☐ **Yes** ☐ **No**
TA.NW.1.32	LAN Reference site:	Structured Cabling System	TIA/EIA-568-C and IEC 61935-1 standards.	**(2)**	☐ **Yes** ☐ **No**

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
	www.tiaonline.org				
	LAN Reference site: www.tiaonline.org	Labelling	ANSI/TIA-606-B	**(2)**	☐ **Yes** ☐ **No**
TA.NW.1.33	LAN Reference site: www.itu.int	Free Space Optics (FSO)	Support Class 1 or Class 3 (excluding Class 3B) laser for FSO.	**(2)**	☐ **Yes** ☐ **No**
TA.NW.1.34	WLAN Reference site: www.wi-fi.org	All technology components	Implement WLAN that supports any of the following standards: (a) Wi-Fi Protected Access (WPA) (b) WPA2	**(1)**	☐ **Yes** ☐ **No**

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
			(c) Advanced Encryption Standard (AES) (d) Mobile Virtual Private Networks (VPNs). (e) Dynamic Wired Equivalent Privacy		
TA.NW.1.37	WLAN Reference site: www.ieee802.org	Wireless Access Point (AP) /	Standard and secure protocol should be used for WPAN.	**(2)**	☐ **Yes** ☐ **No**

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
		Access Controller	Support IEEE 802.11n for 100 Mbps high speed wireless LAN up to 600 Mbps (with 2.4 GHz and 5 GHz range).		
	WiMAX Reference site: www.ieee802.org	MAN Wireless Standard	Support IEEE 802.16 for 30 to 40 Mbps data rates up to 1 Gbps.	**(2)**	□ **Yes** □ **No**
	WPAN Reference site: www.ieee802.org	Wireless Personal Area Network (WPAN)	Support IEEE 802.15 standard for example Blue Tooth Wireless Technology with 1 to 3 Mbps transfer rate works in a range of approximately ten meters.	**(2)**	□ **Yes** □ **No**

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
TA.NW.1.38	IP Telephony and Video Conferencing Reference site: www.itu.int	IP-Telephony Gateway	Use IP Telephony where possible. Support H.323 for converting between voice and data transmission formats and for managing connections between telephony endpoint and Real-Time Transport Protocol (RTP).	**(2)**	☐ **Yes** ☐ **No**
TA.NW.1.39	IP Telephony and Video Conferencing Reference site: www.itu.int	IP-Telephony Gateway	Support H.248 for controlling media gateways on Internet Protocol (IP) network and Public Switched	**(2)**	☐ **Yes** ☐ **No**

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
			Telephone Network (PSTN).		
TA.NW.1.40	IP Telephony and Video Conferencing Reference site: www.ietf.org	IP-Telephony Gateway	Use video conferencing system for collaboration where possible. Support Real Time Transport Protocol (RTP) for end-to-end network transmission of real-time data, such as audio, video or simulation data, over multicast or unicast network services.	**(2)**	☐ **Yes** ☐ **No**
TA.NW.1.41	IP Telephony and Video Conferencing	IP-Telephony Gateway	Support Real Time Streaming Protocol (RTSP) for control over	**(2)**	☐ **Yes** ☐ **No**

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
	Reference site: www.ietf.org		the delivery of data with real-time properties.		
TA.NW.1.42	IP Telephony and Video Conferencing Reference site: www.itu.int	IP-Telephony Gateway	Support H.264 for compression algorithm and optimisation for lower data rates.	**(2)**	☐ **Yes** ☐ **No**
TA.NW.1.43	IP Telephony and Video Conferencing Reference site: www.ietf.org	IP-Telephony Gateway / IP Phone Client	Use Session Initiation Protocol (SIP) to manage IP telephony sessions. SIP is an application-layer control (signalling) protocol for creating, modifying, and terminating sessions	**(2)**	☐ **Yes** ☐ **No**

Clause No. (Other Related Clauses)	Technology Category	Technology Component	Description	Classification	Compliance Checklist
			with one or more participants. These sessions include Internet telephone calls, multimedia distribution, and multimedia conferences.		
TA.NW.1.44	Network Management Reference site: www.ietf.org	Fault Management / Performance Monitoring and Management	Use network management tools to manage LAN Use Simple Network Management Protocol (SNMP) v3 and above as the main management protocol suite.	**(1)**	☐ **Yes** ☐ **No**

Table TS-3: Compliance List for Technical Reference Model

Standard Classification: (1) Mandatory (2) Recommended