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Department:  
Public Service and Administration  
**REPUBLIC OF SOUTH AFRICA**

# **Catalogue of Standards to the MINIMUM INTEROPERABILITY STANDARDS (MIOS) 6**

***Catalogue 1 of 2017***

*May 2017*

## **APPROVAL**

I, the undersigned -

In terms of the Public Service Act, 1994 (Proclamation 103 of 1994 ) sections 3(1)(f) and 3(1)(g) regarding electronic government norms and standards and the Public Service Regulations, 2016 Chapter 6, regulation 97, and the State Information Technology Agency Act, 1988 (Act 88 of 1998) sections 7(6)(a)(i) and 7(6)(b) and the State Information Agency General Regulations, 2005 ( R. 50 of 2005), Part 2, regulation 4.2 and 4.3 regarding interoperability standards and certification hereby approve the Catalogue of Standards in support of Minimum Interoperability Standard (MIOS) for Government Information Systems version 6 as set by the State Information Technology Agency (Pty) Ltd (“SITA”) after consultation by SITA with departments and the Government Information Technology Officer Council (GITO Council).

Understand that the Catalogue of Standards to MIOS will be reviewed and updated on an annual basis to keep it relevant and up to date;

Declare that the Catalogue of Standards to MIOS Version 6.00 supersedes and replaces all previous versions thereof, and be effective and must be complied with in terms of Public Service Regulations Chapter 5, Part III as from the date of signature; and

Understand that the Catalogue augments the MIOS Framework Document. As such this document must always be read in conjunction with the MIOS Framework.

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**MINISTER: PUBLIC SERVICE AND ADMINISTRATION**

**Ms A.F. Muthambi**

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**Date**

## **PUBLICATION ENQUIRIES**

The “Catalogue of Standards to the Minimum Interoperability Standards (MIOS)” for Government Information Systems is developed by the State Information Technology Agency (SITA): Norms Standards and Quality Department in consultation with the GITOC, SC-AGC and appointed MIOS Update Task Team.

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This document is also available on the SITA website (<http://www.sita.co.za>)

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# 1 OVERVIEW

1. This document, known as the “Catalogue of Standards to MIOS” is irrevocably linked to the prescripts, guidelines and principles of the latest approved “MIOS Framework”.
2. This section of the MIOS defines the minimum set of open standards that are necessary to achieve the minimum level of interoperability across e-Government systems, and cites the standards development organisations from where these standards can be obtained.
3. The list of interoperability standards is divided into two sections:
  - (a) Public Sector Records and Data Standards, which must be used to achieve interoperability (data exchange) among e-Government information systems (IS); and
  - (b) Technical Interoperability Standards, which must be used to achieve the required level of interoperability (i.e. network connectivity, data exchange protocols and interfaces, and uniform data access and presentation) across government ICT infrastructure.

The following convention is used in the respective standards tables:

- “Ref” = Unique MIOS Reference Number of the standard.
- “Provider” means the Standards Development Organisation (SDO) who is either the owner or custodian of the interoperability standard as the case may be.
- Text in square brackets [] denotes the Standard Reference Number as allocated by the SDO.
- Text in braces / curly brackets {} denotes a guideline or constraint on the implementation of the standard.

## 1.1 STANDARDS DEVELOPMENT ORGANISATIONS

The following Standards Development Organisations (SDOs) are cited in the MIOS. SDOs marked with an asterisk (\*) indicate that the standards are available from their respective web sites (Uniform Resource Locators (URL)).

<i><b>SDO</b></i>	<i><b>Description</b></i>	<i><b>Uniform Resource Locator (URL)</b></i>
ADL *	Advanced Distributed Learning	<a href="http://www.adlnet.gov">http://www.adlnet.gov</a>
ANSI	American National Standards Institute	<a href="http://www.ansi.org">http://www.ansi.org</a>
ECMA	ECMA International - European association for standardizing information and communication systems (formerly known as "European Computer Manufacturers Association")	<a href="http://www.ecma-international.org">http://www.ecma-international.org</a>
ETSI	European Telecommunications Standard Institute	<a href="http://www.etsi.org">http://www.etsi.org</a>

NIST	National Institute of Standards and Technology [USA]: Federal Information Processing Standards	<a href="http://www.itl.nist.gov/fipspubs">http://www.itl.nist.gov/fipspubs</a>
IEEE	Institute of Electrical and Electronics Engineers	<a href="http://www.ieee.org">http://www.ieee.org</a>
IETF *	Internet Engineering Task Force	<a href="http://www.ietf.org">http://www.ietf.org</a>
ISO	International Organisation for Standardization	<a href="http://www.iso.org">http://www.iso.org</a>
ITU	International Telecommunication Union	<a href="http://www.itu.int">http://www.itu.int</a>
OAI *	Open Archives Initiative	<a href="http://www.openarchives.org">http://www.openarchives.org</a>
OASIS *	Organization for the Advancement of Structured Information Standards	<a href="http://www.oasis-open.org">http://www.oasis-open.org</a>
OCLC	Online Computer Library Center	<a href="http://www.oclc.org">http://www.oclc.org</a>
OGC *	Open Geospatial Consortium	<a href="http://www.opengeospatial.org">http://www.opengeospatial.org</a>
OMA	Open Mobile Alliance	<a href="http://www.openmobilealliance.org">http://www.openmobilealliance.org</a>
OMG *	Object Management Group®	<a href="http://www.omg.org">http://www.omg.org</a>
PKWARE	PKWARE® Inc, open standard for compressed file format, ZIP)	<a href="http://www.pkware.com">http://www.pkware.com</a>
SABS	South African Bureau of Standards (SDO for South African National Standards (SANS))	<a href="http://www.sabs.co.za">http://www.sabs.co.za</a>
W3C *	World Wide Web Consortium	<a href="http://www.w3c.org">http://www.w3c.org</a>
WHO *	World Health Organisation	<a href="http://www.who.int">http://www.who.int</a>

## 1.2 CATALOGUE OF MIOS STANDARDS

**Please Note:** All quoted RFC standards include their relevant updates.

<i>Ref</i>	<i>Component</i>	<i>Interoperability Standards and Identifier</i>	<i>Provider</i>
<b>C01</b>	<b>Data Standards</b>		
C01.01	Disease Codes	International Statistical Classification of Diseases and Related Health Problems, 10th Revision [ICD-10]	WHO
C01.02	Health Image Records	Digital Imaging and Communications in Medicine [ISO 12502]	ISO/IEC
C01.03	e-Learning / Learning Management System	Sharable Content Object Reference Model (SCORM) v1.2, Oct 2001	SCORM
<b>C02</b>	<b>Interconnection Standards and Specifications</b>		
C02.01	Web Transport	Hypertext Transfer Protocol (HTTP/1.1) [RFC 7230 – RFC 7237]	IETF
		Upgrading to TLS Within HTTP/1.1 (HTTPS) [RFC 2817]	IETF
C02.02	e-Mail Transport	Simple Mail Transfer Protocol (SMTP) [RFC 5321]	IETF
		Internet Message Format (IMF) [RFC 5322]	IETF
C02.03	Internet Message Format	Multipurpose Internet Mail Extensions (MIME) [RFC 2045 – RFC 2047, RFC 4289]	IETF
		The Model Primary Content for Multipurpose Internet Mail Extensions [RFC 2077]	IETF
C02.04	Mailbox Access	Internet Message Access Protocol (IMAP v4.1) [RFC 3501]	IETF
		Post Office Protocol Version 3 (POP3) [RFC 1939]	IETF
C02.05	Directory	x.500 [ISO 9594-1]	ISO/IEC
		Lightweight Directory Access Protocol (LDAP) [RFC 4510 – RFC 4519]	IETF
C02.06	Domain Name System	Domain Name System (DNS) [RFC 1032 – RFC 1035]	IETF

		Domain Name System Security (DNSSec) [RFC 4033 – RFC 4035]	IETF
C02.07	File Transfer Protocols	File Transfer Protocol (FTP) [RFC 959]  Firewall-Friendly FTP [RFC 1579]  FTP Extensions for IPv6 and NATs [RFC 2428] The Secure Shell (SSH) Transport Layer Protocol [RFC 4253]  Secure Copy (SCP) (OpenBSD Reference Implementation)	IETF  IETF  IETF
C02.08	LAN/WAN Interworking	Internet Protocol v4 (IPv4) [RFC 791]  Internet Protocol v6 (IPv6) [RFC 2460]	IETF  IETF
C02.09	Network Management Protocol	Simple Network Management Protocol (SNMP) [RFC 3411 – RFC 3418]	IETF
C02.10	Transport	Transmission Control Protocol (TCP) [RFC 793]  A Roadmap for Transmission Control Protocol (TCP) Specification Documents [RFC 7414]  User Datagram Protocol (UDP) [RFC 768]	IETF  IETF  IETF
<b>C03</b>	<b>Data Interoperability Standards and Specifications</b>		
C03.01	Metadata / MetaLanguage	eXtensible Markup Language (XML 1.0)	W3C
C03.02	XML Metadata Definition	XML Schema: Part 1: Structure Second Edition  XML Schema: Part 2: Data types Second Edition OR Regular Language for XML Next Generation (RelaxNG) [ISO 19757]	W3C  W3C  ISO/IEC
C03.03	XML Metadata Transformation	Extensible Stylesheet (XSL 1.1)	W3C
C03.04	XML Data Query	XPath 2.0	W3C
C03.05	XML Signature	XML Signature Syntax and Processing (Second Edition)	W3C



		XML Digital Signatures (XML-DSIG)	W3C
C03.06	XML Security Markup	Security Assertion Markup Language (SAML v2.0)	W3C
C03.07	Public Key Infrastructure	Internet x.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile (X.509 v3) [RFC 5280]	IETF
C03.08	Minimum Interoperable Character Set	Transformation Format – 8 bit UTF-8, individual items in the XML Schema may be further restricted in character set on a case by case basis [RFC 3629]	IETF
C03.09	Modelling and Description Language	Unified Modelling Language (UML 2.1.1)	UML
C03.10	Ontology Based Information Exchange	Web Ontology Language Semantics and Abstract Syntax (OWL)	W3C
C03.11	Model Exchange	XML MetaData Interchange (XMI v2.1)	OMG
C03.12	Business Process Modelling Language	Business Process Model and Notation (BPMN v1.1)	OMG
C03.13	Business Function Modelling Language	Integrated Definition Language and Function Modelling (IDEF-0) – Federal Information Processing Standard [FIPS PUB 183]	IDEF
C03.14	Form Representation and Data	XForms 2.0	W3C
C03.15	Geospatial Data	Geospatial Markup Language (GML) as defined by Open Geographic Council  Geospatial Markup Language (GML) [ISO 19136:2007]	OGC  ISO/IEC
C03.16	Cadastre and Addressing	Geographic Information – Address Standard, Part 1: Data Format of Addresses [SANS 1883-1]  Geographic Information – Address Standard, Part 3: Guidelines for address allocation and updates [SANS 1883-3]	SABS  SABS
<b>C04</b>	<b>Standards for Web Service</b>		
C04.01	Web Service Request Delivery	Simple Object Access Protocol SOAP v1.2 (Second Edition)	W3C
C04.02	Web Service Request Registry	Universal Description, Discovery and Integration (UDDI)	UDDI
C04.03	Web Service Request	Web Services Description Language (WSDL)	W3C

	Language	2.0)	
<b>C05</b>	<b>Standards and Specifications for Information Access</b>		
C05.01	Hypertext Interchange Formats	Hypertext Markup Language 5 (HTML v5)	W3C
C05.02	Working Office Document Formats	UTF-8/ASCII Formatted Text [RFC 3629]  Open Document Format for Office Applications (ODF) [ISO 26300 Part 1 - 3]  Comma-Separated Value (CSV) [RFC 4180]	IETF  ISO/IEC  IETF
C05.03	Document Formats for Presentation View	The Extensible Hypertext Markup Language (XHTML v1.0) (in use for HTML 4)  Portable Document Format (PDF v1.7) [ISO 32000-1:2008]	W3C  ISO/IEC
C05.04	Relational DB Access	Structure Query Language (SQL) 2011 [ISO 9075:2011]	ISO/IEC
C05.05	Character Sets and Alphabets	Universal Multiple-Octet Coded Character Set (UCS) – Part 1: Architecture and Basic Multilingual Plane [ISO 10646-1]	ISO/IEC
C05.06	Graphical/Still Information Exchange	JPEG – Digital compression and coding of continuous-tone still images [ISO 10918 Part 1-6]  Portable Network Graphics [ISO 15948]  Tag Image File Format (.tif) (For images that will not tolerate information loss (TIFF 6.0))	ISO/IEC  ISO/IEC
C05.07	Multimedia Audio/Visual Content	MPEG-1 (Coding of moving pictures and associated audio for digital storage media at up to about 1.5 Mbit/s – Part3: Audio) [ISO 11172-3]  MPEG-2 (Generic Coding of Moving Pictures and Associated Audio Information: Part 1 – Part 3) [ISO 13818-1, ISO 13818-2, ISO 13818-3]  MPEG-4 Part 10, Advanced Video Coding / H.264 [ISO 14496-10]  OGG [https://www.xiph.org/ogg] The OGG Encapsulation Format Version 0	ISO/IEC  ISO/IEC  ISO/IEC  XIPH IETF

		[RFC 3533]	
		OGG Media Types [RFC 5334]	XIPH
		VORBIS (Audio Codec. Used with the OGG Container)	XIPH
		THEORA (Video Codec. Used with the OGG Container)	XIPH
		WebM Multimedia Container Guidelines	WebM
		VP8 Data Format and Decoding Guide (for use within WebM) [RFC 6386]	IETF
		OPUS (Definition of the Opus Audio Codec) [RFC 6716]	IETF
C05.08	Browser Scripting	JavaScript (ECMAScript Language Specification) [ECMA 262]	ECMA
C05.09	Internet Conferencing	Session Initiation Protocol (SIP) [RFC 3261]	IETF
C05.10	File Compression	TAR [POSIX.1-2001]	IEEE
		GZIP (DEFLATE Compressed Data Format Specification version 1.3) [RFC 1951]	IETF
		GZIP (GZIP File Format Specification version 4.3) [RFC 1952]	IETF
		ZIP v 6.3.4 (.zip File Format Specification)	PKWARE
C05.11	Web Accessibility for the Visually Impaired	Web Content Accessibility Guidelines (WCAG 2.0)	W3C
<b>C06</b>	<b>Standards for Content Management Metadata</b>		
C06.01	Content Management Metadata Elements and Refinements	Dublin Core (The Dublin Core Metadata Element Set) [ISO 15836]	ISO/IEC
C06.02	Content Management Interoperability	Content Management Interoperability Services (CMIS)	OASIS
C06.03	Metadata Harvesting	Open Archives Initiative Protocol for Metadata (OAI-PMH)	OAI
C06.04	Content Syndication	Resource Description Framework (RDF) Site Summary (RSS) Version 1.0 (RSS-Dev Working Group)	W3C

		Really Simple Syndication (RSS) Version 2.0 (RSS 2.0) (Berkman Center at Harvard Law School)	
C06.05	Content Sensitive Linking	The OpenURL Framework for Context-Sensitive Services [z39.88]	ANSI/NISO
C06.06	Distributed Searching	Information Retrieval: Application Service Definition and Protocol Specification [z39.50]  Search Retrieval via URL (SRU version 1.2) [SRU v2.0]	ANSI/NISO  SRU
<b>C07</b>	<b>Standards for Identifiers</b>		
C07.01	Persistent and Unique Logical Identifiers	Syntax for the Digital Object Identifier [ANSI z39.84]	ANSI
<b>C08</b>	<b>Standards for Mobile Phones</b>		
C08.01	WAP Specifications	WAP 2.0	OMA
C08.02	GPRS	The General Packet Radio Service Specifications for Mobile Stations [EN 301 113, EN 301 344, EN 301 347, TS 101 297, TS 101 351]	ETSI
C08.03	SMS	The Short Message Service Specifications for Mobile Stations [ETS 300 536, ETS 300 537, ETS 300 559, ETS 300 560]	ETSI
C08.04	MMS	The Multimedia Messaging Service Specifications for Mobile Stations [TS 122 140, TS 123 140, TS 126 140]	ETSI
<b>C09</b>	<b>Standards for Biometric Data Interchange</b>		
C09.01	Secure XML Encoding for Exchanging Biometric Data	OASIS XCBF 1.1 Specification  OASIS XCBF 1.1, Secure XML encodings for the patron formats specified in CBEFF, the Common Biometric Exchange File Format [NISTIR 6529]	OASIS  NISTIR
C09.02	Data Element Specification	Common Biometric Exchange Formats Framework – Part 1: Data Element Specification [ISO 19785-1]	ISO/IEC
C09.03	Interchange Format Framework	Information Technology Biometric Data Interchange Formats – Part 1: Framework [ISO 19794-1]	ISO/IEC
C09.04	Interchange Formats for Finger Minutiae Data	Information Technology Biometric Data Interchange Formats – Part 2: Finger	ISO/IEC

		Minutiae Data [ISO 19794-2]	
C09.05	Interchange Formats for Finger Pattern Spectral	Information Technology Biometric Data Interchange Formats – Part 3: Finger Pattern Spectral [ISO 19794-3]	ISO/IEC
C09.06	Interchange Formats for Finger Image Data	Information Technology Biometric Data Interchange Formats – Part 4: Finger Image Data [ISO 19794-4]	ISO/IEC
C09.07	Interchange Formats for Face Image Data	Information Technology Biometric Data Interchange Formats – Part 5: Face Image Data [ISO 19794-5]	ISO/IEC
C09.08	Interchange Formats for Signature/Sign Behaviour Data	Information Technology Biometric Data Interchange Formats – Part 7: Signature/Sign Behaviour [ISO 19794-7]	ISO/IEC
<b>C10</b>	<b>System Security</b>		
C10.01	e-Mail Security	Cryptographic Message Syntax [RFC 5652]	IETF
		Cryptographic Message Syntax Algorithms [RFC 3370]	IETF
		Diffie-Hellman Key Agreement Method [RFC 2631]	IETF
		Secure/Multipurpose Internet Mail Extensions (S/MIME) Version 3.2 Certificate Handling [RFC 5750]	IETF
		Secure/Multipurpose Internet Mail Extensions (S/MIME) Version 3.2 Message Specification [RFC 5751]	IETF
C10.02	IP Security	Security Architecture for the Internet Protocol (Internet Protocol Security (IPSec)) [RFC 4301]	IETF
		IP Authentication Header [RFC 4302]	IETF
		Cryptographic Algorithm Implementation Requirements and Usage Guidance for Encapsulating Security Payload (ESP) and Authentication Header (AH) [RFC 7321]	IETF
C10.03	IP Encapsulation Security	IP Encapsulating Security Payload (ESP) [RFC 4303]	IETF
		Cryptographic Algorithm Implementation	IETF

		Requirements and Usage Guidance for Encapsulating Security Payload (ESP) and Authentication Header (AH) [RFC 7321]	
C10.04	Transport Security	The Transport Layer Security (TLS) Protocol Version 1.2 [RFC 5246]	IETF
C10.05	Encryption Algorithms	Advanced Encryption Standards (AES) (Information Technology – Security Techniques – Encryption Algorithms Part 3: Block Ciphers) [SANS 18033-3] OR Advance Encryption Standard [FIPS PUB 197]  TWOFISH [RFC 4880]  RSA 2048 bit (Rivest, Shamir and Adleman) (Security Techniques – Encryption Algorithms Part 2: Asymmetric Ciphers) [ISO 18033-2] OR ECC 256 bit (Elliptic Curve Cryptography) (Security Techniques – Cryptographic Techniques based on Elliptic Curves) [ISO 15946]	SABS  FIPS  IETF  ISO/IEC  ISO/IEC
C10.06	Hashing	Secure Hash Algorithm II (SHA-II) SHA-256, or SHA-384 [SANS 18033-3 or ISO 10118-3]	SABS ISO/IEC
C10.07	Digital Signatures	Digital Signatures with Appendix: Part 1: General [SANS 14888-1]  RSA-DSA (Rivest, Shamir and Adleman – Digital Signing Algorithm) [SANS 14888-2] OR EC-DSA (Ellyptic Curve – Digital Signing Algorithm) [SANS 14888-3]	SABS  SABS  SABS
C10.08	Key Management	Security Techniques – Key Management: Part 3: Mechanisms using asymmetric techniques [SANS 11770-3:2009]	SABS
C10.09	Message Authentication	Message Authentication Code (MAC) with Block Cipher [SANS 9797-1] AND/OR Message Authentication Code (MAC) with Hash Function [SANS 9797-2]	SABS  SABS

## 1.3 HARDWARE INFRASTRUCTURE CONSIDERATIONS

In Terms of Hardware Infrastructure, for reference to the relevant standards/specifications (which undergo their own certification processes), please refer to the following:

Personal Computing Devices

<http://www.sita.co.za/Prod%20Cert/1%20PCs&Periph/Detail%20Spec%20PCs&Periph.xlsx>

Peripherals

<http://www.sita.co.za/Prod%20Cert/1%20PCs&Periph/Detail%20Spec%20PCs&Periph.xlsx>

Servers and Storage

<http://www.sita.co.za/Prod%20Cert/2%20Srv&Stor/Detail%20Spec%20Servers%20&%20Storage.xlsx>

Audio visual

<http://www.sita.co.za/Prod%20Cert/3%20AVC/Detail%20Spec%20AVCT.xlsx>

Networking

<http://www.sita.co.za/Prod%20Cert/Networking/Detail%20Spec%20Networking.xlsx>

Infrastructure

<http://www.sita.co.za/Prod%20Cert/infra/Detail%20Spec%20Infrastructure.xlsx>

## ANNEX A: ABBREVIATIONS

BBBEE	Broad Based Black Economic Empowerment
BPMN	Business Process Modelling Notation
EA	Enterprise Architecture
GITO	Government Information Technology Officer
GITOC	Government Information Technology Officers Council
GWEA	Government Wide Enterprise Architecture
ICT	Information and Communication Technology
ISO	International Organisation for Standardisation
MIOS	Minimum Interoperability Standards
SCARC	Standing Committee on Architecture
SITA	State Information Technology Agency
OMG	Object Management Group
TOGAF®	The Open Group Architecture Framework
UML	Unified Modelling Language
ADL	Advanced Distributed Learning
ANSI	American National Standards Institute
ECMA	European association for standardizing information and communication systems
ETSI	European Telecommunications Standard Institute
NIST	National Institute of Standards and Technology
IEEE	Institute of Electrical and Electronics Engineers
IETF	Internet Engineering Task Force
ISO	International Organisation for Standardization
ITU	International Telecommunication Union
OAI	Open Archives Initiative
OASIS	Organization for the Advancement of Structured Information Standards
OCLC	Online Computer Library Center
OGC	Open Geospatial Consortium



OMA	Open Mobile Alliance
OMG	Object Management Group®
PKWARE	PKWARE® Inc, open standard for compressed file format, ZIP)
SABS	South African Bureau of Standards
W3C	World Wide Web Consortium
WHO	World Health Organisation