



Corporate Services for the Natural Resource Sector

Information Management Branch

Systems and Application Technology Standards

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Version Control

This section of the document records the various versions or releases of this document

Table 1: Version Control

Version	Details/Description	Distribution	Author	Organization
1.0	TOC prepared for Initial Review by IMB	2005-Oct	DHK	??
1.1	Reformatted, published. Format revisions	2006-Mar	TG	MOE/MAL
1.1.3	Versions, language revisions; removal of Windows servers	2006-Apr-05	TG	MOE/MAL
1.1.4	Minor spelling corrections; removal of footnote asterisk	2006-May-12	GW	MOE/MAL
1.2.0	Ant version; changed language in Sections 1 and 2	2006-June-06	TG	MOE/MAL
1.2.1	Struts version; note on library versions	2006-July-27	TG	MOE/MAL
1.3.0	Added "Last Updated" column to summary table; updates	2007-05-28	TG	MOE/MAL
1.3.1	Browser standards language: "or" becomes "and"	2007-06-12	TG	MOE/MAL
1.3.2	Spelling correction	2007-09-18	TG	MOE/MAL
1.3.3	Hibernate and Spring discussed	2007-11-01	TG	MOE/MAL
1.3.4	Hibernate Core and Spring	2008-06-01	GW	MOE/MAL
1.4.0	Numerous changes	2008-11-10	TG	MOE/MAL
1.4.1	Correction of typographical error	2009-01-07	TG	MOE/MAL
1.4.2	Correction of version # error for Application Server	2009-01-28	GW	MOE/MAL
1.4.3	Update Oracle Database version	2010-10-28	GW	MOE/MAL
1.5.0	Document moved from IMB and edited to fit with GeoBC	2009-02-04	GB	ILMB
1.5.1	Added PMD and library/software paths	2009-12-??	CD	ILMB
2.0.0	Combined ex-MOE/MAL, ex-ILMB, ex-MFR	2011-12-31	MW	CSNR-IMB

2.1.0	Updated release numbers of software components	2012-07-20	GW	IMB
2.2.0	Updated Versions of various technologies listed. Added deployment pattern diagrams Section 8. Sections edited include 1, 2, 4-7 Added TOC Cross Reference	2016-01-21	WR	IMB

1. Introduction

This is the approved list of technology components to choose from when developing an application. No other components may be introduced into the standard technology environment. The technology environment dictates the tools that may be used during design, development, or implementation.

1.1 Purpose

The purpose of this document is to provide an overview of the standard technologies for the design or deployment of systems or applications for the Natural Resource Sector (NRS). It contains a list of standards for core technology infrastructure approved for use in the Sector. This is an important reference through the Requirements and Design phases of the [NRS System Development Life Cycle](#).

1.2 Audience

This document is primarily intended for Sector contractors engaged in the design and development of systems and applications. It will also be useful to Sector and vendor project managers who direct such development and to Sector technical staff involved in the acceptance and deployment of these systems and applications.

1.3 Assumptions

It is assumed that readers of this document are familiar with the Government Technology Standards at <http://www.cio.gov.bc.ca>, under Policies and Standards.

1.4 Exceptions

Any exception to existing standards must be approved in writing by the [NRS Architectural Review Board](#) before proceeding with design or implementation.

2. Definitions

2.1 Standard

A standard is a specific statement of the rules and constraints governing the naming, contents, and operations of software and hardware. A standard **must** be followed. **There is a contractual obligation on the part of the vendor/developer to adhere to all relevant standards.**

There are three types of standards in this document: Government, Sector, and Legacy.

- A Government standard is set by Shared Services BC (SSBC) of the Ministry Technology, Innovation and Citizens' Services, or by the Government Chief Information Officer of the Province of British Columbia (GCIO).
- A Sector Standard is set by the Sector's IMB under the authority of the Sector Chief Information Officer (CIO).
- A Legacy Standard is also set by the Sector's IMB under the authority of the Sector CIO. Moreover, these standards exist to collectively support a deprecated technology infrastructure and as such are themselves deprecated. Contact the NRS Architectural Review Board if expecting to require use of legacy standards. Note that Legacy Standards exist *in conjunction* with an existing superior (Government or Sector) standard and that absence of a Legacy Standard implies that the superior standard applies. If a standard is not to be used (i.e. not applicable) in the legacy technology infrastructure then this will be indicated.

In some cases, multiple standards are provided, standards may be interpreted in more than one way, have different availability dates within NRS systems environment, or standards are still to be determined (TBD). For this reason the Sector's IMB will clarify the standard specific to its requirements.

In this document a standard is shown using the following convention. Examples:

Legacy Standard: *Macromedia JRun 4 is the application server.*

Sector Standard: *Oracle 12c is the database in the integration environment*

Government Standard: *Computer Associates' SiteMinder is the Enterprise Security gateway service*

2.2 Sector

Unless otherwise specified, "Sector" collectively means the Ministries and agencies which are included under the umbrella of the Natural Resource Sector (NRS). Sector Ministries are all served by a common corporate services division (also known as 'CSNR'). The six sector ministries include:

- Ministry of Aboriginal Relations and Reconciliation (MARR)
- Ministry of Agriculture (AGRI)
- Ministry of Energy and Mines (MEM)
- Ministry of Environment (ENV)
- Ministry of Forests, Lands, and Natural Resource Operations (FLNR)
- Ministry of Natural Gas Development (NGD)

3. Network Standards

Standard	Technology	Last Updated
LAN Standards	Sector Standard: TCP/IP is the only supported protocol	
WAN Standards	Government Standard: Utilize BC Government SPAN/BC (Shared Provincial Access Network) Sector Standard: TCP/IP is the only supported protocol	
Network Hardware Standards	Government Standard: Network hardware is provided by SSBC	

4. Application Standards

Standard	Technology	Last Updated
Application Servers	Sector Standard: Oracle Fusion Middleware (OFM) Suite 12.1.3 including Oracle Service Bus, BPM Suite, SOA Suite, Weblogic on Sun Solaris 11.2 and Tomcat 7 for Sector Middle Tier (SMT) environment on Windows Server 2008 R2 Legacy Standard: Oracle Fusion Middleware's (OFM) WebLogic Server 10.3.6 with the latest Oracle Critical Patch Update (April 2012) on Sun Solaris 10 (SunOS 5.10) ; Apache Tomcat and Windows 2008 R2	2015-01-02
Modeling Tools	Sector Standard: Enterprise Architect as per standard described in NRS Standards for Modeling with Sparx EA . Legacy Standard: Oracle Designer Repository 9i	2015-08-31
Delivery and Development Tools	Sector Standard: Artifactory, GIT, Jenkins, JIRA, Stash, Subversion. Developers may use any Integrated Development Environment (IDE) that produces Java EE 1.8 compliant code. No proprietary Java extensions are supported within the sector's Java Integration environment.	2015-06-30

Standard	Technology	Last Updated
Database	<p>Sector Standard: Oracle 12c Release 12.1.3.0.0</p> <p>Legacy Standard: Oracle 11g Release 11.2.0.1.0 64 bit, with patch CPUJUL2010, on Sun Solaris 10 (SunOS 5.10)</p>	2015-02-01
Spatially Enabled Databases	<p>Sector Standard: Spatial database geometries may be stored as Oracle Locator Geometries in an Oracle Database.</p> <p>Legacy Standard: Spatial database geometries may be stored as SDO (Oracle) Geometries in Oracle Database ; or as Simple-Feature (non-versioned, non-topological) Geodatabase using ESRI's Spatial Data Engine (SDE) over an Oracle Database.</p>	2015-02-01
Forms	<p>Sector Standard: Orbeon Professional (Smart Forms) 4.7 Professional</p> <p>Legacy Standard: Oracle Forms 11.1.1.6.</p> <p><i>Note: The use of Oracle Forms for new application development is not permitted; all new application development must use Java.</i></p>	2015-02-01
Reports	<p>Sector Standard: Jasper Reports Server Community Edition 5.0.0</p> <p>Legacy Standard: Oracle Reports 11.1.1.6 or Crystal Reports 10 and Crystal Enterprise 10 Professional</p>	2015-07-30
Document Management and Generation	<p>Sector Standard: Oracle WebCenter Content ; Winward</p>	2015-06-30
Java build utility	<p>Sector Standard: Ant 1.9.3</p> <p>Legacy Standard: Using several versions Ant 1.8.2 to 1.9.3 depending on server.</p>	2014-03-31
Web Mapping Framework	<p>Sector Standard: NRS Common Web Mapping Service, or the DataBC services including GeoCortex Essentials or Data Mashup Framework.</p> <p>Legacy Standard: Internet Mapping Framework (IMF) services as provided by DataBC including ESRI ArcIMS.</p>	2015-03-01
	<p>Sector Standard: GeoServer 2.6.3</p>	2015-06-30

API Manager	Sector Standard: WSO2 API Manager 1.8.0	2015-06-30
Data Transformation (ETL)	Sector Standard: FME Server 2014 SP4	2015-06-30

5. Web Standards

Standard	Technology	Last Updated
Browser Standards	Sector Standard: Microsoft Internet Explorer 11 and above.	2015-06-25
HTML Standards	Government Standard: HTML version 5	2012-07-20
Java Standards	Sector Standard: Java JDK 1.8.0 Legacy Standard: Java JDK 1.7	2015-06-30
JavaScript	Sector Standard: JavaScript version 1.5 (i.e. ECMA-262-3)	2012-07-20
Java Server Pages	Sector Standard: Java Server Pages as per Java EE 5 standard.	2008-11-10
Portal	Sector Standard: Liferay 6.2 SP 6 Enterprise Edition	2015-06-30
XML	Sector Standard: XML version 1.1	2012-07-20
Web Server	Sector Standard: Apache 2.x IIS 7.5.7600.16385 on Windows 2008 R2 servers. Apache 2.2.25 on SunOS 5.10 on UNIX.	2015-06-30

6. Security Standards

Standard	Technology	Last Updated
Encryption	Sector Standard: Secure Socket Layer 256-bit throughout for any application that requires authentication	2012-01-05
VPN	Government Standard: VPN services as provided by SSBC	
Digital Certificates	Sector Standard: X.509v3 Digital Certificates as provided	2008-10-11

	<i>by SSBC, issued by Entrust Certification Authority – L1C</i>	
Common User Authentication	Government Standard: Enterprise Security Gateway using CA SiteMinder as implemented by SSBC through the Corporate Authentication Program	2008-10-11
Common User Authorization	Sector Standard: WebADE 4.3	2012-07-24

7. Java Shared Libraries

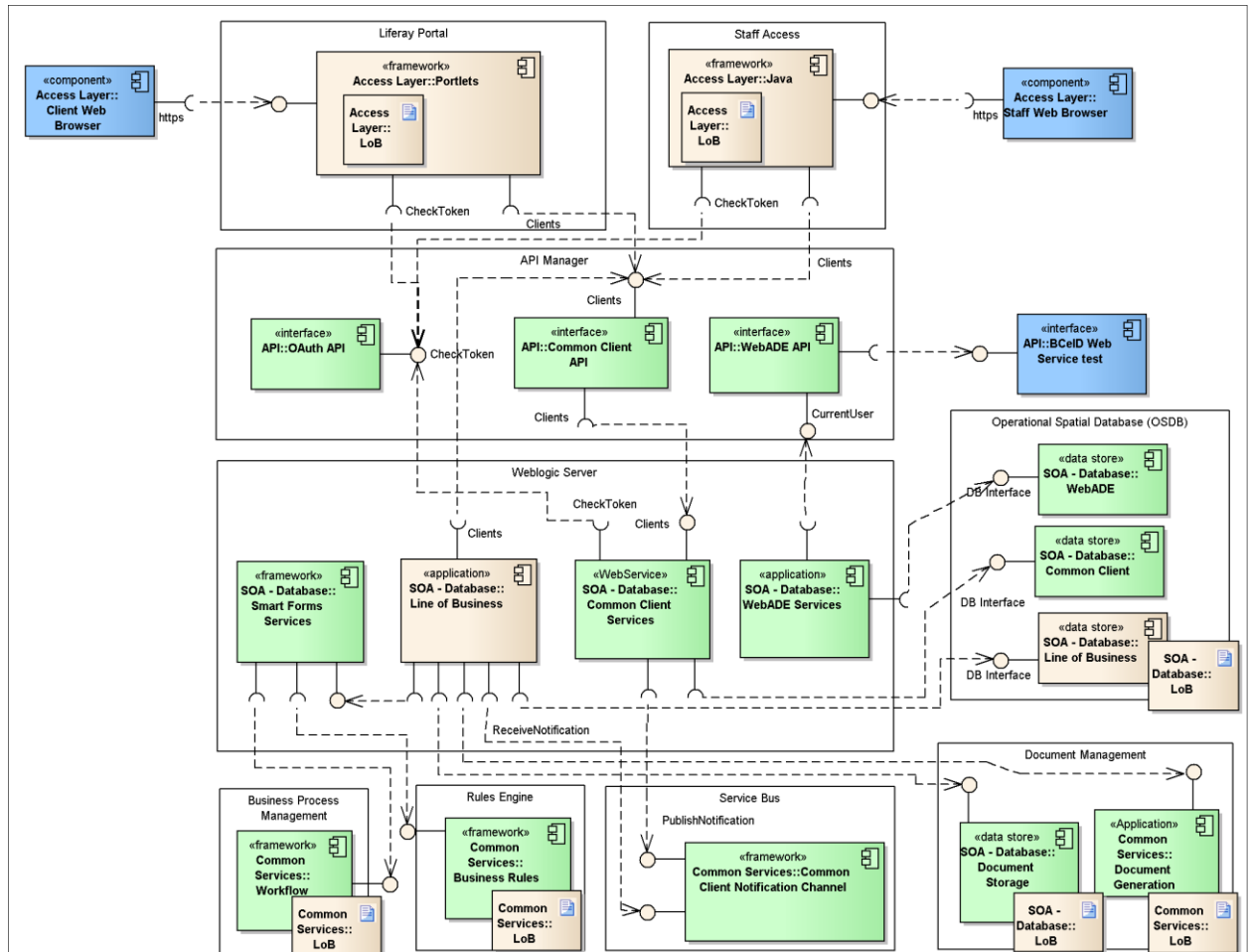
For reference, library versions are listed as *major.minor.patch*. Developed code should reference only *major.minor* (e.g. use “1.2” instead of “1.2.9”). See Java Delivery Standards for details.

Standard	Technology	Last Updated
Application Logging	Sector Standard: Apache log4j 1.2.14 Legacy Standard: Apache log4j 1.2.12 with Apache Commons Logging 1.0.4	2007-05-28
Charting (Graphing)	Sector Standard: JFreeChart 1.0.5	2007-05-28
Enterprise Application Framework	Sector Standard: Spring Framework 3.x Legacy Standard: none	2012-07-20
MVC Framework	Sector Standard: Spring Web MVC Struts, as bundled with delivered version of Spring Framework 3.x Legacy Standard: Apache Struts 1.3.10	2012-07-20
Batch Processing	Sector Standard: Spring Batch, as bundled with delivered version of Spring Framework 3.x	2012-07-20
Object-Relational Mapping	Sector Standard: Hibernate ORM 4.x Legacy Standard: Hibernate 3.2.6	2012-07-20
Unit Testing	Sector Standard: JUnit 4.9+ Legacy Standard: Junit 4.3.1	2012-07-20

8. Technology Patterns

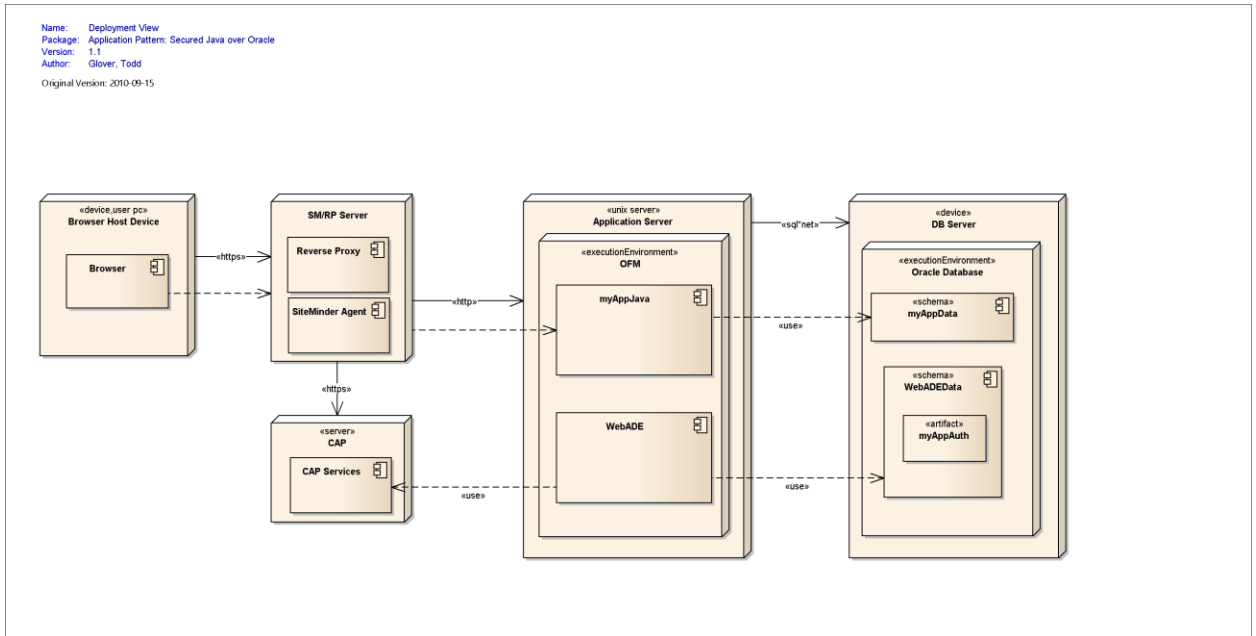
8.1 Integrated Systems and Services Strategy Patterns

8.1.1 ISSS Logical Architecture



8.2 Legacy Patterns

8.2.1 Secured Java over Oracle



8.2.2 Lightweight Development Approach

