Ontario

Government of Ontario

Information & Technology Standards

Government of Ontario IT Standard (GO ITS)

GO-ITS Number 20.1

Platform Software Standard

Version # 3.0

Status: Approved

Prepared under the delegated authority of the Management Board of Cabinet

 Last Review Date: 2013-10-17

Copyright & Disclaimer

Government of Ontario reserves the right to make changes in the information contained in this publication without prior notice. The reader should in all cases consult the Document History to determine whether any such changes have been made.

Template Info

Template Name	Template #	Template Version No.	Template Author	Template Completion Date
GO ITS Template	12.02.10	2.4	Design: PMCoE Boilerplate: SPPB/SCS	2013-08-28

Document History

Date	Summary
March-April 2007	• Version 1.0 o Approved by ARB, April 3, 2007. Pending ITSC endorsement o Endorsement by ITSC, May 9, 2007
2008-09-29	• Proposed Revision created. Updated: Background (pg.4) and Contributors (pg.12). Draft number set to 1.50
2008-10-03	• Tracked changes accepted throughout document; minor typos corrected. • Appendix A: Dashboard/Analytics in .NET Environment updated to MOSS 2007.
2008-10-16	• The statement “Software listed for one category must not be used to provide functionality in another category” is removed from Mandatory Requirement, section 2. • Appendix A: Renamed the column headings; Removed wording “ITS Responsible”; Removed asterisks from Proxy Server since this service is not provided by CCAS; Draft version number set to 1.54
2008-10-21	• Stellent and Cognos added to the .NET Recommended column; Triple asterisk added to Windows Server 2003 (pp. 20, 22) - ITS will move to

Date	Summary
	Windows Server 2008 as the new server standard during 2009. • Draft version number set to 1.55
2008-11-13	• Updated Background (pg.4) with reference to Major Applications Portfolio Strategy (MAPS). Draft set to 1.56
2008-11-19	• Portal Services row for .NET Revised Platform changed to “MOSS 2007/IBM WebSphere Portal” • Endorsed by IT Standards Council (ITSC) to proceed to ARB • Draft version number set to 1.57
2009-01-13	• Page 4: Removed footnote reference to Beyond e-Ontario • Final Draft version number set to 1.59
2009-01-15	• Page 6: Removed redundant statement concerning the GO-ITS exemption process • Architecture Review Board approval • Approved version number set to 2.0
2009-06-17	• Operating System for .NET Platform updated to Windows Server 2008 • Proposed revision number set to Draft Version 2.0c
2009-07-15	• IT Standards Council endorsement
2009-07-16	• Architecture Review Board approval • Approved version number set to 2.1
2013-08-28	• Transferred content to new GO-ITS Template v2.4C 2012-08-03 • Updated ownership section • Update and clarification on Sections 2.3.2 and 5.0 for applicability of this standard to COTS product acquisitions • Ownership of Java stream passed on to Chair of SDLC • Updated consultations and informed sections • Structural changes implemented in Appendix to introduce 2 new ownership streams, one for ITS and Other • Numerous product and/or version updates with product listing in Appendix A • Removal of legacy .NET Standard Platform column in Appendix A • Document version number set to 3.0
2013-09-04	• Architecture Review Board endorsement
2013-10-17	• IT Executive Leadership Council approval

Table of Contents

1. Foreword

Government of Ontario Information Technology Standards (GO ITS) are the official publications on the IT standards adopted by the Ministry of Government Services for use across the government's IT infrastructure.

These publications support the responsibilities of the Ministry of Government Services (MGS) for coordinating standardization of Information & Information Technology (I&IT) in the Government of Ontario.

In particular, GO ITS describe where the application of a standard is mandatory and specify any qualifications governing the implementation of standards.

2. Introduction

2.1. Background and Rationale

The Major Applications Portfolio Strategy (MAPS) provided an approach and comprehensive action plan for supporting the government's major business applications and their underlying technology. The Major Applications Portfolio Strategy established a roadmap for developing an improved decision-making process that will allow for sustainable I&IT investments based on value and risk parameters. One of the six MAPS recommendations is to standardize the I&IT development, test and deployment environments to reduce technology complexity and cost.

This standard lists I&IT software products being deployed within the standardized I&IT development, test and deployment environments. These software products will be hosted on a common shared software environment that consists of a sub-set of the existing software products currently deployed across the Government of Ontario. This shared software environment will be part of the Infrastructure Technology Services (ITS) services offerings.

I&IT product standard approvals from Architecture Review Board and Information Technology Executive Leadership Council do not replace the procurement process. Acquiring the products listed in this platform standard will require the appropriate procurement process.

Some key drivers for standardized I&IT development, test and deployment environments within the OPS are as follows:

- simplified hardware and software environment and software selection;
- reduced software licensing and support costs;
- increased agility in taking advantage of new and emerging technologies which could provide benefits to the OPS;
- improved business and IT alignment;
- supporting eCollaboration

Consultation with each Cluster revealed that two standardized core operating technologies and tools for all major application, database and middle tier tools were widely deployed and supported by existing IT people, processes and technologies; the Intel X86 environment in which Microsoft .NET was used and UNIX Systems environments in which Java (JEE) was deployed. It is also noted that JEE based solutions are also deployed and supported in X86 environments. JEE is OS platform independent and is supported by all major operating systems in the market place. In

addition, deployment of technologies under Government of Ontario's Open Source Software (OSS) policy is also subject to these drivers and must conform to this standard.

The purpose of this document is to define the software products for .NET, Java and Infrastructure Technology.

Because .NET and Java platforms have been standardized in the OPS, the operating systems, tools, languages etc. comprising the ITS-supported platforms generally involve:

- Products such as C++, Java and C# aided by application server technologies such as WebSphere, etc. that can be used to build client/server applications;
- Servers and server-side scripting languages including JSP, ASP, PHP, Perl, Python, etc. that run in web servers and servlet containers that can be used to build browser applications; and
- Robust common components allowing clusters to integrate and deploy mission critical solutions.

Most I&IT clusters and OPS application developers will use a combination of these architectures and tools, and in some cases, several types are used within the context of a single solution. Most clusters will also have a core platform upon which the bulk of their solutions are based – some leaning towards Java, and others towards .NET. There is no single answer to the question "Which platform is best?"

The best answer in selecting the right **primary platform** for a particular solution lies in establishing the most important **application delivery requirements**. The word 'primary' is important because neither platform should ever restrict future choices.

Similarly, it is essential that new technologies are able to be introduced into the stack allowing solutions to adapt as business needs change and as the market's technology landscape evolves.

2.2. Target Audience

Applies to all Government of Ontario technology solutions providers, and all application development and integration initiatives.

2.3. Scope

2.3.1. In Scope

- All net new development and deployment of one, two, three and N-tier systems for use within the OPS.

- Systems that have been identified as candidates for modernization but have not yet begun development or deployment activities.

2.3.2. Out of Scope

- Existing legacy one, two, three and N-Tier systems whether mainframe or distributed that have not begun a modernization review or are not candidates for modernization within the current lifespan of their vendor support agreements.

- Systems that have received approval for development or deployment via the recognized exemption process currently in force. This includes boutique deployments of specific products.

- COTS products, which are end-to-end solutions acquired through the procurement process (i.e. subject to the OPS procurement directive). These acquisitions may include bundled software and infrastructure products. Any GO-ITS 20.1 non-compliant software that is bundled with a COTS product may not be further leveraged or used for other business purposes (i.e. it may not be used to replace or duplicate a product listed in Appendix A). (see section 5 for more information)

- Vendor supplied upgrades to COTS products that have been acquired through the procurement process (i.e. subject to the OPS procurement directive).

2.4. Applicability Statements

2.4.1. Organization

All ministries and clusters are subject to Government of Ontario IT Standards.

All adjudicative and advisory agencies are subject to Government of Ontario IT Standards.

All other agencies that are using OPS information and information technology products or services are required to comply with Government of Ontario IT standards if they are subject to either the *Management and Use of I& IT Directive* OR Government of Ontario IT Standards by Memorandum of Understanding.

As new GO IT standards are approved, they are deemed mandatory on a go-forward basis (Go-forward basis means at the next available project development or procurement opportunity).

When implementing or adopting any Government of Ontario IT standards or IT standards updates, ministries, I&IT Clusters and applicable agencies must follow their organization's pre-approved policies and practices for ensuring that adequate change control, change management and risk mitigation mechanisms are in place and employed. For the purposes

of this document, any reference to ministries or the Government includes applicable agencies.

2.5. Roles and Responsibilities

2.5.1. Contact Information

Accountable Role (Standard Owner) Definition
The individual or committee ultimately accountable for the process of developing this standard. Where a committee owns the standard, the committee Chair is accountable for developing the standard including future updates. There must be exactly one accountable role identified. The accountable person also signs off as the initial approver of the proposed standard before it is submitted for formal endorsement to Architecture Review Board (ARB) and approval by the Information Technology Executive Leadership Council. (Note: in the OPS this role is normally at the IT executive or manager level).

Accountable Role:
Title: Solutions Delivery Leadership Council (SDLC) Chair

Responsible Role Definition
The organization(s) responsible for the development of this standard. There may be more than one responsible organization identified if it is a partnership/joint effort. (Note: the responsible organization(s) provides the resource(s) to develop the standard).

Responsible Organization(s): Java and Other Product Streams
Ministry/Cluster: Solutions Delivery Leadership Council (SDLC) Chair

Responsible Organization(s): .NET Product Stream
Ministry/Cluster: Labour and Transportation Cluster
Branch: .NET Solutions Delivery Centre

Responsible Organization(s): ITS Product Stream
Ministry/Cluster: Ministry of Government Services
Division: Infrastructure Technology Services
Branch: Enterprise Planning and Project Delivery Services

Support Role Definition
The support role is the resource(s) to whom the responsibility for actually completing the work and developing the standard has been assigned. If there is more than one support role, the first role identified should be that of the editor – the resource responsible for coordinating the overall effort.

Support Roles (Editor): Java and Other Product Streams
Ministry/Cluster: Solutions Delivery Leadership Council (SDLC) Chair

Support Roles (Editor): .NET Product Stream
Ministry/Cluster: Labour and Transportation Cluster
Branch: .NET Solutions Delivery Centre
Job Title: Manager, Applied Architecture Services
Name: Dalibor Skakic
Phone: 905-704-2915
Email: Dalibor.Skakic@ontario.ca

Support Roles (Editor): ITS Product Stream
Ministry/Cluster: Ministry of Government Services
Division: Infrastructure Technology Services
Branch: Enterprise Planning and Project Delivery
Job Title: Manager, Enterprise Planning
Name: John Violette
Phone: 905-704-2433
Email: John.Violette@ontario.ca

The above individuals will be contacted by the I&IT Strategy and Cyber Security (SCS) Division, annually, or as required, to discuss and determine potential changes and/or updates to the standard (including version upgrades and/or whether the standard is still relevant and current).

3. Technical Specification

This standard establishes .NET and Java as the two supported development environments and identifies the software that must be used in Appendix “A”. Furthermore, it establishes ITS as the product owner for infrastructure related software that must be used and these are also listed in Appendix A. Clusters/Ministries are required to utilize new services from ITS as they become available. These include a set of standard services for application development, testing, quality assurance and production within the Utility Infrastructure Management Service (UIMS), in support of the infrastructure consolidation mandate.

The following section provides descriptions of the services offered within the Utility Infrastructure Management Service according to the Infrastructure Component Catalogue (ICC), by which the complete list of application development, testing, quality assurance and production software in Appendix A is categorized.

Software in Appendix A has been chosen to provide specific functionality by category. Developers may chose software from either Java or .NET environments according to their functional requirements. Infrastructure technology professionals (ITS) must use the software technology listed under the ITS column in Appendix A. ITS will provide the

requisite infrastructure solutions in order to meet the requirements of the .NET and Java communities.

3.1. Key Categories

The structure of the environment has been determined by the Technology Reference Model (TRM) and more specifically by the Infrastructure Component Catalogue (ICC) which is an integral part of the TRM. The ICC is comprised of categories of services. This is further enhanced with ownership streams depicting .NET, Java, ITS and Other in order to provide clarity on which parts of the organization provide leadership on the identified products. The following chart outlines the categories within the ICC. It is software agnostic and applies to all software technology environments under consideration for use within the OPS.

3.1.1. Infrastructure Component Catalogue Generic Categories

Category	Category Details
Application Program Interface – Intra-API, Inter-API and Infra-API services. Technology that models new APIs or techniques that assure best API use, e.g. Universal Modeling Language (UML) modeling tools	Modeling Tools: • UML Modeling • Requirement Management • Code Modeling
Presentation – Web Server, IVR and WAP Server Technology that provides points of interaction (POI) or different presentations of data	Web server: • Supplied by Operating System (OS) Workflow Tools: • Human Workflow • Business Process • Business Object Components • Unified Communication • Business Intelligence (BI) • Dashboard/Analytics • Peer to Peer) (P2P) • Web Content Management (WCM) • Search Engine

Category	Category Details
	Web Presentation/Authoring: • Web Presentation Components • Business Transaction Components • Data Access APIs • Message Queue Components Portal: • Portal Services
Application – Application Server Application server software that executes business logic	Application Server & Components: • Application Server • Security Services • Proxy Server • Rights Management & Admin (Provisioning)
Integration – Integration Server, Inter-Enterprise Integration (IEI) Server Enterprise application integration (EAI) software that connects different applications together, reformatting and routing data as necessary.	Programming Interface: • Transactions • Message Queuing • Directory • Integration Connectors • Email APIs
Database – DBMS, Data Access Middleware Software that stores data for efficient record and field level retrieval along with data access and gateway function	Database (DBMS)/Development: • Database Messaging/Email: • Messaging/Email • Mailbox Management • Message Hygiene (Antivirus / Anti-spam) • Mobile Messaging • Instant Messaging • Storage / Restore
Server – Application Server HW and OS, Web Server HW and OS Server hardware and operating system	Operating System: • Environment specific OS

Category	Category Details
Directory – Directory Server Across-System (Universal) Service Provision	Directory Services: • Native OS services Web Service Directory (UDDI): • Native OS services
Management – Service Level Management (SLM) monitoring products To ensure that the required application service levels are being suitably supported by the infrastructure platform, an end-to-end enterprise level view of all contributing components must be available. Furthermore, the configuration of this management system and its contributing components must be mapped to enterprise-level policy definitions to ensure consistency.	Monitoring Tools: • Monitoring Tool Supported by OS Management Tools: • Configuration Management Tool Supported by OS Project & Portfolio Management: • Project & Portfolio Management Tool Supported by OS
Universal (including Languages, Debugging and Reporting Tools)	Development/Language: • Language (such as C++, C#) • OS Platform & Runtime • Web, Desktop and Mobile GUI • Server-side Component • Persistent Objects • Web Page Generation • In-Line Code/Code Behind • Relational Data Access • Queuing • Asynchronous Invocation • Naming • HTTP Engine • XML
Testing, Code Management & Quality Assurance	• Code and Quality Assurance (QA) Testing • Scheduling • Analysis Services • Source Code Library

Category	Category Details
	• Code Development • Code Reverse Engineering • Database Debug
Reporting	• Analytics Reporting Tool • SQL Reporting Tool
Collaboration	• Collaboration Service

4. Related Standards

4.1. Impacts to Existing Standards

GO-IT Standard	Impact	Recommended Action
GO-ITS 24 Omnibus Standard	Alignment required for protocol versions within GO-ITS 24	
GO-ITS 30 Database Management Systems	GO-ITS 20.1 effectively signals that three database products are approved for use in the OPS rather than two	
GO-ITS 30.2 OPS Middleware Software for Java	Alignment required with GO-ITS 30.2 to reflect IBM WebSphere	No change required to GO-ITS 30.2. Product is reflected in GO-ITS 20.1
GO-ITS 30.3 OPS Business Intelligence Software	Alignment required with GO-ITS 30.3 to reflect IBM Cognos Business Intelligence	No change required to GO-ITS 30.3. Product is reflected in GO-ITS 20.1

4.2. Impacts to Existing Environment

Impacted Infrastructure (includes Common Components and other applications)	**Impact**	**Recommended Action** (alternatively provide a page number where details can be found)
Net new applications must be developed in one of the software environments outlined under Section 2.1 "*Background and Rationale"* of this document and must use the software listed in Appendix A.	No impact to net new applications planned or under development. Legacy application renewal may be impacted in the case of applications running on mainframes. Impacts may include increased lead	Any application that can interface with an existing legacy application must be developed in accordance with this standard.

Impacted Infrastructure (includes Common Components and other applications)	**Impact**	**Recommended Action** (alternatively provide a page number where details can be found)
Legacy applications are not affected by this standard until they are at the end of their service life and must be either replaced or modernized. The replacement and/or modernization activities are subject to this standard at that time. Applications approved under the exception process are not subject to this standard until they are at the end of their service life and must be modernized or replaced. The replacement and/or modernization activities are subject to this standard at that time unless a new exception process has been approved for the application to be modernized.	times and additional resources to create a modern front end to interface with the existing backend application through the creation of an N-Tier application.	

5. Compliance Requirements

Net new applications must be developed in one of the software environments outlined under Section 2.1 “Background and Rationale” of this document and must use the software listed in Appendix A. This applies to the use and implementation of infrastructure software components identified in Appendix A as well.

Legacy applications and infrastructure are not affected by this standard until they are at the end of their service life and must be either replaced or modernized. The replacement and/or modernization activities are subject to this standard at that time.

Applications and/or infrastructure software approved under the exception process are not subject to this standard until they are at the end of their service life and must be modernized

or replaced. The replacement and/or modernization activities are subject to this standard at that time unless a new exception process has been approved at that time.

COTS solutions that provide end to end functionality and fulfill a specific business need that are acquired through the procurement process (i.e. subject to the OPS procurement directive) are out of scope from this Standard. These types of acquisitions may include bundled software and infrastructure components. However, use of any software product that is bundled with the COTS product, and that is not compliant with this Standard (see Appendix A), may not be used for other business purposes in the future (i.e. it may not be used to replace or duplicate a product listed in Appendix A). For example, if a COTS product is bundled with an enabling piece of software (e.g. BI Reporting Engine), that enabling piece of software cannot be used for other purposes if it duplicates or replaces a named product in the GOITS 20.1 Standard – Appendix A. However, the acquired COTS solution may be reused to satisfy the same business needs of multiple business clients (e.g. an acquired registration system, can be reused for multiple lines of business) using the same out of the box functionality (promoting reuse).

For more info, please see Section 4 (above) for additional guidance.

5.1. Implementation and Metrics

The intention of the OCCIO is to advertise and promote this standard as being a mandatory component throughout government. However, in order to effectively manage its implementation, ministries, clusters and applicable agencies are expected to adopt and monitor compliance to this standard.

6. Acknowledgements

Consulted
Please indicate who was consulted as part of the development of this standard. Include individuals (by role and organization) and committees, councils and/or working groups. (Note: consulted means those whose opinions are sought, generally characterized by two-way communications such as workshops):

Organization Consulted (Ministry/Cluster)	Division	Branch	Date
Victor Chan, Lead I&IT Industry Liaison MGS	OCCIO	Innovation, Controllership and Strategy	2011-12
Stavros Platis, Manager, Applied Architecture Svcs. MTO	Labour and Transportation Cluster	.NET SDC	2011-13
Nagesh Kalegowda, Technology Architect	Infrastructure Technology Services	Enterprise Planning and Project Delivery	2012-13

Organization Consulted (Ministry/Cluster)	Division	Branch	Date
MGS			
Igor Solesa, Sr. Manager Application Delivery MNR	Land and Resources Cluster	Application Delivery Group / Java COE	2011-13
Patrick Chung, Head Business Solutions MNR	Land and Resources Cluster	Business Solutions Services	2012-13
Anupama Ajeya, Technical Lead / Sr. Solutions Des. MNR	Land and Resources Cluster	Application Delivery Group	2012-13
David Lin, Technical Architect MGS	Infrastructure Technology Services	Enterprise Planning and Project Delivery	2012-13

Committee/Working Group Consulted	Date
Java COE Working Group	2011-13
Java COE Governing Council	2011-13
Solutions Delivery Leadership Committee (SDLC)	2013-02-14
Architecture Review Board	2013-04-04
Solutions Delivery Leadership Council (SDLC)	2013-08-29

Informed
Please indicate who was informed during the development of this standard. Include individuals (by role and organization) and committees, councils and/or working groups.

(Note: informed means those who are kept up-to-date on progress, generally characterized by one-way communication such as presentations):

Committee/Working Group Informed	Date
Java COE Governing Council	2011-13
Information Technology Executive Leadership Committee (ITELC)	2013-07-25

7. Recommended Versioning and/or Change Management

Changes (i.e. all revisions, updates, versioning) to the standard require authorization from the "responsible" organization(s).

Once a determination has been made by the responsible organization to proceed with changes, I&IT Strategy and Cyber Security (SCS) as custodians of the I&IT Rules Refresh Plan will coordinate and provide assistance with respect to the approvals process.

The approval process for changes to standards will be determined based on the degree and impact of the change. The degree and impact of changes fall into one of two categories:

Minor updates *- require confirmation from ARB, and communication to stakeholders and ITELC. Changes are noted in the "Document History" section of the standard. Minor updates generally consist of:*

- Editorial corrections (spelling, grammar, references, etc.) made with the intention to eliminate confusion and produce consistent, accurate, and complete work.
- Formatting changes (due to template updates or to improve readability of document).
- Documented organizational changes e.g. renaming of committees, approved transition of committee responsibilities, approved reporting relationship changes.

Standard revisions *- require consultation with stakeholders, ARB endorsement, and ITELC approval. Standard revisions consist of any updates to the I&IT Rules Refresh Plan that are not considered minor and may:*

- represent new standard or significant revision to an existing standard
- represent a major version change to one or more specifications
- impact procurement
- require configuration changes to current solutions
- impact other standards
- respond to legislative, policy or procurement changes

7.1. Publication Details

All approved Government of Ontario IT Standards (GO ITS) are published on the OCCIO Intranet web site. Please indicate with a checkmark below if this standard is also to be published on the public, GO ITS Internet Site.

Standard to be published on both the OPS Intranet and the GO ITS Internet web site (available to the public, vendors etc.)	☑

8. Requirements Levels

Within this document, certain wording conventions are followed. There are precise requirements and obligations associated with the following terms:

Must	This word, or the terms "REQUIRED" or "SHALL", means that the statement is an absolute requirement.
Should	This word, or the adjective "RECOMMENDED", means that there may exist valid reasons in particular circumstances to ignore the recommendation, but the full implications (e.g., business functionality, security, cost) must be understood and carefully weighed before choosing a different course.

9. Appendices

9.1. Normative References

N/A

9.2. Informative References

Historical Contributors

Full Name	Cluster, Ministry and/or Area
Christopher Chua	Ministry of Government Services
Andreas Ott	Ministry of Government Services
Peter Churchard	Ministry of Government Services
Brian Bisaillon	Ministry of Government Services
Stavros Platis	.NET Centre of Excellence/Economics & Transportation Cluster

Historical Consultations

Renee Laforet (HSC)
Ray Nakano (GSDC)
Merlino Franco (LRC)
Barry McKee (CYSS)
Cathy Hamilton (HSC)
Joanne Hiscock (LRC)

David Croft (GSDC)
Howard Bertrand (ETC)
Karl Cunningham (OCCS)
Lakshmi Subash (OCCTO)
Brian Speed (ITS)
Christopher Chua (ITS)

Bud MacDonald (HSC)
Sandy Mannering (JUS)
Kim Langford (ETC)
Rose Reeve (CAC)

Infrastructure Management Committee

Architecture Core Team

Solution Management Forum

10. Glossary

Application Runtime Environment/Library: A runtime library is a collection of utility functions which support a program while it is running, working with the operating system to provide facilities such as mathematical functions, input and output.
Application Server: An application server is a software engine that delivers applications to client computers or devices. Moreover, an application server handles most, if not all, of the business logic and data. A computer that is responsible for accepting HTTP requests from clients, which are known as Web browsers, and serving them HTTP responses along with optional data contents, which usually are Web pages such as HTML documents and linked objects (images, etc.)
Asynchronous Invocation: Asynchronous Invocation in computer and software engineering is the process by which a computer or virtual computer carries out the instructions of a computer program, and program can execute, without receiving a confirmation from other depended process
Business Transaction Components: Interface programs, or set of codes to connection various programs.
Data Access APIs: A collection/set of routine, protocols, and tools for building software applications, to access database systems.
Database: Database is a structured collection of records or data that is stored in a computer so that a program can consult it to answer queries. The records retrieved in answer to queries become information that can be used to make decisions
Directory: A directory or directory service is a software application — or a set of applications — that stores and organizes information about a computer network's users and network resources, and that allows network administrators to manage users' access to the resources. Additionally, directory services act as an abstraction layer between users and shared resources.
Email: An email is a store and forward method of composing, sending, storing, and receiving

messages over electronic communication systems
GUI: A graphical user interface (GUI) is a type of user interface which allows people to interact with a computer or other media formats which employs graphical icons, visual indicators or special graphical elements called "widgets", along with text labels or text navigation to represent the information and actions available to a user. The actions are usually performed through direct manipulation of the graphical elements,
In-line Codes: A line code (also called behind code) is a set of programming language, or codes written connecting two different areas within a program, or can be used to command transmissions within a program.
Integration Connectors: A Set of programming interfaces to connect various programs, and systems.
Language (such as C++, C#): A programming language is a language used to write computer programs, which instruct a computer to perform some kind of computation, and possibly control external devices such as printers, or mainframe systems, etc.
Message Queue Components: Queuing refers to lining up jobs for a computer or device to exchange computer commands, or data objects.
Message Queuing: Message Queuing is a process to use a messaging protocol, that allows applications running on disparate servers to communicate in a failsafe manner. A queue is a temporary storage location from which messages can be sent when conditions permit. This enables communication across heterogeneous networks and between computers which may not always be connected. By contrast sockets and other network protocols assume that direct connections always exist.
Naming: Naming is a process of organizing search of objects on the Internet. An API, such as JNDI can be used to access a directory service that allows clients to discover and lookup data and objects via a name.
Persistent Objects: Persistent objects are individual units of run-time data storage that are used as the basic building block of programs. These objects act on each other, as opposed to a traditional view in which a program may be seen as a collection of functions, or simply as a list of instructions to the computer. Persistent objects are used, when previous versions of software & programs are request to be available, in fail-safe mode. Persistent objects preserves the previous version of itself when it is modified;

such data structures are effectively immutable, as their operations do not (visibly) update the structure in-place, but instead always yield a new updated structure.

Queuing:

Queuing is a buffer abstract data structure providing services in computer science, transport and operations research where various entities such as data, objects, persons, or events are stored and held to be processed later. The most well known operation of the queue is the First-In-First-Out (FIFO) queue process. In a FIFO queue, the first element in the queue will be the first one out; this is equivalent to the requirement that whenever an element is added, all elements that were added before have to be removed before the new element can be invoked. Unless otherwise specified, the remainder of the article will refer to FIFO queues. There are also non-FIFO queue data structures, like priority queues.

There are two basic operations associated with a queue: enqueue and dequeue. Enqueue means adding a new item to the rear of the queue while dequeue refers to removing the front item from the queue and returning it to the calling entity.

Relational Data Access:

Relational Data access typically refers to software and activities related to storing, retrieving, or acting on data housed in a database or other repository.
Historically, different methods and languages were required for every repository, including each different database, file system, etc., and many of these repositories stored their content in different and incompatible formats.
In more recent days, standardized languages, methods, and formats, have been created to serve as interfaces between the often proprietary, and always idiosyncratic, specific languages and methods. Such standards include SQL, ODBC, JDBC, ADO.NET, XML, XQuery, XPath, and Web Services.

Server-side Component:

Collection of code to connect different artefacts, server-side components are also knows is a pattern language. Server-side components are software programs, such as a web server API, which runs on a remote server, reachable from a user's local computer or workstation. Operations may be performed server-side because they require access to information or functionality that is not available on the client, or require typical behaviour that is unreliable when it is done client-side.

Transactions:

A transaction is a unit of interactions with a database management system or similar system that is treated in a coherent and reliable way independent of other transactions that must be either entirely completed or aborted.

Web Presentation Components:

The interface program, or set of codes to generate meaningful information on a computer monitor.

Web Server:

A computer that is responsible for accepting HTTP requests from clients, which are known as Web browsers, and serving them HTTP responses along with optional data contents, which usually are Web pages such as HTML documents and linked objects (images, etc.).
Webpage Generation: It is a process to create a web document, which also known as Web page or webpage. It is a resource of information that is suitable for the World Wide Web and can be accessed through a web browser.
Webpage: A web page or webpage is a resource of information that is suitable for the World Wide Web and can be accessed through a web browser. This information is usually in HTML or XHTML format, and may provide navigation to other web pages via hypertext links. Web pages may be retrieved from a local computer or from a remote web server. The web server may restrict access only to a private network, e.g. a corporate intranet, or it may publish pages on the World Wide Web. Web pages are requested and served from web servers using Hypertext Transfer Protocol (HTTP).
XML: The Extensible Markup Language (XML) is a general-purpose markup language. Its primary purpose is to facilitate the sharing of data across different information systems, particularly via the Internet. It is a simplified subset of the Standard Generalized Markup Language (SGML), and is designed to be relatively human-legible. By adding semantic constraints, application languages can be implemented in XML.

Appendix A

Product List

(See following pages)

GO-ITS 20.1 Appendix A	Product Category	.NET Revised Platform	Java Standard Platform	ITS	Others
2.1.1 INTERFACE AND SYSTEM-LEVEL SERVICE PROVISION					
API – Intra-API, Inter-API and Infra-API services. Technology that models new APIs or techniques that assure best API use (e.g. UML modeling tools like Rational Rose)					
	UML Modeling	Sparx Enterprise Architect, Sybase Powerdesigner, Visual Studio 2010/12	Rational Software Modeller		Rational Requisite Pro
	Requirement Management	Sybase Powerdesigner, , Team Foundation Server 2010			Rational Requisite Pro
	Code Modeling	Sparx Enterprise Architect, Sybase Power Designer, Visual Studio 2010/12	IBM RDT (RSA - Rational Software Architect, RAD - Rational Application Developer, Modeller)		
Presentation – Web Server, IVR and WAP Server. Technology that provides points of interaction (POI) or different presentations of data					
	Web Server	MS-IIS 7.5 or higher		Apache HTTP Server (version 7 or higher)	
	Workflow Tools				
	Human Workflow	.NET 4.0 (Workflow Foundation), SharePoint 2010, MS Dynamics 2011	IBM Business Process Management (IBM BPM) Suite		
	Business Process	.NET 4.0 (WF) MS BizTalk Server 2009			Cognos
	Business Object Components	.NET 4.0, SharePoint 2010 MS Dynamics 2011			Cognos
	Business Intelligence (BI)	SharePoint 2010, MS Dynamics 2011			Cognos***

GO-ITS 20.1 Appendix A	Product Category	.NET Revised Platform	Java Standard Platform	ITS	Others
	Dashboard/Analytics	SharePoint 2010, MS Dynamics 2011			
	P2P	SharePoint 2010, MS Dynamics 2011			
	WCM	SharePoint 2010			Stellent*
	Search Engine	SharePoint 2010			
	Web Presentation/Authoring				
	Web Presentation Components	.NET 4.0 (ASP.NET, MVC, Silverlight 4) IIS 7.5, SharePoint 2010	JEE/JSP Version 4.3 or higher/ WebSphere Suite		
	Business Transaction Components	.NET 4.0 (Windows Communication Foundation (WCF), Web Services (ASMX))	JEE/JSP Version 4.3 or higher/ WebSphere Suite		
	Data Access APIs	.NET 4.0 (ADO.NET, Entity Framework)	JEE 1.6 or higher/WebSphere Suite		
	Message Queue Components	.NET 4.0 (WCF via MSMQ)	IBM MQ Series		
	Portal				
	Portal services	SharePoint 2010	IBM WebSphere Portal**		
Application – Application Server. Application server software that executes business logic					
	Application Server & Components				
	Application Server	Microsoft IIS 7.5 or higher, BizTalk Server 2009	IBM WebSphere Suite		
	Security Services	Active Directory, Windows Identity Foundation			Sun Directory Server
	Proxy Server			IBM Edge Server (part of IBM WebSphere suite),	

GO-ITS 20.1 Appendix A	Product Category	.NET Revised Platform	Java Standard Platform	ITS	Others
				Forefront Unified Access Gateway (2010 or higher)	
	Rights Management & Admin (Provisioning)				Windows RMS, Sun Identity Management Server
Integration – Integration Server, Inter-Enterprise Integration (IEI) Server. Enterprise application integration (EAI) software that connects different applications together, reformatting and routing data as necessary					
	Programming Interface				
	Transactions	BizTalk 2009, Windows Distributed Transaction Coordinator (DTC), .NET 4.0 (WCF)	JTA within JEE 1.6 or higher /WebSphere Suite		
	Message Queuing	BixTalk 2009, .NET 4.0 (Windows Communication Foundationvia MSMQ)	IBM MQ Series		
	Directory	Active Directory Services Interface (ADSI)		Active Directory	
	Integration Connectors	BizTalk Server 2009, .NET 4.0 (WCF), Microsoft Host Integration Server, Windows Server Service Bus 1.0	IBM Enterprise Service Bus		
	Email APIs	.NET 4.0, Messaging API (MAPI)/Resident in Exchange (SMTP native)	JEE 1.6 or higher (Java mail)/WebSphere Suite (SMTP native)		
Database – DBMS, Data Access Middleware. Software that stores data for efficient record and field level retrieval along with data access and gateway functions					
	Database (DBMS)/Development				

GO-ITS 20.1 Appendix A	Product Category	.NET Revised Platform	Java Standard Platform	ITS	Others
	Database	MS – SQL Server 2008 or higher (Database Engine, Integration Services, Analysis Services, Reporting Services), SQL CE 4.0			Oracle *** (see notes)
	Messaging/Email				
	Messaging/Email			Microsoft Exchange Server (2010 or higher)	
	Mailbox Management			Symantec Enterprise Vault (8 or higher), OpenText	
	Message Hygene (Antivirus / Anti-spam)			Microsoft Forefront Protection for Exchange Server (2010 or higher), McAfee Email Gateway	
	Mobile Messaging			BlackBerry Enterprise Server (v5 or higher)	
	Instant Messaging			Microsoft Lync Server (2010 or higher)	
	Backup			Refer to GO-ITS 30.7	
Server – Application Server HW and OS, Web Server HW and OS. Server hardware and operating system					
	Operating System				
	Operating System			Oracle Solaris (v10 or higher), IBM AIX (v6 or higher), Microsoft Windows Server (2008 R2 or higher)	

GO-ITS 20.1 Appendix A	Product Category	.NET Revised Platform	Java Standard Platform	ITS	Others
ACROSS-SYSTEM (UNIVERSAL) SERVICE PROVISION					
Directory – Directory Server. Software that provides centralized object attribute mapping (e.g.: user attributes such as access, component attributes such as cost center, location, etc)					
	Directory Services				
	Directory Services			Active Directory	
	Web Service Directory (UDDI)	Native to Windows Server 2008 R2 or higher	Registry Services (Native to Java-CAP)		
	Management & Monitoring Tools				
	Monitoring/Management Tools			Microsoft System Center (2010 or higher) , HP OpenView, VMware vCenter	
	Project & Portfolio Management				Clarity
Universal (incl. Tools)					
	Development/Language				
	Language (such as C++, C#)	C# (recommended), VB.NET	JEE 1.6 or higher /IBM WebSphere Suite		
	OS Platform & Runtime	.NET 4.0	JEE 1.6 or higher /IBM WebSphere Suite		
	Web, Desktop and Mobile GUI	.NET 4.0 (ASP.NET, WinForms, Windows Presentation Foundation, Silverlight 4), Microsoft Office Infopath Forms	JEE 1.6 or higher /IBM WebSphere Suite		
	Server-side Component	.NET 4.0	JSP/EJB/WebSphere Suite/LogBack ++		

GO-ITS 20.1 Appendix A	Product Category	.NET Revised Platform	Java Standard Platform	ITS	Others
	Persistent Objects	.NET (Entity framework)	EJB 3.0/WebSphere Suite		
	Web Page Generation	Visual Studio 2010/2012 , SharePoint Designer 2010, Microsoft Expression Web	JEE 1.6 or higher /IBM WebSphere Suite		
	In-Line Code/Code Behind	C# (recommended), VB.NET, Javascript	JEE 1.6 or higher /IBM WebSphere Suite		
	Relational Data Access	.NET 4.0 (ADO.NET, Entity framework)	JEE 1.6 or higher /JDBC/IBM WebSphere Suite		
	Queuing	.NET 4.0 (WCF with MSMQ)	JEE 1.6 or higher /JMS/IBM WebSphere Suite		
	Asynchronous Invocation	.NET 4.0 (WCF)	JEE 1.6 /EJB 3.0/IBM WebSphere Suite		
	Naming	.NET 4.0, LDAP	JEE 1.6 /JNDI/IBM WebSphere Suite		
	HTTP Engine	MS-IIS Server 7.5	Apache Server		
	XML	.NET 4.0	JAXM, using SOAP/IBM WebSphere Suite		
	Data Synchronization	MS Synchronization Framework 2.1			
	Testing, Code Management & QA				
	Code and QA testing	Visual Studio 2010/2012	TestNg++; jProfiler; Sonar ++		Mercury Interactive Winrunner/IBM Rat Tools VS Team Edition for Testers
	Scheduling			Tivoli Workload Scheduler	
	Analysis Services	Visual Studio 2010/2012			
	Source Code Library	MS Team Foundation Server 2010	Rational Clearcase		

GO-ITS 20.1 Appendix A	Product Category	.NET Revised Platform	Java Standard Platform	ITS	Others
	Code Development	Visual Studio 2010/2012	RAD - Rational Application Developer + RSA – Rational Software Architect		
	Code Reverse Engineering	Sparx Enterprise Architect, PowerDesigner, Visual Studio 2010/2012			
	Database Debug	Visual Studio 2010/2012, SQL Server Management Studio			
	Reporting				
	Reporting	Crystal Report (Enterprise Version) SQL Server 2008 Reporting Services			
					SQL Reporting
	Collaboration				
	Collaboration	SharePoint 2010			Plone/Zope** ++

Notes:
* Originally offered with the enterprise Portal and Content Management service
** Former CCAS service offering
*** OPS Enterprise Standard, for relational database products refer to GO-ITS 30.0, for business intelligence refer to GO-ITS 30.3
++ Open Source Product