WHITE PAPER

INTEGRATION CAPABILITY

CONTENT

INTEGRATION CAPABILITY

This document provides a technical overview of the integration capability of IFS Applications™ within the defense and business sectors. It is intended to provide a sufficient level of detail by explaining the features built into the IFS business solution to enable the seamless and low risk integration with home-grown software and other third party enterprise applications and point solutions.

EXECUTIVE SUMMARY

In large and disparate organizations it is common place to find a selection of commercial off the shelf (COTS) solutions integrated with purpose built home-grown business software. The success of a COTS application must be measured by its fit for purpose functionality, its ease of use, and its ability to be integrated with other solutions. In this fast changing world it also has to offer users' a low risk means of keeping ahead of technology by having the minimum of technology 'lock-in' and the capability to reapply integration scenarios as business processes change and data connectivity and transfer requirements alter.

IFS Applications is built using the same principles employed by successful manufacturers—the production and assembly of components. This allows change and evolution within a software component without impacting on other software components within the solution. IFS Service-Oriented Component Architecture™ delivers the agility and ease of use found in service-oriented architectures; and the proven benefits of components and object orientation are combined to create a powerful architecture. This granular component approach provides a low risk and more agile access to individual data elements, their interconnectivity and maintenance.

Integration with other applications is supported in the IFS Application through XML, web services, Java, J2EE and .NET technologies. IFS' web, portal, Windows®, and mobile user interfaces are designed to suit the particular roles, environments, and the tasks that are to be found within both the defense and business sectors. With a proven track record of building for change, IFS provides a step-by-step, non-disruptive introduction of new technologies into operational systems. This ensures that you will always be able to benefit from the latest advancements—and so maximizing the benefits from your assets and investments.

IFS INTEGRATION CONCEPTS

Technology continues to drive a wave of integration where new industry standards are enabling more and more applications to communicate and work together. We are seeing internal systems being linked to each other, to extranets, and to the Internet.

Business processes are expanding to include multiple organizations in a networked business community.

For applications, integration is about making independently designed software systems work together, and IFS distinguishes between two main categories of integration, each driven by different needs. The first category gives users access to IFS Applications functionality using other presentation tier applications than those supplied by IFS. For example, a user might want to build a Microsoft Excel macro that integrates with the financials solution or an Intranet web page that retrieves certain customer information. The second category is what is usually assumed when talking about integration in the context of business applications. This refers to sending business documents and transactions between systems, to and from customers and suppliers. EDI and EAI fall into this category.

IFS Applications support the first category of integration with IFS Access Providers —allowing integration of IFS Applications business logic with other clients regardless of the technology with which they are built. The second category is supported through IFS Web Services and IFS Connect. Before these are explained in more detail it is important to review the underlying architecture used within IFS Applications.

THE IFS ARCHITECTURAL FRAMEWORK

IFS Foundation1™

IFS Foundation1 is IFS' strategic packaged architecture platform for component-based business applications. Based on open standards such as XML, UML, BPEL, J2EE and .NET, it includes the technology and tools to design, develop, deploy, configure, integrate, and administer IFS Applications. It is based on four fundamental principles:

1. ***Simplicity*** to support and simplify all tasks for all types of user of IFS Foundation1;
2. ***Flexibility*** to support adjustments of functionality according to customer demands;
3. ***Adaptability*** to support the inclusion of evolving technological enhancements without affecting business;
4. ***Openness*** to make it easy to share data between IFS Applications and other systems, through IFS Connect™ the integration broker.

IFS Foundation1 is also the product family name for all things related to IFS technology and architecture. IFS Foundation1 includes:

- the definition and documentation of IFS Service-Oriented Component Architecture;
- runtime containers, frameworks required to run and manage an IFS Applications installation. This includes runtimes for business logic, portals, web, Windows, and mobile clients;

- user interface environment enabling access to IFS Applications from web browsers, PCs, PDAs and more;
- tools and routines to manage the full lifecycle of the applications. From solution development, through installation and configuration, to administration and use of IFS Applications;
- options that extend the configuration possibilities of the platform. For example, IFS Connect and IFS Report Designer;
- common application components and services such as ISO codes, security services, change logging, event notifications and user collaboration.

Everything in IFS Foundation1—from the choice of core technologies to the functionality in the tools—is optimized for the development of large, scalable, high-quality business applications.

Service Oriented Architecture Layers

Figure 1 shows a schematic of IFS service oriented architecture.

Moving across the diagram the columns represent the business functionality; shown here, for example, by the three functional areas of Finance, Distribution and Manufacturing. The total solution is further broken down into over 160 business software components (or business components for short). It is in these business components that product development, installation and upgrading is managed on a component by component basis; providing a high degree of agility as the control and management of change can be performed on a step-by-step basis (component by component).

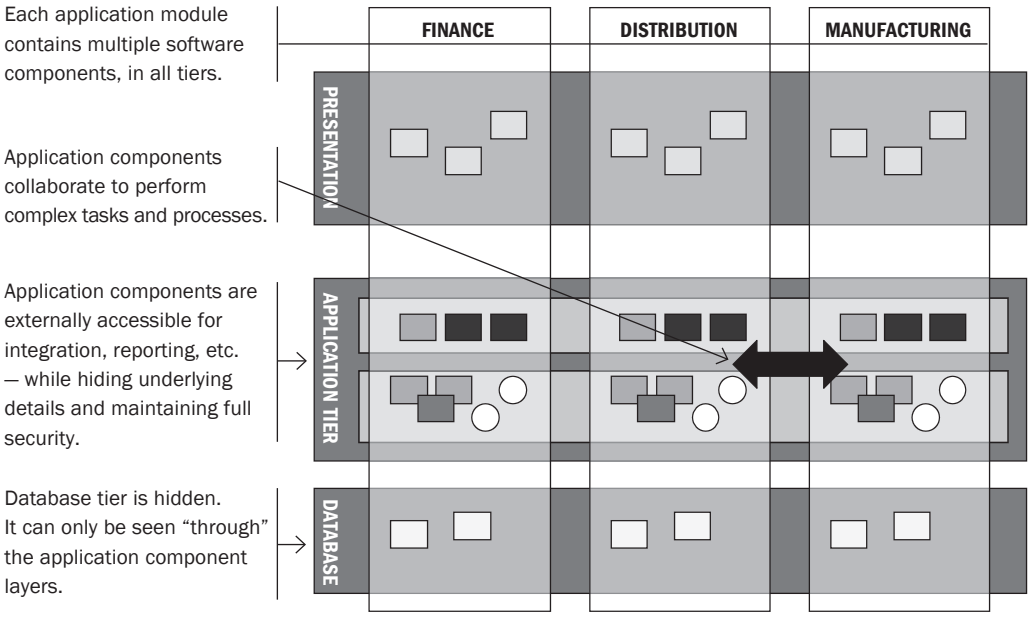


Figure 1. Service Oriented Architecture Layers

Vertically the application is layered in three main tiers—*database, application and presentation (browser)*—and within the application tier the business logic is divided into two sub-tiers—the *application core and the composite services layer*. The application core is where the bulk of the business logic is implemented and the services layer packages this functionality behind a set of services.

Each business component contains multiple software components or objects. The database or storage tier contains tables and indexes, which can only be seen through the *application component layers*. The *application core tier* contains entities that abstract and guard access to storage, activity client-server APIs, and business logic implementation objects. The *composite services layer* contains composite activities and services. The presentation tier contains presentation objects such as portlets, forms and web pages.

Business software components interact with each other to perform larger tasks and to execute processes—business logic communication happens here. There are no hard-wired dependencies between business components in either the *database* tier or the *browser* tier. For example IFS Applications does not use *database* triggers or constraints for data consistency; instead the required checks are performed by logic in what is often called "the business logic tier" (*application core and composite services layer*).

Humans access the functionality through the user interface in the *presentation* tier, whereas other applications and integrations access the *composite services layer* directly. Regardless of how the access is initiated, e.g. web client, Windows client or via a service; then the same common business logic is always executed, maintaining data integrity and adhering to defined security access authorizations.

A combination of service orientation and object orientation is used. The storage and application core is object oriented and draws on the proven benefits, efficiency, maintainability and reliability of object oriented applications; while the composite services layer and the presentation tier is service oriented, tapping into inherent agility and ease of use for integration that service orientation offers.

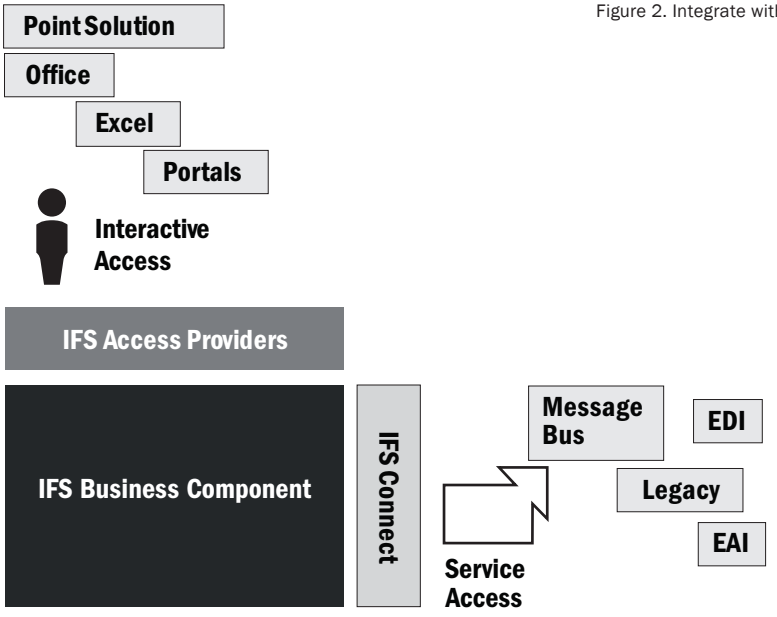
Integration with People and Applications

Figure 2 illustrates *IFS Access Providers* that provide human access via applications such as Microsoft's Office, Microsoft Excel, or via other 3rd party point solutions or via Portals. It also illustrates how *IFS Connect* provides *Service Access* to legacy solutions, supported using: EDI (Electronic Data Interchange), EAI (Enterprise Application Integration) or an industry standard message bus.

IFS ACCESS PROVIDERS

For presentation tier integration, the key factor is flexibility, and IFS believes in making integration easy regardless of which technology, platform, or tool set is used. This is why IFS has chosen to support both .NET and Java platforms and tools for integration development. IFS understands that 'flexible' integration

Figure 2. Integrate with People and Applications



involves the separation of technologies, so it doesn't matter whether your 3rd party system is using the same technology as IFS or not. The exception is for access providers which give *synchronous* access and are *typically* (but not always) used for alternative user interfaces.

IFS Access Providers are small API libraries that work similarly to ODBC/JDBC drivers. However, rather than talking to the database, they communicate with the application server. They also encapsulate and handle the rich client-server semantics used by IFS Applications. For example, the access providers handle user logon, error messages, and retry/resend logic.

IFS Access Providers have been designed to optimize local and wide-area network traffic. The protocol used between the access providers and the server is http, so it can be used across internal and external networks, with full router/firewall security. Http with SSL (https) is also supported. Data sent is compressed by default, drastically reducing bandwidth requirements.

SERVICE ACCESS

IFS Applications includes a number of services that send or receive information. Some are generic services that are part of the platform, such as the reporting framework or replication functionality. Other services, such as order confirmations and invoices, belong to specific business components. With IFS Applications, all services sending or receiving information do so using XML natively.

This policy means that IFS Applications is ideally suited to being integrated with other applications that also use XML and web services. However, despite the popularity of web services in newer applications, many systems in use still require other

ways of integration. These are also supported. Other formats (e.g. another XML format or a delimited file) and different protocols are provided using an integration broker.

IFS CONNECT

IFS Applications comes with its own light-weight integration broker, *IFS Connec*t. It is not intended for *IFS Connect* to match the functionality or to compete with products such as Microsoft's BizTalk or IBM's WebSphere on functionality or tooling etc. IFS Connect includes much of the integration capabilities and functionality required by customers, and is designed to be a less complex and easier to use solution because it interfaces with a message bus and is not designed to run a message bus of its own.

Because of the open architecture, *IFS Connect* can easily be combined with 3rd party integration brokers, EAI and EDI software. Or the 3rd party broker can be used on its own, accessing IFS Applications web services directly through SOAP.

IFS Connect is also designed to extend the capabilities with other parts of IFS Applications. For example, IFS Connect can be used to enable the reporting framework to send reports electronically; and is also an important compliment to Event Management enabling, for example, the sending of e-mail and SMS messages.

Figure 3 illustrates the role played by *IFS Connect*, and the relationship with other 3rd party integration brokers.

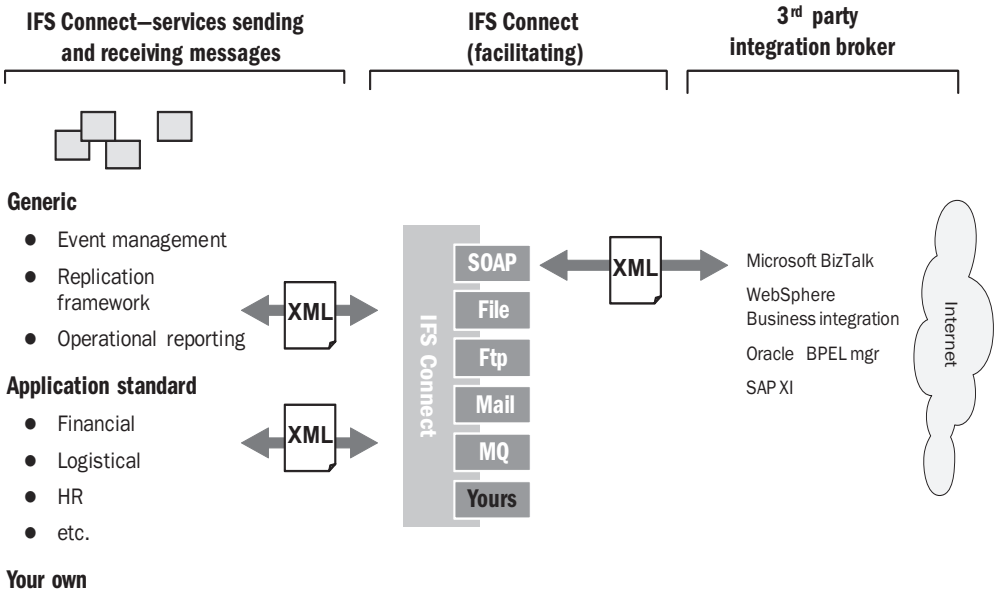


Figure 3. IFS Connect

IFS Connect provides additional integration value, including:

- content-based routing of inbound and outbound messages in one-to-one and one-to-many configurations;
- master/slave configuration for central routing and administration;
- XML style sheet (XSLT) or Java-based message transformation;
- support for enveloping (the packaging of messages inside other messages);
- Synchronous or Asynchronous operation;
- message store-and-forward and archiving;
- ready-to-use connectors based on Internet communications standards, including SOAP, http, https (with SSL), mail (SMTP/POP3), Microsoft BizTalk Server, IBM WebSphere MQ, FTP, and file transfer.

In addition to the integration capabilities, *IFS Connect* also extends other parts of IFS Applications with additional functionality. For example:

- business event notifications using mail, SMS, and other *IFS Connect* connectors;
- electronic distribution of business document reports as XML or ready-to-view PDF documents;
- IFS Applications replication traffic carried over any protocol supported by *IFS Connect*.

INTERFACE BROWSER

In all integration work, access to technical specifications for services, interfaces and messages is critical to ensure rapid and successful integration. In particular, for web services the use of XML schemas (XSD) in conjunction with WSDLs to describe message structure and content is a significant productivity enhancer.

The interface browser is an interactive tool allowing an integrator to browse the technical API documentation for IFS Applications. It contains listings and search capability for all IFS Applications core objects, web services, events, information access layer objects, and XML-enabled reports. For each of these, the technical API specification (function names, syntax, data types, etc.) is presented, with XML, XSD, and WSDL documents where applicable.

Integration Standards—OAGIS

The Open Applications Group is a not-for-profit standards development organization focused on building enterprise ready process-based business language standards for both B2B and A2A integration. IFS Applications supports OAGIS standards where they have been defined, to enable a consistent operability for connecting to other applications from solution vendors.

INTEGRATION EXAMPLES

Integration in the context of business applications refers to sending business documents and transactions between different business systems. To illustrate this we have chosen two scenarios one a business integration with Oracle EBS and the other with SAP. These have been chosen because they are the most frequent integrations for IFS Applications. A third example demonstrates supply chain integration using OAGIS standards with a non-IFS ERP solution.

EXAMPLE 1

IFS Supply Chain Integration with Oracle EBS

The scenario is as follows:

1. The financial and purchasing solution is Oracle EBS.
2. The spare parts planning system is in IFS.
3. The master item and procurement records reside and are maintained within the Oracle EBS.
4. A new maintenance item is required to be purchased.

Figure 4—illustrates schematically the flow of information between the two systems.

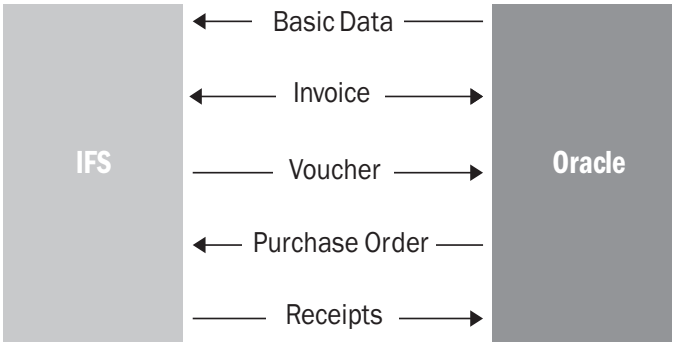


Figure 4. Data Flows

A spare part is required by the maintenance engineer, so he checks the IFS solution to see if this item is in stock, and realizes the item had not been purchased before and in fact has no item record within the IFS solution. So he sends an electronic request into purchasing.

Purchasing receives the request from the maintenance engineer and raises a new item within the Oracle system (or send the request to the authority for the raising of new item details). The new record is added into the Oracle solution and this creates a trigger to raise a record in the IFS solution.

Figure 5—illustrates the systems flow and the process that is executed to create the new item details within the Oracle EBS and how the new item is then downloaded to the IFS solution.

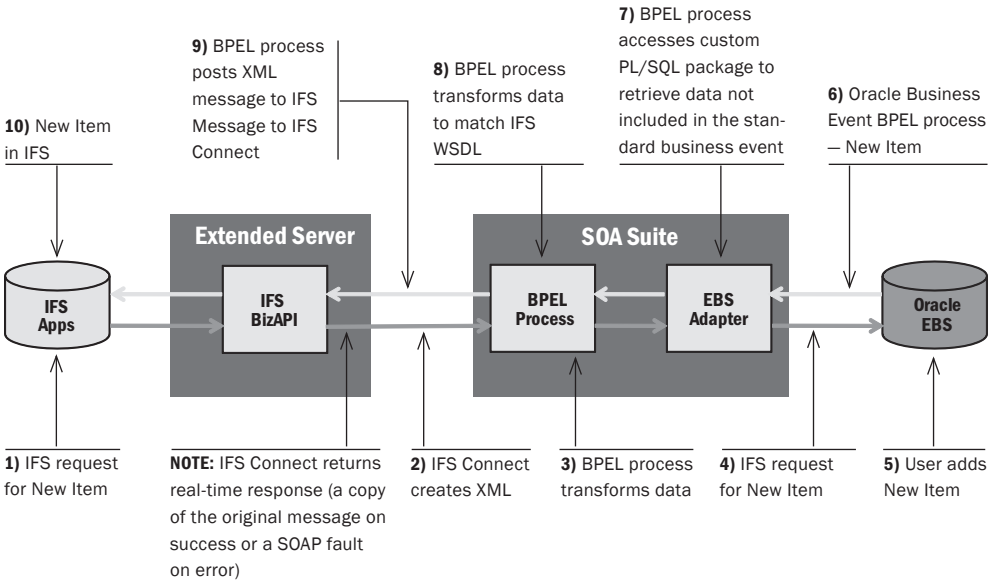


Figure 5. Create New Item in IFS

At each transaction initiation from IFS, IFS Connect returns a real-time response on the success or failure of each transaction or a real-time response if the connection is via Oracle BPEL manager using SOAP. This therefore enables an instant review of any errors before they escalate into a series of compounded errors that become very difficult to untangle and then correct.

With a valid item reference in both the Oracle and the IFS solution, purchasing can select an appropriate vendor and raise a purchase order in Oracle. As the demand for the new item is within the IFS solution, details of the purchase order need to be communicated into IFS to balance the demand for the spare part with the appropriate purchase supply. Figure 6—illustrates this flow of purchase order information.

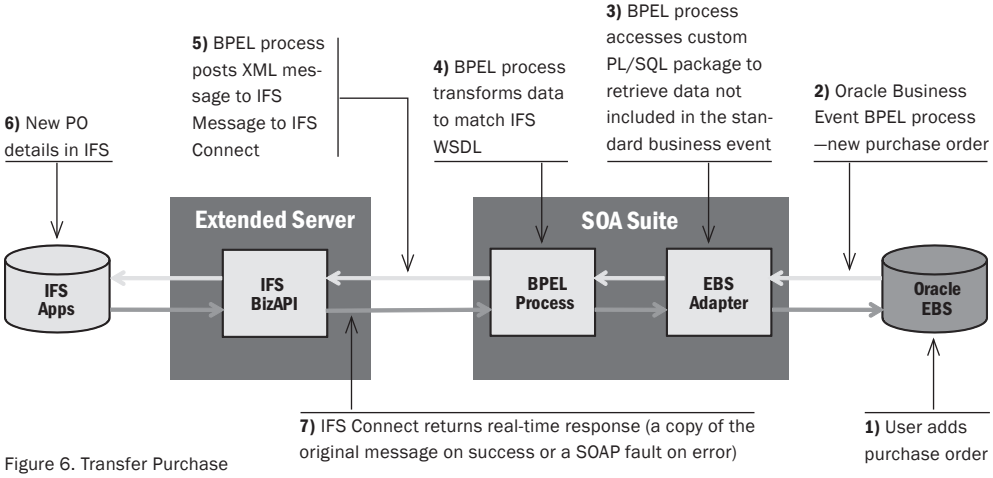


Figure 6. Transfer Purchase Order Details

To continue the process, the receipt of goods is made into the IFS solution, and the inventory balance is accordingly adjusted to match the received quantity. The spare part maintenance demand is satisfied and all the financial transactions and invoice matching are carried out and balances transferred as appropriate between solutions.

This simple scenario illustrates the integration capability of the IFS solution, where multiple scenarios can be supported to configure the integrated requirements of different business models. For example the purchase order may be required to only reside in the IFS solution with just accruals and receiving transactions being managed within the Oracle EBS—IFS Applications provides this capability and flexibility; with the implementation project team reviewing each process to agree the flow and master record owners and maintainers for each record of data.

Table 1—illustrates a number of examples of customer integrations of Oracle with IFS, and it can be seen that the most popular route is to integrate IFS with Oracle Financials:

COUNTRY	IFS APPLICATIONS	ORACLE
USA	Maintenance	Financials
USA	Distribution	Financials
USA	Manufacturing, Distribution & Financials	General Ledger
Poland	Distribution	Financials
Sweden	Distribution & Maintenance	Financials
Sweden	HR	Financials
Sweden	HR	Financials
France	Maintenance	Financials
Norway	Distribution & Maintenance	Financials
Norway	Distribution & Maintenance	Financials
South Africa	Retail & Distribution	Financials & Distribution
India	Distribution	Financials
China	Maintenance	Financials
China	Distribution & Maintenance	Financials
Malaysia	Distribution & Maintenance	Financials

Table 1. IFS Integration with Oracle EBS

To facilitate a more rapid integration process, IFS have built a series of financial integration points with Oracle EBS ('OAG' flag indicates these conform to the current OAGIS standards—currently 9.5); reflecting most popular requirements. This is often referred to as the 'IFS Financial Connector':

Inbound

- SYNC_COA (OAG) – Financial
- SYNC_EXCHNGRATE (OAG) – Financial
- SYNC_SUPPLIER (OAG) - Financial
- CONFIRM_BOD (OAG) – Financial
- RECEIVE_CODE_PART - Financial
- RECEIVE_CURRENCY_RATE - Financial
- RECEIVE_SUPPLIER – Financial
- CONFIRM_TRANSFER_SUPP_INV - Financial
- CONFIRM_TRANSFER_VOUCHER – Financial

Outbound

- POST_JOURNAL (OAG) - Financial
- LOAD_PAYABLE (OAG) – Financial
- TRANSFER_SUPPLIER_INVOICE - Financial
- TRANSFER_VOUCHER – Financial

EXAMPLE 2

IFS Maintenance Repair and Overhaul (MRO) Solution Integration with SAP

The scenario is as follows:

1. All work order activity and processes connected to the maintenance of equipment will be carried out in the IFS Application.
2. All financial and procurement functions will be in SAP.

A schematic of the processes, flows and integration touch points is shown in Figure 7.

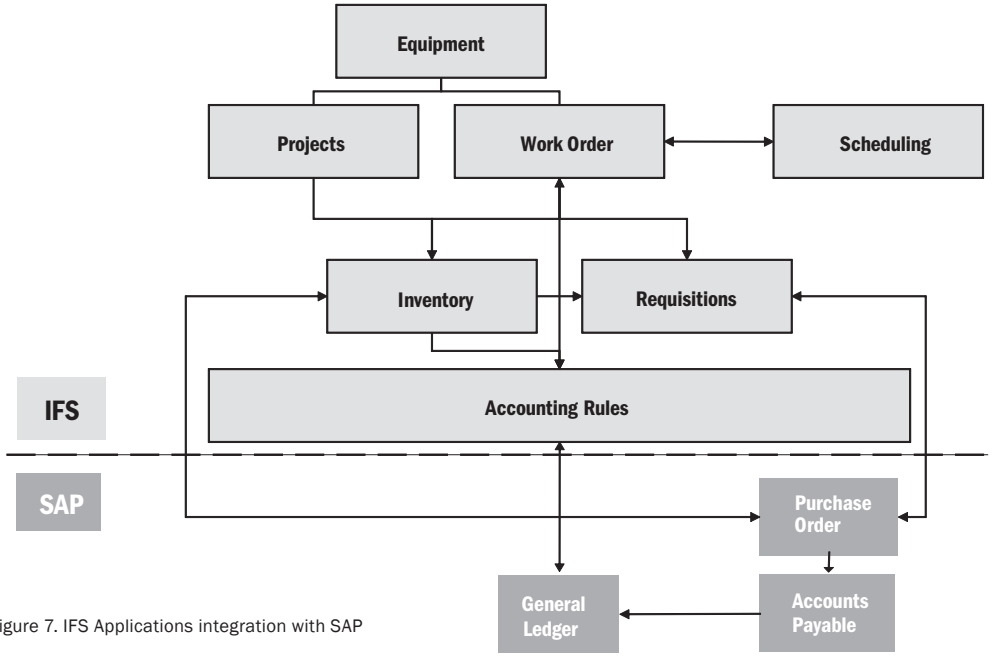


Figure 7. IFS Applications integration with SAP

The integration details are as follows:

Inventory Parts and Stock Levels

- IFS is master for the part-catalog (this is information about an item to indicate if the item has special controls such as lot or serial traceability).
- SAP is master for all Inventory Parts (the item details and information that is site specific such as minimum balance, order quantity etc).
- All changes in the Material Master in SAP are transferred to IFS and stored as an Inventory Part in IFS.
- When a new part is to be created, IFS sends a Material Master message containing part information (Part Number, Description, and Technical Data) to SAP.

IFS Purchase Requisitions (to SAP Material Reservation)

- A Purchase Requisition is connected to a Work Order.
- When a Material Requisition is released in IFS a message is sent to SAP to create a Material Reservation. The procurement and receiving process is handled within SAP as per normal.
- SAP sends back its reservation-id which is stored and displayed on the Material Requisition.
- When a Work Order is released in IFS a Material Requisition is automatically created based on the spare-part-list of the object.
- After release, no changes are allowed to the requisition in IFS.

Suppliers for Purchase Part (SAP Purchase Information Records)

- SAP retains all supplier master data.
- All changes to the suppliers are transferred from SAP to IFS.

Material transactions (receipts) on Work Orders

- All material costs connected to a Work Order will be transferred back to IFS and stored as a posting for the Work Order.

External costs on Work Orders

- All external costs (Invoices) connected to a Work Order will be transferred back to IFS and stored as a posting for the Work Order.

In summary the integration provides the business functional connections, as shown in Figure 8.

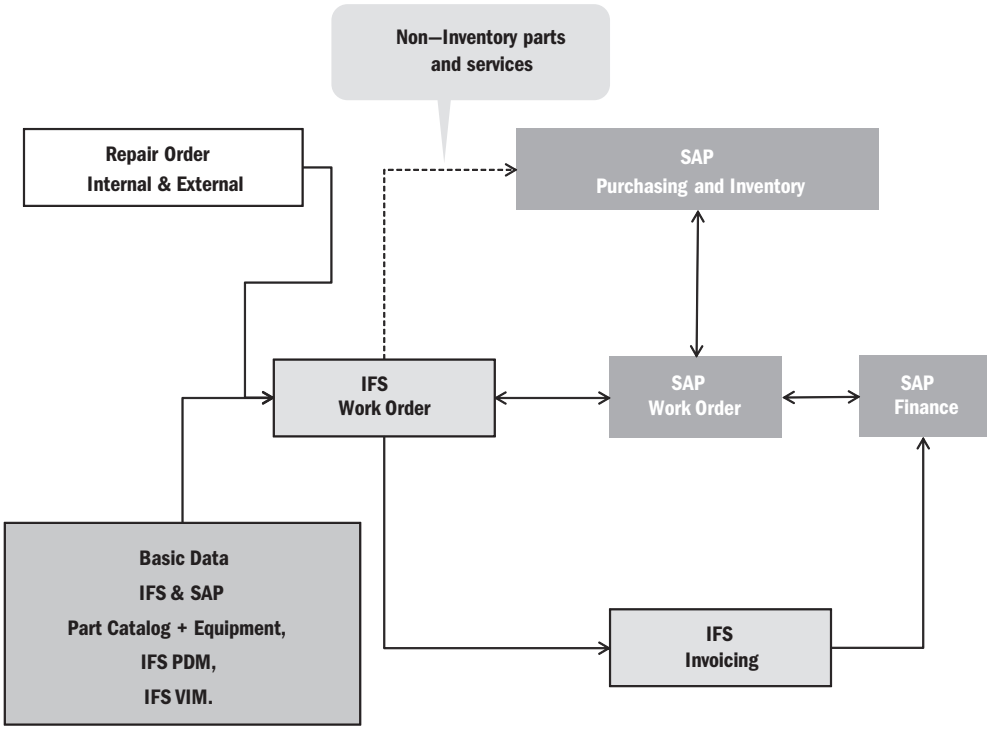


Figure 8. Business Functional Connections

Integration Methodology

To implement the integration between IFS Applications and SAP as described above, the following project methodology will be used:

Solution Blueprint

Following, or during, the map solution phase of the implementation, process flows will be reviewed and finalized. Final decisions about data interchange, data ownership, and integration points are verified.

Technical Solution Mapping

After the process maps are verified, a technical interface is developed and documented. This includes the messaging protocols and formats used between IFS Applications and SAP.

Interface Configuration

IFS Connect is configured to support the agreed upon interface points and message formats. A similar configuration process occurs within SAP (the specific steps are dependent on the SAP implementation, version and messaging middleware used).

Message Translation

Message translations (transformers) are developed to handle differences between IFS Applications and SAP message formats.

Transaction Verification

Each application is tested to verify the generation of messages as needed, message format is correct, message delivery is configured properly, message translation is correct, for each interface point.

Table 2—illustrates a number of examples of customer integrations of SAP with IFS Applications. It can be seen that the most popular route is to integrate IFS with SAP Financials, as is the case with Oracle EBS:

COUNTRY	IFS APPLICATIONS	SAP
Australia	IFS EAM	Purchasing, Inventory
Norway	IFS EAM	Financials
Norway	IFS EAM	General Ledger
Sweden	IFS Maintenance	Financials
Sweden	IFS Manufacturing, Distribution, Engineering	Financials
Sweden	IFS Manufacturing, Distribution, Engineering	Financials
Sweden	IFS Maintenance	Financials
Sweden	IFS Manufacturing, Distribution	Financials
Sweden	IFS Distribution, General Ledger, Accounting Rules	Financials
Sweden	IFS Maintenance	Financials
Sweden	IFS Maintenance	Financials
UK	IFS Distribution, Manufacturing, Project	Financials
UK	IFS Financials, Distribution	Financials
UK	IFS CTO, Manufacturing, Distribution, Financials	Sales Configurator and Financials

Table 2. IFS Integration with SAP

EXAMPLE 3

Supply Chain Management (SCM) integration of IFS using OAGIS with non-IFS ERP

Here we see the OAGIS framework being used, where ever possible, to determine the data standards that will be used for each element within a data record to consistently format all data that passes across the numerous business solutions including: IFS Applications and non-IFS ERP. OAGIS provides a common set of business messages in the form of Business Object Documents (BODs) and example business scenarios that provide example usages of the BODs. The business scenarios identify the business applications and components being integrated and the BODs that are used. Were OAGIS standards, do not fit the required data the User Area of OAGIS

is used to define interface specific data elements. This then enables a common set of data standards to be available for integrated across all solutions used.

The result is that data from different sources within the value chain is harmonized at the boundaries of each disparate solution.

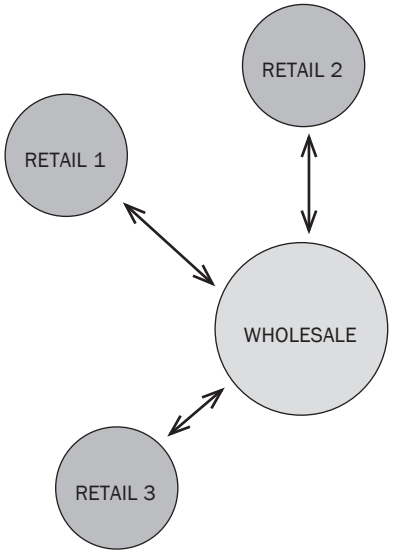


Figure 9. Retail & Wholesale relationship

The IFS solution operates in the maintenance/spares function and local inventory at each site is managed within what is referred to as "Retail SCM", with each maintenance site have its own Retain SCM—with consolidation and purchasing taking place in "Wholesale SCM", represented by Figure 9. Wholesale SCM also manages the creation of new items via engineering.

The types of transaction handled across the enterprise include the normal spare part requests in the form of 'requisitions' (including changes and deletes)—as well as acknowledgements of requisitions and deliveries against requisitions. Demand history and alternatives (approved engineering alternatives) are all managed as well as serial and lot traceability. Inventory is optimized by moving from Wholesale to Retail and between Retail sites as appropriate.

These three illustrations show the capabilities to integrate IFS Applications with the mainstream products Oracle EBS, SAP and other ERPs. IFS has many other examples of implementations involving other products from: Oracle, Infor (Baan), Agresso, CAD solutions and numerous home built software applications.

SECURITY

Business applications contain vast amounts of information that is critical to your business, and much of this is sensitive or secret. Protecting this information from unauthorized access, tampering, destruction and other malicious behavior remains imperative.

A decade or two ago, IT security was very much about controlling system access and backing up data to prevent information loss in the event of system failure or physical destruction such as fire. With the growth of local area networks, wide area networks and later the Internet, focus shifted toward network security. Organizations have since run a tight race against intruders to install firewalls, encryption, virus scanners, and other technologies to protect corporate networks and resources from penetration and sabotage.

As networks are becoming more secure, intruders turn their attention to the applications that run on them. Recent years have seen waves of e-mail viruses and numerous penetrations of well-known web sites. It should be expected that sooner or later similar attention will be paid to business applications. Authorities are also turning up the regulatory pressure on fraud prevention and accountability. Legislation such as the Sarbanes-Oxley Act (SOX) puts a spotlight on the ability of business applications to support segregation of duties, logging, and non-repudiation.

Where there are integration requirements from one business system to another, often using the Internet, then securing within both environments is essential. IFS Applications is built on the principle of "secure by design and secure by default" to prevent application vulnerabilities. Security is enforced at the architecture and framework levels, minimizing the risk of vulnerabilities being introduced through the oversight of individual developers. In addition the Foundation1 platform provides a rich set of security services and tools leveraged by IFS Applications and IFS' customers to implement appropriate security practices.

When it comes to network security, IFS firmly believes in the use of widespread and proven security solutions over home-made "security by obscurity" technology. IFS also believe that security concepts and the underlying application architecture must be easy to understand and consistently implemented to enable organizations to properly configure the right security model. In IFS Applications security is built in—not an afterthought.

Secure by Design and Secure by Default

To preempt security vulnerabilities, we stress again that IFS Applications is "secure by design and secure by default".

Any designs that might affect the security properties of IFS Applications are reviewed by security experts. Questionable designs are rejected in favor of designs whose security implications are easily understood and allow a strong security regime to be implemented. IFS Applications is also designed to prevent exploitation of vulnerabilities that are known to potentially exist in business applications. For example, IFS Applications has built-in protection against SQL injection, session theft, cross-site scripting, and other common vulnerabilities presented by the Open Web Application Security Project (OWASP) and others. "Secure by design" also means minimizing the damage should a system be penetrated. With this in mind all sensitive data in configuration files are encrypted, so if a web server is compromised an attacker will not find plain-text passwords or similar that would help further the attack.

Because not all organizations have the same security requirements, there is sometimes a tradeoff between the highest security, ease of use, and cost. Many aspects of IFS Applications can be configured with different implications for security and convenience. For such configurations, the more secure option is always default. This means that initially IFS Applications runs in a "clamped down" mode, and it is up to each organization to enable the additional features or configurations.

Authorization and Segregation of Duties

IFS Applications uses a role-based authorization system which allows clear segregation of duties, including administrative duties, between users. Depending on the duties to be performed, a user is assigned one or more permission sets; where each permission set details exactly what information and functionality may be viewed, updated, or used. Permission sets can also include other permission sets, making it possible to create rights structures of arbitrary depth.

Strong security while maintaining ease of use is achieved through server-enforced permissions with an adaptive user interface. As permissions are set on presentation objects such as forms and tabs, IFS Applications grants and revokes permissions on the related database objects such as views and tables. This assures that permissions are enforced even if users access the database directly using 3rd party tools. The user interfaces adapt to reflect what permissions the user has, hiding screens, fields, menu items, etc. that are not available to the user. This also helps prevent unprivileged users becoming aware of the complete set of data that is stored in the system.

A built-in history log function is available to track any modification or removal of data done by users. The log stores information about who made the change, when and where, and records old and new values. Together with security checkpoints that force users to re-authenticate themselves when "electronically signing" certain transactions, the history log is a powerful tool for enforcing accountability and non-repudiation.

Open and Flexible Network Security

The most important aspect of network security is the use of well-known technologies that have been proven in real-life applications over long periods of time. IFS Applications is built using established technologies with known security properties, including Oracle database, J2EE application servers, Apache and IIS web servers, Active Directory, LDAP, JAAS, HTTP, SSL, and PKI. Because IFS Applications relies on standards, it can be used with network level security solutions such as firewalls, proxies, and hardware security modules (HSM). De-militarized zone (DMZ), hardened perimeter defense, and other firewall strategies can all be used.

IFS Web Client and all integrations leverage JAAS for user authentication, which means that IFS Applications can utilize the login modules provided with the application server used (IBM WebSphere, Oracle Application Server, or JBoss Enterprise), as well as compatible 3rd party modules. In addition IFS also provides an optional login module for the Oracle database, allowing Oracle database user accounts to be used also for authentication of web users.

Between servers such as *IFS Connect* or *IFS Mobile Server* to the application server, the same unified security model is used as for normal users—each server needs to log on as with a user account present in the chosen directory (Active Directory, LDAP, Oracle). This provides effective protection against forged servers.

Security in Integration

Because all transaction data effectively goes into IFS Applications via the 'front door', all security lockdowns and access rigor that has been applied to the IFS solution is maintained. Likewise traffic going from IFS Applications into a third party solution will be subject to the security regime applied within that environment.

ABBREVIATIONS

LEGEND	
.NET	Microsoft development language
A2A	Application to Application
API	Application Programming Interface
B2B	Business to Business
BizAPI	The IFS Business Application Programming Interface
BOD	Business Object Documents
BPEL	Business Process Execution Language
COM	Component Object Model
COTS	Commercial Off the Shelf
DMZ	De-militarized Zone
EAI	Enterprise Application Integration
EBS	E Business Suite (Oracle)
EDI	Electronic Data Interchange
ESB	Enterprise Service Bus
HSM	Hardware Security Modules
Http	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol Secure
IFS	Industrial and Financial Systems
J2EE	Java 2 Enterprise Edition
JAAS	Java Authentication and Authorization Service
JDBC	Java Database Connectivity
LDAP	Lightweight (or Light) Directory Access Protocol
MQ	IBM WebSphere MQ ESB
MRO	Maintenance Repair and Overhaul
OAG	Open Application Group
OAGIS	Open Application Group Integration Specification
ODBC	Open Database Connectivity
OWASP	Open Web Application Security Project
PDA	Personal Digital Assistant
PDF	Portable Document Format (Adobe Acrobat)
PKI	Public Key Infrastructure
PL	Purchase Ledger

PO	Purchase Order
POP3	Post Office Protocol version 3 (internet email protocol)
SCM	Supply Chain Management
SMS	Short Message Service (cellular phone text messaging)
SMTP	Simple Mail Transfer Protocol
SOAP	Simple Object Access Protocol (XML protocol)
SOX	Sarbanes-Oxley Act
SQL	Structured Query Language
SSL	Secure Sockets Layer
UML	Unified Modeling Language
Web 2.0	Refers to web development and web design that facilitates interactive information sharing, interoperability, user-centered design and collaboration on the World Wide Web
WSDL	Web Services Description Language (XML document used to describe Web services)
XML	Extensible Markup Language
XSD	XML Schema Documentation
XSLT	XML Style-sheet language for transformers

ABOUT IFS

IFS is a public company (OMX STO: IFS) founded in 1983 that develops, supplies, and implements IFS Applications™, a component-based extended ERP suite built on SOA technology. IFS focuses on agile businesses where any of four core processes are strategic: service & asset management, manufacturing, supply chain and projects. The company has 2,000 customers and is present in more than 50 countries with 2,700 employees in total. Net revenue in 2009 was SKr 2.6 billion.

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