

INTELLICYBER

Intellicyber Development Exchange
Version 4



White Paper

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Introduction

Welcome to Intellicyber's Development Exchange platform, version 4.

IDX4 is a visionary concept in the organization, management and development of data management tools.

Quite simply put, it allows the co-ordination of input from many levels within an organization to create, develop and manage the data through an organization.

What is Intellicyber Development Exchange?

IDX4 is a flexible set of tools that allow companies to manage, develop and deploy their own integration solutions. It controls entire processes from concept through to technical coding, allowing business developers, consultants and programmers to work together in the same environment.

As an example, this means that a consultant can create a process flow for a business solution that deals with many different systems, but uses logic and results through a decision tree.

A developer can then use these flows to create high level logic design and document the requirements for the programmers, who would then create the code required.

The different sections of IDX4 allow each of these roles to have a valuable place in the development and creation of the integration.

The primary features of this environment relate to **easy to use interface**, something that doesn't scare away the consultants or is too simple for the programmers, but designed to foster a collaborative development environment. It contains a **repository of all project documents**, including e-mails and tasks in a central environment, synchronized with Microsoft Project.

IDX4 is a Windows development environment, which can be deployed in either a Windows or UNIX environment. Code generated can be either in VB or Java.

IDX4 breaks down into the following components:

- The IDX Development Environment.
- The IDX Deployment Environment
- IDX Runtime, IDX Manager and Clients

A separate version of IDX4 has been developed called IDX MHE which is for material handling equipment and automated systems, and is discussed separately later.

What IDX4 Makes possible

Become self-sufficient with your supply chain integration requirements

Automate current KPI, inventory, and order status reporting



Enable true exception management for WMS, Transportation, Accounts, etc...

Easily publish supply chain event management information from multiple sources

Differentiate your services from competition with customer tailored macros using the powerful imbedded development environment

The IDX4 Development Environment

This is the main component of IDX that generates and builds each of the modules required for deployment into the real environment.

It is an integrated development environment which brings together all of the essential tools needed when creating processes and interfaces. It has a built in report writer, alerting writing tool, business process designer, document, task and e-mail repositories.

Containing native source code control for the projects eliminates redundancies, duplicates, multiple versions of documents, and permission levels for management.

IDX4 will assist with managing of projects, servers and documents

Before we delve into some details of the functions of the Development exchange, it is important to understand some of the concepts that underline its function.

PROJECT: A collection of Processes

PROCESS: A Process is set of functions and logic that will combine to form a finished method. It typically would contain interfaces, logic, and possible alerts for errors.

SUB-PROCESS: A Sub-process is just the same as a normal process, but is called from a primary process.

INTERFACE: A combination of touchpoint mapping and logic formatted through a API, or mapper from source to destination.

ALERT: The ability to derive a result from a function. An Alert can be re-active (i.e. interface fails, etc) or pro-active (daily stock update report sent to clients). Theses alerts are published through e-mails, file, html, etc

IDX4 is broken into the following main functions, each one accessed through the Development Exchange environment.



The Project Explorer

In the enterprise will be machines registered as IDX4 Project Servers. These are the machines that host and control the development environments. These servers will control which document, and projects are currently being used by programmers, developers or analysts and will ensure that only the current versions are used.

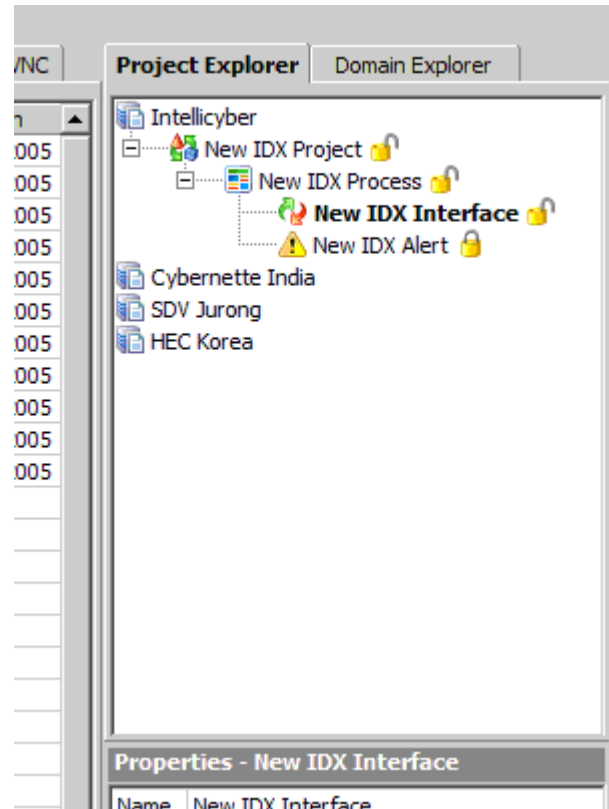
The project explorer displays each of these registered machines, with the ability to drill through a server and display each of the projects currently available from that server. Each separate Project will have processes associated with it. (or you can create new ones, of course). These processes will contain main different items depending of the type of process being performed.

A simple process might be to take a flat file and insert it into a Warehouse Management system as a Customer Order. This process might only have one item called SO Import.

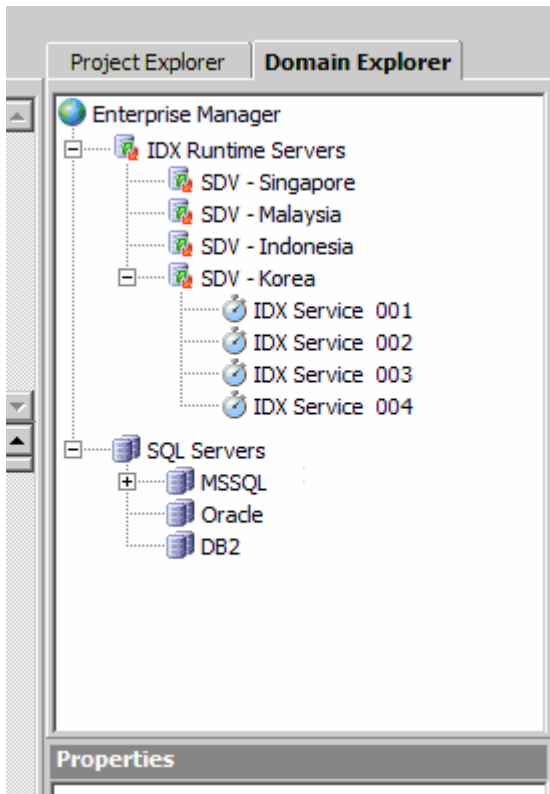
More complex processes can be created to do order sourcing. That is to take this simple file for a Customer Order, but do many things before we decide WHICH warehouse will send the order (or maybe multiple facilities!). In this case, the process itself may have multiple interfaces to different systems to check stock levels, logic around how to source, what criteria to use, and if they can split orders to multiple warehouses, combine the orders with existing orders... etc. It may also have an alert, sending an e-mail warning automatically back to the customer to tell them that the order is now coming in two shipment, or that it will take an extra XX days due to longer delivery times, etc.

The whole point, is that the process is a combination of interface, logic and reporting. What is needed will depend on what is the business need behind the process.

This will be discussed in more detail in the Process Manager where we can easily design and manage this logic.



The Domain Explorer



The Domain explorer is used to view and use the different servers available in the network.

Registered machines can be managed here for a variety of purposes. The two main purposes will be for deployment and development. For Deployment, the Domain Explorer will allow you to monitor and manage the IDX4 runtime services, which will control what process or interface is running and where. This will be discussed in the runtime component.

The development usage is to register databases and make them available for queries and monitoring. This will be discussed in the Query Analyzer function shortly.



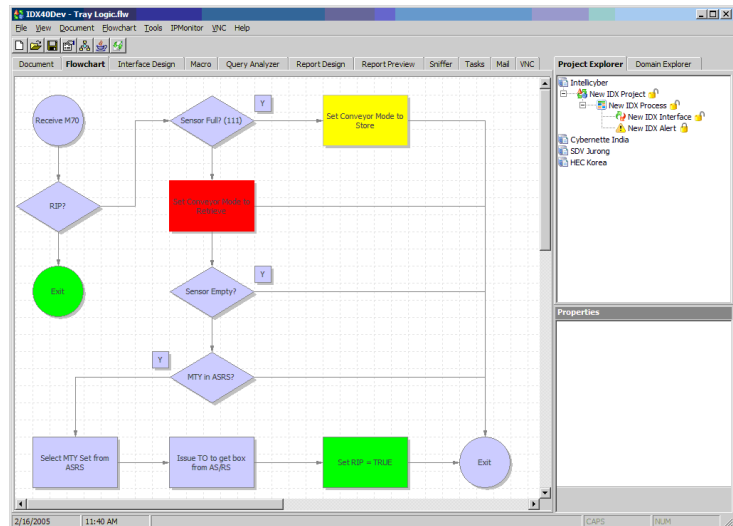
The Process Builder

The process builder is an incredibly important function in IDX4. It allows from the ground up the design and building of processes. The concept is simple, the power is enormous.

As can be seen in the diagram, the process builder is a flow chart designer with which it is possible to create long running processes with many steps.

Each step can be logic, interface, alert, sub-process (i.e. calling another process). Each flow object whatever its function is related to code behind the object. By double clicking on the object you can bring up the

development environment and do coding (as described in the Interface section). This coding could be very simple logic (i.e. if x=1 then do Y), or something much more complex, such as calling may different sub processes to run themselves before any further steps are taken.



If you want to associate an interface, alert or sub process to a flow object, you can just drag it across from the explorer window. In this way you can create enormously complex and powerful processes quickly and efficiently.

More often through, the process will be created first, with some notes and other points first. This may be done by the consultant. Developers can take these process flows and create the logic that belongs to each step on the diagram.

By creating and managing the process flow like this, you are able to create many long running processes and have many steps running in parallel. Sub process may report back their status to primary processes, before continuing on, sub processes may link to their own flow charts, each flow object or process can be running on separate machines all across the network, with the primary process monitoring and managing the results as they return.

When the Process Builder tab is open and the code is running (or being stepped through/ debugged) the flow objects themselves will show which object is currently running, and the resultant path can be watched as it progresses through the logic. In this way, debugging and walking through a process to find where it failed, or the reason for the result is extremely simple.



The Interface Developer

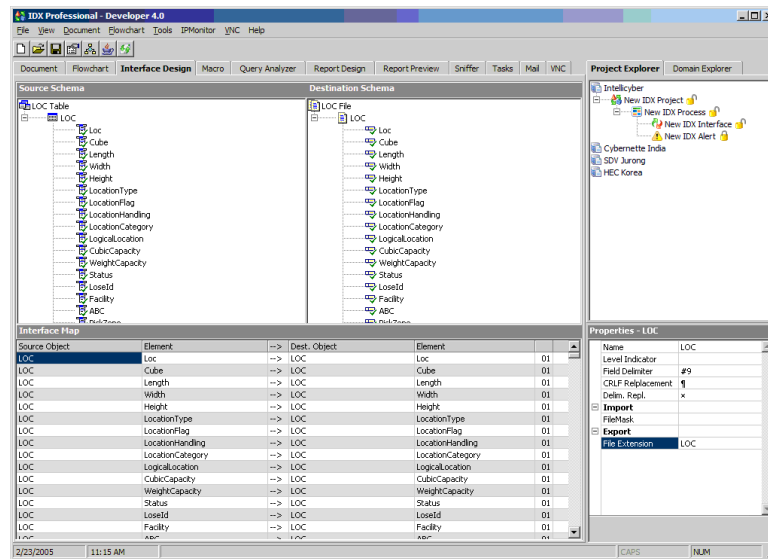
The interface developer is the tool used to create and develop code for deployment. As discussed in the process builder, interfaces and alerts are created with code and applied to a process to run on IDX servers.

There are two main parts to the developer itself, the mapper and the integrated development environment.

The mapping tool allows for automatically generated code to be created by simply selecting the types of source and destination schemas to be used, and

then dragging each column over to its desired location. Of course, this can be done all manually too, but the mapper takes 90% of the grunt work out.

There are many different formats available to receive and send data, flat file, XML, direct DB (DB-DB), Remote Function Calls (RFC), EDI (ANSI /



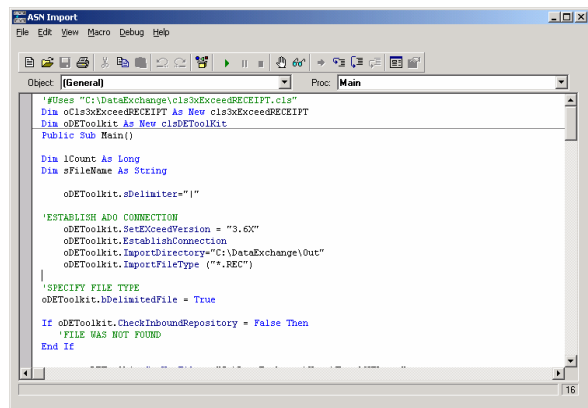
EDIFACT).

On top of this IDX4 has adaptors for many different systems such as SAP, SSA WM (4000 and 1000 aka Exceed), JDE, plus more. These adaptors make connecting to these systems much easier, automatically generating the code required.

IDX Interface Developer makes generating the mapping and adaptor code, but still allows logic and other

additional code to be added in the Integrated Development Environment (IDE). This code is stored as 'Custom Code' which is how the source control can keep up to date with any changes made to the code. The custom code allows developers to write or amend any code to the macro. In this way, if the mapping schemas change, it is not necessary to change any of the code, as your changes are stored separately.

The Development environment also has all the tools needed to reference external COM objects, debug, test and develop the code.



The Interface developer is also used to create Alerts. These are warning for anything that can be imagined. For any business problem that has a formula



applied to it, an alert can be generated. The may be for Supply Chain requirements, such as Low Stock, or delayed orders, or it may be for KPI's and high level management, such as Daily Receipt summaries, Daily balances, Location utilization, etc.

Alerts can also be used to track or manage the interfaces themselves, sending off alerts and notifications for failures, or perhaps where some case fails (or succeeds!)

Don't forget, Alerts can be built into the process builder at any point in the logic.

Publishing Alerts can be done in many ways. The most typical would be through the report creator (discussed later) and sent via an e-mail (smtp server) or the creation of an html file for a web page, it is even possible to send the alert through an SMS (SMS Server needed)

Query Analyzer

The Query Analyzer is included to simplify the process of making and creating SQL queries. Typically when dealing with multiple systems in different environments (i.e. MSSQL and Oracle), you would need two applications open to test and write SQL queries to test data results, etc. This also makes a difference as each different type of DB has different syntax and style, and remembering which is which, can sometimes be a bit difficult.

The Query Analyzer (QA) is designed to smooth this process. It can connect to any of the databases (seen earlier in the Domain Explorer) from either a MSSQL, Oracle or DB2 DB environment.

A single SQL statement can be run on any of these DB's. There is no need to connect to different DB's and write slightly different SQL statements, the QA will do it all for you.

Of course you can save queries and use them again later, but the biggest time saver is its integration with the Interface Developer Environment. When stepping and debugging your code in the IDE, each SQL code that is send to the DB, will be pasted to the window here. You can save it, if needed, see the entire results, etc automatically. This makes checking the SQL code extremely simple. It also means, that when stepping through your code in the IDE, all of the variables assigned to the SQL query will be here, so you can check each of them as well (no more cutting and pasting).

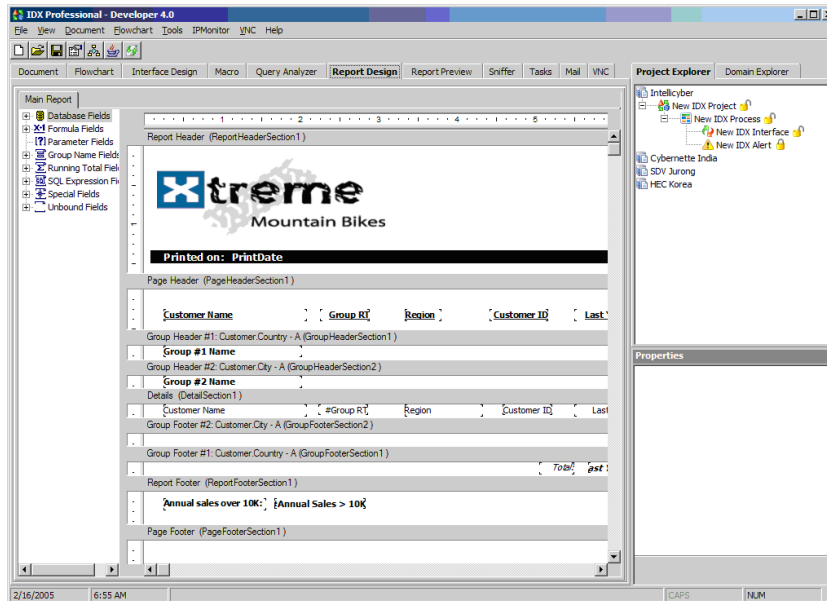
The screenshot shows the Query Analyzer window in the IDX Professional - Developer 4.0 IDE. The window title is "IDX Professional - Developer 4.0" and it has a menu bar with "File", "View", "Document", "Flowchart", "Tools", "IPMonitor", and "UNC", and a toolbar. The main area is divided into two panes. The top pane contains a SQL query: `SELECT O.OrderKey, O.ExternOrderKey, O.OrderDate, O.ConsigneeKey, O.C_Company, O.BuyerPO, O.IntermodalVehicle, O.Route, O.TransMethod, 'EOS' FROM ORDERS O , IDXTTRANS T WHERE T.TransType = 'MF94GIN' and O.Status = '9' and O.ExternOrderKey = T.Key1 and T.Status = '9' and consigneekey like ('0%')`. The bottom pane displays the results of the query in a table with columns: OrderKey, ExternOrderKey, OrderDate, ConsigneeKey, C_Company, and BuyerPO. The table contains 23 rows of data. The status bar at the bottom indicates "2/25/2005 9:57 AM 2536 Records of 2536".

OrderKey	ExternOrderKey	OrderDate	ConsigneeKey	C_Company	BuyerPO
1	000001937	18577 5/19/2003	000110000	DSC LOGISTICS - ALLENTOWN	
2	000001956	18583 5/12/2003	000110000	DSC LOGISTICS - ALLENTOWN	
3	000001957	18584 5/13/2003	000190000	DSC LOGISTICS	
4	000001972	18586 5/12/2003	000110000	DSC LOGISTICS - ALLENTOWN	
5	000001997	18595 5/13/2003	000190000	DSC LOGISTICS	
6	000001998	18596 5/14/2003	000170000	DSC LOGISTICS - DALLAS	
7	000002020	18600 5/14/2003	000140000	SERVICE CRAFT, LLC	
8	000002032	18603 5/14/2003	000140000	SERVICE CRAFT, LLC	
9	000002033	18604 5/16/2003	000110000	DSC LOGISTICS - ALLENTOWN	
10	000002037	18605 5/19/2003	000200000	WORLEY WAREHOUSING, INC.	
11	000002038	18606 5/15/2003	000190000	DSC LOGISTICS	
12	000002039	18607 5/19/2003	000140000	SERVICE CRAFT, LLC	
13	000002061	18619 5/19/2003	000110000	DSC LOGISTICS - ALLENTOWN	
14	000002079	18624 5/21/2003	000190000	DSC LOGISTICS	
15	000002080	18625 5/22/2003	000190000	DSC LOGISTICS	
16	000002081	18626 5/27/2003	000190000	DSC LOGISTICS	
17	000002103	18631 5/28/2003	000110000	DSC LOGISTICS - ALLENTOWN	
18	000002104	18632 5/21/2003	000140000	SERVICE CRAFT, LLC	
19	000002105	18633 6/3/2003	000140000	SERVICE CRAFT, LLC	
20	000002106	18634 5/21/2003	000190000	DSC LOGISTICS	
21	000002145	18638 5/27/2003	000110000	DSC LOGISTICS - ALLENTOWN	
22	000002146	18639 5/28/2003	000110000	DSC LOGISTICS - ALLENTOWN	
23	000002147	18640 6/3/2003	000190000	DSC LOGISTICS	



The Report Designer

IDX4 has its own report writer/designer built in. This allows users to create reports based on any factors or criteria needed. Due to the IDX4 environment, any of the data sources used in the Domain Explorer can be used to query,



this means multiple systems with multiple queries can be combined to create a single report.

The IDE script environment is used to create the logic for the data used, so any logic or mapping required can easily be positioned for the report. The GUI

designer allows for user to position and layout this data as they wish. Logos, subtotals, document information, document versions can all be added.

These documents can be previewed and tested and then deployed.

We spoke about deployment a little earlier when discussing Alerts. These same mechanisms are used to send these documents. With schedules setup documents can be set up to be pushed out at intervals (i.e. every morning at 9am) or when an action/event occurs (then it becomes an Alert)

These documents can be distributed to groups of people, or directly to individuals, it is entirely up to you!



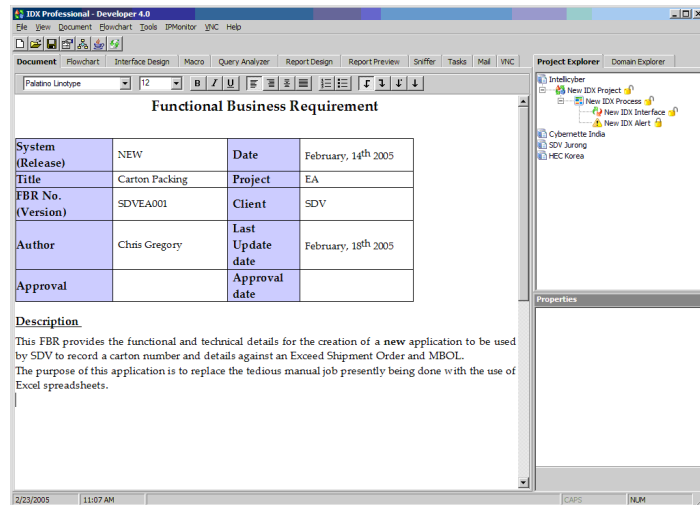
The Document Manager

When creating and managing projects and processes, often many documents are created that 'belong' to the project. Often these are floating around on many different hard drives, and hopefully everyone has access to them.

The IDX4 document manager is a document repository for storing all related project document.

This means everything is available in a single place to anyone who needs it (with permission of course). No more e-mailing document back and forth with different versions getting intertwined. With the IDX4 source control managing people working on particular documents, it is now a simple procedure to see who has made changes, and who is currently working on documents.

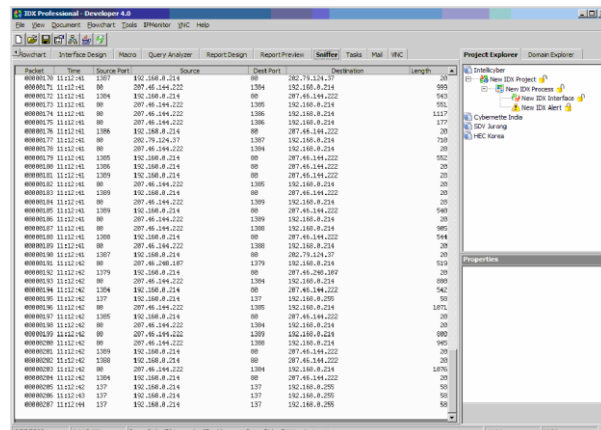
The Document Manager also has a WordPad built in, specifically for editing Word documents, or even creating notes, new documents in the environment itself.



The Network IP Monitor

The IDX4 Network IP Monitor is a useful tool when designing and developing interfaces. It allows users to 'see' what is happening on the network. More specifically, testing the latency of information moving through the network. In this way it is possible to test and monitor the time taken when running SQL statements to DB servers. The IP Monitor will look at the time the SQL query tasks on the DB machine, as well as the time taken moving the query and results back and forth. This is an extremely important tool when moving large

quantities of data through various data environments, as developers can check where bottlenecks are occurring, check to ensure that code is running efficiently, determine information packet transfer, ensure bandwidth resources are not being stretch, and many many more applications.





Task Management

The IDX4 Task Management tab is used to maintain and manage project tasks. Project managers can create tasks, assign tasks to workers, and monitor completion of these tasks.

Description	Status	Assigned To	Completed On	Added By	Added On
Mismatch in Receipt Confirmation quantities	In-Process	SA		KD	01-Feb-2005
SQL Server timeouts when connection is lost	Not Started	MKP		PDS	01-Feb-2005
Orphan ReceiptDetails upon header delete	Not Started	PDS		SA	02-Feb-2005
Get Carton UI FBR signed-off	In-Process	CJG		CJG	10-Feb-2005
Get clarification on Shipment Confirmation format	In-Process	KD		KD	10-Feb-2005
Shipment Receipt macro internal test	In-Process	KXD		KD	03-Feb-2005
Shipment Receipt macro volume test	Not Started	ALP		KD	03-Feb-2005
Carton UI Useability test	Not Started	KH		ALP	12-Feb-2005
Automatically mount shared drives upon restart	Not Started	ALP		ALP	04-Feb-2005
Log SQL connection errors instead of popups	Not Started	PDS		PDS	04-Feb-2005
Match Trailer record with actual record count	Not Started	SXA		KD	13-Feb-2005

All users who login can now see what jobs they have to do, log out the code, project or document to work on them. Business analysts, managers or

consultants can login to see the status of the project, what has happened, and what is left to complete.

E-Mail Repository

One of the biggest headaches facing project managers, and consultants today is email. Specifically keeping track of all the happenings and information passing through this channel. Typically the main development user, and the consultant will discuss back and forth a problem/solution, then the developers will do the same between members of their team. Any changes then need to come back up the chain and hopefully everyone is copied in correctly.

Date	Sender	Subject
Wed, 23 Feb 2005 09:42:04 +0800	Ashok Pereira	FW: Interfaces Development Status
Wed, 23 Feb 2005 09:22:45 +0800	Chris Gregory	RE: SDVSINEA / Phase I confirmation - Carton UI FBR
Tue, 22 Feb 2005 21:48:46 +0800	Albert Tan / SDV Asia Pacific	RE: Questions for Order Import interface (EA project)
Tue, 22 Feb 2005 21:38:51 +0800	Albert Tan / SDV Asia Pacific	RE: Questions for Order Import interface (EA project)
Tue, 22 Feb 2005 03:45:22 -0800	Kanchana Dejjuvaves	Fwd: Queries and Time Spent on SDV_EA Project - 22-02-2005
Mon, 21 Feb 2005 18:06:54 +0800	Ashok Pereira	RE: SDVSINEA / Phase I confirmation - Carton UI FBR - Reply to Chri
Mon, 21 Feb 2005 18:07:46 +0800	Ashok Pereira	RE: SDVSINEA / Phase I confirmation - Carton UI FBR - Send FBR for
Mon, 21 Feb 2005 16:54:06 +0700	Kanchana Dejjuvaves	RE: Questions for Order Import interface (EA project)
Mon, 21 Feb 2005 12:25:04 +0700	Kanchana Dejjuvaves	FW: Questions for Order Import interface (EA project)
Mon, 21 Feb 2005 09:27:35 +0800	Chris Gregory	FW: SDVSINEA / Phase I confirmation - Carton UI FBR
Fri, 18 Feb 2005 18:14:20 +0700	Kanchana Dejjuvaves	RE: SDVSINEA / Phase I confirmation
Fri, 18 Feb 2005 09:56:52 +0700	Kanchana Dejjuvaves	FW: Shipment Acknowledgement export for EA project -->RESEND
Thu, 17 Feb 2005 19:56:41 +0700	Kanchana Dejjuvaves	Shipment Acknowledgement export for EA project
Thu, 17 Feb 2005 20:10:58 +0800	Ashok Pereira	FW: SDVSINEA / Phase I confirmation - Carton UI FBR
Thu, 17 Feb 2005 17:45:23 +0800	Patrick Escalle	RE: SDVSINEA / Phase I confirmation
Thu, 17 Feb 2005 14:00:29 +0800	Ashok Pereira	RE: Shipment Confirmation for EA project
Thu, 17 Feb 2005 11:51:32 +0800	Ashok Pereira	FW: SDV SIN EA / Phase I confirmation - Quotation softcopy
Thu, 17 Feb 2005 11:11:59 +0800	Ashok Pereira	RE: SDV SIN EA / Phase I confirmation - Quotation softcopy

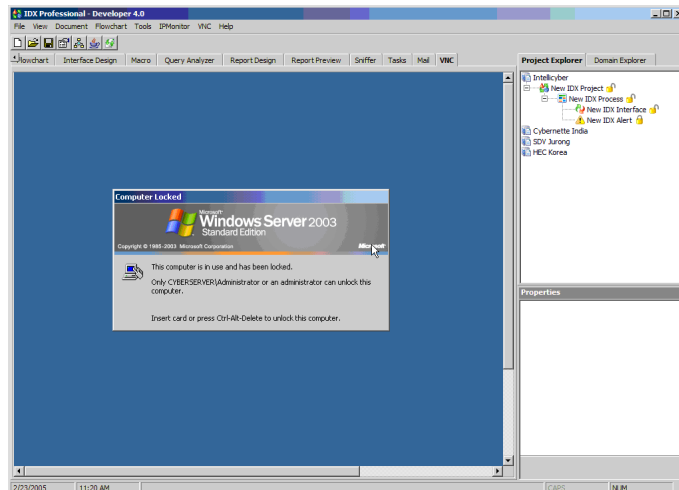
If an employee changes positions, or a new member comes on board, then chances are a lot of this information will be missed or not passed on to them. Many wasted hours will ensue as the new member needs to catch up and find as much information as they can. IDX4 has the solution for this: The IDX4 e-mail repository. Similar to the concept of the document manager, the e-mail repository is used to contain all e-mail relevant to a project in a single place. By designating an e-mail address for a particular project and ensuring all correspondence copies this address in, the e-mail repository will then house ALL e-mail for the project together.

This has many added benefits, as parties who may not normally be copied onto these mails, can peruse them as required. Any attachments or documents are stored there and the trail is quite clear.



VNC Viewer

Connecting to many environments and servers is often done now through thin client (VNC). In this way client log into the server, and act as though they were sitting in front of the machine itself. This makes setting up, configuring, testing and supporting those systems very easy. Commonly though in a large development environment, there are quite a few of these systems to connect to. To simplify this, IDX4 has an inbuilt VCN client. So from a simple place you can access all of the servers running VNC servers available from the domain explorer. As well as making them available, IDX4 also stored all of the properties for connecting to these machines, so that jumping back and forth between servers is a simple and easy task.



The IDX4 Development Environment

Beyond developing the processes and designing all the interfaces, alerts, reports, etc comes the time to deploy.

IDX4 Server (and Services)

As seen earlier in the Project Explorer and Domain explorer, we already have each of the machines setup there where we are going to deploy. Each of their connection settings are loaded and set and we can monitor from the IDX4 environment what is happening where.

The concept is that we have servers out there that are running the IDX Service. Each server may be running multiple instances of the Service, which is really a matter of the size of the machine, and how many concurrent processes we want to run on each machine.

There is an IDX4 Server which stores all the settings and other information needed by the project. This server knows each of the services, where they are and if they are available.

A job will be triggered, either through a schedule, or directly triggered by the application in real time. This trigger is entirely application specific and careful thought must be given to methods of triggering.

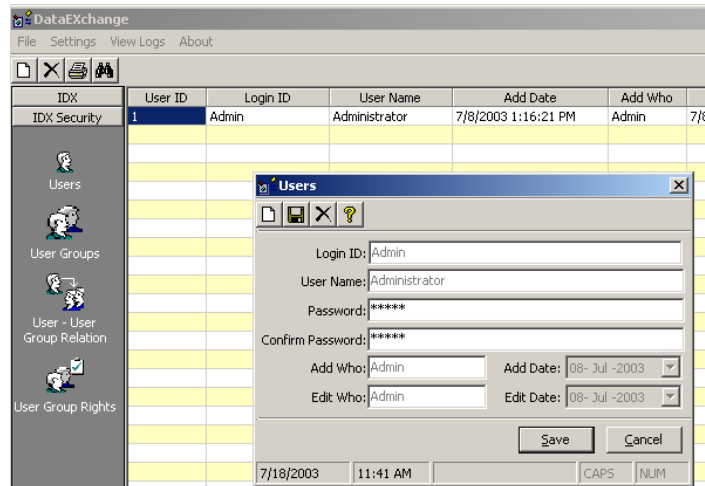
The IDX Server will then give the job to the most appropriate service, depending on the criteria and rules created. In this case multiple instances of the same job could be running on separate machines concurrently. This links



back to the process builder, in which we started setting up long running concurrent and orchestrated processes.

IDX4 Manager / Clients

In the deployed environment, it is typical for many users not to use the development environment to monitor and manage the running of the jobs. The IDX Manager is designed for these users to login and view error logs, any other messages, maintain user permissions, security settings, run ad-hoc jobs (i.e. unscheduled SKU imports), plus other sim



The Intellicyber Client Services (IDX ICS)

IDX ICS product is designed to access some of these features via the internet and can be used to schedule run and view interfaces, reports and alerts externally.

About Intellicyber Ltd

Intellicyber Ltd has been developing software products designed to address supply chain data integration needs since 1999. Intellicyber combines supply chain domain expertise and technical innovation delivering superior solutions to customers around the world. The Company operates a network of offices and partner locations around the world. For more information, please contact one of the Intellicyber regional headquarter locations below.

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