Black Box Environment

Over 323.839 lines or source code
Over 1.000 unit files
Debug lifecycle since 1995

Overview

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BLACKBOX SYSTEM

BlackBox Environment is a system, applied to industrial sector, born in molding factories.
It's a collection of module, hardware, technology and way to use, in order to manage complete cycle production and plant.
It concerns to control and to register operation about management, from the explosion of job, to its production, until expedition to client.

BlackBox Environment consists of:

A) Database environment typically firebird 1.5 SQL server for stored data.
B) IPC server, a real time engine data communication, for industrial data acquisition and job task.
    IPC server is provided with drivers for specifically devices.
    IPC correspond to Industrial Process Communication.
C) Modules for different applications: every module presents different level of complexity.

The BlackBox Environment (BBE) corner stone is IPC server, that provides:
- real time engine;
- drivers technologies;
- multi-thread process;
- client server access data;
- event driven;
- DCOM model with in process and out of process;
- types library for external application;
- four handlers communication
    1. communication service,
    2. job service,
    3. spc service,
    4. stored service.

<u>Others modules complete BlackBox Environment</u>, for example:

--- Data analysis.
--- Management order from clients.
--- Plant supervision.
--- Programming production and scheduling on real time.
--- Statistical process control.
--- Statistical manufacture control and declaration conformity.

--- Worker management;
--- Labeling and management bare code on line with production;

--- Store raw materials and manufacture.
--- Plants control by Internet.
--- Mold management.
--- Groupware.
--- Cross TypeCast.
Integration of all these is powerful.
Data run on line thought module, thank to exclusive distribution event by IPC Loader gateway.

Technology BlacKBox Environment (BBE)

BlackBox Environment is a full, yet lightweight, with minimal configuration administration needs.
It's easily scalable from single-user up to company-wide enterprise purposes.
A single IPC Server (main module BBE) can handle multiple independent drivers, each with multiple TTY connections.
The history of BBE goes back as far as 1995, so in total there are close to 9 years of experience and testing in the product.
The BBE has been developed completely using Borland Delphi.
(http://www.borland.com/delphi_net/)

The code is projected according to OOP technology, RAD with scalable database support; it permits programming DCOM and CORBA.
The database environment is typically a firebird 1.5 SQL server for stored data.

Because of distributed data on real time, BBE works with DCOM model with in process and out of process; we use different ways to send data to clients, from DCOM to TCP-IP, to database connection. We have created a separated module, which manages communications on real time with different client: it's called IPC Loader.
We use model "Client Server" to recorder data on database; sometimes we use multi tier system.

DCOM Technology
The construction of BBE according to distributed COM (component object model) consents some vantage:

1. IPC Server function can be called from other programs. Also the client, if he is capable, can personalize BlackBox with some standard language (for example, Visual Basic). It consents to maintain our resource concentrated on BBE, without losing time in particular module personalized. The core of BBE is always the same, and it never touched by code personalized; also code personalized are maintain with BBE update.
2. Drivers, or link interface with industrial handlers, are managed on distributed and multi-thread.
   Interfaces implement asynchronous and synchronous communication systems; interfaces are their "intelligence"
   and auto polling; they can be executed on remote computers.
   These last characteristic permits to distribute big works on more Pc.
3. Our modules development is simplify, because we can realize more separated project, using binary components. The technique is like "Active X" by Microsoft.
4. DCOM supports Internet link, so it's possible, for example, monitoring production from remote station.

http://www.firebirdsql.it/
http://www.ibphoenix.com/
http://www.borland.com/interbase/

O.S.

Database server	WIN NT 4.0 workstation
	WIN 2000 Professional
	WIN XP Professional
	WIN NT 4.0 Server
	WIN 2000 Server
	WIN 2003 Server
	Linux
	Solaris
	Free BSD
	HP-UX
	AIX
IPC Server	WIN NT 4.0 Work,
(main module BBE)	Win 2000 Professional
Other module BBE	WIN NT 4.0,
	Win 2000 Professional,
	Win XP professional,
	Win 95,
	Win 98,
	Win 98 second Edition

Some modules can be executed on Linux ambient.

List modules BlackBox Environment (BBE)

IPC Server: main module BBE

Icon	Module Name	Description
	IPC Server	It's the core of BBE. It has a real time engine, and it receives and sends information using drivers technologies and multi-thread process. So every module, every machinery (by interface), every one talk to IPC Server; IPC server responds to different clients, by event driven and using DCOM technology. Specifically IPC monitoring plants, present the basil information about production and programming production; it presents also control charts and normal distribution for processes parameter like temperature, injection time....

List modules/expansions about IPC Server

Expansion of IPC	Icon	Description
IPC Supervisor		Real time supervisor
Videoimpianto		Screen Map
IPC Programming		Programming production
IPC Talk		Talk with human voice about principal events
IPC SMS		Mobile phone communication with SMS technology
IPC Loader		Gateway for modules of BlackBox (BB environments)
IPC View		Simple view of work in progress (WIP)
EnterPoint		Enter Point for manual processing, without automatically data entry.

Base drivers of IPC Server

| Drivers	Description
PFMA1010.exe	Driver for Microset A1010 device
Int15.exe	Driver for Sandretto mold machine "serie 7"
Bitbus.exe	Driver for Sandretto mold machine (bitbus)
BB56driver.exe	Driver for tty BB56
BB57driver.exe	Driver for BB57 device
BB IntManual	Driver for manual data entry

Others main module BBE

Module	Nome	Brave Description
	Plan View	Programming production and scheduling. Automatic calculation about beginning and end of order. Automatic calculation about change mold surface, change version (mold) surface and change color. Gantt visualizes information.
	Analysis	Stored data analysis. Product traceable. Production study about job, machinery, client, manufacture. Analysis about manufacturing defect, machinery parameters, stopped machinery time. Efficiency analysis. It includes laboratory for research, report and e graphics.
	Pulsar	Measure sampling. Control charts X, X-R, X-S, frequency histogram, normal distribution, evaluation capability by Cp, Cpk. Production film. Conformity declaration printed on line.

	IPC Label	Label print on line, templates.
	IPC EasyLabel	Easily label print on line.

	IPC TEA	Clients job management Clients order management. Store management.
	IPC Clean	To maintain clean and efficient database. To create historical database, consult able off line.
	Plan MP	Raw materials management
	IPC Mold	Mold handler

Tool & base applications

	IPC data	Data Handler
	BB UserAdmin	Administrative tool for set user rights.
	IPC Configurator	System configuration