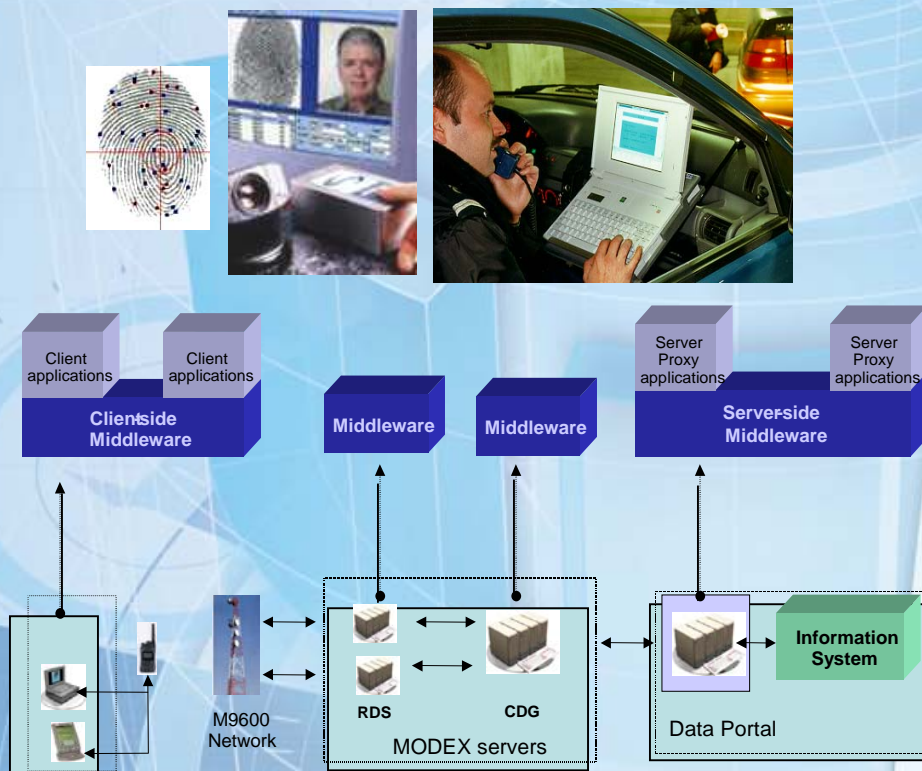


MODEX

Middleware Oriented Data EXchanges



MODEX is a software solution for the management of data exchanges over M9600 networks. Based on a client/server architecture, it can manage:

- A mobile User Data Terminal connected to M9600/M2600 radio terminal
- A data portal connected to an information system (databases, web portal, applications server)

User's benefits:

- ✓ Simplifies development of data applications:
 - High level Java API, decreasing duration of development
 - Development toolkit allowing development and application tests in a complete stand-alone
 - Data application fully independent of M9600 characteristics: no expertise required on radio resources management, neither TETRAPOL knowledge
 - Data applications based on Java technology, allowing the use of several Data Terminal plat-forms
- ✓ Helps to manage data transmissions over radio resources:
 - Data applications putting in service fully controlled by M9600 network operator
 - Control of the data flow emitted by data applications on each Data Terminal
 - Application traffic logging
- ✓ Offers a modular and scalable architecture

Features

Data compression of applicative messages (gzip 4.3)

Control of data flow:

- Template of data transfers defined for each application by the network administrator
- Incompatible messages not transmitted

Applicative message segmentation and re-assembly: up to 20KB

Automatic selection of relevant radio bearer service over M9600 air interface

Secured data exchanges :

- Acknowledgement of transmission (uplink and downlink)
- Retries and notification to application in case of failure

Information available for statistics on operational application use (trace and events logs)

Supervision through standard protocol (MIB SNMP)

Deployment functions client side and server side: from a reference position, global deployment of packages (MODEX software + data applications).

Components and interfaces

MODEX software is deployed :

- Client side: on each Data Terminal (Windows 2000, Windows XP)
- Server side: on data portal (Linux RedHat Enterprise 3.0)
- On MODEX dedicated servers (Linux RedHat Enterprise 3.0)

Data Terminal and M9600 radio terminal interconnected through a serial link RS232

Data portal and CDG MODEX server interconnected through an IP link (TCP/IP)

M9600 core network and RDS MODEX server interconnected through an UDP/IP link

RDS server and CDG server interconnected through a TCP/IP link

MODEX data applications :

- Provided by application developers
- Installed both sides (client side on Data Terminal, server side on data portal)
- Exchanges locally data messages with MODEX middleware through MODEX API

Hardware elements (Data Terminal, servers) not included in MODEX offer

Additional essential elements to be ordered separately

Cable to connect Data Terminal to M9600 radio terminals: refer to radio terminal options

M9600 radio terminal connectors: refer to radio terminal options

Other MODEX linked kit

MODEX development toolkit

- MODEX development environment
- Developer's manual
- API documentation
- MODEX simulator
- M9600 simulation environment
- Example code

MODEX developer training

MODEX operational management training

MODEX development support

Technical specifications of MODEX servers

Following specifications are defined to meet maximum traffic:

- Maximum data rate per RN: 50 kb/s
- Small system: maximum data rate cumulated on whole system: 50 kb/s
- Medium system: maximum data rate cumulated on whole system: 100 kb/s
- Large system: maximum data rate cumulated on whole system: 300 kb/s

Operating system: Linux RedHat Enterprise 3.0 for all positions

Specification for minimum hardware configuration for RDS:

Microprocessor	Mono processor Celeron 2GHz
SDRAM	512 MB
PCI	266 MHz
Hard disk	SCSI, 80 Go, 7200 t/mn
Ethernet board	10/100 BT
CD reader	DVD / CD-ROM IDE-8x
Floppy reader	3" ½
USB ports	2

Specification for minimum hardware configuration for CDG:

	<i>Small system</i>	<i>Medium system</i>	<i>Large system</i>
Microprocessor	Mono processor Celeron 2GHz	Mono processor Xeon 2 GHz	Bi processor Xeon 2GHz
SDRAM	512 MB	1 GB	2GB
PCI	266 MHz	266 MHz	266 MHz
Hard disk	SCSI, 80 Go, 7200 T/mn	SCSI, 80 Go, 7200 T/mn	SCSI, 80 Go, 7200 T/mn
Ethernet board	10/100 BT	10/100/1000 BT	10/100/1000 BT
CD reader	DVD / CD-ROM IDE-8x	DVD / CD-ROM IDE-8x	DVD / CD-ROM IDE-8x
Floppy reader	3" ½	3" ½	3" ½
USB ports	2	2	2

Technical specifications of Data Terminal

Specification for minimum configuration for standard PC platform :

OS	Windows 2000, Windows XP
Microprocessor	PIII, 500 MHz
SDRAM	128 Mo, 256 Mo recommended
PCI	266 MHz
Hard disk	200 MB
Monitor	colour
CD reader	Yes
Floppy reader	Yes
USB ports	1
Serial port	1

Other operating systems: specific study required

PDA platform :

Specific study required depending on PDA model and supported OS, including application and MODEX deployment process

Technical specifications of Data Portal

OS: Linux RedHat Enterprise 3.0

Java environment: J2EE or J2SE

Minimum hardware characteristics of data portal: CDG characteristics