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Network Inter Application Gateway

Presentation document

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CH Brignoles – 2002-2004

Date	Name	Revision
06/10/02	A.FALANGA (a.falanga@ch-brignoles.fr)	1.0
15/03/03	A.FALANGA (a.falanga@ch-brignoles.fr)	2.0



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Introduction

Apollo Gateway was developed in mind that patient identity (and therefore it's quality) is at the center of a major problem nowadays of the medical information system. In this case, the main goal of Apollo is to can present an unique way to « used » and « consume » patient identity thru all component of the medical information system (MIS).

This approach enable :

- Present critical information always in the same format even if backend information change. This feature is essential in an hospital environment since we can't imagine too lose information if the system change, but we can't not change our system too. So the gateway play role of an transparent aggregator here.
- To minimize the dependency with specific software.
- To minimize the dependency with specific OS.
- To manage all stream to and from the indentity gateway.

Apollo is a gateway between the information in MIS and application that need to get the patient identity.

This solution offer thru the used of KbmMW (from Components 4 Developers) a new way to resolve the following problem :

- Transparent communication between application (in term of network and platform), for local (LAN) or large (WAN) exchange.
- Interoperability with other hospital (with help of standard stream transport (like HTTP/HTTPS))
- Securized stream (with help of cryptographic stream).
- Internal management of all streams (tracability).

Technical choice

The main goal of Apollo is to exchange database between application without the need to call the application directly or to know is database structure, this approach ensure future integration or change in the MIS without having to modify all application. In this approach only the Apollo gateway has been modified !

The Apollo's gateway is available in the Linux and Windows environment. The gateway present an API that is callable thru many connector :



1. A COM objet that ensure the communication with application like any OLE-Automation compatible container (VB, VBA, VBScript, Delphi, etc ...)
2. Thru a Web Service



This solutions enables :

Solution 1 : Enable the communication inside the Windows environment (and in future with the latest KbmMW version with the .NET framework).

Solution 2 : Enable to operate outside the Windows environment with access for example in Intranet/Extranet with tools like PHP or ASP.

The Apollo gateway can work in read/write or read/only access to the information, this depend only on the type of the service.

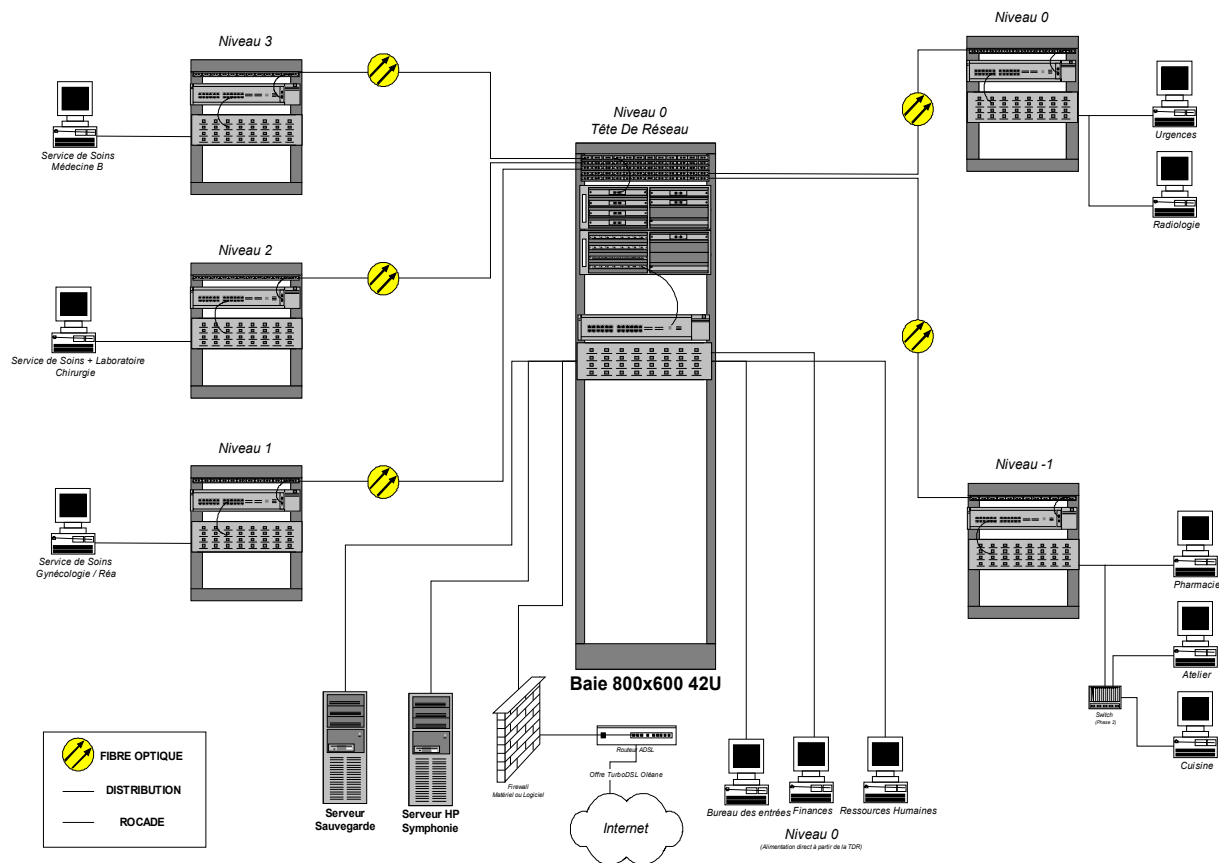
Apollo use KbmMW client/server, cryptographic and load balancing facilities to do this, this will be describe in the next part of this document.



Presentation of the internal Network

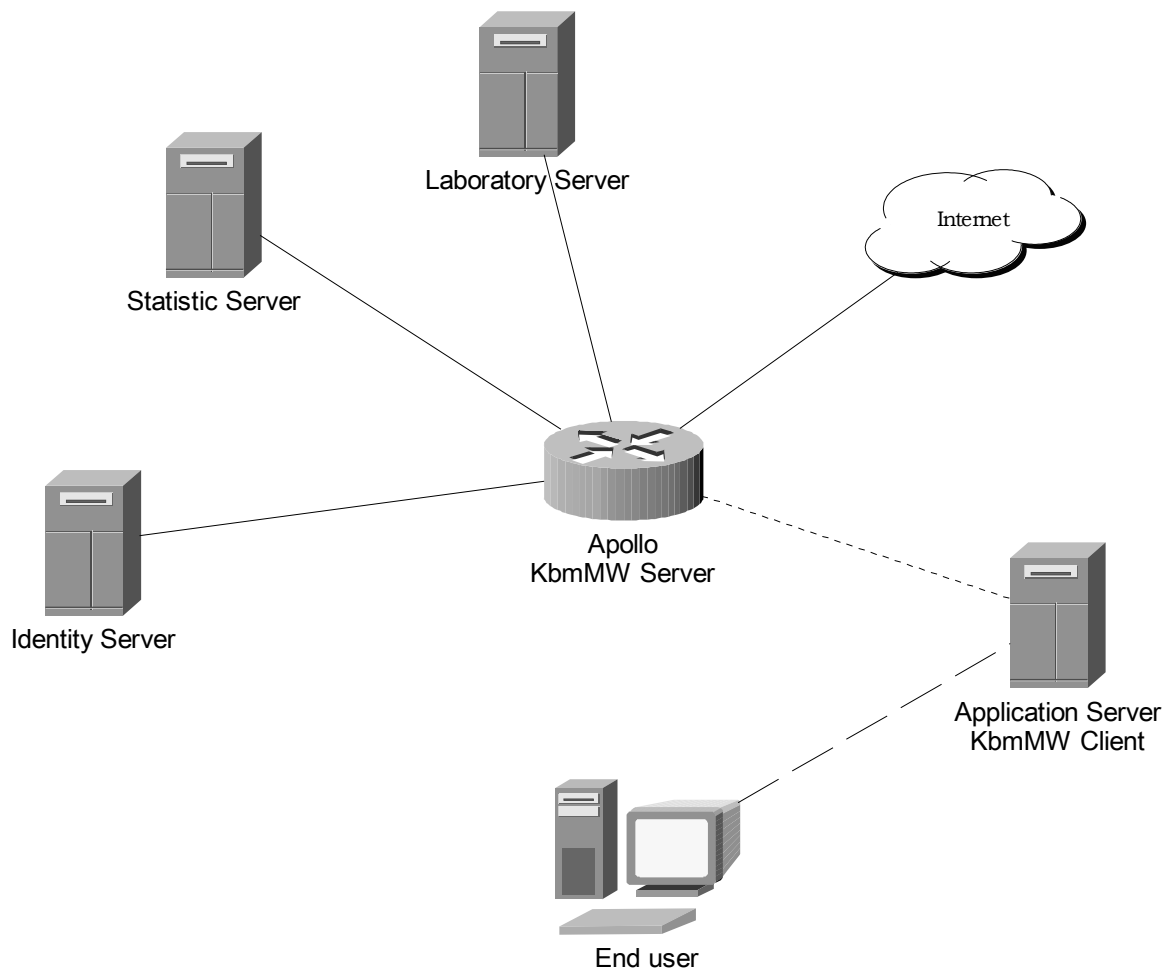
Jean Marcel Hospital has build a new network in 2002, this network has been constructed around the following component :

1. A network head that contain all active network hardware component and server.
2. Backbone in Optic Fiber (at 1 Gigabit – can be upgrade to 10 Gigabit)
3. 5 nodes equipped with Switch Layer 2 and redundant alimentation deliver up to 100 Mbits at each workstation attached to it.
4. The switch support VLAN
5. Internet connexion is done thru an SDSL 2 Mb symetrics secured with a standart ADSL 1024Kb/320Kb.
6. All the data are place on a NAS (Network Area Storage) on the heart of the network and datas are backup nightly on a 1 Terra bit SDLT loader backup system.



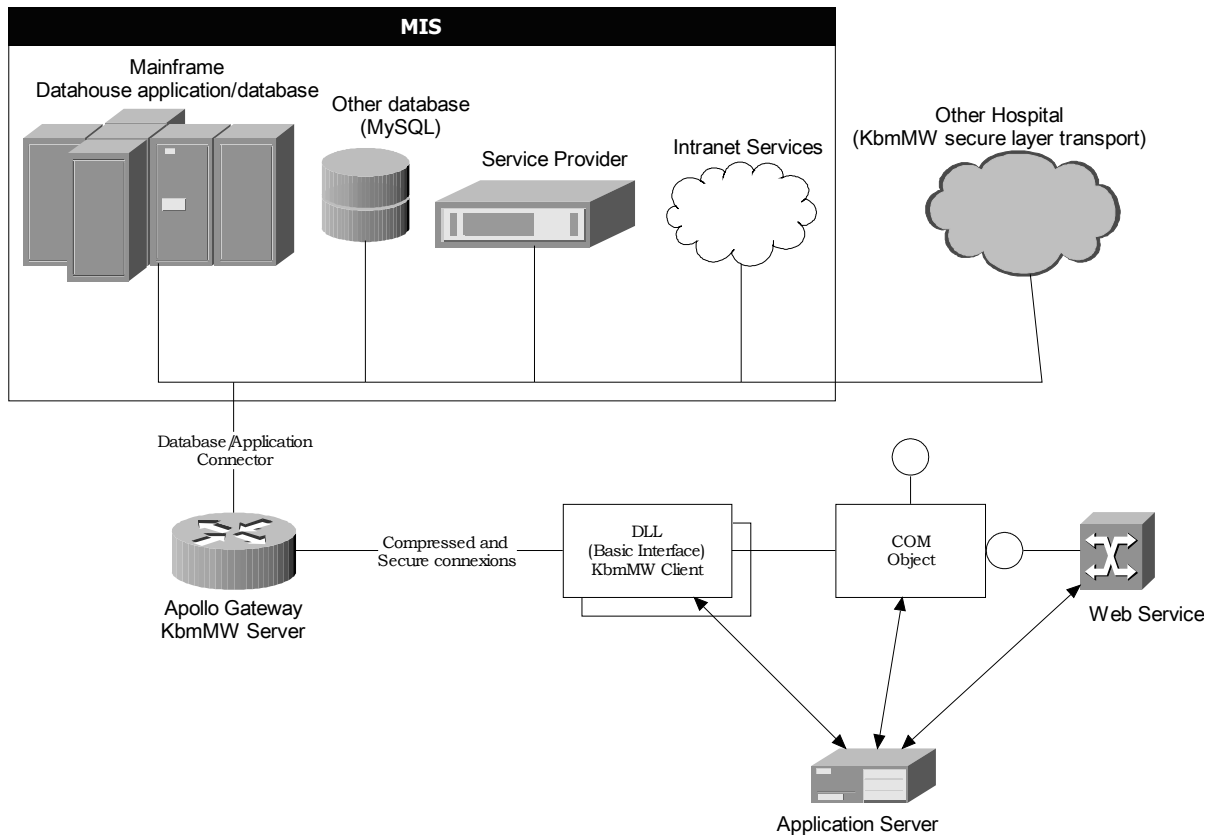
Apollo and the MIS

Apollo gateway is placed at the center of the MIS, Apollo will do ALL the exchange of the patient identity. This has been done securely with help of the KbmMW framework, that ensure reliability, stability and security. The evolution of the KbmMW framework, ensure the capability of the system in future to can connect to any system like PACS for the radio or PDA with Wifi for example). The advanced support of mechanism like : Load Balancing for example enable to have a highly secured system (from now Apollo run on 3 servers and used extensively the KbmMW loadbalancing service).



Description of the Apollo Gateway

The Apollo gateway is at the center of the MIS in the hospital. The components that are present by Apollo connect directly and transparently for external applications to databases inside the MIS (and mask the complexity of the database scheme and therefore enable a change on this without disturbing the works of other parts).



Appollo at works

Since of the 2002, Appollo getway have been succesfully :

- 1 million of patient identity has been exchange without any problem
- 15 applications have been connected to Appollo
- Integration with following database : Oracle, MySQL
- The disponibility of application is : **98,9%** (with help of KbmMW's Loadbalancing and failover facilities this features are really exceptionnal).
- Compression of the stream enable to reduce the size of the packet transmit on the network by **18 %** and speed transaction has been increase up to **10 %** (for the first version to the current version of Appollo – by using : KbmMW's optimized transport layer, compression).

Future of Appollo, what next ...

Next version of Appollo (V3) will be implement with the KmMW's V2 framework help in near future :

- Integrating the new KbmMW messaging system, will enable the communication with HL7 system and can used the power of this new fonctionnality to manage for example health alert in real time in all component of the MIS. This fonctionnality will be used as a generic trigger system and will enhance the backup and tracability system for specific exchange (modification of the identity for example).
- The .NET client to present a new connector and offer an ellegant easy way to integrate mobile terminal.

References

KbmMW – Component 4 Developers

<http://www.components4developers.com/>

