Case study

KPN
Multi-brand
top-up system

JSC INGENIUM

JSC develops a Multi–brand top-up system for KPN Spain

Challenge

KPN Spain is the Spanish subsidiary of the KPN Dutch telecoms group, and offers Network services for Mobile Virtual Network Operators (MVNOs). KPN needed to incorporate a Top-up System, in order to be able to offer a prepayment solution to the various Operators using its Network infrastructure.

KPN needed a top-up system which would meet two requirements:

1) Integrate with the various top-up resellers.
These companies each have networks of sales outlets directly attending to endusers' top-up requests. The sales outlets have multi-service and multi-operator top-up terminals which communicate with the operational platforms of these companies.

2) Integrate with KPN's business systems,
centralising all the queries and requests for top-ups and cancellations coming from the top-up resellers. The main objective was to achieve a client/server solution that could concurrently support several client systems (one per TC), would centralise all the dialogues, and would allow certain external systems to be shared (KPN's business and prepayment systems). All this functionality had to be provided whilst, at the same time, ensuring a high level of insulation between the various processes and resellers.

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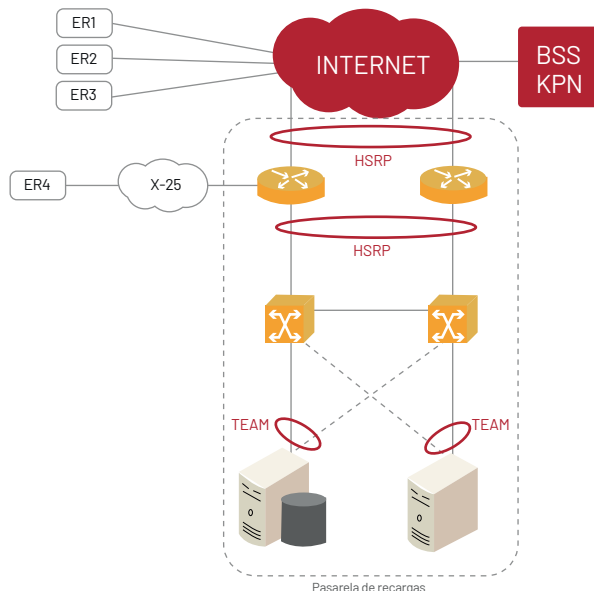
Solution

KPN selected JSC to develop a Topup Gateway between the different top-up resellers (TRs) currently operating in the Spanish market and the operator's prepayment system. This platform supports the top-up protocols of the various TCs and translates their commands to meet the prepayment system's requirements and functionalities.

The Top-up Gateway developed by JSC acts as an interface between KPN's business module (BSS) and the top-up resellers, so that the information from their various systems can converge on KPN's single platform.

Fault-tolerance: The Top-up Gateway's internal architecture ensures physical and logical insulation between the various processes and eliminates any

single point of failure. The top-up terminal sends top-up requests, queries and cancellations through its reseller's platform.

The Protocol between the TC and the Top-up Gateway can optionally be specific to each TC. The gateway receives the order, interprets it, and transmits it to the BSS. As a result, the subscriber's balance is modified, and the terminal is informed of the success or failure of the operation through the Gateway. The gateway receives the order, interprets it, and transmits it to the BSS. As a result, the subscriber's balance is modified, and the terminal is informed of the success or failure of the operation

The solution consists of:

a) Two application servers on which the communications and business logic processes (developed using Microsoft .NET Framework technology) are executed.

b) Two databases (Microsoft SQL Server) that store the information on the status and control of the query requests and the top-up or cancellation orders. They provide a transactional communication and storage repository for the different modules and processes.

c) A redundant communications structure, consisting of two LAN switches, two routers, and redundant TCP/IP and X-25 connectivity. The LAN redundancy uses Cisco's HSRP technology. BGP4 technology and two independent access providers are used to ensure redundancy for the TCP/IP public network access.

The system can interconnect with very different systems while maintaining the same core.

The communications between the top-up resellers and the Top-up Gateway system satisfy the security

Technologies:

Microsoft
1. Net Framework Technology.
2. SQL Server Databases.
3. Windows 2003 R2 Servers.

Cisco Network Equipment
1. Routers and switches.
2. HSRP (Hot Standby Router Protocol)

for the redundancy solution.
3. Virtual private networks (VPN) over TCP/IP.

Others
1. X-25.
2. Access redundancy with BGP4

Advantages:

The main advantages of the solution provided by JSC Ingenium are:

1. High availability: there is redundancy for all the elements of the system, ensuring continued operation.

2. Low cost: because, with just a small hardware deployment, it is possible to connect to all the top-up resellers.

3. Modularity: has the capacity to include new resellers, and modify the software for existing ones, without affecting other systems.

4. This solution stores a considerable amount of information about the topups, and so can act as a platform for generating reports without any need to access the operator's external systems.

Microsoft

Microsoft Corporation (NASDAQ: MSFT) is a US company, founded 1975 by Bill Gates and Paul Allen. It operates in the IT sector, developing, manufacturing, licensing and producing software and electronic equipment. Microsoft annually invests 14% of its worldwide turnover in R&D, making it the biggest international investor in research. It also works with more than 700,000 associated companies which provide products and services based on Microsoft technology, and with a very extensive ecosystem of partners who generate wealth in the 158 local markets in which it operates.

www.microsoft.com

KPN

With 41.2 million customers (as of the 31st of December 2009), KPN is the leading Telecommunications Operator in the Netherlands and offers fixed and mobile telephony, internet and TV services to the residential market, and ITC services to business customers.

KPN established itself in Spain as a full MVNO (using the Orange network), offering Network infrastructure services. It aimed to become the fifth largest Operator in Spain, both through its own brands - Simyo and Blau – and through its partners - Bankinter, Jazztel, etc.

KPN Spain has the infrastructure required to provide 2G and 3G mobile telecommunications services (prepaid and post-paid), which include not only the Network platform, but also the Services and Operations platforms.

www.kpn.es

JSC Ingenium

JSC is the division of the Ingenium Telecom Group which specialises in developing and implementing software components for Mobile Networks. JSC Ingenium provides all the "core" components required for Mobile Virtual Network Operators, and together with their partners also supply all the billing and management software, thus offering complete solutions. Most of these components have been developed by JSC Ingenium, on a common communications platform.

www.jscingenium.com

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