

VIRTUAL ENTERPRISE NETWORK SOLUTION IN THE PREMINV E-PLATFORM

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Abstract: In the 21st century, the enterprises continuous implement ICT strategies & architectures to improve manufacture, research, products quality, sales, services and costs control. All enterprises have a local area network, a virtual private network, an Intranet and Internet, servers and workstations for operations, administration and management working together for the same objective: profits. This work presents a new virtual enterprise network conceptual solution as support for virtual teams work in the PREMINV e-platform.

Key words: virtual private network, virtual teams, virtual enterprise network, virtual enterprise

1. INTRODUCTION

The global market today increase the need for common and collaborative processes and sharing information seamlessly between companies involved in extended enterprise. All forecasts predict very rapid growth in e-commerce as part of e-business and e-services that attract increasing attention because of the impact of new information and communication technologies on firms, markets, employment, and development.

New enterprise model architecture uses the Intranet/Internet/Extranet infrastructure and technologies. Informational society construction can't be realized without research and investment project in ICT. In this new era of information, the fundamental sources of wealth are knowledge and communication, and not natural resources or labor work (Dragoi et al., 2009). Today, companies feel the need to focus on their core competence and join together in virtual industrial groups, dispersed geographically to meet requirements of new products/services required in the market. Hereby, the concept of virtual enterprise (VE) appears. Choosing partners to partnership creation (see figure 1) is very important when seeking to increase the competitiveness of the enterprise in a VE system and represent a step in the process of VE forming.

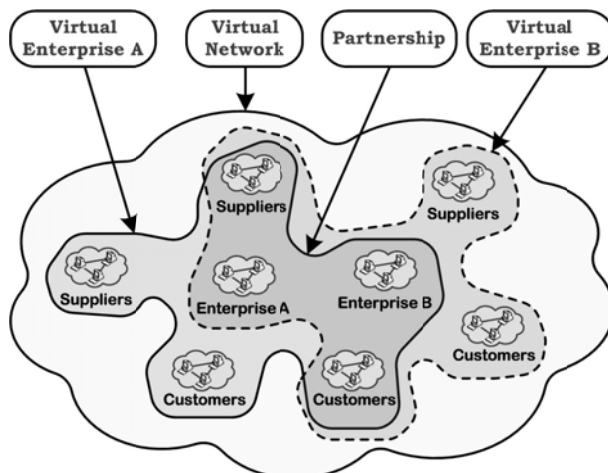


Fig. 1. New enterprise partnership model architecture in e-economy

In this paper, the basic idea of a *virtual enterprise network* (VEN) is meant to establish a dynamic organization by the synergetic combination of dissimilar companies with different core competencies, thereby forming a *best of everything* consortium to perform a given business project to achieve maximum degree of customer satisfaction. In this emerging business model of VEN, the decision support functionality, which addresses the issues such as selection of business partners, coordination in the distribution of production processes and the prediction of production problems, is an important domain to be studied (Rosu et al., 2009)

2. VEN SOLUTION IN THE PREMINV CENTER

Appearance of virtual networks is related to the evolution switches. We purpose in the PREMINV e-platform (see figure 2) a general architecture using Internet or a provider network for a large enterprise or an industrial holding (with headquarters and branches), geographically dispersed.

A *virtual network* is to combine a group of users regardless of their geographical position but such a manner that it flows together and to provide the best performance. The second advantage of a virtual network consists of administrative solutions which accompany the products, allowing users moving from one group to another through a simple reconfiguration of the equipment. A virtual local network (VLAN) is a logical grouping of local network components without regard to their physical grouping. Common commands to create VLANs (for Cisco equipments (Deal, R., 2005)) in the PREMINV e-platform are the following:

```
vlan 85
name Client_PREMINV_Provider1
vlan 86
name Client1_PREMINV_Provider2
vlan 87
name Client2_PREMINV_Provider2
interface FastEthernet1/0/1
description PREMINV_Provider1
switchport access vlan 85
switchport mode access
interface FastEthernet1/0/2
description PREMINV_Provider2
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 86,87
switchport mode trunk
interface Vlan85
description Client_PREMINV_Provider1
ip address 5.10.34.1 255.255.255.252
interface Vlan86
description Client1_PREMINV_Provider2
ip address 5.10.36.1 255.255.255.252
interface Vlan87
description Client2_PREMINV_Provider2
ip address 5.10.36.5 255.255.255.252
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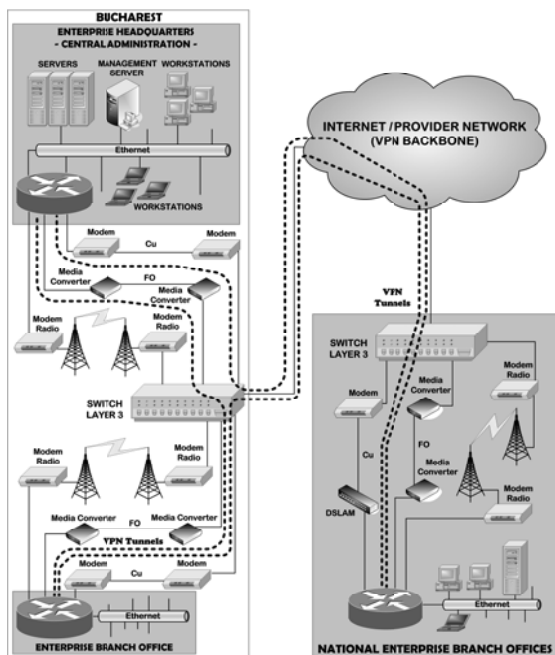


Fig. 2. An architecture for a large enterprise

The *virtual private network (VPN)* is a network emulated (the *virtual*) built on public infrastructure (*shared*), dedicated to a client (the *private*) to connect users in locations and to ensure similar conditions of integrity, confidentiality and quality similar with those of a private network. VPNs allows the provisioning of private network services for an organization or organizations over a public or shared infrastructure such as the Internet or service provider backbone network. The shared service provider backbone network is known as the VPN backbone and is used to transport traffic for multiple VPNs, as well as possibly non-VPN traffic. VPNs provisioned using technologies such as Frame Relay and Asynchronous Transfer Mode (ATM) virtual circuits (VC) have been available for a long time, but over the past few years IP and IP/Multi-protocol Label Switching (MPLS) – based VPNs have become more and more popular. VPNs may be service provider or customer provisioned and fall into one of two broad categories: site-to-site VPNs connect the geographically dispersed sites of an organization or organizations (see figure 3) and remote access VPNs connect mobile or home-based users to an organization's. VPNs can be used in different ways to support business processes, is the ideal solution if it is not efficient in terms of construction costs of a particular network for a firm with a workforce highly mobile, or for small firms that cannot justify the cost of their telecommunications network. VPNs can be purchased from a telecommunications company and as an alternative they can create by using existing network infrastructure as the Internet or public switched telephone network, and software through the tunnel crossing.

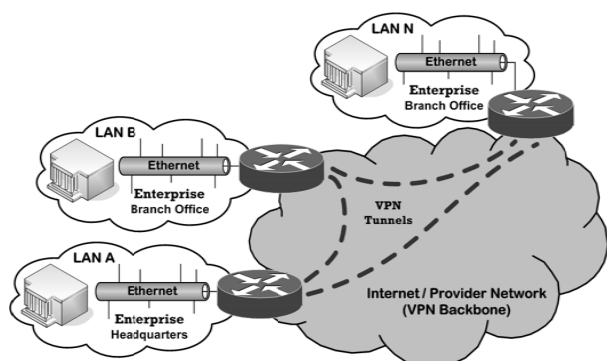


Fig. 3. VEN: Typical Site-to-Site VPN general architecture

The term *virtual team* is used to cover a wide range of activities and forms of technology-supported working (www.cisco.com, 2009). Virtual team is a group of people and sub-teams who interact through interdependent tasks guided by common purpose and work across links strengthened by information, communication and transport technologies. With rare exceptions all organizational teams are virtually to some extent. The virtual teams are the teams whose members use technology to varying degrees in working across location, temporal, and relational boundaries to accomplish an interdependent task (Bjørn, P. & Ngwenyama, O., 2009). Enterprise virtual team's members are located in more than one physical location. This team trait has fostered extensive use of a variety of forms of computer-mediated communication that enable geographically dispersed members to coordinate their individual efforts and inputs. Enterprise virtual teams work across boundaries of time and space by utilizing modern computer-driven technologies. Virtual teams are groups of individuals collaborating in the execution of a specific project while geographically and often temporally distributed, possibly anywhere within (and beyond) their parent organization]. The organizational context of a virtual team is a conglomeration of pieces related to the life worlds, organizational structures and work practices of the local organizational contexts (local sites), the distributed organizational context (global company) and the professional context (software process improvement)]. Virtual teams can be defined as groups of workers geographically, organizationally and/or time dispersed brought together by information technologies to accomplish one or more organization tasks. The degree of geographic dispersion within a virtual team can vary widely from having one member located in a different location than the rest of the team to having each member located in a different country.

3. CONCLUSION

In this paper a collaboration and communication solution for future product development was presented. The main goal of our researches as reflected in this paper was implementing a solution based on a virtual enterprise network new conceptual approach. The validation of this solution by a case study in the PROGPROC research project (CNMP 11014/2007, 2007-2010) was meant to determine the main new organization characteristics. The research project used outsourcing (shared resources from UPB-PREMINV research centre to industrial partners) based on an e-platform. We intend that our future work in this area includes building complementary knowledge bases to evaluate eventually SMEs activities who involve risks.

4. REFERENCES

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