

Dimensioning Company Intranets for IT Bandwidth

CASE Study for Central Europe Telecom

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Abstract: Contemporary renaissance distributed computing architectures use the following disciplines: Client/Server and Internet, Components and DBMS solutions. Both computer systems and telecommunication migrates as well from mainframe protocols into the world of OSI and LAN. Demand for wider broadband is growing. LAN-LAN, LAN-WAN connections become natural. In course of this application dependent communication can be changed to universal. New telecommunication technology could be introduced, ATM, MPLS and Internet. Dumb terminals can be removed and PC LAN connections can be established in remote offices. It is feasible to introduce WEB software together with NC.

1. INTRODUCTION

Let's look at the company's application dependent communication first. Now we focus on WAN (Wide Area Network) requirements, capacity and strategic role.

I would only mark, in 2002, in the year of telecommunication liberalisation in Hungary, we could already start to study how to develop a marketable WAN product, with other major products like VLAN and LAN to make them publicly available for government as well as medium or large business market segment as well. This could also be qualitatively achieved by studying an up-to-date Metropolitan Area Network (MAN), how to create a pure ETHERNET BASED BANDWIDTH on international standards already available. Two alternatives will now be shown:

1. First to understand the utilisation of old traditional SDH and ATM technologies, which seem to be flourishing their RENAISSANCE for years to come despite the maturity of GIGABIT ETHERNET seems to become feasible because world standards are to be ready for implementing the metropolitan core transmission network of a company's WAN VPN. These old technologies can prevail if internet applications like WEB and electronic mail work well or public ftp, telnet and terminal server applications are used instead of SAP to download the required data for the job. It seems the IBM mainframe age is here again at least alternatively. But to tune LOTUS NOTES electronic mail helps. To introduce a centralised IT does not mean not to have decentralised WEB servers and mail forwarding mirrors, since major bandwidth savings can be achieved by establishing many decentralised WEB mirror and cash servers. The user can turn to the closest server he is trying to dial in from his POP.
2. The GIGABIT ETHERNET standard is accessible for now initially and has undergone the necessary conformance and protocol tests as well so is to be proven and founded GOOD! The main driving force for its applications is to gain a cheap as well as well known and classic technology which is popular among our customers/business parties! (Essentially there is no difference between LAN Ethernet and GIGABIT ETHERNET technologies and both are widely used in Company Intranet so their maturity becomes feasible.) The maturity of GIGABIT ETHERNET is proved also in CORE NETWORKS (more then 700 km coverage), at the same time it has been pointed out that the management is sometimes fails, moreover some transport technology manufacturers are not yet supporting the wavelength multiplexing transportation in their products!

The IT rule of thumb in WAN was to increase the necessary bandwidth for improving QOS parameters and response time! Consequently it is high time to make network IT, as opposed to IT on isolated servers only! The design rules for WAN have to be based on harmonisation of server parameters with parameters on all available links!

2. SERVER SOLUTIONS

The 2 tier architecture mostly using stackable hub network connection, but replacing file server, DBMS server and transaction processing (TP) have been introduced. Only executables are on PC fat clients. Characteristic parameters are the performance response to file servers and the replay time.

In 3-tier architecture (1) the server function splits into DBMS server and application server (or business and data logic). The presentation logic is on thin client. Database logic replication is used which means automatic reconstruction with failure.

The N-tier client server architecture is much more complex and difficult to develop. Fewer tools are available. More possible points of failure are due to more links in client/server chain. For any usual server, 5% of server's capacity is taken per client. The fat client concept is not negligible, it makes your server and network live much longer.

Summarised, the server migration requires new tools and technology. Better to use single network protocol (IP) and homogenous operating system, otherwise gateways are used between different network protocols and systems.

3. CLIENT SOLUTIONS

Which one, NCs or PCs (2)? Versatile PCs and low-cost thin clients both have a place in almost any organisation. Intel and Microsoft, leading the charge against NCs, say the new devices are nothing more than throwbacks to the bad old days of centralised computing and dumb terminals. NCs will limit your options and steal your freedom. NCs will cut cost and simplify your life. Why can't less expensive computers just do anything useful? So PCs and NCs are not an either-or choice and neither is a one-size-fits-all solution.

Microsoft has its own fat client, called NetPC (3). It minimises opportunities for users to modify their system configurations. No end-user expansion slots are available. Its cash is lockable. Local hard disk is used only for caching. Network security limits users to install or modify programs. It might not have local floppy or CD drive. Software installation or upgrades take place at the server.

4. WEB SOLUTIONS

On the first generation, so called stateless WEB architecture a HTTP listener responds to connection or disconnection requests to the server. It's file system is HTML using URL indexes. It has no real time updates. User can not interact to server. HTML pages can be read usually with browser.

On the second generation WEB architecture, the concept of separate WEB server is introduced. The usual DBMS and state server is on a different machine. The WEB server contains HTML documents with

sophisticated programming. The application logic is in C, Perl, Tcl, etc. The database interface is in low level CGI programming (4), so is the sorting, reports and state management as well. The advent of Java (5) in 1995 provided a way to create intelligence on the client side.

On the third generation WEB architecture, applet or component based WEB applications are available. Dealing with separate DBMS or O/R DBMS server together with application or Java WEB server (6). The client applications are running from server. Collaborative computing with strangers appears, they use your server but don't need your client. A Java applet or application that can run selected CGI routines (7) to interface with the server services. For server side any old browser can be used and executed.

Internet architecture can be used when clients are strangers, or platform and operating system independence is essential requirement. In this case you never need to negotiate protocols and data formats with partners. Central control can be kept and it is advantageous to have the software mainly on server only. Finally when client logic is simple. As the Internet infrastructure matures, the original simplicity of the HTTP protocol is also its Achilles heel. Because it's a generic request-response protocol, HTTP's main drawbacks are its statelessness and its inefficiency in establishing new connections for each request. The next generation of the Web, which will be driven by electronic-commerce applications, must be able to issue asynchronous requests and will require richer mechanism for passing parameters not only with its character-oriented method but also parameters of integers, structures and other data types.

5. MESSAGE SOLUTIONS

Some companies, mostly small businesses with few legacy systems, are adopting a pure Internet solution. Most businesses, however, can't just throw out their old messaging systems. Their features, plus the investments in equipment, training ensures the continued use of legacy messaging systems for the foreseeable future. The trick then is to integrate Internet messaging with the proprietary systems in a way that maximises the benefits of both.

SMTP has proven its messaging reliability over almost two decades. POP and IMAP both handle message retrieval and the latest version of IMAP lets you review messages and attachments before downloading them. But the Internet e-mail doesn't tell you when or if a message is delivered or provide a guaranteed delivery time. Other desired features include e-mail based faxing, paging and voice. Paging can alert someone to an important message

or to notify a system administrator of a problem. Voice could be in the form of an audio attachment, like VocalTec's Internet Voice Mail 3.0 (8) or making real time voice contact over an IP connection through the desktop interface. Committees within the Internet Engineering Task Force (IETF) are working on specifications, likely as extensions of the Multipurpose Internet Mail Extensions (MIME) format, for all these features. Internet messaging will eventually catch up to proprietary systems' reliability and security, but parity is at least two years away (8) .

In proprietary systems like in Novell 5 or Lotus Notes 5, a universal mailbox is already available. User can perform document management task, send a fax, schedule appointments, maintain a task list, or perform other functions through the mailbox and are accessible to people who are travelling, from a remote location.

6. REFERENCES

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