

Data Transmission Handout

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Here are some semi-random terms and definitions relating to network and data transmission issues. One of the objectives of the workshop will be to provide loose definitions and context for most of these, so you can listen critically when consultants start throwing these buzzwords around...

The NETWORK:

Internet

The interconnected networks of computers using - started with the ARPAnet at the US Dept. of Defense. The research backbone was later NSF Net, and is now the Abilene network, more or less, though lots of experimentation out there. Al Gore did not invent the Internet, but does in fact (along with a number of other government initiatives) deserve significant credit for advancing high speed networking during his government service, (-- according to Vince Cerf)

IP

The Internet Protocol, which allows connections to cross boundaries between networks.

TCP

Transport Control Protocol – the most common protocol used. It provides a reliable, low level, connection from one application to another. Used for file transfer, web access, etc.

TCP/IP

TCP combined with the ability to have connections cross network boundaries. Wow! A really good idea, as it turned out...

DNS

the Domain Name System which identifies each computer as a network node on the Internet using an internet protocol address system to translate from domain names to IP numbers and vice-versa.

DNS Server

the computer you use to access the DNS to allow you to contact other computers on the Internet.

SSL

Secure Sockets Layer – certificate based authentication and encryption. The common encrypted protocol for important things like paying Amazon.com and buying airline tickets. Can also be used for non-web communication, such as email, ftp, etc.

SSH

Secure Shell – A secure, encrypted replacement for telnet, which also allows tunneling of other protocols, such as email, ftp, etc.

stunnel

an open source program which allows tunneling of internet protocols through an SSL connection. Note that this is starting to sound like many ways of doing the same thing. That's accurate!

port

a specific "connection site" within a computer, defined by a number which is associated (by convention only) with a certain internet service.

service

a communication capability offered by a server for structured data exchange. Examples include: web sites (http), secure web sites (https), file transfers (ftp), post office protocol (pop3), simple mail transport protocol (smtp), secure shell login (ssh), windows file sharing, and many others.

VPN

Virtual Private Network. A way of tunneling the network presence of one machine through the public internet to another network. This can be done machine to machine, machine to network, or network to network. While the security of VPNs is good, their use may lead to “sanctuaries” of poorly protected machines that are vulnerable to attack from within that sanctuary. Not a reason not to use them, just something to think about.

firewall

A hardware device on the “edge” of a network, or a software product tightly connected to a particular machine’s network connection, which permits restriction of connection by IP address, time of day, port, protocol, outside weather, result of tarot card readings, or other criteria.

PKI

Public Key Infrastructure – a system, based on encrypted certificates, that allows for both authentication of the parties of a transaction (such as sending data), and for the encryption of that transaction.

INTERNET TOOLS/PROTOCOLS:

ftp

file transfer protocol - a method of serving and obtaining files over the Internet. An unencrypted protocol.

telnet

a method of logging into another computer as a terminal on that computer. An unencrypted protocol.

gopher

a method of serving or retrieving files over the Internet - it has largely been replaced by the Web. An unencrypted protocol.

browser

a client program that retrieves documents and other materials from an HTTPD server and displays them in accord with the HTML specification - MOSAIC was the first widely available browser - CELLO was the second browser - NETSCAPE is the most used browser at this time.

cURL

open source tool that allows an application to pretend it is a human using a browser. Allows ssl encryption, certificate based authentication, other protocols besides web, etc. <http://curl.haxx.se>

email client

a software application that allows one to exchange messages with someone else, typically using SMTP to send messages, and IMAP or POP3 to download them. An unencrypted protocol.

sftp

secure version of ftp

scp

a secure version of the “copy” program. Usually available on unix/linux systems

soap

Simple Object Access Protocol – XML based “envelope” for messages specifying delivery and remote execution (handling) instructions

ebXML

Specified by CDC as a PHIN standard. “ebXML (Electronic Business using eXtensible Markup Language), sponsored by UN/CEFACT and OASIS, is a modular suite of specifications that enables enterprises of any size and in any geographical location to conduct business over the Internet. Using ebXML, companies now have a standard method to exchange business messages, conduct trading relationships, communicate data in common terms and define and register business processes.” Based on soap. <http://ebxml.org>

ebMS

messaging layer of ebXML

(some definitions adapted from Steven C. Perkins <http://www.rci.rutgers.edu/~au/workshop/int-def.htm>)