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MATA KULIAH : KEAMANAN INFORMASI

RESUME TELECOMUNICATION dan NETWORK SECURITY

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Telecommunication & Network Security

A. Telecommunication

Telecommunication & Network Security is one domain / point of discussion in the network security material. Point-point discussion of the existing covering structure, engineering and transport protocols and security measures that are used to maintain the confidentiality, integrity and availability of data that is sent from / to the private and public networks. There are several types of data network structure, including:

- **Local Area Network**

  Commonly abbreviated Local Area Network LAN is a computer network whose network covers only a small area; such as building computer networks, office, home, school or smaller. Today, most LAN based on the IEEE 802.3 Ethernet technologies using a switch device, which has a data transfer speed of 10, 100, or 1000 Mbit / s. In addition to Ethernet technology, current 802.11b technology (commonly called Wi-Fi) is also often used to form a LAN.

- **Personal Area Network**

  At the moment we mutually connecting computers or other devices such as mobile phones, PDAs, keyboards, mouse, wireless headsets, cameras and other equipment that were located quite close (4-6 meters) then we have formed a Personal Area Network.

- **Wide Area Network**

  WAN (Wide Area Network) is a computer network covering a large area as an example of a computer network between regions, cities or even countries, or can be defined as well as computer networks require routers and public communication channel. The Internet is an example of this WAN network.

- **Metropolitan Area Network**

  Metropolitan Area Network (MAN) is a network in a city with high-speed data transfer connecting various locations such as campuses, offices, administration, and so on. MAN network is a combination of several LANs. MAN's range of between 10 to 50 km.

▪ **Intranet**

Intranet is a computer network based on TCP / IP protocols such as internet only used in internal company, office, and even internet cafes (WARNET) can be categorized Intranet.

§ **Extranet**

Extranet is a private network that uses Internet protocols and the public telecommunication system to share some information about the safe operation of the business or to the dealer (supplier), sellers (vendors), partners (partner), customers and others. Method of data communication network consists of two, namely:

1. Analog-based communication

   Broadband analog signal is also called an electronic wave bervariasidan continuously transmitted through a variety of media depending on the frequency. Analog data is distributed via electromagnetic waves (radio waves) continuously, which is heavily influenced by confounding factors or barriers.

2. Communication-based digital

   Digital signals also called baseband .As replace the wave transmitted signal on a digital system in the form of bits of binary bits. The binary system is the system on - off (or the system 1-0), so if there is a voltage or on the in angkakan 1, was when no voltage or off the diangkakan 0.
   In addition, the mode of data communications networks, is:

   a. Synchronous Communication

      Asynchronous technique is sending data per character from time to waktu.Tiap characters that are sent can stand alone, and the receiver must be able to recognize from each character is sent. In this Asynchronous techniques, each character being transmitted is encoded in 11 bits.

   b. Communication asynchronous

      Synchronous techniques for the purpose of data transmission is between the bits that are sent with the received bits must be synchronized. By itself, if the bits are sent and received are not the same (which means that no data errors during data transmission), then there is a synchronization process.
      Here are the types of data networks:

- Circuit-switched network.

  the network allocates a circuit (or channel) between nodes were dedicated and user terminals to be used to communicate.

- Packet-switched networks.
  A method used to move data in the Internet network.
- Virtual circuit
  Virtual Circuit is essentially a logical relationships are formed to connect the two stations. Packet is labeled with a number and serial number of the virtual circuit. Packages are shipped and arrive in sequence. The following figure illustrates the description.
  There are several kinds of topology used in data networks, including:
- Bus Topology
  topology that uses a single cable or cable as the transmission media center where all clients and servers are connected.
- Star Topology
  Is a form of network topologies in the form of convergence of the central node to any node or user. Each workstation is connected directly to Serveratau Hub / Swich.
- Tree Topology.
  combination of characteristics between star topology and bus topology. This topology consists of a collection of star topology are connected in a bus topology as the backbone or backbone lines.
- Ring Topology.
  the form in which each node is connected to two other nodes, a ring-shaped groove
- Mesh Topology
  a form of relationship between devices in which each device is connected directly to other devices on the network. As a result, in a mesh topology each device can communicate directly with the destination device (dedicated links).

B. Network Security

Network security domain discusses how techniques of security in a network in place to protect all the data in the form of physical and logic. There are several techniques that are implemented network security. Among them:

1. Firewall

An important tool in managing and controlling network traffic.

Very powerful firewall to restrict or block traffic and there. Firewall is able to filter traffic based on content, application, protocol, port.

Firewall there are several kinds, namely:

- Static Packet-Filtering Firewall

  The principle works by filtering traffic by examining data from the message header. Normally, the rule is concerned with the source address, destination, and port address.
- Application-level gateway firewalls

  Often called proxy firewall. Proxy is a mechanism that copies packets from one network to another; the copy process also change the source and destination addresses to protect the identity of the internal or private network.
- Circuit-level gateway firewalls

  used to establish communication sessions between partners who trusted (trusted end to end). They operate at the Session layer (layer 5) of the OSI model. SOCKS (sockets, such as TCP / IP port) is a common implementation of this type of firewall.
- Stateful inspection firewalls.

  These firewalls filter network traffic context. By examining the source and destination addresses, use applications, source of origin, and the relationship between the current package and the package of the previous session.

There are several models in implementing the firewall architecture, namely:

- single-tier,

  Implementation modes such as firewall with this position the dibelakan private network firewall.
- two-tier

  Implementation modes such as firewall with this position the private network behind a firewall, have more than one interface connected to divide the kind / type of network. In this case there are two, namely DMZ segment and the Private User.
- And three-tier (multi tier)

  Implementation of the firewall in this kind is to divide the network into multiple subnets between private networks and the Internet.

2. VPN Protocol

A VPN, or Virtual Private Network, allowing you to create secure connections to other networks via the Internet. VPN can be used to access sites that are beyond the reach of the area, protect your browsing activity from data thieves on public Wi-Fi, and more.