Bluetooth™

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DEFINITION

Bluetooth is a method for data communication that uses **short-range radio links** to replace cables between computers and their connected units .

ORIGINATION OF "BLUETOOTH"

- In 10th century **Harald Bluetooth**, **the king of Denmark** united Norway and Denmark into a single kingdom. Apparently he got that name from his penchant for blueberries.

NEED FOR BLUETOOTH

A Cable Replacement Technology

- It's wireless.
- It's inexpensive.
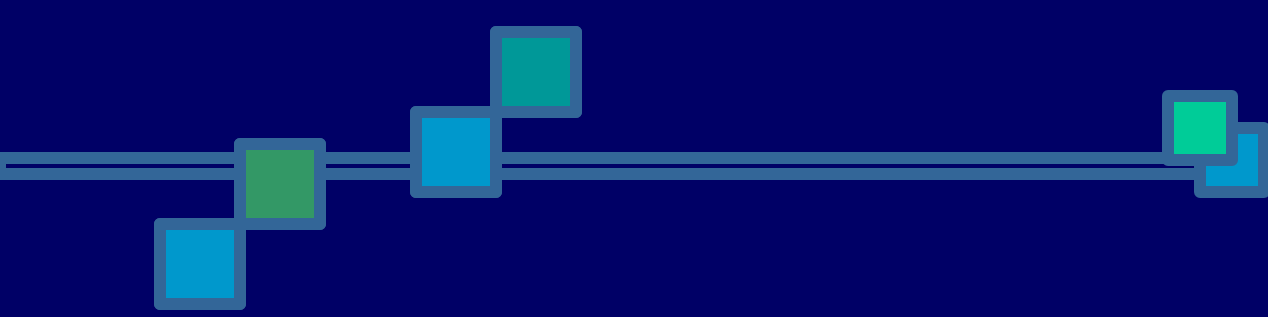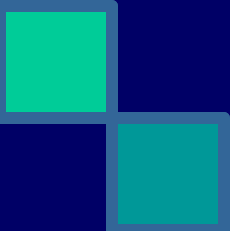- You don't have to think about it.

APPLICATION EXAMPLES:

- A Bluetooth-mouse
- A Bluetooth-keyboard
- Cable-less connection to printers
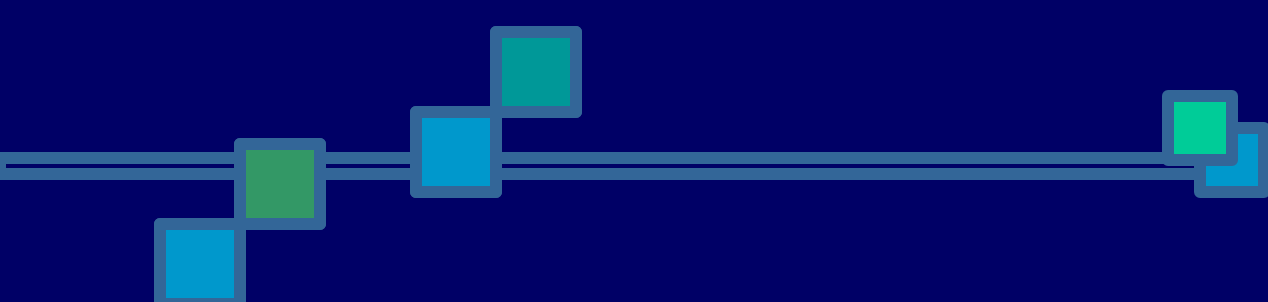- Use e-mail while your portable PC is still in the briefcase!

HISTORY OF BLUETOOTH

- In 1994, **Ericsson Mobile Communication Ltd.** started a project named "Bluetooth".

- In 1998, **Bluetooth SIG** was formed and it officially adopts the project name "Bluetooth" as the name of technology.
    - **Frequency Hopping Spread Spectrum Technology** was used for data transmission.

- In 1999,Bluetooth **1.0** & Bluetooth **1.B** Specification was released.
  - Problem of Hardware interoperability & compatibility between devices.
- In 2000, Bluetooth headset and phone adaptor from Ericsson ; the first consumer product.
  - Improved resistance to frequency
- In 2003, Bluetooth **1.2** was released.
  - Ratified as **IEEE 802.15.1-2005**

- In 2004, **Bluetooth 2.0** with enhanced data rate (**EDR**) is released.
  - **EDR uses combination of GFSK & PSK.** A **3 Mbps** nominal & **2.1 Mbps** practical transfer rate can be achieved.
  - Reduced complexity of multiple connection due to increased bandwidth.
  - Low power consumption through reduced duty cycle.
- In 2006,Bluetooth SIG announced its selection of <u>**Wimedia alliance**</u> for integration with current wireless Bluetooth technology.

- In Jun 2007, Nokia and Bluetooth SIG announced that **Wibree** will be a part of bluetooth Specification as an ultra low power bluetooth technology.

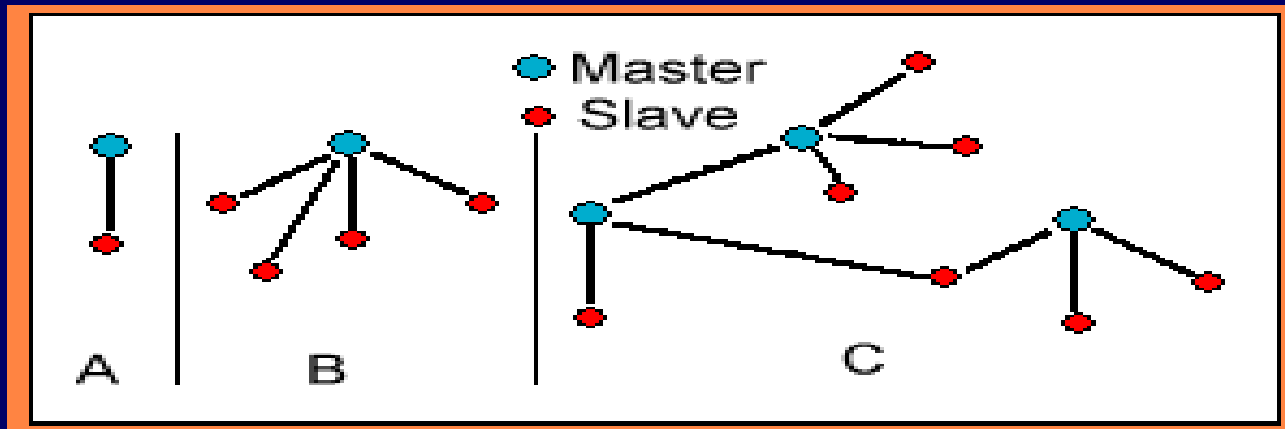- In July 2007,   **2.1 Core** Bluetooth Specification is released.

  - **Extended Inquiry Response**
  - **Sniff Subrating**
  - **Near Field Communication (NFC) Cooperation**
  - **Secure Simple Pairing**

BLUETOOTH DEFINITIONS

❑ Single-slave

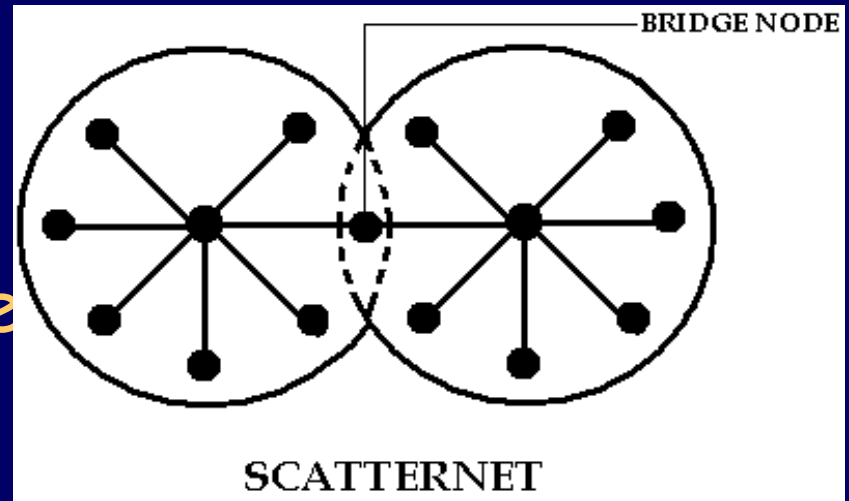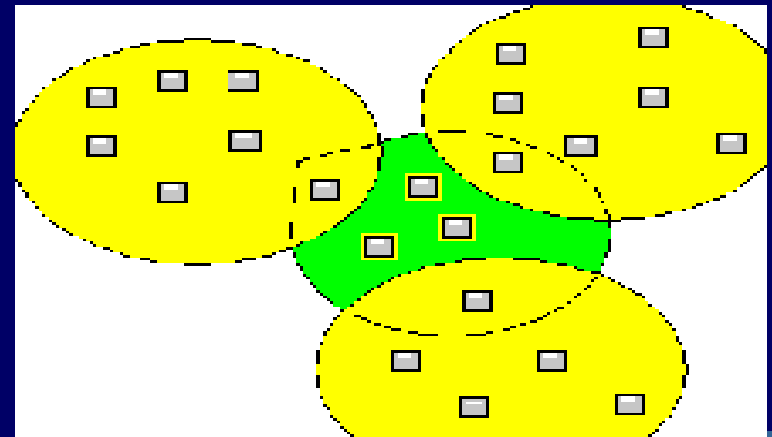❑ Multi-slave (up to 7 "slaves" on one master)

❑ Scatternet

PICONETS

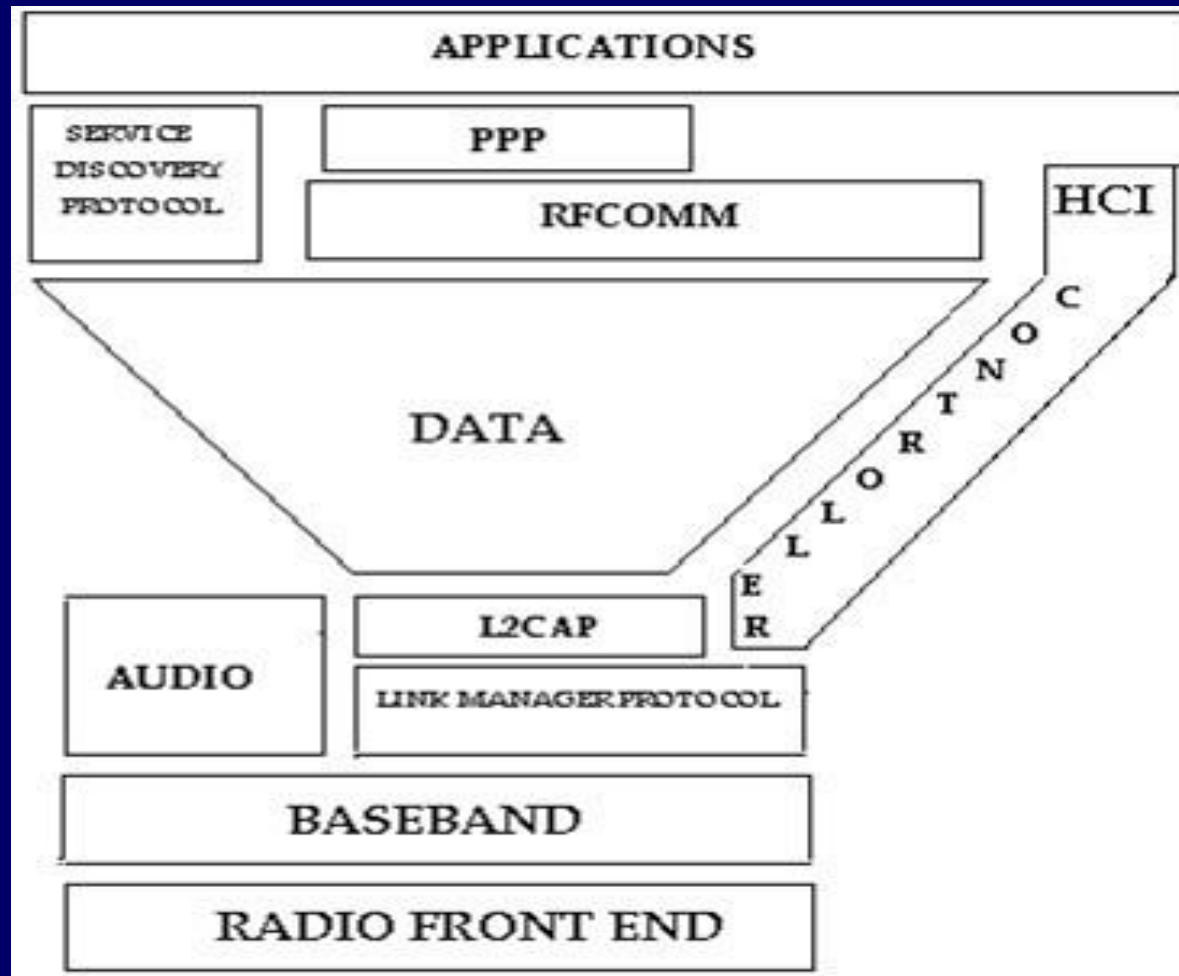A set of BLUETOOTH devices sharing a common channel is called a PICONET

SCATTERNETS

Scatternets are two or more independent and non-synchronized piconets that communicate with each other making that bridge nodes

BRIDGE NODE

SCATTERNET

STACK STRUCTURE
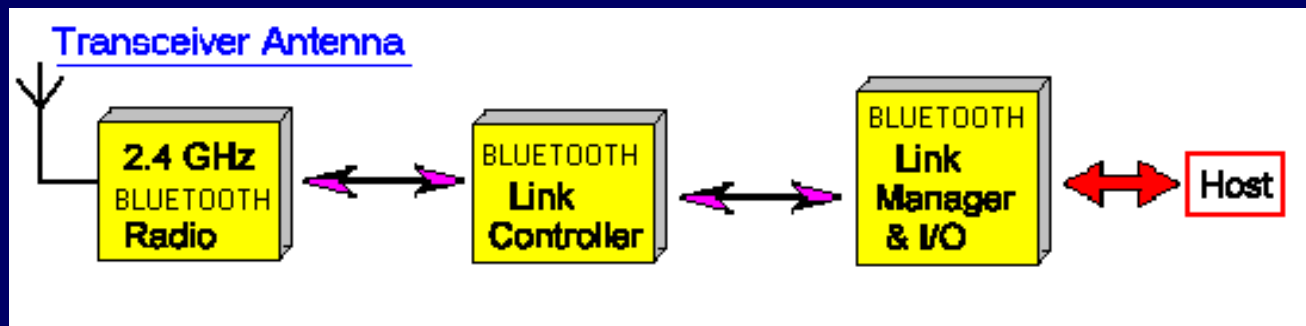
COMPONENTS OF STACK

- Radio Front End (RF)
    - Defines characteristics of **RF, frequency bands, channel arrangements & receiver sensitivity level.**

- Logical Link Control & Adaptation Protocol (L2CAP)
    - For transporting bigger data products to higher layer

- Service Discovery Protocol (SDP)
    - To query and discover services supported by peer Bluetooth device.

- **Link Manager Protocol (LMP)**
  - PICONET, master slave role assignments and link configuration.
  - Security configuration by device authentication using secret key.
- **RFCOMM**
  - Provides transport capabilities for high level services.
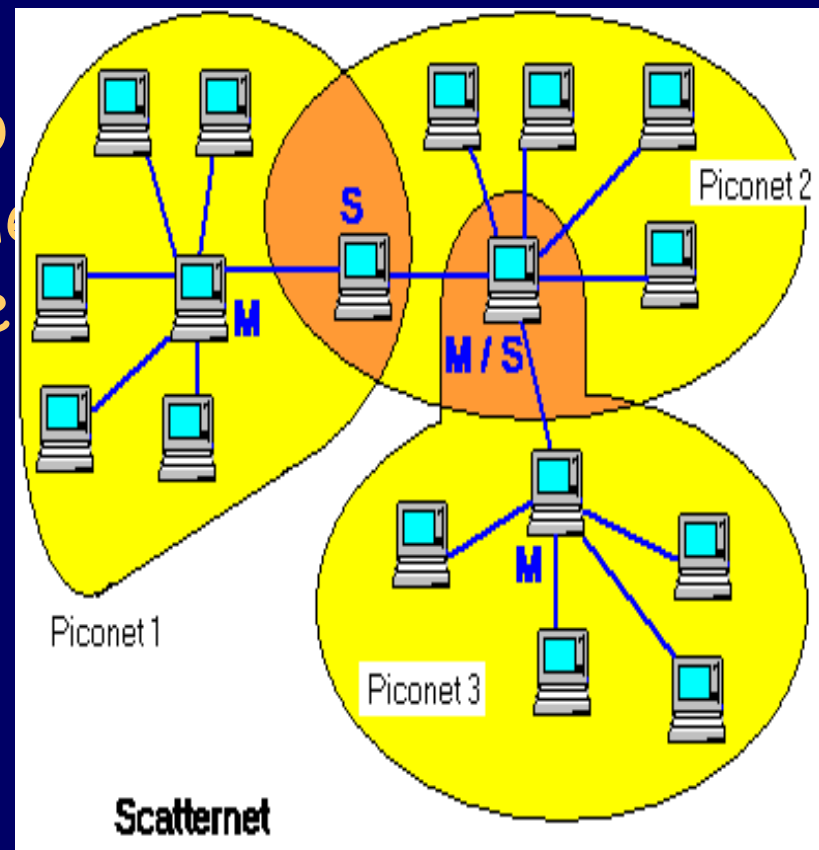
THE EST CONNECTION

- INQUIRY
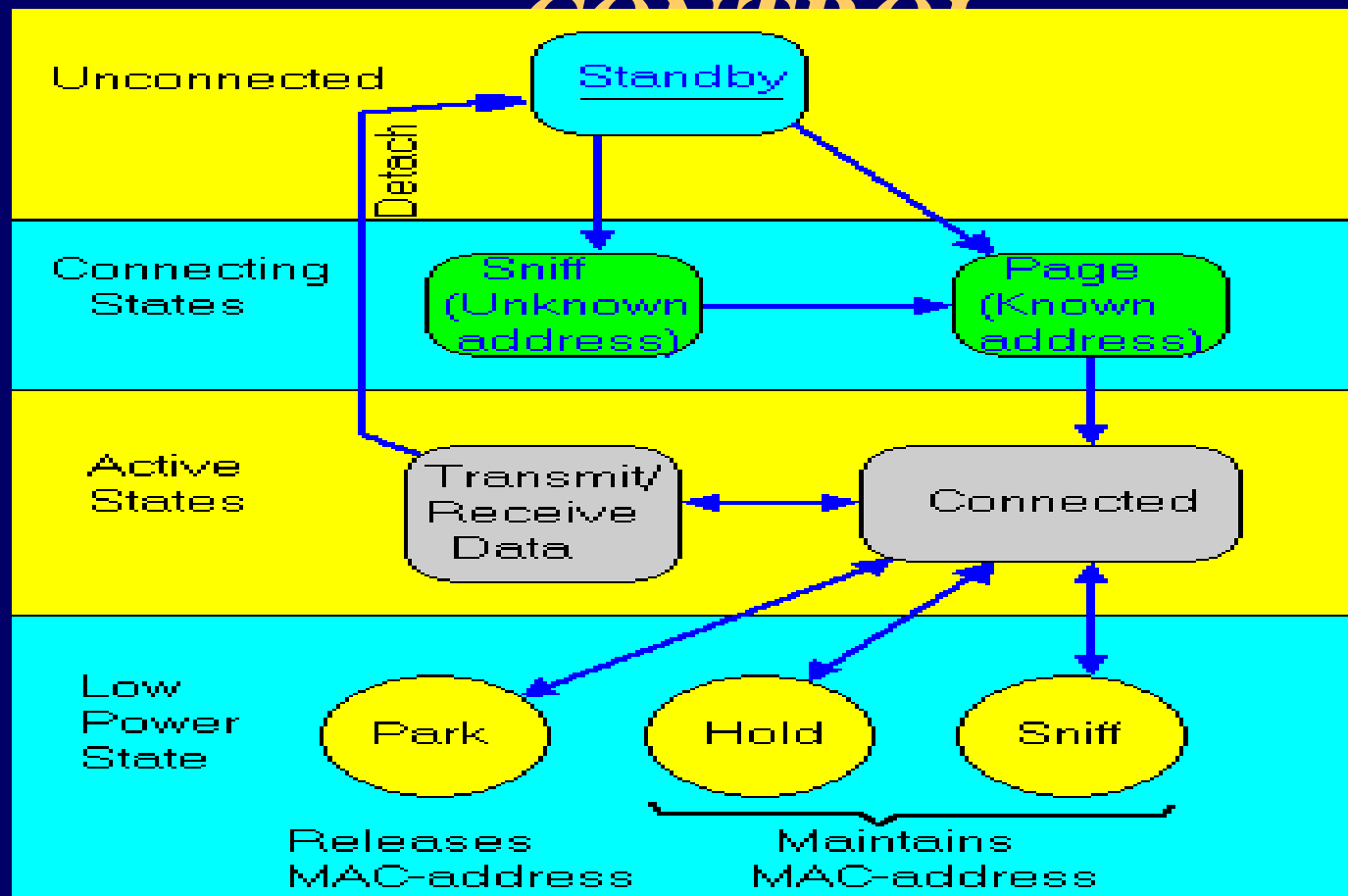- PAGING

CREATION OF A SCATTERNET

A Master o Slave can become Slave in anothe piconet by being

paged by Master the other piconet this

Scatternet
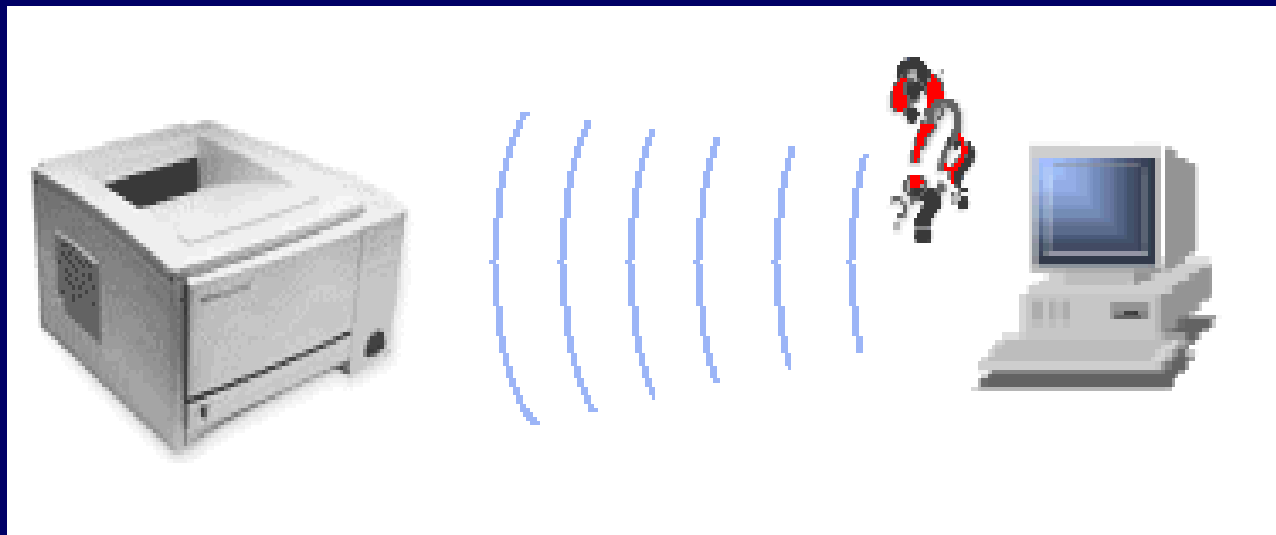
NETWORK FORMATION AND CONTROL

BLUETOOTH'S
SECURITY

- Safer transmission of data in Bluetooth 2.0 and in later versions.
  - ❖ **BLUEJACKING**
  - ❖ **BLUESNARFFING**

- Bluetooth´s Error Correction Schemes
  - **FEC** (Forward Error Correction)
  - **ARQ** unnumbered scheme (Automatic Repeat Request).

IS BLUETOOTH DANGEROUS?

- Bluetooth carrier wave uses same frequency as that of microwave oven (2.402 GHz to 2.48 GHz).

BLUETOOTH'S COMPETING TECHNOLOGIES

- Is Bluetooth a Wireless LAN (WLAN)?
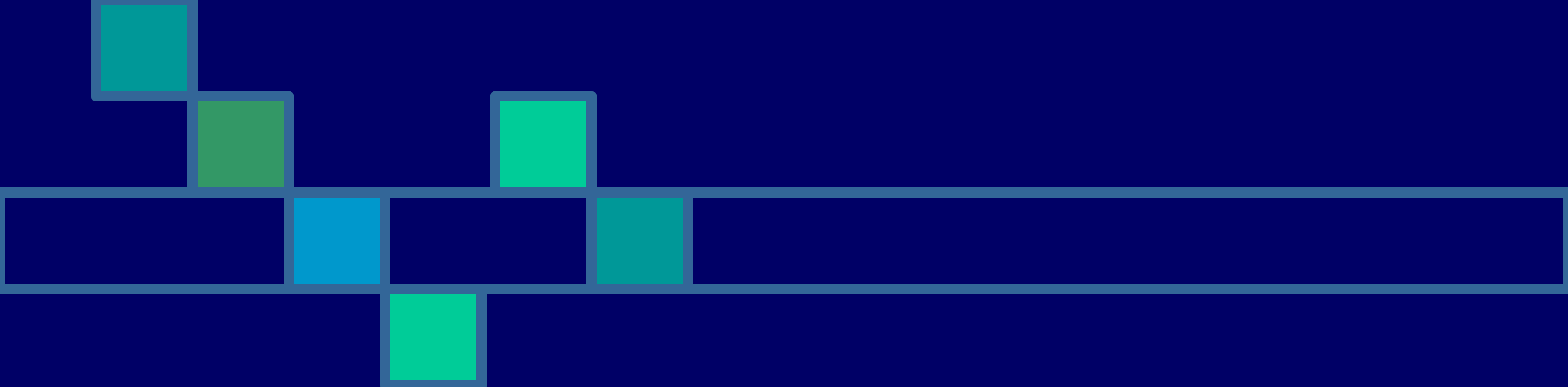- INFRARED TECHNOLOGY

FUTURE OF BLUETOOTH

- BROADCAST CHANNEL
  - Enables Bluetooth information points.
- TOPOLOGY MANAGEMAENT
  - Enables automatic configuration of piconets
- ALTERNATIVE   MAC PHY
  - For transporting bluetooth profile data.
  - For sending lots of data at high speed.
- QOS IMPROVEMENTS
  - Transmission at higer quality

BIBLIOGRAPHY

- WIKIPEDIA
- www.bluetooth.com
- E-book on Wireless Lan Techniques - RF, Wi-Fi, Bluetooth
- E-book on Introduction of Bluetooth Wireless Technology By- INTEL
- E-book on Bluetooth Security

THANKS