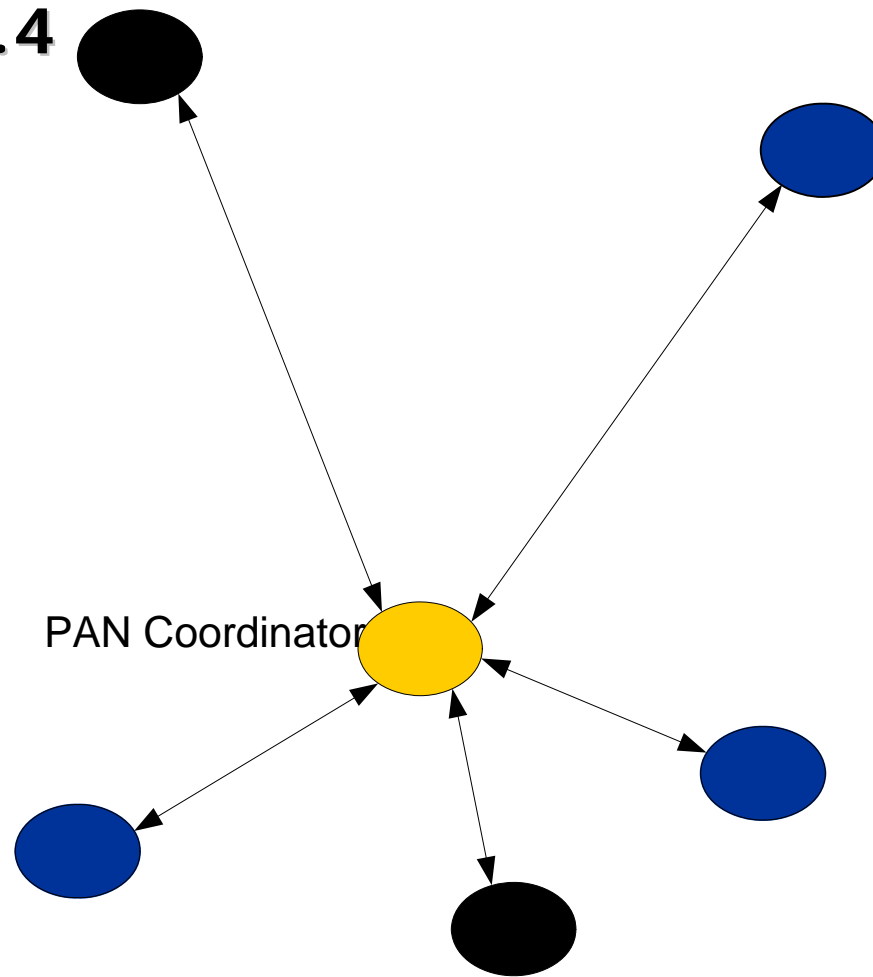


# IEEE 802.15.4

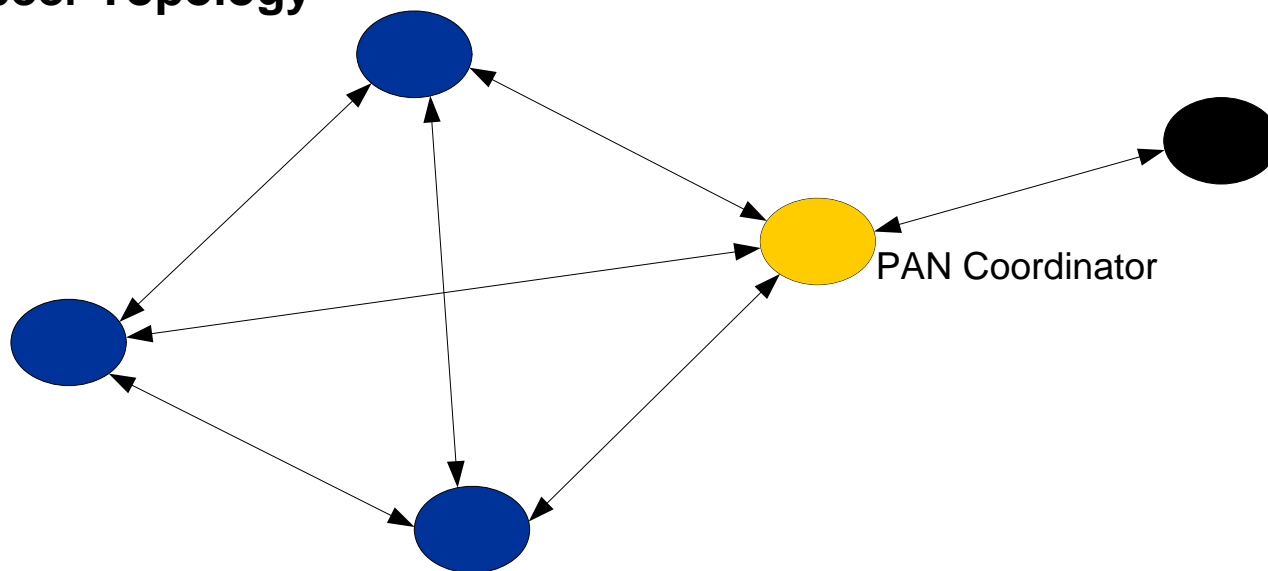
## Star Topology



- Full Function Device
- Reduced Function Device

# IEEE 802.15.4

## Peer-to-peer Topology



- Full Function Device
- Reduced Function Device

## Roadmap

Introduction to MaxStream's ZigBee/802.15.4 modules  
IEEE 802.15.4 (Shipping)

### **MaxStream's ZigBee Offering: ZigBee Phase 1,2 and 3**

Modes of Operation

MaxStream's ZigBee/802.15.4 stand-alone modems

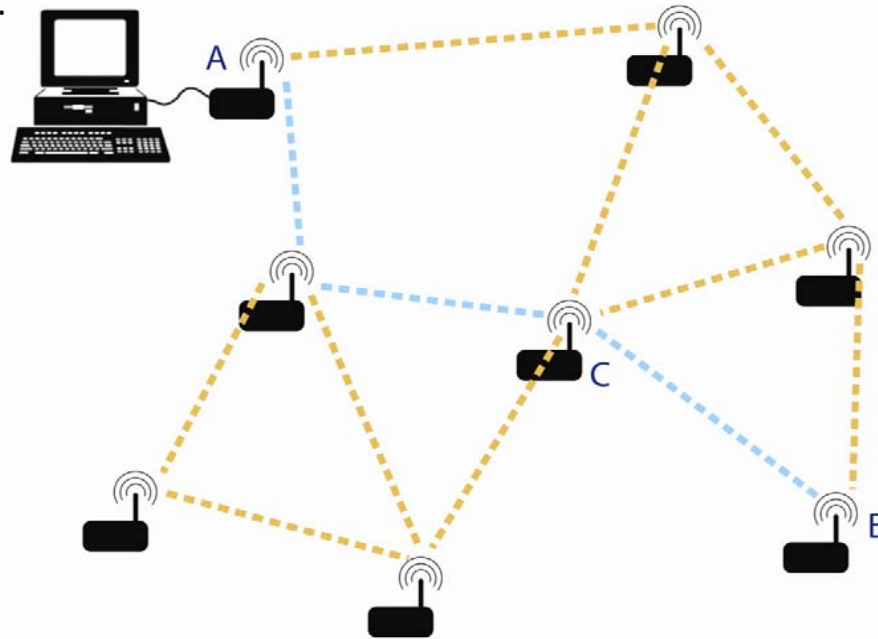
ZigBee-to-MaxStream Bridge



# ZigBee

## What is ZigBee?

A networking protocol built on top of 802.15.4 that allows for mesh networking and provides a communication standard between devices.



## MaxStream's ZigBee Offering: ZigBee Phase 1,2 and 3

Phase 1 (Available for download - September 2005)

ZigBee certified module and profile

Generic data transfer profile

AT commands for configuration

Communication with strings or 16-bit addresses



# MaxStream's ZigBee Offering: ZigBee Phase 1,2 and 3

Phase 1 Addressing Scheme



String addressing  
Generic data flow

## **MaxStream's ZigBee Offering: ZigBee Phase 1,2 and 3**

### **Phase 2 (Available for download - September 2005)**

ZigBee compliant module with no profile

Serial Interface

- UART interface to the APS (application specific) layer.

- Configurable ZigBee stack profiles

Interoperate with other ZigBee networks



## MaxStream's ZigBee Offering: ZigBee Phase 1,2 and 3

### Phase 3 (Available after July 18)

ZigBee compliant module with no profile

Access to MaxStream's microcontroller.

A/D channels, UART, GPIO

Interoperate with other ZigBee networks

Can create public or private profiles



## MaxStream's ZigBee Offering: ZigBee Phase 1,2 and 3

Phase 1	No	No	<ul style="list-style-type: none"><li>▪ Easy to implement</li><li>▪ No processor constraints</li></ul>
Phase 2	No	Yes	<ul style="list-style-type: none"><li>▪ No processor constraints</li></ul>
Phase 3	Yes	Yes	<ul style="list-style-type: none"><li>▪ Constraints on processing power</li></ul>

## Roadmap

Introduction to MaxStream's ZigBee/802.15.4 modules  
IEEE 802.15.4 (Shipping)

MaxStream's ZigBee Offering: ZigBee Phase 1,2 and 3

### **Modes of Operation**

MaxStream's ZigBee/802.15.4 stand-alone modems  
ZigBee-to-MaxStream Bridge



# Modes of Operation

## Addressing

16 bit or 64 bit IEEE addressing

AT Command settable (my, dh, dl)

Broadcast addressing has no retries or acknowledgments

Unicast has up to 3 retries

AT Command: ATDH
Parameter Range: 0 - 0xFFFFFFFF

AT Command: ATDL
Parameter Range: 0 - 0xFFFFFFFF

AT Command: ATMY
Parameter Range: 0 - 0xFFFF

# Modes of Operation

## Examples of AT Command Mode

### DH (Destination Address High) Command

Used to set and read the upper 32 bits of the module's 64-bit destination address.

When combined with the DL (Destination Address Low) parameter, it defines the destination address used for transmission.

### DL (Destination Address Low) Command

Used to set and read the lower 32 bits of the module's 64-bit destination address.

When combined with the DH (Destination Address High) parameter, it defines the destination address used for transmission.

AT Command: ATDH
Parameter Range: 0 - 0xFFFFFFFF

AT Command: ATDL
Parameter Range: 0 - 0xFFFFFFFF

# Modes of Operation

## Examples of AT Command Mode

### MY (16-bit Source Address) Command

Used to set and read the 16-bit source address of the module.

By setting MY to 0xFFFF, the reception of RF packets having a 16-bit address is disabled. The 64-bit address is the module serial number and is always enabled.

AT Command: ATMY	
Parameter Range:	0 - 0xFFFF

# Modes of Operation

## Addressing

### Unicast mode—Guaranteed Delivery

#### Configuring modules using 16-bit short addresses

To enable Unicast Mode using 16-bit short addresses, set DH and DL (Destination Address High and Destination Address Low) parameters as shown below.

The Destination Address is set by writing DH=0x00000000 and DL=0x00000001 to 0x0000FFFE. The Source Address is set by writing MY=0x0000 to 0xFFFE.

#### Configuring modules using 64-Bit IEEE addresses

The source address is set to the 64-bit IEEE address stored in the SH and SL parameters by setting MY = 0xFFFF. The destination address is determined by setting DH to the upper 32 bits and DL to the lower 32 bits. The one exception is that this case is illegal (DH=0x00000000 and DL=0x0000FFFF).