Next Generation Mobile Wireless Internet Technology

Rajiv Laroia

CTO

Flarion Technologies

What is Mobile Wireless Internet?

Anywhere anytime Internet connectivity

Typically over licensed spectrum

- Seamless extension of the Internet: end-to-end IP
- Support for voice and broadband data
- Provide QoS (Quality of Service)
- Affordable to end users

Is 2.5/3G the Answer?

United States --- CDMA 2000

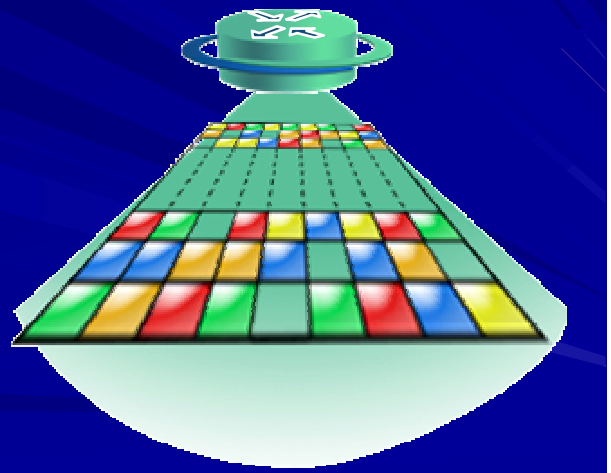
Europe --- GPRS (TDMA) / UMTS (W-CDMA)

- Circuit switched approach, complex network
- Not seamless, Internet protocols don’t work
- Circuit voice, packet data
- No interactive data support, no QoS support
- Expensive to end users

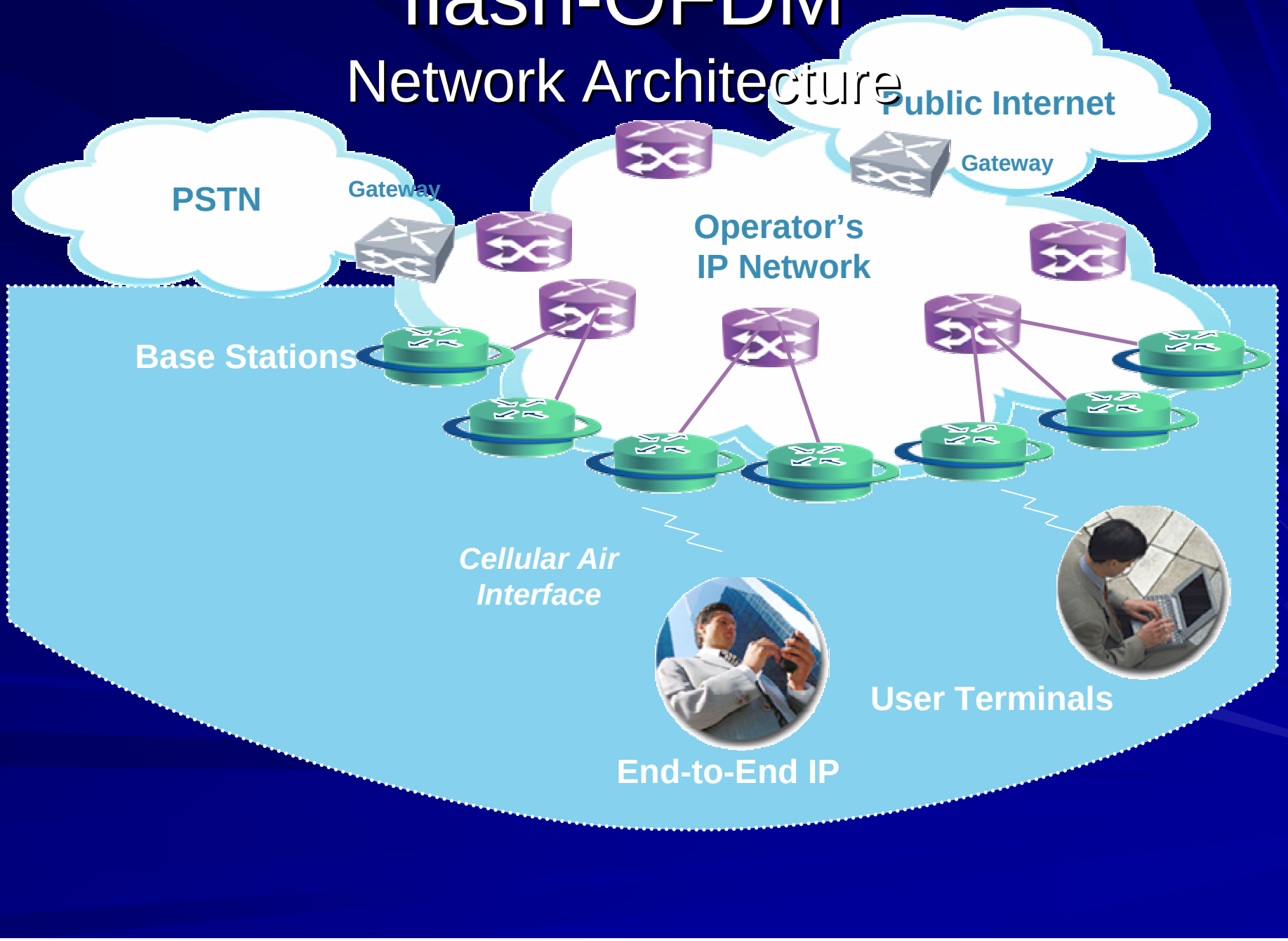
Is OFDM Technology the Answer?

OFDM Based Wireless Technology The Right Answer

Flarion Technologies has developed flash-OFDM™, a new packet data air-interface technology for mobile wireless Internet.

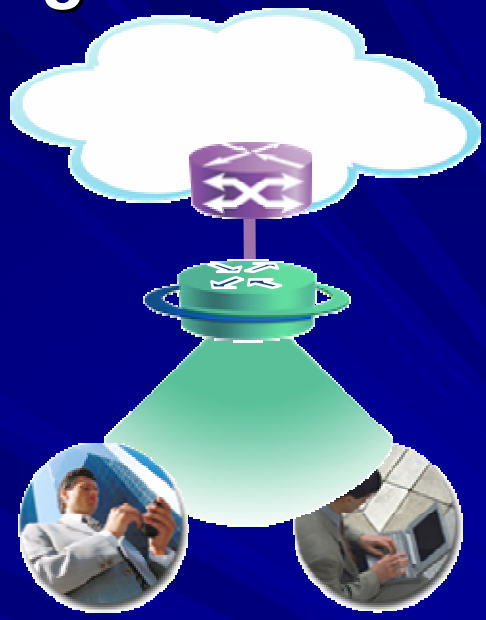


flash-OFDM
Network Architecture



flash-OFDM
Air-Interface Advantage

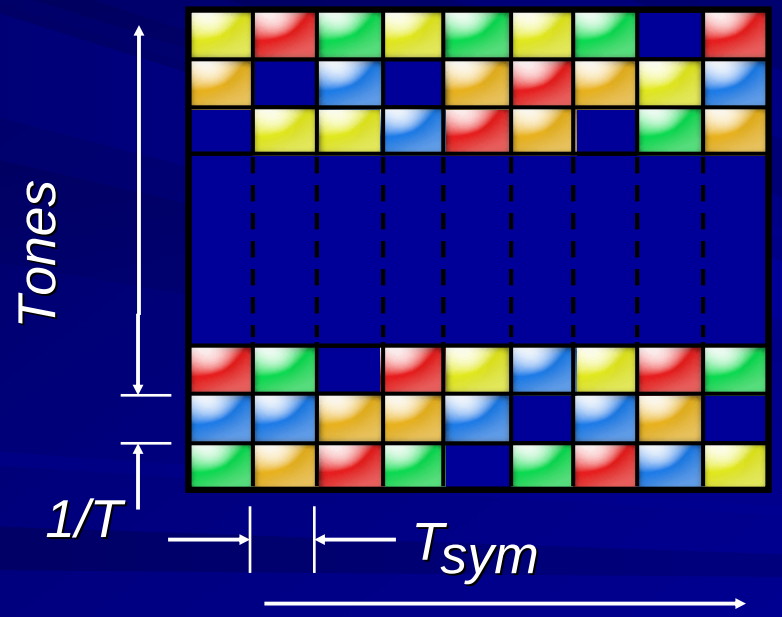
- **Circuit switched systems**
  - Create pipes (physical layer)
- **Packet data systems**
  - Create fat pipe (physical layer)
  - Share pipe efficiently between users (MAC layer)
  - Create reliable links for data (link layer)
  - Send packet data over links (higher layers)



flash-OFDM

Physical Layer Advantage

- **Downlink & Uplink based on OFDM**
  - Orthogonal --- TDMA benefits
  - Spread Spectrum --- CDMA benefits



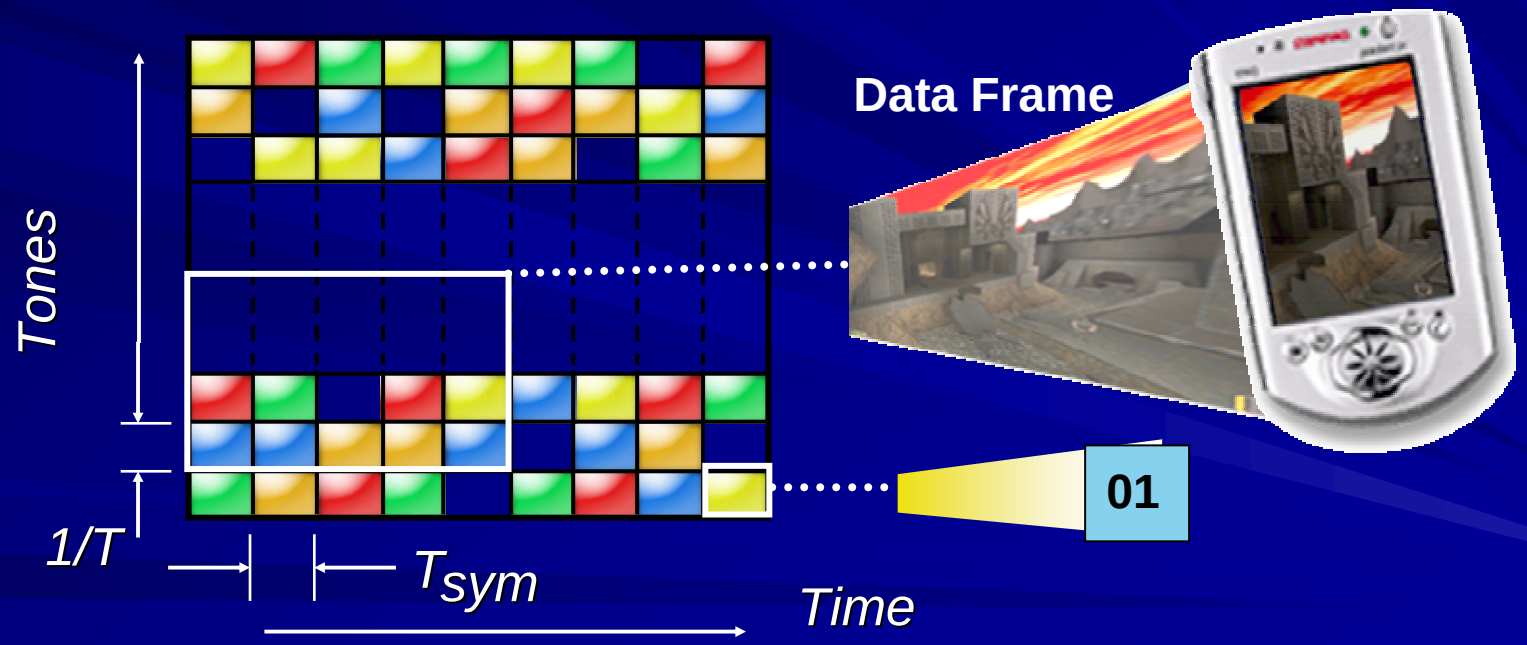
Fat Pipe

Fast Hopped - Spread Spectrum

flash-OFDM

MAC/Link Layer Advantage

- **OFDM granular resource partition**
  - No overhead control messaging
  - Data as frames



flash-OFDM

MAC/Link Layer Advantage

- **Fast retransmission over airlink**
  - Few millisecond retransmission loop time
  - Supports interactive applications

Interactive Data

- **Uplink transmission requests**
  - No contention based access
  - Uplink/downlink data frames scheduled

QoS

flash-OFDM
Higher Layer Advantage

- **Reliable link**
  - Far fewer end-to-end retransmissions
- **Low delay**
  - Efficient transport layer (TCP/IP)
  - Higher burst rates meaningful
  - Interactive applications supported (VoIP)
- **Mobile IP for hand-off**
  - True make-before-break with no soft-handoff
  - IP to the RadioRouter™
  - Reliable seamless handoffs

Better User Experience

flash-OFDM
System Advantages

- **Transmit antenna and multi-user diversity**
- **Autonomous RadioRouters™**
  - No common timing reference (no GPS)
  - No need for frequency or code planning
  - No knowledge of neighboring RadioRouters™
- **Scalable, flexible architecture**
- **Lower cost:**
  - System planning
  - System deployment
  - Maintenance

“Every Bit Wireless”