



# **With The Best in the World The Radiata Story**

**Neil Weste  
Director, Engineering  
Wireless Networking Business Unit (WNBU) Australia  
Cisco Systems Inc.**

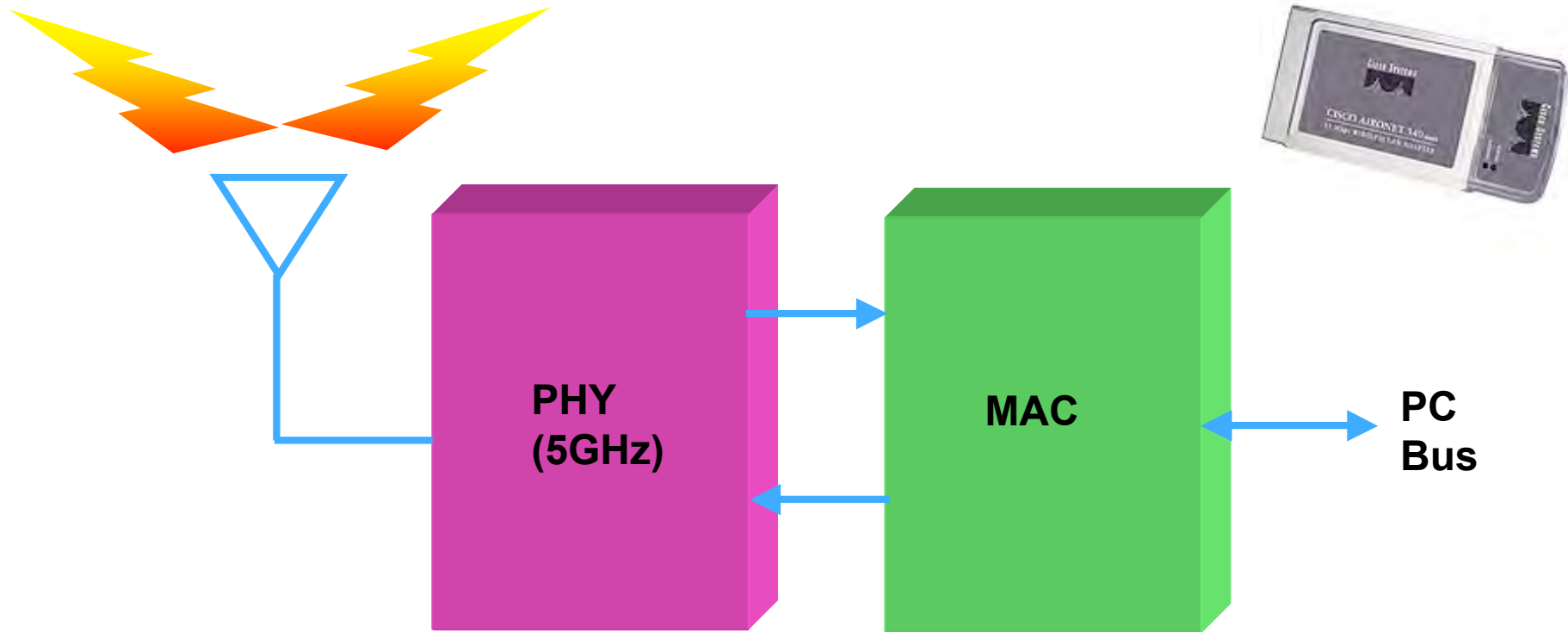
# Outline

- **Background**
- **Lessons learnt**
- **Conclusions**

# Radiata Background

- **CSIRO and Macquarie University R&D into high speed wireless LANs started in the early 1990's**
- **Radiata founded in 1997**
- **Acquired by Cisco in 2001**

# Wireless Local Area Networks



**IEEE 802.11a WLAN standard**

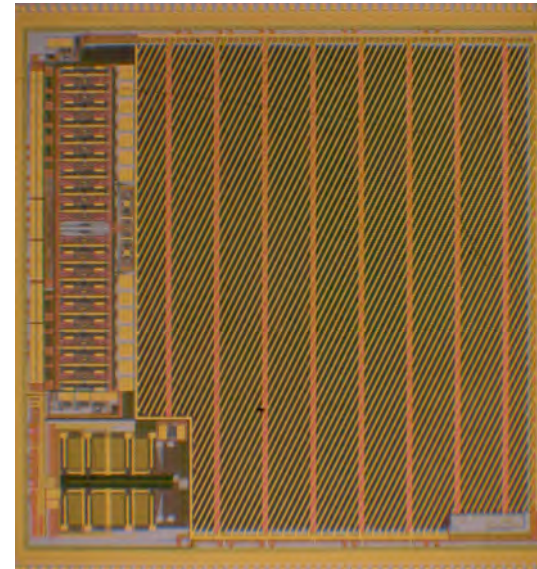
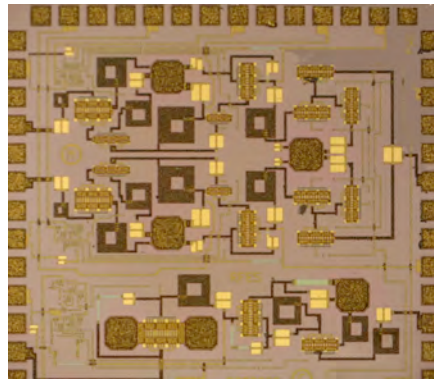
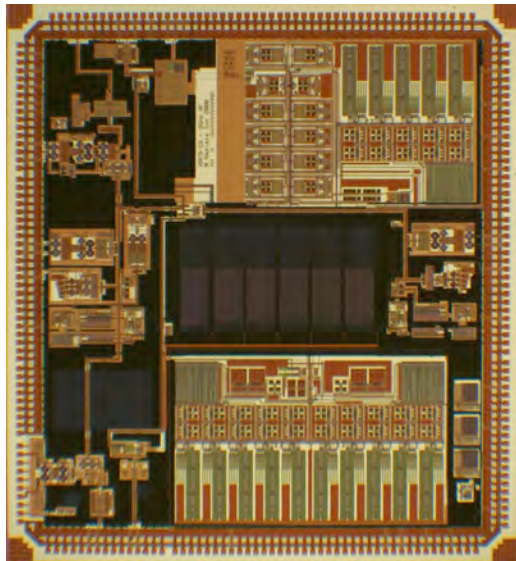
**5.15-5.35 GHz (UNII 1,2)**

**6-54Mbps rate adjustable (BPSK, QPSK, 16QAM, 64QAM)**

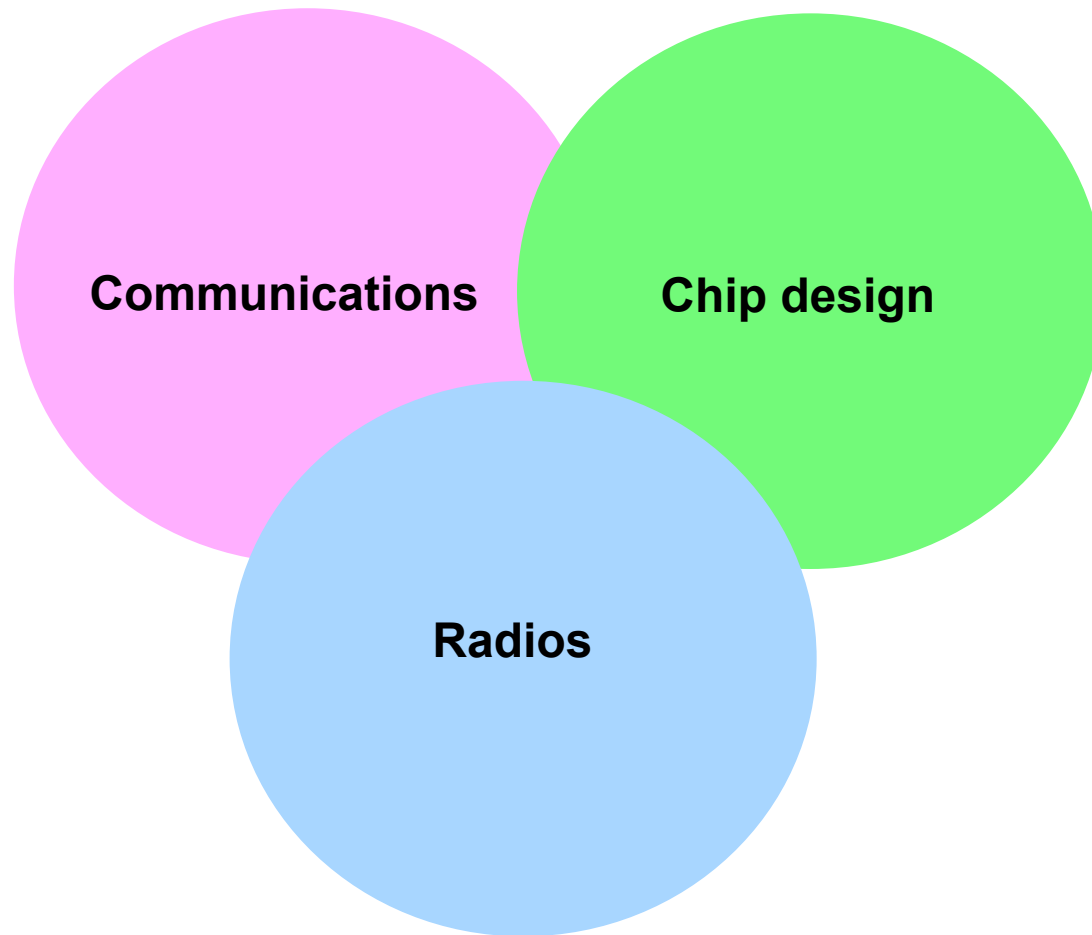
**Coded Orthogonal Frequency Division Multiplexed (COFDM)**

# CMOS Wireless Chips

- **Millions of transistors**
- **Very demanding design challenge**
- **Very few groups in the world equipped to design such chips**



# Technical Expertise



# Keys to Success

- **Timing**
- **Knowledge**
- **Resources**
- **Focus**

# Keys to Success

- **Timing**
- **Knowledge**
- **Resources**
- **Focus**

# Timing

- **Market**
- **Finance**

# Market

- **Market did not exist when we started**
- **Low speed WLAN – not much interest in high speed “But I have 56K”**
- **“What’s the killer app?”**
- **“What’s your value proposition?”**
- **“There’s millions of guys working on this. You’d better hurry”**

# However

- **Internet rapidly growing**
- **Laptops proliferating**
- **We saw a very low cost CMOS solution**
- **IEEE 802.11 standard solidifying**
- **UNII 5GHz spectrum allocated**

# Finance

- **Sept 1997 – founders seed (the gauntlet thrown down)**
- **March 1998 – M/A-COM contract (the broken finger)**
- **Sept 1998 – Start Grant (fonts)**
- **Sept 1999 – First Round funding (PacMan buildings)**

# Keys to Success

- **Timing**
- **Knowledge**
- **Resources**
- **Focus**

# Knowledge

- **Market**
- **Technology**
- **Competitors**
- **Business**

# Market

- **Visited Potential Customers**
- **Events – laptops, internet, spectrum, CMOS**
- **Play with the technology**
- **Cost and Power**
- **Disruptive Technology**

# Technology

- **CMOS for everything (>20 years in field)**
- **There were research protos (visit the profs)**
- **A measured risk for RF CMOS at 5GHz**
- **Careful punt with a backup strategy**
- **Very little used from the academic roots of Radiata (except experience)**

# Competitors

- **Worked the contacts**
- **Visited the competitors**
- **VCS, senior execs, unis, ...**
- **Friends in the valley (in startups – used as models)**
- **Hung out with them at conferences**

# Business

- **Very experienced CEO (Chris Beare)**
- **Ditto CFO (Steve Simpson)**
- **Ditto President (Don MacLennan)**
- **Once a professor, always a professor...(not!)**

# Keys to Success

- **Timing**
- **Knowledge**
- **Resources**
- **Focus**

# Resources

- **People**
- **Facilities**
- **Marketing**

# Background

- **IC designers are a scarce resource worldwide let alone Australia, let alone analog and RF**
- **IC design tools cost > \$1m per year per site**
- **One IC fabrication cycle can cost upwards of \$A500K**

# People

- **Trained core team in IC design tools and design methods at Macquarie**
- **Negotiated deal with CAD vendor for early (cheaper) access to tools contingent on first round funding**
- **Used external contractors while building team**
- **Project a big image and carry some Aussie wine....**

# Facilities

- **CAD Tools (>\$1m per year)**
- **CMOS Fab (>\$1m per year)**
- **Computers**
- **Lab Equipment**

# Marketing

- **Hire a US CEO**
- **He hired a VP Marketing**
- **Both ran a SV marketing campaign**
- **“On site” for majority of customers**

# Keys to Success

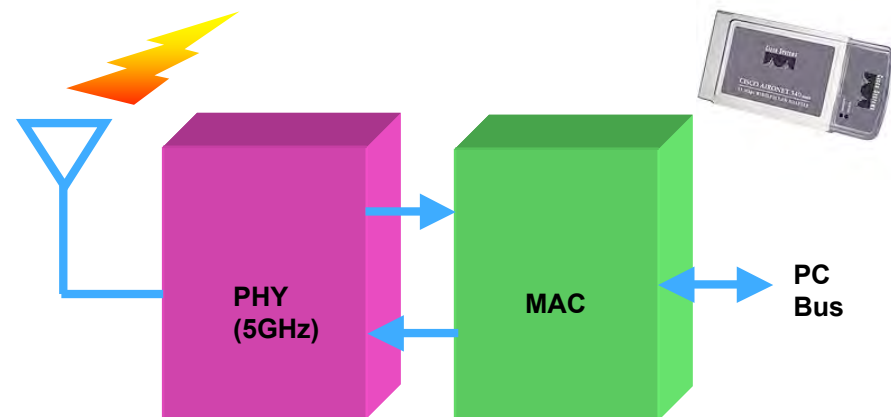
- **Timing**
- **Knowledge**
- **Resources**
- **Focus**

# Focus

- **“all the wood behind the one arrow point” (Scott McNeally, Sun Micro)**
- **However retain adaptation**
- **Total commitment**

# The story changed...

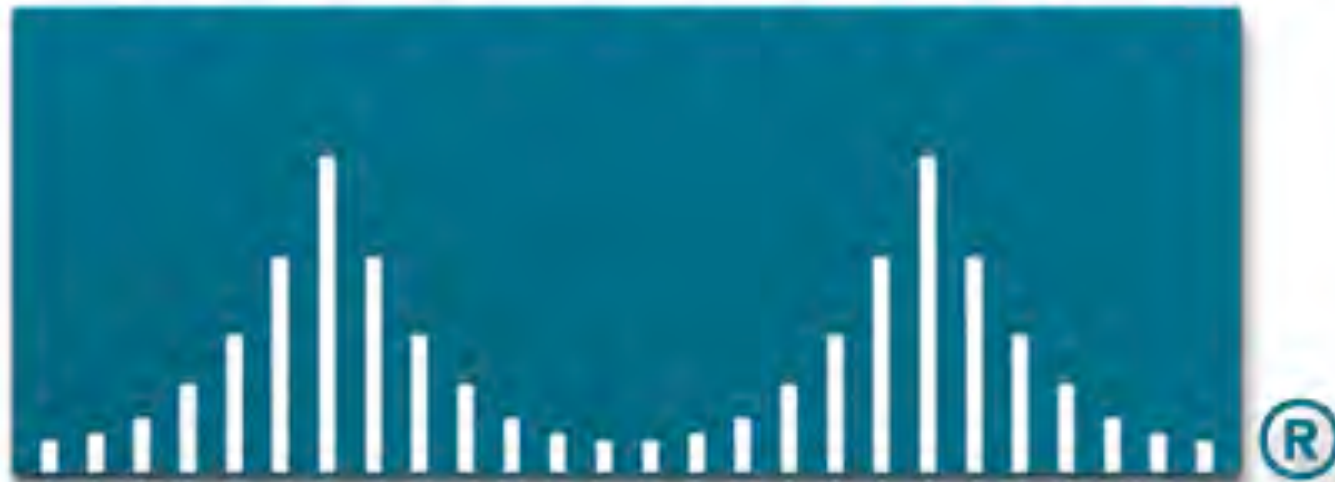
- “not a WLAN company” – chip centric
- CMOS modems for PHY
- CMOS radio – PHY
- MAC partners



# Conclusions

- **Know your market**
- **Know your technology**
- **Know your competition**
- **Know your strengths**
- **Know your limitations (and ignore them..)**
- **Hire good people**

# CISCO SYSTEMS



EMPOWERING THE  
INTERNET GENERATION<sup>SM</sup>