

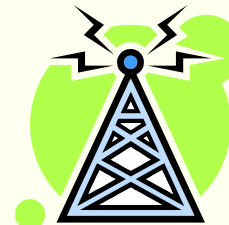
Dept of Communications & Computer Engineering

ICT technologies to make u- & i-Japan (world) a reality

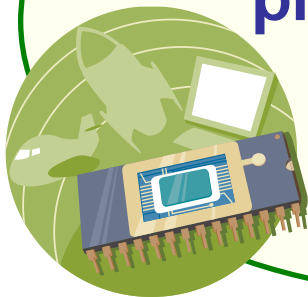
Computer



Communications



LSI & Signal processing

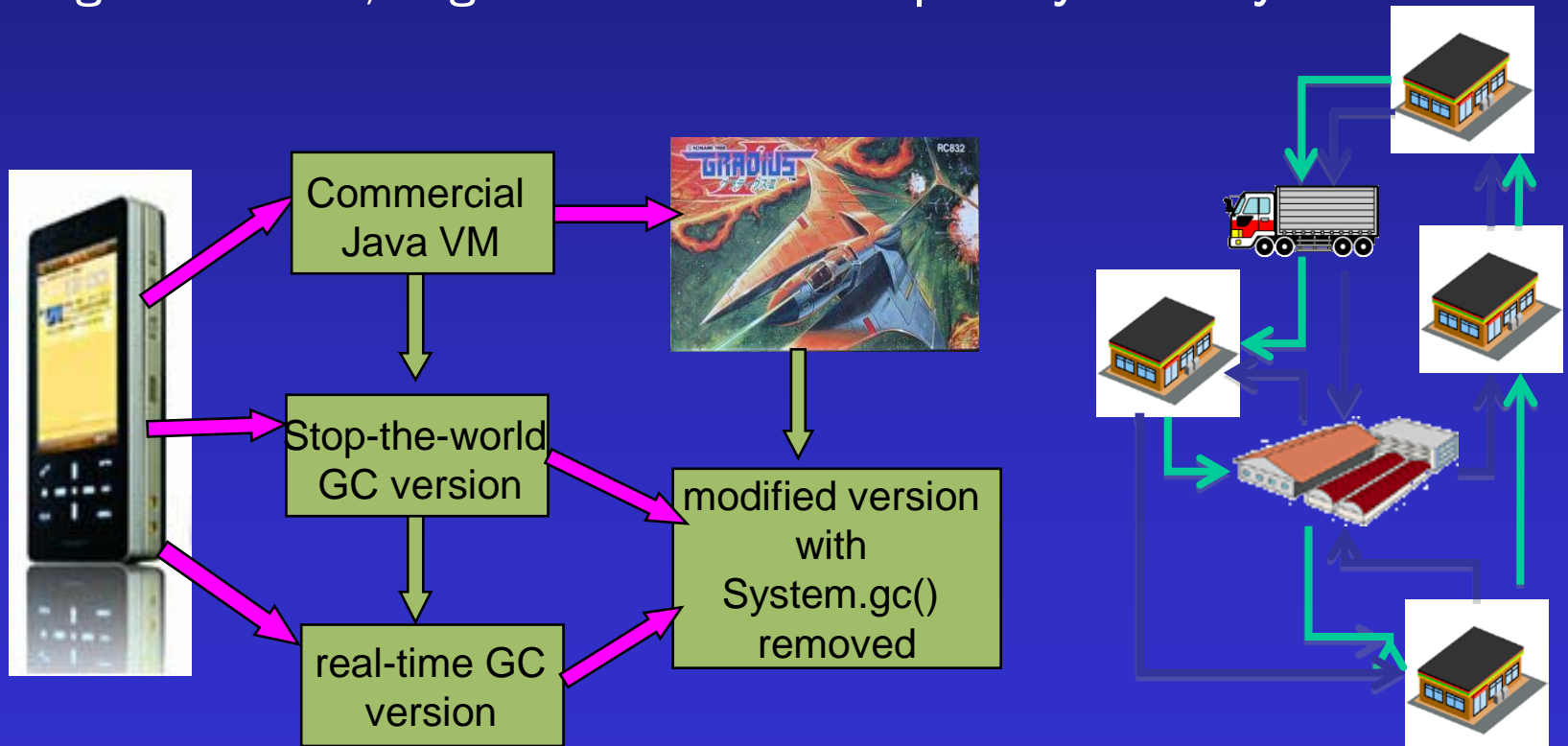


Radio Atmospheric Sciences



Computer Engineering :

- Design of Programming Languages and Mechanisms
- Dependable Execution of Programs
- Computer Architecture
- Logic Circuits, Algorithms and Complexity Theory

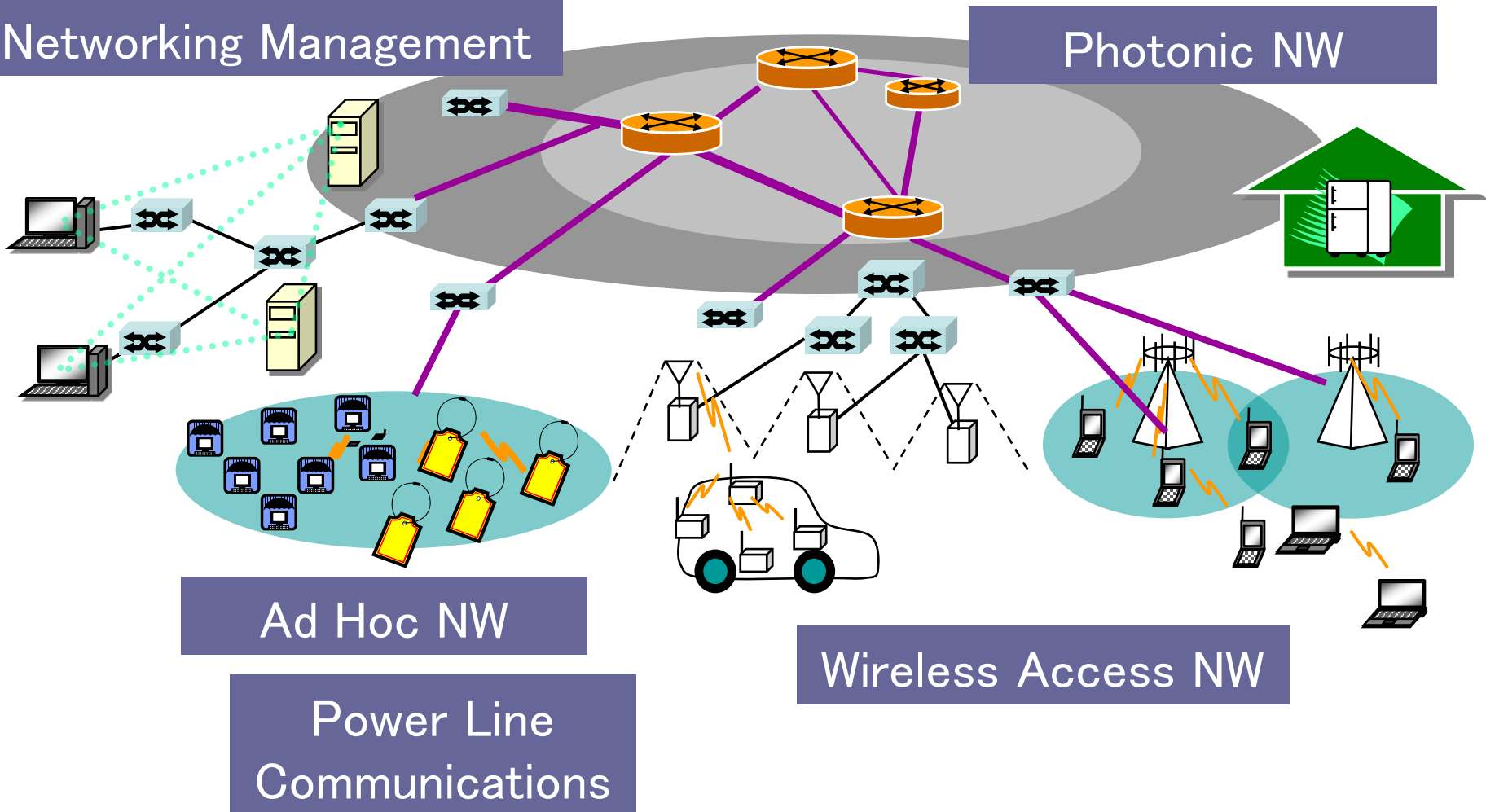


Communications Engineering

Towards Ubiquitous network society

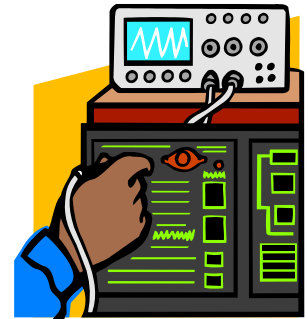
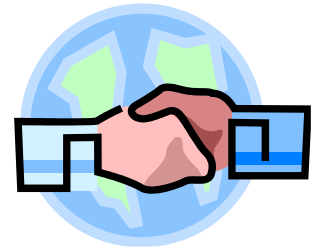
Networking Management

Photonic NW



Dept of Communications and Computer Engineering

- ◆ ICT Technologies supporting secure & sound society
- ◆ Strong needs from various industries
- ◆ Various liaisons with industries
- ◆ Not only theory & simulation, but also prototyping and practical implementations
- ◆ Convergence of engineering & science



Introduction to Digital Communications Lab (Yoshida)

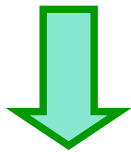
- e-Japan, e-Japan II , u-Japan
- i-Japan strategy 2015:

Japan ICT Strategy

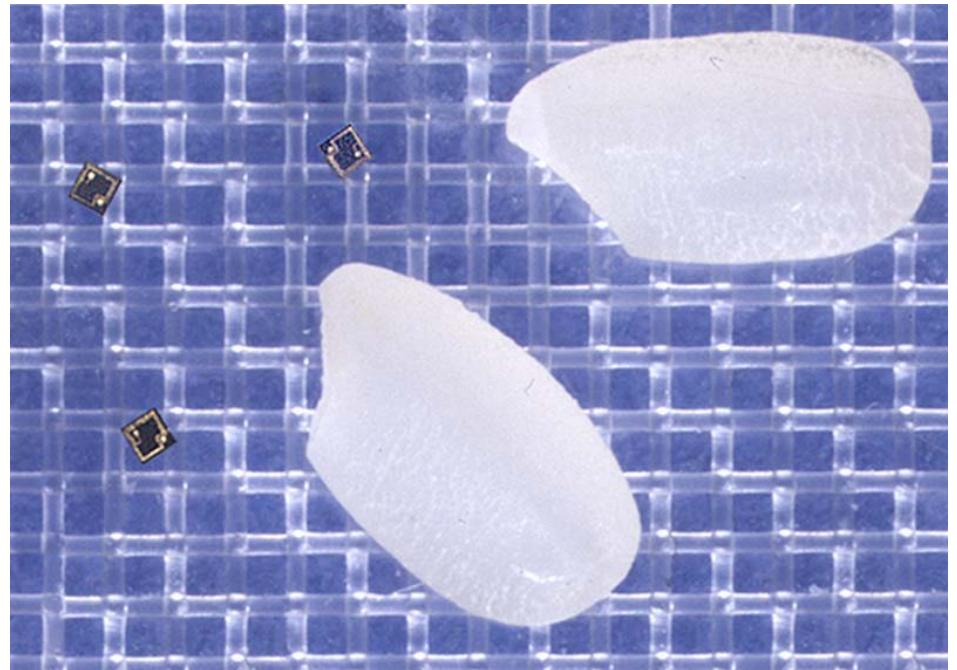
Towards digital /nclusion & /nnovation

“7 trillion wireless devices serving 7 billion people by 2017”

WWRF (wireless world research forum) **vision**



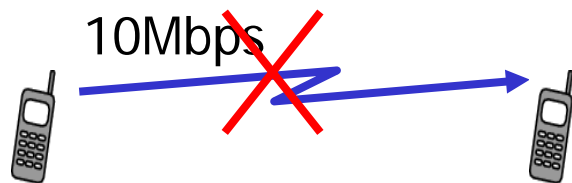
Distributed Wireless Network
(self-organizing ad hoc networks)



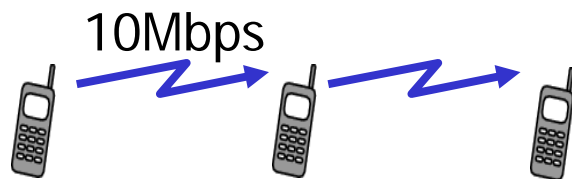
Why multi-hop ?

Higher Tx rate needs higher Tx power

Is multi-hop transmission always effective ?

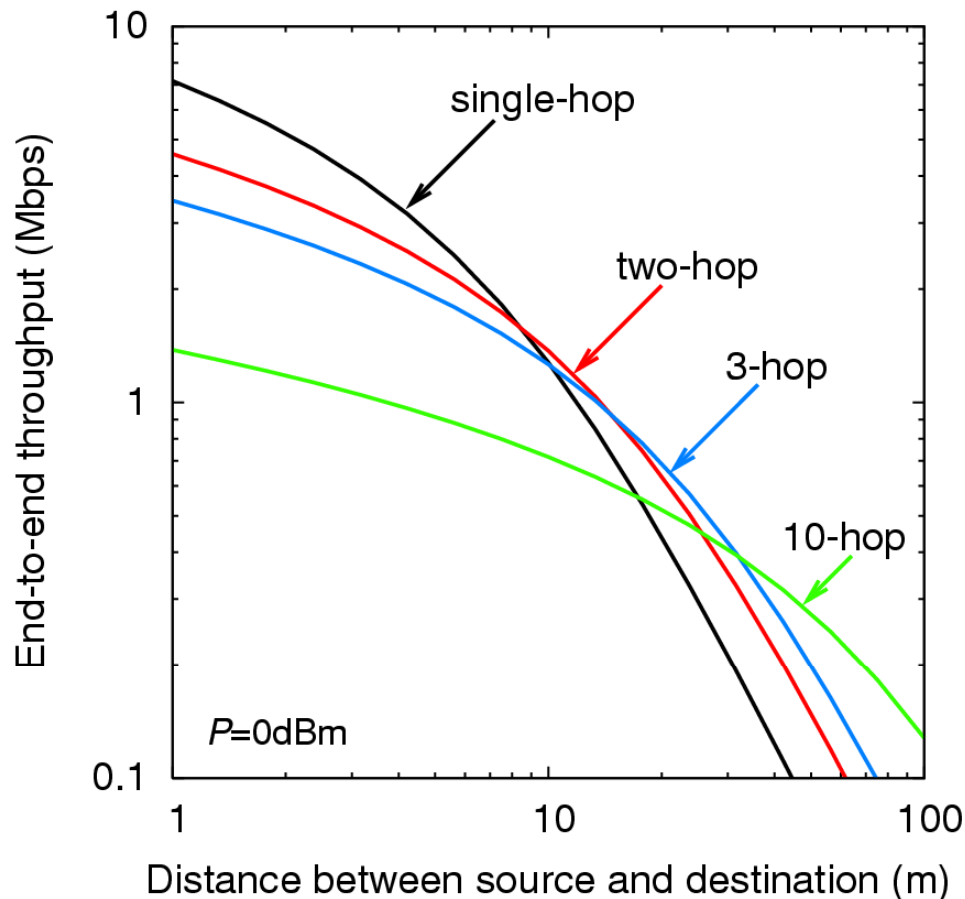


Multihop transmission

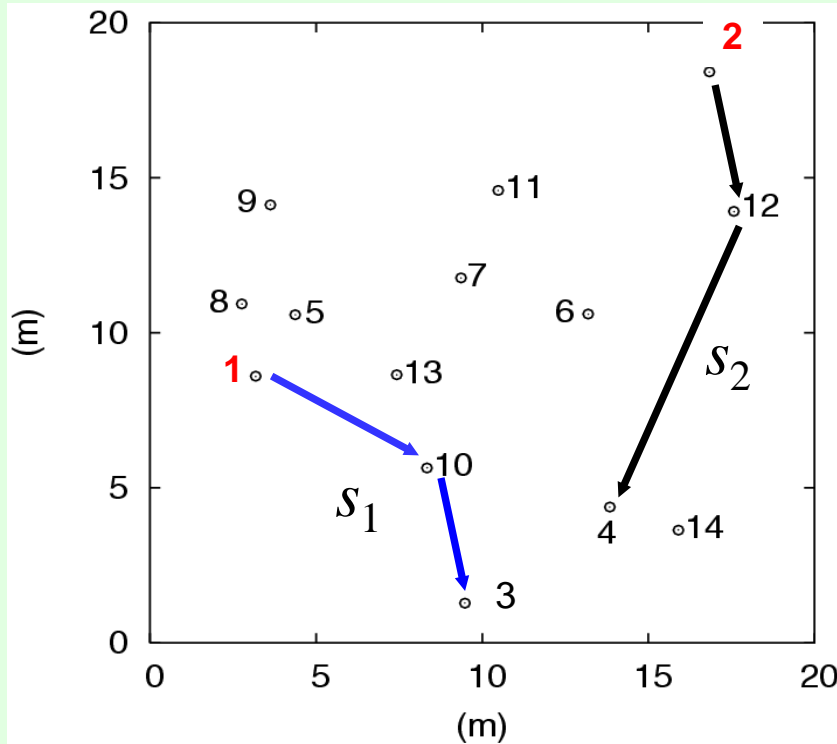


MAC (efficiency: 100%) → 5Mbps

Rate adaptation



Distributed Adaptive Route Selection :

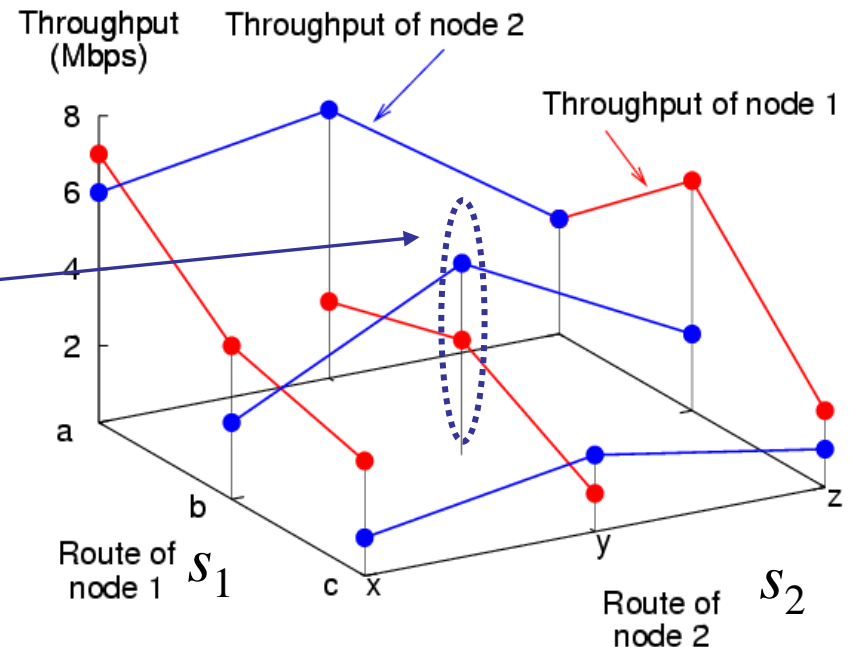


Nash Equilibrium
(game Theory)

Nash equilibrium

$$u_1(s_1^*, s_2^*) \geq u_1(s_1, s_2^*) \quad \forall s_1 \in S_1$$

$$u_2(s_1^*, s_2^*) \geq u_2(s_1^*, s_2) \quad \forall s_2 \in S_2$$



Towards IMT-Advanced (4G)



Laboratory measurement equipments
(fading channel emulators)



Implementation of
Gb/sec MIMO-MLD

Inter-vehicle communication

