



CREW



Cognitive Radio Experimentation World

picoMesh cognitive networking for small embedded devices [Altran]

Goals

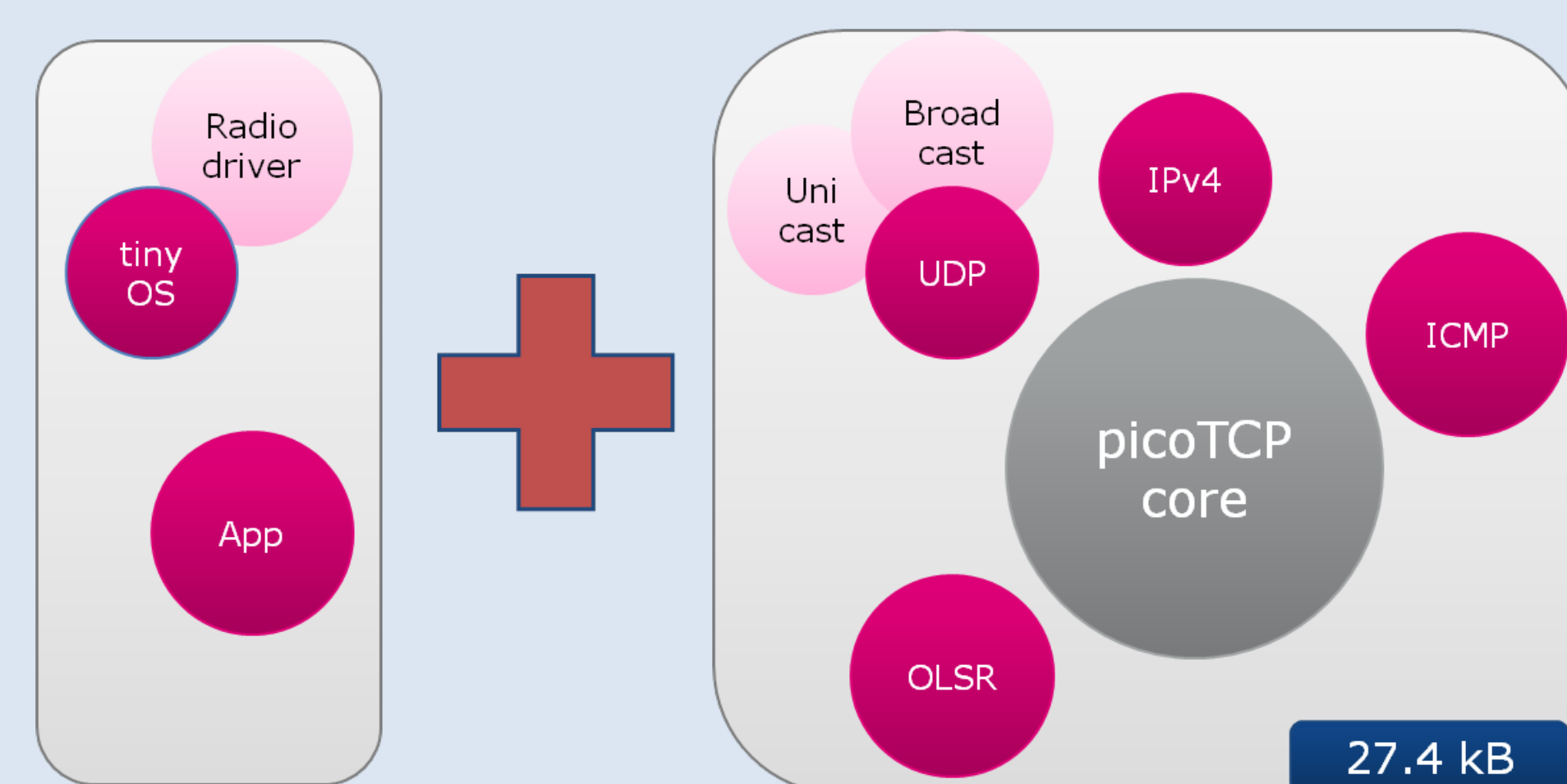
- To port picoTCP to TinyOS
- Establish TCP/IP routes on small nodes
- Test the dynamic routing mechanism on a real MESH network
- Build realistic simulator to speed up development

Challenges

- Provide picoTCP driver for IEEE802.15.4 radio device
- Improve OLSR support
- Integrate real test scenarios with emulation and virtualization tools
- Release validated software as Open Source

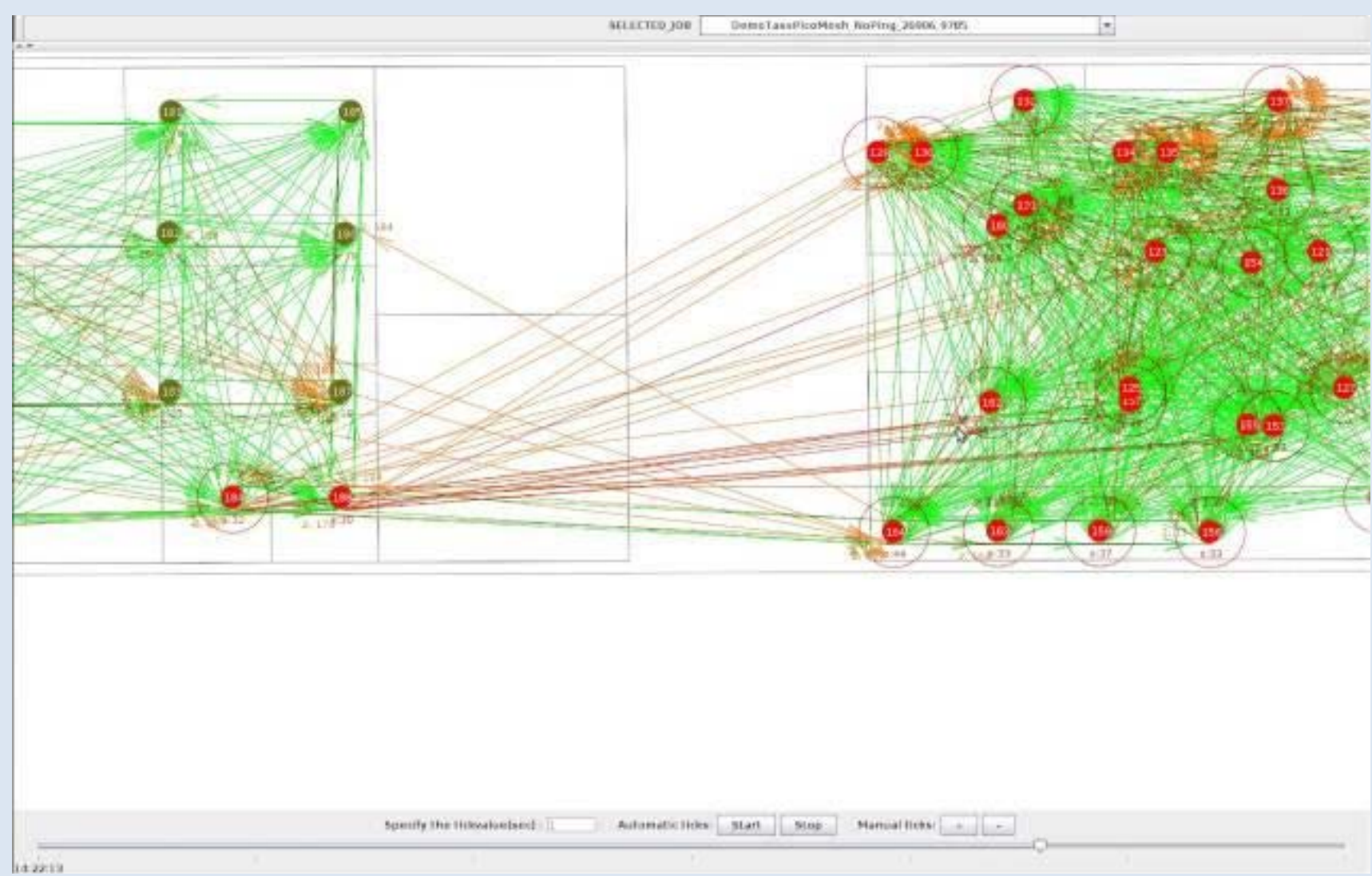
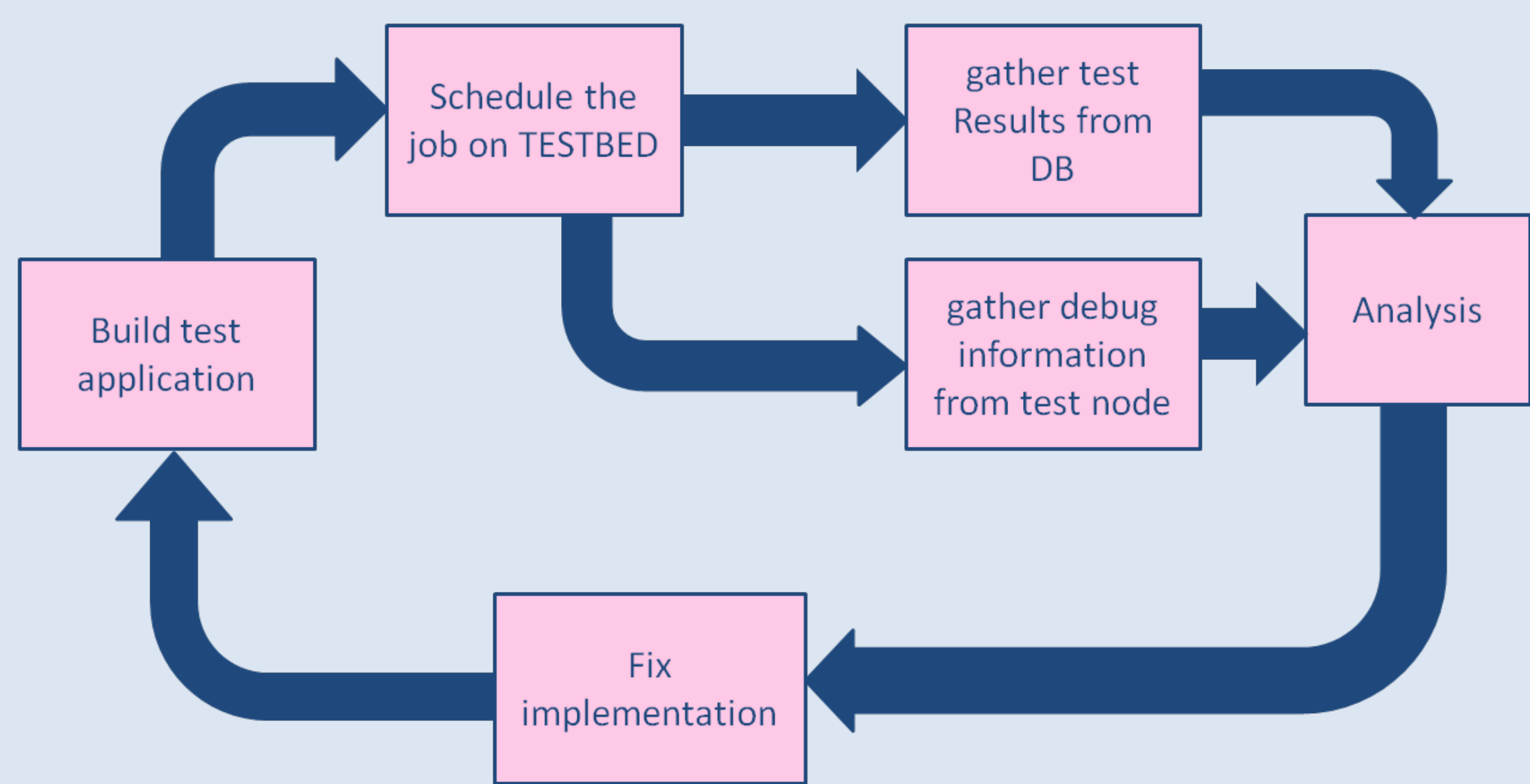
Software

- PicoTCP provides an embedded TCP/IP stack that is scalable, portable and highly performant
- The core can be extended with modules such as OLSR (picoMesh)
- For testing purposes on w-iLab.t, a TinyOS application was written that makes use of the picoTCP library and calls the correct radio driver for the Tmote Sky sensor nodes.



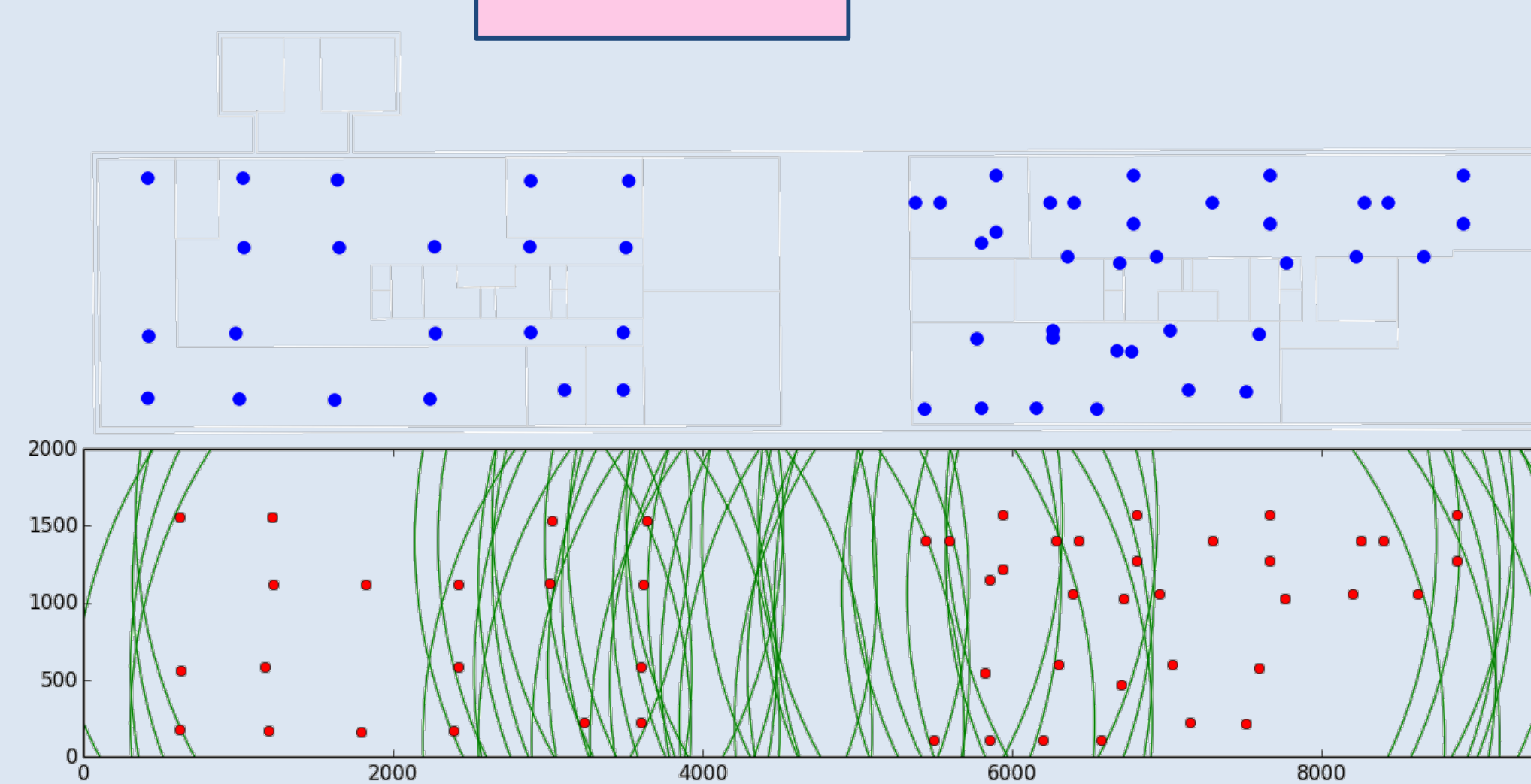
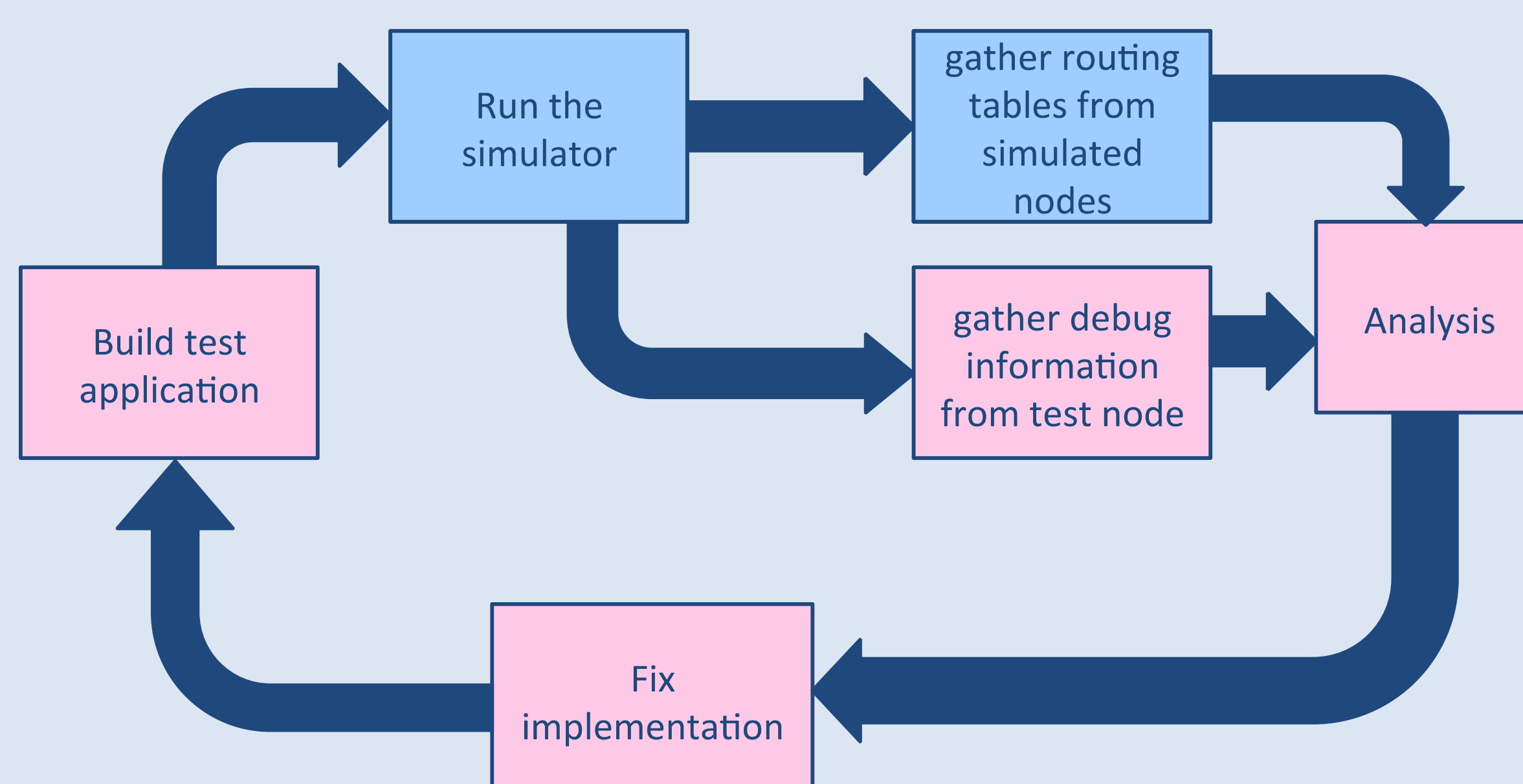
From experiment...

Compile, test, debug, repeat



... to simulation

Compile, simulate, debug, repeat



Conclusions

- Successfully ported picoTCP to tinyOS
- Developed an Open Source MESH network simulator
- Improved OLSR (RFC3626) implementation for picoTCP
- Proven feasibility of real IPv4 MESH networking over a IEEE802.15.4 network
- Solved the hidden-node problem using dynamic routing

Testimony

- w-iLab.t eases to scale the number of nodes
- Using an issue tracker is a very efficient way of problem solving
- CREW team has been very supportive during the whole duration of the experiments



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PROJECT DATA

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