**Моделирование беспроводных сенсорных сетей на cooja симуляторе**

**Лабораторная работа No4: Rest пример (протокол COAP)**

**Начать COOJA**

cd contiki-2.6/tools/cooja/

ant run

COOJA compiles, and after a few seconds the simulator appears. All COOJA simulations are controlled using plugins: small Java programs that interact with simulations and simulated nodes. When COOJA is started, no simulation is loaded and no plugins are started.

**Создать симуляцию**

A new simulation is created via the menu.

• Click menu item: File, New Simulation. A number of configuration options are presented. Feel free to ask if you have any questions.

• Enter a Simulation title, and click Create.

We have now created our first simulation in COOJA. However, the simulation does not contain any nodes yet. To add nodes we need to first create a node type, and then add nodes to the simulation.

**Создать типы узлов**

Any simulated node in COOJA belongs to a node type. The node type determines, among others, which Contiki applications to simulate. The node type also determines whether nodes are simulated or emulated.

• Click menu item: Motes, Add Motes, Create new mote type, Sky mote. You have selected to emulate Tmote Sky nodes, and now need to select what Contiki program to simulate.

• Enter a Description.

• Click Browse, and navigate to examples/rest-examples/rest-examples/rest-server-example

• Click Compile to start compiling the Contiki program

• Click Create when complication finishes.

We have now created a simulation with a single node type. Before finally starting to simulate, we need to add nodes belonging to this node type.

**Добавить узлы**

A dialog allowing you to add nodes has appeared. This dialog can later be accessed via:

• Menu item: Motes, Add motes, [examples/rest-examples/coap-client-example

].

• Enter the number of nodes you want to simulate (e.g., 5), and press Create and Add.

Five nodes are added to the simulation, randomly located in the XY-plane. Instead of using the Random Position, you can also use Linear, Ellipse, or Manual Positioning. Note that when you add nodes later, the visualiser plugin is rescaled in order to distribute the nodes all over the XY- plane. Moving nodes is possible by left-clicking on a node and dragging it across the XY-plane. Go to the “Network” window, click the view menu, and choose the properties you want to show for the nodes.

**Начать симуляцию**

A number of plugins are automatically started. These, and more plugins, can be accessed via the tools menu. Mouse drag and drop nodes to change their positions. In the Control Panel, click Start to start the simulation. Note the node serial data appearing in the radio messge.

**Сохранить симуляцию**

COOJA allows for saving and loading simulation configurations. When a simulation is saved, any active plugins are also stored with the configuration. The state of a current simulation is however not saved; all nodes are reset when the simulation is loaded again.

To save your current simulation, click menu item: File, Save simulation. Simulations are stored with the file extensions .csc.

To later load a simulation, click menu item: File, Open simulation, Browse...., Select a simulation configuration. When a simulation is loaded, all simulated Contiki applications are recompiled. A functionality similar to saving and loading simulations, is reloading a simulation. Reloading can be used to reset the simulation to restart all nodes. More importantly, reloading a simulation will recompile all Contiki code, useful while developing Contiki programs. To reload your current simulation, press Ctrl+R

1) дайте определение протоколу coap

2) поверх какого транспортного протокола работает coap

3) как посмотреть маршрут трафика в сенсорной сети