

# **WinPEPSY Guide**

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# WinPEPSY Guide

## ❖ Overview

- The Main WinPEPSY Window
- Network Construction
- Analysis
- Performance Quantities
- Solution Algorithms

# WinPEPSY Guide

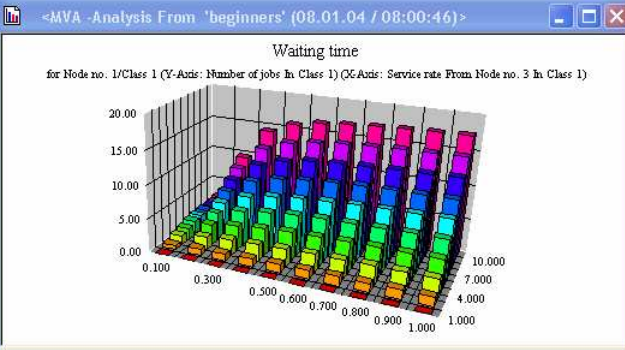
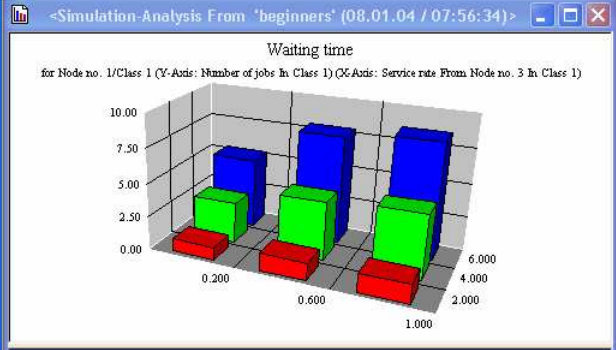
## ❖ The Main WinPEPSY Window

The screenshot displays the WinPEPSY software interface. The main window shows a network diagram with three nodes (Node no. 1, Node no. 2, and Node no. 3) and their connections. Node no. 1 is an M/M/m - FCFS queue. Node no. 2 is an M/M/m - FCFS queue. Node no. 3 is an M/M/m - FCFS queue. The network is a closed net.

The right-hand side of the window contains a tree view showing the network structure:

- beginners
  - Net type: Closed net
  - Nodes (3)
    - Node no. 1
      - Node type: M/M/m - FCFS (symmetric / multi server)
      - Service rates
      - Transition probabilities
    - Node no. 2
    - Node no. 3
  - Job classes (1)
    - Class No. 1 (Closed)

| Methods        | Explanation   |
|----------------|---|
| MVA            | Mean value analysis for closed product form networks with several class   |
| BIPHASE        | BIPHASE analysis for closed networks without classes                      |
| Simulation     | Simulation for mixed networks with classes and general service time distr |
| OPFN analysis  | OPFN analysis for open networks with classes and single server nodes      |
| SOPFN analysis | SOPFN analysis for open networks without classes and with multi server    |
| Marie          | MARIE analysis for closed networks without classes with general service   |
| DECOMP         | Decomposition analysis for open networks with classes and general serv    |
| STATESP        | Statespace analysis for closed networks with classes (not implemented)    |

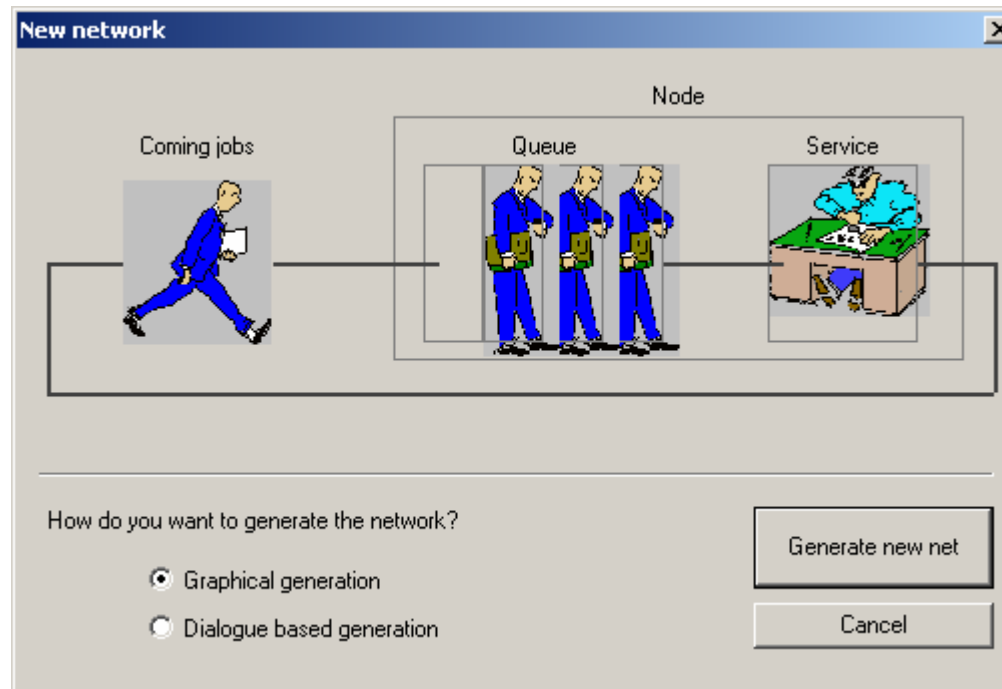


## ❖ Network Construction

- open a new network

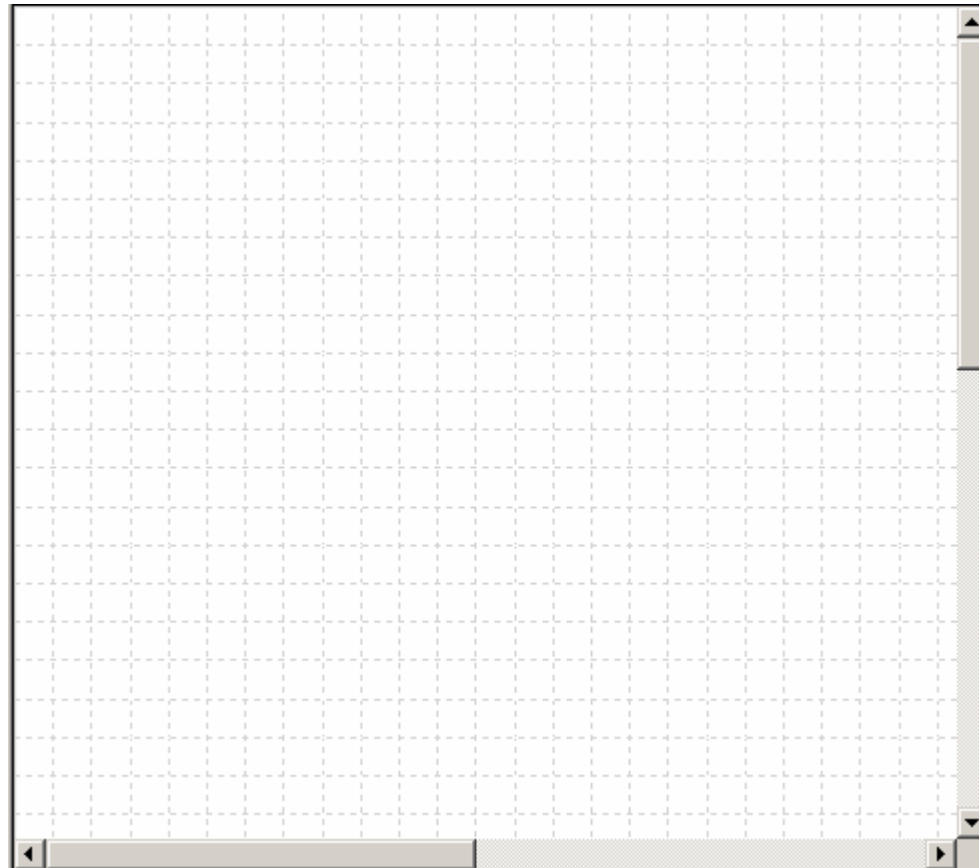


- graphical generation



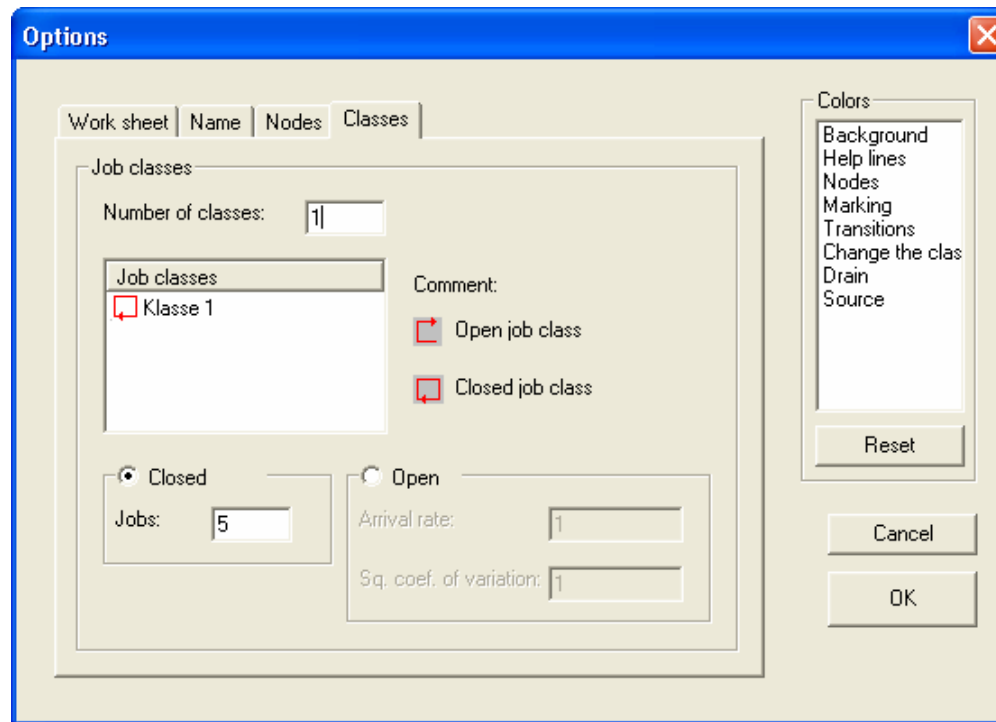
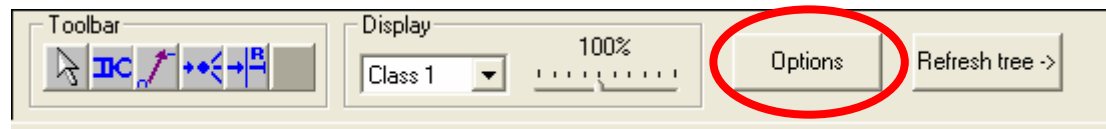
## ❖ Network Construction (cont.)

- empty net window



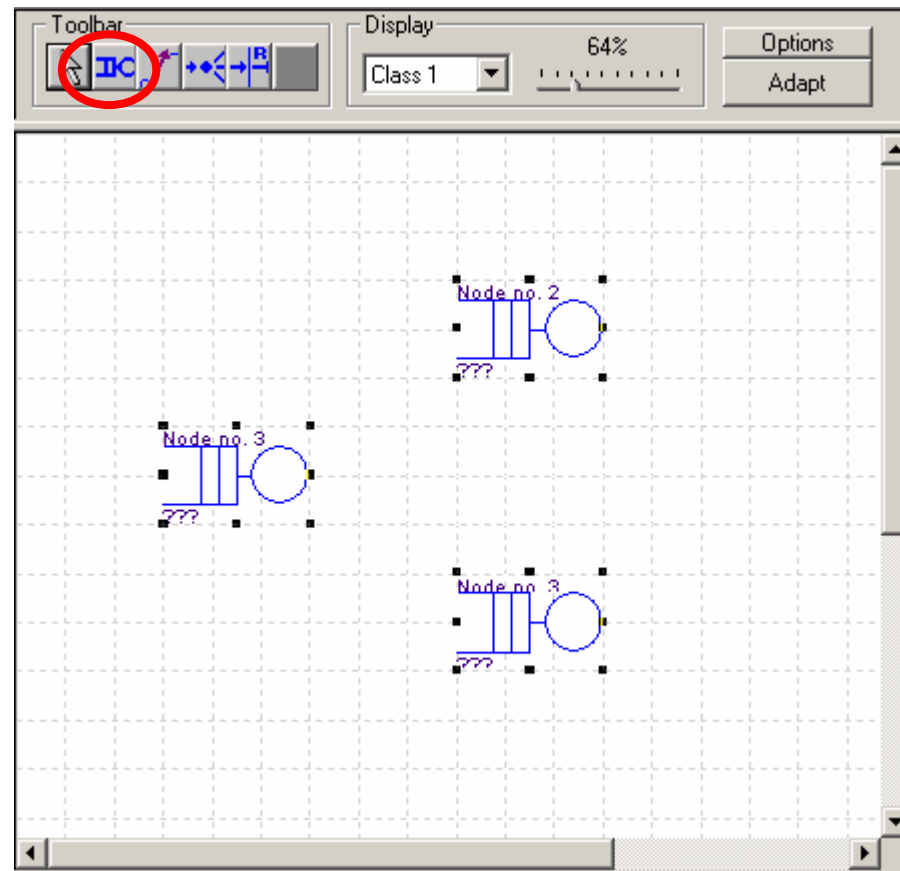
## ❖ Network Construction (cont.)

- choose number of classes and class types



## ❖ Network Construction (cont.)

- insert nodes

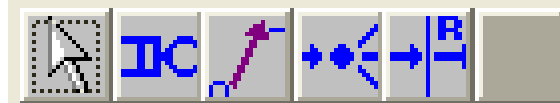


## ❖ Network Construction (cont.)

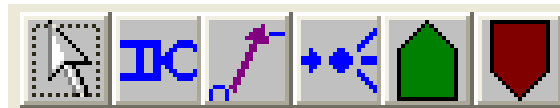
- select class for construction



- toolbar for closed classes



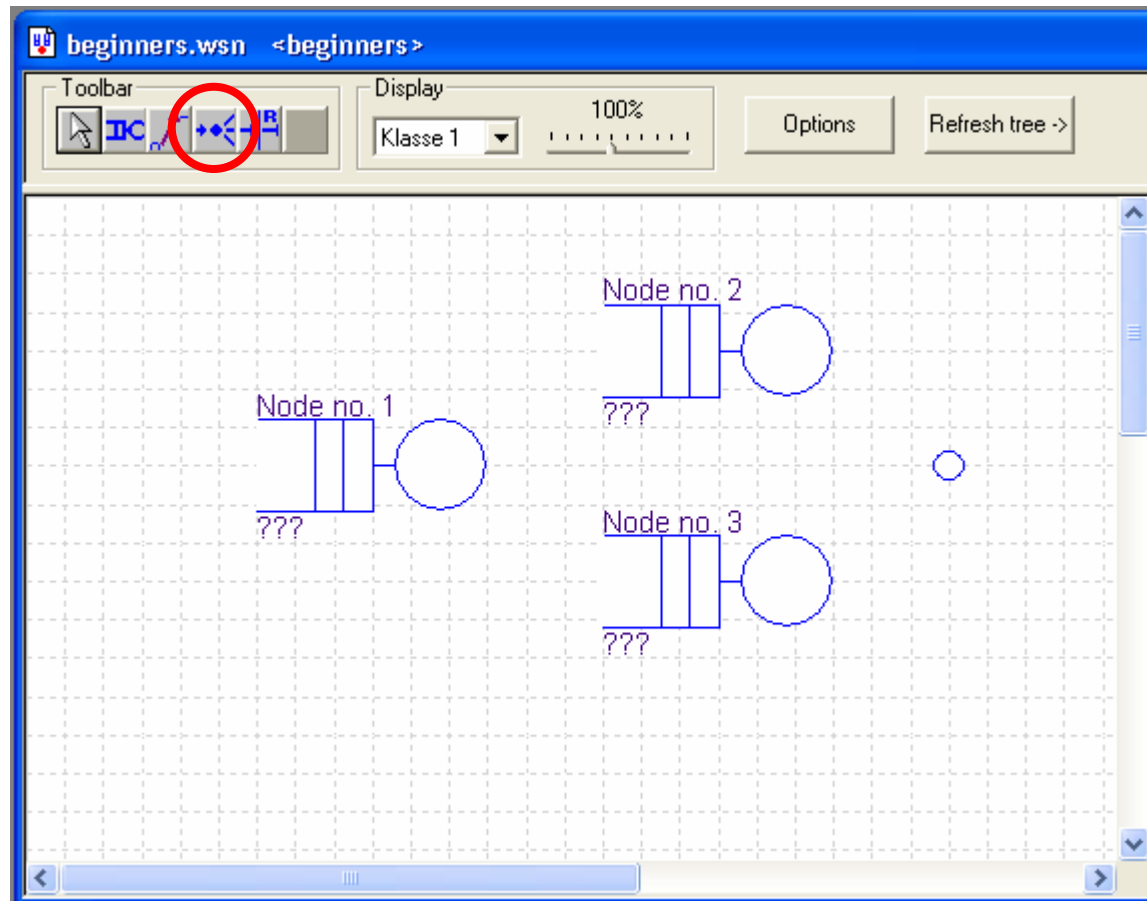
- toolbar for open classes





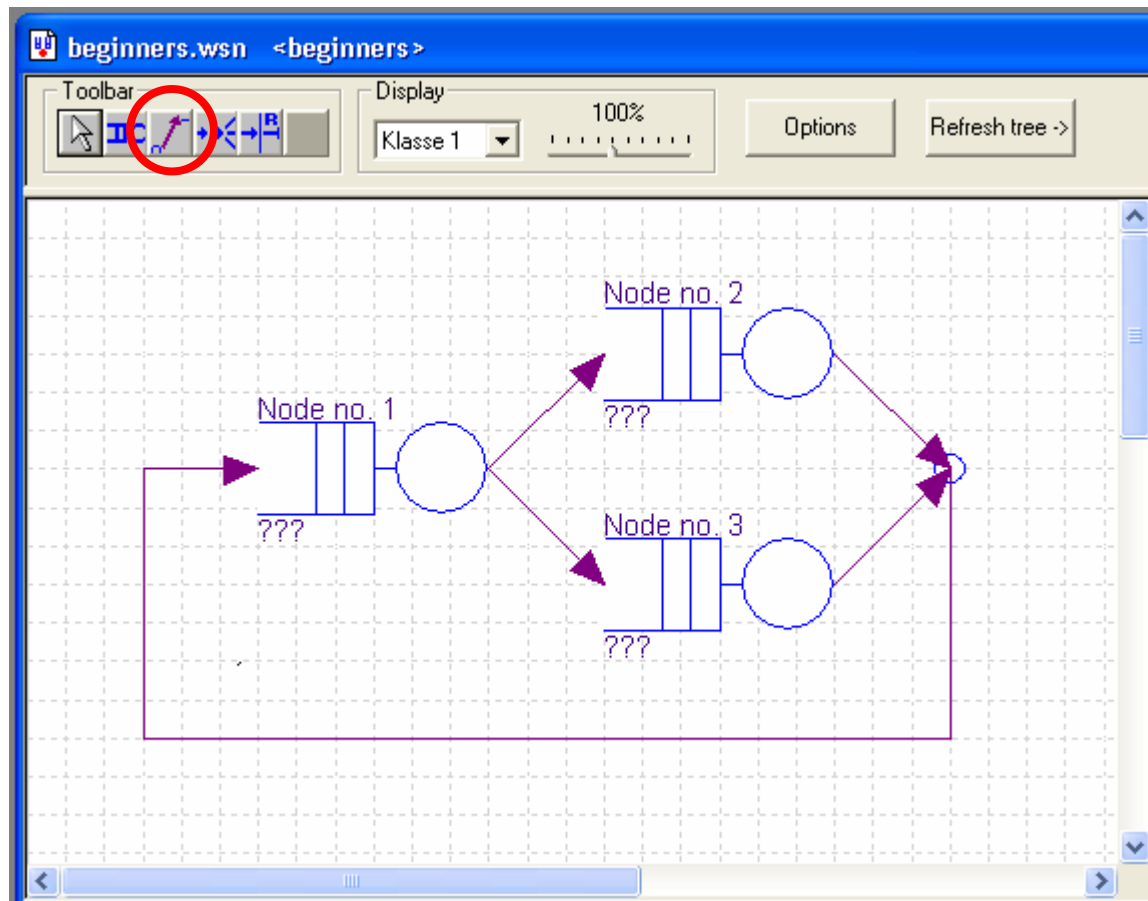
## ❖ Network Construction (cont.)

- create collecting points




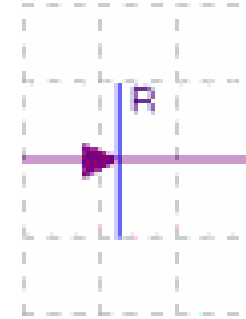
## ❖ Network Construction (cont.)

- create node transitions



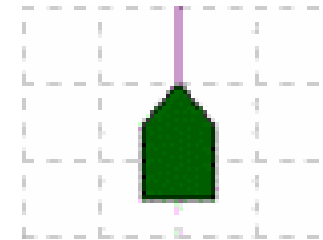
## ❖ Network Construction (cont.)

- insert reference (closed network)   
(otherwise the first node is reference!)

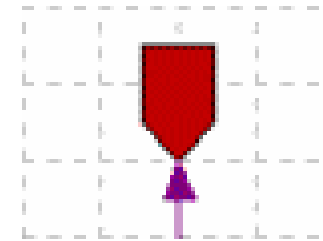


- insert outer world (open network)

- job-source

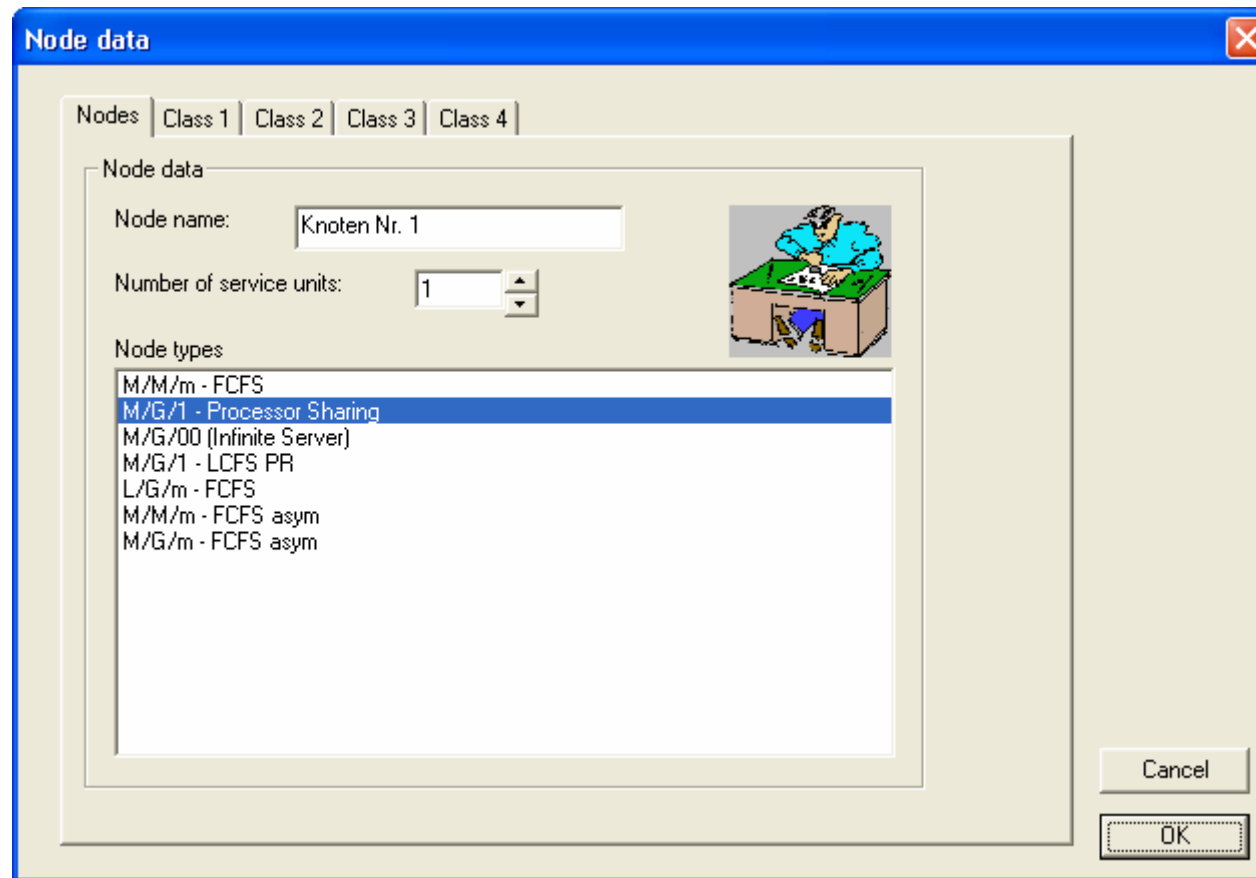


- job-sink



## ❖ Network Construction (cont.)

- assign node name and type with double click on node



## ❖ Network Construction (cont.)

- enter service rate and transition probabilities

Node data

Nodes Class 1

Service rate

Normal service rate

Service rate: 0.400000

Interval

from: to:

Last flows

| Job   | Service rate $\mu(k)$ |
|-------|-----------------------|
| k = 1 | 1.000000              |
| k = 2 | 1.000000              |
| k = 3 | 1.000000              |
| k = 4 | 1.000000              |
| k = 5 | 1.000000              |

Optional

Sq. coef. of variation: 1

Quota

Priority  HOL  PF

Transitions

| To           | C... | p        |
|--------------|------|----------|
| → Node no. 2 | 1    | 0.500000 |
| → Node no. 3 | 1    | 0.500000 |

Cancel

OK

# WinPEPSY Guide

## ❖ Network Construction (cont.)

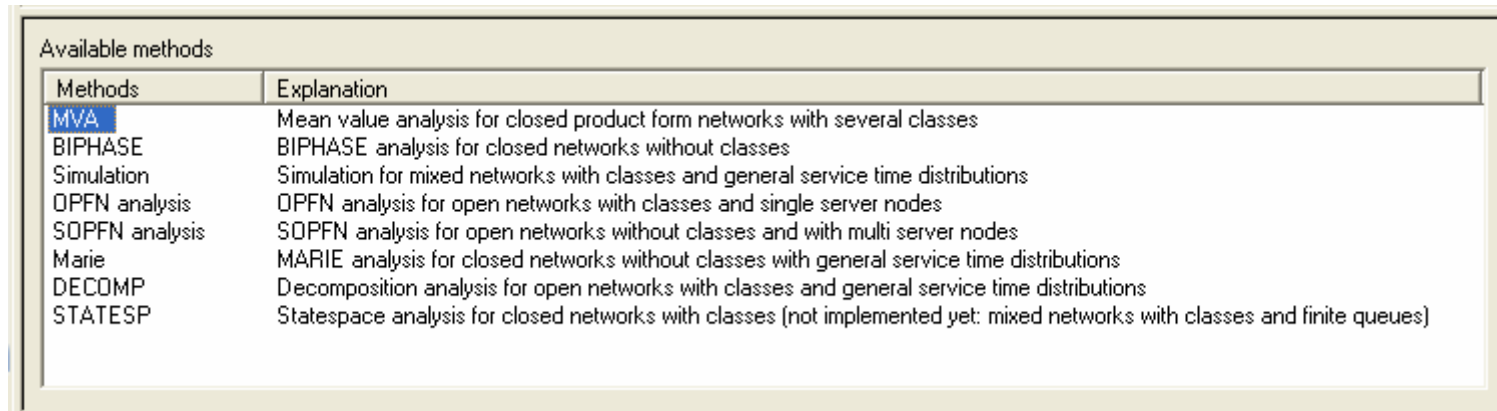
- finish the construction

The screenshot displays the WinPEPSY software interface. The main window shows a network diagram with three nodes (Node no. 1, Node no. 2, and Node no. 3) connected in a loop. Each node is labeled "M/M/m - FCFS". The diagram is overlaid on a grid. The top toolbar includes a "Refresh tree" button, which is circled in red. The right-hand side of the interface shows a tree view of the network structure, including "Net type: Closed net", "Nodes (3)", "Node no. 1", "Node no. 2", "Node no. 3", "Job classes (1)", and "Class No. 1 (Closed)". Below the tree view is a table of available methods.

| Methods        | Explanation   |
|----------------|---|
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## ❖ Analysis

- choose an analysis method



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| Marie          | MARIE analysis for closed networks without classes with general service time distributions                                |
| DECOMP         | Decomposition analysis for open networks with classes and general service time distributions                              |
| STATESP        | Statespace analysis for closed networks with classes (not implemented yet: mixed networks with classes and finite queues) |

## ❖ Analysis (cont.)

- enter scenarios and start analysis

**Net analysis**

Chosen method  
Name: MVA  
Explanation: Mean value analysis for closed product form networks with several classes

Scenario

You can select one parameter, whose value is changed. The network will be analysed for each different value.

Parameter:

Node:

Class:

Optional:

Start value:  End   
Increment:

Secondary scenario

You can select a second parameter. An analysis for the first parameter will be analysed for each different value of the second.

Parameter:

Node:

Class:

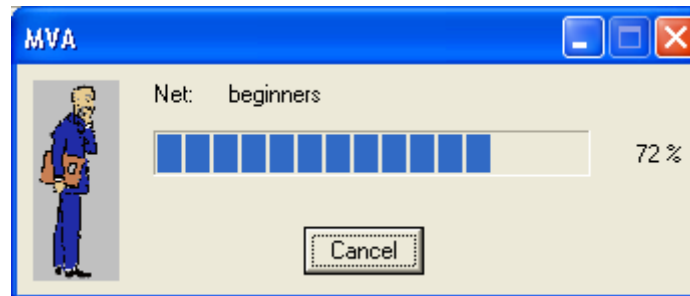
Service:

Start value:  End   
Increment:



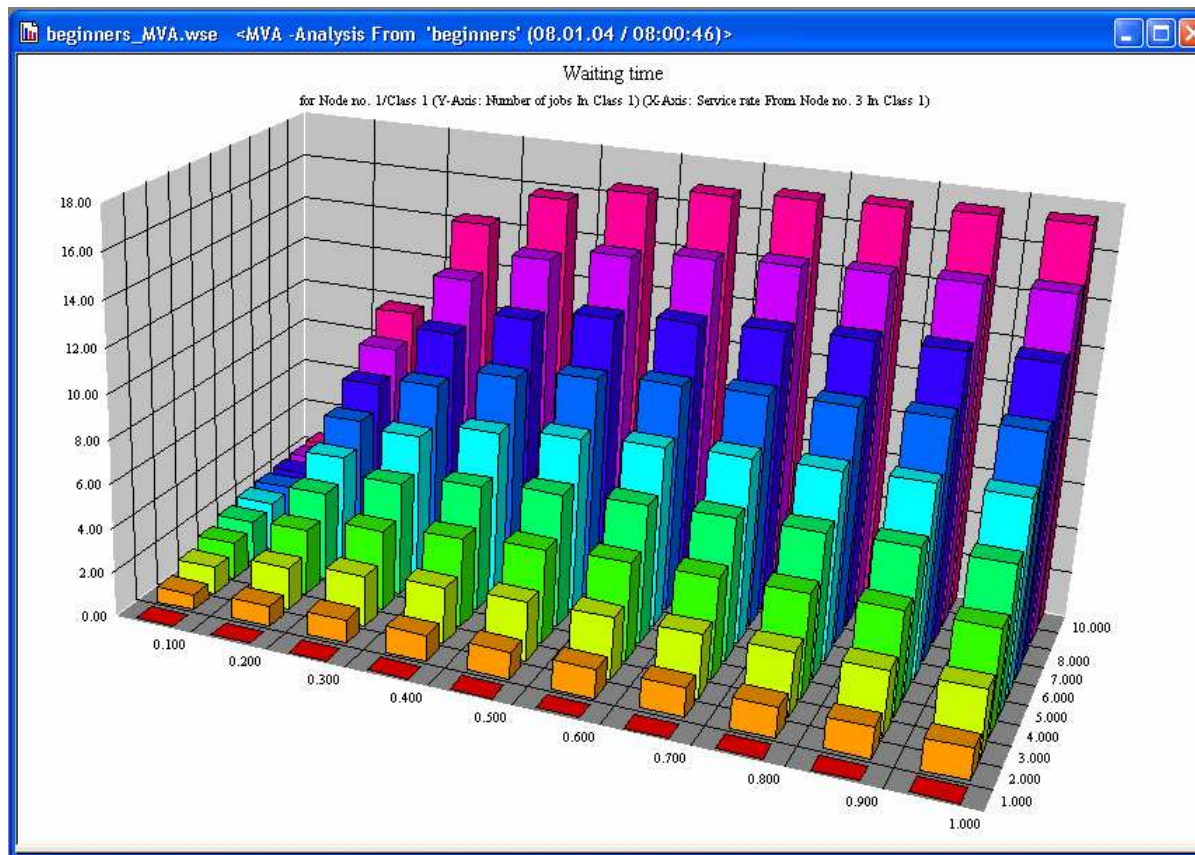
## ❖ Analysis (cont.)

- wait for completion or enter a new network



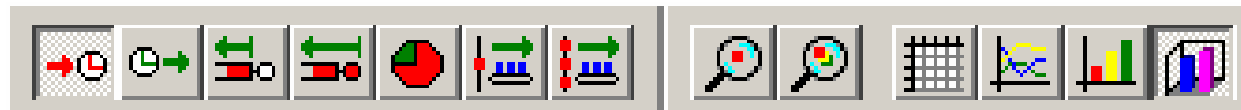
## ❖ Performance Quantities

- after finishing the computation the result window appears

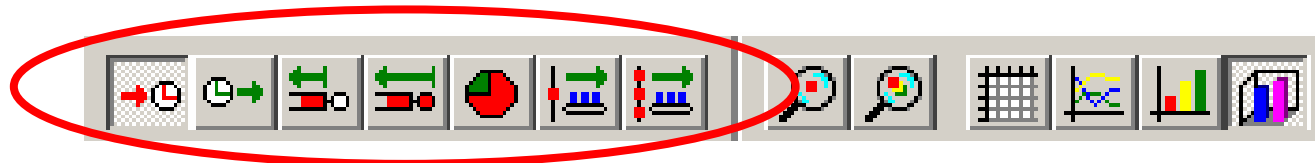


## ❖ Performance Quantities (cont.)

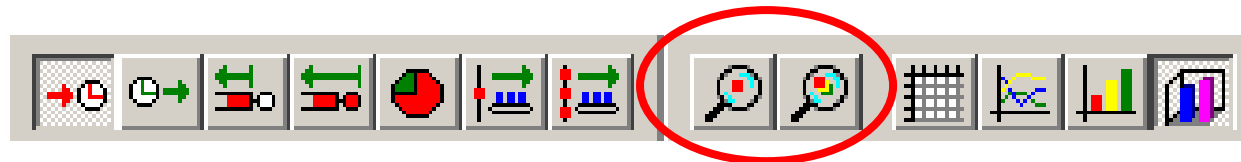
- use buttons to change the visualization



- choose desired performance quantity



- restrict node or class



- select type of representation

