

SARP Watcher Manual v0.1

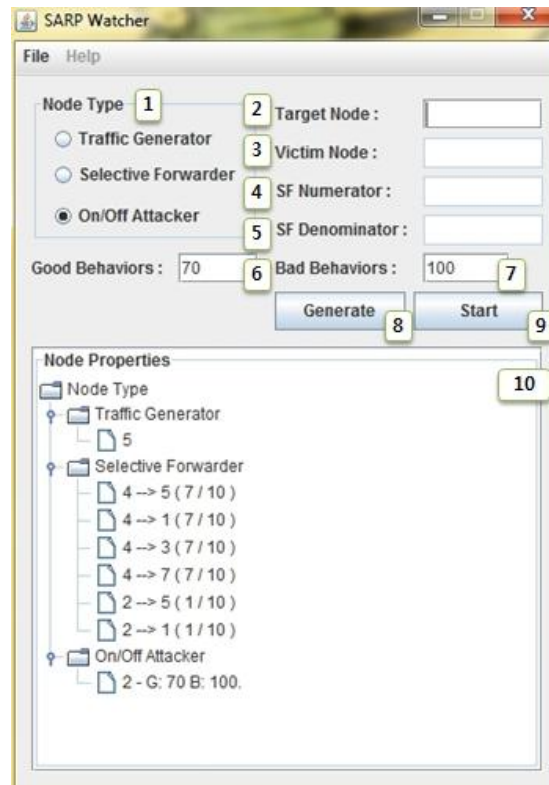
Contents

1. User Interface	3
1.1. Main Window	3
1.1.1. Node Type	3
1.1.2. Target Node	3
1.1.3. Victim Node	3
1.1.4. SF Numerator	3
1.1.5. SF Denominator	3
1.1.6. Good Behaviors.....	4
1.1.7. Bad Behaviors.....	4
1.1.8. Generate	4
1.1.9. Start	4
1.1.10. Node Properties.....	4
1.2. Topology Displayer.....	5
1.3. Throughput History	6
1.3.1. Percentage	6
1.3.2. Count	6
1.3.3. Route	6
1.4. Trust Chart Selector	7
1.5. Trust Chart	8
1.5.1. Forward	8

1.5.2.	Predictable	8
1.5.3.	Overall.....	8
2.	Menus.....	9
2.1.	Topology.....	9
2.1.1.	Open Topology.....	9
2.1.2.	Save Topology.....	9
2.2.	Result.....	10
2.2.1.	Load Result.....	10
2.2.2.	Save Result	10
2.3.	Generate Headers	11
2.4.	Analysis	12
3.	Execution	13
3.1.	Open and generate topology (can be skipped)	13
3.2.	Generates Header files (can be skipped)	13
3.3.	Start the monitoring server by clicking the start button	14
3.4.	Compile and execute.....	15
3.4.1.	Setting for GUI	15
3.4.2.	Build.....	15
3.4.3.	Descriptions for make commands.	15
3.4.4.	Execution.	15

1. User Interface

1.1. Main Window



1.1.1. Node Type

Select node type, Traffic generator nodes or Attack nodes.

1.1.2. Target Node

Select a node, which you want to change the property.

1.1.3. Victim Node

Select a node which you want to attack. Only for Selective Forwarder

1.1.4. SF Numerator

Enter a numerator for Selective forwarder. Only for Selective Forwarder

1.1.5. SF Denominator

Enter a denominator for Selective forwarder. Only for Selective Forwarder

1.1.6. Good Behaviors

Enter the number of good behaviors for On/Off attack. If the value of **1.1.7** is 100, this value represents the percentage of the attack probability. Only for On/Off Attacker

1.1.7. Bad Behaviors

Enter the number of bad behaviors for On/Off attack. If this value is 100, the value of **1.1.6** represents the percentage of the attack probability. Only for On/Off Attacker

1.1.8. Generate

Generate a property for a node. The result would be displayed in **1.1.10**.

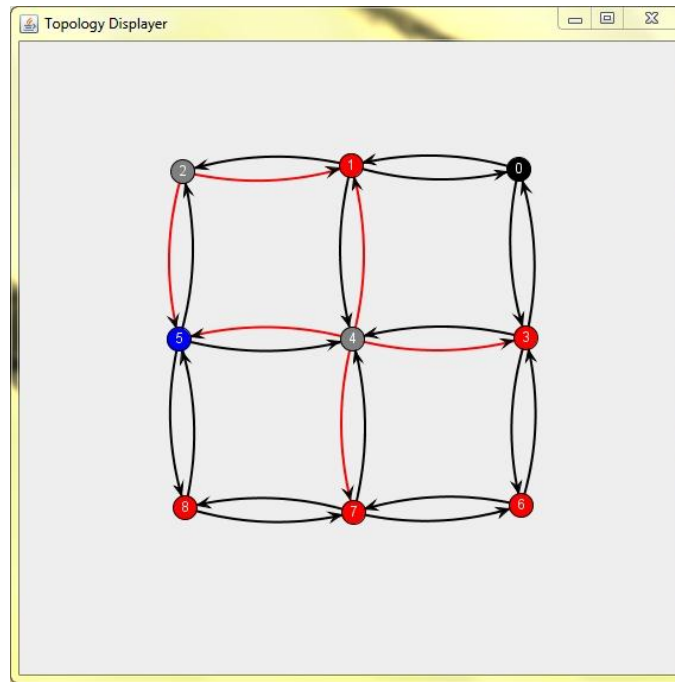
1.1.9. Start

Start the Monitoring server.

1.1.10. Node Properties

Displays the results of generated properties by **1.1.8**.

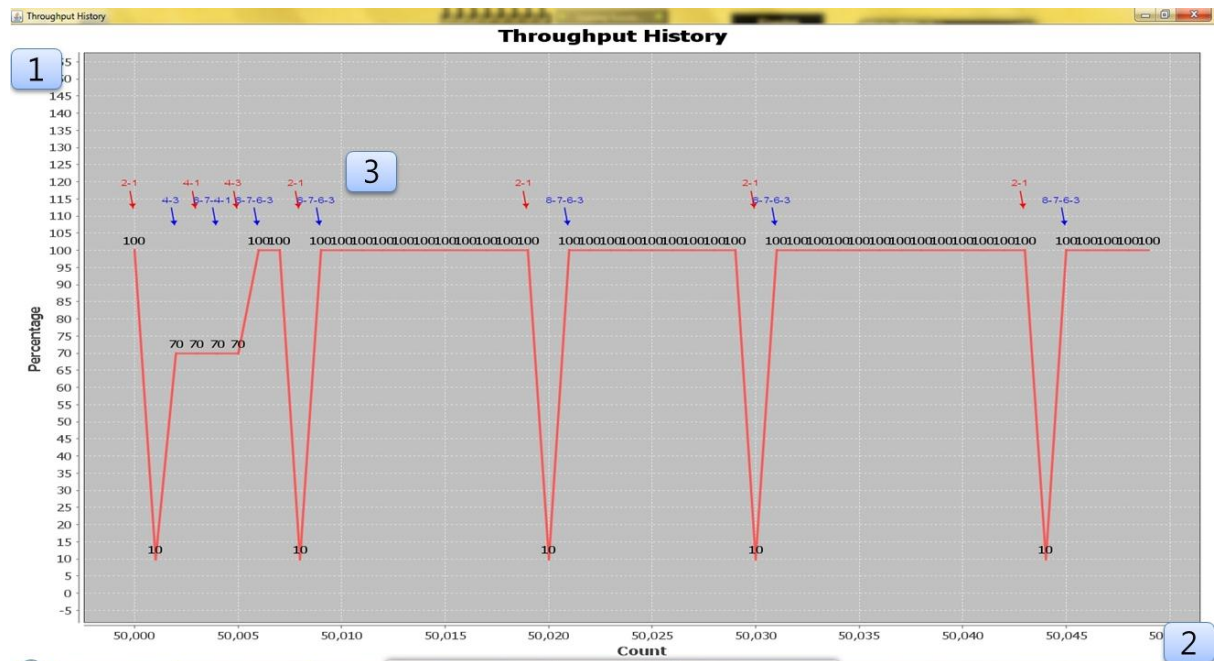
1.2. Topology Displayer



This window displays the topology. You can open this window from "NSS" or "NTP" file. The "NSS" file contains only the aspect of topology. On the other hand, the "NTP" file contains not only the aspect of topology, but also the properties of each node.

Kind \ Color	Vertex	Edge
RED	Normal	Selective Forward
BLACK	Base Station	Normal
BLUE	Traffic Generator	Transaction Route
GRAY	Selective Forwarder	—
ORANGE	Loop Creator	Loop Creator
GREEN	No Response	—

1.3. Throughput History



This window displays throughput history based on transaction.

1.3.1. Percentage

Indicates throughput rates.

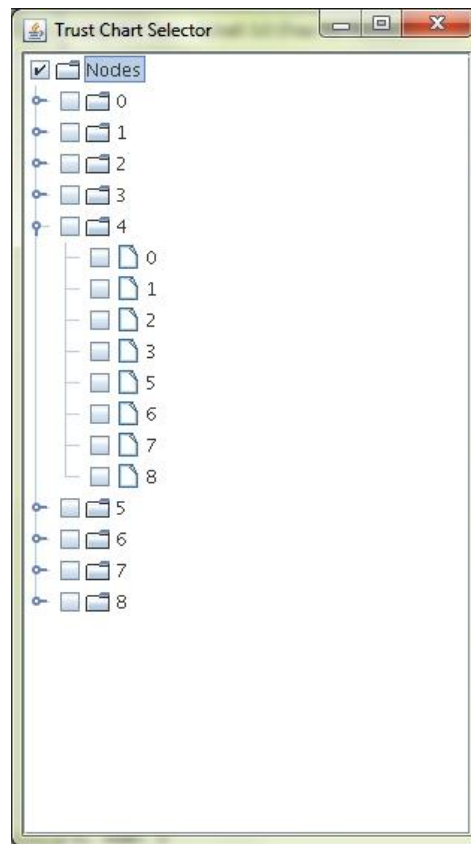
1.3.2. Count

Indicates transaction numbers.

1.3.3. Route

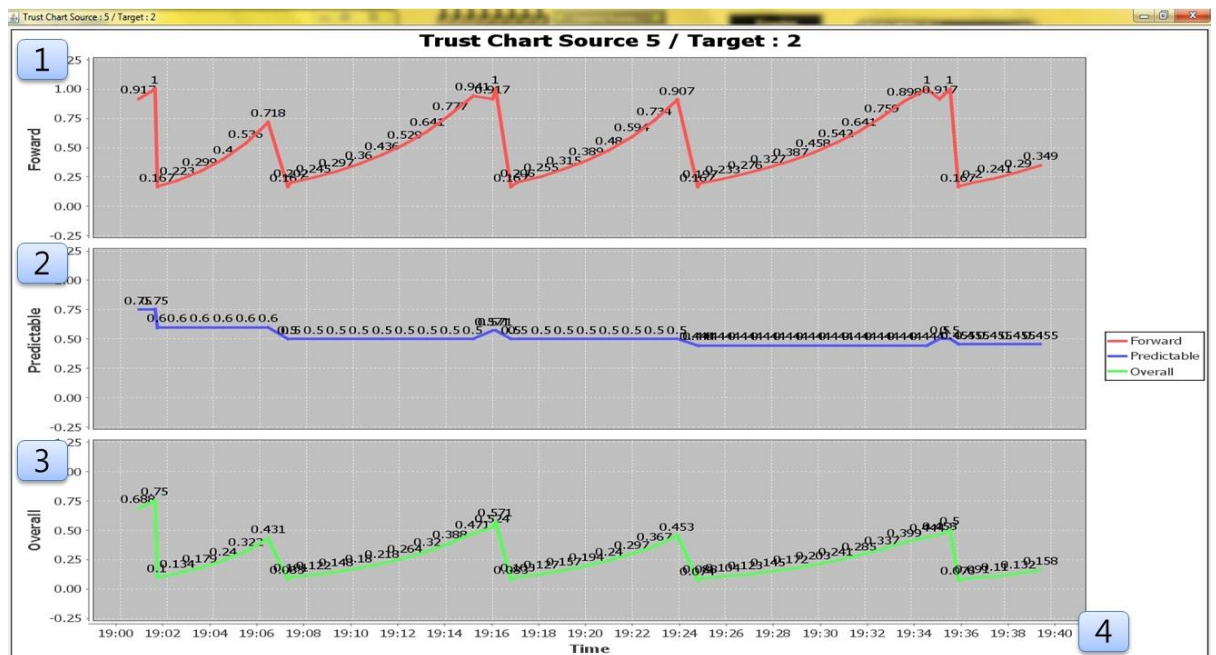
Indicates the route from data source to base-station.

1.4. Trust Chart Selector



This window displays trust value charts. When any check box is checked, the trust chart window appears (1.5). On the other hand, the check box is unchecked, the trust chart window disappears.

1.5.Trust Chart



This window displays trust values based on time.

1.5.1. Forward

Indicates Forwarding trust values from Source node to Target node.

1.5.2. Predictable

Indicates Predictability trust values from Source node to Target node.

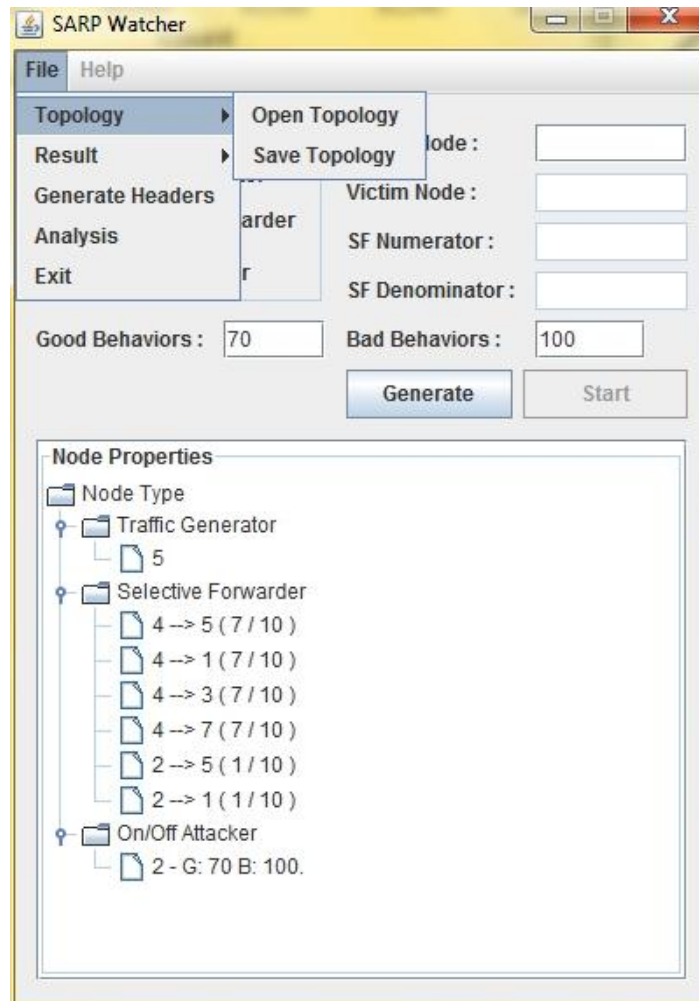
1.5.3. Overall

Indicates Overall trust values from Source node to Target node.

2. Menus

2.1. Topology

- Open Topology: "NSS" or "STP" files could be selected.
- Save Topology: Save to "STP" file.



2.1.1. Open Topology

Open the topology displayer (**1.2**) from "STP" or "NSS" file.

NSS: Contains the aspect of topology.

STP (Sarp ToPology): Contains the location of "NSS" file and node properties.

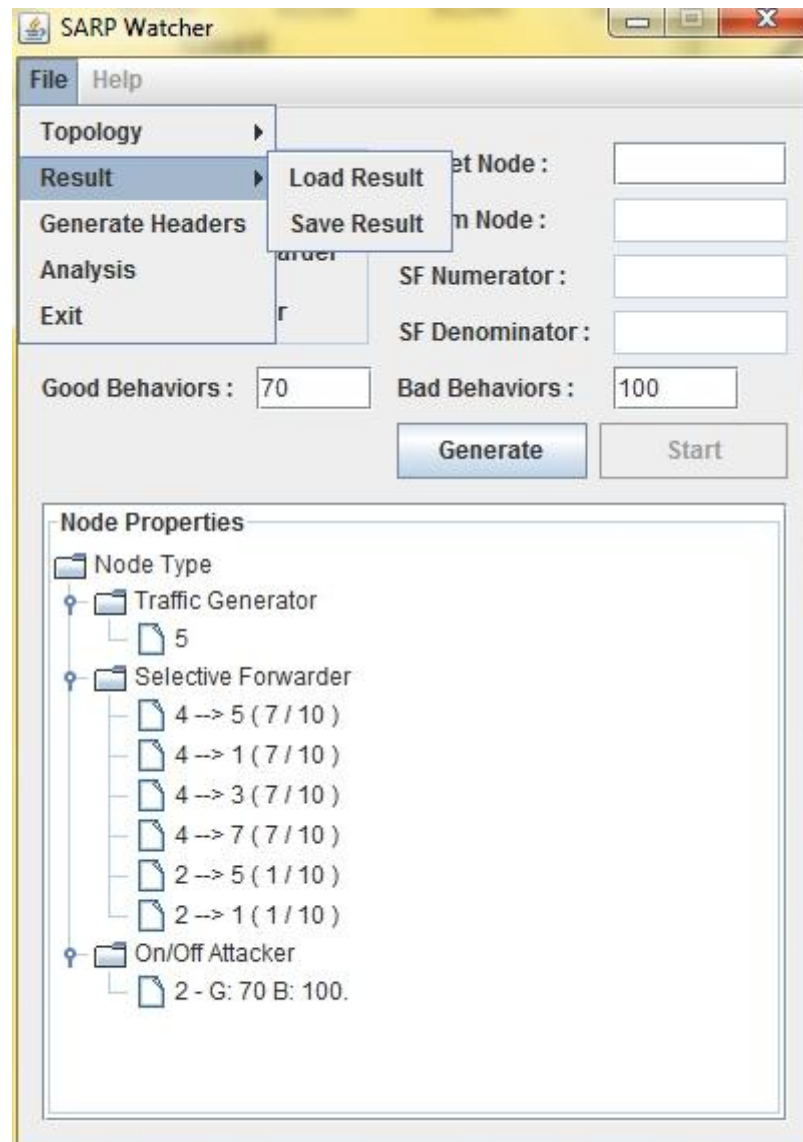
2.1.2. Save Topology

Save the topology to "STP" file. This file contains the location of "NSS" file and node properties.

2.2. Result

→ Load Result: "SRE" file could be selected.

→ Save Result: Save the results to "SRE" file.



2.2.1. Load Result

Load the saved results from "SRE" files.

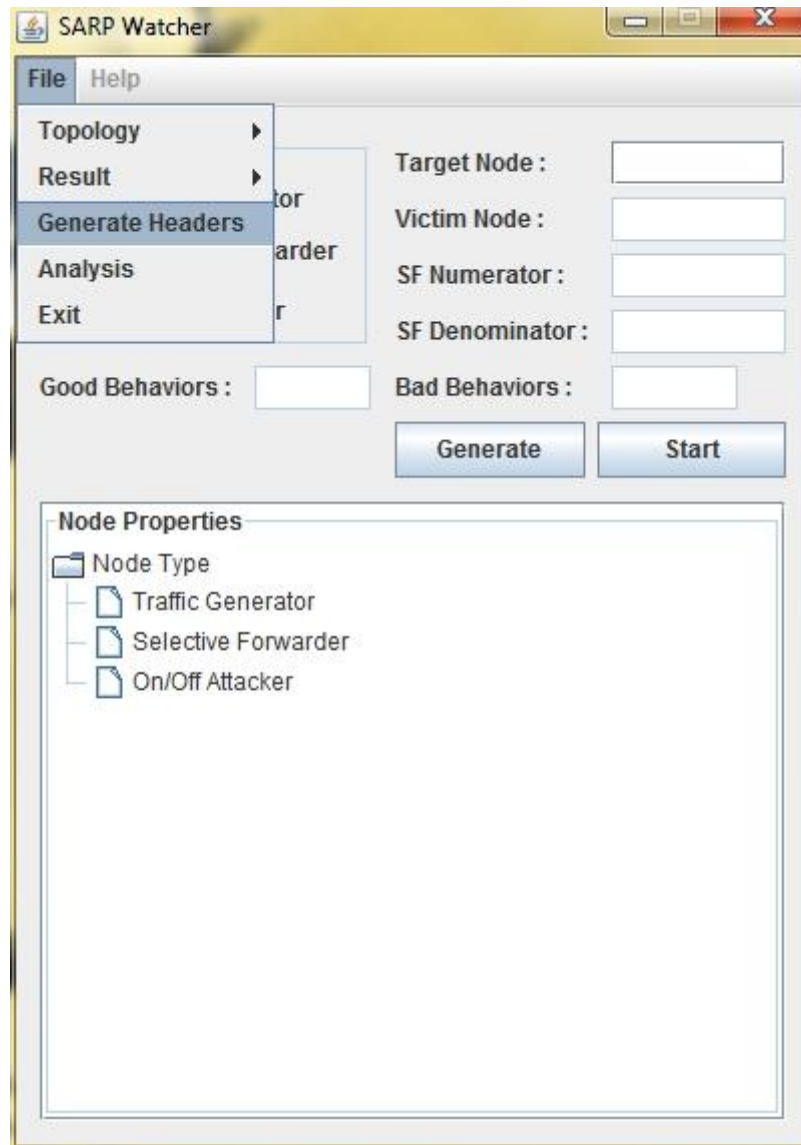
SRE (Sarp REsults): Contains the location of "NSS" file (optional), node properties (optional), throughput, trust values, and transaction routes.

2.2.2. Save Result

Save the results to "SRE" file. This file contains the location of "NSS" file (optional), node properties (optional), throughput, trust values, and transaction routes.

2.3. Generate Headers

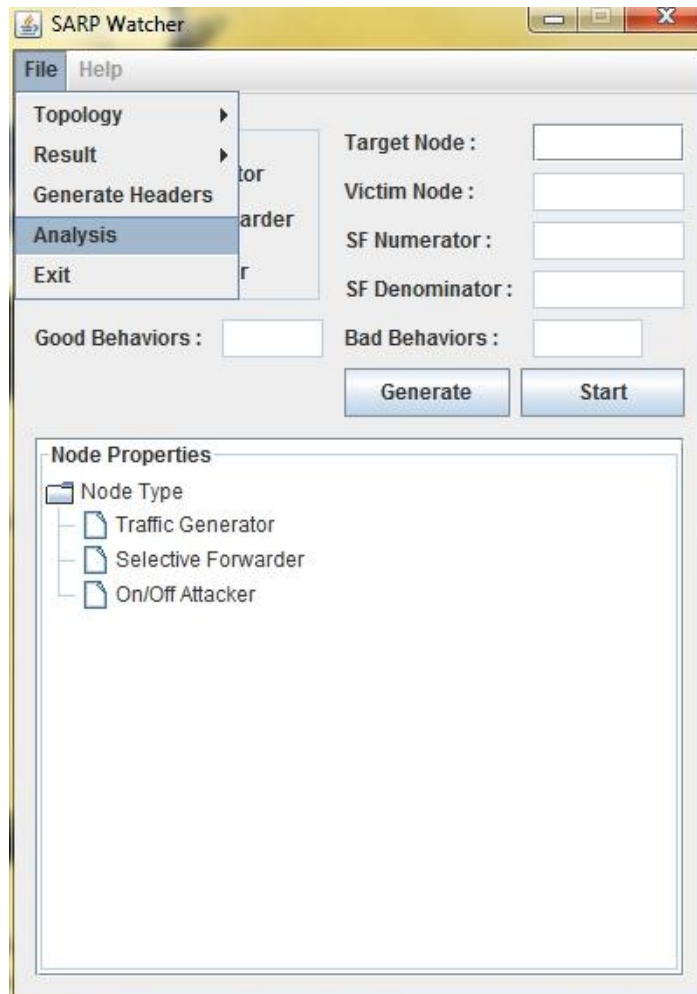
Generates "AttackH.h" and "TrafficGeneratorH.h" files in selected folder.



Select a folder that contains "AttackH.h" and "TrafficGeneratorH.h" files. These files are generated by following the node properties.

2.4. Analysis

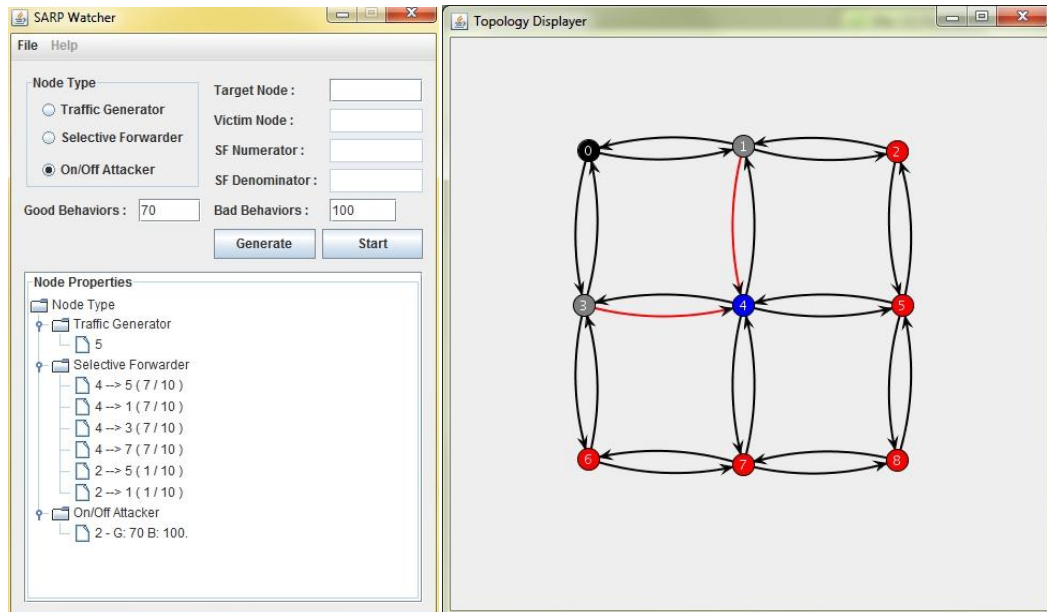
Analyze the result from "SRE" files.



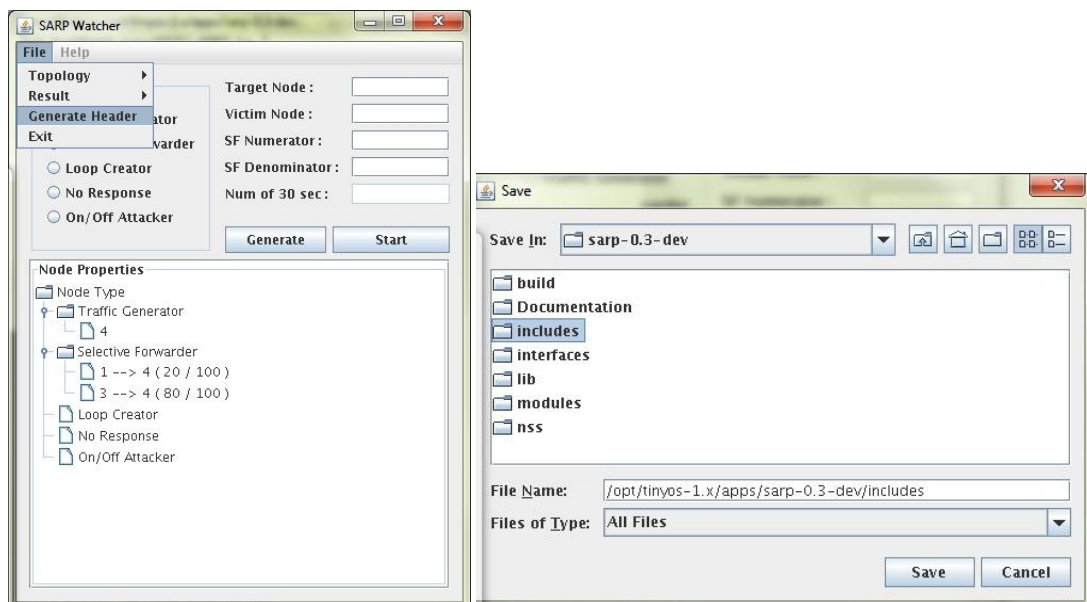
This window indicates Number of total Transactions, Overall Throughput Rates, Number of good behaviors (100% throughput), Number of bad behaviors (Otherwise), Number of Hops, and Average Hops. These analyses are used for comparing with other schemes.

3. Execution

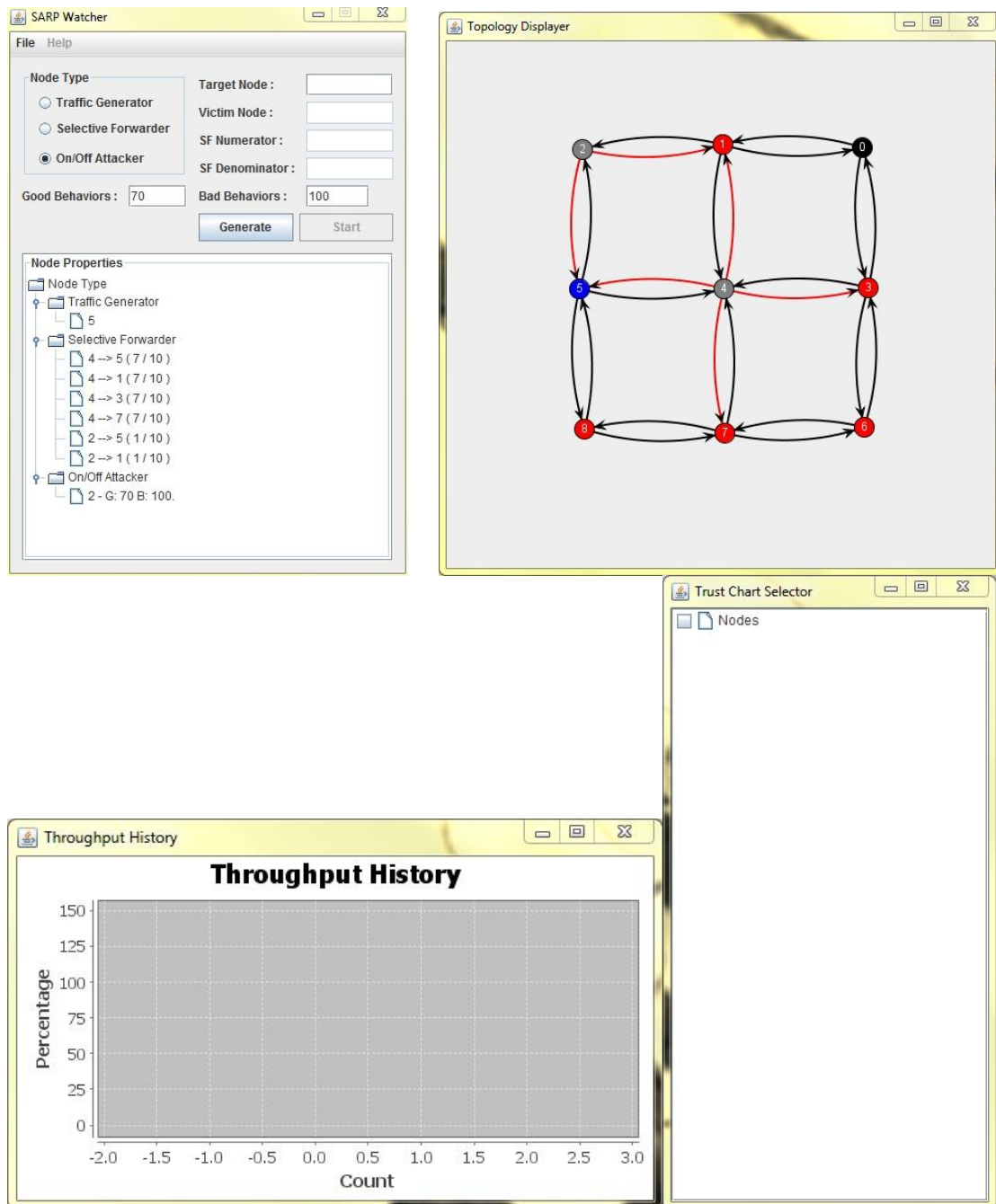
3.1. Open and generate topology (can be skipped)



3.2. Generates Header files (can be skipped)



3.3. Start the monitoring server by clicking the start button



When you click the start button, Throughput Graph (**1.3**) and Trust Chart Selector (**1.4**) will be appeared. The topology displayer (**1.2**) is optional, but not after start.

3.4. Compile and execute

3.4.1. Setting for GUI

If you want to use the GUI, you need to set the server IP address in

\$TOSDIR/platform/pc/external_comm.c

file at **Line 33**.

#define SERV_ADDRESS "192.168.1.1"

3.4.2. Build

```
[root@iplusu sarp-0.4-dev]# ./make_pcdebug
rm -rf build
mkdir -p build/pc
    compiling Sarp to a pc binary
ncc -o build/pc/main.exe -g -O0 -I$I/lib/Counters -I$I/../apps/sarp-0.4-dev/includes -I$I/../apps/sarp-0.4-dev/modules -I$I/../apps/sarp-0.4-dev/interfaces -DDEBUG -DONOFFATTACK -DSARP04 -DPREDICTABILITY -DDYNAMIC_FORGETTING -pthread -fnesc-nido-tosnodes=1000 -fnesc-simulate -Wall -Wshadow -DDEF_TOS_AM_GROUP=0x7d -Wnesc-al 1 -target=pc -fnesc-cfile=build/pc/app.c -board=micasb -DIDENT_PROGRAM_NAME=\"Sarp\" -DIDENT_USER_ID=\"root\" -DIDENT_HOSTNAME=\"iplusu.com\" -DIDENT_USER_HASH=0x1e422720L -DIDENT_UNIX_TIME=0x4cc4b044L -DIDENT_UID_HASH=0xaadde2adL Sarp.nc -lm
nesc1: warning: calls to UARTReceiveMsg.receive in Nido fan out, but there is no combine function specified for the return type
nesc1: warning: calls to PowerManagement.adjustPower in AMStandard fan out, but there is no combine function specified for the return type
/opt/tinyos-1.x/tos/platform/pc/PowerStateM.nc: In function ? __nesc_nido_initialise? ?:
/opt/tinyos-1.x/tos/platform/pc/PowerStateM.nc:1214: warning: passing argument 1 of ? ?memset? ? discards qualifiers from pointer target type
    compiled Sarp to build/pc/main.exe
```

3.4.3. Descriptions for make commands.

- **make_pc**: Build SARP source codes for TOSSIM without debug messages.
- **make_pcdebug**: Build SARP source codes for TOSSIM with debug messages.
- **make_pcnodfpr**: Build SARP without Dynamic forgetting and Predictability Trust source codes for TOSSIM with debug messages.
- **make_pcnopr**: Build SARP without Predictability Trust source codes for TOSSIM with debug messages.
- **make_pcnosarp**: Build NO SARP source codes for TOSSIM with debug messages.
- **make_telosb**: Build SARP source codes for Telosb motes.

3.4.4. Execution.

```
[]# DBG=DEBUG_LEVEL ./build/pc/main.exe -rf=NSS_FILE NUMBER_OF_NODES
```

Ex) []# DBG=usr3 ./build/pc/main.exe -rf=./nss/grid_9_motes.nss 9