“Modeling and analysis of WAP protocol family”

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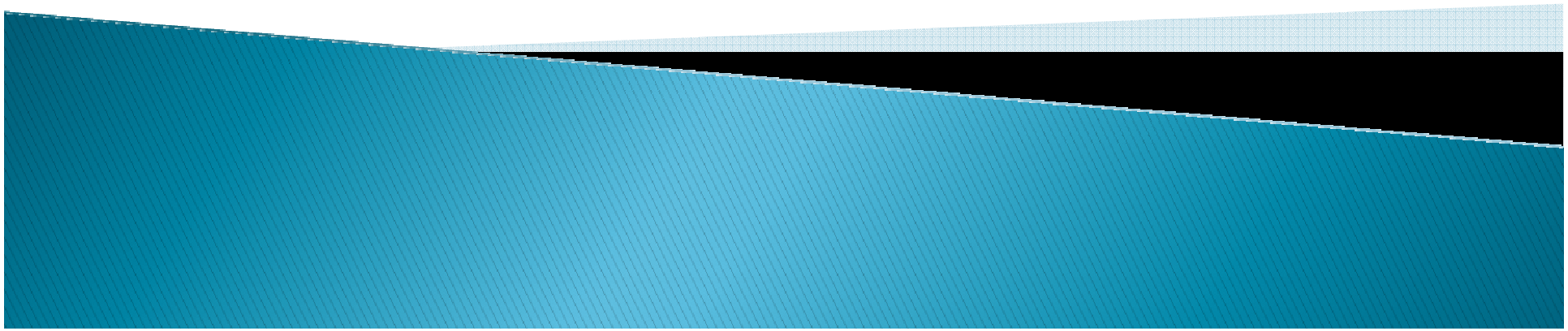
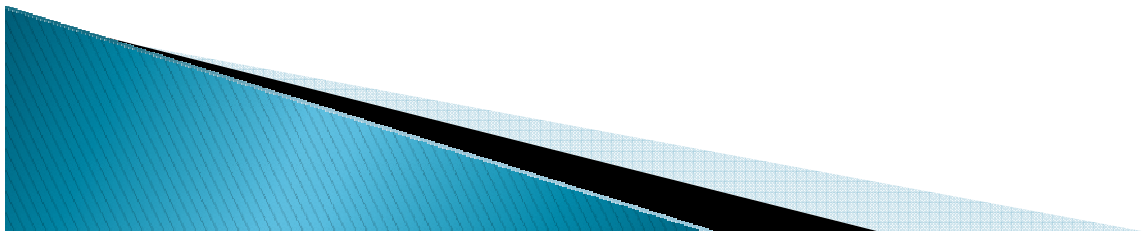


“So, what is WAP about?”

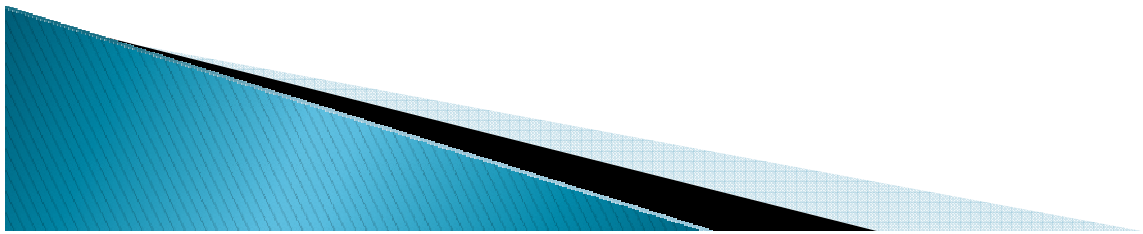
- WAP is a stack of protocols that are responsible for wireless Internet connection.
- Its history goes back to the 1997 when the WAP forum was organized by Nokia, Ericsson and Motorola.
- WAP was designed as an open standard for wireless data exchanging, independent from devices and services providers, it is a good decision for mobile hosts with a small display, little memory.



“The problem”

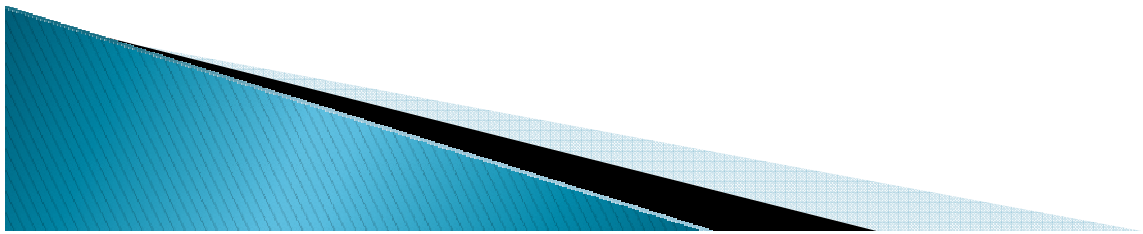
- analyze a model of the Wireless Transaction Protocol specification and perspectives of research and development in the field of transport protocols for wireless networks.

- propose a modification for WTP which improves the original flow control algorithm.



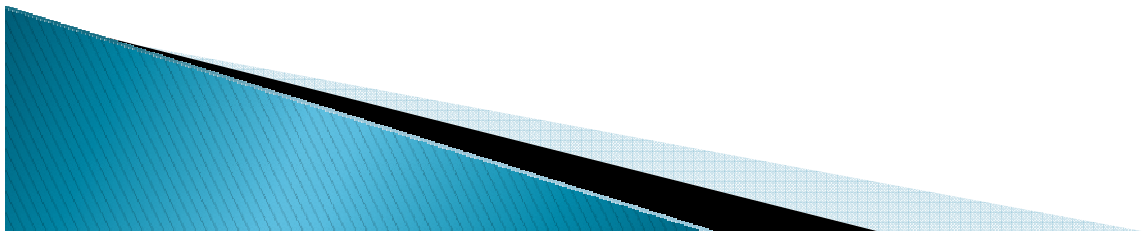
Specification

- Huge amount of various texts
- Difficulty in interrelating of all of these documents
- Basic features are buried under dozens of non relevant features

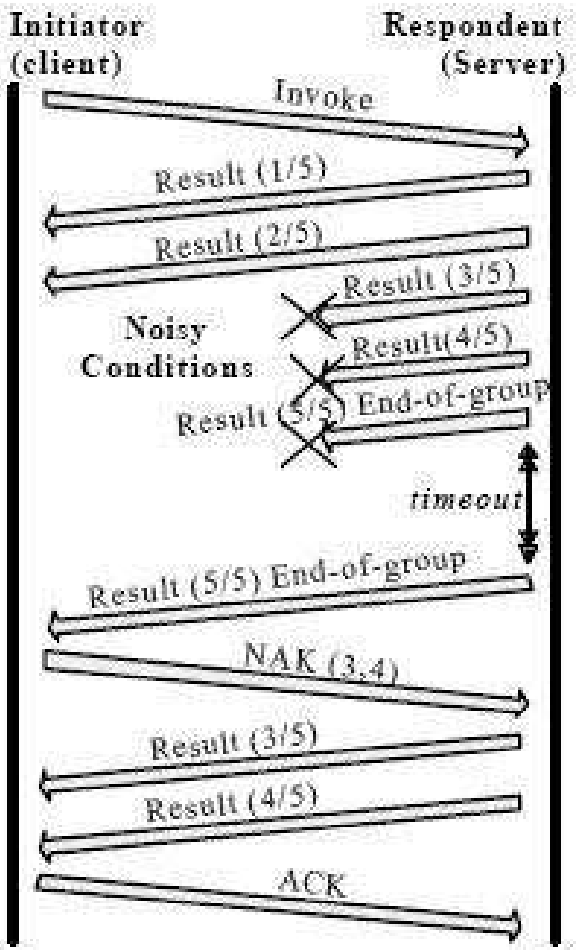


The basis. WTP

- WTP is responsible for packet segmentation and reassembly and for acknowledgment of packets and retransmission of lost, unacknowledged or corrupt packets.

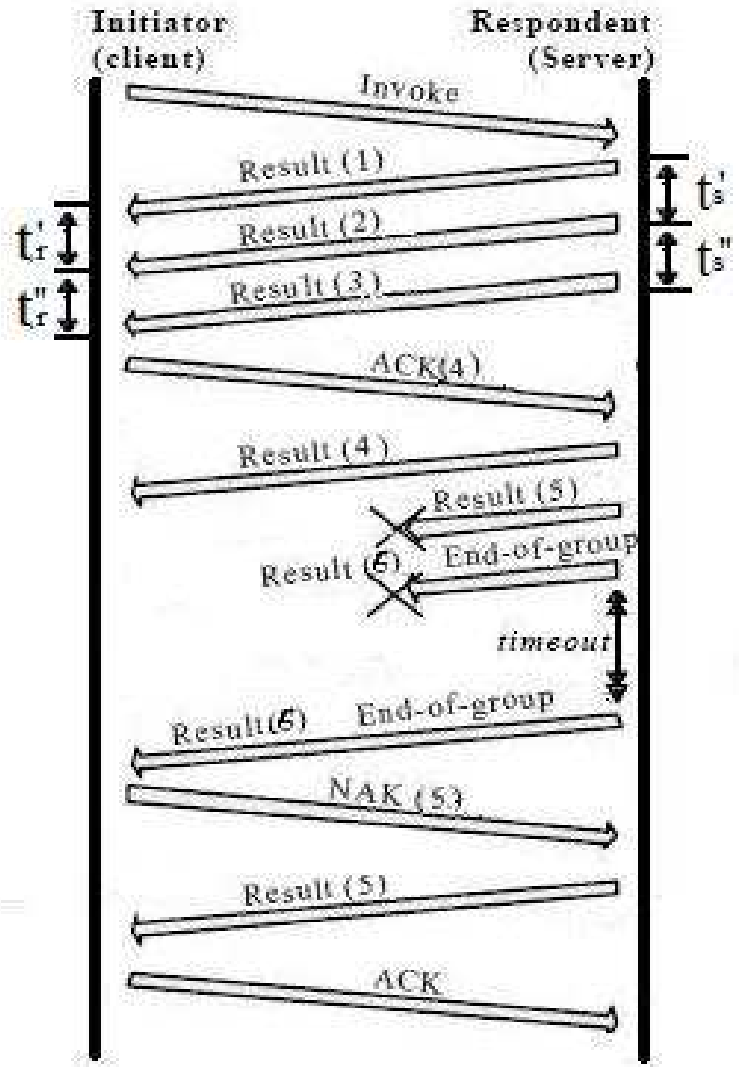


Target setting



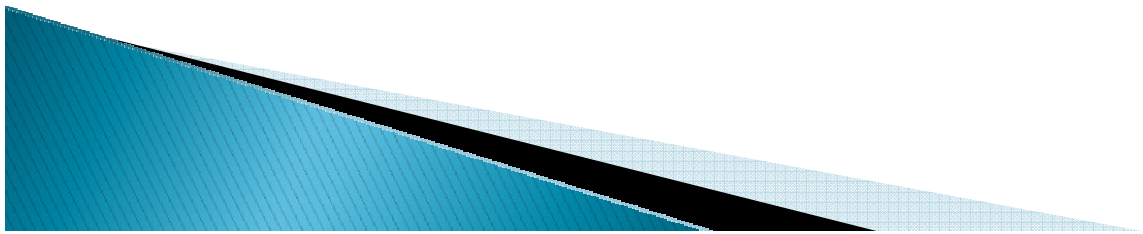
WTP packet loss recovery

Scheme of work



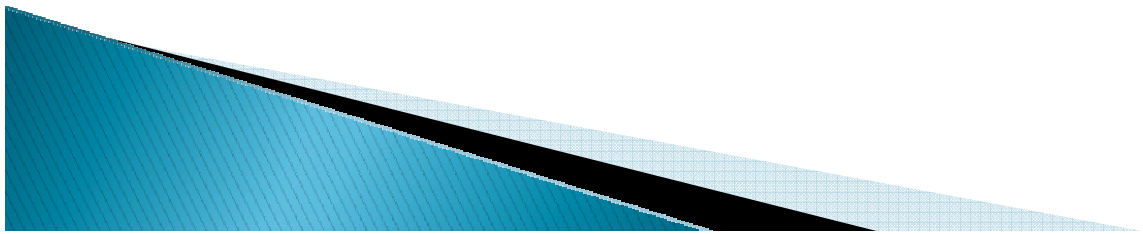
Proposal

- $t_s / t_r = 1$ – perfect network conditions.
- P_{am} – amount of packets in the group;
- $0,85 <= t_s / t_r < 1$ –increasing P_{am}, decreasing t_s and timeout.
- $0,70 <= t_s / t_r < 0,85$ –there is no enough data to make a decision.
- $t_s / t_r < 0,70$ – decreasing $P_{am,}$ increasing t_s and timeout.



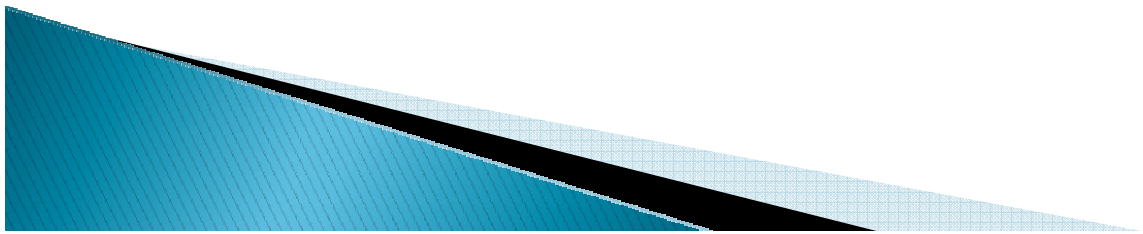
Proposal ($0,85 <= t_s / t_r < 1$)

- $P_{am} = 2 * P_{am}$;
- $t_s = t_s / 2$;
- timeout = timeout /2;



Proposal (t_s/ t_r <0,70)

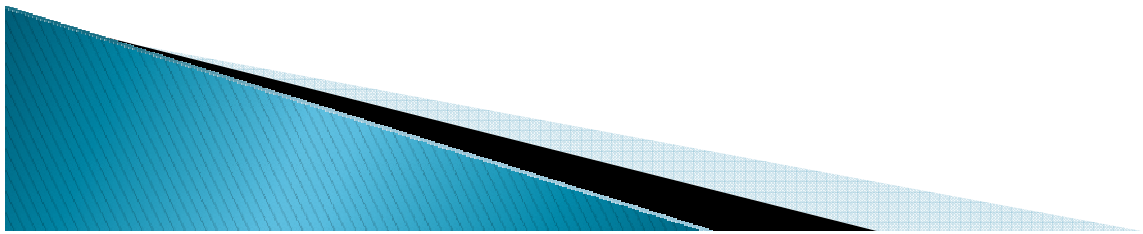
- P_{am}=P_{am} /2;
- t_s = 2* t_s;
- timeout = 2* timeout;



Network Simulator (Version 2)

- NS2 provides users with a way of specifying network protocols and simulating their behaviors.

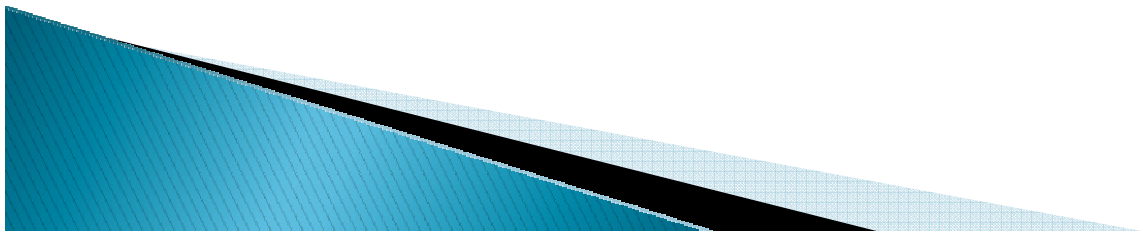
- NS2 suggest two steps of work.



Our model

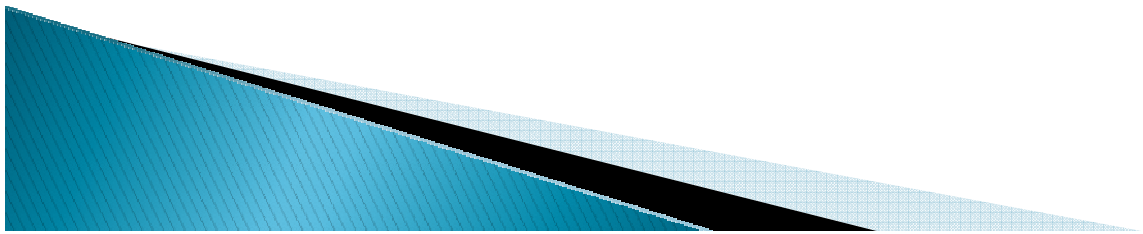
We suggest using two types of packets:

- DATA – the packets which are sent by the sender (it is a structure which contain such fields as: seqno, NumbOfGroup, eog etc.)
- ACK/NAK – the packets which are sent by receiver (it is a structure which contain such fields as: seqno, NumbOfGroup, non_delivered_packets[amountOfPackets])



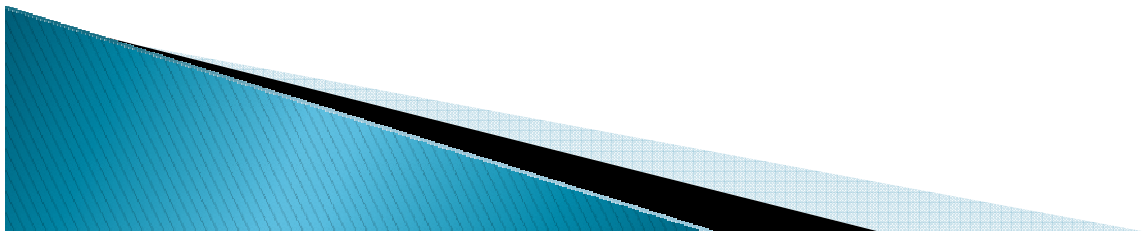
Our model(con.)

- Two types of Timers;
- Two classes: Receiver, Sender
  - Overdetermined function recv, timeout
  - Defined functions:
    - Sender – send_group, recount, etc.
    - Receiver – checking, recount_tr, etc.



Conclusion

The work includes new ideas of developing and improving WAP as one of the important contemporary technologies.



Future work

- To perform experiments that prove its flexibility
- Verification of the new protocol

Thank you for attention!