Priority based Session Management for STANAG 4538

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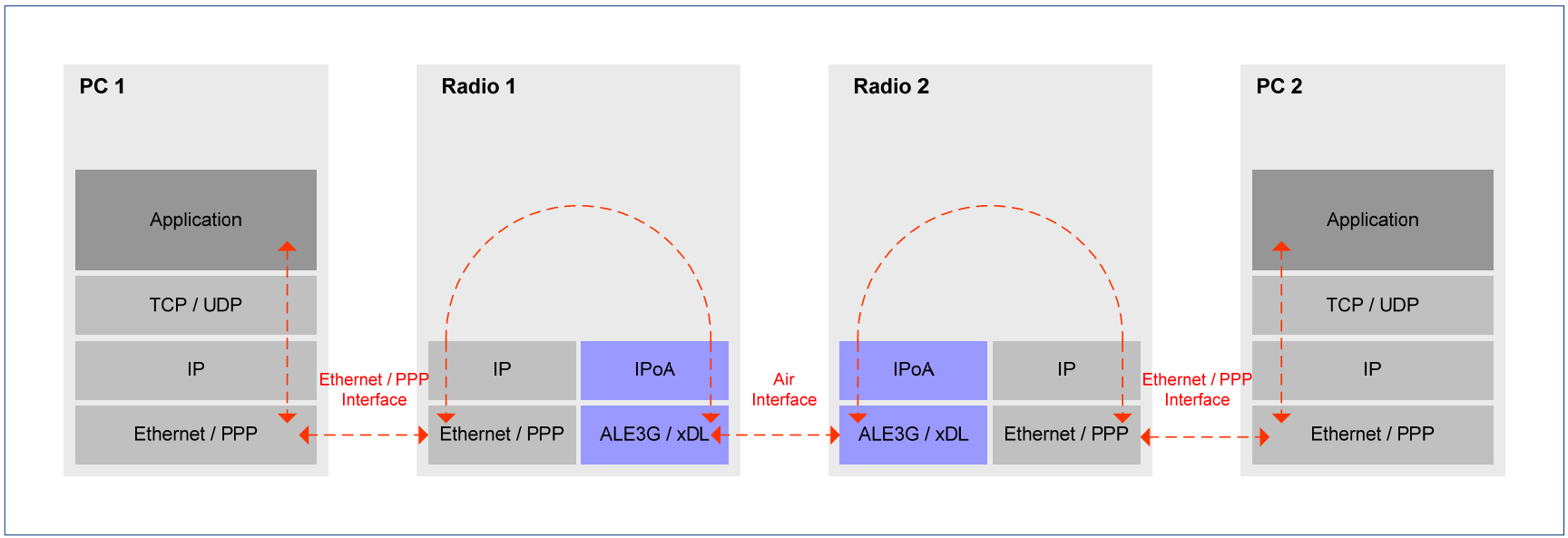
Overview

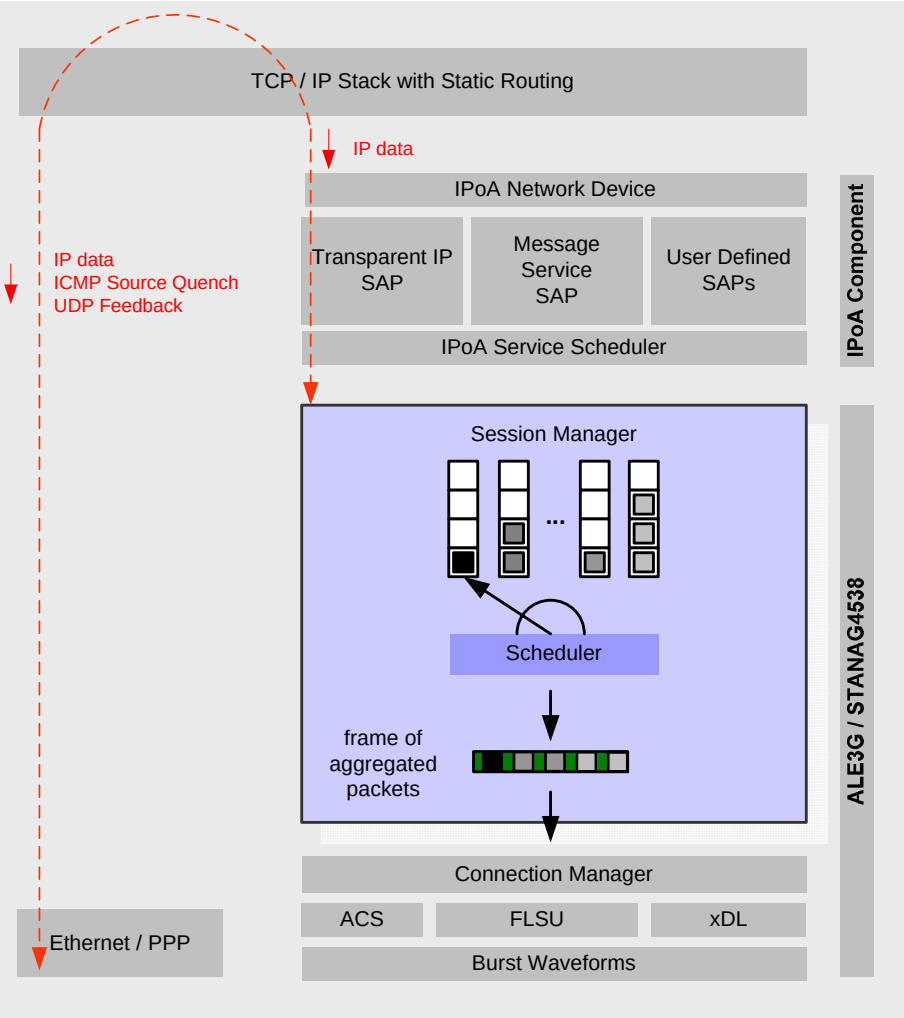
- **STANAG 4538 IP Interface (IPoA)**
- **Priority based Packet Aggregation**
- **Priority based Maximum Session Time**
- **Conclusion**

STANAG 4538 IP Interface (IPoA)

- **Transparent IP interface with static IP routing**



Session Manager Overview



- **IPoA**

  Classification of IP Packets

  Feedback Mechanism (ICMP/UDP)

- **Session Manager**

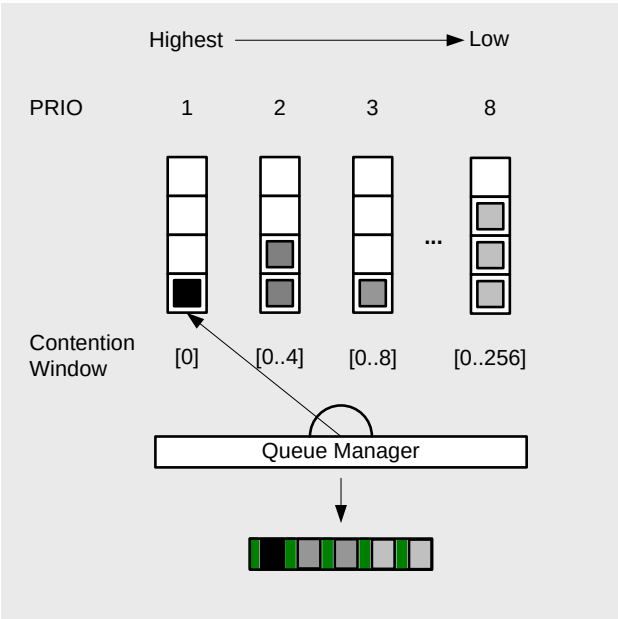
  Queueing and scheduling of packets according to their priority

  Aggregation of packets

  Control of Maximum Session Time

Priority based Packet Aggregation

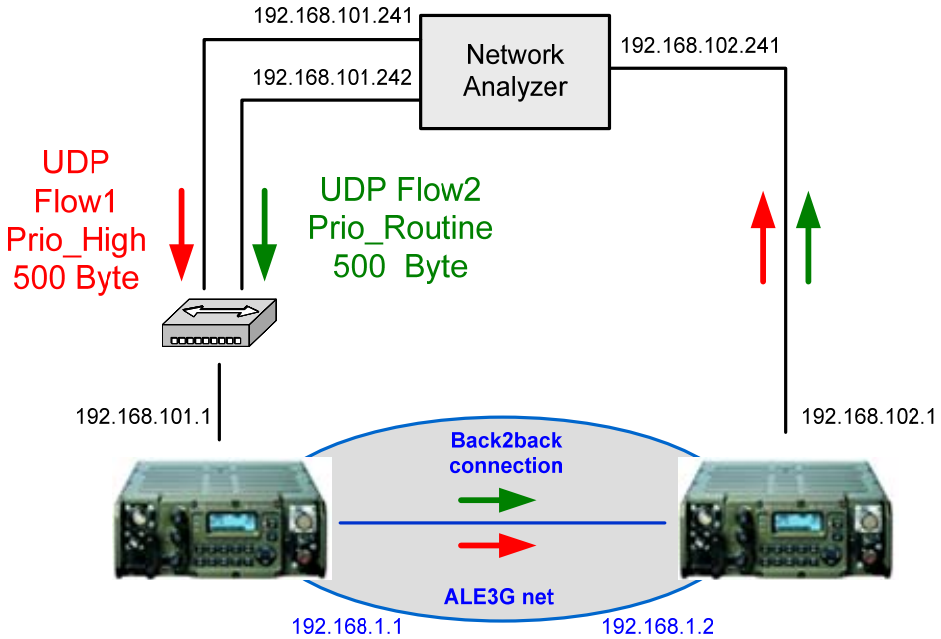
- **Stochastic Queuing Mechanism similar to EDCA of WLAN 802.11e**
- **Adaptive Aggregation according to the channel quality**
  - Steps: No aggregation, 1500 Byte, 3000 Byte and 10000 Byte
  - → Achieve relative constant delays for the packet delivery
- **Additional Aggregation header to disassemble packets at receiver**

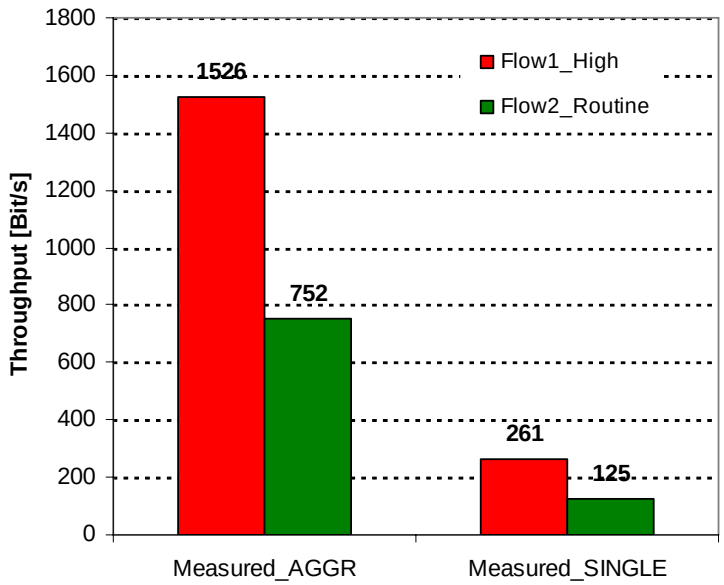


Aggregation Header

+	Bits 0-7	8-17	18-31
0	Version	Control	Reserved
32	Size		

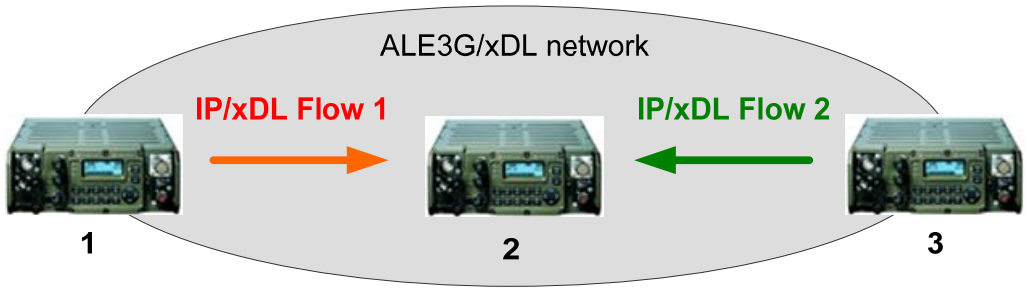
Measurement results





- **Optimal Throughput distribution**
- **Under very good conditions (>15 dB, AWGN) the throughput can be increased dramatic (e.g. 2278 Bit/s instead of 386 Bit/s)**

Priority based Maximum Session Time

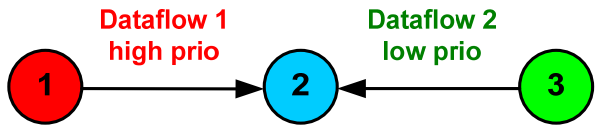


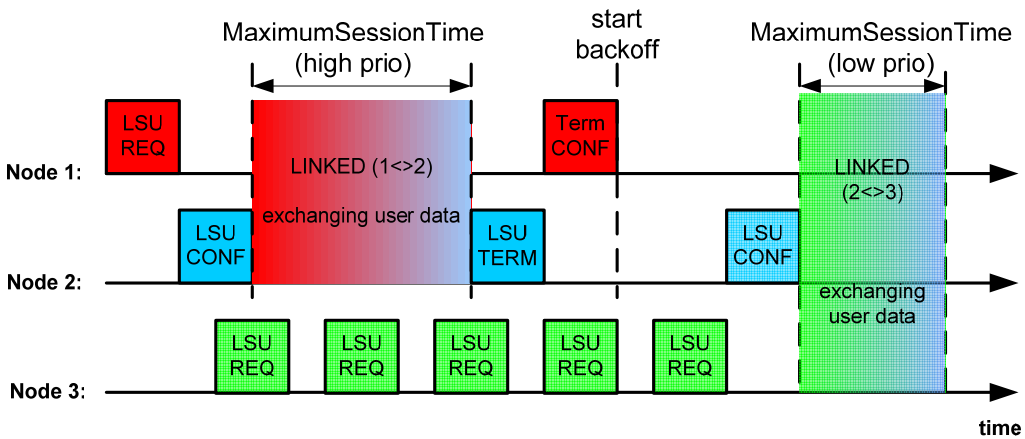
- **Optimize ALE for network operation**
- **Low priority data flows shall not block high priority flows**
- **Avoid unnecessary packet drops in case the destination is currently communicating with an other station**

→ **Maximum Session Time which depends on the prio**

→ **Unlink and Backoff after the Maximum Session Time has been reached**

Maximum Session Time (example)

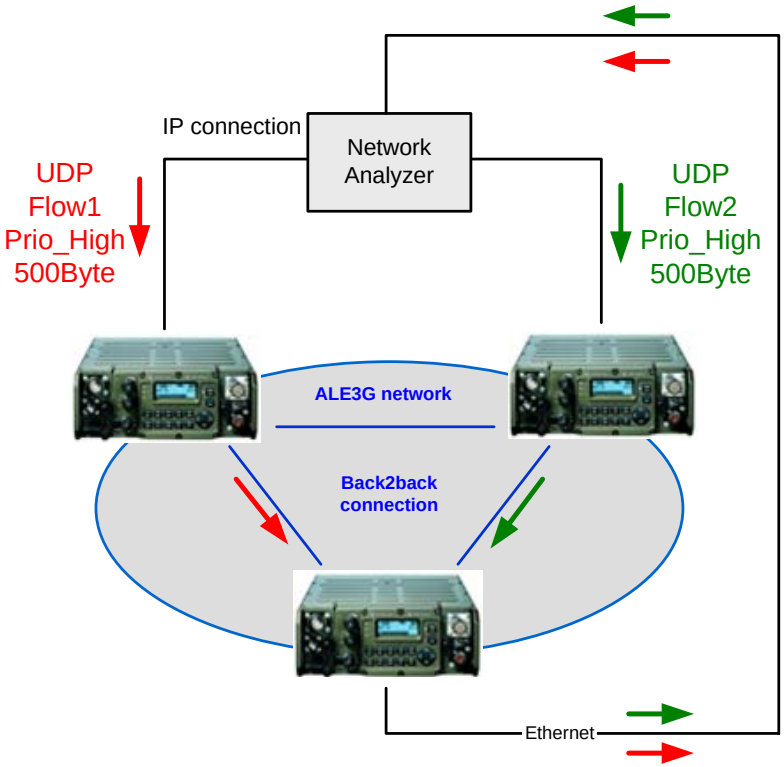


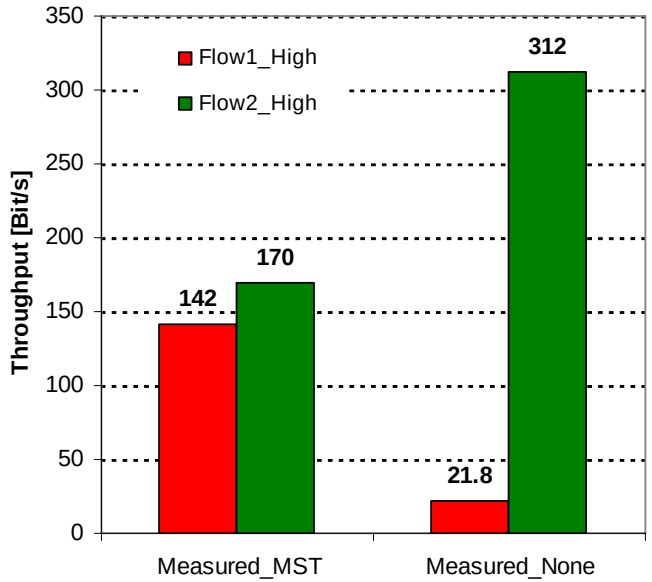


LSU REQ	Link setup request
LSU CONF	Link setup confirmation
LSU TERM	Link termination request
Term CONF	Link termination confirmation

LSU_PRIO	Max SessionTime [sec]
HIGHEST	240
HIGH	180
ROUTINE	120
LOW	60

Measurement results (concurrent UDP flows)





- **Nearly optimal channel allocation according to priority**
- **No blocking of other flows**

Conclusion

- **Priority based Packet Aggregation**
  - Optimal stochastic queueing according to priority
  - Dramatic throughput improvements under good channel conditions
  - Due to the adaptivity of the aggregation size the packet transfer delay keeps relative constant

- **Priority based Maximum Session Time**
  - Easy way to achieve a priority based channel allocation
  - Optimizes network traffic (multiple traffic flows to the same dest)

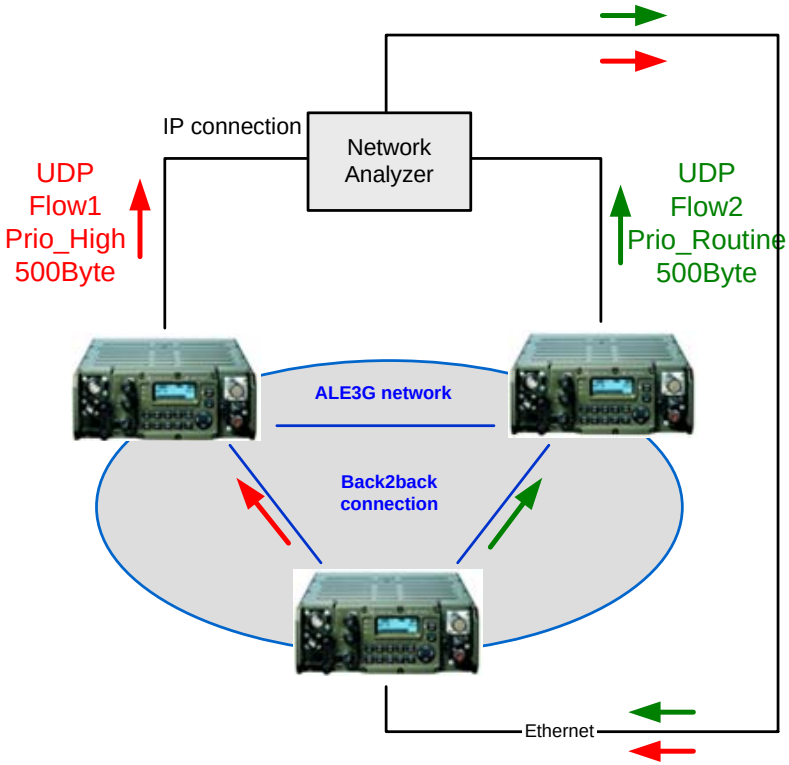
- **Both features are available in the actual SW Release 6.2 for R&S MR300xH and R&S M3SR Series 4100**

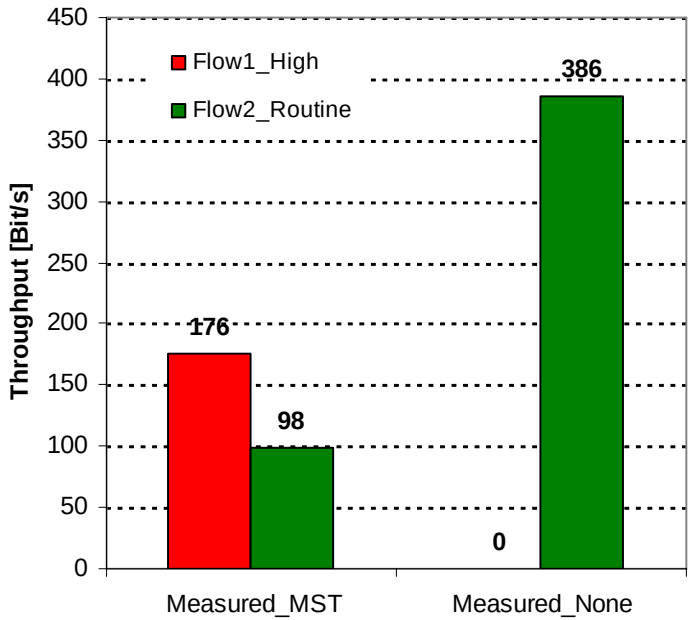
Priority based Session Management for STANAG 4538

Thank you for your attention

Any questions ?

Measurement results (concurrent UDP flows)





Measurements (Concurrent ICMP Ping)