



**Finnish Defense Research Agency**

# **ESSOR tests in CWIX'18**

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Försvarsmakten • The Finnish Defence Forces



# Agenda

1. ESSOR CWIX2018 test goal
2. ESSOR test implementation
3. ESSOR test plan
4. Results of the ESSOR CWIX2018 tests
5. Conclusions



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# ESSOR CWIX2018 test goal

Demonstrate the interoperability of the ESSOR HDR waveform to facilitate multinational or coalition missions statically and in mobility.





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# ESSOR test implementation

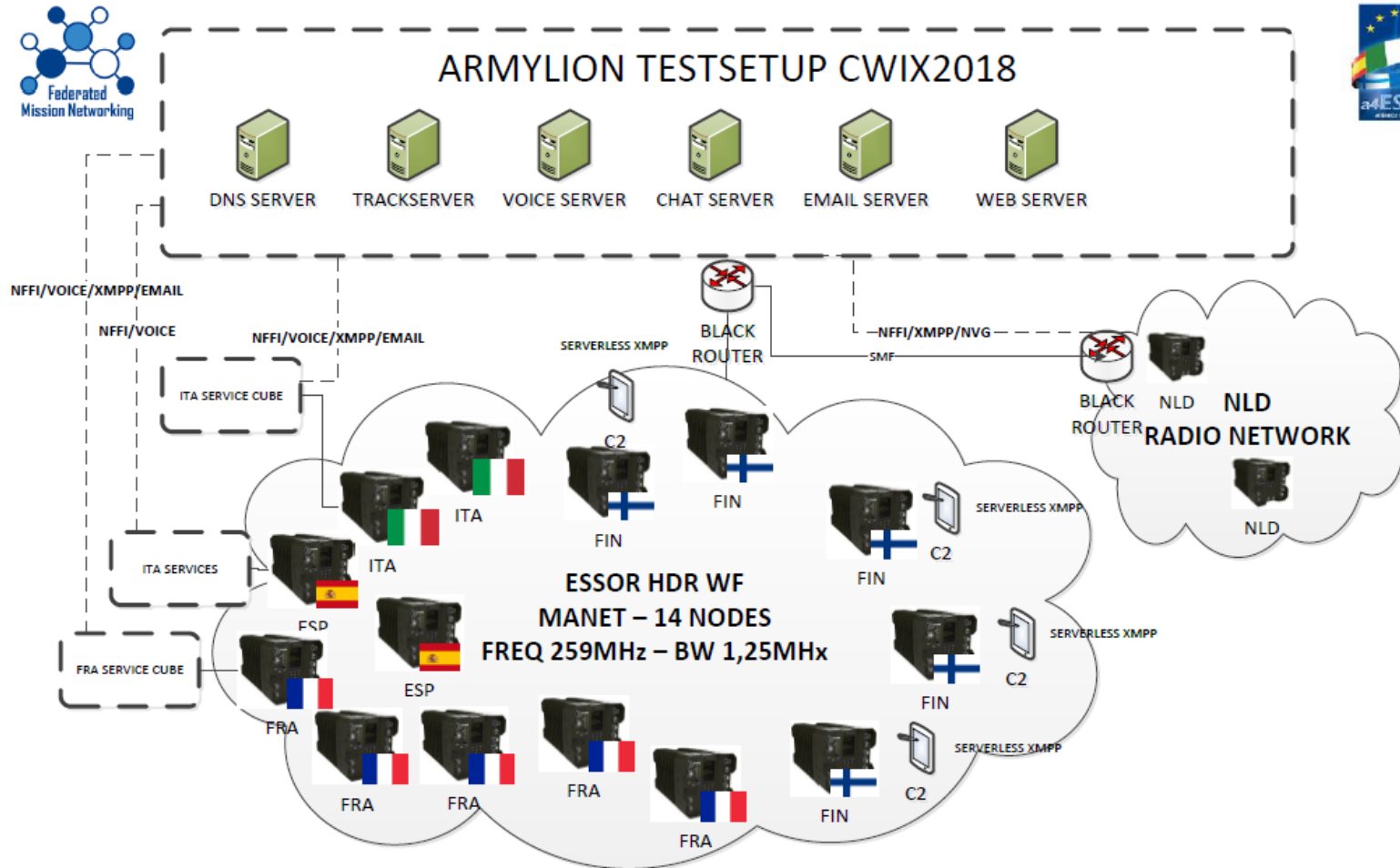
**EXECUTION:** Mission Network based on ESSOR HDR waveform in up to 14 nodes multi-hop network between:

- **Spain (ESP):** SYNAPS-T (THALES) vehicular radios,
- **Finland (FIN):** Tacwin (Bittium) tactical router vehicular radios
- **France (FRA):** CONTACT ERS-p (THALES SYNAPS-H) handheld radios,
- **Italy (ITA):** SWave VQ1 (Leonardo) vehicular radios,



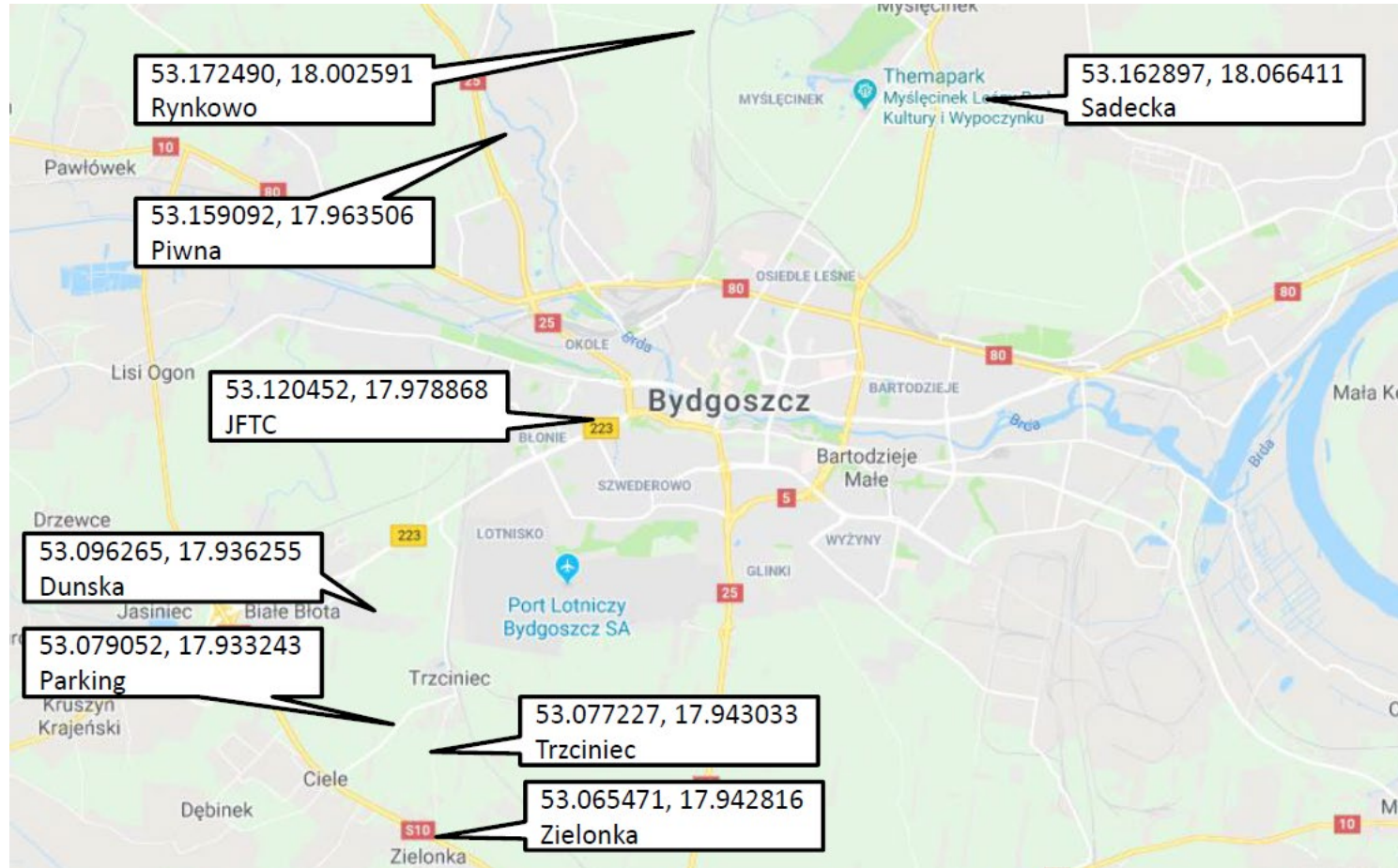


# ESSOR test implementation





# ESSOR test implementation







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# ESSOR CWIX2018 test plan

Objective 1: Exercise the HDR waveform		
	Title	Test Template
1	Topology: late entry	<a href="#">ESSOR HDR WF - Topology: late entry (#2493)</a>
2	Topology: mobility	<a href="#">ESSOR HDR WF - Topology: mobility (#2494)</a>
3	Topology: Network setup time	<a href="#">ESSOR HDR WF - Topology : network setup time (#2495)</a>
4	Latency	<a href="#">ESSOR HDR WF - Latency (#2496)</a>
5	Throughput - iperf	<a href="#">ESSOR HDR WF - Throughput iperf (#2497)</a>
6	Split and merge, also subnets	<a href="#">ESSOR HDR WF - Split and merge subnet (#2498)</a>
7	Ping and traceroute over multiple hops	<a href="#">ESSOR HDR WF - Ping and Traceroute over multiple hops (#2499)</a>





# ESSOR CWIX2018 test plan

Objective 2: Test Spiral (1.1) services on top of the ESSOR HDR WF		
	Title	Test Template
1	Chat: Message send and receive - point to point	<a href="#">ESSOR HDR WF – Chat Service: Message send and receive - Point to Point (#2453)</a>
2	Chat: Multi messages at same time: Joining the same CHAT room	<a href="#">ESSOR HDR WF – Chat Service: Multi messages at the same time, Joining the same CHAT room (#2454)</a>
3	Chat: Usability of the CHAT service: All are able to communicate in the same CHAT room	<a href="#">ESSOR HDR WF – Usability of the Chat Service: All are able to communicate in the same CHAT room (#2455)</a>
4	Email: Message send and receive - point to point	<a href="#">ESSOR HDR WF – Email Service: Message send and receive - Point to Point (#2457)</a>
5	Email: Multi messages at same time: point to multi-point	<a href="#">ESSOR HDR WF – Email Service: Multi messages at the same time - Point to Multipoint (#2458)</a>
6	Email: Usability of EMAIL service: sending a 500kb file	<a href="#">ESSOR HDR WF – Usability of the Email Service: Sending a 500 Kbytes file (#2459)</a>
7	Web: able to open FIN portal (test site)	<a href="#">ESSOR HDR WF – Web Service: Able to open/display Web Portal content (#2456)</a>
8	FFT: Open connection between NFFI gateway and NFFI hub	<a href="#">ESSOR HDR WF – FFT Service: Open connection between NFFI Gateway and NFFI Hub (#2460)</a>
9	FFT: Send 10 tracks via NFFI gateway - confirm receiving tracks	<a href="#">ESSOR HDR WF – FFT Service: Send 10 Tracks via NFFI Gateway (#2461)</a>





# ESSOR CWIX2018 test plan

10	FFT: Receive other tracks from the NFFI hub	<a href="#">ESSOR HDR WF – FFT Service: NFFI Gateways receive other tracks from NFFI Hub (#2462)</a>
11	FFT: Usability of FFT: ALL tracks to ALL from the NFFI hub. Same COP in all systems	<a href="#">ESSOR HDR WF – Usability of the FFT Service: ALL tracks to ALL from the NFFI hub. All the systems sharing the same COP. (#2463)</a>
12	Voice: call point to point	<b>PENDING</b>
13	Voice: call point to multi-point	<b>PENDING</b>
14	Voice: Usability of VOICE service: conference call	<b>PENDING</b>
15	Video: One sending video source from mobile node	<a href="#">ESSOR HDR WF – Video Point to Point from mobile node (#2540)</a>
16	MIP: Updating MIP 3.1 database over the ESSOR waveform	<a href="#">ESSOR HDR WF – MIP Service: Update MIP3.1 database over radio (#2464)</a>
17	Operational testing: Running the scenario with all services	<b>PENDING</b>





# ESSOR CWIX2018 test plan

Objective 3: OTHERS		
	Title	Test Template
1	NINE Tactical Radio Profile Service	<a href="#">ESSOR HDR - NINE Tactical Radio Profile Service</a>
2	SCIP Multipoint Service	<a href="#">ESSOR HDR WF - SCIP Multipoint Service (#</a>





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# Results of single tests

## FMN Spiral 4 WBWF testing

		ESP	FIN	FRA	ITA
ESSOR WBWF					
	SETUP (04422)	<15s	<15s	<15s	<15s
	LATE ENTRY (04420)	<30s	<30s	<30s	<30s
	DISJOIN / MERGE (04425)	No loss	No loss	No loss	No loss
	MOBILITY (04421)				
	MULTIHOP MOBILITY (04426)				
	UNICAST (04424)	~35kbps	~35kbps	~35kbps	~35kbps
	MULTICAST (04424)	~35kbps	~35kbps	~35kbps	~35kbps
	LATENCY over 2-3 hops (04423)	~225ms	~225ms	~225ms	~225ms





# Results of single tests

## FMN Spiral 4 WBWF + FMN Services concept testing

		ESP	FIN	FRA	ITA
ESSOR WBWF WITH					
	VoIP G.729 (05498)				
	SCIP (05935)	N/A		N/A	
	DNS (04142)				
	EMAIL (04142)				
	CHAT (04061, 04138)				
	PORTAL – ITA (04139)				
	NFFI (04308, 04309 04311)				
	MIP3.1 (04312)		N/A		N/A
	SCIP (04403)				
	NINE (04400)				N/A







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# Summary of the test results

- The ESSOR HDR network successfully demonstrated its capability to support the FMN Spiral 1.1 and MIP 3 enhanced services.
  - In addition, the ESSOR HDR network successfully demonstrated its ability to support:
    - **SCIP** Point to Multipoint encrypted MELP 2.4 voice encapsulated in IP multicast packets (CIFPECOM from TECNOBIT Spain)
    - NINE unicast(\*) and multicast secure IP communications.
- (\*) NINE terminal multi vendors configuration: CIFPECOM from TECNOBIT Spain and RP-101NINE from Transbit Poland





# Conclusion

**ESSOR demonstrated technical  
readiness to be incorporated  
in to the FMN SP4**

