

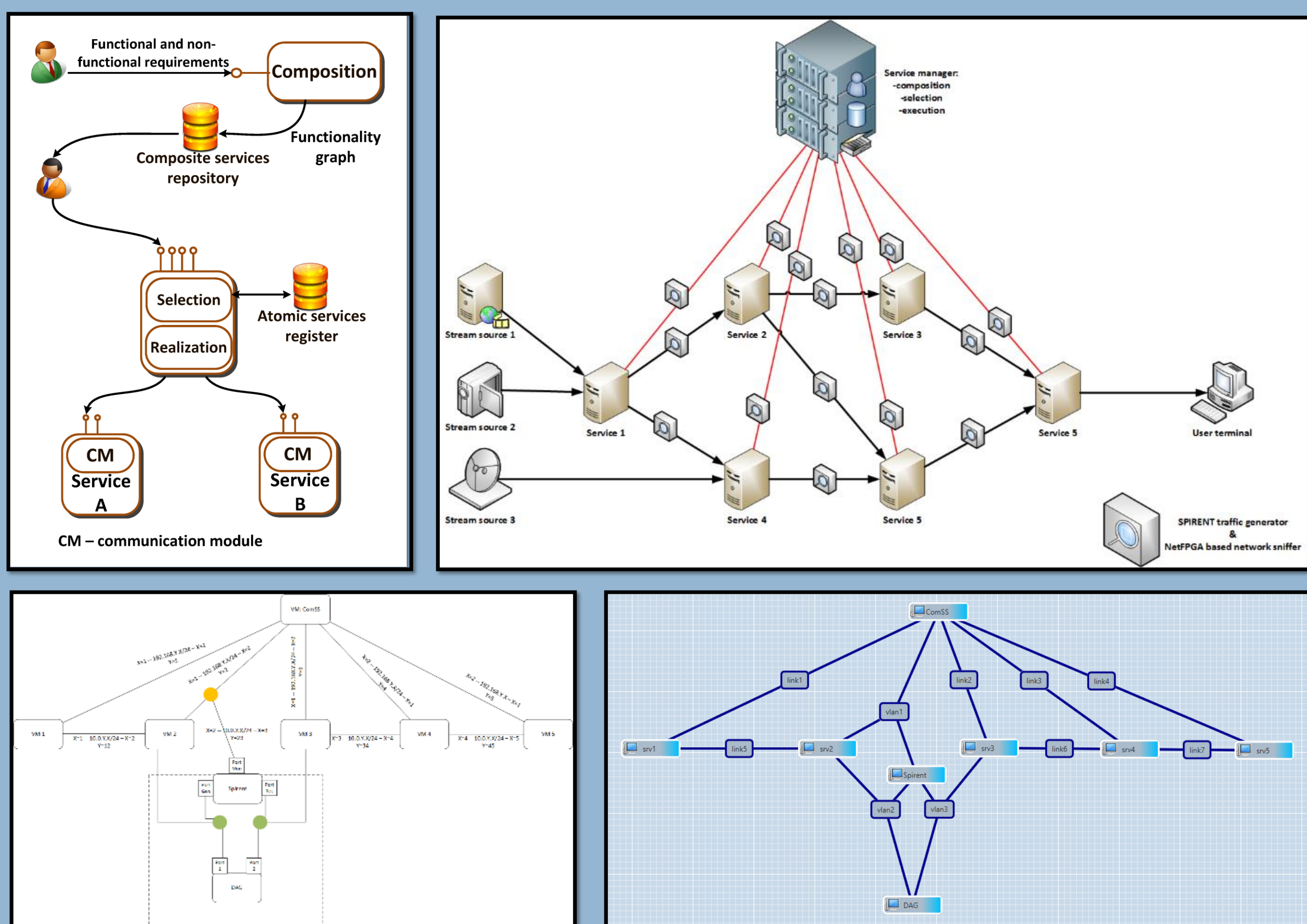
GOALS

- Development of our new solution for multimedia data stream processing.
- Evaluation of protocols and data format negotiation methods for composite streaming service execution.
- Measurement of time and quality of negotiations in scenarios differing in: complex service structure, network connections parameters and computing resources.

CHALLENGES

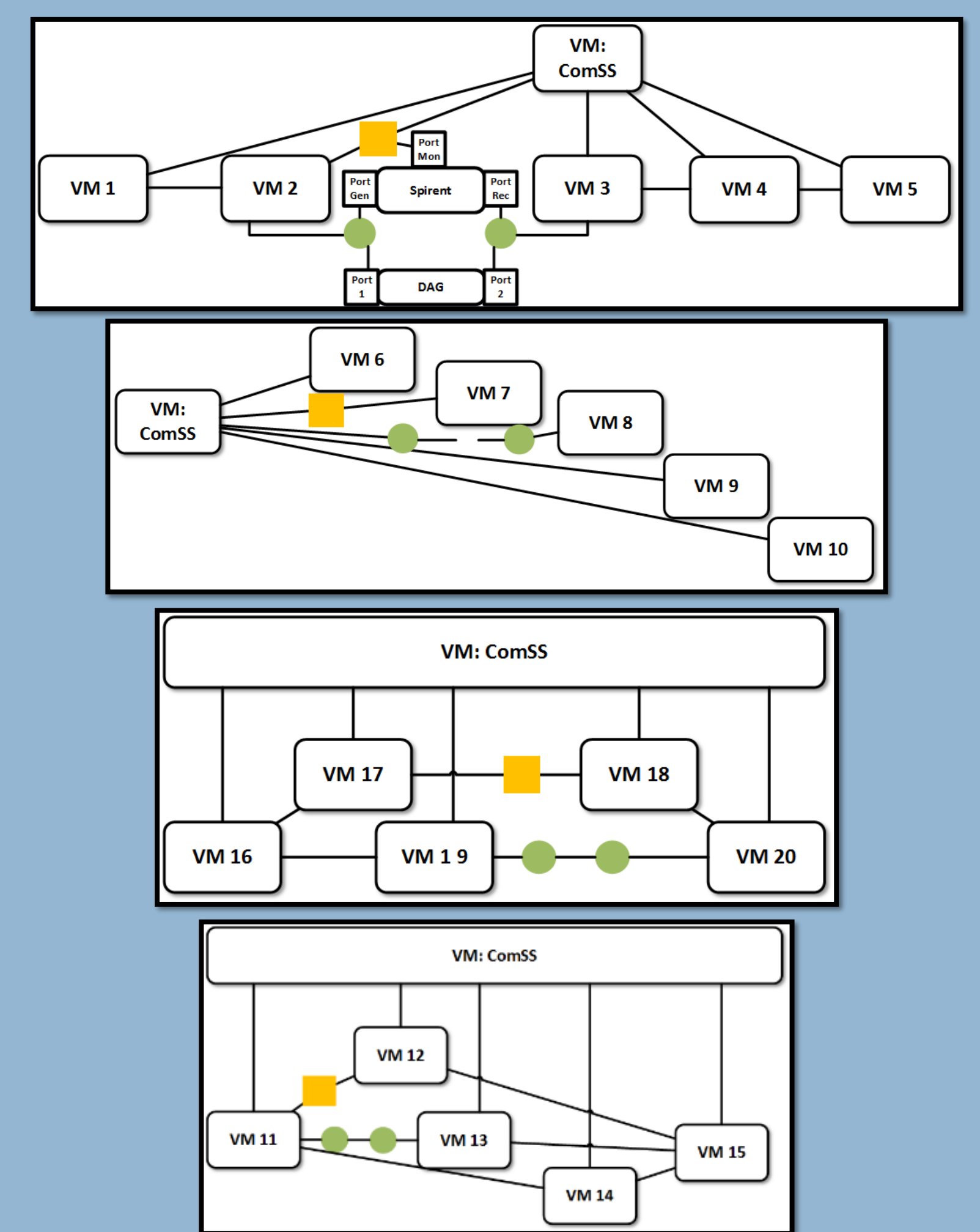
- Limited access to large scale computing infrastructure offering required level of manageability and isolation.
- Lack of specialized tools for network traffic generation and analysis.
- Verification in near real-life environment.
- Research and development of Future Internet solution by SME with restrained resources.

DEMO SETUP



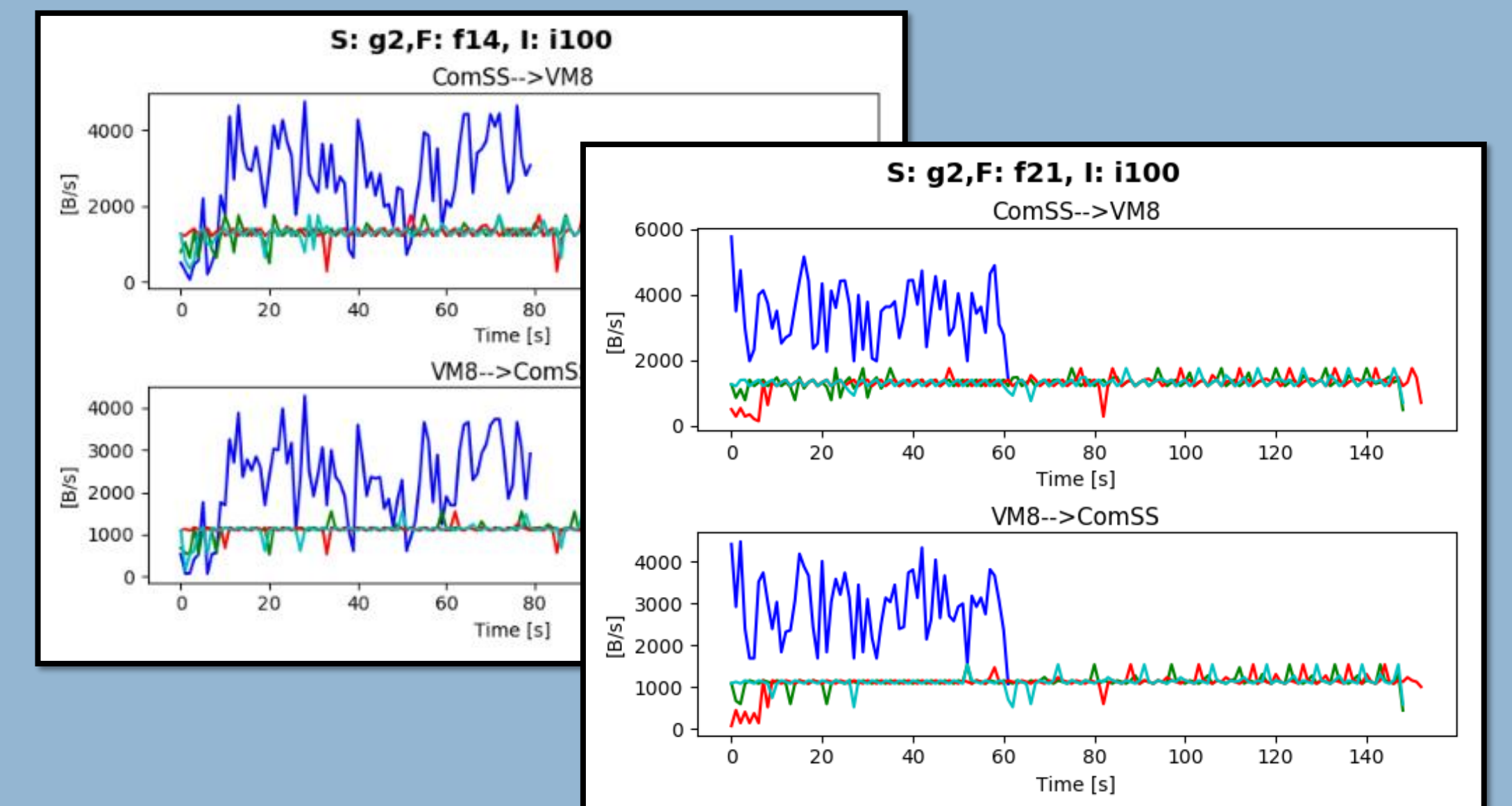
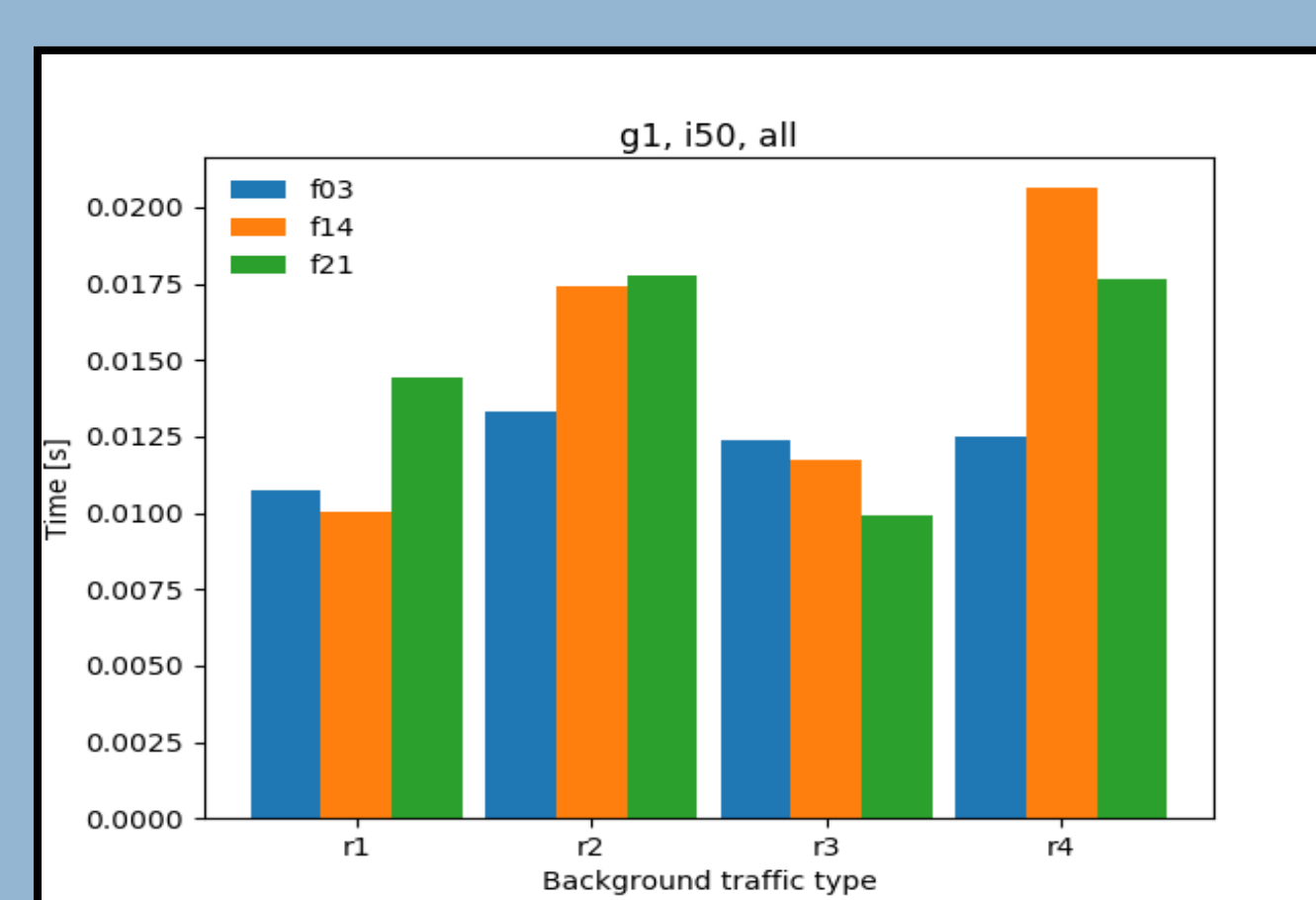
EXPERIMENT SCENARIOS

- selected composite data stream processing workflow (g1, g2, g3, g4),
- number of individual user requests sent during test (i10: 10 requests, i50: 50 requests, i100: 100 requests),
- number of feasible data formats, which were used during negotiations (f03: 3 formats, f14: 14 formats, f21: 21 formats),
- characteristic of background network traffic (r1: 0% of background traffic, r2: 95%, r3: 99%, r4: 100%).



RESULTS

		Workflow 1.		Workflow 2.		Workflow 1.		Workflow 2.						
		max init	max neg	mean init	mean neg	max init	max neg	mean init	mean neg					
f03	r1	16,00	15,37	14,20	13,44	40,15	33,18	31,00	29,67	28,70	27,72	72,09	68,14	
	r2	32,00	31,08	29,10	28,24	76,58	75,27	57,00	56,56	46,50	45,83	152,45	148,36	
	r3	32,50	30,53	28,20	27,37	77,27	74,91	58,00	57,67	55,40	54,79	152,90	121,37	
	r4	29,50	28,54	27,90	27,37	77,71	75,78	60,00	58,68	56,60	55,80	151,31	148,93	
i50	f14	r1	16,50	15,23	12,90	12,41	36,07	33,49	30,00	29,90	26,90	26,52	79,89	70,34
	r2	30,00	28,83	28,60	28,11	79,12	76,29	56,50	55,65	54,70	53,91	152,59	122,94	
	r3	32,00	28,97	28,40	27,14	78,59	77,45	55,50	53,76	54,20	53,49	153,41	122,81	
	r4	36,00	35,84	29,70	29,50	79,02	75,93	57,50	55,40	53,90	53,56	151,99	123,83	
i100	f21	r1	16,50	15,07	14,40	13,37	35,82	33,05	65,50	60,75	48,50	43,71	70,16	65,59
	r2	6,00	4,98	3,80	3,30	79,68	75,90	9,50	8,78	7,80	7,00	150,85	121,63	
	r3	5,00	5,18	3,50	3,32	80,67	76,93	10,00	7,75	7,10	6,34	153,05	149,54	
	r4	29,50	29,40	27,80	27,31	77,27	75,87	59,50	57,45	55,20	54,72	149,92	148,18	



Aggregated communication times required for composite data stream processing services set-up for a stream of 50 and 100 consecutive user requests.

Average aggregated communication time value of reservation, configuration and control stages times for workflow 1.

Network characteristics for management message exchange between negotiation modules of services for 14 and 21 data formats and 100 user requests (blue - R1 background traffic, green - R2, red - R3, cyan - R4).

CONCLUSIONS

- The experiment enabled us to fully evaluate and verify our protocol and data format negotiation methods in an isolated and controlled environment which simulated real world use cases.
- Tested protocols and methods retain their reliability and performance even in case of larger number of formats and high network load.
- Structure of the workflow does not have a considerable impact on the performance of the communication modules and protocol and data format negotiation methods.
- Introduction of adaptable protocol and data format negotiation methods does not introduce a considerable delay to the composite data stream processing service set-up, hence the developed solutions can be considered as viable for utilization in production environments.

POST MORTEM

- Improved protocols and data format negotiation methods on the basis of Fed4FIRE experimentation.
- Implementation of tested protocols and negotiation methods in our product.
- Increased market readiness of our solution for composite data stream processing.
- Thanks to Fed4FIRE for supporting our product, especially for:
 - access to unique tools and computing resources,
 - diversity of available resources,
 - ease of experiment setup and management,
 - high quality of support from our patron - PSNC.