

# valkyrie.

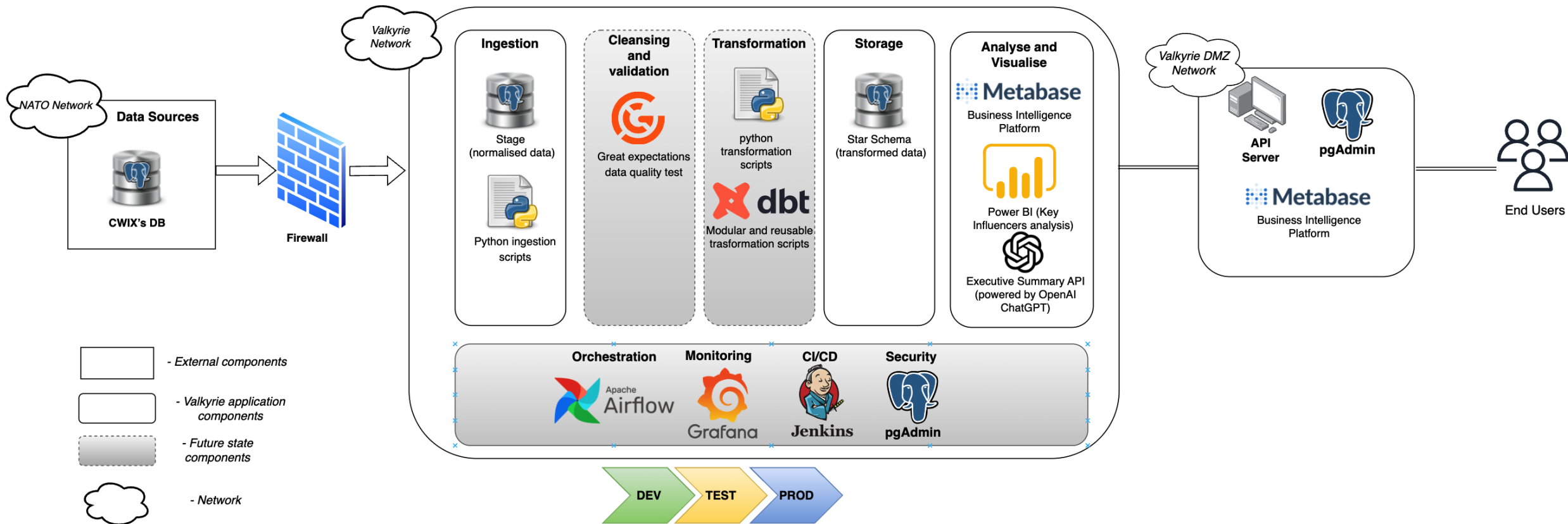




# Architecture and Process

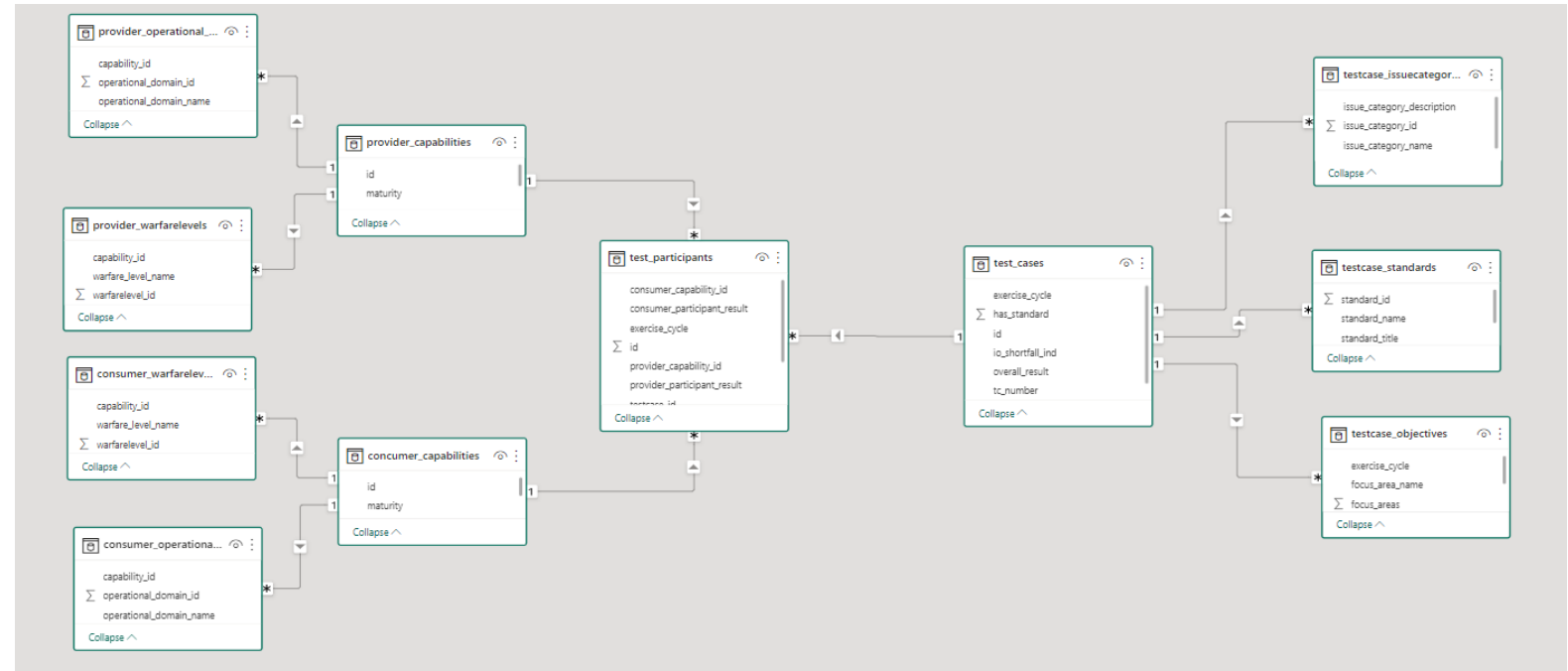


# System Architecture Overview





# Data Warehouse Schema



IDEATION & PLANNING

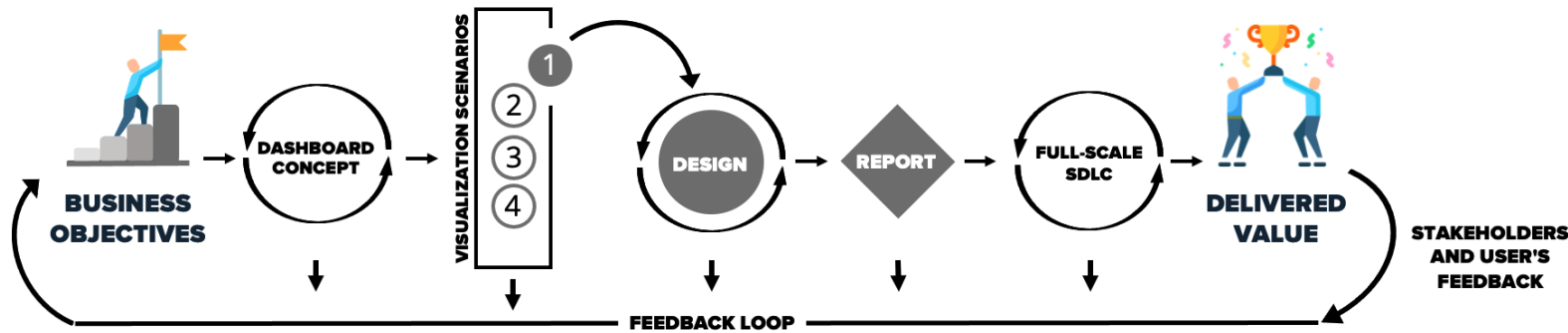
DESIGN & PROTOTYPE

IMPLEMENTATION

UI TESTING & DATA VALIDATION

DEPLOYMENT

## BI Implementation Approach



**SUCCESS FORMULA TO GET ACTIONABLE INSIGHTS**

**DATA PLATFORM (DATA MODEL) + REPORTING (UI+UX) + CULTURE + GOVERNANCE + MANAGEMENT**

softserve





# Key Performance Indicators



# Cross-Nation Interpretability Index



## CROSS-NATION INTERPRETABILITY INDEX

CWIX 2021

CWIX 2022

Overall

Index 2021 **66.8**

Index 2022 **65.4**

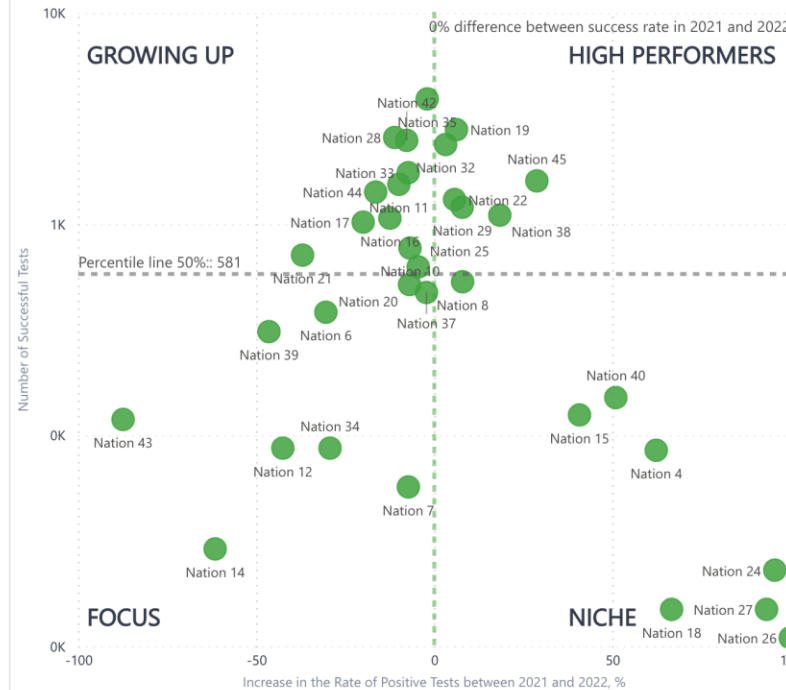
Index Difference **- 1.4**

Index Overall **66.0**

### Cross-Nation Interpretability Index - CWIX 2022

Consumers	N04	N06	N07	N08	N10	N11	N14	N15	N16	N17	N18	N19	N20	N21	N22	N24	N25	N26	N27	N28	N29	N32	N33	N34	N35	Total
N04					0		57						71				85									
N06		67											42	13												
N07															91											
N08				76		0		56				48			81											
N10													66													
N11				74		73		100	34	0		100	98	100	82	64	92									
N14				60				33																		
N15		0		100		41		0				42					35									
N16			100	20		55	0		74	60		82	11	50	83		100									
N17			50		0	21		0	40	100		94	100	73	54		100									
N18				0												50		100								
N19			100	58	64	100			96	86	100	56	80	67	100	75										
N20		73					91		72		0	76	100	94	5		90									
N21		100		0			100		45	60		100	80	84	59	78	50									
N22				78		39			71	64	100	88	0	60	97		10	100								
N24														80												
N25		71				73		54				100		84		0	100	29								
N26													100													
N27				50									100													
N28		26	60	32		63			37	62		48	100	100	43	83	67									
N29		33		41			0		36	78		52	20	75	90	100										
N32		17		49	58	86			78			92				85	100									
N33		100		63		50			64	62	0	75		65	73	100										
N34		100							100		100	9		100	100	100										
N35				63	65	100			91	40	100	89	93	100	100		100									
Total	75	36	43	50	63	73	0	62	63	58	88	75	75	61	67	79	73	91								

### Quadrant of Nations by Successful Tests and Increase in the Rate of Positive Tests



The Cross-Nation Interpretability Index is a way to measure **how well countries can work together** when they do tests. It considers how good the results are when one country does the tests, and another uses them. This can help us determine how to improve testing and make it easier for countries to work together.





# Multi-Domain Capability Coverage



## MULTI-DOMAIN CAPABILITY COVERAGE

Operational

Strategic

Tactical

Index 2021 **80.7**

Index 2022 **78.3**

Index Difference **- 2.4**

Index Overall **78.7**

1

2

3

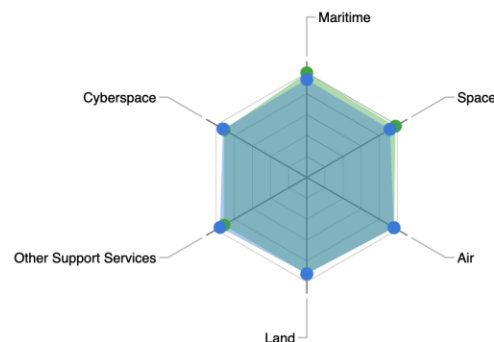
4

### Multi-Domain Capability Coverage Details

Nations	Index 2021	Index 2022	Difference
Nation 4	100.00	100.00	0.00
Nation 6	100.00	66.67	-33.33
Nation 7	100.00	100.00	0.00
Nation 8	75.00	77.78	2.78
Nation 10	100.00	100.00	0.00
Nation 11	66.67	71.43	4.76
Nation 12	100.00		-100.00
Nation 14	100.00	66.67	-33.33
Nation 15		50.00	50.00
Nation 16	100.00	92.31	-7.69
Nation 17	100.00	80.00	-20.00
Nation 18		100.00	100.00
Nation 19	84.62	74.07	-10.54
Nation 20	100.00	75.00	-25.00
Nation 21	66.67	100.00	33.33
Nation 22	81.82	66.67	-15.15
Nation 24		0.00	0.00
Nation 25	100.00	50.00	-50.00
Nation 26		0.00	0.00
Nation 27		0.00	0.00
Nation 28	79.41	80.43	1.02
Total	80.69	78.28	-2.42

### Operational Domain Coverage of Capabilities

● Index 2021 ● Index 2022



### Summary generated by OpenAI ChatGPT

The data shows that there were improvements in the Multi-Domain Capability Coverage metric for the Other Support Services and Cyberspace domains in 2022 compared to 2021. However, despite these improvements, there was an overall slight decline in the metric values for all domains in 2022, which suggests a potential decrease in the effectiveness of combined operations across different domains.

Capability Multi-Domain Coverage is a metric that shows the **percentage of testing in which capabilities are used in multiple operational domains**. It helps assess the ability of different countries to work together in diverse situations and identify areas for improvement.



# NDPP Capability Utilization Index



## NDPP CAPABILITY UTILIZATION INDEX

CWIX 2021

CWIX 2022

Overall

Index 2021

19.1

Index 2022

19.8

Difference

0.7

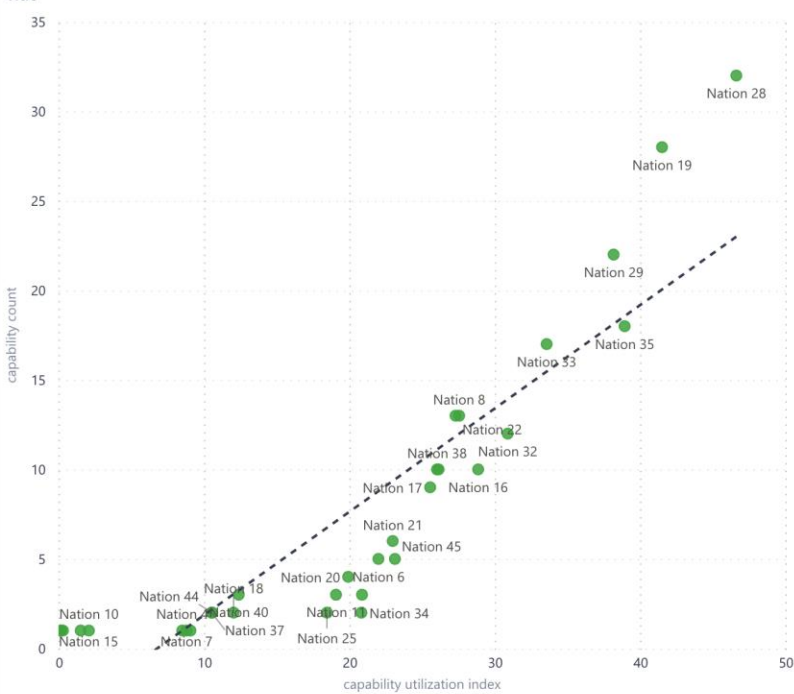
Index Overall

23.5

### NDPP Capability Utilization Index Details

Providers	Air	Cyberspace	Land	Maritime	Space	Other Supp...	Total
Nation 4				1.00	50.00		8.50
Nation 6	3.00	18.18	2.53		100.00	5.26	22.00
Nation 7				1.00	50.00	1.75	8.79
Nation 8	6.00	36.36	4.43	8.00	100.00	10.53	27.55
Nation 10	1.00	9.09	0.63			1.75	2.08
Nation 11	1.00	9.09	0.63	2.00	100.00	1.75	19.08
Nation 14	1.00		0.63	1.00	50.00	1.75	9.06
Nation 15						1.75	0.29
Nation 16	6.00	45.45	3.16	8.00	100.00	10.53	28.86
Nation 17	4.00	27.27	3.80	6.00	100.00	12.28	25.56
Nation 18		18.18	1.27	1.00	50.00	1.75	12.03
Nation 19	8.00	100.00	9.49	14.00	100.00	17.54	41.51
Nation 20	3.00	9.09	1.90	2.00	100.00	3.51	19.92
Nation 21	2.00	18.18	3.16	4.00	100.00	10.53	22.98
Nation 22	7.00	36.36	3.16	5.00	100.00	12.28	27.30
Nation 24			0.63				0.11
Nation 25		9.09	0.63	1.00	100.00		18.45
Nation 26		9.09					1.52
Nation 27				1.00			0.17
Nation 28	16.00	100.00	8.86	18.00	100.00	36.84	46.62
Nation 29	9.00	81.82	4.43	11.00	100.00	22.81	38.18
Nation 32	4.00	63.64	4.43	1.00	100.00	12.28	30.89
Nation 33	5.00	63.64	8.23	7.00	100.00	17.54	33.57
Total	4.25	35.66	2.91	4.07	87.04	9.18	19.82

### Title



The NDPP Capability Utilization Index measures how effectively nations **use NATO-recommended capabilities** during CWIX events, identifying areas for improvement, and maximizing available resources.

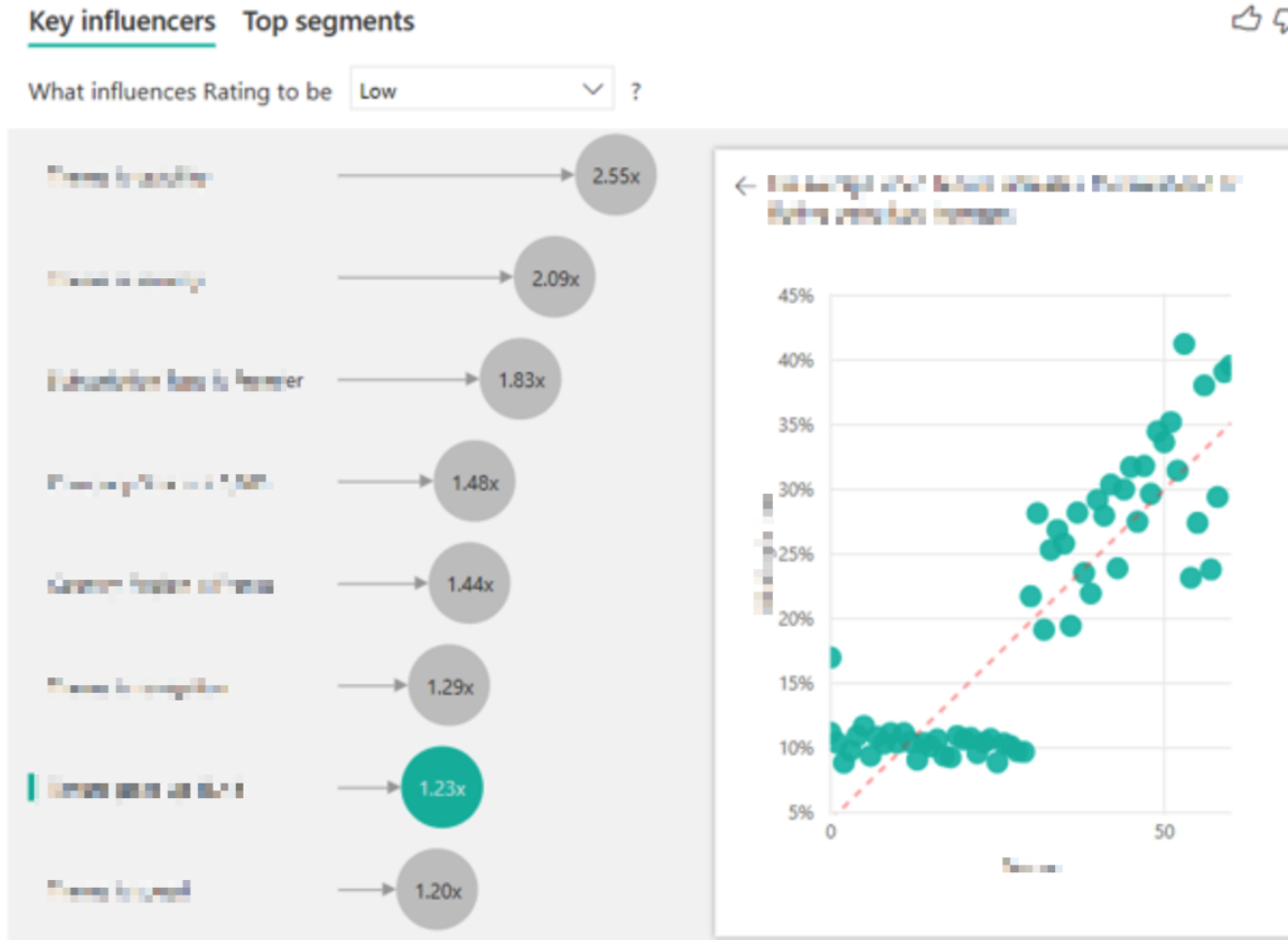




# Improving Future CWIX Events



# Key Influencers Report



The Key Influencers report provides insights on the Cross-Nation Interpretability Index, Multi-Domain Capability Coverage, and NDPP Capability Utilization Index, **helping identify areas for improvement.**



# Nation Pairing Recommendation Report



## NATIONAL PAIRING RECOMMENDATION INDEX





Overall

Air

Cyberspace



The Nation Pairing Recommendation Report suggests which **countries should conduct testing together** for better coverage and efficiency while avoiding repeated testing.

National Pairing Recommendation Index																																																
Consumers	N04	N06	N07	N08	N10	N11	N12	N14	N15	N16	N17	N18	N19	N20	N21	N22	N24	N25	N26	N27	N28	N29	N32	N33	N34	N35	N37	N38	N39	N40	N42	N43	N44	N45														
N04	57.1	74.4	73.1	69.7	61.3	100.0	53.7	64.2	42.9	67.6	73.3	49.6	63.9	28.6	55.9	71.3	53.0	15.4	53.8	52.1	70.1	59.6	59.5	51.9	55.0	62.8	31.6	59.4	62.7	59.9	60.0	57.7	67.9	61.4														
N06	61.6	3.4	63.6	73.3	61.8	60.9	60.7	71.9	73.9	62.1	29.9	49.8	50.0	81.4	62.2	71.4	51.2	58.1	54.8	55.9	75.0	42.1	76.7	55.2	0.0	9.1	69.3	62.7	63.2	93.9	57.0	53.9	22.2	59.8														
N07	45.9	64.3	69.3	69.4	60.2	57.7	55.3	68.3	73.0	61.5	0.0	47.2	63.5	57.3	9.1	63.3	49.0	55.1	50.4	50.8	70.9	63.4	64.1	52.1	44.8	56.3	65.1	7.3	63.4	69.8	0.0	0.0	68.7	56.6														
N08	55.4	69.5	69.0	28.6	62.8	58.4	45.5	50.0	66.6	45.5	48.3	48.3	69.5	59.7	0.0	18.5	51.7	58.8	47.7	0.0	62.3	61.8	75.0	0.0	49.6	31.6	64.2	69.1	91.2	80.0	14.3	54.0	33.3	57.3														
N10	60.8	68.2	67.9	72.1	50.0	61.0	59.6	70.0	69.7	63.9	0.0	49.2	38.4	62.2	62.6	37.9	53.9	28.8	51.0	52.9	72.4	64.7	41.4	56.2	51.3	29.7	66.7	33.9	65.0	73.0	0.0	54.4	0.0	60.7														
N11	54.3	71.5	72.2	34.3	63.8	26.7	60.0	70.0	0.0	66.0	100.0	52.2	0.0	2.0	0.0	18.1	27.8	7.7	51.1	50.9	75.6	2.3	16.7	0.0	53.0	95.2	21.7	2.4	26.9	0.0	6.3	58.3	8.7	0.0														
N12	46.7	67.1	61.2	64.7	61.8	55.4	0.0	100.0	61.0	62.3	62.5	50.5	50.0	56.2	57.8	65.6	51.0	54.9	46.3	49.2	71.4	100.0	64.2	0.0	46.7	56.1	59.6	36.4	63.8	69.5	56.0	73.5	69.8	56.6														
N14	45.3	68.0	68.6	25.0	61.7	57.4	0.0	0.0	69.8	66.7	63.5	50.0	0.0	57.7	60.3	67.1	54.2	57.5	48.5	50.8	100.0	68.8	66.6	0.0	50.5	58.3	60.3	0.0	65.8	70.6	58.7	0.0	71.2	59.2														
N15	100.0	72.2	71.2	0.0	62.0	58.8	57.7	68.1	64.2	66.4	100.0	53.0	65.0	57.9	60.7	68.5	54.4	65.0	55.5	53.2	33.3	100.0	66.0	0.0	54.1	83.3	55.6	62.0	64.5	72.0	61.2	56.1	66.7	100.0														
N16	59.7	0.0	68.0	80.0	62.8	45.5	59.2	100.0	68.7	21.9	40.0	49.1	18.5	88.9	50.0	17.4	51.4	0.0	50.6	52.0	38.0	52.6	59.5	31.4	20.0	15.3	100.0	58.3	63.4	72.1	33.3	53.8	27.3	6.7														
N17	55.8	47.6	0.0	50.8	7.1	78.6	56.7	70.5	100.0	60.3	2.9	48.1	20.0	0.0	27.4	34.9	25.0	0.0	54.8	53.9	48.1	19.7	40.0	23.1	0.0	14.1	70.0	86.4	75.0	72.1	65.3	0.0	53.3	100.0														
N18	51.7	65.3	66.5	100.0	57.7	52.5	48.7	54.7	67.8	53.5	59.0	33.5	62.3	56.2	51.0	50.0	44.1	52.3	0.0	0.0	66.8	57.2	60.2	43.2	0.0	50.0	62.8	53.5	59.6	70.4	0.0	52.6	60.2	43.7														
N19	52.5	31.3	65.6	38.8	37.7	0.0	20.0	0.0	68.0	4.3	17.6	0.0	35.6	22.6	50.0	65.5	25.0	37.9	48.7	49.9	56.3	37.1	25.0	11.7	0.0	18.4	41.7	53.3	12.5	71.3	30.8	14.8	41.2	42.9														
N20	26.7	83.3	72.3	69.4	60.9	9.1	57.5	67.9	27.6	65.1	100.0	49.8	13.5	0.0	6.3	95.0	50.5	10.4	51.1	50.2	78.5	0.0	62.1	0.0	50.2	0.0	45.0	10.0	60.5	67.1	58.1	53.8	48.1	60.0														
N21	0.0	69.9	100.0	0.0	59.7	0.0	58.5	69.4	66.5	54.9	39.7	49.6	0.0	20.0	15.0	40.7	22.2	50.0	54.1	53.6	4.3	20.0	63.4	21.3	49.0	0.0	16.7	0.0	33.3	69.6	57.3	0.0	70.4	59.9														
N22	55.8	77.8	67.5	21.7	62.3	60.6	56.3	64.8	66.2	29.4	33.6	0.0	59.7	85.3	40.5	5.9	49.4	58.7	0.0	33.3	62.1	35.7	62.8	23.8	0.0	33.1	91.1	40.2	30.4	100.0	3.0	54.0	33.3	0.0														
N24	47.9	64.0	61.7	68.7	59.5	57.2	54.8	69.1	60.8	60.6	62.7	50.1	62.6	57.7	20.0	64.9	48.1	0.0	47.1	46.5	0.0	60.6	62.8	0.0	0.0	56.3	65.3	59.0	60.7	71.6	54.6	49.7	67.7	56.4														
N25	29.0	68.5	66.0	67.6	25.0	27.3	54.2	63.5	46.4	59.0	62.4	0.0	44.9	16.1	55.2	61.4	0.0	66.7	47.0	45.8	67.5	58.2	58.3	48.7	0.0	13.3	37.8	26.2	56.4	66.5	54.3	49.0	100.0	55.1														
N26	57.2	66.9	64.2	68.4	59.2	53.1	54.9	56.5	68.6	54.2	59.7	0.0	65.0	54.5	55.4	0.0	44.7	56.8	37.1	0.0	70.6	60.6	59.9	47.1	42.4	0.0	62.5	56.1	63.9	75.7	48.7	52.3	62.9	48.3														
N27	57.8	68.4	68.1	50.0	59.1	55.5	53.6	58.5	69.3	55.5	60.9	0.0	64.9	57.4	58.9	0.0	52.1	56.9	0.0	42.9	71.1	61.2	60.7	49.9	44.7	0.0	64.6	56.3	60.5	76.3	50.8	53.3	64.9	50.7														
N28	55.4	72.4	62.5	80.2	61.2	25.7	56.8	0.0	62.5	56.1	73.6	46.7	58.4	6.7	24.1	55.0	16.7	59.1	33.3	0.0	51.2	34.5	52.5	20.3	28.6	65.0	33.3	13.3	63.0	38.1	42.1	100.0	19.2	23.3														
N29	55.1	39.4	69.0	64.3	61.9	25.0	97.0	100.0	64.5	62.5	25.0	49.9	51.4	52.8	28.6	33.3	0.0	59.6	52.0	51.8	43.8	18.4	35.7	37.3	52.0	17.8	65.6	72.3	0.0	46.9	13.3	54.7	50.0	28.6														
N32	56.6	82.7	70.4	50.4	38.4	14.3	60.6	70.2	64.3	22.0	46.6	50.8	20.3	61.1	100.0	15.7	0.0	61.5	52.8	52.5	56.0	30.3	18.0	53.8	51.8	23.3	15.8	40.0	54.2	10.2	13.6	56.2	22.2	25.0														
N33	52.5	0.0	68.3	47.4	62.0	50.0	18.2	69.9	66.0	35.8	35.8	100.0	19.5	60.3	30.8	24.1	0.0	58.4	52.2	52.9	14.6	33.8	36.4	8.1	0.0	0.0	33.3	1.2	0.0	0.0	0.0	85.7	6.3															
N34	55.1	0.0	65.2	69.7	59.3	56.7	55.4	67.8	70.5	0.0	0.0	0.0	90.9	58.3	58.6	0.0	0.0	0.0	47.0	47.9	100.0	66.7	62.3	11.1	0.0	0.0	65.4	0.0	75.0	69.6	0.0	0.0	68.3	0.0														



# Test Standards Improvement Report

[TBD]

The Test Standards Improvement Report identifies which **standards caused issues during testing and need improvement**. It helps to ensure that tests are more effective and efficient, leading to better overall results.



# Failed Test Cases Analysis Report

[TBD]

The Failed Test Cases Analysis Report evaluates test cases that have consistently failed over time, identifying which cases should be reconsidered or recreated to improve overall testing effectiveness.



# Nation Page (Details)

[TBD]

The report provides a visual overview of each nation's capabilities, test cases, and test partners in CWIX events. It enables easy analysis and decision-making on the overall success of participating in CWIX viewable on a per-nation basis.





# Publicly Available Dashboard



<http://metabase.valkyrie.org.ua/public/dashboard/47a3ce1b-752f-40ef-b40c-ba3fd6fc6fa7>



# Any Questions?

# valkyrie.

