

AIS Service Assurance for Individual Service



5G

The '5G' text is rendered in a large, bold, green font with a white outline. It is part of a larger graphic that includes several circular icons connected by a series of thin, curved lines. The icons include a 5G lightning bolt, a Wi-Fi symbol, a mobile phone with signal waves, a cloud with Wi-Fi, and a speedometer. The background features a stylized city skyline and a green wave at the bottom.

Build the Best-in-Class Network

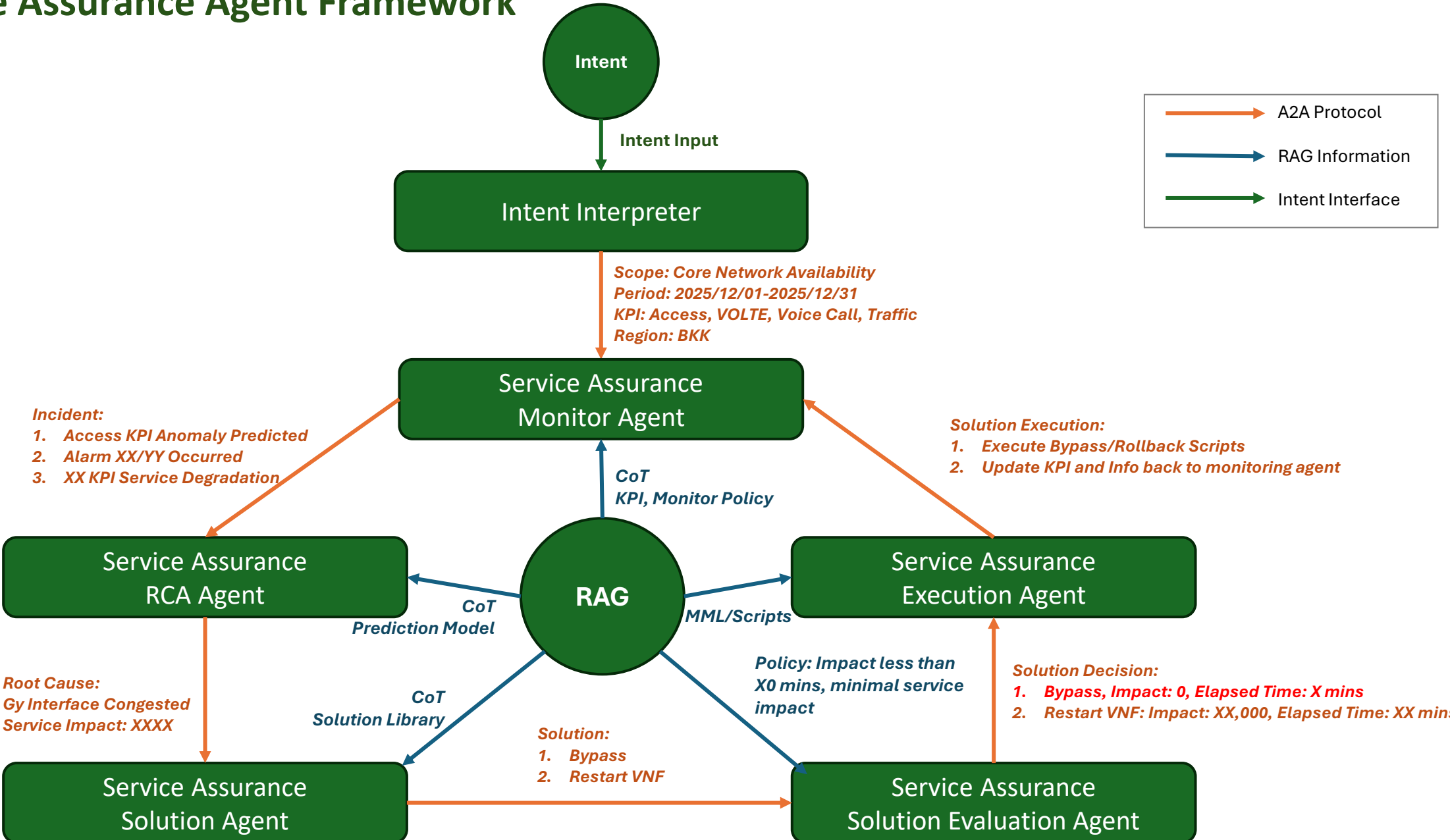
Overall Score

Process Flow	Cognitive Activity	Service Capability	Weight	Question	Method: Average							
					Criteria				Answer	Calculation		
					Option A	Option B	Option C	Option D		Original score	Compensated score	Overall Score
Service Assurance	Intent	Intent Translation & Fulfilment	10%	How does the System translate mobile Service intents (e.g., throughput, latency, availability) into network actions and evaluate their fulfillment?	4	3	0	0	A	4	4	4.00
	Awareness	Service Performance Monitoring & degradation Detection	10%	How does the System monitor mobile Service KPIs (e.g.: throughput, latency...) and detect performance degradation or anomalies?	3	2	1	0	A	3	4	
		Service Performance degradation Prediction	15%	How does the System predict Service performance degradation (e.g. Throughput, latency ...) and SLA violation before they affect Service performance?	4	3	2	0	A	4	4	
	Analysis	Service Performance degradation Impact Analysis	10%	How does the System identify and analyze the impact of performance degradation (e.g., throughput, latency ...) on user experience or SLA compliance in the mobile network?	4	3	2	0	A	4	4	
		Service Performance degradation Demarcation & Root Cause Analysis	10%	How does the System isolate the root cause of Service degradation across the network domains (i.e.: RAN, transport, and core)?	4	3	2	0	A	4	4	
		Solution Generation	15%	How does the System generate solutions to address Service degradation in mobile Services based on root cause analysis	4	3	2	0	A	4	4	
	Decision	Solution Evaluation & Decision making	20%	How does the System evaluate solution and decide on the best solution to implement ?	4	3	2	0	A	4	4	
	Execution	Solution Implementation	10%	How does the System implement solution and apply fallback mechanisms in case of solution failure?	2	1	0	0	A	2	4	

Deployment Scope: National wide(Except for North East Region), MBB Core Network Availability for Data, Voice on 5G Core

Note: The options for the sub-scenarios are determined based on the actual weights.

AIS Service Assurance Agent Framework



Intent-Intent Translation & Fulfillment

Question :

How does the System translate mobile Service intents (e.g., throughput, latency, availability) into network actions and evaluate their fulfillment?

Options :

Option A	Option B	Option C	Option D
The System automatically generates Service Assurance objectives (e.g., throughput targets, latency bounds) and policy actions based on mobile Service intents. The System evaluates intent fulfillment based on implementation effect.	The System processes Intent using predefined rules and policies. Intent fulfillment evaluation is manually validated.	Intent configuration and evaluation are entirely manual and rely on static KPIs and human expertise.	

Answer :

Option A
The System automatically generates Service Assurance objectives (e.g., throughput targets, latency bounds) and policy actions based on mobile Service intents. The System evaluates intent fulfillment based on implementation effect

Intent-Intent Translation & Fulfilment

Agent input and output
Hello, how can I help you today?

I want to assure mobile core network availability, once incident occurred, the fault impact should be less than 15 mins. And minimize the service impact to mobile Voice Services.

Agent input and output
[Class: KPI Recommendation]
Do you have a specified region and time to monitor?

2025/12/01-2025/12/31

Agent input and output
Noted!
Do you wish to monitor all regions or any in particular?

2025/12/01-2025/12/31

Agent input and output
Noted!
Do you wish to monitor all regions or any in particular?

just Bangkok

Agent input and output
Great! You want to assure mobile core network availability from 2025/12/01 – 2025/12/31 on 'BKK' region. If an incident occurred, the fault impact must be less than 15 mins, with minimal Mobile Voice Services impact.

To achieve this, I suggest we monitor the following items:
- Attach Success Rate
- VoLTE Call Success Rate
- Voice Call Attempt
- Data Traffic Volume

If you are satisfied, I shall start the Monitoring Agent with these items

OK you can start to monitor

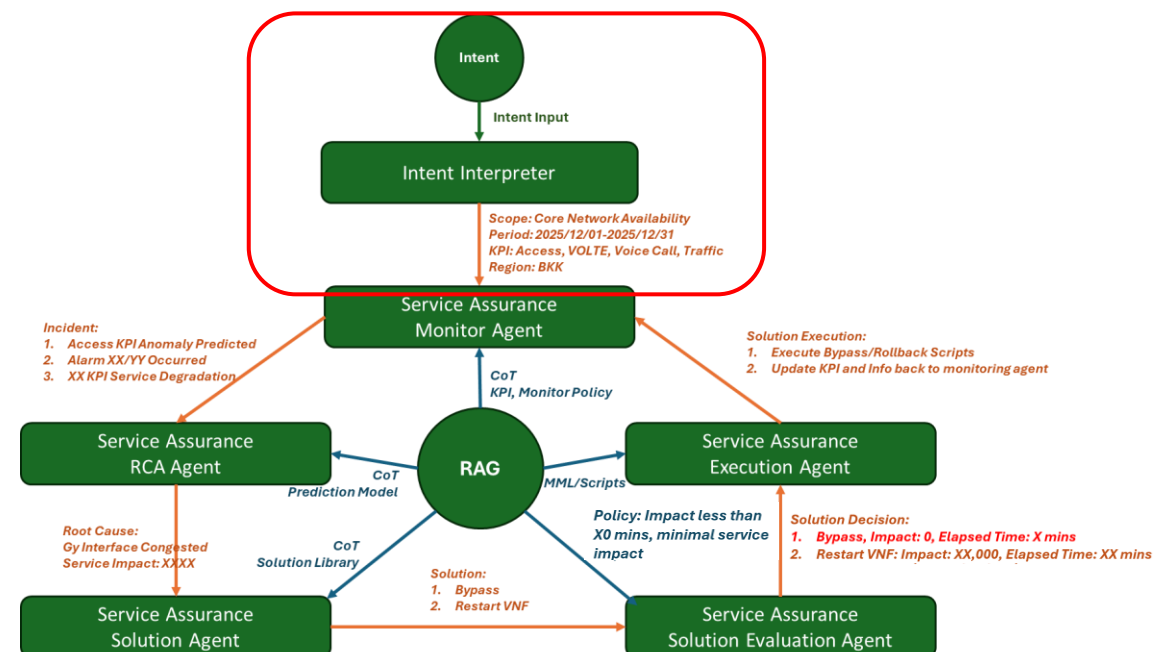
Agent input and output
Alright!
Monitoring Agent Started

Thailand AIS network can meet option A:

Intent:

I want to assure mobile core network availability from 2025/12/01 – 2025/12-31 on BKK region, once incident occurred, the fault impact should be less than XX mins. And minimize the service impact to mobile Voice Services.

Intent interpreter can interact with service assurance intent by AI model to interpret intent to Monitor agent for service assurance monitoring and detection,



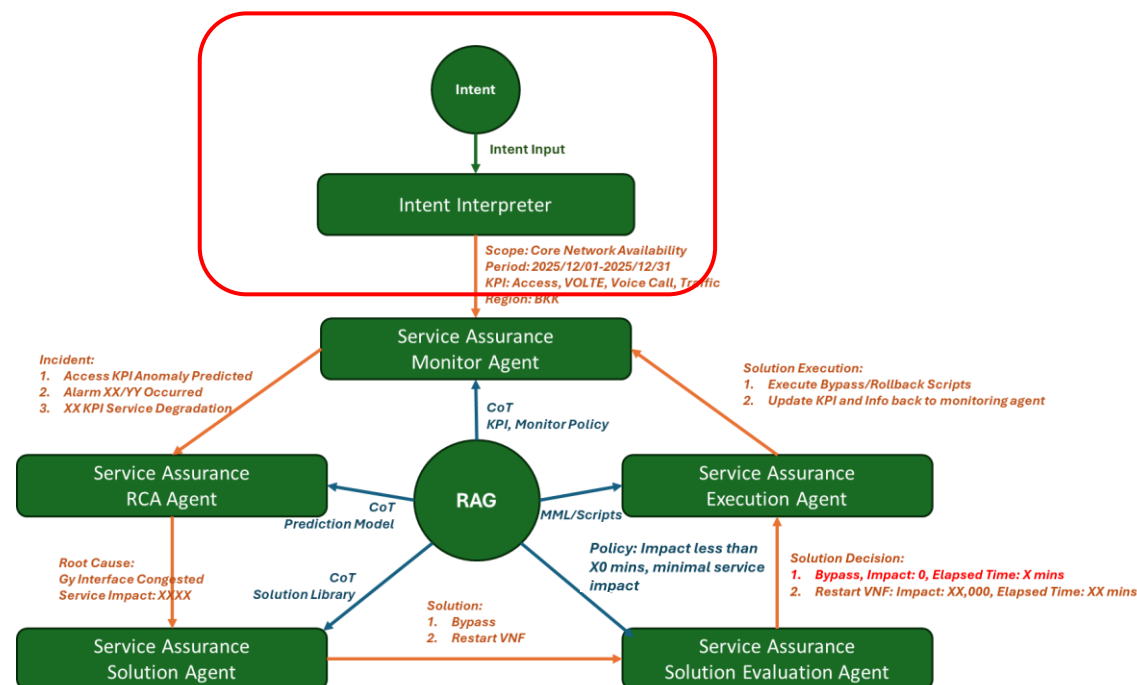
Intent-Intent Translation & Fulfilment

AIS 5G Core Availability Service Assurance Intent								
Intent ID	Intent Type	Intent Description	Intent Fulfillment Scope	Start Date	End Date	Intent Status	Incident Times	Incident SLA Violation Times
	5G Core Network Availability	Core Network Availability, SLA 15 mins	NR,CR	11/1/2025	11/30/2025	Deactivated	<u>4</u>	<u>1</u>
	5G Core Network Availability	Core Network Availability, SLA 20 mins	NER	11/1/2025	11/30/2025	Deactivated	<u>5</u>	<u>1</u>
	5G Core Network Availability	Core Network Availability, SLA 15 mins	BKK	12/1/2025	12/31/2025	Active	<u>3</u>	<u>0</u>

Thailand AIS network can meet option A:

Intent:

all of intents and following monitoring, incident awareness, RCA, decision, execution, status logged at backend log and data repository. And we also build up Intent Tracking Table to track how many intents are active and how many incidents occurred during intent fulfillments and how many of them violate intent targets(based on SLA or execution status..), we also can click Incidents or Incidents Violation to see the details.



Awareness: Service Performance Monitoring & degradation Detection

Question :

How does the System monitor mobile Service KPIs (e.g.: throughput, latency...) and detect performance degradation or anomalies?

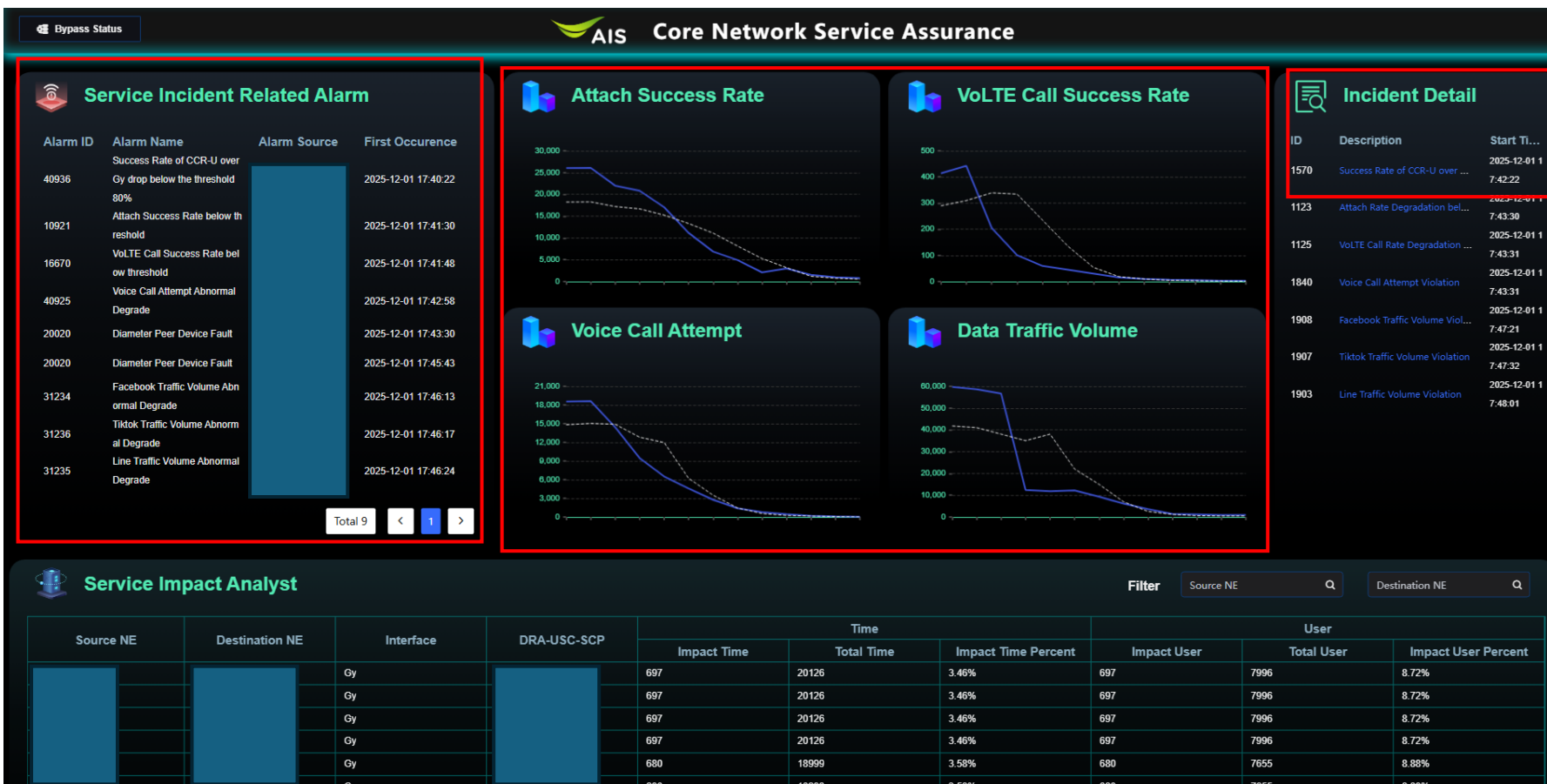
Options :

Option A	Option B	Option C	Option D
The System continuously monitors mobile Service KPIs and detects anomalies or performance degradation, without human intervention.	The System monitors Service KPIs and detects anomalies or performance degradation based on predefined rules	Performance monitoring, Service degradation and anomaly detection are determined based on human expertise	

Answer :

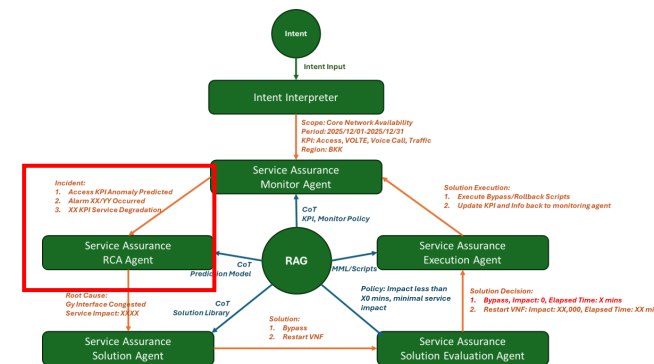
Option A
The System continuously monitors mobile Service KPIs and detects anomalies or performance degradation, without human intervention.

Awareness - Service Performance Monitoring & degradation Detection



Thailand AIS network can meet option A:

The AI agent is implemented to continuously monitor the service performance and degradation detection. The dashboard shows the AIS Core Network Service Assurance dashboard that monitor service related KPIs, alarms and service impact information. And once agent detect Alarm/KPI degradation, it will identify incidents for further root cause analysis and actions.



Awareness - Service Performance degradation Prediction

Question :

How does the System predict Service performance degradation (e.g. Throughput, latency ...) and SLA violation before they affect Service performance?

Options :

Option A	Option B	Option C	Option D
The System uses dynamically programable policies to analyze performance patterns and predicts potential SLA violations	The System predicts SLA violations based on pre-defined rules.	SLA violation is manually detected and addressed based on performance reports.	The System uses dynamically programable policies to analyze performance patterns and predicts potential SLA violations

Answer :

Option A
The System uses dynamically programable policies to analyze performance patterns and predicts potential SLA violations

Awareness - Service Performance degradation Prediction

```

File Edit View Run Kernel Tabs Settings Help
Launcher KPI_ATTACH_SUCCESS_x
Filter files by name
/KPI_ATTACH_SUCCESS/src/
Name Last Modified
KPI_ATTACH_SUC... 3 minutes ago
KPI_ATTACH_SUC... 18 minutes ago
README.md 18 minutes ago

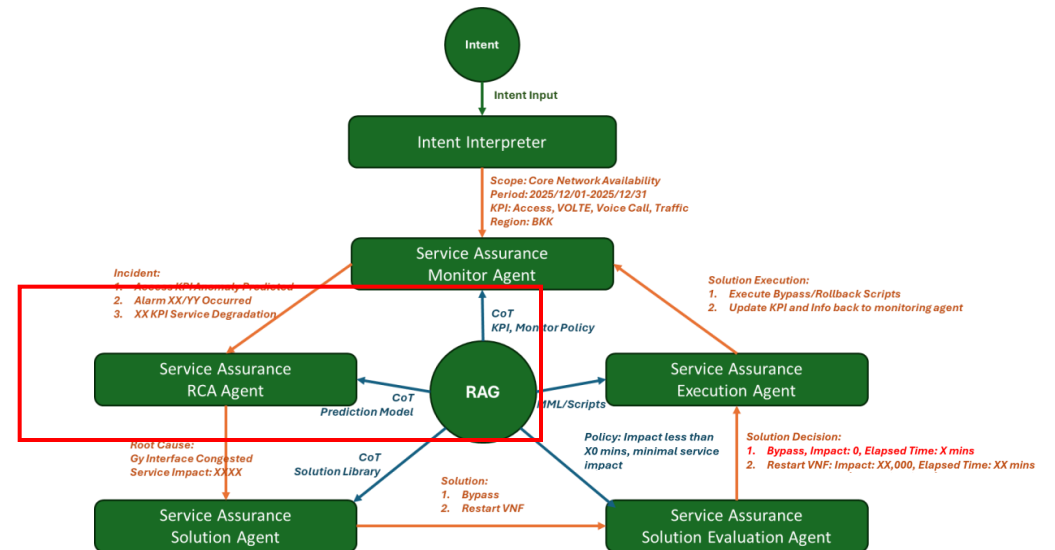
1 from uuid import uuid4
2 from nslc.lifecycle import Lifecycle
3 from nslc.log import logger
4
5 import os
6 import shutil
7 import pickle
8 import re
9
10 import numpy as np
11 import pandas as pd
12 import math
13 import time
14 import builtins
15 import sys
16
17 from builtins import open
18 from datetime import date, datetime, timedelta
19 from dateutil.relativedelta import relativedelta
20 from sktime.forecasting.base import ForecastingHorizon
21 from sktime.forecasting.exp_smoothing import ExponentialSmoothing
22 # from joblib import Parallel, delayed, cpu_count
23
24 # Set local time zone -> GMT+7
25 import pytz
26 tz = pytz.timezone('Asia/Bangkok')
27
28 @Lifecycle.setup(order=1)
29 def init_instance():
30     """
31     Initialize the instance
32     :return:
33     """
34     logger.info("[KPI_ATTACH_SUCC][instance] >>> setup_init_instance")
35
36 @Lifecycle.teardown(order=1)
37 def destroy_instance():
38     """
39     Destroy the instance
40     :return:
41     """
42     logger.info("[KPI_ATTACH_SUCC][instance] >>> start_destroy_instance")
43
44 def get_hdfs(hdfs_client, hdfs_file, local_path):
45     try:
46         (hdfs_path, file_name) = os.path.split(hdfs_file)
47         if not os.path.exists(local_path):
48             os.makedirs(local_path)
49         local_file = os.path.join(local_path, file_name)
50         with open(local_file, 'wb') as f:
51             hdfs_client.download(hdfs_file, f)
52         logger.info("[KPI_ATTACH_SUCC][get_hdfs] >>> download file: {local_file}")
53

```

ALARMNAME	ALARMID	CLEARTIME	FIRSTINSERTTIME	REGION	DESCRIPTION	ALERTNAME
ATTACH_SUCCESSRATE_UPPER_THRESHOLD	0	11/15/2025 7:03	11/15/2025 6:50		2025-11-15 06:15:00,MME_attach_succ=16.54,HigherTH=(16.52) (ATTACH_SUCCESSRATE_UPPER_THRESHOLD	
ATTACH_SUCCESSRATE_UPPER_THRESHOLD	0	11/15/2025 5:18	11/15/2025 5:04		2025-11-15 04:30:00,MME_attach_succ=15.06,HigherTH=(15.01) (ATTACH_SUCCESSRATE_UPPER_THRESHOLD	
ATTACH_SUCCESSRATE_UPPER_THRESHOLD	0	11/15/2025 4:03	11/15/2025 3:35		2025-11-15 03:00:00,MME_attach_succ=14.98,HigherTH=(14.41) (ATTACH_SUCCESSRATE_UPPER_THRESHOLD	
ATTACH_SUCCESSRATE_UPPER_THRESHOLD	0	11/15/2025 3:03	11/15/2025 2:19		2025-11-15 01:45:00,MME_attach_succ=67.75,HigherTH=(14.49) (ATTACH_SUCCESSRATE_UPPER_THRESHOLD	
ATTACH_SUCCESSRATE_UPPER_THRESHOLD	0	11/15/2025 3:03	11/15/2025 2:18		2025-11-15 01:45:00,MME_attach_succ=67.45,HigherTH=(14.53) (ATTACH_SUCCESSRATE_UPPER_THRESHOLD	
MAX_ATTACH_USERS_UPPER_THRESHOLD	0	11/15/2025 2:48	11/15/2025 2:04		2025-11-15 01:30:00,MME_attach_max=1133965.0,HigherTH=(11:MAX_ATTACH_USERS_UPPER_THRESHOLD	
MAX_ATTACH_USERS_UPPER_THRESHOLD	0	11/15/2025 2:48	11/15/2025 2:04		2025-11-15 01:30:00,MME_attach_max=1135433.0,HigherTH=(11:MAX_ATTACH_USERS_UPPER_THRESHOLD	

Thailand AIS network can meet option A:

Develop KPI Anomaly Detection Model by Machine Learning Algorithm to proactively identify Attached Success Rate related KPI performance degradation before incidents.



Analysis: Service Performance degradation Impact Analysis

Question:

How does the System identify and analyze the impact of performance degradation (e.g., throughput, latency ...) on user experience or SLA compliance in the mobile network?

Options:

Option A	Option B	Option C	Option D
The System identifies and analyzes the impact of performance degradation, using AI models without human intervention.	The System identifies and analyzes the impact of mobile Service degradation using dynamically programable policies, but requires human confirmation to proceed.	The System identifies & analyzes impact of performance degradation, based on predefined rules	Impact of degradation is determined based on human expertise.

Answer:

Option A
The System identifies and analyzes the impact of performance degradation, using AI models without human intervention.

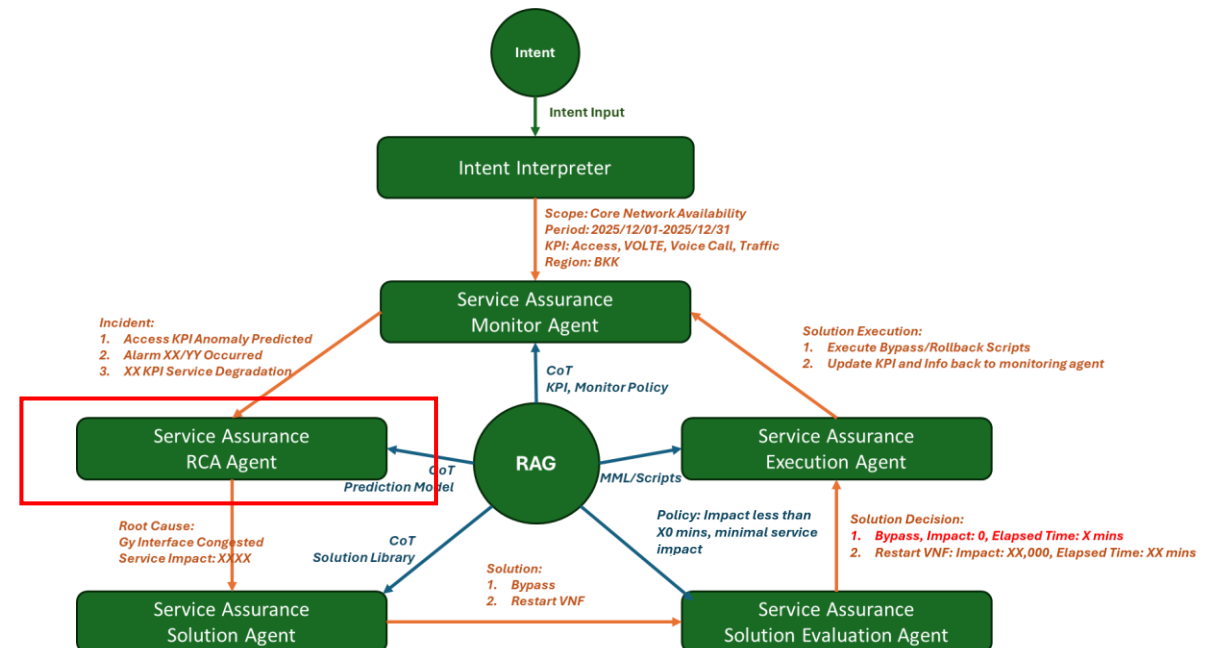
Analysis: Service Performance degradation Impact Analysis

Service Impact Analyst Filter

Source NE	Destination NE	Interface	DRA-USC-SCP	Time			User		
				Impact Time	Total Time	Impact Time Percent	Impact User	Total User	Impact User Percent
		Gy		694	19515	3.56%	240	5058	4.74%
		Gy		1	9	11.11%	1	2	50.00%
		Gy		501	26729	1.87%	167	6402	2.61%
		Gy		3	12	25.00%	1	4	25.00%
		Gy		2	6	33.33%	1	4	25.00%
		Gy		0	10	0.00%	0	2	0.00%

Thailand AIS network can meet option A:

Once incident happened, AI agent try to based impact NE and traffic information to evaluate how many subscribers be impacted.



Analysis: Service Performance degradation Demarcation & Root Cause Analysis

Question :

How does the System isolate the root cause of Service degradation across the network domains (i.e.: RAN, transport, and core)?

Options :

Option A	Option B	Option C	Option D
The System isolates and analyzes the root cause of mobile Service degradation across network domains using AI models, without human intervention.	The System isolates and analyzes the root cause of mobile Service degradation using dynamically programable policies, but requires human confirmation.	The System isolates & analyzes performance degradation Root Cause, based on predefined rules	Performance data and alarms are manually analyzed to determine the root cause.

Answer :

Option A
The System isolates and analyzes the root cause of mobile Service degradation across network domains using AI models, without human intervention.

Analysis: Service Performance Degradation, Demarcation & Root Cause Analysis

Demarcation of vertical scenarios by AI & DTN

Alarm Name	First Occurred On	Last Occurred On	Cleared On	Root Alarm	Device Name	Physical Board	Physical Port Name	Confidence
Diameter Peer Device Fault	2025-12-01 17:43:30	2025-12-01 17:43:50	--	Yes		--	--	--
VLTE Call Success Rate below threshold	2025-12-01 17:41:48	2025-12-01 17:42:07	--	No		--	--	--
Attach Success Rate below threshold	2025-12-01 17:41:30	2025-12-01 17:41:45	--	No		--	--	--
Success Rate of CCR-U over Gy drop b...	2025-12-01 17:40:22	2025-12-01 17:41:00	--	No		--	--	--

Root Cause Analysis by AI Agent

Diagnosis Details

View Chain-of-Thought

- Steps 1: Extract alarm parameters (NE name, alarm ID, alarm name) based on user questions. Execution succeeded
- Steps 2: Query alarm details based on user-provided information. Execution succeeded
- Steps 3: Extract the alarm cause from the Location Information or Additional information. Execution succeeded
- Steps 4: run DSP INTERFACE to check whether state of the interface is normal. Execution succeeded
- Steps 5: Please summarize the diagnostic process. Execution succeeded

Alarm Diagnosis Result
 Analysis conclusion: The Sy interface has congested.
 [Handling suggestions] System interface have some congestion, disable or bypass peer element to reduce the load. ★★★★★

Demarcation of horizontal scenarios by AI & DTN

Alarm Name	First Occurred On	Last Occurred On	Cleared On	Root Alarm	Device Name	Physical Board	Physical Port Name	Confidence
MTP Link Fault	2025-12-01 17:46:13	2025-12-01 17:46:50	--	No		--	--	--
MTP Route Unavailable	2025-12-01 17:46:01	2025-12-01 17:46:32	--	No		--	--	--
MSPA Link Fault	2025-12-01 17:45:51	2025-12-01 17:46:02	--	Yes		--	--	--
MTP Route Unavailable	2025-12-01 17:45:42	2025-12-01 17:47:34	--	No		--	--	--

Thailand AIS network can meet option A:

AI Inference can analyze and identify the root cause based on the expert network experience training and present the link level root cause relationship by Digital Twin and AI Agent to come out Root Causes and Impact analysis.

Analysis: Solution Generation

Question:

How does the System generate solutions to address Service degradation in mobile Services based on root cause analysis

Options:

Option A	Option B	Option C	Option D
The System generates corrective actions to address mobile Service degradation and continuously learns from past resolutions using AI models, without human intervention.	The System generates corrective actions using dynamically programmable policies based on prior resolutions but requires human confirmation before execution.	The System suggests corrective actions based on predefined rules.	Solutions are manually created based on human expertise

Answer:

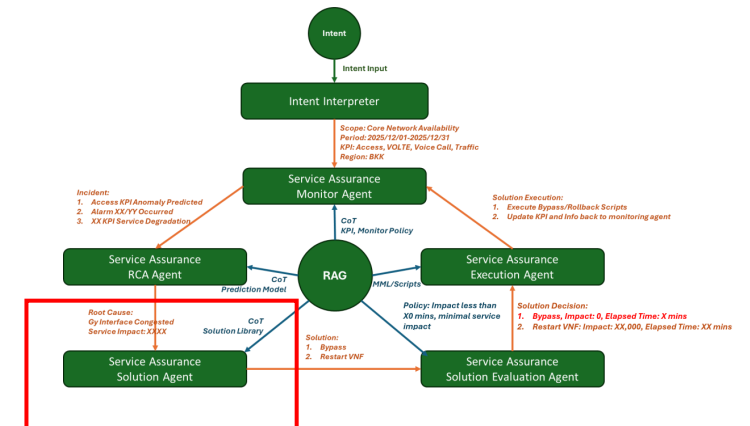
Option A
The System generates corrective actions to address mobile Service degradation and continuously learns from past resolutions using AI models, without human intervention.

Analysis: Solution Generation

The screenshot displays the CN FaultSpirit interface. On the left, there's a sidebar with 'Faults 17' and '14 times investigations'. The main area shows a list of faults, with the first one, 'Interface congestion', highlighted in a red box. This fault is marked as 'Auto Finished' and has a ticket ID of 'sys_auto_985255f5-7d4e-5f01-...'. Below the list, a detailed view of this fault is shown, also with a red box around the 'Follow-up Suggestions' section. The suggestions are: 'Based on Root Cause is OCS fault, Solution Agent reasoning to 2 possible solution to solve the problem 1.Bypass 2.Restart VNF'.

Alarm Name	Ticket ID
Interface congestion	sys_auto_985255f5-7d4e-5f01-a14d-452f78125cb5

Follow-up Suggestions:
Based on Root Cause is OCS fault, Solution Agent reasoning to 2 possible solution to solve the problem
1.Bypass 2.Restart VNF



Thailand AIS network can meet option A:

Based on Root Cause is Gy Interface Congested, Solution Agent reasoning to 2 possible solution to solve the problem

1. Bypass
2. Restart VNF

Decision: Solution Evaluation & Decision making

Question :

How does the System evaluate solution and decide on the best solution to implement ?

Options :

Option A	Option B	Option C	Option D
The System evaluates multiple remediation options, analyzes risk and trade-offs, and selects the best solution using AI models, without requiring human decision-making.	The System assesses remediation options using dynamically programmable policies and recommends the optimal choice, but requires human approval.	Remediation options, risk assessment and selection of appropriate solutions are manually done	

Answer :

Option A
The System evaluates multiple remediation options, analyzes risk and trade-offs, and selects the best solution using AI models, without requiring human decision-making.

Decision: Solution Evaluation & Decision making

Interface congestion

Alarm ID: 31057

Alarm Name: Interface congestion

Alarm Time: 2025-12-01 17:50:25

End Time: 2025-12-01 17:42:22

Diagnosis Result

Handling Conclusion: OCS Fault

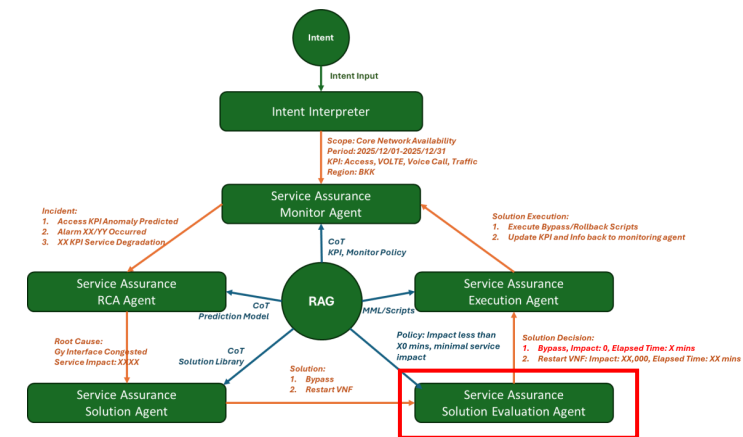
Follow-up Suggestions

Solution evaluation agent based RAG Policy minimize service impact and service impact time less than 15 mins to auto decide and suggest adopt bypass solution

1. Bypass- Impacted User 0 switch time: 1 mins
2. Restart VNF: Impacted User 100,000, Impact Time: 10 mins

1. Bypass:
Evaluation Result: Service Impact=0,
Elapsed Time: X mins

2. Restart VNF
Evaluation Result: Service Impact=XX,000
Elapsed Times: XX mins



Thailand AIS network can meet option A:

Solution evaluation agent based RAG Policy minimize service impact and service impact time less than X0 mins to auto decide and suggest adopt bypass solution.

1. **Bypass**- Impacted User 0, switch time: X mins.
2. **Restart VNF**: Impacted User XXX,000 and Impact Time: XX mins

Execution: Solution Implementation

Question:

How does the System implement solution and apply fallback mechanisms in case of solution failure?

Options:

Option A	Option B	Option C	Option D
How does the System implement solution and apply fallback mechanisms in case of solution failure?	The System implements the selected corrective action and triggers fallback mechanisms in case of failure, without human intervention	The System applies corrective action and fallback mechanisms using pre-defined rules, based on human approval.	Implementation and fallback handling are manually executed

Answer:

Option A
How does the System implement solution and apply fallback mechanisms in case of solution failure?

Thank you