

ENI New PoC Proposal

HMDCOM— Health Management of Data Center Optical Modules

Yakun Hu China Unicom

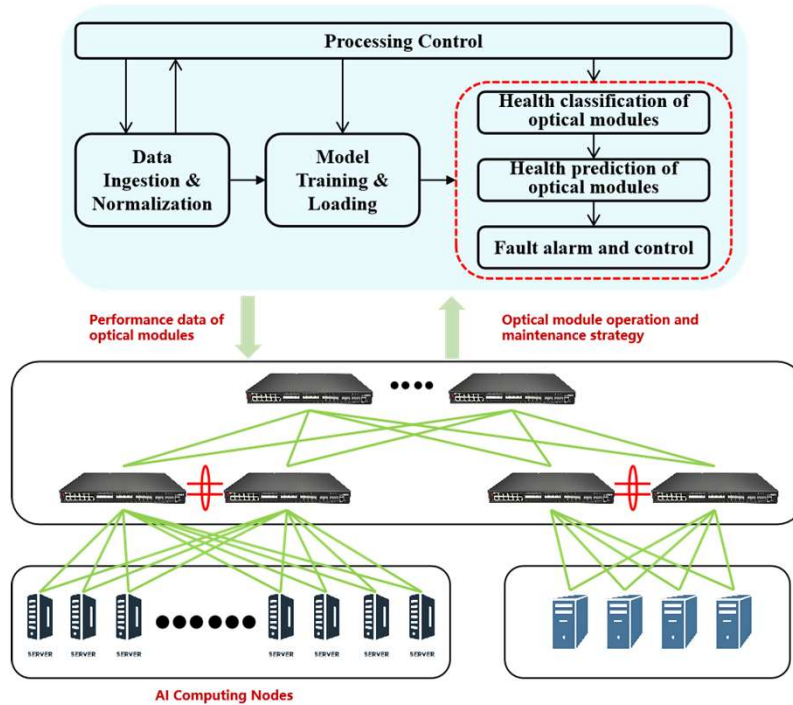
HMDCOM— Health Management of Data Center Optical Modules

Contents

- **PoC Project**
- **PoC Team Members**
- **PoC Project Scope**
- **PoC Project Stages/Milestones**
- **PoC Technical Details**

HMDCOM— Health Management of Data Center Optical Modules

PoC Project



Short Description: This PoC aims to demonstrate the proposed artificial intelligence/machine learning (AI/ML) algorithm for solving the challenges of data center optical module operation and maintenance. The main type of data center optical network failure is gradual change. Through dynamic monitoring and perception of optical module parameters, multidimensional parameter analysis is carried out to predict the health of the data center network, early warning of risks, and active operation and maintenance.

HMDCOM— Health Management of Data Center Optical Modules

PoC Team Members

	Organization name	ISG ENI participant (yes/no)	Contact (Email)	PoC Point of Contact (see note 1)	Role (see note 2)	PoC Components
1	China Unicom	No	Yakun Hu, huyk13@chinaunicom.cn	X	Network Service Provider	-Storyline/ Implementation of the baseline architecture- Implementation of deployment in an experimental network- Testbed logistic and setup
2	China Telecom	Yes	Yu Zeng zengyu@chinatelecom.cn		Network Service Provider	-Participation in project discussions
3	ZTE Corporation	Yes	Liya Yuan yuan.liya@zte.com.cn		Others	-Help with the test of algorithm
4	Caict	Yes	Zhiruo Liu liuzhiruo@caict.ac.cn		Others	-Participation in project discussions
5						
<p>The Role will be network operator/service provider, infrastructure provider, application provider or other as given in the Definitions of ETSI Classes of membership.</p> <p>Identify the PoC Point of Contact with an X. NOTE 2:</p> <p>NOTE 1:</p>						

HMDCOM— Health Management of Data Center Optical Modules

PoC Project Scope

- **PoC Project Goal #1:** □ Classification and evaluation of the health status of optical modules. Demonstrate the use of machine learning algorithms to determine the level of health of data center optical modules and predict their operational status for a period of time in the future. Determine whether to trigger the warning mechanism based on the health status of the optical module.
- **PoC Project Goal #2:** □ Automated closed-loop management. Simulate the data center network architecture of the system to achieve a full closed-loop process from reporting the performance of optical modules to network management, health classification and prediction, and feedback on optical module health operation and maintenance decisions to network management. It is hoped to significantly improve the digital capabilities and operational efficiency of operators.

HMDCOM— Health Management of Data Center Optical Modules

PoC Topics

PoC Topic Description	Related WI	Expected Contribution	Target Date
Infrastructure Management-> Health Management of Data Center Optical Modules	ENI-005(GS ENI 005 system architecture) – Stabledraft ENI-008(GS ENI 001 Use Cases) –Stabledraft	Predicting the future health of optical modules based on performance data.Functional blocks for this PoC.Feasibility of using AI/ML algorithm for performance data predictionReport on the suitability of ENI Reference Architecture for this PoC	02/06/2025

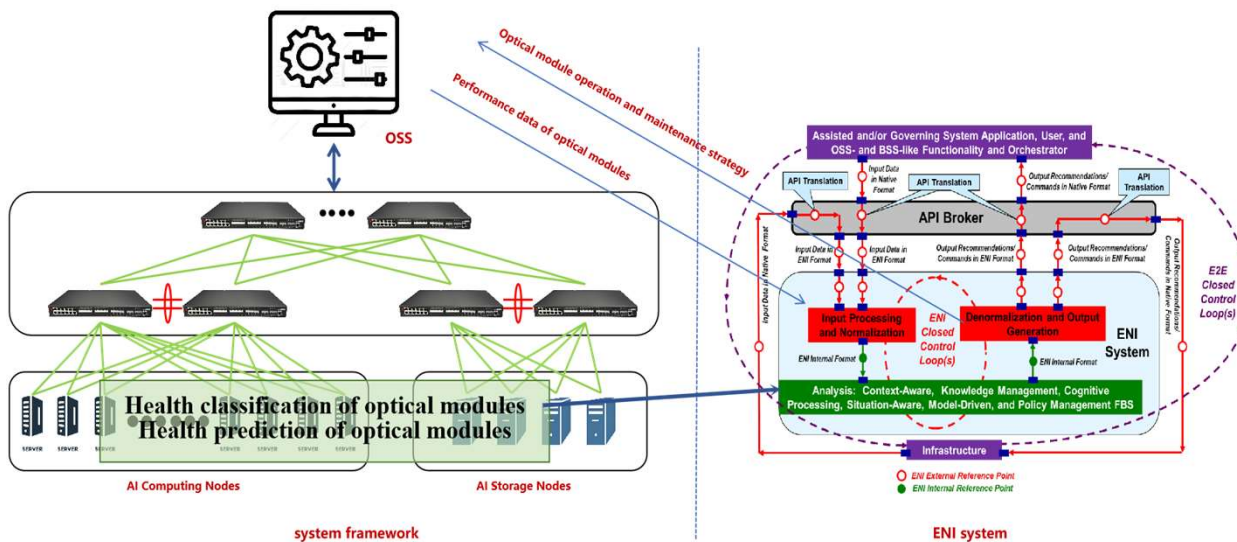
HMDCOM— Health Management of Data Center Optical Modules

PoC Project Stages/Milestones

PoC Milestone	Stages/Milestone description	Target Date	Additional Info
P.S	PoC project submission	06/2024	
P.TP.1	PoC user story finalization	08/2024	Finalization of the high-level description of the two scenarios described In Section 2.
P.TP.1	PoC Test Plan 1	011/2024	Initial algorithm testbed up and running
P.D1	PoC Demo 1	1/2025	Webinar demo at an ENI plenary meeting.
P.C1	PoC Expected Contribution 1	TBD	Contributions to ENI requirements.
P.C2	PoC Expected Contribution 2	TBD	Contributions to ENI reference architecture.
P.R	PoC Report	03/2025	PoC-Project-End Feedback
P.E	PoC Project End	06/2025	Presented to ISG ENI for information

HMDCOM— Health Management of Data Center Optical Modules

PoC Technical Details



1. The first stage is data ingestion and processing, mapping to the data ingestion and normalization functional blocks of the ENI system.
2. The second stage is model training and loading, mapping to the cognitive framework, knowledge management, and context aware management FB of the ENI system.
3. The third stage is process control, which maps to the cognitive framework, knowledge management, and context aware management FB of the ENI system.
4. The fourth stage is inference and output, which maps to the knowledge management, denormalization, and output generation of the ENI system.