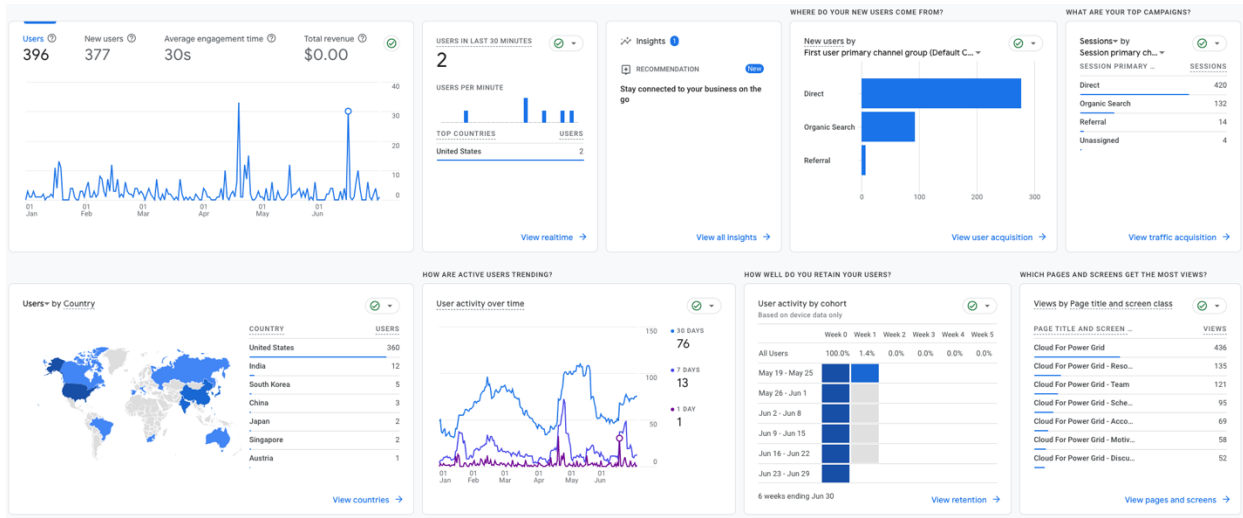


Report of WG for PESGM24

Overview

From July 2023 to July 2024, the IEEE Working Group on Cloud for Grid Modernization and Digital Transformation has hosted 6 events, including 2 GenAI office hours, 1 workshop, 1 energy showcase demo and 2 webinars (see the list in detail below). The total number of attendees reached 156. Besides, there are 4 webinars under plan. The core team finalized a book chapter writing which is now in editor’s review for publication on CIGRE Greenbook. The team also contributed to the NERC white paper “BES operations in the cloud”, which was approved and published by NERC Reliability and Security Technical Committee (RSTC) in December 2023. The WG kept stakeholders updated with the most recent industry news and bridged members to relevant events. For example, the NERC GridSecCon 2023 and GE’s webinar “Mastering APM in the cloud”.

The [WG website](#) had 377 new visitors reflecting its global impact was extended to more Geos including North America, South America, Europe, Asia Pacific, and Africa (see the screenshot below).



Tutorial Development

One of our workstreams is to develop tutorials for cloud adoption. In 2024, we added no new tutorial but there was a major overhaul of a preexisting example: [elastic simulation cluster for power grid analysis](#). The team is working with ORNL and UTK to increase the visibility of DOE Open Energy Data Initiative Solar Systems Integration Data and Modeling (OEDI SI), which is

believed to be a key enabler for cloud-hosted renewable (solar) solutions. Moreover, the WG Secretary, Shaohui Liu, submitted a proposal to NSF National Artificial Intelligence Research Resource (NAIRR) Pilot program to explore the cloud-based AI/ML solutions.

Publication

1. WG Core Team as contributors, "BES Operations in the Cloud", NERC SITES Whitepaper, approved and published in December, 2023.
2. S. Zhang, X. Luo, A. Pandey, A. Parchure, "Accelerating Power System Dynamics Study using Cloud-enabled Scalable Computing", CIGRE Green Book Chapter, expected August 2024.

Impact Expansion

The WG received 2 Task Force proposals: TF on Edge Computing for Grid Edge Sensing and Control (EC4SC) led by Jamie Lian at Oak Ridge National Lab and TF on Data Governance in the Cloud for Power System Organizations led by Tom Nudell from PIQEnergy. The proposal were reviewed by the core team and sent to BDA Subcommittee and AMPS Committee seeking for approval at PESGM. The addition of these two TFs will help the WG lead to address domain-specific challenges as the industry is using more and more cloud services and cloud-native technologies.

WG Events

1. Monthly core members meetings and outreach meetings
2. Generative AI Office Hour Sessions
 - a. 02/09/2024: How to do prompt engineering for LLM to precisely address your power system related questions, Tom Nudell, PIQEnergy
 - b. 11/10/2023: RAG in Power Systems: A New Frontier for AI-assisted analysis using Langchain, Dio Stamatiadis, PIQEnergy
 - c. 09/22/2023: Q&A and energy showcases demo, Song Zhang, AWS
3. HPC Workshop and Happy Hour
 - a. 10/20/2023: Create a cloud-based HPC cluster, connect to it and run batch jobs in parallel on it, Song Zhang, AWS
4. Webinars
 - a. 07/12/2024: Overview of Project CloudZero, Anthony Wallace, NREL
 - b. 04/12/2024: Democratizing creation of semantic knowledge graphs, Nikola Vasiljevic, Cognite

c. Another 4 webinars in pipeline/planning

Action Items

- The WG is planning a PES Magazine paper and two new tutorials (market simulation and generator interconnection study in the cloud)
- 4 webinars have been scheduled in the rest of the year