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CERN SCADA systems 2024 large upgrade campaign retrospective

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This paper presents a recent upgrade campaign of supervisory control systems within CERN's Accelerator and Technologies Sector. The effort covered over 240 WinCC OA SCADA applications across more than 120 servers, spanning core accelerator systems such as Power Converters, the Quench Protection System, and the Power Interlock Controller, along with essential technical infrastructure including Cryogenics, Vacuum, and Gas Control. These systems are crucial for machine protection, performance, and the reliable operation of the accelerator complex. Building on experience from previous upgrade efforts, this campaign introduced important advances in automation and process optimization. For the first time, a fully unattended upgrade workflow was achieved through the use of Ansible. In addition the campaign involved a major operating system migration and the upgrade of several supporting satellite systems. This paper details the improvements made in this iteration, discusses the challenges and compares the current campaign with earlier ones. The analysis highlights the evolution of automation strategies and reflects on both successes and difficulties. The work offers valuable insights for future upgrade initiatives and demonstrates how automation tools can significantly enhance the maturity and reliability of large-scale software maintenance in complex operational environments.

Footnotes

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Author: GORALCZYK, Lukasz (European Organization for Nuclear Research)

Co-authors: KOSTOPOULOS, Alexandros (European Organization for Nuclear Research); BES, Marcin (European Organization for Nuclear Research); Mr KAZEPIS, Orfeas (European Organization for Nuclear Research)

Presenter: GORALCZYK, Lukasz (European Organization for Nuclear Research)

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