

DCS Analysis for Switchover Shutdown

Homayoun Gerami



What?

Purpose:

- To provide DCS maintenance services without impacting customer production

Definition:

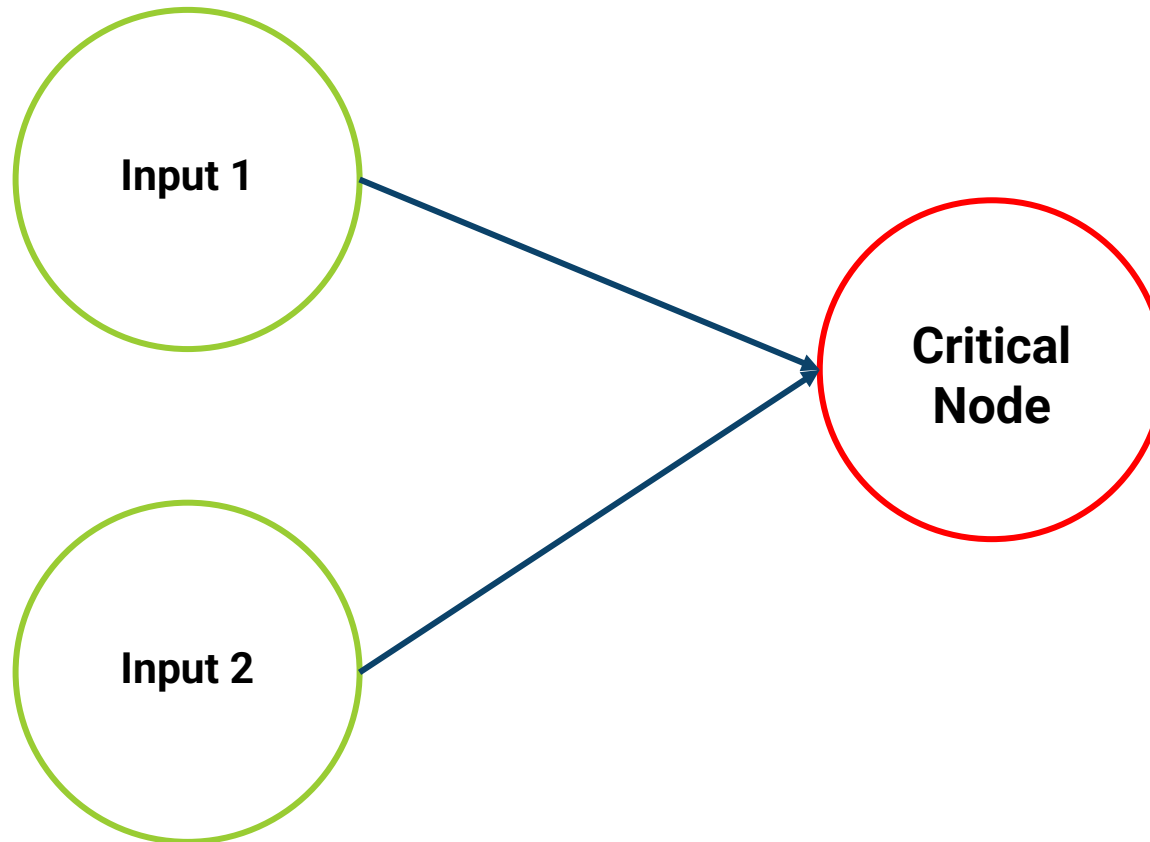
- When the entire Distributed Control System becomes unstable as a result of taking a component temporarily out of service. (e.g. controller replacement, firmware update)

Why?

- **System Stability:** When performing maintenance, the engineer needs to know with certainty that the system will remain stable.
- **Process Automation:** The existing method is to manually trace the logic of the control programming. (i.e. FHX or Delta V)
- **Scalability:** Currently no universal tool exists that can work on multiple fhx files

DCS Analysis | UC2: Switchover shutdown

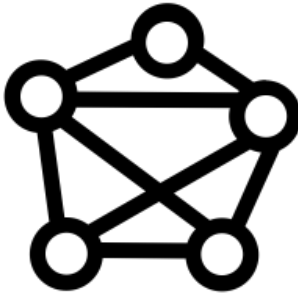
- Given a **DCS** system, we need to identify the critical components that have the potential to cause instability, and trace the inputs affecting these components.



DCS Analysis | Switchover shutdown



FHX File



Connections



Switchover Shutdown

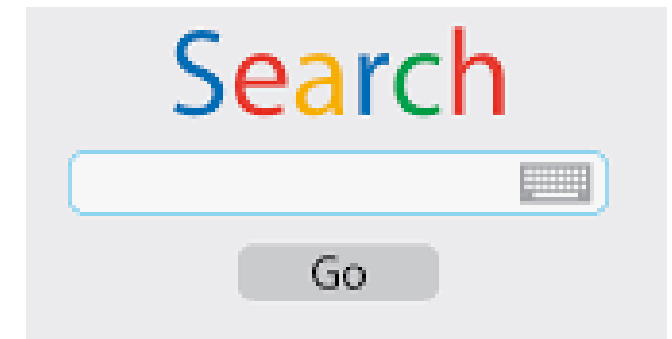
1. Why Combine Them?

- Both require mapping network connections as a critical step.
- Both require a searchable data structure.

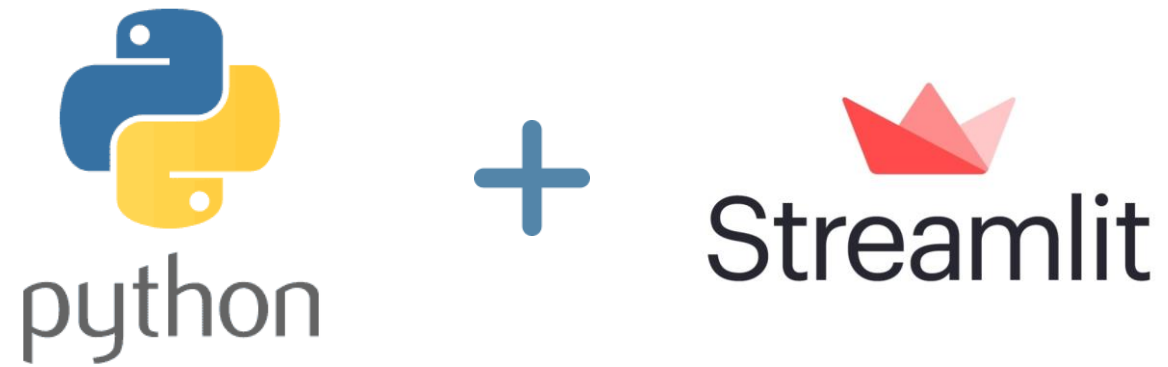
A U B

2. Why Graph Data Structure?

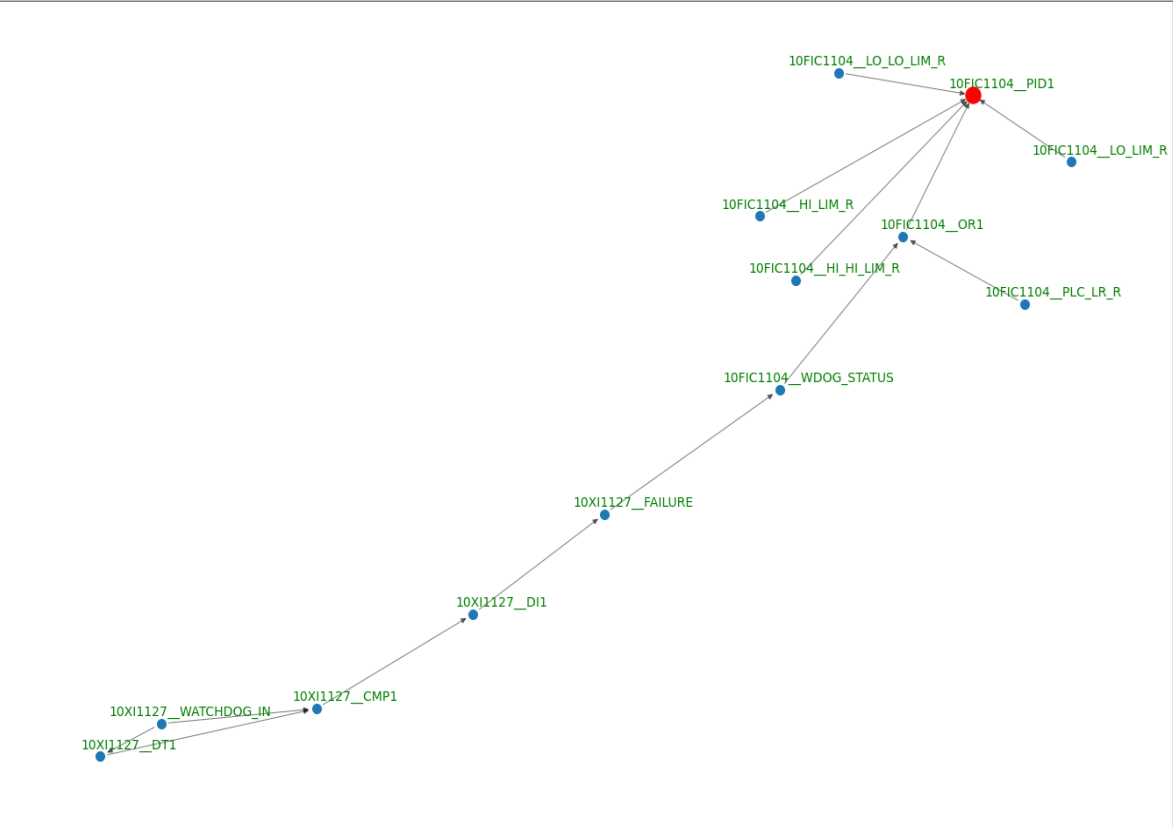
- Robust and scalable, applicable to different plants/customers
- Google search engine for DCS.
- Access to wide array of graph algorithms
- Potential for **competitive edge**



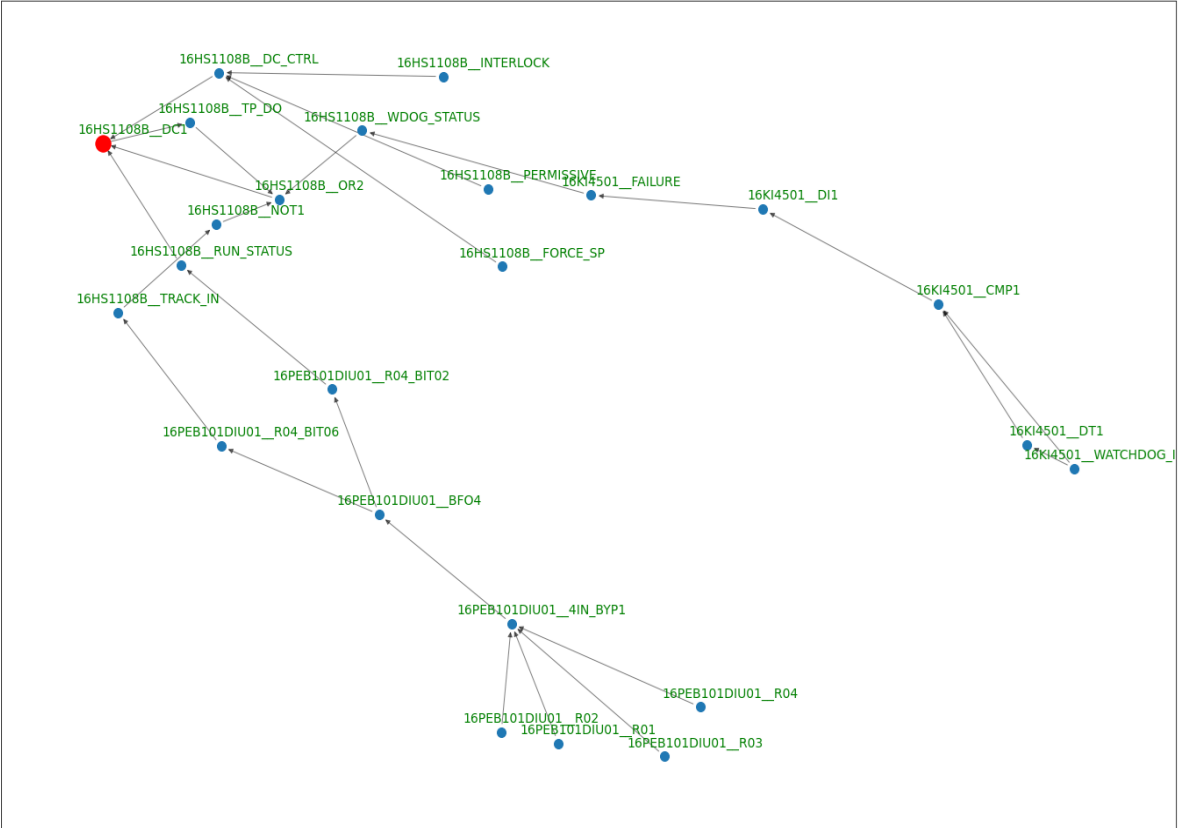
Equipment Downtime Prediction | Dashboard Demo!



Module Instance: '10FIC1104', Function Block: 'PID1'

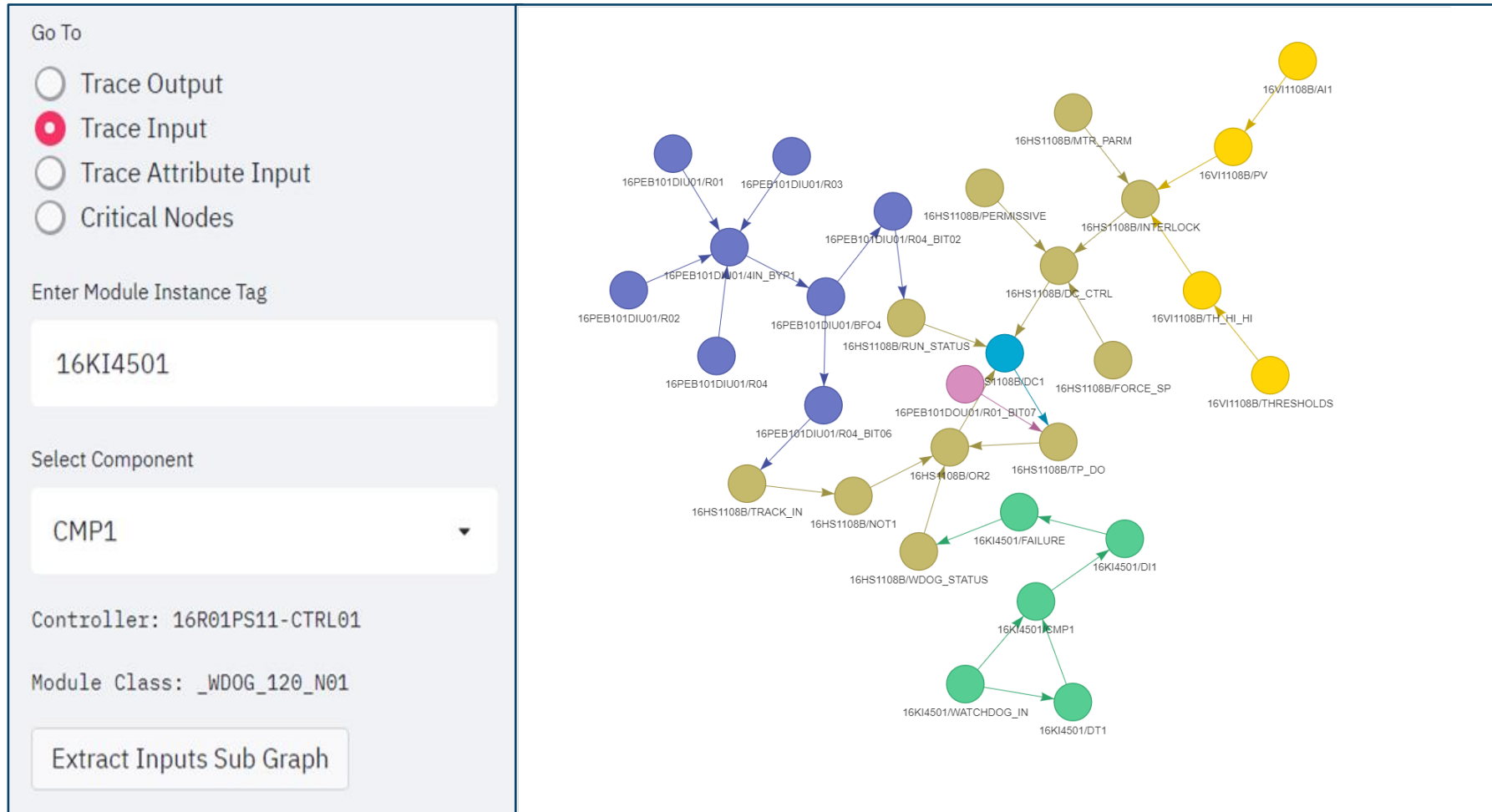


Module Instance: '16HS1108B', Function Block: 'DC1'



DCS Analysis | Dashboard Layout | Node Tracing

This dashboard serves as an interface to query and navigate the DCS systems



DCS Analysis | Dashboard Layout | Critical Nodes

The point of interest tab is used for the switchover shutdown

