

# **2023-2025 WMP Joint IOU Covered Conductor Working Group**

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**New Technologies  
Workstream**

**Topics:  
Distribution Fault Anticipation**



# AGENDA

- Background
- Discussion
- Next Steps

# DISTRIBUTION FAULT ANTICIPATION (DFA)

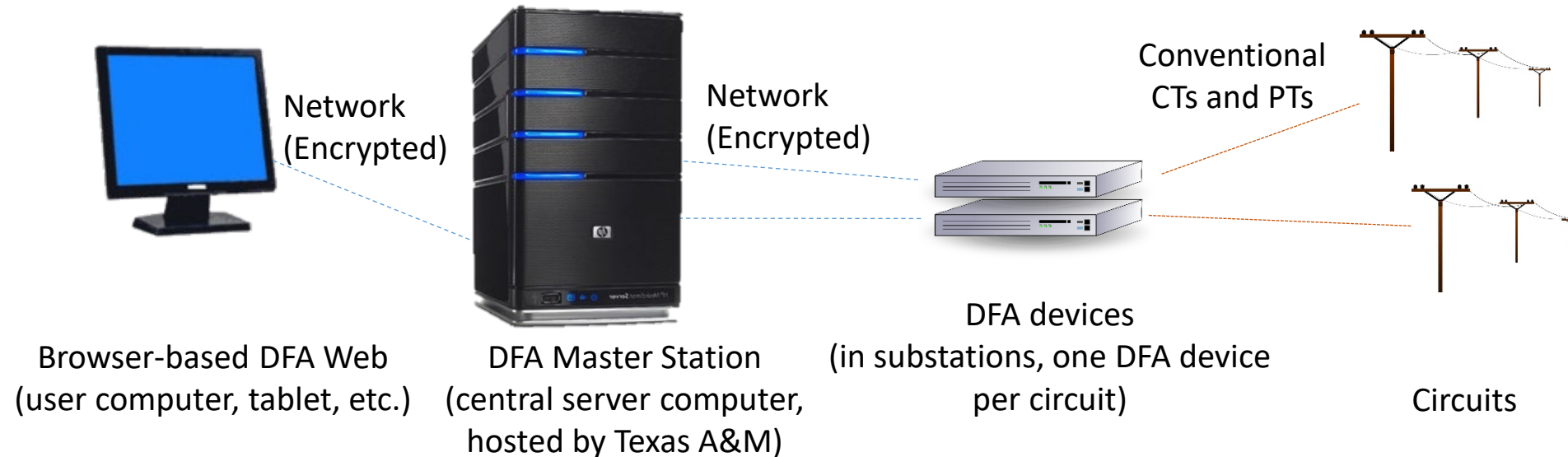
- Technology developed by Texas A&M Engineering, with substantial early support from EPRI and EPRI-member host sites
  - DFA algorithms are based on more than 2,000 circuit-years of field data
- The DFA hardware/software platform analyzes high-fidelity electrical signals to detect line events, including incipient failures
- DFA clusters and categorizes events and generates waveforms, enabling preemptive repairs that reduce ignition risks and improve reliability
- Similar capabilities can be realized using other recording devices such as digital fault recorders



# DFA OPERATING FUNDAMENTALS

- DFA hardware continuously monitors conventional electrical signals, like relays, but with substantially higher fidelity and sensitivity
  - High fidelity and sensitivity are necessary to detect low-current, incipient conditions before they escalate into conventional faults
- Based on learnings from more than 2,000 circuit-years of data, DFA software analyzes the electrical data to differentiate specific types of line events, including multiple types of incipient failures
- DFA system software automates the process of analyzing vast amounts of data, to deliver pre-processed, actionable alerts to users (software algorithm data is regularly updated based on learnings across all utilities that deploy it)

# DFA System Architecture



- Each substation-installed DFA device monitors an entire circuit 24x7 by analyzing conventional CT and PT waveforms with advanced software and sending results to a central DFA Master Station
- Personnel access DFA results via DFA Web, a browser-based website provided by the DFA Master Station.

# Discussion/Roundtable

- **How this technology is being used**
- **Effectiveness / Use cases**

# Next Steps

- **Meeting Minutes**
- **Action Items**
- **Next workshop**