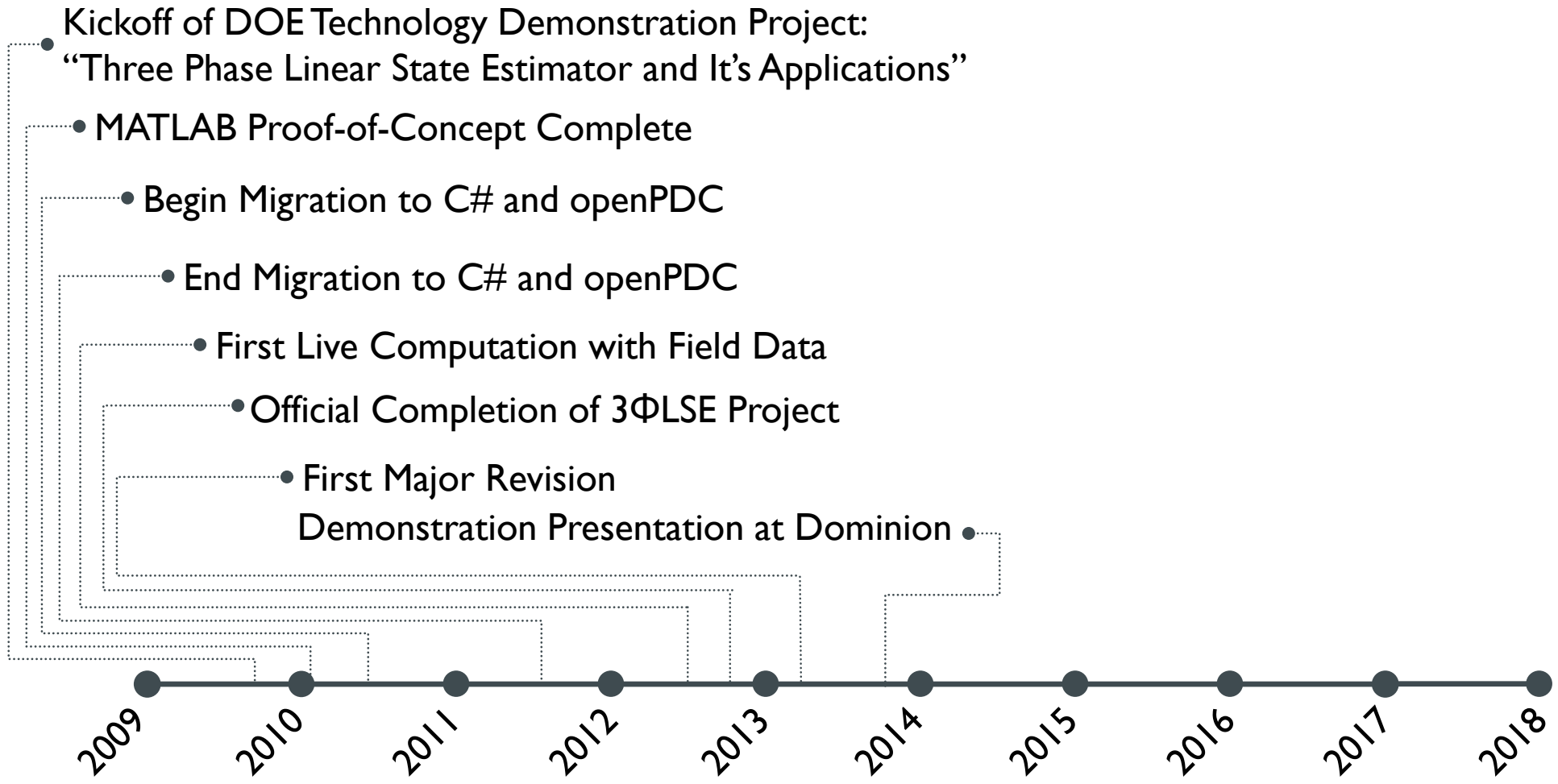

The Open Source Linear State Estimator

openECA Summit at Dominion Energy Virginia

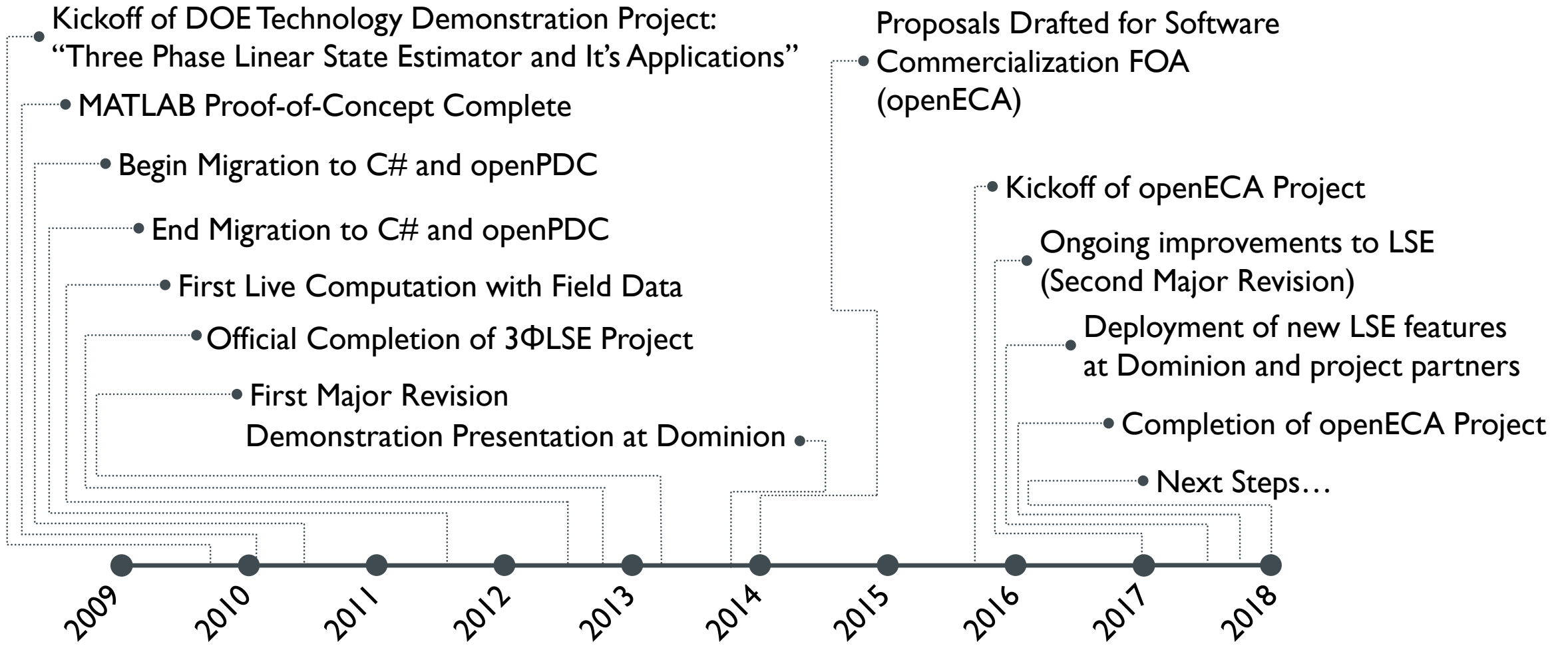
November 8, 2017

Kevin D. Jones, Ph.D.

History of the Open Source Linear State Estimator



History of the Open Source Linear State Estimator



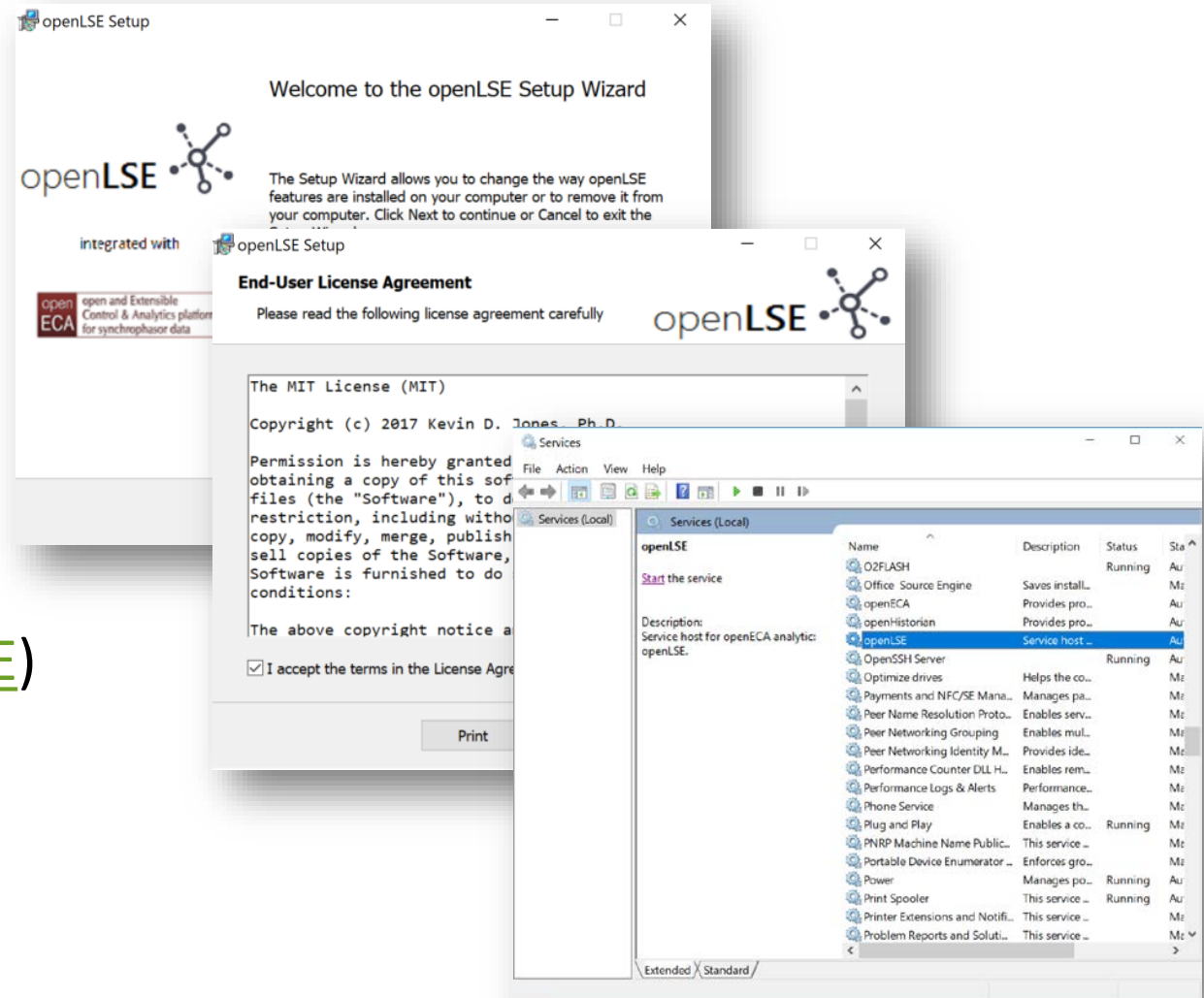
Everything is Different with openECA

- I have synchrophasor data, both streaming and historical, provided directly to my development environment
- Directly compile deployable applications
- openECA APIs enable automation of complex analytic configuration
- Include several technology solutions to bridge the skills gap
- Now I've been able to use the openECA and its constituent technologies to move the LSE forward.



Primary Updates to the Linear State Estimator

- Provisioned with an easy installer package
- Deployable as a real-time service (<https://github.com/kdjones/openLSE>)

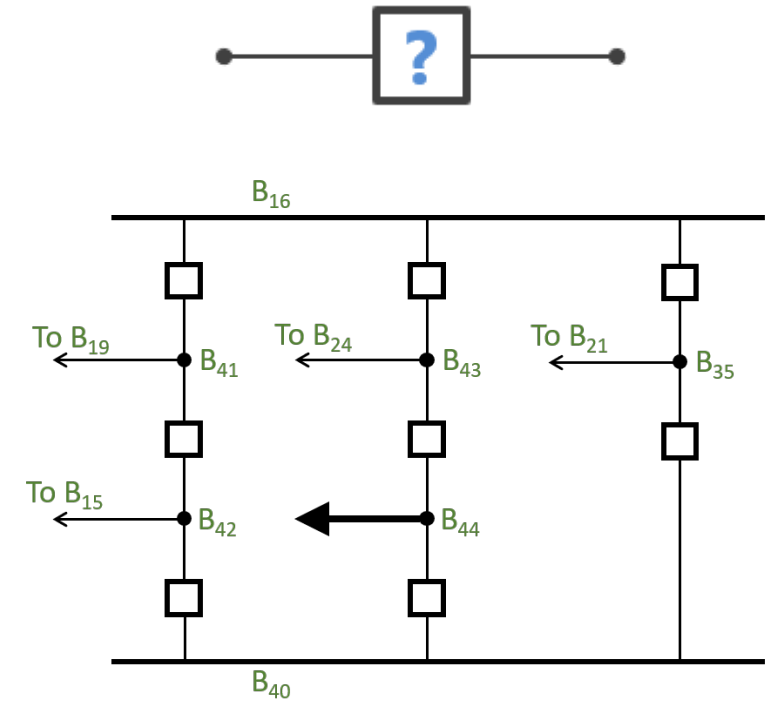
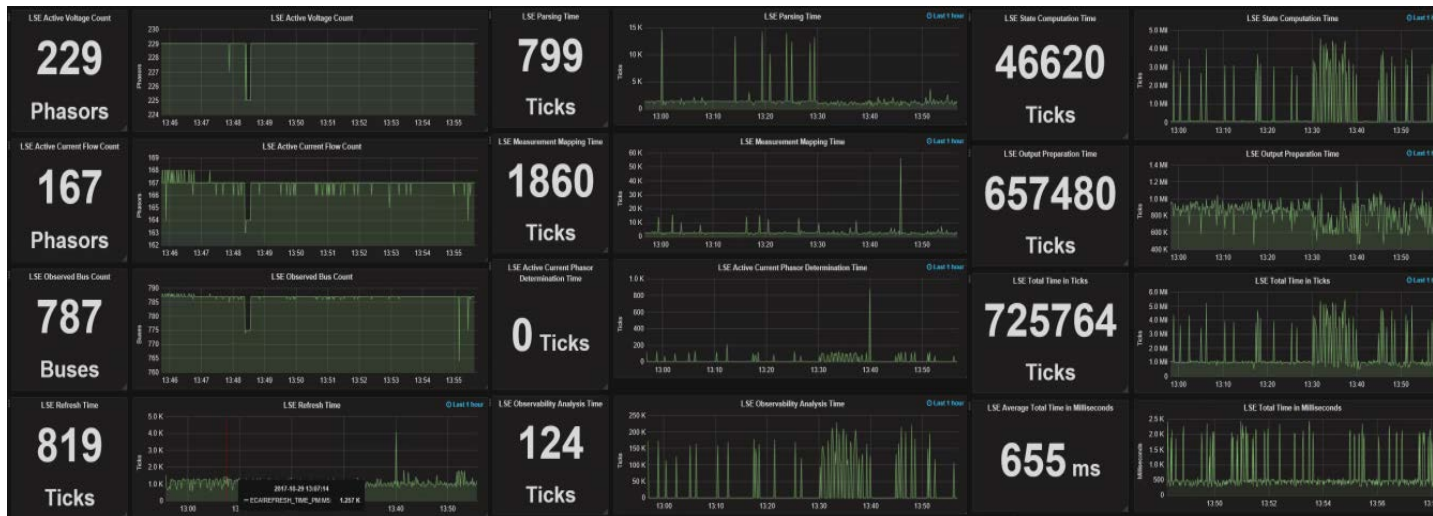


Primary Updates to the Linear State Estimator

■ Integration of a Topology Estimator

- Enables use of LSE without breaker telemetry (a common hurdle to adoption)

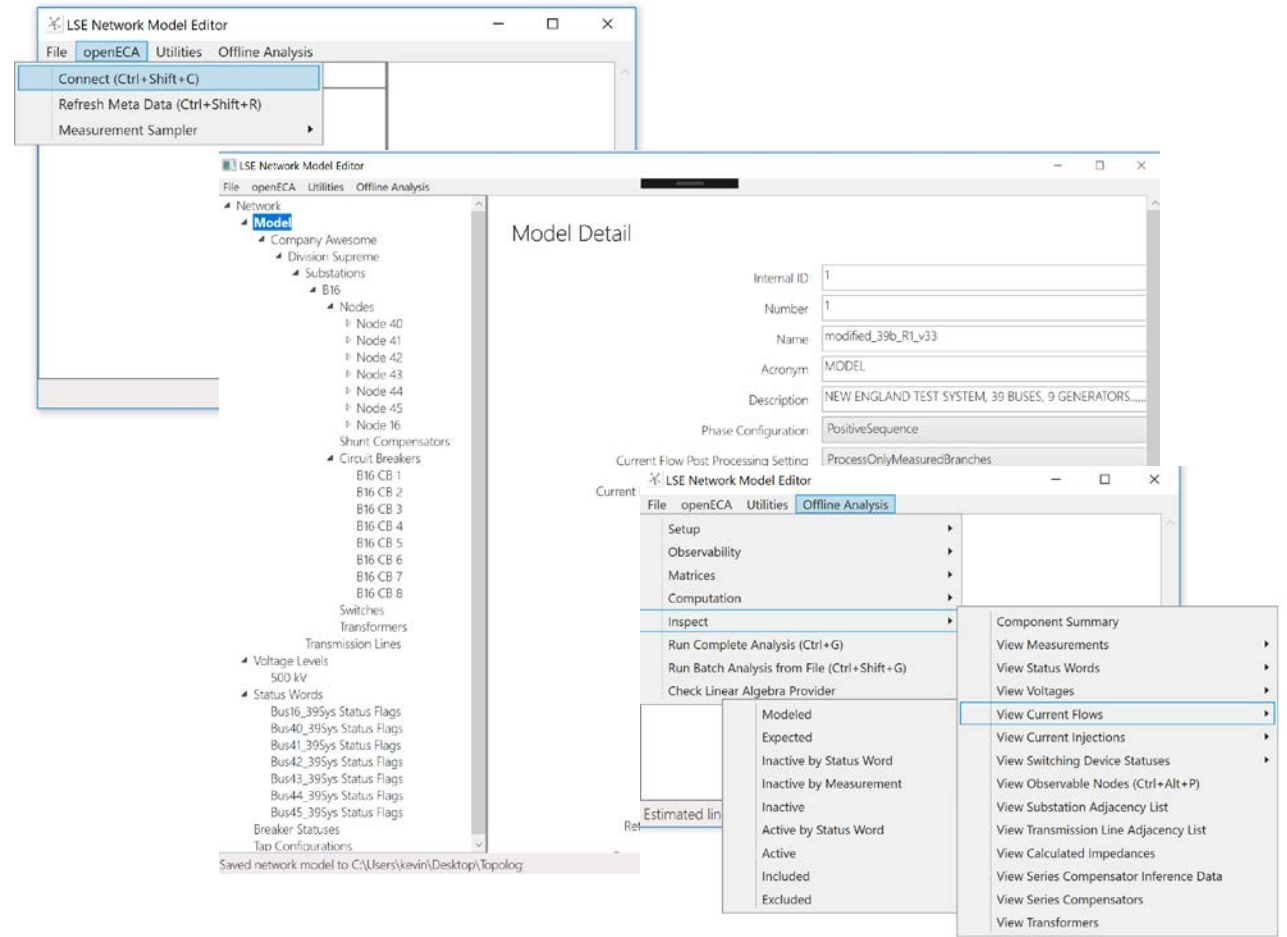
■ Integration with Grafana for Dashboard Vis.



Primary Updates to the Linear State Estimator

■ Improvements to Network Model Editor and Offline Analysis to semi-automate the model building process

- Metadata connection to openECA for modeling automation
- Import models from GE-Alstom EMS and PSSEv33 format for semi-automated model build
- Import measurement information for semi-automated mapping
- Auto-generated *.ecamap file for openECA
- Integrated openECA Measurement Sampler Analytic
- Merged modeling and analysis tools for better workflow



Recap

Major Project Accomplishments

- Demonstrations at:
 - Dominion
 - Southwest Power Pool
 - Oklahoma Gas & Electric
- Hundreds of observable substations
- Demonstrations for Today
 - Live field data on Dominion Servers
 - Tabletop demo with ePHASORSIM

What's Next for the LSE?

- Grow User Community
- Work with GPA to setup support mechanisms
- Scaling up as Dominion's PMU footprint continues to grow
- Performance at scale
- ...and a wish list of other features



...my story is not unique
