

Survalent.

Offline Environments

Oct 9th, 2025



Introduction

ADMS is a complex environment, and it is one of the core applications of a utility. Offline environments are available to address the different utility needs, including:

- Test and confirm any changes made to the ADMS beforehand
- Ensure users are trained on all the new and advanced applications
- Provide operators with an option to evaluate their possible actions without impacting the production

Available Offline Environments

Project Development System (PDS)

Allows users to:

- Edit in an offline environment
- Publish changes to production once the user is ready

- Project-based – multiple concurrent projects can be active at any time
- Multiple users can edit concurrently as well
- Option to test changes in the offline environment before publishing to production

Quality Assurance System (QAS)

Allows users to:

- Test software updates/patches
- Test configuration changes
- Perform hardware/software tests

- Replicate your production environment in a test setting

Operator Training Simulator (OTS)

Allows users to:

- Train on the ADMS in an offline environment
- Test or validate scenarios (in testing phase)

- Take a snapshot of the production system
- Save multiple snapshots of DB into separate studies
- Global command sequence manager available for all studies
- Validate switch orders in OTS, then import into the production system

Operational Analysis Env. (OAE)

Allows users to:

- investigate future hypothetical states of the network
- Offline power system simulator available to see how the network would react

- Available pool of VMs, allows multiple users to run separate studies at once
- Can be used to validate Switch Orders
- Two modes available:
 - Real-time
 - What-if
- Offline power system simulator available to see how the network would react

** Data forwarding license can be used with any of these four servers to update the servers with real-time data*

Differentiating the Offline Environments

The screenshot displays the Survalent SCADA interface for the PEARSON TS substation. The main window shows a single-line diagram with various components and their status. A modal window titled "PEARSON-F3,BRK Breaker Status" is open, showing the current status of the breaker.

PEARSON-F3,BRK Breaker Status

Currently **Closed**
9/4/2024 3:20:09 PM.
Has Note.

Buttons: Set Manual, Open, Close, Alarm Ackn, Activate, Alarm Block, Deactivate, Tag/Untag, Properties, Cancel.

Substation Data:

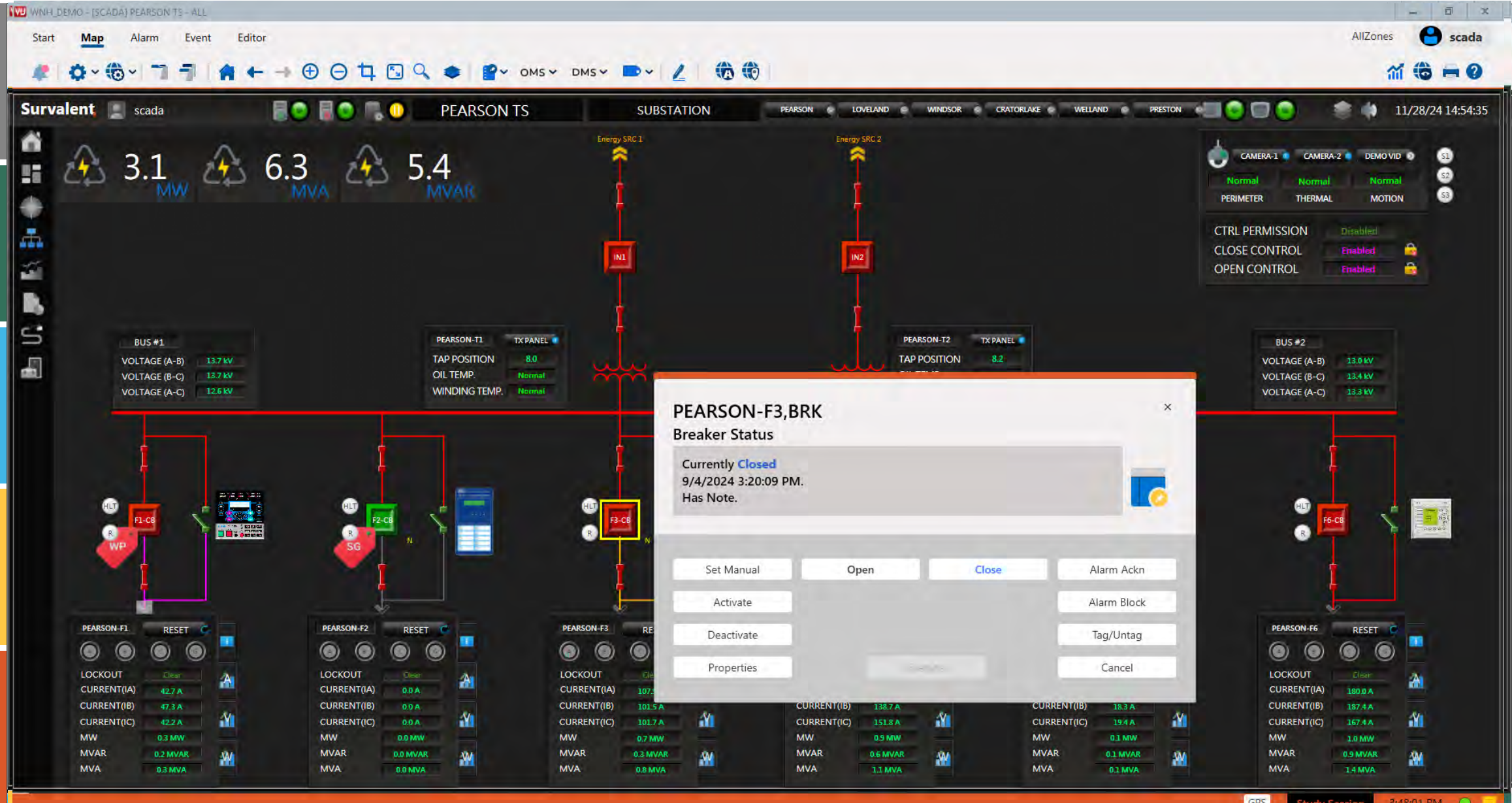
- BUS #1:** VOLTAGE (A-B) 13.7 kV, VOLTAGE (B-C) 13.7 kV, VOLTAGE (A-C) 12.6 kV
- PEARSON-T1:** TAP POSITION 8.0, OIL TEMP. Normal, WINDING TEMP. Normal
- BUS #2:** VOLTAGE (A-B) 13.0 kV, VOLTAGE (B-C) 13.4 kV, VOLTAGE (A-C) 13.3 kV
- PEARSON-F6:** LOCKOUT Clear, CURRENT (IA) 0.0 A, CURRENT (IB) 4.4 A, CURRENT (IC) 4.4 A, MW 0.0 MW, MVAR 0.1 MVAR, MVA 0.1 MVA

System Status: 11/28/24 14:54:35

Navigation: Start, Map, Alarm, Event, Editor

Tools: OMS, DMS, and other utility icons.

Differentiating the Offline Environments





Project Development System (PDS)



Project Development System (PDS)

PDS is an offline
development and quality
assurance environment
for utility administrators

SurvalentONE users can design, test, and approve
proposed changes to their ADMS environment before
publishing them to the production system



Current Way of Editing

- Changes are applied directly to the production (live) system
- Logging of edits must be turned on (database only)
- No automatic backup, no warning messages
- GIS import can affect the state of the network

Drivers for PDS

Users looking for an application that:

- Reduces RISK for new projects in existing systems – mistakes are caught in the offline environment
- Enables users to perform routine tasks (e.g. adding/replacing IEDs) without impacting the production system (which can impact the end-users in their day-to-day operations)
- Provides better auditing capabilities
- Helps with staff turnover – new users are not making their changes directly on the production system
- Improves the process of updating the system
 - Facilitates having multiple users editing at once



PDS Benefits

1. **Sandbox** – Mirror production environment and data forwarding
2. **Isolation** – Adding new communication lines and testing directly from PDS
3. **Share the work** – Concept of projects, submaps and individual resources locking
4. **Validate/Approve** – Controlling when the changes are ready for publishing
5. **Integrate changes** – Journal takes care of transferring all the DB changes to the live system

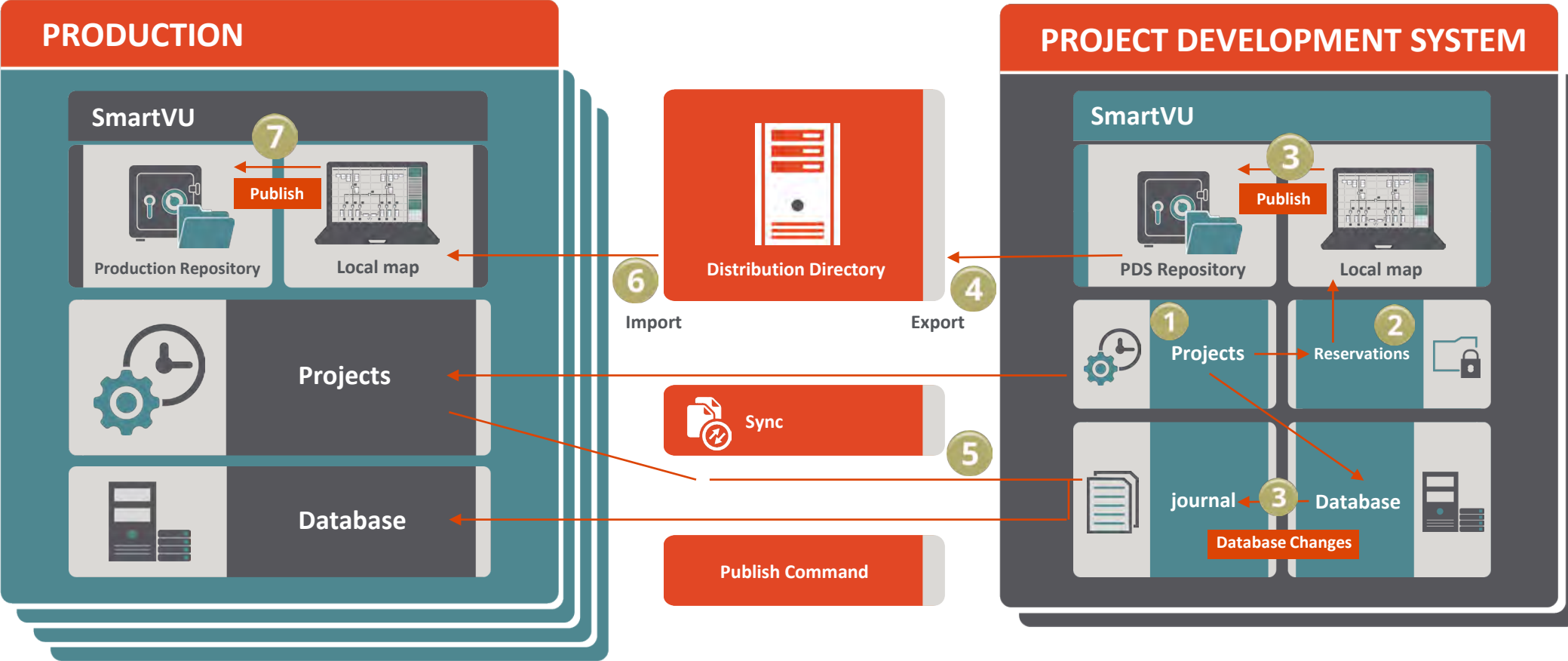


PDS Requirements

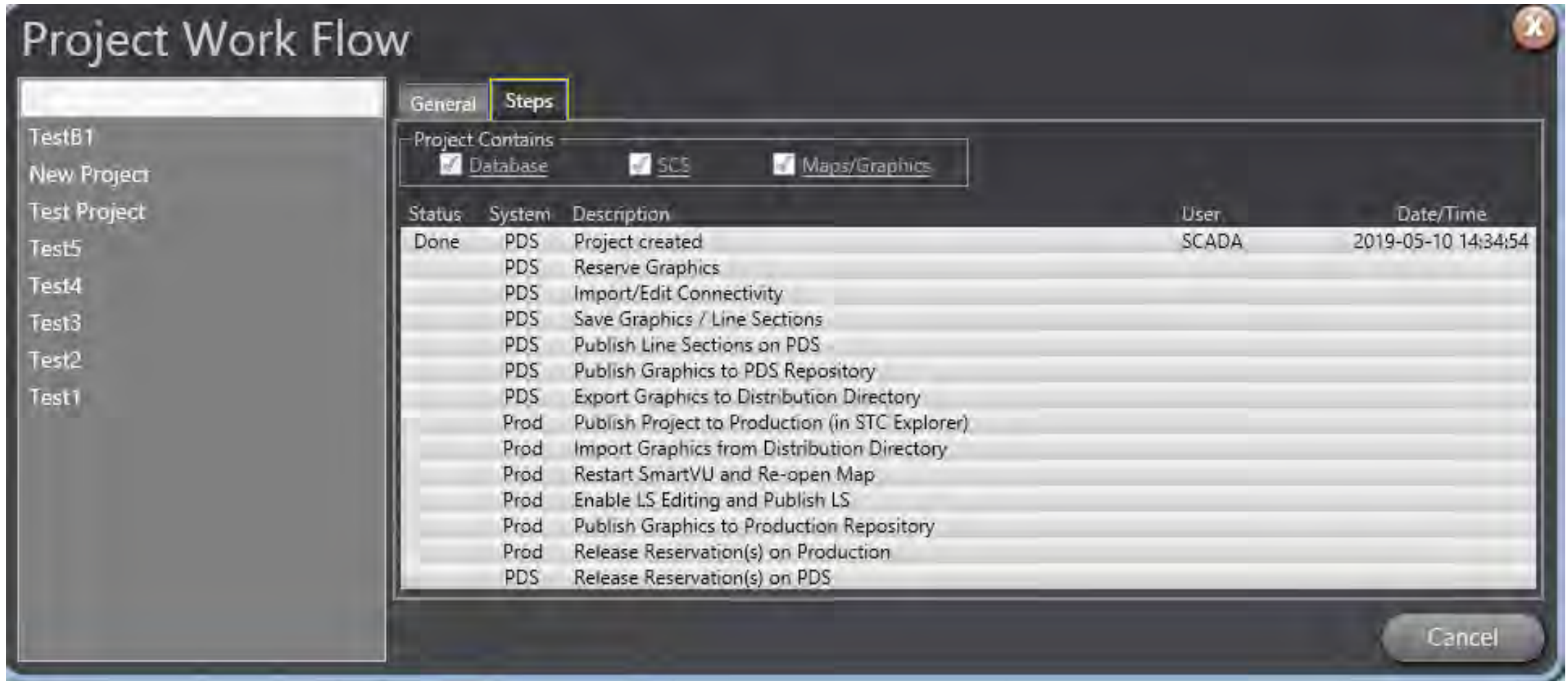
1. Separate license required for PDS
2. Requires a standalone server(s), physical or virtual
 - A. Requires network access to production, to synchronize and publish changes
 - B. PDS supports dual-redundancy
3. Administrator/Operator Training
4. Data Forwarding Configuration (optional)



PDS Workflow



PDS Project Workflow





Quality Assurance System (QAS)

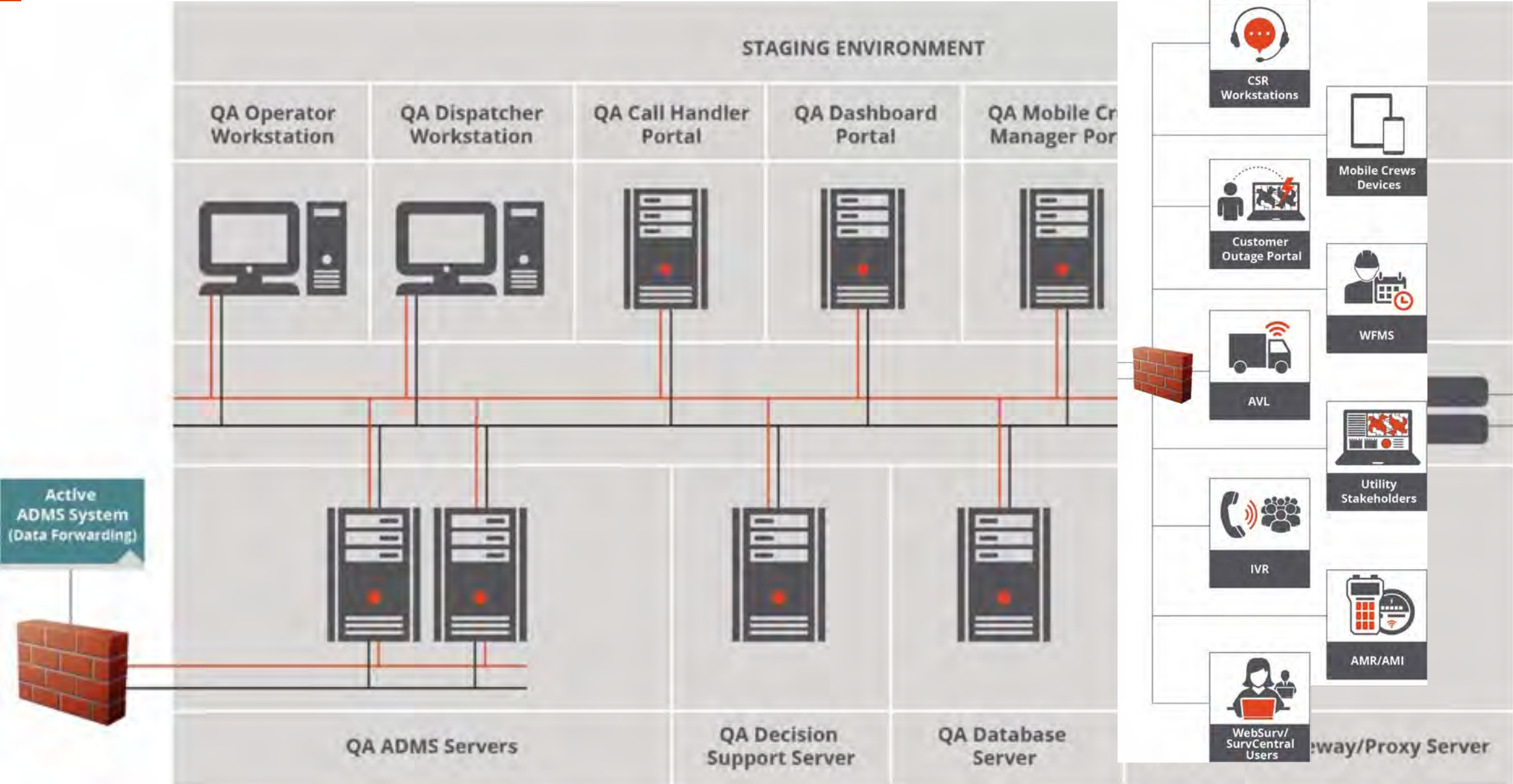
Quality Assurance System (QAS)

QAS is an offline system
for utility administrators
to test software/hardware
changes

SurvalentONE users can apply any new Survalent kit, Windows update, and third-party software update to the QAS first to validate it before making the changes to their production environment



QAS Environment





Operator Training Simulator (OTS)

Operator Training Simulator (OTS)

OTS is an offline system
for operators and
dispatchers to train on the
ADMS

SurvalentONE users can familiarize themselves with new applications by training in the OTS. Trainers can setup scenarios for the trainees to walkthrough

Operator Training Simulator

- Operators and dispatchers need a sandbox environment to learn about new features and applications
 - Train in the offline environment before a feature goes live in production
- Trainers can create scenarios for the trainees to learn on
 - Command sequences and scripts are available to simulate events
- Multiple scenarios (called 'studies') can be saved and loaded as a starting point

Operator Training Simulator

- Synchronize with the production database or create snapshots ('studies') of the production database
 - Multiple 'studies' can be saved and loaded at any time
- Command sequences can be used to simulate scenarios
 - Global command sequence editor available where the command sequences can be used in any study
- OMS scripting tools available as well
 - Simulate calls, AMI events and device operations
- SCANX protocol available to simulate communication lines

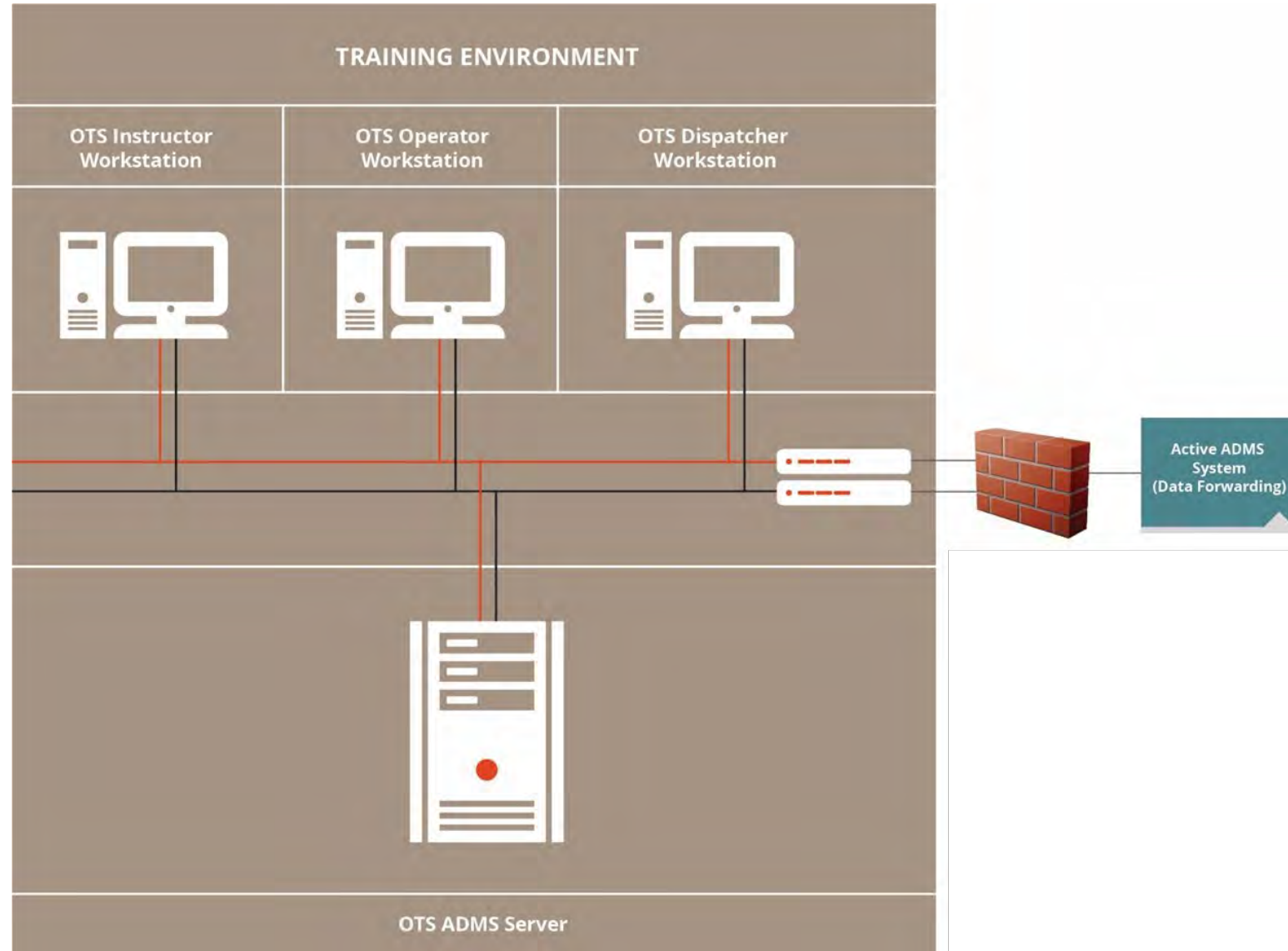
OTS Control Panel


ID	Name	Description	Autostart	Running
1	Tot_MW_2xTR	Template for 2 trafo total MW	<input type="checkbox"/>	<input type="checkbox"/>
2	Tot_MVA_2xTR	Template for 2 trafo total MVA	<input type="checkbox"/>	<input type="checkbox"/>
3	EPSi_commissioning	Commissions Vana EPS2 batteries once a year	<input type="checkbox"/>	<input type="checkbox"/>
4	EPSi_Commissioning	Commissions Vana EPS1 batteries once a year - Autostart	<input type="checkbox"/>	<input type="checkbox"/>
5	EPSi_Conditioning	Conditions Vana EPS1 batteries once a month - Autostart	<input type="checkbox"/>	<input type="checkbox"/>
6	EPSi_Conditioning	Conditions Vana EPS2 batteries once a month	<input type="checkbox"/>	<input type="checkbox"/>
7	07		<input type="checkbox"/>	<input type="checkbox"/>
8	RTU_Shutdown	Timed Shutdown for AC Failed RTUs - Autostart	<input type="checkbox"/>	<input type="checkbox"/>
9	Bus_Status	Bus status (SCS)	<input type="checkbox"/>	<input type="checkbox"/>
10	ForAnnunciation	Sequence used for pager annunciation service	<input type="checkbox"/>	<input type="checkbox"/>
11	11		<input type="checkbox"/>	<input type="checkbox"/>
12	Disable All Auto Transfers	Disable All Auto Transfers	<input type="checkbox"/>	<input type="checkbox"/>
13	Battest_SC067	Test for RTU Batteries - Autostart	<input type="checkbox"/>	<input type="checkbox"/>
14	Battest_Short	Daily Short Duration Battery Test for RTUs - Autostart	<input type="checkbox"/>	<input type="checkbox"/>
15	15		<input type="checkbox"/>	<input type="checkbox"/>
16	Enable All Auto Transfers	Enable All Auto Transfers	<input type="checkbox"/>	<input type="checkbox"/>
17	Battest_Long	Yearly Long Duration Battery Test for RTUs - Autostart	<input type="checkbox"/>	<input type="checkbox"/>
18	18		<input type="checkbox"/>	<input type="checkbox"/>
19	Disable_Unsolicited	Disable all Unsolicited Reporting for Remote Switches	<input type="checkbox"/>	<input type="checkbox"/>
20	Enable_Unsolicited	Enable all Unsolicited Reporting for Remote Switches	<input type="checkbox"/>	<input type="checkbox"/>
21	Test_Reset_Stats	Sequence to reset RTU stats	<input type="checkbox"/>	<input type="checkbox"/>
22	Battest_TEL_QUI_ASW	Daily Battery Test for RTUs - Autostart	<input type="checkbox"/>	<input type="checkbox"/>
23	23		<input type="checkbox"/>	<input type="checkbox"/>
24	24		<input type="checkbox"/>	<input type="checkbox"/>
25	25		<input type="checkbox"/>	<input type="checkbox"/>
26	26		<input type="checkbox"/>	<input type="checkbox"/>
27	27		<input type="checkbox"/>	<input type="checkbox"/>
28	28		<input type="checkbox"/>	<input type="checkbox"/>
29	29		<input type="checkbox"/>	<input type="checkbox"/>
30	30		<input type="checkbox"/>	<input type="checkbox"/>
31	31		<input type="checkbox"/>	<input type="checkbox"/>
32	32		<input type="checkbox"/>	<input type="checkbox"/>
33	33		<input type="checkbox"/>	<input type="checkbox"/>

18:05:08.943 UserTypes.DBF: SIZE = 7406
18:05:08.958 Version.DBF: SIZE = 2644
18:05:08.974 VoiceGroups.DBF: SIZE = 1904
18:05:08.990 Voices.DBF: SIZE = 19548
18:05:09.005 VrGroups.DBF: SIZE = 3632
18:05:09.021 VrRegulators.DBF: SIZE = 21780
18:05:09.036 WmsInterfaces.DBF: SIZE = 14502
18:05:09.052 WorkTypes.DBF: SIZE = 21748
18:05:09.068 WvParams.DBF: SIZE = 1666
18:05:09.099 ZoneGroups.DBF: SIZE = 45888
18:05:09.115 Zones.DBF: SIZE = 13632
18:05:09.115 c==== COPY OK. FILES: 280 BYTES: 887190181 TIME: 57 SECS
18:05:09.115

LOCALHOST

OTS Architecture





Operational Analysis Environment (OAE)

Operational Analysis Environment (OAE)

OAE is an offline environment for users to investigate hypothetical future states of the power system

The Operational Analysis Environment allows users to investigate how their operations can affect the production system without impacting the production system. Studies can be performed on data synchronized from the production system or from saved snapshots

Operational Analysis Environment (OAE)

- The OAE allows operators/engineers to perform their analysis (what if/playback) in an offline environment without impacting the production environment
- From their production environment SmartVU, users can initiate a Study Session and/or Playback Session based on their licensing
 - A separate instance of SmartVU, connected to the OAE, will launch
- Users can use the knowledge gained in the OAE to more confidently perform their actions in the production environment or to better prepare for future events



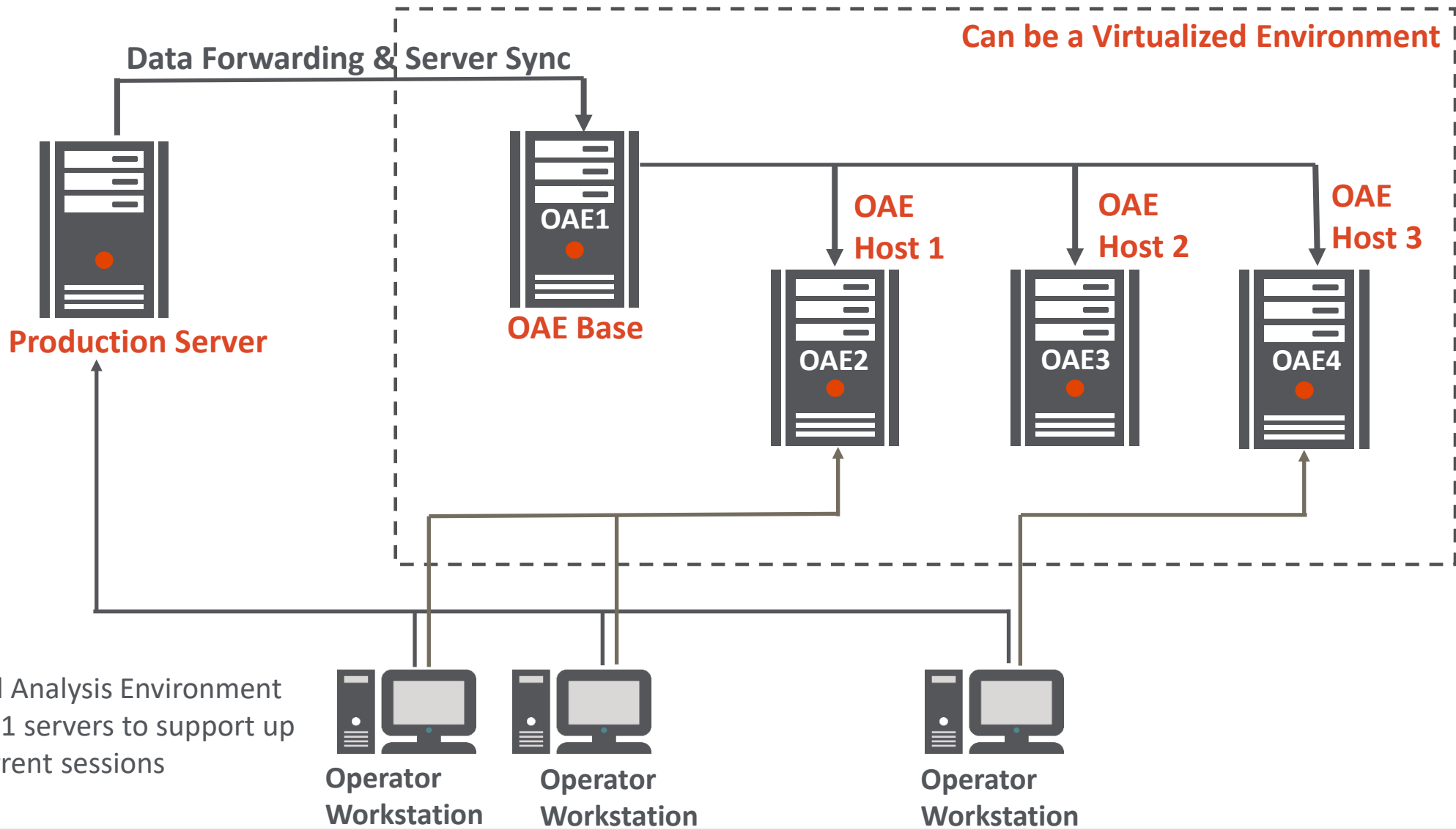
OAE Components

- **Production Servers:** Keeps the Study Base synchronized with the latest real-time values (and database)
- **Production Workstation:** Users would call up a study or playback session from their production SmartVU
- **OAE Base:** Keeps all the OAE Hosts synchronized when not in use so that users could quickly initiate a study session with real-time values
- **OAE Hosts:** A study host would be reserved when a user wants to start a study or playback session. To be able to run N unique concurrent sessions, there would need to be N OAE Hosts available



OAE Architecture

Operational Analysis Environment (OAE)



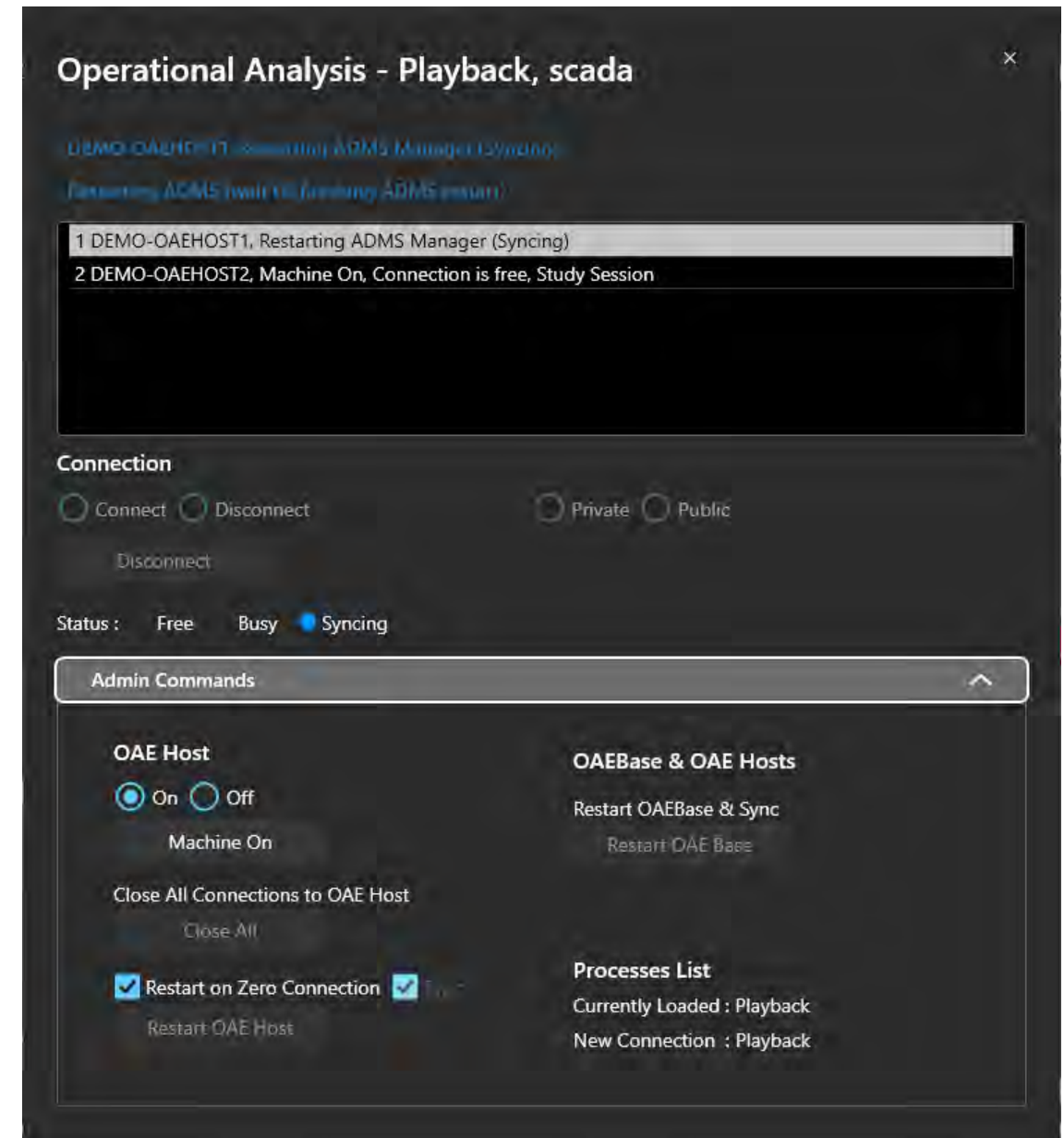
OAE Use Cases

■ Study Mode

- Prepare switch orders
- Review actions before executing them in the production system

■ Playback

- Review a major event that occurred in the system





OAE Key Features

- Option to have multiple users using Study Mode or Playback concurrently
- Create, edit and validate switch orders in Study Mode and import the modified switch orders to the production system
- Initiate a study session from the real-time production system data, saved studies, or the as-built network
- Power System Simulator module available to simulate the effects of the switching operations on the network
- Playback mode available to replay an event

OAE Playback

- Short-term (14 days) and long-term playback available
 - Long-term playback requires the Advanced Historian
- Specify the start/end range of the playback period
- Control the speed of the playback
- Choose to step through the playback by time or events





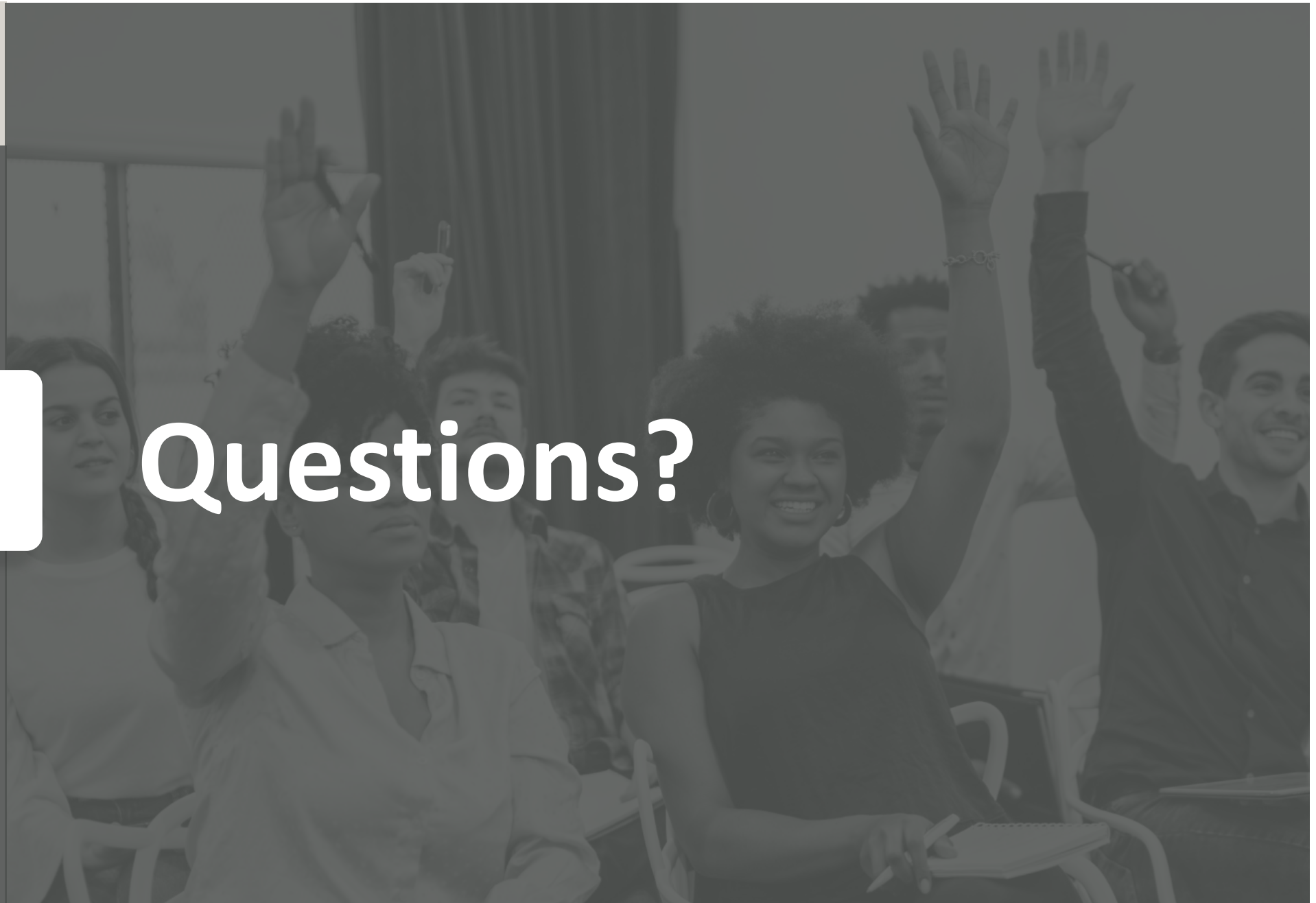
Conclusion

- As ADMS becomes more complex and critical for utilities, it becomes crucial to offload certain tasks (editing, testing, training, studies) to an offline server
 - Utilities can choose which servers to prioritize first
- The offline servers allow users to do their tasks with confidence without affecting the production system
- Helps ensure that the production system only has validated changes applied

Survalent.



Questions?



Thank You