


GE
Energy

Acquiring Operational and Non-Operational Data From Substation IEDs




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The Smart Grid

POWERING POTENTIAL



“Operational” Data



- Data that represents the **real-time status, performance, and loading** of power system equipment
- This is the **fundamental information used by system operators** to monitor and control the power system
- Examples:
 - Circuit breaker open/closed status
 - Line current (amperes)
 - Bus voltages
 - Transformer loading (real and reactive power)
 - Substation alarms (high temperature, low pressure, intrusion)

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“Non-Operational” Data

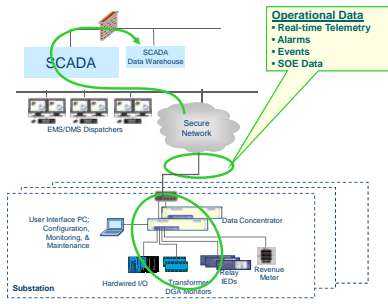
- Data items for which the **primary user is someone other than the system operators** (engineering, maintenance, etc.)
- Note that operators are usually interested in some data that is classified as non-operational
- Examples of “Non-Operational” data:
 - Digital fault recorder records (waveforms) (protection engineer)
 - Circuit breaker contact wear indicator (maintenance)
 - Dissolved gas/moisture content in oil (maintenance)

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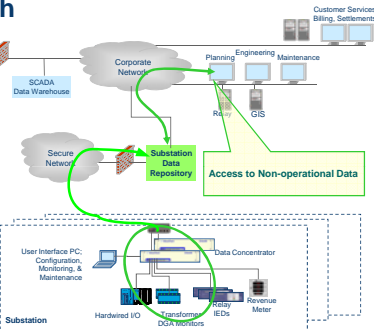
Acquisition of Operational Data Items

- SCADA protocol like DNP3 can be used to access most “simple” IED data items
- Data passed to SCADA supplier’s data warehouse (historian)



Acquisition of Non-Operational Data Files – Basic Approach

1. Use manufacture specific software (or equivalent) to **extract data from the IED** (acSELerator, TapTalk, etc)
2. **Capture the data** acquired by this software in a non-proprietary format
3. **Transmit (push or pull) the resultant data file** to a shared drive on the corporate network
4. **Enable authorized personnel to access the data** using standard analytical tools

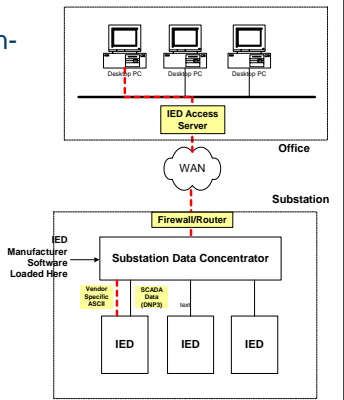


Approaches for Obtaining Non-Operational Data

- **Approach 1:** Download directly from the IED
- **Approach 2:** Use “Pass through” capabilities of substation data concentrator
- **Approach 3:** Local data concentrator as non-operational data server

Approach 3 - Data Concentrator as Non-Operational Data Gateway

- Advantage of this approach:
 - Fewer field devices to manage from central location - 1 SDC versus multiple IEDs
 - Data files transferred over WAN using FTP, OPC or other standard method versus IED specific protocol
- Disadvantage
 - SDC must support the IED proprietary ASCII protocols
 - Not many do at this time



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