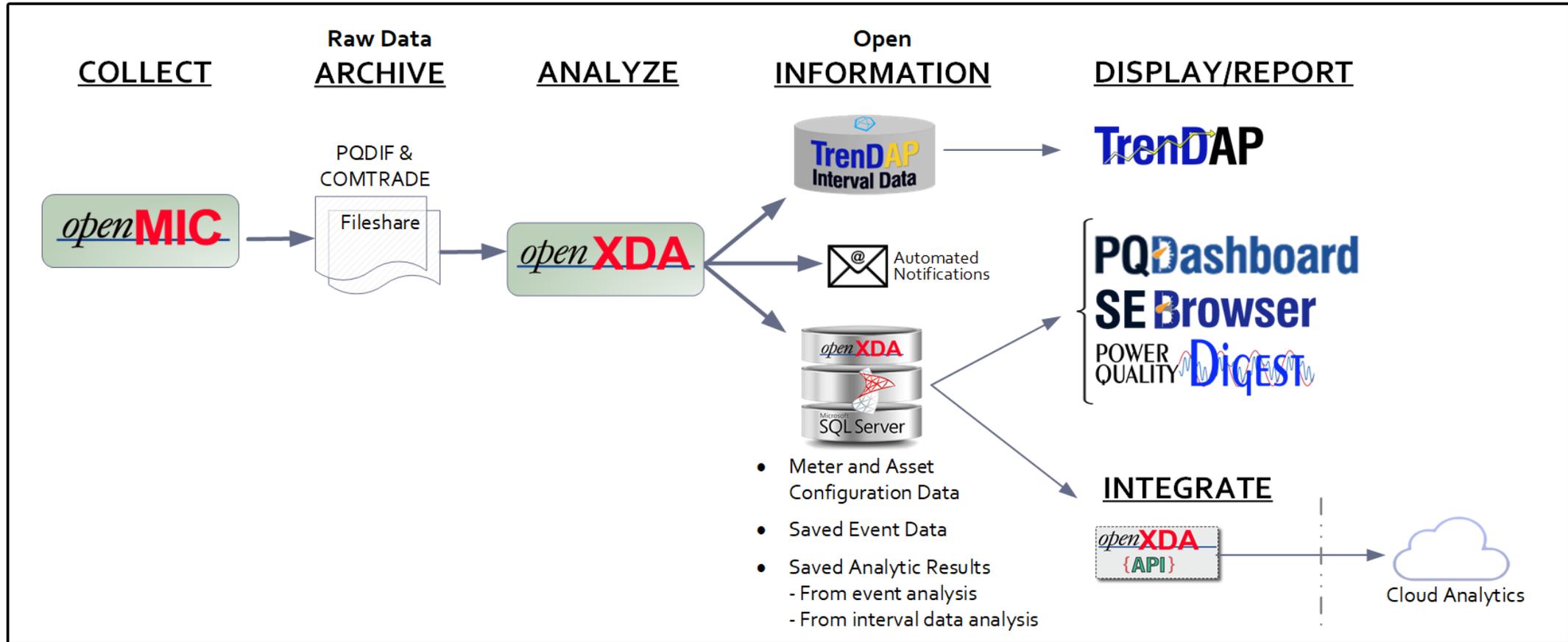


**Dr. Christoph Lackner**

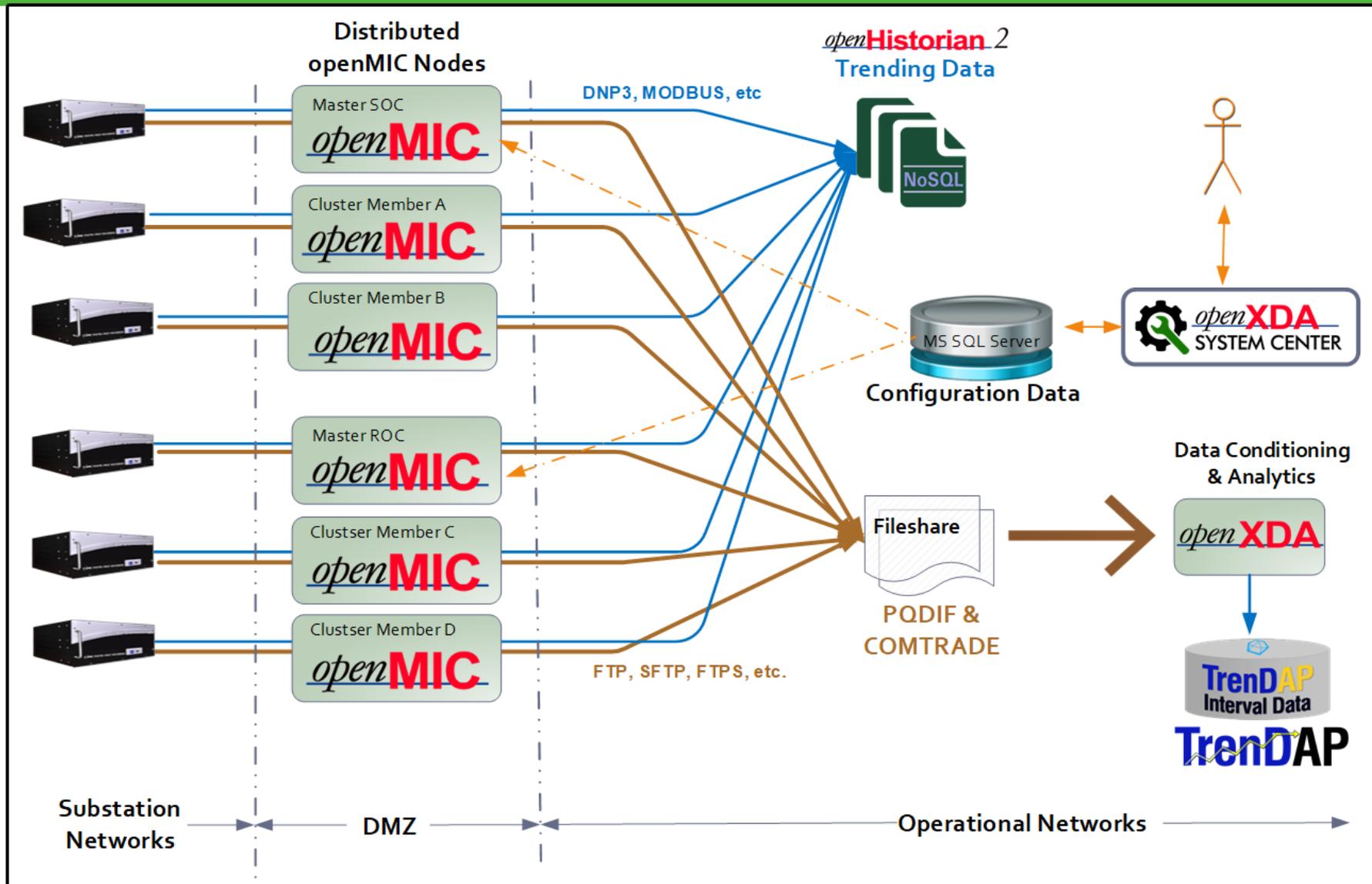
**PQ Dashboard User's Group - 2021**

# openMIC Improvements

# High-Level Data Flow



# openMIC Data Flow



# openMIC – Key Features

- Designed for deployment on critical, utility networks
- Polls substation devices for data – each device can be on separate schedule
- Default polling uses FTP, but openMIC can use custom downloaders to accommodate proprietary device protocols – i.e., for BIN DFRs
- Uses IP or RAS/modem communications paths for downloading files with event, configuration or trending data
- Other time-series data flows are supported over IP and serial using Modbus, DNP3, STTP, etc.
- Includes a built-in web-based configuration system
- Includes logging and reporting on communication success and failure to identify communications issues

# Web Configuration System

The screenshot displays the openMIC web interface. The top navigation bar includes 'Home', 'Devices', 'Monitoring', 'Meta-data', 'Settings', and 'Help', along with a 'Log Out' button. The main content area is divided into several sections:

- Quick Links:** A sidebar menu with buttons for 'Devices', 'Status', 'Connection Profiles', 'Graph Measurements', and 'Restart Service'.
- System Health:** A table showing performance metrics for various system components.
- Server Information:** A section displaying 'Server Time', 'Local Time', 'Current User', 'App Version', 'Config Type', and 'Config Name' with their respective values.
- Footer:** A URL 'http://localhost:8089/'.

An 'Edit APP Device Connection Task' modal window is open in the foreground, containing the following fields and options:

- Name:** Download Config Files
- External operation application:** (Empty field)
- File Names or Extensions to Download:** \*.ini,\*.par,\*.inf,\*.zip
- Maximum File Size to Download (MB):** 1000
- Remote Path:** /
- Maximum Files to Download (-1 = no limit):** -1
- Local Path:** C:\Users\sjenks\Documents\GitHub\openMIC\Build\Output\IC
- Directory Naming Expression:** <YYYY><MM>\<DeviceFolderName>
- Local Path Aut:** (Empty field)
- Local Path Aut:** (Empty field)
- Task Settings:** A text area containing configuration parameters: fileExtensions=\*.ini,\*.par,\*.inf,\*.zip; remotePath=/; localPath=C:\Users\sjenks\Documents\GitHub\openMIC\Build\Output\Debug\Applications\openMIC;

A tooltip is visible over the 'Directory Naming Expression' field, listing available template fields: year as <YYYY> or <YY>, month as <MM>, day as <DD>, device name as <DeviceName>, device acronym as <DeviceAcronym>, device folder name as <DeviceFolderName>, and connection profile name as <ProfileName>.

# Download Progress Screen

The screenshot shows the 'Status' page in the openMIC interface. It features a search bar, a 'Query Limit' of 100, and a 'Queue All for Processing...' button. Below are seven meter cards, each displaying the file being transferred, the start time, and a progress bar with current and target percentages.

Meter	Downloads	File	Time	Current %	Target %
METER1	5	TestFiles.zip	2016-08-18 20:05:29.845	19%	84%
METER2	4	TestFiles.txt	2016-08-18 20:05:29.793	72%	75%
METER3	4	TestFiles.txt	2016-08-18 20:05:29.848	95%	75%
METER4	4	TestFiles.txt	2016-08-18 20:05:29.878	67%	75%
METER5	4	TestFiles.txt	2016-08-18 20:05:29.941	46%	75%
METER6	4	TestFiles.txt	2016-08-18 20:05:29.837	33%	75%
METER7	4	TestFiles.txt	2016-08-18 20:05:29.904	22%	75%

The screenshot shows the 'Status' page in the openMIC interface, displaying a list of records. The page includes a search bar, a 'Records: 286' indicator, and a list of records with their respective download progress.

Record	Downloads	Total
ACKERMAN_CC: [ @MIC-ROC1 ]	2 Files Downloaded	(2497 Total)
ALAMO_TN_CAPBK_AHM: [ @MIC-ROC1 ]	2 Files Downloaded	(1989 Total)
ALBERTVILLE_AL: [ @MIC-ROC1 ]	0 Files Downloaded	(36 Total)
ALCOA_TN_161_CAP1_RELAY: [ @MIC-ROC1 ]	0 Files Downloaded	(0 Total)
ALCOA_TN_161_CAP2_RELAY: [ @MIC-ROC1 ]	0 Files Downloaded	(0 Total)
ALCOA_TN_161_CAPBK		
ALCOA_TN_SS_1		
ALCOA_TN_SS_2: [ @MIC-ROC1 ]	0 Files Downloaded	(12 Total)
ALLEN_CC: [ @MIC-ROC1 ]	1 Files Downloaded	(2450 Total)
ALLEN_FP: [ @MIC-ROC1 ]	0 Files Downloaded	(1,691 Total)
ALPHA_GA: [ @MIC-ROC1 ]	0 Files Downloaded	(6 Total)
ANGELTOWN_TN: [ @MIC-ROC1 ]	0 Files Downloaded	(7 Total)
APALACHIA_HP: [ @MIC-ROC1 ]	0 Files Downloaded	(0 Total)
APISON_PIKE_TN_13-T1		
APISON_PIKE_TN_13-T2		
APISON_PIKE_TN_13-T3		
ARDMORE_AL: [ @MIC-ROC1 ]	0 Files Downloaded	(6 Total)
ASCEND_AL_13_B500_TOTAL: [ @MIC-ROC1 ]	0 Files Downloaded	(0 Total)
ATHENS_AL: [ @MIC-ROC1 ]	0 Files Downloaded	(8 Total)
ATHENS_TN: [ @MIC-ROC1 ]	0 Files Downloaded	(0 Total)
BARKLEY_HP: [ @MIC-ROC1 ]	0 Files Downloaded	(0 Total)
BASIN_TN: [ @MIC-ROC1 ]	0 Files Downloaded	(31 Total)

# Recent openMIC Improvements

- Improved FTP time constraints
- Support for overridable task schedules
- Added support for priority-based download schedules, include custom task schedules
- Ability to queue tasks with time-constrained download
- Updated CRON schedule validation and help dialogs
- Included support for STTP in openMIC for improved time-series data distribution, e.g., from DNP3 or Modbus
- DNP3 updated with TLS support

# openMIC Enterprise Edition

- Ability to interrogate substation devices using vendor specific, proprietary protocols
  - ION meters
  - Dranetz 61000s
  - SATEC meters
- These custom adapters produce well-formed PQDIF so that raw data can be achieved vis-à-vis other meter types
- Ability to horizontally scale into a high-availability, load-balanced system
  - One system, typically a fail-over cluster, is setup to be the *primary scheduling system*
  - Any number of other systems are then setup as *subordinate pooled worker instances*
  - Pooled instances can easily come and go for maintenance or load distribution
- Ability place devices in a substation where there has been a breaker operation at the top of polling queue
- Available at the cost of standard maintenance for openMIC