openPDC

Phasor Data Concentrator

Version 2.0

GRID PROTECTION ALLIANCE

1206 Broad Street, Chattanooga, TN 37402 **423-702-8136**

The *open*PDC is a high-performance platform for managing synchrophasor data and processing streaming time-series data in real-time. Various wizards are included to streamline the initial setup and configuration process. The *open*PDC is the most versatile and extensible phasor data concentrator available.

Application Profile

The openPDC is a back office system designed to consume all standard PMU input protocols, provide lossless phasor data transformation and replication, and support user configurable output streams with low latency.

Required Hardware

openPDC can execute on standard server or workstation hardware as well as on fan-less systems for use in substations. A minimum of 8 GB of memory is recommended. Version 2.0 is only supported on 64-bit platforms.

Required OS and Services

The openPDC is intended for deployment using Windows Server 2008 or later. However, the openPDC will run under all 64-bit MS Windows operating systems, Vista or later.

Current Release

openPDC v2.0

Free Download at:
http://www.openpdc.com

FEATURES

Inputs

Comprehensive input protocol support including IEEE C37.118, IEEE 1344, IEC 61850-90-5, Macrodyne Versions G and N, SEL FastMessage, OSI-PI reader, F-Net protocols, among others.

Data Format and Coordinate Conversion

Multiple outputs can be fully configured individually.

Scalability

Distributed multi-node architecture supported for customers with need for high availability and throughput.

Phasor Data Storage

GPA's built in openHistorian is included with support for other data archives, such as the OSIsoft PI Historian and most relational data systems.

A simple web-service call can be made to the openHistorian to return near-real time or historical data.

Monitoring

Performance statistics are logged every 10 seconds and include latency, data quality, and time code errors as well as stream statistics for input and output streams.

Setup and Configuration

"Help-Me-Choose" decision trees for contextual help on openPDC configuration settings.

The openPDC's configuration database can be MS SQLserver, MySQL, SQLite, or Oracle.

Security

Role-based security for configuration management with configuration change logging for CIP compliance.

Easy Data Integration and Extensibility

A real-time output API for .NET developers.

Code examples for development of new customer input, output, or action adapters.

Why an openPDC?

The openPDC has been in production use since 2004 with proven high performance, and it continues to be on a steep improvement curve. There are no licensing costs for the openPDC allowing it be easily tested within an environment prior to making production implementation commitments.

The openPDC is not just a data concentrator, it's a flexible platform for processing high-speed time series data that can adapt with changing technology to provide a future-proof phasor data architecture. The openPDC can be used as a managed phasor data bus to effectively distribute data (both real-time and historical) to consuming applications.

The openPDC can be installed anywhere within the phasor data infrastructure. The openPDC has been successfully tested on fan-less computers for use in substation environments.

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openPDC— open source phasor data concentrator

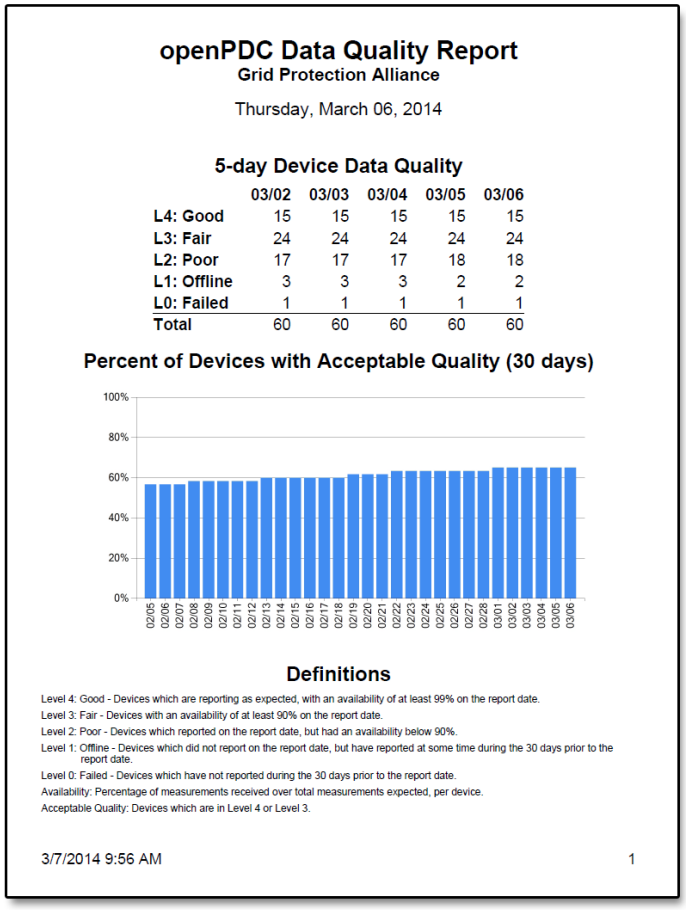
NEW ! openPDC Data Quality Reporting Services

Monitoring the quality of the data from Synchrophasor measurement devices is a critical function for operators of large synchrophasor data systems. Reports are need so that business metrics can be tracked and actions taken to improvement them.

Previous versions of the openPDC included "performance historian" to track detailed performance of the data flows from each contributing phasor measurement device at high granularity. The default configuration for the openPDC is to log hundreds of statistics every 10 minutes. These statistics include metrics on the openPDC itself such as CPU utilization, memory use, and I/O volume as well as metrics on contributing devices such as device errors, time errors and measurements received.

This daily report includes:

- Configurable levels to describe device performance.
- Yesterday's performance compared to the last 4 calendar days
- A high level summary of device availability for the last 30 days.
- A detailed list of specific PMU performance for the day of the report



openPDC Data Quality Report
Grid Protection Alliance

Thursday, March 06, 2014

5-day Device Data Quality

	03/02	03/03	03/04	03/05	03/06
L4: Good	15	15	15	15	15
L3: Fair	24	24	24	24	24
L2: Poor	17	17	17	18	18
L1: Offline	3	3	3	2	2
L0: Failed	1	1	1	1	1
Total	60	60	60	60	60

Percent of Devices with Acceptable Quality (30 days)

Definitions

Level 4: Good - Devices which are reporting as expected, with an availability of at least 99% on the report date.
Level 3: Fair - Devices with an availability of at least 90% on the report date.
Level 2: Poor - Devices which reported on the report date, but had an availability below 90%.
Level 1: Offline - Devices which did not report on the report date, but have reported at some time during the 30 days prior to the report date.
Level 0: Failed - Devices which have not reported during the 30 days prior to the report date.
Availability: Percentage of measurements received over total measurements expected, per device.
Acceptable Quality: Devices which are in Level 4 or Level 3.

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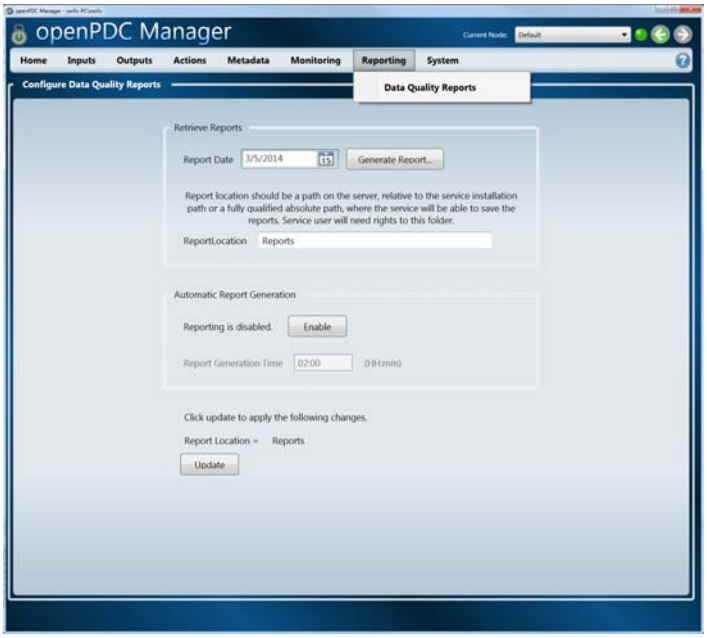

New with the latest build (Version 2.0.118 or later) of the openPDC is the ability to automatically produce the daily report shown above to get a quick summary of the status of devices connected to the openPDC. Implemented as a generic class in the Grid Solutions Framework this new capability is extensible for routine reporting on other performance metrics within the performance historian.

As shown to the left configuration options in the openPDC Manger for this report include:

- Turning on automated daily reporting
- Selecting the location to save the report
- Running ah-hoc reports for any day.

Through the configuration setup file the break points for "fair" and "poor" can be set. Default values are: 99% and above of expected measurements received places a device in the "Good" level; 90% and below of expected values results in a "Poor" level device.

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