Power Analytics Software

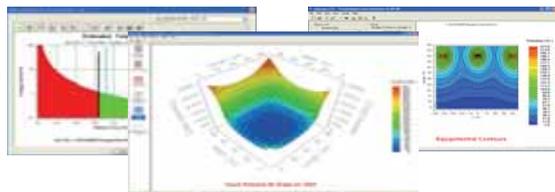**2013 Asia Pacific Clean Energy Summit**

September 2013

- Power Analytics, formally EDSA, started in 1983

- In 2008, EDSA developed its Real Time Energy Management System, **The Paladin Suite**

- In 2011, EDSA changed its name to Power Analytics

- In 2012, Power Analytics added Paladin PV (Solar Forecasting) to its Paladin Suite

- Power Analytics is a best in class analytics, modeling, optimization, integration, forecasting, and reporting software solution for Commercial & Industrial customers including mission critical, solar farms, and microgrids

- Leader in renewables (PV, Wind, EV) based design and optimization solutions

- More than $100B in assets around the world modeled and managed

Executive Summary

- Power Analytics teaming and can provide a turn key design, engineering, monitoring, forecasting, management, and operations solution

- Power Analytics began with UCSD 2010

    - Paladin PV solution is a modular solar design, monitoring, management, and forecasting solution, demonstrated for the Dept of Energy in 2011

    - Energy storage optimization, minimize battery size, maximize battery total life cycle

    - Maximizes PV performance

    - Solar forecasting

- ESTCP recipient for the first Microgrid Cluster involving three Navy bases in San Diego

Paladin® Family

Paladin's Power & Energy Life Cycle Management

SOLAR FORECASTING & OPTIIMIZAION:
Paladin PV
Solar Modeling, forecasting and optimization

DESIGN & MODEL:
Paladin DesignBase
Planning electrical power systems modeling, simulation, analytics, and optimization

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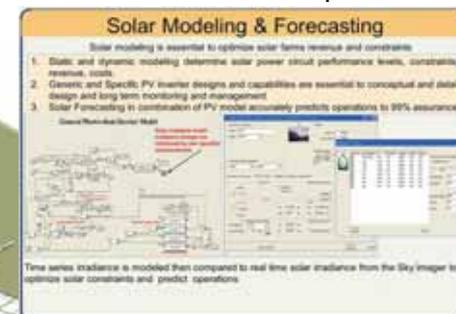**CONTROLS & OPTIMIZATION:**
Paladin SmartGrid Power Management Systems
Optimization of operations with controls for all power components

4

REAL TIME OPERATIONS:
Paladin Live
Ensures reliability, Real Time equipment analytics, and simulation of power

3

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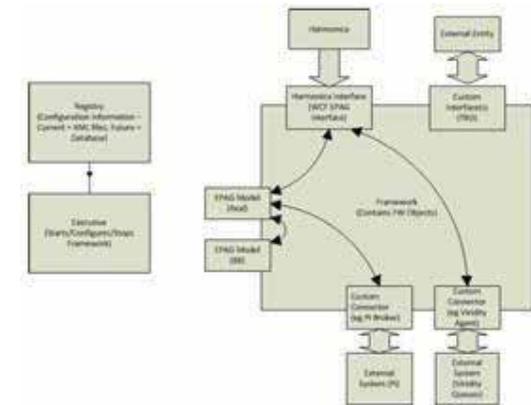## End-to-End Power System Intelligence

- **Paladin® Reports™ Report Generation Tool**

  Aggregates raw textual data from nearly infinite number of devices, resulting in a relational, searchable repository of exposed information gathered from across the enterprise; enables the creation of high quality professional reports that depict their findings, customized for a particular site, customer, or application, extremely quickly for real time and after the fact operational reports

- **Paladin® Gateway™**

  Allows 2 way communication with power devices and systems from nearly any major vendor. Solves one of the most vexing problems facing electrical system operators: the lack of networkability and interoperability between competing vendors' systems, which prohibits the sharing of data between them. Significantly reduces the risk in data integration between systems including EMS, DMS, GIS, AMI, MDMS, BMS, PI

- **Paladin® DesignView™**

  Lets users easily create very detailed "dashboards" that provide up-to-the-millisecond information about power infrastructure performance. Provides highly configurable operator screens and the ability to port to smart devices and import 3rd party systems "widgets" in a revolutionary new real-time scientific visualization software tool.

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End-to-End Power System Intelligence – Advisory Applications

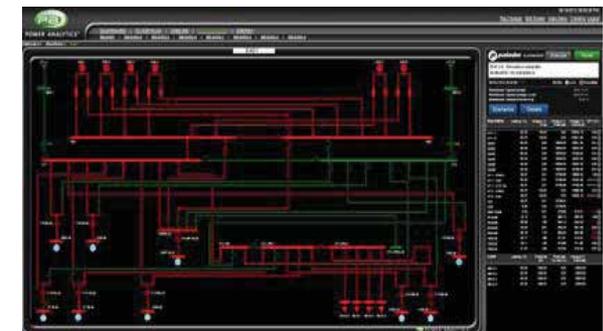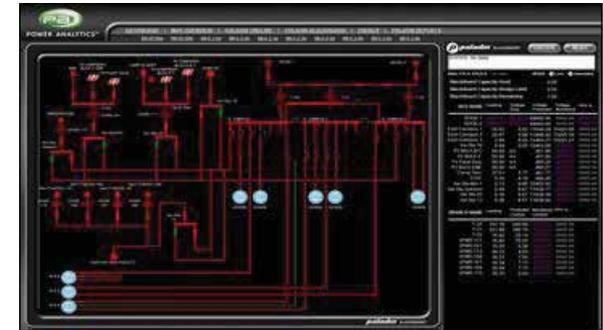- **Paladin® BlackBoard™ Simulation Environment:**

  Provides an on-line, mirror image of Live operations in a virtual environment; allows any changes to processes, procedures, hardware, or maintenance activities to be simulated before they are implemented and saved as cases

- **Paladin® Live™ Real-Time Energy Management Advisor**

  Enables demand management by showing precisely where, when, and how energy is being consumed; assesses where opportunities for energy saving may exist; enables end use personnel to conduct detailed, what-if simulations of energy efficiency strategies as well as point out defective equipment

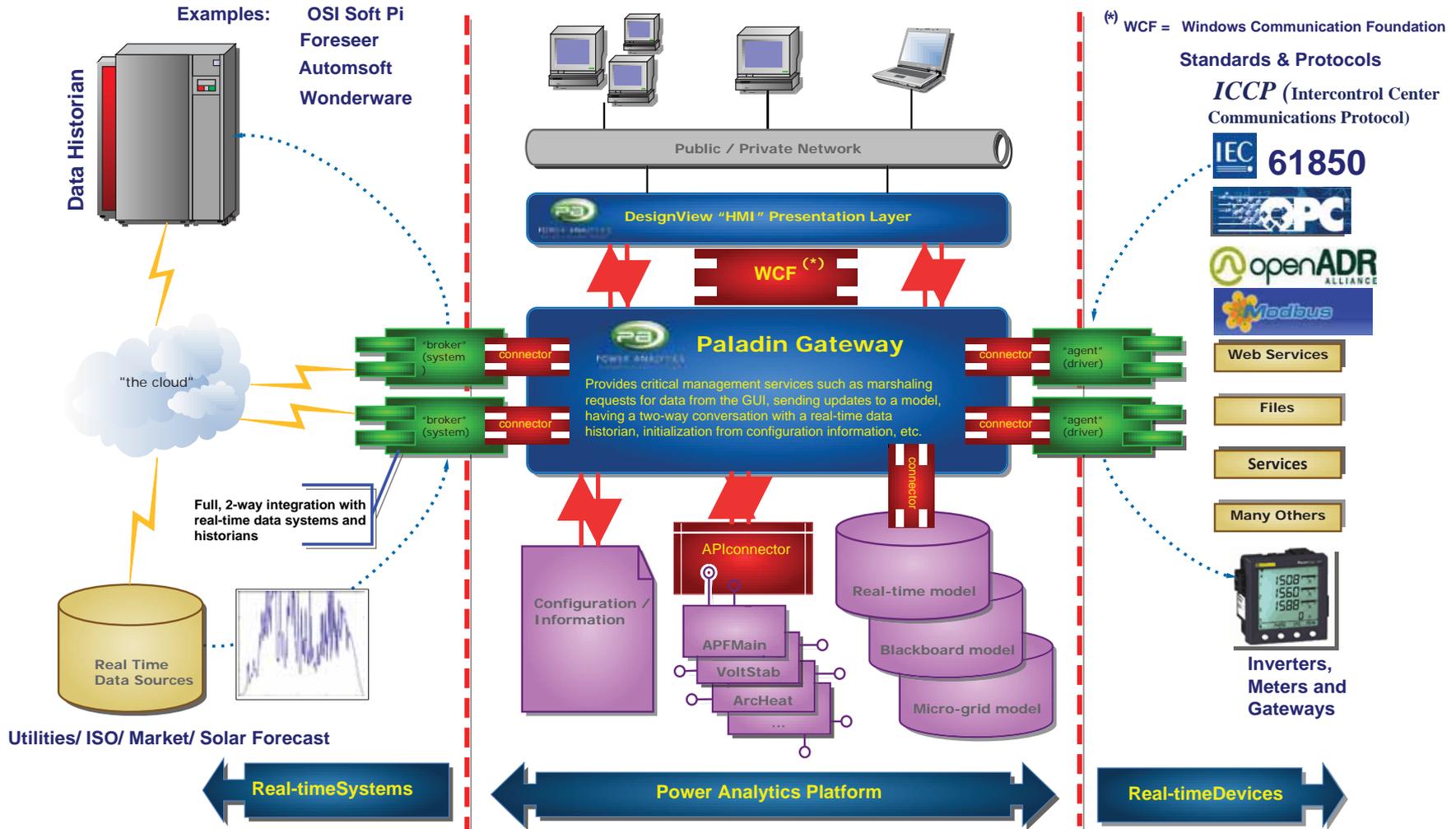- **Paladin® Live™ Stranded Capacity/ Assets Advisor**

  360º view of the end user facility and power optimization potential, continually checking all components, equipment, and systems for limits and constraints. Provides detailed, updated advisories and reports regarding the appropriate recommended limits.

Paladin Open Architecture Platform

- Own the Concept: Power Analytics' IP is anchored in the patented core concept of a power software system that continuously compares an as-designed electrical network model with as-operating conditions for Energy Management and Demand Management.

- Protect by Patent: Power Analytics has filed 172 patent applications 35 of these have been issued. This represents the culmination of 25 years of software design and development. The patents incorporate deep industry knowledge in electrical design and power infrastructure operation, combined with massive data processing and real-time analytics know-how.

- Enhance and Extend: Power Analytics will continue to enhance and extend our patent portfolio in areas that stress real-time analytics, demand management, and visualization of the analytics. In addition, Power Analytics has also increased focus on high-value alternative energy components.