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2019 "STATE OF ENERGISTICS" ORIENTATION

Jana Schey, COO

Jay Hollingsworth, CTO

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Introductions

Philip Neri
Marketing Director

Jana Schey
Chief Operating Officer

Jay Hollingsworth
Chief Technology Officer

Agenda

- About Energistics
- Standards Overview
- 2019 Plans
- How We Work
- Q&A

About Energistics

Energistics…past and present

- Energistics is not a vendor. We are a non-profit industry organization.
- Our role is to help companies manage and share data more efficiently and cost-effectively by using industry-defined data exchange standards
- We have served the industry for more than 25 years
- Our **110+** members include leading E&P companies, oilfield service companies, software vendors, system integrators, regulatory agencies
- Our standards are the result of open collaboration between members, facilitated by Energistics
- In short, the standards are created **by the industry** and **for the industry**

Our Current Members – Come Join Us!

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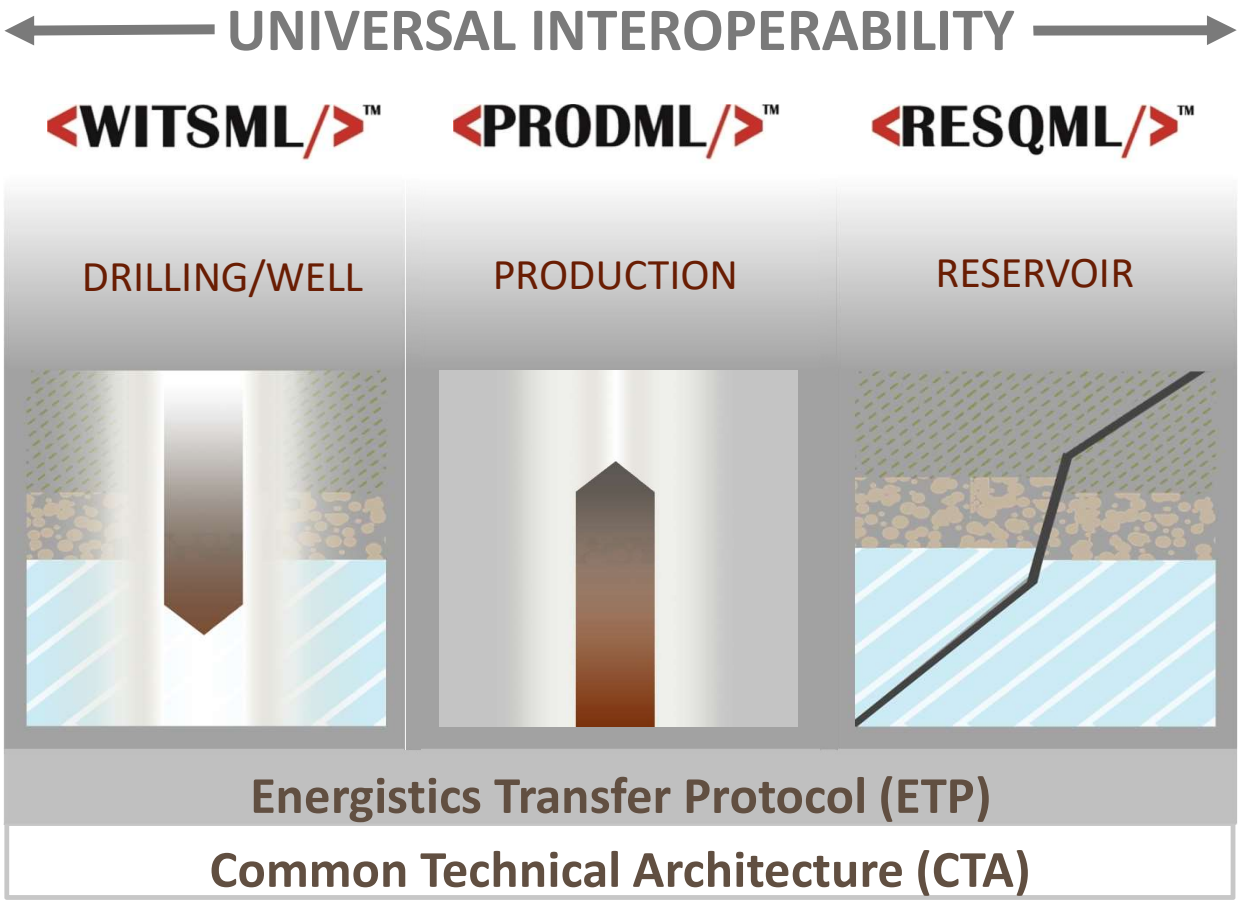
Standards Overview

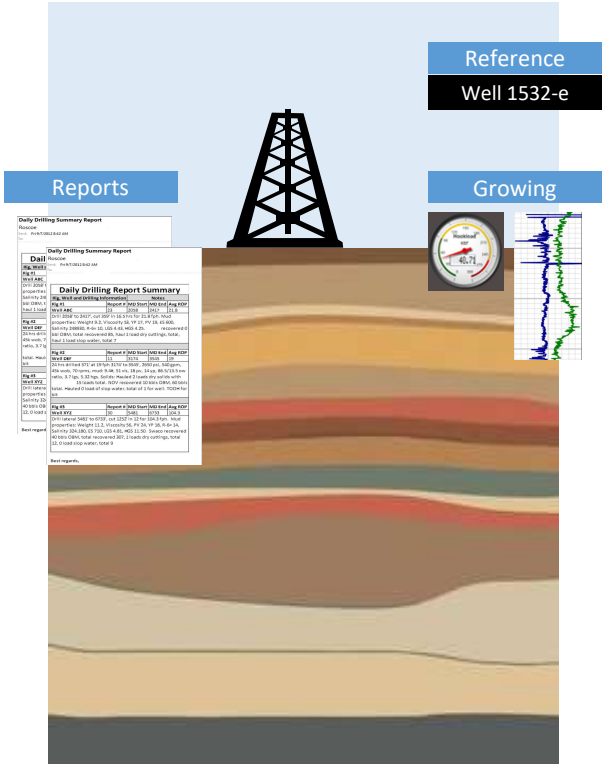
Energistics' Spectrum of Standards



- Defined by collaboration between member SMEs
- Coherent set of standards to eliminate data 'friction'
- Goal is to cover all key activities in upstream
- Shared components enable cross-functional workflows

Well Information Standards: WITSML™

- Consistent high-quality transfer of wellbore and drilling-related data
  - Real-time data transfer
    - ✓ Reference objects – Well and Wellbore
    - ✓ Growing objects – Log (time, depth), Trajectory, Mud Log, etc.
    - ✓ Snapshots in time – with “report” information
  - Move well-related data between applications
  - Real-time availability of drilling operations
  - Archival history of drilling operations



Production Standards: PRODML™

- Consistent, high-quality transfer of production-related data
  - Data transfer to production surveillance centers
    - ✓ Real-time measurements from sensor through analysis
    - ✓ Static configurations of production and surface facilities
    - ✓ Regulatory and partner reporting
    - ✓ Movement of analyses from service company to operator
  - Move production-related data among databases and applications
  - Archival history of production operations

Reservoir Standards: RESQML™

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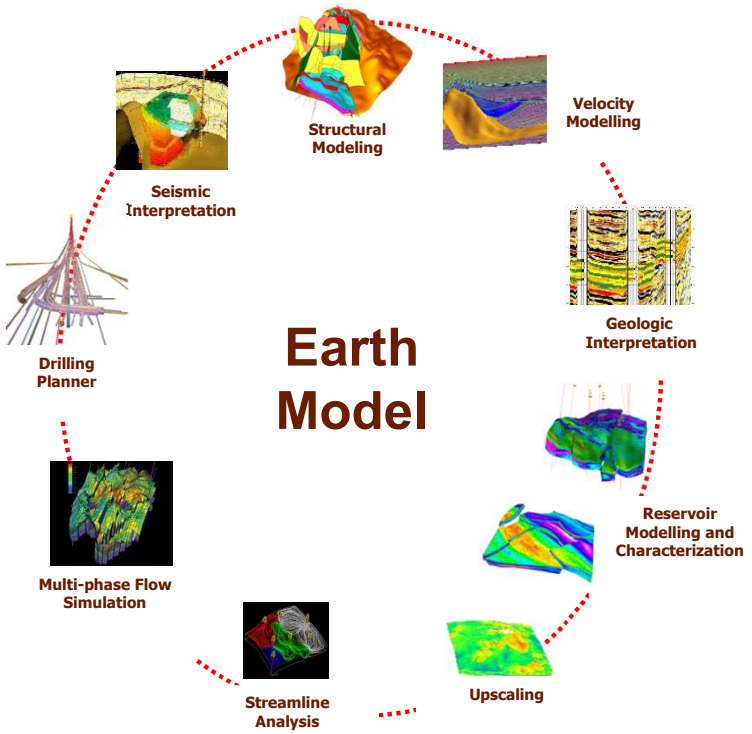
- High fidelity transfer of earth model data across applications and vendors
  - Sharing earth model data across asset teams
  - Movement of data through the seismic to simulation workflow
  - All kinds of grids
  - Traceability via metadata
  - File-format-neutral archival of earth model at key decision points



BP/Shell Implementation Pilot

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- Multi-vendor pilot of RESQML v2 to exhibit the value of standards in normal partner earth model data transfers
- Pilot participants: BP, Shell, CMG, Dynamic Graphics, Emerson (Paradigm and Roxar), IFP/Beicip, Schlumberger and Energistics
- Successful in demonstrating data exchange of real field data, across six different vendors using several applications
- Live demonstration in a poly-cloud environment at SEG 2018

Data - Kepler Field, Na Kika, Gulf of Mexico

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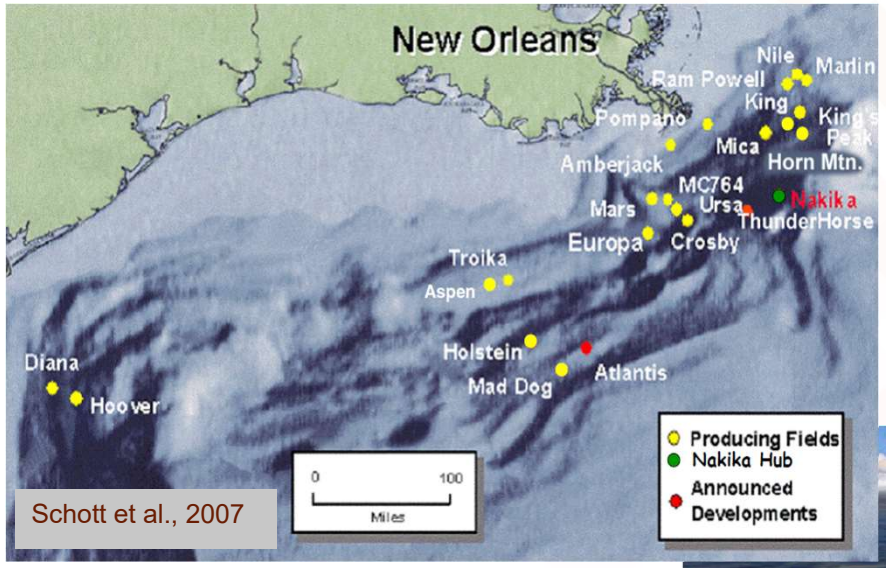
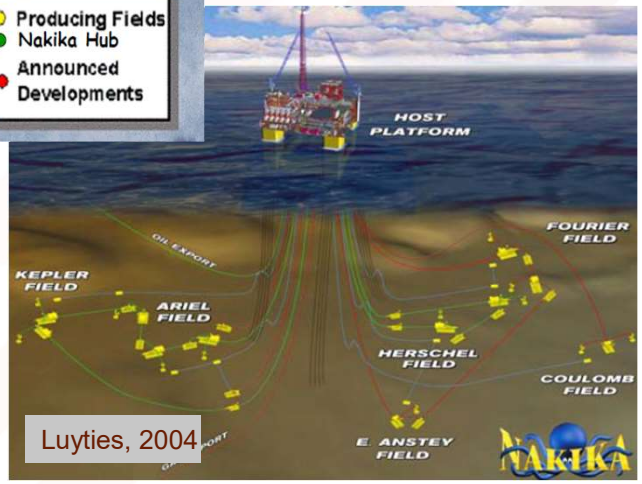
Data in project:

- Wells (trajectories, logs, picks)
- Faults
- Horizons
- Polygons
- 3D grid arrays (static)
- 3D grid arrays (dynamic time-stepped)



Schott et al., 2007



Luyties, 2004

RESQML 2.0.1 Pilot/Demonstration

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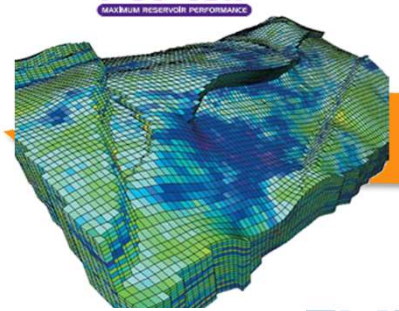
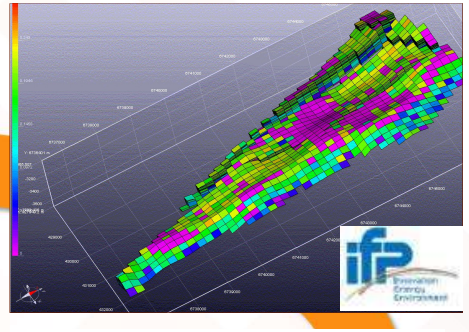
roxar



Grid creation
(RMS)

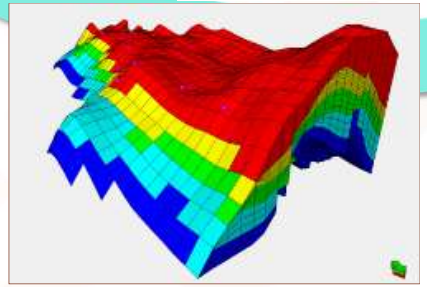
EMERSON

Facies modeling
(Skua)



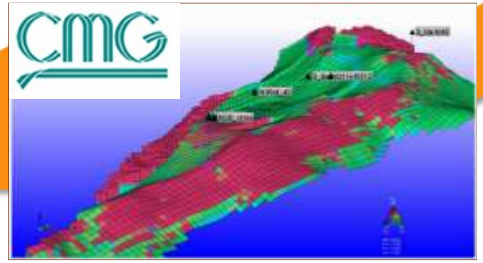
Fracture porosity
(OpenFlow)

Schlumberger



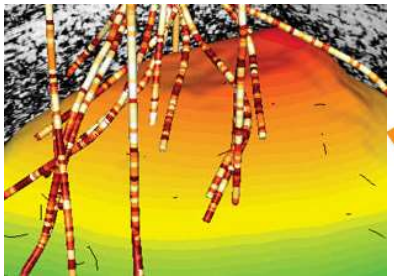
Property calculation
(Petrel)

amazon web services



Reservoir simulation
(Builder, IMEX and Results)

DYNAMIC GRAPHICS, INC.



Results visualization
(CoViz 4D)

Energistics' Transfer Protocol (ETP)

- Latest version of Energistics' standards leverage a new streaming transfer protocol called ETP (Energistics Transfer Protocol)
  - 10x faster than previous technologies
  - "Real-time" is truly Real Time, for the First Time!
  - Uses 1/10th of the bandwidth
  - Can supply a given data feed to multiple recipients with no overhead
- Not limited to transfers from remote locations to onshore monitoring sites
  - Can also be used to stream data between applications, eliminating typical I/O files

2019 Plans

Vision & Mission

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- Vision
  - Seamless Data Sharing in Oil & Gas
- Mission
  - The Energistics community is dedicated to the development and adoption of open data standards in the Oil & Gas industry.

Adopt > Advance > Accelerate™

Strategic objectives

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1. Demonstrate value of standards to the industry
2. Make standards easy to implement and use
3. Ensure standards evolve to remain relevant as technical environments change
4. Ensure organization growth and sustainability

Development

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- Update WITSML v2 to expand capabilities and address bugs found during commercial implementations
- Publish ETP v1.2 to expand coverage for drilling, reservoir and potentially production workflows
- Update RESQML v2 capabilities for post-2019 publication
- Update PRODML v2 to include pressure transient analysis coverage and improve distributed acoustic sensing capabilities
- Define and document how standards support implementations in a cloud environment

Adoption

- Forum for implementers to share successes and lessons learned
- Continue BP RESQML Implementation Pilot – Phase 2; possibly others
- Webinar series highlighting our standards and how they are being used
- Tools to aid development and deployment
- Conference and user forum papers and participation
- Documentation to guide implementers and users
- Case studies and white papers
- Public and private training courses

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How We Work

Standards Development Process…and Beyond

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DELIVERABLES

Definition	Planning & Design	Development	Release	Adoption
Project charter [Template] Project plan [Template] Team distribution list ECC project	Use case(s) [Template] [Ex] Requirements [Example] Gap analysis [Example] Conceptual architecture Outlines for test data and documentation Refined project plan	EA model* Derived schemas and/or services specification Examples* Documentation [Example] Issues list [Example] Public review (PR) package	Final phase 3 docs MarComm Plan Support plan PR feedback & response Website posting	DevKit support Education/Training Promotional materials Case study/Paper Lessons learned Marketing Communications

Organizational Structure

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- Board: Strategic and financial oversight of Energistics
- Special Interest Groups for domain-specific standards work
  - Executive Team (elected annually) – provide day-to-day oversight for SIG activities
  - Steering Committee – typically main company and business reps focused on business usage
  - Technical Team – technical and business representatives focused on technical aspects of development and adoption activities
- Cross-SIG teams for cross-domain and common technical architecture
  - ETP
  - Cloud

2019 SIG Executive Teams

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WITSML	PRODML	RESQML	X-SIG/Architecture
Pete Morrison, BHGE	David Smith, BHGE	Astor-Lonice Ball, BP	Executive Teams
Nick Whiteley, BP	Curley Thomas, Chevron	Laurent Deny, Emerson	Laurent Deny, Emerson
Shaddick Keagy, Chevron	Peter Westwood, EnergySys	Marcus Apel, Equinor	Philippe Verney, F2I-Consulting
Lars Olav Grøvik, Equinor	Magnus Svensson, EPIM	Matthias Imhof, ExxonMobil	Robert Schave, Halliburton
James Jerry, Halliburton	Raed Charrouf, Halliburton	Philippe Verney, F2I-Consulting	Mark Farnan, Petrolink
Ted Abramsen, Kongsberg	Daniel Lucas-Clements, SLB	Jean-Francois Rainaud, Geosiris	Bobby Diaz, PDS
Eric Griffith, PDS	Wilfred Berlang, Shell	Jessie Lu, Halliburton	Nathaniel Burger, Scientific Drilling
Nigel Deeks, Schlumberger	Laurent Ricarrere, Total	Tormod Slettemeas, Schlumberger	Energistics
Sushma Bhan, Shell	Energistics + Advisors (invitation)	Jerre Parker, Shell	
Yannick Barbel, Total		Francis Morandini, Total	
Energistics + Advisors (invitation)		Energistics + Advisors (invitation)	

Join Us!

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RESQML SIG
August &
December 2018

Board of Directors and staff – November 2018

WITSML SIG
September 2018

Q&A

Thank you!

www.energistics.org