



World Oil[®] **HPHT**

DRILLING, COMPLETIONS & PRODUCTION CONFERENCE

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Norris Conference Centers – CityCentre, Houston, Texas

HPHTConference.com

Faster data transfer allows reduced staffing on rig and improves crisis management.

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Energistics Consortium – founded 1990 – 110 members – Data Exchange Standards for Upstream Data



Digital Transformation

1. Digitize analog activities
 - Opens opportunities for analytics, searchability
2. Leverage digital to re-engineer processes
 - More people seeing the same data
 - Sophisticated alarm systems
 - Early warning based on pattern recognition

Staff location

- Rig personnel is expensive and exposed
 - Life support (food, lodging, safety, rotations)
 - Transport (helicopters)
 - Rotations
- Decisions on a rig are taken by a small group
 - A lot of pressure in tight (crisis) situations
 - 24/7 availability

Relocate to shore

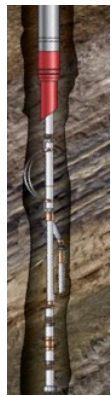
- One central location monitors multiple rigs
 - Depth of expertise on hand
 - More sophisticated IT / data tools
 - Escalate staff and resources to manage a crisis

Requirements for staff relocation

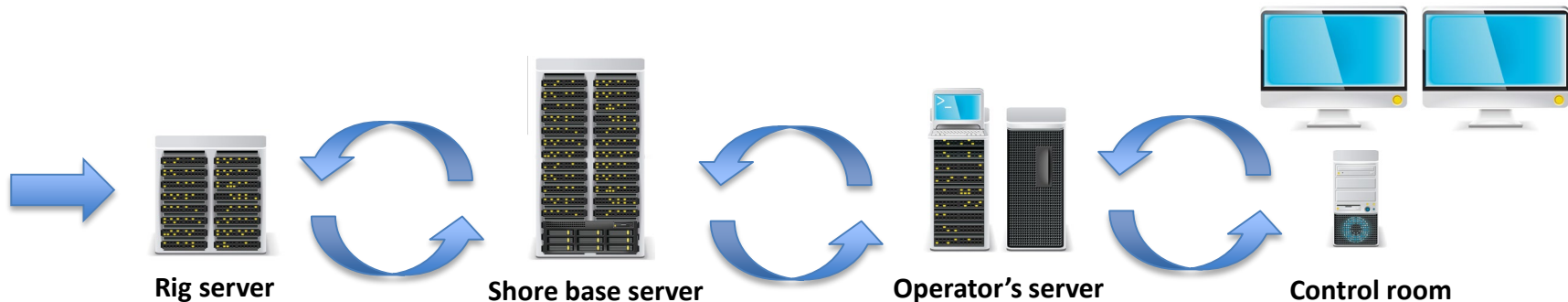
- Fidelity of remote systems
 - Reactivity
 - Breadth of available data
 - Real-time must be real, +/- 1 second, not 15 seconds
- Data distribution
 - Data feed going to multiple actors
 - Leverage expertise: specialized vendors, partners

Legacy data transmittal systems

- Polling of a chain of servers (SOAP)
 - Lag times of 15 seconds or more
 - Data delivered in packets of 5 - 10 seconds
 - Only 10% of bandwidth usage is actual data



Tool

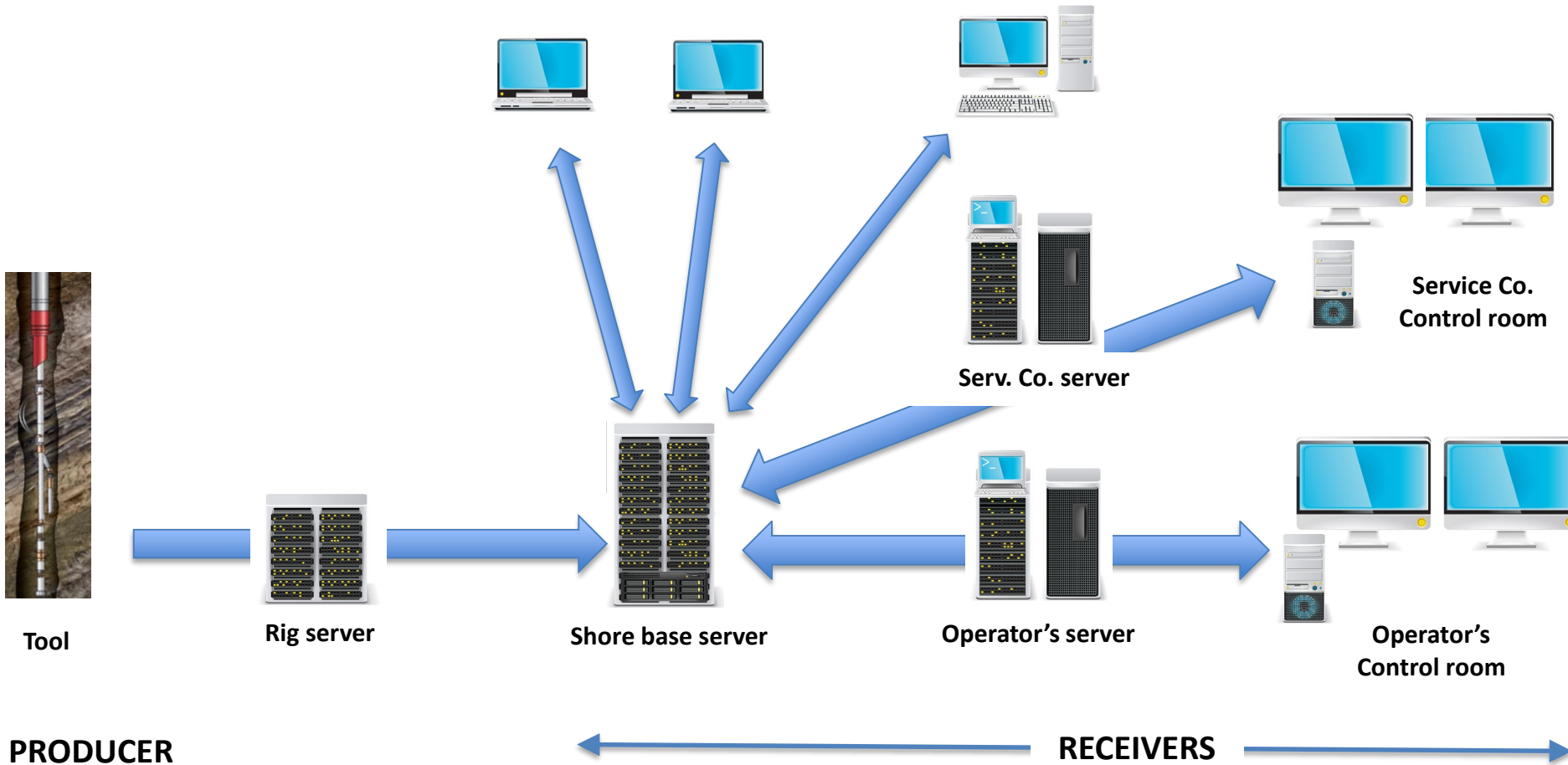


*SOAP – Simple Object Access Protocol (XML protocol)

New data transmittal protocol

- Connect receivers directly to data producers
 - Analogy with Netflix streaming
 - Reduce lag time to 1 second
 - 95% of bandwidth usage is data (10x improvement)
 - Practically no degradation for multiple receivers

Streaming Data



The “real” real-time defined

- User experience
 - Lag-free data stream, similar to being on the rig
 - 10x number of channels on same infrastructure
 - Multiple receiving parties see same data

Alignment with HP/HT drilling

- Extreme drilling conditions
 - Drift from well plan must be managed tightly
 - Abnormal situations must be contained
 - Rapid decisions needed if a crisis is unfolding

Full-scale test of new protocol

- Norwegian North Sea rig
- Comparing:
 - [Legacy] SOAP data servers
 - [New] ETP streaming
- Measure time lag
- Observe data flow

[Legacy] SOAP data servers

- 10-15 seconds lag due to SOAP server polling
- Data moves in packages of ~10 seconds of data

Streaming protocol

- Data lag: 1 second on average
- Data flow: continuous during measurements

Operational impact

- Test duration: 4 months
- Positive resolution by the monitoring team of abnormal data readings in a number of cases
- Avoided triggering the contractor intervention crew (and the associated helicopter transport)

Deployment

- The operator now demands use of the new protocol
- Service providers and data aggregators are implementing the new protocol
- Compatibility with legacy protocol maintained during transition

Conclusions

- Reduced manning of HP/HT rigs is enabled by real-time remote monitoring
- Decision-making and crisis management are improved with more “eyes on the ball”
- Cost reductions from fewer on-rig staff, fewer interventions
- Still to be measured: savings (less NPT) from an early remediation of developing issues

Thank You

Questions?

www.energistics.org