

长安大学
CHANG'AN UNIVERSITY



DOFIAC 2017
第五届数字油田国际学术会议
The Fifth Digital Oilfield International Academic Conference

DOF challenges: Control and engineering systems integration

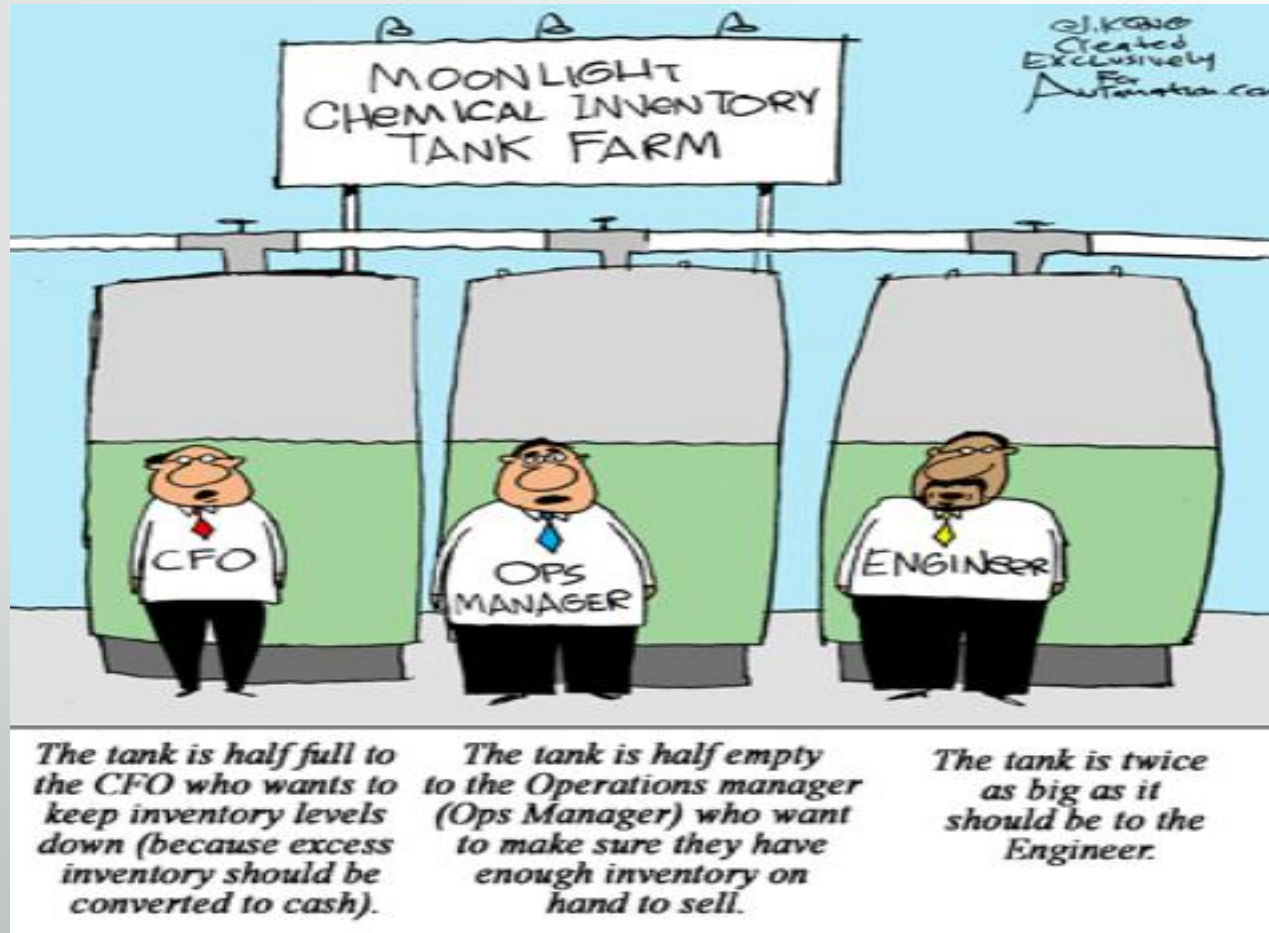
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高級數字油田顧問

Qingdao, Republic of China

2017

Challenge: How we are thinking?



Alarming Statistics:

- 60 % of time is spent in search for information,
- 10 % that information is correct
- Do you know that decision is implemented ?

3人不能相互理解

DOF challenges and drivers

- **It was** relatively easy and cheap to get production from the ground with high oil prices
- Field measurements and control technology maturity
- Deficiency in IT networks infrastructure, especially on scattered fields
- No modern inexpensive communication media (FO & LTE)
- No standard Specialized Informational software solutions covering DOF
- High performance IT hardware solutions (servers, network)
- Gap between NOC and vendors
- Organizational silos in Oil companies
- Manual business processes between field development, production and operation areas
- Isolated islands between Automation and Petroleum engineering areas
- Human organization not ready for new kind of work

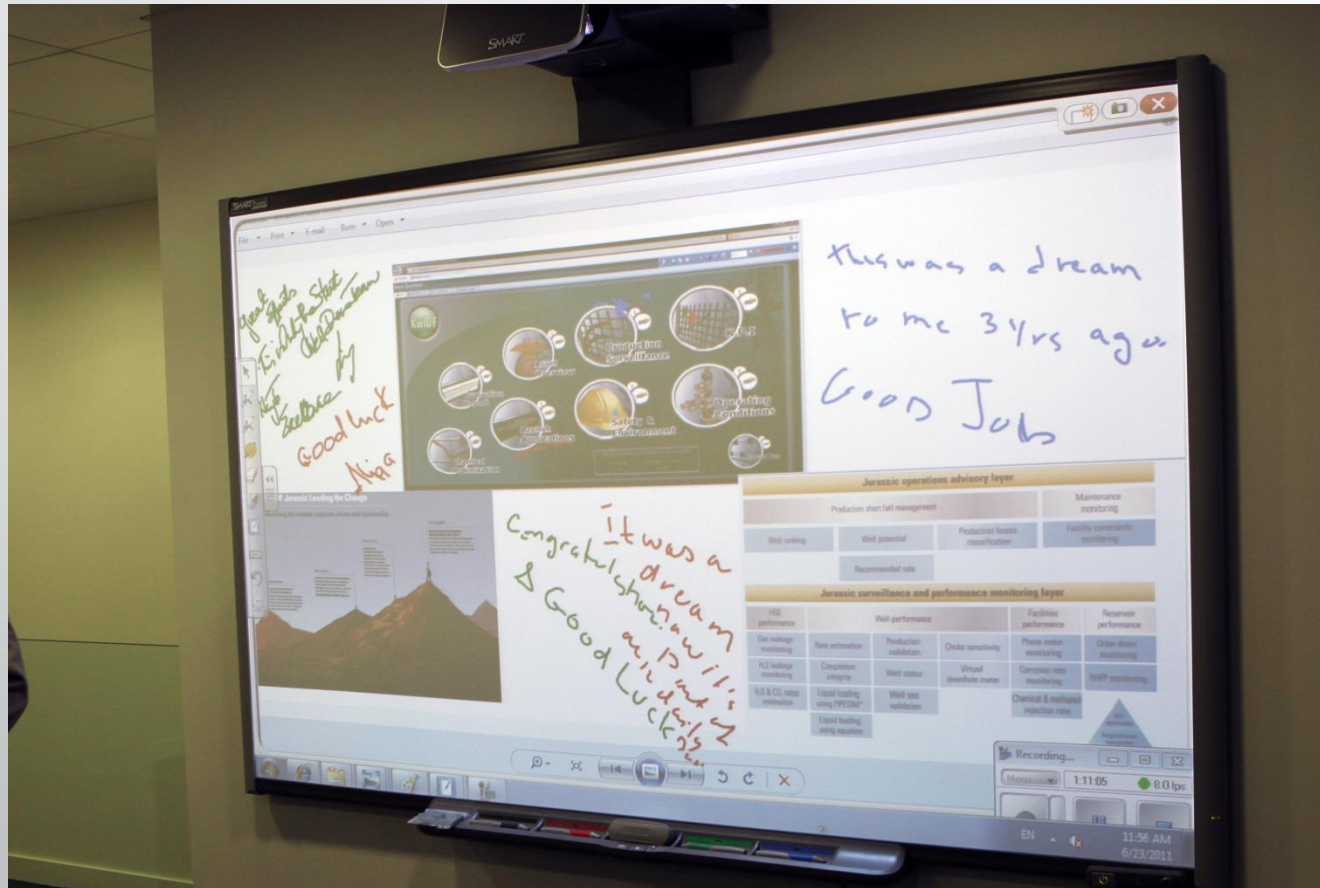
What is DOF?

- DOF is far beyond of advanced wells instrumentation
- Is DOF is end point?
- Can DOF solution to be standardized?
- What is next steps to resolve Oil company issues?
- What do you need – field devices, software, collaboration?

SCADA is base for DOF

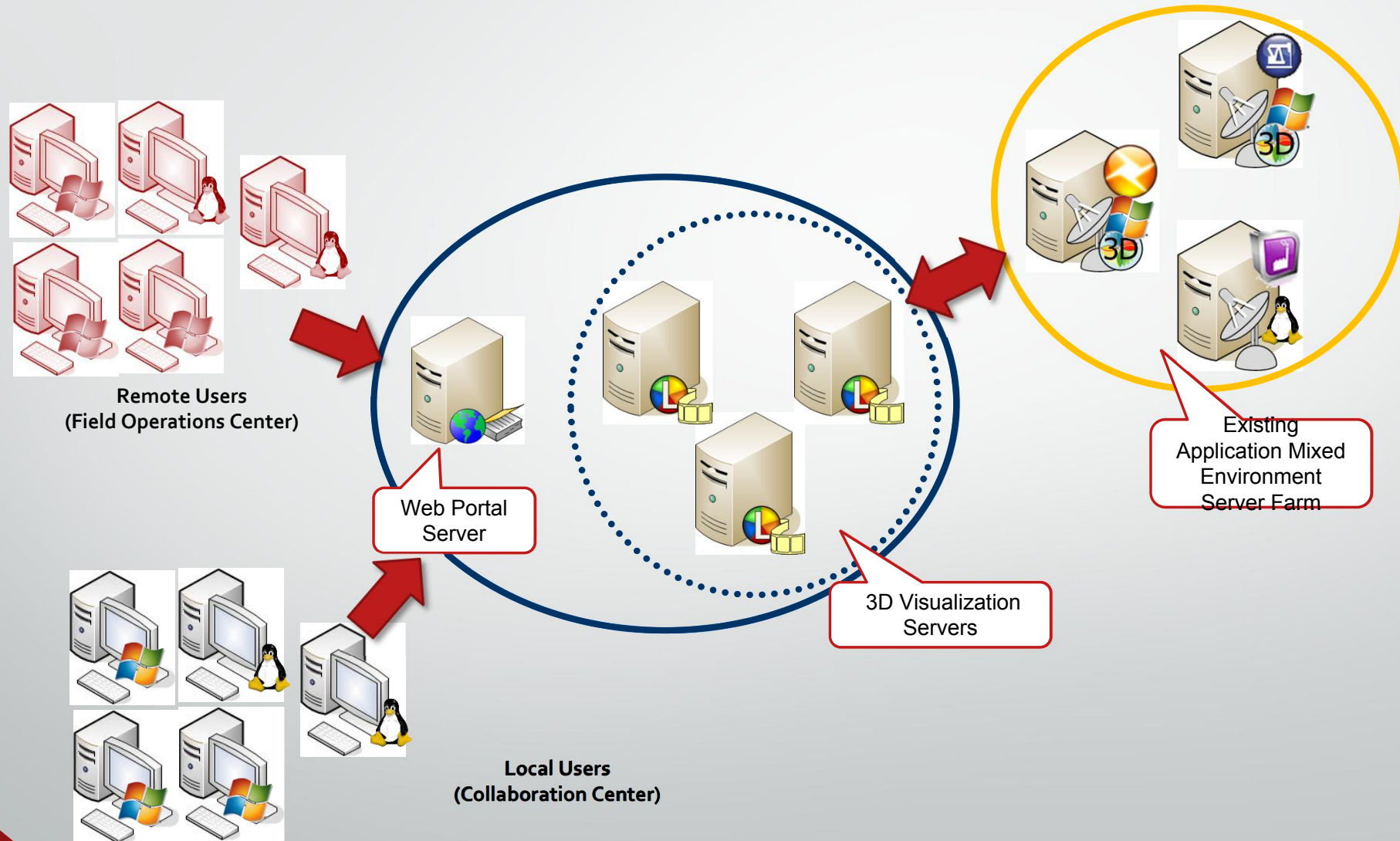
- Without advanced SCADA DOF is not possible!
- SCADA is crucial component in controlling and monitoring fields remotely, helping to run operations more efficiently and safely.
- However if this information remains in the field, major part of benefits remain unutilized
- A key issue how safely and reliably transfer real-time information to engineers
- Capable to receive and execute demand from Collaboration centers in semi- or automated manner
- Future control from remote location, if local is not available or inconvenient
- Polling method of data collection and SCADA communication protocols are no more matching available network capabilities
- SCADA RTU and software need to be improved to match current level of IT technologies.

DOF collaboration technologies

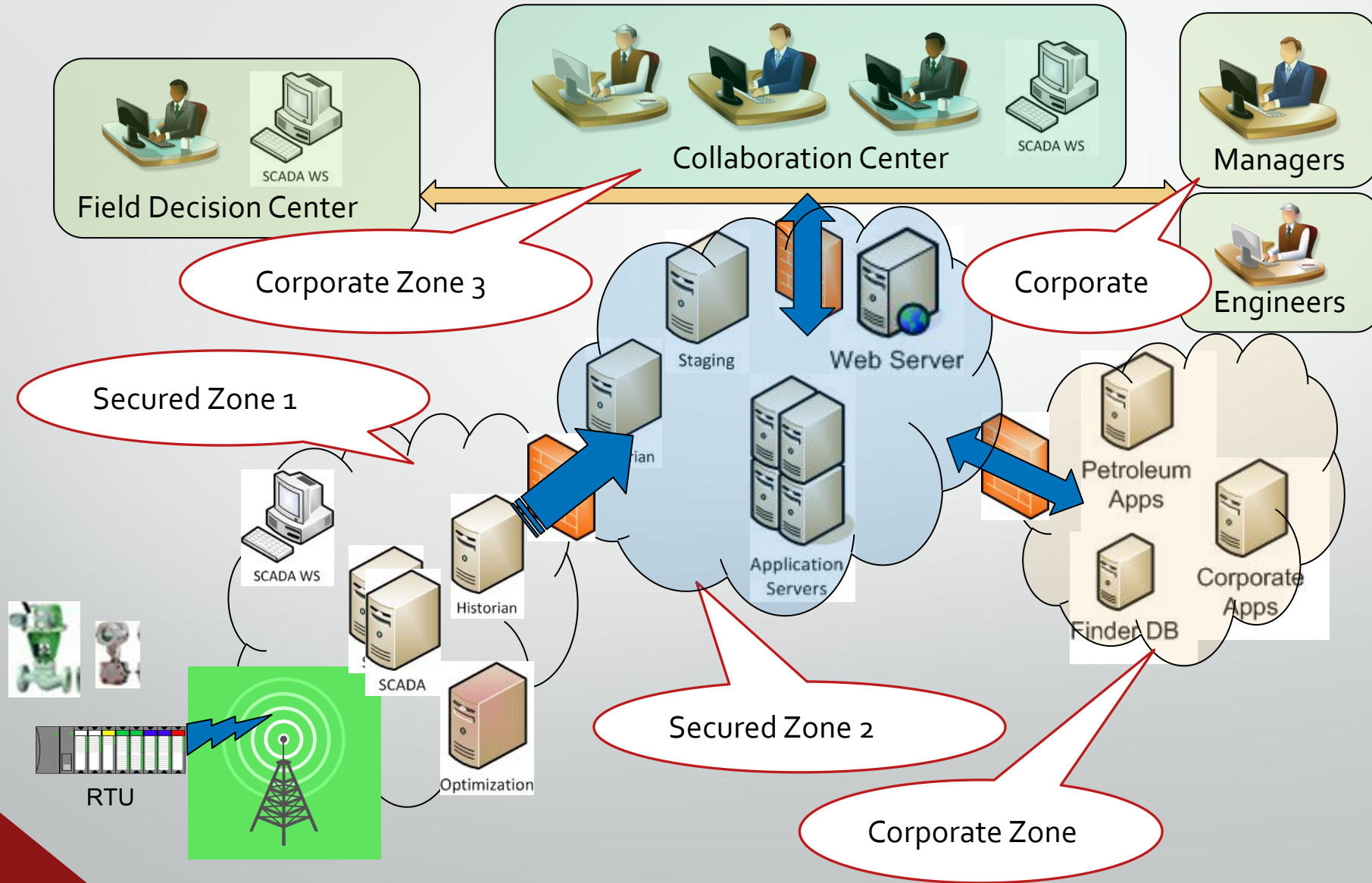


- Sharing of engineers desktops
- Handout notes
- Along with main screen projection
- Engineers has same view in remote areas

Collaborative portal with Web Accelerator



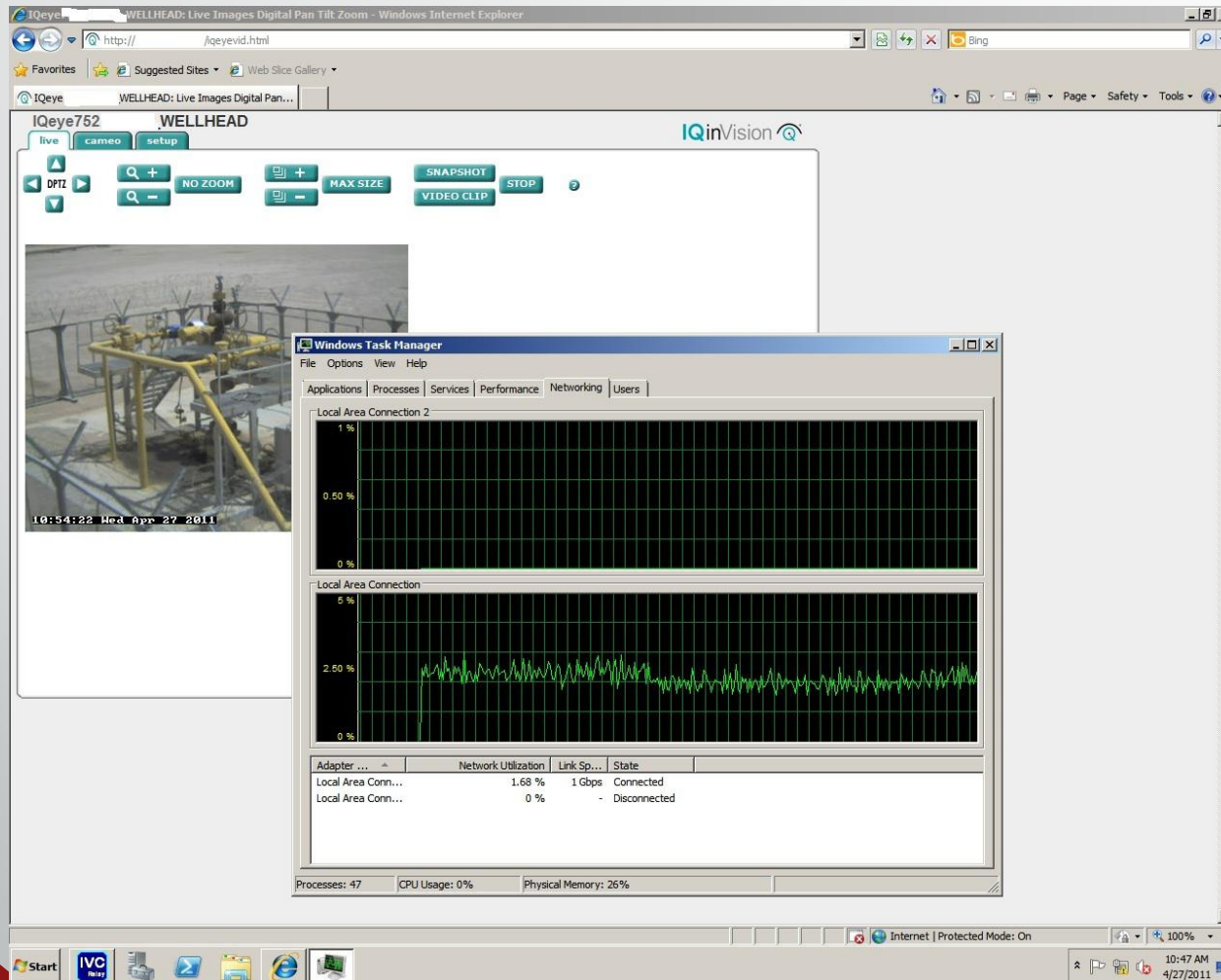
DOF Typical architecture



DOF vs. Information systems portal

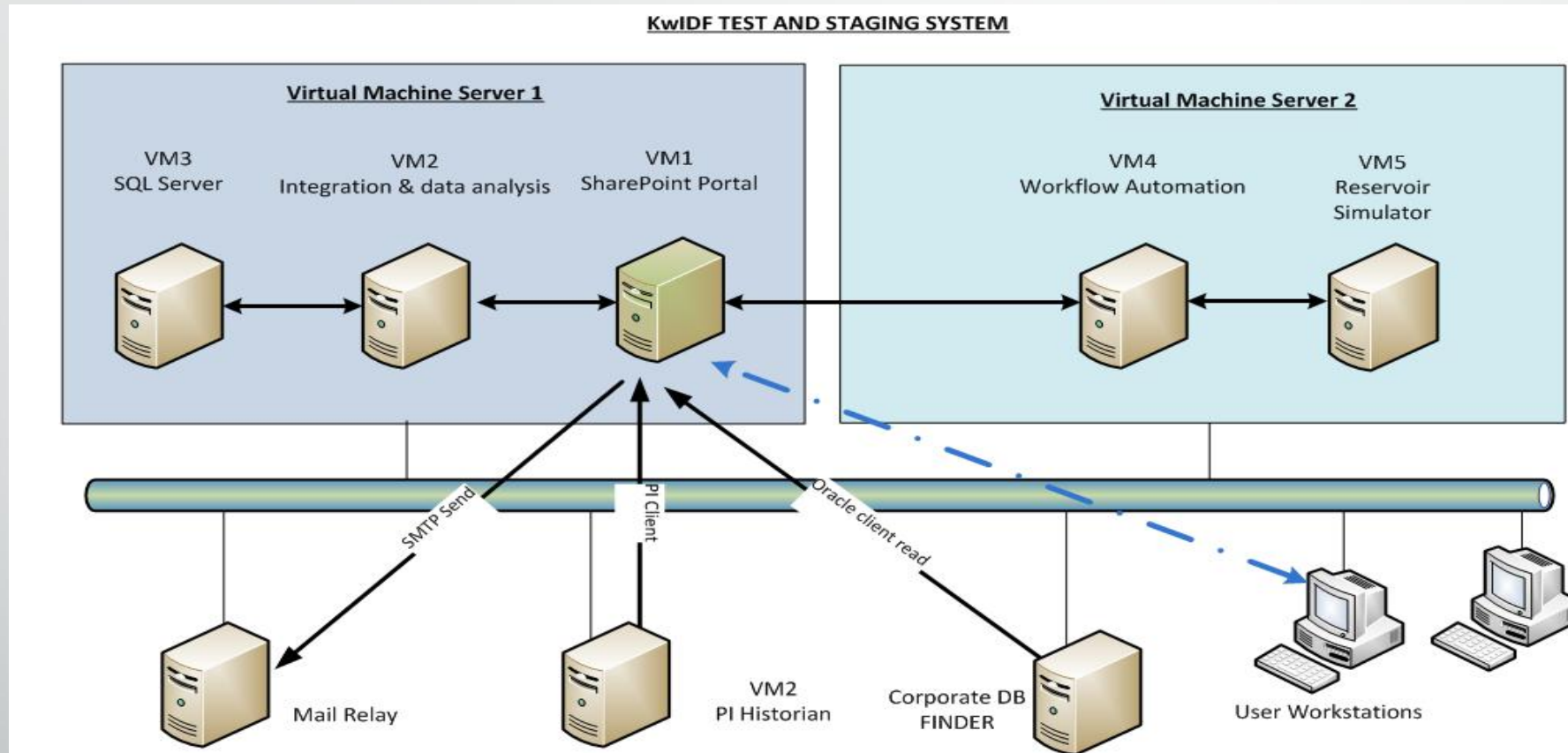
	DOF	IS portal	
Intelligent aggregating algorithms.	Y	N	
Adoptable multidiscipline collaborative environment	Y	N	
Validated real-time and historical data	Y	Y	
Decision support system	Y	N	
Human interactions automation via workflows	Y	N	
Coordinated optimization and control capabilities	Y	N	
Modern IT components (virtualization, HPC)	Y	Y	

Art of engineering 1: CCTV over WiMax



- Use for Operations and maintenance purpose
- Low bandwidth – 256 kbps
- Compression without loose quality of live stream
- Multiple tests shows that bandwidth didn't affect quality due to compression algorithms

Art of engineering 2: Test and Staging Virtualization



- Test of the workflows and models, without disturbing main system
- Test updates and patches of the existing system
- Test new software revisions or versions of software

What is next in DOF

- Transformation of the DOF solutions to Platform solution
- Horizontal expansion to complete field wells
- Integration with subsurface engineering systems
- Integration with Production operation and maintenance systems
- Complete solution virtualization
- And many other new technologies advancements

发现

EVERYTHING HAS ITS BEAUTY, BUT NOT EVERYONE SEES IT
CONFUCIUS

Discover

Japanographix

开始

OF A GOOD BEGINNING COMETH A GOOD END.

Beginning