

# Next Generation Process Analyzer System Connectivity Issues

**Peter van Vuuren**

*ExxonMobil Chemical*

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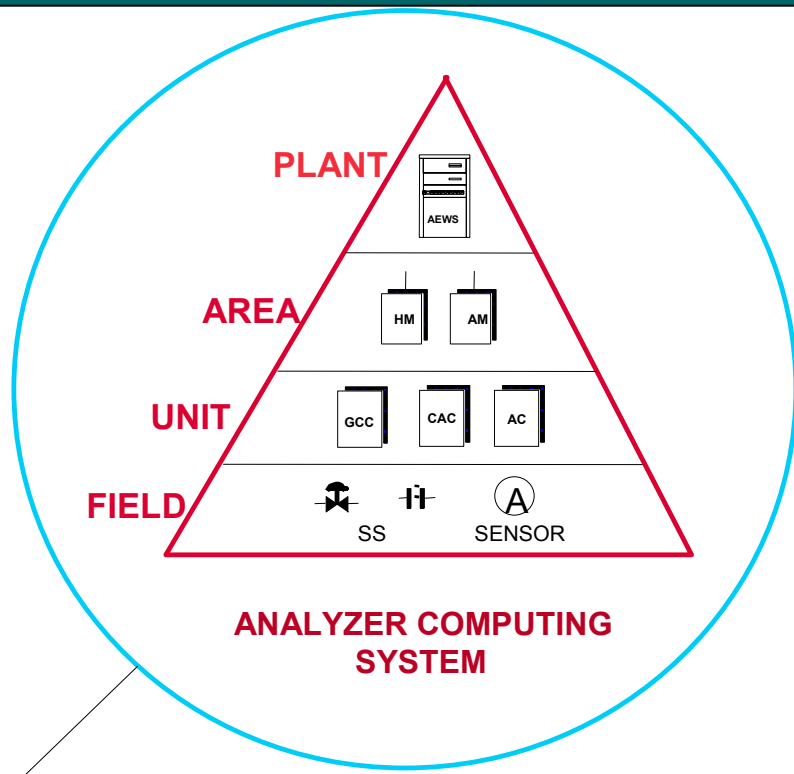
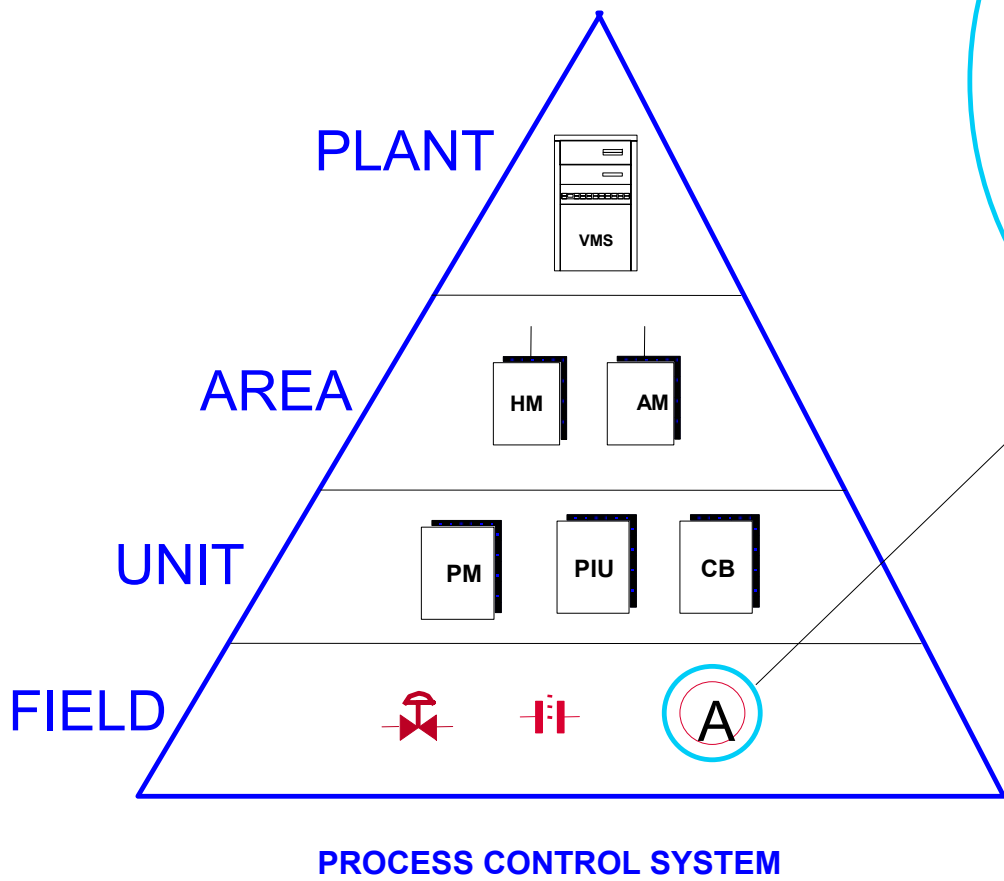
*Baytown, Texas*

*January 22, 2001*

# Topics

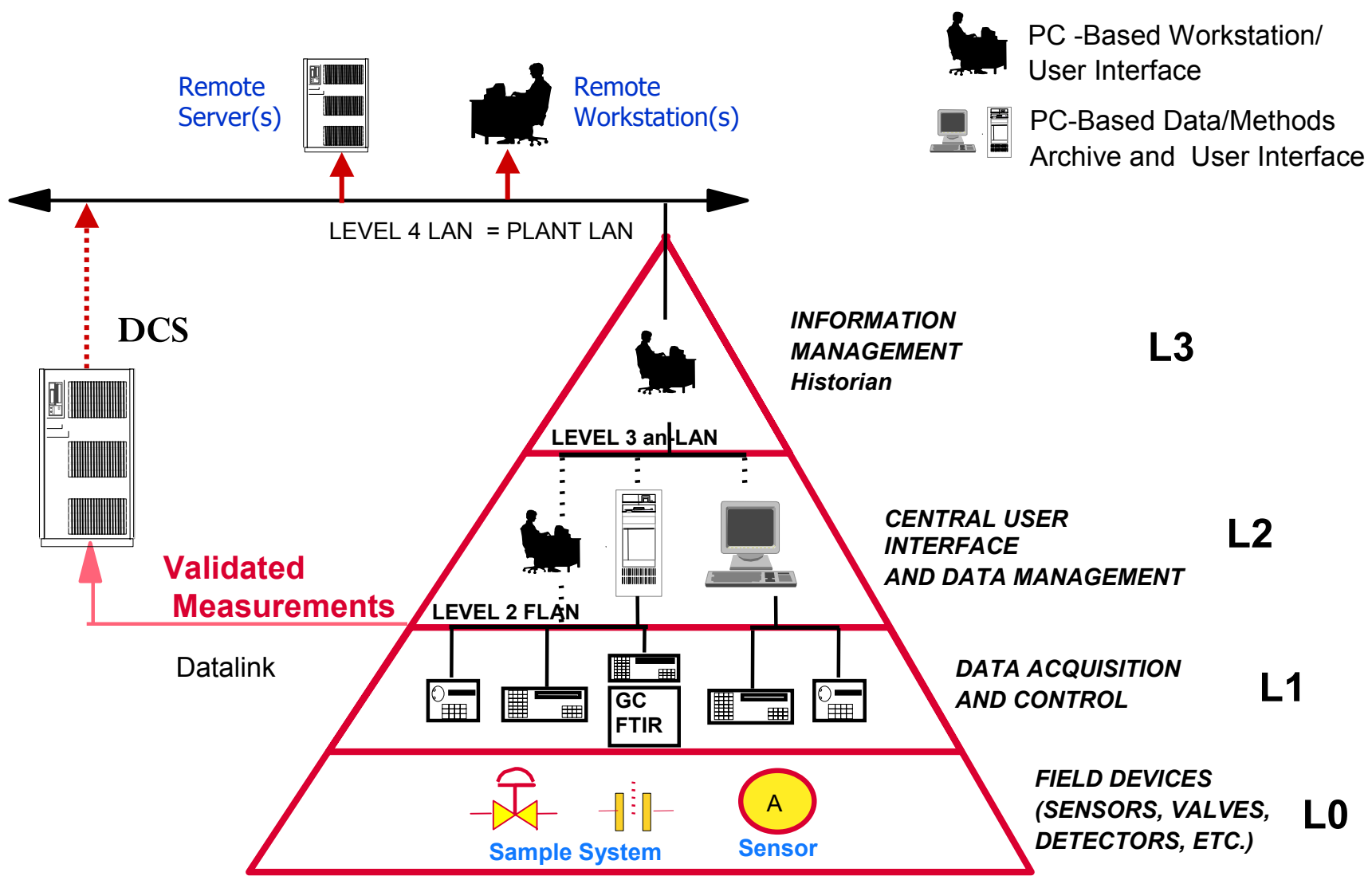
- Analyzer Computing System Hierarchy
- Proprietary vs. Open Connectivity Solutions
- Level 0/1 Challenges
- Level 1/2 Challenges :Data Domains
- The Process Analytics Community 1M\$?
- Opportunity for Action

# Process Control System/Analyzer System Perspective

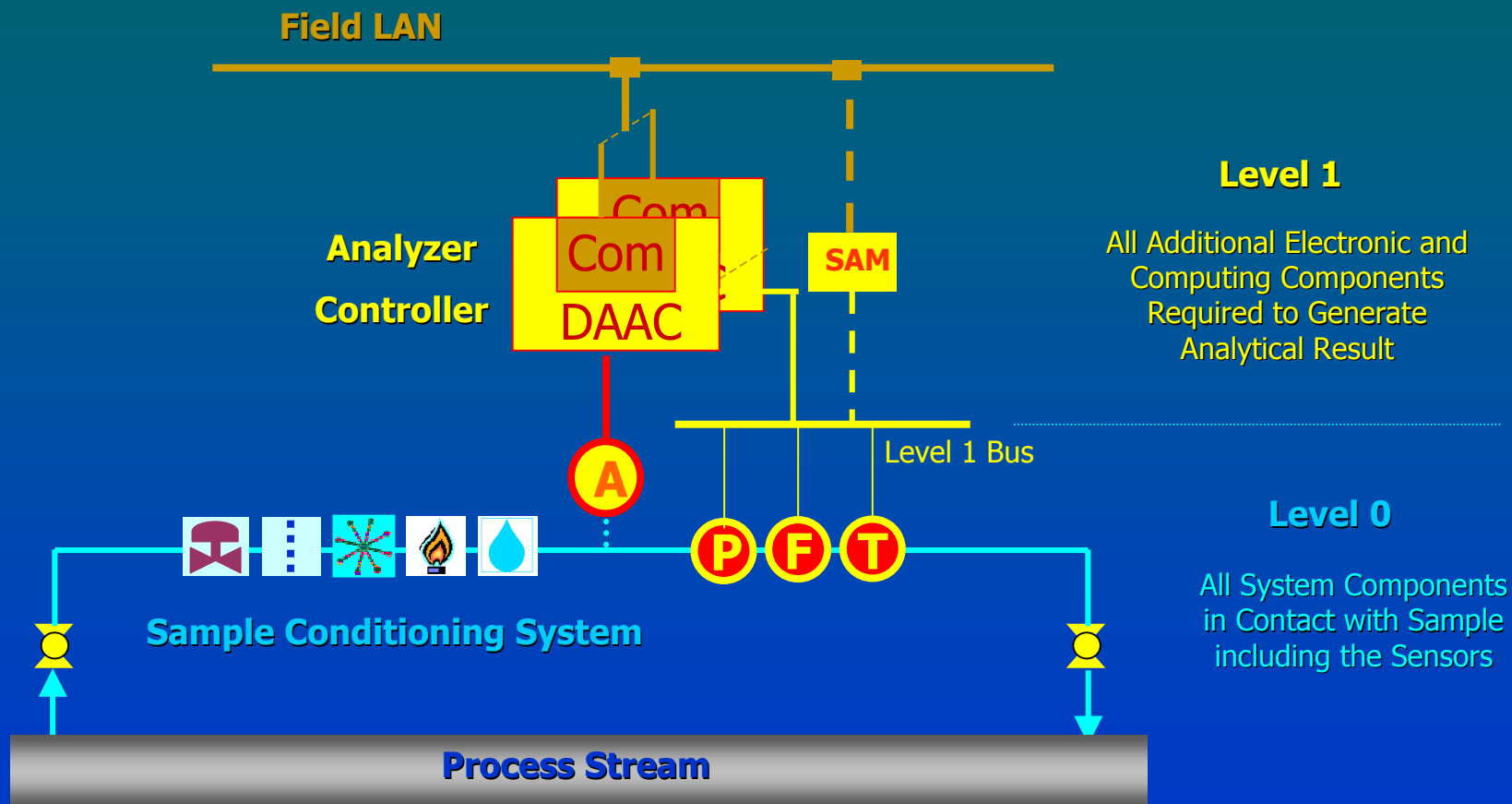


**System within a System**

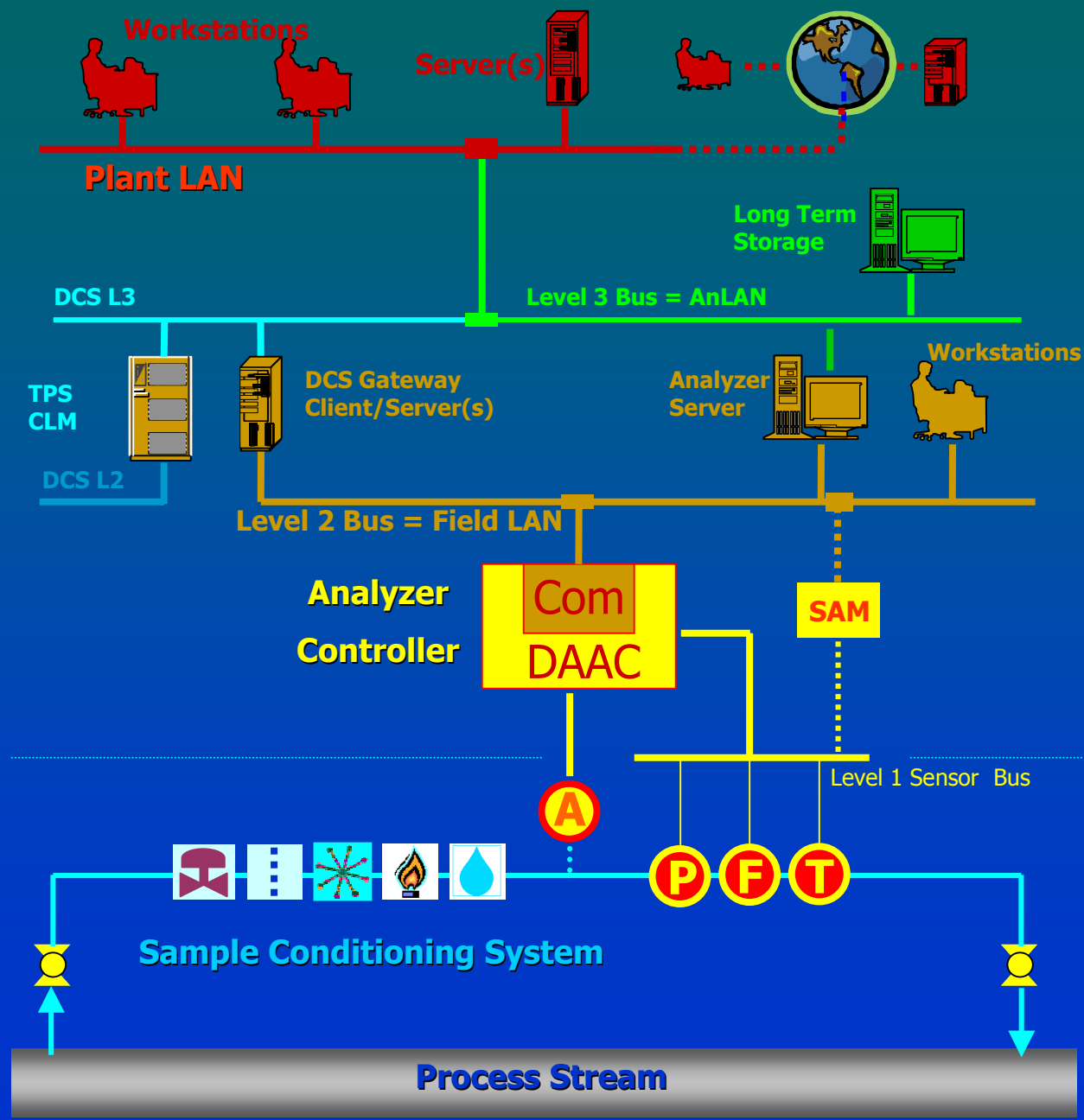
# Analyzer Computing System Hierarchy



## Analyzer Computing System Hierarchy (Level 0/1)



# Analyzer Computing System Hierarchy (Level 0 - 4)



**Level 4**  
Remote User  
Interface/Applications

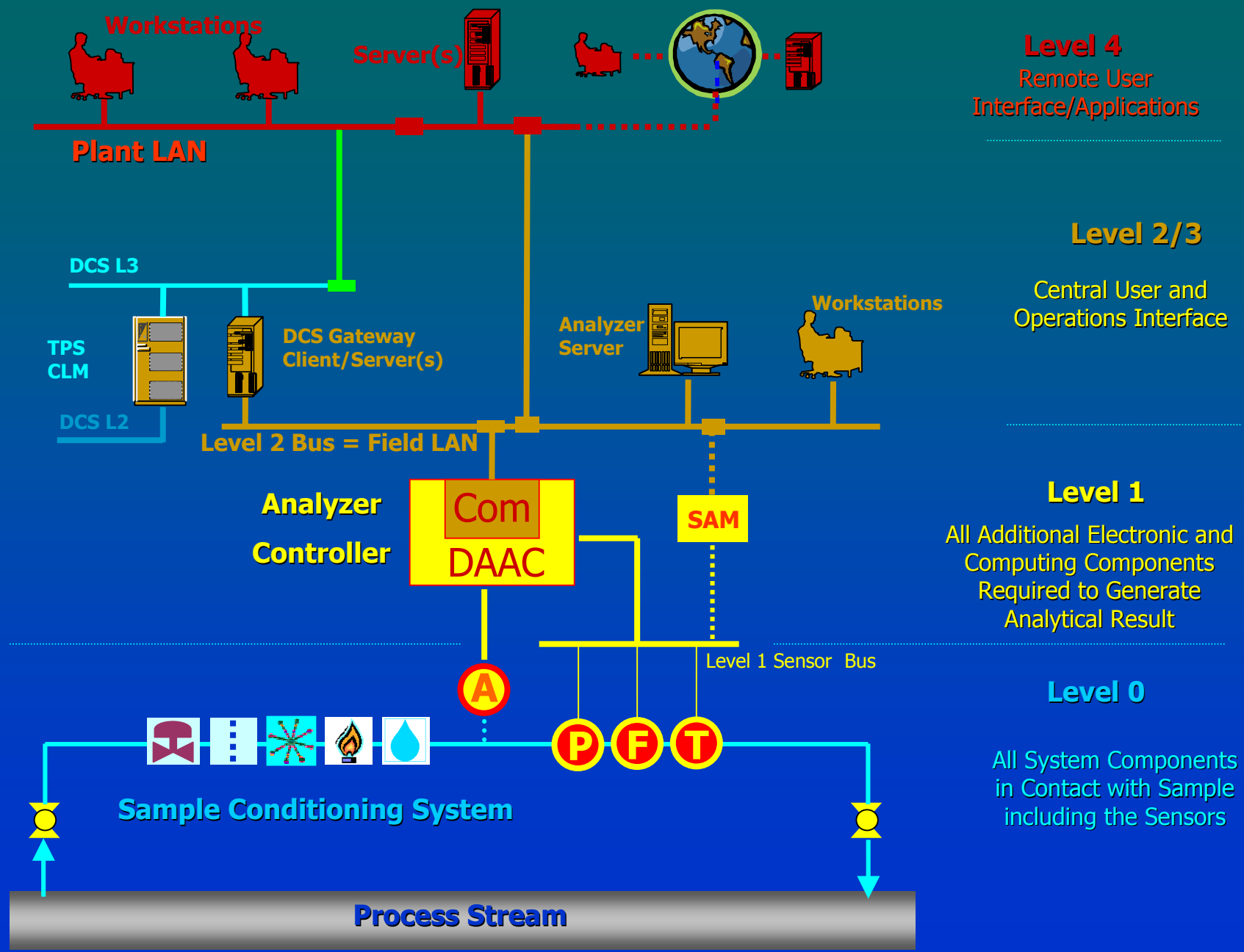
**Level 3**  
Applications and Data  
Management (Archiving)

**Level 2**  
Central User and  
Operations Interface

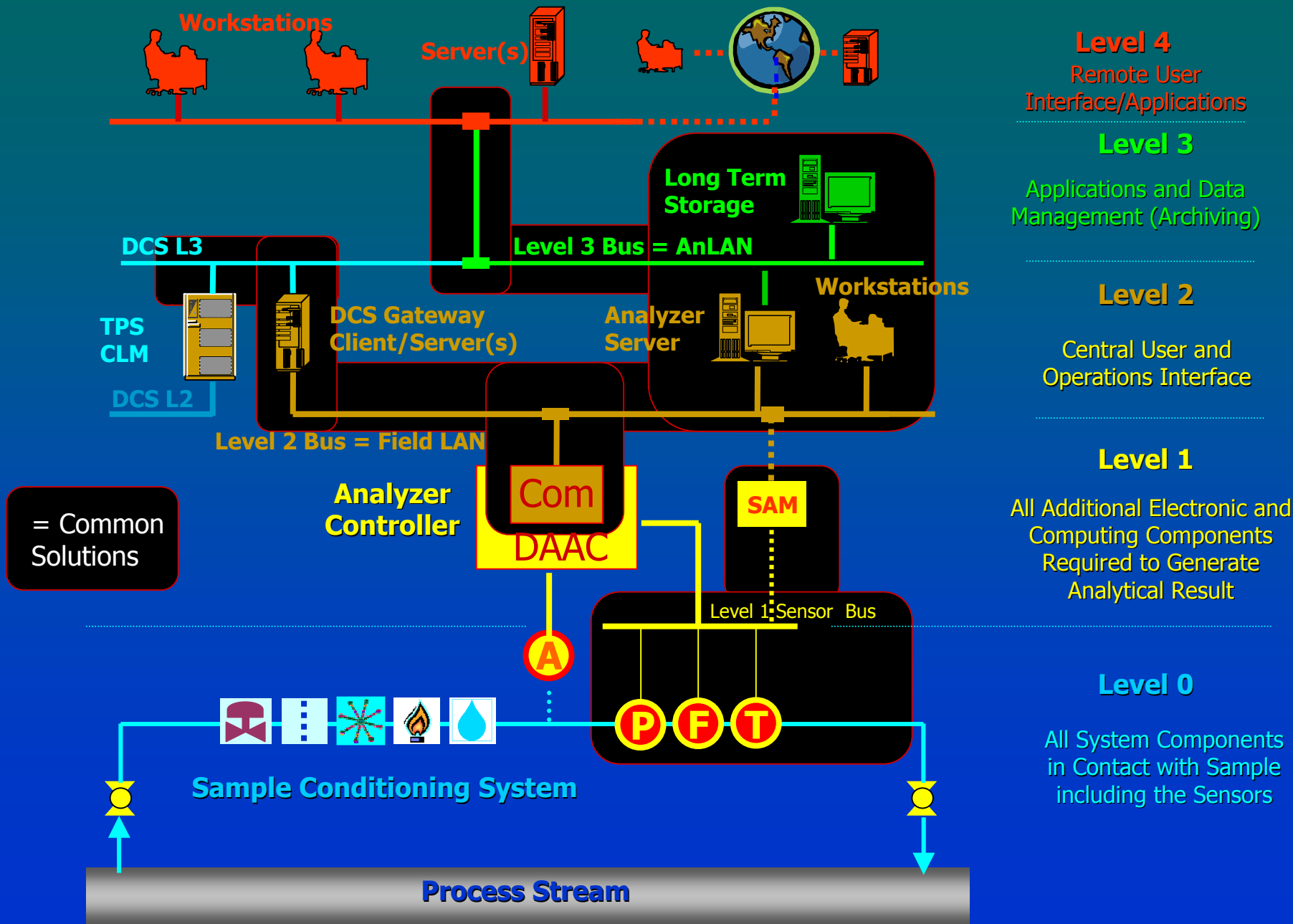
**Level 1**  
All Additional Electronic and  
Computing Components  
Required to Generate  
Analytical Result

**Level 0**  
All System Components  
in Contact with Sample  
including the Sensors

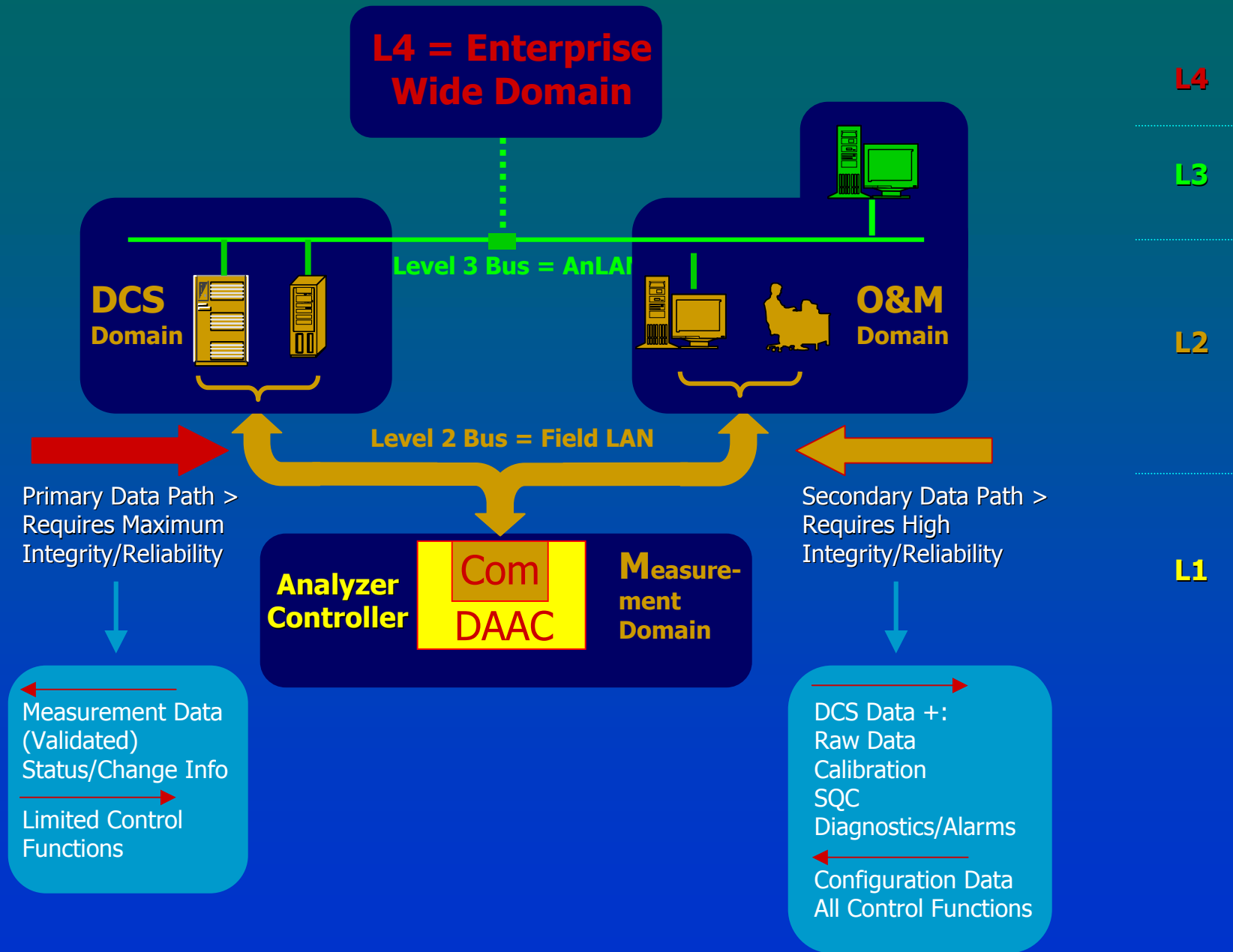
# Analyzer Computing System Hierarchy (Level 0 - 4)



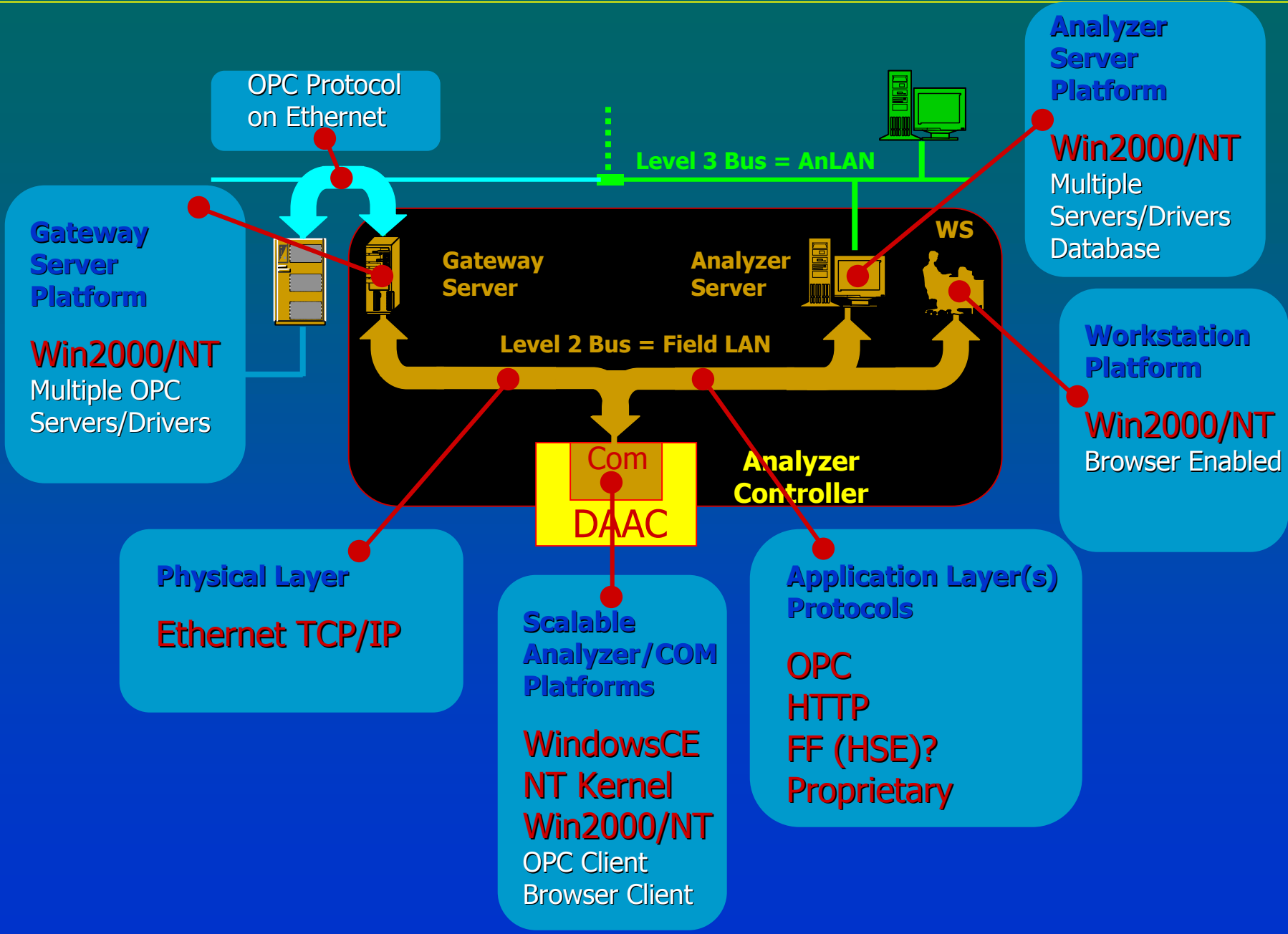
# Proprietary vs. Open Connectivity Solutions



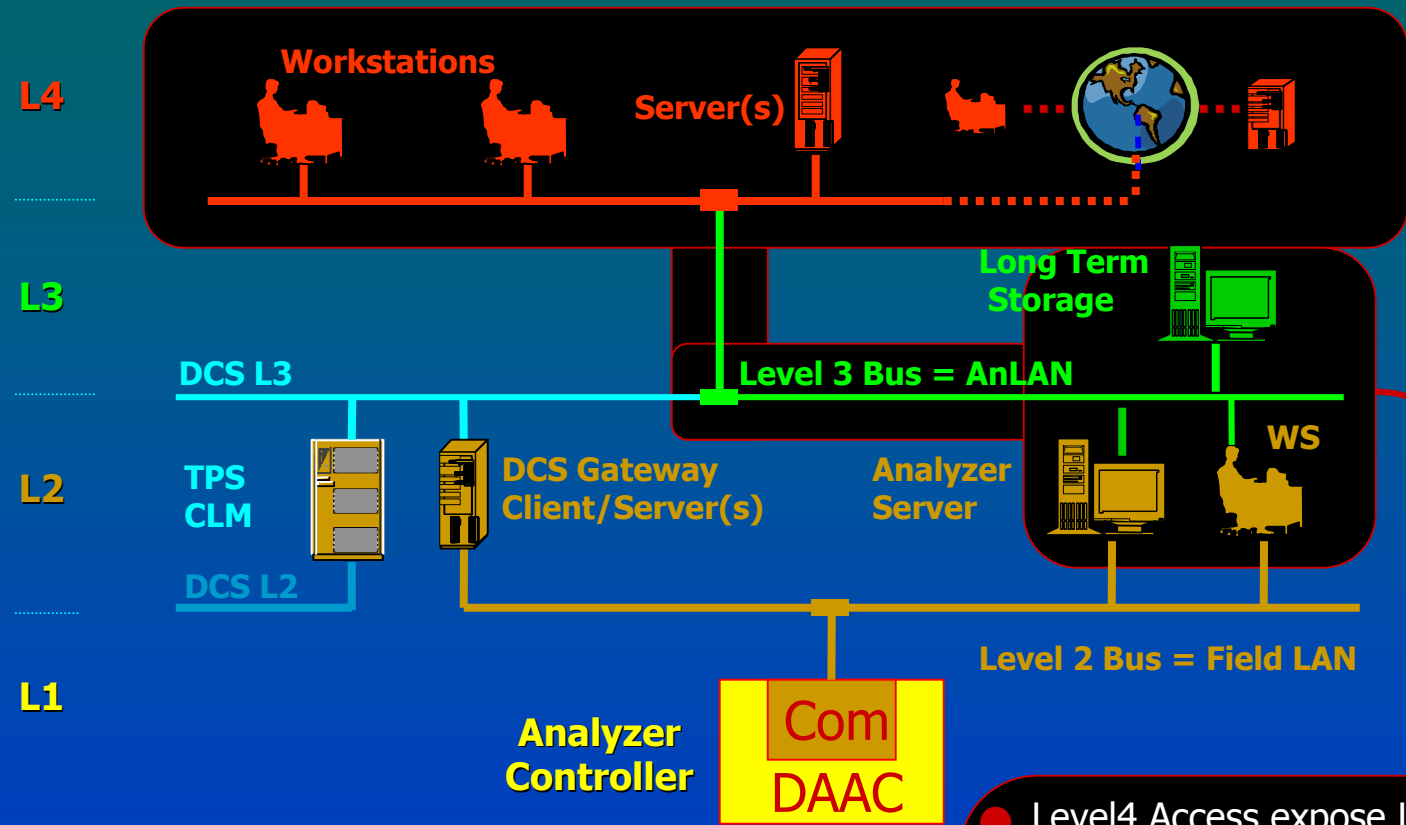
# Level 1-2 Challenges: Domain Interactions



# Level 1-2 Challenges: DCS/O&M Domains



# Level 4/3/2 Challenges: Remote Access & Security and Controls



- Level4 Access expose L2/L3 Analyzer Devices to Enterprise-wide Network
- L2/L3 must meet Enterprise-wide Security/Controls standards:
  - Logon authentication (Requires NT Domain Controller – not shown)
  - Software Isolation (Requires Win2000/NT Terminal Server)

# The Process Analytics Community 1M\$?

Given the choices of:

- controller, server and workstation platforms
- communication protocols
- HMI interfaces
- database options (short term and long term)
- security and controls needs (local & remote access)

?? BIG QUESTION ??

How do we (as end-users and suppliers) develop and agree on industry guidelines for the analyzer connectivity infrastructure which will ensure *plug-and-play* compatibility for all analyzers?

?? BIG ANSWER ??

**CPAC Sponsored Connectivity Initiative**

# The Process Analytics Community 1M\$?

## Exploratory Meeting at Pittcon2001:

End-users

Shell, Dupont, EMCC

Suppliers

ABB, AAI, Rosemount, ThermoOnix

Panametrics, Servomex

## Outcome:

Confirmed the Need for Industry Wide Effort

Group Volunteered to act as “Steering Team”

Requested CPAC to Sponsor Effort

End-users to Develop Connectivity Functional Specification

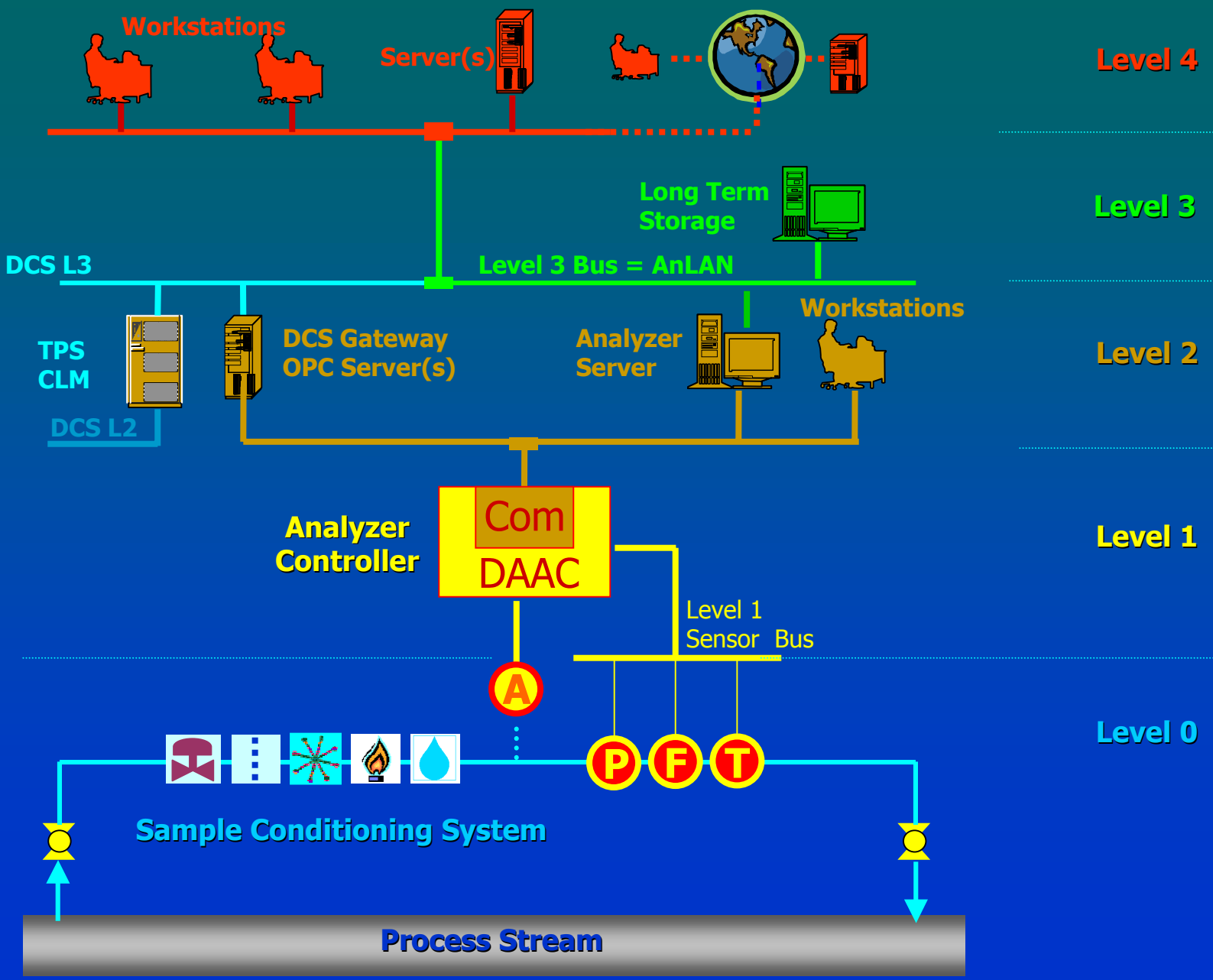
## Next Step:

Get CPAC Endorsement for Workgroup

Initiate Development of Functional Specification

FINI

# Plug-and-Play Connectivity



# The Process Analytics Community 1M\$?

## Food for Thought:

- Convene a Process Analytics “Connectivity Focus Group” (Sponsored by CPAC or ISA AD?)  
Representation: End-users/Analyzer Vendors
- Develop a consensus about Proprietary vs Open Model (POM) (Learn from FF and OPCF?) - Vendor Issue
- Agree on the System Functionality Requirements - End-User Issue
- Understand the possible range of compatible/incompatible solutions (Hardware & Software)
- Propose a plan to develop a connectivity/infrastructure model (Include industry acceptance)
- Continue?

# Acknowledgements

Mark Griffin - ExxonMobil Chemical

Larry Washburn - ExxonMobil Chemical

Jeff Gunnell - ExxonMobil Chemical

Dan Podkulski - ExxonMobil Chemical

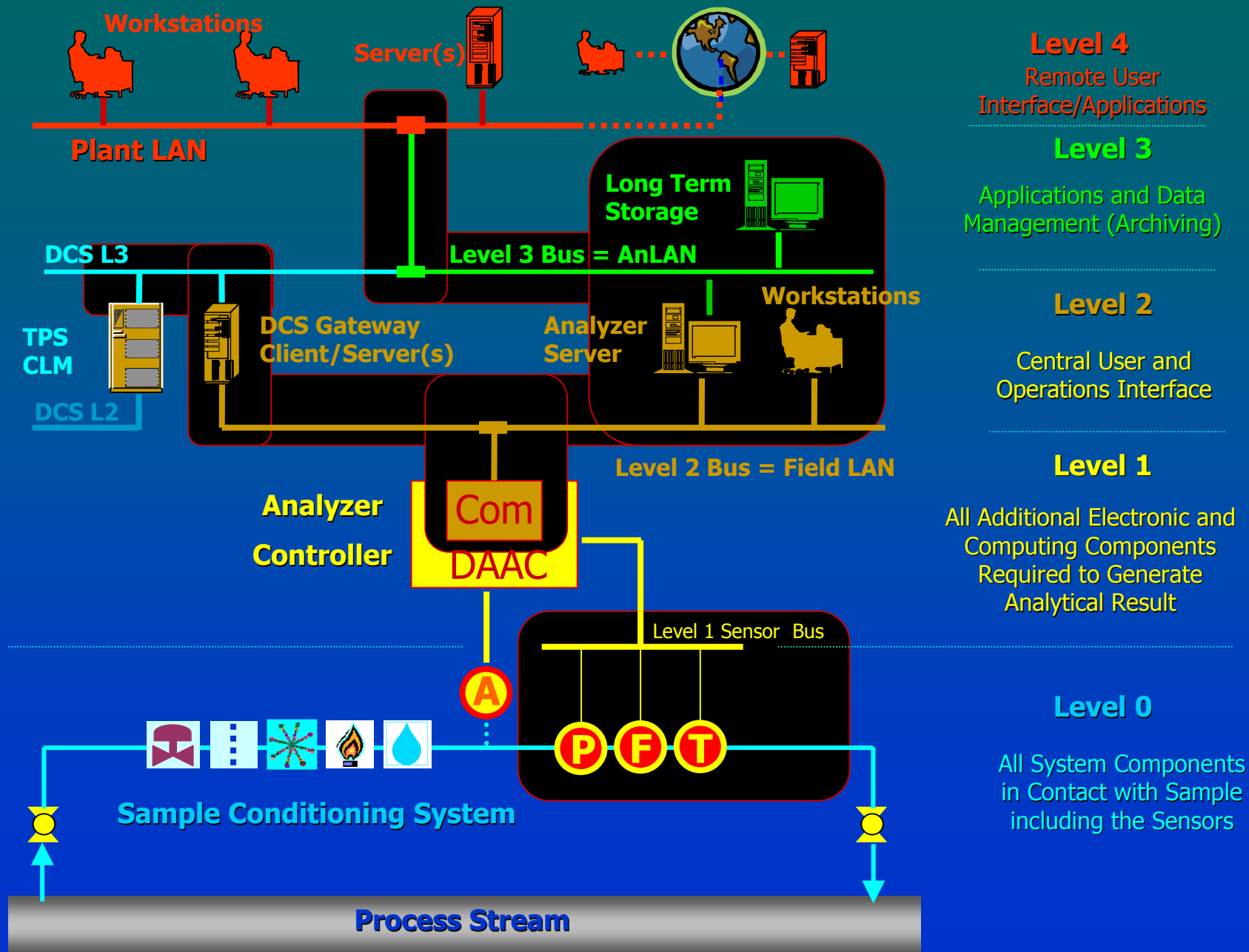
Norm Kincade - LaPlace Technologies

ABB Analytical

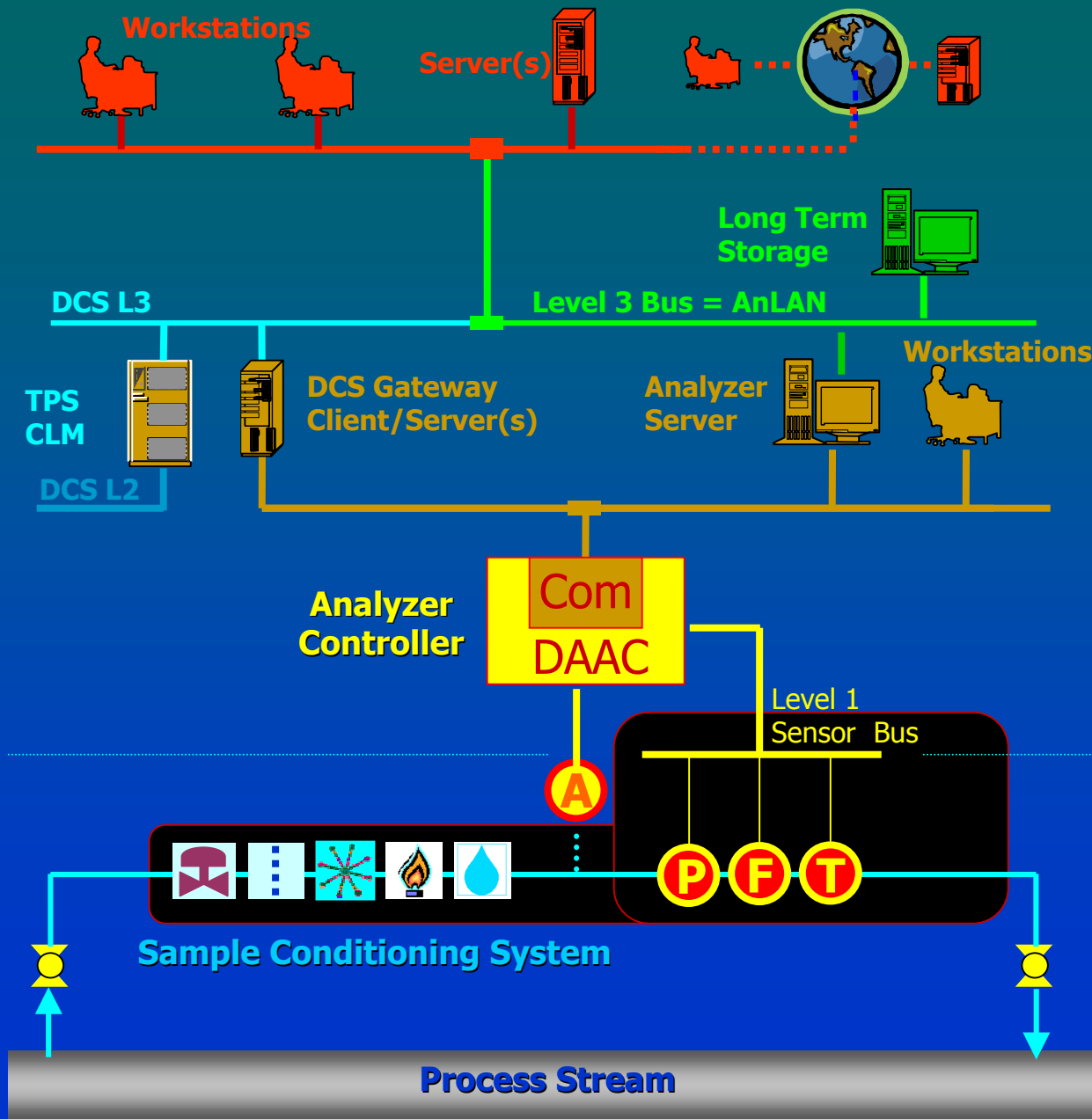
SAAI

Rosemount Analytical

# Challenges/Opportunities



# Level 0/1 Challenges Opportunities



- Level 4**  
Remote User Interface/Applications

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- Level 3**  
Applications and Data Management (Archiving)

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- Level 2**  
Central User and Operations Interface

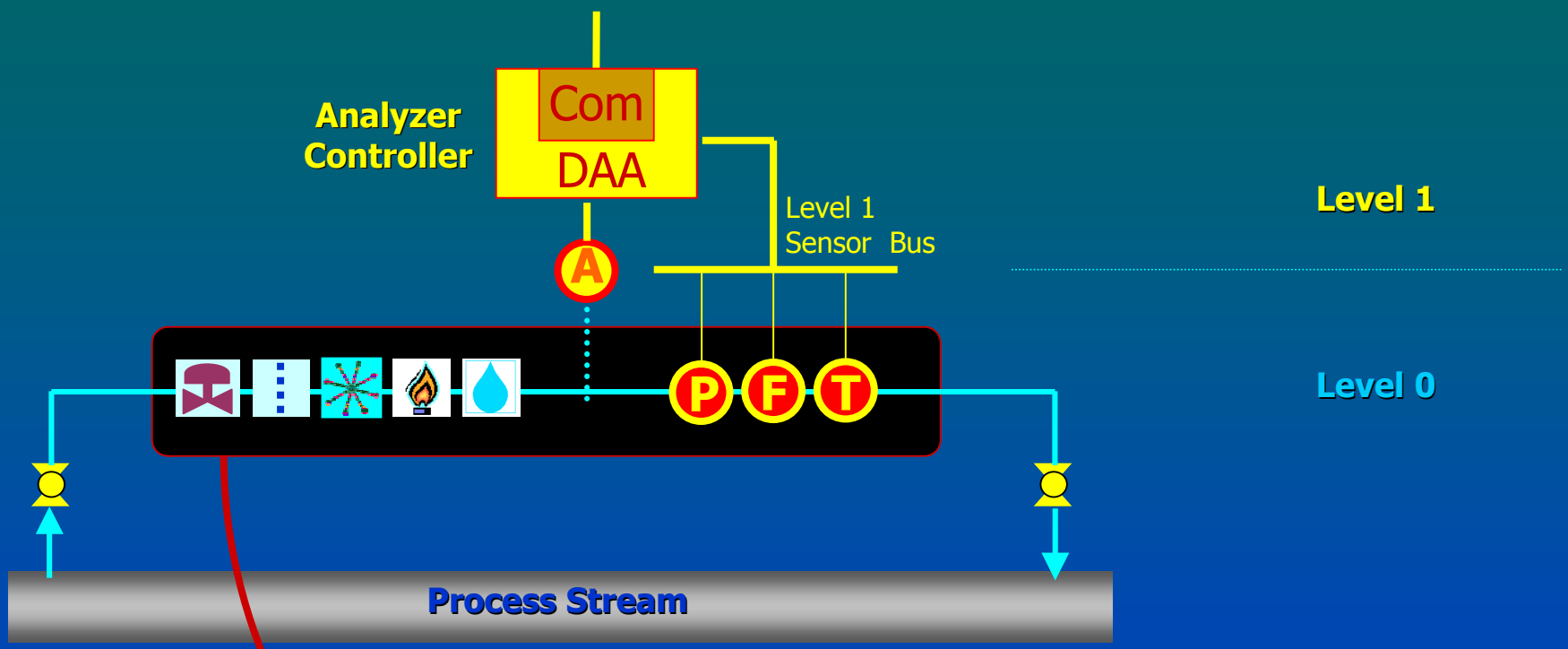
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- Level 1**  
All Additional Electronic and Computing Components Required to Generate Analytical Result

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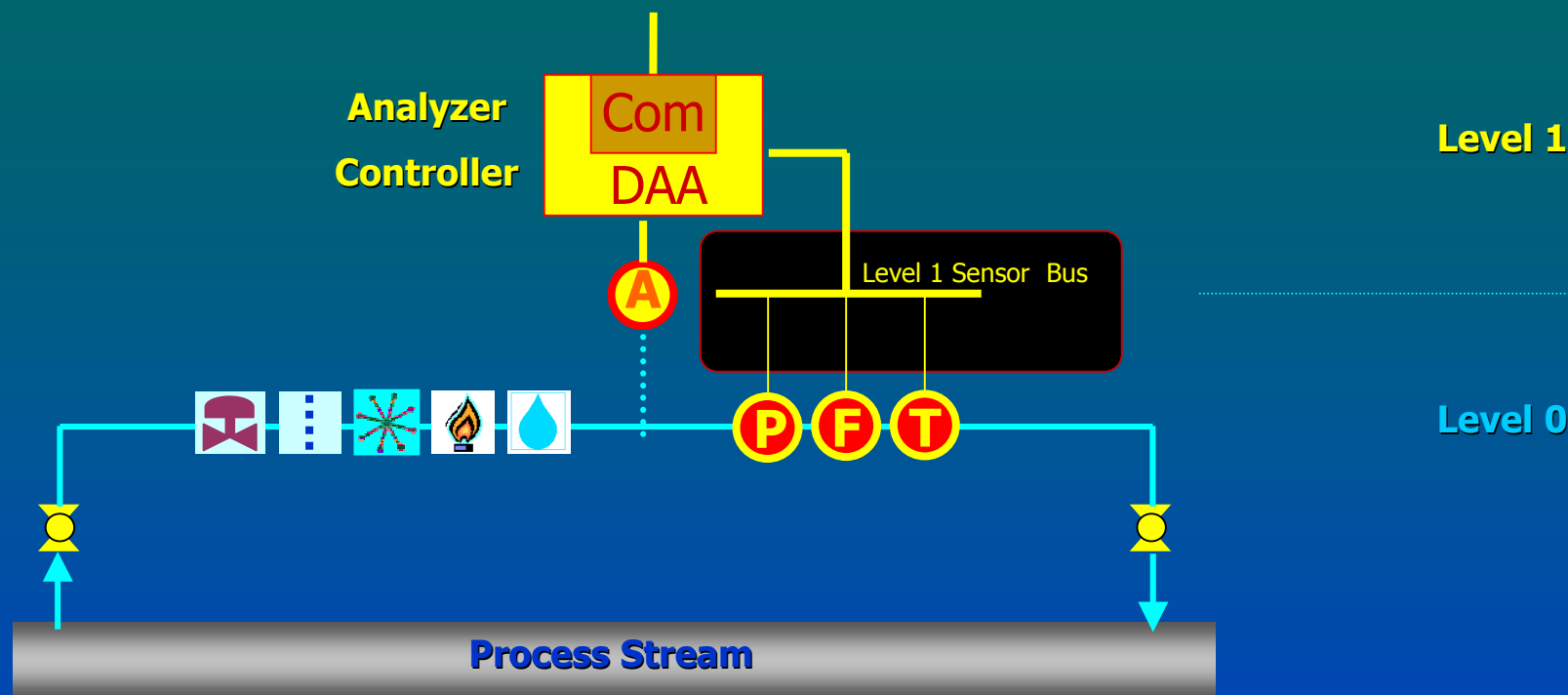
- Level 0**  
All System Components in Contact with Sample including the Sensors

# Level 0/1 Challenges Opportunities



**NeSSI Concept (CPAC Initiative):**  
Small Smart Integrated Sensor and Sampling system  
Modular Design based on Surface Mount Technology  
Ensure the Representativeness of Sample (Data Validation)

## Level 0/1 Challenges Opportunities



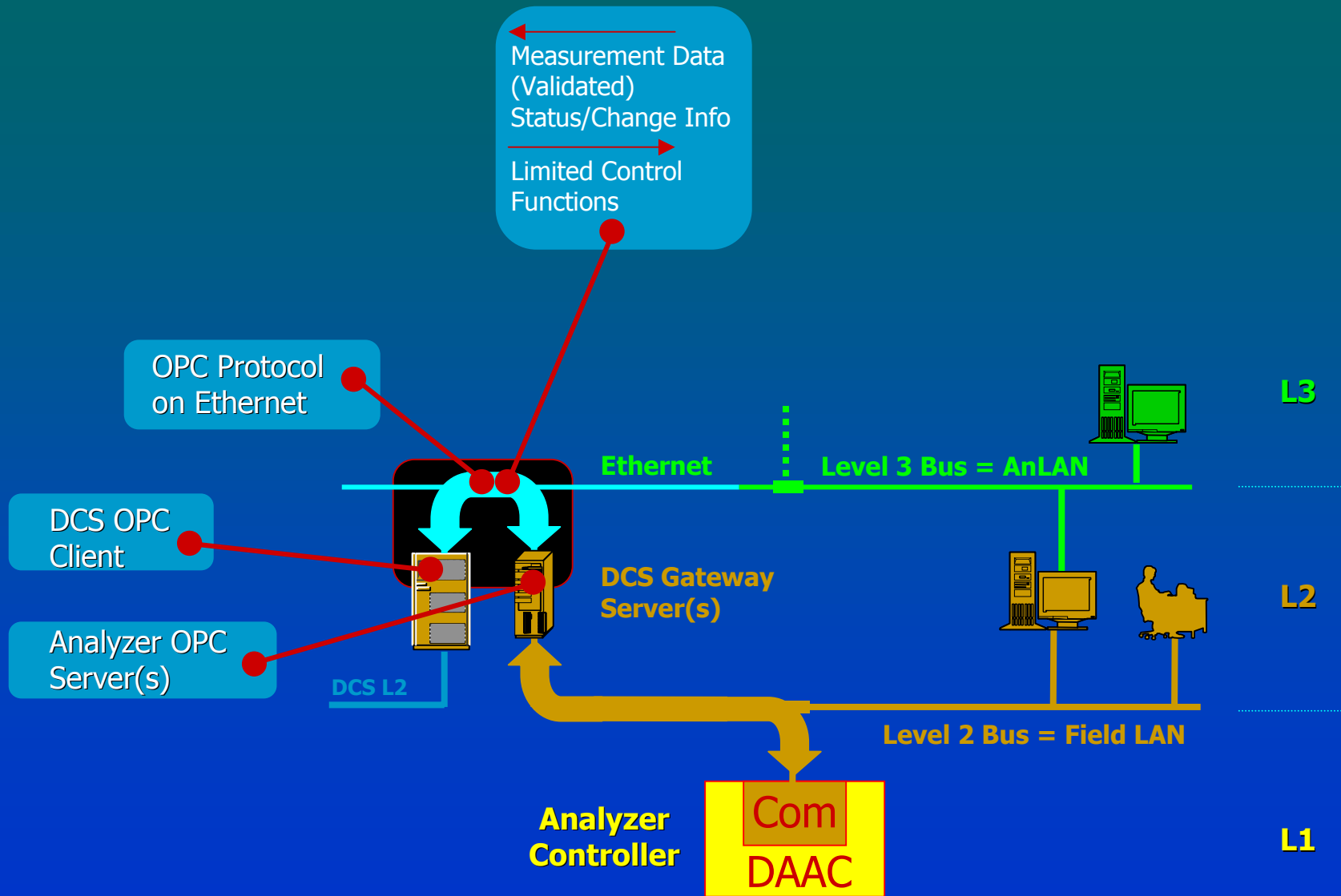
Level 1 Sensor Bus:

True Plug and Play Installation/Configuration (a la USB?)

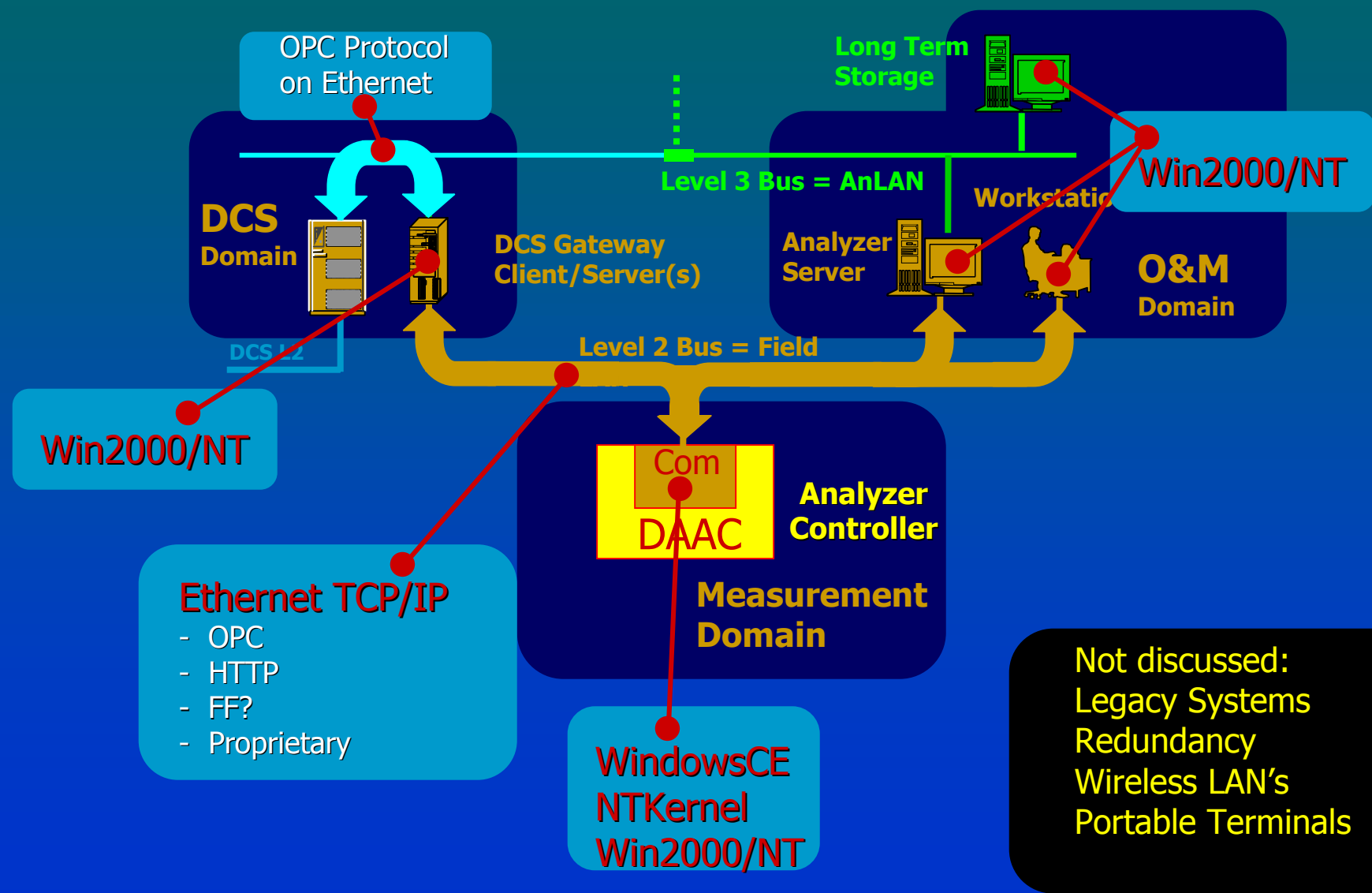
Should ideally include Analytical Sensor (pH, Cond etc.)

Potential for Inherently Safe Designs

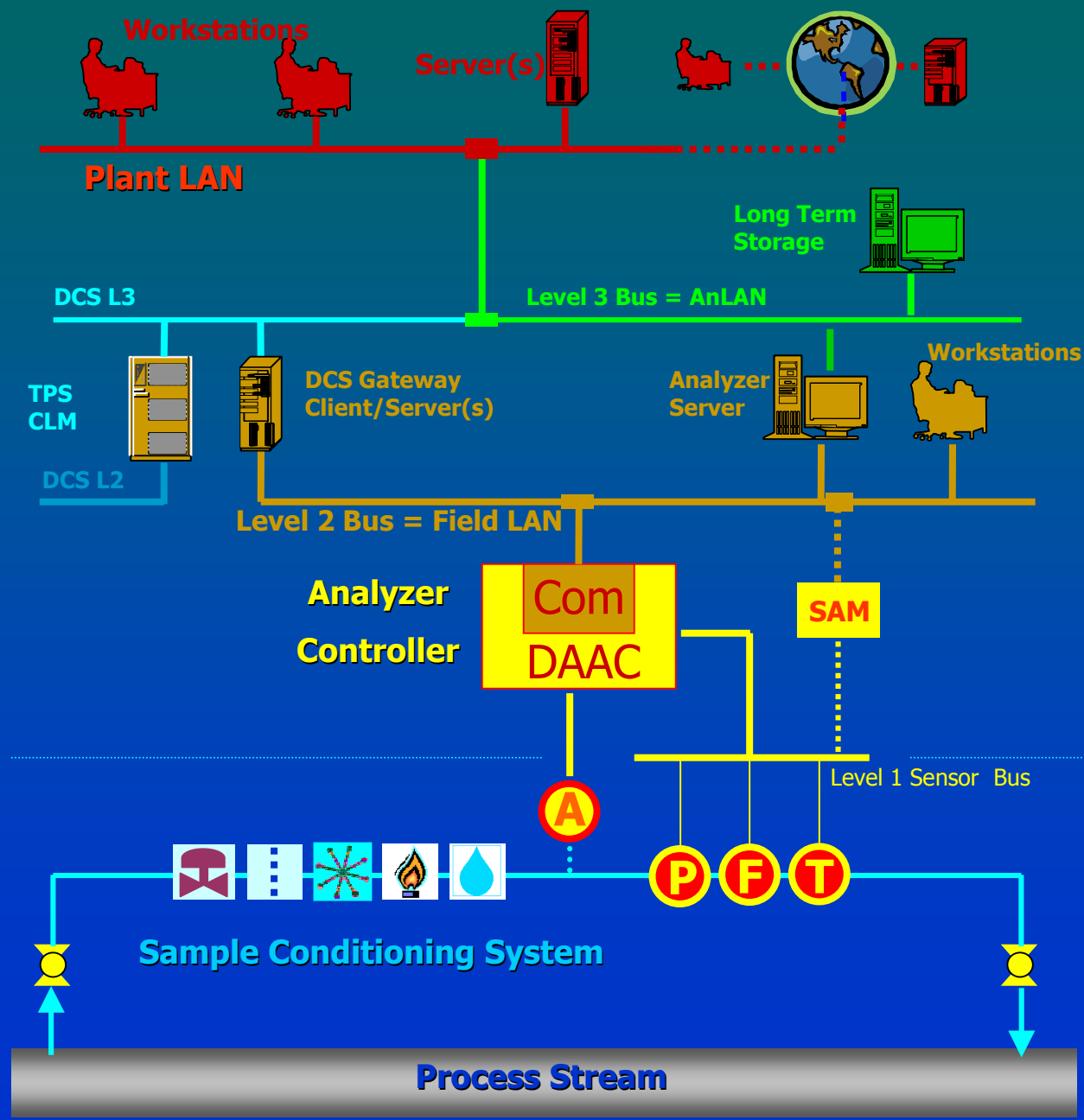
# Level 1-2 Challenges: DCS Domain



# Connectivity: Summary



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