The Virtual Process Overview and Applications

Cape Software Inc.

Houston TX

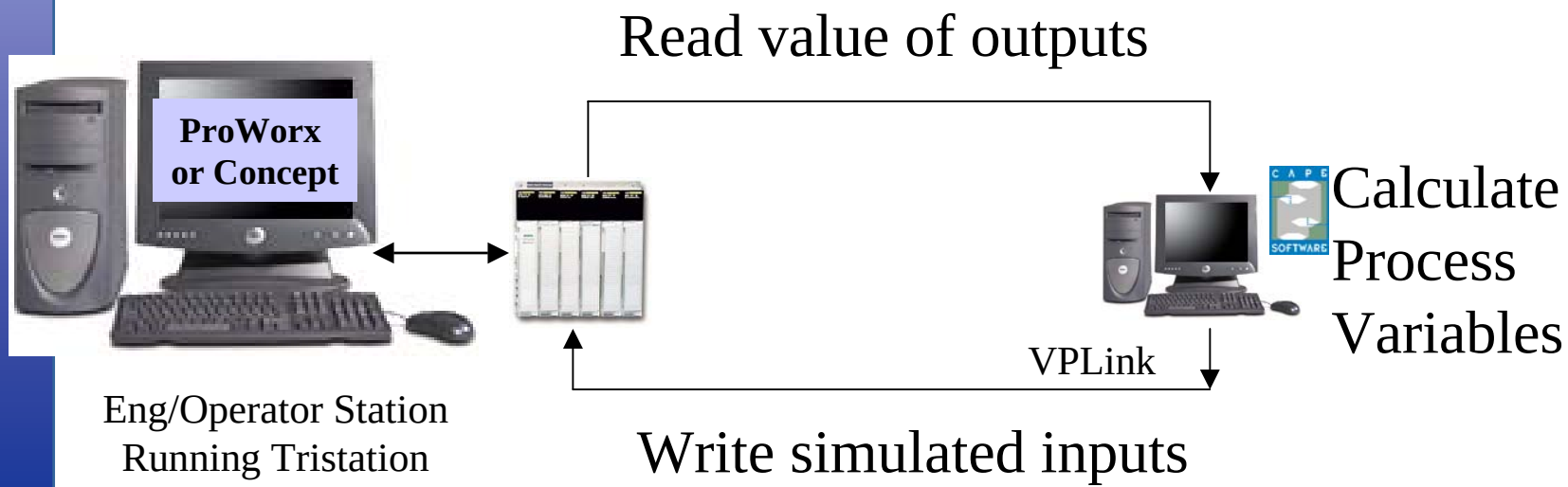
VP Link

What is VPLink ?

- A **representation** of the process **inputs** to an **offline control system**
- What does VP Link do?
  - **Read** control system **outputs**
  - **Calculate** the Virtual Process State – ie, Process Model
  - **Write values** for Process Variables
  - **Offer GUI** for engineer or instructor to present scenarios such as equipment fault, process upset, or transmitter drift (failure)

Virtual Process Overview

- Windows based interface: intuitive
- No Changes to the Tricon program: non-invasive
- I/O board Hardware not required (cost advantage)
- Multiple interface to Modicon Controllers,including
  - Modbus, Modbus+, Serial or Ethernet



Some of our customers...

BASF – many plants across several sites W/W

TOTAL refinery – Vlessingen,Netherlands

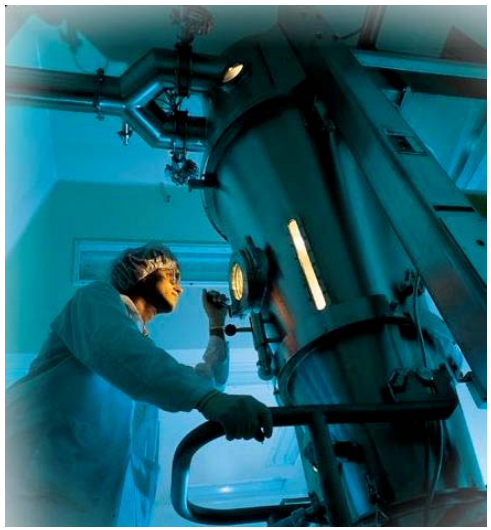
Eastman – several systems within Kingsport, TN

Air Products & Chemicals – several systems W/W

ConocoPhillips –San Francisco,CA

Phillips Refining – Several Sites Licenses

ChevronTexaco –San Pablo,CA



Lubrizol – several licenses within Deer Park, TX

BP – several licenses at several sites

Shell Deepwater / Shell Chemicals,UK

Eli Lilly – Corporate licensing

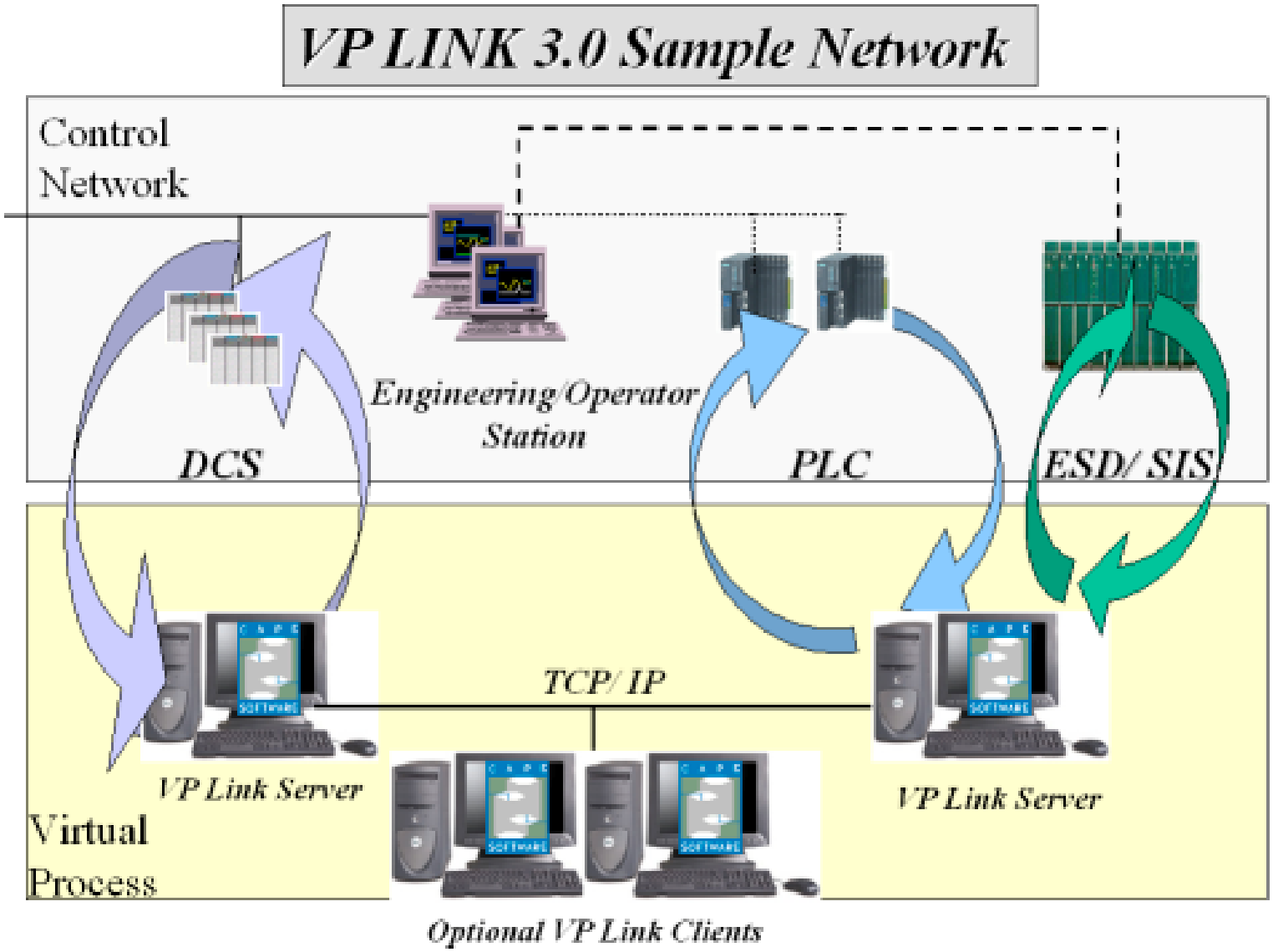
Genentech – several licenses at different sites

General Mills – W/W licensing

Murphy Oil - Mereaux, LA

Some Supported Systems

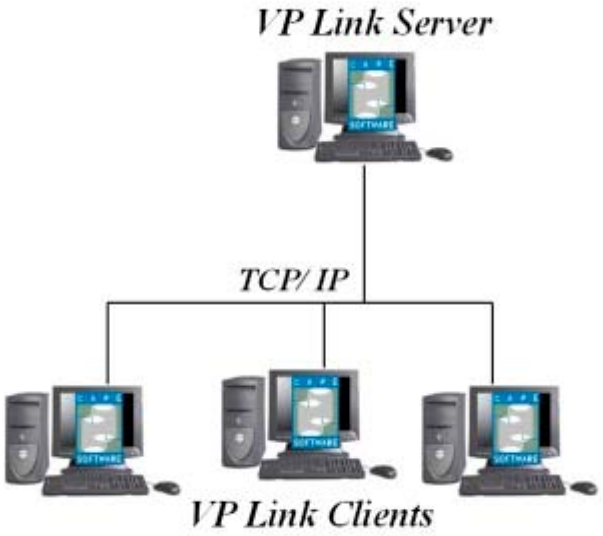
- **Modicon Quantum,Micro etc...**
- Triconex:Tricon/Trident
- Foxboro I/A,Archestra
- Honeywell Plantscape / Rockwell ProcessLogix
- Honeywell TPS Honeywell FSC,PKS
- A-B PLC5/SLC500,CLX, Modicon,Siemens-Ti 505
- Emerson DeltaV,PROVOX
- Siemens APACS, PCS7, S7
- ABB Mod300, Advant
- Yokogawa CS3000/R3/ ProSafe
- Etc...



Control Network Systems are solving the logic, responding to simulated VP Link inputs

Different Architectures for different Applications

Staging Floor Setup



Engineers test different units, interacting with each other

Training Setup

Trainees operate identical units, in parallel

Virtual Process Network for MODICON

Modicon Engineering Station

Running MBX Driver and VP Link c

Link can be MB or MB+ over Ethernet

Quantum PLCs

VP Link server,running the simulation server

Remote VP Link clients: allowing for simultaneous testing of PLC configuration

VP Link

VP Link 3.0
5 steps to simulation

- Extract the control systems I/O images, using platform specific tools
- Import the images in VP Link
- Model the process, using loop templates, algorithms and CalcBlock
- Write training/failure scenarios
- Connect to Modicon PLC's

VP Link for Modicon Specifics

- HMI Graphics Import in Toolbook for realistic trainer/tester interface
- Fast *Ethernet* Interface available
- Modbus or Modbus+ protocol available, using MBX driver suite
- seamlessly set all I/O blocks in Simulation mode by removing I/O allocation tables
- Utilization of *non-modified actual Control Program*

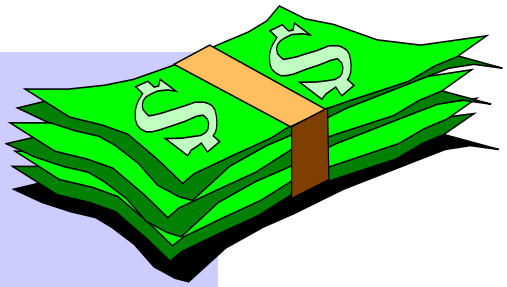
I - Logic Validation

- **Graphics** verification
- **Logic** checkout
- **Automate** repetitive testing task (ie resets etc…)
- Facilitate Testing with practical graphics
- **Interlock** schedule approval
- **Mapping** to DCS and interaction between DCS/PLC logic (gateway points tests)
- Thoroughly debug prior to online download, ie, **Management of Change** and periodical testing
- **Test Compiler complies with IEC61508/61511**

II-Operator Training

- **Familiarize** staff with HMI, Overlays, Navigation, Alarm Pages, Trend Displays
- **Exercise Startup** / **Shutdown** Procedures
- **Test Emergency** Responses to Faults / **Malfunctions** / **Upsets** (Real or Instrumentation)
- Refresher Training or Re-certification
- **Track** trainee's **proficiency** (**Scoring Engine**)
- **Knowledge Transfer** Tool

Resulting In...



- Reduced start-up time,due to thorough off-line testing of start-up logic.
- Reduced down time,due to on-going logic testing
- Reduced Factory Acceptance Test Time
- Reduced Risk of Equipment Damage.
- Reduced Risk of Personnel Injury.
- Reduced Risk of Wasted Product.
- Reduced Risk of Environmental Release.
- **Documented, Validating Operator Sessions Logs**

Conclusion

- VPLink solves simulation needs from *simple to sophisticated*, rigorous modeling.
- OTS node can used as an engineering Test Bed system, for *preventive / periodical logic validation*
- *Unattended Real Time* trainee performance logs
- Modeling environment is *flexible,easy to learn and maintain*
- Available *New Version Service* keeps VP Link components up to date,with free technical support
- *Cost Effective* simulation package for *OTS*,using Off the Shelf components for process model and control or emulated control
- *Cross platform* functionalites makes VP Link an *evolutive investment*