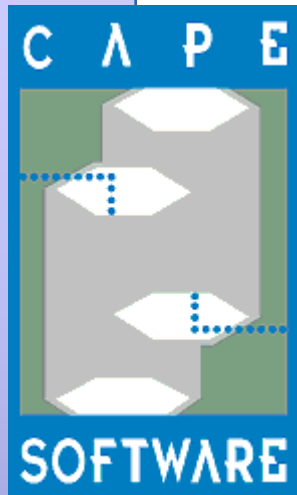


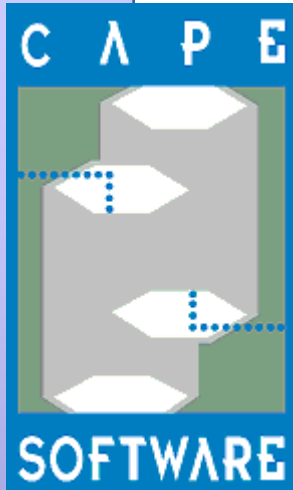
*The **V**irtual **P**rocess : Overview and Applications*

Cape Software Inc.
Houston TX



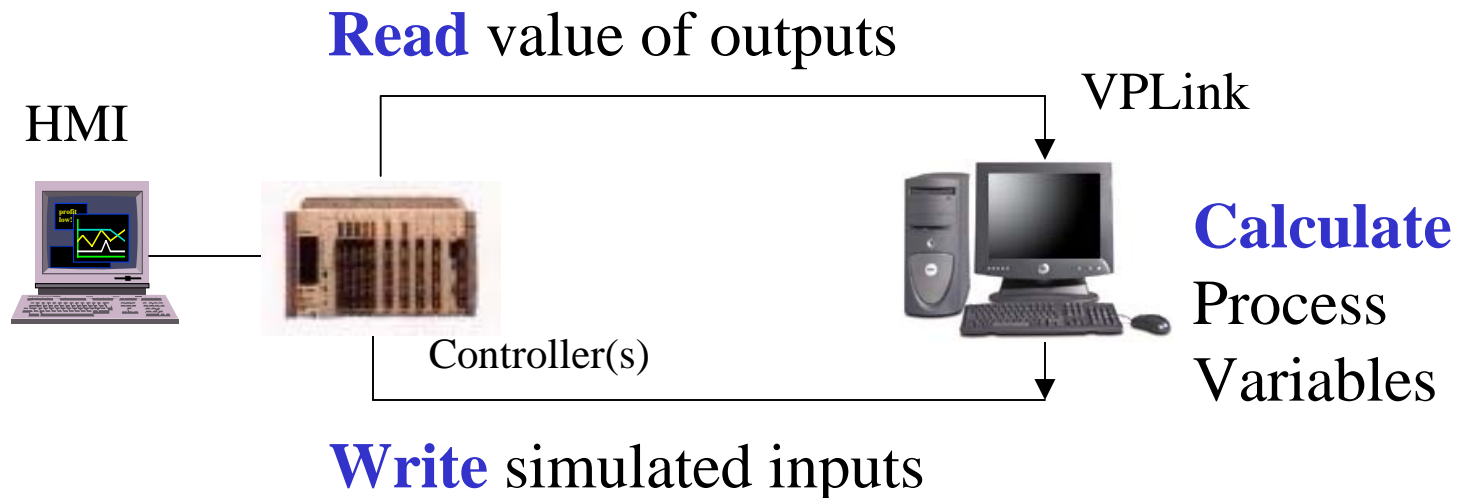
What is VPLink ?

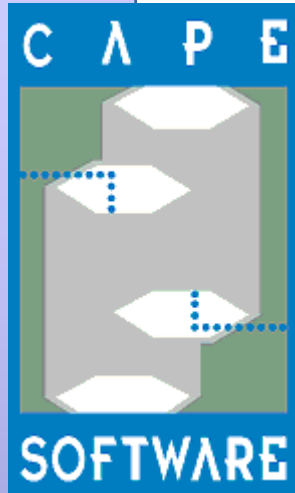
- A **representation** of the process **inputs** to an **offline control system**
- What does VP Link do?
 - **Read** control system **outputs**
 - **Calculate** the Virtual Process State – ie, Process Model
 - **Write values** for Process Variables
 - **Offer GUI** for engineer or instructor to present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



The Virtual Process Loop with TI 5x5 PLCs

- Object Oriented and Tag-based.
- Direct Connect bypasses hardware I/O

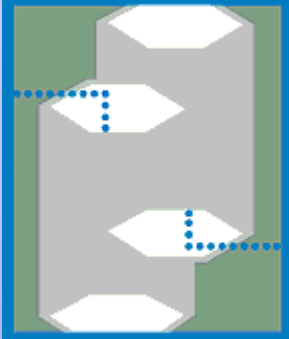




Some Supported Systems

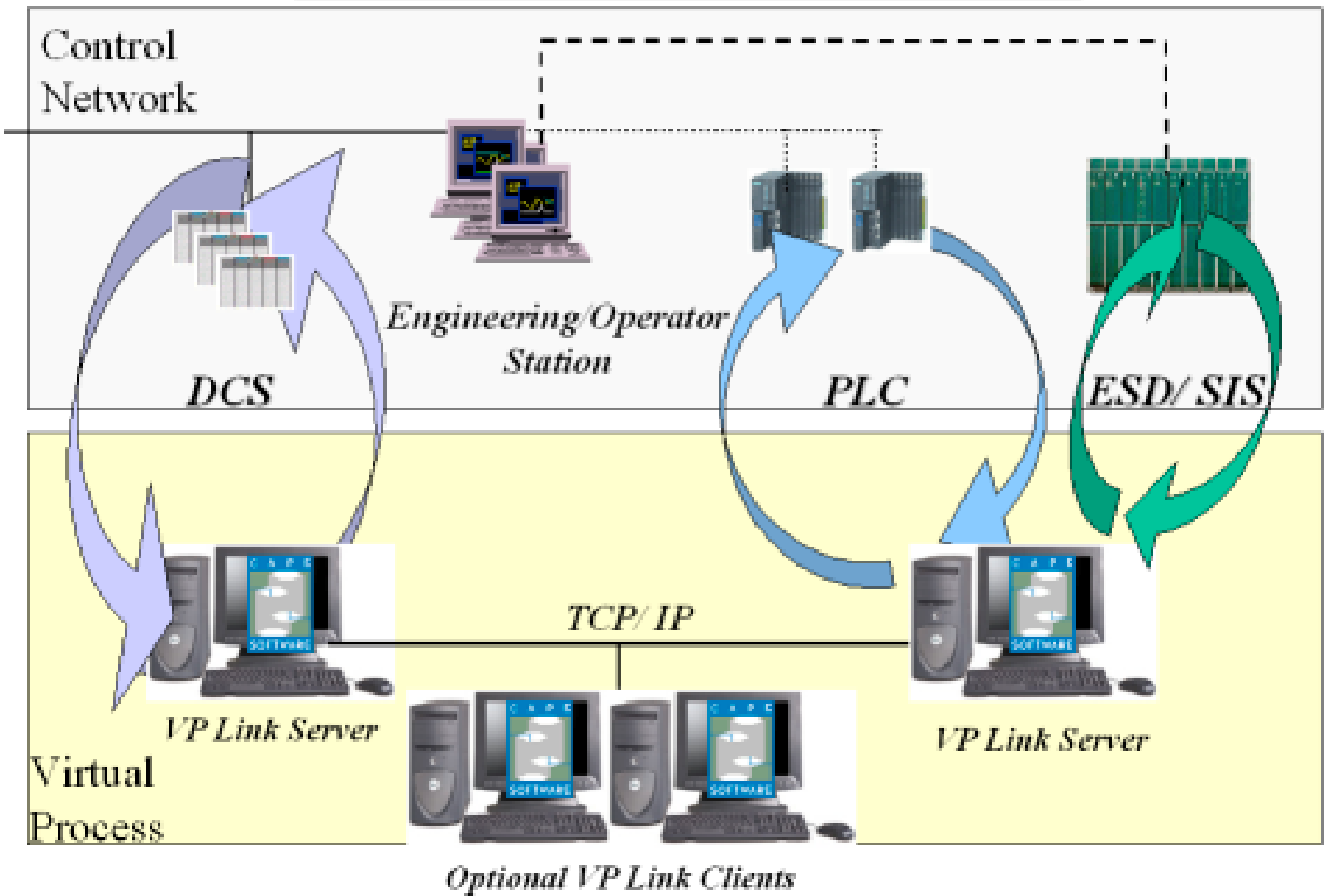
- Siemens TI 5x5
- Emerson DeltaV
- Emerson PROVOX
- A-B PLC5/SLC500, Modicon, Siemens-Ti 505
- Foxboro I/A
- Honeywell Plantscape / Rockwell ProcessLogix
- Honeywell TPS Honeywell FSC
- Siemens APACS, PCS7, S7
- ABB Mod300, Advant
- Triconex
- Yokogawa CS3000/ ProSafe

C A P E

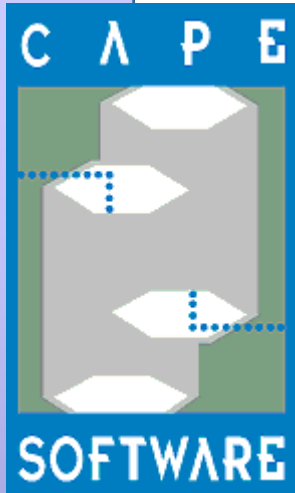


SOFTWARE

VP LINK 3.0 Sample Network

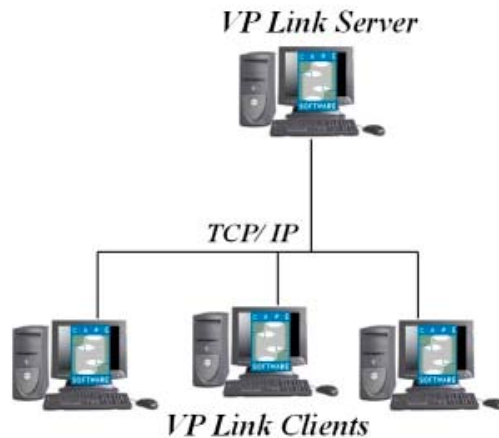


Control Network Systems are solving the logic, responding to simulated VP Link inputs



Different Architectures for different Applications

Integrated Training Setup

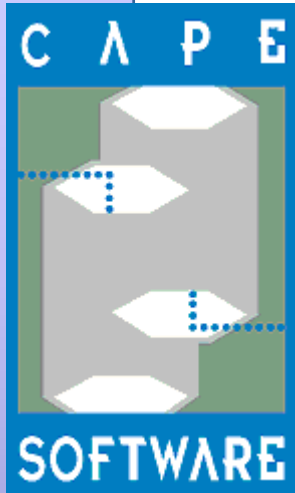


Trainees operate different units, interacting with each other

Parallel Training Setup

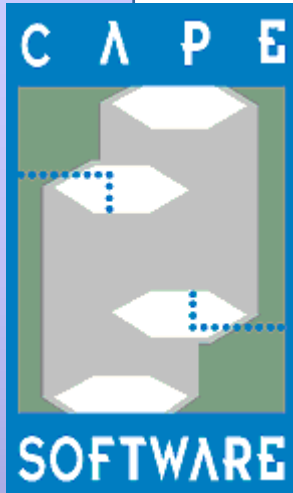


Trainees operate identical units, in parallel



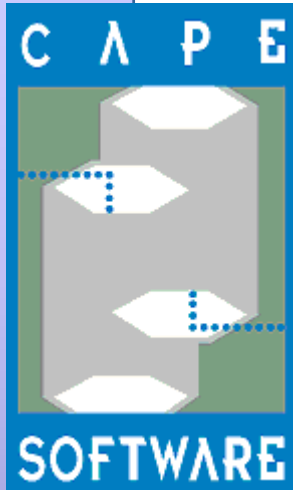
VP Link Advantages

- **Safer**, off the critical path, many more events can be **examined without damage** to actual equipment
- **No I/O required**, no wiring, eliminate panel devices: Cost Effective Operator Training System
- **Easy to create** scenarios and/or automate the model
- ➔ Valuable for repeated testing (**Off Line Test Bed**)
- **No changes to logic**, ie, test code which will execute in the field – fits **FDA and ESD** needs in particular
- **Flexible environment** specifically designed to create process response models and complete validation
- **Minimal** implementation time
- Improved Test quality (“**6 σ** ” objectives)
- Complies with IEC61508,61511 and TuV control related software testing procedures



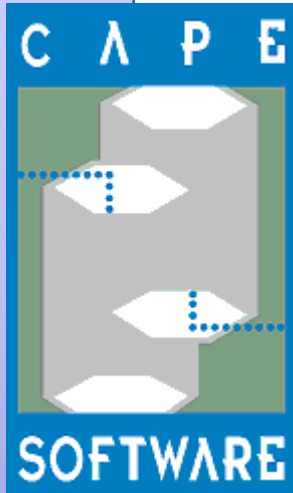
I - Logic Validation

- **Graphics** verification
- **Logic** checkout
- **Interlock** schedule approval
- **Mapping** to DCS and interaction between DCS/PLC logic (gateway points tests)
- **Interaction** between DCS (batch) and PLC logic
- Find the “I never thought of that!” situations
- Thoroughly debug prior to online download, ie, **Management of Change**

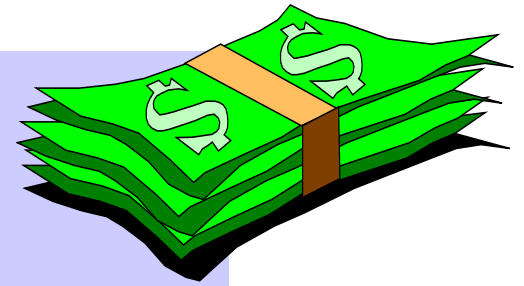


II-Operator Training

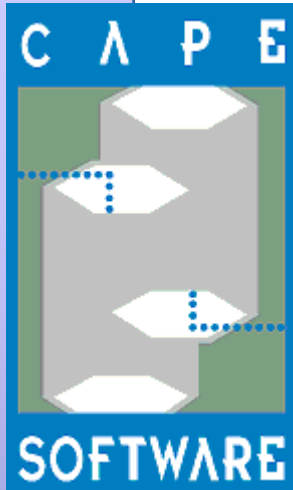
- **Familiarize** staff with HMI, Overlays, Navigation, Alarm Pages, Trend Displays
- **Exercise Startup / Shutdown** Procedures
- **Test Emergency** Responses to Faults / **Malfunctions / Upsets** (Real or Instrumentation)
- Refresher Training or Re-certification
- Approvals needed to Certify as board level qualified
- **Track** trainee's **proficiency** (time/module/quiz)
- **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, Validated Test Plan**



Conclusion

- VPLink solves simulation needs from **simple to sophisticated**, rigorous modeling.
- Trivial solution begins with I/O list and creates **metaphor for hardware** panel within minutes.
- Test Compiler makes it **easy to** construct prescribed input values to write into controller, then **examine output table for reaction**.
- Modeling environment is **flexible** and **easy to learn** and use
- Thorough **lateral** (PLC/DCS gateways) **validation** of the control strategy.