

SCADA & Scottsdale

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SCADA

- **S**upervisory
- **C**ontrol
- **A**nd
- **D**ata
- **A**cquisition

Supervisory

- From the dictionary:
 - To “supervise” means to “oversee.” An overseer watches over and sets the direction but does not do the detailed work.
Typically the overseer is charged with seeing “the big picture” and with directing the many elements of that picture to work in concert for maximum effect.

Supervisory

- Supervisory Control generally entails:
- such binary things as OPEN/CLOSE, ON/OFF, UP/DOWN etc.
- Multiple choice options like recipes and programs.
- Setpoints for continuously variable processes.

Control

- Control means to “command”, “direct”, and “guide”.
- Control also means to “regulate”, implying a careful and constant vigilance that ensures that the regulated process remains within acceptable limits.

Data Acquisition

- In order to make “big picture” decisions, the supervisor must be cognizant of salient conditions and facts about the process he is controlling. The supervisor must have data about the status of key parameters. The supervisor is tasked with integrating that data into information that he uses to issue supervisory commands.

Some Background on SCADA

- SCADA has been around as long as there have been supervisors.
- There have been supervisors since Adam and Eve.
- The way that SCADA is done has changed over the years as technology has provided new tools.
- SCADA is used in every field of human endeavor.

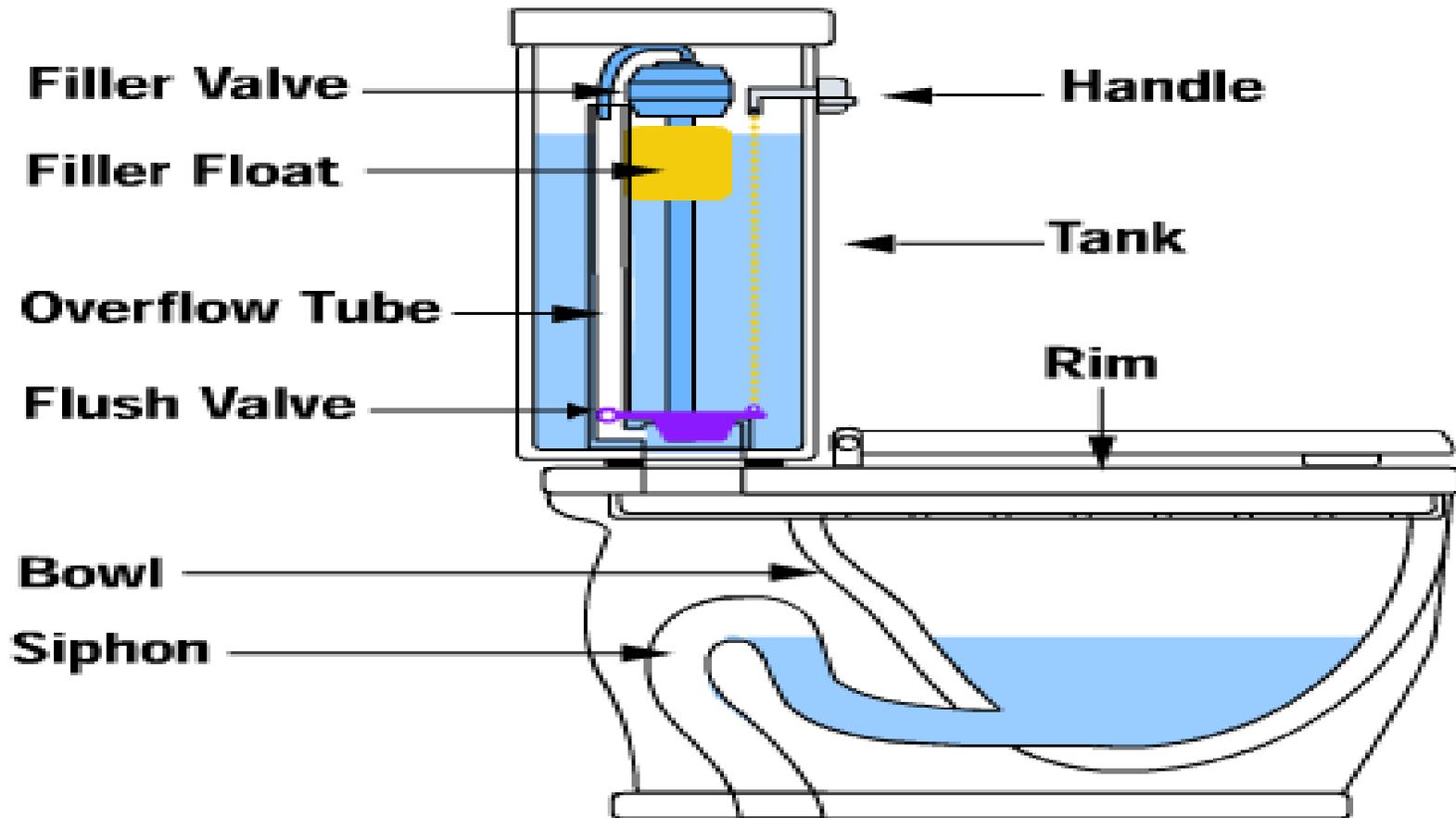
A Typical SCADA System from the 19th Century to Today

**Supervisory
Control**



**Data
Acquisition**

The Detailed Regulation (control) that is Supervised



A Typical SCADA System from the 60's thru the early 90's



Some SCADA Users

- Oil Refineries
- Water Treatment Facilities
- Electric Power Plants
- Paper Mills

Some Relevant Terms and Issues

- Islands of Automation
- Proprietary Communication Protocols
- Systems Integration
- Alarm Management
- Enterprise Wide Facility Management Systems

Islands of Automation

- Vastly different control systems used on seemingly unrelated processes.
- SCADA makes them all look like one, seamless control system.

Proprietary Protocols

- SCADA systems address proprietary protocols with a variety of integrating tools.
- DDE
- ODBC
- OPC
- BACNET
- MODBUS

Systems Integration

- A whole industry exists making the limitless sources of process information and control available to the relatively non-technical user in a form that is easily and quickly understood.

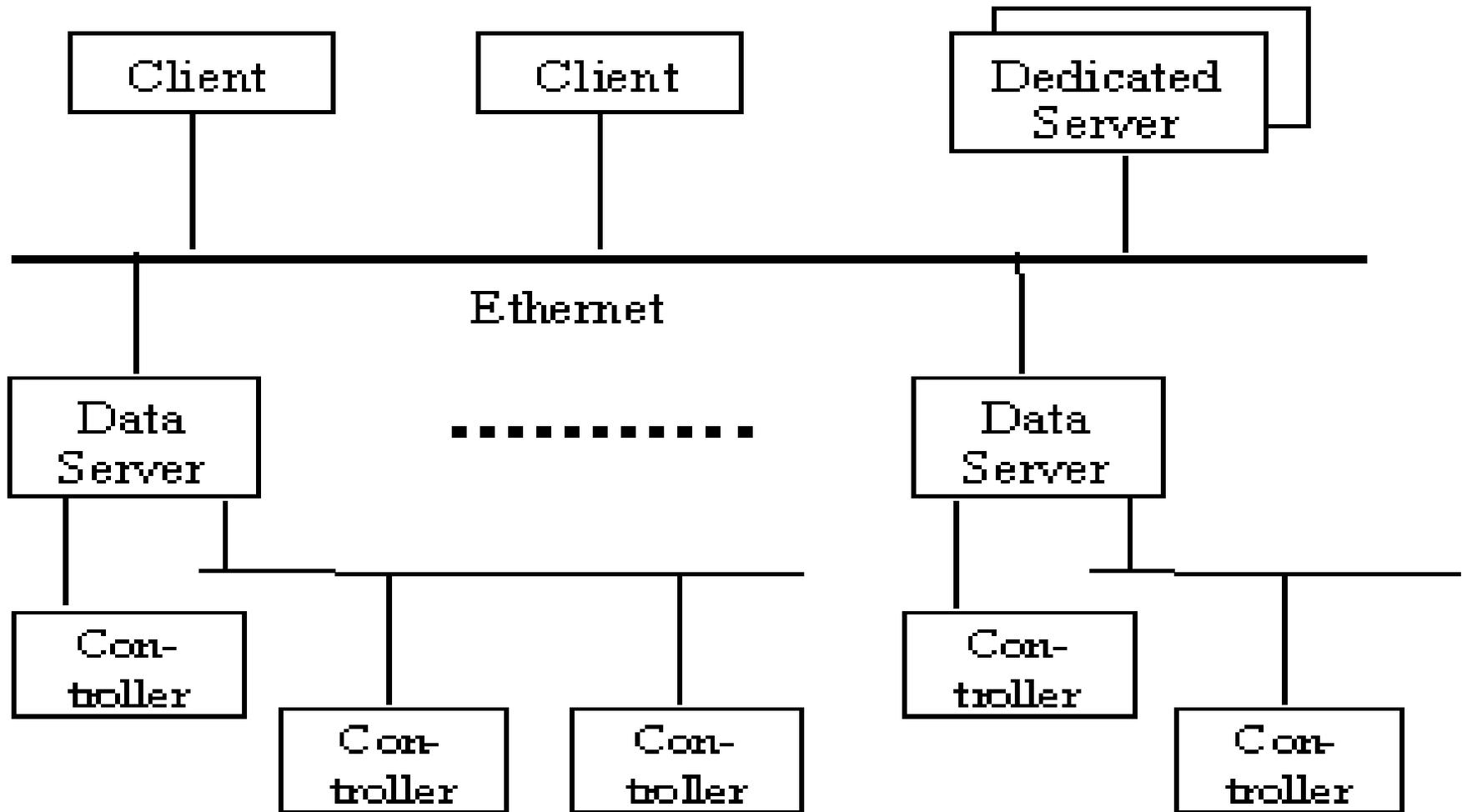
Alarm Management

- A good SCADA system can provide relevant alarms from many disparate sources and display them in a way that maximizes the operator's ability to react in an informed and safe manner.

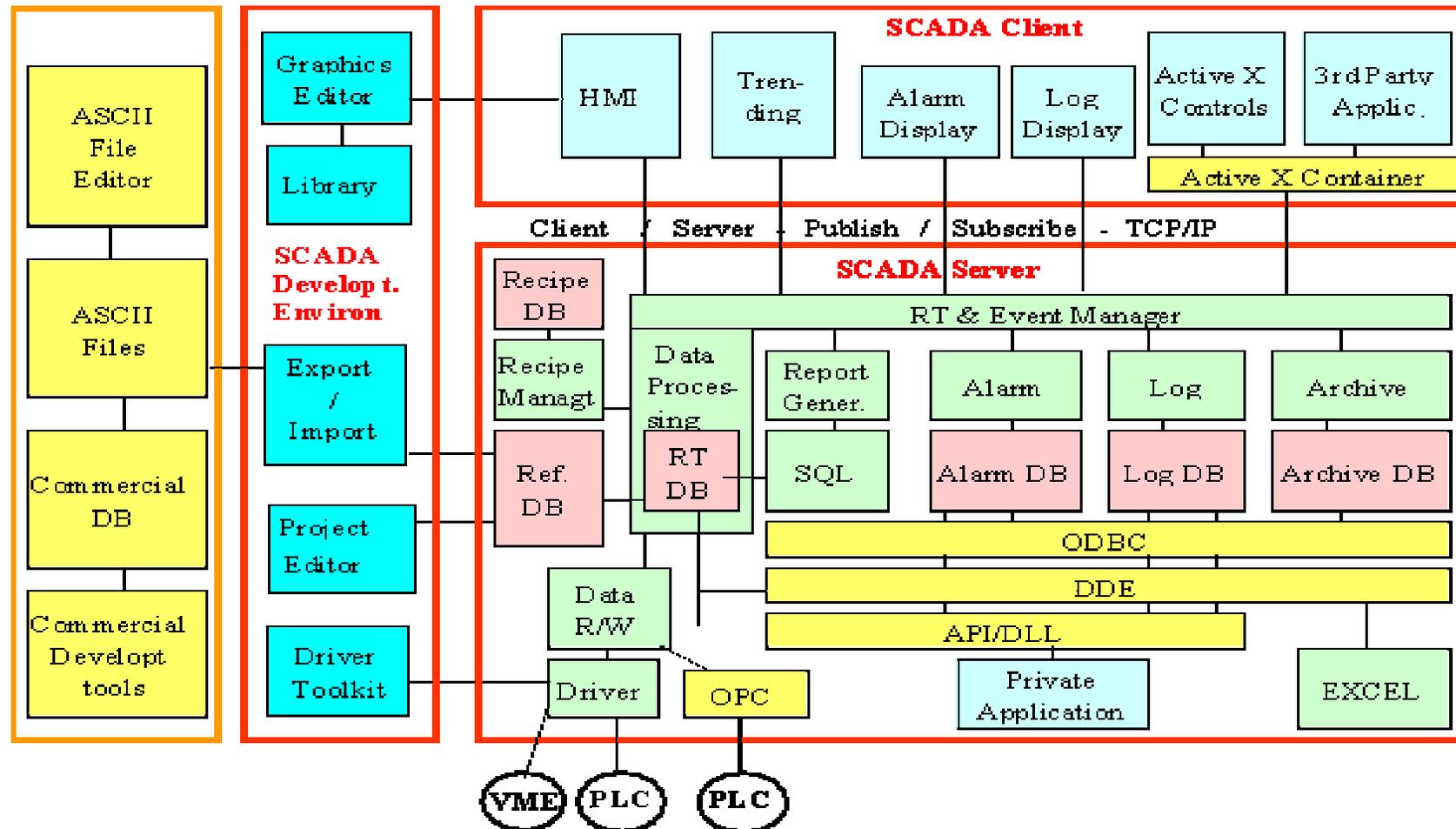
Enterprise Wide Facility Management

- The ultimate SCADA system has no physical boundaries.

Elementary Modern SCADA Architecture



Typical SCADA Architecture



SCADA has become a software application

- Intellution FIX DMAPCS
- Wonderware
- Tritium
- Allen Bradley
- Square D
- Westinghouse
- GE
- ...

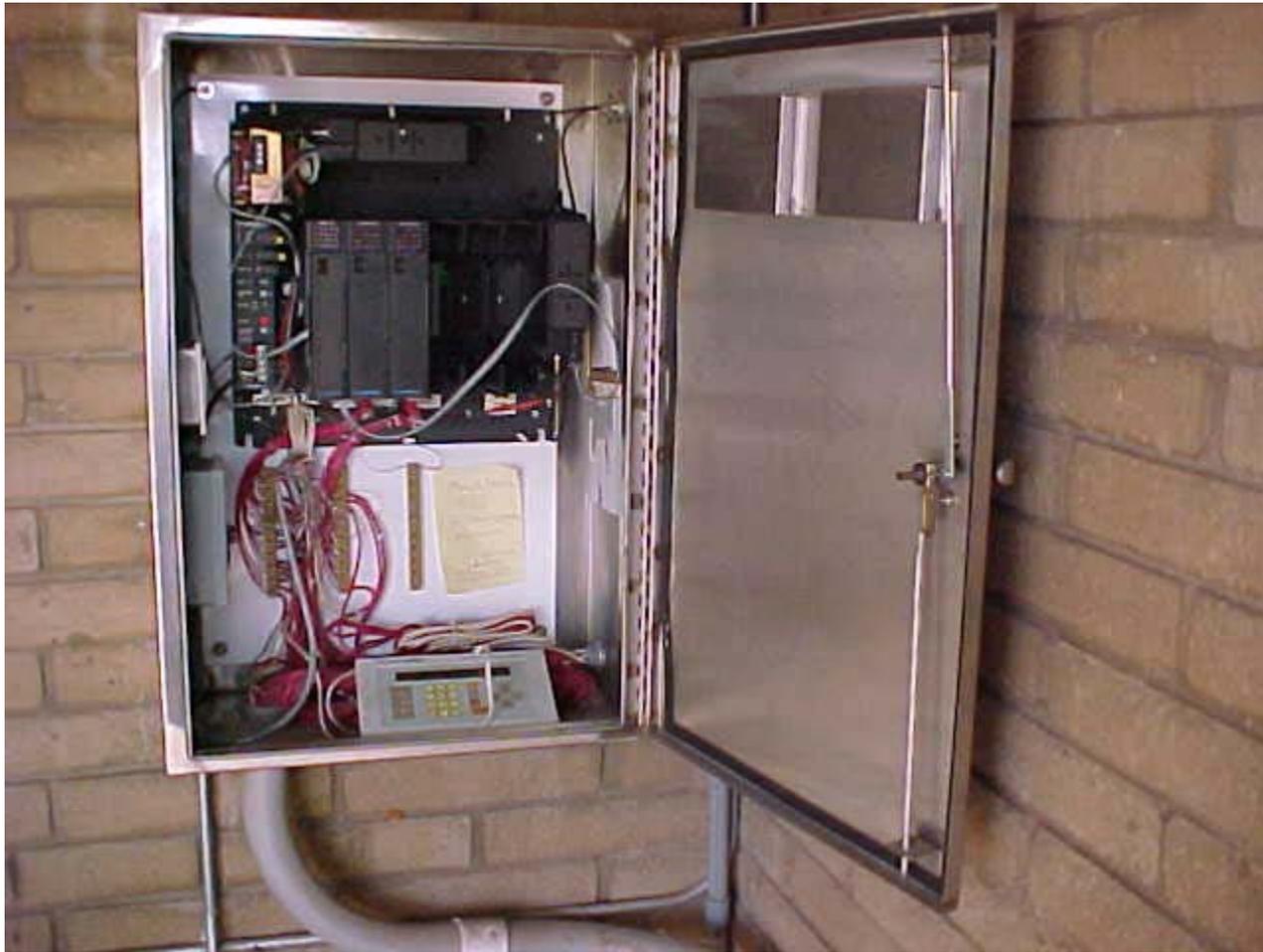
SCADA Systems in Scottsdale

- Water – clean and not so clean
- Water – irrigation
- Traffic – Intelligent Transportation System
- Building controls-
- Security – Access control, monitoring and recording
- Police and Fire

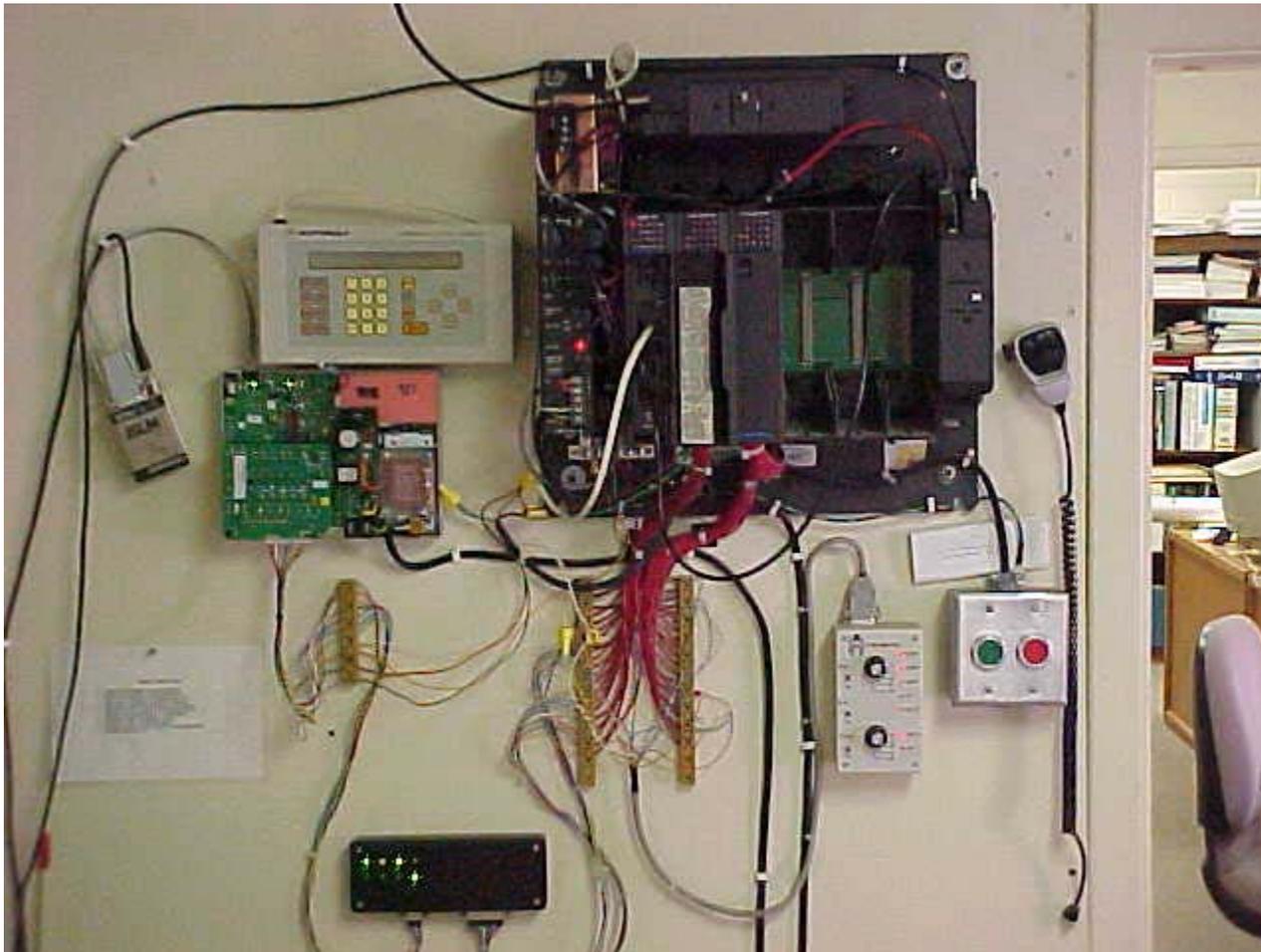
Water - Irrigation



Water - Irrigation



Water - Irrigation



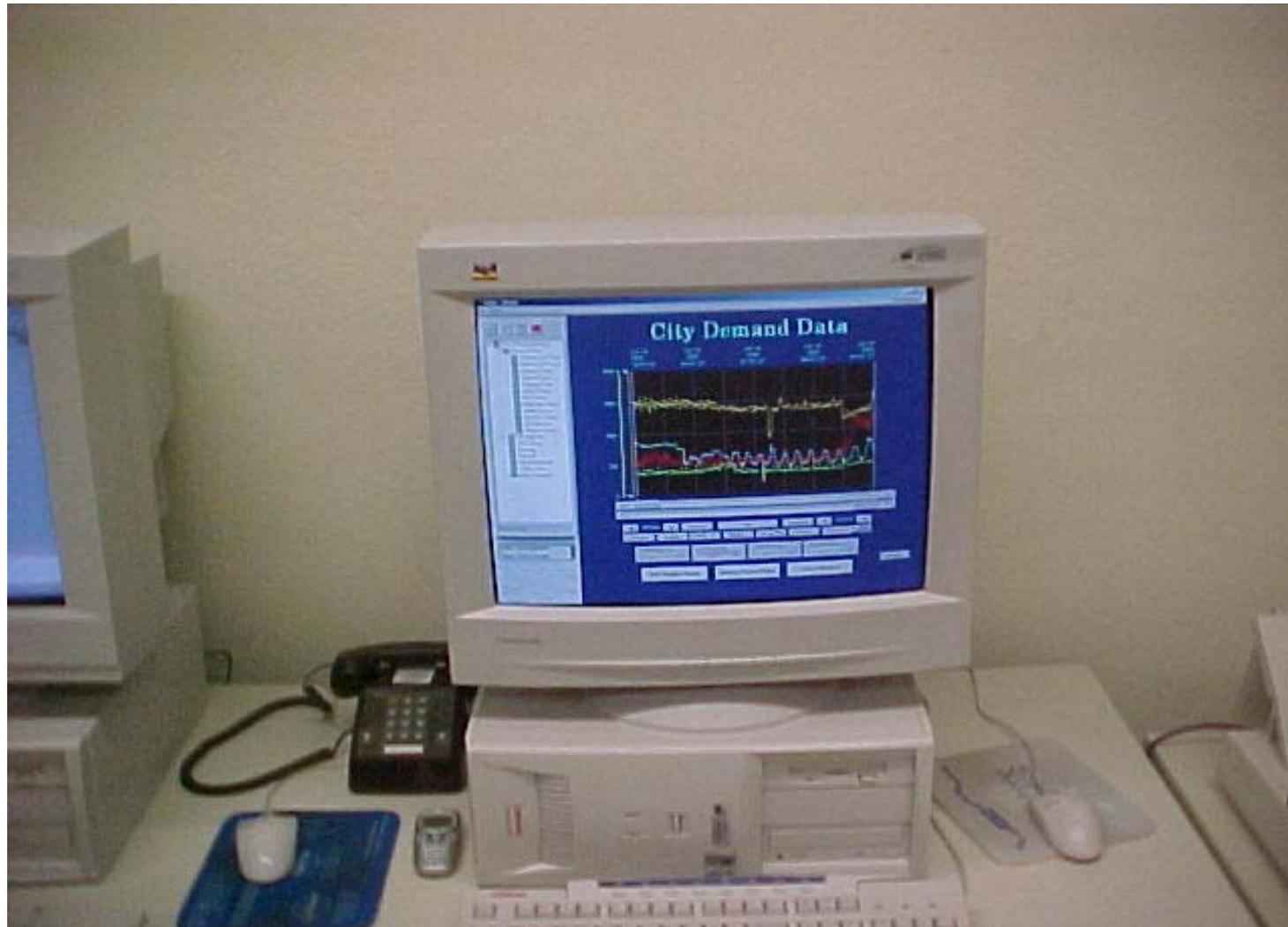
Intelligent Transportation System



Building Controls



Building Controls



Building Controls



Building Controls



Back to the “Head” of the Presentation



From SCADA to EWCIM

- The IT department has or will need to have the infrastructure to handle Enterprise Wide Control and Information Management,