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Tri-Service
Infrastructure 2005
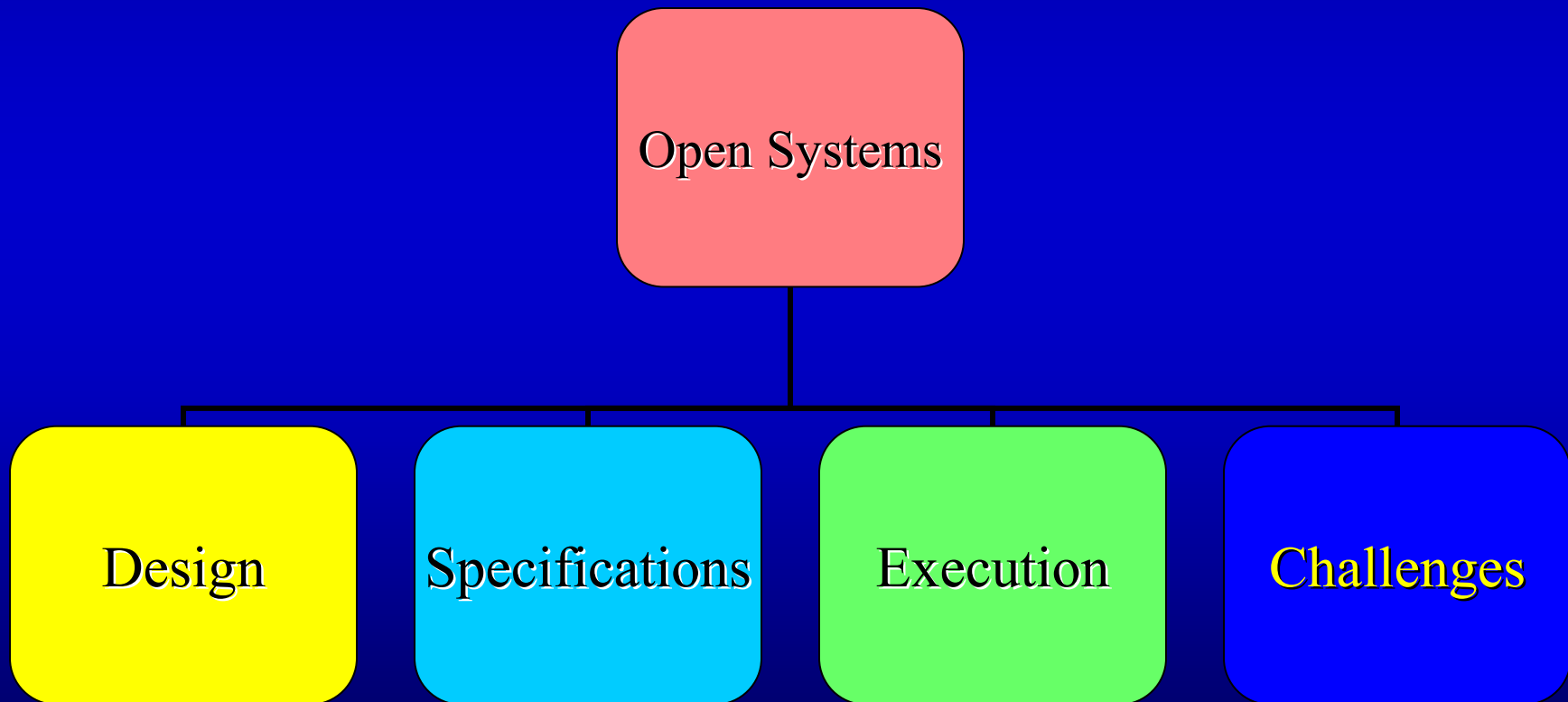
Implementation of Lon-Based Specifications

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Discussion Outline

Open Systems

Design

Specifications

Execution

Challenges

LonWorks

- Let the buyer be aware

- LonWorks provides a method for a building owner to purchase building automation controls from <u>multiple vendors</u> that can integrate with your existing base wide network and base wide "head end"...

. . . . .BUT . . . .

The devil is IN the details

Open Systems

➢ No standard definition for an open system

Here's one: One that is easily modified: where components (hardware and software) may be acquired from multiple sources and are readily added to or removed by not only the original installer but also by others after the original installation.

➢ There is MUCH more to open systems that just using a open protocol

➢ Ensuring 'Openness' is HARD work, but most of the work has been done, what's left is to enforce the specifications (UFGS-13801 & 15951)

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- Implementation at Fort Sill, OK.

  16 buildings ~ $1.3M

- Intent is to purchase a DDC system so that the 'Head-End' can be replaced without making hardware/software changes at the building level.

  – Maintaining an 'Open System' access to Time Schedules, Alarms, Manual Functions & Trending

Design

Make a Plan

You need a good picture in mind of what you need

System Architecture

System Architecture

Workstation (Front End)

IP - Network

Building

Router (LON to IP)

Lon-network

Sensor

Actuator

ASC

Repeater

VAV Controller

ASC

Programmable Controller
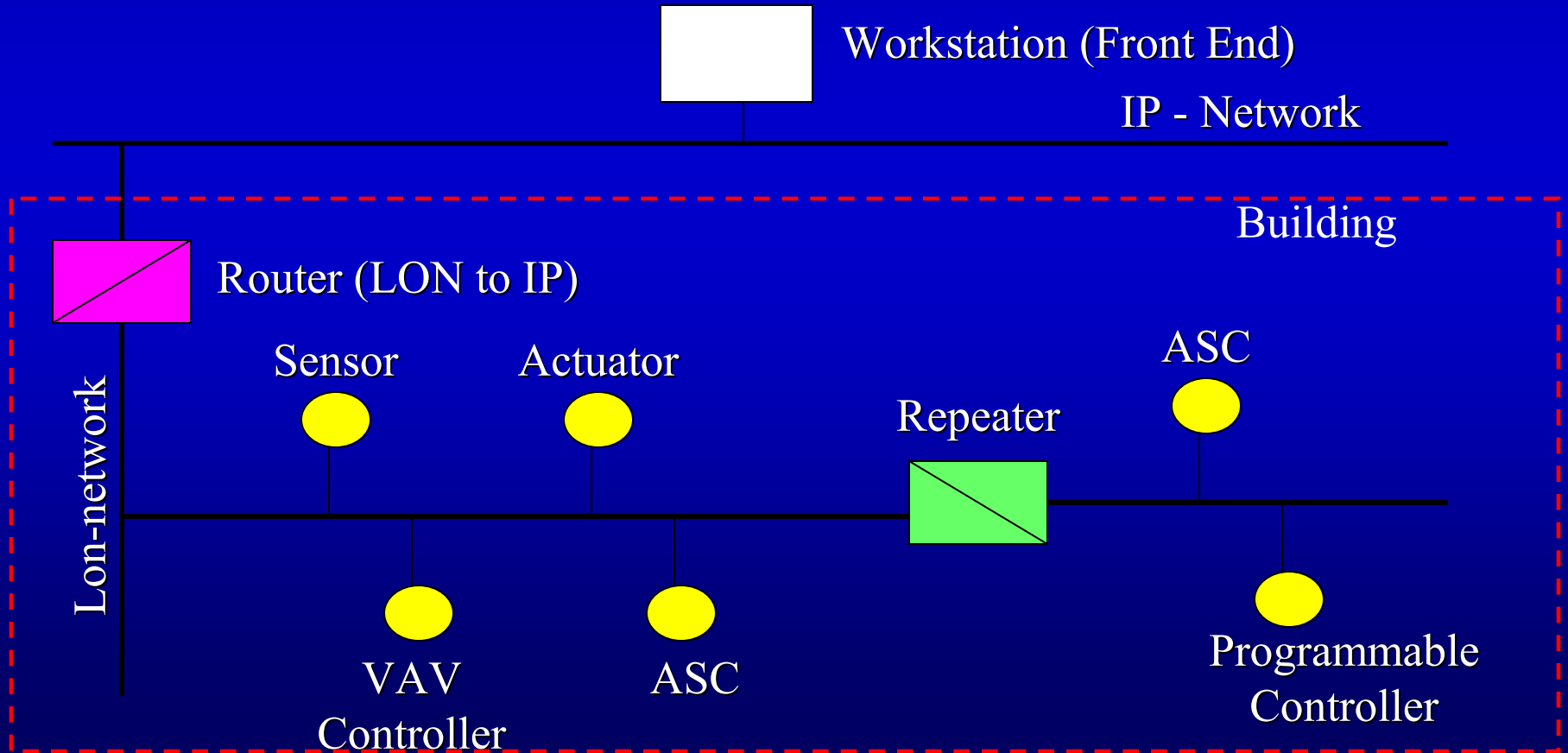
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Design

➢ Most control vendors perform, Scheduling, Alarm Handling & Manual Functions in a proprietary method, <u>EVEN</u> on an "Open" System

➢ The Guide Specs include requirements that these be done in a specific and Open manner, using Standard Network Variable Types (SNVTs), allowing another control vendor to access all these functions

Design

➢ <u>"Kinky SNVTs"</u> – improper use of SNVTs

– when a controls vendor violates the SNVT data format standards.

<u>Example:</u> using a snvt_amp to transfer a temperature, instead of the proper SNVT snvt_temp_p.

Specifications

➢Two General Types of Controllers:

    - Application Specific Controllers (ASC)

    - General Purpose Programmable Controllers (GPPC)

➢The preferred type is ASC's

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Specifications

➤ Unless the Government makes an exception, all Application Specific Controllers (ASC) shall have plug-ins which must be supplied by the controls vendor

➤ Plug-In – software tool that gives you a better look and feel to configure an ASC.

Specifications

- Programmable Controllers
  - Permitted in the project
  - Need not be LonMark Certified
  - Needs to conform to the LonMark Interoperability Guidelines
  - Ensure there are sufficient numbers of SNVTs (input and output) available to fulfill its function.
  - Ensure all SNVTs are defined in the Points Schedule

Specification

➤ The Programmable Controllers are most easily replaced with the same make/model of controller (this allows the reuse of the program)

➤ If another vendor's programmable controller is used, it will require new programming for it to perform the same functions as the old unit… but then it can be wired right into the existing network.

Specifications

- Manual overrides of inputs/outputs (good for test mode use) are not always available. All of the output manual overrides are a requirement of the current specification, Inputs are not.

- Be aware of the advantages of exercising the manual overrides.

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Execution

➢ **Some Point Schedule Requirements – (DRAFT UFCs) http://www.cecer.army.mil/KD/HVAC/**
- **Shows device addresses**
- **Shows device configuration settings**
- **Shows Graphical User Interface (GUI) Points**
  - **Alarms**
  - **Trending**
  - **Scheduling**
- **Shows variables that are available on the network**
- **Shows which points are available for manual functions (overrides)**

Execution

- <u>Ensure</u> that your controls contractor provides the network configuration software tool (UFGS-13801)

- <u>Ensure</u> that the devices and head-end conform to and utilize an LNS database (Beware! Some vendors convert an LNS database to a proprietary format)

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Execution

➢ Establish Master Plan

➢ Get Smart – find training opportunities

– Prospect Courses (Design 340, QV 382, UMCS 094)

➢ Ensure qualified QA people are available to witness verification testing

Challenges

➤ The control vendors, given their choice, would rather sell you a proprietary system.

➤ Ensuring that the final product is truly 'Open' demands attention to <u>many</u> details (just because it "talks" LonTalk does not make it an 'Open System').

Challenges

➢ New Building Integration Issues:
- Different vendors, tools and software
- Backup the LNS Database BEFORE any new integration and after successful commissioning

➢ Insist on complete interface documentation. No finger pointing allowed.
- Point Schedule (Very Important!)
- LNS Database

Challenges

➢ Clarify who is in charge of the network. One may step on the other and lose data.

➢ New buildings and addressing schemes

– node and domain addressing

- no undo button.

Challenges

Directorate of Information Management (DOIM)

- **Critical** element in the success of your project – involve them **EARLY** in the project
- Increased network security requirements
- Networthiness – undefined policy / requirements
- Fee for IP drops – budget/cost issue?
- Alternative - dedicated DDC network – cost?

Summary

➢ To succeed with Open Systems:

    ➢ Use and enforce the specifications

    ➢ Make a plan

    ➢ Seek qualified people, training and vendors

    ➢ Test, Test, Test

    ➢ Send flowers to DOIM

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Questions?