Addendum No.: 4   **Date Of Addendum: 9/11/2020**

CT DAS ❚ Construction Services ❚ Office of Legal Affairs, Policy, and Procurement

Roof Top A/C and Roof Replacement
300 Corporate Place
Rocky Hill, CT
BI-2B-387

TO: **Prospective Bid Proposers:**

This Addendum forms part of the "Contract Documents" and modifies or clarifies the original "Contract Documents" for this Project dated 5/22/2020. Prospective Bid Proposers **shall** acknowledge receipt of the total number the Addenda issued for this Project on the space provided on Section 00 41 00 Bid Proposal Form.

Failure to acknowledge receipt of the total number the Addenda issued for this Project on the space provided on Section 00 41 00 Bid Proposal Form shall subject Bid Proposers to disqualification.

The following clarifications are applicable to drawings and specifications for the project referenced above.

Item 1:

Q: Please provide the type of radiator covers used in the building with dimensions. (If necessary I would visit the site and take the dimensions of the radiators covers. I would only have to measure one. We think it may be less costly to replace the covers in lieu of painting them. That would be a costly labor intensive proposition.)

A: Radiation covers shall be repaired, painted & reinstalled in exact location labeled under demolition per keynote 1 on M-101, M-102 & M-103. The exact make/model of the radiator covers is not available to the design team. The approximate lengths of radiator covers are shown on drawing M-101, M-102 & M-103. Radiator lengths as indicated are approximations of exact conditions to be verified in the field. Refer to image below issued in the 2020.07.24 Existing MEP Pictures for Bidding document for existing perimeter finned tube.

Existing Perimeter Finned Tube

Item 2:

Q: Specifications 01 11 00 Summary of Work: After reviewing the phasing plans there is a plan for the split A/C Units as well as a plan for AC-1/ACCU-1 & AC-2/ACCU-2. I believe the only split units on this job are AC-1/ACCU-1 & AC-2/ACCU-2 so for the split A/C Unit phasing plan I am assuming it is referring to the same units as the other plan. The problem is that these plans have different dates. Please advise what plan is the one that is intended or if I am missing something as far as split units that need to be removed that I am unaware of.

A: There are split indoor A/C units and their associated condensing units (located on the roof on drawing MD-104, keynote #8 and on M-104, keynote #4) serving the Third-Floor server room that shall be removed and reinstalled in such a manner so that there is no interruption in the operation of the space served. These split systems are

Addendum No.: 4   **Date Of Addendum: 9/11/2020**

separate from AC-1 & AC-2 and their associated condensing units ACCU-1 & ACCU-2. The removal and reinstallation for these systems are noted in the Phasing Plan in 01 11 00 Summary of Work.

Item 3:

Q: Can you verify that existing fire alarm system is simplex?

A: The existing fire alarm system is manufactured by Simplex Grinnell.

Item 4:

Q: Per article 4.9 of the general conditions of the contract, the contractor is required to provide a fulltime project manager who is to be located and assigned to the project site during and for the duration of the work. Considering the limited scope of this project, could you please advise if this requirement for a fulltime onsite project manager can be waived and that it would be acceptable to just provide a project manager assigned to this project who is not fulltime onsite but rather would be based out of the contractors office and spend the time needed to properly manage the project including visiting the jobsite and attending project meetings.

A: A project manager must be on the project and be located and assigned to the project site during and for the duration of the work. No exceptions can be made.

Item 5:

Q: Please confirm that the contractor's site superintendent, ie., the contractor's quality control (QC) person can also be the SSHO on this project as long as they meet the SSHO requirements in the project specifications.

A: Yes, that is correct.

Item 6:

Q: Replacement of the sloped glazing and construction of the new entrance canopy will have substantial impact on both the access into the building from the front entrance as well as use/travel through the rooms below the sloped glazing. Do we need to maintain access through the front entrance and these areas during performance of this work or could a side door be used as a temporary entrance and the areas below the sloped glazing replacement be temporarily closed off during performance of this work?

A: 01 11 00; 1.8 Occupancy Requirements A1 states that, "The contractor shall be responsible for preparing egress plans for Owner approval and for DAS/CS Office of the State Building Official and Office of the Fire Marshall for approval if required." 1.11 D Site Logistics Plan(s) describes what is to be included on a site logistics plan that will be reviewed with the Architect and Agency including temporary access-ways, building egress, proposed pedestrian traffic flows in the interior and exterior of the building.

If the contractor determines the need to limit access at the front entry, the logistics plan should include alternate access. The access will need to be coordinated with the Agency for security requirements and temporary signage.

Item 7:

Q: The units for the roof have notes on the mechanical drawings but do not have the notes in the remarks so I am not sure which pertain. M-302 and M-303. Remarks for AC-1, AC-2, AC-3, AC-4, B-1, B-2, VFD-1 VFD-2 etc. have notes underneath but remarks are blank. I am not sure which notes pertain to which unit or item

A: All notes shown below the equipment schedules shall apply to all of the equipment scheduled unless remarks are noted specifically for certain equipment.

Item 8:

Q: The lighting room controller is not shown on the E-101A drawing for the lights. I also want to verify that you can only put 2 lights and 1 OCC sensor on each controller? That would make for a total of 5 controllers.?

A: Lighting room controller shall be located above ceiling, as noted on detail 3/E-002.

Item 9:

Q: Could we get the Panel manufacturers for the existing panelboards? I.e., PPP1, PPP2, PPP3 PP1, PP22, and PP32.

A: KR Response: Most panelboards in the first floor electrical room are manufactured by Siemens. The switchboards, outdoor lighting panelboard, and heating panelboard are manufactured by ITE. EP panelboard is

Addendum No.: 4   **Date Of Addendum: 9/11/2020**

manufactured by Square D. Panelboards in the second and third floor electrical rooms are manufactured by Siemens. Penthouse equipment PPP1 and PPP3 are manufactured by ITE. PPP2 is manufactured by Siemens.

Item 10:

Q: No panel designation for the heaters in the connector entrance (need to supply conduit and breakers). Please advise.

A: See response to Item 9.

Item 11:

Q: No panel designations on E-102 or E-103 for ceiling mounted junction box with terminations (need to supply breakers). Please advise.

A: See response to Item 9.

Item 12:

Q: No panel designations on E-301 for HWP-1,2,3,4 (need to supply breakers). Please advise.

A: See response to Item 9.

Item 13:

Q: No panel designation for boiler control panel (need to supply breakers). Please advise.

A: See response to Item 9.

Item 14:

Q: Could you please advise on who the fire alarm vendor is for the building? i.e., Simplex?

A: See response to item 3.

Item 15:

Q: On drawing E-101A connector floor plan it shows "Sm". Are these switches located on the nearest wall to the radiant panel?

A: Correct, equipment switches shall be located above the ceiling on the nearest wall of the associated radiant panel.

Item 16:

Q: Who is the fire alarm vendor or who has the fire alarm contract for this building?

A: See response to Item 3.

Item 17:

Q: Is there a BMS contractor for this building? Is control work being done under Mechanical Div 23?

A: Portions of the mechanical systems are controlled through the existing Delta BMS system. The existing Delta BMS control system shall be replaced with a new complete Direct Digital Control system as specified in Specification 230900, under Division 23.

Item 18:

Q: Can a lift fit into the connector for the high ceiling?

A: There is an exterior 6' wide door at the connector that can be used for bringing in a small lift.

Item 19:

Q: What type of heating element will be used for temporary heating if necessary?

A: Specification 23000 Section 3.20 Temporary Heat: Heating to the building shall be maintained at all times when required. If schedule does not allow for seasonal changing of the boilers or maintaining conditions for proper construction methods then temporary heating may be required. Refer to Phasing General Note(s) on the plans.

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Item 20:

Q: Could we get the Panel manufacturers for the existing panelboards? PPP1, PPP2, PPP3 PP1, PP22, PP32, No panel designation for the heaters in the connector entrance(need to supply conduit and breakers). No panel designations on E-102 or E-103 for ceiling mounted junction box with terminations (need to supply breakers). No panel designations on E-301 for HWP-1,2,3,4 (need to supply breakers). No panel designation for boiler control panel (need to supply breakers)

A: See response to item 9.

Item 21:

Q: In addendum 2 on page 5 there is a picture of the fin tube radiation which looks like sterling senior base board. It would be more cost effective to change the front covers and the wall ends than to remove them off site to a paint shop and reinstall them. The existing would also have the hole in the front where the manual control valve is located. If someone can identify and confirm this is sterling base board and give us the correct height I believe this will be a more cost effective alternative to painting the existing baseboard. Please advise.

A: The scope of work for the radiators will remain as noted in the bid. If a bidder wants to carry changing the covers in their bid because they can get a better price than painting the covers that is a business decision on their part.

Item 22:

Q: The temp heating spec calls for us to supply fuel which is understandable if it was for temp heat for construction use, ie., for concrete, etc. However, could you please confirm that the temporary heat for the building (ie., as a result of taking the existing equipment offline and replacing with new) will be tied into the existing services within the building and we are not responsible for these fuel costs.

A: Refer to previous response regarding temporary heating. The contractor shall refer to Spec. 230000, 3.02; G. Contractor to coordinate any additional requirements with the DAS construction manager.

G. After the building is enclosed and the permanent heating system or portion of the system is substantially complete and acceptable to the Owner for temporary heating use, the contractor may, at the Owner's discretion, be permitted to use such heating facilities for temporary heat.

Item 23:

Q: Last year when this project was bid, there was an addendum calling for a whole new control system. This bid's document's appear to have language suggesting utilizing and modifying the existing system and also language and specs suggesting a whole new control system. Could you please confirm that we are to provide a whole new HVAC control system as part of this project.

A: The building control system will be a new, complete Direct Digital Control system replacing the existing Delta Controls System. Refer to Specification 230900 for requirements.

Item 24:

Q: Please see the attached product substitution request from Trane. Please advise if this is acceptable.

A: Substitution request is granted, see attached Form 7001 and product information.

Item 25:

Q: Drawing E-102 shows TCP (temperature control panel). Who is to furnish the panel?

A: Temperature control panel to be furnished by BMS contractor under Specification 230900. Refer to BMS Responsibility Matrix for work required by division.

Item 26:

Q: Is the mechanic contractor or electrical contractor responsible for furnish of VFD's?

A: Mechanical contractor (Division 23) shall furnish the VFD's. Refer to Specification 232913 for requirements.
.

Item 27:

Q: Can the 24" Temp duct be run as heavy duty flex inside the penthouse? It would be more cost effective than spiral when relocating it.

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A: Heavy duty flexible ductwork for the temporary 24" round ductwork shown on the phasing plan is acceptable for routing inside the penthouse.

Item 28:

Q: More information is needed on the louver section that is to be removed for the 2-24" diameter temp ducts. We need to know how big the louver section to be removed is and how it is fastened together.

A: Refer to architectural detail M/A-302 for fastening method of louver to building. The overall louver is approximately 20'-0"L x 8'-0"H. The louver is split into two sections. See image below at louver section.
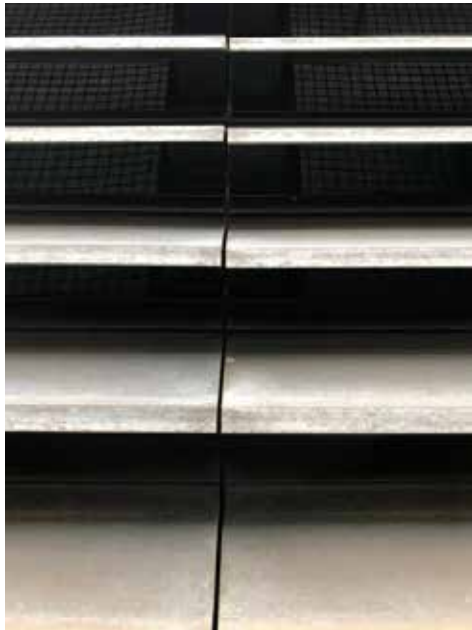
All questions must be **emailed** (not **verbal** or by **phone**) to the consulting Architect/Engineer Lori Donadio, OAKPARK Architects, Email: lorid@oakparkarchitects.com with copies sent to the DAS/CS Project Manager (Barbara Cosgrove, Email: barbara.cosgrove@ct.gov and Construction Administrator Rizwan Mumtaz, Email: rmumtaz@aiengineers.com

End of Addendum 4

Mellanee Walton

Mellanee Walton, Associate Fiscal Administrative Officer
State of Connecticut
Department of Administrative Services, Construction Services
Office of Legal Affairs, Policy, and Procurement
450 Columbus Boulevard, Suite 1302
Hartford, CT 06103

| Request Phase: | Pre-Bid ☒ | Post Bid ☐ | (*See Article 15 Materials: Standards, General Conditions*) |

| (If Pre-bid only) Current Bid Due Date: | 8/27/2020 | Request No.: | 1 | Dated: | 8/27/2020 |

To: State of Connecticut
Department of Administrative Services,
Construction Services

DAS Project No.: BI-2B-387

Project Name / Location: Roof Top A/C and Roof Replacement
300 Corporate Place
Rocky Hill, CT

| References: | Specification(s): | Section(s): | 23 09 00 | Paragraph(s): | 2.01, A |

| | Drawing(s): | Drawing(s) No(s): | | Detail(s) No(s): | |

Contractually Specified Product: Tridium Niagara BMS Framework

Contractor Proposed Product: Lynxspring/Trane Niagara BMS Framework

Proposed Product is: Equal: ☒ Substitute: ☒ Model No.: JENEsys

IMPORTANT:
See Attached Data For Both Specified And Proposed Products
As Required By Article 15 General Conditions.

Data attached: Drawings: ☐ Product Data: ☒ Reports: ☐ Samples: ☐

Tests: ☐ Other:

Reason(s) for not providing the Specified Product:

Lynxspring/Trane Niagara BMS is Trane's Niagara offering utilizing a total BACNET solution.

Similar Installation:

Project Name:	ACES Education Center for the Arts	**Architect's Name:**	N/A
Project Location:	60 Audubon Street New Haven, CT 06510	**Owner's Name:**	Area Cooperative Educational Services
		Date Installed:	November, 2018

Will proposed substitution impact other parts of the Work?	No ☒	Yes ☐	*If Yes Attach An Explanation.*	
Will proposed substitution increase Contract Time?	No ☒	Yes ☐	*By Number Of Calendar Days*	

Actual Dollar Savings to the State of Connecticut if substitution is accepted: **$** | TBD

The Undersigned Certifies:
That The Proposed Request For An Equal Or Substitute Product Conforms To All Of The Requirements Of Division 01 General Requirements, Section 01 25 00 Substitution Procedures.

Request Submitted By General Contractor / CMR:

(Firm's Typed Name)

By:

(Typed Name)	*(Title)*	*(Signature)*	*(Date)*

Contractor / CMR Send copies to :   **DAS PM:** ☐   **CA:** ☐

Consultant's Request Received on (Date):   9/3/2020

Consultant's Review – This Substitution Request is:

☒ **Approved:** *(Submittal(s) in accordance with Div. 01 General Requirements, Section 01 33 00 Submittal Procedures.)*

☐ **Approved as Noted:** *(Submittals in accordance with Div. 01 General Requirements, Section 01 33 00 Submittal Procedures.)*

☐ **Rejected:** **Use Specified Materials.**

☐ **Rejected:** **Request Not Received Within Specified Time Period - Use Specified Materials.**

Reviewed Issued By:

Name: Craig F. Razza, PE
(Typed Name)

Title: Partner

Signature: | 9/10/2020
(Signature)   *(Date)*

CONSULTANT Send copies to: DAS PM ☐   CA ☐   Chief Architect ☐   Chief Engineer ☐

If Approved: As noted by Consultant,
DAS Chief Architect:

(Signature)   *(Date)*

Copies: Project File   Red R2

END

Trane's New Integration Platform

Lynxspring's JENEsys™

Trane is Working with Lynxspring, Why?

- Speed to market

- Established training and support program

- Custom development capabilities

- Available software components to simplify integration

- Build's their own hardware (JENE)

  – Based on a widely accepted Niagara AX platform

- "Best of Breed" strategy

JENEsys™ Powered by Niagara
- a ubiquitous technology

- Designed to unify diverse devices, protocols and data
- Built-in Internet standards take advantage of the web
- Embedded and scalable solution – same software up and down
- Connects real time data from field devices to enterprise
- Integrated tools sets – for fast development
- Connects disparate devices peer to peer without independent of central server

The Niagara OEM Community

What Integration Means for Trane's Clients

- Renewed focus on providing solutions to your current environment

- Ability to provide you with system solutions

- Allow us to say:

  "Yes, we can work with your current system"

  "Yes, we can provide an integrated solution"

- A "best of breed" integration platform to complement Trane controls product portfolio

- Integration platform extends Tracer's ability to provide a total building automation solution

integration
interoperability
information
intelligence

Product Overview

JENEsys™ Internet Integration Platform
## - flexible, scalable…

JENEsys™ PC 1000 (64MB & 128MB)

JENEsys™ PC 6000 (128 MB & 256MB)

JENEsys™ Web Server Software

JENE PC 1000

- Fully Programmable

- 64 or 128 MB of RAM, 64 MB Flash Drive

- 1-1000 points

- Communicates 20-40 Nodes (LON or BACnet controllers)

- Add features as you need them, (Lon, Bacnet I/P, Bacnet MSTP, Modbus, Modem, etc.)

- Add Web UI (graphics) for stand alone front end.

- Add Niagara™ Network Driver for peer to peer communication, to be part of a larger system.
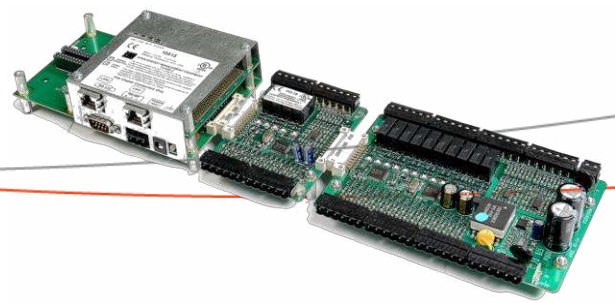
JENE PC 6000

- Embedded PowerPC 524MHz Processor

- 128 or 256 MB RAM; 128 MB Flash Drive

- Large Bus Network Controller 41-120 Nodes

- 1001-2000 points

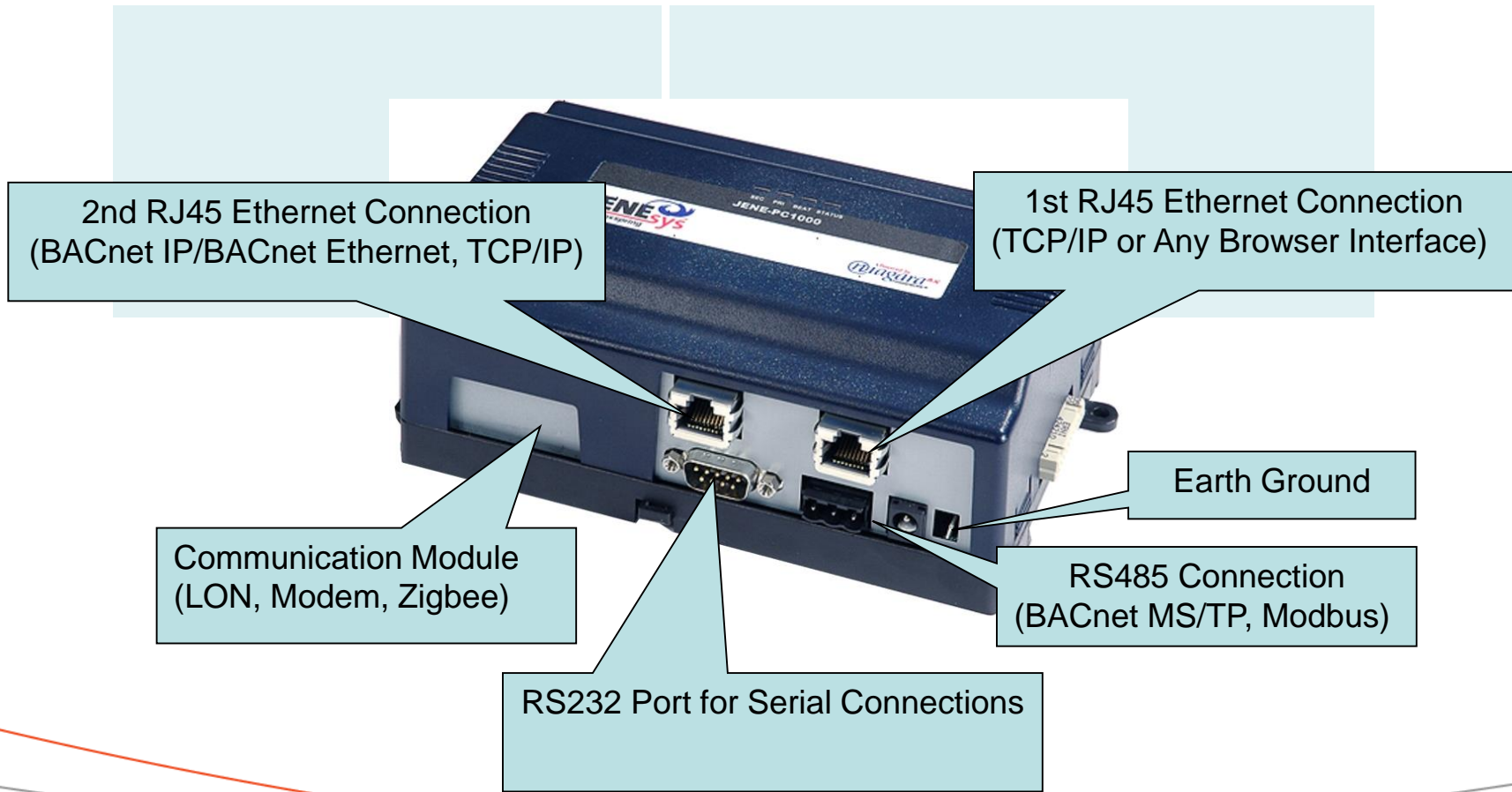- Same I/O and Communication options as the JENE PC 1000.

JENEsys™ Web Supervisor

- Use Supervisor primarily as a DB application

- Network Server for multiple JENE's

- Single point of access

- Utilize large memory and disk space for data

- Includes the programming tool

- May be purchased as a BACnet interface to BCU for data collection and transfer applications
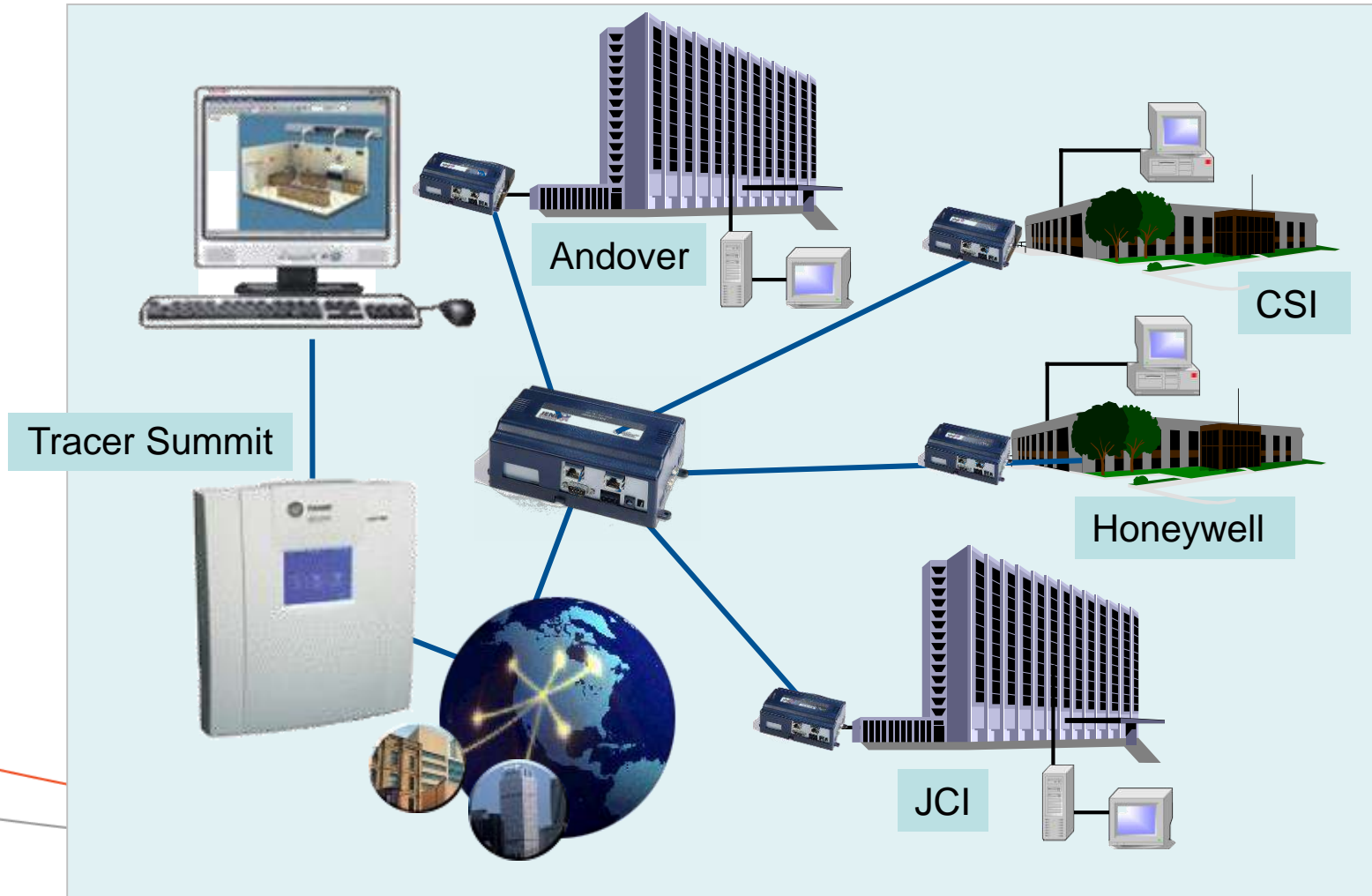
JENEsys™ Built-in Communications

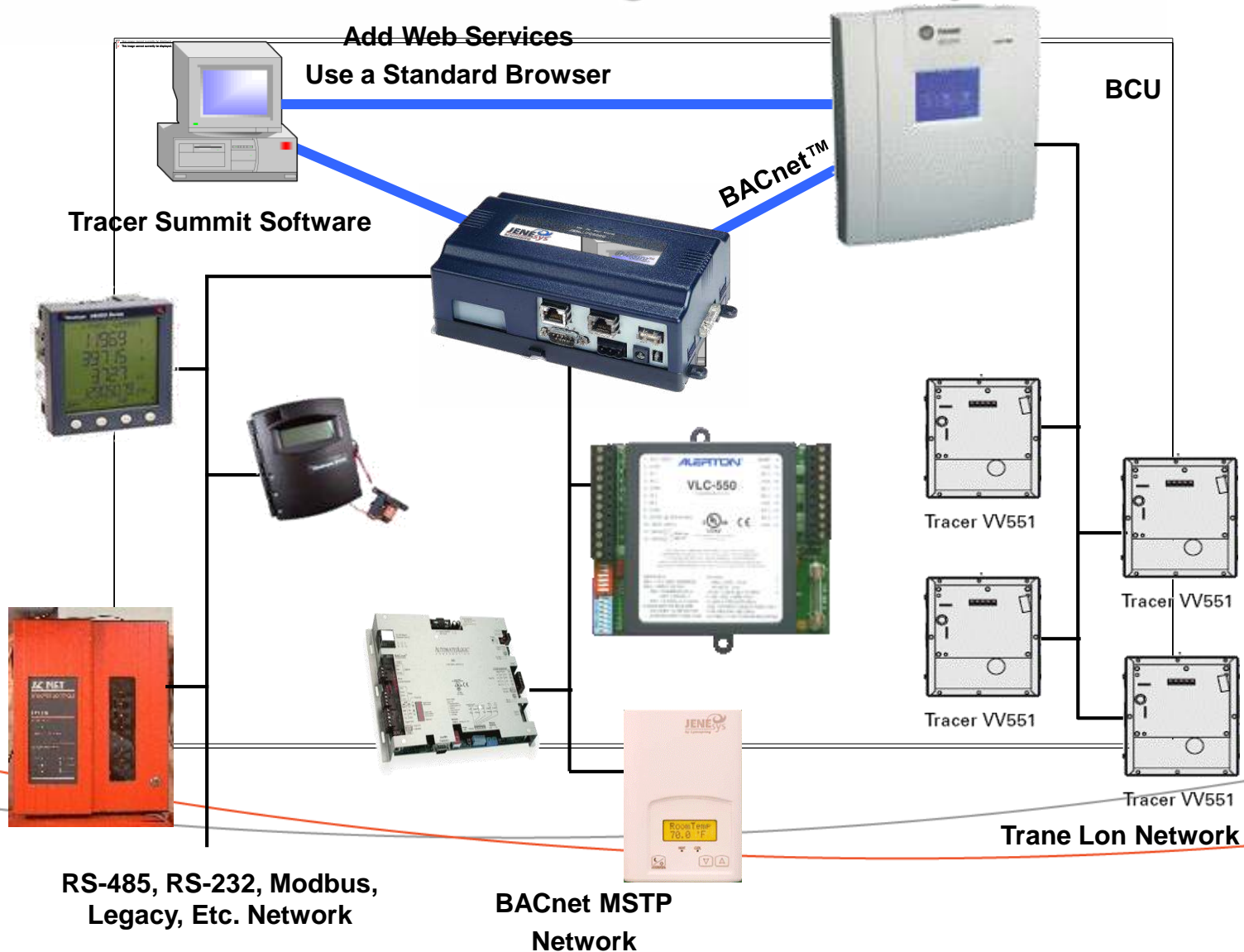2nd RJ45 Ethernet Connection
(BACnet IP/BACnet Ethernet, TCP/IP)

1st RJ45 Ethernet Connection
(TCP/IP or Any Browser Interface)

Earth Ground

Communication Module
(LON, Modem, Zigbee)

RS485 Connection
(BACnet MS/TP, Modbus)

RS232 Port for Serial Connections

Target Application

Legacy Integration

Legacy Integration Projects

Andover

Tracer Summit

CSI

Honeywell

JCI

Add 🔴 *TRANE* to Existing Control System

Add Web Services

Use a Standard Browser

BCU

BACnet™

Tracer Summit Software

Tracer VV551

Tracer VV551

Tracer VV551

Tracer VV551

RS-485, RS-232, Modbus, Legacy, Etc. Network

BACnet MSTP Network

Trane Lon Network

Our Solution "Normalizes" Data

- JENEsys™ is an integration platform
- JENEsys™ "normalizes" integration data
- JENEsys™ is not a gateway

Gateway

- Translates protocols – typically using a matrix type equivalency table – N to N relationship
- Very specific to revision level on both sides
  – Difficult to upgrade either side without causing a problem
- Requires extensive support from vendor at the corporate level to implement.
- Must be cooperation between parties involved.
- Cost will vary from expensive to very expensive

Gateway Matrix Example

| Item	BACnet Registry	BACnet Instance	SNVT Name	SNVT Type
Supply Air	Analog	AV 00	nvoDischAirTemp	temp_p / 105
Outside Air	Analog	AV 01	nvoOutsideTemp	temp_p / 105
Fan Status	Boolean	BV 00	nvoUnitState	state / 83
Space Temp	Analog	AV 10	nvoSpaceTemp	temp_p / 105
Fan Start/Stop	Boolean	BV 00	nvoUnitState	state / 83
Compressor Start/Stop	Boolean	BV 16	nvoCompState	state / 83

Gateway – N to N Example
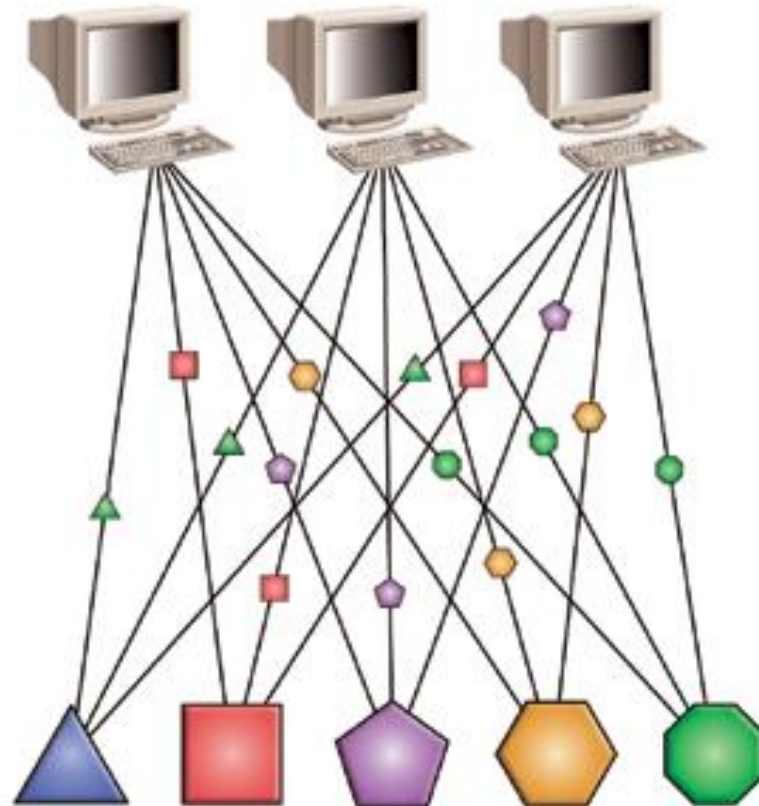
Normalized Data

- Is a relational database function
- Brings all data into the platform
- Has higher data integrity
- Provides a uniform view of device data
- Is less subject to "versioning" issues
- Allows the data to be output into multiple formats (e.g. one to anything conversion)
- Provides common "look and feel" to all systems
  - Similar to FILE EDIT VIEW TOOLS in Microsoft
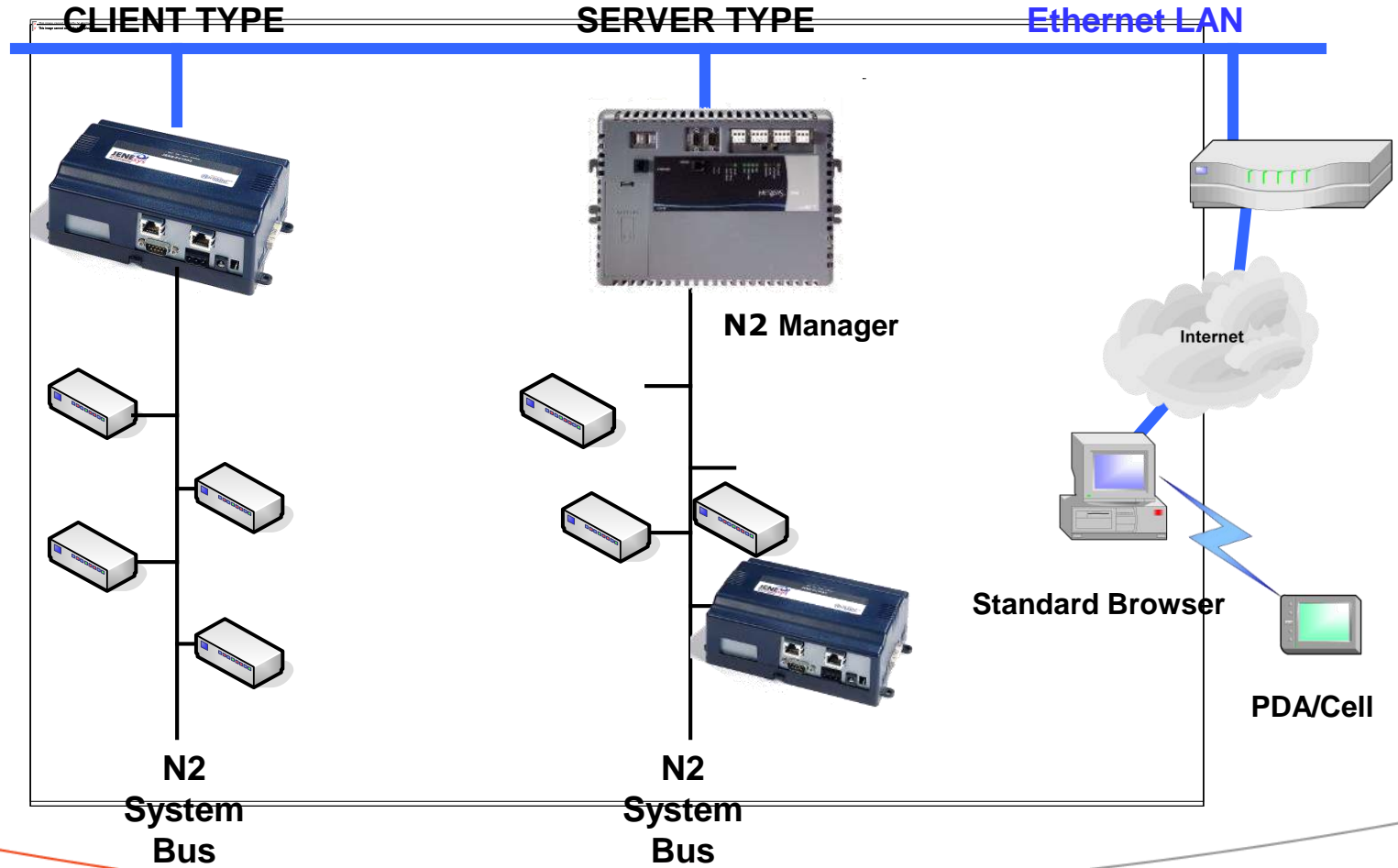
Normalized Data
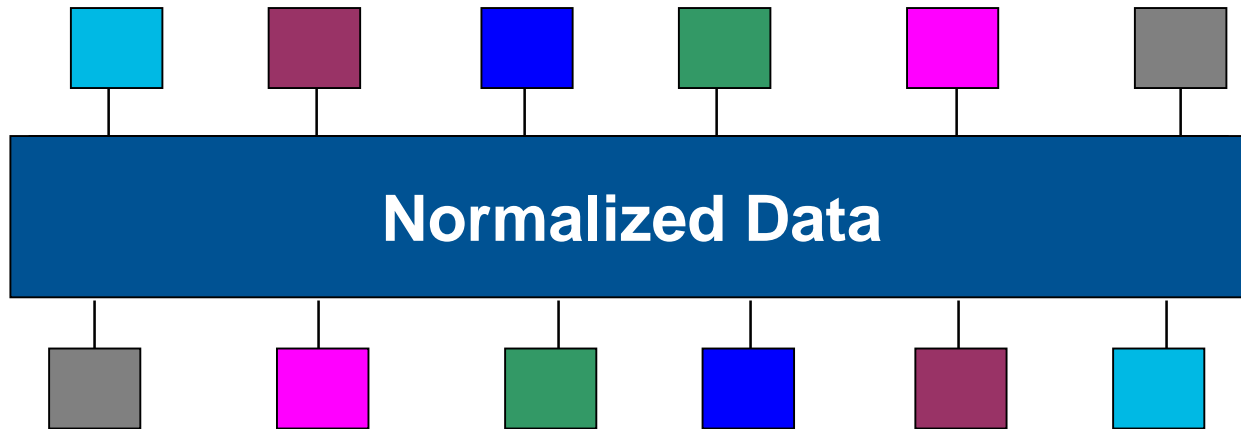
Takeaways on Normalized Data

- JENEsys™ provides normalized data
- This means:
  - A more robust interface
  - Easier data handling for integrators
  - More flexibility in providing interfaces
  - One to anything capability
  - Less prone to re-visioning issues

Open Client Drivers

Driver	Description
BACnet IP Client	BACNet IP Client over Ethernet
BACnet MS/TP	BACNet MS/TP over RS-232 or RS-485
LON	LON over twisted pair, FTT-10 Port
iLON	iLON over Ethernet
Modbus RTU	Modbus RTU over RS-232 or RS-485
Modbus TCP	Modbus TCP over Ethernet
M-Bus	M-bus serial and IP
oBIX Client	oBIX Client over Ethernet
OPC Client	OPC Client over Ethernet
SMS	SMS over Ethernet
SNMP	SNMP over Ethernet
Z-Wave	Z-Wave via ACT RS232 to wireless interface

TRANE

Open Server Drivers

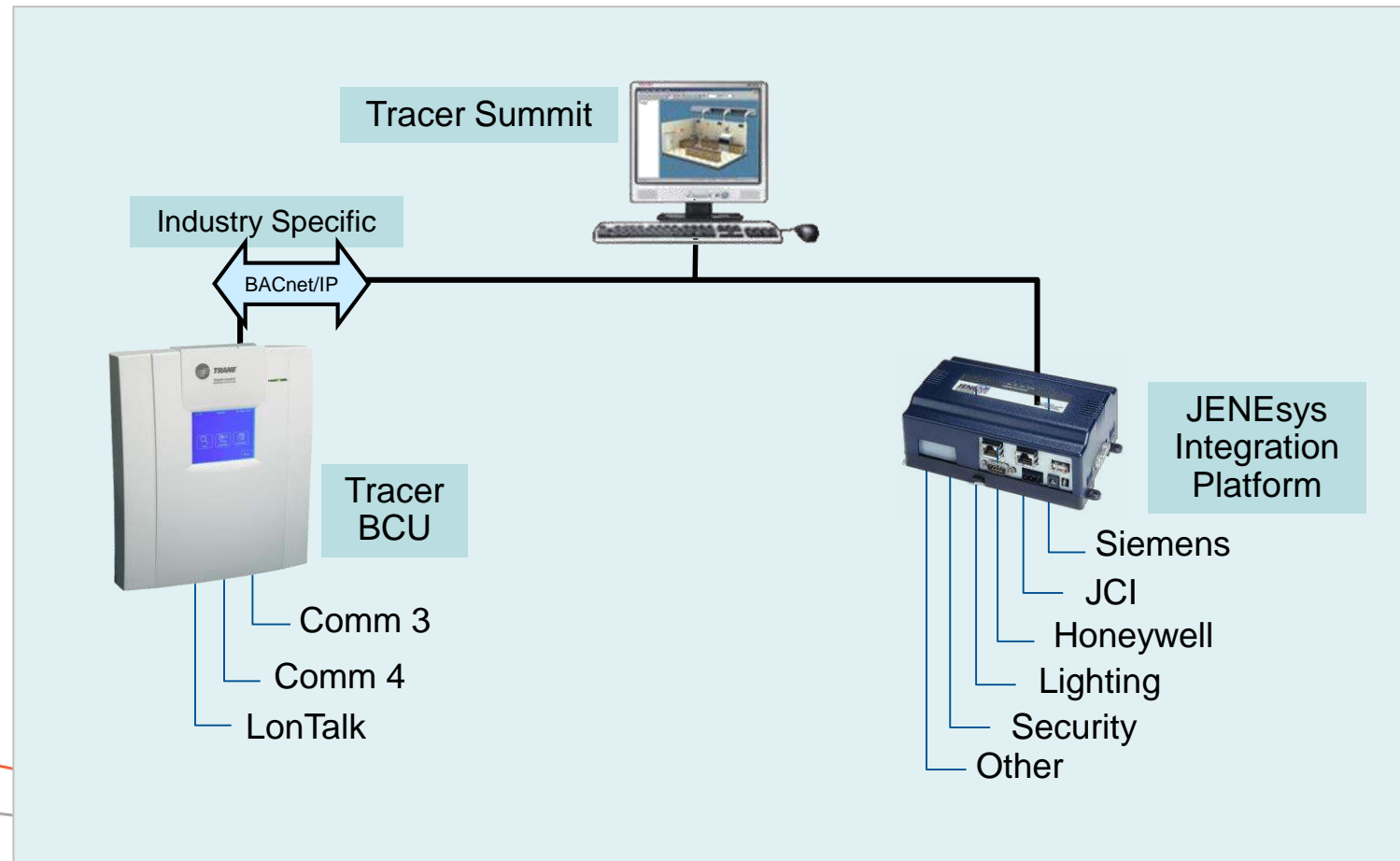| Driver	Description
BACnet IP Server	BACNet IP Server over Ethernet
Modbus RTU Slave	Modbus RTU Slave over RS-232 or RS-485
Modbus TCP Slave	Modbus TCP Slave over Ethernet
oBIX Server	oBIX Server over Ethernet
OPC Server	OPC Server over Ethernet

Legacy Client Drivers

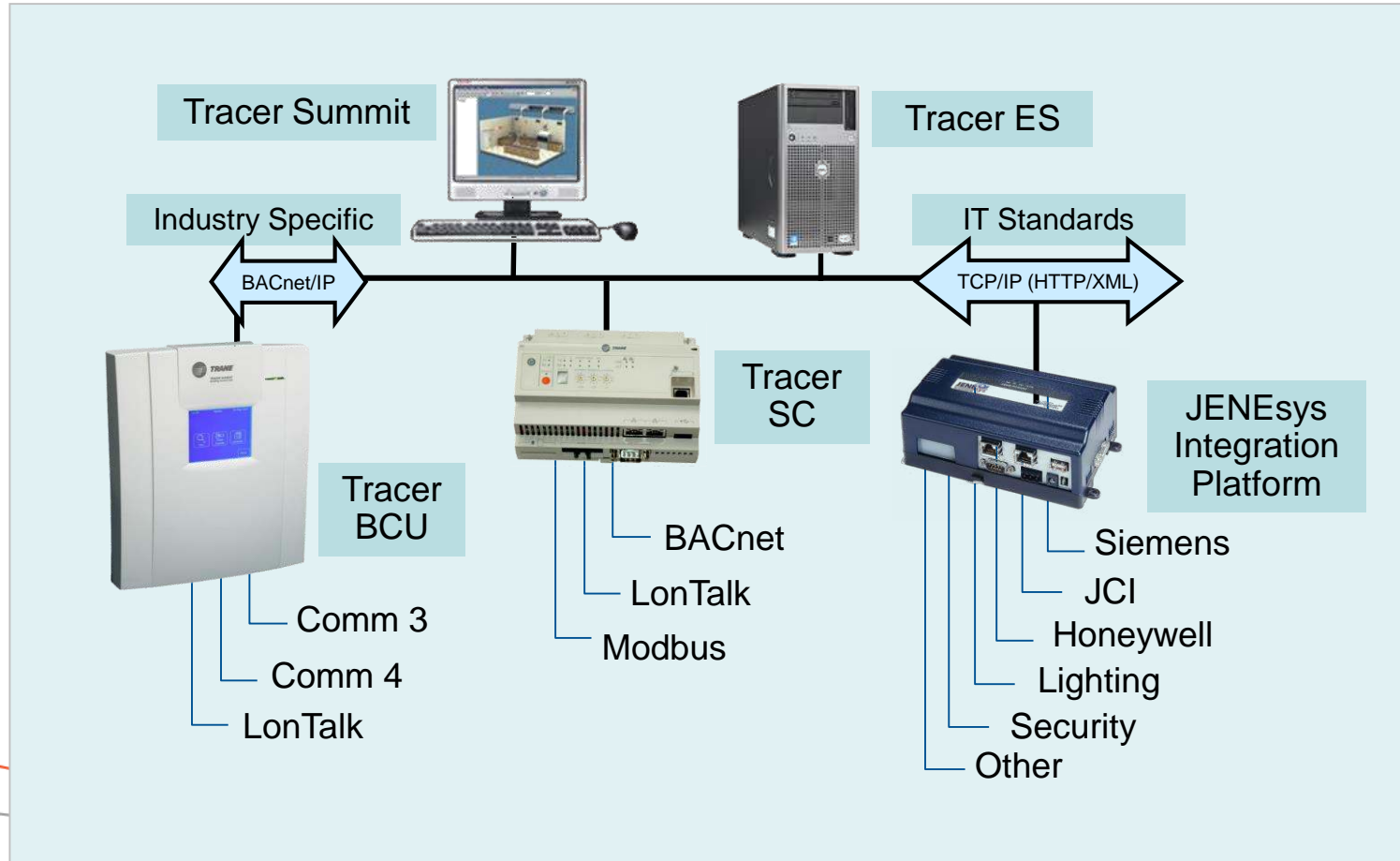| Driver	Description
AAM PHP	American Automatix PHP over RS-232 or RS-485
AAM PUP	American Automatix PUP over RS-232 or RS-485
Andover AC256	Andover AC256 over RS-232 or RS-485
Andover Infinity/Continuum	Andover Infinity/Continuum
Barber Coleman GCM	Network 8000 RS232 driver
Barber Coleman GCM	Network 8000 RS232 driver
Barber Coleman ASD	Network 8000 ASD RS485 Driver
Clipsal	Cgate Server Driver
Dynalite	Dynalite
E-Mon Meters	Class 300, 500, and IDRs
Global Cache	Global Cache over Ethernet
Helvar	Helvar via RS232 to DALI interface
Honeywell C-BUS	AX interface to Softyon C-Bus OPC Server
Honeywell C-BUS	OPC interface to Softyon C-Bus OPC Server
Honeywell Security	Vista
Honeywell Hometronic	Hometronic via RS232 to wireless interface
Horstmann Mainscomm	Hortsmann powerline via RS232 interface module

Legacy Client Drivers

Driver	Description
Johnson Controls	N2 Open
Josam Grease Trap Sensor	Josam Grease Trap Sensor [Note1]
Lang Oven	Lang Oven over RS-232 or RS-485 [Note1]
Motion Control Engineering	Motion Control Elevator Controller Interface over Ethernet
OMRON	FINS Ethernet Protocol
Resol	Resol via RS232 port
Siebe, Robertshaw	Microsmart
Siemens System 600/Apogee	RS-232 to MMI port
Sonance/IPORT	IPOD docking station
TCS/BASYS	RS-485 driver
Trend Serial	IQ Serial Driver
Trend Ethernet	IQ Ethernet Driver
Ubiwave	Ubiwave [Note1]
Veeder Root	VeederRoot over RS-232 or RS-485
Wattstopper Miro	Control of Miro wireless lighting devices

Adding an Integration Platform

Tracer Summit

Industry Specific

BACnet/IP

Tracer BCU

Comm 3
Comm 4
LonTalk

JENEsys Integration Platform

Siemens
JCI
Honeywell
Lighting
Security
Other

Complements Trane's Future Plans

Tracer Summit

Tracer ES

Industry Specific

IT Standards

BACnet/IP

TCP/IP (HTTP/XML)

Tracer SC

JENEsys Integration Platform

Tracer BCU

- Comm 3
- Comm 4
- LonTalk

- BACnet
- LonTalk
- Modbus

- Siemens
- JCI
- Honeywell
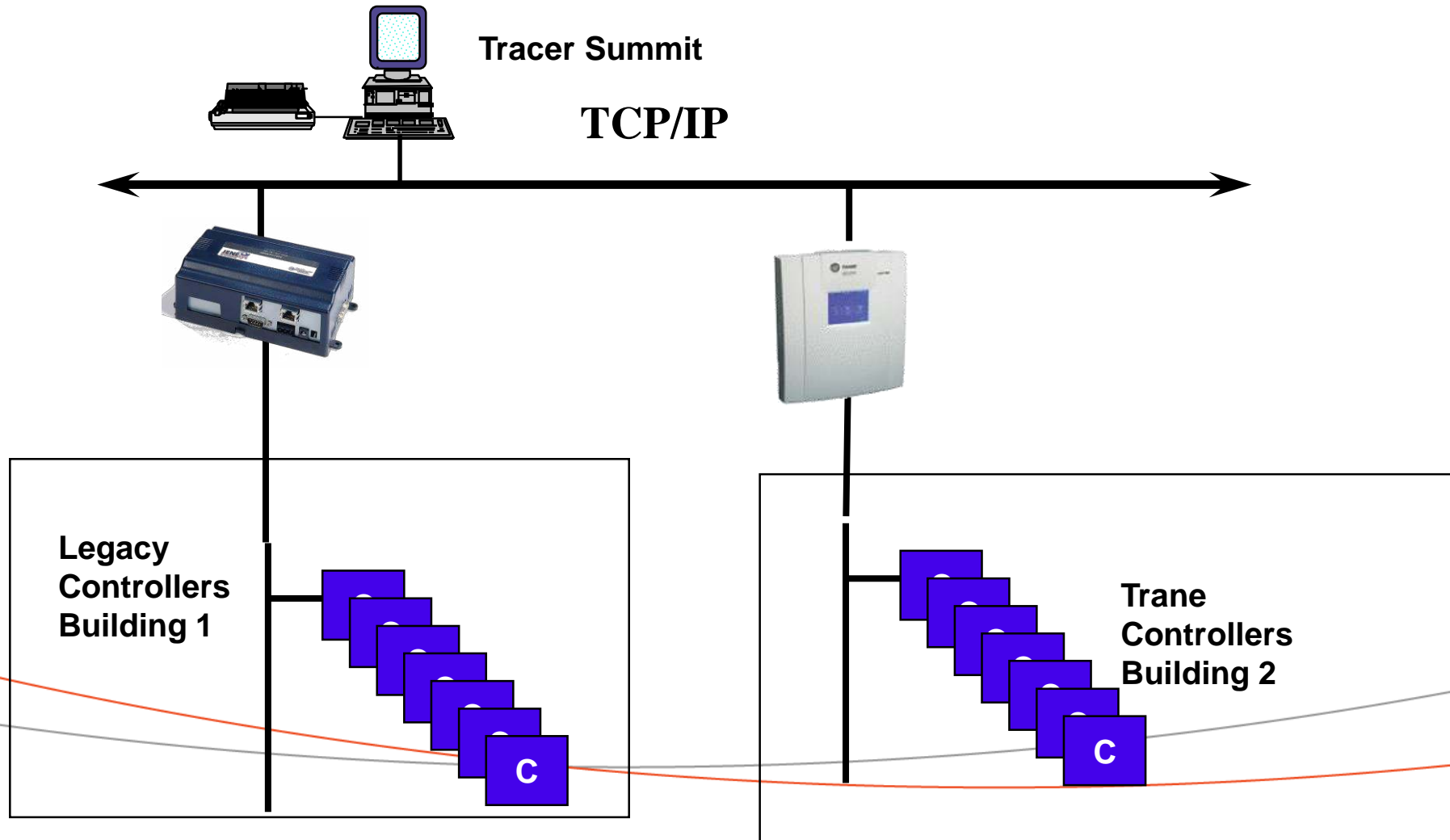- Lighting
- Security
- Other

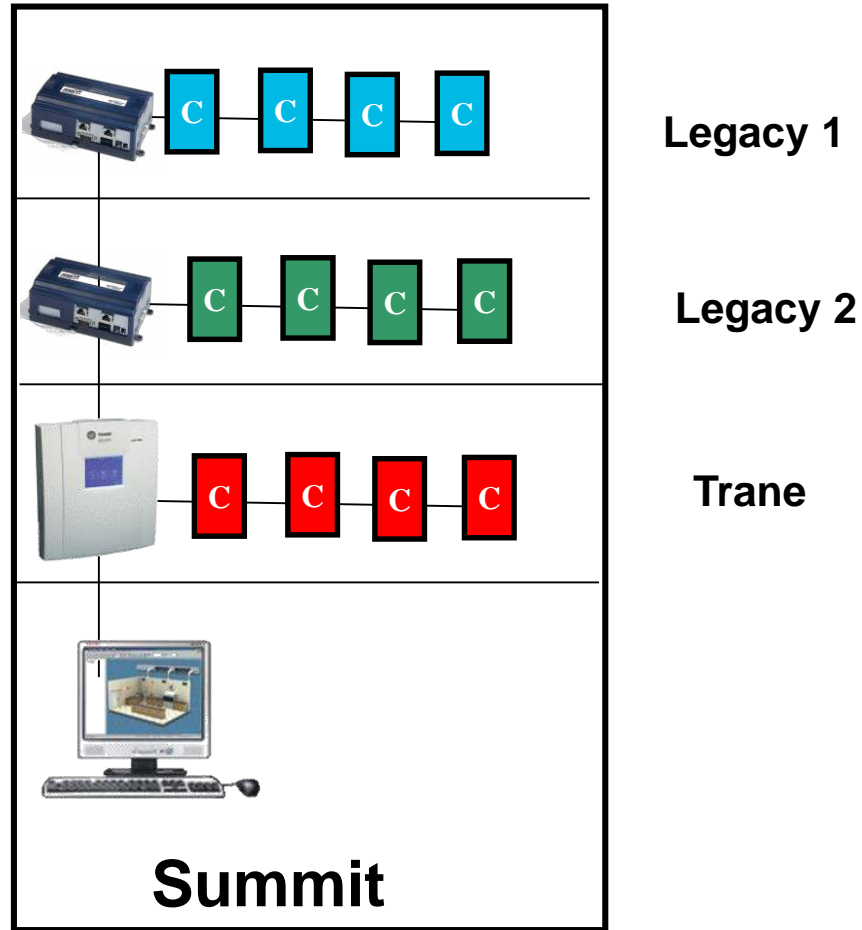# Gather Information from Other Applications

Target Applications

- Integrating 3rd Party Control Systems into Summit
- Purpose:

  – Save you money by deferring product change outs

  – Integrate existing systems into a Trane networks

  – Customer investment in other controls is not lost

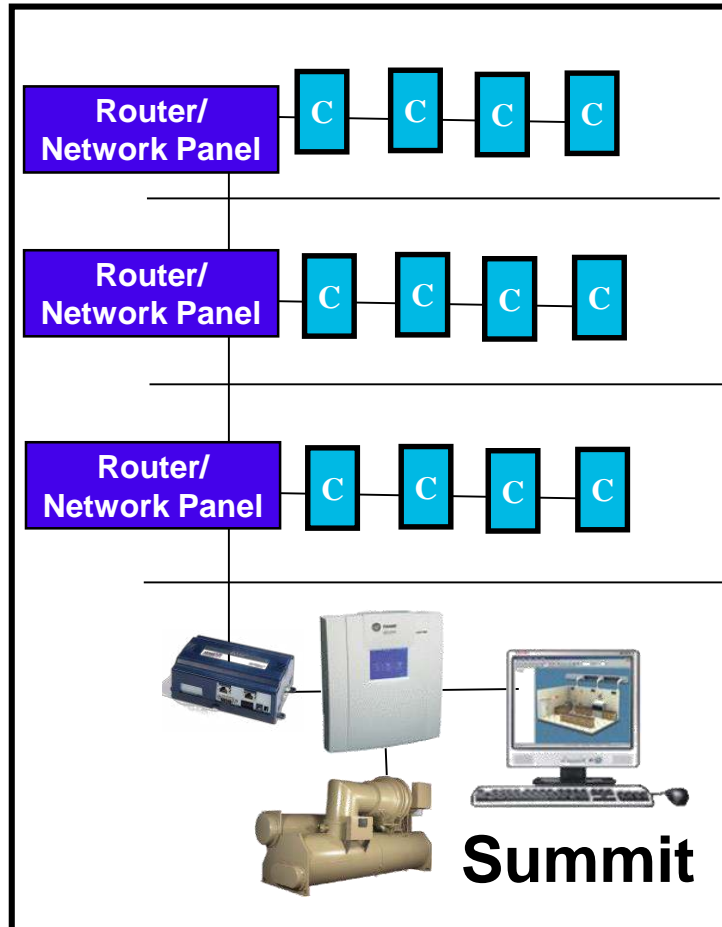 – Provide you with a migration path for replacing older systems
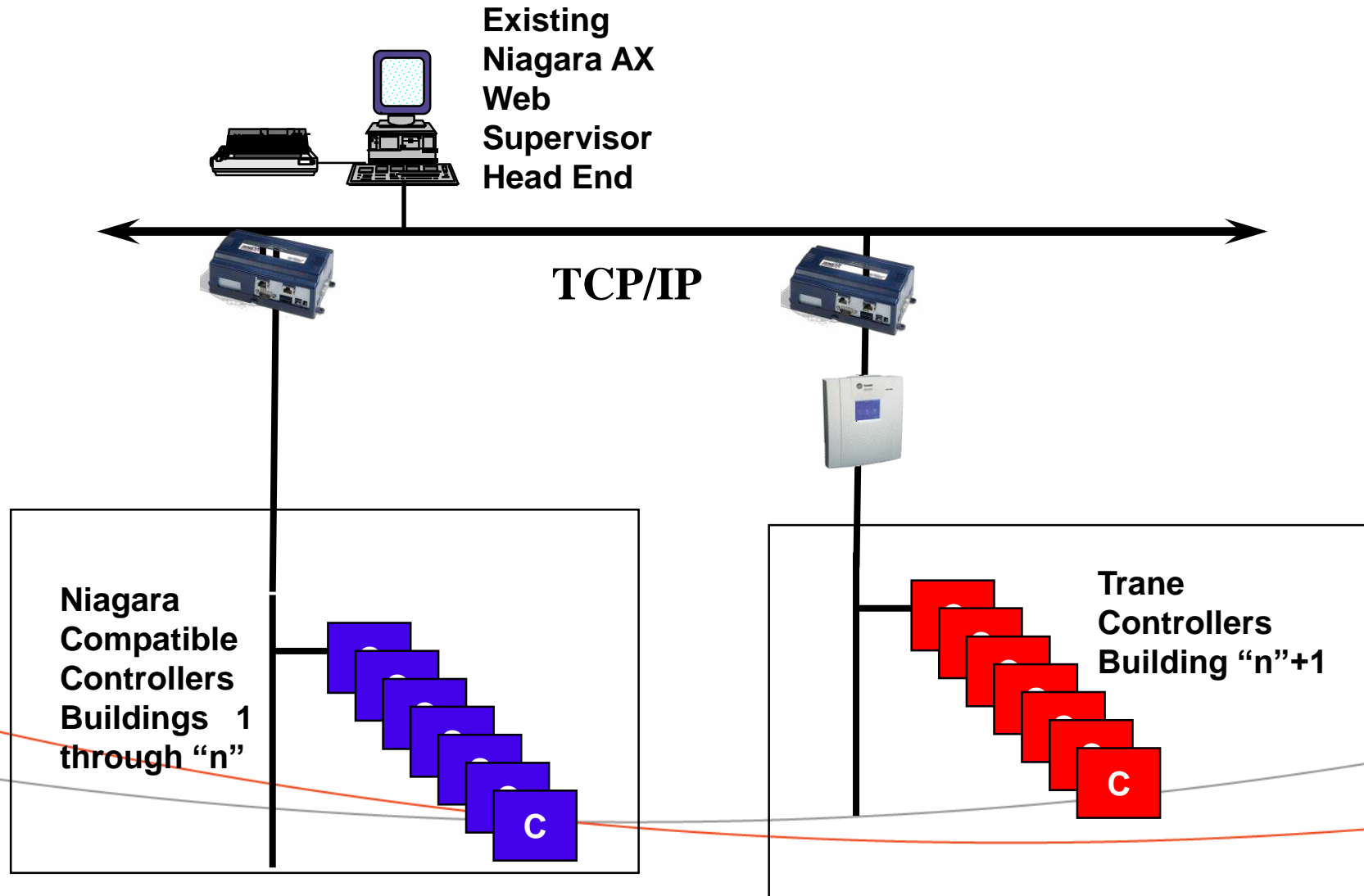
Variation 1 - Campus

Tracer Summit

TCP/IP

Legacy Controllers Building 1

C

Trane Controllers Building 2

C

Variation 2 - Building

Legacy 1

Legacy 2

Trane

Summit

Variation 3 – Summit HMI

Variation 4: Niagara Specified Projects – Campus or Building

Existing Niagara AX Web Supervisor Head End

TCP/IP

Niagara Compatible Controllers Buildings 1 through "n"

Trane Controllers Building "n"+1

C

C

Variation 5: Non-HVAC Integrations

Variation 6: Database Integrations

Corporate DB

Niagara AX Web Supervisor

Trane Summit Network

Legacy Network

Export using:
  - ➢ .pdf
  - ➢ .csv
  - ➢ .txt
- ➢ SQL queries
- ➢ Oracle queries
- ➢ Java
- ➢ Email
- ➢ SNMP
- ➢ Web Services
- ➢ HTML
- ➢ XML
- ➢ OPC

KEY

Data Flow Direct

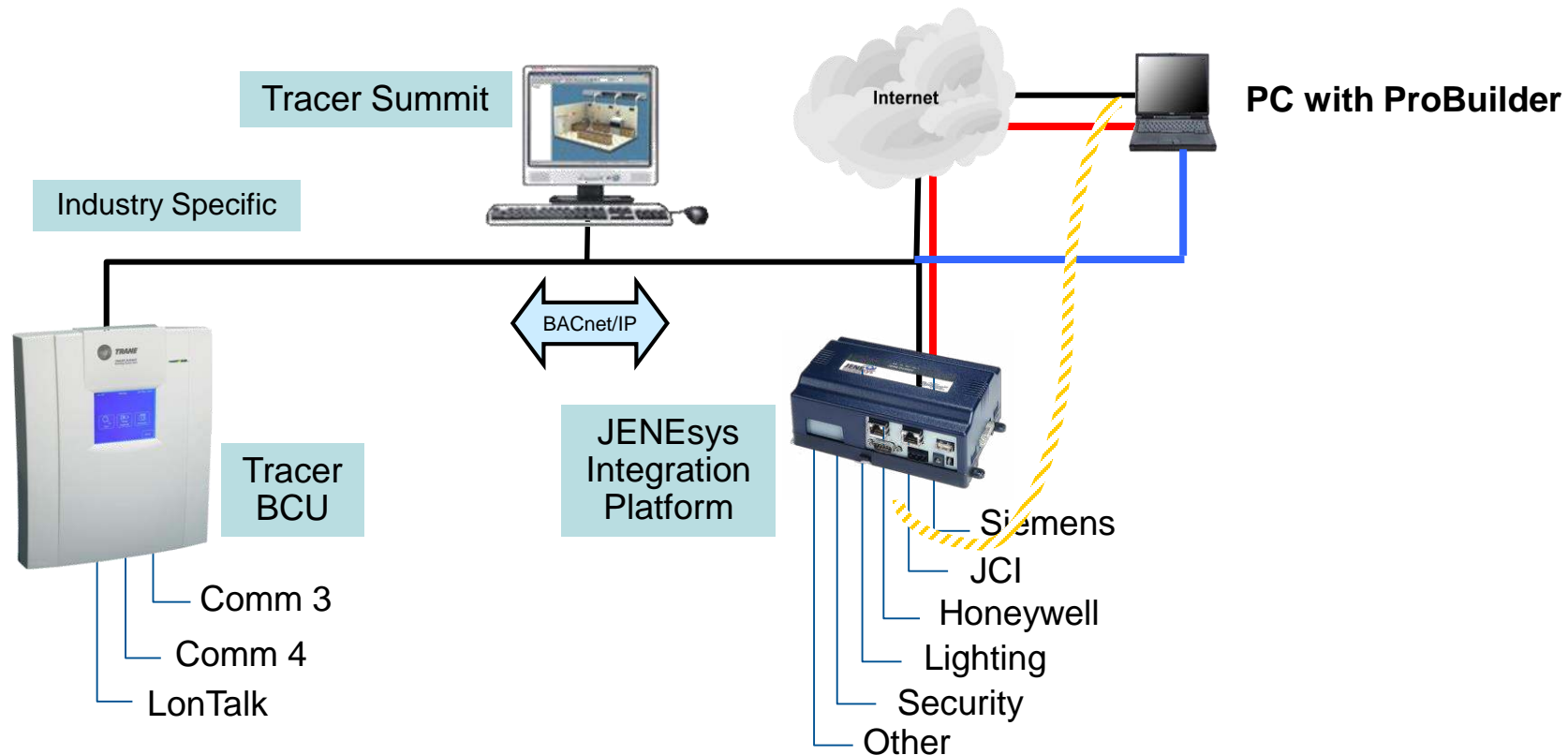**Data Flow Using Supervisor**
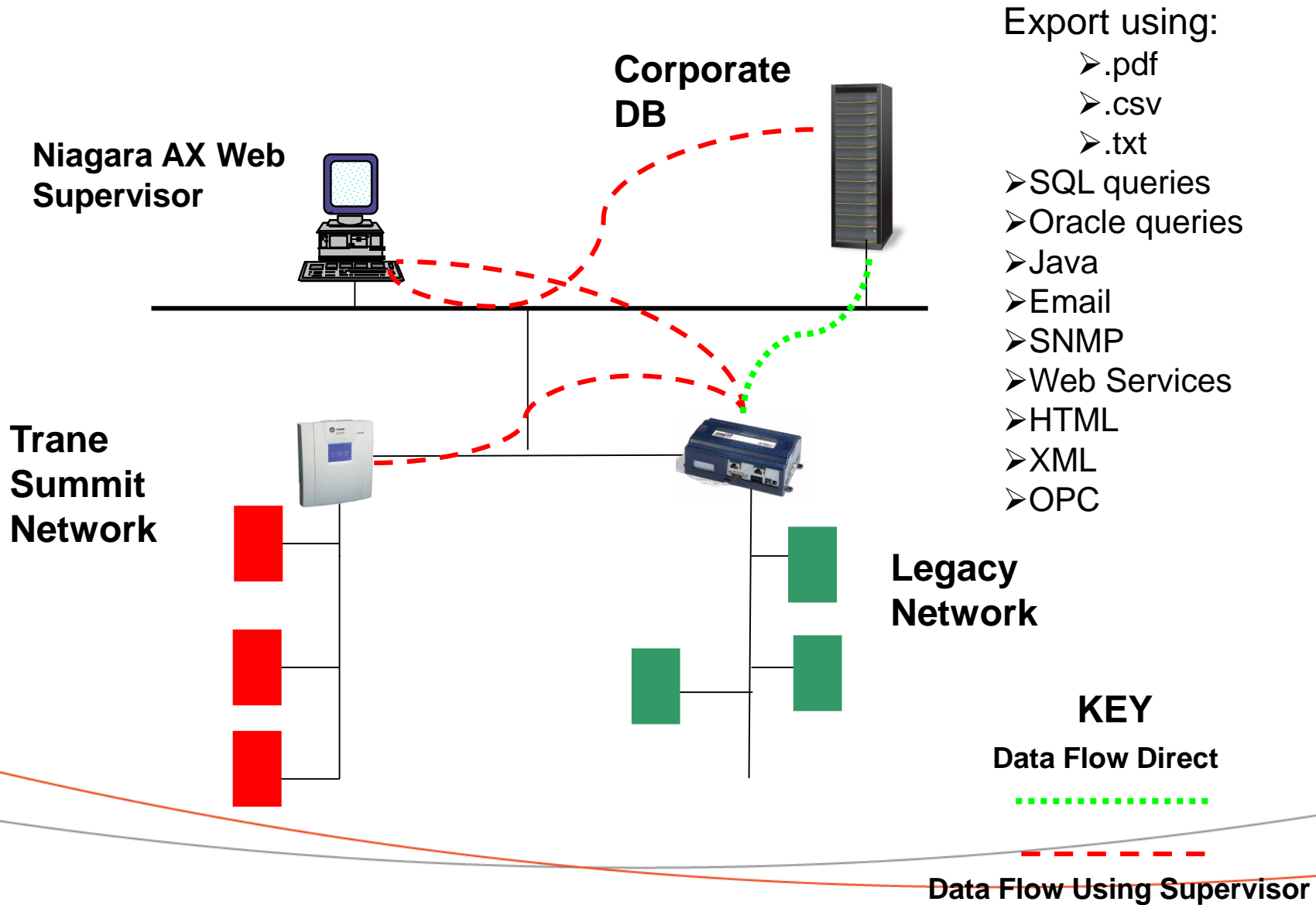
Service Platform Remotely

Trane and/or Lynxspring Technical People will access the JENEsys™ integration platform via ProBuilder over the Internet, Intranet or a direct connection

Tracer Summit

Industry Specific

Internet

PC with ProBuilder

BACnet/IP

Tracer BCU

JENEsys Integration Platform

Comm 3

Comm 4

LonTalk

Siemens

JCI

Honeywell

Lighting

Security

Other

Benefits

- Preserves your investment in legacy systems
  - Extend the life of existing control systems

- Saves you money by deferring product replacement

- Makes legacy systems and new Trane systems part of an integrated BAS network - "Embrace not Replace"….

- Legacy driver applications allow sharing of data from one system to another, allows greater flexibility for you when choosing equipment or services

Benefits

- Future proof technology – can "morph" over time

- You own the intellectual property and tools

- Multi-tier enterprise level system allows you to extend the BAS beyond HVAC control. (Lighting, Security, Energy Modeling, etc)

- Highly Scalable. Stand alone small building to multiple instances all communicating together

Discussion Issues

- It is not a "plug and play" solutions

- We will need your help

- We need to understand the legacy system

- We will need resources – some of which you may have
  - Tools
  - Software
  - Technical Expertise
  - Site specific expertise

Working as a Team

- Can you provide:
  - Fluency in legacy system
  - A "native guide"
  - Access to tools for legacy system
  - A map of building
    - Current layout
    - What are the system's actual functions?
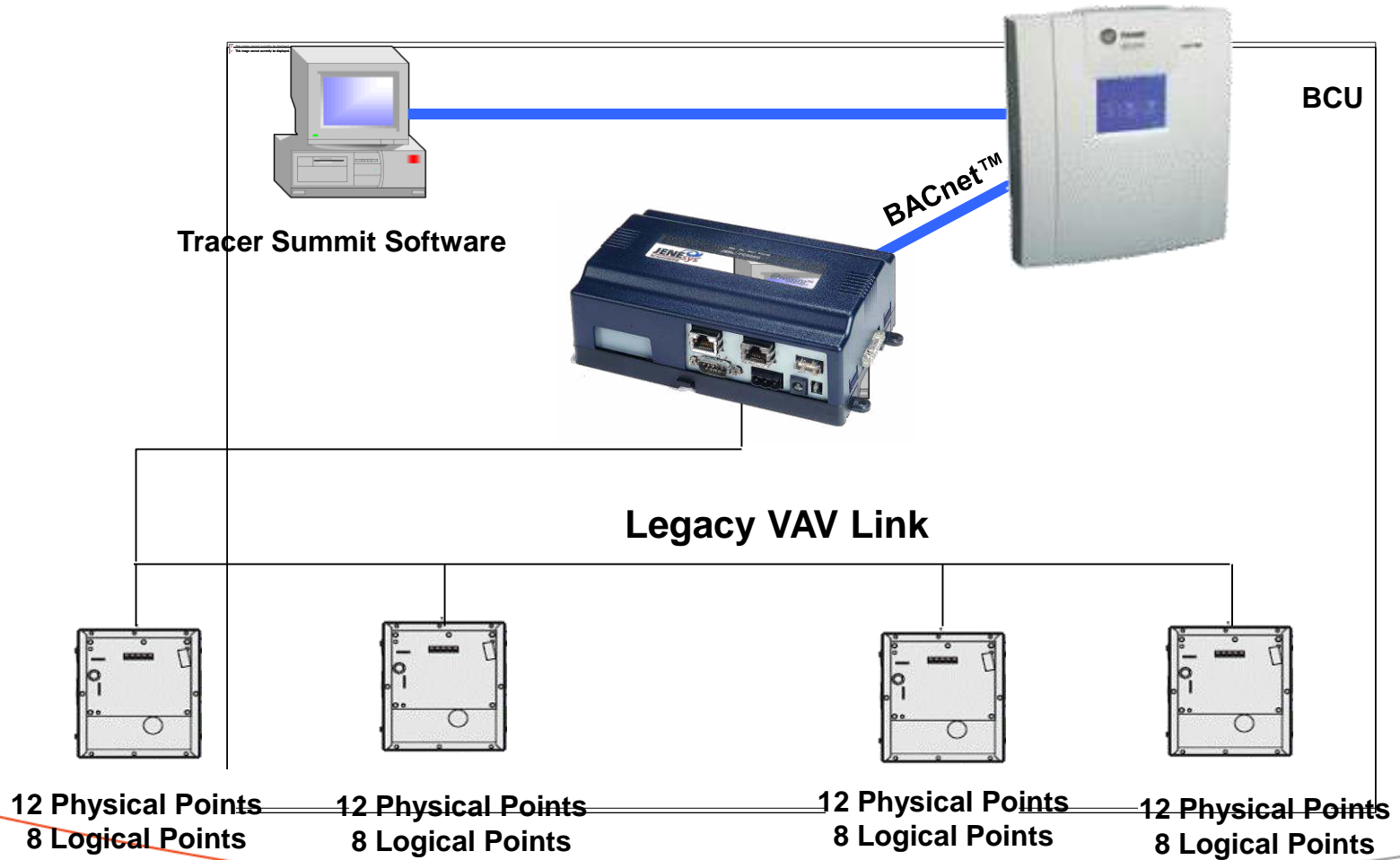   - Where are key functions "stashed"?

Working as a Team

- Trane provides:
  - Integration platform and protocol translators
    - JENE
    - Appropriate drivers
  - Applications knowledge
    - HVAC systems
    - IT
  - Integration services
    - Making the integration work

We need to understand:

- Points required for integration
  - Read
  - Read/Write
- Your expectations
  - Speed
  - Fidelity
  - Connectivity
  - Simplicity
- Your staff's tolerance for change
  - Look and feel issues
  - We have one client but many customers:
    - Board Room to Boiler Room
    - Thermostat and Time Clock "habits"

Defining a Point

BCU

Tracer Summit Software

BACnet™

Legacy VAV Link

12 Physical Points
8 Logical Points

12 Physical Points
8 Logical Points

12 Physical Points
8 Logical Points

12 Physical Points
8 Logical Points
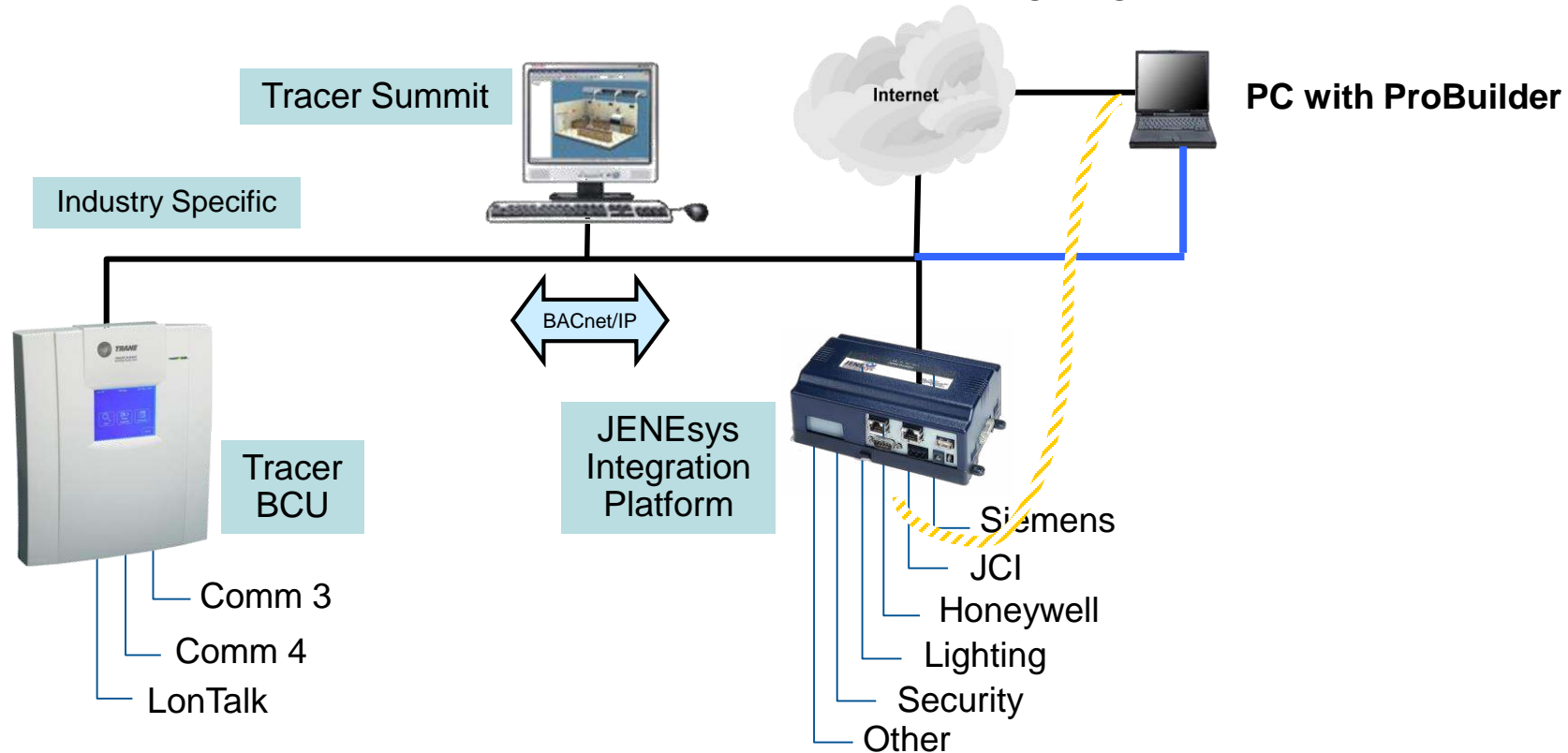
Summary: Defining a Point

- The Role of a JENE
  - Discover devices/points on legacy network
  - Select desired points
  - "Map" desired points to BACnet
  - Only "mapped" points count towards sizing

Summary: Defining a Point, Cont.

- The Role of a BCU
  - Graphics
    - Discover "mapped" points as "non-Trane device"
    - Tracer Summit graphics don't require additional BCU capacity to display/control "mapped points"
  - Trends
    - Trending "mapped" points does not require additional BCU points (but you do need additional storage for the trends)
  - Alarming
    - BCU Points must be created if alarming required
  - Programming
    - CPL that references the "mapped" points does not require BCU points
  - Scheduling
    - BCU scheduling that references the "mapped" points does not require BCU points

ProBuilder

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- Siemens
- JCI
- Honeywell
- Lighting
- Security
- Other

Understand Our Labor Components

- Deploying JENE
  - Install hardware
  - Configure hardware parameters (IP Address, etc)
  - Station Setup (Drivers, Programming, etc)
    - Install and configure client driver (legacy field bus)
    - Install and configure BACnet driver (for export to Tracer)
  - Discover legacy points
    - Select points needed based on requirements
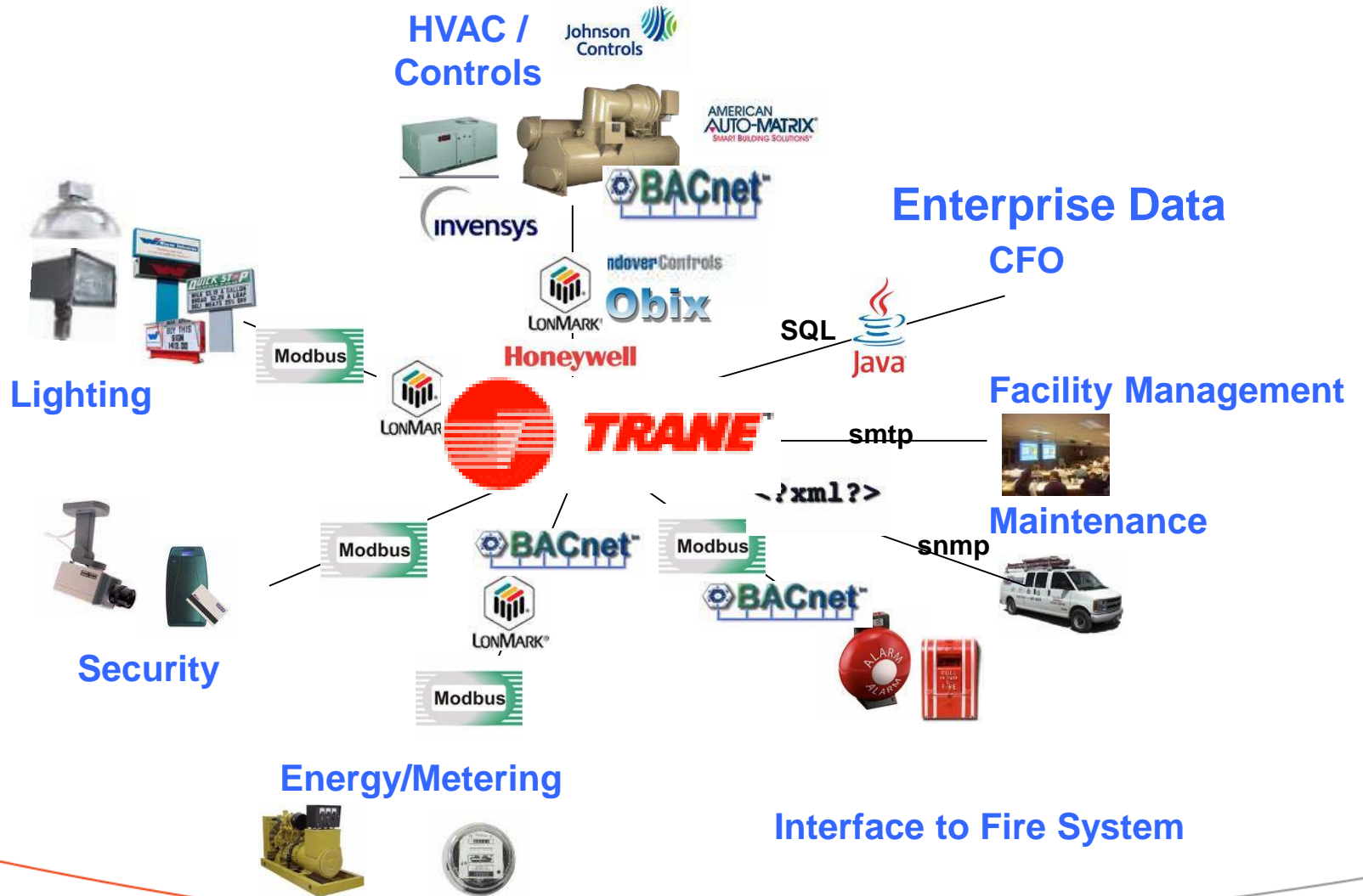 - Map selected legacy points to BACnet points

Integration Labor Components, Cont.

- Will you require System Level or Field Bus Level Integration?
- Depends on your requirements and driver capabilities
- Integration at System Level
    - Add to graphics
        - Will we add graphics for status/control
    - Add to programming
        - Adding additional control not previously available
- Integration at Field Bus Level
    - Duplicate removed system level control routines in Tracer system
    - Duplicate removed system level graphics in Tracer system
    - Supplement graphics/programming as required

Other Issues to Discuss

- Does your application require additional BCU capacity?
- Do we need to acquire legacy tools or do you have them?
  - Configuration
  - Programming
  - Servicing
- Subcontracting
  - Is there a "guide"?
  - Legacy protocol technician capabilities
- What are your requirements for warrantees and service?

End Result: Total Integrated Building Solutions

Questions and Discussions