

## Legacy Building Automation Integration

Location – USA

**Project Introduction:** The S4 Group, Inc. is a software development and system integration company focused on providing open interfaces to legacy building automation systems. A large multi-national government contractor contacted The S4 Group, Inc. indicating that they were interested in the S4 Open: BACnet-N2 Router. In addition, the customer requested a solution that exceeded the standard S4 Open product capabilities and asked if a custom solution could be developed. They needed to bring information from electric power monitoring meters, building and network infrastructure equipment, and other devices into their Johnson Controls Metasys® building automation system. The traditional integrations that were offered by the manufacturer were not adequate for their needs.

### System Requirements:

- \* Provide a system to gather information from any OPC based device, SNMP manageable device, or Modbus device and publish it to either Johnson Controls Proprietary N2 Bus or to BACnet.
- \* An auto-discovery and auto-configuration wizard similar to those included in S4's standard products is required.
- \* The resulting integrated devices and point lists must be definable to Metasys® NCM and NAE based supervisory controllers with the minimal possible manual effort.

**Project Implementation:** Advantech products used: UNO-2059E – AMD GX2 Embedded Automation Computer with 4x COM, LAN, and PC Card.

**System (Hardware) Description:** The solution is based on our S4Open: BACnet-N2 Router. The BACnet-N2 Router is a network appliance hosted on the Advantech Embedded Automation Computer, the UNO-2059E platform.



**S4 Open: BACnet-N2 Router**

Standard functions and features of the S4 Open: BACnet N2 Router:

- Delivered as a turnkey network appliance, hosted on an Embedded Automation Computer
- Publishes all N2 devices and points to a standard BACnet IP or BACnet MS/TP interface.
- Expands the number of devices and N2 buses that a Metasys<sup>®</sup> supervisory controller can support
- Combines multiple legacy N2 buses in a large complex building into one Virtual N2 bus<sup>®</sup>.
- Standard vendor tools are used to configure N2 devices on each N2 bus.
- All standard Metasys<sup>®</sup> N2 devices are supported including N2 Open, System-91, VMA, and 3<sup>rd</sup> party Metasys<sup>®</sup> Compatible devices.
- Automatically discovers and identifies devices on the N2 bus.
- Automatically provides N2 address translation and mapping.
- N2 bus is extended via Ethernet - TCP/IP to remote locations utilizing commercially available Ethernet Serial Server technology
- Upgrade existing Metasys<sup>®</sup> infrastructure at a low cost
- The number of N2 devices and points supported is limited only by the N2 protocol standard and the capabilities of the selected Metasys<sup>®</sup>, or 3<sup>rd</sup> party, supervisory controller.
- Easily upgradeable via protocol and functionality plug-ins for expanded functionality

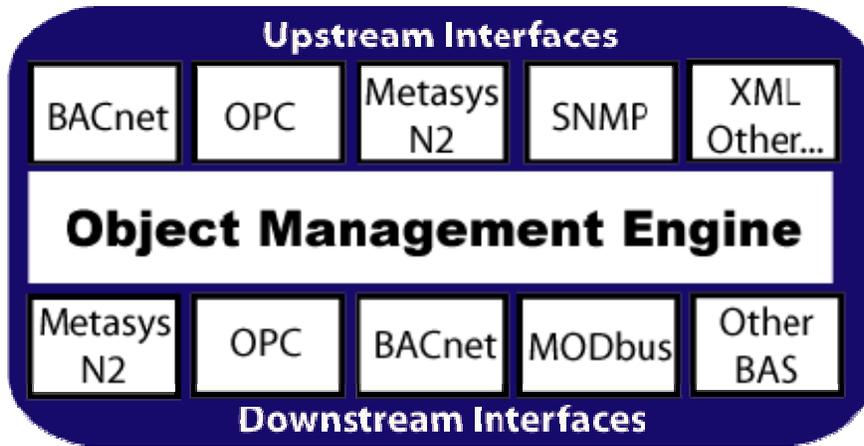
\* The S4 Open: BACnet-N2 Router from the S4 group enables seamless migration to BACnet environments for Metasys<sup>®</sup> N2 legacy systems while preserving existing investment in N2 Bus based infrastructure.

\* Built-in Ethernet connectivity offers broad flexibility for introducing future protocol plug-ins to support additional standards based open interfaces.

\* The BACnet-N2 Router introduces cost saving in virtually every upgrade, enhancement, or replacement of legacy Metasys installations.

All of the S4 Open appliances, the N2 Switch, the OPC-N2 Router, and the BACnet-N2 Router extend and enhance traditional Johnson Controls Metasys<sup>®</sup> building automation systems. The products are developed around Obermeier Software's Automation.net software framework which allowed S4 to develop a core set of functions critical to the building automation industry and then add protocol and application plug-ins to extend that functionality in a Lego<sup>®</sup>-like manner. Each protocol or application that is developed becomes a building block for other products or product options.

## S4 Group Technology Core



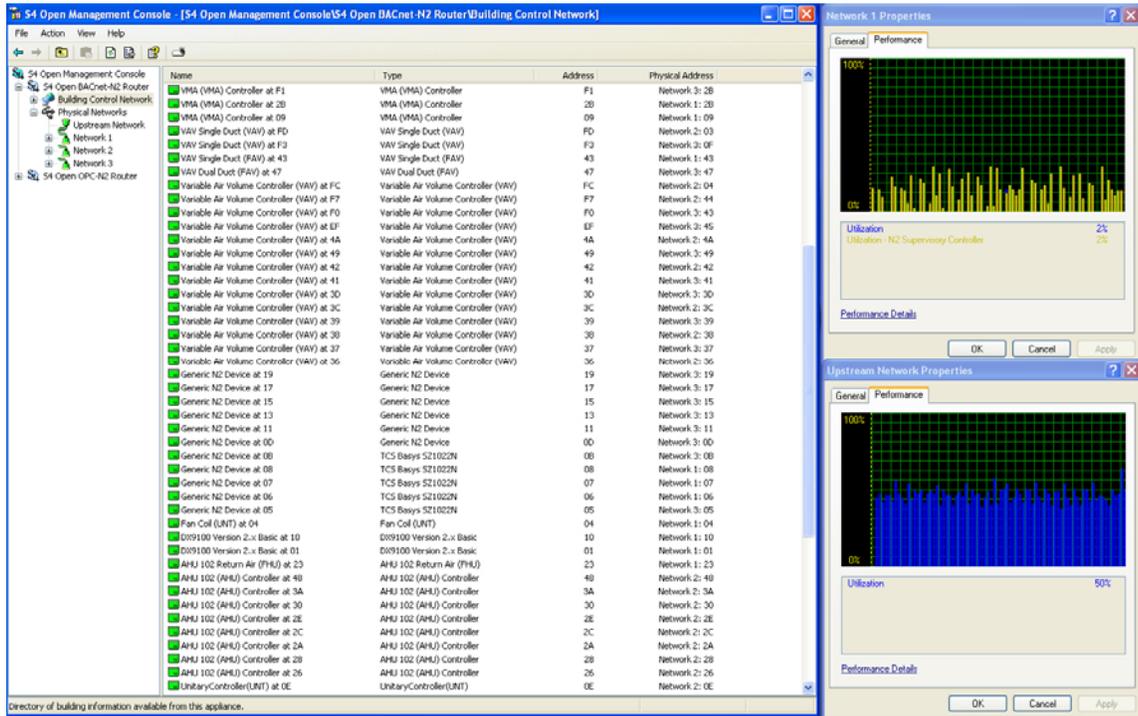
On the hardware side, S4 made the decision that they didn't want to be in the hardware manufacturing business. They did a product search and found that Advantech's UNO-2059E was a nearly perfect match for their needs. In addition, the Advantech ADAM Ethernet Serial servers and I/O devices gave S4 additional capabilities that very few others in the Building Automation marketplace can match as cost effective. As the S4 Open product line matures, you'll see new variations on larger or smaller Advantech platforms. For instance, S4 has a request for a Small Building Version of the OPC-N2 Router. S4 will be looking at Advantech's UNO-1019 (similar to UNO-2059 but more compact and DIN rail), the TPC product family (Touch Screen for a Controller version of the product with on-board HMI), and also the ADAM-6501 (low end N2 router targeted towards small buildings, very price effective).

S4 emphasizes that one of the key advantages of delivering the product as a network appliance with the hardware and software pre-installed is the cost effectiveness of the solution. The customer wires the power and data, installs an administrative client on his PC, runs an auto-configure command, and they are in production! All competing alternatives S4 has seen take days worth of planning and configuration support to get them up and running. They have to go through the same process if they have to make configuration changes in the future.

All systems and appliances within the S4 Open family of products are managed by this single management console. Being familiar with one S4 Open Product means you are automatically familiar with all other S4 Open Products. The Console uses Microsoft Windows' Look & Feel which is the defacto state of the art in the User Interface Technology.

This capability allows you to either centrally manage all appliances in your network or distribute the

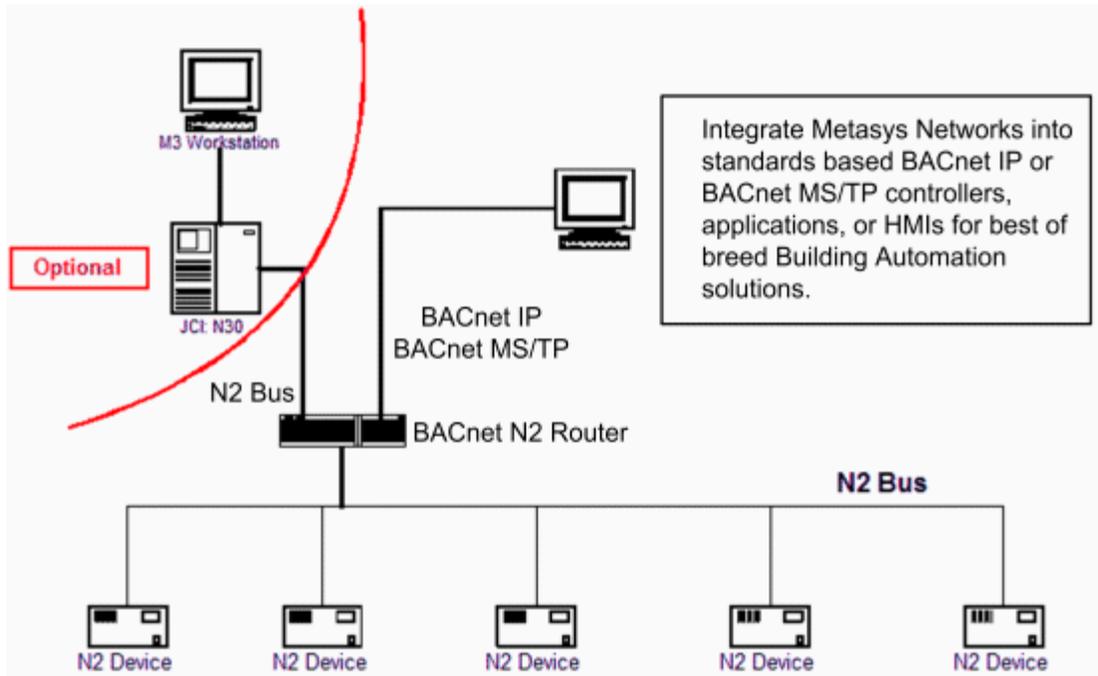
management responsibility as appropriate within your organization. Each S4 Open Appliance is identified by a name and can include further optional administrative information such as a description, location and contact person. After you assign a name to the Appliance this name will be used in the S4 Open: Console for easy reference.



The S4 Open: Console is based on Microsoft Management Console technology and implements all requirements in the Microsoft style guide to certify for the "designed for XP" or "designed for Vista" logo.

When you purchase and license any S4 Group, Inc. product you may install the S4 Open: Console on as many Windows desktop systems as you need to monitor and manage your enterprise.

**Conclusion:** One of the elements in this project solution design is the S4 flexibility in delivering features as they were developed, rather than asking the customer to wait for actual release of the product. Instead of approaching the requirements as a custom application the software framework and Advantech product line hardware flexibility allowed S4 to meet the customer's very specific requirements and package each of the integrations as optional features that could be added to any of our standard products. This greatly decreased the cost to design and development of these integration capabilities.



**System Diagram**