Case Study : Calgary International Airport Upgrade

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Background:

The existing airport terminals are all automated using a JCI Metasys system installed and maintained by JCI. The contract for the automation of the new terminal was awarded to ESC automation. ESC Automation is a partner company of Delta Controls. Delta controls are a manufacturer of building automation controllers and field devices which communicate using the BACnet family of protocols. The Metasys installations at the existing terminals are between 10 and 15 years and some of the controllers and field devices are nearing the end of life. There are 21 Automation controllers in the existing terminals.

Major Project Challenges (from an integration point of view)

1. Almost impossible to get 'down' time in an airport. Integration must minimize disruption.
2. Normal operation must continue during construction and integration.
3. Existing terminal HVAC automation is based on JCI Metasys. New terminal is automated using a Delta System. Airport Operations require one integrated system for monitoring and controlling all terminals. The two systems are not compatible.

Why the S4 Solution was chosen:

1. S4 system allows existing controllers to continue to function (as they always did) without interruption AND at the same time exposes the data via BACnet so the new Delta System GUI can build screens for monitoring and control of the existing terminals equipment.
2. A command contention system in the S4 allows the integrator to control whether the legacy or new system take control of a field point. Thus you can have the legacy controller controlling a zone. Via the S4's bacnet interface the zone can be monitored using the new Delta GUI. At a point in time by changing a command setting, the new GUI can take control of the zone without any changes in the legacy system.
3. Other gateways require the mapping between the legacy system (JCI N2 Open in this case) and the new system (BACnet) to be done manually. The mapping relates a point in the one system to a point in the new system. Manual mapping is prone to manual errors and requires accurate input information about the installed devices. The S4 gateway avoids this by connecting to and discovering the field devices and auto creating the corresponding BACnet points to monitor and control the field devices. The result is always accurate. A site with 21 controllers has over 1000 field devices in total. Each device has dozens to hundreds of points. The total number of points that would need to be mapped is 10's of thousands. That constitutes a significant engineering effort. So part of the decision to choose S4 was based on engineering labor cost savings and accuracy.

Some Key project Information and successes

1. Using only 10's of hour of effort and without disruption of the operation of the airports busy existing terminals, ESC automation were able to install 21 gateways and exposes all the existing terminal field points as BACnet points.
2. ESC automation were then able to start building the graphics and trends on the new BACnet GUI to provide an new operator interface to the legacy system. They were able to start this task within weeks of project commencement.
3. Device Counts in the existing terminal.

Controller	Total Devices
DX9100:	106
XT9100:	120
UNT:	332
VMA:	659
VAV:	149
VND:	3
MIG:	5
NDM:	3
Total:	1377