

DIGITAL TRANSFORMATION: SMART INFRASTRUCTURE

Making buildings smarter with an integrated automation platform and high-performing infrastructure

Photo courtesy of Siemens

"When we're handing a Desigo CC solution over to an end user customer, the people in the building, we need to make sure the software is installed on a reliable hardware platform, such as Dell EMC PowerEdge servers and Unity storage, and that it securely connects to building networks. That's why we work with Dell Technologies OEM Solutions."

Tom Rule, Segment Head of Digital Buildings at Siemens Smart Infrastructure

Situation Analysis

The performance of a building automation system can have a profound impact on its occupants and our environment and the businesses that depend on them.

Even as the Internet of Things (IoT) enables more individual devices to be monitored and controlled from a single station, the purpose of building automation systems has expanded from providing basic operation to creating high-performance buildings whose integrated technology can save energy, make maintenance easier and improve service to building occupants.

The management of a single building involves a complex web of essential systems and services: temperature controls, internal and external lighting, fire suppression, security, access control, video surveillance and power management. The monitoring and management of each of these building automation systems

disciplines traditionally requires many specialized software applications that send and receive data to specific controllers, such as heating, ventilation and air conditioning (HVAC) units, closed-circuit television (CCTV) cameras or employee badge readers.

INTEGRATION FOR HIGHER PERFORMANCE

Many custom integrations are needed to bring separate aspects together, or to add or upgrade controls. Somebody might have to build an adapter to support a proprietary protocol or design interfaces so different alarms and alerts make sense when viewed side by side. As sustainability and energy conservation goals are added, the system needs to not only maintain proper temperatures, but also optimize the performance of fans and chillers to reduce energy use or respond to weather changes. Creating high-performing buildings requires a holistic approach that can constantly evolve and adapt.



This kind of integration was possible before, but it was hard. Siemens Desigo CC software makes it easy.

Taking into consideration all these complexities and requirements, Siemens Smart Infrastructure developed the Desigo CC integration platform. Desigo CC provides the software required to turn existing buildings into high-performing ones. Desigo CC makes it easy and cost-effective to integrate existing automation systems or add new ones using general programming expertise.

For example, facility managers can use classroom-scheduling software to predict when their rooms are occupied or unoccupied. With that information, 15 minutes before class starts, the system can automatically turn on the lights, unlock the doors, set the temperature, deactivate the motion detectors and do anything else to ensure the room is ready for occupancy. Then, 20 minutes after class is over, it can lock everything down again and go back into an energy-saving mode.

APIs FOR EASY INTEGRATION

This kind of integration was possible before, but it was hard. Siemens Desigo CC software makes it easy. Desigo CC software uses application programming interfaces (APIs) to retrieve classroom schedules, pull them into the automation system and then align the building control schedules with the classroom schedules. The same technique could be used for other situations. Facilities are starting to monitor electrical vehicle charging stations, for example, and adjust their operation during peak time when energy costs are high.

The more systems that are connected, the more efficiently a building can be run. Then there's the lower cost of maintaining one software package instead of five or six: It's cheaper to create and maintain one set of graphic floor plans, set up one remote notification scheme and maintain user accounts

in just one application. Finally, a holistic view of all controls provides additional benefits. Users who can prioritize all the things going on in a building, discipline by discipline, can make sure the right things are getting attention in the right order.

"The Desigo CC building automation platform is used everywhere from a small office building and a K-12 school up to some of the largest university and hospital campuses. In some cases, the platform allows users to connect multiple buildings located in different parts of the world back to a central management station," says Rule.

Design Partnership

Siemens leverages Dell Technologies OEM Solutions to create the smart buildings platform.

While Siemens Desigo CC is a pure software application, the company also provides the automation



While the Siemens team came up with an engineered design to converge these networks, Dell Technologies OEM Solutions assisted with the hardware platform design, fulfillment, configuration and more.

controller hardware for many building operations, as well as network and system design, and installation services. For large installations, Siemens leverages a leading technology infrastructure provider—Dell Technologies OEM Solutions. Dell Technologies augments Siemens' resources by offering the hardware platform, collaborating on solution design, and providing development, installation, and post-deployment support services.

In completing building automation for one large corporate customer in the northeastern U.S., the Siemens Smart Infrastructure team in Philadelphia worked with Dell Technologies OEM Solutions to streamline hardware requirements, virtually commission a new converged network and deliver a turnkey solution.

DESIGNING A SECURE SYSTEM

The role of the Philadelphia team was to design a platform for integration and a reliable network for a critical facility. Patrick Downs, Sr. Executive Account Manager with Siemens Smart

Infrastructure, Building Technologies division, leveraged the Desigo Building Automation platform for the basis of design. Siemens designed and supplied the products to create a converged system that supported their client.

"The client was managing many physical servers. These independent, decoupled networks proved to be vulnerabilities for the client. The subsystems supported other automation subsystems, such as batteries, uninterruptible power supplies, meters, energy gateways, white space optimization, security and fire systems," says Downs. "Often, the 3rd party systems are set up as a separate islands of automation."

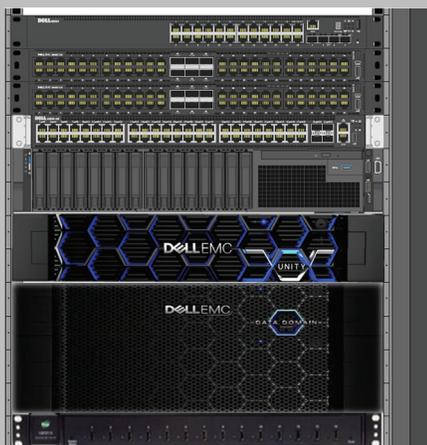
The Siemens teams' task was to create an engineered design to converge these networks and create a single cyber secure solution. "We listen a lot for what a client is trying to achieve. We have conversations to raise cybersecurity awareness, reduce security threats and help them manage the threats," says Downs.

"That includes reviewing network topologies of existing systems, making recommendations, and showing them reliable and supported equipment options."

SUPPORTING A CONVERGED NETWORK

While the Siemens team came up with an engineered design to converge these networks, Dell Technologies OEM Solutions assisted with the hardware platform design, fulfillment, configuration, installation, implementation, security verification and end state install onto the customer's floor. This "single vendor approach" allowed Siemens to focus on its customer's needs while trusting OEM Solutions to deliver a highly resilient and high-performing infrastructure with a great total cost of ownership.

The Dell Technology end-to-end support included pre-sales engineering of networking, compute, storage, software, security and services requirements; program management and support; onsite



Dell Technologies Solution for Siemens Desigo CC Customer

- Networking switches
- R740 PowerEdge servers
- Unity Storage Array using MetroSync replication for redundancy
- Data domain purpose-built backup appliance
- Data protection suite for VMware
- Microsoft licenses for Windows & SQL
- Vulnerability scan
- Turnkey implementation services SOW for entire stack
- Ongoing custom SOWs in support of the network

services to aid Siemens for the length of the project; and Dell Technologies' assistance in moving the infrastructure from Siemens' environment to the customer datacenter.

PRE-TESTING IN A VIRTUALIZED ENVIRONMENT

Moving the infrastructure from Siemens' environment to the customer datacenter was a step enabled by the virtual environment that OEM Solutions was able to create. Once the design was completed, the customer's entire Desigo CC solution—hardware and software—was set up in the Siemens local office in Bluebell,

Pennsylvania. It incorporated all the switching and loading of all the third-party software products so tests could be run on all systems.

All the third-party vendors brought a device to connect to this staging area network so the Siemens team could demonstrate that the pre-production network design, devices and servers worked successfully together. The team could make sure the ABA log backup was working with the antivirus software, for example, as well as create a disaster recovery plan for the entire system. The client could even witness a test of the failover-and-restore sequences.

The Dell Technologies' solution for Siemens Desigo CC customer included high-power, secure PowerEdge servers and Unity storage arrays using MetroSync replication for redundancy. OEM Solutions also performed a cybersecurity vulnerability scan of all the hardware during this pre-commissioning phase—a service Dell Technologies offers for all its PowerEdge servers.

"If you can prioritize events from all disciplines in your building, in a single application, then you really can make sure that the right things are getting attention in the right order," says Rule. ■

Find out more at

[Dell Technologies.com/OEM/Industrial](https://DellTechnologies.com/OEM/Industrial)
Siemens.com/SmartInfrastructure



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