



# SkyFoundry Insider

Special Issue No. 35

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## A Special Issue

**SkySpark®  
Everywhere™  
Distributed Data  
Architecture**

**Clustering,  
Replication and  
Provisioning –  
the What and  
Why**

**The Benefits of  
Distributed  
Architecture**

**Proven in  
Applications of  
All Types**

## ***Understanding SkySpark® Everywhere's™ Distributed Data Architecture***

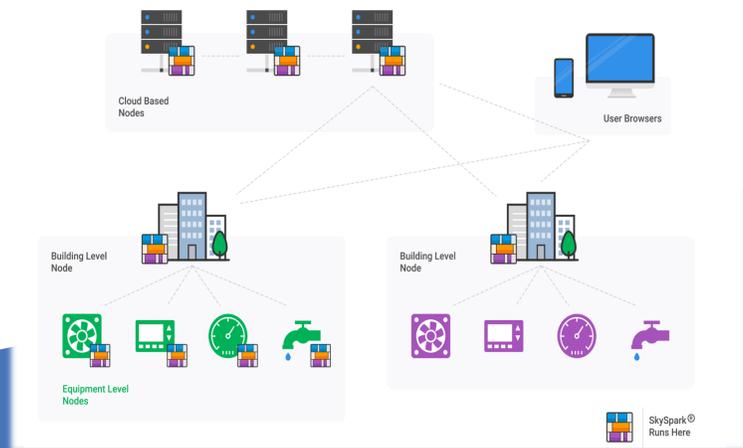
We hear lots of talk about the “cloud” as it relates to the IoT. In many cases it seems like the “cloud” is being presented as the solution to all things IoT. The reality is that it is not possible, cost effective or desirable to transmit every piece of data from our devices to the cloud in order to gain value from the data. A true IoT architecture needs to recognize and embrace the highly distributed nature of the IoT and enable data processing at the edge as well as the cloud. An IoT platform must provide a software architecture that matches that reality.

Software functions need to be able to reside at every level of the architecture from the “edge” – for example, on a piece of equipment in an electrical closet or equipment room, to the building level where data from multiple smaller nodes can be collected, aggregated and analyzed, to the cloud where data analysis can be performed at a portfolio level. SkySpark® Everywhere™ provides this edge-to-cloud capability.

SkySpark Everywhere allows systems consisting of multiple SkySpark nodes to be connected in unified, near-seamless systems. Data collection, storage, management, analytics processing and visualization functions are performed by the individual nodes at whatever level they are deployed, while applications that present data and analytics results to users work as if the system were one, unified, seamless system. Let's move on to the “what and the why”.

# Distributed Architecture, Clustering, Replication and Provisioning – the What and the Why

SkySpark is unique in the world of software for device and equipment data because it can be applied from the “edge” to the “cloud” providing a fully distributed data and compute platform. Sounds cool, but what does that really mean and why is it important? Let’s start with a brief look at “what” these terms mean.



**Distributed Architecture** – By this we mean that SkySpark can be deployed on multiple nodes (computing devices) distributing the work of data collection, analytics processing and presentation of results to users.

**Clustering** refers to the ability of distributed SkySpark nodes to be connected into a seamless unified system over SkyFoundry’s highly efficient and secure Arcbeam protocol. Once connected into a cluster, users interact with their data, analytic results, reports and views as if they were interacting with a single computer and single database. The result is a seamless user experience even as data and processing are distributed across many computing nodes.

**Replication** is a SkySpark feature that enables copies of SkySpark databases from distributed nodes to be automatically copied (replicated) to one or more servers. But SkySpark replicas are not simple data backups. Rather SkySpark replicas are fully operational copies of individual distributed nodes. They provide the full user experience even when the original data source(s) are not available (offline) allowing users to work with the last available data and analytic results.

**Provisioning.** And finally, if I have a system made up of numerous individual nodes, I need an easy way to update them with new software revisions, new analytic rules, and other new features. That’s the role of SkySpark’s Automated Provisioning features.

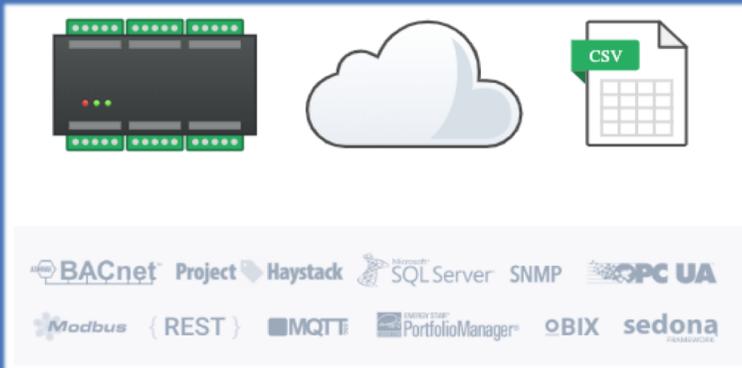
*That’s the “What”. Now let’s talk about the Why?*

## Why? Addressing Key Challenges for Next Era of the IoT With an Edge-to-Cloud Data Architecture

So why does any of this matter? The reasons are actually quite compelling...

- **Greater fault tolerance**
  - For data collection, storage & processing – Collect data, process analytics and create visualizations for users as close to the source as possible
  - Allow in-building personnel full access to their data and analytic results even if they cannot communicate to an external cloud
- **Low latency**
  - Provide near real-time data acquisition, processing of analytic rules and algorithms
- **Support applications with “constrained networks”**
  - IoT devices and equipment are often connected to slower, bandwidth limited or intermittent networks, or use cellular connections with high data transfer costs. By processing analytics at the edge, network traffic can be reduced by as much as 1000:1 !!!
- **Security**
  - Keep data on premise - Meet requirements for projects that cannot send data to an external cloud
  - Isolate in-building systems from the Internet – SkySpark acts as a security barrier to connected equipment with its Arcbeam, websocket-based protocol
  - Meet regulatory requirements for data storage location - keep data within a region or jurisdiction
- **Save Engineering Costs** – using SkySpark from the edge to the cloud means you engineer once – set up data acquisition and tagging once with one uniform set of tools
- **Reduce hardware costs** – eliminate gateways and security appliances in many applications
- **Provide a Seamless User Experience** – across multi-node systems that include data from multiple systems – they appear as a single system
- **Digital Data Replication**
  - SkySpark provides automated replication of the distributed nodes in clustered systems
  - Replication provides a fully operational replica of each node that users can interact with - EVEN WHEN the actual node is OFFLINE
  - User queries do not have to penetrate down to the actual nodes – can work with last available data – saving significant data transfer costs
  - Replication also provides a full automated backup of individual nodes
    - saves time and work

# What data do you have? SkySpark works with it all – live data, batch data, historical data



## Proven in applications of all types

SkySpark is used successfully in all types of facilities with deployments across well over **1 Billion square feet** (over 92,903,040 m<sup>2</sup>) of space on 6 continents. Applications include:

- Commercial office buildings (owner occupied, REITs)
- Utilities (demand response, load management)
- Government and Military facilities
- Data Centers
- Industrial facilities
- Multi-site Retail and Quick Serve Restaurants
- Higher Education
- Indoor Agriculture
- Laboratories (Government, research and universities)
- Entertainment/Hospitality (casinos, shopping centers, hotels)
- Smart Cities
- Facility management service providers
- Oil Rigs

## See Real World Results in Our Many Case Studies

Case Studies	Newsletters	White Papers
Case Study: University of Utah by BuildingFit		
Case Study: Sistol BBVA Bank Project		
Case Study: SkySpark® Analytics in Healthcare - Banner Health by ETC		
GSALink - The GSA's Analytics Project Across 44 Million sq ft		
Case Study: The Franklin		
Case Study: California State University, Dominguez Hills		
Case Study: GSA Portfolio		
Case Study: Altura - Connected Commissioning ASHRAE Journal		
Case Study: City of Kortrijk Takes Control of its Smart City		

SkySpark is available through a worldwide network of authorized partners, providing maximum choice for best-of-breed implementation services.

Learn more at: <http://www.skyfoundry.com/partners/>





## The Leading IoT Data and Analytics Platform for the Built Environment

SkySpark® Analytics automatically analyzes data from building automation, metering systems and other smart devices to identify issues, faults and opportunities for savings. Learn why SkySpark has been deployed to over 1 Billion square feet of facilities around the world for energy management, optimization, monitoring-based commissioning and fault detection.



*Find What Matters™* to Improve Equipment Performance and Reduce Operational Costs.

### SkyFoundry

[www.skyfoundry.com](http://www.skyfoundry.com)

## Learn More About SkySpark® and How to Apply Analytics to Your Application

Join us for a comprehensive demonstration webcast.

We publish our calendar of upcoming sessions and other events here: <https://skyfoundry.com/calendar>

Or contact us at: [info@skyfoundry.com](mailto:info@skyfoundry.com)

Or visit us at: <https://skyfoundry.com/>