Open. Together.

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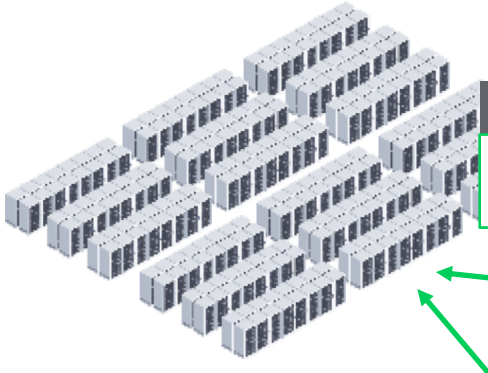
Building resiliency through a collaborative ecosystem

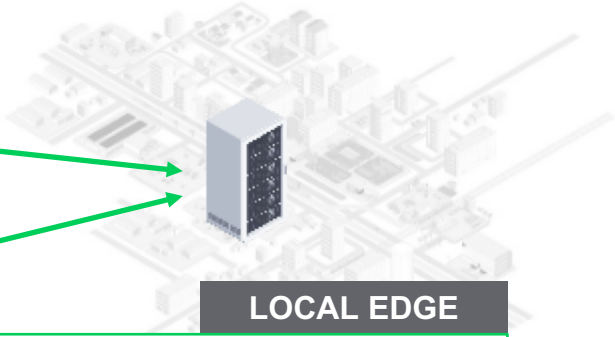
Steven Carlini, VP, Innovation and Data Center
Schneider Electric

Our simplified view of this architecture



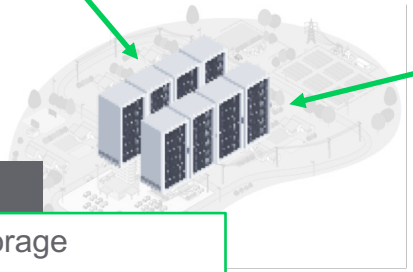
CENTRALIZED

Massive compute and storage located in remote areas



LOCAL EDGE

Compute and storage where data is generated and consumed



REGIONAL EDGE

Large compute and storage located in central or urban areas

Availability implications from the viewpoint of the edge

If my focus is the availability of only the centralized data center...

Centralized data center (tier 3)

Tier 3 Availability = **99.98%**
Downtime = **1.6 hours/year**

But, if I take the viewpoint of the customers and employees at the retail store

Local edge data center (tier 1)

Availability system **= Availability** **x Availability**

Centralized Data Center Availability = **99.98%**
Edge Data Center Availability = **99.67%**

Availability = 99.98% x 99.67% = **99.65%**
Downtime = **30.7 hours/year**

White Paper 256 *"Why Cloud Computing is Requiring us to Rethink Resiliency at the Edge"*

The industry needs improvement in 3 key areas to make the edge resilient

1. An integrated ecosystem
2. Management tools
3. Analytics & AI to augment staff

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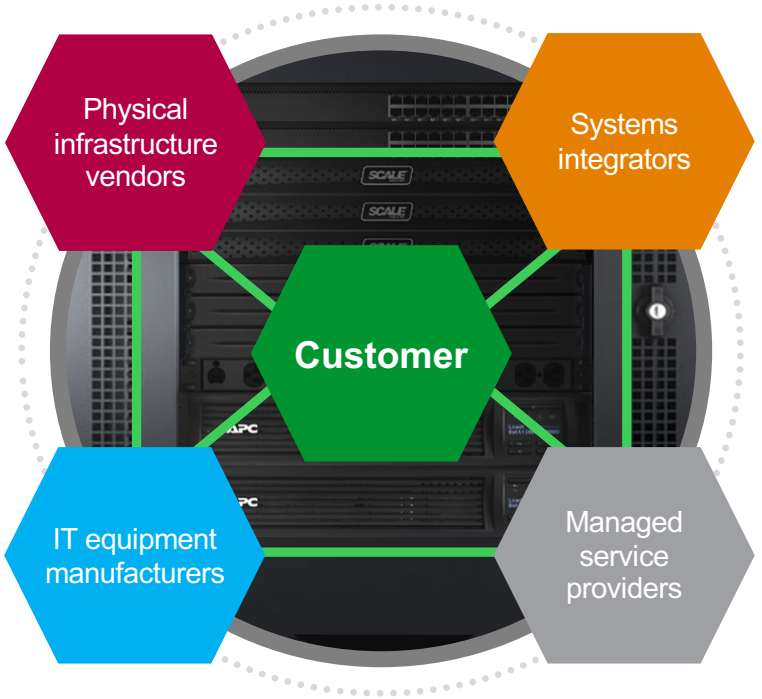
A collaborative ecosystem addresses unique edge challenges

Edge Challenges

- Many sites
- Lack of onsite staff

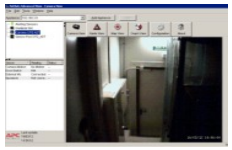


“Open-access” is critical…

- ✓ Edge ecosystems require open systems
- ✓ Open-access
- ✓ Partner access to data and outputs to leverage in management tools

Fully integrated modular/micro data center

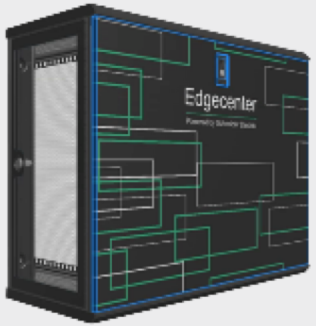
Remote administration & real time monitoring, management & control



Security access & CCTV

Environmental monitoring (temperature, humidity, smoke, water)

Micro data center



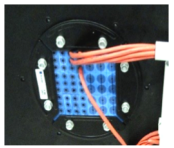
Converged infrastructure

OR

Network & storage switches

Servers

Storage



Cables/cable management

Rack power distribution

UPS

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Conventional management tools are inadequate to address the challenges at the edge

I have so many edge sites and no onsite IT and facilities staff…

How do I know if I have a problem, before it's too late?

How do I monitor if I can't get enough IP addresses?

Who is accessing my equipment?

I get so many status alerts, how do I know what to act on?

How do I monitor and maintain the equipment?

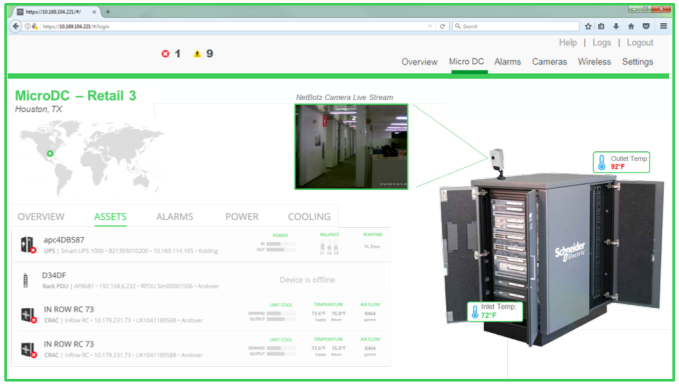
Assertion: Each edge site should be managed as a **complete micro data center**, not individual components

Old paradigm

Each device is managed separately and requires it's own IP address

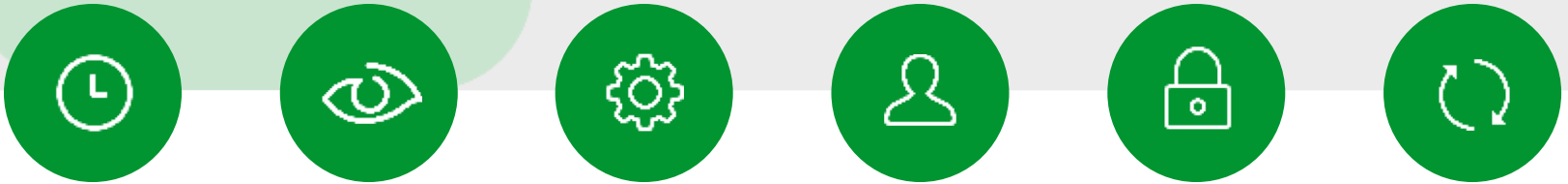
New paradigm

One dashboard to manage all components as a single system at a given edge site



Assertion: Management tools must be **cloud-based**

> *The biggest challenge is keeping everything good (normal operating status) because it's not just monitoring the alarm, the alerts, etc., it's resolving them.*
>
> Customer – 451 Research, 2017



Easy to get started

Access from anywhere, at anytime

Pay as you grow

Maintenance free

Up-to-date cyber security

Automatic software updates and backup

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We believe there are the 4 key ingredients

1. A secure, scalable, robust **cloud architecture**
2. A **data lake** with massive amounts of normalized data
3. A talent pool of **subject matter experts** with deep knowledge of system behavior
4. Access to **machine learning** algorithm expertise

A solid foundation is critical

1 Cloud architecture

2 Data lake

3 Subject matter experts

- Aggregate data securely
- Create specific AI use cases
- Identify critical variables
- Normalize the data sets
- Provide compute power to analyze data

+

4 Machine learning algorithm expertise

- Develop algorithms
- Train algorithms
- Test & refine algorithms

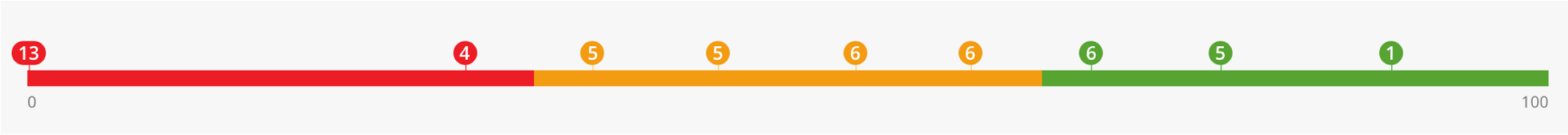
AI enables better insights

Methodology

- Benchmark performance of key parameters
- Determine pattern of healthy behavior
- Generate alerts when outside expected operation
- Provide scorecard identifying what needs attention

Benefits

- Hours spent evaluating alarms
- Downtime avoidance
- Peace of mind & pressure off team



Key takeaways to achieving a resilient edge

1. A collaborative ecosystem that includes the customer is necessary

2. Cloud-based software is imperative to managing the edge

3. A strong industry foundation for applying AI will address unique management challenges by augmenting staff