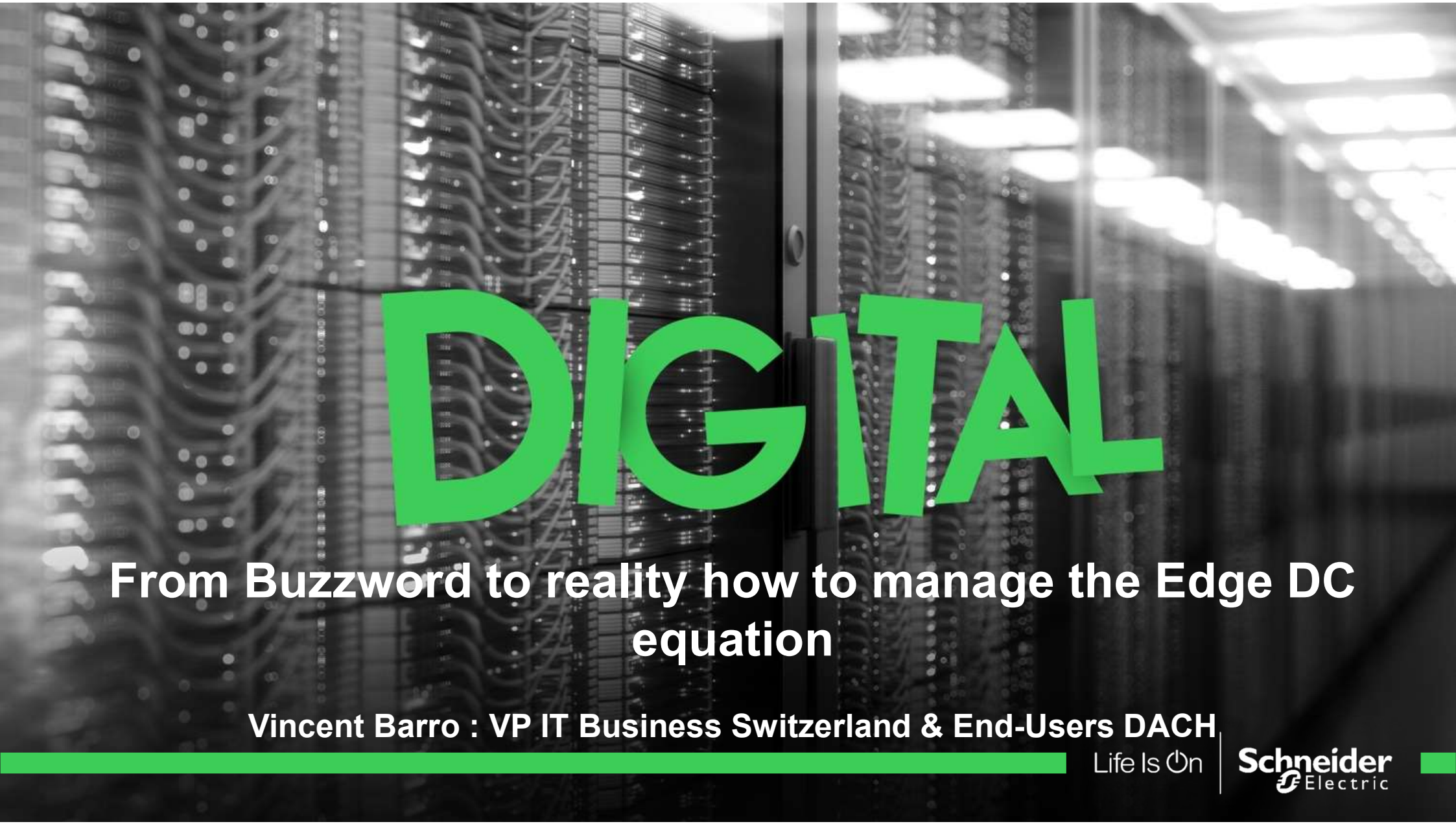

From Buzzword to reality how to manage the Edge DC equation

Vincent Barro : VP IT Business Switzerland & End-Users DACH

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In just over ten years, we've witnessed **a rapid progression of the digital world**…creating much more questions

2006–2007

Part of the debate is who should get credit for inventing the idea. The notion of network-based computing dates to the **1960s**, but many believe the first use of "cloud computing" in its modern context occurred on **August 9, 2006**, when then Google CEO Eric Schmidt introduced the term to an industry conference. Oct 31, 2011

Who Coined 'Cloud Computing'? - MIT Technology Review

PRESS RELEASE

<< Back

Amazon Web Services Launches

SEATTLE--(BUSINESS WIRE)--March 14, 2006-- S3 Provides Application Programming Interface for Highly Scalable, Reliable, Low-Latency Storage at Very Low Costs

Amazon Web Services today announced "Amazon S3(TM)," a simple storage service that offers software developers a highly scalable, reliable, and low-latency data storage infrastructure at very low costs. Amazon S3 is available today at http://aws.amazon.com/s3.

2016–2017

INDUSTRY PERSPECTIVES

The Era of the Smart Data Center

BY INDUSTRY PERSPECTIVES ON OCTOBER 26, 2016 — ADD YOUR COMMENTS

INDUSTRY PERSPECTIVES

Cloud Computing Moves to the Edge

BY INDUSTRY PERSPECTIVES ON APRIL 5, 2017 — ADD YOUR COMMENTS

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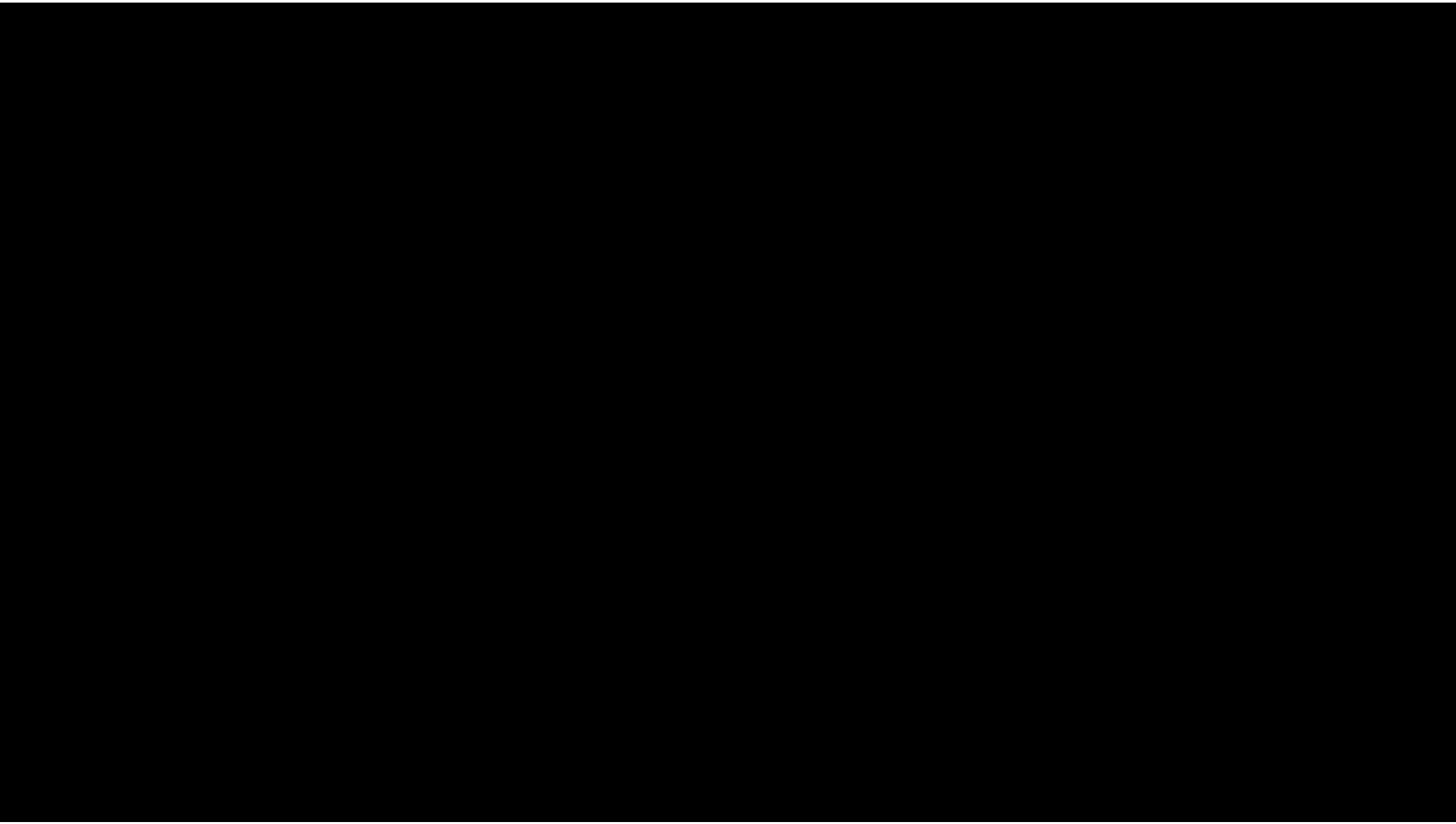

Edge Computing will drive **more complexity**

From a centralized cloud vision

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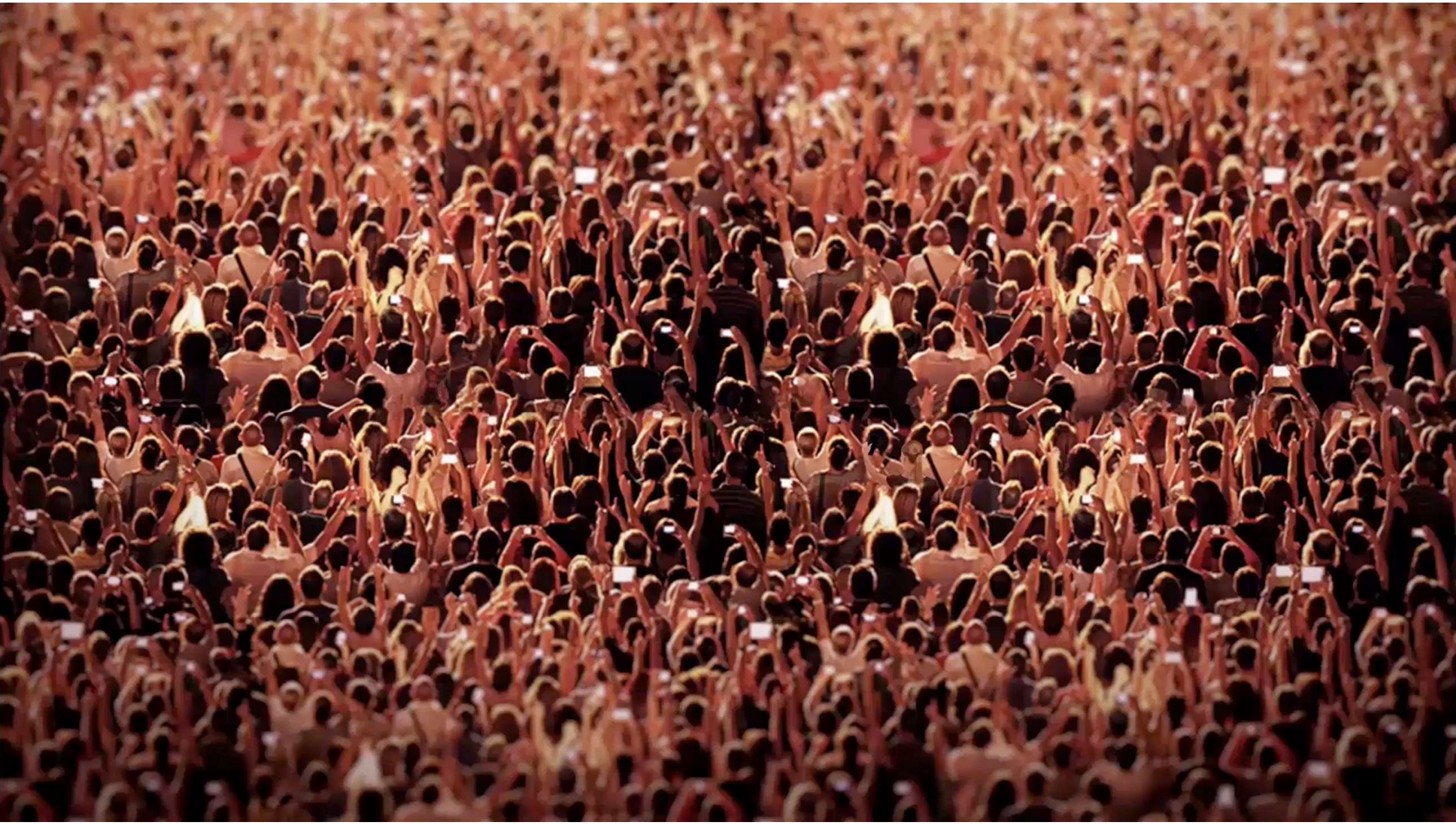



And new generations are more
dependent on the network

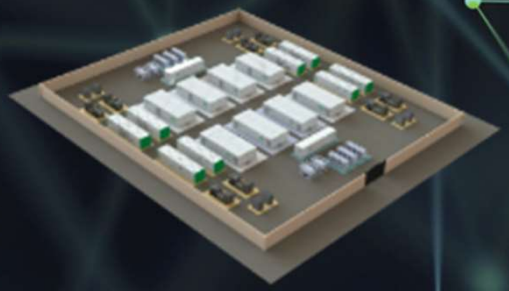
Which leads to three types of Data Centers all of which are mission critical

1

Centralized Cloud Data Center

2

Regional Data Centers



3

Localized or Micro Data Centers

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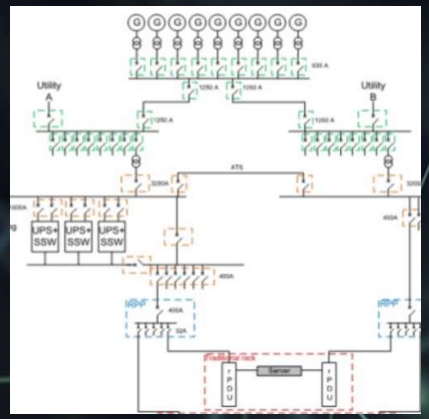
However, best practices seen in centralized and regional data centers…



Redundancy

Monitoring

Data Center staff

Organization

Security

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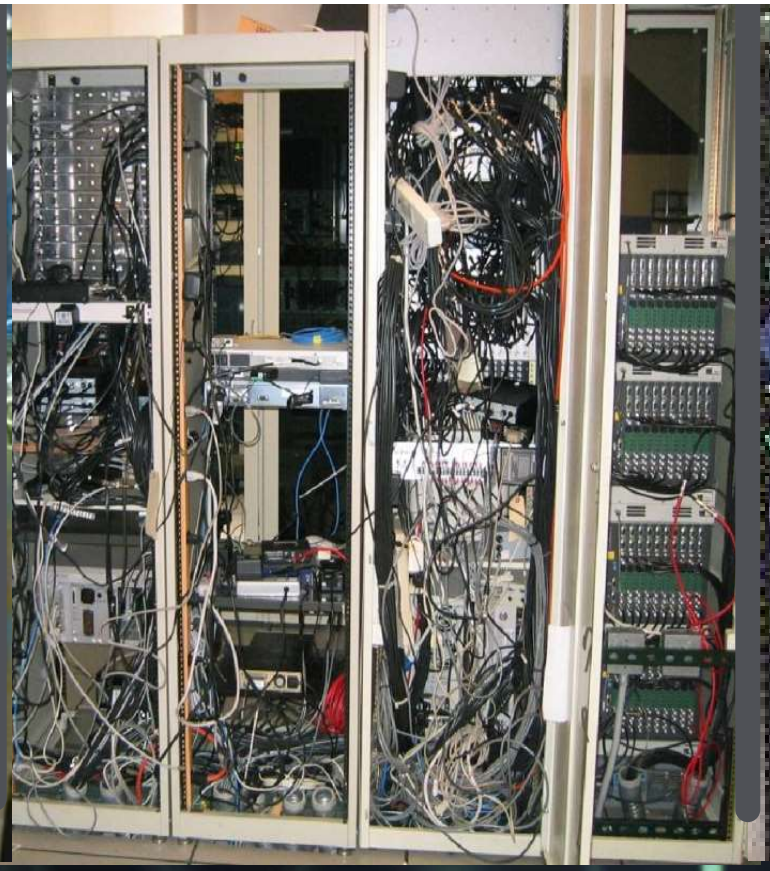
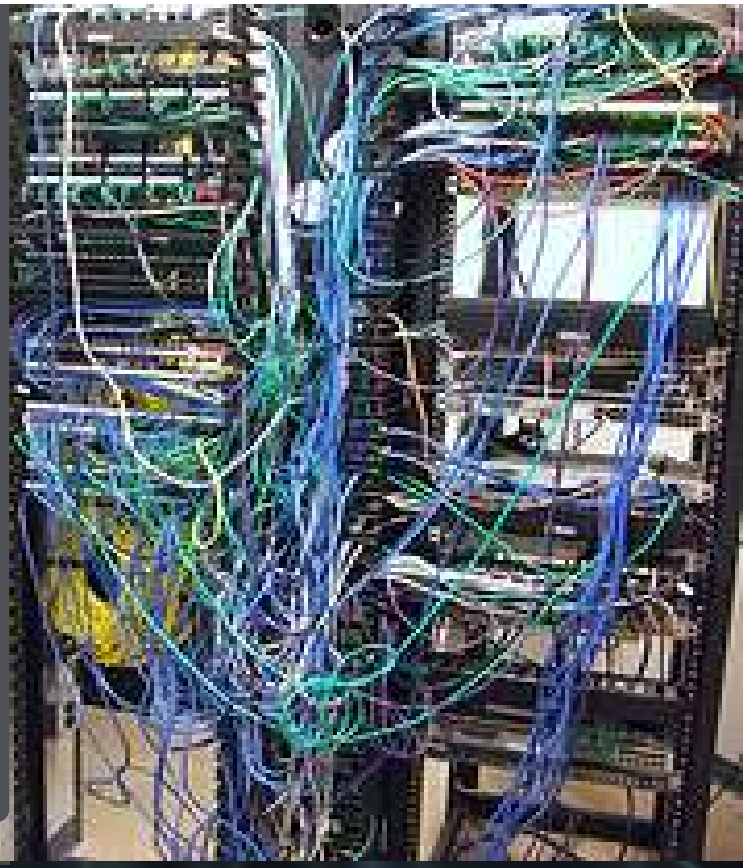

…are usually not at the localized edge

- ✖ Unsecured racks
- ✖ No monitoring / management
- ✖ No redundancy
- ✖ Lacking local staff
- ✖ Lack of dedicated cooling

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Our perception of “failure” is inadequate and needs to evolve

Current paradigm

Failure is a disruption to any IT equipment within a single data center

- Focused on the centralized data center
- Failure of IT rack meant a failure
- Doesn’t comprehend branch/remote sites

New paradigm

Failure is user interruption, including loss of connectivity at localized / micro data centers

- Focuses on the system performance
- Considers employees at localized sites
- Considers functions at localized sites

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Availability of dependent systems creates new challenges

Current Paradigm

Centralized Cloud Data Center

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

New Paradigm with Edge

Centralized Cloud Data Center

Edge Data Center

$Availability_{system} = Availability_1 * Availability_2$

Tier 3 Cloud Availability = 99.98%
Tier 1 Edge Availability = 99.67%
Availability = 99.98% x 99.67% = **99.65%**
Downtime = 30.7 hours/year

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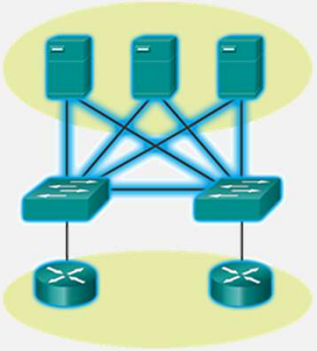
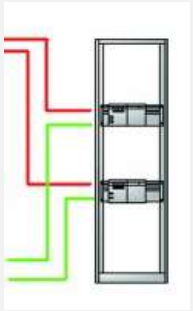
We need to rethink robust architectures for the localized data centers – focus on security, redundancy, and management

Dual network connectivity



Redundancy in critical components of power/cooling



Secure, safe environment

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Over these same 10 years, we've also seen a dramatic increase in data center efficiency

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Where will the next 80% improvement come from?

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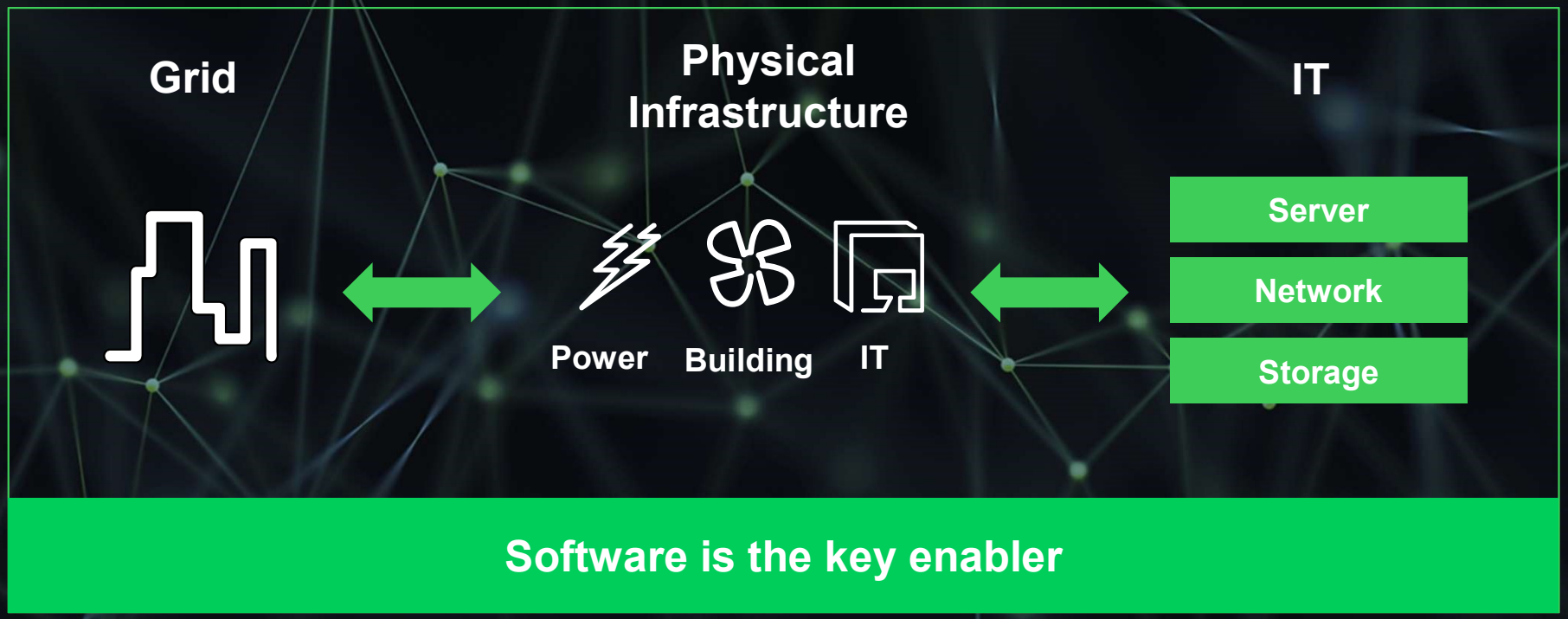
Success will take more collaboration and more openness



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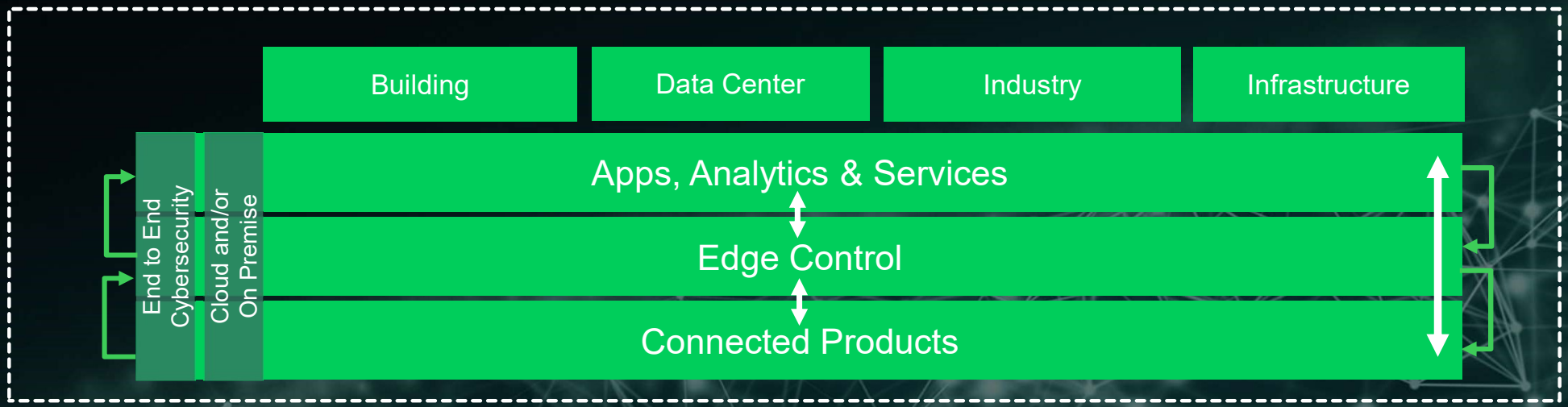
Our solution : The EcoStruxure Architecture



EcoStruxure Building | **EcoStruxure Power** | **EcoStruxure IT** | **EcoStruxure Machine** | **EcoStruxure Plant** | **EcoStruxure Grid**

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EcoStruxure™ Innovation At Every Level

for Data Centers

Objectives

- Increase customer intimacy with all segments
- Create positive feedback throughout the life cycle: design, build, operate and maintain
- Be open and collaborative with partners and developers

Value Proposition

Increase Efficiency

- 33% more staff productivity
- 25% increase in energy savings
- 30% increase in infrastructure utilization

Maximize Availability

- 50% faster service dispatch
- 30% reduction in false alarms
- 35% faster site problem resolution

Reduce Time

- 60% faster to deploy
- 50% faster design time
- 30 minutes to first insights

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Driving customer intimacy digitally throughout the life cycle

Engaging at every phase of the life cycle creates a **positive feedback loop**

CapEx cycle | **OpEx cycle**

Design

Research, design tools, and engineering expertise

Build

Global reach with local expertise

Operate

Maintain

Cloud-based, IoT-enabled software management tools and services

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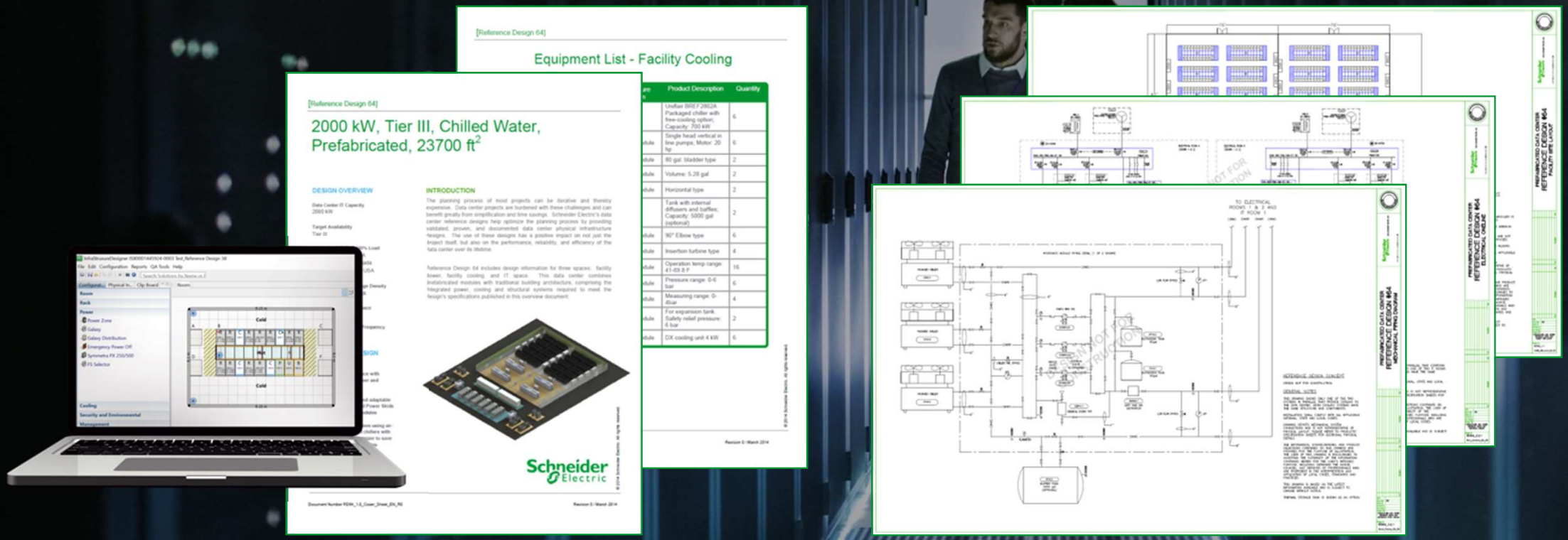
We've created a large portfolio of **digital planning tools** serving small and large data centers



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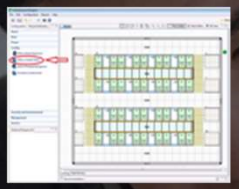
Connecting to customers early drives long-term success

Reference Designs

- 100+ EcoStruxure designs
- 6,000 downloads per year

"… covers the high level requirements of my clients and gives them quickly a realistic view of the project so we can kick off the project faster in a more controlled and deterministic fashion."

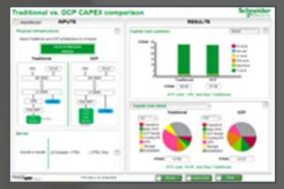
Design/ configuration tools



- 80,000 configurations per year
- 70 GW of capacity configured

"I use (ISX) Designer often, and the output helps 'paint a picture' for the customer."

TradeOff Tools & White Papers



- 200+ papers and tools
- 400,000 paper views per year
- 20,000 users of tools per year

"… tools let me quickly and easily analyze complex technology choices to help me justify business decisions regarding my data center."

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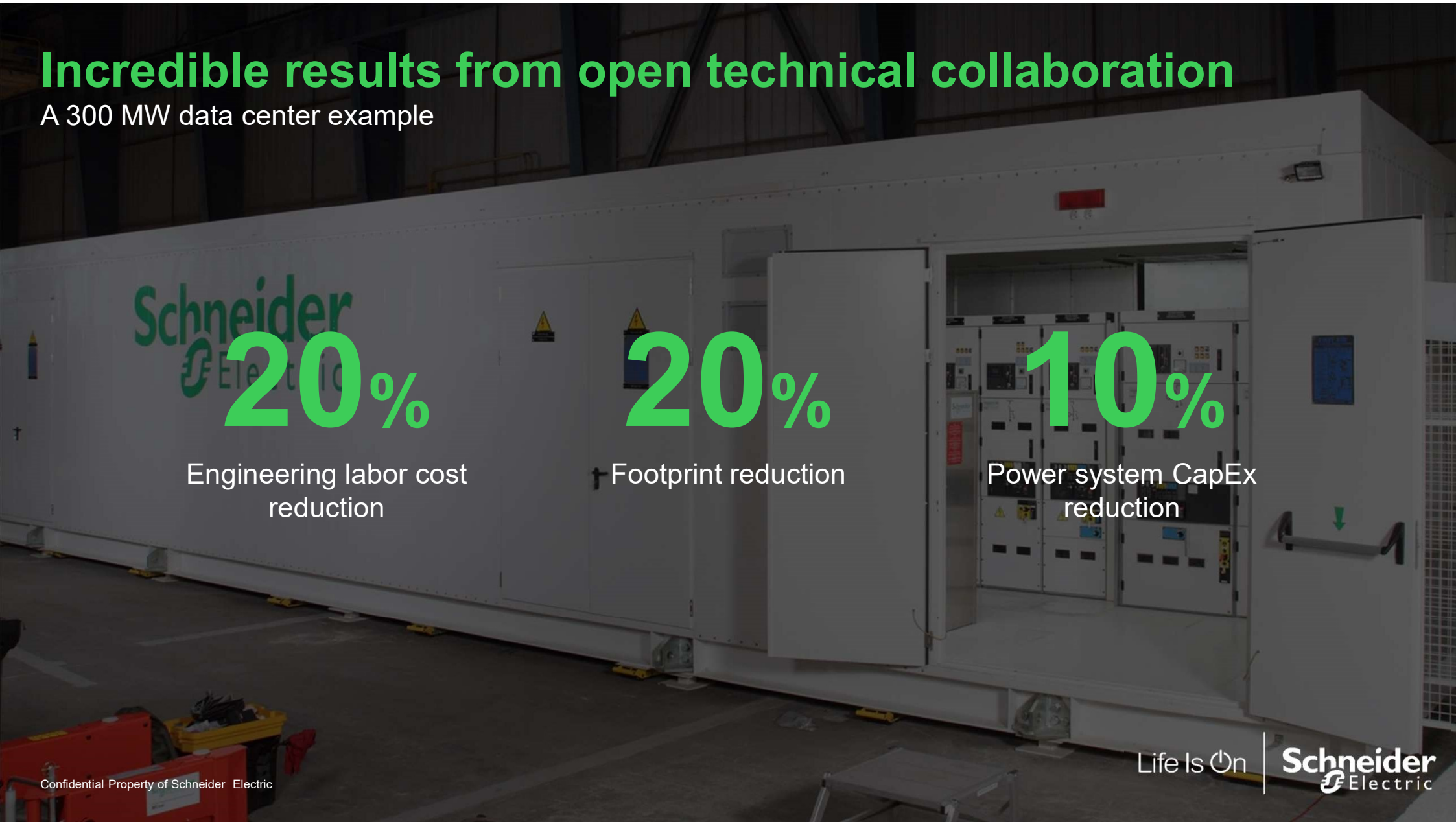
Incredible results from open technical collaboration

A 300 MW data center example



20%

Engineering labor cost reduction

20%

Footprint reduction

10%

Power system CapEx reduction

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We believe **cloud-based management** systems are the only way to meet these challenges

Collect & analyze

massive amounts of data; scope & depth of analytics is much larger

Remotely monitor & manage

all of your sites from a single device; and connect outside experts to remotely monitor & service

Scale management systems

easily without limit

Better performance with predictive capability

by utilizing ‘big data analytics’ to spot trends and forecast failures

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Example of benefits by operating
EcoStruxure at a global retail chain
Improved store stability by
88%
Decreased average active UPS faults from
70 to 10
Allowing employees to focus on selling returned over
5,600 work hours
Easily manage global standards for security and settings to
2,300 devices
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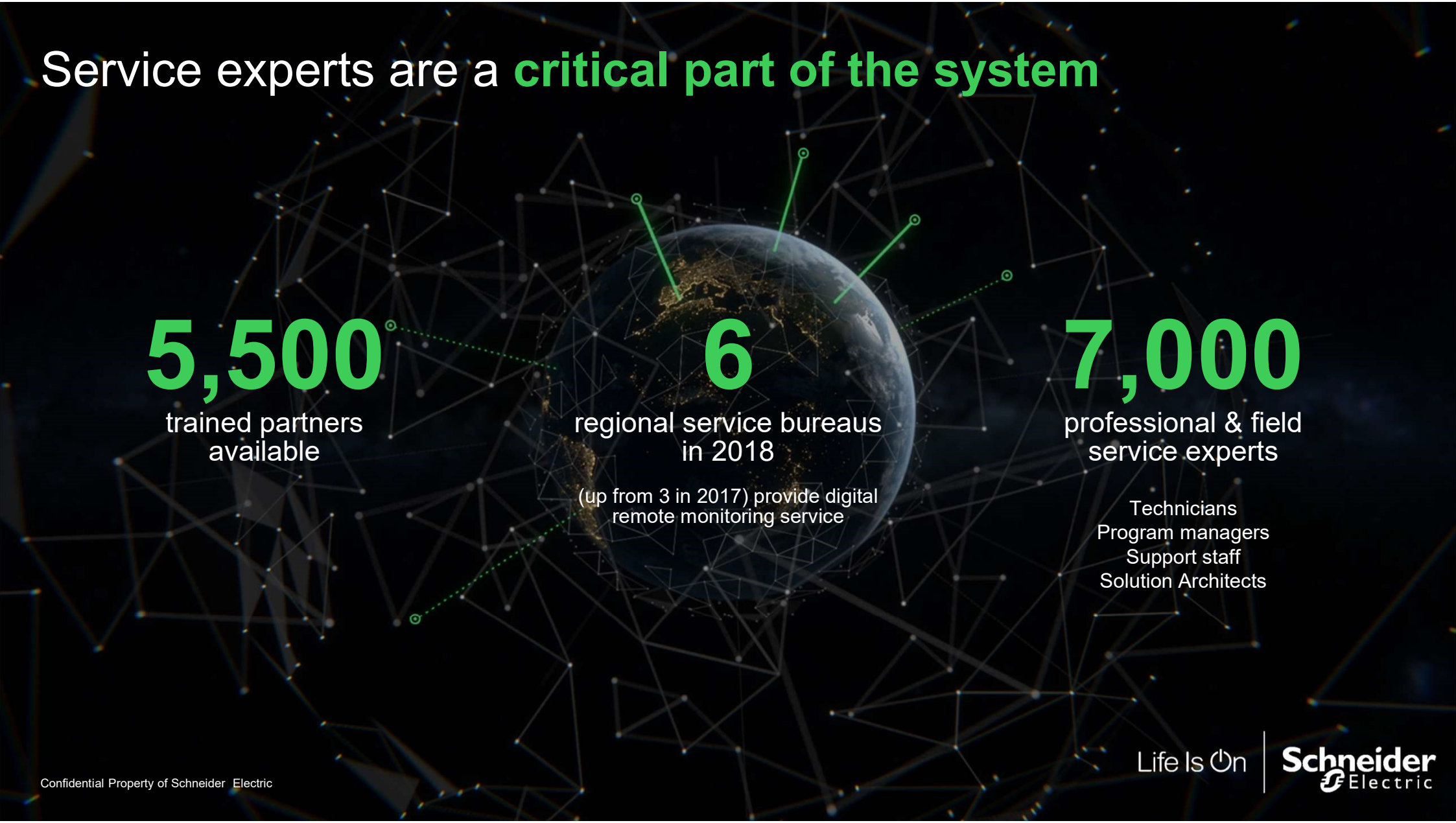
Service experts are a **critical part of the system**



5,500

trained partners available

6

regional service bureaus in 2018

(up from 3 in 2017) provide digital remote monitoring service

7,000

professional & field service experts

Technicians
Program managers
Support staff
Solution Architects

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