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A Journey to AiDI

Vice President of 21Vianet

Liu Feng

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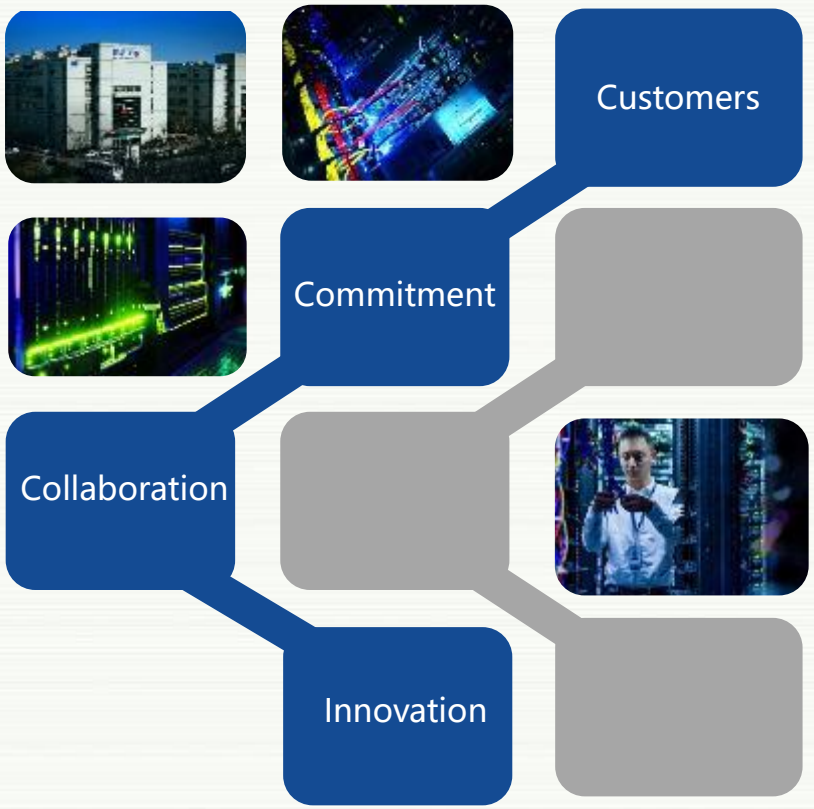
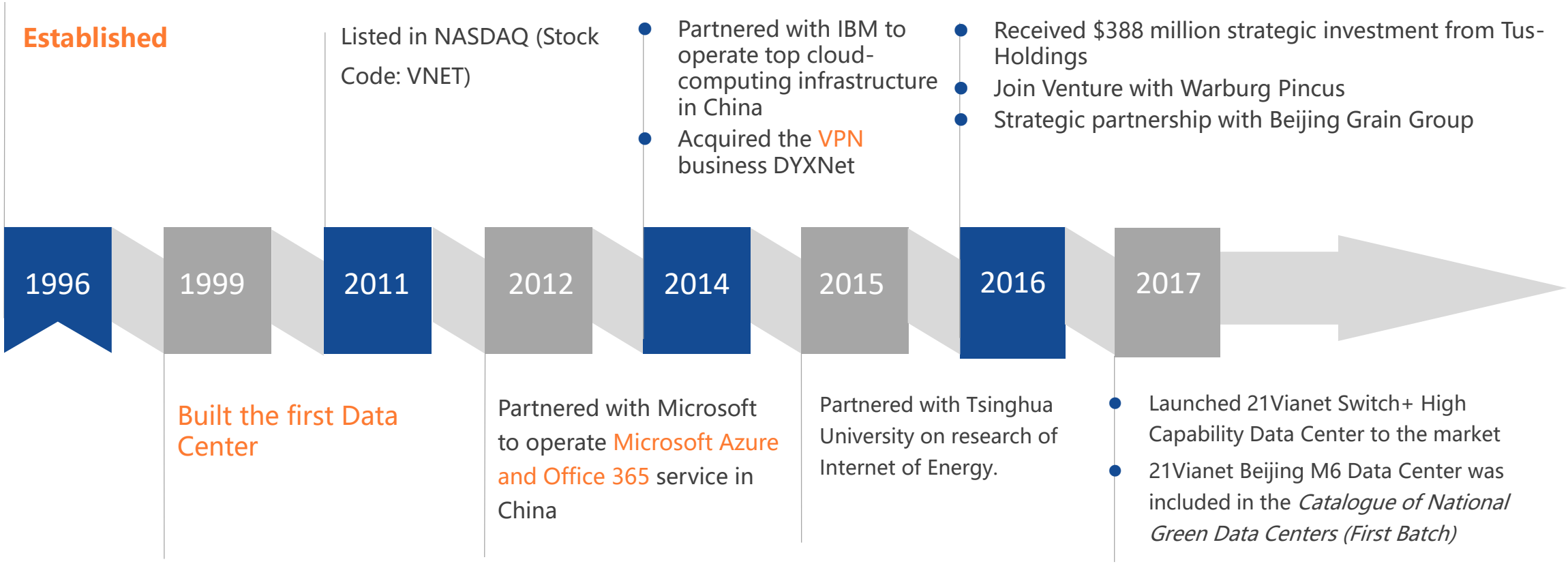
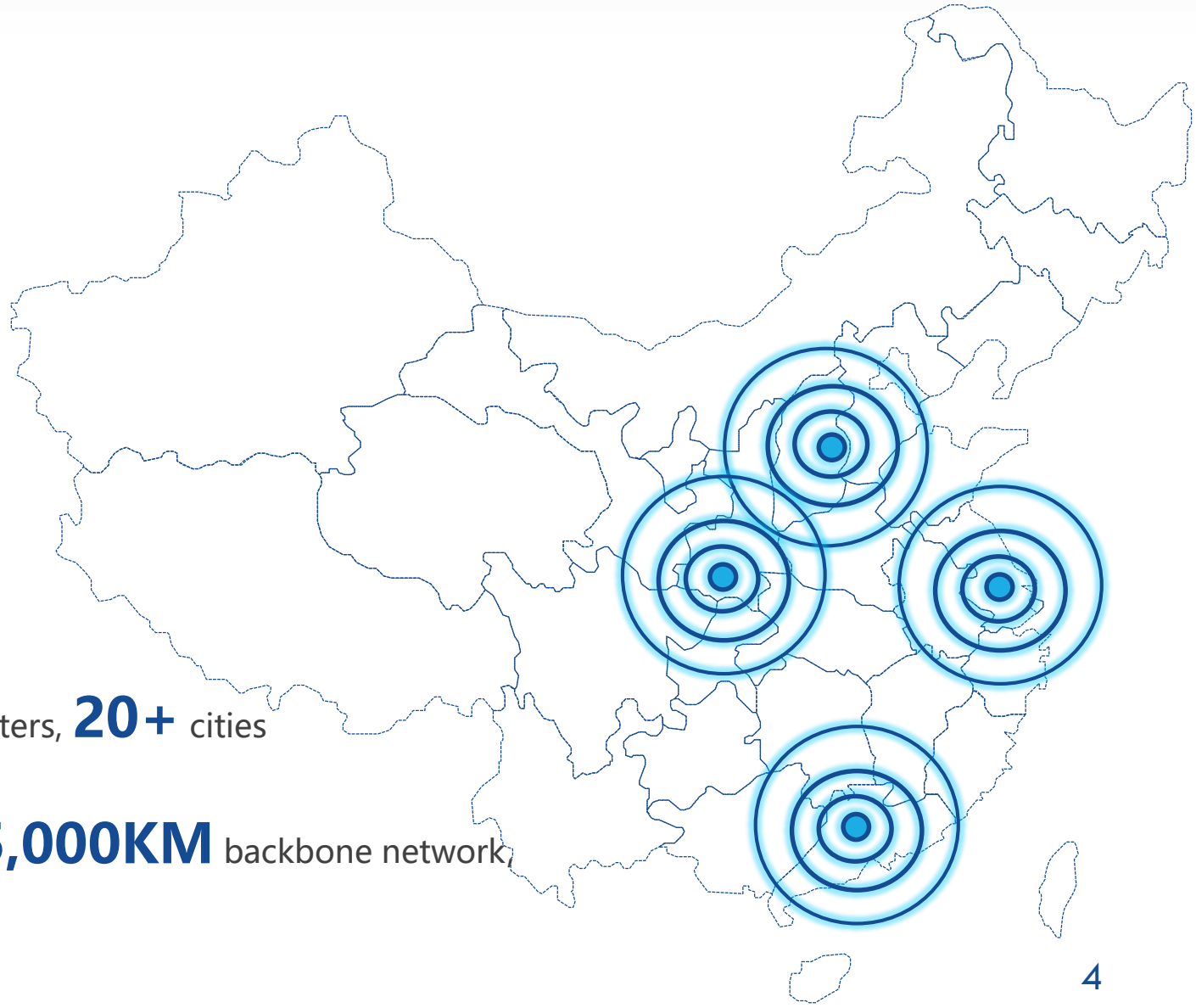


Milestones Achieved Over 20+ Years



Footprint of 21Vianet



2,000+ quality customers

50 self-built and self-operated data centers

20+ years of operation experience, **50+** data centers, **20+** cities

29,000+ cabinets, **400+** network nodes, **15,000KM** backbone network, **1,000G+** estimated network service capacity

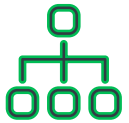
Problems & Challenges

Facility

- Data centers are the largest global energy users by 2025 at 4.5%, an increase from just 0.9% in 2015
- Cooling accounts for 40% of all data center energy consumed
- Energy consumption accounts for 30% of IDC cost

Cloud Operation

- Over-provisioning of resource
- Lack of unified management tool
- Lots of manual routine work
  - Deployment
  - Monitoring
  - Update & Patch
  - Troubleshooting
- Human error is still the biggest issue



Network

- Rapid growth in the number of devices & High complexity of the network,
- High skill requirements for administrators
- Lack of automation in traffic management
- Insufficient breadth and depth of monitoring，too many alarms, and critical alarms are overwhelmed

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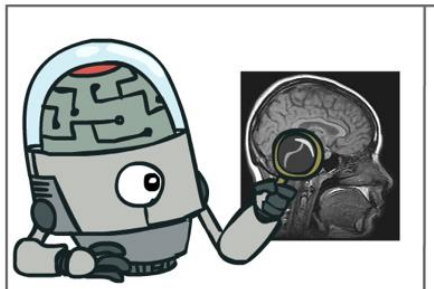
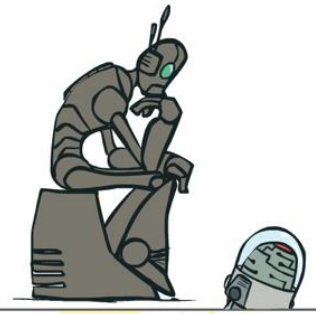
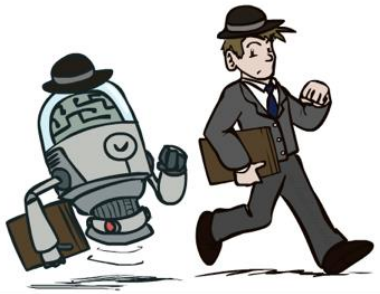
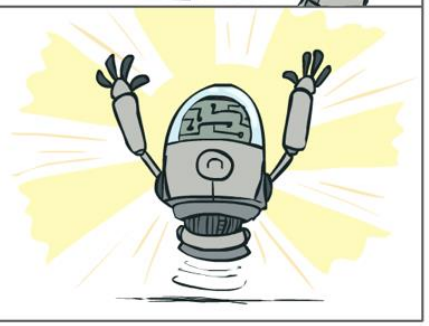
What is AI?

The science of making machines that:

	Humanly	Rationally
Thinking		
Acting		

The three types/stages of AI:

Narrow AI

Dedicated to assist with or take over specific tasks

General AI

Take knowledge from one domain, transfers to other domain

Supper AI

Machines that are in order of magnitude smarter than humans

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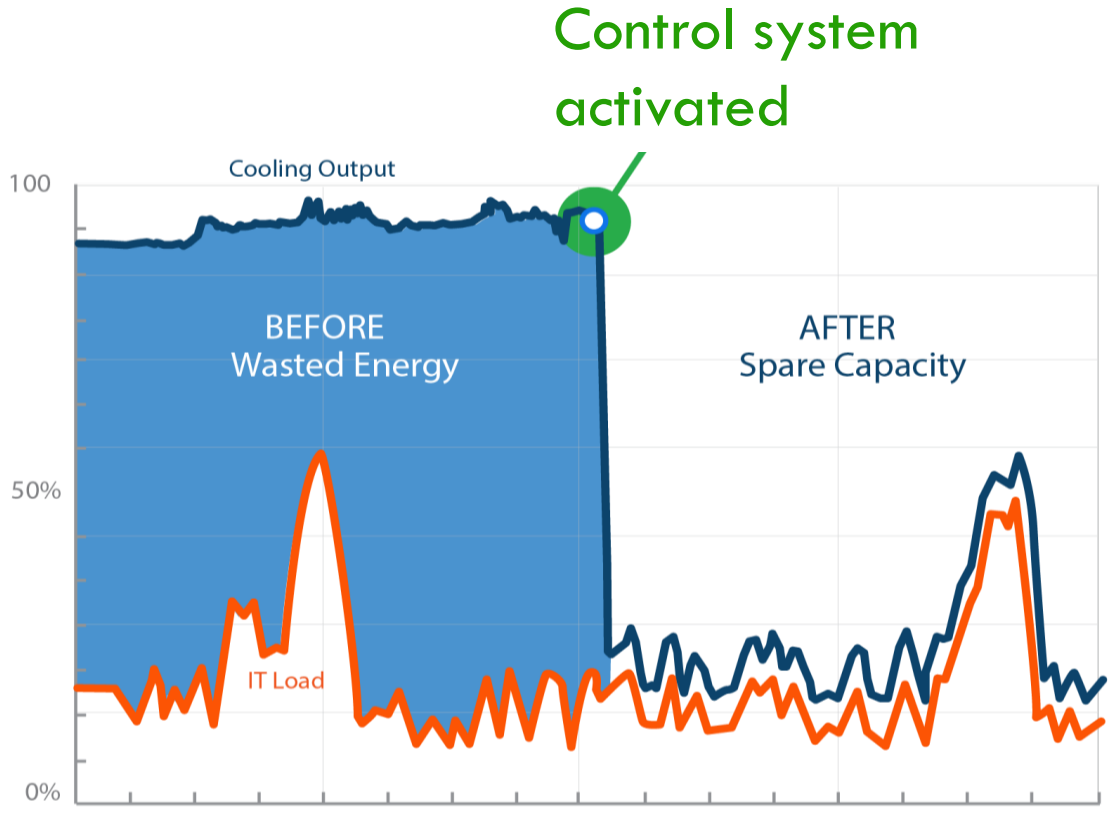
What can AI resolve - Energy optimization

A **Design standards provide more cooling than necessary**

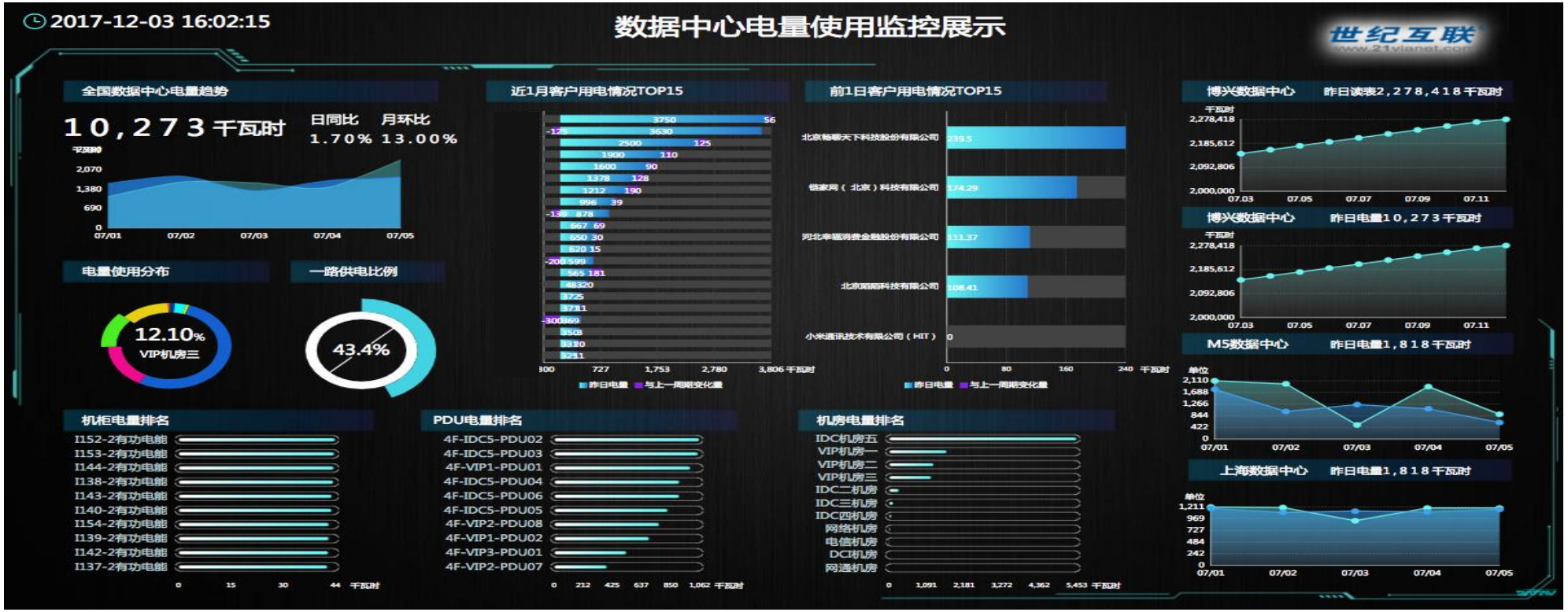
B **Airflow complexity and IT variability make it impossible to manually optimize**

C **The result is wasted energy and lost capacity**



What have done

- Data Collection, Modeling and Analysis, improved PUE
- Gain customer insight by trends analysis, provide personalized offers according usage behavior



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Achievements

The PUE of 21Vianet in Beijing data centers is around 1.35

Energy Saving Improves the Operation Level of Data Centers

The Way Ahead -Romonet Partnership

romonet®

Rising data center predictive analytics software and services provider in UK, Around 30+ global customers including :Amazon, Equinix, Campass datacenters, Bank of America and so on

+

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Leading data center /IT infrastructure operator and provider In China

Since Q3,2017, working on POC with joint-effort and targeting with PUE performance improvement for data center in 21Vnet

Chillers and pumps metering

PDU metering data

Lighting and power, gen preheating and office load

Weather data

PUE Optimization

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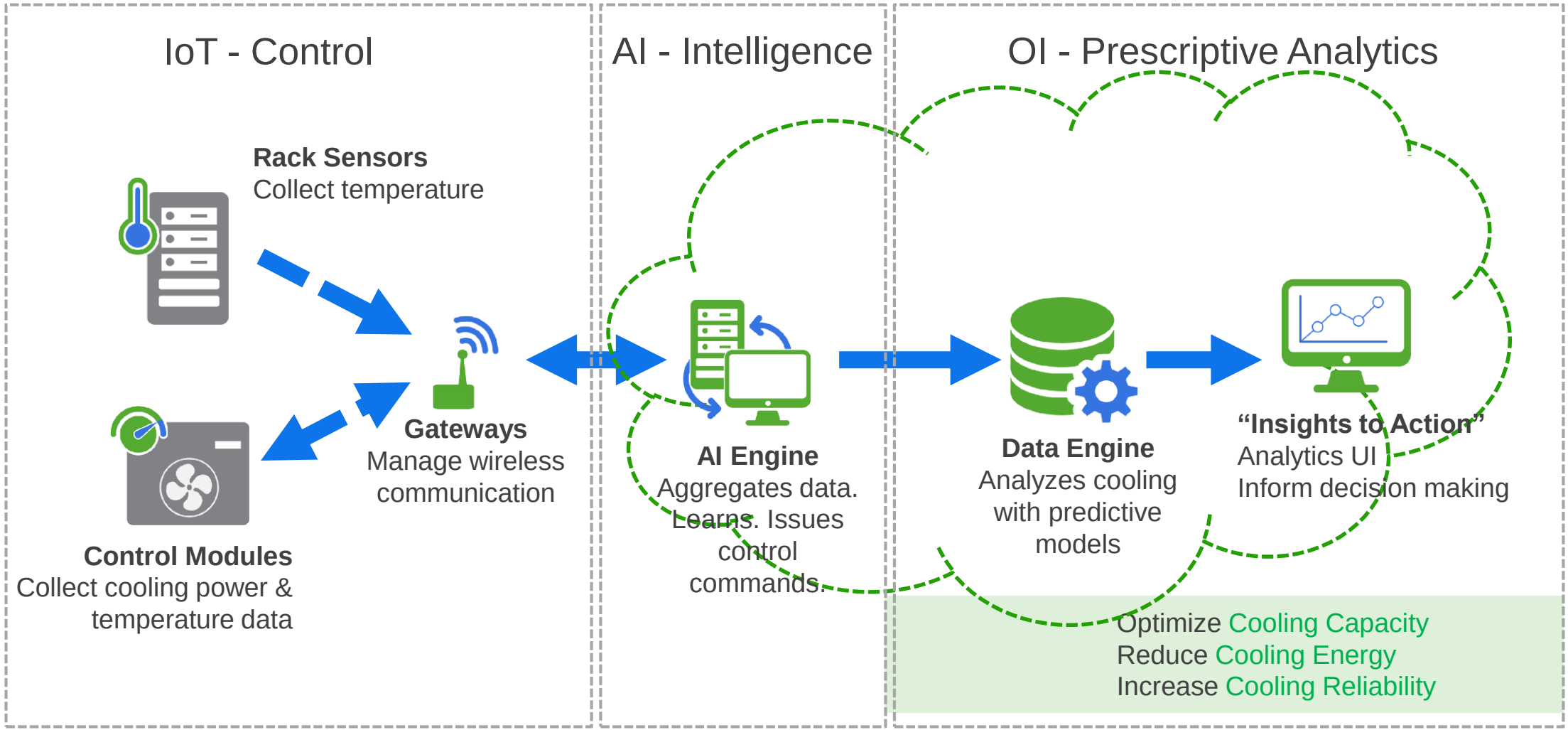
The Way Ahead – AiDI Architecture

Dynamic Control with Adaptive AI Optimizes Cooling



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The Way Ahead — AI-Defined Infrastructure /AI-Defined Enterprise

AiDI enablement

- Sophisticated algorithm
- Machine learning
- Artificial intelligence

Capability enhancement

- Elastic resource deployment
- Self-awareness & autonomous
- Reacting or proactively acting
- True real-time IT environment

AI-defined Infrastructure (AiDI)

AI-Defined Enterprise (AiDE)

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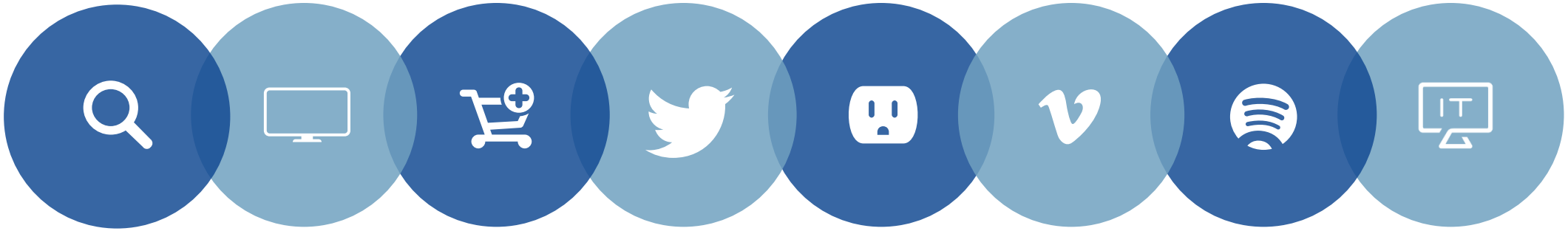
Our customers: Unicorn companies growing with 21Vianet



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