IBM Scalable Modular Data Centre

Providing Energy Efficiency , Agile, Cost Effective Data Centre

IBM Software

PCTY2010

Pulse Comes to You

Optimizing the World's Infrastructure
[**13 April Singapore**]

Agenda

- Needs and challenges
- Offering overview
- Client example of benefits achieved
- How the offering addresses needs and challenges
- How Site and Facilities Services can help
- IBM's expertise in this area
- Next steps

Executive summary

- Clients need to increase compute capacity in server rooms to meet business demand while improving availability

- Cost-effective solutions should include decreased capital *and* operating costs

- Data center design needs to change to be more flexible and responsive to meet unpredictable changes in business needs, technology and compute models

- Modular data centers allow for quick and cost-effective implementation for increased server room capacity

Customer's challenges are driven by three issues

Increased IT Demand

- 54% growth in storage shipments due to explosion of information[1]

- 85% of distributed computing capacity sits idle[1]

- Data centers energy use will double from 2006-2012[2]

- 51% of clients will be adding new server rooms in next 12-24 months[3]

Increasing Cost Pressures

- 14% of CIO's time is spent removing costs from the technology environment[4]

- 75% of CIO's anticipate a strongly centralized infrastructure in 5 years[4]

- Global electricity prices are increasing 10-25% per year[5]

Responsiveness to Change
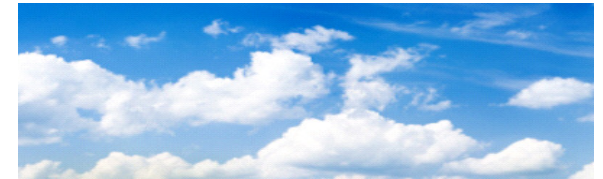
- 64% of CIO's expect moderate to significant change ahead[4]

- 80% of every $1 is spent to maintain and manage mid-size clients existing infrastructure[1]

- Technology densities are growing 20x this decade[6]

- 5-60% of IT workloads may be cloud-enabled[7]

1. IBM Dynamic Infrastructure client presentation, July 2009
2. Environmental Protection Agency, Report to Congress on Server and Data Center Energy Efficiency, Public Law 109-431, August 2, 2007; IDC, Koomey et al (2009)
3. Digital Realty Trust survey, US and Western Europe (Feb and March 2009)

4. IBM Global CIO study, September 2009
5. Energy Information Administration, 2001-2009; IBM analysis
6. ASHRAE Publication: Datacomm Equipment Power and Cooling Applications, 2009
7. IBM research, September 2009

We can help clients in three simple ways…

Extend the life of an existing data center infrastructure.

Rationalize the data center infrastructure across the company.

Design new infrastructure to be **responsive** to change.

Double IT capacity or reduce operational expenses by 50%.

Improve operational efficiencies while reducing operational expenses by 50%.

*Pay as you grow by deferring 40-50% of capital and operational costs.*

Improve your availability and flexibility with a turnkey, cost-effective scalable modular data center solution from IBM

Description:

- The IBM solution is designed to enable rapid deployment of a cost-effective, high-quality 500 to 2,500 sq ft (50 to 250 sq m) data center/server room. The turnkey solution can be designed and installed in nearly any working environment in much less time than a traditional raised-floor data center.

Benefits:

- Turnkey data center design/build solution
- Designed to support the client's specific data center availability requirements
- 15-25% lower costs than traditional data centers
  - Up to 25 % less capital costs
  - Up to 15% less total operational costs
- Rapid deployment: in 8 to 12 weeks after design
- Scalable and flexible to "pay as you grow"
  - Supports increased power and cooling requirements from new technology
  - Allows for non-disruptive growth
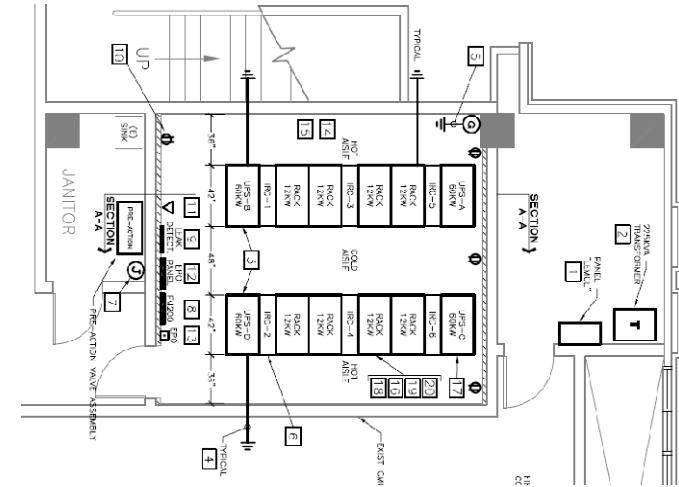
Columbia County obtains a highly scalable, energy-efficient data center solution by working with IBM

Business challenge:

The government of Columbia County, one of the fastest growing regions in Georgia, was seeing an increase in demand for its services—many of which were available on the Internet. But the supporting IT infrastructure was struggling to keep pace with demands and had run out of space. Even worse, aging power and cooling systems threatened system availability and wasted energy, prompting the organization to pursue a new solution that would help it meet future growth, reduce costs and improve availability.

Solution:

Having worked with IBM in the past, the county signed a site and facilities services contract with IBM Global Technology Services. The IBM staff, after an initial assessment of the client's infrastructure, designed and deployed a 1,200-square-foot scalable modular data center solution, featuring scalable & modular InfraStruXure architecture and IBM BladeCenter and IBM System x servers.

Benefits:

- Doubles Columbia County's IT capacity with virtually no increase in energy usage

- Anticipates operational savings of approximately US$30,000 annually due to more-energy-efficient equipment

- Gains a redundant, highly available environment, expertly designed by IBM and deployed without disrupting operations

- Monitors power and cooling efficiencies to control resource consumption

"We wanted to work with IBM staff because we thought they would have the expertise to deliver what we needed—and quickly. And we were right. IBM delivered a data center that has not only met but also exceeded our expectations."

—Lewis Foster, CIO, Columbia County

Solution components:

- Site and facilities services – scalable modular data center

COLUMBIA COUNTY
GEORGIA

IBM works with you to help translate business objectives into data center infrastructure requirements

Business objectives

- Meet business and IT growth

- Balance capital and operating costs

- Flexible to support new technology

- Faster time to deploy

Data center requirements

- High availability[1]

- Provide required capacity[1]

- Optimize capital costs

- Maximize scalability

- Maximize flexibility for technology and computing model adoption

- Minimize capital *and* operational costs
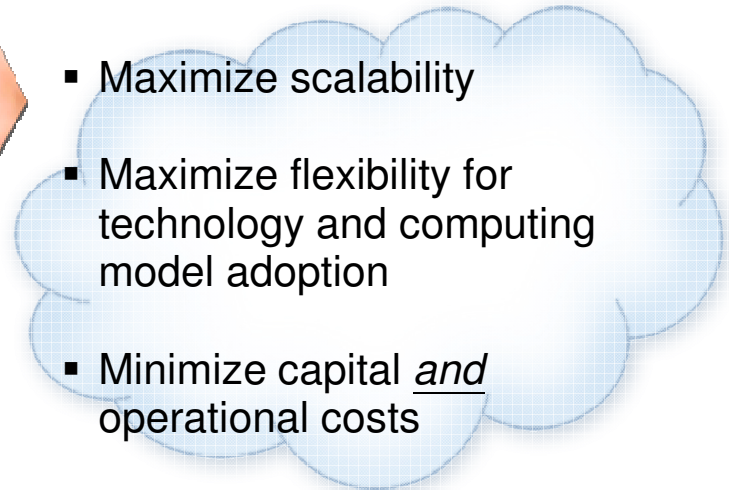
1. Digital Realty Trust; Emerging Trends in the data centre market, DCD London, November 2007; US EPA Study, August 2007
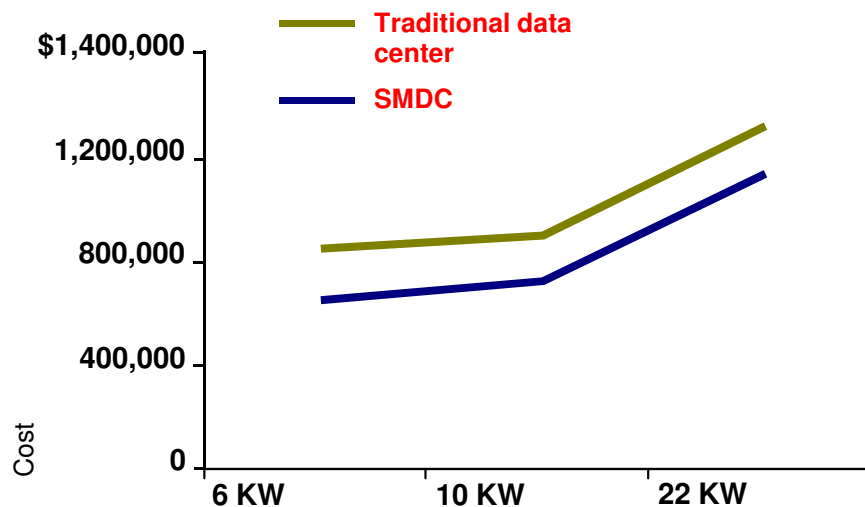
SMDC provides "right sized" power and cooling solutions to reduce costs 10-25% over traditional data center designs

Example: approx. 500 sq. foot (50 sq. meter) data center

Capital Costs
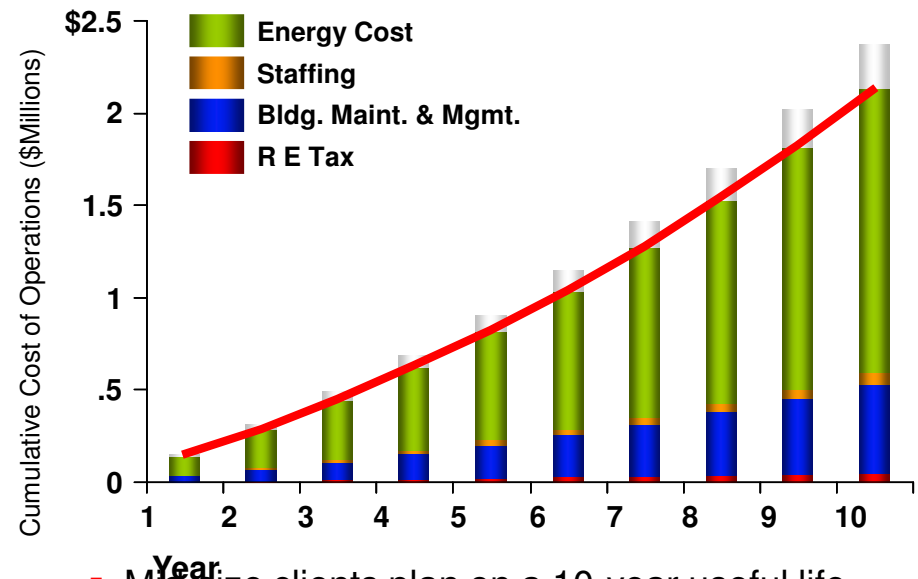*SMDC provides a 20-25% capital savings over traditional data center alternatives.*

Source: IBM Estimates

- 70% of mid-size clients are planning plan < 10 kw/rack.
- Designed at IBM Level 2, can scale to IBM Level 3.

Operational Costs
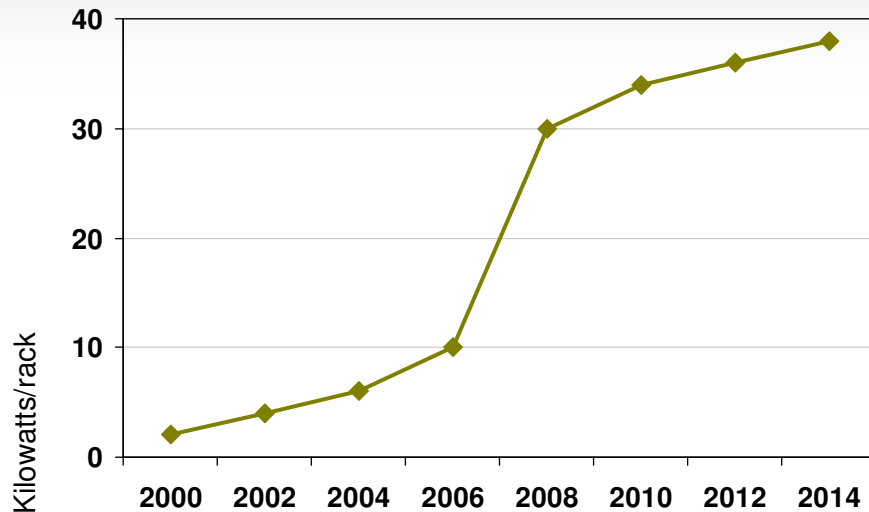*SMDC provides up to 10-15% lower operational costs than a traditional data center*

- Mid-size clients plan on a 10-year useful life.
- Assumes energy costs increase 10% per year.

SMDCs are designed with the flexibility to support existing and future technology power density changes
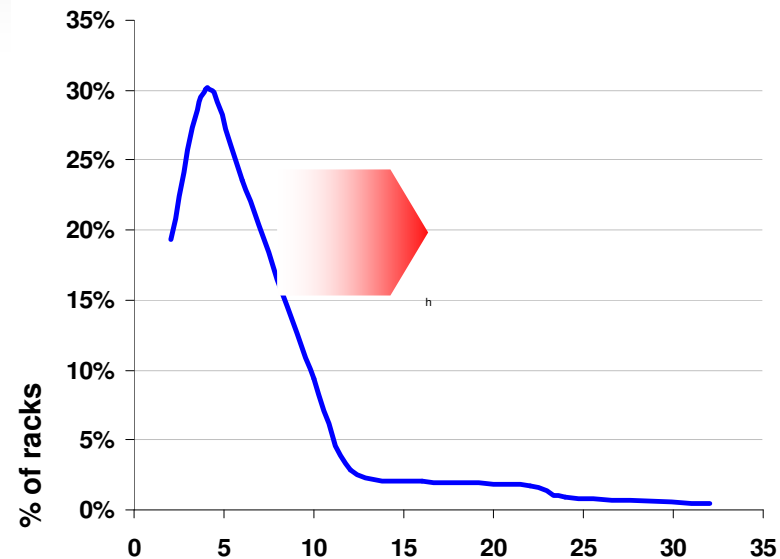
Business challenge:
Server power density trends[1]: 20x

Source: Page 4, Figure 1.3, Best Practices for Datacom Facility Energy Efficiency Second Ed. (c) 2009.

Meet your IT kw/rack power density
70% of midsize clients planning for < 10kw/rack

Solutions...

- Create a scaleable design which allows for rack density changes over time
- Provide modular growth of cooling and backup power capacity as demands evolve over the life of the data center
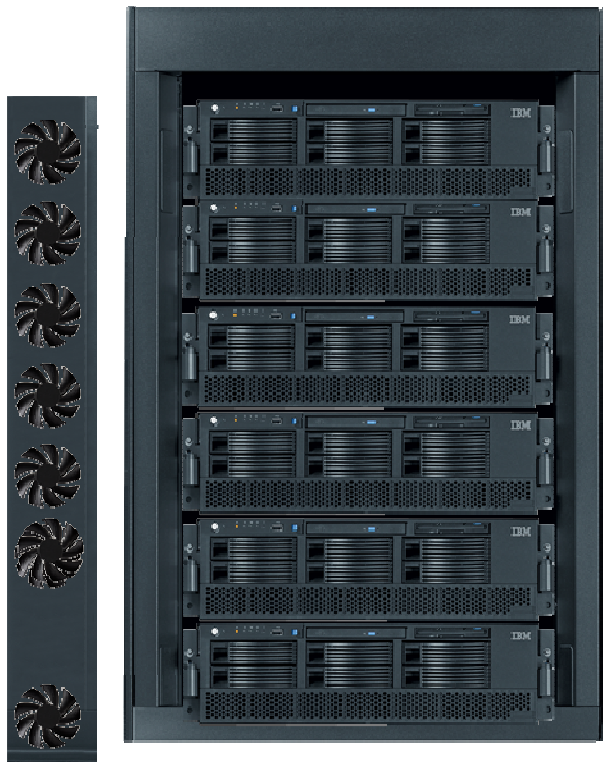
- Design growth to minimize or eliminate disruption to current operations
- Modularity creates agility

SMDC provides scalability to support vertical and horizontal growth

Vertical scalability …
supporting for more power density per rack as needed

Horizontal scalability …
add additional racks, cooling and UPS in a non-disruptive manner

Future IT load

Cooling on demand …
cooling only when the workload needs it.

Future IT load

IBM's turnkey solution approach is targeted at balancing your availably needs with the cost to achieve them through smarter design

Approx. 7.8 hrs/year down time

Approx. 48 min/year down time

Cost per square foot of raised floor

200%
175%
150%
125%
100%
75%

1   2   2+   3   3+   4

Data center reliability level (IBM Levels)
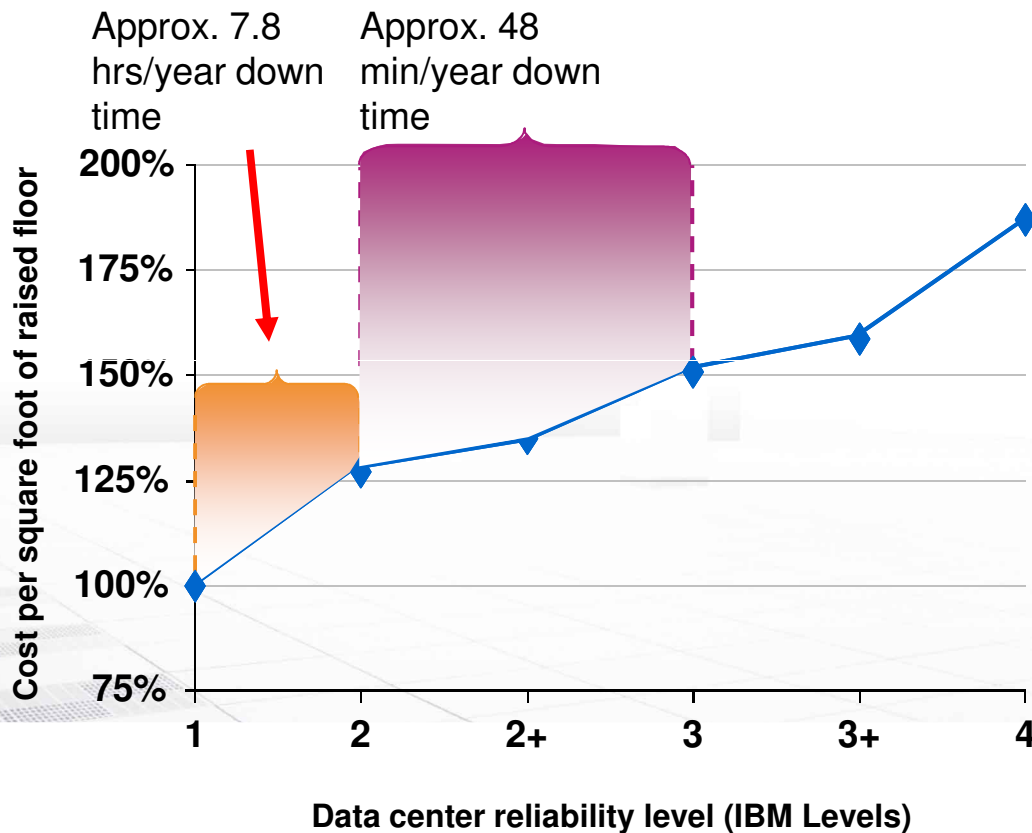
Note: The "+" indicates designed with concurrent maintenance
Source: IBM Estimates

Business challenge

- Balance availability with data center budget

- Does reducing outage time from 53 minutes to 5 minutes at 25% additional capital cost make business sense?

Solution

- We can use smarter design to achieve same availability at less cost (Level 2+, Level 3+)

  - Generator (s)

  - Dual power feeds to critical equipment

  - N + 1 UPS capacity

  - Power and cooling system concurrent maintainability

Our data center specialists will translate your business, technical and financial objectives into a turnkey SMDC design/build solution

DETERMINE REQUIREMENTS

What are your data center requirements?

- Availability
- Capacity
- Scalability
- Security

DETAILED PLANNING / DESIGN

Create a design based on the requirements, defining:

- Space
- Power
- Cooling

TURNKEY CONSTRUCTION

Turnkey construction:

- Architectural
- Electrical and mechanical systems
- Fire protection
- Security
- SMDC installation

START UP TESTING/ SITE TURNOVER

Site turnover:
- Start up / test power and cooling equipment
- IT equipment relocation and migration
- Cabling
- Commissioning and solution turnover

IBM's experienced data center project managers can help you quickly and cost effectively implement a state-of-the-art data center

IBM partnerships

CLIENT IT STAFF

ARCHITECTS AND ENGINEERS

IBM

APC
Legendary Reliability®

CONSTRUCTION CONTRACTORS

MECHANICAL AND ELECTRICAL EQUIPMENT PROVIDERS

IBM's value as a project manager

- *Augment your in-house resources*

- *Quickly and cost effectively implement data center capacity*

- *Coordinate specialists across IT and facilities*

- *Communicate project status and actions*

IBM runs the project from concept, through to construction, testing and turnover

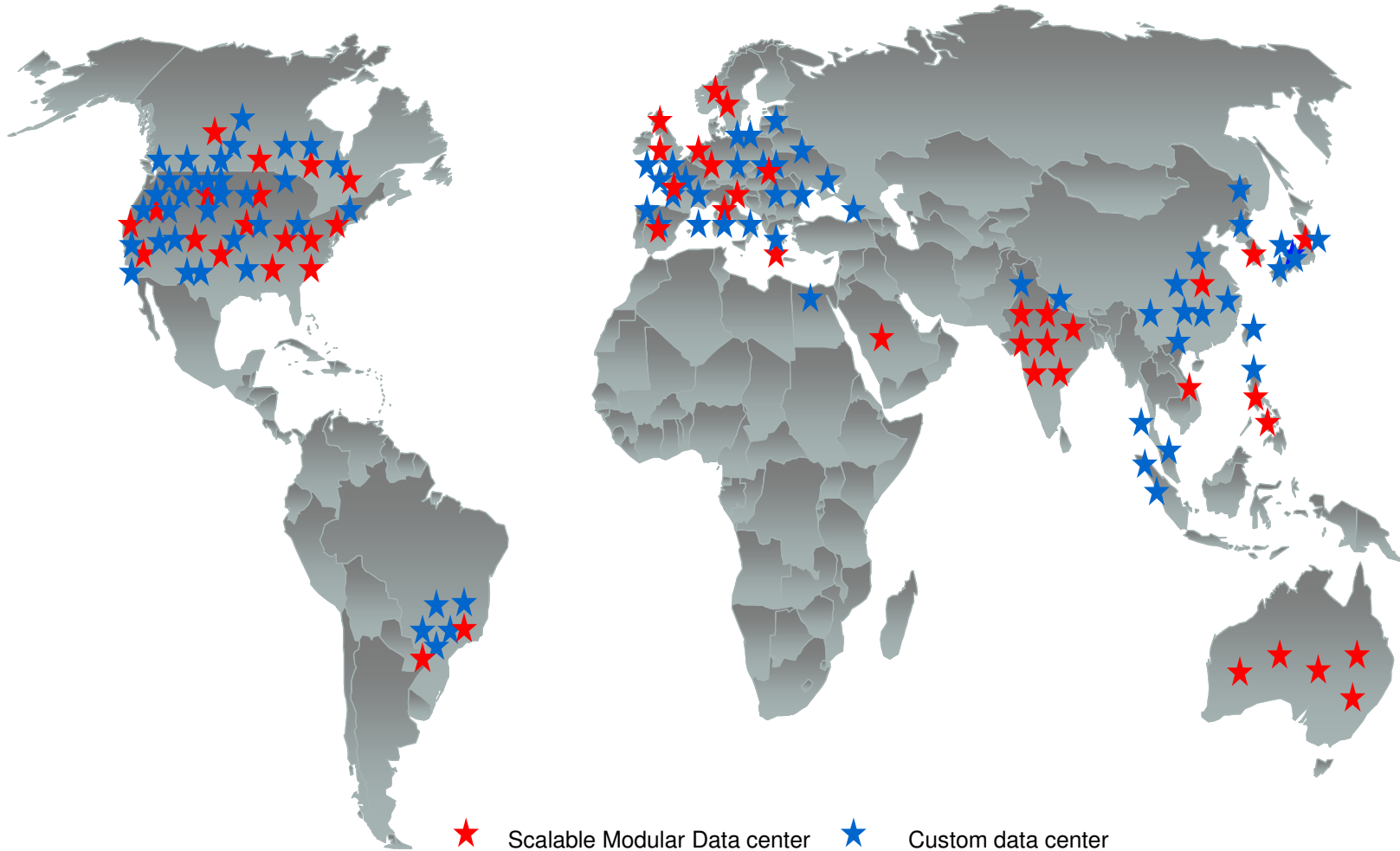| REQUIREMENTS	DESIGN	CONSTRUCTION	TURNOVER
What are your data center requirements?	Create a design based on space, power and cooling.	Build	Test and turnover.

IBM has global experience in data center design and build
Over 300 implementations of custom and standardized design in the past 2-3 years

★ Scalable Modular Data center   ★ Custom data center

IBM can be your trusted data center advisor

"In IBM we have an IT partner who meets our ideal expectations for sustainable business"

Dr. Herbert Koch, manager of the kika/Leiner group

"With the state-of-the-art data center, we will provide total IT services for clients and strengthen our position in the Data Center market as a leading Internet Data Center service provider."

Kim SeungMin, Hostway Korea, CEO

"We consulted several vendors and it was clear that IBM had the edge in terms of innovative ideas … the quality of the engineering work and project management from IBM was outstanding."

Art Gloster, Bryant University CIO

Why take action now?

- Yesterday's data center power and cooling strategies are not in sync with today's IT equipment demands
- IBM's SMDC solutions provide you with:
  - Increased computing capacity in your server rooms
  - Improved reliability to keep up with the business demands for increased availability
  - Decreased operating costs due to lower maintenance costs and improved power/cooling energy efficiencies
  - Decreased capital costs from reduced real estate spending associated with new server room projects
  - Quick and cost effective design and installation of additional server room or data center space to support business growth
- Engineering, installation and service cost reduction is now possible

IBM will work with you to understand your data center requirements and implement the best solution to meet your needs

Thank you for your time today

For more information, Contact:

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