

Experience the **Transformation** of Data Center  
through “**Green**” approach

## - Next Generation Data Center

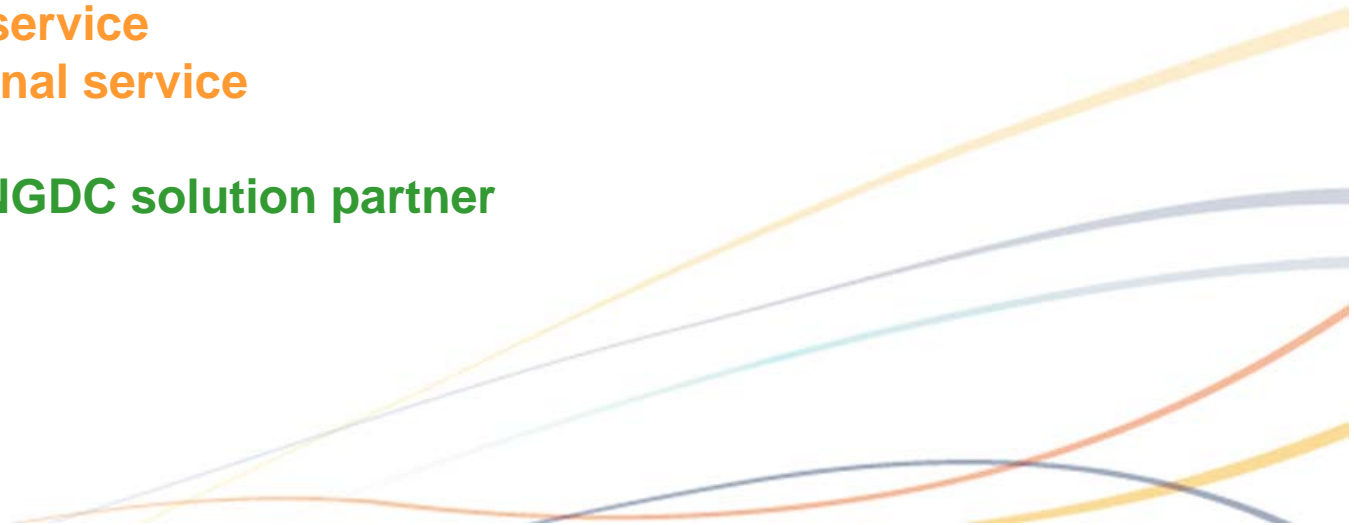
Assistant Vice President, Bid & Solutions Consulting

**Steve Ng**

**10 June, 2008**



- **Impact of power and heat in Data Center**
- **Enterprise challenges in Hong Kong**
- **How IT goes green?**
- **Next Generation Data Center transformation**
  - Vision
  - Framework
- **Energy Efficiency**
- **Operation Efficiency**
  - Network service
  - Professional service
- **A competent NGDC solution partner**
- **GOAL**
- **Case study**



## Impact of power and heat on the data center

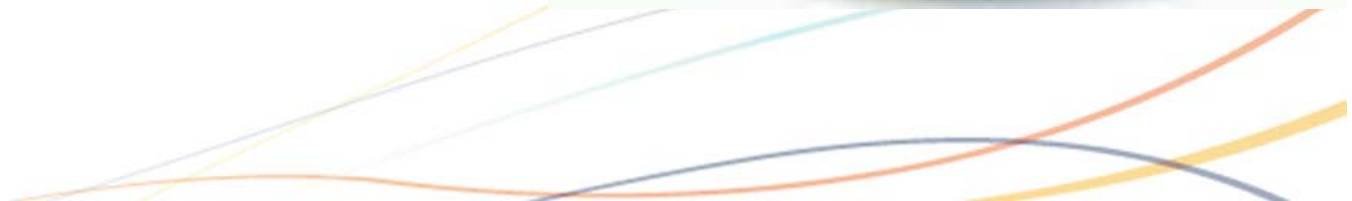
- Today, 50 cents are spent on energy for every dollar of hardware
- This is expected to increase by 54% over the next four years
- By 2010, Energy = 71% of annum IT spend



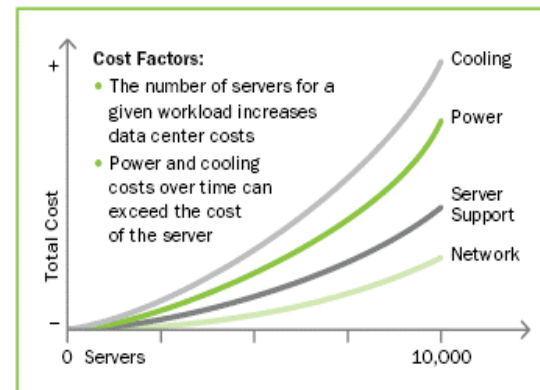
SOURCE: IDC, 'Worldwide Server Power and Cooling Expense 2006-2010,' Document #203598

Green Data Centers focus to deliver a perfect blend of **green and efficiency** in response for Data Center and information service needs

Green = less power & cooling  
Efficiency = less input & more output



A non-profit trade organization of IT professionals formed to address the issues of power and cooling in data centers



## Responsibilities

- Framework for improving the energy efficiency
- Power consumption, productivity metric



Over 150 members in total

## Market overview

- Over 80% of data centers in HK were built before 2001

## Market trend

- In the next 12 months, Grade A office rental likely stabilizes, and relatively lower rentals in HK east and Kowloon east attract tenants to relocate.

Comments Mr Kenneth Tsang, Head of Research, Greater China(South) at Jones Lang LaSalle.

## Space is limited

- Hong Kong now has 300,000 – 400,000 square feet net of data center space

## Response time

- Urban areas - 2-hr onsite service commitment

Source: [www.cw.com.hk](http://www.cw.com.hk) , March 10, 2008 vol XXV No2



## The Bad News

- There is No world –wide recognized standard

## The good news

- Best practices / semi standards

TIA Data Center standard

Tier 1 (Basic: 99.671 **availability**)

Tier 2 (99.741% **availability**)

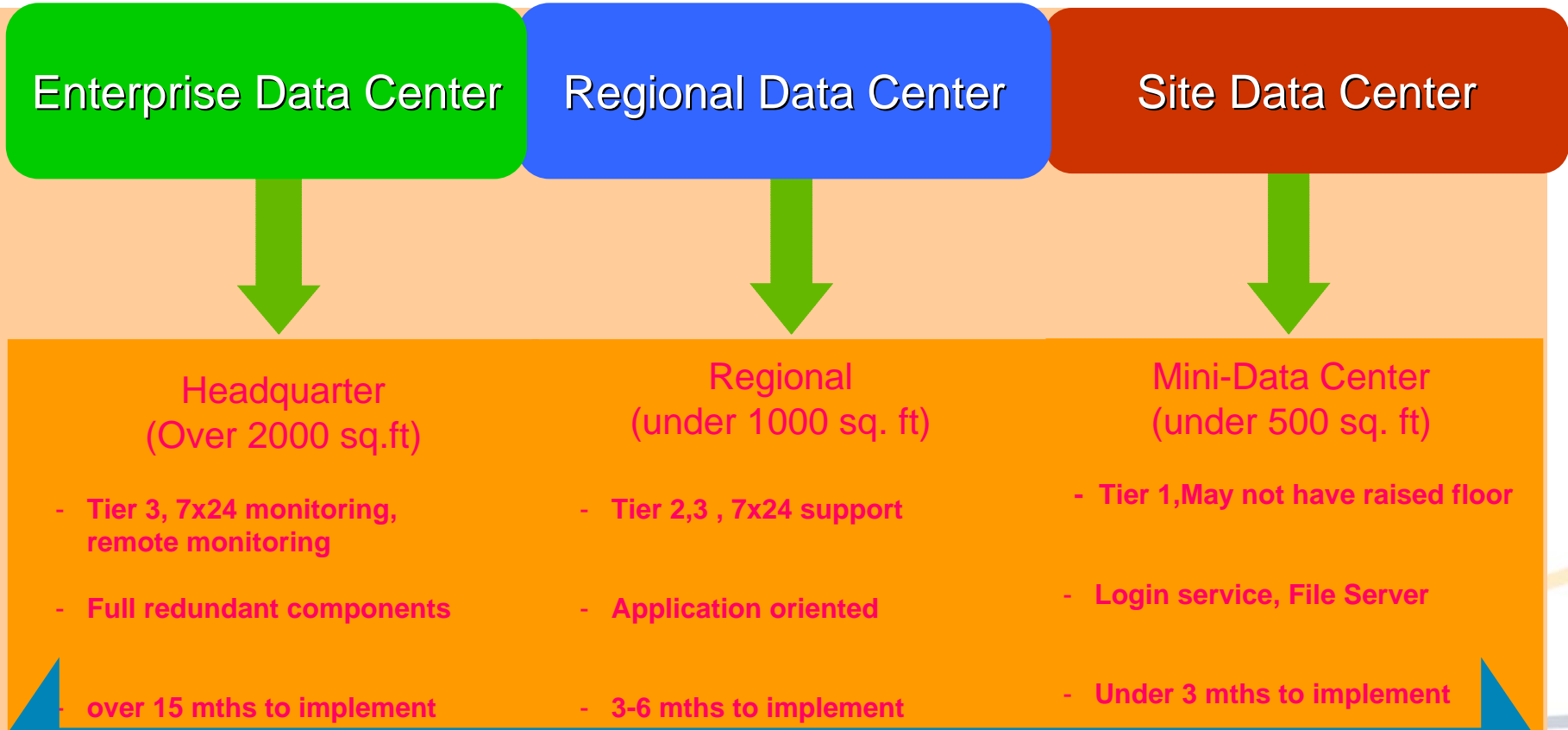
Tier 3 (99.982% **availability**)

Tier 4 (Fault tolerant: 99.995% **availability**)

- IT service management: **ISO-20000**



Size based on business outcomes



## Infrastructure Provision

Wireline LAN Facilities    Wireless LAN Server    Optimization Storage    Voice Video    Security Cabling

## Consolidation

Fewer is better

Lower Operational Expenses

## Automation

Align Resources to Business Objectives

Simplified, Policy Based Provisioning

## Virtualization

Capital Asset Utilization Improvement

Eliminate geographical issue



All you want for Data Center  
is what you got?



Think

Next Generation Data Center  
(NGDC)



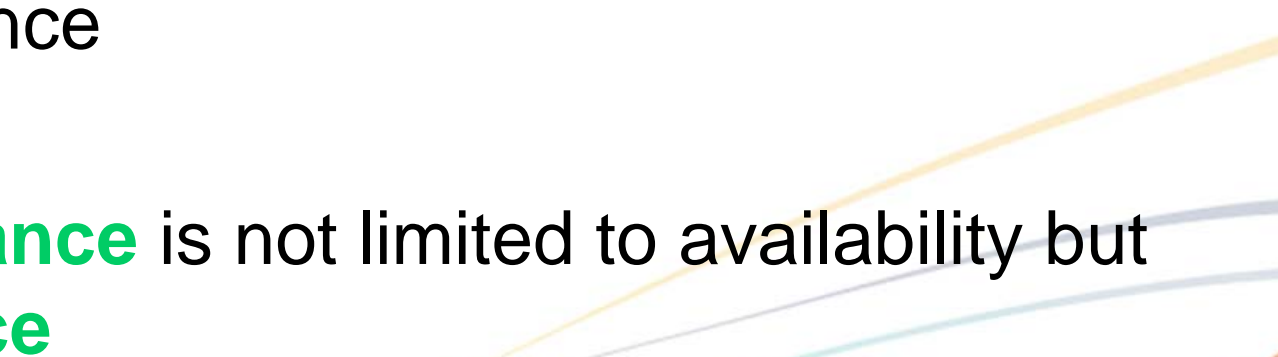
No Green  
IT as a cost center  
Focus on internal communication  
Availability

Green  
IT as a service center  
Increasing complexity & external communication  
Performance + Assurance

Before

From now

<u>Infrastructure Provision</u>			
Wireline LAN Facilities	Wireless LAN Server Video	Optimization Storage Cabling	Security Voice

- 1 Deployment of **GREEN IT portfolio** of CPE
  - 2 **Optimization** of Data Center resource and best practices to meet business needs
  - 3 Provision of **complete flexibility & choices of connectivity** to users, optimized for price & performance
  - 4 **Performance** is not limited to availability but **assurance**
- 

## Green IT

### Energy Efficiency

Consolidation

Virtualization

Automation



## Performance

### Operation Efficiency

Flexibility

Manageability

Security

Availability

Accessibility



# Energy Efficiency



**Consolidation**

**Automation**



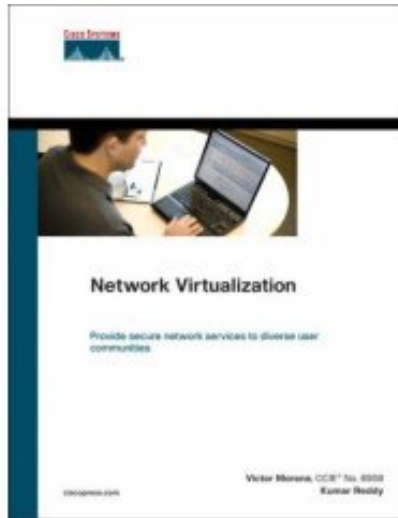
# Virtualization

**Data Center 3.0**

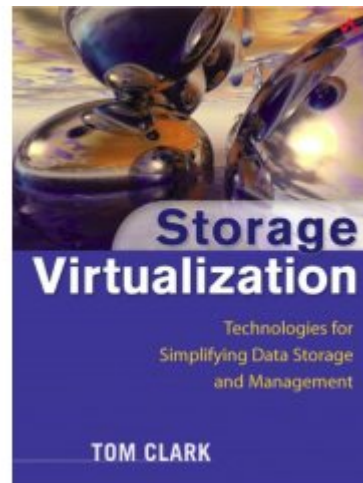
Service Oriented and  
Web 2.0 Based



**VIRTUALIZED**



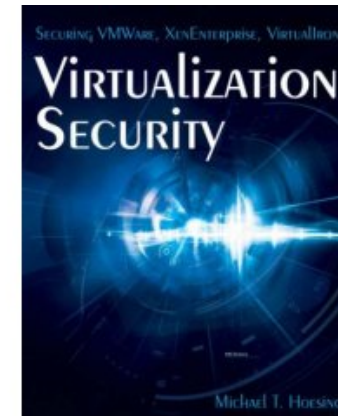
Network



Storage



Server



Security

Think  
Virtualization.....

Energy Efficiency

# Scenario

(Network Virtualization)

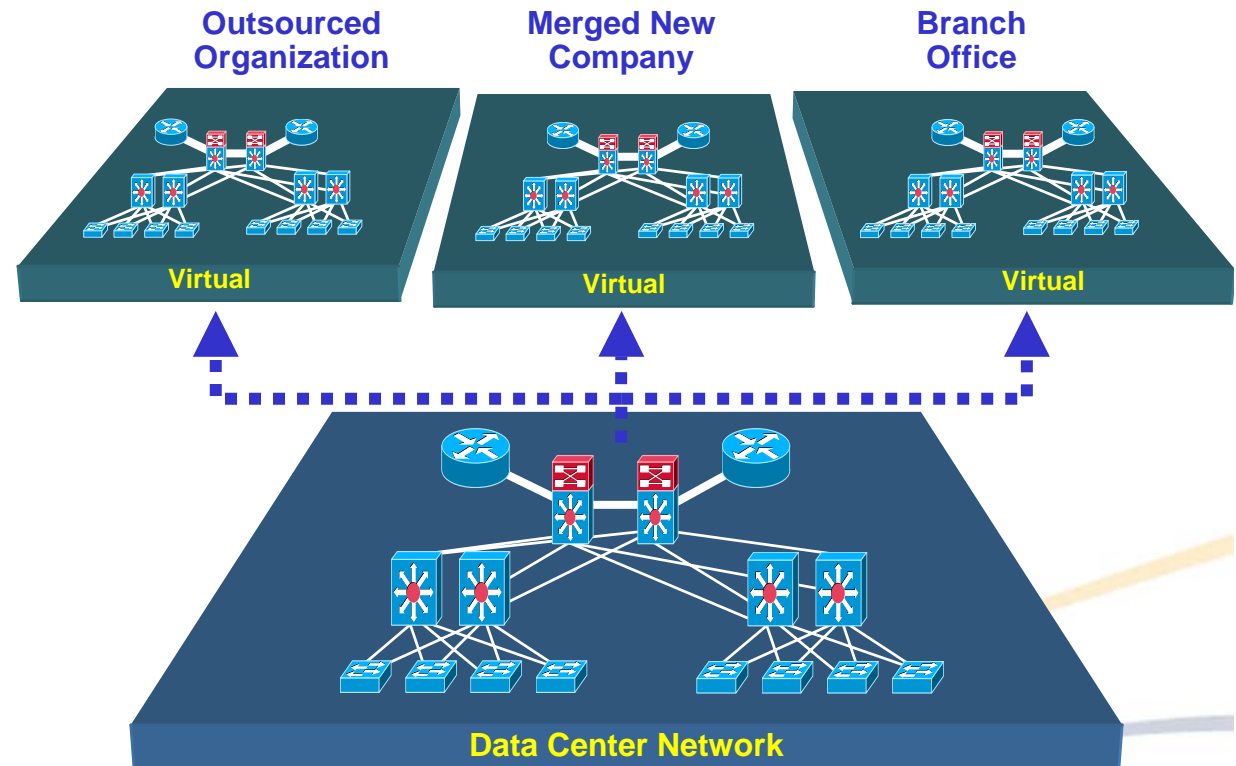
A decorative graphic consisting of several curved lines in shades of orange, blue, and red, positioned in the lower right quadrant of the slide.

Energy Efficiency

## Virtualization Topology in Enterprises

### Highlights

- Increased network utilization
- Logically Partitions physical network into multiple Virtual Networks
- Virtual Networks can be dynamically created as required to meet Business objectives



## Infrastructure Provisioning

**Network**

**Storage**

**Server**

**Security**

**Network service**

**Professional service**

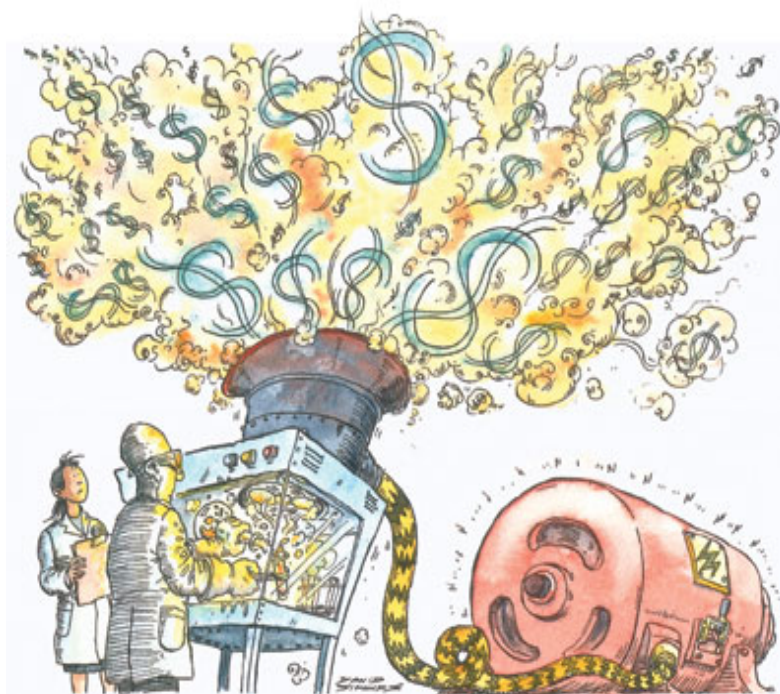
**Performance Assurance Service**

**Energy Efficiency**



# Operation Efficiency

Network  
service



Professional  
service

**Flexibility**

**Manageability**

**Security**

**Availability**

**Accessibility**

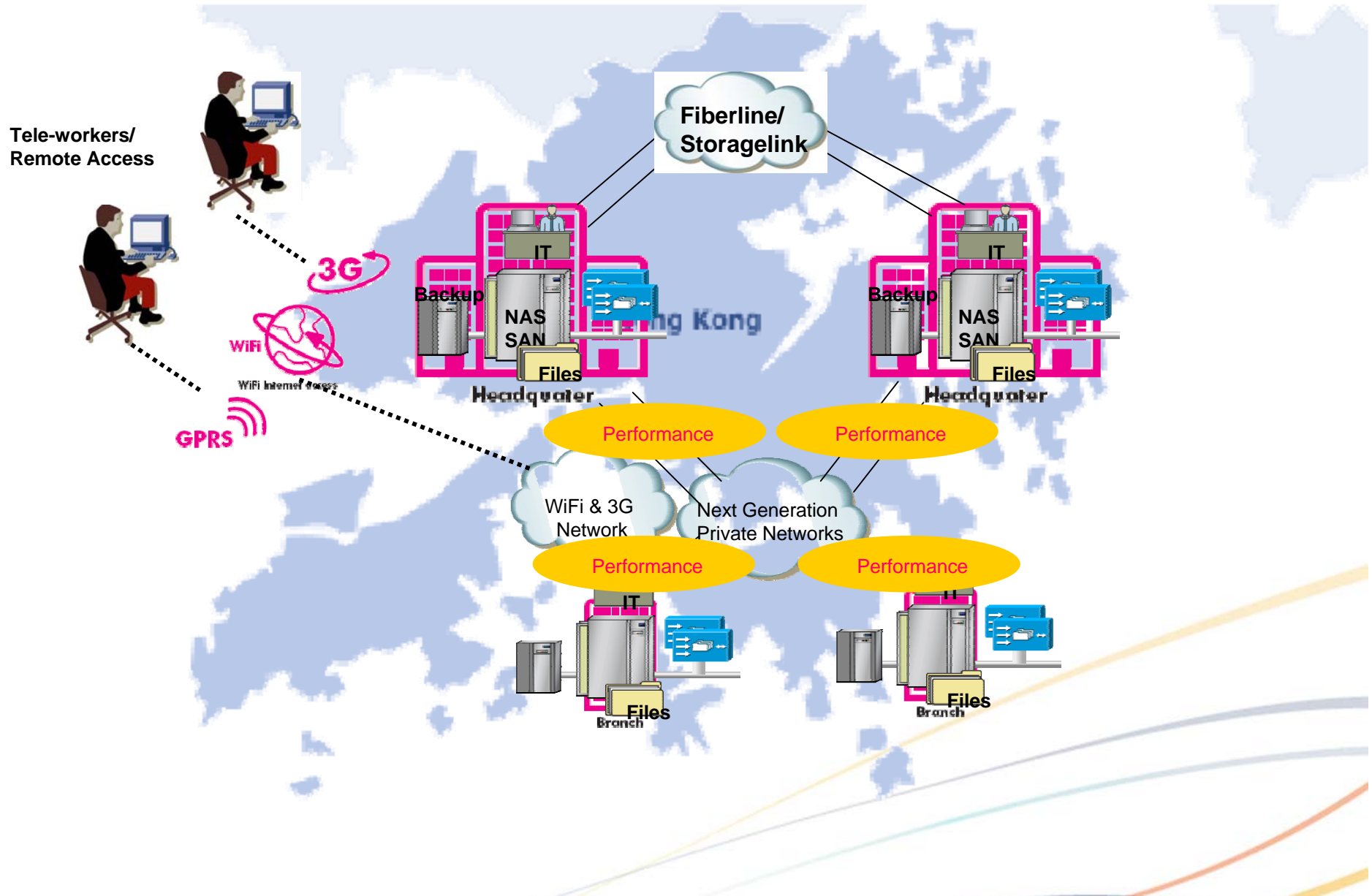
**Go NGDC**

**Operation Efficiency**

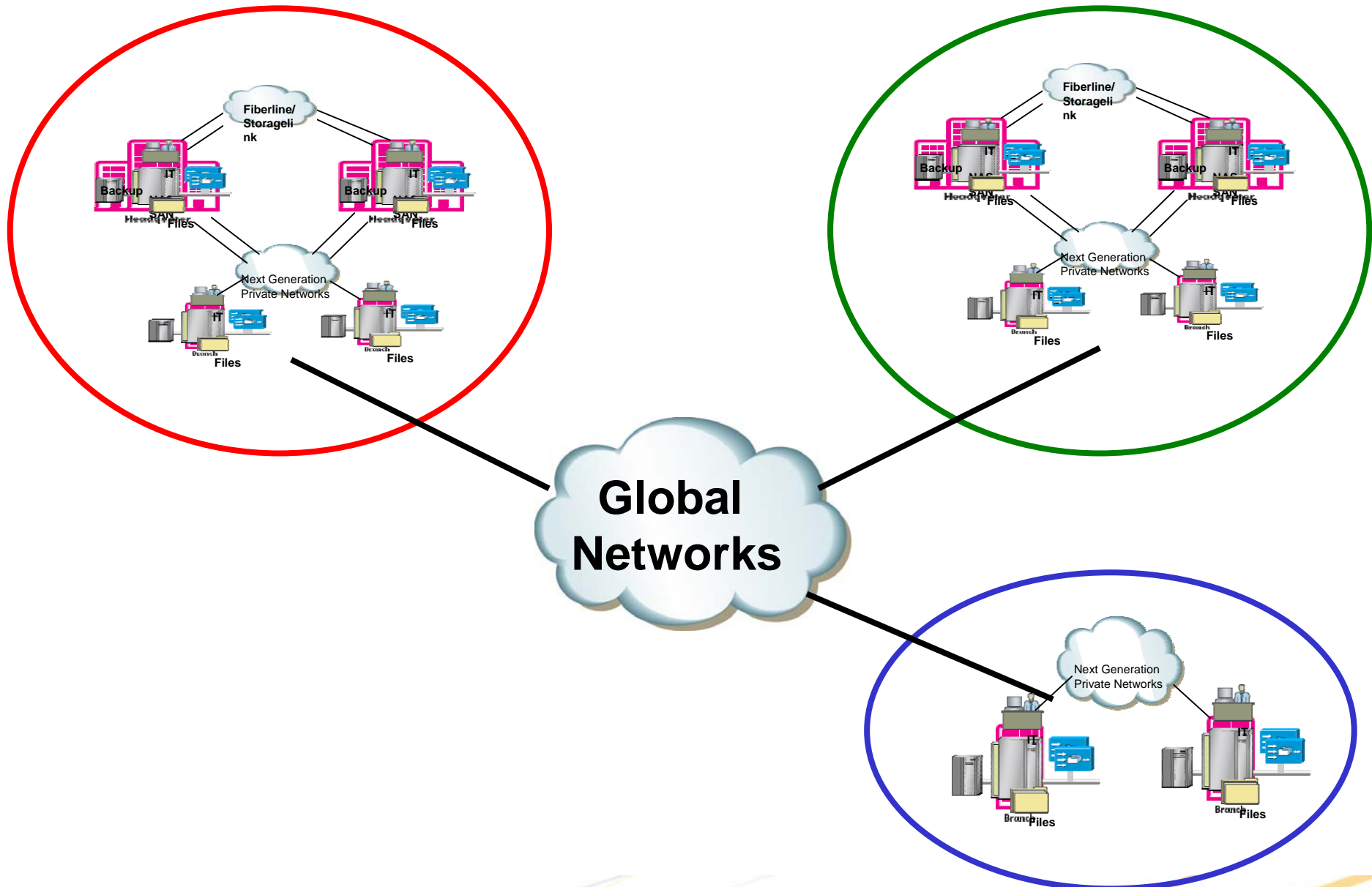
# Network Service in Next Generation Data Center Environment



Operation Efficiency



# Regional/International Data Center



# Performance Assurance Service (PAS)

powered by PCCW

**Traffic  
Distribution**

**Users  
Behavior**

**Proactive  
Handling**

**Historical  
Record**

**Infrastructure Performance  
Assurance**

**Operation  
Efficiency**

**Energy  
Efficiency**

**Operation Efficiency**

## My Network View

Powered by Managed Service

[Log Out](#)  
[Change password](#)  
[Net Administration](#)

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[Home](#)

Network Usage History Analysis > Historial Chart Top 10 Protocols (By IP) History

[Help](#)

Device: rt1 (988900)

Direction:  Traffic-Out  Traffic-In

Basis:  By Data Volume  By Connection

Period: 2008-Apr-15 09:00 1 Hour Chart Submit

Total Traffic: 621 KBytes Start Time: 2008-04-15 09:00:00  
End Time: 2008-04-15 10:00:00

**Traffic-Out**

Protocol	Traffic
<a href="#">NETBIOS Name Service</a>	244 KBytes
<a href="#">NETBIOS Datagram Service</a>	227 KBytes
<a href="#">Bootstrap Protocol Client</a>	102 KBytes
<a href="#">Internet Control Message</a>	31 KBytes
<a href="#">Network Time Protocol</a>	4,256 Bytes
<a href="#">SNMP</a>	3,384 Bytes
<a href="#">1033 (UDP)</a>	2,400 Bytes
<a href="#">54386 (UDP)</a>	804 Bytes
<a href="#">54475 (UDP)</a>	804 Bytes
<a href="#">54571 (UDP)</a>	804 Bytes
The Rest	5,107 Bytes

Network Usage History Analysis > Historial Chart Top 10 Protocols (By IP) History

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Period: 2008-Apr-15 09:00 1 Hour Chart Submit

Total Traffic: 621 KBytes Start Time: 2008-04-15 09:00:00  
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Protocol	Traffic	Percentage
<a href="#">NETBIOS Name Service</a>	244 KBytes	39.4%
<a href="#">NETBIOS Datagram Service</a>	227 KBytes	36.6%
<a href="#">Bootstrap Protocol Client</a>	102 KBytes	16.4%
<a href="#">Internet Control Message</a>	31 KBytes	4.9%
<a href="#">Network Time Protocol</a>	4,256 Bytes	0.7%
<a href="#">SNMP</a>	3,384 Bytes	0.5%
<a href="#">1033 (UDP)</a>	2,400 Bytes	0.4%
<a href="#">54386 (UDP)</a>	804 Bytes	0.1%
<a href="#">54475 (UDP)</a>	804 Bytes	0.1%
<a href="#">54571 (UDP)</a>	804 Bytes	0.1%
The Rest	5,107 Bytes	0.8%

**Traffic-Out (Pie)**

Operation Efficiency

# Performance Assurance

Network Forensics

Network Policing

Real time Infrastructure Management

## PCCW Integrated Service Platform

Performance

Operation Efficiency

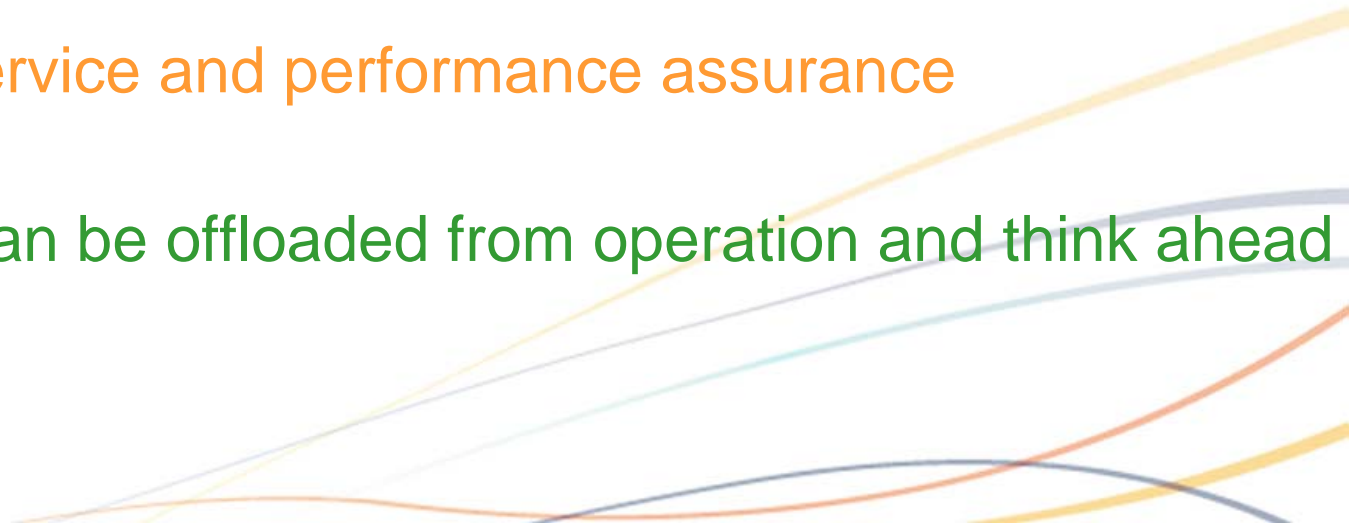


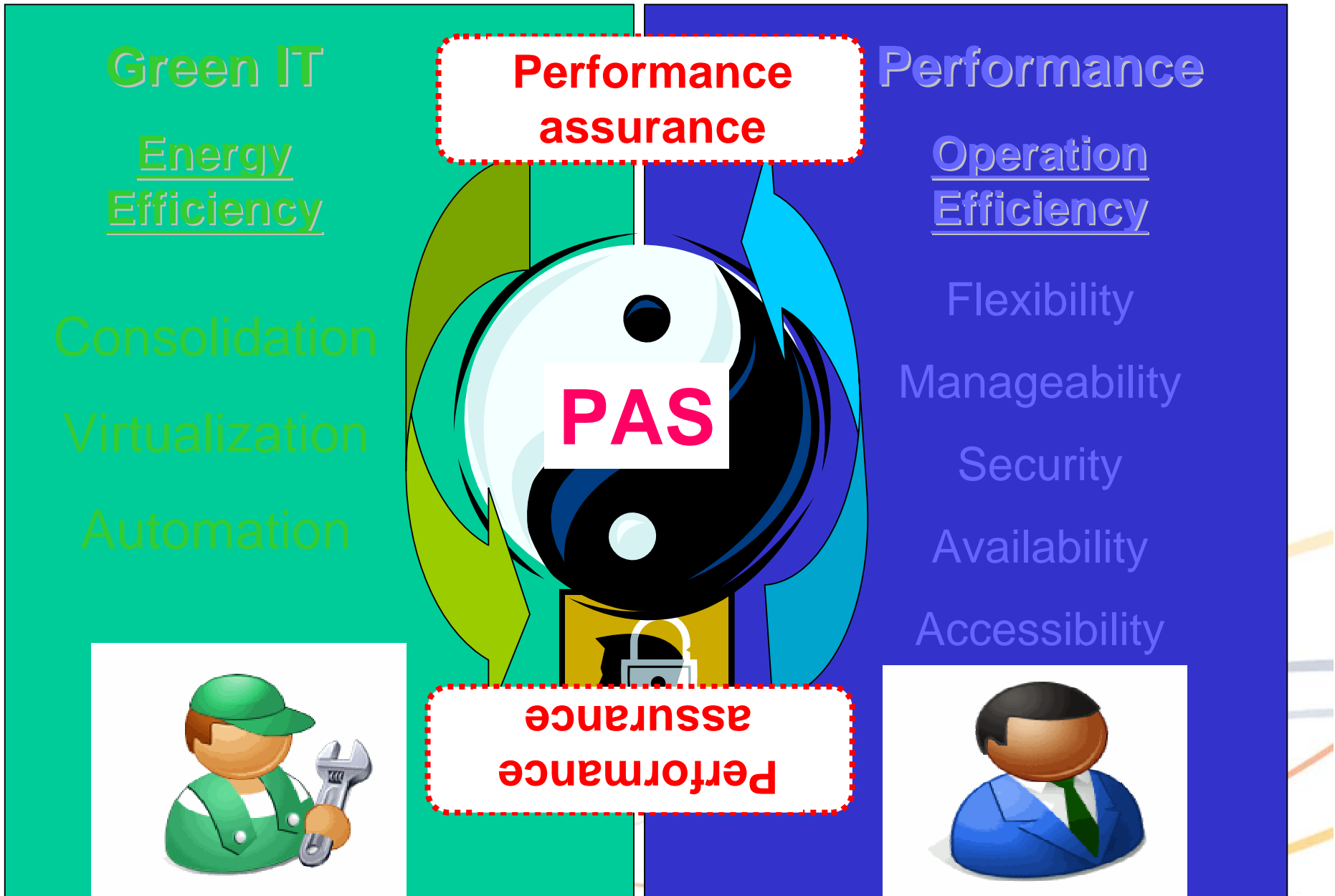
**A competent**  
**Next Generation Data Center**  
**solution partner**



## Being ensured that:

- The Next Generation Data center is planned and run at highest efficiency & effectiveness
- PCCW provide almost any kind of network connectivity needs
- Experienced expertise will proactively give you advise when appropriate
- Professional service and performance assurance
- .....You can be offloaded from operation and think ahead





# Case Study



## Success Case – Data Center Relocation

### Background

- Relocate existing data center to class 5 super data center

### PCCW Solution

- Comprehensive relocation plan with contingency arrangement
- Deploy ring architecture with zero downtime
- 100% redundant equipment on site for smooth relocation

### Critical Success Factors

- **Reliability:** risk free & shortened implementation
- Excellent Exchange and path diversity



Thank you

