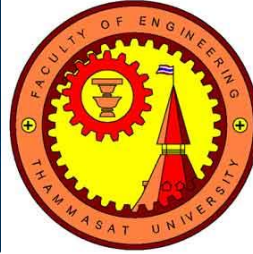




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Neutral Data Center

By

Associate Professor Dr. Montri Wiboonrat

รองศาสตราจารย์ ดร.มนตรี วิบูลย์รัตน์

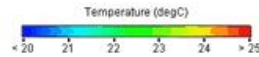
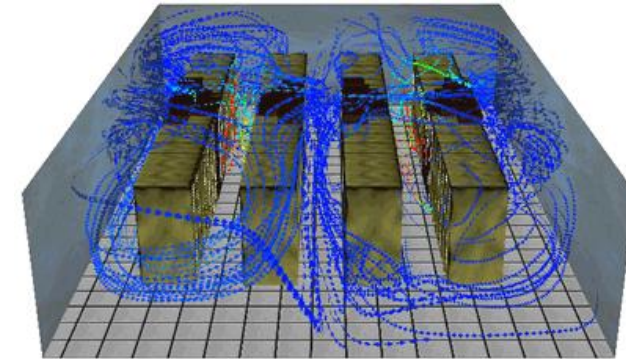
The Association of Researchers of Thailand





Agenda

1. Data Center Structure
2. What is Neutral Data Center?
3. What are the benefits of its?
4. Data Center Trends and Gameplay
5. What is going on in Thailand?
6. Opportunity of Neutral Data Center in Thailand





Data Center Structure

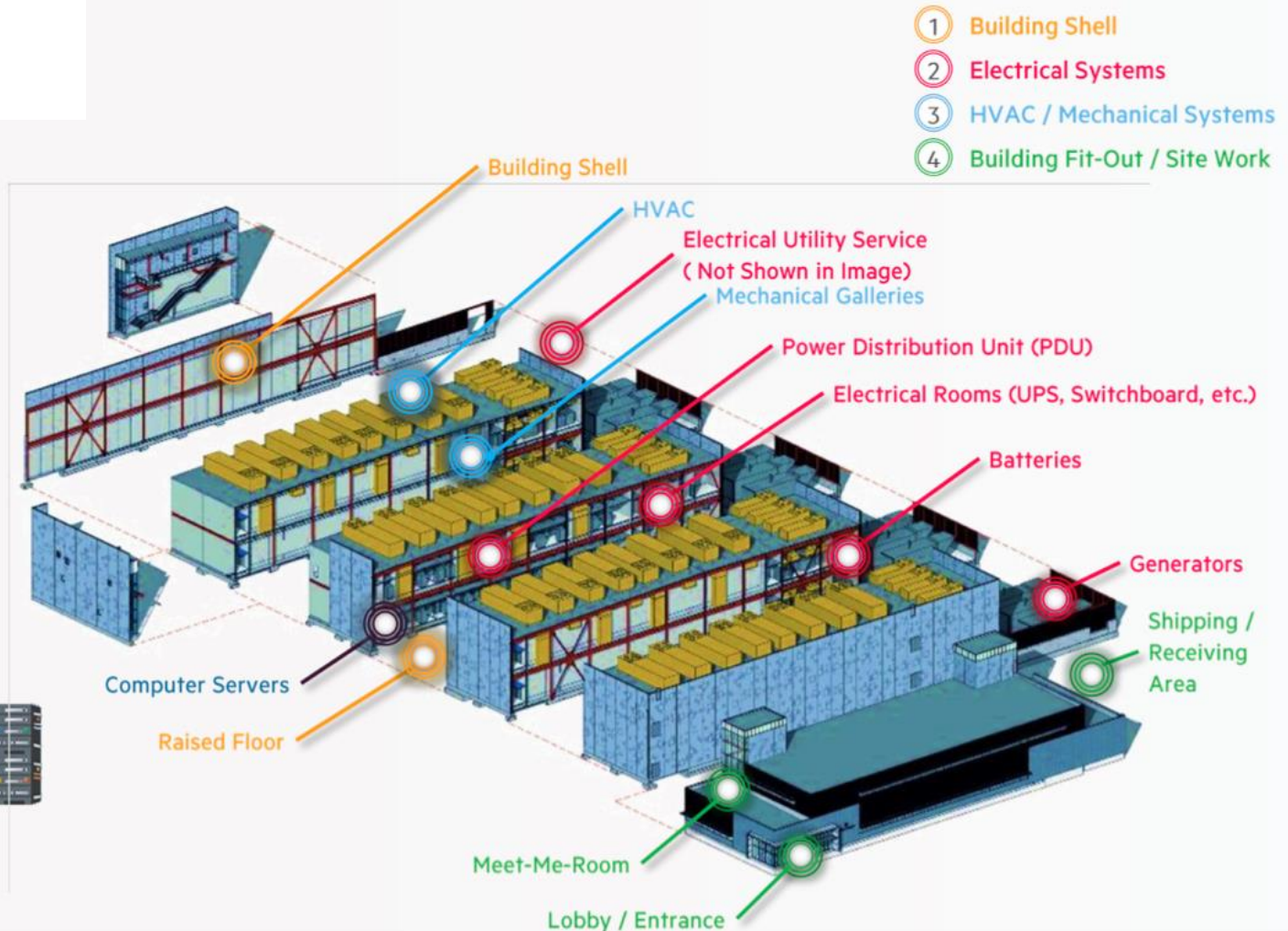
Physical Structure or Infrastructure

Data Centers

Data centers are designed to house servers and network equipment. Data centers provide a highly reliable, secure environment with redundant mechanical, cooling, electrical power systems and network communication connections.

Servers

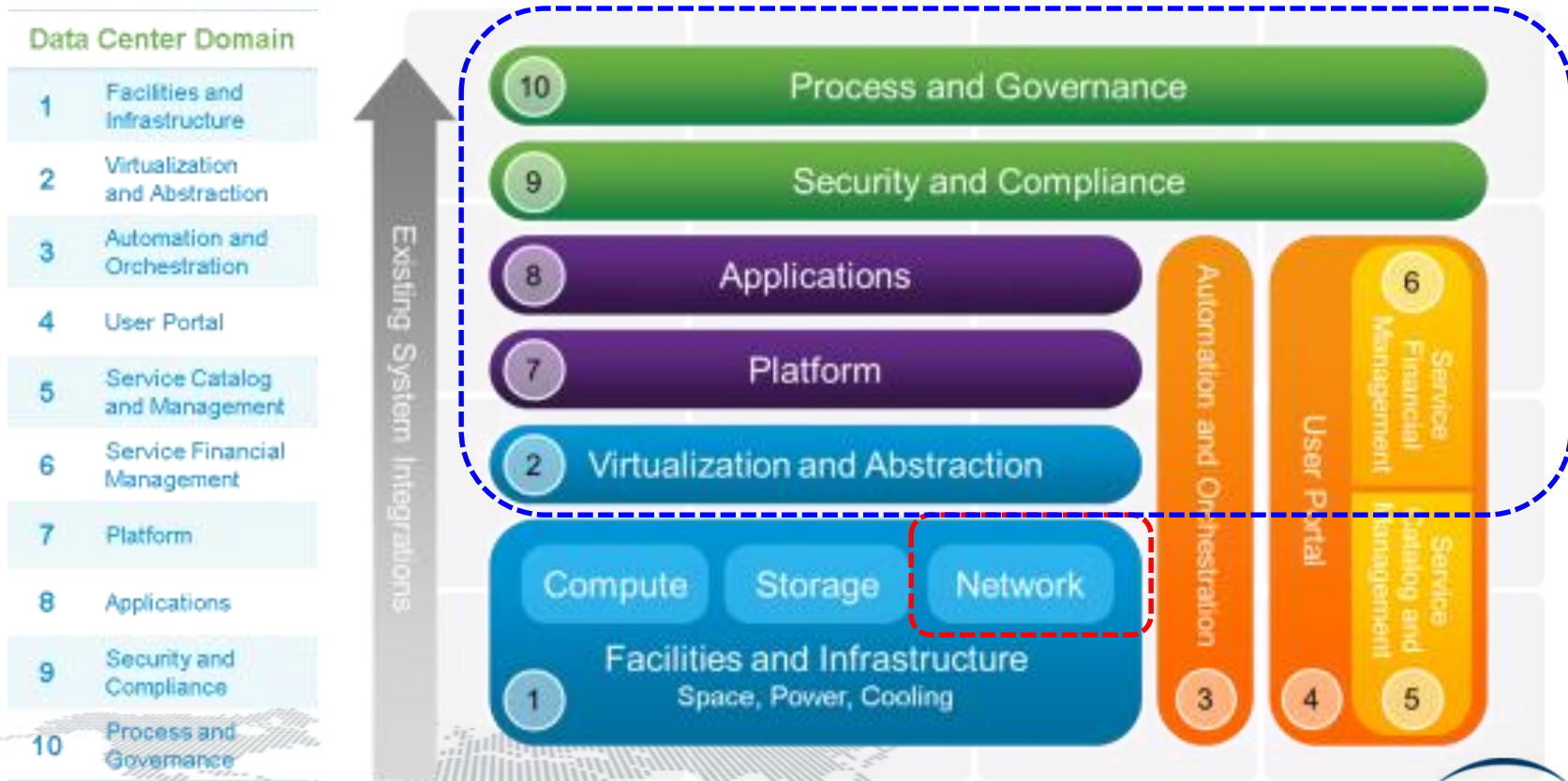
Computer servers, which process and store data, are supplied and owned by customers.





Data Center Structure

Logical Structure





Neutral Data Center

A neutral data center is a data center facility that is entirely independent of **network providers** or **cloud service providers**.

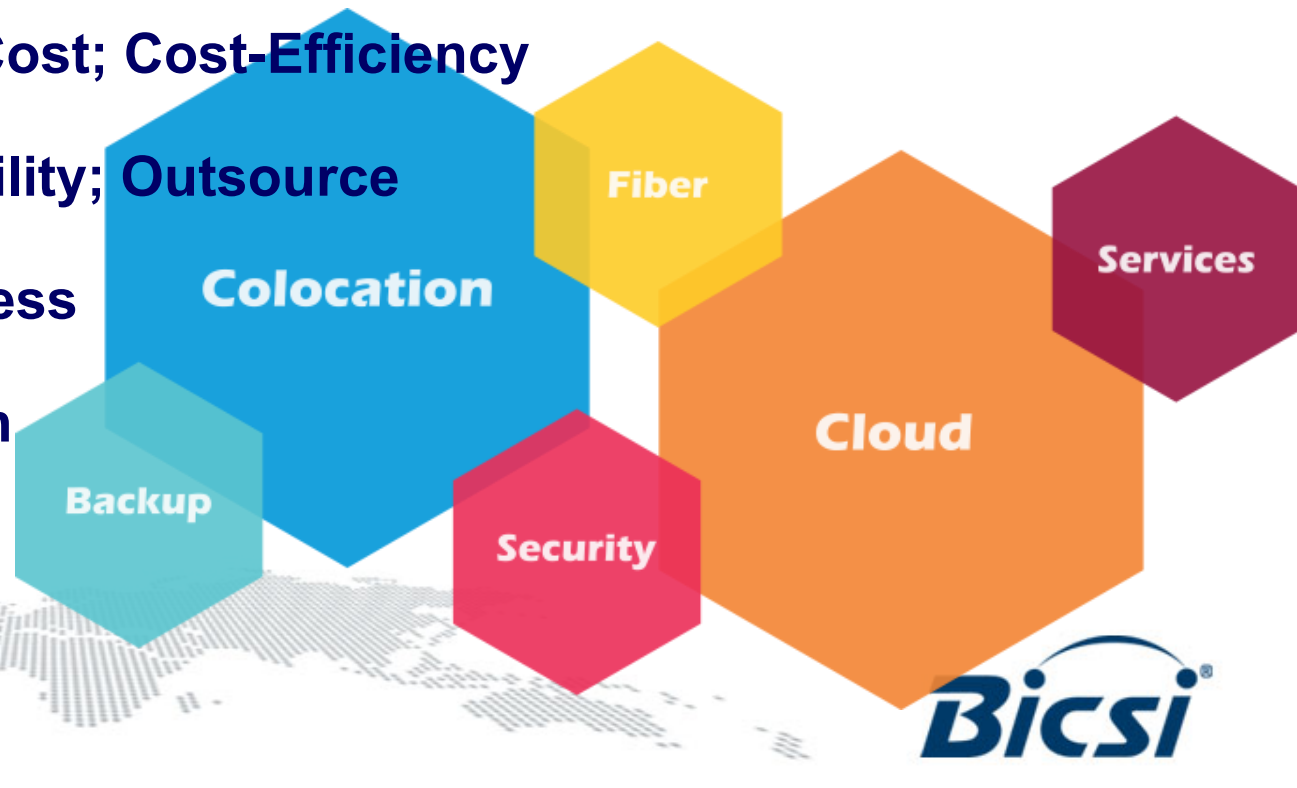
This allows any hosting client to have a direct connection to the network providers or cloud service providers of their choice, letting you choose who you want to directly connect or service with to better suit your business operations.



Benefits of Neutral Data Center

Colocation, Interconnection, and Free Service Selection

1. Redundancy-Optimal Uptime
2. Connectivity Cost; Cost-Efficiency
3. Service Flexibility; Outsource
4. Time to Business
5. Risk Mitigation

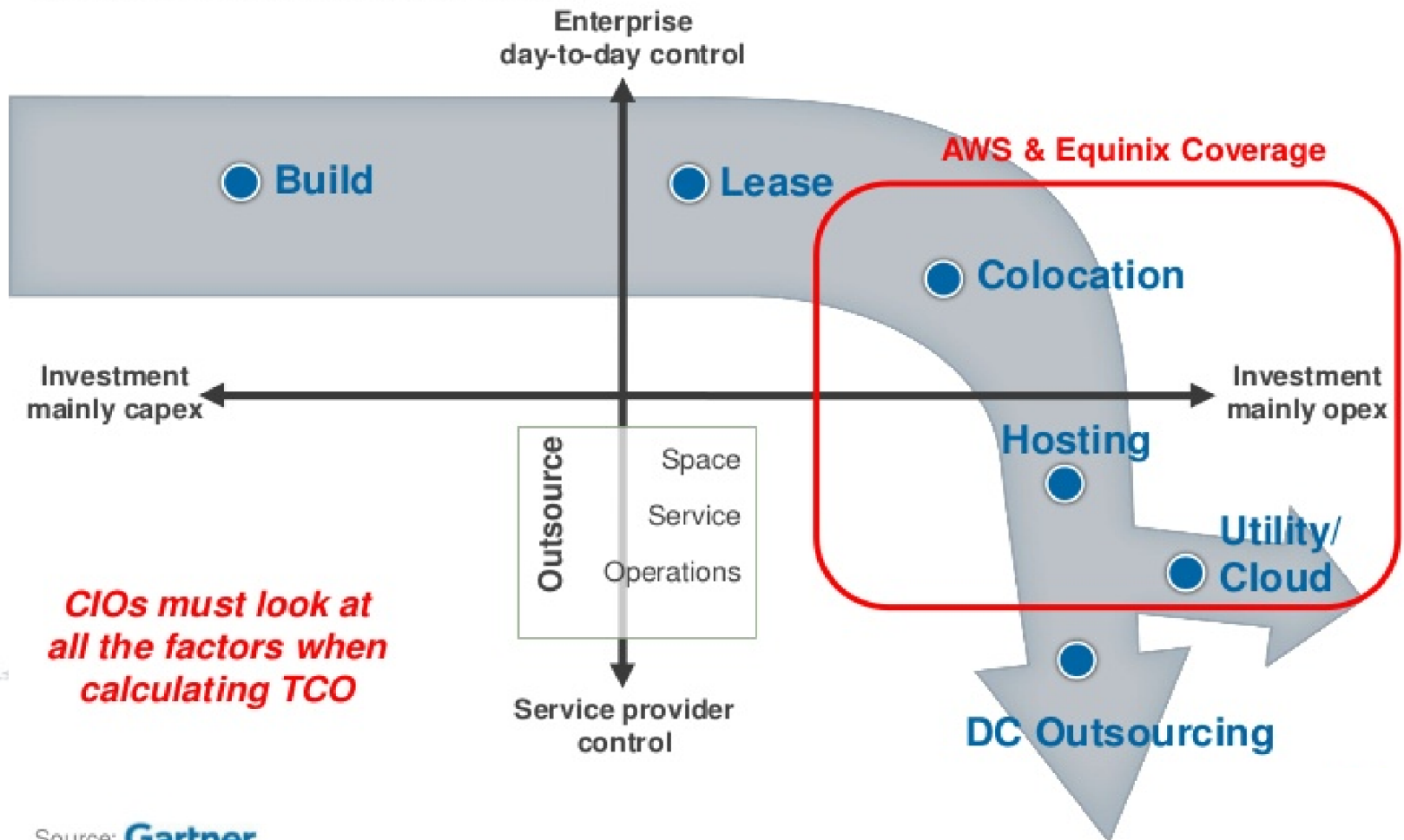




Data Center Trends

Data Center Manager's Choices:

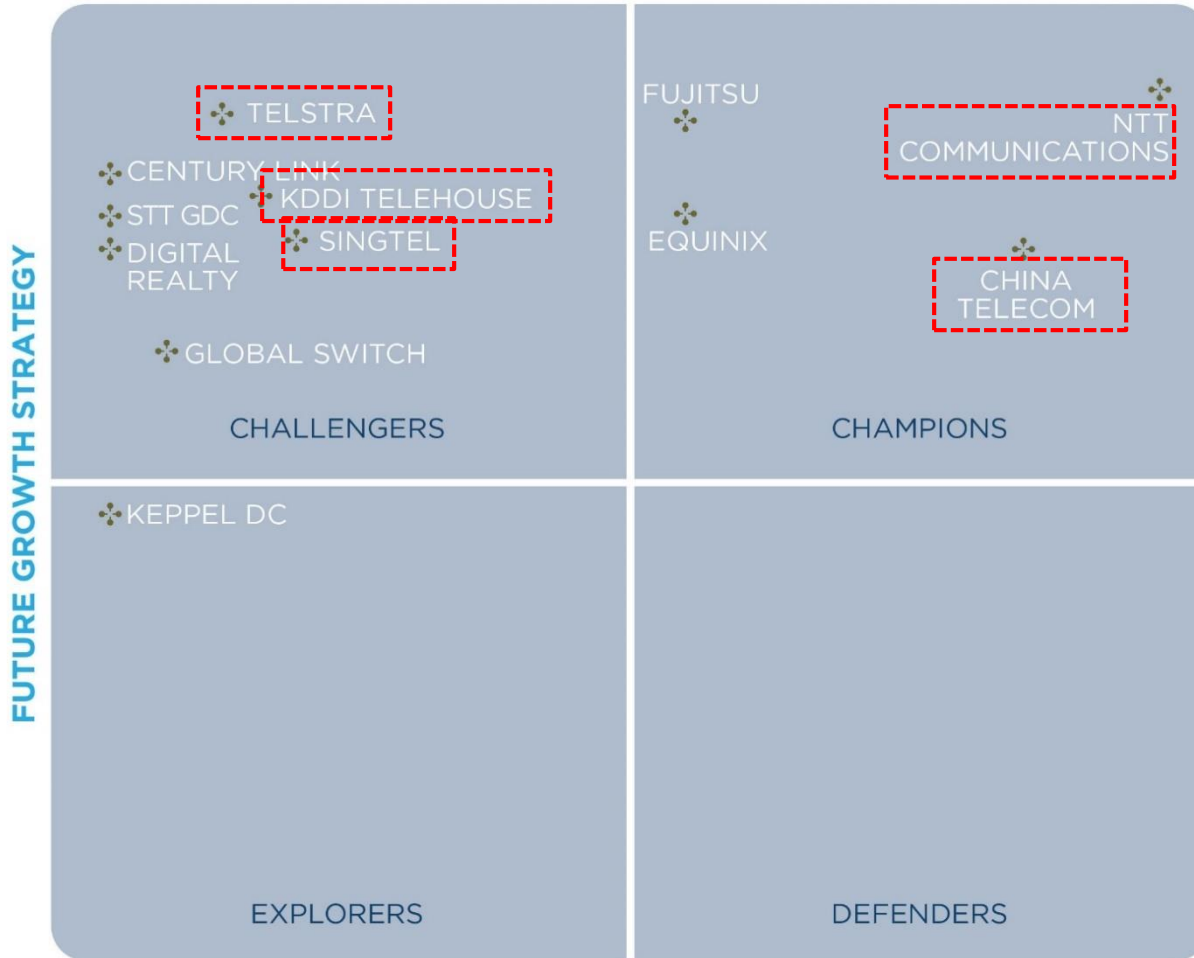
Insource?/Outsource?/Multisource?





Data Center Major Players

HIGH



FUTURE GROWTH STRATEGY

LOW

REVENUE MARKET SHARE (2016)

HIGH

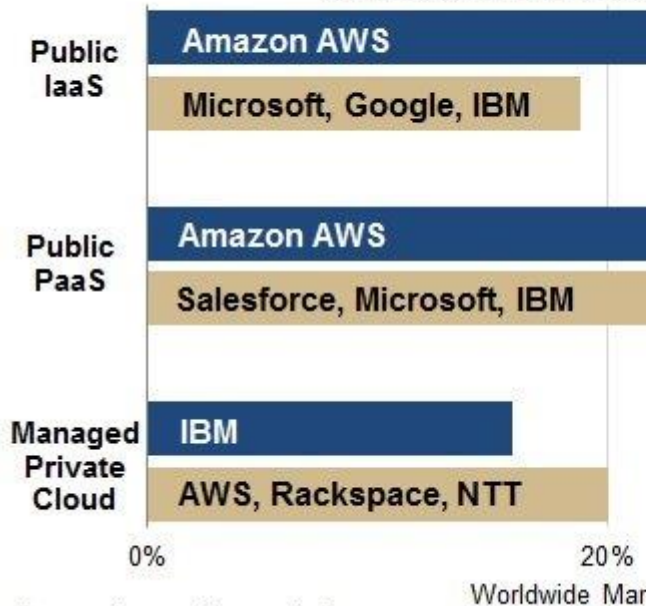




Cloud Infrastructure Services

Cloud Market Leadership

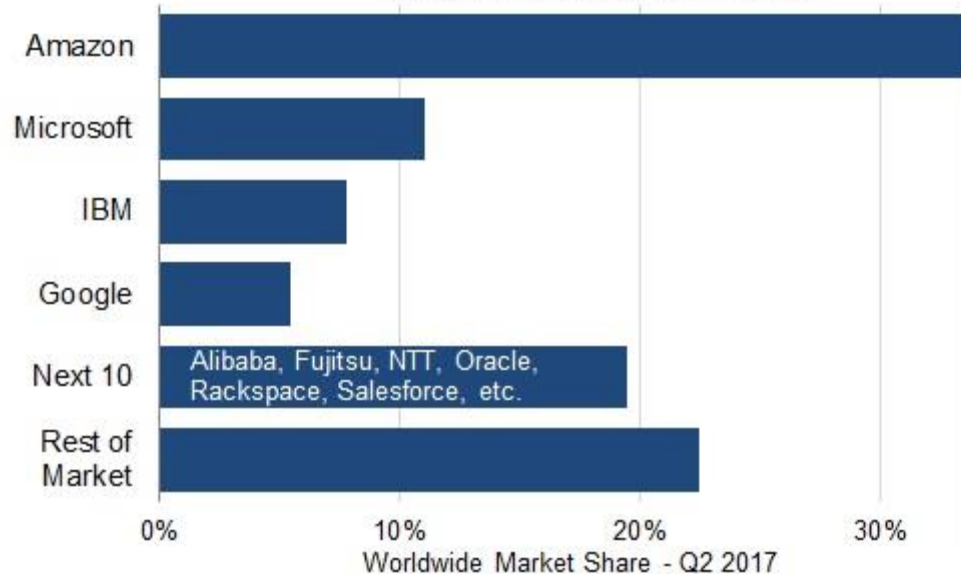
Cloud Infrastructure Service Revenues - Q3 2016



Source: Synergy Research Group

Cloud Infrastructure Services - Q2 2017 Market Share & Revenue Growth

(IaaS, PaaS, Hosted Private Cloud)



Source: Synergy Research Group

Market Share Gain - Last 4 Quarters

Amazon	+1%
Microsoft	+3%
IBM	0%
Google	+1%
Next 10	-1%
Rest of Market	-5%





Data Center Operators

DATA CENTER OPERATOR LEADERBOARD (Q2, 2017)

Source: cloudscene.com

NORTH AMERICA		EMEA		OCEANIA		ASIA	
	—		—		—		—
	—		—		—		—
	—		—		↑ 2		—
	—		—		↓ 1		—
	↑ 4		—		↓ 1		—
	NEW		—		—		—
	↓ 1		NEW		↑ 2		↑ 1
	↓ 1		↓ 1		↓ 1		NEW
	NEW		↓ 1		NEW		NEW
	—		↓ 1		NEW		—

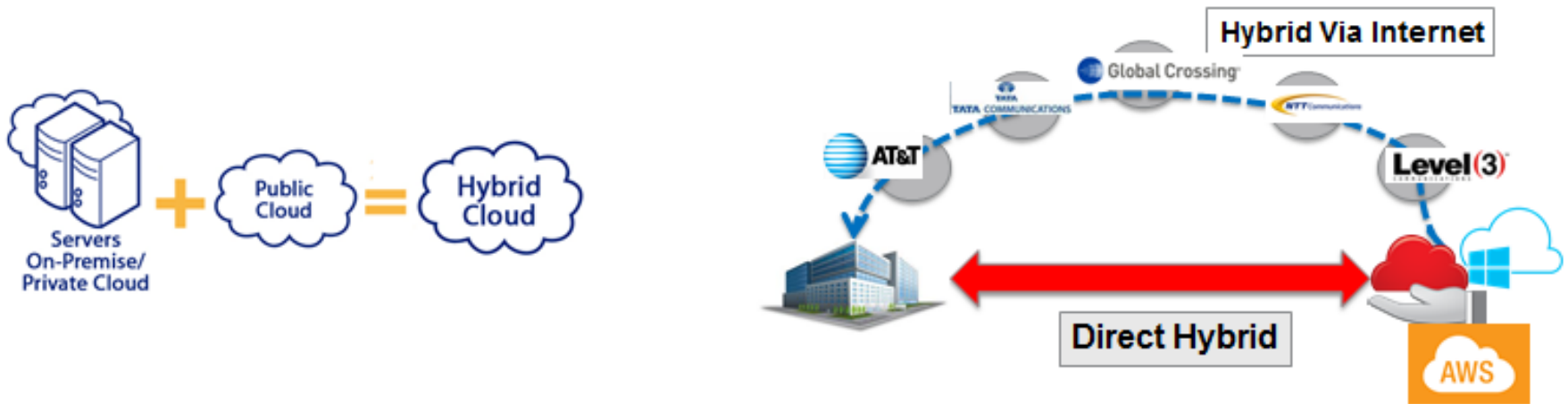




Cloud Operating

Direct Hybrid Cloud Computing

Enterprises connecting to Cloud Service Providers (CSPs) at POPs instead of via Internet



Internet Hybrid Cloud

- Unpredictable SLA
 Jitter and Latency unpredictable
- Packet Loss – No control
- Privacy– Snooping possibility
- Routing – No control over Routing policies

Direct Hybrid Cloud Computing

- Reliable and predictable performance
 Low Jitter/Latency
- Packet Loss – CoS/QoS can be applied
- Privacy
- Control over Routing policies





News

Facebook is leasing space at a **Digital Realty** facility in Singapore, according to an industry source who wished to remain anonymous. Dec 15, 2015

Equinix and **Microsoft** have partnered to offer performance- and privacy-sensitive enterprises the option to consume Microsoft's cloud productivity software suite Office 365 over private network links out of Equinix data centers around the world. Sep 29, 2015

Facebook and **Microsoft** are laying a massive cable across the middle of the Atlantic. May 26, 2016.





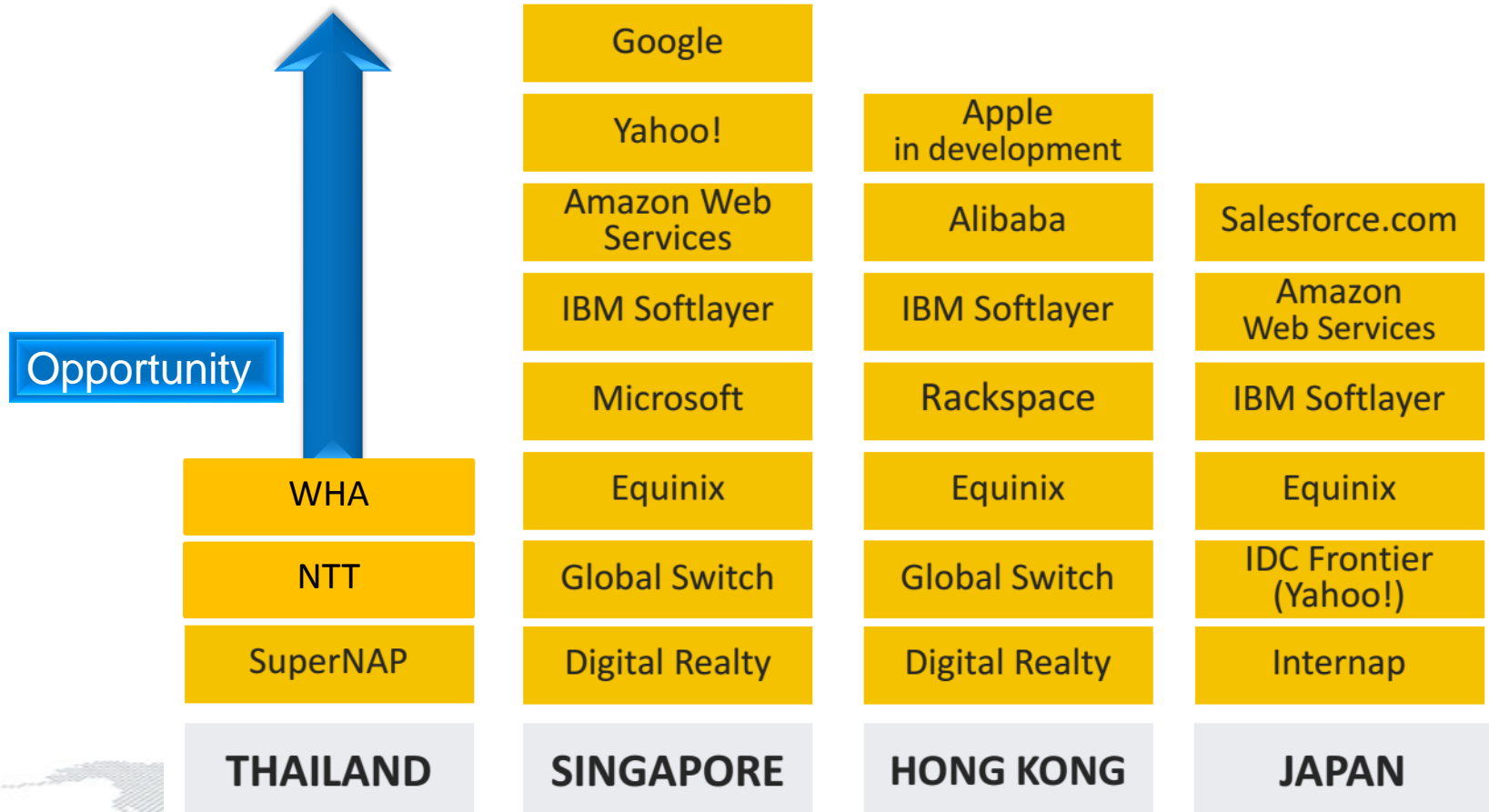
Data Centers in Thailand

	Data Centers	Location
1	CAT IDC FI.14	Servenet Solution Limited Partnership, 72 Charoenkrung Bangruk 10500 Bangruk, Bangkok, Thailand
2	CAT Telecom IDC	CAT Telecom, 72 CATTelecom Bld. FI 13., New Rd., Bangrak 10500, Bangkok, Thailand
3	CS Loxinfo	CS Loxinfo Public Company Limited., Ratchdapisak Rd., Huai Khwang, 10310, Bangkok, Thailand
4	INET	1768 Thai Summit Tower, 10th -12th Floor and IT Floor, New Petchaburi Road, Khwaeng Bang Kapi, Khet Huay Khwang, Bangkok 10310
5	JasTel IDC	Jas Tel Network 200 Moo 4 Jasmine Interational Tower Chaengwattana Rd., 11120 Pakkret, Nontaburi, Thailand
6	KIRZ	KIRZ 60 New Rachadapisek Rd., Klongtoey 10110 Bangkok, Thailand
7	PITH-IDC	Pacific Interent (Thailand) Limited. 20th Fl., CAT Telecom Tower, Bangrak road, 10500 Bangrak, Thailand
8	PROEN Internet IDC	Proimage Engineering and Communication Co., Ltd. 72 4th Fl. CATTelecom Tower Charoen Krung Rd., 10500, Bangrak, Thailand
9	SuperNap	SuperNap Thailand, Hermeraj Chonburi Industrial Estate, Chonburi, Thailand
10	TCCT (Bangna)	T.C.C Technology Co.,Ltd. 1854 Bangna-Trad 10260, Bangkok, Thailand
11	TCCT (Empire Tower)	T.C.C Technology Co.,Ltd. Empire Tower 195 South Sathorn Yanawa 10210 Bangkok, Sathorn, Thailand
12	TCCT Amata	T.C.C Technology Co.,Ltd. Amata Service Center Building 20131 Chonburi, Thailand
13	Thailand Bangkok 1 (NTT)	NTT Communications Corporation, 10260, Bangkok, Thailand
14	Thailand Bangkok 2 (NTT)	NTT Communications Corporation, Amata Nakorn 20160, Amat Nakorn, Thailand
15	The Cloud Data Center	CS Loxinfo Public Company Limited., Ramintra-Ratchadapisek Rd., Bueng Kum. 10240, Bangkok, Thailand
16	TOT IDC	TOT Public Company Limited., Chaengwattana Rd., Laksi, 10210, Bangkok. Thailand.
17	True Internet	True Internet Data Center, 14th Fl. True Tower, Ratchadaphisak Rd., 10310 Huai Khwang, Bangkok, Thailand
18	True Internet Mungthong	True Internet Data Center, 8th Fl. Of Bangkok Land Building 11120 Nonthaburi, Bangkok, Thailand
19	WHA	Bang-Na Trad, Bangkok and Hemaraj Industrial Estates, Chonburi, Thailand
20	Interlink Data Center	9/1 Soi 01 Kanchanaphisek 5/5, Kanchanaphisek Road, Tha Reang, Bang Khen, Bangkok 10220





IDC Operators in Thailand





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Tax Privileges for Data Centers



THAILAND
BOARD OF
INVESTMENT
www.boi.go.th

WHY THAILAND?

The BOI offers numerous tax and non-tax privileges under the 'AI' category. With the government's plan to develop Thailand's digital infrastructure well under way, data center and cloud service providers can look to reap the benefits of a positive investment environment. Thailand's renowned position in the Hard Disk Drive (HDD) industry also helps support the government's digital economy development plan. The country's prominent role as one of the largest global producer and exporter of HDDs, (one of the main data storage units used in data centers), ensures a solid electrical and electronics supply chain, which investors looking to start a data center operation can easily utilize. Taking this into account, along with Thailand's recognition of the importance of knowledge-based activities such as data centers and cloud services, the country is sure to retain its standing as a major center for regional operating hubs and Information Technology (IT) in **ASEAN**.

The BOI also offers promotion incentives for **Cloud service** businesses. Projects wishing to apply for the promotion must be located in at least 2 data centers in Thailand that possess the ISO/IEC 27001 (data center) certification. These data centers are required to have a main communication network and a back-up network connecting all related data centers, with a minimum speed of 10 Gbps. Cloud service providers looking to apply for BOI incentives must be **certified with the ISO/IEC 27001 (cloud security) and ISO/IEC 20000-1 (cloud service) standards**, in order to increase business competency.



Future in Thailand

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THAILAND E

ECOMMERCE P

B2B



C2C



CLASSIFIED:



MARKET RESEARCH



CONSULTING



ECOMMERCE ENABLER



ECOMMERCE SOFTWARE



BRANDS

ASEAN-6 digital population 2017

Indonesia

Population	262.0 M
Internet users	132.7 M
Social media users	106.0 M
Mobile connections	371.4 M
Mobile social users	92.0 M

Malaysia

Population	30.96 M
Internet users	22.00 M
Social media users	22.00 M
Mobile connections	42.93 M
Mobile social users	20.00 M

Philippines

Population	103.0 M
Internet users	60.0 M
Social media users	60.0 M
Mobile connections	129.4 M
Mobile social users	54.0 M

Thailand

Population	68.22 M
Internet users	46.00 M
Social media users	46.00 M
Mobile connections	90.94 M
Mobile social users	42.00 M

Singapore

Population	5.74 M
Internet users	4.71 M
Social media users	4.40 M
Mobile connections	8.44 M
Mobile social users	4.00 M

Vietnam

Population	94.93 M
Internet users	50.05 M
Social media users	46.00 M
Mobile connections	124.7 M
Mobile social users	41.00 M

Source: WeAre Social, Hootsuite Jan 2017

ASEAN^{up} Empowering business in Southeast Asia - aseanup.com

ecommerceiq

CUSTOMERS

IS
3.3%
993

Subscribers

To find more data and insights about ecommer

V1.0 © ecommerceIQ 2016



Future in Smart City

What Makes a Smart City?
Multiple Applications Create Big Data

Connected Plane

40 TB per day (0.1% transmitted)

Connected Factory

1 PB per day (0.2% transmitted)

Public Safety

50 PB per day (<0.1% transmitted)

Weather Sensors

10 MB per day (5% transmitted)

Intelligent Building

275 GB per day (1% transmitted)

Smart Hospital

5 TB per day (0.1% transmitted)

Smart Car

70 GB per day (0.1% transmitted)

Smart Grid

5 GB per day (1% transmitted)



Source: Cisco Global Cloud Index, 2015-2020



Future in Thailand (7 Projects)

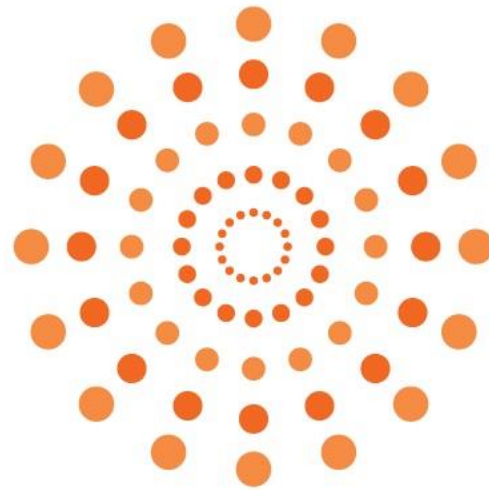


สำนักงานนโยบาย
และแผนพลังงาน
กระทรวงพลังงาน



คณะกรรมการได้ทำการคัดเลือกเหลือ 7 โครงการ และทุกโครงการจะได้รับ
การสนับสนุนเงินจากกองทุนฯ เพื่อใช้ในการดำเนินการขั้นต่อไป รายละเอียดไม่เกิน
10,000,000 บาท โดยมีโครงการที่เข้ารอบดังนี้

1. นิต้า : มหาวิทยาลัยอจจริยะ รัฐรักษพลังงาน สู่การพัฒนาที่ยั่งยืน
2. มช. (เมือง) มหาวิทยาลัยอจจริยะพลังงานสะอาด
3. เมืองจุฬาฯ อจจริยะ
4. ธรรมศาสตร์ ศูนย์รังสิต : ต้นแบบเมืองมหาวิทยาลัยอจจริยะ
5. วิสซ์ดอม วัน-โอ-วัน
6. ขอนแก่น Smart City (ระยะที่ ๑) : ขนส่งสาธารณะเปลี่ยนเมือง
7. เมืองใหม่อจจริยะบ้านฉาง



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Thank You

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