Data Centres
What to Do in the Face of Public Cloud?

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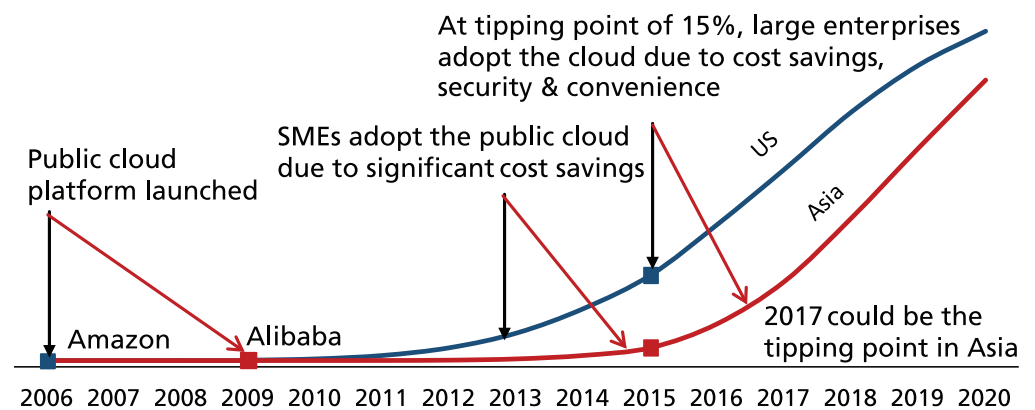
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Executive Summary

A paradigm shift in computing is changing the way enterprises operate from top to bottom. Adoption of public cloud reached a tipping point in 2015, crossing the mid-teens. As more companies adopt the public cloud – with the technology making its way from small- and medium-sized enterprises (SMEs) to large enterprises – its penetration rate can only accelerate. Netflix, for example, closed its last data centre in the US in 2015 to shift to public cloud.

Public cloud is evolving into a three-player market, dominated by Amazon Web Services (AWS), Microsoft Azure, and Google. Everyone else is finding it difficult to match their scale; Hewlett Packard Enterprise and Rackspace threw in the towel in 2015. In the US, there is a shift to hybrid cloud, with some workloads on private cloud and a rising portion on public cloud.
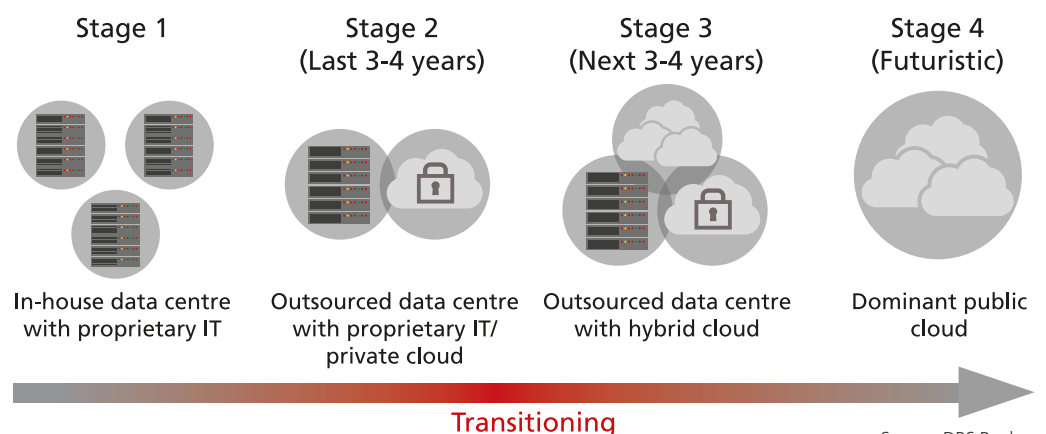
Public-Cloud Evolution – Asia is catching up with the US in public-cloud adoption

At tipping point of 15%, large enterprises adopt the cloud due to cost savings, security & convenience

SMEs adopt the public cloud due to significant cost savings

Public cloud platform launched

US

Asia

Amazon   Alibaba

2017 could be the tipping point in Asia

2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

Source: DBS Bank

Increasingly, data centres will need to support hybrid cloud architecture due to rising adoption of public cloud. This clearly favours large players with a solid tenant mix of public-cloud providers.

Evolution of Data Centres – US is at Stage 3; Asia is at Stage 2 transitioning to Stage 3

| Stage 1	Stage 2 (Last 3-4 years)	Stage 3 (Next 3-4 years)	Stage 4 (Futuristic)
In-house data centre with proprietary IT	Outsourced data centre with proprietary IT/ private cloud	Outsourced data centre with hybrid cloud	Dominant public cloud

Transitioning

Source: DBS Bank

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> *As more companies adopt the public cloud… its penetration rate can only accelerate*

Enterprises in China and Indonesia are shifting from in-house to outsourced data centres to save costs and consolidate their IT operations. Over the longer term, large data-centre providers in these countries will benefit from demand for co-location space from public-cloud providers.

However, we see data-centre supply exceeding demand in the mature markets of Hong Kong, Singapore, Malaysia, and Thailand. Small retail co-location players may struggle in the wake of oversupply. Even if the supply of data centres corrects in 2-3 years, rising public-cloud adoption in these markets may favour large co-location players with direct connectivity to multiple cloud providers. Enterprises do not want to rely on the public internet for accessing public cloud. They want private connections to public cloud for security, performance, and cost reasons. Only large co-location providers can connect enterprises to multiple cloud providers on-demand and simultaneously, as one cloud provider may not provide all the required services.

Pure co-location players are outpacing players offering both cloud and co-location services
Y-O-Y growth of revenue
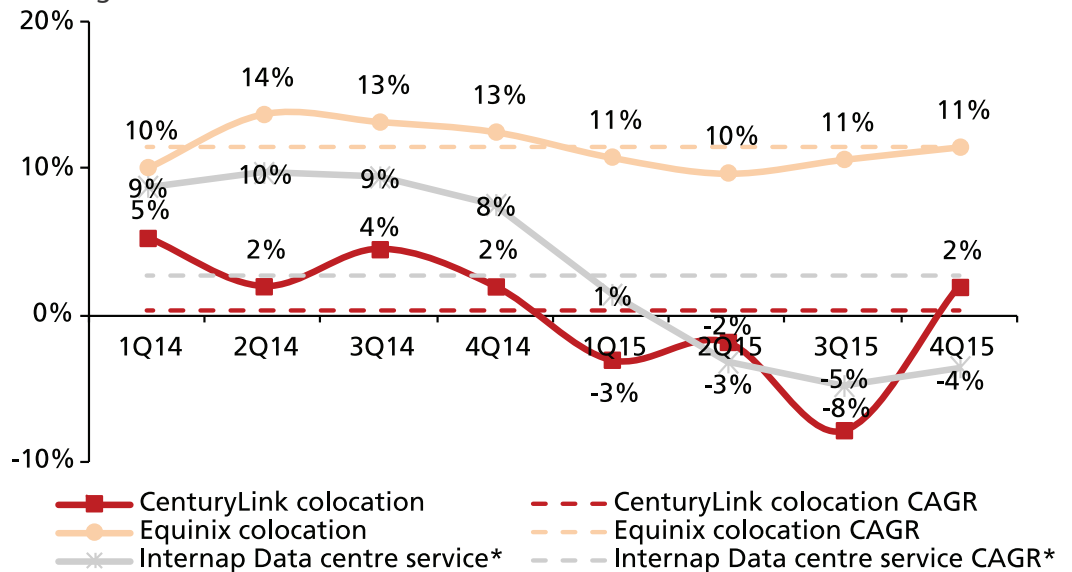
*Adjusted for acquisitions
Source: Companies, DBS Bank

We recommend telecom operators in Asia to separate their co-location and private-cloud businesses. US telcos like CenturyLink, AT&T, and Verizon are reported to be exploring leaving the data-centre business entirely. In our view, there are three key concerns for telcos. Firstly, running a co-location business often conflicts with their private-cloud business as many co-location clients want access to the public-cloud services while telcos continue to promote their own private-cloud services. Secondly, running a data-centre business is expensive and telcos are often committed to paying out high dividends to their shareholders. Spinning off the data-centre business may help conserve some cash. Thirdly, large enterprises prefer to use one data centre globally and many telcos are disadvantaged due to their limited geographical presence. ✖

Public Cloud Has Reached a Tipping Point Globally

The adoption of cloud services reached the mid-teens in 2015, marking a tipping point for further acceleration, in our view. Adoption of smartphones and first-generation Enterprise Resource Planning (ERP) systems are interesting case studies of this trend.

Public-cloud adoption has approached the mid-teens

Rate of adoption

— First Gen ERP   — Smartphone Penetration   — Workloads in Public Cloud
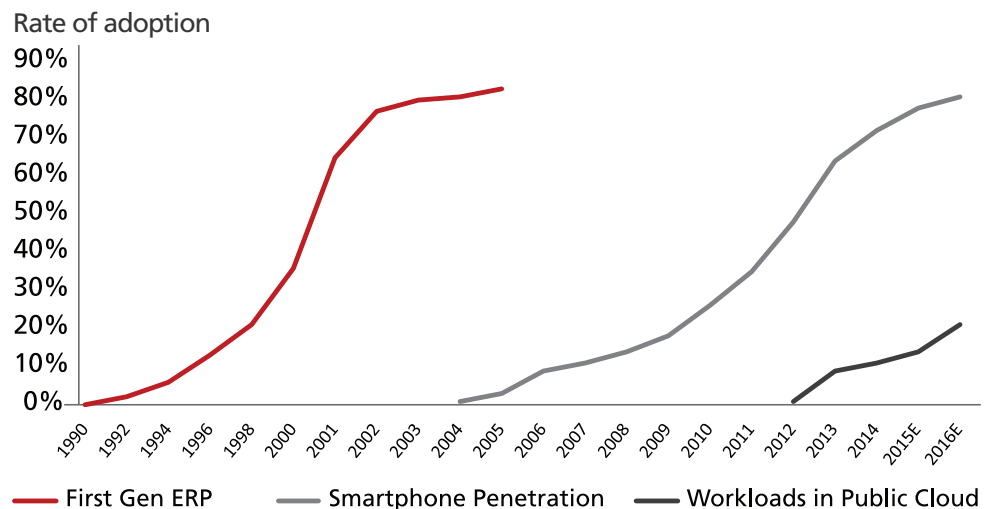
Sources: IDC, GSMA, DBS Bank

In the case of smartphones, network speed was the key barrier, which was resolved when adoption rate hit the mid-teen mark in 2010. ERP systems came into play in the early 1990s and their adoption rate was still languishing at less than 5% in 1993. The turning point was in late 1994 when clear industry leaders such as SAP emerged; and adoption of ERP systems skyrocketed in the late 1990s. For cloud, security was a key barrier, but that appears to have been resolved.

Understanding the different cloud services available

Public Cloud	Delivers the service from outside the corporate network and serves multiple clients with the same infrastructure. The biggest benefit of public cloud is the fact that customers pay only for what they use. It also offers agility and cost savings from economies of scale. AWS and Microsoft are leading vendors.
Private Cloud	Delivers the service over the corporate network and serves a single client. It is considered more secure. Hewlett Packard and IBM are leading vendors.
Hybrid Cloud	Delivers a mix of public- and private-cloud services.

Source: DBS Bank

Everett M. Rogers, in his theory of "Diffusion of Innovation" published in 1962, proposed that adopters of any new innovation can be categorised as Innovators (2.5%), Early Adopters (13.5%), Early Majority (34%), Late Majority (34%), and Laggards (16%) based on the bell curve. It essentially shows a cumulative percentage of adopters over time – slow at the start, more rapid as adoption increases, then levelling off until only a small percentage of laggards has not adopted. Public cloud saw a sharp acceleration in 2015, signalling its entry to the 'rapid growth' phase of the curve.

Public Cloud Is Evolving Into a Three-Player Market

AWS, the No. 1 cloud provider globally, witnessed its growth rate doubling to 70% and annual income jumping to US$7.9 billion in 2015. Microsoft Corp's Azure evolved into the clear No. 2 public-cloud platform, leaving Google Cloud Platform at a distant No. 3. Microsoft's cloud offerings appeal to a large portion of enterprises using its on-premises software, while Google has little experience with enterprise sales, in our view.

In 2015, leading cloud vendors such as Hewlett Packard and Rackspace gave up their fight in the public-cloud space in favour of AWS, Microsoft Azure, and Google. However, in order to benefit from the growth of the segment, Hewlett Packard and Rackspace turned themselves into managed service providers for AWS and Azure's cloud services. Hewlett Packard and Rackspace will also continue to host private-cloud services for enterprises. Another large player, IBM, has not given up its public-cloud ambitions. But in our opinion, IBM may not have sufficient scale, compared to the three biggest vendors.

Public cloud saw a sharp acceleration in 2015, signalling its entry to the 'rapid growth' phase of the curve

Public cloud is seeing growth across all segments

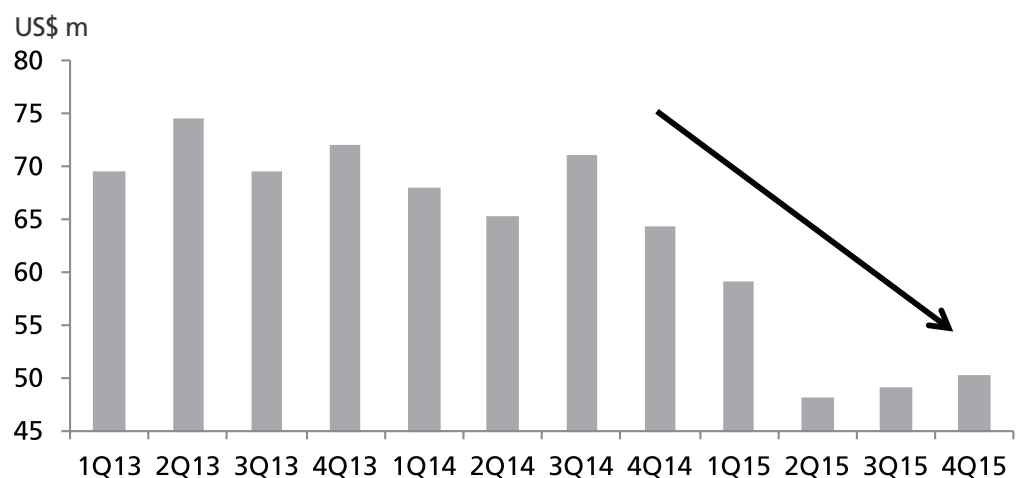Public-cloud growth
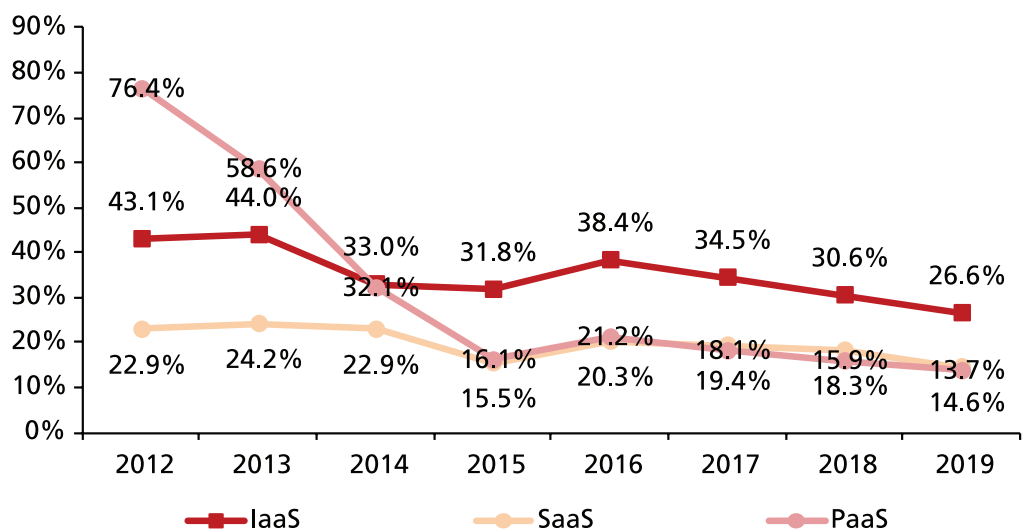
Source: Gartner

What is driving this explosion? Besides cost savings from migrating to cloud, we believe there are three key factors.

1 **Security is less of a concern now.** Many cloud adopters claim that the scale and sophistication of AWS make its services even more secure than on-premise deployment. Providers are also addressing the security challenge by promising to locate new data centres in various national borders to mitigate cyber-security risks.

2 **Introduction of services for large enterprises.** This is a big change from the initial focus on SMEs. AWS doubled the number of products it launched in 2015, increasing its offerings for large enterprises, putting it a couple of years ahead of its rivals.

3 **A supportive ecosystem.** There are more than 900 managed service providers (MSPs) that support enterprises in the adoption of AWS' cloud. Out of these, 40 MSPs have been verified to be using AWS' best practices by a third-party auditor. Microsoft Azure has an emerging MSP ecosystem while Google lags its peers on this front.
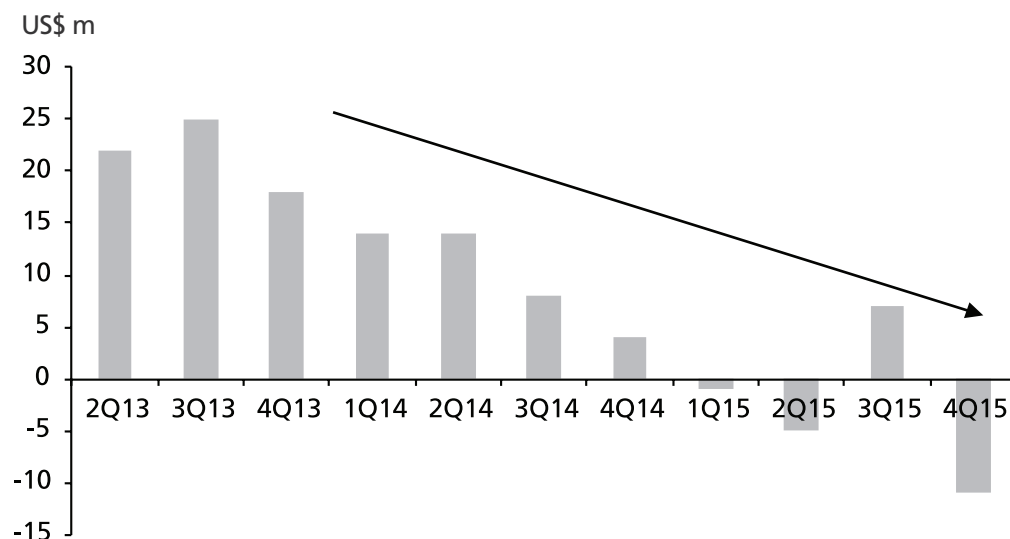
Private-Cloud Growth Is Slowing Down

Rackspace, a leading private-cloud host in the US, said it expects revenue growth of 6-10% in 2016 versus the 11% and 17% growth it registered in 2015 and 2014, respectively. This is also much slower than the projected compound annual growth rate (CAGR) of 32% over 2015-19 for public cloud (infrastructure as a service or IaaS) by Gartner[1]. Rackspace believes that in 5-7 years, most new applications will be hosted on public cloud, with 20-30% of the market on private-cloud infrastructure.

Rackspace's top-line growth slowed down in 2015

Source: Company

CenturyLink's cloud and managed hosting revenue growth has slowed down

US$ m

[Bar chart showing revenue growth values from 2Q13 to 4Q15, with a downward arrow indicating declining trend. Values: 2Q13 ≈ 22, 3Q13 ≈ 25, 4Q13 ≈ 18, 1Q14 ≈ 14, 2Q14 ≈ 14, 3Q14 ≈ 8, 4Q14 ≈ 4, 1Q15 ≈ -1, 2Q15 ≈ -4, 3Q15 ≈ 7, 4Q15 ≈ -11. Y-axis from -15 to 30.]

Source: Company

According to Wikibon[2], the private-cloud market was worth less than US$7 billion in 2015, smaller than AWS, whose 2015 revenue topped US$7.9 billion. And, it's much smaller than the overall public-cloud market. An area that is seeing growth is hybrid cloud. Many companies that have existing private-cloud infrastructure have been using public cloud for newer applications and projects. Enterprises like the cost savings and flexibility of public-cloud services, but they continue to maintain their most sensitive operations on their private-cloud platforms.

Private-cloud players are adopting third-party cloud management services to prepare for hybrid cloud. Having foreseen slower growth in private cloud, cloud-service providers are now trying to benefit from the growth in managed third-party cloud services. Companies such as Datapipe have been providing managed services for AWS since 2010. Datapipe bought AWS migration firm DualSpark in 2015 to improve their AWS offerings. Hewlett Packard Enterprises and Rackspace, which used to compete with AWS and Azure in the public-cloud space, started to provide AWS and Azure support in 2015. Customers that already use private-cloud services from these players can also procure public-cloud services by simply expanding their existing service agreements.

Rackspace claims that managed services for public cloud contributed similar margins (at earnings before interest and tax, or EBIT level) as those from hosting private clouds. Therefore, with substantially lower capital spend on IT assets, private-cloud players should be able to improve both capital efficiency and free cash flows in the medium term. There are certain downsides to embracing third-party public cloud management services, in our view. Cloud players could see cannibalisation of legacy cloud business due to public-cloud services. However, private-cloud players may need to go through short-term pain to strengthen their position in the long term.

An area that is seeing growth is hybrid cloud

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Workloads on public cloud will increase at a CAGR of about 40% over the next four years, according to Cisco[3]. This is in comparison to just 8% in workloads seen in enterprise IT and private-cloud segments. Furthermore, despite the growth in workloads in enterprise IT and private cloud, the number of servers utilised by the segment is expected to shrink. The number of workloads a server can handle (i.e. workload density) is expected to increase by about 10% during the period, according to Cisco. Therefore, the overall installed base of servers in enterprise IT and private cloud, as well as investment in hardware, will shrink.

Servers in public cloud are growing; Enterprise and private-cloud servers are shrinking

Workload growth (Y-O-Y)
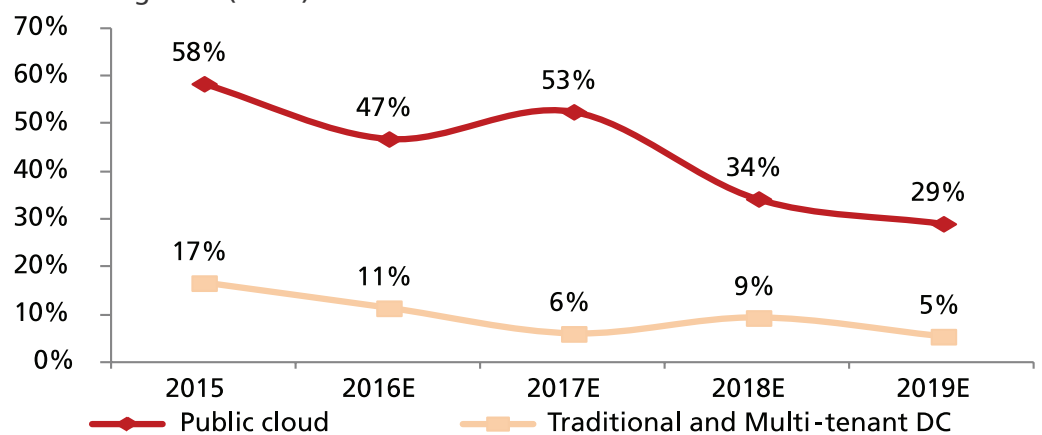
Source: Cisco, DBS Bank

Public-Cloud Adoption in Asia

After talking to various enterprises, we gathered that public-cloud adoption is limited in emerging Asia such as China and Indonesia where mainly SMEs are the key adopters. In developed Asia, public-cloud adoption is catching up with the US as global data-centre players like Equinix and NTT provide direct connections to global cloud providers like AWS and Azure. ✖

Evolution of public cloud: Asia is 1-2 years behind the US in public-cloud adoption
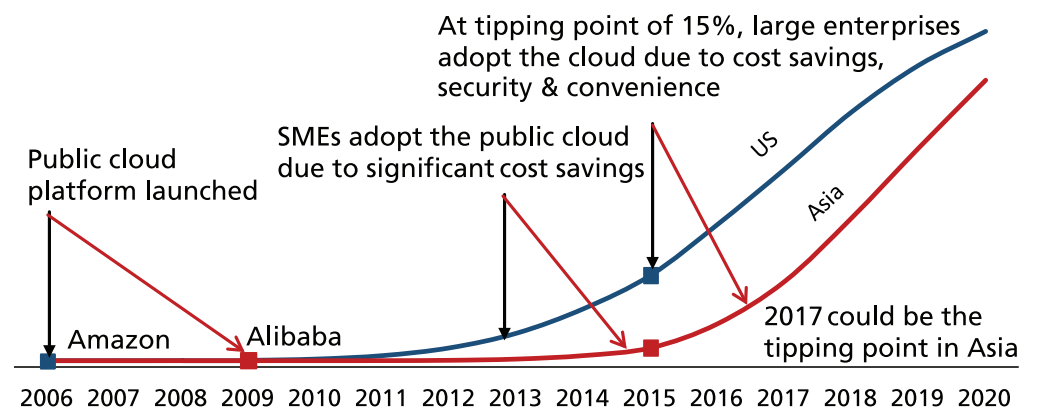
Source: DBS Bank

Trends Across the Data-Centre Market

With less than 25% of enterprise IT currently outsourced, we are still in the early innings of a multi-year transition cycle. While that transition mostly favours cloud computing as enterprises are looking for cheaper IT solutions, co-location providers will also benefit. Netflix, the online media-streaming giant, closed its final data centre in the US and moved all of its content to AWS cloud in 2015. This shows that the retail co-location business could see some adverse impact from cloud adoption.

Difference between retail co-location and wholesale co-location

Retail Co-location	• Lease individual racks and cages ranging from 500-5,000 square feet (sq ft) and power capacity below 500 kiloWatt (kW) • Equinix is the leader in this space
Wholesale Co-location	• Lease more than 5,000 sq ft and 500 kW capacity to one or a few clients • Contracts tend to be longer term • Cater to cloud providers, retail co-location companies, and corporations • Digital Realty Trust is the leader

Source: DBS Bank

Here are four key observations which we expect to continue beyond 2016:

1 Wholesale co-location to register superior growth to retail co-location business

We expect retail co-location to grow at a slower pace as more workloads shift to public-cloud providers that in turn will lease more space from wholesale co-location providers. According to Allied Market Research, the global wholesale co-location market is expected to register a higher CAGR of 13.7% over 2015-2020 versus 12.4% for the total co-location market. In 2014, the retail co-location market accounted for approximately two-thirds of the total market share as the per-square-foot rate for retail co-location was almost three times that for wholesale co-location.

The wholesale co-location business is less volatile than the retail co-location segment, with fewer clients to manage and longer-term contracts. Lease contracts typically range from 5-15 years for wholesale co-location and less than five years for retail co-location. However, wholesale co-location rates tend to be only 20-30% of retail co-location rates,

resulting in return on invested capital (ROIC) of 6-8% versus 12-18% for retail co-location. Due to lower ROIC, only specialised players focusing on wholesale co-location and those with deep pockets are able to add more capacity.

Wholesale co-location providers get lower ROIC than retail players but the business is less volatile and growth prospects are superior

ROIC in 2015
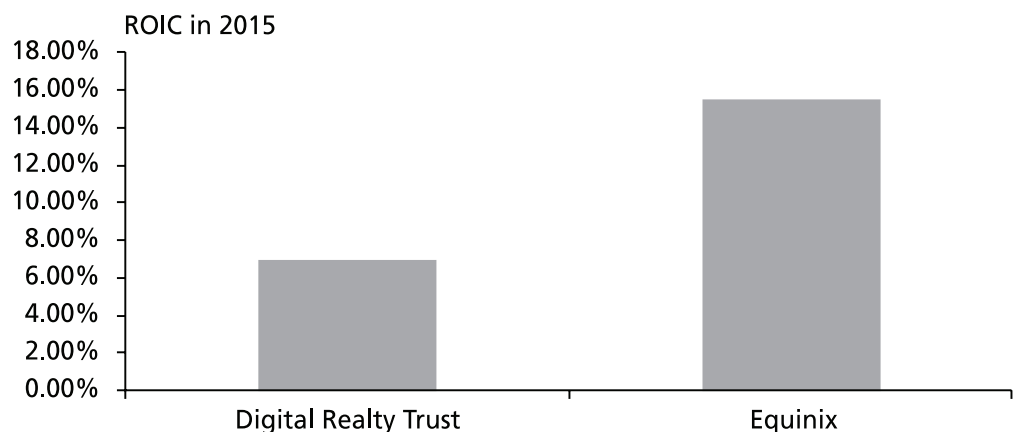
Source: Companies, DBS Bank

2 Integrated cloud and retail co-location players are affected adversely by public-cloud services of AWS and Azure

Enterprises like private connections to multiple public clouds simultaneously. Enterprises do not want to rely on the public internet for accessing public clouds. They want private connections to public clouds for security, performance, and cost reasons. Co-location providers should be able to connect enterprises to multiple cloud providers on-demand and simultaneously, as one cloud provider may not provide all the required services.

Conflict of interest at integrated players is resulting in weaker co-location businesses. Pure co-location players such as Equinix provide private connections to popular public-cloud services like AWS and Azure while integrated cloud and co-location players like CenturyLink and Internap continue to promote their own cloud services. As enterprises are reluctant to co-locate data centres without private connections to popular public-cloud services, integrated players are seeing lower utilisation levels.

Enterprises want private connections to public clouds for security, performance, and cost reasons

Pure co-location players have better utilisation than players offering both cloud and co-location services
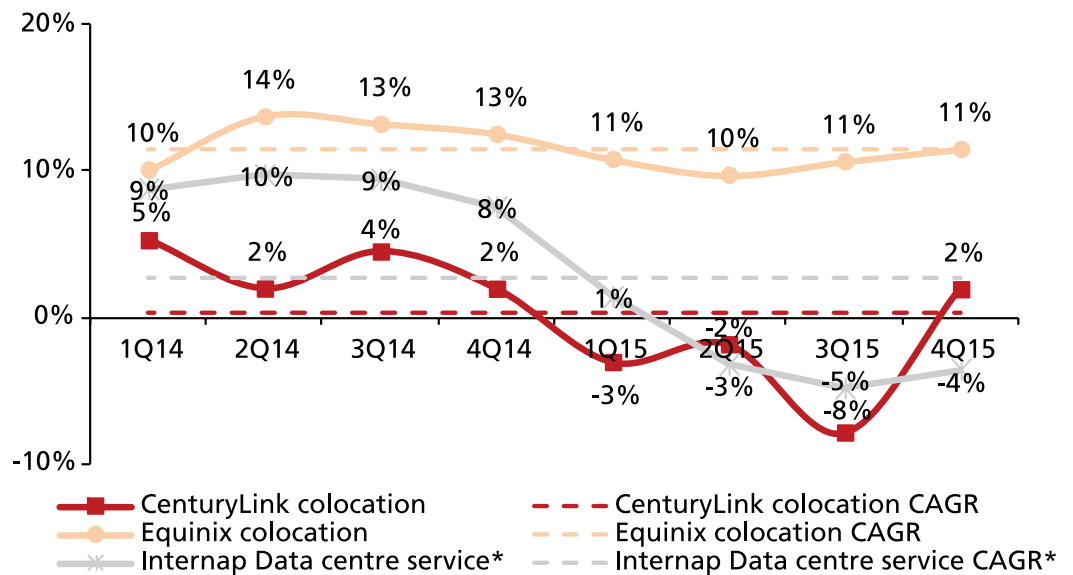
Data centre utilisation
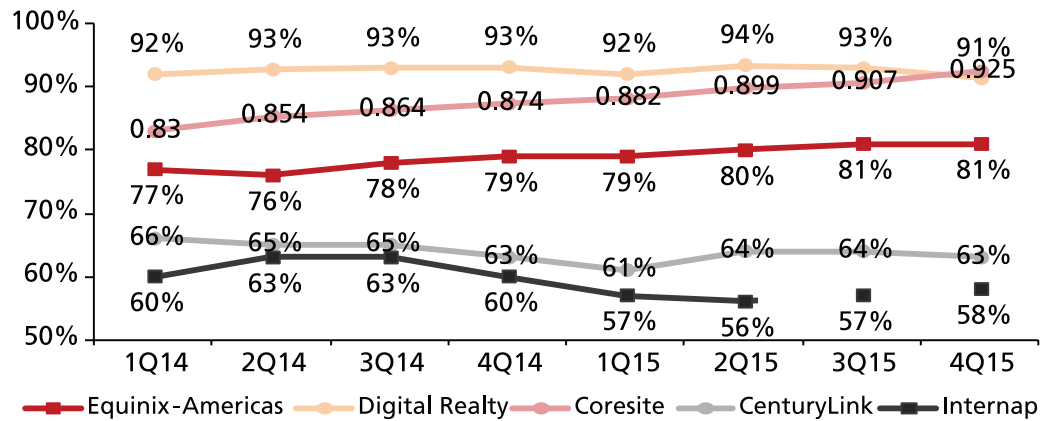
Source: Companies, DBS Bank

Pure co-location players are outpacing players offering both cloud and co-location services
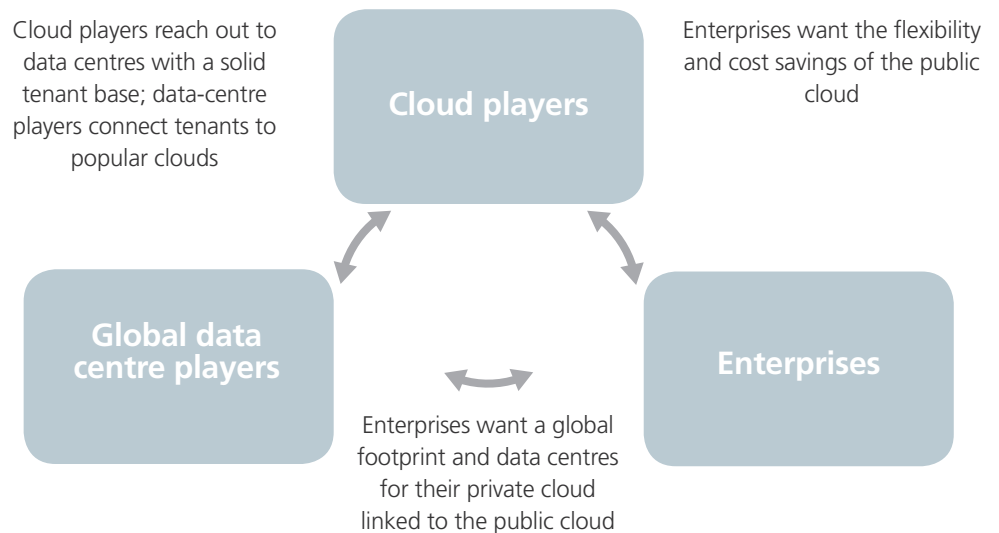
Y-O-Y growth of revenue

*Adjusted for acquisitions
Source: Companies, DBS Bank

Many global enterprises prefer to use one global co-location provider to serve various regions

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3 The scale advantage is getting even more pronounced in the co-location space

Global retail co-location players provide cloud players with a global footprint to expand their operations and easy access to a large number of enterprises that co-locate on these data centres. Many global enterprises prefer to use one global co-location provider to serve various regions. Global co-location players are benefitting from this virtuous loop through which cloud players and enterprise players benefit from one another's presence.

Virtuous loop for data-centre players with a global footprint

Cloud players reach out to data centres with a solid tenant base; data-centre players connect tenants to popular clouds

Cloud players

Enterprises want the flexibility and cost savings of the public cloud

Global data centre players

Enterprises

Enterprises want a global footprint and data centres for their private cloud linked to the public cloud

Source: DBS Bank

Co-location with public-cloud providers globally is a future-proof strategy for enterprises

950+ Network providers

450+ Cloud & SaaS providers
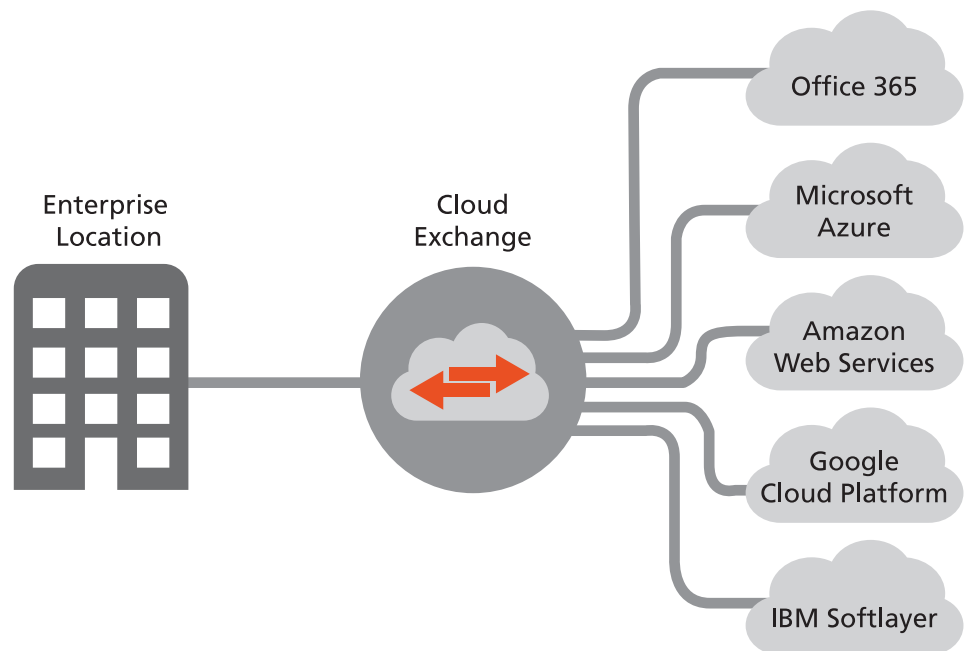
500+ IT services providers

110K+ Cross-connects

Source: Equinix

In fact, a big portion of revenue for data-centre players in the future will likely be coming from interconnection to cloud providers and data centres. Notably, US-based data centre player Telx's interconnection business contributed US$7 million in the 2015 December quarter while the remaining US$6 million came from space and power.

Large data-centre players can provide private connections to multiple cloud providers

Enterprise Location

Cloud Exchange

Office 365

Microsoft Azure

Amazon Web Services

Google Cloud Platform

IBM Softlayer

Source: Equinix

## 4 Telcos need to separate their co-location and cloud businesses to resolve any conflict of interest

In late 2015, CenturyLink indicated its willingness to exit from a part of their data-centre investments. A report by Reuters[4] in early January 2016 claimed Verizon is looking to sell its data-centre assets to raise US$2.5 billion. Similarly, AT&T has been exploring this option since 2015.

Telcos have been focusing on providing private-cloud services to their clients for which they can lease co-location space from third-party players on an "as needed" basis. However, running data centres often conflicts with their private-cloud businesses as many data-centre clients want access to public-cloud services. Besides, telcos are at a disadvantage when it comes to running data centres because of geographic limitations compared to global data-centre players. As a result, we are likely to see increasing divestments of data centres by telcos.

Data Centres in Asia

Data centre co-location sales growth in the US over 2013-15 can be used as a leading indicator for Asia, which is almost two years behind in public-cloud adoption. Equinix, the largest co-location player by revenue, grew its co-location revenue in the US by 7.8% CAGR over 2013-15, which we use as a proxy for the growth of the outsourced data-centre market in the US.
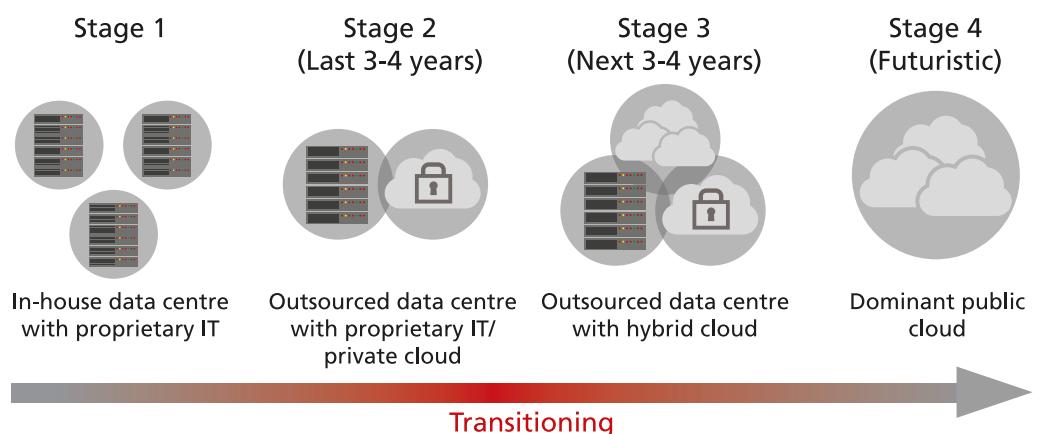
Equinix's co-location revenue (US$m) in the US is growing moderately
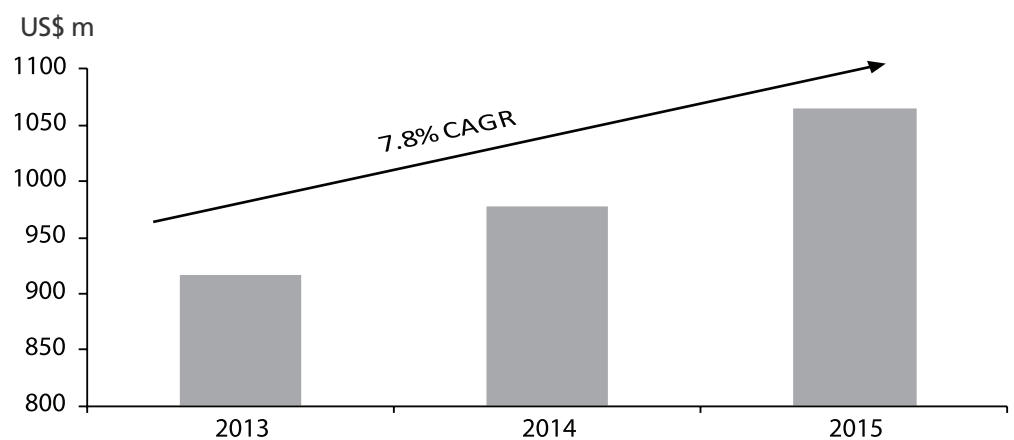
Source: Company

According to Frost & Sullivan[5], the Asia-Pacific data-centre space will grow at a CAGR of 7.8% from 2015-2020, with some 386 million sq ft of space in use by the end of 2020. However, most of the growth will be driven by large retail co-location players. Smaller retail co-location players may struggle to lease out their data centres in the wake of oversupply in the mature markets of Singapore, Malaysia, and Hong Kong. This may not improve in the long term due to rising adoption of public cloud, which favours large global co-location players.

Data-centre evolution: US is at Stage 3; Asia is at Stage 2 transitioning to Stage 3

Stage 1	Stage 2 (Last 3-4 years)	Stage 3 (Next 3-4 years)	Stage 4 (Futuristic)
In-house data centre with proprietary IT	Outsourced data centre with proprietary IT/ private cloud	Outsourced data centre with hybrid cloud	Dominant public cloud

Transitioning

Source: DBS Bank

Singapore: Oversupply Till 2018

Singapore's data-centre market is set to hit US$1.27 billion (S$1.82 billion) in 2016, up from US$936.2 million in 2014, according to Toronto-based Structure Research[6].

There is about 248.5 megawatts (MW) of supply across roughly 50 data centres in Singapore, of which 163MW, or 66%, has been utilised, according to a report by Cushman & Wakefield. At least seven new data centres will be completed in 2016, representing about 116 MW of IT power supply – or about 47% of total current stock by MW – said Structure Research.

These include I-Net's I-Net North, StarHub's MediaHub, Digital Realty's second data centre (opening at the start of 2017), Telin Singapore's Telin-3, and Singtel's DC West (opening in the 2016 September quarter). Average occupancy could fall in the face of new supply.

Key data-centre players in Singapore

Company	Country of Origin	Floor area
SingTel	Singapore	805,000+ sq ft
Equinix	USA	370,000+ sq ft
Global Switch	USA	270,000 sq ft
Keppel DC Trust	Singapore	146,462 sq ft
Digital Realty	USA	547,500 sq ft
Ascendas REIT	Singapore	889,206 sq ft
AIMS	Malaysia	45,000 sq ft

Source: Companies

Increased compliance requirements on data security from the financial industry, as well as exponential growth in data storage and management in a digital economy, should underpin medium-term growth. According to Cushman & Wakefield, this presents an ideal scenario for tenants seeking better data centres or migrating from ageing facilities as pricing will be competitive.

Malaysia: Oversupply May Lead to Consolidation

The Malaysian Data Centre Alliance (MDCA) estimates that there is a total of one million sq ft of data-centre space available in Malaysia across 17 players[7]. It is a well-known

fact that Malaysia has an oversupply of data-centre space, which has resulted in prices being depressed as players are forced to engage in a price war to attract customers. In fact, these issues have driven out some players, including Malaysia's first internet service provider (ISP) Jaring, which went into liquidation last year.

Another case in point is London AIM-listed CSF Group, the largest wholesale supplier of data-centre space in Malaysia with a total net floor area of 410,000 sq ft. Due to high rents and operational costs, the company was forced to negotiate with building owners to restructure rental rates in 2015. It will still operate at a loss even if its data centres achieve full occupancy.

Key data-centre players in Malaysia

Company	Country of Origin	Floor area
CSF	Malaysia	392,000 sq ft
VADS	Malaysia	89,017 sq ft
Keppel DC Trust	Singapore	48,680 sq ft
AIMS	Malaysia	73,000 sq ft

Source: Companies

Top players still doing well

AIMS, a subsidiary of Time dotCom, recorded healthy sales growth of 17% for its data-centre business in 2015. AIMS alluded that the oversupply of data-centre space is not a huge concern and it is still achieving decent utilisation rate of 75-80% for its data centres. This is because most of the smaller players in Malaysia mainly provide only co-location services, which put them in a weak position to compete against the top data-centre players due to lack of connectivity and value-added services. In fact, the top players in Malaysia such as VADS (owned by Telekom Malaysia), NTT MSC, and AIMS have been expanding their data-centre capacity to cater for growing demand, a testament that they are not worried about the oversupply situation.

Consolidation among Malaysian players has yet to pick up, with the only case so far being the acquisition of Jaring's assets by AIMS after the former went into liquidation in 2015. We see Tier-2 Malaysian players such as Strategq, Skali, Freenet, and Basis Bay as potential acquisition candidates as they have the technical capabilities to provide managed services but are lacking in connectivity compared to Tier-1 players.

Thailand: Supply Could Outstrip Demand in the Future

IDC[8] projects that by the end of 2017, data-centre space in Thailand will have grown over 180%, from 2015. Several local and regional players are taking advantage of investment policies by the government such as tax privileges and preferential electricity rates. However, the growth in demand will lag that of supply. As such, data-centre operators will have to adjust their operations and services to stay relevant in the market.

The excess supply is likely to generate intense competition for customers regardless of size, industry, and market focus. Existing operators will initially compete on price but will realise quickly that customers are willing to pay a premium for systems of engagement, insight, and action rather than maintain existing systems of record. However, local operators will essentially need to compete with a new standard for quality, security, and innovation set by aggressive international players in order to differentiate their services. The hybrid cloud model will continue to proliferate as it allows companies to shift to an automated, policy-based, services-oriented approach to IT delivery.

Indonesia: Favourable Demand-Supply Dynamics

According to Indonesia's General Directorate of Applied Informatics, the data-centre market in the country will grow at 20% CAGR in financial years 2015-2017 from 2014's 4.4 trillion Indonesian rupiah (US$338.5 million). Indonesian laws mandating financial organisations keep financial data within the country have served to increase domestic demand for data centres. Banking, financial services, and insurance will continue to be the biggest spender on information, communications and technology (ICT) services, while manufacturing and transportation will show steady growth with respect to adoption of ICT services. Concerns around security and resiliency are also expected to drive government demand for data-connectivity services especially for disaster recovery, according to Frost & Sullivan.

Supply growth depends on infrastructure development. The Indonesian data-centre industry is still in its infancy, with 60% of centres located in the Greater Jakarta area. The General Directorate of Applied Informatics believes that the current expansion can meet demand until 2017.

The largest player now is Telkomsigma, a subsidiary of Telkom Indonesia. It has 100 cloud-computerised clients, ranging from SMEs to large corporations.

Key challenges and barriers of entry include connectivity (infrastructure), reliability (track record), sustainability (execution), and affordability (competitive pricing). Cloud services may still be too expensive for Indonesian companies and the infrastructure is not yet stable enough to support reliable cloud services. So far, there has not been any significant

issue surrounding regulation as the Indonesian government sees the data-centre industry as part of the ICT ecosystem. For example, there is no hurdle for foreign investors to invest in the industry, as seen in NTT Communications' acquisition of Cyber CSF.

Key data-centre players in Indonesia

Company	Country of Origin	Floor area
Telkom Sigma	Indonesia	132,396 sq ft
NTT	Japan	82,882+ sq ft
Equinix	USA	18,500+ sq ft
Nex	Indonesia	19,375 sq ft
Aplikasi Lintasarta	Indonesia	8,038 sq ft

Source: Companies

Hong Kong: Oversupply in the Near Term

Hong Kong is one of the key regional data-centre hubs in Asia. The telecommunication and power supply infrastructure in Hong Kong is advanced and reliable, and able to support the operation of data centres. In Hong Kong, the total gross floor area (GFA) of data centres was 4.95 million square feet as at December 2015, according to the Innovation and Technology Bureau of Hong Kong[9]. The major local players are PCCW, Hutchison Telecom, and Sunevision; while the major international players are NTT and Equinix. Frost & Sullivan forecast that Hong Kong's data-centre market would grow at a CAGR of 15.3%, reaching US$803 million in 2019[10]. According to Gartner, banking and financial services institutions, as well as the communications, government, and transportation sectors were estimated to account for 40%, 22%, 9%, and 7% of the total spending on data centres in 2015, respectively[11].

The Hong Kong government encourages the development of data centres. It assigned three parcels of land in Tseung Kwan O, bigger than 1.06 million square feet in 2013 for the development of data centres. It also provides incentives for companies that want to retrofit and turn existing industrial buildings into data centres. The current planned pipeline of projects will bring total capacity to 7 million square feet in 2016-17. The expected surge in capacity is mainly due to the development of Tseung Kwan O. As the increase in supply may outgrow the increase in demand, there may be pricing pressure for

data-centre services in the next two years. However, it is not easy to find suitable sites to build data centres. There could be a shortage after 2017, depending on the government's policies.

Key data-centre players in Hong Kong

Company	Country of Origin	Floor area
Equinix	USA	226,000 sq ft
NTT	Japan	965,000 sq ft
PCCW Solutions	Hong Kong	430,000+ sq ft
iAdvantage	China	770,000 sq ft
IBM	USA	Not Available
China Unicom	China	Not Available

Source: Companies

Data centre spending breakdown by industry in Hong Kong
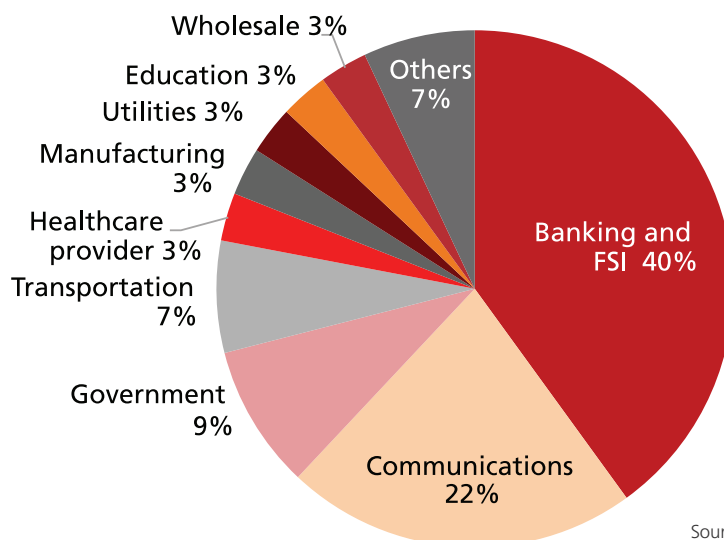
Source: Gartner

China: Strong Momentum

China's data-centre market grew from 7.3 billion Chinese yuan in 2009 to 37.2 billion yuan in 2014, representing a CAGR of 39% according to China IDC Quan[12]. It is estimated

to grow at a CAGR of 35% to 91.9 billion yuan from 2015-17. The major players in China include telcos, namely China Telecom and China Unicom, as well as GDS and 21 Vianet. Telcos leverage their communication networks to set up data centres to provide enterprises with more value-added services. Internet companies have also been extending their businesses to include cloud services.

The data-centre market in China

RMB bn

DC Market in China (LHS)   YoY growth (RHS)
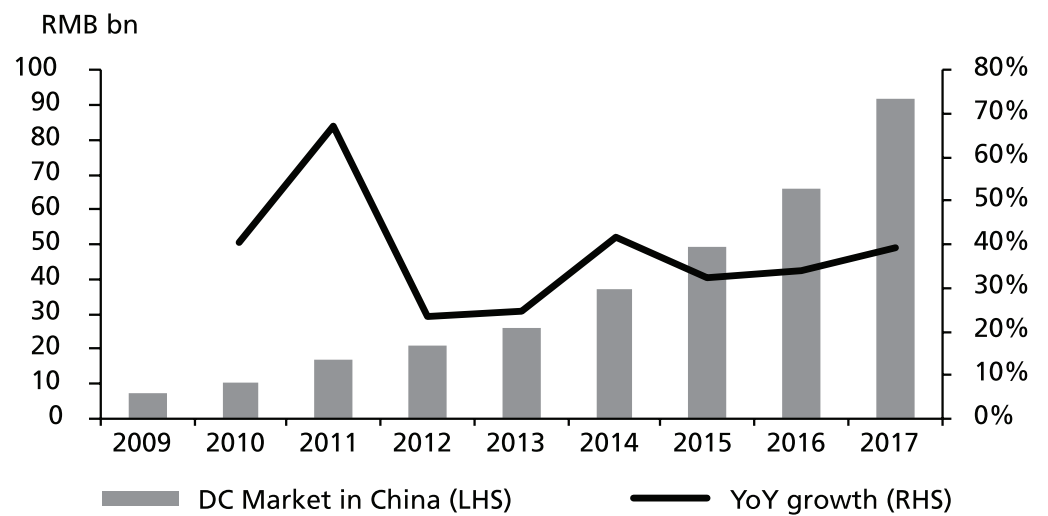
Source: China IDC Quan

Often, they own their data centres. Aliyun, which is the largest local cloud player in China, has data centres in Hangzhou, Qingdao, Beijing, Shenzhen, and Hong Kong. Tencent has Q-Cloud, which targets the online game market, supporting game publishers. Its data centres are located in Tianjin, Shanghai, and Guangzhou. Local cloud players also face competition from foreign players such as Amazon's AWS Cloud. ⊠

Data Centre M&A Activity in 2015

Timeline	Acquirer	Target	Description of the Target Entity	Value in US$m	EV/EBITDA*
February	Zayo Group	Latisys Holdings	US-based co-location provider specalising in IaaS and managed services	675	13.5
March	NTT Communications	E-Shelter	German-based data centre operator with over 700,000 square footage in Europe	832	22
May	Equinix Inc.	Telecity Group	UK-based co-location and managed services provider with over 30 data centres in Europe	3,800	15.5
June	Quality Technology Services	Carpathia	US-based data centre operator with substantial exposure to US federal agencies	326	9.6
July	CyrusOne	Cervalis	New York-based privately held data-centre operator with a speciality in catering to the financial services industry	400	10.5**
October	TierPoint	Windstream Hosted Solutions (WHS)	Data centre business of US-based Windstream Communications, WHS provides retail co-location, managed hosting and cloud services	575	14.1
October	Digital Realty Trust	Telx Group	US-based retail co-location and interconnection solutions provider with 21 data centres in the US	1,886	16.3

* - Trailing Twelve months EBITDA
** - Offer price to Annualized Latest Quarter EBITDA
Sources : North American Data Centers Newsletter, DBS Bank

Merger and acquisition (M&A) deals tend to favour bigger players. Data centre M&As in 2015 had a broad range of valuation from ten to 22 times enterprise value/EBITDA. Deals involving smaller players such as Carpathia and Cervalis carried lower valuations than larger deals like Equinix's acquisition of Telecity or Digital Realty's acquisition of Telx. However, some smaller deals also commanded higher valuations due to the strategic importance of the assets to the buyer. For example, NTT Communications paid 22 times EV/EBITDA for E-shelter, the highest on our list. This deal made NTT the third-largest data centre operator in Europe and allowed NTT to cater to the rising demand for data centres in the region. ✖

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Top Data-Centre Players Globally

Data centre	Listed Exchange/ Ownership	No. of Data centres	Estimated total capacity in Square Feet	Presence in				Services on offer				FY 15 Data Centre revenues (US$m)
				USA	EMEA	APAC	Latin America	Retail	Whole sale*	Managed Services	Cloud	
Digital Realty	NASDAQ	140	22,894,255	✗	✗	✗		✗	✗	✗		1,763
Equinix**	NASDAQ	112	12,000,000	✗	✗	✗	✗	✗		✗		2,725
Level 3 Comms ***	NYSE	20	8,000,000	✗	✗		✗	✗	✗	✗		605
Telehouse	Owned by KDDI group	48	4,000,000	✗	✗	✗	✗	✗				-
Verizon	NYSE	48	3,600,000	✗	✗	✗	✗	✗	✗	✗	✗	-
Global Switch	Privately Held	10	3,200,000		✗	✗			✗			-
AT&T	NYSE	38	2,600,000	✗	✗	✗		✗	✗	✗	✗	-
NTT	NYSE	140	1,900,000	✗	✗	✗	✗	✗	✗	✗	✗	-
CoreSite	NYSE	17	1,659,816	✗				✗	✗			325
CenturyLink	NYSE	59	1,580,000	✗	✗	✗		✗	✗	✗	✗	1,316
CyrusONE	NASDAQ	32	1,573,510	✗	✗	✗		✗	✗			399
Dupont Fabros Tech	NYSE	12	1,503,000	✗					✗			452
ViaWest	Owned by Shaw Telecom	29	1,119,407	✗				✗	✗			-
Quality Technology Services	NYSE	24	1,118,506	✗	✗	✗		✗	✗	✗		311
InterXion	NYSE	41	1,090,000		✗			✗				435
Keppel DC REIT	SGX	9	597,900		✗	✗			✗			80
InterNAP	NASDAQ	15	445,000	✗	✗	✗		✗		✗	✗	236
Peak 10	Privately Held	27	350,000	✗				✗		✗	✗	-
365 Data Centers	Privately Held	14	158,198	✗				✗				-
NaviSite	Owned by Time Warner Cable	9	150,000	✗	✗			✗	✗	✗	✗	-
CentriLogic	Privately Held	10	150,000	✗	✗	✗		✗		✗	✗	-

* Trailing 12-month EBITDA
** Offer price to Annualised Latest Quarter EBITDA
*** Estimated capacity includes leased data centre space
Sources : North American Data Centers Newsletter, DBS Bank

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