

FROST & SULLIVAN

Frost Industry Quotient (IQ):  
Asia-Pacific Unified Communications-  
as-a-Service Providers, 2014

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**1. Market Definition and Scope**

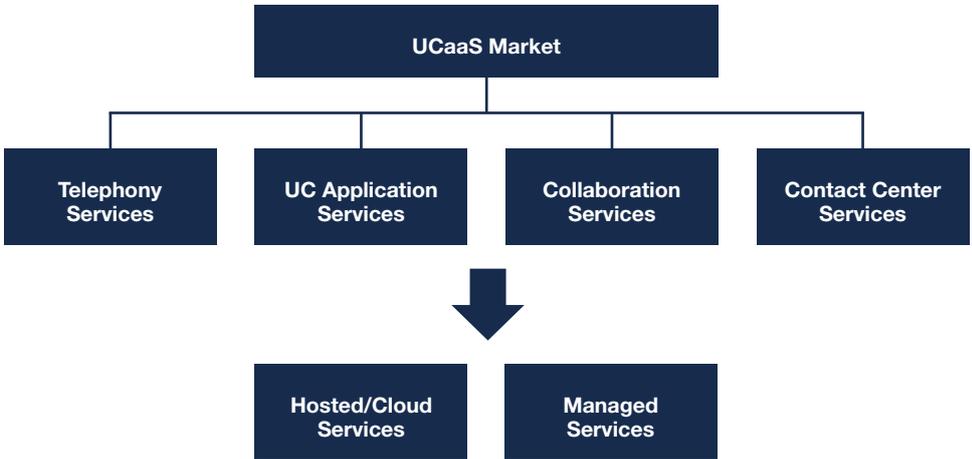
Frost & Sullivan defines the Unified Communications-as-a-Service (UCaaS) market as an integrated communications environment that combines/unifies voice, video, and text communications, delivered through hosted, cloud, and managed services.

Telephony services, UC application services, collaboration services, and contact center services are the major components for the Asia-Pacific UCaaS market.

The scope of this research study only covers services delivered through hosted/cloud and managed platforms on a subscription basis. Premise-based deployments are not included.

Revenue is calculated based on the end-user price, which is the actual price paid by customers for the service.

**Figure 1: Unified Communications-as-a-Service (UCaaS) Market Market Segmentation**



Source: Frost & Sullivan analysis

The Hosted/Cloud Services covered by this Frost IQ (FIQ) report includes:

- **Hosted Telephony Services**

Centrex: Refers to telephony services offered by a provider from the local central switching office which typically uses a Class Five switch. The service identifies the groups that can be billed together at a fixed charge instead of charging for individual calls made within the same group.

Internet Protocol Centrex (IP Centrex): Similar to Centrex, IP Centrex is a hosted service based on a multi-tenant infrastructure that can be used to serve multiple customers simultaneously, where a service provider uses a soft switch and an application server.

Hosted IP Private Branch Exchange (PBX): Similar to IP Centrex, hosted IP PBX services offer a scalable PBX that is hosted by the service provider. Offering telephony and UC features, this carrier-class PBX can be delivered via single-tenant or multi-tenant platforms.

- **Collaboration services** include audio conferencing services, video conferencing services, web conferencing services and other services. Conferencing services facilitate enterprise-grade two-way interactive communication between multiple parties through audio, video, or web channels that are hosted by a third-party service provider.

The services run either on stand-alone platforms or are integrated with enterprise communications tools such as instant messaging (IM)/presence, email, voice over IP (VoIP), and desktop productivity software.

- **UC application services** aim to integrate applications such as IM/presence, document sharing, white board, and hosted email into a single hosted/cloud platform. Hosted email services are delivered through the cloud via a web browser or an email client, where the email server system is hosted by a service provider.

A **hosted/cloud contact center service** is a network-based service where the service provider hosts a contact center technology platform and provisions contact center applications to customers. The customer pays a usage-based fee for activating certain number of hosted contact center seats via hosted/cloud platforms. Typically, the pricing is on a per-agent-per-month or per-minute or per-interaction basis.

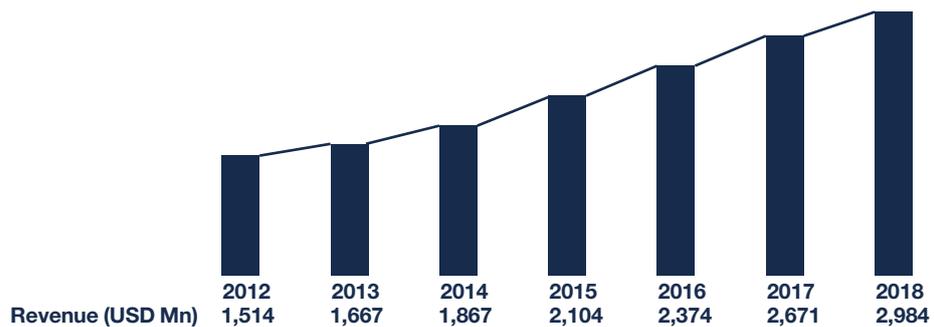
- **Managed services** refer to the provision of integrated services including the maintenance, support, operations management services for on-premise solutions, such as telephony systems and UC applications.

## 2. Market Assessment

### 2.1 Market Size and Forecasts

The UCaaS market is growing dramatically in the Asia-Pacific region. Frost & Sullivan estimates that the total spending on hosted/cloud/managed UC services was USD1.67 billion in 2013 and expects this figure to reach USD2.98 billion by 2018, charting a CAGR of 12.4 percent in the process. Growth is expected to be strongest in industry verticals with highly mobile workforces, such as in high-tech, professional services, logistics, travel, and hospitality sectors.

**Figure 2: Asia-Pacific UCaaS Market: Revenue Forecast, 2012-2018**



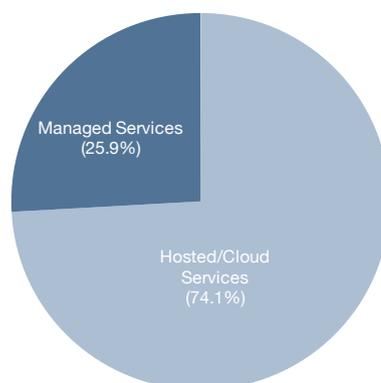
Source: Frost & Sullivan analysis

Key trends for the Asia-Pacific UCaaS market:

- The shift to IP with ubiquitous Internet-based connectivity, hosted PBX and VoIP is bringing both growth opportunities and challenges for the UCaaS market in the Asia-Pacific region. Hosted/cloud and managed services deliver a UC experience which is consistent in terms of balance of quality, scalability, and ease-of-use. However, the increasing adoption of IP into the business environment presents a potential threat to the traditional voice services offered on the PSTN platform.

- Cross-platform integration is becoming an investment focus for both telecom operators and pure-play service providers. Integration refers to a single user interface with feature-set such as mobile voice, IM/presence, and conferencing. Furthermore, users can get seamless access into an integrated platform across multiple devices including PCs, smartphones, or tablets. Cross-platform integration is expected to reduce costs and complexities, and offer greater flexibility for organizations.
- More and more Telcos are taking advantage of their existing infrastructure and technology to move beyond traditional voice and data to IT services. In 2013, a number of Telcos acquired IT services companies to drive growth in the sector and related network areas. Examples include Telstra’s acquisition of NSC, SingTel’s acquisition of National Computer System (NCS), and NTT Com’s acquisition of Arkadin.
- Emerging cloud service providers are leveraging over-the-top (OTT) services and IP-based communication applications to make in roads into the telecom space by offering alternatives to telecom services such as voice and SMS. The OTT alternatives are often offered at a low cost or for free, which poses a threat to telecom operators’ voice and SMS revenues.

**Figure 3: Asia Pacific UCaaS Market: Revenue Breakdown by Delivery Type, 2013**



Source: Frost & Sullivan analysis

Hosted/Cloud services comprise hosted telephony services, UC application services, collaboration services, and hosted/cloud contact center services. The segment accounted for more than 75 percent of the total UCaaS market in 2013, while the revenue contribution of managed services was close to 25 percent. Managed services witnessed strong revenue growth in markets such as China, India, and the Southeast Asia region.

The Video-as-a-Service (VaaS) is an emerging segment in the UCaaS market, with a number of start-up service providers entering the Asia-Pacific market in 2013. As market awareness for video collaboration services has grown significantly in recent years, VaaS is anticipated to be the most promising segment during the forecast period. Technology complexity and affordability are the major restraints for mass adoption of VaaS. In fact, VaaS providers have yet to launch VaaS that is affordable enough to appeal to the mass market.

## 2.2 Competitive Landscape

The market participants may be classified into three broad categories.

**Figure 4: Classification of Enterprise Mobile Collaboration Services Market Participants**

	Telecom Operators	Pure-play Service Providers	System Integrators
Strength	Advanced infrastructure and fixed-mobile convergence (FMC)	Expertise in segments such as conferencing services	Large customer base for on-premise deployment
Services	Full-fledged UCaaS portfolio	Stand-alone, telephony, audio, video, and web conferencing services	Managed services
Customer Focus	All levels	All levels	All levels

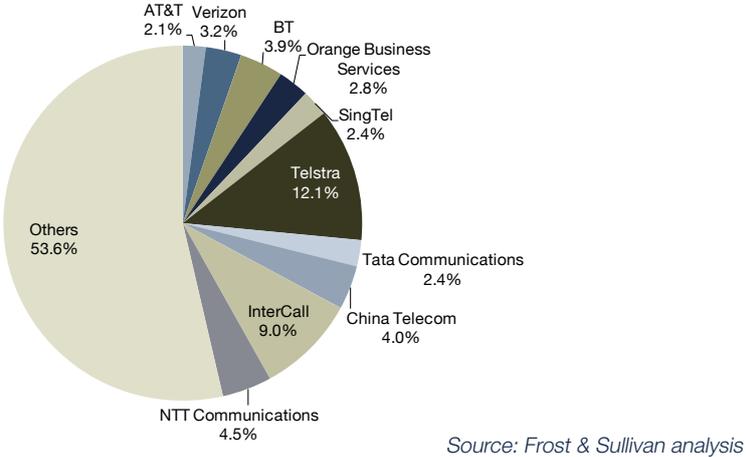
Source: Frost & Sullivan analysis

The evolution and convergence of ICT have blurred the lines of various communication platforms such as voice, video, and data. In light of this convergence, various participants in the UCaaS market, such as telecom operators, pure-play service providers or system integrators gradually find themselves on a collision course. There have been a number of mergers and acquisitions, and partnerships formalised in the three vendor groups. For instance, NTT Communications acquired Arkadin; and in the Australian market, Telstra established a partnership with Blue Jeans to provide VaaS while Arkadin partnered with Tata Communications to resell its video collaboration services, Jamvee™.

**2.3 Market Share**

Due to the broad service offerings in the industry, the Asia-Pacific UCaaS market is highly fragmented with a mix of global, regional, and local service providers.

**Figure 5: Asia-Pacific UCaaS Market: Market Share by Revenue, 2013**



### 3. Industry Trends

In this section, Frost & Sullivan examines the key elements that shape the Asia-Pacific UCaaS market.

#### 3.1 Regulatory

Regulations relating to telecommunication services are one of the key barriers that restrict global service providers from entering Asian countries such as India, China, Indonesia, and Vietnam. Foreign services providers are not allowed to host their own VoIP and cloud services in these countries. As a result, local telecom operators have a monopolistic advantage in the UCaaS market to some extent.

In recent years, however, many governments' regulatory bodies have started to extend telecom services licenses to qualified third-party IT service providers. The independent licenses allow service providers to leverage on the Telcos' infrastructure and provide services backed by high-level service level agreements (SLAs) to customers. More importantly, third-party IT service providers are able to provide value-added services in which UCaaS is one of the key services offered to enterprise customers. Frost & Sullivan anticipates the establishment of more joint ventures and strategic partnerships with local service providers during the forecast period, which is likely to increase the market presence of global/regional service providers in these tightly-regulated countries.

### 3.2 Economic

Asian economies witnessed slow growth rates in 2013 compared with 2012. Despite the growth potential of the Asia-Pacific, especially among emerging economies, the sluggishness experienced by some of the larger economies, such as China and India, has affected the overall growth momentum in the region.

The continued currency depreciation in Asian countries such as Japan, India, and Korea has also had a negative impact on the operational profits for global and regional enterprises. In 2013, an increasing number of service providers reported either flat growth or declines in their revenues.

Due to mounting business challenges, a growing number of enterprises are turning to advanced technologies to stay competitive in the market and streamlining their collaborative processes. Furthermore, enterprises' investments in ICT services are gradually shifting to an operational expenses (OPEX) model to reduce their investment outlay.

### 3.3 Technology

In the Asia-Pacific region, there are multiple software delivery models available, including on-premise, as well as private, hybrid, and public clouds. Hybrid and public cloud services have emerged as focus areas for service providers and vendors in recent years. Developed ICT markets such as Australia, Japan, and South Korea are overseeing complete rollouts of multiple delivery models for UC services. However, in developing countries, slow enterprise network bandwidth speeds and legacy IT infrastructure, continue to inhibit the migration to the cloud.

### 3.4 Competition

The Asia-Pacific UCaaS provider's landscape is relatively fragmented compared to the on-premise UC applications market. Telecommunication regulations in developing and emerging economies create a business advantage for home-grown telecom operators and service providers over global services providers. On the other hand, due to the wide range of solutions on offer, it requires a skilled workforce and established infrastructure in each sub-segment to support the sales of such services. Hence, it's fairly challenging for a single market participant to dominate the entire market.

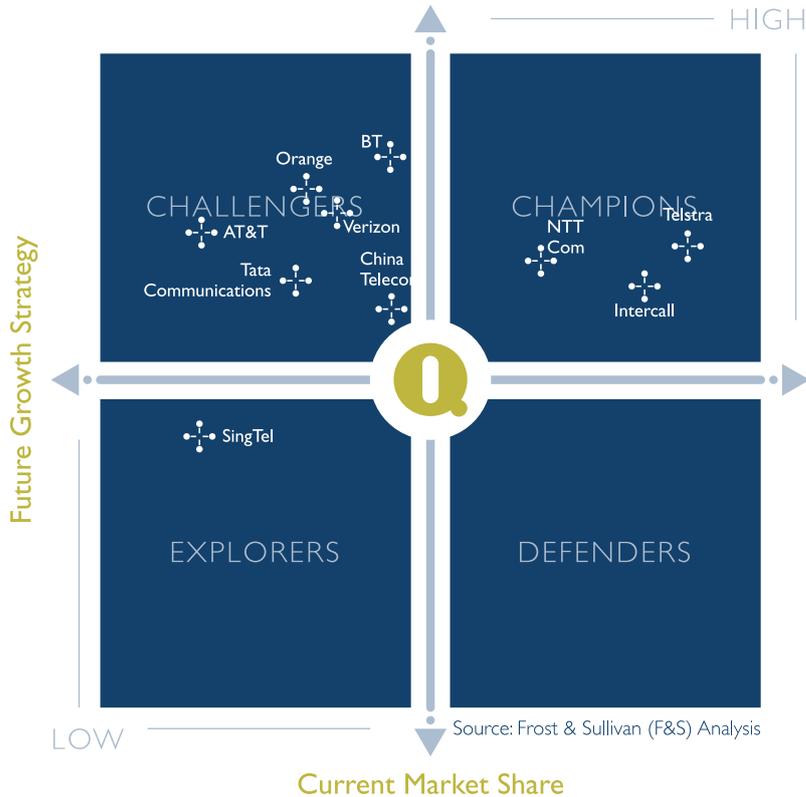
In recent years, local service providers have been prudent about investing in advanced UC infrastructures such as the Cisco Hosted Collaboration Solution (HCS) and Microsoft Lync. Furthermore, the development of mobile solutions for UC has been relatively slow opening up opportunities for other technology players. Likewise, OTT players have increased pressure on telecom operators' traditional voice and data services. For example, in 2013 China Telecom launched Jego, a hosted mobile voice service developed in-house which has been rapidly gaining customer mindshare.

**4. Frost IQ Matrix: Asia-Pacific Unified Communications-as-a-Service Providers, 2013**

Frost & Sullivan evaluated 10 major service providers in the Asia-Pacific region to identify their position on the Frost IQ matrix. The key criteria used to evaluate the position of service providers on the matrix are:

- Market Share
- Product/Service Strategy
- People and Skills Strategy
- Ecosystem Strategy
- Business Strategy

**Figure 6: Frost IQ Matrix: Asia-Pacific Unified Communications-as-a-Service Providers, 2013**



Source: Frost & Sullivan analysis

## 5. Profiles of Unified Communications-as-a-Service Providers

### 5.1 AT&T

In 2013, this global telecom operator actively expanded its presence in the Asia-Pacific UCaaS market, primarily in countries such as Singapore, Japan, and Hong Kong. Conferencing and collaboration services have emerged as key growth areas for the company. AT&T targets large multinational companies with its vast portfolio of bundled services, as well as advanced IP and networking solutions which include conferencing services. Its self-developed web conferencing services, AT&T Connect, also saw strong growth both in terms of customer awareness and adoption.

#### Strengths

AT&T is well-positioned to capture the growth opportunity in the global UCaaS market by creating a strong partnership with advanced platform providers such as Microsoft and Cisco. In the Asia-Pacific region, the company has shown strong capabilities in the areas of sophisticated network design and integration skills.

#### Challenges

The company has limited presence among the local accounts, in particular the SMB segment. This is mainly due to the lack of partnerships with local service providers, and weak direct sales and customer support in emerging countries.

## 5.2 BT

One of the most prominent global service providers in the Asia-Pacific region, BT has been shaping itself as a company that fully embraces the ongoing convergence in telecommunication and enterprise IT. In the UCaaS market segment, BT is actively scaling up its offerings from basic voice and data services to include professional services for on-premise UC solutions. As a result, BT is one of the few telecom operators that are capable of delivering hybrid UC solutions in the Asia-Pacific region.

### Strengths

BT has established strong brand recognition in the region, coupled with an equally strong local set-up in areas such as product development, field support as well as sales and marketing. Moreover, the capability of deploying hybrid UC solutions is one of the key differentiators for BT against its competitors. Its extensive range of technology partnerships with key UC vendors including Cisco, Microsoft, and Avaya have also enhanced the company's credentials in the enterprise segment.

### Challenges

In the Asia-Pacific region, BT has limited local accounts presence as most of its clients are multinational corporations.

## 5.3 China Telecom

This leading fixed line telecommunication provider in mainland China has made significant investments on collaboration services in recent years, including video bridging services, web conferencing services by partnering with Citrix Online, and self-developed audio conferencing services. BizNavigator is the service brand for its UCaaS portfolio with key UC functionalities such as telephony, IM/presence, email, audio and video conferencing.

**Strengths**

Strong branding recognition of BizNavigator among enterprise customers and government entities is one of the key competitive advantages China Telecom has leveraged on to grow its customer base. With a nationwide network infrastructure and full-suite of UCaaS solutions, China Telecom has built a large enterprise customer base in recent years, especially in Tier-1 provinces such as Guang Dong, Zhe Jiang, and Jiang Su.

**Challenges**

There is a limitation on the geographical scope of service operations and support. The full suite of UCaaS portfolio is only available in selected provinces and municipalities such as Guang Dong, Jiang Su, Zhe Jiang, Beijing, Shanghai, and Shen Zhen. It has yet to expand into Tier-2 provinces in the country.

**5.4 InterCall**

A global market leader in the audio conferencing services market, the company is shaping its future growth strategy in the UCaaS marketplace. In 2013, InterCall strengthened its partnerships with two major unified communications vendors, Microsoft and Cisco. It was one of the first to adopt Cisco HCS providers and offer it to prospective clients. In addition, the service provider is able to provide a hybrid PSTN-VoIP audio conferencing with Microsoft's Lync platform.

**Strengths**

The company has a large conferencing and collaboration customer base in key countries in the Asia-Pacific. InterCall is leveraging on this installed base by upselling its existing UCaaS offerings such as hosted telephony and Lync Online to its customers. In addition, it is able to provide deep integration between Cisco and Microsoft UCaaS platforms, which is important for premise-based UC customers to migrate into cloud services.

### Challenges

Branding in its UCaaS market is not fully established. Besides, not all components in its UCaaS portfolio have been launched or are available in the Asia-Pacific, leading to a narrow product line compared to its rivals.

## 5.5 NTT Communications

The largest telecom operator in Japan, NTT Com has established an extensive network infrastructure worldwide. Revenue from its UCaaS offerings is primarily from Japan, although growth from Singapore, Malaysia, China, and Australia has been very encouraging. The company continues to focus heavily on building its UCaaS business in the Asia-Pacific.

### Strengths

NTT Com provides a broad range of UCaaS services, including hosted telephony services, hosted email and hosted conferencing services. Its vast suite of services developed from multiple platforms provides international enterprises with greater flexibility and scalability, making them easier to deploy across multiple regions. Moreover, the company's global network infrastructure which spans across Japan, UK, and US ensures high-quality service delivery. In 2013, its cloud-based service portfolio, Arcstar, gained a high level of customer awareness and adoption in the Japanese market.

### Challenges

More than 90 percent of the company's revenue in the Asia-Pacific UCaaS market is contributed by the Japanese market. Most of NTT Com's clients outside Japan are Japanese-based multinational corporations. Due to the nature of its business and geographical footprint, NTT Com is highly focused on winning large-scale service engagements which means its value proposition is fairly limited when it comes to the SMB segment.

## 5.6 Orange Business Services

Orange Business Services (Orange) is enhancing the branding awareness of “Business Together as a Service” as its key UCaaS offering primarily focusing on MNCs and large enterprises. The service is available in 9 countries across the Asia-Pacific and is expected to launch in more countries in the region in 2014.

### Strengths

The company has managed to establish and retain a large customer base in Asia-Pacific in key UCaaS segments such as hosted email, IM/Presence, and audio and web conferencing services. In addition, Orange has strong expertise and capabilities in telephony and contact center managed services across the region. Orange is also one of the key service providers that are able to provide deep integration between Cisco and Microsoft UC solutions.

### Challenges

With its service capability and portfolio primarily focused on large enterprises, Orange faces a strong challenge winning enterprise customers in the SMB sector.

## 5.7 SingTel

A major presence in Southeast Asian countries, SingTel offers hosted and managed telephony and conferencing services as part of its UCaaS solutions. The iPhoneNet is SingTel's key offering in the UCaaS market. In early 2013, SingTel launched the mobile application version on both iOS and Android platforms to further improve customer experience of iPhoneNet.

### Strengths

SingTel has a strong customer base in the hosted telephony services segment in the ASEAN region which includes many large local and regional enterprises. Also, the company has been fairly successful in attracting customers in the managed services space since acquiring NCS. The mobile application, mobile i-PN, provides a user-friendly interface and rich feature set which helped SingTel to rapidly expand its customer base in the SMB segment in the second half of 2013.

### Challenges

The company has been conservative in investing in cloud UC platforms, which has limited its service offering and cloud services.

## 5.8 Tata Communications

In July 2013, Tata Communications launched Jamvee™, a cloud-based video conferencing service built on a carrier-class network that brings together video platforms, room systems, video and audio endpoints into an on-demand, pay-as-you-go service platform. The interconnections of Jamvee™ with Tier-1 carriers have been established, which is crucial for large enterprises to ensure there is a consistent level of user experience globally. The company is also in partnership with audio conferencing service provider Arkadin to resell Jamvee™ in the Australian market.

### Strengths

An established presence in the region, Tata Communications has achieved significant growth in the managed video and public room services segments. With Jamvee™, the company continues to expand its video collaboration capabilities into desktop and mobile devices, which cater to customers' growing demand for video usage while reducing costs.

### Challenges

Absence of an effective go-to-market strategy for Jamvee™, be it direct or indirect sales.

### 5.9 Telstra

With a full spectrum of UCaaS solutions targeting the Australian market, Telstra covers all service segments such as Telstra IP Telephony (TIPT) for hosted telephony services, 1 Touch and Visionnet V2 for video conferencing services, Microsoft Lync Online services, Cisco Jabber IM and voice services.

### Strengths

Telstra's position as a leading telecom operator with system integration capabilities has enabled it to secure a significant share of the overall IT services market in Australia. It has built strong partnerships with major vendors such as Cisco, Microsoft, Avaya, Verint Systems, and ShoreTel, giving it a comprehensive service portfolio to address the growing demand for hosted solutions. In addition, Telstra has partnerships with cloud-based vendors such as IPscope and Blue Jeans to capture future demand.

### Challenges

Growing competition in the cloud services market will be Telstra's biggest challenge in the next few years. Although Telstra is expanding its presence in Asia Pacific, its expansion is not as robust as some global and regional telecom operators and system integrators in the region.

## 5.10 Verizon

In 2012, Verizon launched its UCaaS services based on Cisco's HCS in North America. Although the service provider has exercised caution in terms of resource investment, the company's expansion plans in the Asia-Pacific region has been ongoing with a number of pilot deployments in the second half of 2013. Instant video services and IP audio conferencing services saw healthy growth in the Asia-Pacific region in 2013 primarily driven by existing customers from the Multi-Protocol Label Switching (MPLS) and security market segments.

### Strengths

The company provides advanced IP-based networking services across key markets such as Australia, Hong Kong, Singapore, and Japan, which provides it with a platform to cross-sell its UCaaS offerings. The integrated collaboration service offering including audio, video and web conferencing is one of the most established segments for Verizon in the Asia-Pacific.

### Challenges

Verizon lacks local resources to reach local enterprises and government entities in the Asia-Pacific region.

## 6. Profiles of Emerging Unified Communications-as-a-Service Provider

### 6.1 Google

Google Enterprise witnessed explosive growth both in terms of revenue and brand awareness in the enterprise segment in 2013. Google Enterprise has won significant paid enterprise customers adoption in Australia, India, Indonesia, Japan, Philippines, and Singapore. Google is enhancing the features and functionalities of Hangouts, Google Drive, and Google+ to become more business-focused.

#### Strengths

The integration of PSTN and HD video into Google Hangouts is tailored for businesses rather than consumers as it provides enterprises with cost-effective and scalable telephony, UC, and video experience. Google's go-to-market strategy was one of the critical factors for its accelerated growth in 2013. By refining its channel partner program with attractive margins to channel partners, Google has managed to expand its channel network in selected Asia-Pacific countries. The number of local telecom operators and Internet Service Providers that have joined Google's channel network are also increasing.

#### Challenges

Security and privacy remain key challenges for Google to stay ahead of major competitors, for e.g., Microsoft, especially in industry verticals such as banking and financial services. Feature-wise, Google enterprise lags behind in terms of advanced functionalities for its solutions which are critical for both internal and external communications of customers.

## 6.2 Microsoft

One of the fastest-growing vendors in the Asia-Pacific UCaaS market, Microsoft has achieved exponential growth in its cloud UC offerings, namely Office 365. In 2013, the installed base of Office 365 grew close to 200 percent in the Asia-Pacific region, while revenue grew over 150 percent. Office 365 is available most Asian countries with local language and currency support, which has accelerated its adoption among non-English speaking countries including Malaysia, Thailand, Indonesia, and Korea.

### Strengths

A key differentiator for Microsoft is that it supports a hybrid adoption model of on-premise software and online services across all applications including email, voice, and collaboration. Office 365 has attracted customers in public sector agencies, travel and hospitality sectors in countries such as Australia, New Zealand, Singapore, Korea, and Japan.

### Challenges

From a technology standpoint, Lync does not support co-existence between Lync Online and Lync Server using a single domain. For example, it is not possible to deploy IM and meetings in the cloud with voice on-premises for a single user. Therefore, it increases the complexity of hybrid adoption

## 7. Analyst Word

The Asia-Pacific UCaaS market is expected to grow from USD1.67 billion in 2013 to USD2.98 billion by 2018, at an estimated CAGR of 12.4 percent. Telephony services segment is the most widely adopted market, and it is likely to maintain its prominence in the future. Audio conferencing services segment is matured and expected to remain an important segment during the forecast period.

Telstra, NTT Com, and InterCall have been placed in the Champion quadrant based on service innovation and performance in 2013. Service providers in the Champion quadrant have delivered complete UCaaS solutions for more than a year, have a customer base of more than 1,000 subscribers, and have over 10,000 total end points in service. These companies offer comprehensive and integrated UCaaS solutions directly, or with well-defined partnerships, and address the full range of market needs, including the ability to service large accounts.

BT, Orange Business Services, AT&T, Verizon, Tata Communications and China Telecom are positioned in the Challenger quadrant. These companies have the potential to deliver a full suite of UCaaS solutions to both large and SMB customers, and are poised to move into the Champion quadrant. Among the companies listed in this quadrant, Tata Communications and China Telecom are Asian-based telecom operators with their core UCaaS functionalities only available for home-country enterprises. Frost & Sullivan anticipates that both companies will expand their UCaaS business to other Asian countries during the forecast period.

SingTel is placed in the Explorer quadrant. While the company is developing differentiated functionalities and services in core UCaaS areas, it has yet to establish its presence in the Southeast Asia market.

Microsoft and Google are positioned as emerging vendors in the Asia-Pacific UCaaS market. In 2013, both companies recorded exponential growth in Asia-Pacific in terms of revenue and customer base. With disruptive offerings such as the software-based PBX solutions and OTT services, the two market participants are expected to propel into the Challenger quadrant within the next 24 months.

## 8. Frost IQ Methodology

The focus of Frost IQ is to provide a balanced assessment of selected markets. These markets have been tracked rigorously by Frost & Sullivan's analysts for a period of time. Data collected, such as vendors' revenue, is scrutinized and forms part of the input for the Frost IQ matrix. Information on vendors has been collated from various sources and interviews with over 20 companies.

The study approach provides a mix of quantitative and qualitative assessments. The Frost IQ matrix has two major attributes: Market Share and Future Growth Strategy.

### 1. Market Share

Market share information is derived from Frost & Sullivan's research programs which include market trackers and syndicated research reports. Based on regular research studies conducted at quarterly, semi-annually or annual intervals, analysts build a strong revenue database of key participants in the market.

According to the Frost IQ Matrix, the X-axis measures the share on a percentage scale. The divide line on the matrix is set at 50 percent of the market share of the leading player in that market.

## 2. Growth Strategy

Frost & Sullivan considers 4 main components in the growth strategy assessment of Frost IQ. The guiding principle is that these components and their subcomponents follow the MECE (Mutually Exclusive and Comprehensively Exhaustive) test. The proposed components are as follows:

- Product/Service Strategy
- People and Skills Strategy
- Ecosystem Strategy
- Business Strategy

There is equal weightage to all the components with measurement on a 10-point scale. The dividing line on the Y-axis is at the mid-point, i.e., a weighted score of 5 on a 10-point scale. Analysts provide feedback on industry participants on the above parameters based on their expertise in the industry. Details of the sub-components are available, if required.

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